

**DOCKETED**

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<b>Project Title:</b>	Abengoa Mojave Compliance
<b>TN #:</b>	232301
<b>Document Title:</b>	COMPLIANCE7-03-00, Mojave Solar Project 2019 Annual Compliance Report (09-AFC-5C) 6
<b>Description:</b>	COMPLIANCE7-03-00, Mojave Solar Project 2019 Annual Compliance Report (09-AFC-5C) part 6
<b>Filer:</b>	Jose Manuel Bravo Romero
<b>Organization:</b>	Mojave Solar Project
<b>Submitter Role:</b>	Applicant
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# Mojave Solar LLC

42134 Harper Lake Road  
Hinkley, California 92347

Phone: 760 308 0400

## SUBMITTED ELECTRONICALLY

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**Subject:** 09-AFC-5C  
**Condition Number:** Compliance 7  
**Description:** Mojave Solar Project 2019 Annual Compliance Report  
**Submittal Number:** COMPLIANCE7-03-00  
**Distribution:** Keith Winstead, CEC; Kara Harris, US DOE; Dr. Sharma Shankar CDFW; Ray Bransfield, USFWS; Thomas Dietsch, USFWS

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February 27, 2020

Keith Winstead  
Compliance Project Manager  
California Energy Commission  
1516 Ninth Street, MS-2000  
Sacramento, CA 95814  
[keith.winstead@energy.ca.gov](mailto:keith.winstead@energy.ca.gov)

Dear Mr. Winstead,

The attached Mojave Solar Project 2019 Annual Compliance Report (09-AFC-5C) is submitted for your review as part of the ongoing reporting required by the California Energy Commission's Conditions of Certification for the Mojave Solar Project.

Sincerely,

Jose Manuel Bravo Romero  
Manager  
Compliance, Permitting, Quality and Environment Department  
ASI Operations LLC  
**Mojave Solar Project**  
42134 Harper Lake Rd  
Hinkley, CA 92347  
(303) 378-7302  
[jmanuel.bravo@atlanticayield.com](mailto:jmanuel.bravo@atlanticayield.com)

Attachment: 09-AFC-5C Mojave Solar Project 2019 Annual Compliance Report.

**09-AFC-5C Mojave Solar Project  
Annual Compliance Report  
2019 reporting period**



Prepared by:

**AS Industrial Operations LLC.**

for

**Mojave Solar LLC**

42134 Harper Lake Road  
Hinkley, California 92347

# Safety Data Sheet

## Diesel Low Sulfur (LSD) and Ultra Low Sulfur Diesel (ULSD)

**NFPA:** Flammability



### SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

<b>Product name</b>	: Diesel Low Sulfur (LSD) and Ultra Low Sulfur Diesel (ULSD)		
<b>Synonyms</b>	: CARB Diesel, 888100004478		
<b>MSDS Number</b>	888100004478	<b>Version</b>	2.31
<b>Product Use Description</b>			
<b>Company</b>	For: Tesoro Refining & Marketing Co. 19100 Ridgewood Parkway, San Antonio, TX 78259		
<b>Tesoro Call Center</b>	(877) 783-7676	<b>Chemtrec (Emergency Contact)</b>	(800) 424-9300

### SECTION 2. HAZARDS IDENTIFICATION

**Classifications**

- Flammable Liquid – Category 3
- Skin Irritation – Category 2
- Eye Irritation – Category 2B
- Aspiration Hazard – Category 1
- Carcinogenicity – Category 2
- Acute Toxicity - Inhalation – Category 4
- Chronic Aquatic Toxicity – Category 2

**Pictograms**



**Signal Word**

**Danger**

**Hazard Statements**

Flammable liquid and vapor.  
 May be fatal if swallowed and enters airways – do not siphon diesel by mouth.  
 Causes skin irritation.  
 Causes eye irritation.  
 Suspected of causing skin cancer if repeated and prolonged skin contact occurs.  
 Suspected of causing cancer in the respiratory system if repeated and prolonged over-exposure by inhalation occurs.  
 May cause damage to liver, kidneys and nervous system by repeated and prolonged inhalation.



Toxic if inhaled.  
 May cause drowsiness or dizziness by inhalation.  
 Toxic to aquatic life with long lasting effects.

**Precautionary statements****Prevention**

Obtain special instructions before use.  
 Do not handle until all safety precautions have been read and understood.  
 Keep away from heat, sparks, open flames, welding and hot surfaces.  
 No smoking.  
 Keep container tightly closed.  
 Ground and/or bond container and receiving equipment.  
 Use explosion-proof electrical equipment.  
 Use only non-sparking tools if tools are used in flammable atmosphere.  
 Take precautionary measures against static discharge.  
 Wear gloves, eye protection and face protection as needed to prevent skin and eye contact with liquid.  
 Wash hands or liquid-contacted skin thoroughly after handling.  
 Do not eat, drink or smoke when using this product.  
 Avoid breathing vapors or mists.  
 Use only outdoors or in a well-ventilated area.

**Response**

In case of fire: Use dry chemical, CO<sub>2</sub>, water spray or fire fighting foam to extinguish.  
 If swallowed: Immediately call a poison center, doctor, hospital emergency room, medical clinic or 911. Do NOT induce vomiting. Rinse mouth.  
 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.  
 If in eye: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 If skin or eye irritation persists, get medical attention.  
 If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call or doctor or emergency medical provider. See Section 4 and Section 11 for medical treatment information.

**Storage**

Store in a well ventilated place. Keep cool. Store locked up. Keep container tightly closed. Use only approved containers.

**Disposal**

Dispose of contents/containers to approved disposal site in accordance with local, regional, national, and/or international regulations.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Component	CAS-No.	Weight %
Fuels, diesel, No 2; Gasoil - unspecified	68476-34-6	100%
Nonane	111-84-2	0 - 5%
Naphthalene	91-20-3	0 - 1%

1,2,4-Trimethylbenzene	95-63-6	0 - 2%
Xylene	1330-20-7	0 - 2%
Sulfur	7704-34-9	15 ppm maximum

**SECTION 4. FIRST AID MEASURES**

<b>Inhalation</b>	: Move to fresh air. Give oxygen. If breathing is irregular or stopped, administer artificial respiration. Seek medical attention immediately.
<b>Skin contact</b>	: Take off all contaminated clothing immediately. Wash off immediately with soap and plenty of water. Wash contaminated clothing before re-use. If skin irritation persists, seek medical attention immediately.
<b>Eye contact</b>	: Remove contact lenses. Rinse thoroughly with plenty of water for at least 15 minutes. If symptoms persist, seek medical attention.
<b>Ingestion</b>	: Do not induce vomiting without medical advice. If a person vomits when lying on his back, place him in the recovery position. Seek medical attention immediately.
<b>Notes to physician</b>	: Symptoms: Dizziness, Discomfort, Headache, Nausea, Disorder, Vomiting, Lung edema, Liver disorders, Kidney disorders. Aspiration may cause pulmonary edema and pneumonitis.

**SECTION 5. FIRE-FIGHTING MEASURES**

<b>Suitable extinguishing media</b>	: SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO <sub>2</sub> , water spray or fire fighting foam. LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers. Keep containers and surroundings cool with water spray.
<b>Specific hazards during fire fighting</b>	: Fire Hazard Do not use a solid water stream as it may scatter and spread fire. Cool closed containers exposed to fire with water spray.
<b>Special protective equipment for fire-fighters</b>	: Wear self-contained breathing apparatus and protective suit. Use personal protective equipment.
<b>Further information</b>	: Exposure to decomposition products may be a hazard to health. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

<b>Personal precautions</b>	: Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to contain spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact. Ensure adequate ventilation. Use personal protective equipment.
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- Environmental precautions** : Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection. Discharge into the environment must be avoided. If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods for cleaning up** : Take up with sand or oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

## SECTION 7. HANDLING AND STORAGE

- Precautions for safe handling** : Keep away from fire, sparks and heated surfaces. No smoking near areas where material is stored or handled. The product should only be stored and handled in areas with intrinsically safe electrical classification.
- : Hydrocarbon liquids including this product can act as a non-conductive flammable liquid (or static accumulators), and may form ignitable vapor-air mixtures in storage tanks or other containers. Precautions to prevent static-initiated fire or explosion during transfer, storage or handling, include but are not limited to these examples:
- (1) Ground and bond containers during product transfers. Grounding and bonding may not be adequate protection to prevent ignition or explosion of hydrocarbon liquids and vapors that are static accumulators.
  - (2) Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such as gasoline or naphtha).
  - (3) Storage tank level floats must be effectively bonded.
- For more information on precautions to prevent static-initiated fire or explosion, see NFPA 77, Recommended Practice on Static Electricity (2007), and API Recommended Practice 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents (2008).
- Conditions for safe storage, including incompatibilities** : Keep away from flame, sparks, excessive temperatures and open flame. Use approved containers. Keep containers closed and clearly labeled. Empty or partially full product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose containers to sources of ignition. Store in a well-ventilated area. The storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".
- : Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure.
- Keep away from food, drink and animal feed. Incompatible with oxidizing agents. Incompatible with acids.

## SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Exposure Guidelines**

List	Components	CAS-No.	Type:	Value
OSHA Z1	Xylene	1330-20-7	PEL	100 ppm 435 mg/m3
	Naphthalene	91-20-3	PEL	10 ppm 50 mg/m3
ACGIH	Diesel Fuel	68476-30-2	TWA	100 mg/m3
	Xylene	1330-20-7	TWA	100 ppm
		1330-20-7	STEL	150 ppm
	Naphthalene	91-20-3	TWA	10 ppm
		91-20-3	STEL	15 ppm
	Nonane	111-84-2	TWA	200 ppm

- Engineering measures** : Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Use only intrinsically safe electrical equipment approved for use in classified areas.
- Eye protection** : Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.
- Hand protection** : Gloves constructed of nitrile, neoprene, or PVC are recommended. Consult manufacturer specifications for further information.
- Skin and body protection** : If needed to prevent skin contact, chemical protective clothing such as of DuPont TyChem®, Saranex or equivalent recommended based on degree of exposure. The resistance of specific material may vary from product to product as well as with degree of exposure.
- Respiratory protection** : A NIOSH/ MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection. Use a NIOSH/ MSHA-approved positive-pressure supplied-air respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.
- Work / Hygiene practices** : Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and laundry before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance</b>	Clear to straw colored liquid								
<b>Odor</b>	Characteristic petroleum or kerosene-like odor								
<b>Odor threshold</b>	0.1 - 1 ppm typically reported								
<b>pH</b>	Not applicable								
<b>Melting point/freezing point</b>	Gel point can be about -15°F; freezing requires laboratory conditions								
<b>Initial boiling point &amp; range</b>	154 - 372 °C (310° - 702 °F)								
<b>Flash point</b>	38°C Minimum for #1 Diesel, 52°C Minimum for #2 Diesel								
<b>Evaporation rate</b>	Higher initially and declining as lighter components evaporate								
<b>Flammability (solid, gas)</b>	Flammable vapor released by liquid								
<b>Upper explosive limit</b>	6.5 %(V)								
<b>Lower explosive limit</b>	0.6 %(V)								
<b>Vapor pressure</b>	< 2 mm Hg at 20 °C								
<b>Vapor density (air = 1)</b>	> 4.5								
<b>Relative density (water = 1)</b>	0.86 g/mL								
<b>Solubility (in water)</b>	0.0005 g/100 mL								
<b>Partition coefficient (n-octanol/water)</b>	> 3.3 as log Pow								
<b>Auto-ignition temperature</b>	257 °C (495 °F)								
<b>Decomposition temperature</b>	Will evaporate or boil and possibly ignite before decomposition occurs.								
<b>Kinematic viscosity</b>	1 to 6 mm <sup>2</sup> /s range reported for No.1 or No.2 diesel at ambient temperatures								
<b>Conductivity (conductivity can be reduced by environmental factors such as a decrease in temperature)</b>	<table border="0"> <tr> <td>Diesel Fuel Oils at terminal load rack:</td> <td>At least 25 pS/m</td> </tr> <tr> <td>Ultra Low Sulfur Diesel (ULSD) without conductivity additive:</td> <td>0 pS/m to 5 pS/m</td> </tr> <tr> <td>ULSD at terminal load rack with conductivity additive:</td> <td>At least 50 pS/m</td> </tr> <tr> <td>JP-8 at terminal load rack:</td> <td>150 pS/m to 600 pS/m</td> </tr> </table>	Diesel Fuel Oils at terminal load rack:	At least 25 pS/m	Ultra Low Sulfur Diesel (ULSD) without conductivity additive:	0 pS/m to 5 pS/m	ULSD at terminal load rack with conductivity additive:	At least 50 pS/m	JP-8 at terminal load rack:	150 pS/m to 600 pS/m
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ULSD at terminal load rack with conductivity additive:	At least 50 pS/m								
JP-8 at terminal load rack:	150 pS/m to 600 pS/m								

**SECTION 10. STABILITY AND REACTIVITY**

<b>Reactivity</b>	: Vapors may form explosive mixture with air. Hazardous polymerization does not occur.
<b>Chemical stability</b>	Stable under normal conditions.
<b>Possibility of hazardous reactions</b>	Can react with strong oxidizing agents, peroxides, acids and alkalies. Do not use with Viton or Fluorel gaskets or seals.
<b>Conditions to avoid</b>	Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Avoid static charge accumulation and discharge (see Section 7).
<b>Hazardous decomposition products</b>	Ignition and burning can release carbon monoxide, carbon dioxide, non-combusted hydrocarbons (smoke) and, depending on formulation, trace amounts

of sulfur dioxide. Diesel exhaust particulates may be a lung hazard (see Section 11).

## SECTION 11. TOXICOLOGICAL INFORMATION

<b>Inhalation</b>	: Vapors or mists from this material can irritate the nose, throat, and lungs, and can cause signs and symptoms of central nervous system depression, depending on the concentration and duration of exposure.
<b>Skin contact</b>	Skin irritation leading to dermatitis may occur upon prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed. Long-term, repeated skin contact may cause skin cancer.
<b>Eye contact</b>	Eye irritation may result from contact with liquid, mists, and/or vapors.
<b>Ingestion</b>	Harmful or fatal if swallowed. Do NOT induce vomiting. This material can irritate the mouth, throat, stomach, and cause nausea, vomiting, diarrhea and restlessness. Aspiration hazard if liquid is inhaled into lungs, particularly from vomiting after ingestion. Aspiration may result in chemical pneumonia, severe lung damage, respiratory failure and even death.
<b>Target organs</b>	Central nervous system, Eyes, Skin, Kidney, Liver
<b>Further information</b>	Studies have shown that similar products produce skin cancer or skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation. Repeated over-exposure may cause liver and kidney injury. IARC classifies whole diesel fuel exhaust particulates as carcinogenic to humans (Group 1). NIOSH regards whole diesel fuel exhaust particulates as a potential cause of occupational lung cancer based on animal studies and limited evidence in humans.

### Component:

<b>Fuels, diesel, No 2; Gasoil - unspecified</b>	68476-34-6	<u>Acute oral toxicity:</u> LD50 rat Dose: 5,001 mg/kg  <u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg  <u>Acute inhalation toxicity:</u> LC50 rat Dose: 7.64 mg/l Exposure time: 4 h  <u>Skin irritation:</u> Classification: Irritating to skin. Result: Severe skin irritation  <u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation
<b>Nonane</b>	111-84-2	<u>Acute oral toxicity:</u> LD50 mouse Dose: 218 mg/kg  <u>Acute inhalation toxicity:</u> LC50 rat Exposure time: 4 h
<b>Naphthalene</b>	91-20-3	<u>Acute oral toxicity:</u> LD50 rat Dose: 2,001 mg/kg  <u>Acute dermal toxicity:</u> LD50 rat Dose: 2,501 mg/kg

		<p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 101 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes Result: Mild eye irritation</p> <p><u>Carcinogenicity:</u> N11.00422130</p>
1,2,4-Trimethylbenzene	95-63-6	<p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 18 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Eye irritation</p>
Xylene	1330-20-7	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 2,840 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: ca. 4,500 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 6,350 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>

**Carcinogenicity**

NTP	Naphthalene (CAS-No.: 91-20-3)
IARC	Naphthalene (CAS-No.: 91-20-3)
OSHA	No component of this product which is present at levels greater than or equal to 0.1 % is identified as a carcinogen or potential carcinogen by OSHA.
CA Prop 65	WARNING! This product contains a chemical known to the State of California to cause cancer. naphthalene (CAS-No.: 91-20-3)

**SECTION 12. ECOLOGICAL INFORMATION**

**Additional ecological information** : Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

**Component:**

Diesel	68476-34-6	<p><u>Toxicity to fish:</u> LC50 Species: <i>Jordanella floridae</i> Dose: 54 mg/l</p>
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Exposure time: 96 h

Toxicity to crustacea:  
 Species: Palaemonetes pugio  
 TLm (48 hour) = 3.4 mg/l

**SECTION 13. DISPOSAL CONSIDERATIONS**

**Disposal** : Dispose of container and unused contents in accordance with federal, state and local requirements.

**SECTION 14. TRANSPORT INFORMATION****CFR**

Proper shipping name : DIESEL FUEL  
 UN-No. : UN1202 (NA 1993)  
 Class : 3  
 Packing group : III

**TDG**

Proper shipping name : DIESEL FUEL  
 UN-No. : UN1202 (NA 1993)  
 Class : 3  
 Packing group : III

**IATA Cargo Transport**

UN UN-No. : UN1202 (NA 1993)  
 Description of the goods : DIESEL FUEL  
 Class : 3  
 Packaging group : III  
 ICAO-Labels : 3  
 Packing instruction (cargo aircraft) : 366  
 Packing instruction (cargo aircraft) : Y344

**IATA Passenger Transport**

UN UN-No. : UN1202 (NA 1993)  
 Description of the goods : DIESEL FUEL  
 Class : 3  
 Packaging group : III  
 ICAO-Labels : 3  
 Packing instruction (passenger aircraft) : 355  
 Packing instruction (passenger aircraft) : Y344

**IMDG-Code**

UN-No. : UN 1202 (NA 1993)  
 Description of the goods : DIESEL FUEL  
 Class : 3  
 Packaging group : III  
 IMDG-Labels : 3



EmS Number : F-E S-E  
 Marine pollutant : No

**SECTION 15. REGULATORY INFORMATION**

: **CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)**  
 The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil. Fractions of crude oil, and products (both finished and intermediate) from the crude oil refining process and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, as well as the Clean Water Act may still apply.

TSCA Status : On TSCA Inventory

DSL Status : All components of this product are on the Canadian DSL list.

SARA 311/312 Hazards : Fire Hazard  
 Acute Health Hazard  
 Chronic Health Hazard

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

<u>Components</u>	<u>CAS-No.</u>
Xylene	1330-20-7
1,2,4-Trimethylbenzene	95-63-6
Naphthalene	91-20-3

PENN RTK US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

<u>Components</u>	<u>CAS-No.</u>
Nonane	111-84-2
Naphthalene	91-20-3
1,2,4-Trimethylbenzene	95-63-6
xylene	1330-20-7
Fuels, diesel, No 2; Gasoil - unspecified	68476-34-6

MASS RTK US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

<u>Components</u>	<u>CAS-No.</u>
Xylene	1330-20-7
1,2,4-Trimethylbenzene	95-63-6
Naphthalene	91-20-3
Nonane	111-84-2

NJ RTK US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

<u>Components</u>	<u>CAS-No.</u>
Nonane	111-84-2

Naphthalene	91-20-3
1,2,4-Trimethylbenzene	95-63-6
Xylene	1330-20-7
Fuels, diesel, No 2; Gasoil - unspecified	68476-34-6
California Prop. 65	: WARNING! This product contains a chemical known to the State of California to cause cancer.
	Naphthalene 91-20-3

**SECTION 16. OTHER INFORMATION**Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

10/29/2012

1153, 1250, 1443, 1454, 1814, 1815, 1866, 1925



Be Right™

# SAFETY DATA SHEET

Issue Date 21-Jul-2016

Revision Date 23-Aug-2016

Version 2

Page 1 / 20

## 1. IDENTIFICATION

### Product identifier

**Product Name** EDTA Tetrasodium Salt 0.800 ± 0.004 M

### Other means of identification

**Product Code(s)**  
1439901

**Safety data sheet number** M00449

**Component of Kits or Sets** 001-H00522.88; 2063600; 2063600RGT; 2063900; 2063900RGT; 2272000; 2272100; 2350600; 2350600RGT; 2350700; 2350700RGT; 243001; 243001RGT; 243003; 243003RGT; 2447500; 2448100; 2448700; 251232; 251232K; 251233; 251233K; 251235; 251235K; 251238; 251238K; 251239; 251239K; 2687900K; 2690200; 2690600; 2690800; 2690900; 2691700; 2922400; 2922400K; 2922401; 2922401K; 2922500; 2922500K; 2922501; 2922501K; 2922600; 2922600K; 2922601; 2922601K; 2923200; 2923300; 2953100; 2991100; 2991200; 2994000; 2994000K; 2994010; 2997100; 6024656; L7420; L7420K

### Recommended use of the chemical and restrictions on use

**Recommended Use** Laboratory reagent. Hardness determination. Standard solution.  
**Uses advised against** None.  
**Restrictions on use** None.

### Details of the supplier of the safety data sheet

#### Manufacturer Address

Hach Company  
P.O.Box 389 Loveland, CO 80539 USA  
(970) 669-3050

#### Emergency telephone number

(303) 623-5716 - 24 Hour Service (515)232-2533 - 8am - 4pm CST

### Product Information

**Chemical Name** Not applicable  
**Formula** Not applicable  
**CAS No** Not applicable  
**Alternate CAS Number** Not applicable  
**NIOSH (RTECS) Number** None reported

## 2. HAZARDS IDENTIFICATION

### Classification

#### Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Serious eye damage/eye irritation

Category 1

**Product Code(s)** 1439901  
**Issue Date** 21-Jul-2016  
**Version** 2

**Product Name** EDTA Tetrasodium Salt 0.800 ± 0.004 M  
**Revision Date** 23-Aug-2016  
**Page** 2 / 20

**Hazards not otherwise classified (HNOC)**  
Not applicable

**Label elements**

**Signal word** - Danger



**Hazard statements**  
H318 - Causes serious eye damage EUH208 - May produce an allergic reaction

**Precautionary statements**  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P310 - Immediately call a POISON CENTER or doctor/physician

**Other Information**  
Not applicable

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Substance**  
Not applicable

**Mixture**

**Chemical Family** Mixture.

Percent ranges are used where confidential product information is applicable.

Chemical Name	CAS No	Percent Range	HMRIC #
Tetrasodium EDTA	64-02-8	10 - 30	-
Formaldehyde	50-00-0	<0.1	-
Methyl alcohol	67-56-1	<0.1	-

#### 4. FIRST AID MEASURES

##### Description of first aid measures

<b>General advice</b>	In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).
<b>Eye contact</b>	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician immediately.
<b>Skin contact</b>	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. If symptoms persist, call a physician.
<b>Inhalation</b>	IF INHALED: Remove person to fresh air and keep comfortable for breathing. If symptoms persist, call a physician.
<b>Ingestion</b>	IF SWALLOWED: Rinse Mouth. If symptoms persist, call a physician.
<b>Self-protection of the first aider</b>	Use personal protective equipment as required. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

##### Most important symptoms and effects, both acute and delayed

**Symptoms** See Section 11: TOXICOLOGICAL INFORMATION.

##### Indication of any immediate medical attention and special treatment needed

**Note to physicians** Treat symptomatically.

#### 5. FIRE-FIGHTING MEASURES

##### Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Unsuitable extinguishing media** Caution: Use of water spray when fighting fire may be inefficient.

##### Flammable properties

Material is not classified as flammable according to GHS criteria. Substance does not burn.

##### Specific hazards arising from the chemical

None reported.

**Hazardous combustion products** This material will not burn.

##### Protective equipment and precautions for firefighters

Wear self contained breathing apparatus for fire fighting if necessary.

##### Special protective equipment for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary

#### 6. ACCIDENTAL RELEASE MEASURES

**U.S. Notice** Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

**EC Notice** Only persons properly qualified to respond to an emergency involving hazardous

Product Code(s) 1439901  
Issue Date 21-Jul-2016  
Version 2

Product Name EDTA Tetrasodium Salt 0.800 ± 0.004 M  
Revision Date 23-Aug-2016  
Page 4 / 20

substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

**WHMIS Notice**

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

**Personal precautions, protective equipment and emergency procedures**

**Personal precautions** Evacuate personnel to safe areas. Do not touch or walk through spilled material. Ventilate affected area. Use personal protective equipment as required.

**For emergency responders** Use personal protection recommended in Section 8.

**Environmental precautions**

**Environmental precautions** Avoid release to the environment. See Section 12 for additional ecological information.

**Methods and material for containment and cleaning up**

**Methods for containment** Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.

**Methods for cleaning up** Neutralize spill if necessary. Soak up with inert absorbent material. Take up mechanically, placing in appropriate containers for disposal. Clean contaminated surface thoroughly. Dispose of in accordance with local, state and federal regulations or laws.

**Emergency Response Guide Number** Not applicable

**7. HANDLING AND STORAGE**

**Precautions for safe handling**

**Advice on safe handling** Use personal protective equipment as required. Avoid contact with skin, eyes or clothing. Do not breathe dust/fume/gas/mist/vapors/spray.

**Conditions for safe storage, including any incompatibilities**

**Storage Conditions** Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children. Keep containers tightly closed in a cool, well-ventilated place. Keep in properly labeled containers.

**Flammability class** Not applicable

**Incompatible materials** Strong oxidizing agents. Strong acids. Strong bases.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Control parameters**

**Exposure Guidelines**

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Formaldehyde <0.1	Ceiling: 0.3 ppm	TWA: 0.75 ppm (vacated) TWA: 3 ppm (vacated) STEL: 10 ppm (vacated) Ceiling: 5 ppm STEL: 2 ppm	IDLH: 20 ppm Ceiling: 0.1 ppm 15 min TWA: 0.016 ppm
Methyl alcohol <0.1	STEL: 250 ppm TWA: 200 ppm S*	TWA: 200 ppm TWA: 260 mg/m <sup>3</sup> (vacated) TWA: 200 ppm	IDLH: 6000 ppm TWA: 200 ppm TWA: 260 mg/m <sup>3</sup>

		(vacated) TWA: 260 mg/m <sup>3</sup> (vacated) STEL: 250 ppm (vacated) STEL: 325 mg/m <sup>3</sup> (vacated) SKN*	STEL: 250 ppm STEL: 325 mg/m <sup>3</sup>
--	--	--	--

Chemical Name	Alberta OEL	British Columbia OEL	Manitoba OEL	New Brunswick OEL	New Foundland & Labrador OEL
Formaldehyde <0.1	Ceiling: 1 ppm Ceiling: 1.3 mg/m <sup>3</sup> TWA: 0.75 ppm TWA: 0.9 mg/m <sup>3</sup>	TWA: 0.3 ppm Ceiling: 1 ppm SKN+	Ceiling: 0.3 ppm	TWA: 0.5 ppm STEL: 1.5 ppm	RSP+ Ceiling: 0.3 ppm SKN+
Methyl alcohol <0.1	TWA: 200 ppm TWA: 262 mg/m <sup>3</sup> STEL: 250 ppm STEL: 328 mg/m <sup>3</sup> SKN*	TWA: 200 ppm STEL: 250 ppm SKN*	TWA: 200 ppm STEL: 250 ppm SKN*	TWA: 200 ppm TWA: 262 mg/m <sup>3</sup> STEL: 250 ppm STEL: 328 mg/m <sup>3</sup> SKN*	TWA: 200 ppm STEL: 250 ppm SKN*

Chemical Name	Northwest Territories OEL	Nova Scotia OEL	Nunavut OEL	Ontario TWA	Prince Edward Island OEL
Formaldehyde <0.1	Ceiling: 0.3 ppm SKN+	RSP+ Ceiling: 0.3 ppm SKN+	Ceiling: 0.3 ppm	STEL: 1 ppm Ceiling: 1.5 ppm	Ceiling: 0.3 ppm
Methyl alcohol <0.1	TWA: 200 ppm STEL: 250 ppm SKN*	STEL: 250 ppm TWA: 200 ppm SKN*	TWA: 200 ppm STEL: 250 ppm SKN*	TWA: 200 ppm STEL: 250 ppm SKN*	STEL: 250 ppm TWA: 200 ppm

Chemical Name	Quebec OEL	Saskatchewan OEL	Yukon OEL
Formaldehyde <0.1	Ceiling: 2 ppm Ceiling: 3 mg/m <sup>3</sup>	Ceiling: 0.3 ppm SKN+	Ceiling: 2 ppm Ceiling: 3 mg/m <sup>3</sup>
Methyl alcohol <0.1	TWA: 200 ppm TWA: 262 mg/m <sup>3</sup> STEL: 250 ppm STEL: 328 mg/m <sup>3</sup> SKN*	TWA: 200 ppm STEL: 250 ppm SKN*	STEL: 250 ppm STEL: 310 mg/m <sup>3</sup> TWA: 200 ppm TWA: 260 mg/m <sup>3</sup> SKN*

**Other Information** Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

**Legend** See section 16 for terms and abbreviations

**Appropriate engineering controls**

**Engineering Controls** Showers  
 Eyewash stations  
 Ventilation systems

**Individual protection measures, such as personal protective equipment**

**Eye/face protection** Wear tight sealing safety goggles and/or face protection shield.

**Skin and body protection** Wear protective gloves and protective clothing.

**Respiratory protection** In case of insufficient ventilation, wear suitable respiratory equipment.

**General Hygiene Considerations** Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Take off all contaminated clothing and wash it before reuse. Wash hands thoroughly after handling. Regular cleaning of equipment, work area and clothing is recommended.

**Environmental exposure controls**

Do not allow into any sewer, on the ground or into any body of water.

Product Code(s) 1439901  
Issue Date 21-Jul-2016  
Version 2

Product Name EDTA Tetrasodium Salt 0.800 ± 0.004 M  
Revision Date 23-Aug-2016  
Page 6 / 20

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

**Physical state** Liquid  
**Gas Under Pressure** Not classified according to GHS criteria  
**Appearance** aqueous solution **Color** colorless  
**Odor** Odorless **Odor threshold** No data available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
<b>Molecular weight</b>	No data available	
<b>pH</b>	10.2	
<b>Melting point/freezing point</b>	-14 °C / 7 °F	
<b>Boiling point / boiling range</b>	104 °C / 219 °F	
<b>Evaporation rate</b>	0.98 (water = 1)	
<b>Vapor pressure</b>	23.027 mm Hg / 3.07 kPa at 25 °C / 77 °F	
<b>Vapor density (air = 1)</b>	0.6	
<b>Specific gravity (water = 1 / air = 1)</b>	1.160	
<b>Partition Coefficient (n-octanol/water)</b>	Not applicable	
<b>Soil Organic Carbon-Water Partition Coefficient</b>	Not applicable	
<b>Autoignition temperature</b>	No data available	
<b>Decomposition temperature</b>	No data available	
<b>Dynamic viscosity</b>	~ 1 cP (mPa s) at 20 °C / 68 °F	
<b>Kinematic viscosity</b>	~ 0.862 cSt (mm <sup>2</sup> /s) at 20 °C / 68 °F	

### Solubility(ies)

#### **Water solubility**

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
Soluble	> 1000 mg/L	25 °C / 77 °F

#### **Solubility in other solvents**

<u>Chemical Name</u>	<u>Solubility classification</u>	<u>Solubility</u>	<u>Solubility Temperature</u>
None reported	No information available	No data available	No information available

### Other Information

**Metal Corrosivity** Not classified as corrosive to metal according to GHS criteria



**Product Code(s)** 1439901  
**Issue Date** 21-Jul-2016  
**Version** 2

**Product Name** EDTA Tetrasodium Salt 0.800 ± 0.004 M  
**Revision Date** 23-Aug-2016  
**Page** 7 / 20

<b>Steel Corrosion Rate</b>	No data available
<b>Aluminum Corrosion Rate</b>	No data available
<b>Volatile Organic Compounds (VOC) Content</b>	See ingredients information below.
<b>Bulk density</b>	Not applicable
<b>Explosive properties</b>	Not classified according to GHS criteria.
<b>Explosion data</b>	No data available
<b>Upper explosion limit</b>	No data available
<b>Lower explosion limit</b>	No data available
<b>Flammable properties</b>	Material is not classified as flammable according to GHS criteria. Substance does not burn.
<b>Flammability Limit in Air</b>	
<b>Upper flammability limit:</b>	No data available
<b>Lower flammability limit:</b>	No data available
<b>Flash point</b>	No data available
<b>Method</b>	No information available
<b>Oxidizing properties</b>	Not classified according to GHS criteria.
<b>Reactivity properties</b>	Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria.

## 10. STABILITY AND REACTIVITY

### **Reactivity properties**

Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria

### **Chemical stability**

Stable under recommended storage conditions.

### **Special dangers of the product**

None reported

### **Possibility of Hazardous Reactions**

None under normal processing.

**Hazardous polymerization**      Hazardous polymerization does not occur.

### **Conditions to avoid**

Extreme temperatures. Evaporation.

### **Incompatible materials**

Strong oxidizing agents. Strong acids. Strong bases.

**Product Code(s)** 1439901  
**Issue Date** 21-Jul-2016  
**Version** 2

**Product Name** EDTA Tetrasodium Salt 0.800 ± 0.004 M  
**Revision Date** 23-Aug-2016  
**Page** 8 / 20

**Hazardous Decomposition Products**

Carbon dioxide. Carbon monoxide. Nitrogen oxides. sodium oxides.

**Explosive properties**

Not classified according to GHS criteria.

**Upper explosion limit** No data available

**Lower explosion limit** No data available

**Autoignition temperature**

No data available

**Sensitivity to Static Discharge**

None reported

**Sensitivity to Mechanical Impact**

None reported

**11. TOXICOLOGICAL INFORMATION**

**Information on Likely Routes of Exposure**

<b>Product Information</b>	Corrosive to eyes.
<b>Inhalation</b>	No known effect based on information supplied.
<b>Eye contact</b>	Corrosive to the eyes and may cause severe damage including blindness.
<b>Skin contact</b>	No known effect based on information supplied.
<b>Ingestion</b>	No known effect based on information supplied.
<b>Aggravated Medical Conditions</b>	Eye disorders.
<b>Toxicologically synergistic products</b>	None known.
<b>Toxicokinetics, metabolism and distribution</b>	See ingredients information below.

<b>Chemical Name</b>	<b>Toxicokinetics, metabolism and distribution</b>
Formaldehyde (<0.1) CAS#: 50-00-0	Readily Absorbed via the respiratory and gastrointestinal routes. Absorbed formaldehyde can be oxidized to formate and carbon dioxide. Half-life of formaldehyde is 1 min in rat plasma.
Methyl alcohol (<0.1) CAS#: 67-56-1	Metabolism of methanol appears to be similar regardless of administrative route. Methanol is converted to formaldehyde, which is converted to formate which is oxidized to carbon dioxide in primates.

**Product Acute Toxicity Data**

**Oral Exposure Route** No data available

**Dermal Exposure Route** No data available

**Inhalation (Dust/Mist) Exposure Route** No data available

**Inhalation (Vapor) Exposure Route** No data available

**Inhalation (Gas) Exposure Route** No data available

The following values are calculated based on chapter 3.1 of the GHS document

<b>ATEmix (oral)</b>	5,775.00 mg/kg
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**Ingredient Acute Toxicity Data**

**Oral Exposure Route**

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Tetrasodium EDTA (10 - 30) CAS#: 64-02-8	Rat LD <sub>50</sub>	1658 mg/kg	None reported	None reported	ERMA (New Zealand's Environmental Risk Management Authority)
Formaldehyde (<0.1) CAS#: 50-00-0	Rat LD <sub>50</sub>	100 mg/kg	None reported	None reported	No information available
Methyl alcohol (<0.1) CAS#: 67-56-1	Human LD <sub>50</sub>	300 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Methyl alcohol (<0.1) CAS#: 67-56-1	Rat LD <sub>50</sub>	5628 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Human LD <sub>Lo</sub>	70 mg/kg	None reported	<b>Kidney, Ureter, or Bladder</b> Other changes <b>Liver</b>	RTECS (Registry of Toxic Effects of Chemical Substances)
Methyl alcohol (<0.1) CAS#: 67-56-1	Human LD <sub>Lo</sub>	143 mg/kg	None reported	<b>Lungs, Thorax, or Respiration</b> Dyspnea	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Human TD <sub>Lo</sub>	643 mg/kg	None reported	<b>Lungs, Thorax, or Respiration</b> Respiratory obstruction	RTECS (Registry of Toxic Effects of Chemical Substances)
Methyl alcohol (<0.1) CAS#: 67-56-1	Man LD <sub>Lo</sub>	3.571 mg/kg	None reported	<b>Lungs, Thorax, or Respiration</b> Dyspnea	RTECS (Registry of Toxic Effects of Chemical Substances)

**Dermal Exposure Route**

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Rabbit LD <sub>50</sub>	270 mg/kg	None reported	None reported	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Methyl alcohol (<0.1) CAS#: 67-56-1	Human LD <sub>50</sub>	1000 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Methyl alcohol (<0.1) CAS#: 67-56-1	Rabbit LD <sub>50</sub>	15800 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)

**Inhalation (Dust/Mist) Exposure Route**

No data available

**Inhalation (Vapor) Exposure Route**

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Rat LC <sub>50</sub>	250 mg/L	4 hours	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Methyl alcohol (<0.1)	Human LC <sub>50</sub>	10 mg/L	4 hours	None reported	IUCLID (The International Uniform Chemical Information Database)

Product Code(s) 1439901  
 Issue Date 21-Jul-2016  
 Version 2

Product Name EDTA Tetrasodium Salt 0.800 ± 0.004 M  
 Revision Date 23-Aug-2016  
 Page 10 / 20

CAS#: 67-56-1					Database)
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Methyl alcohol (<0.1) CAS#: 67-56-1	Rat LC <sub>50</sub>	64000 mg/L	6 hours	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Methyl alcohol (<0.1) CAS#: 67-56-1	Human TC <sub>Lo</sub>	300 mg/L	None reported	Lungs, Thorax, or Respiration Other changes	RTECS (Registry of Toxic Effects of Chemical Substances)

**Inhalation (Gas) Exposure Route**

No data available

**Product Skin Corrosion/Irritation Data**

No data available.

**Ingredient Skin Corrosion/Irritation Data**

Chemical Name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Standard Draize Test	Human	0.150 mg	72 hours	Corrosive to skin	RTECS (Registry of Toxic Effects of Chemical Substances)
Methyl alcohol (<0.1) CAS#: 67-56-1	Standard Draize Test	Rabbit	20 mg	24 hours	Skin irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Standard Draize Test	Rabbit	2 mg	24 hours	Corrosive to skin	RTECS (Registry of Toxic Effects of Chemical Substances)

**Product Serious Eye Damage/Eye Irritation Data**

No data available.

**Ingredient Eye Damage/Eye Irritation Data**

Chemical Name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Rinse Test	Human	1 ppm	6 minutes	Corrosive to eyes	RTECS (Registry of Toxic Effects of Chemical Substances)
Methyl alcohol (<0.1) CAS#: 67-56-1	Standard Draize Test	Rabbit	40 mg	None reported	Eye irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Standard Draize Test	Rabbit	0.750 mg	24 hours	Corrosive to eyes	RTECS (Registry of Toxic Effects of Chemical Substances)

**Sensitization Information**

Product Code(s) 1439901  
Issue Date 21-Jul-2016  
Version 2

Product Name EDTA Tetrasodium Salt 0.800 ± 0.004 M  
Revision Date 23-Aug-2016  
Page 11 / 20

### Product Sensitization Data

Skin Sensitization Exposure Route No data available.

Respiratory Sensitization Exposure Route No data available.

### Ingredient Sensitization Data

#### Skin Sensitization Exposure Route

Chemical Name	Test method	Species	Results	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Patch test	Human	Confirmed to be a skin sensitizer	ERMA (New Zealand's Environmental Risk Management Authority)

#### Respiratory Sensitization Exposure Route

Chemical Name	Test method	Species	Results	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	IgE Specific Immune Response Test	Guinea pig	Confirmed to be a respiratory sensitizer	CICAD (Concise International Chemical Assessment Documents)

### Chronic Toxicity Information

#### Product Repeat Dose Toxicity Data

Oral Exposure Route No data available.

Dermal Exposure Route No data available.

Inhalation (Dust/Mist) Exposure Route No data available.

Inhalation (Vapor) Exposure Route No data available.

Inhalation (Gas) Exposure Route No data available.

#### Ingredient Repeat Dose Toxicity Data

Oral Exposure Route No data available

Dermal Exposure Route No data available

Inhalation (Dust/Mist) Exposure Route No data available

#### Inhalation (Vapor) Exposure Route

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Human TC <sub>Lo</sub>	0.017 mg/L	0.5 days	Eye Lacrimation Lungs, Thorax, or Respiration Other changes	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Human TC <sub>Lo</sub>	2 mg/L	40 minutes	Lungs, Thorax, or Respiration Other changes Respiratory depression	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Gas) Exposure Route No data available

Product Code(s) 1439901  
 Issue Date 21-Jul-2016  
 Version 2

Product Name EDTA Tetrasodium Salt 0.800 ± 0.004 M  
 Revision Date 23-Aug-2016  
 Page 12 / 20

Chemical Name	CAS No	ACGIH	IARC	NTP	OSHA
Tetrasodium EDTA	64-02-8	-	-	-	-
Formaldehyde	50-00-0	A2	Group 1	Known	X
Methyl alcohol	67-56-1	-	-	-	-

**Legend**

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of Labor)	X - Present

**Product Carcinogenicity Data** No data available

**Oral Exposure Route** No data available

**Dermal Exposure Route** No data available

**Inhalation (Dust/Mist) Exposure Route** No data available

**Inhalation (Vapor) Exposure Route** No data available

**Inhalation (Gas) Exposure Route** No data available

**Ingredient Carcinogenicity Data**

**Oral Exposure Route** No data available

**Dermal Exposure Route** No data available

**Inhalation (Dust/Mist) Exposure Route** No data available

**Inhalation (Vapor) Exposure Route**

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Rat	15 mg/L	78 weeks	Olfaction Tumors	RTECS (Registry of Toxic Effects of Chemical Substances)

**Inhalation (Gas) Exposure Route** No data available

**Product Germ Cell Mutagenicity *invitro* Data**

No data available.

**Ingredient Germ Cell Mutagenicity *invitro* Data**

Chemical Name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Methyl alcohol (<0.1) CAS#: 67-56-1	DNA inhibition	Human lymphocyte	300 mmol/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

**Oral Exposure Route** No data available

**Dermal Exposure Route** No data available

**Inhalation (Dust/Mist) Exposure Route** No data available

Product Code(s) 1439901  
 Issue Date 21-Jul-2016  
 Version 2

Product Name EDTA Tetrasodium Salt 0.800 ± 0.004 M  
 Revision Date 23-Aug-2016  
 Page 13 / 20

Inhalation (Vapor) Exposure Route No data available

Inhalation (Gas) Exposure Route No data available

**Ingredient Germ Cell Mutagenicity *in vivo* Data**

**Oral Exposure Route**

Chemical Name	Test	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Methyl alcohol (<0.1) CAS#: 67-56-1	DNA damage	Rat	0.405 mg/kg	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Test	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Methyl alcohol (<0.1) CAS#: 67-56-1	Cytogenetic analysis	Mouse	1000 mg/kg	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

Dermal Exposure Route No data available

**Inhalation (Dust/Mist) Exposure Route**

Chemical Name	Test	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	DNA damage	Rat	0.000035 mg/L	8 weeks	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

**Inhalation (Vapor) Exposure Route**

Chemical Name	Test	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Micronucleus test	Human	.000985 mg/L	8.5 years	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Test	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Micronucleus test	Human	2 mg/L	15 minutes	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Gas) Exposure Route No data available

Oral Exposure Route No data available

Dermal Exposure Route No data available

Inhalation (Dust/Mist) Exposure Route No data available

Inhalation (Vapor) Exposure Route No data available

Inhalation (Gas) Exposure Route No data available

**Ingredient Reproductive Toxicity Data**

**Oral Exposure Route**

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Methyl alcohol (<0.1) CAS#: 67-56-1	Rat TD <sub>Lo</sub>	4118 mg/kg	10 days	<b>Effects on Embryo or Fetus</b> Fetotoxicity (except death e.g. stunted fetus) <b>Specific Developmental Abnormalities</b> Ear Eye Urogenital System	RTECS (Registry of Toxic Effects of Chemical Substances)

**Dermal Exposure Route**

No data available

**Inhalation (Dust/Mist) Exposure Route**

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Methyl alcohol (<0.1) CAS#: 67-56-1	Rat TC <sub>Lo</sub>	0.0026 mg/L	22 days	<b>Effects on Embryo or Fetus</b> Fetotoxicity (except death e.g. stunted fetus)	RTECS (Registry of Toxic Effects of Chemical Substances)

**Inhalation (Vapor) Exposure Route**

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Rat TC <sub>Lo</sub>	40 mg/L	14 days	<b>Effects on Embryo or Fetus</b> Fetotoxicity (except death e.g. stunted fetus)	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Rat TC <sub>Lo</sub>	.001 mg/L	24 weeks	<b>Effects on Embryo or Fetus</b> Cytological changes (including somatic cell genetic material)	RTECS (Registry of Toxic Effects of Chemical Substances)
Methyl alcohol (<0.1) CAS#: 67-56-1	Mouse TC <sub>Lo</sub>	1500 mg/L	7-9 days	<b>Specific Developmental Abnormalities</b> Central Nervous System	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	Rat TC <sub>Lo</sub>	.0005 mg/L	19 days	<b>Specific Developmental Abnormalities</b> Musculoskeletal system	RTECS (Registry of Toxic Effects of Chemical Substances)

**Inhalation (Gas) Exposure Route**

No data available

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

Based on the classification principles, not classified as hazardous to the environment.

**Product Ecological Data**

**Aquatic toxicity**

**Fish**

No data available

**Crustacea**

No data available

**Algae**

No data available



**Product Code(s)** 1439901  
**Issue Date** 21-Jul-2016  
**Version** 2

**Product Name** EDTA Tetrasodium Salt 0.800 ± 0.004 M  
**Revision Date** 23-Aug-2016  
**Page** 15 / 20

### Terrestrial toxicity

**Soil** No data available

**Vertebrates** No data available

**Invertebrates** No data available

### Ingredient Ecological Data

#### Aquatic toxicity

##### Fish

Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	96 hours	<i>Morone saxatilis</i>	LC <sub>50</sub>	6.7 mg/L	PEEN (Pan European Ecological Network)
Methyl alcohol (<0.1) CAS#: 67-56-1	96 hours	<i>Pimephales promelas</i>	LC <sub>50</sub>	15000 mg/L	IUCLID (The International Uniform Chemical Information Database)
Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	96 hours	None reported	LC <sub>50</sub>	52.5 mg/L	PEEN (Pan European Ecological Network)

##### Crustacea

Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	48 Hours	<i>Daphnia pulex</i>	EC <sub>50</sub>	5.8 mg/L	PEEN (Pan European Ecological Network)
Methyl alcohol (<0.1) CAS#: 67-56-1	48 Hours	<i>Daphnia magna</i>	EC <sub>50</sub> LC <sub>50</sub>	2500 mg/L	IUCLID (The International Uniform Chemical Information Database)
Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Formaldehyde (<0.1) CAS#: 50-00-0	48 hours	<i>Daphnia magna</i>	EC <sub>50</sub>	29 mg/L	PEEN (Pan European Ecological Network)

**Algae** No data available

### Terrestrial toxicity

**Soil** No data available

**Vertebrates** No data available

**Invertebrates** No data available

### Other Information

#### Persistence and degradability

None known.

#### Product Biodegradability Data

If available, see ingredient data below.

**Product Code(s)** 1439901  
**Issue Date** 21-Jul-2016  
**Version** 2

**Product Name** EDTA Tetrasodium Salt 0.800 ± 0.004 M  
**Revision Date** 23-Aug-2016  
**Page** 16 / 20

### Ingredient Biodegradability Data

Test data reported below

### Bioaccumulation

If available, see ingredient data below.

### **Product Bioaccumulation Data**

If available, see ingredient data below.

### **Ingredient Bioaccumulation Data**

Chemical Name	Test method	Exposure time	Species	Bioconcentration factor (BCF)	Results
Formaldehyde (<0.1) CAS#: 50-00-0	None reported	None reported	None reported	None reported	Does not have the potential to bioaccumulate

### **Additional information**

#### Product Information

#### **Partition Coefficient (n-octanol/water)**

Not applicable

#### Ingredient Information

Chemical Name	Partition Coefficient (n-octanol/water)	Method
Formaldehyde (<0.1) CAS#: 50-00-0	$\log K_{ow} = 0.35$	No information available
Methyl alcohol (<0.1) CAS#: 67-56-1	$\log K_{ow} = -0.7$	No information available

#### Mobility

Mobility in soil: High mobility. If available, see ingredient data below.

#### **Product Information**

#### **Soil Organic Carbon-Water Partition Coefficient**

Not applicable

#### **Ingredient Information**

Chemical Name	Soil Organic Carbon-Water Partition Coefficient	Method
Formaldehyde (<0.1) CAS#: 50-00-0	$\log K_{oc} = 0.89$	No information available
Methyl alcohol (<0.1) CAS#: 67-56-1	$\log K_{oc} = 0.44$	No information available

### Additional information

#### **Water solubility**

#### **Product Information**

Product Code(s) 1439901  
Issue Date 21-Jul-2016  
Version 2

Product Name EDTA Tetrasodium Salt 0.800 ± 0.004 M  
Revision Date 23-Aug-2016  
Page 17 / 20

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
Soluble	> 1000 mg/L	25 °C / 77 °F

#### Ingredient Information

Chemical Name	Water solubility classification	Water solubility	Water solubility temperature °C	Water solubility temperature °F
Formaldehyde (<0.1) CAS#: 50-00-0	Completely soluble	> 40000 mg/L	20 °C	68 °F
Methyl alcohol (<0.1) CAS#: 67-56-1	Soluble	> 1000 mg/L	25 °C	77 °F

#### Other adverse effects

Contains a substance with an endocrine-disrupting potential.

### 13. DISPOSAL CONSIDERATIONS

#### Waste treatment methods

##### Disposal of wastes

Disposal should be in accordance with applicable regional, national, and local laws and regulations.

##### Contaminated packaging

Working in a well-ventilated area. Rinse three times with an appropriate solvent. Collect rinsate and dispose of according to local, state, or federal regulations. Dispose of empty container as normal trash. In the US, rinsate from empty containers is classified as hazardous waste and should be disposed of at an E.P.A. approved facility. Rinsate from empty containers may contain sufficient product to require disposal as hazardous waste in countries other than the US. Improper disposal or reuse of this container may be dangerous and illegal. Disposal should be in accordance with applicable regional, national, and local laws and regulations.

##### US EPA Waste Number

U122 U154

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Formaldehyde 50-00-0	U122	Included in waste streams: K009, K010, K038, K040, K156, K157	-	U122
Methyl alcohol 67-56-1	-	Included in waste stream: F039	-	U154

##### Special instructions for disposal

Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. If permitted by regulation. Open cold water tap completely, slowly pour the reacted material to the drain. Allow cold water to run for 5 minutes to completely flush the system. Check with national, local municipal and state authorities and waste contractors for pertinent local information on the disposal of this article.

### 14. TRANSPORT INFORMATION

##### DOT

Not regulated

##### TDG

Not regulated

**Product Code(s)** 1439901  
**Issue Date** 21-Jul-2016  
**Version** 2

**Product Name** EDTA Tetrasodium Salt 0.800 ± 0.004 M  
**Revision Date** 23-Aug-2016  
**Page** 18 / 20

**IATA** Not regulated

**IMDG** Not regulated

**Note:** No special precautions necessary.

#### Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

### 15. REGULATORY INFORMATION

#### National Inventories

**TSCA** Complies  
**DSL/NDSL** Complies

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

#### International Inventories

**EINECS/ELINCS** Complies  
**ENCS** Complies  
**IECSC** Complies  
**KECL** Complies  
**PICCS** Complies  
**TCSI** Complies  
**AICS** Complies  
**NZIoC** Complies

**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

**ENCS** - Japan Existing and New Chemical Substances

**IECSC** - China Inventory of Existing Chemical Substances

**KECL** - Korean Existing and Evaluated Chemical Substances

**PICCS** - Philippines Inventory of Chemicals and Chemical Substances

**TCSI** - Taiwan Chemical Substances Inventory

**AICS** - Australian Inventory of Chemical Substances

**NZIoC** - New Zealand Inventory of Chemicals

#### US Federal Regulations

##### SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	SARA 313 - Threshold Values %
Formaldehyde (CAS #: 50-00-0)	0.1
Methyl alcohol (CAS #: 67-56-1)	1.0

##### SARA 311/312 Hazard Categories

**Acute health hazard** Yes  
**Chronic Health Hazard** No  
**Fire hazard** No  
**Sudden release of pressure hazard** No  
**Reactive Hazard** No

##### CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Product Code(s) 1439901  
 Issue Date 21-Jul-2016  
 Version 2

Product Name EDTA Tetrasodium Salt 0.800 ± 0.004 M  
 Revision Date 23-Aug-2016  
 Page 19 / 20

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Formaldehyde 50-00-0	100 lb	-	-	X

**CERCLA**

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Formaldehyde 50-00-0	100 lb	100 lb	RQ 100 lb final RQ RQ 45.4 kg final RQ
Methyl alcohol 67-56-1	5000 lb	-	RQ 5000 lb final RQ RQ 2270 kg final RQ

**U.S. - Department of Homeland Security - Chemical Facility Anti-Terrorism Standards (CFATS) - Security Issues**

Chemical Name	U.S. - Department of Homeland Security - Chemical Facility Anti-Terrorism Standards (CFATS) - Security Issues
Formaldehyde (<0.1) CAS#: 50-00-0	Release - Toxic (solution)

**US State Regulations**

**California Proposition 65**

This product contains the following Proposition 65 chemicals

**U.S. State Right-to-Know Regulations**

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Formaldehyde 50-00-0	X	X	X
Methyl alcohol 67-56-1	X	X	X

**U.S. EPA Label Information**

EPA Pesticide Registration Number Not applicable

**16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION**

**NFPA and HMIS Classifications**

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 3	Flammability - 0	Physical hazards - 0	Personal protection - X - See section 8 for more information

**Key or legend to abbreviations and acronyms used in the safety data sheet**

NIOSH IDLH

Immediately Dangerous to Life or Health

**Product Code(s)** 1439901  
**Issue Date** 21-Jul-2016  
**Version** 2

**Product Name** EDTA Tetrasodium Salt 0.800 ± 0.004 M  
**Revision Date** 23-Aug-2016  
**Page** 20 / 20

ACGIH  
NDF

ACGIH (American Conference of Governmental Industrial Hygienists)  
*no data*

**Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
MAC	Maximum Allowable Concentration	Ceiling	Ceiling Limit Value
X	Listed	Vacated	These values have no official status. The only binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.
SKN*	Skin designation	SKN+	Skin sensitization
RSP+	Respiratory sensitization	**	Hazard Designation
C	Carcinogen	R	Reproductive toxicant
M	mutagen		

**Prepared By** Hach Product Compliance Department

**Issue Date** 21-Jul-2016

**Revision Date** 23-Aug-2016

**Revision Note** None

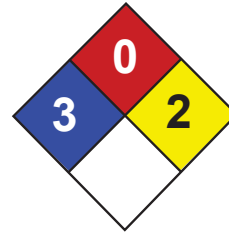
**Disclaimer**

**USER RESPONSIBILITY:** Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

**THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.**

HACH COMPANY ©2015

**End of Safety Data Sheet**



Health	3
Fire	0
Reactivity	2
Personal Protection	J

## Material Safety Data Sheet Ferric chloride MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Ferric chloride

**Catalog Codes:** SLF1675, SLF2188

**CAS#:** 7705-08-0

**RTECS:** LJ9100000

**TSCA:** TSCA 8(b) inventory: Ferric chloride

**CI#:** Not available.

**Synonym:**

**Chemical Formula:** FeCl<sub>3</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Ferric chloride	7705-08-0	100

**Toxicological Data on Ingredients:** Ferric chloride: ORAL (LD50): Acute: 900 mg/kg [Rat]. 1278 mg/kg [Mouse].

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of ingestion. Hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator). Corrosive to eyes and skin. The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death.

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**

If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical got on the victim's exposed skin, such as the hands : Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion:**

Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:**

Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

**Large Spill:**

Corrosive solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.



Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep locked up Keep container dry. Keep away from heat. Keep away from sources of ignition. Keep away from direct sunlight or strong incandescent light. Do not ingest. Do not breathe dust. Never add water to this product Avoid shock and friction. Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

**Storage:** Corrosive materials should be stored in a separate safety storage cabinet or room.

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

### Personal Protection:

Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 1 CEIL: 2 (mg/m<sup>3</sup>) Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid.

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** 162.21 g/mole

**Color:** Not available.

**pH (1% soln/water):** 2 [Acidic.]

**Boiling Point:** 316°C (600.8°F)

**Melting Point:** 306°C (582.8°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 2.9 (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** 5.61 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water.

**Solubility:** Soluble in cold water.

### Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:**

The product may undergo hazardous decomposition, condensation or polymerization, it may react violently with water to emit toxic gases or it may become self-reactive under conditions of shock or increase in temperature or pressure.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

### Section 11: Toxicological Information

**Routes of Entry:** Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:** Acute oral toxicity (LD50): 900 mg/kg [Rat].

**Chronic Effects on Humans:** The substance is toxic to lungs, mucous membranes.

**Other Toxic Effects on Humans:**

Very hazardous in case of ingestion. Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator).

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

### Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

### Section 13: Disposal Considerations

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:** CLASS 8: Corrosive solid.

**Identification :** Ferric chloride, anhydrous : UN1773 PG: III

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

### Federal and State Regulations:

Pennsylvania RTK: Ferric chloride Massachusetts RTK: Ferric chloride TSCA 8(b) inventory: Ferric chloride CERCLA: Hazardous substances.: Ferric chloride

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

### Other Classifications:

#### WHMIS (Canada):

CLASS E: Corrosive solid. CLASS F: Dangerously reactive material.

**DSCL (EEC):** R36/38- Irritating to eyes and skin.

#### HMIS (U.S.A.):

**Health Hazard:** 3

**Fire Hazard:** 0

**Reactivity:** 2

**Personal Protection:** j

#### National Fire Protection Association (U.S.A.):

**Health:** 3

**Flammability:** 0

**Reactivity:** 2

**Specific hazard:**

#### Protective Equipment:

Gloves. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 05:32 PM

**Last Updated:** 05/21/2013 12:00 PM

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.*



# Material Safety Data Sheet

Issue Date: 03-AUG-2012  
Supercedes: 03-OCT-2011

FLOGARD MS6209

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## 1 Identification

**Identification of substance or preparation**  
FLOGARD MS6209

**Product Application Area**  
Water-based corrosion inhibitor.

**Company/Undertaking Identification**  
GE Betz, Inc.  
4636 Somerton Road  
Trevose, PA 19053  
T 215 355-3300, F 215 953 5524

**Emergency Telephone**  
(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300    Prepared on: 03-AUG-2012

## 2 Hazard(s) identification

\*\*\*\*\*

### EMERGENCY OVERVIEW

#### DANGER

Corrosive to skin. Corrosive to the eyes. Mists/aerosols cause irritation to the upper respiratory tract.

DOT hazard: Corrosive to skin/steel  
Odor: Slight; Appearance: Colorless To Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical/CO2/foam or water--slippery condition; use sand/grit.

\*\*\*\*\*

### POTENTIAL HEALTH EFFECTS

#### ACUTE SKIN EFFECTS:

Primary route of exposure; Corrosive to skin.

#### ACUTE EYE EFFECTS:

Corrosive to the eyes.

#### ACUTE RESPIRATORY EFFECTS:

Mists/aerosols cause irritation to the upper respiratory tract.

#### INGESTION EFFECTS:

May cause severe irritation or burning of mouth, throat, and gastrointestinal tract with severe chest and abdominal pain, nausea, vomiting, diarrhea, lethargy and collapse. Possible death when ingested in very large doses.

**TARGET ORGANS:**

Prolonged or repeated exposures may cause tissue necrosis.

**MEDICAL CONDITIONS AGGRAVATED:**

Not known.

**SYMPTOMS OF EXPOSURE:**

Causes severe irritation, burns or tissue ulceration with subsequent scarring.

### 3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation. This product is subject to the Pennsylvania and New Jersey Worker and Community Right to Know Law.

**HAZARDOUS INGREDIENTS:**

Cas#	Chemical Name	Range (w/w%)
13598-37-3	PHOSPHORIC ACID, ZINC SALT (2:1) Irritant	40-70
7664-38-2	PHOSPHORIC ACID Corrosive	15-40

**NON-HAZARDOUS INGREDIENTS:**

CAS#	CHEMICAL NAME
7732-18-5	WATER

### 4 First-aid measures

**SKIN CONTACT:**

URGENT! Wash thoroughly with soap and water. Remove contaminated clothing. Get immediate medical attention. Thoroughly wash clothing before reuse.

**EYE CONTACT:**

URGENT! Immediately flush eyes with plenty of low-pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical attention.

**INHALATION:**

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.

**INGESTION:**

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Rinse mouth with plenty of water. Dilute contents of stomach using 4-10 fluid ounces (120-300 mL) of milk or water.

**NOTES TO PHYSICIANS:**

Material is corrosive. It may not be advisable to induce vomiting.  
Possible mucosal damage may contraindicate the use of gastric lavage.

## 5 Fire-fighting measures

**FIRE FIGHTING INSTRUCTIONS:**

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

**EXTINGUISHING MEDIA:**

dry chemical/CO2/foam or water--slippery condition; use sand/grit.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

oxides of phosphorus

**FLASH POINT:**

> 200F > 93C P-M(CC)

**MISCELLANEOUS:**

Corrosive to skin/steel

UN 1805;Emergency Response Guide #154

## 6 Accidental release measures

**PROTECTION AND SPILL CONTAINMENT:**

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container.

Flush area with water. Wet area may be slippery. Spread sand/grit.

**DISPOSAL INSTRUCTIONS:**

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

## 7 Handling and storage

**HANDLING:**

Acidic. Corrosive(Skin/eyes). Do not mix with alkaline material.

**STORAGE:**

Keep containers closed when not in use. Preferably stored between 40-100F (5-38C).

## 8 Exposure controls / personal protection

**EXPOSURE LIMITS****CHEMICAL NAME**

PHOSPHORIC ACID, ZINC SALT (2:1)

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.

TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

PHOSPHORIC ACID

PEL (OSHA): 1 MG/M3

TLV (ACGIH): TWA = 1 MG/M3; STEL = 3 MG/M3

MISC: NIOSH REL = 1 MG/M3; NIOSH STEL = 3 MG/M3; NIOSH IDLH = 1000 MG/M3

**ENGINEERING CONTROLS:**

Adequate ventilation to maintain air contaminants below exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT:**

Use protective equipment in accordance with 29CFR 1910 Subpart I

**RESPIRATORY PROTECTION:**

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.

**SKIN PROTECTION:**

gauntlet-type rubber, butyl or neoprene gloves, chemical resistant apron -- Wash off after each use. Replace as necessary.

**EYE PROTECTION:**

splash proof chemical goggles, face shield

## 9 Physical and chemical properties

Spec. Grav. (70F, 21C)	1.711	Vapor Pressure (mmHG)	~ 15.0
Freeze Point (F)	< -30	Vapor Density (air=1)	< 1.00
Freeze Point (C)	< -34		
Viscosity(cps 70F, 21C)	70	% Solubility (water)	100.0

Odor	Slight
Appearance	Colorless To Yellow
Physical State	Liquid
Flash Point	P-M(CC) > 200F > 93C
pH As Is (approx.)	< 1.0
Evaporation Rate (Ether=1)	< 1.00
Percent VOC:	0.0

NA = not applicable      ND = not determined

## 10 Stability and reactivity

**CHEMICAL STABILITY:**

Stable under normal storage conditions.

**POSSIBILITY OF HAZARDOUS REACTIONS:**

Contact with strong bases may cause a violent reaction releasing heat.

**INCOMPATIBILITIES:**

May react with bases or strong oxidizers.

**DECOMPOSITION PRODUCTS:**

oxides of phosphorus

## 11 Toxicological information

Oral LD50 RAT: 2830 mg/kg  
NOTE - Calculated value according to GHS additivity formula  
Dermal LD50 RABBIT: 3890 mg/kg  
NOTE - Calculated value according to GHS additivity formula  
Skin Irritation Score RABBIT: CORROSIVE  
NOTE - EPA Category I  
Eye Irritation Score RABBIT: CORROSIVE  
NOTE - Estimated value

## 12 Ecological information

### AQUATIC TOXICOLOGY

Ceriodaphnia 48 Hour Static Renewal Bioassay  
LC50= 1.5; No Effect Level= .63 mg/L  
Ceriodaphnia 7 Day Static Renewal Bioassay  
IC25 = 1.9 mg/L  
Daphnia magna 48 Hour Static Renewal Bioassay  
LC50= 12; No Effect Level= 1.5 mg/L  
Fathead Minnow 7 Day Static Renewal Bioassay  
IC25 = 5 mg/L  
Fathead Minnow 96 Hour Static Renewal Bioassay  
LC50= 14; No Effect Level= 2.5 mg/L  
Rainbow Trout 96 Hour Static Renewal Bioassay  
LC50= 4.9; No Effect Level= 1.6 mg/L

### BIODEGRADATION

Product contains only inorganics that are not subject to typical biological degradation. Assimilation by microbes may occur in waste treatment or the environment.

## 13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :  
D002=Corrosive (pH,steel); D006=Cadmium; D008=Lead.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

## 14 Transport information

Transportation Hazard: Corrosive to skin/steel  
DOT: PHOSPHORIC ACID SOLUTION  
8, UN1805, PG III, RQ  
DOT EMERGENCY RESPONSE GUIDE #: 154  
Note: Some containers may be DOT exempt, please check BOL for exact container classification  
IATA: PHOSPHORIC ACID SOLUTION  
8, UN1805, PG III  
IMDG: PHOSPHORIC ACID SOLUTION  
8, UN1805, PG III



## 15 Regulatory information

### TSCA:

All components of this product are included on or are in compliance with the U.S. TSCA regulations.

### CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

1,962 gallons due to PHOSPHORIC ACID;

### FOOD AND DRUG ADMINISTRATION:

21 CFR 176.170 (components of paper and paperboard in contact with aqueous and fatty foods)

### NSF Registered and/or meets USDA (according to 1998 Guidelines):

Registration number: 140901

Category Code(s):

- G5 Cooling and retort water treatment products - all food processing areas
- G7 Boiler treatment products - all food processing areas/nonfood contact

### SARA SECTION 312 HAZARD CLASS:

Immediate (acute); Delayed (Chronic)

### SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

### SARA SECTION 313 CHEMICALS:

CAS#	CHEMICAL NAME	RANGE
13598-37-3	PHOSPHORIC ACID, ZINC SALT (2:1)	41.0-50.0%

### CALIFORNIA REGULATORY INFORMATION

#### CALIFORNIA SAFE DRINKING WATER AND TOXIC

#### ENFORCEMENT ACT (PROPOSITION 65):

This product contains one or more ingredients at trace levels known to the state of California to cause cancer and reproductive toxicity.

#### MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

## 16 Other information

### HMIS VII

### CODE TRANSLATION

Health	3	Serious Hazard
Fire	0	Minimal Hazard
Reactivity	0	Minimal Hazard
Special	CORR	DOT corrosive
(1) Protective Equipment	D	Goggles, Face Shield, Gloves, Apron

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

### CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	11-NOV-1997		** NEW **
	05-JAN-1999	10	11-NOV-1997
	25-JUN-1999	11	05-JAN-1999
	23-AUG-1999	12	25-JUN-1999
	13-JUL-2000	15	23-AUG-1999
	03-JAN-2001	15	13-JUL-2000

01-MAY-2001 12  
01-MAY-2007 4, 5, 8, 10, 15  
29-JAN-2008 4, 8, 13  
29-JAN-2009 3, 4, 8, 10, 15  
24-JUN-2009 15  
03-OCT-2011 11  
03-AUG-2012 15

03-JAN-2001  
01-MAY-2001  
01-MAY-2007  
29-JAN-2008  
29-JAN-2009  
24-JUN-2009  
03-OCT-2011

## SAFETY DATA SHEET

According to OSHA Hazard Communication Standard 29 CFR 1910.1200 (GHS)

Product name	FYRQUEL EHC PLUS	
Product id	7080	
Revision date	30/05/2016	Revision: 8
Supersedes	31/03/2014	

### 1. Identification of the substance & the company

Chemical name	Phenol, isobutyleneated, phosphate (3:1)
Chemical family	Aryl phosphate
Type of product and use	Fire-resistant hydraulic fluid
Supplier	ICL-IP America Inc 622 Emerson Road - Suite 500 St Louis, Missouri 63141, USA Tel:(314)983-7884 Fax (314)983-7807 e-mail msdsinfo@icl-group.com
Emergency Telephone	Chemtrec: (800) 424-9300 Medical: PROSAR 1-888-875-1885 (24HRS)

### 2. Hazards identification

Product is not subject to classification according to GHS. No label elements required.

NFPA Ratings (Scale 0-4)	Health = 1, Fire = 1, Reactivity = 0
HMS Ratings (Scale 0-4)	Health = 1, Fire = 1, Reactivity = 0

### 3. Composition / information on ingredients

Components	CAS No.	Weight %
Triphenyl phosphate	115-86-6	0-4
t-Butylphenyl diphenyl phosphate	56803-37-3	32-76
Bis(t-butylphenyl)phenyl phosphate	65652-41-7	10-40
tri(t-butylphenyl) phosphate	78-33-1	0-10

This product can also be described as:  
CAS No. 68937-40-6 , Phenol, isobutyleneated, phosphate (3:1)

### 4. First-aid measures

Eye contact	Holding the eyelids apart, flush eyes promptly with copious flowing water for at least 20 minutes. Get medical attention immediately.
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# SAFETY DATA SHEET

According to OSHA Hazard Communication Standard 29 CFR 1910.1200 (GHS)

<b>Product name</b>	<b>FYRQUEL EHC PLUS</b>	
<b>Product id</b>	7080	
<b>Revision date</b>	30/05/2016	<b>Revision: 8</b>
<b>Supersedes</b>	31/03/2014	

**Skin contact** Remove contaminated clothing. Wash skin thoroughly with mild soap and plenty of water for at least 15 minutes. Wash clothing before reuse. Get medical attention if irritation persists.

**Inhalation** In case of mist inhalation or breathing fumes released from heated material, remove person to fresh air. Keep him quiet and warm. Apply artificial respiration if necessary and get medical attention immediately.

**Ingestion** If swallowed, wash mouth thoroughly with plenty of water. Get medical attention immediately.

NOTE: Never give an unconscious person anything to drink

**Symptoms / Effects, Acute and Delayed** No specific information available

**Most important symptoms and effects, acute or delayed**

None known

**Notes to the physician** Treat symptomatically and supportively.  
No specific antidote.

## 5. Fire - fighting measures

**Suitable extinguishing media** Use extinguishing media appropriate to surrounding fire conditions.

**Unusual fire and explosion hazards** When heated to decomposition, may release poisonous and corrosive fumes of carbon dioxide, carbon monoxide and phosphorus oxides.

**Fire fighting procedure** Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA). Contain runoff to prevent entry into water or drainage systems.

## 6. Accidental release measures

**Personal precautions** Wear appropriate safety clothing and eyeface protection (see Section 8)

**Methods for cleaning up** Soak up with sand or other suitable absorbent and dispose of as solid waste. Collect in suitable and properly labeled containers. Ventilate area and wash spill site after material pickup is complete.

**Environmental precautions** Prevent product from entering drains, ditches and rivers.

# SAFETY DATA SHEET

According to OSHA Hazard Communication Standard 29 CFR 1910.1200 (GHS)

Product name **FYRQUEL EHC PLUS**  
Product Id 7080  
Revision date 30/05/2016 Revision: 8  
Supersedes 31/03/2014

## 7. Handling and storage

**Handling** Avoid bodily contact. Keep containers tightly closed.

**Storage** Store in a dry, cool, well-ventilated area away from incompatible materials (see "materials to avoid"). Maximum recommended storage temperature of 50°C (122 F). Store above 4.4°C (40° F) for improved pumping rates. Temperatures between 27 - 37 B C (80 - 100°F) provide good flow rates.

## 8. Exposure controls / personal protection

Exposure Limits :

Components	ACGIH-TLV Data	OSHA (PEL) Data
Triphenyl phosphate 115-86-6	3 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>
t-Butylphenyl diphenyl phosphate 56803-37-3	Not determined	Not determined
Bis(t-butylphenyl)phenyl phosphate 65652-41-7	Not determined	Not determined
tri(t-butylphenyl) phosphate 78-33-1	Not determined	Not determined

**Ventilation requirements** Ventilation must be sufficient to maintain atmospheric concentration below recommended exposure limit.

**Personal protective equipment:**

- Respiratory protection In case of insufficient ventilation wear suitable respiratory equipment
- Hand protection Neoprene gloves
- Eye protection Chemical splash goggles and/or face shield if splash hazard exists
- Skin and body protection Body covering clothes and boots

**Hygiene measures** Do not eat, smoke or drink where material is handled, processed or stored. Wash hands thoroughly after handling and before eating or smoking. Safety shower and eye bath should be provided.

## 9. Physical and chemical properties

Appearance Clear liquid  
Odor Slight  
Melting point/range -21 °C  
Boiling point/range >400 °C (762mmHg)  
Flash point >246 °C (>475 °F) (closed cup)  
Evaporation rate (ether=1) Not available  
Flammability (solid, gas) Not applicable  
Flammable/Explosion limits Not flammable/Not explosive  
Vapor pressure 1.08x10<sup>-3</sup>Pa (20°C)  
Vapor density Not available

# SAFETY DATA SHEET

According to OSHA Hazard Communication Standard 29 CFR 1910.1200 (GHS)

<b>Product name</b>	<b>FYRQUEL EHC PLUS</b>	
<b>Product id</b>	7080	
<b>Revision date</b>	30/05/2016	<b>Revision: 8</b>
<b>Supersedes</b>	31/03/2014	
<b>Density</b>	1.16-1.18 g/mL (25°C)	
<b>Solubility:</b>		
- Solubility in water	121 µg/l (20°C)	Based on primary component
<b>Partition coefficient (n-octanol/water)</b>	Log Pow : 5.61	
<b>Auto-ignition temperature</b>	Not self-ignitable	
<b>Viscosity</b>	42-46 cSt. (40°C)	
<b>Ignition temperature</b>	593°C (1100°F)	
<b>Explosive properties</b>	There are no chemical groups associated with explosive properties present in the molecule	
<b>Oxidising properties</b>	The structure indicates non oxidizing properties	

## 10. Stability and reactivity

<b>Reactivity</b>	No reactive hazards known/expected
<b>Stability</b>	Stable under normal conditions
<b>Possibility of hazardous reactions</b>	Not expected to occur
<b>Conditions to avoid</b>	Heating above decomposition temperature.
<b>Materials to avoid</b>	Strong oxidizers, strong acids and strong alkalis. It hydrolyzes slowly at normal temperatures in acidic or alkaline aqueous solutions.
<b>Hazardous decomposition products</b>	Phosphorus oxides Carbon dioxide and carbon monoxide

## 11. Toxicological information

<b>Note:</b>	<i>The toxicological data refer to a similar product</i>
<b>Acute toxicity:</b>	
- Rat oral LD50	> 5000 mg/kg
- Rabbit dermal LD50	> 2000 mg/kg
- Rat inhalation LC50	> 0.4 mg/l
- Dermal irritation (rabbit)	Not irritant
- Eye irritation (rabbit)	Not irritant
<b>Dermal sensitization</b>	Not a sensitizer
<b>Mutagenicity</b>	Not mutagenic by the Ames Test and by mouse lymphoma assay Negative in chromosome aberration and sister chromatid exchange tests in mouse lymphoma cells



# SAFETY DATA SHEET

According to OSHA Hazard Communication Standard 29 CFR 1910.1200 (GHS)

Product name	FYRQUEL EHC PLUS	
Product id	7080	
Revision date	30/05/2016	Revision: 8
Supersedes	31/03/2014	

Carcinogenicity	Not classified by IARC Not included in NTP 13th Report on Carcinogens Not classified as a carcinogen by USA OSHA
Reproductive toxicity	Butylated triphenyl phosphate did not demonstrate reproductive toxicity. In a rat reproduction study, male and female animals received either 50, 250 or 1000 mg/kg/day for several weeks after which they mated. There was no reproductive toxicity observed at any dose level. Diagnostic pathology confirmed no alterations to the reproductive organs. There was no effect on mating index, litter size, survival of the offspring or on any other measured parameter.
Teratogenicity	Not teratogenic when administered orally up to 1000 mg/kg
Specific Target Organ Toxicity (STOT) - Single exposure	No effects on specific target organs have been identified
Specific Target Organ Toxicity (STOT) - Repeat exposure	NOAEL 107.5 mg/kg bw /day (90 days oral, male rat) NOAEL 124.8 mg/kg bw /day (90 days oral, female rat)
Aspiration hazard	Not expected to occur
Neurotoxicity	No signs of acute delayed neurotoxicity when administered orally to hens at 11.7 g/kg

## 12. Ecological information

Aquatic toxicity :	No effects on aquatic organisms occurred at concentrations up to the substances water solubility.
Biodegradation	Readily biodegradable
Bioaccumulative potential	Not bioaccumulative The wholefish BCF was found to be 1850
Mobility in soil	Not relevant
Note:	Not considered to be PBT or vPvB

## 13. Disposal considerations

Waste disposal	Observe all federal, state and local environmental regulations when disposing of this material.
Disposal of Packaging	Dispose of in a safe manner in accordance with local/national regulations.

## 14. Transportation information

DOT	Not regulated
IMDG	Not regulated

# SAFETY DATA SHEET

According to OSHA Hazard Communication Standard 29 CFR 1910.1200 (GHS)

Product name	FYRQUEL EHC PLUS	
Product id	7080	
Revision date	30/05/2016	Revision: 8
Supersedes	31/03/2014	

ICAO/IATA Not regulated

## 15. Regulatory information

USA	Reported in the EPA TSCA Inventory
- SARA 313	This product does not contain a chemical listed at or above de minimis concentrations
- Massachusetts Right-to-Know Hazardous Substances list	Listed (Triphenyl phosphate)
- New Jersey Right-to-Know Hazardous Substances list	Listed (Triphenyl phosphate)
- Pennsylvania Right-to-Know Hazardous Substances list	Listed (Triphenyl phosphate)
- Rhode Island Right-to-Know Hazardous Substances list	Listed (Triphenyl phosphate)
- California-Prop 65	This product does not contain any ingredient known to the State of California to cause cancer or reproductive toxicity as listed under the State drinking Water and Toxic Enforcement Act of 1986.
- Waste Classifications	This material does not meet RCRA's characteristic definition of ignitability, corrosivity, or reactivity, and is not listed in 40CFR 261.33.
Canada	Listed in DSL
WHMIS hazard class	Non-controlled
EU	Reported in EINECS
EC No.	939-505-4
Japan	Listed in ENCS
Australia	Listed in AICS
New Zealand Inventory	Listed in NZIoC
China	
- China inventory	Listed in IECSC
Korea	Listed in ECL
Taiwan	Listed
Philippines	Listed in PICCS



# SAFETY DATA SHEET

According to OSHA Hazard Communication Standard 29 CFR 1910.1200 (GHS)

Product name	FYRQUEL EHC PLUS	
Product id	7080	
Revision date	30/05/2016	Revision: 6
Supersedes	31/03/2014	

## 16. Other information

This data sheet contains changes from the previous version in section(s)

1, 3, 8, 11, 12, 15

### Health, Safety & Environment Policy

We will strive to ensure that our operations and products meet the needs of the present global community without compromising the ability of future generations to meet their needs. We accept that the success of our business is dependent on the supply of products and services that will benefit society whilst ensuring human safety and protection of the environment and natural resources. Within the framework of our commitment to the Responsible Care program, we will provide a healthy and safe work environment for employees and will responsibly manage our products at all stages of their life cycle in order to protect human health and the environment whilst maintaining high production standards of operation.

**TO MEET THIS COMMITMENT WE WILL:** Comply with or exceed applicable national and international regulatory requirements and other requirements to which we subscribe. Communicate openly and actively encourage dialogue with employees, customers and community concerning our products and operations. Implement documented management systems consistent with and for promotion of the Responsible Care ethics.

Develop and supply products that can be manufactured, transported, used and disposed of safely whilst best meeting the needs of our customers. Regularly assess, continually improve and responsibly manage health, safety and environmental risks associated with products and processes throughout their life-cycles. Share knowledge and expertise with others and seek to learn from and incorporate improved practices into our own operations.

Educate and train employees, contractors and customers to improve their HSE performance. Communicate up-to-date information to enable our workers, customers and other interested parties to handle our products in a safe and environmentally responsible manner. Endeavor to work with customers, suppliers, distributors and contractors to foster the safe use, transport and disposal of our chemicals. Support Product Stewardship programs in cooperation with customers, distributors and transporters.

Although the information and recommendations set forth herein (hereinafter "information") are presented in good faith and believed to be correct as of the date hereof, ICL-IP America Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its safety and suitability for their purposes prior to use. In no event will ICL-IP America Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. **NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE, ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH THE INFORMATION REFERS.**

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End of safety data sheet



# Safety Data Sheet



## 1. Identification

<b>Product Name:</b>	HIPERF QT 2PK ZINC COLD GALV COMPOUND	<b>Revision Date:</b>	12/29/2016
<b>Product Identifier:</b>	206194T	<b>Supersedes Date:</b>	9/10/2014
<b>Product Use/Class:</b>	Cold Galvanizing Compound/High Performance Epoxy Ester		
<b>Supplier:</b>	Rust-Oleum Corporation 11 Hawthorn Parkway Vernon Hills, IL 60061 USA	<b>Manufacturer:</b>	Rust-Oleum Corporation 11 Hawthorn Parkway Vernon Hills, IL 60061 USA
<b>Preparer:</b>	Regulatory Department		
<b>Emergency Telephone:</b>	24 Hour Hotline: 847-367-7700		

## 2. Hazard Identification

### Classification

#### Symbol(s) of Product



#### Signal Word

Danger

#### Possible Hazards

87% of the mixture consists of ingredient(s) of unknown acute toxicity.

#### GHS HAZARD STATEMENTS

Flammable Liquid, category 3	H226	Flammable liquid and vapour.
STOT, repeated exposure, category 1	H372	Causes damage to organs through prolonged or repeated exposure.
Skin Sensitizer, category 1	H317	May cause an allergic skin reaction.

#### GHS LABEL PRECAUTIONARY STATEMENTS

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233	Keep container tightly closed.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P370+P378	In case of fire: Use alcohol film forming foam, carbon dioxide, dry chemical, dry sand to extinguish.
P403+P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/container in accordance with local, regional and national regulations.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P264	Wash hands thoroughly after handling.
P314	Get medical advice/attention if you feel unwell.
P272	Contaminated work clothing should not be allowed out of the workplace.

P302+P352  
P333+P313  
P321

IF ON SKIN: Wash with plenty of soap and water.  
If skin irritation or rash occurs: Get medical advice/attention.  
For specific treatment see label

**GHS SDS PRECAUTIONARY STATEMENTS**

P240 Ground/bond container and receiving equipment.  
P241 Use explosion-proof electrical/ventilating/lighting/equipment.  
P242 Use only non-sparking tools.  
P243 Take precautionary measures against static discharge.  
P270 Do not eat, drink or smoke when using this product.  
P363 Wash contaminated clothing before reuse.

**3. Composition/Information On Ingredients****HAZARDOUS SUBSTANCES**

<u>Chemical Name</u>	<u>CAS-No.</u>	<u>Wt.% Range</u>	<u>GHS Symbols</u>	<u>GHS Statements</u>
Zinc	7440-66-6	75-100	Not Available	Not Available
Hydrotreated Light Distillate	64742-47-8	2.5-10	GHS08	H304
Zinc Oxide	1314-13-2	2.5-10	Not Available	Not Available
Stoddard Solvent	8052-41-3	1.0-2.5	GHS08	H304-372
Zeolite	1318-02-1	0.1-1.0	GHS06	H331
Methyl Ethyl Ketoxime	96-29-7	0.1-1.0	GHS05-GHS06	H302-312-317-318-331

**4. First-aid Measures**

**FIRST AID - EYE CONTACT:** Immediately flush eyes with plenty of water for at least 15 minutes holding eyelids open. Get medical attention. Do NOT allow rubbing of eyes or keeping eyes closed.

**FIRST AID - SKIN CONTACT:** Wash skin with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

**FIRST AID - INHALATION:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention. Do NOT use mouth-to-mouth resuscitation. If you experience difficulty in breathing, leave the area to obtain fresh air. If continued difficulty is experienced, get medical assistance immediately.

**FIRST AID - INGESTION:** If swallowed, get medical attention.

**5. Fire-fighting Measures**

**EXTINGUISHING MEDIA:** Alcohol Film Forming Foam, Carbon Dioxide, Dry Chemical, Water Fog

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** No unusual fire or explosion hazards noted. Closed containers may explode when exposed to extreme heat due to buildup of steam. Keep containers tightly closed. Combustible liquid and vapor.

**SPECIAL FIREFIGHTING PROCEDURES:** Evacuate area and fight fire from a safe distance. Use water spray to keep fire-exposed containers cool. Containers may explode when heated.

**6. Accidental Release Measures**

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Dispose of according to local, state (provincial) and federal regulations. Do not incinerate closed containers. Remove all sources of ignition, ventilate area and remove with inert absorbent and non-sparking tools.

**7. Handling and Storage**

**HANDLING:** Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and launder before reuse. Use only with adequate ventilation. Follow all MSDS/label precautions even after container is emptied because it may retain product residues. Avoid breathing fumes, vapors, or mist. Avoid contact with eyes, skin and clothing.

**STORAGE:** Store in a dry, well ventilated place. Keep container tightly closed when not in use. Keep containers tightly closed. Isolate from heat, electrical equipment, sparks and open flame. Avoid excess heat.

## 8. Exposure Controls/Personal Protection

Chemical Name	CAS-No.	Weight % Less Than	ACGIH TLV- TWA	ACGIH TLV- STEL	OSHA PEL-TWA	OSHA PEL- CEILING
Zinc	7440-66-6	85.0	N.E.	N.E.	N.E.	N.E.
Hydrotreated Light Distillate	64742-47-8	10.0	N.E.	N.E.	N.E.	N.E.
Zinc Oxide	1314-13-2	5.0	2 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	N.E.
Stoddard Solvent	8052-41-3	5.0	100 ppm	N.E.	500 ppm	N.E.
Zeolite	1318-02-1	1.0	N.E.	N.E.	N.E.	N.E.
Methyl Ethyl Ketoxime	96-29-7	1.0	10 ppm	N.E.	N.E.	N.E.

### PERSONAL PROTECTION

**ENGINEERING CONTROLS:** Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Prevent build-up of vapors by opening all doors and windows to achieve cross-ventilation.

**RESPIRATORY PROTECTION:** A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

**SKIN PROTECTION:** Use gloves to prevent prolonged skin contact. Nitrile or Neoprene gloves may afford adequate skin protection.

**EYE PROTECTION:** Use safety eyewear designed to protect against splash of liquids.

**OTHER PROTECTIVE EQUIPMENT:** Refer to safety supervisor or industrial hygienist for further guidance regarding types of personal protective equipment and their applications.

**HYGIENIC PRACTICES:** Wash thoroughly with soap and water before eating, drinking or smoking. Remove contaminated clothing immediately and launder before reuse.

## 9. Physical and Chemical Properties

<b>Appearance:</b>	Liquid	<b>Physical State:</b>	Liquid
<b>Odor:</b>	Solvent Like	<b>Odor Threshold:</b>	N.E.
<b>Relative Density:</b>	3.386	<b>pH:</b>	N.A.
<b>Freeze Point, °C:</b>	N.D.	<b>Viscosity:</b>	N.D.
<b>Solubility in Water:</b>	Negligible	<b>Partition Coefficient, n-octanol/ water:</b>	N.D.
<b>Decomposition Temp., °C:</b>	N.D.	<b>Explosive Limits, vol%:</b>	0.8 - 6.0
<b>Boiling Range, °C:</b>	149 - 537	<b>Flash Point, °C:</b>	38
<b>Flammability:</b>	Supports Combustion	<b>Auto-ignition Temp., °C:</b>	N.D.
<b>Evaporation Rate:</b>	Slower than Ether	<b>Vapor Pressure:</b>	N.D.
<b>Vapor Density:</b>	Heavier than Air		

(See "Other information" Section for abbreviation legend)

## 10. Stability and Reactivity

**CONDITIONS TO AVOID:** Avoid contact with strong acid and strong bases.

**INCOMPATIBILITY:** Incompatible with strong oxidizing agents, strong acids and strong alkalies.

**HAZARDOUS DECOMPOSITION:** When heated to decomposition, it emits acrid smoke and irritating fumes. Contains solvents which may form carbon monoxide, carbon dioxide, and formaldehyde.

**HAZARDOUS POLYMERIZATION:** Will not occur under normal conditions.

**STABILITY:** This product is stable under normal storage conditions.

## 11. Toxicological information

**EFFECTS OF OVEREXPOSURE - EYE CONTACT:** Substance causes moderate eye irritation.

**EFFECTS OF OVEREXPOSURE - SKIN CONTACT:** Substance may cause slight skin irritation.

**EFFECTS OF OVEREXPOSURE - INHALATION:** High gas, vapor, mist or dust concentrations may be harmful if inhaled. Avoid breathing fumes, spray, vapors, or mist. High vapor concentrations are irritating to the eyes, nose, throat and lungs. Prolonged or

excessive inhalation may cause respiratory tract irritation.

**EFFECTS OF OVEREXPOSURE - INGESTION:** Irritating to the nose, throat and respiratory tract. Harmful if swallowed.

**EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS:** Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage.

**PRIMARY ROUTE(S) OF ENTRY:** Eye Contact, Ingestion, Inhalation, Skin Absorption, Skin Contact

#### ACUTE TOXICITY VALUES

The acute effects of this product have not been tested. Data on individual components are tabulated below:

<u>CAS-No.</u>	<u>Chemical Name</u>	<u>Oral LD50</u>	<u>Dermal LD50</u>	<u>Vapor LC50</u>
64742-47-8	Hydrotreated Light Distillate	>5000 mg/kg Rat	>2000 mg/kg Rabbit	>5000 mg/L Rat
1314-13-2	Zinc Oxide	>5000 mg/kg Rat	N.I.	N.I.
1318-02-1	Zeolite	5000 mg/kg Rat	>2000 mg/kg Rabbit	2.4 mg/L Rat
96-29-7	Methyl Ethyl Ketoxime	930 mg/kg Rat	1100 mg/kg Rabbit	>4.8 mg/L Rat

N.I. - No Information

## 12. Ecological Information

**ECOLOGICAL INFORMATION:** Product is a mixture of listed components.

## 13. Disposal Information

**DISPOSAL INFORMATION:** Dispose of material in accordance to local, state, and federal regulations and ordinances. Do not allow to enter waterways, wastewater, soil, storm drains or sewer systems.

## 14. Transport Information

	<u>Domestic (USDOT)</u>	<u>International (IMDG)</u>	<u>Air (IATA)</u>	<u>TDG (Canada)</u>
UN Number:	N.A.	1263	1263	N.A.
Proper Shipping Name:	Not Regulated	Paint	Paint	Not Regulated
Hazard Class:	N.A.	3	3	N.A.
Packing Group:	N.A.	III	III	N.A.
Limited Quantity:	No	Yes	Yes	No

## 15. Regulatory Information

### U.S. Federal Regulations:

#### CERCLA - SARA Hazard Category

This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

#### Sara Section 313:

This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR part 372:

<u>Chemical Name</u>	<u>CAS-No.</u>
Zinc	7440-66-6
Zinc Oxide	1314-13-2

**Toxic Substances Control Act:**

This product contains the following chemical substances subject to the reporting requirements of TSCA 12(b) if exported from the United States:

<u>Chemical Name</u>	<u>CAS-No.</u>
n-Nonane	111-84-2

**16. Other Information****HMIS RATINGS**

Health: 3\*      Flammability: 2      Physical Hazard: 0      Personal Protection: X

**NFPA RATINGS**

Health: 3      Flammability: 2      Instability: 0

VOLATILE ORGANIC COMPOUNDS, g/L: 361

SDS REVISION DATE: 12/29/2016

REASON FOR REVISION: Product Composition Changed  
 Substance and/or Product Properties Changed in Section(s):  
 01 - Identification  
 02 - Hazard Identification  
 05 - Fire-fighting Measures  
 09 - Physical & Chemical Properties  
 15 - Regulatory Information  
 16 - Other Information  
 Statement(s) Changed

Legend: N.A. - Not Applicable, N.E. - Not Established, N.D. - Not Determined

Rust-Oleum Corporation believes, to the best of its knowledge, information and belief, the information contained herein to be accurate and reliable as of the date of this safety data sheet. However, because the conditions of handling, use, and storage of these materials are beyond our control, we assume no responsibility or liability for personal injury or property damage incurred by the use of these materials. Rust-Oleum Corporation makes no warranty, expressed or implied, regarding the accuracy or reliability of the data or results obtained from their use. All materials may present unknown hazards and should be used with caution. The information and recommendations in this material safety data sheet are offered for the users' consideration and examination. It is the responsibility of the user to determine the final suitability of this information and to comply with all applicable international, federal, state, and local laws and regulations.



# SAFETY DATA SHEET

SDS ID NO.: 0127MAR019  
Revision Date: 05/14/2015

## 1. IDENTIFICATION

Product Name: Marathon Petroleum Regular Unleaded Gasoline

Synonym: Conventional Regular Unleaded Gasoline  
Chemical Family: Complex Hydrocarbon Substance

Recommended Use: Fuel.  
Use Restrictions: All others.

Supplier Name and Address:  
**MARATHON PETROLEUM COMPANY LP**  
**539 South Main Street**  
**Findlay, OH 45840**

SDS information: 1-419-421-3070

Emergency Telephone: 1-877-627-5463

## 2. HAZARD IDENTIFICATION

### Classification

#### OSHA Regulatory Status

This chemical is considered hazardous according to the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 1
Skin corrosion/irritation	Category 2
Germ cell mutagenicity	Category 1B
Carcinogenicity	Category 1B
Reproductive toxicity	Category 2
Specific target organ toxicity (single exposure)	Category 3
Aspiration toxicity	Category 1
Acute aquatic toxicity	Category 2
Chronic aquatic toxicity	Category 2

#### Hazards Not Otherwise Classified (HNOC)

Static accumulating flammable liquid

### Label elements

#### EMERGENCY OVERVIEW

#### Danger

EXTREMELY FLAMMABLE LIQUID AND VAPOR  
May accumulate electrostatic charge and ignite or explode



May be fatal if swallowed and enters airways  
Causes skin irritation  
May cause genetic defects  
May cause cancer  
Suspected of damaging fertility or the unborn child  
May cause respiratory irritation  
May cause drowsiness or dizziness  
Toxic to aquatic life with long lasting effects



**Appearance** Clear or Colored Liquid

**Physical State** Liquid

**Odor** Strong Hydrocarbon

**Precautionary Statements - Prevention**

Keep away from heat/sparks/open flames/hot surfaces. — No smoking  
Keep container tightly closed  
Ground/bond container and receiving equipment  
Use explosion-proof electrical/ventilating/lighting/equipment  
Use only non-sparking tools  
Take precautionary measures against static discharge  
Obtain special instructions before use  
Do not handle until all safety precautions have been read and understood  
Wear protective gloves/protective clothing/eye protection/face protection  
Do not eat, drink or smoke when using this product  
Do not breathe mist/vapors/spray  
Use only outdoors or in a well-ventilated area  
Wash hands thoroughly after handling  
Avoid release to the environment

**Precautionary Statements - Response**

IF exposed or concerned: Get medical attention  
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower  
If skin irritation occurs: Get medical attention  
Wash contaminated clothing before reuse  
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing  
Call a POISON CENTER or doctor if you feel unwell  
IF SWALLOWED: Immediately call a POISON CENTER or doctor  
Do NOT induce vomiting  
In case of fire: Use water spray, fog or regular foam for extinction

**Precautionary Statements - Storage**

Store in a well-ventilated place. Keep container tightly closed  
Keep cool  
Store locked up

**Precautionary Statements - Disposal**

Dispose of contents/container at an approved waste disposal plant

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Gasoline is a complex combination of hydrocarbons consisting of paraffins, cycloparaffins, aromatic and olefinic hydrocarbons having molecular chains ranging in length from four to ten carbons. May contain small amounts of dye and other additives (>0.02%) which are not considered hazardous at the concentrations used.

**Composition Information:**

Name	CAS Number	Weight %
Gasoline	86290-81-5	100
Toluene	108-88-3	1-15
Xylene (mixed isomers)	1330-20-7	2-10
1,2,4-Trimethylbenzene	95-63-6	1-5
Benzene	71-43-2	0.5-3.5
n-Hexane	110-54-3	0-3
Ethylbenzene	100-41-4	0.5-2.0
Naphthalene	91-20-3	0.1-0.5

**4. FIRST AID MEASURES**

**First Aid Measures**

- General advice** In case of accident or if you feel unwell, seek medical advice immediately (show directions for use or safety data sheet if possible).
- Inhalation:** Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear, give oxygen and continue to monitor. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.
- Skin Contact:** Immediately wash exposed skin with plenty of soap and water while removing contaminated clothing and shoes. May be absorbed through the skin in harmful amounts. Get medical attention if irritation persists. Any injection injury from high pressure equipment should be evaluated immediately by a physician as potentially serious (See NOTES TO PHYSICIAN).  
  
Place contaminated clothing in closed container until cleaned or discarded. If clothing is to be laundered, inform the person performing the operation of contaminant's hazardous properties. Destroy contaminated, non-chemical resistant footwear.
- Eye Contact:** Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Gently remove contacts while flushing. Get medical attention if irritation persists.
- Ingestion:** Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs, keep head below hips, or if patient is lying down, turn body and head to side to prevent aspiration and monitor for breathing difficulty. Never give anything by mouth to an unconscious person. Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.
- Most important signs and symptoms, both short-term and delayed with overexposure**
- Adverse Effects:** Acute: Headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Delayed: Dry skin and possible irritation with repeated or prolonged exposure.
- Indication of any immediate medical attention and special treatment needed**

**NOTES TO PHYSICIAN:**

**INHALATION:** This material (or a component) sensitizes the myocardium to the effects of sympathomimetic amines. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in individuals exposed to this material. Administration of sympathomimetic drugs should be avoided.

**SKIN:** Leaks or accidents involving high-pressure equipment may inject a stream of material through the skin and initially produce an injury that may not appear serious. Only a small puncture wound may appear on the skin surface but, without proper treatment and depending on the nature, original pressure, volume, and location of the injected material, can compromise blood supply to an affected body part. Prompt surgical debridement of the wound may be necessary to prevent irreversible loss of function and/or the affected body part. High pressure injection injuries may be **SERIOUS SURGICAL EMERGENCIES**.

**INGESTION:** This material represents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended.

**5. FIRE-FIGHTING MEASURES**

**Suitable extinguishing media**

For small fires, Class B fire extinguishing media such as CO2, dry chemical, foam (AFFF/ATC) or water spray can be used. For large fires, water spray, fog or foam (AFFF/ATC) can be used. Firefighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

**Unsuitable extinguishing media**

Do not use straight water streams to avoid spreading fire.

**Specific hazards arising from the chemical**

This product has been determined to be an extremely flammable liquid per the OSHA Hazard Communication Standard and should be handled accordingly. May accumulate electrostatic charge and ignite or explode. Vapors may travel along the ground or be moved by ventilation and ignited by many sources such as pilot lights, sparks, electric motors, static discharge, or other ignition sources at locations distant from material handling. Flashback can occur along vapor trail. For additional fire related information, see NFPA 30 or the North American Emergency Response Guide 128.

**Hazardous combustion products**

Smoke, carbon monoxide, and other products of incomplete combustion.

**Explosion data**

- Sensitivity to Mechanical Impact** No.
- Sensitivity to Static Discharge** Yes.

**Special protective equipment and precautions for firefighters**

Firefighters should wear full protective clothing and positive-pressure self-contained breathing apparatus (SCBA) with a full face-piece, as appropriate. Avoid using straight water streams. Water may be ineffective in extinguishing low flash point fires, but can be used to cool exposed surfaces. Avoid excessive water spray application. Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and from as far a distance as possible. Keep run-off water out of sewers and water sources.

**NFPA:** Health 1 Flammability 3 Instability 0 Special Hazards -

**6. ACCIDENTAL RELEASE MEASURES**

**Personal Precautions:**

Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Eliminate all ignition sources.

**Protective Equipment:**

Use personal protection measures as recommended in Section 8.

**Emergency Procedures:**

Advise authorities and National Response Center (800-424-8802) if the product has entered a water course or sewer. Notify local health and pollution control agencies, if appropriate.

**Environmental precautions:**

Avoid release to the environment. Avoid subsoil penetration.

**Methods and materials for containment:** Contain liquid with sand or soil.

**Methods and materials for cleaning up:** Use suitable absorbent materials such as vermiculite, sand, or clay to clean up residual liquids. Recover and return free product to proper containers. When recovering free liquids ensure all equipment is grounded and bonded. Use only non-sparking tools.

## 7. HANDLING AND STORAGE

**Safe Handling Precautions:**

NEVER SIPHON THIS PRODUCT BY MOUTH. Use appropriate grounding and bonding practices. Static accumulating flammable liquid. Bonding and grounding may be insufficient to eliminate the hazard from static electricity. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. No smoking. Avoid repeated and prolonged skin contact. Use personal protection measures as recommended in Section 8. Use only non-sparking tools. Do not cut, drill, grind or weld on empty containers since explosive residues may remain. Refer to applicable EPA, OSHA, NFPA and consistent state and local requirements.

Hydrocarbons are basically non-conductors of electricity and can become electrostatically charged during mixing, filtering, pumping at high flow rates or loading and transfer operations. If this charge reaches a sufficiently high level, sparks can form that may ignite the vapors of flammable liquids. Sudden release of hot organic chemical vapors or mists from process equipment operating under elevated temperature and pressure, or sudden ingress of air into vacuum equipment may result in ignition of vapors or mists without the presence of obvious ignition sources. Nozzle spouts must be kept in contact with the containers or tank during the entire filling operation.

Portable containers should never be filled while in or on a motor vehicle or marine craft. Containers should be placed on the ground. Static electric discharge can ignite fuel vapors when filling non-grounded containers or vehicles on trailers. The nozzle spout must be kept in contact with the container before and during the entire filling operation. Use only approved containers.

A buildup of static electricity can occur upon re-entry into a vehicle during fueling especially in cold or dry climate conditions. The charge is generated by the action of dissimilar fabrics (i.e., clothing and upholstery) rubbing across each other as a person enters/exits the vehicle. A flash fire can result from this discharge if sufficient flammable vapors are present. Therefore, do not get back in your vehicle while refueling.

Cellular phones and other electronic devices may have the potential to emit electrical charges (sparks). Sparks in potentially explosive atmospheres (including fueling areas such as gas stations) could cause an explosion if sufficient flammable vapors are present. Therefore, turn off cellular phones and other electronic devices when working in potentially explosive atmospheres or keep devices inside your vehicle during refueling.

High-pressure injection of any material through the skin is a serious medical emergency even though the small entrance wound at the injection site may not initially appear serious. These injection injuries can occur from high-pressure equipment such as paint spray or grease or guns, fuel injectors, or pinhole leaks in hoses or hydraulic lines and should all be considered serious. High pressure injection injuries may be SERIOUS SURGICAL EMERGENCIES (See First Aid Section 4).

**Storage Conditions:** Store in properly closed containers that are appropriately labeled and in a cool, well-ventilated area.

**Incompatible materials** Strong oxidizing agents.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	ACGIH TLV	OSHA PELs:	OSHA - Vacated PELs	NIOSH IDLH
Gasoline 86290-81-5	300 ppm TWA 500 ppm STEL	-	300 ppm TWA 900 mg/m <sup>3</sup> TWA 500 ppm STEL 1500 mg/m <sup>3</sup> STEL	-
Toluene 108-88-3	20 ppm TWA	TWA: 200 ppm Ceiling: 300 ppm	100 ppm TWA 375 mg/m <sup>3</sup> TWA 150 ppm STEL 560 mg/m <sup>3</sup> STEL	500 ppm
Xylene (mixed isomers) 1330-20-7	100 ppm TWA 150 ppm STEL	TWA: 100 ppm TWA: 435 mg/m <sup>3</sup>	100 ppm TWA 435 mg/m <sup>3</sup> TWA 150 ppm STEL 655 mg/m <sup>3</sup> STEL	900 ppm
1,2,4-Trimethylbenzene 95-63-6	25 ppm TWA	-	25 ppm TWA 125 mg/m <sup>3</sup> TWA	-
Benzene 71-43-2	0.5 ppm TWA 2.5 ppm STEL Skin - potential significant contribution to overall exposure by the cutaneous route	TWA: 10 ppm (applies to industry segments exempt from the benzene standard at 29 CFR 1910.1028) TWA: 1 ppm STEL: 5 ppm (see 29 CFR 1910.1028)	25 ppm Ceiling 1 ppm TWA 5 ppm STEL	500 ppm
n-Hexane 110-54-3	50 ppm TWA Skin - potential significant contribution to overall exposure by the cutaneous route	TWA: 500 ppm TWA: 1800 mg/m <sup>3</sup>	50 ppm TWA 180 mg/m <sup>3</sup> TWA	1100 ppm
Ethylbenzene 100-41-4	20 ppm TWA	TWA: 100 ppm TWA: 435 mg/m <sup>3</sup>	100 ppm TWA 435 mg/m <sup>3</sup> TWA 125 ppm STEL 545 mg/m <sup>3</sup> STEL	800 ppm
Naphthalene 91-20-3	10 ppm TWA Skin - potential significant contribution to overall exposure by the cutaneous route	TWA: 10 ppm TWA: 50 mg/m <sup>3</sup>	10 ppm TWA 50 mg/m <sup>3</sup> TWA 15 ppm STEL 75 mg/m <sup>3</sup> STEL	250 ppm

**Notes:** The manufacturer has voluntarily elected to provide exposure limits contained in OSHA's 1989 air contaminants standard in its SDSs, even though certain of those exposure limits were vacated in 1992.

**Engineering measures:** Local or general exhaust required in an enclosed area or when there is inadequate ventilation. Use mechanical ventilation equipment that is explosion-proof.

**Personal protective equipment**

**Eye protection:** Use goggles or face-shield if the potential for splashing exists.

**Skin and body protection:** Use nitrile rubber, viton or PVA gloves for repeated or prolonged skin exposure. Glove suitability is based on workplace conditions and usage. Contact the glove manufacturer for specific advice on glove selection and breakthrough times.

**Respiratory protection:** Approved organic vapor chemical cartridge or supplied air respirators should be worn for exposures to any components exceeding the established exposure limits. Observe respirator assigned protection factors (APFs) criteria cited in federal OSHA 29 CFR 1910.134. Self-contained breathing apparatus should be used for fire fighting.

**Hygiene measures:** Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Information on basic physical and chemical properties**

<b>Physical State</b>	Liquid
<b>Appearance</b>	Clear or Colored Liquid
<b>Color</b>	Clear or Colored
<b>Odor</b>	Strong Hydrocarbon
<b>Odor Threshold</b>	No available data.

<u>Property</u>	<u>Values (Method)</u>
<b>Melting Point / Freezing Point</b>	No available data.
<b>Initial Boiling Point / Boiling Range</b>	32-225 °C / 90-437 °F
<b>Flash Point</b>	-45.5 °C / -50 °F
<b>Evaporation Rate</b>	No available data.
<b>Flammability (solid, gas)</b>	Not applicable.
<b>Flammability Limit in Air (%)</b>	
Upper Flammability Limit:	7.6
Lower Flammability Limit:	1.4
<b>Vapor Pressure</b>	403-776 mm Hg@ 100°F
<b>Vapor Density</b>	3-4
<b>Specific Gravity / Relative Density</b>	0.70-0.77
<b>Water Solubility</b>	Negligible
<b>Solubility in other solvents</b>	No available data.
<b>Partition Coefficient</b>	2.13-4.5
<b>Decomposition temperature:</b>	No available data.
<b>pH:</b>	Not applicable
<b>Autoignition Temperature</b>	C.A. 257 °C / 495 °F
<b>Kinematic Viscosity</b>	No available data.
<b>Dynamic Viscosity</b>	No available data.
<b>Explosive Properties</b>	No available data.
<b>Softening Point</b>	No available data.
<b>VOC Content (%)</b>	100%
<b>Density</b>	5.9-6.3 lbs/gal
<b>Bulk Density</b>	Not applicable.

## 10. STABILITY AND REACTIVITY

<b><u>Reactivity</u></b>	The product is non-reactive under normal conditions.
<b><u>Chemical stability</u></b>	The material is stable at 70°F, 760 mmHg pressure.
<b><u>Possibility of hazardous reactions</u></b>	None under normal processing.
<b><u>Hazardous polymerization</u></b>	Will not occur.
<b><u>Conditions to avoid</u></b>	Excessive heat, sources of ignition, open flame.
<b><u>Incompatible materials</u></b>	Strong oxidizing agents.
<b><u>Hazardous decomposition products</u></b>	None known under normal conditions of use.

## 11. TOXICOLOGICAL INFORMATION

### Potential short-term adverse effects from overexposures

<b>Inhalation</b>	Irritating to the respiratory system. May cause drowsiness or dizziness. Breathing high concentrations of this material in a confined space or by intentional abuse can cause irregular heartbeats which can cause death.
<b>Eye contact</b>	Causes mild eye irritation.

**Skin contact** Causes skin irritation. Effects may become more serious with repeated or prolonged contact. May be absorbed through the skin in harmful amounts.

**Ingestion** May be fatal if swallowed or vomited and enters airways. May cause irritation of the mouth, throat and gastrointestinal tract.

**Acute Toxicological data**

Name	Oral LD50	Dermal LD50	Inhalation LC50
Gasoline 86290-81-5	14000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 5.2 mg/L (Rat) 4 h
Toluene 108-88-3	> 2000 mg/kg (Rat)	8390 mg/kg (Rabbit)	12.5 mg/L (Rat) 4 h
Xylene (mixed isomers) 1330-20-7	> 2000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 5.04 mg/L (Rat) 4 h
1,2,4-Trimethylbenzene 95-63-6	3280 mg/kg (Rat)	> 3160 mg/kg (Rabbit)	18,000 mg/m <sup>3</sup> (Rat) 4 h
Benzene 71-43-2	> 2000 mg/kg (Rat)	> 5000 mg/kg (Rabbit)	> 20 mg/l (Rat) 4 h
n-Hexane 110-54-3	15000 mg/kg (Rat)	3000 mg/kg (Rabbit)	48000 ppm (Rat) 4 h
Ethylbenzene 100-41-4	> 2000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	17.2 mg/L (Rat) 4 h
Naphthalene 91-20-3	490 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 340 mg/m <sup>3</sup> (Rat) 1 h

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**



**BENZENE:** Studies of workers exposed to benzene show clear evidence that overexposure can cause cancer and other diseases of the blood forming organs including Acute Myelogenous Leukemia (AML), and Aplastic Anemia (AA), an often fatal disease. Some studies suggest overexposure to benzene may also be associated with Myelodysplastic Syndrome (MDS). Findings from a case control study of workers exposed to benzene was reported during the 2009 Benzene Symposium in Munich included an increase in Acute Myeloid Leukemias and Non-Hodgkins Lymphoid Neoplasms (NHLN) of the subtype follicular lymphoma (FL) in some occupational categories. Some studies of workers exposed to benzene have shown an association with increased rates of chromosome aberrations in circulating lymphocytes. One study of women workers exposed to benzene suggested a weak association with irregular menstruation. However, other studies of workers exposed to benzene have not demonstrated clear evidence of an effect on fertility or reproductive outcome in humans. Benzene can cross the placenta and affect the developing fetus. Cases of AA have been reported in the offspring of persons severely overexposed to benzene. Studies in laboratory animals indicate that prolonged, repeated exposure to high levels of benzene vapor can cause bone marrow suppression and cancer in multiple organ systems. Studies in laboratory animals show evidence of adverse effects on male reproductive organs following high levels of exposure but no significant effects on reproduction have been observed. Embryotoxicity has been reported in studies of laboratory animals but effects were limited to reduced fetal weight and minor skeletal variations. Benzene has been classified as a proven human carcinogen by OSHA and a Group 1 (Carcinogenic to Humans) material by IARC. The current proposed IARC classification for benzene is summarized as follows: Sufficient evidence for Acute Myeloid Leukemia; limited evidence for Acute Lymphatic Leukemia, Chronic Lymphatic Leukemia, Non-Hodgkin Lymphoma, and Multiple Myeloma.

**NAPHTHAS:** In a large epidemiological study on over 15,000 employees at several petroleum refineries and amongst residents located near these refineries, no increased risk of kidney cancer was observed in association with gasoline exposures (a similar material). In a similar study, no increased risk of kidney cancer was observed among petroleum refinery workers, but there was a slight trend in the incidence of kidney cancers among service station employees, especially after a 30-year latency period. Altered mental state, drowsiness, peripheral motor neuropathy, irreversible brain damage (so-called Petrol Sniffer's Encephalopathy), delirium, seizures, and sudden death have been reported from repeated overexposure to some hydrocarbon solvents, naphthas, and gasoline.

**ISOPARAFFINS:** Studies in laboratory animals have shown that long-term exposure to similar materials (isoparaffins) can cause kidney damage and kidney cancer in male laboratory rats. However, in-depth research indicates that these findings are unique to the male rat, and that these effects are not relevant to humans.

**TOLUENE:** Case studies of persons abusing toluene suggest isolated incidences of adverse effects on the fetus including birth defects. Abuse of toluene at high concentrations (e.g., glue sniffing and solvent abuse) has been associated with adverse effects on the liver, kidney and nervous system, and can cause CNS depression, cardiac arrhythmias, and death. Studies of workers indicate longterm exposure may be related to impaired color vision and hearing. Some studies of workers suggest longterm exposure may be related to neurobehavioral and cognitive changes. Some of these effects have been observed in laboratory animals following repeated exposure to high levels of toluene. Several studies of workers suggest longterm exposure may be related to small increases in spontaneous abortions and changes in some gonadotropic hormones. However, the weight of evidence does not indicate toluene is a reproductive hazard to humans. Studies in laboratory animals indicate some changes in reproductive organs following high levels of exposure, but no significant effects on mating performance or reproduction were observed. Case studies of persons abusing toluene suggest isolated incidences of adverse effects on the fetus including birth defects. Findings in laboratory animals have been largely negative. Positive findings include small increases in minor skeletal and visceral malformations and developmental delays following very high levels of maternal exposure. Studies of workers indicate long-term exposure may be related to effects on the liver, kidney and blood, but these appear to be limited to changes in serum enzymes and decreased leukocyte counts. Adverse effects on the liver, kidney, thymus and nervous system were observed in animal



studies following very high levels of exposure. The relevance of these findings to humans is not clear at this time.

**ETHYLBENZENE:** Findings from a 2-year inhalation study in rodents conducted by NTP were as follows: Effects were observed only at the highest exposure level (750 ppm). At this level the incidence of renal tumors was elevated in male rats (tubular carcinomas) and female rats (tubular adenomas). The incidence of tumors was also elevated in male mice (alveolar and bronchiolar carcinomas) and female mice (hepatocellular carcinomas). IARC has classified ethyl benzene as "possibly carcinogenic to humans" (Group 2B). Studies in laboratory animals indicate some evidence of post-implantation deaths following high levels of maternal exposure. The relevance of these findings to humans is not clear at this time. Studies in laboratory animals indicate limited evidence of renal malformations, resorptions, and developmental delays following high levels of maternal exposure with evidence of maternal toxicity. The relevance of these findings to humans is not clear at this time. Studies in laboratory animals have demonstrated evidence of ototoxicity (hearing loss) following exposure levels as low as 300 ppm for 5 days. Studies in laboratory animals indicate some evidence of adverse effects on the liver, kidney, thyroid, and pituitary gland.

**XYLENES, ALL ISOMERS:** Overexposure to xylene may cause upper respiratory tract irritation, headache, cyanosis, blood serum changes, nervous system damage and narcosis. Effects may be increased by the use of alcoholic beverages. Evidence of liver and kidney impairment were reported in workers recovering from a gross overexposure. Effects from Prolonged or Repeated Exposure: Impaired neurological function was reported in workers exposed to solvents including xylene. Studies in laboratory animals have shown evidence of impaired hearing following high levels of exposure. Studies in laboratory animals suggest some changes in reproductive organs following high levels of exposure but no significant effects on reproduction were observed. Studies in laboratory animals indicate skeletal and visceral malformations, developmental delays, and increased fetal resorptions following extremely high levels of maternal exposure with evidence of maternal toxicity. The relevance of these observations to humans is not clear at this time. Adverse effects on the liver, kidney, bone marrow (changes in blood cell parameters) were observed in laboratory animals following high levels of exposure. The relevance of these observations to humans is not clear at this time.

**C9 AROMATIC HYDROCARBONS:** A developmental inhalation study was conducted in laboratory mice. Increased implantation losses, reduced fetal weights, delayed ossification and an increased incidence of cleft palate were observed at the highest exposure level (1,500 ppm). This exposure level was extremely toxic to pregnant female mice (44% mortality). Reduced fetal body weights were also observed at 500 ppm. A multi-generation reproduction inhalation study was conducted in laboratory rats. Reductions in pup weights, pup weight gain, litter size, and pup survival were observed at 1,500 ppm, an exposure level at which significant maternal toxicity was observed. Reduced pup weight gain was also observed at 500 ppm.

**NAPHTHALENE:** Severe jaundice, neurotoxicity (kernicterus) and fatalities have been reported in young children and infants as a result of hemolytic anemia from overexposure to naphthalene. Persons with glucose 6-phosphate dehydrogenase (G6PD) deficiency are more prone to the hemolytic effects of naphthalene. Adverse effects on the kidney have been reported in persons overexposed to naphthalene but these effects are believed to be a consequence of hemolytic anemia, and not a direct effect. Hemolytic anemia has been observed in laboratory animals exposed to naphthalene. Laboratory rodents exposed to naphthalene vapor for 2 years (lifetime studies) developed non-neoplastic and neoplastic tumors and inflammatory lesions of the nasal and respiratory tract. Cataracts and other adverse effects on the eye have been observed in laboratory animals exposed to high levels of naphthalene. Findings from a large number of bacterial and mammalian cell mutation assays have been negative. A few studies have shown chromosomal effects (elevated levels of Sister Chromatid Exchange or chromosomal aberrations) in vitro. Naphthalene has been classified as Possibly Carcinogenic to Humans (2B) by IARC, based on findings from studies in laboratory animals.

**N-HEXANE:** Long-term or repeated exposure to n-hexane can cause peripheral nerve

damage. Initial symptoms are numbness of the fingers and toes. Also, motor weakness can occur in the digits, but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. Testicular atrophy and partial to full loss of the germ cell line were observed in sub-chronic high-dose inhalation studies of laboratory rodents. These effects appeared irreversible. Rodent reproduction studies have shown evidence of reduced fetal weight but no frank malformations.

PENTANES: Studies of pentane isomers in laboratory animals indicate exposure to extremely high levels (roughly 10 vol.%) may induce cardiac arrhythmias (irregular heartbeats) which may be serious or fatal.

CARBON MONOXIDE: is a chemical asphyxiant with no warning properties (such as odor). At 400-500 ppm for 1 hour headache and dyspnea may occur. If activity is increased, symptoms of overexposure may include nausea, irritability, increased respiration, tinnitus, sweating, chest pain, confusion, impaired judgement, dizziness, weakness, drowsiness, ataxia, irregular heart beat, cyanosis and pallor. Levels in excess of 1000 ppm can result in collapse, loss of consciousness, respiratory failure and death. Extremely high concentrations (12,800 ppm) can cause immediate unconsciousness and death in 1-3 minutes. Repeated anoxia can lead to central nervous system damage and peripheral neuropathy, with loss of sensation in the fingers, amnesia, and mental deterioration and possible congestive heart failure. Damage may also occur to the fetus, lung, liver, kidney, spleen, cardiovascular system and other organs.

COMBUSTION ENGINE EXHAUST: Chronic inhalation studies of gasoline engine exhaust in mice, rats and hamsters did not produce any carcinogenic effects. Condensates/extracts of gasoline engine exhaust produced an increase in tumors compared to controls when testing by skin painting, subcutaneous injection, intratracheal instillation or implantation into the lungs.

**Adverse effects related to the physical, chemical and toxicological characteristics**

- Signs & Symptoms** Nausea, vomiting, signs of nervous system depression: headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue.
- Sensitization** Not expected to be a skin or respiratory sensitizer.
- Mutagenic effects** May cause genetic defects.

**Carcinogenicity** Cancer designations are listed in the table below.

Name	ACGIH (Class)	IARC (Class)	NTP	OSHA
Gasoline 86290-81-5	Confirmed animal carcinogen (A3)	Possibly Carcinogenic (2B)	Not Listed	Not Listed
Toluene 108-88-3	Not Classifiable (A4)	Not Classifiable (3)	Not Listed	Not Listed
Xylene (mixed isomers) 1330-20-7	Not Classifiable (A4)	Not Classifiable (3)	Not Listed	Not Listed
1,2,4-Trimethylbenzene 95-63-6	Not Listed	Not Listed	Not Listed	Not Listed
Benzene 71-43-2	Confirmed human carcinogen (A1)	Carcinogenic to humans (1)	Known to be human carcinogen	Known carcinogen
n-Hexane 110-54-3	Not Listed	Not Listed	Not Listed	Not Listed
Ethylbenzene 100-41-4	Confirmed animal carcinogen (A3)	Possible human carcinogen (2B)	Not Listed	Not Listed
Naphthalene 91-20-3	Confirmed animal carcinogen (A3)	Possible human carcinogen (2B)	Reasonably anticipated to be a human carcinogen	Not Listed

**Reproductive toxicity** Suspected of damaging fertility or the unborn child.

**Specific Target Organ Toxicity (STOT) - single exposure** Respiratory system. Central nervous system.

**Specific Target Organ Toxicity (STOT) - repeated exposure** Not classified.

**Aspiration hazard** May be fatal if swallowed or vomited and enters airways.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity** This product should be considered toxic to aquatic organisms, with the potential to cause long lasting adverse effects in the aquatic environment.

Name	Algae/aquatic plants	Fish	Toxicity to Microorganisms	Crustacea
Gasoline 86290-81-5	72-hr EC50 = 56 mg/l Algae	96-hr LC50 = 11 mg/l Rainbow trout (static)	-	48-hr LC50 = 7.6 mg/l Daphnia magna
Toluene 108-88-3	72-hr EC50 = 12.5 mg/l Algae	96-hr LC50 <= 10 mg/l Rainbow trout	-	48-hr EC50 = 5.46-9.83 mg/l Daphnia magna 48-hr EC50 = 11.5 mg/l Daphnia magna (Static)
Xylene (mixed isomers) 1330-20-7	72-hr EC50 = 11 mg/l Algae	96-hr LC50 = 8 mg/l Rainbow trout	-	48-hr LC50 = 3.82 mg/l Daphnia magna
1,2,4-Trimethylbenzene 95-63-6	-	96-hr LC50 = 7.19-8.28 mg/l Fathead minnow (flow-through)	-	48-hr EC50 = 6.14 mg/L Daphnia magna
Benzene 71-43-2	72-hr EC50 = 29 mg/l Algae	96-hr LC50 = 5.3 mg/l Rainbow trout (flow-through)	-	48-hr EC50 = 8.76-15.6 mg/l Daphnia magna (Static)
n-Hexane 110-54-3	-	96-hr LC50 = 2.5 mg/l Fathead minnow	-	-
Ethylbenzene 100-41-4	72-hr EC50 = 1.7-7.6 mg/l Algae	96-hr LC50 = 4 mg/L Rainbow trout	-	48-hr EC50 = 1-4 mg/L Daphnia magna
Naphthalene 91-20-3	-	96-hr LC50 = 0.91-2.82 mg/l Rainbow trout (static) 96-hr LC50 = 1.99 mg/l Fathead minnow (static)	-	48-hr LC50 = 1.6 mg/l Daphnia magna

**Persistence and degradability** Expected to be inherently biodegradable.

**Bioaccumulation** Has the potential to bioaccumulate.

**Mobility in soil** May partition into air, soil and water.

**Other adverse effects** No information available.

## 13. DISPOSAL CONSIDERATIONS

**Description of Waste Residues**  
This material may be a flammable liquid waste.

**Safe Handling of Wastes**  
Handle in accordance with applicable local, state, and federal regulations. Use personal protection measures as required. Use appropriate grounding and bonding practices. Use only non-sparking tools. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. No smoking.

**Disposal of Wastes / Methods of Disposal**  
The user is responsible for determining if any discarded material is a hazardous waste (40 CFR 262.11). Dispose of in accordance with federal, state and local regulations.

**Methods of Contaminated Packaging Disposal**

Empty containers should be completely drained and then discarded or recycled, if possible. Do not cut, drill, grind or weld on empty containers since explosive residues may be present. Dispose of in accordance with federal, state and local regulations.

**14. TRANSPORT INFORMATION**

**DOT (49 CFR 172.101):**

UN Proper shipping name: Gasoline  
 UN/Identification No: UN 1203  
 Transport Hazard Class(es): 3  
 Packing group: II

**TDG (Canada):**

UN Proper shipping name: Gasoline  
 UN/Identification No: UN 1203  
 Transport Hazard Class(es): 3  
 Packing group: II

**15. REGULATORY INFORMATION**

**US Federal Regulatory Information:**

US TSCA Chemical Inventory Section 8(b): This product and/or its components are listed on the TSCA Chemical Inventory.

**EPA Superfund Amendment & Reauthorization Act (SARA):**

**SARA Section 302:** This product does not contain any component(s) included on EPA's Extremely Hazardous Substance (EHS) List.

Name	CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs
Gasoline	NA
Toluene	NA
Xylene (mixed isomers)	NA
1,2,4-Trimethylbenzene	NA
Benzene	NA
n-Hexane	NA
Ethylbenzene	NA
Naphthalene	NA

**SARA Section 304:** This product may contain component(s) identified either as an EHS or a CERCLA Hazardous substance which in case of a spill or release may be subject to SARA reporting requirements:

Name	CERCLA/SARA - Hazardous Substances and their Reportable Quantities
Gasoline	NA
Toluene	1000 lb final RQ 454 kg final RQ
Xylene (mixed isomers)	100 lb final RQ 45.4 kg final RQ
1,2,4-Trimethylbenzene	NA
Benzene	10 lb final RQ 4.54 kg final RQ
n-Hexane	5000 lb final RQ 2270 kg final RQ
Ethylbenzene	1000 lb final RQ 454 kg final RQ

Naphthalene	100 lb final RQ 45.4 kg final RQ
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**SARA:** The following EPA hazard categories apply to this product:

- Acute Health Hazard
- Chronic Health Hazard
- Fire Hazard

**SARA Section 313:** This product may contain component(s), which if in exceedance of the de minimus threshold, may be subject to the reporting requirements of SARA Title III Section 313 Toxic Release Reporting (Form R).

Name	CERCLA/SARA 313 Emission reporting:
Gasoline	None
Toluene	1.0 % de minimis concentration
Xylene (mixed isomers)	1.0 % de minimis concentration
1,2,4-Trimethylbenzene	None
Benzene	0.1 % de minimis concentration
n-Hexane	1.0 % de minimis concentration
Ethylbenzene	0.1 % de minimis concentration
Naphthalene	0.1 % de minimis concentration

**State and Community Right-To-Know Regulations:**

The following component(s) of this material are identified on the regulatory lists below:

**Gasoline**

- Louisiana Right-To-Know: Not Listed.
- California Proposition 65: Not Listed.
- New Jersey Right-To-Know: SN 0957
- Pennsylvania Right-To-Know: Present
- Massachusetts Right-To Know: Present
- Florida Substance List: Not Listed.
- Rhode Island Right-To-Know: Not Listed.
- Michigan Critical Materials Register List: Not Listed.
- Massachusetts Extraordinarily Hazardous Substances: Not Listed.
- California - Regulated Carcinogens: Not Listed.
- Pennsylvania RTK - Special Hazardous Substances: Not Listed.
- New Jersey - Special Hazardous Substances: Carcinogen; Flammable - third degree
- New Jersey - Environmental Hazardous Substances List: SN 0957 TPQ: 10000 lb (Under N.J.A.C. 7:1G, environmental hazardous substances in mixtures such as gasoline or new and used petroleum oil may be reported under these categories)
- Illinois - Toxic Air Contaminants: Present
- New York - Reporting of Releases Part 597 - List of Hazardous Substances: Not Listed.

**Toluene**

- Louisiana Right-To-Know: Not Listed.
- California Proposition 65: Developmental toxicity, initial date 1/1/91  
Female reproductive toxicity, initial date 8/7/09
- New Jersey Right-To-Know: SN 1866
- Pennsylvania Right-To-Know: Environmental hazard
- Massachusetts Right-To Know: Present
- Florida Substance List: Not Listed.
- Rhode Island Right-To-Know: Toxic (skin); Flammable (skin)
- Michigan Critical Materials Register List: 100 lb Annual usage threshold
- Massachusetts Extraordinarily Hazardous Substances: Not Listed.
- California - Regulated Carcinogens: Not Listed.
- Pennsylvania RTK - Special Hazardous Substances: Not Listed.
- New Jersey - Special Hazardous Substances: Flammable - third degree; Teratogen

New Jersey - Environmental Hazardous Substances List:	SN 1866 TPQ: 500 lb
Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	1000 lb RQ (air); 1 lb RQ (land/water)
Xylene (mixed isomers)	
Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Not Listed.
New Jersey Right-To-Know:	SN 2014
Pennsylvania Right-To-Know:	Environmental hazard
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Toxic (skin); Flammable (skin)
Michigan Critical Materials Register List:	100 lb Annual usage threshold all isomers
Massachusetts Extraordinarily Hazardous Substances:	Not Listed.
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Not Listed.
New Jersey - Special Hazardous Substances:	Flammable - third degree
New Jersey - Environmental Hazardous Substances List:	SN 2014 TPQ: 500 lb
Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	1000 lb RQ (air); 1 lb RQ (land/water)
1,2,4-Trimethylbenzene	
Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Not Listed.
New Jersey Right-To-Know:	SN 1929
Pennsylvania Right-To-Know:	Present
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Toxic
Michigan Critical Materials Register List:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed.
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Not Listed.
New Jersey - Special Hazardous Substances:	Not Listed.
New Jersey - Environmental Hazardous Substances List:	Not Listed.
Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed.
Benzene	
Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Carcinogen, initial date 2/27/87 Developmental toxicity, initial date 12/26/97 Male reproductive toxicity, initial date 12/26/97
New Jersey Right-To-Know:	SN 0197
Pennsylvania Right-To-Know:	Environmental hazard; Special hazardous substance
Massachusetts Right-To Know:	Carcinogen; Extraordinarily hazardous
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Toxic (skin); Flammable (skin); Carcinogen (skin)
Michigan Critical Materials Register List:	100 lb Annual usage threshold
Massachusetts Extraordinarily Hazardous Substances:	Carcinogen; Extraordinarily hazardous
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Present
New Jersey - Special Hazardous Substances:	Carcinogen; Flammable - third degree; Mutagen
New Jersey - Environmental Hazardous Substances List:	SN 0197 TPQ: 500 lb

Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	10 lb RQ (air); 1 lb RQ (land/water)
<b>n-Hexane</b>	
Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Not Listed.
New Jersey Right-To-Know:	SN 1340
Pennsylvania Right-To-Know:	Present
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Toxic; Flammable
Michigan Critical Materials Register List:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed.
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Not Listed.
New Jersey - Special Hazardous Substances:	Flammable - third degree
New Jersey - Environmental Hazardous Substances List:	SN 1340 TPQ: 500 lb
Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	1 lb RQ (air); 1 lb RQ (land/water)
<b>Ethylbenzene</b>	
Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Carcinogen, initial date 6/11/04
New Jersey Right-To-Know:	SN 0851
Pennsylvania Right-To-Know:	Environmental hazard
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Toxic; Flammable
Michigan Critical Materials Register List:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed.
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Not Listed.
New Jersey - Special Hazardous Substances:	Carcinogen; flammable - Third degree
New Jersey - Environmental Hazardous Substances List:	SN 0851 TPQ: 500 lb
Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	1000 lb RQ (air); 1 lb RQ (land/water)
<b>Naphthalene</b>	
Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Carcinogen, initial date 4/19/02
New Jersey Right-To-Know:	SN 1322 SN 3758
Pennsylvania Right-To-Know:	Environmental hazard Present (particulate)
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Toxic; Flammable
Michigan Critical Materials Register List:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed.
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Not Listed.
New Jersey - Special Hazardous Substances:	Carcinogen
New Jersey - Environmental Hazardous Substances List:	SN 1322 TPQ: 500 lb (Reportable at the de minimis quantity of >0.1%)
Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	100 lb RQ (air); 1 lb RQ (land/water)



**Canada DSL/NDSL Inventory:** This product and/or its components are listed either on the Domestic Substances List (DSL) or are exempt.

**Canadian Regulatory Information:** "This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the (M)SDS contains all the information required by the Controlled Products Regulations."

Name	Canada - WHMIS: Classifications of Substances:	Canada - WHMIS: Ingredient Disclosure:
Gasoline	B2,D2A,D2B	0.1%
Toluene	B2,D2A,D2B	0.1%
Xylene (mixed isomers)	B2,D2A,D2B	m-, o-isomers 1.0%; p-isomer 0.1%
1,2,4-Trimethylbenzene	B3	1
Benzene	B2,D2A,D2B	0.1%
n-Hexane	B2,D2A,D2B	1%
Ethylbenzene	B2,D2A,D2B	0.1%
Naphthalene	B4,D2A	0.1%



**NOTE:** Not Applicable.

## 16. OTHER INFORMATION

**Prepared By** Toxicology and Product Safety  
**Revision Date:** 05/14/2015

**Revision Note:**

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is intended as guidance for safe handling, use, processing, storage, transportation, accidental release, clean-up and disposal and is not considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.



# MATERIAL SAFETY DATA SHEET

## UNLEADED GASOLINE (UNBRANDED)

MSDS No.  
**APPC975**  
Version: 1  
Date  
**05/19/2003**

**IMPORTANT:** Read this MSDS before handling and disposing of this product and pass this information on to employees, customers, and users of this product.

### 1. PRODUCT and COMPANY IDENTIFICATION

<b>Material Identity</b>	Unleaded Gasoline (Unbranded)		
<b>Trade Name(s)</b>	None		
<b>Other Name(s)</b>	Unleaded Motor Vehicle Gasoline, Unleaded Premium Gasoline, Unleaded Regular Gasoline or Petrol, Clear Gasoline.		
<b>Chemical Description</b>	Petroleum Hydrocarbons		
<b>Manufacturer's Address</b>	BP West Coast Products LLC Carson Business Unit 1801 E. Sepulveda Boulevard Carson, California 90749-6210	BP West Coast Products LLC Cherry Point Business Unit 4519 Grandview Road Blaine, Washington 98230	
<b>Telephone Numbers</b>	Emergency Health Information: Emergency Spill Information: Other Product Information:  Customer Service:	1 (800) 447-8735 1 (800) 424-9300 CHEMTREC (USA) 1 (866) 4BP-MSDS (866-427-6737 Toll Free - North America) email: bpcares@bp.com 1 (800) 322-3736 INFO	

### 2. COMPONENTS and EXPOSURE LIMITS

<u>Component</u> <sup>1</sup>	<u>CAS No.</u>	<u>% Composition By Volume</u> <sup>2</sup>	<u>ACGIH TLV</u>	<u>Exposure Limits</u>		
				<u>OSHA PEL</u> <sup>3</sup>	<u>Units</u>	<u>Type</u>
GASOLINE <sup>(2)(4)</sup>	8006-61-9	EQ 100	500 300	500 300	ppm ppm	STEL TWA
which contains:						
BENZENE <sup>(1)(2)(3)(4)</sup>	71-43-2	AP 1 to 5	2.5 0.5 skin	5 1	ppm ppm	STEL TWA
CYCLOHEXANE	110-82-7	LT 2	400 300	N/AP 300	ppm ppm	STEL TWA
ETHYLBENZENE <sup>(2)</sup>	100-41-4	AP 1 to 3	125 100	125 100	ppm ppm	STEL TWA
HEXANE (N-HEXANE)	110-54-3	AP 2 to 5	50 skin	50	ppm	TWA
TOLUENE	108-88-3	AP 7 to 14	N/AP 50 skin	150 100	ppm ppm	STEL TWA
TRIMETHYL BENZENE (ALL ISOMERS)	25551-13-7	LT 5	25	25	ppm	TWA
1,2,4-TRIMETHYLBENZENE	95-63-6	AP 1 to 4	25	25	ppm	TWA

2,2,4 TRIMETHYLPENTANE							
540-84-1	AP	3 to 10	N/AP	N/AP			
XYLENE							
1330-20-7	AP	8 to 15	150	150	ppm	STEL	
			100	100	ppm	TWA	
which may contain:							
ETHANOL							
64-17-5	AP	0 to 10	1000	1000	ppm	TWA	
METHYL TERTIARY BUTYL ETHER (MTBE) <sup>(4)</sup>							
1634-04-4	AP	0 to 15	40	N/AP	ppm	TWA	

<sup>1</sup> Carcinogen displayed after Component Name. Listed by <sup>(1)</sup> NTP, <sup>(2)</sup> IARC, <sup>(3)</sup> OSHA, <sup>(4)</sup> Other

<sup>2</sup> See Abbreviations on last page

<sup>3</sup> The OSHA exposure limits were changed in 1993 due to a federal court ruling. ARCO has chosen to list the 1989 OSHA exposure limits in this document as they are generally more stringent and therefore more protective than the current exposure limits. (Refer to 29 CFR 1910.1000).

### 3. HAZARD IDENTIFICATION

#### IMMEDIATE HAZARDS

##### DANGER

**HIGHLY FLAMMABLE! OSHA/NFPA Class IB flammable liquid.** Keep away from heat, sparks, and open flame.

Never siphon gas by mouth. Harmful if swallowed. Contains petroleum distillates.

**ASPIRATION HAZARD!** If swallowed, do not induce vomiting since aspiration into the lungs may cause chemical pneumonia. Obtain prompt medical attention.

**Prolonged or repeated liquid contact may cause irritation.** High vapor concentrations (greater than 1000 ppm) may cause irritation to eyes and respiratory system and may cause dizziness and other nervous system effects.

Generally, human exposures to gasoline are considerably lower than levels which have caused adverse health effects in animal studies or human case studies of gasoline misuse or abuse (such as gasoline sniffing). Adverse health effects are not expected to occur at exposure levels typically encountered in the use of gasoline as a motor fuel.

Avoid breathing vapors or mists. Use only with adequate ventilation. Use as a motor fuel only. Do not use as a cleaning solvent, thinner or for other non-motor fuel use.

Wash hands thoroughly after handling.

#### ACUTE HEALTH HAZARDS

##### Routes of Exposure

##### Signs and Symptoms

<b>Inhalation (Primary)</b>	Exposures at airborne concentrations well above the recommended exposure limits in Section 2 may cause irritation of the nose, throat, and lungs, headache, dizziness, drowsiness, confusion, loss of coordination, fatigue, nausea, labored breathing and irregular heartbeats. May lead to unconsciousness, convulsions, and possibly death.
<b>Eye Contact</b>	May cause some transitory eye irritation but not expected to cause prolonged or significant eye irritation.
<b>Skin Contact</b>	Moderate skin irritation may occur upon short-term exposure. May be absorbed and contribute to the acute inhalation health effects (see above).
<b>Ingestion</b>	<p><b>ASPIRATION HAZARD!</b> This material can enter the lungs during swallowing or vomiting and may cause acute lung inflammation and damage which in severe cases may be fatal.</p> <p>Ingestion may cause irritation of the mouth, throat and gastrointestinal tract leading to nausea, vomiting, diarrhea, and restlessness.</p> <p>May cause headache, dizziness, drowsiness, confusion, loss of coordination, fatigue, nausea and labored breathing. May lead to unconsciousness, convulsions, and possibly death.</p>

**Summary of Chronic Hazards and Special Health Effects**

Exposures at airborne concentrations well above the recommended exposure limits in Section 2 may aggravate medical conditions such as chronic respiratory diseases, cardiovascular disease, skin diseases, or blood disorders.

Prolonged/repeated exposures above the recommended exposure limits via skin contact, inhalation or ingestion of this material may result in adverse dermal or systemic effects. Avoid prolonged or repeated overexposure.

Contains benzene, a chemical known to cause cancer in humans. Repeated and prolonged overexposure to benzene vapors may cause leukemia, aplastic anemia, or other blood disorders, immunotoxicity, reproductive harm or fetal toxicity.

Neurotoxic effects have been associated with n-hexane, a component of this material upon prolonged or repeated overexposure.

Generally, human exposures to gasoline are considerably lower than levels which have caused adverse health effects in animal studies or human case studies of gasoline misuse or abuse (such as gasoline sniffing). Adverse health effects are not expected to occur at exposure levels typically encountered in the use of gasoline as a motor fuel.

See Section 11 for Additional Toxicological Information.

**4. EMERGENCY and FIRST AID**

<b>Inhalation</b>	Immediately move personnel to area with fresh air. For respiratory distress, give oxygen, rescue breathing or administer CPR (cardiopulmonary resuscitation). Obtain prompt medical attention.
<b>Eye Contact</b>	Flush with clean, low-pressure water for at least 15 minutes, occasionally lifting the eyelids. If pain or redness is present after flushing, obtain medical attention.
<b>Skin Contact</b>	Immediately remove contaminated clothing. Wash affected skin thoroughly with soap and water. If irritation persists, obtain medical attention.
<b>Ingestion</b>	Do not induce vomiting. Obtain prompt medical attention.  ASPIRATION HAZARD: This material can enter the lungs during swallowing or vomiting and may cause lung inflammation and damage.

<b>Emergency Medical Treatment Procedures</b>	See above procedures.
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**5. FIRE and EXPLOSION**

<b>Flash Point (Method)*</b>	AP -45°F **	<b>NFPA Hazard Rating:</b> <b>Health:</b> 1 = Slight <b>Fire:</b> 3 = High <b>Reactivity:</b> 0 = Insignificant <b>Special:</b> = ---
<b>Autoignition Temperature (Method)*</b>	AP 536°F **	
<b>Flammable Limits (% Vol. in Air)*</b>	AP 1.4	
<b>Lower Upper</b>	AP 7.6	

\* At Normal Atmospheric Temperature and Pressure

\*\* Based on NFPA Gasoline

**Fire and Explosion Hazards**

HIGHLY FLAMMABLE! Vaporizes easily at normal and below normal temperatures. When mixed with air in certain proportions and exposed to an ignition source, these vapors can burn in the open or explode in confined spaces. Being heavier than air, flammable vapors may travel long distances along the ground before reaching a point of ignition and flashing back.

May accumulate static electricity.

Liquid floats on water and may travel to a source of ignition and spread fire.

"Empty" containers retain liquid and vapor residues and, if exposed to source of ignition, may explode.

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<b>Extinguishing Media</b>	Foam, Water fog, Dry chemical, Carbon Dioxide (CO <sub>2</sub> ) Water and water spray may cool the fire but may not extinguish the fire.
<b>Special Firefighting Procedures</b>	For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of combustion products and oxygen deficiencies. If firefighters cannot work upwind to the fire, respiratory protective equipment must be worn. Cool tanks and containers exposed to fire with water.

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## 6. ACCIDENTAL RELEASE MEASURES

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<b>Precautions if Material is Spilled or Released</b>	Eliminate all potential sources of ignition. Handling equipment and tools should be grounded to prevent sparking. Contain spill, evacuate non-essential personnel, and safely stop flow. Blanket spill with foam or use water fog to reduce vapor cloud. On hard surfaces, spilled material may create a slipping hazard. Equip cleanup crews with proper protective equipment (as specified in Section 8) and advise of hazards. Clean up by recovering as much spilled or contaminated materials as possible and placing into closed containers. Consult with an environmental professional for the federal, state and local cleanup and reporting requirements for spills and releases.
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## 7. HANDLING and STORAGE

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<b>Handling, Storage and Decontamination Procedures</b>	<p>Avoid exposure to liquid and gas vapors. Odor is not a reliable warning of overexposure. Use only with adequate ventilation.</p> <p>Keep away from sources of heat, flames, sparks or other ignition sources. Storage and use areas should be "No Smoking" areas. Containers should be bonded and grounded for transfers to avoid static sparks.</p> <p>Outside or detached storage is preferred. Inside storage should be in a standard flammable liquids storage warehouse, room or cabinet. Separate from oxidizing materials.</p> <p>Filling Portable Containers (less than 10 gallons) - to minimize static spark hazard:</p> <ol style="list-style-type: none"><li>1. Fill only metal containers or those approved to hold gasoline;</li><li>2. Place containers on the ground while dispensing fuel;</li><li>3. Keep hose nozzle in contact with the approved container during the entire filling process.</li></ol> <p>DO NOT fill any portable container in or on a vehicle.</p> <p>"Empty" containers retain liquid and vapor residues and can be dangerous. Do not pressurize, cut, weld, drill, grind or expose to heat, flame, sparks, static electricity, or other sources of ignition containers with ANY residue; they may explode and cause injury or death.</p> <p>For determining National Electrical Code (NEC) Hazardous (Classified) Location requirements for electrical installation, consider this material Class 1, Group D.</p> <p>KEEP OUT OF REACH OF CHILDREN!</p>
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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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<b>Engineering Controls</b>	Where possible, use adequate ventilation to keep vapor and mist concentrations of this material below the occupational exposure limits shown in Section 2. Electrical equipment should comply with National Electrical Code (NEC) standards (see Section 7).
<b>Respiratory</b>	A NIOSH/MSHA-approved air-purifying respirator with an organic vapor cartridge may be permissible under certain circumstances where airborne concentrations may exceed the exposure limits in Section 2. Consult a health and safety professional for guidance in respirator selection. Respirator use should comply with OSHA 29 CFR 1910.134.

**CAUTION:** The protection provided by air-purifying respirators is limited. Use a positive pressure air-supplied respirator if there is any potential for an uncontrolled release, if exposure levels are not known, or if concentrations exceed the protection limits of the air-purifying respirator.

<b>Eyes</b>	Eye protection should be worn. If there is potential for splashing or spraying, chemical protective goggles and a face shield should be worn. If contact lenses are worn, consult an eye specialist or a safety professional for additional precautions. Suitable eye wash water should be available in case of eye contact with this material.
<b>Skin</b>	Avoid prolonged and/or repeated skin contact. If conditions or frequency of use make significant contact likely, clean and impervious clothing such as gloves, apron, boots and facial protection should be worn. Nitrile and Viton protective clothing material is recommended.  Non-impervious clothing which becomes contaminated with this material should be removed promptly and not reworn until the material is effectively removed from the clothing.
<b>Other Hygienic and Work Practices</b>	Use good personal hygiene practices. In case of skin contact, wash with mild soap and water or a waterless hand cleaner. Wash hands and other exposed areas thoroughly before eating, drinking, smoking, or using toilet facilities.

## 9. PHYSICAL and CHEMICAL PROPERTIES

<b>Boiling Point:</b>	AP 35°F to 437°F
<b>Viscosity Units, Temp. (Method):</b>	N/AP
<b>Dry Point:</b>	AP 430°F
<b>Freezing Point:</b>	N/AP
<b>Vapor Pressure, Temp. (Method):</b>	AP 5 to 15 at 100°F (REID-PSIA)
<b>Volatile Characteristics:</b>	Appreciable
<b>Specific Gravity (H<sub>2</sub>O = 1 @ 39.2°F):</b>	AP 0.7 to 0.8
<b>Vapor Sp. Gr. (Air = 1.0 @ 60°F - 90°F):</b>	AP 4
<b>Solubility in Water:</b>	Slight
<b>PH:</b>	N/AP
<b>Appearance and Odor:</b>	Colorless to straw-colored liquid; petroleum naphtha odor.
<b>Other Physical and Chemical Properties:</b>	Vapor pressure will vary seasonally in compliance with industry standards and federal and state regulations.

## 10. STABILITY and REACTIVITY

<b>Stability</b>	Stable
<b>Hazardous Polymerization</b>	Not expected to occur.
<b>Other Chemical Reactivity</b>	Reacts with oxidizing materials.

<b>Conditions to Avoid</b>	Heat, sparks, flame, and build up of static electricity.
<b>Materials to Avoid</b>	Halogens, strong acids, alkalies, and oxidizers.
<b>Hazardous or Decomposition Products</b>	Burning or excessive heating may produce carbon monoxide and other harmful gases or vapors including oxides and/or other compounds of sulfur.  The inhalation of components of exhaust from combusted fuel can be fatal in high concentrations in an enclosed area. Exposure to exhaust from this fuel should be minimized.

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**11. TOXICOLOGICAL INFORMATION**


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<b>Toxicological Information</b>	The information found in this section is written for medical, toxicology, occupational health and safety professionals. This section provides technical information on the toxicity testing of this or similar materials or its components. If clarification of the technical content is needed, consult a professional in the areas of expertise listed above.
<b>Inhalation</b>	Toxicity studies on this material resulted in LC50 values greater than 5.0 mg/l indicating a low potency. There were signs of respiratory tract irritation and central nervous system depression.
<b>Eye Contact</b>	Minimal to no irritation in animal studies.
<b>Skin Contact</b>	Animal studies resulted in moderate skin irritation following short term or prolonged/repeated exposure. The acute dermal toxicity tests indicate LD50 values greater than 2.0 g/kg indicating a low potency. Exposure to sunlight does not increase skin irritation. This material appears to be non-sensitizing.
<b>Ingestion</b>	The acute oral toxicity tests produced LD50 values greater than 5.0 g/kg indicating a low potency. There were signs of gastrointestinal tract irritation and central nervous system depression.
<b>Prolonged/ Repeated Exposures</b>	<p>Twenty-eight day dermal toxicity studies resulted in moderate skin irritation. In some studies changes in liver, kidney, testes and whole body weights were noted, but no significant systemic tissue changes characteristic of disease. Ninety-day dermal toxicity studies with similar material resulted in moderate skin irritation and not other significant observations or systemic tissue changes characteristic of disease. Twenty-eight day inhalation toxicity study similar materials resulted in kidney damage in male rats.</p> <p>A two-year inhalation study with a generic unleaded gasoline formulated by the American Petroleum Institute caused kidney damage and kidney tumors in male rats and liver tumors in female mice. These effects are considered specific to these laboratory animals and not applicable to humans.</p> <p>Exposure to components of gasoline such as benzene, toluene, xylene, ethylbenzene, trimethylbenzene, and N-hexane has also been shown to affect reproductive capacity and/or fetal development in laboratory animals.</p> <p>Studies with laboratory animals (dogs) indicate that exposure to extremely high concentrations of gasoline (greater than 50,000 ppm) may cause irregular heartbeats and sudden death. Exposures of laboratory animals to some components of this material at very high concentrations, well above the recommended exposure limits in Section 2, have resulted in cardiac sensitization with irregular heartbeats.</p> <p>Exposure to n-hexane at concentrations considerably higher than the current permissible exposure limit has reportedly been associated with peripheral neuropathy. Commercial hexane exposures up to 9000 ppm were not carcinogenic in laboratory animals.</p> <p>In animal studies and in workers with chronic benzene poisoning, alterations in structure of chromosomes in bone marrow and white blood cells have been observed.</p>
<b>Additional Ethanol Toxicity Information</b>	<p>Exposures to ethanol in gasoline are considerably lower than levels which have caused adverse health effects. Adverse health effects are not expected to occur at exposure levels typically encountered in the use of ethanol as a gasoline additive.</p> <p>Prolonged and repeated exposure to ethanol vapor above 1000 ppm may cause headache, lack of coordination, sleepiness, fatigue, and difficulty concentrating. Chronic ingestion of ethanol in the form of alcoholic beverages has resulted in liver, stomach, heart and nervous system damage as well as cancers of the mouth, pharynx, larynx, esophagus, and liver in humans. Repeated ingestion of ethanol in the form of alcoholic beverages by pregnant women has caused miscarriage, premature birth and low birth weight, and birth defects (fetal alcohol syndrome).</p>
<b>Additional MTBE Toxicity Information</b>	MTBE at very high exposure levels (8000 ppm) did induce developmental toxicity in mice, but only at levels where there was also maternal toxicity. In rabbits exposed to the same MTBE levels, there were no indicators of any effects on the offspring, even in the presence of maternal toxicity. The abnormal findings in the mice (cleft palate, etc.) are well-recognized effects of stress in the pregnant mouse and have no correlation with development hazards in humans.

Chronic toxicity studies have been completed for MTBE. In these studies, B6C3F1 mice and F344 rats were exposed to 400, 3000, or 8000 ppm MTBE vapors, 6 hrs/day, 5 days/week for life. Few adverse effects were noted for either rats or mice.

Male and female mice exposed to 8000 ppm MTBE vapors developed a slightly higher incidence of benign liver tumors during their lifetime. No other adverse effects or increases in tumor incidences were found.

Male and female rats exposed to high concentrations of MTBE vapors developed an increasing incidence of chronic progressive kidney damage, an effect typically noted in aging rats. These effects were most severe in 3000 and 8000 ppm exposure groups and were accompanied by an increased incidence of kidney tumors (males only). These findings are consistent with kidney damage associated with accumulation of protein in cells, an effect which may be unique to the male rat. Benign testicular tumors were numerically increased in high dose MTBE male rats, but this is an age-related lesion which typically occurs in a very high proportion of control untreated rats.

MTBE does not appear to be a mutagen.

All of these effects either occur in tissues prone to the development of tumors or may occur by a mechanism not considered relevant to humans. The significance of these findings for human health hazards estimation is unclear. Furthermore, IARC has determined that MTBE is not classifiable as to its carcinogenicity to humans (Group 3).

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**12. ECOLOGICAL INFORMATION**

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Not Available

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**13. DISPOSAL CONSIDERATIONS**

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**Waste Disposal Methods** Consult an environmental professional to determine if state or federal regulations would classify this material as a hazardous waste. Use only approved transporters, recyclers, treatment, storage or disposal facilities. Comply with all federal, state and local laws pertaining to waste management.

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**14. TRANSPORT INFORMATION**

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<b>UN Proper Shipping Name</b>	Gasoline
<b>UN Hazard Class</b>	3
<b>UN Number</b>	UN1203
<b>UN Packing Group</b>	PGII



**15. REGULATORY INFORMATION****SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA), TITLE III****Section 311/312 Hazard Categories:**

Acute Health Hazard  
 Delayed (chronic) health hazard  
 Fire hazard

**Section 313:**

This product contains the following chemicals subject to the reporting requirements established by SARA Title III:

BENZENE  
 CYCLOHEXANE  
 ETHYLBENZENE  
 METHYL TERT-BUTYL ETHER  
 TOLUENE  
 XYLENE

**TOXIC SUBSTANCES CONTROL ACT (TSCA)**

All components of this product are listed on the TSCA Inventory.

**COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA)**

This material is covered by CERCLA's PETROLEUM EXEMPTION.  
 (Refer to 40 CFR 307.14)

**CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 - PROPOSITION 65****PROP 65 WARNING LABEL:**

Chemicals known to the State to cause cancer, birth defects, or other reproductive harm are found in gasoline, crude oil, and many other petroleum products and their vapors, or result from their use. Read and follow label directions and use care when handling or using all petroleum products.

**WARNING:**

This product contains the following chemical(s) listed by the State of California as known to cause cancer or birth defects or other reproductive harm.

BENZENE <sup>(C)</sup> <sup>(R)</sup>  
 TOLUENE <sup>(R)</sup>

Other Prop 65 chemicals will result under certain conditions from the use of this material. For example, burning fuels produces combustion products including carbon monoxide, a Prop 65 reproductive toxin.

<sup>(C)</sup> = Carcinogen

<sup>(R)</sup> = Birth Defects or other Reproductive Harm

**16. OTHER INFORMATION****General Comments**

Because of volatility characteristics, gasoline vapors may have concentrations of components different from those of liquid gasoline. The major components of gasoline vapors from liquid gasoline are butane, isobutane, pentane and isopentane.

The information and conclusions herein reflect normal operating conditions and may be from sources other than direct test data on the mixture itself.

Abbreviations:	EQ = Equal	AP = Approximately	N/P = No Applicable Information Found
	LT = Less Than	UK = Unknown	N/AP = Not Applicable
	GT = Greater Than	TR = Trace	N/DA = No Data Available

Prepared by: Product Stewardship

**Disclaimer of Liability**

The information in this MSDS was obtained from sources which we believe are reliable. **HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, REGARDING ITS CORRECTNESS.**

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. **FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.**

This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.





# SAFETY DATA SHEET

## GENGARD\* GN8004

### 1. Identification

Product identifier	<b>GENGARD GN8004</b>
Other means of identification	None.
Recommended use	Corrosion inhibitor
Recommended restrictions	None known

#### Company/undertaking Identification

GE Belz, Inc  
4636 Somerton Road  
Trevose, PA 19053  
T 215 355 3300, F 215 953 5624

#### Emergency telephone

(800) 877 1940

### 2. Hazard(s) identification

Physical hazards	Not classified
Health hazards	Not classified.
OSHA defined hazards	Not classified.

#### Label elements

Hazard symbol	None.
Signal word	None.
Hazard statement	The mixture does not meet the criteria for classification.
Precautionary statement	
Prevention	Observe good industrial hygiene practices.
Response	Wash hands after handling.
Storage	Store away from incompatible materials.
Disposal	Dispose of waste and residues in accordance with local authority requirements.
Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental Information	None.

### 3. Composition/information on ingredients

#### Mixtures

The manufacturer lists no ingredients as hazardous according to OSHA 29 CFR 1910.1200.

Composition comments	This product does not contain hazardous ingredients in reportable concentrations.
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### 4. First-aid measures

Inhalation	If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.
Skin contact	Rinse skin with water/shower. Get medical attention if irritation develops and persists.

<b>Eye contact</b>	Rinse with water. Get medical attention if irritation develops and persists.
<b>Ingestion</b>	Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately.
<b>Most important symptoms/effects, acute and delayed</b>	Direct contact with eyes may cause temporary irritation.
<b>Indication of immediate medical attention and special treatment needed</b>	Treat symptomatically.
<b>General information</b>	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

## 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Water fog, Foam, Dry chemical powder, Carbon dioxide (CO <sub>2</sub> ).
<b>Unsuitable extinguishing media</b>	Do not use water jet as an extinguisher, as this will spread the fire.
<b>Specific hazards arising from the chemical</b>	During fire, gases hazardous to health may be formed.
<b>Special protective equipment and precautions for firefighters</b>	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
<b>Fire fighting equipment/instructions</b>	Use standard firefighting procedures and consider the hazards of other involved materials.
<b>Specific methods</b>	Use standard firefighting procedures and consider the hazards of other involved materials.
<b>General fire hazards</b>	No unusual fire or explosion hazards noted.

## 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.
<b>Methods and materials for containment and cleaning up</b>	<p>Large Spills: Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.</p> <p>Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.</p> <p>Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.</p>
<b>Environmental precautions</b>	Avoid discharge into drains, water courses or onto the ground.

## 7. Handling and storage

<b>Precautions for safe handling</b>	Handle in accordance with good industrial hygiene and safety procedures. Avoid prolonged exposure.
<b>Conditions for safe storage, including any incompatibilities</b>	Shelf life 360 days. Keep container tightly closed. Store in cool, well ventilated area. Store away from oxidizers. Protect from freezing. If frozen, thaw completely and mix thoroughly prior to use. Store in original tightly closed container.

## 8. Exposure controls/personal protection

<b>Occupational exposure limits</b>	No exposure limits noted for ingredient(s).
<b>Biological limit values</b>	No biological exposure limits noted for the ingredient(s).
<b>Appropriate engineering controls</b>	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.
<b>Individual protection measures, such as personal protective equipment</b>	
<b>Eye/face protection</b>	Splash proof chemical goggles.
<b>Skin protection</b>	
<b>Hand protection</b>	Wear appropriate chemical resistant gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Glove selection must take into account any solvents and other hazards present.
<b>Other</b>	Wear suitable protective clothing.

<b>Respiratory protection</b>	In case of insufficient ventilation, wear suitable respiratory equipment. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
<b>Thermal hazards</b>	Wear appropriate thermal protective clothing, when necessary.
<b>General hygiene considerations</b>	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

## 9. Physical and chemical properties

<b>Appearance</b>	
Color	Amber
Physical state	Liquid
Odor	Mild
Odor threshold	Not available
pH (concentrated product)	5
pH in aqueous solution	5.9 (5% SOL)
Melting point/freezing point	25 °F   4 °C
Initial boiling point and boiling range	220 °F (104 °C)
Flash point	Not applicable
Evaporation rate	< 1 (Ether = 1)
Flammability (solid, gas)	Not applicable
<b>Upper/lower flammability or explosive limits</b>	
Flammability limit - lower (%)	Not available
Flammability limit - upper (%)	Not available
Explosive limit - lower (%)	Not available
Explosive limit - upper (%)	Not available
Vapor pressure	18 mm Hg
Vapor pressure temp.	70 °F (21 °C)
Vapor density	< 1 (Air = 1)
Relative density	1.13
Relative density temperature	70 °F (21 °C)
<b>Solubility(ies)</b>	
Solubility (water)	100 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	44 cps
Viscosity temperature	70 °F (21 °C)
<b>Other information</b>	
Percent volatile	0 (Calculated)
Pour point	30 °F (-1 °C)
Specific gravity	1.13

## 10. Stability and reactivity

<b>Reactivity</b>	The product is stable and non-reactive under normal conditions of use, storage and transport.
<b>Chemical stability</b>	Material is stable under normal conditions.
<b>Possibility of hazardous reactions</b>	Contact with water reactive compounds may cause fire or explosion. Hazardous polymerization does not occur.
<b>Conditions to avoid</b>	Avoid contact with strong oxidizers. Protect from freezing. Contact with incompatible materials.
<b>Incompatible materials</b>	Strong oxidizing agents.

**Hazardous decomposition products** Oxides of carbon evolved in fire

## 11. Toxicological information

### Information on likely routes of exposure

**Inhalation** May cause irritation to respiratory organs  
**Skin contact** Prolonged or repeated contact may cause transient irritation  
**Eye contact** Direct contact with eyes may cause temporary irritation  
**Ingestion** May cause gastrointestinal irritation.

**Symptoms related to the physical, chemical and toxicological characteristics** Direct contact with eyes may cause temporary irritation.

### Information on toxicological effects

#### Acute toxicity

Product	Species	Test Results
GENGARD GN8004 (CAS Mixture)		
<b>Acute</b>		
<i>Dermal</i>		
LD50	Rabbit	> 5000 mg/kg. (Calculated according to GHS additivity formula)
<i>Oral</i>		
LD50	Rot	> 5000 mg/kg. (Calculated according to GHS additivity formula)

\* Estimates for product may be based on additional component data not shown.

**Skin corrosion/irritation** Prolonged skin contact may cause temporary irritation.

**Serious eye damage/eye irritation** Direct contact with eyes may cause temporary irritation.

#### Respiratory or skin sensitization

**Respiratory sensitization** Not a respiratory sensitizer.

**Skin sensitization** This product is not expected to cause skin sensitization.

**Germ cell mutagenicity** No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

**Carcinogenicity** This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

#### IARC Monographs. Overall Evaluation of Carcinogenicity

Not available

#### OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

#### US. National Toxicology Program (NTP) Report on Carcinogens

Not available.

**Reproductive toxicity** This product is not expected to cause reproductive or developmental effects

**Specific target organ toxicity - single exposure** Not classified

**Specific target organ toxicity - repeated exposure** Not classified

**Aspiration hazard** Based on available data, the classification criteria are not met. May be harmful if swallowed and enters airways.

**Chronic effects** Prolonged inhalation may be harmful.

## 12. Ecological information

**Ecotoxicity** The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
GENGARD GN8004 (CAS Mixture)	LC50	Ceriodaphnia	1707.6 mg/L, Static Acute Bioassay, 48 hour
		Fathead Minnow	2367 mg/L, Static Acute Bioassay, 96 hour
	LOEL	Ceriodaphnia	1000 mg/L, Chronic Bioassay, 7 day
		Fathead Minnow	2000 mg/L, Chronic Bioassay, 7 day
	NOEL	Ceriodaphnia	1250 mg/L, Static Acute Bioassay, 48 hour 500 mg/L, Chronic Bioassay, 7 day
		Fathead Minnow	1250 mg/L, Static Acute Bioassay, 96 hour 1000 mg/L, Chronic Bioassay, 7 day
			Aquatic Crustacea
	LC50	Daphnia magna	3677 mg/L, Static Acute Bioassay, 48 hour
		NOEL	Daphnia magna
	Fish	LC50	Rainbow Trout
NOEL		Rainbow Trout	1250 mg/L, Static Acute Bioassay, 96 hour

\* Estimates for product may be based on additional component data not shown.

#### Bioaccumulative potential

**Mobility in soil** No data available

**Other adverse effects** Nutrients: P: 1.449 mg/g, N: 2.62 mg/g

**Environmental fate** The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

#### Persistence and degradability

No data is available on the degradability of this product.

- COD (mgO2/g) 385 (calculated data)
- BOD 5 (mgO2/g) 0 (calculated data)
- BOD 28 (mgO2/g) 24 (calculated data)
- Closed Bottle Test (% Degradation in 28 days) 6 (calculated data)
- TOC (mg C/g) 109 (calculated data)

### 13. Disposal considerations

**Disposal instructions** Collect and reclaim or dispose in sealed containers at licensed waste disposal site.

**Local disposal regulations** Dispose in accordance with all applicable regulations.

**Hazardous waste code** The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

**Waste from residues / unused products** Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

**Contaminated packaging** Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

### 14. Transport information

#### DOT

Not regulated as dangerous goods.

Some containers may be exempt from Dangerous Goods/Hazmat Transport Regulations, please check BOL for exact container classification.

#### IATA

Not regulated as dangerous goods.

#### IMDG

Not regulated as dangerous goods.

## 15. Regulatory information

**US federal regulations** All components are on the U.S. EPA TSCA Inventory List  
This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200

### TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated

### CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed

### SARA 304 Emergency release notification

Not regulated

### OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed

### Superfund Amendments and Reauthorization Act of 1986 (SARA)

**Hazard categories** Immediate Hazard - No  
Delayed Hazard - No  
Fire Hazard - No  
Pressure Hazard - No  
Reactivity Hazard - No

### SARA 302 Extremely hazardous substance

Not listed

**SARA 311/312 Hazardous chemical** No

### SARA 313 (TRI reporting)

Not regulated.

### Other federal regulations

#### Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

#### Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated

**Safe Drinking Water Act (SDWA)** Not regulated

### Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

### US state regulations

#### US - Massachusetts RTK - Substance List

Not regulated.

#### US - Pennsylvania RTK - Hazardous Substances

Not regulated

#### US - Rhode Island RTK

Not regulated

#### US. California Controlled Substances, CA Department of Justice (California Health and Safety Code Section 11100)

Not listed

#### US. New Jersey Worker and Community Right-to-Know Act

Not listed

#### US. Pennsylvania Worker and Community Right-to-Know Law

Not listed

#### US. California Proposition 65

**US - California Proposition 65 - CRT: Listed data/Carcinogenic substance**

No ingredient listed

US - California Proposition 65 - CRT: Listed data/Developmental toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed data/Female reproductive toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed data/Male reproductive toxin

No ingredient listed.

## 16. Other information, including date of preparation or last revision

<b>Issue date</b>	Oct-27-2014
<b>Revision date</b>	Jan-14-2016
<b>Version #</b>	3.0
<b>List of abbreviations</b>	CAS: Chemical Abstract Service Registration Number TWA: Time Weighted Average STEL: Short Term Exposure Limit LD50: Lethal Dose, 50% LC50: Lethal Concentration, 50% NOEL: No Observed Effect Level COD: Chemical Oxygen Demand BOD: Biochemical Oxygen Demand TOC: Total Organic Carbon IATA: International Air Transport Association IMDG: International Maritime Dangerous Goods Code ACGIH: American Conference of Governmental Industrial Hygienists NFPA: National Fire Protection Association TSRN indicates a Trade Secret Registry Number is used in place of the CAS number.
<b>References:</b>	No data available
<b>Disclaimer</b>	The information in the sheet was written based on the best knowledge and experience currently available.
<b>Revision information</b>	Hazard(s) identification: Prevention Hazard(s) identification: Supplemental information Composition / Information on Ingredients: Disclosure Overrides Composition/information on ingredients: Composition comments Handling and storage: Precautions for safe handling Exposure controls/personal protection: Eye/face protection Physical & Chemical Properties: Multiple Properties Physical and chemical properties: Explosive properties Physical and chemical properties: Oxidizing properties Toxicological information: Further information Other information, including date of preparation or last revision: Prepared by GHS: Classification
<b>Prepared by</b>	This SDS has been prepared by GE Water & Process Technologies Regulatory Department (1-215-355-3300).

\* Trademark of General Electric Company. May be registered in one or more countries.







Health	1
Fire	1
Reactivity	0
Personal Protection	G

## Material Safety Data Sheet Glycerin MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Glycerin

**Catalog Codes:** SLG1171, SLG1894, SLG1111, SLG1615

**CAS#:** 56-81-5

**RTECS:** MA8050000

**TSCA:** TSCA 8(b) inventory: Glycerin

**CI#:** Not available.

**Synonym:** 1,2,3-Propanetriol; Glycerol

**Chemical Name:** Glycerin

**Chemical Formula:** C<sub>3</sub>H<sub>5</sub>(OH)<sub>3</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Glycerin	56-81-5	100

**Toxicological Data on Ingredients:** Glycerin: ORAL (LD50): Acute: 12600 mg/kg [Rat]. 4090 mg/kg [Mouse]. DERMAL (LD50): Acute: 10000 mg/kg [Rabbit]. MIST(LC50): Acute: >570 mg/m 1 hours [Rat].

### Section 3: Hazards Identification

**Potential Acute Health Effects:** Slightly hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys. Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention if irritation occurs.

**Skin Contact:**

Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.

**Serious Skin Contact:** Not available.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

**Serious Inhalation:** Not available.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** May be combustible at high temperature.

**Auto-Ignition Temperature:**

370°C (698°F)(NFPA Fire Protection Guide to Hazardous Materials, 13th ed., 2002; NIOSH ICSC, 2001; CHRIS, 2001) 392 C (739 F) (Lewis, 1997)

**Flash Points:**

CLOSED CUP: 160°C (320°F). (Chemical Hazard Response Information System, 2001; Lewis, 1997). OPEN CUP: 177°C (350.6°F) (Budavari, 2000; Chemical Response Information System, 2001; NIOSH ICSC, 2001) OPEN CUP: 199 C(390 F) (National Fire Protection Association, Fire Protection Guide to Hazardous Materials, 13 ed., 2002)

**Flammable Limits:** LOWER: 0.9%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>), irritating and toxic fumes.

**Fire Hazards in Presence of Various Substances:**

Slightly flammable to flammable in presence of open flames and sparks, of heat, of oxidizing materials. Non-flammable in presence of shocks.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Explosive in presence of oxidizing materials.

**Fire Fighting Media and Instructions:**

SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:**

Glycerin is incompatible with strong oxidizers such as chromium trioxide, potassium chlorate, or potassium permanganate and may explode on contact with these compounds. Explosive glyceryl nitrate is formed from a mixture of glycerin and nitric and sulfuric acids. Perchloric acid, lead oxide + glycerin form perchloric esters which may be explosive. Glycerin and chlorine may explode if heated and confined.

## Section 6: Accidental Release Measures

**Small Spill:**

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill:**

Stop leak if without risk. If the product is in its solid form: Use a shovel to put the material into a convenient waste disposal container. If the product is in its liquid form: Do not get water inside container. Absorb with an inert material and put the spilled material in an appropriate waste disposal. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area. Hygroscopic

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

### Personal Protection:

Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 10 (mg/m<sup>3</sup>) from ACGIH (TLV) [United States] [1999] Inhalation Total. TWA: 15 (mg/m<sup>3</sup>) from OSHA (PEL) [United States] Inhalation Total. TWA: 10 STEL: 20 (mg/m<sup>3</sup>) [Canada] TWA: 5 (mg/m<sup>3</sup>) from OSHA (PEL) [United States] Inhalation Respirable. Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid. (Viscous (Syrupy) liquid.)

**Odor:** Mild

**Taste:** Sweet.

**Molecular Weight:** 92.09 g/mole

**Color:** Clear Colorless.

**pH (1% soln/water):** Not available.

**Boiling Point:** 290°C (554°F)

**Melting Point:** 19°C (66.2°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 1.2636 (Water = 1)

**Vapor Pressure:** 0 kPa (@ 20°C)

**Vapor Density:** 3.17 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** The product is more soluble in water;  $\log(\text{oil/water}) = -1.8$

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, acetone.

**Solubility:**

Miscible in cold water, hot water and alcohol. Partially soluble in acetone. Very slightly soluble in diethyl ether (ethyl ether). Limited solubility in ethyl acetate. Insoluble in carbon tetrachloride, benzene, chloroform, petroleum ethers, and oils

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Avoid contact with incompatible materials, excess heat and ignition, sources, moisture.

**Incompatibility with various substances:** Highly reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Hygroscopic. Glycerin is incompatible with strong oxidizers such as chromium trioxide, potassium chlorate, or potassium permanganate. Glycerin may react violently with acetic anhydride, aniline and nitrobenzene, chromic oxide, lead oxide and fluorine, phosphorous triiodide, ethylene oxide and heat, silver perchlorate, sodium peroxide, sodium hydride.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Eye contact.

**Toxicity to Animals:**

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 4090 mg/kg [Mouse]. Acute dermal toxicity (LD50): 10000 mg/kg [Rabbit]. Acute toxicity of the mist (LC50): >570 mg/m<sup>3</sup> 1 hours [Rat].

**Chronic Effects on Humans:** May cause damage to the following organs: kidneys.

**Other Toxic Effects on Humans:** Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:**

TDL (rat) - Route: Oral; Dose: 100 mg/kg 1 day prior to mating. TDL (human) - Route: Oral; Dose: 1428 mg/kg

**Special Remarks on Chronic Effects on Humans:**

Glycerin is transferred across the placenta in small amounts. May cause adverse reproductive effects based on animal data (Paternal Effects (Rat): Spermatogenesis (including genetic material, sperm morphology, motility, and count), Testes, epididymis, sperm duct). May affect genetic material.

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects: Low hazard for normal industrial handling or normal workplace conditions. Skin: May cause skin irritation. May be absorbed through skin Eyes: May cause eye irritation with stinging, redness, burning sensation, and tearing, but no eye injury. Ingestion: Low hazard. Low toxicity except with very large doses. When large doses are ingested, it can cause gastrointestinal tract irritation with thirst (dehydration), nausea or vomiting diarrhea. It may also affect behavior/central nervous system/nervous system (central nervous system depression, general anesthetic, headache, dizziness, confusion, insomnia, toxic psychosis, muscle weakness, paralysisconvulsions), urinary system/kidneys(renal failure,

hemoglobinuria), cardiovascular system (cardiac arrhythmias), liver. It may also cause elevated blood sugar. Inhalation: Due to low vapor pressure, inhalation of the vapors at room temperature is unlikely. Inhalation of mist may cause respiratory tract irritation. Chronic Potential Health Effects: Ingestion: Prolonged or repeated ingestion may affect the blood(hemolysis, changes in white blood cell count), endocrine system (changes in adrenal weight), respiratory system, and may cause kidney injury.

## Section 12: Ecological Information

**Ecotoxicity:** Ecotoxicity in water (LC50): 58.5 ppm 96 hours [Trout].

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**

Illinois toxic substances disclosure to employee act: Glycerin Rhode Island RTK hazardous substances: Glycerin Pennsylvania RTK: Glycerin Minnesota: Glycerin Massachusetts RTK: Glycerin Tennessee - Hazardous Right to Know: Glycerin TSCA 8(b) inventory: Glycerin

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):** Not controlled under WHMIS (Canada).

**DSCL (EEC):**

Not available S24/25- Avoid contact with skin and eyes.

**HMIS (U.S.A.):**

**Health Hazard:** 1

**Fire Hazard:** 1

**Reactivity:** 0

**Personal Protection:** g

**National Fire Protection Association (U.S.A.):**

**Health:** 1

**Flammability:** 1

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

**Section 16: Other Information**

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:38 PM

**Last Updated:** 05/21/2013 12:00 PM

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**GRAYMONT**

# SAFETY DATA SHEET

**HIGH CALCIUM HYDRATED LIME**

## Section 1. Identification

**GHS product identifier** : HIGH CALCIUM HYDRATED LIME  
**Other means of identification** : Hydrated Lime, Calcitic Hydrated Lime, Lime, Slaked lime, Lime Putty, Lime Slurry, Milk of Lime, Calcium Hydroxide.  
**Product code** : Not available.  
**Product type** : Solid.

**Identified uses**

Neutralization, focculation, stabilization, absorption.

**Supplier/Manufacturer** : GRAYMONT  
 #200-10991 Shellbridge Way  
 Richmond, BC V6X 3C6  
 Canada  
 Phone: 1 604 207-4292  
 Toll free : 1 866 207-4292  
 Fax: 1 604 207-9014  
 Web Site: <http://www.graymont.com/>

**Emergency telephone number (with hours of operation)** : CANUTEC (613-996-6666)  
 CHEMTREC, US (800-424-9300)  
 INTERNATIONAL: (703-527-3887)

## Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : SKIN CORROSION/IRRITATION - Category 2  
 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1  
 CARCINOGENICITY (inhalation) - Category 1A  
 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3  
 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1

**GHS label elements**

**Hazard pictograms** :



**Signal word** :

Danger

**Hazard statements** :

H318 - Causes serious eye damage.  
 H315 - Causes skin irritation.  
 H350 - May cause cancer if inhaled.  
 H335 - May cause respiratory irritation.  
 H372 - Causes damage to organs through prolonged or repeated exposure.

**Precautionary statements**

## Section 2. Hazards identification

- Prevention** : P201 - Obtain special instructions before use.  
P202 - Do not handle until all safety precautions have been read and understood.  
P281 - Use personal protective equipment as required.  
P280 - Wear protective gloves. Wear eye or face protection.  
P271 - Use only outdoors or in a well-ventilated area.  
P260 - Do not breathe dust.  
P270 - Do not eat, drink or smoke when using this product.  
P264 - Wash hands thoroughly after handling.
- Response** : P314 - Get medical attention if you feel unwell.  
P308 + P313 - IF exposed or concerned: Get medical attention.  
P304 + P340 + P312 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell.  
P302 + P352 + P362 + P363 - IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse.  
P332 + P313 - If skin irritation occurs: Get medical attention.  
P305 + P351 + P338 + P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.
- Storage** : P401 - Store to minimize dust generation.
- Disposal** : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

### Hazards not otherwise classified (HNOC)

- Physical hazards not otherwise classified (PHNOC)** : None known.
- Health hazards not otherwise classified (HHNOC)** : None known.

## Section 3. Composition/information on ingredients

- Substance/mixture** : Mixture
- Other means of identification** : Hydrated Lime, Calcitic Hydrated Lime, Lime, Slaked lime, Lime Putty, Lime Slurry, Milk of Lime, Calcium Hydroxide.

### CAS number/other identifiers

- CAS number** : Not applicable.
- Product code** : Not available.

Ingredient name	%	CAS number
Calcium Hydroxide	90 - 100	1305-62-0
Crystalline silica, quartz	0.0001 - 1	14808-60-7

Crystalline silica has been found in some products at or above detection level 0.1%. Concentration is dependent upon limestone source.

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.



## Section 4. First aid measures

### Description of necessary first aid measures

- Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Chemical burns must be treated promptly by a physician. Get medical attention immediately. Call a poison center or physician.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 20 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

- Eye contact** : Causes serious eye damage.
- Inhalation** : May cause respiratory irritation.
- Skin contact** : Causes skin irritation.
- Ingestion** : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:  
pain  
watering  
redness
- Inhalation** : Adverse symptoms may include the following:  
respiratory tract irritation  
coughing  
burning sensation
- Skin contact** : Adverse symptoms may include the following:  
pain or irritation  
redness  
blistering may occur
- Ingestion** : Adverse symptoms may include the following:  
burning sensation  
abdominal cramps and pain  
vomiting



## Section 4. First aid measures

### Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : No specific fire or explosion hazard.

**Hazardous thermal decomposition products** : None.

**Special protective actions for fire-fighters** : No special measures are required.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

- Spill** : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.



## Section 7. Handling and storage

### Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures.
- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store to minimize dust generation. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## Section 8. Exposure controls/personal protection

### Control parameters

#### United States

#### Occupational exposure limits

Ingredient name	Exposure limits
Calcium Hydroxide	<b>OSHA PEL (United States, 2/2013).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m <sup>3</sup> 8 hours. Form: Total dust <b>ACGIH TLV (United States, 4/2014).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. <b>NIOSH REL (United States, 10/2013).</b> TWA: 5 mg/m <sup>3</sup> 10 hours. <b>MSHA PEL</b> TWA 8/40 hours: 5 mg/m <sup>3</sup>
Crystalline silica, quartz	<b>OSHA PEL Z3 (United States, 2/2013).</b> TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Respirable TWA: 250 mppcf 8 hours. Form: Respirable <b>NIOSH REL (United States, 10/2013).</b> TWA: 0.05 mg/m <sup>3</sup> 10 hours. Form: Respirable dust <b>ACGIH TLV (United States, 4/2014).</b> TWA: 0.025 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction <b>MSHA PEL</b> TWA 8/40 hours: 30 mg/m <sup>3</sup> /(%SiO <sub>2</sub> )+2 mg/m <sup>3</sup> Form: Total dust 10 mg/m <sup>3</sup> /(%SiO <sub>2</sub> )+2 mg/m <sup>3</sup> Form: Respirable dust

#### Canada

<u>Occupational exposure limits</u>		<u>TWA (8 hours)</u>			<u>STEL (15 mins)</u>			<u>Ceiling</u>			
<u>Ingredient</u>	<u>List name</u>	<u>ppm</u>	<u>mg/m<sup>3</sup></u>	<u>Other</u>	<u>ppm</u>	<u>mg/m<sup>3</sup></u>	<u>Other</u>	<u>ppm</u>	<u>mg/m<sup>3</sup></u>	<u>Other</u>	<u>Notations</u>
Calcium dihydroxide	US ACGIH 4/2014	-	5	-	-	-	-	-	-	-	
	AB 4/2009	-	5	-	-	-	-	-	-	-	[3]
	BC 7/2013	-	5	-	-	-	-	-	-	-	
	ON 1/2013	-	5	-	-	-	-	-	-	-	
	QC 1/2014	-	5	-	-	-	-	-	-	-	
Crystalline silica, quartz	US ACGIH 4/2014	-	0.025	-	-	-	-	-	-	-	[a]
	AB 4/2009	-	0.025	-	-	-	-	-	-	-	[b]
	BC 7/2013	-	0.025	-	-	-	-	-	-	-	[c]
	ON 1/2013	-	0.1	-	-	-	-	-	-	-	[a]
	QC 1/2014	-	0.1	-	-	-	-	-	-	-	[d]



## Section 8. Exposure controls/personal protection

[3]Skin sensitization

Form: [a]Respirable fraction [b]Respirable particulate. [c]Respirable [d]Respirable dust

**Appropriate engineering controls** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Engineering controls may be required to control the primary or secondary risks associated with this product.

**Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

### Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

### Skin protection

**Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

**Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory protection** : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Wear an appropriate NIOSH approved respirator if concentration levels exceed the safe exposure limits.

## Section 9. Physical and chemical properties

### Appearance

**Physical state** : Solid. [Fine powder.]  
**Color** : White.  
**Odor** : Sweet, soil like odor.  
**Odor threshold** : Not available.  
**pH** : 12.45 [ Sat. soln.] at 25°C  
**Melting point** : Not available.



## Section 9. Physical and chemical properties

<b>Boiling point</b>	: Not available.
<b>Flash point</b>	: Not applicable.
<b>Evaporation rate</b>	: Not available.
<b>Flammability (solid, gas)</b>	: Not applicable.
<b>Lower and upper explosive (flammable) limits</b>	: Not applicable.
<b>Vapor pressure</b>	: Not available.
<b>Vapor density</b>	: Not available.
<b>Relative density</b>	: 2.3 to 2.4
<b>Solubility</b>	: Not available.
<b>Solubility in water</b>	: 0.165 g/100 g at 20°C
<b>Partition coefficient: n-octanol/water</b>	: Not available.
<b>Auto-ignition temperature</b>	: Not applicable.
<b>Decomposition temperature</b>	: 540°C (1004°F)
<b>Viscosity</b>	: Not available.
<b>Volatility</b>	: Not available.
<b>VOC (w/w)</b>	: 0 % (w/w)

## Section 10. Stability and reactivity

<b>Reactivity</b>	: No specific test data related to reactivity available for this product or its ingredients.
<b>Chemical stability</b>	: The product is stable.
<b>Possibility of hazardous reactions</b>	: None.
<b>Conditions to avoid</b>	: Do not allow quicklime to come into contact with incompatible materials. e.g. Water, acids, reactive fluoridated compounds, reactive brominated compounds, reactive powdered metals, organic acid anhydrides, nitro-organic compounds, reactive phosphorous compounds, interhalogenated compounds.
<b>Incompatible materials</b>	: Reactive or incompatible with the following materials: oxidizing materials and acids.
<b>Hazardous decomposition products</b>	: None.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Calcium Hydroxide	LD50 Oral	Rat	7340 mg/kg	-

#### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Calcium Hydroxide	Eyes - Severe irritant	Rabbit	-	10 mg	-

## Section 11. Toxicological information

### Sensitization

There is no data available.

### Carcinogenicity

#### Classification

Product/ingredient name	OSHA	IARC	NTP	ACGIH	EPA	NIOSH
Crystalline silica, quartz	-	1	Known to be a human carcinogen.	A2	-	+

### Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Calcium Hydroxide	Category 3	Not applicable.	Respiratory tract irritation

### Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Crystalline silica, quartz	Category 1	Inhalation	kidneys, respiratory tract and testes

### Aspiration hazard

There is no data available.

**Information on the likely routes of exposure** : Dermal contact. Eye contact. Inhalation. Ingestion.

### Potential acute health effects

**Eye contact** : Causes serious eye damage.  
**Inhalation** : May cause respiratory irritation.  
**Skin contact** : Causes skin irritation.  
**Ingestion** : No known significant effects or critical hazards.

### Symptoms related to the physical, chemical and toxicological characteristics

**Eye contact** : Adverse symptoms may include the following:  
 pain  
 watering  
 redness

**Inhalation** : Adverse symptoms may include the following:  
 respiratory tract irritation  
 coughing  
 burning sensation

**Skin contact** : Adverse symptoms may include the following:  
 pain or irritation  
 redness  
 blistering may occur

**Ingestion** : Adverse symptoms may include the following:  
 burning sensation  
 abdominal cramps and pain  
 vomiting

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure



## Section 11. Toxicological information

**Potential immediate effects** : No known significant effects or critical hazards.

**Potential delayed effects** : No known significant effects or critical hazards.

### Long term exposure

**Potential immediate effects** : No known significant effects or critical hazards.

**Potential delayed effects** : No known significant effects or critical hazards.

### Potential chronic health effects

**General** : Causes damage to organs through prolonged or repeated exposure.

**Carcinogenicity** : May cause cancer if inhaled. Risk of cancer depends on duration and level of exposure.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

There is no data available.

## Section 12. Ecological information

### Toxicity

Product/ingredient name	Result	Species	Exposure
Calcium Hydroxide	Acute LC50 33884.4 µg/L Fresh water	Fish - Clarias gariepinus - Fingerling	96 hours

### Persistence and degradability

There is no data available.

### Bioaccumulative potential

There is no data available.

### Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of

### Section 13. Disposal considerations

spilled material and runoff and contact with soil, waterways, drains and sewers.

### Section 14. Transport information

	DOT	TDG	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

**AERG** : Not applicable.

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

### Section 15. Regulatory information

- U.S. Federal regulations** : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined  
**United States inventory (TSCA 8b):** Calcium Hydroxide is subject to inventory update reporting (IUR).  
**RCRA classification:** Calcium Hydroxide is not listed or classified.  
**CWA-311:** Calcium Hydroxide has been withdrawn from the Clean Water Act (CWA) list of hazardous substances. (11/13/79) (44FR65400).  
**CERCLA:** Calcium Hyrdoxide is not listed.  
**FDA:** Calcium Hydroxide has been determined as Generally Recognized As Safe (GRAS) by FDA. See 21CFR184.1205. (CFR Title 21 Part 184 - - Direct food substances affirmed as generally recognized as safe).
- Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed
- Clean Air Act Section 602 Class I Substances** : Not listed
- Clean Air Act Section 602 Class II Substances** : Not listed



## Section 15. Regulatory information

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.

### SARA 311/312

**Classification** : Immediate (acute) health hazard  
Delayed (chronic) health hazard

#### Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Calcium Hydroxide Crystalline silica, quartz	90 - 100 0.0001 - 1	No. No.	No. No.	No. No.	Yes. No.	No. Yes.

### SARA 313

	Product name	CAS number	%
<b>Form R - Reporting requirements</b>	Not listed	-	-
<b>Supplier notification</b>	Not listed	-	-

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

### State regulations

**Massachusetts** : The following components are listed: Calcium Hydroxide; Crystalline silica, quartz

**New York** : None of the components are listed.

**New Jersey** : The following components are listed: Calcium Hydroxide; Crystalline silica, quartz

**Pennsylvania** : The following components are listed: Calcium Hydroxide; Crystalline silica, quartz

### California Prop. 65

**WARNING:** This product contains a chemical known to the State of California to cause cancer.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Crystalline silica, quartz	Yes.	No.	No.	No.

### Canada

#### Canadian lists

**Canadian NPRI** : None of the components are listed.

**CEPA Toxic substances** : None of the components are listed.

**Canada inventory** : All components are listed or exempted.

### International lists

#### National inventory

## Section 15. Regulatory information

<b>Australia</b>	: All components are listed or exempted.
<b>China</b>	: All components are listed or exempted.
<b>Europe</b>	: All components are listed or exempted.
<b>Japan</b>	: All components are listed or exempted.
<b>Malaysia</b>	: Not determined.
<b>New Zealand</b>	: All components are listed or exempted.
<b>Philippines</b>	: All components are listed or exempted.
<b>Republic of Korea</b>	: All components are listed or exempted.
<b>Taiwan</b>	: Not determined.

## Section 16. Other information

### Hazardous Material Information System (U.S.A.)

**Health :** 3 \* **Flammability :** 0 **Physical hazards :** 1

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

### National Fire Protection Association (U.S.A.)

**Health :** 3 **Flammability :** 0 **Instability :** 1

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

### History

**Date of issue mm/dd/yyyy :** 04/15/2015

**Version :** 1

**Prepared by :** KMK Regulatory Services Inc.

### Key to abbreviations

: ATE = Acute Toxicity Estimate  
 : BCF = Bioconcentration Factor  
 : GHS = Globally Harmonized System of Classification and Labelling of Chemicals  
 : IATA = International Air Transport Association  
 : IBC = Intermediate Bulk Container  
 : IMDG = International Maritime Dangerous Goods  
 : LogPow = logarithm of the octanol/water partition coefficient  
 : MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)  
 : UN = United Nations

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



# SAFETY DATA SHEET

CITGO AW Hydraulic Oil 32



## Section 1. Identification

<b>GHS product identifier</b>	: CITGO AW Hydraulic Oil 32
<b>Synonyms</b>	: Hydraulic Fluid
<b>Code</b>	: 633491001
<b>Supplier's details</b>	: CITGO Petroleum Corporation P.O. Box 4689 Houston, TX 77210 sdsvend@citgo.com
<b>Emergency telephone number</b>	: Technical Contact: (800) 248-4684 Medical Emergency: (832) 486-4700 CHEMTREC Emergency: (800) 424-9300 (United States Only)

## Section 2. Hazards identification

<b>OSHA/HCS status</b>	: While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
<b>Classification of the substance or mixture</b>	: Not classified.
<b>GHS label elements</b>	
<b>Signal word</b>	: Warning
<b>Hazard statements</b>	: Injection under the skin can cause severe injury. Most damage occurs in the first few hours. Initial symptoms may be minimal.
<b>Precautionary statements</b>	
<b>General</b>	: Avoid contact with eyes, skin and clothing. MAY BE HARMFUL IF SWALLOWED. IF IN EYES: Rinse cautiously with water for several minutes. Do NOT induce vomiting. After handling, always wash hands thoroughly with soap and water. If you feel unwell, seek medical attention and show the label when possible. Keep out of reach of children.
<b>Prevention</b>	: Not applicable.
<b>Response</b>	: Not applicable.
<b>Storage</b>	: Store in a dry place and/or in closed container. Store in accordance with all local, regional, national and international regulations.
<b>Disposal</b>	: Dispose of contents and container in accordance with all local, regional, national and international regulations.
<b>Hazards not otherwise classified</b>	: Injection of petroleum hydrocarbons requires immediate medical attention

## Section 3. Composition/information on ingredients

<b>Substance/mixture</b>	: Mixture
<b>Other means of identification</b>	: Hydraulic Fluid
<b>CAS number/other identifiers</b>	
<b>CAS number</b>	: Not applicable.

## Section 3. Composition/information on ingredients

Any concentration shown as a range is to protect confidentiality or is due to process variation.

**There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.**

**Occupational exposure limits, if available, are listed in Section 8.**

## Section 4. First aid measures

### Description of necessary first aid measures

- |                     |  |
|---------------------|--|
| <b>Eye contact</b>  | : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.  |
| <b>Inhalation</b>   | : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.  |
| <b>Skin contact</b> | : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.   |
| <b>Ingestion</b>    | : Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur. |

### Most important symptoms/effects, acute

#### Potential acute health effects

- |                     |  |
|---------------------|--|
| <b>Eye contact</b>  | : No known significant effects or critical hazards.  |
| <b>Inhalation</b>   | : No known significant effects or critical hazards.  |
| <b>Skin contact</b> | : Injection of pressurized hydrocarbons can cause severe permanent tissue damage. Initial symptoms may be minor. |
| <b>Ingestion</b>    | : No known significant effects or critical hazards.  |

#### Over-exposure signs/symptoms

- |                     |                     |
|---------------------|---------------------|
| <b>Eye contact</b>  | : No specific data. |
| <b>Inhalation</b>   | : No specific data. |
| <b>Skin contact</b> | : No specific data. |
| <b>Ingestion</b>    | : No specific data. |

### Indication of immediate medical attention and special treatment needed, if necessary

- |                                   |   |
|-----------------------------------|---|
| <b>Notes to physician</b>         | : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. |
| <b>Specific treatments</b>        | : Treat symptomatically and supportively.   |
| <b>Protection of first-aiders</b> | : No action shall be taken involving any personal risk or without suitable training.  |

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

- |   |   |
|---|---|
| <b>Specific hazards arising from the chemical</b> | : In a fire or if heated, a pressure increase will occur and the container may burst. |
|---|---|

### Extinguishing media

- |   |  |
|---|--|
| <b>Suitable extinguishing media</b>             | : Use an extinguishing agent suitable for the surrounding fire.                                    |
| <b>Unsuitable extinguishing media</b>           | : None known.  |
| <b>Hazardous thermal decomposition products</b> | : Decomposition products may include the following materials:<br>carbon dioxide<br>carbon monoxide |

## Section 5. Fire-fighting measures

- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8).
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
- Bulk Storage Conditions:** Maintain all storage tanks in accordance with applicable regulations. Use necessary controls to monitor tank inventories. Inspect all storage tanks on a periodic basis. Test tanks and associated piping for tightness. Maintain the automatic leak detection devices to assure proper working condition.

## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

None identified.

- Appropriate engineering controls** : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, vapor controls, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Individual protection measures

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles. Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If inhalation hazards exist, a full-face respirator may be required instead.
- Skin protection**
- Hand protection** : Chemical-resistant gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Avoid skin contact with liquid. Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Leather boots are not protective for liquid contact.
- Respiratory protection** : Avoid inhalation of gases, vapors, mists or dusts. Use a properly fitted, air-purifying or supplied-air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

- Physical state** : Liquid.
- Color** : Light amber [Light]
- Odor** : Mild petroleum odor [Slight]
- pH** : Not applicable.
- Boiling point/boiling range** : Not available.
- Flash point** : Open cup: 214°C (417.2°F) [Cleveland.]
- Lower and upper explosive (flammable) limits** : Not available.
- Vapor pressure** : Not available.
- Vapor density** : Not available.
- Relative density** : Not available.
- Density lbs/gal** : 7.14 lbs/gal
- Gravity, °API** : 33.6

## Section 9. Physical and chemical properties

**Viscosity** : Dynamic (room temperature): Not applicable.  
Kinematic (room temperature): Not applicable.  
Kinematic (40°C (104°F)): 0.32 cm<sup>2</sup>/s (32 cSt)

**Viscosity SUS** : 155 SUS @100 F

## Section 10. Stability and reactivity

**Reactivity** : Not expected to be Explosive, Self-Reactive, Self-Heating, or an Organic Peroxide under US GHS Definition(s).

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : No specific data.

**Incompatible materials** : No specific data.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

**Conclusion/Summary** : **Distillates (petroleum), hydrotreated heavy paraffinic**: Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects.

#### Irritation/Corrosion

**Skin** : No additional information.

**Eyes** : No additional information.

**Respiratory** : No additional information.

#### Sensitization

**Skin** : No additional information.

**Respiratory** : No additional information.

#### Mutagenicity

**Conclusion/Summary** : No additional information.

#### Carcinogenicity

**Conclusion/Summary** : No additional information.

#### Reproductive toxicity

**Conclusion/Summary** : No additional information.

#### Teratogenicity

**Conclusion/Summary** : No additional information.

#### Specific target organ toxicity (single exposure)

Not available.

#### Specific target organ toxicity (repeated exposure)

Not available.

## Section 11. Toxicological information

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

### Potential acute health effects

**Eye contact** : No known significant effects or critical hazards.  
**Inhalation** : No known significant effects or critical hazards.  
**Skin contact** : Injection of pressurized hydrocarbons can cause severe permanent tissue damage. Initial symptoms may be minor.  
**Ingestion** : No known significant effects or critical hazards.

### Symptoms related to the physical, chemical and toxicological characteristics

**Eye contact** : No specific data.  
**Inhalation** : No specific data.  
**Skin contact** : No specific data.  
**Ingestion** : No specific data.

### Potential chronic health effects

**General** : No known significant effects or critical hazards.  
**Carcinogenicity** : No known significant effects or critical hazards.  
**Mutagenicity** : No known significant effects or critical hazards.  
**Teratogenicity** : No known significant effects or critical hazards.  
**Developmental effects** : No known significant effects or critical hazards.  
**Fertility effects** : No known significant effects or critical hazards.

## Section 12. Ecological information

### Toxicity

**Conclusion/Summary** : Not available.

### Persistence and degradability

**Conclusion/Summary** : Not available.

### Bioaccumulative potential

Not available.

### Mobility in soil

**Soil/water partition coefficient ( $K_{oc}$ )** : Not available.

**Other adverse effects** : No known significant effects or critical hazards.



## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.
Additional information	-	-	-

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

## Section 15. Regulatory information

**U.S. Federal regulations** : **United States inventory (TSCA 8b):** All components are listed or exempted.  
**Clean Water Act (CWA) 307:** Zinc and zinc compounds; Toluene; Phenol  
**Clean Water Act (CWA) 311:** Toluene; Phenol  
 This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.

### SARA 302/304

#### Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
Phenol	<0.001	Yes.	500 / 10000	-	1000	-

## Section 15. Regulatory information

**SARA 304 RQ** : 106837606.8 lbs / 48504273.5 kg [14899387.7 gal / 56400318 L]

**SARA 311/312**

**Classification** : Not applicable.

**Composition/information on ingredients**

**State regulations**

**Massachusetts** : None of the components are listed.

**New York** : None of the components are listed.

**New Jersey** : None of the components are listed.

**Pennsylvania** : None of the components are listed.

**California Prop. 65**

**WARNING:** This product contains less than 0.1% of a chemical known to the State of California to cause cancer.

**WARNING:** This product contains less than 1% of a chemical known to the State of California to cause birth defects or other reproductive harm.

Ingredient name	%	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Toluene	<0.01	No.	Yes.	No.	7000 µg/day (ingestion)
ethyl acrylate	<0.001	Yes.	No.	No.	No.

**International regulations**

**International lists**

**Australia inventory (AICS):** All components are listed or exempted.

**China inventory (IECSC):** All components are listed or exempted.

**Japan inventory:** All components are listed or exempted.

**Korea inventory:** All components are listed or exempted.

**Malaysia Inventory (EHS Register):** Not determined.

**New Zealand Inventory of Chemicals (NZIoC):** All components are listed or exempted.

**Philippines inventory (PICCS):** All components are listed or exempted.

**Taiwan inventory (CSNN):** Not determined.

**Canada inventory** : All components are listed or exempted.

**EU Inventory** : All components are listed or exempted.

**WHMIS (Canada)** : Not controlled under WHMIS (Canada).

## Section 16. Other information

**National Fire Protection Association (U.S.A.)**



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

**History**

**Date of issue/Date of revision** : 5/20/2015.

## Section 16. Other information

### Key to abbreviations

- : ATE = Acute Toxicity Estimate
- BCF = Bioconcentration Factor
- GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- IATA = International Air Transport Association
- IBC = Intermediate Bulk Container
- IMDG = International Maritime Dangerous Goods
- LogPow = logarithm of the octanol/water partition coefficient
- MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
- UN = United Nations

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Univar USA Inc Material Safety Data Sheet

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MSDS No:

Version No:

Order No:

Univar USA Inc., 17425 NE Union Hill Rd., Redmond WA 98052  
(425) 889 3400

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Emergency Assistance

For emergency assistance involving chemicals call  
Chemtrec - (800) 424-9300

The Version Date and Number for this MSDS is : 09/24/2009 - #009

PRODUCT NAME: HYDROCHLORIC ACID (HCl) (ALL GRADES)  
MSDS NUMBER: OZ34514  
DATE ISSUED: 07/30/2008  
SUPERSEDES: 01/26/2006  
ISSUED BY: 008730

\*\*\*\*\*  
\*\*\*\*\*

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Distributed by:  
Univar USA Inc.  
17425 NE Union Hill Road  
Redmond, WA 98052  
425-889-3400

Trade Name: HYDROCHLORIC ACID (HCl) (ALL GRADES)

Synonyms:  
Muriatic Acid  
HCl Solution  
Aqueous hydrogen chloride

Product Use: Process chemical, Metal cleaning, Water purification, Petroleum Industry

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Color: Colorless  
Physical State: Liquid  
Appearance: Clear  
Odor: Irritating, Pungent, Sharp  
Signal Word: Danger

MAJOR HEALTH HAZARDS: CAUSES BURNS TO THE RESPIRATORY TRACT, SKIN AND EYES.  
CAUSES PERMANENT EYE DAMAGE. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING.

PHYSICAL HAZARDS: May spatter or generate heat when mixed with water. Contact

Annotation:

with metals may evolve flammable hydrogen gas.

PRECAUTIONARY STATEMENTS: Do not breathe vapor or mist. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Wash thoroughly after handling. Use only with adequate ventilation.

2. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS:

Inhalation: May cause irritation (possibly severe), chemical burns, and pulmonary edema.

Skin contact: May cause irritation (possibly severe) and chemical burns.

Eye contact: May cause irritation (possibly severe), chemical burns, eye damage, and blindness. Ingestion: Not a likely route of exposure.

Target Organs Effected: Respiratory System, Skin, Eye

Chronic Effects: Repeated or prolonged exposure to dilute solutions may result in dermatitis. Discoloration of the teeth may occur as a result of long term exposure.

Interaction with Other Chemicals Which Enhance Toxicity: None known

Medical Conditions Aggravated by Exposure: None known

See Section 11: TOXICOLOGICAL INFORMATION

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component	Concentration (by weight %)	CAS - No.
Water	63 91	7732-18-5
Hydrogen chloride	9 - 36	7647-01-0

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. If respiration or pulse has stopped, have a trained person administer basic life support (Cardio-Pulmonary Resuscitation and/or Automatic External Defibrillator) and CALL FOR EMERGENCY SERVICES IMMEDIATELY.

SKIN CONTACT: Immediately flush contaminated areas with water. Remove contaminated clothing, jewelry, and shoes immediately. Wash contaminated areas with soap and water. Thoroughly clean and dry contaminated clothing and shoes before reuse. GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT: Immediately flush eyes with a directed stream of water for at

**Annotation:**

least 15 minutes, forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissues. Washing eyes within several seconds is essential to achieve maximum effectiveness. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION: Not a likely route of exposure.

**5. FIRE-FIGHTING MEASURES**

Fire Hazard: Negligible fire hazard.

Extinguishing Media: Use media appropriate for surrounding fire

Fire Fighting: Keep unnecessary people away, isolate hazard area and deny entry. Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Move container from fire area if it can be done without risk. Cool non-leaking containers with water. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Flash point: Not flammable

Hazardous Combustion Products: Hydrogen chloride, Chlorine, Hydrogen gas

**6. ACCIDENTAL RELEASE MEASURES**

**Occupational Release:**

Remove sources of ignition. Wear appropriate personal protective equipment recommended in Section 8 of the MSDS. Stop leak if possible without personal risk. Consider evacuation of personnel located downwind if material is leaking. Shut off ventilation system if needed. Completely contain spilled material with dikes, sandbags, etc. Neutralize with soda ash or dilute caustic soda. Collect with appropriate absorbent and place into suitable container. Liquid material may be removed with a properly rated vacuum truck. Keep out of water supplies and sewers. This material is acidic and may lower the pH of the surface waters with low buffering capacity. Releases should be reported, if required, to appropriate agencies.

**7. HANDLING AND STORAGE**

Storage Conditions: Store and handle in accordance with all current regulations and standards. Store in rubber-lined steel, acid-resistant plastic or glass containers. Keep container tightly closed. Store in a cool, dry area. Store in a well-ventilated area. Keep away from heat, sparks and open flames. Keep separated from incompatible substances. Do not store in aluminum container or use aluminum fittings or transfer lines. Protect from physical damage. Dike and vent storage tanks.

Handling Procedures: Avoid breathing vapor or mist. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. When mixing, slowly add to water to minimize heat generation and spattering.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

OSHA Regulatory Exposure limit(s):

Hazardous Component	CAS-No.	OSHA Final PEL	OSHA Final PEL	OSHA Final PEL
		TWA	STEL	Ceiling
Hydrogen chloride	7647-01-0			5 ppm 7 mg/m3

Non-Regulatory Exposure Limit(s):

The Non-Regulatory OSHA limits shown in the table are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).

Hazardous Component	CAS-No.	ACGIH	ACGIH	ACGIH	OSHA	OSHA	OSHA Ceiling
		TWA	STEL	Ceiling	TWA	STEL	(Vacated)
Hydrogen chloride	7647-01-0			2 ppm	(Vacated)	(Vacated)	5 ppm 7 mg/m3

ENGINEERING CONTROLS: Use closed systems when possible. Provide local exhaust ventilation where vapor or mist may be generated. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear chemical safety goggles with a faceshield to protect against eye and skin contact when appropriate. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear chemical resistant clothing and rubber boots when potential for contact with the material exists. Always place pants legs over boots.

Hand Protection: Wear appropriate chemical resistant gloves

Protective Material Types: Nitrile, Neoprene, Butyl rubber, Polyvinyl chloride (PVC), Responder, Trelchem, Tychem

Hazardous Component	Immediately Dangerous to Life/ Health (IDLH)
Hydrogen chloride	50 ppm IDLH

Respiratory Protection: A NIOSH approved full-face respirator equipped with acid gas cartridges (appropriate for hydrogen chloride) may be permissible under certain circumstances where airborne concentrations of hydrogen chloride are expected to exceed exposure limits, or when symptoms have been observed that are indicative of overexposure. When the level may be above the



Annotation:

IDLH, use an SCBA or pressure-demand supplied air with an auxiliary self-contained escape pack. Pressure-demand SCBA (self-contained breathing apparatus) must be used when there is a potential for uncontrolled release or unknown concentrations. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Appearance:	Clear
Color:	Colorless
Odor:	Irritating, Pungent, Sharp
Odor Threshold	0.3 ppm (causes olfactory fatigue)
Molecular Weight:	36.46
Molecular Formula:	HCl
Flash point:	Not flammable
Boiling Point/Range:	140 - 221 deg F (60 105 deg C)
Freezing Point/Range:	-29 to 5 deg F (-34 to -15 deg C)
Vapor Pressure:	14.6 - 80 mmHg @ 20 deg C
Vapor Density (air=1):	1.3 @ 20 deg C
Specific Gravity (water=1):	1.05 1.18
Density:	8.75 9.83 lbs/gal
Water Solubility:	100%
pH:	2 (0.2% solution)
Volatility:	9 - 36% by volume
Evaporation Rate (ether=1):	< 1.00 (butyl acetate=1)

10. STABILITY AND REACTIVITY

Reactivity/ Stability: Stable at normal temperatures and pressures.

Conditions to Avoid: Avoid heat, flames, sparks and other sources of ignition. Avoid contact with water. Will react with some metals forming flammable hydrogen gas. Hydrogen chloride may react with cyanide, forming lethal concentrations of hydrocyanic acid. Avoid contact with incompatible materials.

Incompatibilities/Materials to Avoid: Metals, Alkalis, Oxidizing agents, Mercuric sulfate, Perchloric acid, Carbides of calcium, cesium, rubidium, Acetylides of cesium and rubidium, Phosphides of calcium and uranium, Lithium Silicide

Hazardous Decomposition Products: Chlorine, Hydrogen chloride, Hydrogen gas

Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Standard Draize (Eye):	rabbit-eye mild
Standard Draize (Skin):	human-skin mild

TOXICITY DATA:

Hazardous Component	LD50 Oral	LC50 Inhalation	LD50 Dermal
	700 mg/kg (Rat)	3124 ppm (1 hr-Rat)	5010 mg/kg
Hydrogen chloride	900 mg/kg (Rabbit)		(Rabbit)

TOXICITY:

Inhalation will cause severe irritation and possible burns with coughing and choking. If inhaled deeply, edema and hemorrhage of the lungs may occur. Prolonged exposure may cause discoloration and/or erosion of teeth. Contact with eyes causes immediate severe irritation with possible burns, permanent visual impairment, or total loss of sight. Skin contact with this material may cause severe irritation and corrosion of tissue. Ingestion may cause immediate burns of the mouth, esophagus, and stomach. Ingestion may cause intense pain, nausea, vomiting, bleeding, circulating collapse, shock and death.

CARCINOGENICITY: This product is not classified as a carcinogen by NTP, IARC or OSHA.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

LC50 Gambusia affinis: 282 mg/L 96 h  
LC50 goldfish: 178 mg/L (1 to 2 hour survival time)  
LC50 bluegill: 3.6 mg/L 48 h  
LC50 shrimp: 100 330 mg/L

FATE AND TRANSPORT:

BIODEGRADATION: This material is inorganic and not subject to biodegradation.

PERSISTENCE: This material is believed not to persist in the environment. This material is believed to exist in the disassociated state in the environment. If released to soil, hydrogen chloride will sink into the soil. The acid will dissolve some soil material (in particular, anything with a carbonate base) and will be somewhat neutralized. The remaining portion is thought to transport downward to the water table. If released to water, it dissociates almost completely and will be neutralized by natural alkalinity and carbon dioxide.

BIOCONCENTRATION: This material is not expected to bioconcentrate in organisms.

ADDITIONAL ECOLOGICAL INFORMATION: This material has exhibited toxicity to terrestrial organisms. May decrease pH of waterways and adversely affect aquatic life.

13. DISPOSAL CONSIDERATIONS

Annotation:

Reuse or reprocess, if possible. Dispose in accordance with all applicable regulations. May be subject to disposal regulations: U.S. EPA 40 CFR 261.  
Hazardous Waste Number(s): D002

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Hydrochloric acid solution  
DOT UN NUMBER: UN1789  
HAZARD CLASS/ DIVISION: 8  
PACKING GROUP: II  
LABELING 8  
REQUIREMENTS:  
DOT RQ (lbs): RQ 5,000 Lbs. (Hydrochloric acid)

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME: Hydrochloric acid solution  
UN NUMBER: UN1789  
CLASS: 8  
PACKING/RISK GROUP: II

15. REGULATORY INFORMATION

U.S. REGULATIONS

OSHA REGULATORY STATUS:

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200) (US).

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 4262675.

Hazardous Component	CERCLA Reportable Quantities:
Hydrogen chloride	5000 lb (final RQ)

EPCRA EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):

If a release is reportable under EPCRA, notify the state emergency response commission and local emergency planning committee. If the TPQ is met, facilities are subject to reporting requirements under EPCRA Sections 311 and 312.

Hazardous Component	EPCRA RQs	Threshold Planning Quantity (TPQs)
Hydrogen chloride	5000 lb (EPCRA RQ)	500 lb (TPQ)

EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.21):

Sudden Release of Pressure, Extremely Hazardous, Acute Health Hazard

EPCRA SECTION 313 (40 CFR 372.65):

The following chemicals are listed in 40 CFR 372.65 and may be subject to  
Community Right-to Know Reporting requirements.

Hazardous Component	Status:
Hydrogen chloride	Listed

DEPARTMENT OF HOMELAND SECURITY (DHS)- Chemical Facility Anti-Terrorism  
Standards (6 CFR 27):

Hydrogen chloride is regulated under DHS as follows:

- DHS - Release Min. Concentration
- DHS - Release Screening Threshold Quantity
- DHS - Security Issue
- DHS - Theft Screening Threshold Quantity

OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):

Not regulated

NATIONAL INVENTORY STATUS

U.S. INVENTORY STATUS (TSCA): All components are listed or exempt

TSCA 12(b): This product is not subject to export notification

CANADIAN DOMESTIC SUBSTANCE LIST (DSL/NDSL): All components are listed.

STATE REGULATIONS

Hazardous Component	Hydrogen chloride
California Proposition 65 Cancer WARNING:	Not Listed
California Proposition 65 CRT List - Male reproductive toxin:	Not Listed
California Proposition 65 CRT List - Female reproductive toxin:	Not Listed.
Massachusetts Right to Know Hazardous Substance List	Listed
New Jersey Right to Know Hazardous Substance List	sn 1012; sn 2909 (gas only)
New Jersey Special Health Hazards Substance List	corrosive
New Jersey - Environmental Hazardous Substance List	Listed
Pennsylvania Right to Know Hazardous Substance List	Listed
Pennsylvania Right to Know Special Hazardous Substances	Not Listed
Pennsylvania Right to Know Environmental Hazard List	Listed
Rhode Island Right to Know Hazardous Substance List	Listed

CANADIAN REGULATIONS

This product has been classified in accordance with the hazard criteria of  
the Controlled Products Regulations and the MSDS contains all the information  
required by the Controlled Products Regulations.

Hazardous Component	Hydrogen chloride
Canada - CEPA Schedule I - Toxic Substance list	Not Listed
WHMIS Classification:	E

UNIVAR USA INC.  
ISSUE DATE:2008-07-30  
Annotation:

MSDS NO:OZ34514  
VERSION:009 2009-09-24

16. OTHER INFORMATION

Disclaimer:

This information is intended solely for the use of individuals trained in the NFPA and/or HMIS systems. HMIS: (SCALE 0-4) (Rated using National Paint & Coatings Association

HMIS: Rating Instructions, 2nd Edition)

Health: 3 Flammability: 0 Reactivity: 1

NFPA 704 - Hazard Identification Ratings (SCALE 0-4)

Health: 3 Flammability: 0 Reactivity: 1

## Univar USA Inc Material Safety Data Sheet

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For Additional Information contact MSDS Coordinator during business hours, Pacific time: (425) 889-3400

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This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process



Health	3
Fire	0
Reactivity	1
Personal Protection	

## Material Safety Data Sheet Hydrochloric acid MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Hydrochloric acid

**Catalog Codes:** SLH1462, SLH3154

**CAS#:** Mixture.

**RTECS:** MW4025000

**TSCA:** TSCA 8(b) inventory: Hydrochloric acid

**CI#:** Not applicable.

**Synonym:** Hydrochloric Acid; Muriatic Acid

**Chemical Name:** Not applicable.

**Chemical Formula:** Not applicable.

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**  
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Hydrogen chloride	7647-01-0	20-38
Water	7732-18-5	62-80

**Toxicological Data on Ingredients:** Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

Slightly hazardous in case of skin contact (sensitizer). **CARCINOGENIC EFFECTS:** Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth. Repeated or prolonged exposure to the substance can produce target

organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion:**

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

**Serious Ingestion:** Not available.

#### Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** of metals

**Explosion Hazards in Presence of Various Substances:** Non-explosive in presence of open flames and sparks, of shocks.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:**

Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammable gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrogen gas.

**Special Remarks on Explosion Hazards:**



Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl<sub>4</sub> Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca<sub>3</sub>P<sub>2</sub> Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO<sub>4</sub> Hexalithium disilicide H<sub>2</sub>SO<sub>4</sub> Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U<sub>3</sub>P<sub>4</sub>, Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

## Section 6: Accidental Release Measures

### Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

### Large Spill:

Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, metals, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

### Personal Protection:

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m<sup>3</sup>) from OSHA (PEL) [United States] CEIL: 5 from NIOSH CEIL: 7 (mg/m<sup>3</sup>) from NIOSH TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)] TWA: 2 STEL: 8 (mg/m<sup>3</sup>) [United Kingdom (UK)] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Pungent. Irritating (Strong.)

**Taste:** Not available.

**Molecular Weight:** Not applicable.

**Color:** Colorless to light yellow.

**pH (1% soln/water):** Acidic.

**Boiling Point:**

108.58 C @ 760 mm Hg (for 20.22% HCl in water) 83 C @ 760 mm Hg (for 31% HCl in water) 50.5 C (for 37% HCl in water)

**Melting Point:**

-62.25°C (-80°F) (20.69% HCl in water) -46.2 C (31.24% HCl in water) -25.4 C (39.17% HCl in water)

**Critical Temperature:** Not available.

**Specific Gravity:**

1.1- 1.19 (Water = 1) 1.10 (20%and 22% HCl solutions) 1.12 (24% HCl solution) 1.15 (29.57% HCl solution) 1.16 (32% HCl solution) 1.19 (37% and 38%HCl solutions)

**Vapor Pressure:** 16 kPa (@ 20°C) average

**Vapor Density:** 1.267 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.25 to 10 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether.

**Solubility:** Soluble in cold water, hot water, diethyl ether.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials, water

**Incompatibility with various substances:**

Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, water.

**Corrosivity:**

Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Reacts with water especially when water is added to the product. Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothermic reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the following can cause explosion or ignition on contact or

**Special Remarks on Corrosivity:**

Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinum, tantalum, silver, and certain alloys are exceptions). It is one of the most corrosive of the nonoxidizing acids in contact with copper alloys. No corrosivity data on zinc, steel. Severe Corrosive effect on brass and bronze

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation.

### **Toxicity to Animals:**

Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

### **Chronic Effects on Humans:**

CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.

### **Other Toxic Effects on Humans:**

Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, . Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

### **Special Remarks on Toxicity to Animals:**

Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

### **Special Remarks on Chronic Effects on Humans:**

May cause adverse reproductive effects (fetotoxicity). May affect genetic material.

### **Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects: Skin: Corrosive. Causes severe skin irritation and burns. Eyes: Corrosive. Causes severe eye irritation/conjunctivitis, burns, corneal necrosis. Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and laryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well as headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure, occur, particularly if exposure is prolonged. May affect the liver. Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomiting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophageal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel. Chronic Potential Health Effects: dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

### **Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

### Section 14: Transport Information

**DOT Classification:** Class 8: Corrosive material

**Identification:** : Hydrochloric acid, solution UNNA: 1789 PG: II

**Special Provisions for Transport:** Not available.

### Section 15: Other Regulatory Information

**Federal and State Regulations:**

Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid California Director's List of Hazardous Substances: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**

CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

**DSCL (EEC):**

R34- Causes burns. R37- Irritating to respiratory system. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**HMIS (U.S.A.):**

**Health Hazard:** 3

**Fire Hazard:** 0

**Reactivity:** 1

**Personal Protection:**

**National Fire Protection Association (U.S.A.):**

**Health:** 3

**Flammability:** 0

**Reactivity:** 1

**Specific hazard:**

**Protective Equipment:**

Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

### Section 16: Other Information

**References:**

-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Industrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangereuses au Canada. Centre de conformité international Ltée. 1986.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 05:45 PM

**Last Updated:** 05/21/2013 12:00 PM

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# Hydrogen, compressed

## Safety Data Sheet P-4604

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1980    Revision date: 10/17/2016    Supersedes: 06/03/2015

### SECTION 1: Product and company identification

#### 1.1. Product identifier

Product form : Substance  
 Name : Hydrogen, compressed  
 CAS No : 1333-74-0  
 Formula : H<sub>2</sub>  
 Other means of identification : Dihydrogen, parahydrogen, refrigerant gas R702, water gas

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Industrial use. Use as directed.

#### 1.3. Details of the supplier of the safety data sheet

Praxair, Inc.  
 10 Riverview Drive  
 Danbury, CT 06810-6268 - USA  
 T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146  
[www.praxair.com](http://www.praxair.com)

#### 1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week  
 — Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887  
 (collect calls accepted, Contract 17729)

### SECTION 2: Hazard identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Flam. Gas 1    H220  
 Compressed gas    H280

#### 2.2. Label elements

##### GHS-US labeling

Hazard pictograms (GHS-US) :



GHS02

GHS04

Signal word (GHS-US) : DANGER

Hazard statements (GHS-US) : H220 - **EXTREMELY FLAMMABLE GAS**  
 H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED  
 OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION  
 CGA-HG04 - MAY FORM EXPLOSIVE MIXTURES WITH AIR  
 CGA-HG08 - BURNS WITH INVISIBLE FLAME

Precautionary statements (GHS-US) : P202 - Do not handle until all safety precautions have been read and understood  
 P210 - Keep away from Heat, Open flames, Sparks, Hot surfaces. - No smoking  
 P271+P403 - Use and store only outdoors or in a well-ventilated place  
 P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely  
 P381 - Eliminate all ignition sources if safe to do so  
 CGA-PG05 - Use a back flow preventive device in the piping  
 CGA-PG10 - Use only with equipment rated for cylinder pressure  
 CGA-PG12 - Do not open valve until connected to equipment prepared for use  
 CGA-PG06 - Close valve after each use and when empty  
 CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)



# Hydrogen, compressed

## Safety Data Sheet P-4604

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1980    Revision date: 10/17/2016    Supersedes: 06/03/2015

### 2.3. Other hazards

Other hazards not contributing to the classification : None.

### 2.4. Unknown acute toxicity (GHS US)

No data available

## SECTION 3: Composition/Information on ingredients

### 3.1. Substance

Name : Hydrogen, compressed  
CAS No : 1333-74-0

Name	Product identifier	%
Hydrogen	(CAS No) 1333-74-0	99.5 - 100

### 3.2. Mixture

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.. Get immediate medical attention.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

### 4.2. Most important symptoms and effects, both acute and delayed

No additional information available

### 4.3. Indication of any immediate medical attention and special treatment needed

None.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide, dry chemical powder, water spray, fog.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : **EXTREMELY FLAMMABLE GAS.** The hydrogen flame is nearly invisible. Hydrogen has a low ignition energy; escaping hydrogen gas may ignite spontaneously. A fireball forms if the gas cloud ignites immediately after release. Hydrogen forms explosive mixtures with air and oxidizing agents.

Explosion hazard : **EXTREMELY FLAMMABLE GAS.** Forms explosive mixtures with air and oxidizing agents.

Reactivity : No reactivity hazard other than the effects described below.

### 5.3. Advice for firefighters

Firefighting instructions : If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

# Hydrogen, compressed

## Safety Data Sheet P-4604

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1980    Revision date: 10/17/2016    Supersedes: 06/03/2015

Protection during firefighting	: Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.
Special protective equipment for fire fighters	: Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	: Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems
	Stop flow of product if safe to do so
	Use water spray or fog to knock down fire fumes if possible.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : **DANGER: EXTREMELY FLAMMABLE GAS. Forms explosive mixtures with air and oxidizing agents.** See section 5. Evacuate personnel to a safe area. Appropriate self-contained breathing apparatus may be required. Approach suspected leak area with caution. Remove all sources of ignition, if safe to do so. Reduce gas with fog or fine water spray. Stop flow of product if safe to do so. Ventilate area or move container to a well-ventilated area. Flammable gas may spread from leak. Before entering the area, especially a confined area, check the atmosphere with an appropriate device.

##### 6.1.1. For non-emergency personnel

No additional information available

##### 6.1.2. For emergency responders

No additional information available

#### 6.2. Environmental precautions

Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

#### 6.3. Methods and material for containment and cleaning up

No additional information available

#### 6.4. Reference to other sections

See also sections 8 and 13.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g. wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

# Hydrogen, compressed

## Safety Data Sheet P-4604

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1980    Revision date: 10/17/2016    Supersedes: 06/03/2015

### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post "No Smoking/No Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g. NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16

**OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE:** When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

### 7.3. Specific end use(s)

None.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Hydrogen, compressed (1333-74-0)		
ACGIH	Not established	
USA OSHA	Not established	
Hydrogen (1333-74-0)		
ACGIH	Remark (ACGIH)	Simple asphyxiant
USA OSHA	Not established	

### 8.2. Exposure controls

Appropriate engineering controls : Use an explosion-proof local exhaust system. Local exhaust and general ventilation must be adequate to meet exposure standards. **MECHANICAL (GENERAL): Inadequate - Use only in a closed system.** Use explosion proof equipment and lighting.

Eye protection : Wear safety glasses with side shields.

Respiratory protection : An air-supplied respirator must be used while working with this product in confined spaces. The respiratory protection used must conform with OSHA rules as specified in 29 CFR 1910.134. Select per OSHA 29 CFR 1910.134 and ANSI Z88.2.

Thermal hazard protection : None necessary.

Other information : Consider the use of flame resistant anti-static safety clothing. Wear safety shoes while handling containers.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Colorless gas.

Molecular mass : 2 g/mol

Color : Colorless.

Odor : Odorless.

Odor threshold : No data available

pH : Not applicable.

Relative evaporation rate (butyl acetate=1) : No data available

Relative evaporation rate (ether=1) : Not applicable.

Melting point : -259.2 °C (-434.56°F)

# Hydrogen, compressed

## Safety Data Sheet P-4604

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1980    Revision date: 10/17/2016    Supersedes: 06/03/2015

Freezing point	: No data available
Boiling point	: -252.9 °C (-422.97°F)
Flash point	: No data available
Critical temperature	: -239.9 °C (-399.82°F)
Auto-ignition temperature	: 566 °C (1051°F)
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: Not applicable.
Relative vapor density at 20 °C	: No data available
Relative density	: No data available
Density	: 0.089 g/l (0.0056 lb/ft3) (at STP = 0°C and 1atm)
Relative gas density	: 0.07
Solubility	: Water: 1.6 mg/l
Log Pow	: Not applicable.
Log Kow	: Not applicable.
Viscosity, kinematic	: Not applicable.
Viscosity, dynamic	: Not applicable.
Explosive properties	: Not applicable.
Oxidizing properties	: None.
Explosion limits	: 4 - 77 vol %

### 9.2. Other information

Gas group	: Compressed gas
Additional information	: BURNS WITH INVISIBLE FLAME

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No reactivity hazard other than the effects described below.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

Can form explosive mixture with air. May react violently with oxidants.

### 10.4. Conditions to avoid

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

### 10.5. Incompatible materials

Oxidizing agents. Lithium. Halogens.

### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Not classified

<b>Hydrogen, compressed ( l f )1333-74-0</b>	
LC50 inhalation rat (ppm)	> 15000 ppm/1h
<b>Hydrogen (1333-74-0)</b>	
LC50 inhalation rat (ppm)	> 15000 ppm/1h

# Hydrogen, compressed

## Safety Data Sheet P-4604

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1980    Revision date: 10/17/2016    Supersedes: 06/03/2015

Skin corrosion/irritation	:	Not classified
		pH: Not applicable.
Serious eye damage/irritation	:	Not classified
		pH: Not applicable.
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified

### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

#### 12.2. Persistence and degradability

Hydrogen, compressed (1333-74-0)	
Persistence and degradability	No ecological damage caused by this product.
Hydrogen (1333-74-0)	
Persistence and degradability	No ecological damage caused by this product.

#### 12.3. Bioaccumulative potential

Hydrogen, compressed (1333-74-0)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.
Hydrogen (1333-74-0)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

#### 12.4. Mobility in soil

Hydrogen, compressed (1333-74-0)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.
Hydrogen (1333-74-0)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

#### 12.5. Other adverse effects

Effect on ozone layer : None

Effect on the global warming : No known effects from this product

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

# Hydrogen, compressed

## Safety Data Sheet P-4604

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1980    Revision date: 10/17/2016    Supersedes: 06/03/2015

### SECTION 14: Transport information

In accordance with DOT  
 Transport document description : UN1049 Hydrogen, compressed, 2.1  
 UN-No.(DOT) : UN1049  
 Proper Shipping Name (DOT) : Hydrogen, compressed  
 Class (DOT) : 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115  
 Hazard labels (DOT) : 2.1 - Flammable gas



DOT Special Provisions (49 CFR 172.102) : N89 - When steel UN pressure receptacles are used, only those bearing the "H" mark are authorized

#### Additional information

Emergency Response Guide (ERG) Number : 115 (UN1049)  
 Other information : No supplementary information available.  
 Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers:  
 - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

#### Transport by sea

UN-No. (IMDG) : 1049  
 Proper Shipping Name (IMDG) : HYDROGEN, COMPRESSED  
 Class (IMDG) : 2 - Gases  
 MFAG-No : 115

#### Air transport

UN-No. (IATA) : 1049  
 Proper Shipping Name (IATA) : Hydrogen, compressed  
 Class (IATA) : 2  
 Civil Aeronautics Law : Gases under pressure/Gases flammable under pressure

### SECTION 15: Regulatory information

#### 15.1. US Federal regulations

Hydrogen, compressed (1333-74-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Sudden release of pressure hazard Fire hazard

All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.



# Hydrogen, compressed

## Safety Data Sheet P-4604

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1980    Revision date: 10/17/2016    Supersedes: 06/03/2015

### 15.2. International regulations

#### CANADA

##### Hydrogen, compressed (1333-74-0)

Listed on the Canadian DSL (Domestic Substances List)

##### Hydrogen (1333-74-0)

Listed on the Canadian DSL (Domestic Substances List)

#### EU-Regulations

##### Hydrogen, compressed (1333-74-0)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

#### 15.2.2. National regulations

##### Hydrogen, compressed (1333-74-0)

Listed on the AICS (Australian Inventory of Chemical Substances)  
 Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
 Listed on the Korean ECL (Existing Chemicals List)  
 Listed on NZIoC (New Zealand Inventory of Chemicals)  
 Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
 Listed on INSQ (Mexican National Inventory of Chemical Substances)

### 15.3. US State regulations

#### Hydrogen, compressed(1333-74-0)

U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

#### Hydrogen (1333-74-0)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

#### Hydrogen (1333-74-0)

U.S. - Massachusetts - Right To Know List  
 U.S. - New Jersey - Right to Know Hazardous Substance List  
 U.S. - Pennsylvania - RTK (Right to Know) List

# Hydrogen, compressed

## Safety Data Sheet P-4604

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1980    Revision date: 10/17/2016    Supersedes: 06/03/2015

### SECTION 16: Other information

**Other information**

: When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc, it is the user's obligation to determine the conditions of safe use of the product

Praxair SDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from [www.praxair.com](http://www.praxair.com). If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (Phone: 1-800-PRAXAIR/1-800-772-9247; Address: Praxair Call Center, Praxair, Inc, P.O. Box 44, Tonawanda, NY 14151-0044)

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**NFPA health hazard**

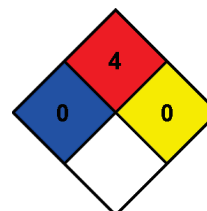
: 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

**NFPA fire hazard**

: 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.

**NFPA reactivity**

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



**HMIS III Rating**

- Health : 0 Minimal Hazard - No significant risk to health
- Flammability : 4 Severe Hazard
- Physical : 3 Serious Hazard

SDS US (GHS HazCom 2012) - Praxair

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*



Univar USA Inc Material Safety Data Sheet

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MSDS No:

Version No:

Order No:

Univar USA Inc., 17425 NE Union Hill Rd., Redmond WA 98052  
(425) 889 3400

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Emergency Assistance

For emergency assistance involving chemicals call  
Chemtrec - (800) 424-9300

UNIVAR USA INC.  
ISSUE DATE:2010-12-22  
Annotation:

MSDS NO:CDS1733  
VERSION:001 2010-12-22

COMPANY IDENTITY: Univar USA Inc.  
PRODUCT IDENTITY: MAGNESIUM SULFATE 10-40%

DATE: 12/22/10  
PAGE: 1 OF 8

### SAFETY DATA SHEET

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System.  
THIS SDS COMPLIES WITH 29 CFR 1910.1200 (HAZARD COMMUNICATION STANDARD)  
IMPORTANT: Read this SDS before handling & disposing of this product.  
Pass this information on to employees, customers, & users of this product.

#### SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: MAGNESIUM SULFATE 10-40%  
SDS NUMBER: CDS1733  
NEW MSDS DATE: 12/22/2010  
COMPANY IDENTITY: Univar USA Inc.  
COMPANY ADDRESS: 17425 NE Union Hill Road  
COMPANY CITY: Redmond, WA 98052  
COMPANY PHONE: 1-425-889-3400  
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)  
CANUTEC: 1-613-996-6666 (CANADA)

#### SECTION 2. HAZARDS IDENTIFICATION

##### CAUTION

RISK STATEMENTS:  
R36 Irritating to eyes and skin.

SAFETY STATEMENTS:  
S25 Avoid contact with eyes.

SEE SECTIONS 8, 11 & 12 FOR TOXICOLOGICAL INFORMATION.

COMPANY IDENTITY: Univar USA Inc.  
PRODUCT IDENTITY: MAGNESIUM SULFATE 10-40%

DATE: 12/22/10  
PAGE: 2 OF 8

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS#	EINECS#	WT %
Water	7732-18-5	231-791-2	60-90
Magnesium Sulfate, Heptahydrate	7487-88-9	-	10-40

### SECTION 4. FIRST AID MEASURES

**EYE CONTACT:**

For eyes, flush with plenty of water for 15 minutes & get medical attention.

**SKIN CONTACT:**

In case of contact with skin immediately remove contaminated clothing.  
Wash with soap & water.

**INHALATION:**

No significant hazard.

**SWALLOWING:**

Rinse mouth. GET MEDICAL ATTENTION IMMEDIATELY. Do NOT give liquids to an unconscious or convulsing person.

### SECTION 5. FIRE FIGHTING MEASURES

**FIRE & EXPLOSION PREVENTIVE MEASURES**

Not Applicable.

**EXTINGUISHING MEDIA**

Use appropriate extinguishing media for surrounding fires.

**SPECIAL FIRE FIGHTING PROCEDURES**

Water spray may be ineffective on fire but can protect fire-fighters & cool closed containers. Use fog nozzles if water is used.  
Do not enter confined fire-space without full bunker gear.  
(Helmet with face shield, bunker coats, gloves & rubber boots).  
Use NIOSH approved positive-pressure self-contained breathing apparatus.

COMPANY IDENTITY: Univar USA Inc.  
PRODUCT IDENTITY: MAGNESIUM SULFATE 10-40%

DATE: 12/22/10  
PAGE: 3 OF 8

#### SECTION 5. FIRE FIGHTING MEASURES (CONTINUED)

##### UNUSUAL EXPLOSION AND FIRE PROCEDURES

Noncombustible.  
Closed containers may explode if exposed to extreme heat.  
Applying to hot surfaces requires special precautions.

#### SECTION 6. ACCIDENTAL RELEASE MEASURES

##### PERSONAL PROTECTIVE MEASURES:

Keep unprotected personnel away.  
Wear appropriate personal protective equipment given in Section 8.

##### ENVIRONMENTAL PRECAUTIONS:

Keep from entering storm sewers and ditches which lead to waterways.

##### CONTAINMENT AND CLEAN-UP MEASURES:

Stop spill at source. Dike and contain.  
Collect leaking & spilled liquid in sealable containers as far as possible.

#### SECTION 7. HANDLING AND STORAGE

##### HANDLING

Avoid prolonged or repeated contact.  
To minimize static discharge when transferring, ensure electrical continuity by bonding and grounding all equipment. Use an inlet line diameter of at least 3.5 inches (8.9 centimeters) with a maximum flow rate of 1 meter/second.

##### STORAGE

Isolate from strong oxidants. Do not store above 49 C/120 F.  
Keep container tightly closed & upright when not in use to prevent leakage.



COMPANY IDENTITY: Univar USA Inc.  
PRODUCT IDENTITY: MAGNESIUM SULFATE 10-40%

DATE: 12/22/10  
PAGE: 4 OF 8

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

MATERIAL	CAS#	EINECS#	TWA (OSHA)	TLV (ACGIH)
Water	7732-18-5	231-791-2	None Known	None Known
Magnesium Sulfate Heptahydrate	7487-88-9	-	None Known	None Known

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

**RESPIRATORY EXPOSURE CONTROLS**

A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z86.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**VENTILATION**

LOCAL EXHAUST: Necessary                      MECHANICAL (GENERAL): Acceptable  
SPECIAL:                      None                      OTHER:                      None  
Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

**PERSONAL PROTECTIONS:**

Wear impervious gloves and clothing.

**WORK & HYGIENIC PRACTICES:**

Provide readily accessible eye wash stations & safety showers.  
Wash at end of each workshift & before eating, smoking or using the toilet.  
Promptly remove clothing that becomes contaminated. Destroy contaminated leather articles. Launder or discard contaminated clothing.

COMPANY IDENTITY: Univar USA Inc.  
PRODUCT IDENTITY: MAGNESIUM SULFATE 10-40%

DATE: 12/22/10  
PAGE: 5 OF 8

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES

APPEARANCE:	Liquid, Water-White
ODOR:	None
ODOR THRESHOLD:	Not Available
pH (Neutrality):	7.0
MELTING POINT/FREEZING POINT:	Not Available
BOILING RANGE (IBP, 50%, Dry Point):	100 100 100*C/212 212 212*F(*=End Point)
FLASH POINT (TEST METHOD):	Not Applicable
EVAPORATION RATE (n-BUTYL ACETATE=1):	Not Applicable
FLAMMABILITY CLASSIFICATION:	Non-Combustible
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Available
VAPOR PRESSURE (mm of Hg)@20 C	17.5
VAPOR DENSITY (air=1):	0.670
GRAVITY @ 68/68 F / 20/20 C:	
SPECIFIC GRAVITY (Water=1):	1.052
POUNDS/GALLON:	8.763
WATER SOLUBILITY:	Complete
PARTITION COEFFICIENT (n-Octane/Water):	Not Available
AUTO IGNITION TEMPERATURE:	Not Applicable
DECOMPOSITION TEMPERATURE:	Not Available
VOC'S (>0.44 Lbs/Sq In) :	0.0 Vol% /0.0 g/L / 0.000 Lbs/Gal
TOTAL VOC'S (TVOC)*:	0.0 Vol% /0.0 g/L / 0.000 Lbs/Gal
NONEXEMPT VOC'S (CVOC)*:	0.0 Vol% /0.0 g/L / 0.000 Lbs/Gal
HAZARDOUS AIR POLLUTANTS (HAPS):	0.0 Wt% /0.0 g/L / 0.000 Lbs/Gal
NONEXEMPT VOC PARTIAL PRESSURE (mm of Hg @ 20 C)	0.0

\* Using California South Coast Air Quality Management District (SCAQMD) Rule 443.1.

SECTION 10. STABILITY & REACTIVITY

STABILITY

Stable under normal conditions.

CONDITIONS TO AVOID

Isolate from extreme heat.

MATERIALS TO AVOID

Isolate from strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS

At very high temperatures, magnesium oxide, sulfur dioxide and sulfur trioxide may be generated.

HAZARDOUS POLYMERIZATION

Will not occur.

COMPANY IDENTITY: Univar USA Inc.  
PRODUCT IDENTITY: MAGNESIUM SULFATE 10-40%

DATE: 12/22/10  
PAGE: 6 OF 8

#### SECTION 11. TOXICOLOGICAL INFORMATION

##### ACUTE HAZARDS

###### EYE & SKIN CONTACT:

Acute overexposure can cause irritation to skin.  
Acute overexposure can cause irritation to eyes.

###### INHALATION:

No significant hazard.

###### SWALLOWING:

Swallowing can cause abdominal irritation, nausea, vomiting & diarrhea.

##### SUBCHRONIC HAZARDS/CONDITIONS AGGRAVATED

###### CONDITIONS AGGRAVATED

None Known.  
CONDITIONS AGGRAVATED:None Known.

##### CHRONIC HAZARDS

###### CANCER, REPRODUCTIVE & OTHER CHRONIC HAZARDS:

This product has no carcinogens listed by IARC, NTP, NIOSH,  
OSHA or ACGIH, as of this date, greater or equal to 0.1%.

##### MAMMALIAN TOXICITY INFORMATION

No mammalian information is available on this product.

COMPANY IDENTITY: Univar USA Inc.  
PRODUCT IDENTITY: MAGNESIUM SULFATE 10-40%

DATE: 12/22/10  
PAGE: 7 OF 8

#### SECTION 12. ECOLOGICAL INFORMATION

##### AQUATIC ANIMAL INFORMATION:

No aquatic environmental information is available on this product.

##### MOBILITY IN SOIL

Mobility of this material has not been determined.

##### DEGRADABILITY

This product is completely biodegradable.

##### ACCUMULATION

Bioaccumulation of this product has not been determined.

#### SECTION 13. DISPOSAL CONSIDERATIONS

Processing, use or contamination may change the waste management options. Recycle / dispose of observing national, regional, state, provincial and local health, safety & pollution laws. If in doubt, contact appropriate agencies.

#### SECTION 14. TRANSPORT INFORMATION

DOT SHIPPING NAME: None  
DRUM LABEL: None  
IATA / ICAO: None  
IMO / IMDG: None  
EMERGENCY RESPONSE GUIDEBOOK NUMBER: None

#### SECTION 15. REGULATORY INFORMATION

##### EPA REGULATION:

SARA SECTION 311/312 HAZARDS: None Known

All components of this product are on the TSCA list.

This material contains no known products restricted under SARA Title III, Section 313 in amounts greater or equal to 1%.

UNIVAR USA INC.  
ISSUE DATE:2010-12-22  
Annotation:

MSDS NO:CDS1733  
VERSION:001 2010-12-22

COMPANY IDENTITY: Univar USA Inc.  
PRODUCT IDENTITY: MAGNESIUM SULFATE 10-40%

DATE: 12/22/10  
PAGE: 8 OF 8

#### SECTION 15. REGULATORY INFORMATION (CONTINUED)

##### INTERNATIONAL REGULATIONS

The components of this product are listed on the chemical inventories of the following countries:

Australia (AICS), Canada (DSL, NDSL), China (IECSC), Europe (EINECS, ELINCS), Japan (METI/CSCl, MHLW/ISHL), South Korea (KECI), New Zealand (NZIoC), Philippines (PICCS), Switzerland (SWISS), Taiwan (NECSI), USA (TSCA).

CANADA: WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)  
D2B: Irritating to skin / eyes.

#### SECTION 16. OTHER INFORMATION

##### HAZARD RATINGS:

HEALTH (NFPA): 1, HEALTH (HMIS): 1, FLAMMABILITY: 0, REACTIVITY: 0  
(Personal Protection Rating to be supplied by user based on use conditions.)  
This information is intended solely for the use of individuals trained in the NFPA & HMIS hazard rating systems.

## Univar USA Inc Material Safety Data Sheet

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For Additional Information contact MSDS Coordinator during business hours, Pacific time: (425) 889-3400

### **Notice**

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Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a product specification sheet and/or a certificate of analysis. These can be obtained from your local Univar sales office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein.

This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process



# MAGNESIUM SULFATE MONOHYDRATE POWDER

PEÑOLES METALS & CHEMICALS

## MATERIAL SAFETY DATA SHEET

### SECTION A: GENERAL INFORMATION

Peñoles Metals & Chemicals, Inc.  
2 Stamford Plz, Stamford, CT 06901  
Phone (203) 359-6775  
Fax: (203) 359-3692

TRADE NAME		Issue Date: October 14, 2008
CHEMICAL NAME	Magnesium sulfate monohydrate	
FORMULA	MgSO <sub>4</sub> (H <sub>2</sub> O)	Revision Date: Original
MOLECULAR WEIGHT	138.38	

### SECTION B: PRODUCT COMPOSITION

Time Weighted Average (8-hour) Permissible Air Concentrations (mg/m <sup>3</sup> )					
Material or Component	Wt. %	C.A.S. #	OSHA PEL	ACGIH TLV	NIOSH REL
Magnesium sulfate monohydrate	99	14168-73-1	* 5.0	None	None
Inert/Insoluble material	< 1.0	NA	None	None	None

\* The OSHA PEL is for the respirable fraction of dust suspended in air.

### SECTION C: FIRST AID MEASURES

**INHALATION:** Inhaled dust or fume may cause coughing. Remove victim to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, administer artificial respiration.

**INGESTION:** Give several glasses of water.

**EYES:** Solid and dust may be irritating to the eyes. Hold eyelids open and flush with water for 15 minutes.

**SKIN:** Remove contaminated clothing. Wash skin with plenty of water.





## **MAGNESIUM SULFATE MONOHYDRATE POWDER**

PEÑOLES METALS & CHEMICALS

### **SECTION D: HEALTH HAZARD INFORMATION**

Inhalation	Dust can be irritating.
Ingestion:	Can cause abdominal pain, vomiting and diarrhea and hypocalcemia.
Eyes:	Dust and fume contact with eyes may cause irritation.
Skin:	May cause irritation. Inorganic magnesium sulfate will not be absorbed through the skin.
Medical conditions aggravated:	Not noted.
Carcinogenicity information:	None.
Other:	None noted.
Target organs:	Digestive system.

### **SECTION E: PRECAUTIONS / PROCEDURES**

Fire extinguishing agents:	Use agents appropriate for the material burning.
Fire extinguishing agents to avoid:	None
Special fire fighting precautions:	Expect the production of magnesium oxide and sulfur oxides in fire conditions. Use self-contained breathing apparatus.
Engineering controls:	Local exhaust ventilation should be used during operations where dust exposures may occur.
Normal handling:	Bulk material should be handled with cotton or leather gloves.
Storage:	No special precautions are necessary.
Spill or leak:	Minimize dust production and contain the spilled material.
Special precautions, procedures:	No additional precautions are necessary.
Personal Hygiene:	Practice good housekeeping and personal hygiene procedures. No tobacco, smoking, or food in the work area. Wash thoroughly before leaving the work area, eating, drinking, applying cosmetics or smoking. Avoid ingestion or inhalation. Do not use compressed air for blowing dust off clothing.



# **MAGNESIUM SULFATE MONOHYDRATE POWDER**

PEÑOLES METALS & CHEMICALS

## **SECTION F: PERSONAL PROTECTIVE EQUIPMENT**

Respiratory Protection: NIOSH/MSHA approved respirator. Selection of the respiratory protection equipment depends on the concentration and form of magnesium sulfate present. Each workplace where exposure potentials exist must be evaluated to determine the selection of respiratory protection.

Eyes and Face: Where dusts or fumes exist, goggles should be worn.

Hands, arms and body: Gloves. Cotton or Leather when handling bulk material

Other clothing and equipment: None.

## **SECTION G: PHYSICAL DATA**

Physical State at 76 deg F	Solid	Vapor Density	NA
Appearance	Transparent crystals or white powder	Solubility in water	> 99%
Odor	None	pH	6.0 – 7.5
Melting Point	1124 deg C 2055 deg F	Vapor Pressure	NA
Boiling Point	NA	Evaporation Rate	NA
Specific Gravity (H <sub>2</sub> O = 1)	2.16	Volatiles	0%
Lower Explosive Limit	NA	Upper Explosive Limit	NA

## **SECTION H: REACTIVITY DATA**

Stability: Stable.

Conditions to avoid: Avoid creating dusts or exposing magnesium sulfate to high temperatures.

Incompatibilities: None noted.

Decomposition products: Water (steam), magnesium oxide and sulfur oxides.

Hazardous polymerization: Does not occur.



## **MAGNESIUM SULFATE MONOHYDRATE POWDER**

**PEÑOLES METALS & CHEMICALS**

### **SECTION I: ENVIRONMENTAL**

EPA Hazardous Substance?            No.  
Waste disposal methods:            None.  
DOT hazard classification:            None  
DOT label required:                  None  
DOT Identification number:          None

This material may be subject to the following SARA Title III requirements depending on the quantities processed or stored:

40 CFR 355.30	Emergency Planning
40 CFR 370	Hazardous Chemical reporting
40 CFR 372	Toxic Chemical Release reporting.

THIS MATERIAL SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION. IT PROVIDES NO WARRANTIES, EITHER EXPRESS OR IMPLIED, AND ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE DATA CONTAINED HEREIN.



## **MAGNESIUM SULFATE MONOHYDRATE POWDER**

PEÑOLES METALS & CHEMICALS

### **SECTION J: REFERENCES**

American Conference of Governmental Industrial Hygienists (ACGIH). Documentation of the Threshold Limit Values. Cincinnati: ACGIH, 2004.

Clayton, G.D., and Clayton, F.E. eds. Patty's Industrial Hygiene and Toxicology. New York: John Wiley and Sons, 1987.

National Fire Protection Association. Fire Protection Guide on Hazardous Materials, 1986.

Sax, N.I. Dangerous Properties of Industrial Materials. New York: Van Nostrand Reinhold, 1999.

U.S. Department of Health and Human Services (DHHS/CDC). NIOSH Pocket Guide to Chemical Hazards (NPG) NIOSH Publication No.97-140, 2004

U.S. Department of Health and Human Services (DHHS/PHS). Registry of Toxic Effects of Chemical Substances. NIOSH Publication No.86-103

U.S. Department of Labor. OSHA. 29 Code of Federal Regulations (CFR) Part 1910.1200 Hazard Communication. Final Rule.

U.S. Department of Labor. OSHA. 29 Code of Federal Regulations (CFR) Part 1910.1000 Air Contaminants. Final Rule.

U.S. Environmental Protection Agency (EPA). 40 Code of Federal Regulations (CFR) Part 370. Hazardous Chemical Reporting: Emergency Planning and Community Right-to-Know Programs.

U.S. Environmental Protection Agency (EPA). 40 Code of Federal Regulations (CFR) Part 302. Designation. Reportable Quantities. and Notification.

U.S. Environmental Protection Agency (EPA). 40 Code of Federal Regulations (CFR) Part 261.30, Subpart D Lists of Hazardous Waste.

U.S. Department of Transportation (DOT). 49 Code of Federal Regulations (CFR) Part 172 Hazardous Materials Regulations.

# Safety Data Sheet

According to OSHA HCS 2012 (29 CFR 1910.1200)



## Section 1: Identification

**Product Identifier:** **Megaflow™ AW HVI Hydraulic Oil 22, 32, 46, 68, 100**

**Other means of identification:** Megaflow™ AW HVI Hydraulic Oil 22  
Megaflow™ AW HVI Hydraulic Oil 32  
Megaflow™ AW HVI Hydraulic Oil 46  
Megaflow™ AW HVI Hydraulic Oil 68  
Megaflow™ AW HVI Hydraulic Oil 100

**SDS Number:** **814633**

**Uses Advised Against:** All others

**Emergency Health and Safety** CHEMTREC 800-424-9300 (24 Hours)

**Number:** CANUTEC 613-996-6666

CHEMTREC Mexico 01-800-681-9531

**Manufacturer:**  
Phillips 66 Lubricants  
P.O. Box 4428  
Houston, TX 77210

**SDS Information:**  
Phone: 800-762-0942  
Email: SDS@P66.com  
URL: www.Phillips66.com

**Customer Service:**  
U.S.: 1-800-822-6457 or International: +1-83-2486-3363  
**Technical Information:** 1-877-445-9198

## Section 2: Hazards Identification

### Classified Hazards

This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

### Other Hazards

None Known

### Label Elements

No classified hazards

## Section 3: Composition / Information on Ingredients

Chemical Name	CASRN	Concentration <sup>1</sup>
Distillates, petroleum, hydrotreated heavy paraffinic	64742-54-7	>70
Distillates, petroleum, hydrotreated light paraffinic	64742-55-8	<30
Non-Hazardous Materials	VARIOUS	<15

<sup>1</sup> All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

## Section 4: First Aid Measures

**Eye Contact:** If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

**Skin Contact:** Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician. (see Note to Physician)

**Inhalation (Breathing):** First aid is not normally required. If breathing difficulties develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. Seek immediate medical attention.

**Ingestion (Swallowing):** First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

**Most important symptoms and effects, both acute and delayed:** Inhalation of oil mists or vapors generated at elevated temperatures may cause respiratory irritation. Accidental ingestion can result in minor irritation of the digestive tract, nausea and diarrhea. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation. Dry skin and possible irritation with repeated or prolonged exposure.

**Notes to Physician:** Acute aspirations of large amounts of oil-laden material may produce a serious aspiration pneumonia. Patients who aspirate these oils should be followed for the development of long-term sequelae. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities. When using high-pressure equipment, injection of product under the skin can occur. In this case, the casualty should be sent immediately to the hospital. Do not wait for symptoms to develop. High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. These injuries often require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury. Early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

## Section 5: Fire-Fighting Measures

### NFPA 704 Hazard Class

Health: 0 Flammability: 1 Instability: 0



0 (Minimal)  
1 (Slight)  
2 (Moderate)  
3 (Serious)  
4 (Severe)

**Extinguishing Media:** Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F / 100°C. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

### Specific hazards arising from the chemical

**Unusual Fire & Explosion Hazards:** This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire.

**Hazardous Combustion Products:** Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of sulfur, nitrogen or phosphorus may also be formed.

**Special protective actions for firefighters:** For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

## Section 6: Accidental Release Measures

**Personal precautions, protective equipment and emergency procedures:** This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

**Environmental Precautions:** Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

**Methods and material for containment and cleaning up:** Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken. See Section 13 for information on appropriate disposal.

## Section 7: Handling and Storage

**Precautions for safe handling:** Keep away from flames and hot surfaces. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8). Spills will produce very slippery surfaces. High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes.

**Conditions for safe storage:** Use and store this material in cool, dry, well-ventilated area away from heat and all sources of ignition. Keep container(s) tightly closed and properly labeled. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

## Section 8: Exposure controls/personal protection

Chemical Name	ACGIH	OSHA	Other
Distillates, petroleum, hydrotreated heavy paraffinic	TWA: 5mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup> as Oil Mist, if Generated	TWA: 5mg/m <sup>3</sup> as Oil Mist, if Generated	---
Distillates, petroleum, hydrotreated light paraffinic	TWA: 5mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup> as Oil Mist, if Generated	TWA: 5mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup> as Oil Mist, if Generated	---

**Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.**

**Engineering controls:** If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

**Eye/Face Protection:** The use of eye/face protection is not normally required; however, good industrial hygiene practice suggests the use of eye protection that meets or exceeds ANSI Z.87.1 whenever working with chemicals.

**Skin/Hand Protection:** The use of skin protection is not normally required; however, good industrial hygiene practice suggests the use of gloves or other appropriate skin protection whenever working with chemicals. Suggested protective materials: Nitrile

**Respiratory Protection:** Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with R or P95 filters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).



Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

## Section 9: Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

<b>Appearance:</b> Amber, Transparent	<b>Flash Point:</b> > 284 °F / > 140 °C
<b>Physical Form:</b> Liquid	<b>Test Method:</b> Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
<b>Odor:</b> Petroleum	<b>Initial Boiling Point/Range:</b> No data
<b>Odor Threshold:</b> No data	<b>Vapor Pressure:</b> <1 mm Hg
<b>pH:</b> Not applicable	<b>Partition Coefficient (n-octanol/water) (Kow):</b> No data
<b>Vapor Density (air=1):</b> >1	<b>Melting/Freezing Point:</b> < -31 °F / < -35 °C
<b>Upper Explosive Limits (vol % in air):</b> No data	<b>Auto-ignition Temperature:</b> No data
<b>Lower Explosive Limits (vol % in air):</b> No data	<b>Decomposition Temperature:</b> No data
<b>Evaporation Rate (nBuAc=1):</b> No data	<b>Specific Gravity (water=1):</b> 0.86-0.88 @ 60°F (15.6°C)
<b>Particle Size:</b> Not applicable	<b>Bulk Density:</b> 7.14 - 7.32 lbs/gal
<b>Percent Volatile:</b> Negligible	<b>Viscosity:</b> 4 - 14 cSt @ 100°C; 22 - 108 cSt @ 40°C
<b>Flammability (solid, gas):</b> Not applicable	<b>Pour Point:</b> < -31 °F / < -35 °C
<b>Solubility in Water:</b> Negligible	

## Section 10: Stability and Reactivity

**Reactivity:** Not chemically reactive.

**Chemical stability:** Stable under normal ambient and anticipated conditions of use.

**Possibility of hazardous reactions:** Hazardous reactions not anticipated.

**Conditions to avoid:** Extended exposure to high temperatures can cause decomposition. Avoid all possible sources of ignition.

**Incompatible materials:** Avoid contact with strong oxidizing agents and strong reducing agents.

**Hazardous decomposition products:** Not anticipated under normal conditions of use.

## Section 11: Toxicological Information

### Information on Toxicological Effects of Substance/Mixture

#### Substance / Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Unlikely to be harmful		>5 mg/L (mist, estimated)
Dermal	Unlikely to be harmful		> 2 g/kg (estimated)
Oral	Unlikely to be harmful		> 5 g/kg (estimated)

**Aspiration Hazard:** Not expected to be an aspiration hazard.

**Skin Corrosion/Irritation:** Not expected to be irritating. Repeated exposure may cause skin dryness or cracking.

**Serious Eye Damage/Irritation:** Not expected to be irritating.

**Skin Sensitization:** No information available on the mixture, however none of the components have been classified for skin sensitization (or are below the concentration threshold for classification).

**Respiratory Sensitization:** No information available.

**Specific Target Organ Toxicity (Single Exposure):** No information available on the mixture, however none of the components have been classified for target organ toxicity (or are below the concentration threshold for classification).

**Specific Target Organ Toxicity (Repeated Exposure):** No information available on the mixture, however none of the components have been classified for target organ toxicity (or are below the concentration threshold for classification).

**Carcinogenicity:** No information available on the mixture, however none of the components have been classified for carcinogenicity (or are below the concentration threshold for classification).

**Germ Cell Mutagenicity:** No information available on the mixture, however none of the components have been classified for germ cell mutagenicity (or are below the concentration threshold for classification).

**Reproductive Toxicity:** No information available on the mixture, however none of the components have been classified for reproductive toxicity (or are below the concentration threshold for classification).

#### Information on Toxicological Effects of Components

##### Lubricant Base Oil (Petroleum)

**Carcinogenicity:** The petroleum base oils contained in this product have been highly refined by a variety of processes including severe hydrocracking/hydroprocessing to reduce aromatics and improve performance characteristics. All of the oils meet the IP-346 criteria of less than 3 percent PAH's and are not considered carcinogens by NTP, IARC, or OSHA.

## Section 12: Ecological Information

### GHS Classification: No classified hazards

**Toxicity:** All acute aquatic toxicity studies on samples of lubricant base oils show acute toxicity values greater than 100 mg/L for invertebrates, algae and fish. These tests were carried out on water accommodated fractions and the results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions.

**Persistence and Degradability:** The hydrocarbons in this material are not readily biodegradable, but since they can be degraded by microorganisms, they are regarded as inherently biodegradable.

**Bioaccumulative Potential:** Log Kow values measured for the hydrocarbon components of this material are greater than 5.3, and therefore regarded as having the potential to bioaccumulate. In practice, metabolic processes may reduce bioconcentration.

**Mobility in Soil:** Volatilization to air is not expected to be a significant fate process due to the low vapor pressure of this material. In water, base oils will float and spread over the surface at a rate dependent upon viscosity. There will be significant removal of hydrocarbons from the water by sediment adsorption. In soil and sediment, hydrocarbon components will show low mobility with adsorption to sediments being the predominant physical process. The main fate process is expected to be slow biodegradation of the hydrocarbon constituents in soil and sediment.

**Other adverse effects:** None anticipated.

## Section 13: Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations. This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste and is not believed to exhibit characteristics of hazardous waste. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the SDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste. This material under most intended uses would become "Used Oil" due to contamination by physical or chemical impurities. Whenever possible, Recycle used oil in accordance with applicable federal and state or local regulations. Container contents should be completely used and containers should be emptied prior to discard.

## Section 14: Transport Information

### U.S. Department of Transportation (DOT)

#### Shipping Description:

*Not regulated*

#### Note:

*If shipped by land in a packaging having a capacity of 3,500 gallons or more, the provisions of 49 CFR, Part 130 apply. (Contains oil)*

### International Maritime Dangerous Goods (IMDG)

Shipping Description: *Not regulated*  
Note: *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25.*

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:  
Not applicable

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

UN/ID #: *Not regulated*  
Note: *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 24.*

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---

### Section 15: Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):

This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health Hazard: No  
Chronic Health Hazard: No  
Fire Hazard: No  
Pressure Hazard: No  
Reactive Hazard: No

CERCLA/SARA - Section 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Chemical Name	Concentration <sup>1</sup>	de minimis
Zinc Compound(s)	1.0 - 1.5	1.0%

EPA (CERCLA) Reportable Quantity (in pounds):

This material does not contain any chemicals with CERCLA Reportable Quantities.

California Proposition 65:

This material does not contain any chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

International Hazard Classification

Canada:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all the information required by the Regulations.

WHMIS Hazard Class:

none

National Chemical Inventories

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.  
All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

### Section 16: Other Information

Date of Issue:	Previous Issue Date:	SDS Number:	Status:
20-Jun-2014	26-Jul-2013	814633	FINAL

**Revised Sections or Basis for Revision:**

Composition (Section 3); Regulatory information (Section 15)

**Guide to Abbreviations:**

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

**Disclaimer of Expressed and Implied Warranties:**

The information presented in this Safety Data Sheet is based on data believed to be accurate as of the date this Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

# Material Safety Data Sheet

## 1 . Identification of the material and supplier

**Product name** Bynorm 4 Stroke Engine Oil 10W30 (Semi Synthetic)

**Other Names**

**Product use** Lubricant for lawnmowers, ride on mowers & stationary engines.

**Supplier** Peak Lubricants Pty Ltd  
224- 230 South Gippsland Hwy  
Dandenong  
Victoria 3175

ABN 74887410101

**Telephone** (03) 9799 0977

**EMERGENCY TELEPHONE NUMBER (03) 9799 0977**

## 2 . Hazards identification

**Statement of hazardous/dangerous nature**

NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS

While this material is not considered to be hazardous, it should be handled in accordance with good industrial hygiene and safety practices.

**Safety Phrase**

S2- Keep out of the reach of children.

## 3 . Composition/information on ingredients

	Proportion
Highly refined mineral base oil	50%
Synthesized hydrocarbons	30%
Other ingredients	20%

This product does not contain any hazardous ingredients at or above regulated thresholds.

## 4 .First-aid measures

**Skin contact**

Immediately wash exposed skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if irritation develops.

**Inhalation**

If inhaled, remove to fresh air. Get medical attention if symptoms appear.

**Eye contact**

In case of contact, immediately flush eyes with a copious amount of water for at least 15 minutes. Get medical attention if irritation occurs.

**Ingestion**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately.

**Notes to physician**

**Product name** Bynorm 4 Stroke Engine Oil 10W30

**Issue Date** 30 October 2011

Treatment should in general be symptomatic and directed to relieving any effects.

## 5 . Fire-fighting measures

### Extinguishing Media Suitable

In case of fire, use water fog, foam, dry chemical or carbon dioxide extinguisher or spray.

**Do not use water jet.**

### Protection of fire-fighters

Fire-fighters should wear self-contained positive pressure breathing apparatus (SCBA) and full turnout gear.

### Special fire-fighting procedures

None identified

### Unusual fire/explosion Hazards

This material is not explosive as defined by established regulatory criteria.

### Hazards from combustion products

Decomposition products may include the following materials:

- carbon oxides
- sulfur oxides
- phosphorus oxides
- metal oxide/oxides

## 6 . Accidental release measures

### Emergency Procedures

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and clean-up

If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) scoop up material and place in a sealed, liquid proof container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Avoid contact of spilt material with soil and prevent runoff entering surface waterways. See Section 13 for Waste Disposal Information.

#### Large Spill

Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

#### Small Spill

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

## 7 . Handling and storage

### Handling

Avoid prolonged or repeated contact with skin. Wash thoroughly after handling.

### Storage

Keep container tightly closed. Keep container in a cool, well-ventilated area. Store under cover away from heat and sources of ignition. Reference should be made to Australian Standard AS1940- The storage and handling of flammable and combustible liquids.

### Additional information-Storage

Classified as combustible liquid Class C2 (AS 1940).

Product contaminated rags paper or material used to absorb spillages represent a fire hazard and should not be allowed to accumulate. Dispose of safely immediately after use.

## 8 . Exposure controls/personal protection

**Product name** Bynorm 4 Stroke Engine Oil 10W30

**Issue Date** 30 October 2011

### Ingredient name Occupational exposure limits

Base oil - unspecified **NOHSC (Australia)**. TWA: 5 mg/m<sup>3</sup> 8 hour(s). Form: Oil mist, mineral.

Whilst specific OELs for certain components are included in this data sheet, it should be noted that other components of the preparation will be present in any mist, vapour or dust produced. For this reason, the specific OELs may not be applicable to the product and are provided for guidance purposes.

### Control Measures

Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.

### Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

### Biological Limit Values

No biological limit allocated.

### Personal protective equipment

#### Hands

Wear protective gloves if prolonged or repeated contact is likely. Chemical resistant gloves. Recommended: Nitrile gloves.

The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

#### Eyes

Safety glasses with side shields.

#### Skin and Body

Avoid prolonged or repeated contact with skin. Wear protective clothing if prolonged or repeated contact is likely.

#### Respiratory system

Avoid breathing of vapours, mists or spray. Select and use respirators in accordance with AS/NZS 1715/1716. When mists or vapours exceed the exposure standards then the use of the following is recommended: Approved respirator with organic vapour and dust/mist (Type P1) filters. Filter capacity and respirator type depends on exposure level

## 9 . Physical and chemical properties

Flash point	> 200 °C
Colour	Amber
Physical state	Liquid
Density	0.876 kg/L
Solubility	Insoluble in water
pH	Not applicable
Viscosity	75 cst @ 40°C

## 10 . Stability and reactivity

### Hazardous polymerization

Will not occur

### Stability

This product is stable

### Conditions to Avoid

Keep away from fire, extreme heat, and oxidising compounds

### Incompatibility with various substances/Hazardous Reactions

Reactive with oxidizing compounds

**Product name** Bynorm 4 Stroke Engine Oil 10W30

**Issue Date** 30 October 2011



### **Hazardous Decomposition Products**

Decomposition products may include the following materials:  
carbon oxides  
sulfur oxides  
phosphorus oxides  
metal oxide/oxides

## **11 . Toxicological information**

### **Effects and symptoms**

#### **Eyes**

Unlikely to cause more than transient stinging or redness if accidental eye contact occurs.

#### **Skin**

Prolonged or repeated contact can de-fat the skin and lead to irritation and/or dermatitis.

#### **Inhalation**

Inhalation of oil mist or vapours at elevated temperatures may cause respiratory irritation.

#### **Ingestion**

Unlikely to cause harm if accidentally swallowed in small doses, though larger quantities may cause nausea and diarrhoea.

### **Carcinogenic effects**

No component of this product at levels greater than or equal to 0.1% is identified as a carcinogen by ACGIH, the International Agency for Research on Cancer (IARC), the European Commission (EC), or the National Occupational Health and Safety Commission (Australia).

## **12 .Ecological information**

### **Ecotoxicity**

Not classified as environmentally hazardous in accordance with the 'Approved Criteria for Classifying Hazardous Substances' [NOHSC (1008)/2004 as amended and adapted].

### **Biodegradability**

The biodegradability of this material has not been determined.

### **Mobility**

Spillages may penetrate the soil causing ground water contamination.

### **Other ecological information**

Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

## **13 . Disposal considerations**

### **Disposal Consideration / Waste information**

Avoid contact of spilled material and runoff with soil and surface waterways. Consult an environmental professional to determine if local, regional or national regulations would classify spilled or contaminated materials as hazardous waste. Use only approved transporters, recyclers, treatment, storage or disposal facilities. Dispose of in accordance with all applicable local and national regulations.

### **Special Precautions for Landfill or Incineration**

No additional special precautions identified.

## **14 .Transport information**

Not classified as dangerous for transport (ADG, IMDG, ICAO/IATA).

### **Special precautions for user**

No known special precautions required. See Section: "Handling and storage" for additional information.

## **15 . Regulatory information**

**Product name** Bynorm 4 Stroke Engine Oil 10W30

**Issue Date** 30 October 2011

### Standard for the Uniform Scheduling of Drugs and Poisons

Not regulated.

### Control of Scheduled Carcinogenic Substances

#### Ingredient name Schedule

No Listed Substance

### Inventories

### Other regulations

## 16 . Other information

**Prepared by** Peak Technical Advice

### Notice to reader

The information sourced for the preparation of this document was correct and complete at the time of writing to the best of the writer's knowledge. The document represents the commitment to the company's responsibilities surrounding the supply of this product, undertaken in good faith. This document should be taken as a safety guide for the product and its recommended uses, but is in no way an absolute authority. Please consult the relevant legislation and regulations governing the use and storage of this type of product. For further information, please contact Peak Lubricants.

### Key to abbreviations

AMP = Acceptable Maximum Peak

ACGIH = American Conference of Governmental Industrial Hygienists, an agency that promulgates exposure standards.

ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail

ADG Code = Australian Code for the Transport of Dangerous Goods by Road and Rail

CAS Number = Chemical Abstracts Service Registry Number

HAZCHEM Code = Emergency action code of numbers and letters which gives information to emergency services. Its use is required by the ADG Code for Dangerous Goods in bulk.

ICAO = International Civil Aviation Organization.

IATA = International Air Transport Association, the organization promulgating rules governing shipment of goods by air.

IMDG = International Maritime Organization Rules, rules governing shipment of goods by water.

IP 346 = A chemical screening assay for dermal toxicity. The European Commission has recommended that Method IP 346 be used as the basis for labelling certain lubricant oil base stocks for carcinogenicity. The EU Commission has stipulated that the classification as a carcinogen need not apply if it can be shown that the substance contains less than 3% DMSO extract as measured by IP 346. (See Note L, European Commission Directive 67/548/EEC as amended and adapted.) DMSO is a solvent.

NOHSC = National Occupational Health & Safety Commission, Australia

TWA = Time weighted average

STEL = Short term exposure limit

UN Number = United Nations Number, a four digit number assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods.

**Product name** Bynorm 4 Stroke Engine Oil 10W30

**Issue Date** 30 October 2011

Air Products and Chemicals, Inc  
7201 Hamilton Blvd.  
Allentown, PA 18185-1501  
GST No. 123800835 RT0001  
QST No. 102753981 TQ0001

ARIZONA SOLAR ONE LLC  
LIN 10,000 GAL TK  
57750 S PAINTED ROCK DAM RD  
GILA BEND AZ 85337

Customer: 1311490  
Package ID: 3866848

Print Date: 03/13/2015

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Dear Valued Customer,

Please find enclosed Material Safety Data Sheet(s), MSDS, or a SARA 313 notification (U.S. customers) for the following product(s):

<b>Nitrogen (Refrigerated)</b>	<b>300000000100</b>	<b>1.11</b>
--------------------------------	---------------------	-------------

An MSDS will provide the information that is necessary for personnel training in the proper and safe handling, storage, transport and use of the product(s). Please ensure that the relevant MSDS(s) are circulated to the appropriate personnel that are responsible for MSDS management and training for your site and/or company. For additional information, please visit our Product Stewardship web site at <http://www.airproducts.com/productstewardship/>

A SARA 313 notification is provided in pursuant to 40 CFR Part 372, Toxic Chemical Release Reporting: Community Right-To-Know. This notification is being provided to assist with your reporting obligations under this regulation. If applicable, this information can also be found in Section 15 of the MSDS for the product.

Thank you for your order.

Air Products and Chemicals, Inc

1-610-481-4911

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# Safety Data Sheet

Version 1.11  
Revision Date 01/26/2015

SDS Number 300000000100  
Print Date 03/13/2015

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product name** : Nitrogen (Refrigerated)

**Chemical formula** : N<sub>2</sub>

**Synonyms** : Nitrogen (refrigerated), Liquid Nitrogen, LIN, Cryogenic Liquid Nitrogen, Nitrogen

**Product Use Description** : General Industrial

**Manufacturer/Importer/Distributor** : Air Products and Chemicals, Inc  
7201 Hamilton Blvd.  
Allentown, PA 18195-1501  
GST No. 123600835 RT0001  
QST No. 102753981 TQ0001

**Telephone** : 1-610-481-4911 Corporate  
1-800-345-3148 Chemicals Cust Serv  
1-800-752-1597 Gases/Electronics Cust Serv

**Emergency telephone number (24h)** : 800-523-9374 USA  
+1 610 481 7711 International

## 2. HAZARDS IDENTIFICATION

### GHS classification

Gases under pressure - Refrigerated liquefied gas

Simple Asphyxiant

### GHS label elements

#### Hazard pictograms/symbols



Signal Word: **Warning**

Hazard Statements:

# Safety Data Sheet

Version 1.11

Revision Date 01/26/2015

SDS Number 300000000100

Print Date 03/13/2015

H281:Contains refrigerated gas; may cause cryogenic burns or injury.  
May displace oxygen and cause rapid suffocation.

## Precautionary Statements:

- Prevention : P282:Wear cold insulating gloves/face shield/eye protection.
- Response : P315 :Get immediate medical advice/attention.  
P336 :Thaw frosted parts with lukewarm water. Do not rub affected area.
- Storage : P403:Store in a well-ventilated place.

## Hazards not otherwise classified

Extremely cold liquid and gas under pressure.  
Direct contact with liquid can cause frostbite.  
Can cause rapid suffocation.  
Avoid breathing gas.  
Self contained breathing apparatus (SCBA) may be required.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Concentration (Volume)
Nitrogen	7727-37-9	100 %

Concentration is nominal. For the exact product composition, please refer to Air Products technical specifications.

## 4. FIRST AID MEASURES

- General advice : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- Eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
Keep eye wide open while rinsing.
- Skin contact : In case of frostbite, obtain medical treatment immediately. As soon as practical, place the affected area in a warm water bath- which has a temperature not to exceed 40 °C (105 °F). Do not rub frozen parts as tissue damage may result.  
Cover wound with sterile dressing.
- Ingestion : Ingestion is not considered a potential route of exposure.
- Inhalation : Move to fresh air. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped,

# Safety Data Sheet

Version 1.11

Revision Date 01/26/2015

SDS Number 300000000100

Print Date 03/13/2015

trained personnel should begin cardiopulmonary resuscitation immediately. In case of shortness of breath, give oxygen.

Most important symptoms/effects - acute and delayed : Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness.

## 5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : All known extinguishing media can be used.
- Specific hazards : Spill will rapidly vaporize forming an oxygen deficient vapor cloud. Vapor cloud may obscure visibility. Do not direct water spray at container vent. Move away from container and cool with water from a protected position. Keep containers and surroundings cool with water spray.
- Special protective equipment for fire-fighters : Wear self contained breathing apparatus for fire fighting if necessary.

## 6. ACCIDENTAL RELEASE MEASURES

- Personal Precautions, Protective Equipment, and Emergency Procedures : Evacuate personnel to safe areas. Ventilate the area. Monitor oxygen level. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
- Environmental precautions : Prevent further leakage or spillage. Prevent from entering sewers, basements and workplts, or any place where its accumulation can be dangerous. Do not discharge into any place where its accumulation could be dangerous.
- Methods for cleaning up : Ventilate the area.
- Additional advice : If possible, stop flow of product. Increase ventilation to the release area and monitor oxygen level. Vapor cloud may obscure visibility. Do not spray water directly at leak. If leak is from cylinder or cylinder valve, call the Air Products emergency telephone number. If the leak is in the user's system, close the cylinder valve and safely vent the pressure before attempting repairs.

## 7. HANDLING AND STORAGE

### Handling

Know and understand the properties and hazards of the product before use. Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Before using the product, determine its identity by reading the label. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials. Before connecting the container for use, ensure that back feed from the system into the container is prevented. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. If user experiences any difficulty operating cylinder valve discontinue

# Safety Data Sheet

Version 1.11

Revision Date 01/26/2015

SDS Number 300000000100

Print Date 03/13/2015

use and contact supplier. Do not remove or interchange connections. Ensure the complete gas system has been checked for leaks before use. Prevent entrapment of cryogenic liquid in closed systems not protected with relief device. A small quantity of liquid produces large volumes of vaporized gas at atmospheric pressure. Containers used in shipment, storage, and transfer of cryogenic liquid are specially designed, well-insulated containers equipped with a pressure relief device and valves to control pressure. Under normal conditions, these containers will periodically vent product to limit pressure buildup. Ensure that the container is in a well-ventilated area to avoid creating an oxygen-deficient atmosphere. Use adequate pressure relief in systems and piping to prevent pressure buildup; liquid in a closed container can generate extremely high pressures when vaporized by warming. Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with lower pressure rating than that of the container. Only transfer lines designed for cryogenic liquids shall be used. Do not subject containers to abnormal mechanical shock. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier.

## Storage

Use a back flow preventative device in the piping. Do not change or force fit connections. Close valve after each use and when empty. Always keep container in upright position. Read and follow the Safety Data Sheet (SDS) before use. Do not allow storage temperature to exceed 50°C (122°F). Containers should be stored in a purpose built compound which should be well ventilated, preferably in the open air. Full containers should be stored so that oldest stock is used first. Do not store in a confined space. Full and empty cylinders should be segregated. Store containers in location free from fire risk and away from sources of heat and ignition. Return empty containers in a timely manner. Stored containers should be periodically checked for general condition and leakage. Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Cryogenic containers are equipped with pressure relief devices to control internal pressure. Under normal conditions these containers will periodically vent product. All vents should be piped to the exterior of the building. Observe all regulations and local requirements regarding storage of containers.

For further information on storage, handling, and use, consult Air Products' Safetygram 7: Liquid Nitrogen, available on our web site at [www.airproducts.com](http://www.airproducts.com).

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Engineering measures

Natural or mechanical to prevent oxygen deficient atmospheres below 19.5% oxygen.  
Keep self contained breathing apparatus readily available for emergency use.

### Personal protective equipment

- Respiratory protection : Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmosphere.  
Air purifying respirators will not provide protection. Users of breathing apparatus must be trained.
- Hand protection : Wear working gloves when handling gas containers.  
If the operation involves possible exposure to a cryogenic liquid, wear loose fitting thermal insulated or cryo-gloves.  
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.



# Safety Data Sheet

Version 1.11

Revision Date 01/26/2015

SDS Number 300000000100

Print Date 03/13/2015

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Eye protection	: Safety glasses recommended when handling cylinders. Protect eyes, face and skin from liquid splashes. Wear goggles and a face shield when transfilling or breaking transfer connections.
Skin and body protection	: Never allow any unprotected part of the body to touch uninsulated pipes or vessels which contain cryogenic fluids. The extremely cold metal will cause the flesh to stick fast and tear when one attempts to withdraw from it. Safety shoes are recommended when handling cylinders.
Special instructions for protection and hygiene	: Ensure adequate ventilation, especially in confined areas.
Remarks	: Simple asphyxiant.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Liquefied gas. Colorless.
Odor	: No odor warning properties.
Odor threshold	: No data available.
pH	: Not applicable.
Melting point/range	: -346 °F (-210 °C)
Boiling point/range	: -321 °F (-196 °C)
Flash point	: Not applicable.
Evaporation rate	: Not applicable.
Flammability (solid, gas)	: Refer to product classification in Section 2
Upper/lower explosion/flammability limit	: No data available.
Vapor pressure	: Not applicable.
Water solubility	: 0.02 g/l
Relative vapor density	: 0.97 (air = 1)
Relative density	: 0.8 (water = 1)
Partition coefficient (n-octanol/water)	: Not applicable.

# Safety Data Sheet

Version 1.11  
Revision Date 01/26/2015

SDS Number 300000000100  
Print Date 03/13/2015

Auto-ignition temperature : No data available.  
Decomposition temperature : No data available.  
Viscosity : Not applicable.  
Molecular Weight : 28 g/mol

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## 10. STABILITY AND REACTIVITY

Chemical Stability : Stable under normal conditions.  
Conditions to avoid : No data available.  
Materials to avoid : Carbon steel.  
Hazardous decomposition products : No data available.  
Possibility of hazardous Reactions/Reactivity : No data available.

---

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

#### Likely routes of exposure

Effects on Eye : Contact with liquid may cause cold burns/frostbite.  
Effects on Skin : Contact with liquid may cause cold burns/frostbite. May cause severe frostbite.  
Inhalation Effects : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themselves.  
Ingestion Effects : Ingestion is not considered a potential route of exposure.  
Symptoms : Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness, Salivation, Nausea, Vomiting, Loss of mobility/consciousness.

#### Acute toxicity

Acute Oral Toxicity : No data is available on the product itself.  
Inhalation : No data is available on the product itself.  
Acute Dermal Toxicity : No data is available on the product itself.

# Safety Data Sheet

Version 1.11

Revision Date 01/26/2015

SDS Number 300000000100

Print Date 03/13/2015

Skin corrosion/irritation : No data available.

Serious eye damage/eye irritation : No data available.

Sensitization. : No data available.

## Chronic toxicity or effects from long term exposures

Carcinogenicity : No data available.

Reproductive toxicity : No data is available on the product itself.

Germ cell mutagenicity : No data is available on the product itself.

Specific target organ systemic toxicity (single exposure) : No data available.

Specific target organ systemic toxicity (repeated exposure) : No data available.

Aspiration hazard : No data available.

## Delayed and Immediate Effects and Chronic Effects from Short and Long Term Exposure

Not applicable.

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## 12. ECOLOGICAL INFORMATION

### Ecotoxicity effects

Aquatic toxicity : Not applicable.

Toxicity to other organisms : Not applicable.

### Persistence and degradability

Biodegradability : No data is available on the product itself.

Mobility : No data available.

Bioaccumulation : No data is available on the product itself.

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## 13. DISPOSAL CONSIDERATIONS

7/10

Air Products and Chemicals, Inc

Nitrogen (Refrigerated)

# Safety Data Sheet

Version 1.11

Revision Date 01/26/2015

SDS Number 300000000100

Print Date 03/13/2015

Waste from residues / unused products : Return unused product in original cylinder to supplier. Contact supplier if guidance is required.

Contaminated packaging : Return cylinder to supplier.

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## 14. TRANSPORT INFORMATION

### DOT

UN/ID No. : UN1977  
Proper shipping name : Nitrogen, refrigerated liquid  
Class or Division : 2.2  
Label(s) : 2.2  
Marine Pollutant : No

### IATA

UN/ID No. : UN1977  
Proper shipping name : Nitrogen, refrigerated liquid  
Class or Division : 2.2  
Label(s) : 2.2  
Marine Pollutant : No

### IMDG

UN/ID No. : UN1977  
Proper shipping name : NITROGEN, REFRIGERATED LIQUID  
Class or Division : 2.2  
Label(s) : 2.2  
Marine Pollutant : No

### TDG

UN/ID No. : UN1977  
Proper shipping name : NITROGEN, REFRIGERATED LIQUID  
Class or Division : 2.2  
Label(s) : 2.2  
Marine Pollutant : No

### Further Information

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact an Air Products customer service representative.

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## 15. REGULATORY INFORMATION

# Safety Data Sheet

Version 1.11

Revision Date 01/26/2015

SDS Number 300000000100

Print Date 03/13/2015

Toxic Substance Control Act (TSCA) 12(b) Component(s):

None.

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on Inventory.
Canada	DSL	Included on Inventory.
Australia	AICS	Included on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.
Philippines	PICCS	Included on Inventory.
Japan	ENCS	Included on Inventory.

EPA SARA Title III Section 312 (40 CFR 370) Hazard Classification

Acute Health Hazard

EPA SARA Title III Section 313 (40 CFR 372) Component(s) above 'de minimus' level

None.

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other harm.

## 16. OTHER INFORMATION

### NFPA Rating

Health : 3  
Fire : 0  
Instability : 0

### HMIS Rating

Health : 3  
Flammability : 0  
Physical hazard : 2

Prepared by : Air Products and Chemicals, Inc. Global EH&S Product Safety Department

Telephone : 1-610-481-4911 Corporate  
1-800-345-3148 Chemicals Cust Serv  
1-800-752-1597 Gases/Electronics Cust Serv

Preparation Date : 03/13/2015

For additional information, please visit our Product Stewardship web site at  
<http://www.airproducts.com/productstewardship/>

# Safety Data Sheet

Version 1.11

Revision Date 01/26/2015

SDS Number 300000000100

Print Date 03/13/2015

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# SAFETY DATA SHEET

## Nitrogen

### Section 1. Identification

<b>GHS product identifier</b>	: Nitrogen
<b>Chemical name</b>	: nitrogen
<b>Other means of identification</b>	: nitrogen (dot); nitrogen gas; Nitrogen NF, Nitrogen FG
<b>Product use</b>	: Synthetic/Analytical chemistry.
<b>Synonym</b>	: nitrogen (dot); nitrogen gas; Nitrogen NF, Nitrogen FG
<b>SDS #</b>	: 001040
<b>Supplier's details</b>	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
<b>Emergency telephone number (with hours of operation)</b>	: 1-866-734-3438

### Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** : GASES UNDER PRESSURE - Compressed gas

#### GHS label elements

**Hazard pictograms** :



**Signal word** : Warning

**Hazard statements** : Contains gas under pressure; may explode if heated.  
May displace oxygen and cause rapid suffocation.

#### Precautionary statements

**General** : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction.

**Prevention** : Use and store only outdoors or in a well ventilated place.

**Response** : Not applicable.

**Storage** : Protect from sunlight. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.

**Disposal** : Not applicable.

**Hazards not otherwise classified** : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.



### Section 3. Composition/information on ingredients

<b>Substance/mixture</b>	: Substance
<b>Chemical name</b>	: nitrogen
<b>Other means of identification</b>	: nitrogen (dot); nitrogen gas; Nitrogen NF, Nitrogen FG

#### CAS number/other identifiers

<b>CAS number</b>	: 7727-37-9
<b>Product code</b>	: 001040

Ingredient name	%	CAS number
Nitrogen	100	7727-37-9

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

### Section 4. First aid measures

#### Description of necessary first aid measures

<b>Eye contact</b>	: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
<b>Inhalation</b>	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
<b>Skin contact</b>	: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
<b>Ingestion</b>	: As this product is a gas, refer to the inhalation section.

#### Most important symptoms/effects, acute and delayed

##### Potential acute health effects

<b>Eye contact</b>	: Contact with rapidly expanding gas may cause burns or frostbite.
<b>Inhalation</b>	: Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
<b>Skin contact</b>	: Contact with rapidly expanding gas may cause burns or frostbite.
<b>Frostbite</b>	: Try to warm up the frozen tissues and seek medical attention.
<b>Ingestion</b>	: As this product is a gas, refer to the inhalation section.

##### Over-exposure signs/symptoms

<b>Eye contact</b>	: No specific data.
<b>Inhalation</b>	: No specific data.
<b>Skin contact</b>	: No specific data.
<b>Ingestion</b>	: No specific data.

## Section 4. First aid measures

### Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.

- Specific hazards arising from the chemical** : Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials: nitrogen oxides

- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

- Environmental precautions** : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

- Small spill** : Immediately contact emergency personnel. Stop leak if without risk.
- Large spill** : Immediately contact emergency personnel. Stop leak if without risk. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
Nitrogen	Oxygen Depletion [Asphyxiant]

**Appropriate engineering controls** : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

**Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

#### Skin protection

## Section 8. Exposure controls/personal protection

- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

### Appearance

- Physical state** : Gas. [Compressed gas.]
- Color** : Colorless.
- Molecular weight** : 28.02 g/mole
- Molecular formula** : N<sub>2</sub>
- Boiling/condensation point** : -196°C (-320.8°F)
- Melting/freezing point** : -210.01°C (-346°F)
- Critical temperature** : -146.95°C (-232.5°F)
- Odor** : Odorless.
- Odor threshold** : Not available.
- pH** : Not available.
- Flash point** : [Product does not sustain combustion.]
- Burning time** : Not applicable.
- Burning rate** : Not applicable.
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Not available.
- Lower and upper explosive (flammable) limits** : Not available.
- Vapor pressure** : Not available.
- Vapor density** : 0.967 (Air = 1) Liquid Density@BP: 50.46 lb/ft<sup>3</sup> (808.3 kg/m<sup>3</sup>)
- Specific Volume (ft<sup>3</sup>/lb)** : 13.8889
- Gas Density (lb/ft<sup>3</sup>)** : 0.072
- Relative density** : Not applicable.
- Solubility** : Not available.
- Solubility in water** : Not available.
- Partition coefficient: n-octanol/water** : 0.67
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : Not available.

## Section 9. Physical and chemical properties

**SADT** : Not available.

**Viscosity** : Not applicable.

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : No specific data.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

**Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Not available.

#### Irritation/Corrosion

Not available.

#### Sensitization

Not available.

#### Mutagenicity

Not available.

#### Carcinogenicity

Not available.

#### Reproductive toxicity

Not available.

#### Teratogenicity

Not available.

#### Specific target organ toxicity (single exposure)

Not available.

#### Specific target organ toxicity (repeated exposure)

Not available.

#### Aspiration hazard

Not available.

## Section 11. Toxicological information

**Information on the likely routes of exposure** : Not available.

### Potential acute health effects

- Eye contact** : Contact with rapidly expanding gas may cause burns or frostbite.
- Inhalation** : Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- Skin contact** : Contact with rapidly expanding gas may cause burns or frostbite.
- Ingestion** : As this product is a gas, refer to the inhalation section.

### Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : No specific data.
- Inhalation** : No specific data.
- Skin contact** : No specific data.
- Ingestion** : No specific data.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

#### Long term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

#### Potential chronic health effects

Not available.

- General** : No known significant effects or critical hazards.
- Carcinogenicity** : No known significant effects or critical hazards.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Not available.

## Section 12. Ecological information

### Toxicity

Not available.

### Persistence and degradability

Not available.

## Section 12. Ecological information

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
Nitrogen	0.67	-	low

### Mobility in soil






Soil/water partition coefficient (K<sub>oc</sub>) : Not available.

Other adverse effects : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

## Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
<b>UN number</b>	UN1066	UN1066	UN1066	UN1066	UN1066
<b>UN proper shipping name</b>	NITROGEN, COMPRESSED	NITROGEN, COMPRESSED	NITROGEN, COMPRESSED	NITROGEN, COMPRESSED	NITROGEN, COMPRESSED
<b>Transport hazard class(es)</b>	2.2 	2.2 	2.2 	2.2 	2.2 
<b>Packing group</b>	-	-	-	-	-
<b>Environment</b>	No.	No.	No.	No.	No.
<b>Additional information</b>	<b>Limited quantity</b> Yes. <b>Packaging instruction</b> <b>Passenger aircraft</b> Quantity limitation: 75 kg <b>Cargo aircraft</b> Quantity limitation: 150 kg	<b>Explosive Limit and Limited Quantity Index</b> 0.125 <b>Passenger Carrying Road or Rail Index</b> 75	-	-	<b>Passenger and Cargo Aircraft</b> Quantity limitation: 75 kg <b>Cargo Aircraft Only</b> Quantity limitation: 150 kg

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”



## Section 14. Transport information

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 8(a) CDR Exempt/Partial exemption:** This material is listed or exempted.  
**United States inventory (TSCA 8b):** This material is listed or exempted.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.

### SARA 311/312

**Classification** : Sudden release of pressure

#### Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Nitrogen	100	No.	Yes.	No.	No.	No.

### State regulations

**Massachusetts** : This material is listed.

**New York** : This material is not listed.

**New Jersey** : This material is listed.

**Pennsylvania** : This material is listed.

**Canada inventory** : This material is listed or exempted.

### International regulations

## Section 15. Regulatory information

**International lists**

- Australia inventory (AICS):** This material is listed or exempted.
- China inventory (IECSC):** This material is listed or exempted.
- Japan inventory:** Not determined.
- Korea inventory:** This material is listed or exempted.
- Malaysia Inventory (EHS Register):** Not determined.
- New Zealand Inventory of Chemicals (NZIoC):** This material is listed or exempted.
- Philippines inventory (PICCS):** This material is listed or exempted.
- Taiwan inventory (CSNN):** Not determined.

**Chemical Weapons Convention List Schedule I Chemicals** : Not listed

**Chemical Weapons Convention List Schedule II Chemicals** : Not listed

**Chemical Weapons Convention List Schedule III Chemicals** : Not listed

### Canada

**WHMIS (Canada)** : Class A: Compressed gas.

- CEPA Toxic substances:** This material is not listed.
- Canadian ARET:** This material is not listed.
- Canadian NPRI:** This material is not listed.
- Alberta Designated Substances:** This material is not listed.
- Ontario Designated Substances:** This material is not listed.
- Quebec Designated Substances:** This material is not listed.

## Section 16. Other information

**Canada Label requirements** : Class A: Compressed gas.

### Hazardous Material Information System (U.S.A.)

Health	0
Flammability	0
Physical hazards	0

**Caution:** HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

### National Fire Protection Association (U.S.A.)



Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

## Section 16. Other information

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

### History

**Date of printing** : 11/11/2014.

**Date of issue/Date of revision** : 11/11/2014.

**Date of previous issue** : 10/16/2014.

**Version** : 0.05

**Key to abbreviations** :

- ATE = Acute Toxicity Estimate
- BCF = Bioconcentration Factor
- GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- IATA = International Air Transport Association
- IBC = Intermediate Bulk Container
- IMDG = International Maritime Dangerous Goods
- LogPow = logarithm of the octanol/water partition coefficient
- MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
- UN = United Nations ACGIH – American Conference of Governmental Industrial Hygienists
- AIHA – American Industrial Hygiene Association
- CAS – Chemical Abstract Services
- CEPA – Canadian Environmental Protection Act
- CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act (EPA)
- CFR – United States Code of Federal Regulations
- CPR – Controlled Products Regulations
- DSL – Domestic Substances List
- GWP – Global Warming Potential
- IARC – International Agency for Research on Cancer
- ICAO – International Civil Aviation Organisation
- Inh – Inhalation
- LC – Lethal concentration
- LD – Lethal dosage
- NDSL – Non-Domestic Substances List
- NIOSH – National Institute for Occupational Safety and Health
- TDG – Canadian Transportation of Dangerous Goods Act and Regulations
- TLV – Threshold Limit Value
- TSCA – Toxic Substances Control Act
- WEEL – Workplace Environmental Exposure Level
- WHMIS – Canadian Workplace Hazardous Material Information System

**References** : Not available.

▣ Indicates information that has changed from previously issued version.

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

# SAFETY DATA SHEET

**Airgas**

Oxygen

## Section 1. Identification

<b>GHS product identifier</b>	: Oxygen
<b>Chemical name</b>	: oxygen
<b>Other means of identification</b>	: Molecular oxygen; Oxygen molecule; Pure oxygen; O <sub>2</sub> ; UN 1072; Dioxygen; Oxygen USP, Aviator's Breathing Oxygen (ABO)
<b>Product use</b>	: Synthetic/Analytical chemistry.
<b>Synonym</b>	: Molecular oxygen; Oxygen molecule; Pure oxygen; O <sub>2</sub> ; UN 1072; Dioxygen; Oxygen USP, Aviator's Breathing Oxygen (ABO)
<b>SDS #</b>	: 001043
<b>Supplier's details</b>	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
<b>24-hour telephone</b>	: 1-866-734-3438

## Section 2. Hazards identification

<b>OSHA/HCS status</b>	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Classification of the substance or mixture</b>	: OXIDIZING GASES - Category 1 GASES UNDER PRESSURE - Compressed gas

### GHS label elements

<b>Hazard pictograms</b>	: 
--------------------------	---

<b>Signal word</b>	: Danger
<b>Hazard statements</b>	: May cause or intensify fire; oxidizer. Contains gas under pressure; may explode if heated.

### Precautionary statements

<b>General</b>	: Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Open valve slowly. Use only with equipment cleaned for Oxygen service.
<b>Prevention</b>	: Keep away from clothing, incompatible materials and combustible materials. Keep reduction valves, valves and fittings free from oil and grease.
<b>Response</b>	: In case of fire: Stop leak if safe to do so.
<b>Storage</b>	: Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.
<b>Disposal</b>	: Not applicable.
<b>Hazards not otherwise classified</b>	: None known.

## Section 3. Composition/information on ingredients

<b>Substance/mixture</b>	: Substance
<b>Chemical name</b>	: oxygen
<b>Other means of identification</b>	: Molecular oxygen; Oxygen molecule; Pure oxygen; O <sub>2</sub> ; UN 1072; Dioxygen; Oxygen USP, Aviator's Breathing Oxygen (ABO)

### CAS number/other identifiers

<b>CAS number</b>	: 7782-44-7
<b>Product code</b>	: 001043

Ingredient name	%	CAS number
oxygen	100	7782-44-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.**

**Occupational exposure limits, if available, are listed in Section 8.**

## Section 4. First aid measures

### Description of necessary first aid measures

<b>Eye contact</b>	: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
<b>Inhalation</b>	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
<b>Skin contact</b>	: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
<b>Ingestion</b>	: As this product is a gas, refer to the inhalation section.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

<b>Eye contact</b>	: Contact with rapidly expanding gas may cause burns or frostbite.
<b>Inhalation</b>	: No known significant effects or critical hazards.
<b>Skin contact</b>	: Contact with rapidly expanding gas may cause burns or frostbite.
<b>Frostbite</b>	: Try to warm up the frozen tissues and seek medical attention.
<b>Ingestion</b>	: As this product is a gas, refer to the inhalation section.

#### Over-exposure signs/symptoms

<b>Eye contact</b>	: No specific data.
<b>Inhalation</b>	: No specific data.
<b>Skin contact</b>	: No specific data.
<b>Ingestion</b>	: No specific data.

### Indication of immediate medical attention and special treatment needed, if necessary

<b>Notes to physician</b>	: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
<b>Specific treatments</b>	: No specific treatment.

## Section 4. First aid measures

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : Contains gas under pressure. Oxidizing material. This material increases the risk of fire and may aid combustion. Contact with combustible material may cause fire. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

**Hazardous thermal decomposition products** : No specific data.

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

**Small spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

**Large spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling



## Section 7. Handling and storage

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Keep away from clothing, incompatible materials and combustible materials. Keep reduction valves free from grease and oil. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Separate from acids, alkalies, reducing agents and combustibles. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

oxygen

None.

- Appropriate engineering controls** : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Individual protection measures

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.



## Section 8. Exposure controls/personal protection

- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

### Appearance

- Physical state** : Gas. [Compressed gas.]
- Color** : Colorless. Blue.
- Molecular weight** : 32 g/mole
- Molecular formula** : O<sub>2</sub>
- Boiling/condensation point** : -183°C (-297.4°F)
- Melting/freezing point** : -218.4°C (-361.1°F)
- Critical temperature** : -118.15°C (-180.7°F)
- Odor** : Odorless.
- Odor threshold** : Not available.
- pH** : Not available.
- Flash point** : [Product does not sustain combustion.]
- Burning time** : Not applicable.
- Burning rate** : Not applicable.
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Extremely flammable in the presence of the following materials or conditions: reducing materials, combustible materials and organic materials.
- Lower and upper explosive (flammable) limits** : Not available.
- Vapor pressure** : Not available.
- Vapor density** : 1.1 (Air = 1)
- Specific Volume (ft<sup>3</sup>/lb)** : 12.0482
- Gas Density (lb/ft<sup>3</sup>)** : 0.083
- Relative density** : Not applicable.
- Solubility** : Not available.
- Solubility in water** : Not available.
- Partition coefficient: n-octanol/water** : 0.65
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : Not available.
- SADT** : Not available.
- Viscosity** : Not applicable.

## Section 10. Stability and reactivity

- Reactivity** : No specific test data related to reactivity available for this product or its ingredients.
- Chemical stability** : The product is stable.

## Section 10. Stability and reactivity

- Possibility of hazardous reactions** : Hazardous reactions or instability may occur under certain conditions of storage or use. Conditions may include the following:  
contact with combustible materials  
Reactions may include the following:  
risk of causing fire
- Conditions to avoid** : No specific data.
- Incompatible materials** : Highly reactive or incompatible with the following materials:  
combustible materials  
reducing materials  
grease  
oil
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Not available.

#### Irritation/Corrosion

Not available.

#### Sensitization

Not available.

#### Mutagenicity

Not available.

#### Carcinogenicity

Not available.

#### Reproductive toxicity

Not available.

#### Teratogenicity

Not available.

#### Specific target organ toxicity (single exposure)

Not available.

#### Specific target organ toxicity (repeated exposure)

Not available.

#### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

### Potential acute health effects

**Eye contact** : Contact with rapidly expanding gas may cause burns or frostbite.

**Inhalation** : No known significant effects or critical hazards.

## Section 11. Toxicological information

- Skin contact** : Contact with rapidly expanding gas may cause burns or frostbite.  
**Ingestion** : As this product is a gas, refer to the inhalation section.

### Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : No specific data.  
**Inhalation** : No specific data.  
**Skin contact** : No specific data.  
**Ingestion** : No specific data.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

- Potential immediate effects** : Not available.  
**Potential delayed effects** : Not available.

#### Long term exposure

- Potential immediate effects** : Not available.  
**Potential delayed effects** : Not available.

#### Potential chronic health effects

Not available.

- General** : No known significant effects or critical hazards.  
**Carcinogenicity** : No known significant effects or critical hazards.  
**Mutagenicity** : No known significant effects or critical hazards.  
**Teratogenicity** : No known significant effects or critical hazards.  
**Developmental effects** : No known significant effects or critical hazards.  
**Fertility effects** : No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Not available.

## Section 12. Ecological information

### Toxicity

Not available.

### Persistence and degradability

Not available.

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
oxygen	0.65	-	low

### Mobility in soil

- Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.






## Section 12. Ecological information

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

## Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
<b>UN number</b>	UN1072	UN1072	UN1072	UN1072	UN1072
<b>UN proper shipping name</b>	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED
<b>Transport hazard class(es)</b>	2.2 (5.1) 	2.2 	2.2 (5.1) 	2.2 (5.1) 	2.2 (5.1) 
<b>Packing group</b>	-	-	-	-	-
<b>Environment</b>	No.	No.	No.	No.	No.
<b>Additional information</b>	<p><b>Limited quantity</b> Yes.</p> <p><b>Packaging instruction</b> <b>Passenger aircraft</b> Quantity limitation: 75 kg</p> <p><b>Cargo aircraft</b> Quantity limitation: 150 kg</p> <p><b>Special provisions</b> A52</p>	<p>Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2), 2.23-2.25 (Class 5).</p> <p><b>Explosive Limit and Limited Quantity Index</b> 0.125</p> <p><b>ERAP Index</b> 3000</p> <p><b>Passenger Carrying Ship Index</b> 50</p> <p><b>Passenger Carrying Road or Rail Index</b> 75</p> <p><b>Special provisions</b> 42</p>	-	-	<p><b>Passenger and Cargo Aircraft</b> Quantity limitation: 75 kg</p> <p><b>Cargo Aircraft Only</b> Quantity limitation: 150 kg</p>

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

**Special precautions for user** : **Transport within user’s premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

## Section 14. Transport information

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 8(a) CDR Exempt/Partial exemption**: This material is listed or exempted.  
**United States inventory (TSCA 8b)**: This material is listed or exempted.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.

### SARA 311/312

**Classification** : Sudden release of pressure

#### Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
oxygen	100	No.	Yes.	No.	No.	No.

### State regulations

**Massachusetts** : This material is listed.

**New York** : This material is not listed.

**New Jersey** : This material is listed.

**Pennsylvania** : This material is listed.

### International regulations

#### International lists

#### National inventory

**Australia** : This material is listed or exempted.

**Canada** : This material is listed or exempted.

**China** : This material is listed or exempted.

**Europe** : This material is listed or exempted.

**Japan** : Not determined.

**Malaysia** : Not determined.

**New Zealand** : This material is listed or exempted.

**Philippines** : This material is listed or exempted.

**Republic of Korea** : This material is listed or exempted.

**Taiwan** : This material is listed or exempted.

## Section 15. Regulatory information

### Canada

#### WHMIS (Canada)

: Class A: Compressed gas.  
Class C: Oxidizing material.

**CEPA Toxic substances:** This material is not listed.

**Canadian ARET:** This material is not listed.

**Canadian NPRI:** This material is not listed.

**Alberta Designated Substances:** This material is not listed.

**Ontario Designated Substances:** This material is not listed.

**Quebec Designated Substances:** This material is not listed.

## Section 16. Other information

**Canada Label requirements** : Class A: Compressed gas.  
Class C: Oxidizing material.

### Hazardous Material Information System (U.S.A.)

Health	0
Flammability	0
Physical hazards	3

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

### National Fire Protection Association (U.S.A.)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

### Procedure used to derive the classification

Classification	Justification
Ox. Gas 1, H270 Press. Gas Comp. Gas, H280	Expert judgment According to package

### History

**Date of printing** : 8/26/2015  
**Date of issue/Date of revision** : 8/26/2015  
**Date of previous issue** : No previous validation  
**Version** : 0.01

## Section 16. Other information

**Key to abbreviations** : ATE = Acute Toxicity Estimate  
BCF = Bioconcentration Factor  
GHS = Globally Harmonized System of Classification and Labelling of Chemicals  
IATA = International Air Transport Association  
IBC = Intermediate Bulk Container  
IMDG = International Maritime Dangerous Goods  
LogPow = logarithm of the octanol/water partition coefficient  
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)  
UN = United Nations

**References** : Not available.

✔ Indicates information that has changed from previously issued version.

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



### SECTION: 1. Product and company identification

#### 1.1. Product identifier

Product form : Substance  
Name : Propane  
CAS No : 74-98-6  
Formula : C3H8  
Other means of identification : Propane, Liquefied Petroleum Gas, n-propane, dimethylmethane, propyl hydride, refrigerant gas R290

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Industrial use. Use as directed.

#### 1.3. Details of the supplier of the safety data sheet

Praxair, Inc.  
39 Old Ridgebury Road  
Danbury, CT 06810-5113 - USA  
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146  
[www.praxair.com](http://www.praxair.com)

#### 1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week  
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887  
(collect calls accepted, Contract 17729)

### SECTION 2: Hazard identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Flam. Gas 1 H220  
Liquefied gas H280

#### 2.2. Label elements

##### GHS-US labeling

Hazard pictograms (GHS-US) :



GHS02

GHS04

Signal word (GHS-US) :

DANGER

Hazard statements (GHS-US) :

H220 - EXTREMELY FLAMMABLE GAS  
H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED  
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION  
CGA-HG04 - MAY FORM EXPLOSIVE MIXTURES WITH AIR  
CGA-HG01 - MAY CAUSE FROSTBITE

Precautionary statements (GHS-US) :

P202 - Do not handle until all safety precautions have been read and understood  
P210 - Keep away from Heat, Open flames, Sparks, Hot surfaces. - No smoking  
P271+P403 - Use and store only outdoors or in a well-ventilated place  
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely  
P381 - Eliminate all ignition sources if safe to do so  
CGA-PG05 - Use a back flow preventive device in the piping  
CGA-PG12 - Do not open valve until connected to equipment prepared for use  
CGA-PG06 - Close valve after each use and when empty  
CGA-PG11 - Never put cylinders into unventilated areas of passenger vehicles  
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

### 2.3. Other hazards

Other hazards not contributing to the classification : Contact with liquid may cause cold burns/frostbite.

### 2.4. Unknown acute toxicity (GHS US)

No data available

## SECTION 3: Composition/Information on ingredients

### 3.1. Substance

Name	Product identifier	%
Propane (Main constituent)	(CAS No) 74-98-6	100

### 3.2. Mixture

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

- First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- First-aid measures after skin contact : The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.
- First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately. Get immediate medical attention.
- First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

### 4.2. Most important symptoms and effects, both acute and delayed

No additional information available

### 4.3. Indication of any immediate medical attention and special treatment needed

None.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide, dry chemical powder, water spray, fog.

### 5.2. Special hazards arising from the substance or mixture

- Fire hazard : EXTREMELY FLAMMABLE GAS. If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device.
- Explosion hazard : EXTREMELY FLAMMABLE GAS. Forms explosive mixtures with air and oxidizing agents.
- Reactivity : No reactivity hazard other than the effects described in sub-sections below.

### 5.3. Advice for firefighters

- Firefighting instructions : Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.
- Protection during firefighting : Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.

Special protective equipment for fire fighters	: Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	: Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems  Stop flow of product if safe to do so  Use water spray or fog to knock down fire fumes if possible.
Other information	: Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.)

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Evacuate area. Ensure adequate air ventilation. Stop leak if safe to do so.

##### 6.1.1. For non-emergency personnel

No additional information available

##### 6.1.2. For emergency responders

No additional information available

#### 6.2. Environmental precautions

Try to stop release.

#### 6.3. Methods and material for containment and cleaning up

No additional information available

#### 6.4. Reference to other sections

See also sections 8 and 13.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post "No Smoking or Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g., NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16

**OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE:** When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

### 7.3. Specific end use(s)

None.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Propane (74-98-6)		
USA OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	1800 mg/m <sup>3</sup>
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
USA IDLH	US IDLH (mg/m <sup>3</sup> )	< mg/m <sup>3</sup>
USA IDLH	US IDLH (ppm)	2100 ppm (10% LEL)
ACGIH	Not established	

### 8.2. Exposure controls

Appropriate engineering controls : An explosion-proof local exhaust system or a mechanical system is acceptable if it can prevent oxygen deficiency and keep hazardous fumes and gases below all applicable exposure limits in the worker's breathing area. During welding, ensure that there is adequate ventilation to keep worker exposure below applicable limits for fumes, gases, and other by-products of welding. Do not breathe fumes or gases. Short-term overexposure to fumes may cause dizziness, nausea, and dryness or irritation of the nose, throat, and eyes, or may cause other similar discomfort.

Eye protection : Wear safety glasses with side shields.

Skin and body protection : As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder's gloves and protective goggles, and may include arm protectors, aprons, hats, and shoulder protection as well as substantial clothing.

respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections.

Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

Other information : Consider the use of flame resistant anti-static safety clothing. Wear safety shoes while handling containers.

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Colorless gas.
Molecular mass	: 44 g/mol
Color	: Colorless.
Odor	: Poor warning properties at low concentrations. Stenchant often added. Sweetish.
Odor threshold	: No data available
pH	: Not applicable.
Relative evaporation rate (butyl acetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable.
Melting point	: No data available
Freezing point	: -187.69 °C (-305.8°F)
Boiling point	: -42.1 °C (-44.32°F)
Flash point	: -104.4 °C (-155.2°F) TCC
Critical temperature	: 96.8 °C (206°F)
Auto-ignition temperature	: 450 °C (842°F)
Decomposition temperature	: No data available
Flammability (solid, gas)	: 2.1 - 9.5 vol %
Vapor pressure	: 8.58 bar (109.73 psig)
Relative vapor density at 20 °C	: No data available
Relative density	: 0.58
Density	: 0.506 - 0.583 g/cm <sup>3</sup> (at 15 °C)
Relative gas density	: 1.5
Solubility	: Water: 75 mg/l
Log Pow	: 2.36
Log Kow	: Not applicable.
Viscosity, kinematic	: Not applicable.
Viscosity, dynamic	: Not applicable.
Explosive properties	: Not applicable.
Oxidizing properties	: None.
Explosion limits	: No data available

#### 9.2. Other information

Gas group	: Liquefied gas
Additional information	: Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

Can form explosive mixture with air. May react violently with oxidants.

#### 10.4. Conditions to avoid

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

#### 10.5. Incompatible materials

Air, Oxidizer. Chlorine dioxide.

### 10.6. Hazardous decomposition products

Thermal decomposition or burning may produce carbon monoxide, carbon dioxide, and hydrogen. The welding and cutting process may form reaction products such as carbon monoxide and carbon dioxide. Other decomposition products of normal operation originate from the volatilization, reaction, or oxidation of the material being worked.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Not classified

Propane ( 1f )74-98-6	
LC50 inhalation rat (mg/l)	658 mg/l/4h
ATE US (vapors)	658.000 mg/l/4h
ATE US (dust, mist)	658.000 mg/l/4h

Skin corrosion/irritation : Not classified  
pH: Not applicable.

Serious eye damage/irritation : Not classified  
pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

### 12.2. Persistence and degradability

Propane (74-98-6)	
Persistence and degradability	The substance is biodegradable. Unlikely to persist.

### 12.3. Bioaccumulative potential

Propane (74-98-6)	
Log Pow	2.36
Log Kow	Not applicable.
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

### 12.4. Mobility in soil

Propane (74-98-6)	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

### 12.5. Other adverse effects

Effect on ozone layer : None

Effect on the global warming : No known effects from this product

**SECTION 13: Disposal considerations**

**13.1. Waste treatment methods**

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

**SECTION 14: Transport information**

In accordance with DOT

Transport document description : UN1978 Propane (see also Petroleum gases, liquefied [UN1075]), 2.1

UN-No.(DOT) : UN1978

Proper Shipping Name (DOT) : Propane  
 see also Petroleum gases, liquefied [UN1075]

Class (DOT) : 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115

Hazard labels (DOT) : 2.1 - Flammable gas



DOT Special Provisions (49 CFR 172.102) : 19 - For domestic transportation only, the identification number UN1075 may be used in place of the identification number specified in column (4) of the 172.101 table. The identification number used must be consistent on package markings, shipping papers and emergency response information  
 T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter

**Additional information**

Emergency Response Guide (ERG) Number : 115 (UN1075)

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers:  
 - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

**Transport by sea**

UN-No. (IMDG) : 1978

Proper Shipping Name (IMDG) : PROPANE

Class (IMDG) : 2 - Gases

MFAG-No : 115

**Air transport**

UN-No. (IATA) : 1978

Proper Shipping Name (IATA) : PROPANE

Class (IATA) : 2

Civil Aeronautics Law : Gases under pressure/Gases flammable under pressure

**SECTION 15: Regulatory information**

**15.1. US Federal regulations**

Propane (74-98-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Sudden release of pressure hazard Fire hazard



# Propane

## Safety Data Sheet P-4646

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.  
Date of issue: 01/01/1984    Revision date: 01/21/2016    Supersedes: 04/08/2015

### Propane (74-98-6)

All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

## 15.2. International regulations

### CANADA

#### Propane (74-98-6)

Listed on the Canadian DSL (Domestic Substances List)

### EU-Regulations

#### Propane (74-98-6)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

### 15.2.2. National regulations

#### Propane (74-98-6)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
Listed on INSQ (Mexican national Inventory of Chemical Substances)  
Listed on CICR (Turkish Inventory and Control of Chemicals)

## 15.3. US State regulations

### Propane(74-98-6)

U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

**SECTION 16: Other information**

Other information

: When using this product in welding and cutting, read and understand the manufacturer's instructions and the precautionary label on the product. Ask your welding products supplier for a copy of Praxair's free safety booklet, P-2035, Precautions and Safe Practices for Gas Welding, Cutting, and Heating, and for other manufacturers' safety publications. For a detailed treatment, get ANSI Z49.1, Safety in Welding, Cutting, and Allied Processes, published by the American Welding Society (AWS), www.aws.org. Order AWS documents from Global Engineering Documents, global.ihc.com. Arcs and sparks can ignite combustible materials. Prevent fires. Refer to NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hotwork. Do not strike an arc on the container. The defect produced by an arc burn may lead to container rupture

Fumes and gases produced during welding and cutting processes can be dangerous to your health and may cause serious lung disease. KEEP YOUR HEAD OUT OF FUMES. DO NOT BREATHE FUMES AND GASES. Use enough ventilation, local exhaust, or both to keep fumes and gases from your breathing zone and the general area. Short-term overexposure to fumes may cause dizziness, nausea, and dryness or irritation of the nose, throat, and eyes; or may cause other similar discomfort. Contaminants in the air may add to the hazard of fumes and gases

When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product

Praxair SDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from www.praxair.com. If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (Phone: 1-800-PRAXAIR/1-800-772-9247; Address: Praxair Call Center, Praxair, Inc., P.O. Box 44, Tonawanda, NY 14151-0044)

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NFPA health hazard

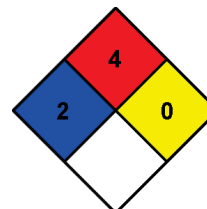
: 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard

: 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.

NFPA reactivity

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.





# Propane

## Safety Data Sheet P-4646

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.  
Date of issue: 01/01/1984    Revision date: 01/21/2016    Supersedes: 04/08/2015

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### HMIS III Rating

Health : 1 Slight Hazard - Irritation or minor reversible injury possible  
Flammability : 4 Severe Hazard  
Physical : 2 Moderate Hazard

SDS US (GHS HazCom 2012) - Praxair

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

## Material Safety Data Sheet

According to the Controlled Product Regulations

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### 1. MATERIAL AND COMPANY IDENTIFICATION

**Material Name** : Shell Omala S2 G 320  
**Uses** : Gear lubricant.  
**Product Code** : 001D7838

**Manufacturer/Supplier** : Shell Canada Products  
400 - 4th Avenue S.W  
Calgary AB T2P 0J4  
Canada

**Telephone** : (+1) 8006611600  
**Fax** : (+1) 4033848345

**Emergency Telephone Number**  
: CHEMTREC (24 hr): (+1) 800-424-9300  
CANUTEC (24 hr): (+1) 613-996-6666

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### 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Mixture Description** : Highly refined mineral oils and additives.

The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

Refer to Chapter 8 for Occupational Exposure Guidelines.

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### 3. HAZARDS IDENTIFICATION

**WHMIS Class/Description** : THIS PRODUCT IS NOT A WHMIS CONTROLLED SUBSTANCE.

**Routes of Exposure** : Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

**Health Hazards** : Not expected to be a health hazard when used under normal conditions. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis. Used oil may contain harmful impurities.

**Signs and Symptoms** : Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.

**Safety Hazards** : Not classified as flammable but will burn.

**Environmental Hazards** : Not classified as dangerous for the environment.

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### 4. FIRST AID MEASURES

**General Information** : Not expected to be a health hazard when used under normal conditions.

## Material Safety Data Sheet

According to the Controlled Product Regulations

- Inhalation** : No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.
- Skin Contact** : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention.
- Eye Contact** : Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
- Ingestion** : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.
- Advice to Physician** : Treat symptomatically.

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### 5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

- Flash point** : Typical 255 °C / 491 °F (COC)
- Upper / lower Flammability or Explosion limits** : Typical 1 - 10 %(V)(based on mineral oil)
- Auto ignition temperature** : > 320 °C / 608 °F
- Hazardous Combustion Products and Specific Hazards** : Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Unidentified organic and inorganic compounds.
- Suitable Extinguishing Media** : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
- Unsuitable Extinguishing Media** : Do not use water in a jet.
- Protective Equipment for Firefighters** : Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

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### 6. ACCIDENTAL RELEASE MEASURES

- Protective Measures** : Avoid contact with skin and eyes. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.
- Clean Up Methods** : Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.
- Additional Advice** : Local authorities should be advised if significant spillages cannot be contained.

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### 7. HANDLING AND STORAGE

- General Precautions** : Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage

## Material Safety Data Sheet

According to the Controlled Product Regulations

- and disposal of this material.
- Handling** : Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.
- Storage** : Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Store at ambient temperature.
- Product Transfer** : This material has the potential to be a static accumulator. Proper grounding and bonding procedures should be used during all bulk transfer operations.
- Recommended Materials** : For containers or container linings, use mild steel or high density polyethylene.
- Unsuitable Materials** : PVC.
- Additional Information** : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

If the American Conference of Governmental Industrial Hygienists (ACGIH) value is provided on this document, it is provided for information only.

#### Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Oil mist, mineral	ACGIH	TWA(Inhalable fraction.)		5 mg/m3	

Consult local authorities for acceptable exposure limits within their jurisdiction.

#### Biological Exposure Index (BEI)

No biological limit allocated.

- Exposure Controls** : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated. Define procedures for safe handling and maintenance of controls. Educate and train workers in the hazards and control measures relevant to normal activities associated with this product. Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment,

## Material Safety Data Sheet

According to the Controlled Product Regulations

local exhaust ventilation. Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

- Personal Protective Equipment**
- : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
- Respiratory Protection**
- : No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65°C(149 °F)].
- Hand Protection**
- : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognise that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time may be acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material.
- Eye Protection**
- : Wear safety glasses or full face shield if splashes are likely to occur.
- Protective Clothing**
- : Skin protection not ordinarily required beyond standard issue work clothes.
- Monitoring Methods**
- : Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to



**Material Safety Data Sheet**

According to the Controlled Product Regulations

confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory. Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.

National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods <http://www.cdc.gov/niosh/>  
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods <http://www.osha.gov/>  
Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances <http://www.hse.gov.uk/>  
Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA), Germany. <http://www.dguv.de/inhalt/index.jsp>  
L'Institut National de Recherche et de Sécurité, (INRS), France <http://www.inrs.fr/accueil>

**Environmental Exposure Controls** : Take appropriate measures to fulfil the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Chapter 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water. Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance	: Brown. Liquid at room temperature.
Odour	: Slight hydrocarbon.
Odour threshold	: Data not available
pH	: Not applicable.
Initial Boiling Point and Boiling Range	: > 280 °C / 536 °F estimated value(s)
Pour point	: Typical -15 °C / 5 °F
Vapour pressure	: < 0.5 Pa at 20 °C / 68 °F (estimated value(s))
Specific gravity	: Typical 0.903 at 15 °C / 59 °F
Density	: Typical 903 kg/m <sup>3</sup> at 15 °C / 59 °F
Water solubility	: Negligible.
n-octanol/water partition coefficient (log Pow)	: > 6 (based on information on similar products)
Kinematic viscosity	: Typical 320 mm <sup>2</sup> /s at 40 °C / 104 °F
Vapour density (air=1)	: > 1 (estimated value(s))
Electrical conductivity	: This material is not expected to be a static accumulator.

## Material Safety Data Sheet

According to the Controlled Product Regulations

Evaporation rate (nBuAc=1) : Data not available

### 10. STABILITY AND REACTIVITY

**Stability** : Stable.  
**Conditions to Avoid** : Extremes of temperature and direct sunlight.  
**Materials to Avoid** : Strong oxidising agents.  
**Hazardous Decomposition Products** : Hazardous decomposition products are not expected to form during normal storage.  
**Hazardous Polymerisation** : No  
**Sensitivity to Mechanical Impact** : No  
**Sensitivity to Static Discharge** : No

### 11. TOXICOLOGICAL INFORMATION

**Basis for Assessment** : Information given is based on data on the components and the toxicology of similar products.  
Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

**Routes of Exposure** : Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

**Acute Oral Toxicity** : Expected to be of low toxicity: LD50 > 5000 mg/kg , Rat.  
**Acute Dermal Toxicity** : Expected to be of low toxicity: LD50 > 5000 mg/kg , Rabbit.  
**Acute Inhalation Toxicity** : Not considered to be an inhalation hazard under normal conditions of use.

**Skin Irritation** : Expected to be slightly irritating.  
**Eye Irritation** : Expected to be slightly irritating.  
**Respiratory Irritation** : Inhalation of vapours or mists may cause irritation.  
**Sensitisation** : Not expected to be a skin sensitiser.  
**Repeated Dose Toxicity** : Not expected to be a hazard.  
**Mutagenicity** : Not considered a mutagenic hazard.  
**Carcinogenicity** : Not expected to be carcinogenic. Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC).

Material		Carcinogenicity Classification
Highly refined mineral oil (IP346 <3%)	:	ACGIH Group A4: Not classifiable as a human carcinogen.
Highly refined mineral oil (IP346 <3%)	:	IARC 3: Not classifiable as to carcinogenicity to humans.
Highly refined mineral oil (IP346 <3%)	:	GHS / CLP: No carcinogenicity classification

**Reproductive and** : Not expected to be a hazard.

## Material Safety Data Sheet

According to the Controlled Product Regulations

**Developmental Toxicity  
Additional Information** : Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal.  
ALL used oil should be handled with caution and skin contact avoided as far as possible.

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### 12. ECOLOGICAL INFORMATION

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

**Acute Toxicity** : Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l (to aquatic organisms) LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract. Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.

**Mobility** : Liquid under most environmental conditions. If it enters soil, it will adsorb to soil particles and will not be mobile. Floats on water.

**Persistence/degradability** : Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.

**Bioaccumulation** : Contains components with the potential to bioaccumulate.

**Other Adverse Effects** : Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

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### 13. DISPOSAL CONSIDERATIONS

**Material Disposal** : Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses.

**Container Disposal** : Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.

**Local Legislation** : Disposal should be in accordance with applicable regional, national, and local laws and regulations.

## Material Safety Data Sheet

According to the Controlled Product Regulations

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### 14. TRANSPORT INFORMATION

#### Canadian Road and Rail Shipping Classification

This product is not regulated under the Canadian Transportation of Dangerous Goods Regulations for transport by road and rail.

Additional Information : MARPOL Annex 1 rules apply for bulk shipments by sea.

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### 15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Class/Description : THIS PRODUCT IS NOT A WHMIS CONTROLLED SUBSTANCE.

#### Inventory Status

EINECS : All components listed or polymer exempt.  
TSCA : All components listed.  
DSL : All components listed.

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### 16. OTHER INFORMATION

SDS Version Number : 1.2  
SDS Effective Date : 07-12-2013  
SDS Revisions : A vertical bar (|) in the left margin indicates an amendment from the previous version.  
SDS Regulation : The content and format of this (M)SDS is in accordance with the Controlled Product Regulations.  
SDS Prepared By : Shell Product Stewardship; 1-800-661-1600  
SDS Distribution : The information in this document should be made available to all who may handle the product.

Disclaimer : The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to

**Shell Omala S2 G 320**  
Version 1.2

Effective Date 07-12-2013

**Material Safety Data Sheet**

According to the Controlled Product Regulations

be obtained from the use of the product.

## SAFETY DATA SHEET

Creation Date 23-Jun-2008

Revision Date 19-Jan-2018

Revision Number 5

### 1. Identification

**Product Name** Silicon, Powder, -60 Mesh, 99.999%

**Cat No. :** AC225510050

**CAS-No** 7440-21-3  
**Synonyms** No information available

**Recommended Use** Laboratory chemicals.  
**Uses advised against** Not for food, drug, pesticide or biocidal product use

#### Details of the supplier of the safety data sheet

##### Company

Fisher Scientific  
One Reagent Lane  
Fair Lawn, NJ 07410  
Tel: (201) 796-7100

Acros Organics  
One Reagent Lane  
Fair Lawn, NJ 07410

#### **Emergency Telephone Number**

For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11  
Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99  
**CHEMTREC** Tel. No.**US**:001-800-424-9300 / **Europe**:001-703-527-3887

### 2. Hazard(s) identification

#### Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable solids

Category 2

#### Label Elements

##### **Signal Word**

Warning

##### **Hazard Statements**

Flammable solid



##### **Precautionary Statements**

Prevention

Keep away from heat/sparks/open flames/hot surfaces. - No smoking  
 Ground/bond container and receiving equipment  
 Use explosion-proof electrical/ventilating/lighting/equipment  
 Wear protective gloves/protective clothing/eye protection/face protection

**Fire**

In case of fire: Use CO<sub>2</sub>, dry chemical, or foam for extinction

**Hazards not otherwise classified (HNOC)**

None identified

### 3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Silicon	7440-21-3	> 99

### 4. First-aid measures

<b>General Advice</b>	If symptoms persist, call a physician.
<b>Eye Contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
<b>Skin Contact</b>	Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.
<b>Inhalation</b>	Move to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.
<b>Ingestion</b>	Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.
<b>Most important symptoms and effects</b>	None reasonably foreseeable.
<b>Notes to Physician</b>	Treat symptomatically

### 5. Fire-fighting measures

<b>Unsuitable Extinguishing Media</b>	No information available
<b>Flash Point</b>	Not applicable
<b>Method -</b>	No information available
<b>Autoignition Temperature</b>	Not applicable 150 °C / 302 °F
<b>Explosion Limits</b>	
<b>Upper</b>	No data available
<b>Lower</b>	No data available
<b>Sensitivity to Mechanical Impact</b>	No information available
<b>Sensitivity to Static Discharge</b>	No information available

**Specific Hazards Arising from the Chemical**

Keep product and empty container away from heat and sources of ignition.

**Hazardous Combustion Products**

None known

**Protective Equipment and Precautions for Firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.



**NFPA**Health  
2Flammability  
3Instability  
0Physical hazards  
N/A**6. Accidental release measures**

**Personal Precautions** Ensure adequate ventilation. Use personal protective equipment. Avoid dust formation.  
**Environmental Precautions** Should not be released into the environment.

**Methods for Containment and Clean Up** Sweep up or vacuum up spillage and collect in suitable container for disposal. Keep in suitable, closed containers for disposal.

**7. Handling and storage**

**Handling** Wear personal protective equipment. Ensure adequate ventilation. Avoid ingestion and inhalation. Avoid dust formation. Do not get in eyes, on skin, or on clothing.

**Storage** Keep containers tightly closed in a dry, cool and well-ventilated place.

**8. Exposure controls / personal protection****Exposure Guidelines**

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Silicon		(Vacated) TWA: 10 mg/m <sup>3</sup> (Vacated) TWA: 5 mg/m <sup>3</sup> TWA: 15 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	TWA: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	TWA: 10 mg/m <sup>3</sup> STEL: 20 mg/m <sup>3</sup>

**Legend**

**OSHA** - Occupational Safety and Health Administration

**NIOSH IDLH**: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

**Engineering Measures** None under normal use conditions.

**Personal Protective Equipment**

**Eye/face Protection** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin and body protection** Long sleeved clothing.

**Respiratory Protection** No protective equipment is needed under normal use conditions.

**Hygiene Measures** Handle in accordance with good industrial hygiene and safety practice.

**9. Physical and chemical properties**

<b>Physical State</b>	Powder Solid
<b>Appearance</b>	White
<b>Odor</b>	Odorless
<b>Odor Threshold</b>	No information available
<b>pH</b>	Not applicable
<b>Melting Point/Range</b>	1410 °C / 2570 °F
<b>Boiling Point/Range</b>	2355 °C / 4271 °F @ 760 mmHg
<b>Flash Point</b>	Not applicable
<b>Evaporation Rate</b>	Not applicable
<b>Flammability (solid,gas)</b>	No information available
<b>Flammability or explosive limits</b>	

Upper	No data available
Lower	No data available
Vapor Pressure	No information available
Vapor Density	Not applicable
Specific Gravity	2.3300
Solubility	insoluble
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	Not applicable 150 °C / 302 °F
Decomposition Temperature	No information available
Viscosity	Not applicable
Molecular Formula	Si
Molecular Weight	28.09

## 10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable under normal conditions.
Conditions to Avoid	Incompatible products. Excess heat. Avoid dust formation.
Incompatible Materials	Strong oxidizing agents
Hazardous Decomposition Products	None under normal use conditions
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

## 11. Toxicological information

### Acute Toxicity

#### Product Information Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Silicon	LD50 = 3160 mg/kg ( Rat )	Not listed	Not listed

**Toxicologically Synergistic Products** No information available

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation	No information available
Sensitization	No information available
Carcinogenicity	The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Silicon	7440-21-3	Not listed	Not listed	Not listed	Not listed	Not listed

<b>Mutagenic Effects</b>	No information available
<b>Reproductive Effects</b>	No information available.
<b>Developmental Effects</b>	No information available.
<b>Teratogenicity</b>	No information available.
<b>STOT - single exposure</b>	None known
<b>STOT - repeated exposure</b>	None known

Aspiration hazard	No information available
Symptoms / effects, both acute and delayed	No information available
Endocrine Disruptor Information	No information available
Other Adverse Effects	The toxicological properties have not been fully investigated.

## 12. Ecological information

### Ecotoxicity

Do not empty into drains.

Persistence and Degradability	Insoluble in water
Bioaccumulation/ Accumulation	No information available.
Mobility	Is not likely mobile in the environment due its low water solubility.

## 13. Disposal considerations

Waste Disposal Methods	Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.
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## 14. Transport information

### DOT

UN-No	UN1346
Proper Shipping Name	SILICON POWDER, AMORPHOUS
Hazard Class	4.1
Packing Group	III

### TDG

UN-No	UN1346
Proper Shipping Name	SILICON POWDER, AMORPHOUS
Hazard Class	4.1
Packing Group	III

### IATA

UN-No	UN1346
Proper Shipping Name	SILICON POWDER, AMORPHOUS
Hazard Class	4.1
Packing Group	III

### IMDG/IMO

UN-No	UN1346
Proper Shipping Name	SILICON POWDER, AMORPHOUS
Hazard Class	4.1
Packing Group	III

## 15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

### International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Silicon	X	X	-	231-130-8	-		X	-	X	X	X

#### Legend:

X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated

polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

#### U.S. Federal Regulations

TSCA 12(b)	Not applicable
SARA 313	Not applicable
SARA 311/312 Hazard Categories	See section 2 for more information
CWA (Clean Water Act)	Not applicable
Clean Air Act	Not applicable
OSHA Occupational Safety and Health Administration	Not applicable
CERCLA	Not applicable
California Proposition 65	This product does not contain any Proposition 65 chemicals

#### U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Silicon	X	X	X	-	X

#### U.S. Department of Transportation

Reportable Quantity (RQ):	N
DOT Marine Pollutant	N
DOT Severe Marine Pollutant	N

#### U.S. Department of Homeland Security

This product does not contain any DHS chemicals.

#### Other International Regulations

Mexico - Grade	No information available
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## 16. Other information

Prepared By	Regulatory Affairs Thermo Fisher Scientific Email: EMSDS.RA@thermofisher.com
Creation Date	23-Jun-2008
Revision Date	19-Jan-2018
Print Date	19-Jan-2018
Revision Summary	This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

#### Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of SDS**

## Section 1 - Product and Company Identification

**Product Name:** Sodium Bisulfite  
**Chemical Formula:** NaHSO<sub>3</sub>  
**CAS Number:** 007631-90-5  
**Other Designations:** Sodium Bisulfite Solution, Sodium Hydrogen Sulfite Solution.  
**General Use:** Food and pharmaceutical preservative, waste water dechlorination agent, laboratory reagent, reducing agent, dietary supplement, and color preservative.

**Manufacturer:** Calabrian Corporation  
5500 Hwy. 366  
Port Neches, Texas 77651

**Telephone:** 409-727-1471  
**Fax:** 409-727-5803  
**Emergency Contact:** CHEMTREC 800-424-9300

## Section 2 - Hazards Identification

### Emergency Overview

**Target Organs:** Respiratory system, eyes, skin  
**GHS Classification:** Acute Toxicity, Oral (Category 4)  
Acute Toxicity, Dermal (Category 5)  
Serious Eye Irritant (Category 2A)

**GHS Label Elements:** Signal Word – Warning

Pictogram



*Corrosive*



*Irritant*

**Hazard Statements:** H302 – Harmful if swallowed  
H313 – May be harmful to skin  
H319 – Causes serious eye irritation

**Precautionary Statements:** P280 – Wear protective equipment for hands, eyes, face and respiratory tract  
P305, P351 and P338 – IF IN EYES: Rinse with water for several minutes.  
Remove contact lenses if present and continue rinsing.

**Other Hazards:** Contact with acids liberates toxic sulfur dioxide gas.

**HMIS Classification:** Health Hazard 2  
Flammability 0  
Physical 0



## Safety Data Sheet SODIUM BISULFITE

**NFPA Rating:** Health Hazard 2  
Fire 0  
Reactivity 0

**Potential Health Effects:** Inhalation: Irritant to respiratory tract  
Eye: Irritant  
Skin: Irritant  
Ingestion: Harmful if swallowed  
Aggravated Medical Condition: Capable of provoking bronchospasm in sulfite sensitive individuals with asthma.

### Section 3 - Composition / Information on Ingredients

Composition	CAS Number	% Wt
Water	-	50 – 70
Sodium bisulfite	007631-90-5	30 – 50
Sodium Sulfite	007757-83-7	< 1.0
Sodium Sulfate	007757-82-6	< 3.5

### Section 4 - First Aid Measures

<u>Exposure Route</u>	<u>Symptom</u>	<u>Treatment</u>
<b>Inhalation:</b>	Sore throat, shortness of breath coughing, and congestion.	Remove from exposure to fresh air. Seek medical attention in severe cases or if recovery is not rapid.
<b>Eye Contact:</b>	Irritation to eyes and mucous membranes.	Irrigate with water until no evidence of chemical remains. Obtain medical attention.
<b>Skin Contact:</b>	Irritation, itching, dermatitis	Wash with soap and drench with water. Remove contaminated clothing and wash before reuse.
<b>Ingestion:</b>	Irritation to mucous membranes.	Give large quantities of water or milk immediately. Obtain medical attention.

Seek appropriate medical attention *and provide this SDS to attending doctor*

**Note to physician:** Exposure may aggravate acute or chronic asthma, emphysema and bronchitis.

### Section 5 - Fire-Fighting Measures

**Flash Point:** Not combustible.  
**Flash Point Method:** Not Applicable.  
**Burning Rate:** Not Applicable.  
**Auto Ignition Temperature:** Not Applicable.  
**LEL:** Not Applicable.  
**UEL:** Not Applicable.  
**Flammability Classification:** Not Flammable.  
**Extinguishing Media:** Use extinguishing agent appropriate for surrounding fire conditions.  
**Unusual Fire or Explosion Hazards:** None indicated.  
**Hazardous Combustion Product:** May release hazardous gas.  
**Fire-Fighting Instructions:** Do not release runoff from fire control methods to sewers or





## Safety Data Sheet SODIUM BISULFITE

### Fire-Fighting Equipment:

waterways.  
Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full face piece operated in pressure-demand or positive- pressure mode.

### Section 6 - Accidental Release Measures

#### Spill / Leak Procedures: Small Spills / Leaks:

Wear appropriate PPE - See Section 8.  
Spills can be neutralized with an alkaline material such as caustic soda. Leaks may be located by spraying the area with ammonium hydroxide solution which forms a white fume in the presence of sulfur dioxide.

#### Large Spills / Leaks: Containment:

Large spills should be handled according to a predetermined plan. For large spills, dike far ahead of contaminated runoff for later disposal.

### Section 7 - Handling and Storage

#### Handling Precautions: Storage Requirements:

Avoid contact with product. Do not breathe dust or vapor.  
Store in areas, away from heat and moisture and protect from *physical* damage. Segregate from acids and oxidizers.

### Section 8 - Exposure Controls / Personal Protection:

**Component:** Sodium Bisulfite

**CAS Number:** 007631-90-5

#### ACGIH (TLV)

**TWA:** 5 mg/m<sup>3</sup>

#### OSHA (PEL)

**TWA:** 5 mg/m<sup>3</sup>

#### NIOSH (REL)

**TWA:** 5 mg/m<sup>3</sup>

**IDLH** – None established

**IDLH** - Immediately Dangerous to Life or Health

**PEL** – Permissible Exposure Limit

**REL** – Recommended Exposure Limit

**TLV** – Threshold Limit Value

**ACGIH** – American Conference of Governmental Industrial Hygienists

**TWA** – Time Weighted Average based on 8 hour exposure days and a 40 hour week.

#### **Ventilation:**

Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA limits (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at the source.

#### **Respiratory Protection:**

Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or non-routine operations (cleaning spills, reactor vessels, or storage tanks), wear a SCBA. **Warning! Air-**



## Safety Data Sheet SODIUM BISULFITE

*purifying respirators do not protect workers in oxygen-deficient atmospheres.*

- Protective Clothing / Equipment:** Wear protective gloves, boots, and clothing when necessary to prevent excessive skin contact. Wear protective eyeglasses or goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).
- Safety Stations:** Make emergency eyewash stations, showers, and washing facilities available in the work area.
- Contaminated Equipment:** Remove this material from personal protective equipment as needed. Do not eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before food or beverage consumption.

### Section 9 - Physical and Chemical Properties

<b>Physical State:</b>	Liquid	<b>Water Solubility:</b>	NA
<b>Appearance:</b>	Yellow	<b>Other Solubility:</b>	NA
<b>Odor Threshold:</b>	Pungent SO <sub>2</sub> odor	<b>Boiling Point:</b>	205 °F
<b>Vapor Pressure:</b>	NA	<b>Freezing Point:</b>	26 °F
<b>Vapor Density (Air=1):</b>	NA	<b>Melting Point:</b>	
<b>Formula Weight:</b>	104	<b>Evaporation Rate:</b>	Normal.
<b>Density:</b>	NA	<b>pH:</b>	2.9 – 4.9
<b>Specific Gravity (H<sub>2</sub>O=1):</b>	1.3 - 1.4	<b>% Volatile:</b>	NA

### Section 10 - Stability & Reactivity

- Stability:** Stable under normal conditions.
- Polymerization:** Hazardous polymerization will not occur.
- Chemical Incompatibilities:** Sodium Bisulfite Solutions may release toxic and hazardous fumes of sulfur oxides, including sulfur dioxide. Acute poisoning from sulfur dioxide is rare because the gas is easily detected. It is so irritating that contact cannot be tolerated. Symptoms include coughing, hoarseness, sneezing, tearing, and breathing difficulty. However, workers who cannot escape high accidental exposure may suffer severe pulmonary damage which can be fatal. Contact with powdered potassium, sodium metals, alkali, and oxidizing agents produce violent reactions. Reacts with water and steam to form corrosive sulfurous acid. Reacts with chlorates to form unstable chlorine dioxide.
- Conditions to Avoid:** Avoid excessive heat, or open flame.
- Hazardous Decomposition Products:** May release hazardous sulfur dioxide gas

### Section 11 - Toxicological Information

- Eye Effects (rabbit):** Not available.      **Acute Inhalation Effects (rat):** Not available.
- Skin Effects (rabbit):** Not available.      **Acute Oral Effects (rat):** LD<sub>50</sub> = 2,000 mg/kg
- Carcinogenicity:** IARC, NTP, and OSHA do not list Sodium Bisulfite as a carcinogen.
- Chronic Effects:** Prolonged or repeated exposure may cause dermatitis, and sensitization



## Safety Data Sheet SODIUM BISULFITE

reactions. Exposure to asthmatic, atopic and sulfite sensitive individuals may result in severe bronchioconstriction and reduced levels in forced expiratory volume. Decomposition of sodium bisulfite solutions may release toxic and hazardous fumes of sulfur oxides, including sulfur dioxide, which may cause permanent pulmonary impairments from acute and chronic exposure. The Immediately Dangerous to Life or Health (IDLH) level for SO<sub>2</sub> is 100 ppm.

**Aquatic Toxicity:** The toxicity threshold of Sodium Bisulfite (100 hr. at 23 degrees Celsius) to Daphnia Magna has been reported to be 102 mg/l. In the presence of additional sodium salts, this threshold may be lower. For minnows, exposed for 6 hours to sodium bisulfite solution in distilled water at 19 degrees Celsius it was 60-65 mg/l, and in hard water at 18 degrees Celsius it was 80-85 mg/l.

The 24, 48, and 96 hour LC50 value was 240 mg/l for the mosquito-fish (Gambusia affinis) in turbid water at 17 - 22 degree Celsius.

### Section 12 - Ecological Information

**Ecotoxicity:** Sodium Bisulfite is a non hazardous solution commonly used as a waste water dechlorination agent. High concentrations will contribute to elevated chemical oxygen demand in aquatic environments.

**Environmental Transport:** Soluble in water.

**Environmental Degradation:** Rapid biological decomposition.

**Soil Absorption/Mobility:** Slight.

### Section 13 - Disposal Considerations

**Disposal:** Waste determinations typically consider Sodium Bisulfite contaminated materials to be non-hazardous.

**Disposal Regulatory Requirements:** Follow applicable Federal, state and local regulations.

**Container Cleaning and Disposal:** Follow applicable Federal, state and local regulations.

### Section 14 - Transport Information

**Shipping Name:** Bisulfites, aqueous solutions, n.o.s.  
**Technical Name:** Sodium Bisulfite  
**Shipping Symbols:** Corrosive  
**Hazard Class:** 8 - Corrosive  
**Subsidiary Hazard:** NA  
**ID No. (Placard):** UN2693  
**Packing Group:** III  
**Label:** Required  
**Reputable Quantity:** (RQ) 5,000 Lbs



**Section 15 - Regulatory Information**

**EPA Regulations:**

RCRA Hazardous Waste Classification (40 CFR 261):	Not listed.
RCRA Hazardous Waste Number (40 CFR 261):	Not listed.
CERCLA Hazardous Substance (40 CFR 302.4):	Listed.
CERCLA Reportable Quantity (RQ):	5000 pounds
SARA Title III:	Not listed.
FIFRA:	Not regulated.
TSCA:	Inventory listed chemical; PAIR Reportable; Not listed in Toxic Substances Chemical Index

**OSHA Regulations:**

Air Contaminant (29 CFR 1910.1000):	Not listed.
OSHA Specifically Regulated Substance:	Not listed.

**Other Regulations:**

FDA:	Regulated when used as a food preservative.
Proposition 65 (California):	Not Listed

**Section 16 - Other Information**

This product is NSF certified to NSF/ANSI Standard 60 and is subject to a maximum use limit (MUL) of 46 mg/L for potable water dechlorination applications.

**Previous SDS issue date:** March, 2015

**Current SDS issue date:** May, 2015

**Reason for current revision:** Change in sodium sulfite limit from < 3.5 to < 1.0 % (Section 3).

The information herein is believed to be reliable. However, no warranty, expressed or implied, is made as to its accuracy or completeness and none is made as to the fitness of this material for any purpose. The manufacturer shall not be liable for damages to person or property resulting from its use. Nothing herein shall be construed as a recommendation for use in violation of any patent.

**SAFETY DATA SHEET**  
Sodium Carbonate, Anhydrous

SDS #: 497-19-8  
Revision date: 2015-03-30  
Format: NA  
Version 5



**1. PRODUCT AND COMPANY IDENTIFICATION**

**Product Identifier**

**Product Name** Sodium Carbonate, Anhydrous

**Other means of identification**

**Product Code(s)** 497-19-8

**Synonyms** Sodium carbonate; Carbonic acid, disodium salt; Disodium carbonate

**Chemical Family** Alkali salt

**Recommended use of the chemical and restrictions on use**

**Recommended Use:** Glass manufacture , Personal care, Detergent, Water treatment chemical, Chemical processing

**Restrictions on Use:** See section 16 for more information

**Manufacturer Address**

Tronox Alkali Wyoming Corporation  
1735 Market Street  
Philadelphia, PA 19103  
Tel: +1 877-362-2248 or +1 215-299-6904  
www.tronox.com

**Emergency telephone number**

1 307 / 872 2452 (Plant - Green River, WY)  
1 303/ 389-1409 (Medical - U.S. - Call Collect)

For leak, fire, spill or accident emergencies, call:  
1 800 / 424 9300 (CHEMTREC - U.S.A.)  
1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)

**2. HAZARDS IDENTIFICATION**

**Classification**

**OSHA Regulatory Status**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Serious eye damage/eye irritation	Category 2
-----------------------------------	------------

GHS Label elements, including precautionary statements

## EMERGENCY OVERVIEW

## Warning

Hazard Statements

H319 - Causes serious eye irritation

**Precautionary Statements - Prevention**

P264 - Wash face, hands and any exposed skin thoroughly after handling

P280 - Wear eye protection/ face protection

**Precautionary Statements - Response**

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P337 + P313 - If eye irritation persists: Get medical advice/ attention

Hazards not otherwise classified (HNOC)

No hazards not otherwise classified were identified.

Other Information

May be harmful if swallowed.

**3. COMPOSITION/INFORMATION ON INGREDIENTS****Chemical Family** Alkali salt.  
**Formula** Na<sub>2</sub>CO<sub>3</sub>

Chemical name	CAS-No	Weight %
Sodium carbonate	497-19-8	100

Synonyms are provided in Section 1.

**4. FIRST AID MEASURES**

**Eye Contact** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.

**Skin Contact** Wash off with warm water and soap. Get medical attention if irritation develops and persists. Remove and wash contaminated clothing before re-use.

**Inhalation** Remove person to fresh air. If signs/symptoms continue, get medical attention.

<b>Ingestion</b>	Never give anything by mouth to an unconscious person Get medical attention if symptoms occur
<b>Most important symptoms and effects, both acute and delayed</b>	Causes serious eye damage / eye irritation.
<b>Indication of immediate medical attention and special treatment needed, if necessary</b>	Treat symptomatically.

**5. FIRE-FIGHTING MEASURES**

<b>Suitable Extinguishing Media</b>	Use extinguishing agent suitable for type of surrounding fire.
<b>Specific Hazards Arising from the Chemical</b>	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes
<b>Hazardous Combustion Products</b>	Fumes of sodium oxide. Carbon oxides (COx).
<b><u>Explosion data</u></b>	
<b>Sensitivity to Mechanical Impact</b>	Not sensitive.
<b>Sensitivity to Static Discharge</b>	Not sensitive.
<b>Protective equipment and precautions for firefighters</b>	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

**6. ACCIDENTAL RELEASE MEASURES**

<b>Personal Precautions</b>	Avoid dust formation. Sweep up to prevent slipping hazard.
<b>Other</b>	For further clean-up instructions, call Emergency Hotline number listed in Section 1 "Product and Company Identification" above.
<b>Environmental Precautions</b>	Do not flush into surface water or sanitary sewer system.
<b>Methods for Containment</b>	Prevent large quantities of this product from contacting vegetation or waterways. Cover with plastic sheet to prevent spreading. Pick up and transfer to properly labeled containers. Keep in suitable and closed containers for disposal.
<b>Methods for cleaning up</b>	Pick up and transfer to properly labeled containers. Keep in suitable and closed containers for disposal. Dispose of waste as indicated in Section 13.

**7. HANDLING AND STORAGE**

<b>Handling</b>	Use air conveying/mechanical systems for bulk transfer to storage. Provide appropriate exhaust ventilation at places where dust is formed. In case of insufficient ventilation, wear suitable respiratory equipment if release of airborne dust is expected.
<b>Storage</b>	Store in original container. Keep in properly labeled containers. Keep container tightly closed.
<b>Incompatible products</b>	Aluminium. Powdered aluminum. Acids

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Control parameters**

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies Local nuisance dust standards apply



**Appropriate engineering controls**

**Engineering measures** Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction.

**Individual protection measures, such as personal protective equipment**

**Eye/Face Protection** Tightly fitting safety goggles.

**Skin and Body Protection** Wear suitable protective clothing. Protective shoes or boots.

**Hand Protection** Nitrile rubber, Neoprene gloves

**Respiratory Protection** In case of inadequate ventilation wear respiratory protection.

**Hygiene measures** Handle in accordance with good industrial hygiene and safety practice.

**General information** These recommendations apply to the product as supplied

**9. PHYSICAL AND CHEMICAL PROPERTIES****Information on basic physical and chemical properties**

<b>Appearance</b>	Granules
<b>Physical State</b>	Solid
<b>Color</b>	White
<b>Odor</b>	odorless
<b>Odor threshold</b>	Not applicable
<b>pH</b>	11.4 (1% solution in water)
<b>Melting point/freezing point</b>	851 °C
<b>Boiling Point/Range</b>	No information available
<b>Flash point</b>	Not applicable
<b>Evaporation Rate</b>	No information available
<b>Flammability (solid, gas)</b>	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes
<b>Flammability Limit in Air</b>	
<b>Upper flammability limit:</b>	No information available
<b>Lower flammability limit:</b>	No information available
<b>Vapor pressure</b>	No information available
<b>Vapor density</b>	No information available
<b>Density</b>	No information available
<b>Specific gravity</b>	2.52
<b>Water solubility</b>	212.5 g/L @ 20 °C
<b>Solubility in other solvents</b>	No information available
<b>Partition coefficient</b>	No information available
<b>Autoignition temperature</b>	No information available
<b>Decomposition temperature</b>	400 °C
<b>Viscosity, kinematic</b>	No information available
<b>Viscosity, dynamic</b>	No information available
<b>Explosive properties</b>	Not explosive
<b>Oxidizing properties</b>	Non-oxidizing
<b>Molecular weight</b>	105.99
<b>Bulk density</b>	0.86 - 1.12 g/cm <sup>3</sup> (Dense grades) 0.70 - 0.90 g/cm <sup>3</sup> (Light Grades)
<b>K<sub>st</sub></b>	0 bar m/s

**10. STABILITY AND REACTIVITY**

**Reactivity** None under normal use conditions.

**Chemical Stability** Stable. Decomposes by reaction with strong acid.

## Sodium Carbonate, Anhydrous

SDS #: 497-19-8  
Revision date: 2015-03-30  
Version 5

**Possibility of Hazardous Reactions** None under normal processing.

**Hazardous polymerization** Hazardous polymerization does not occur.

**Conditions to avoid** Exposure to air or moisture over prolonged periods.

**Incompatible materials** Aluminium. Powdered aluminum. Acids.

**Hazardous Decomposition Products** Sodium oxides. Carbon oxides (COx).

### 11. TOXICOLOGICAL INFORMATION

#### Product Information

**LD50 Oral** 2,800 mg/kg (rat)  
**LD50 Dermal** > 2,000 mg/kg (rabbit)  
**LC50 Inhalation** 2.3 mg/L (rat)

**Eye Contact** Irritating to eyes.  
**Skin Contact** Non-irritating  
**Sensitization** Patch test on human volunteers did not demonstrate sensitization properties.

#### Information on toxicological effects

**Symptoms** No information available.

#### Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Chronic toxicity** No known effect.  
**Mutagenicity** No information available  
**Carcinogenicity** Not recognized as carcinogenic by Research Agencies (IARC, NTP, OSHA, ACGIH).  
**Reproductive toxicity** No information available.  
**STOT - single exposure** No information available.  
**STOT - repeated exposure** No information available.  
**Aspiration hazard** No information available.

### 12. ECOLOGICAL INFORMATION

#### Ecotoxicity

Sodium carbonate (497-19-8)				
Active Ingredient(s)	Duration	Species	Value	Units
Sodium Carbonate	96 h LC50	Bluegill sunfish	300	mg/L
Sodium Carbonate	48 h EC50	Ceriodaphnia	200-227	mg/L

**Persistence and degradability** Biodegradability does not pertain to inorganic substances.

**Bioaccumulation** Does not bioaccumulate.

**Mobility** Dissociates into ions.

**Other Adverse Effects** None known.

### 13. DISPOSAL CONSIDERATIONS

# Sodium Carbonate, Anhydrous

SDS #: 497-19-8  
Revision date: 2015-03-30  
Version 5

**Waste disposal methods** This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). Dispose of in accordance with local regulations.

**Contaminated Packaging** Dispose of in accordance with local regulations.

## 14. TRANSPORT INFORMATION

DOT NOT REGULATED

TDG NOT REGULATED

ICAO/IATA NOT REGULATED

IMDG/IMO NOT REGULATED

## 15. REGULATORY INFORMATION

### U.S. Federal Regulations

#### SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

#### SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic health hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

#### Clean Water Act

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

#### CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

### US State Regulations

#### California Proposition 65

This product does not contain any Proposition 65 chemicals.

#### U.S. State Right-to-Know Regulations

This product does not contain any substances regulated by state right-to-know regulations

### International Inventories

Component	TSCA (United States)	DSL (Canada)	EINECS/ELI NCS (Europe)	ENCS (Japan)	China (IECSC)	KECL (Korea)	PICCS (Philippines)	AICS (Australia)
Sodium carbonate 497-19-8 ( 100 )	X	X	X	X	X	X	X	X

# Sodium Carbonate, Anhydrous

SDS #: 497-19-8  
Revision date: 2015-03-30  
Version 5

Mexico - Grade Moderate risk, Grade 2

WHMIS Hazard Class D2B - Toxic materials, Eye irritation  
Class E : Corrosive to aluminum. Not corrosive to animal skin or carbon steel.



D2B - Toxic



E - Corrosive

## 16. OTHER INFORMATION

NFPA	Health Hazards 2	Flammability 0	Instability 0	Special Hazards -
HMIS	Health Hazards 2	Flammability 0	Physical hazard 0	Personal Protection X

NFPA/HMIS Ratings Legend Severe = 4; Serious = 3; Moderate = 2; Slight = 1; Minimal = 0

### Product Certifications

This product meets the chemical testing specifications defined in the Food Chemicals Codex (FCC), 8th Edition.

This product is certified to NSF/ANSI Standard 60 for use in drinking water treatment at the specified maximum use limit. The MUL (maximum use level) for sodium carbonate, anhydrous is 150 mg/L under NSF/ANSI Standard 60.



OU Kasher Certification



# American Water Works Association

Revision date: 2015-03-30  
Revision note: Minor change

### Disclaimer

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Prepared By:

Tronox Limited

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**End of Safety Data Sheet**

**SAFETY DATA SHEET**  
Sodium Carbonate, Anhydrous

SDS #: 497-19-8  
Revision date: 2015-03-30  
Format: NA  
Version 5



**1. PRODUCT AND COMPANY IDENTIFICATION**

**Product Identifier**

**Product Name** Sodium Carbonate, Anhydrous

**Other means of identification**

**Product Code(s)** 497-19-8

**Synonyms** Sodium carbonate; Carbonic acid, disodium salt; Disodium carbonate

**Chemical Family** Alkali salt

**Recommended use of the chemical and restrictions on use**

**Recommended Use:** Glass manufacture , Personal care, Detergent, Water treatment chemical, Chemical processing

**Restrictions on Use:** See section 16 for more information

**Manufacturer Address**

Tronox Alkali Wyoming Corporation  
1735 Market Street  
Philadelphia, PA 19103  
Tel: +1 877-362-2248 or +1 215-299-6904  
www.tronox.com

**Emergency telephone number**

1 307 / 872 2452 (Plant - Green River, WY)  
1 303/ 389-1409 (Medical - U.S. - Call Collect)

For leak, fire, spill or accident emergencies, call:  
1 800 / 424 9300 (CHEMTREC - U.S.A.)  
1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)

**2. HAZARDS IDENTIFICATION**

**Classification**

**OSHA Regulatory Status**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Serious eye damage/eye irritation	Category 2
-----------------------------------	------------

GHS Label elements, including precautionary statements

## EMERGENCY OVERVIEW

## Warning

Hazard Statements

H319 - Causes serious eye irritation

**Precautionary Statements - Prevention**

P264 - Wash face, hands and any exposed skin thoroughly after handling

P280 - Wear eye protection/ face protection

**Precautionary Statements - Response**

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P337 + P313 - If eye irritation persists: Get medical advice/ attention

Hazards not otherwise classified (HNOC)

No hazards not otherwise classified were identified.

Other Information

May be harmful if swallowed.

**3. COMPOSITION/INFORMATION ON INGREDIENTS****Chemical Family** Alkali salt.  
**Formula** Na<sub>2</sub>CO<sub>3</sub>

Chemical name	CAS-No	Weight %
Sodium carbonate	497-19-8	100

Synonyms are provided in Section 1.

**4. FIRST AID MEASURES**

**Eye Contact** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.

**Skin Contact** Wash off with warm water and soap. Get medical attention if irritation develops and persists. Remove and wash contaminated clothing before re-use.

**Inhalation** Remove person to fresh air. If signs/symptoms continue, get medical attention.

<b>Ingestion</b>	Never give anything by mouth to an unconscious person Get medical attention if symptoms occur
<b>Most important symptoms and effects, both acute and delayed</b>	Causes serious eye damage / eye irritation.
<b>Indication of immediate medical attention and special treatment needed, if necessary</b>	Treat symptomatically.

**5. FIRE-FIGHTING MEASURES**

<b>Suitable Extinguishing Media</b>	Use extinguishing agent suitable for type of surrounding fire.
<b>Specific Hazards Arising from the Chemical</b>	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes
<b>Hazardous Combustion Products</b>	Fumes of sodium oxide. Carbon oxides (COx).
<b><u>Explosion data</u></b>	
<b>Sensitivity to Mechanical Impact</b>	Not sensitive.
<b>Sensitivity to Static Discharge</b>	Not sensitive.
<b>Protective equipment and precautions for firefighters</b>	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

**6. ACCIDENTAL RELEASE MEASURES**

<b>Personal Precautions</b>	Avoid dust formation. Sweep up to prevent slipping hazard.
<b>Other</b>	For further clean-up instructions, call Emergency Hotline number listed in Section 1 "Product and Company Identification" above.
<b>Environmental Precautions</b>	Do not flush into surface water or sanitary sewer system.
<b>Methods for Containment</b>	Prevent large quantities of this product from contacting vegetation or waterways. Cover with plastic sheet to prevent spreading. Pick up and transfer to properly labeled containers. Keep in suitable and closed containers for disposal.
<b>Methods for cleaning up</b>	Pick up and transfer to properly labeled containers. Keep in suitable and closed containers for disposal. Dispose of waste as indicated in Section 13.

**7. HANDLING AND STORAGE**

<b>Handling</b>	Use air conveying/mechanical systems for bulk transfer to storage. Provide appropriate exhaust ventilation at places where dust is formed. In case of insufficient ventilation, wear suitable respiratory equipment if release of airborne dust is expected.
<b>Storage</b>	Store in original container. Keep in properly labeled containers. Keep container tightly closed.
<b>Incompatible products</b>	Aluminium. Powdered aluminum. Acids

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Control parameters**

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies Local nuisance dust standards apply



**Appropriate engineering controls**

**Engineering measures** Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction.

**Individual protection measures, such as personal protective equipment**

**Eye/Face Protection** Tightly fitting safety goggles.

**Skin and Body Protection** Wear suitable protective clothing. Protective shoes or boots.

**Hand Protection** Nitrile rubber, Neoprene gloves

**Respiratory Protection** In case of inadequate ventilation wear respiratory protection.

**Hygiene measures** Handle in accordance with good industrial hygiene and safety practice.

**General information** These recommendations apply to the product as supplied

**9. PHYSICAL AND CHEMICAL PROPERTIES****Information on basic physical and chemical properties**

<b>Appearance</b>	Granules
<b>Physical State</b>	Solid
<b>Color</b>	White
<b>Odor</b>	odorless
<b>Odor threshold</b>	Not applicable
<b>pH</b>	11.4 (1% solution in water)
<b>Melting point/freezing point</b>	851 °C
<b>Boiling Point/Range</b>	No information available
<b>Flash point</b>	Not applicable
<b>Evaporation Rate</b>	No information available
<b>Flammability (solid, gas)</b>	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes
<b>Flammability Limit in Air</b>	
<b>Upper flammability limit:</b>	No information available
<b>Lower flammability limit:</b>	No information available
<b>Vapor pressure</b>	No information available
<b>Vapor density</b>	No information available
<b>Density</b>	No information available
<b>Specific gravity</b>	2.52
<b>Water solubility</b>	212.5 g/L @ 20 °C
<b>Solubility in other solvents</b>	No information available
<b>Partition coefficient</b>	No information available
<b>Autoignition temperature</b>	No information available
<b>Decomposition temperature</b>	400 °C
<b>Viscosity, kinematic</b>	No information available
<b>Viscosity, dynamic</b>	No information available
<b>Explosive properties</b>	Not explosive
<b>Oxidizing properties</b>	Non-oxidizing
<b>Molecular weight</b>	105.99
<b>Bulk density</b>	0.86 - 1.12 g/cm <sup>3</sup> (Dense grades) 0.70 - 0.90 g/cm <sup>3</sup> (Light Grades)
<b>K<sub>st</sub></b>	0 bar m/s

**10. STABILITY AND REACTIVITY**

**Reactivity** None under normal use conditions.

**Chemical Stability** Stable. Decomposes by reaction with strong acid.

## Sodium Carbonate, Anhydrous

SDS #: 497-19-8  
Revision date: 2015-03-30  
Version 5

**Possibility of Hazardous Reactions** None under normal processing.

**Hazardous polymerization** Hazardous polymerization does not occur.

**Conditions to avoid** Exposure to air or moisture over prolonged periods.

**Incompatible materials** Aluminium. Powdered aluminum. Acids.

**Hazardous Decomposition Products** Sodium oxides. Carbon oxides (COx).

### 11. TOXICOLOGICAL INFORMATION

#### Product Information

**LD50 Oral** 2,800 mg/kg (rat)  
**LD50 Dermal** > 2,000 mg/kg (rabbit)  
**LC50 Inhalation** 2.3 mg/L (rat)

**Eye Contact** Irritating to eyes.  
**Skin Contact** Non-irritating  
**Sensitization** Patch test on human volunteers did not demonstrate sensitization properties.

#### Information on toxicological effects

**Symptoms** No information available.

#### Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Chronic toxicity** No known effect.  
**Mutagenicity** No information available  
**Carcinogenicity** Not recognized as carcinogenic by Research Agencies (IARC, NTP, OSHA, ACGIH).  
**Reproductive toxicity** No information available.  
**STOT - single exposure** No information available.  
**STOT - repeated exposure** No information available.  
**Aspiration hazard** No information available.

### 12. ECOLOGICAL INFORMATION

#### Ecotoxicity

Sodium carbonate (497-19-8)				
Active Ingredient(s)	Duration	Species	Value	Units
Sodium Carbonate	96 h LC50	Bluegill sunfish	300	mg/L
Sodium Carbonate	48 h EC50	Ceriodaphnia	200-227	mg/L

**Persistence and degradability** Biodegradability does not pertain to inorganic substances.

**Bioaccumulation** Does not bioaccumulate.

**Mobility** Dissociates into ions.

**Other Adverse Effects** None known.

### 13. DISPOSAL CONSIDERATIONS

# Sodium Carbonate, Anhydrous

SDS #: 497-19-8  
Revision date: 2015-03-30  
Version 5

**Waste disposal methods** This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). Dispose of in accordance with local regulations.

**Contaminated Packaging** Dispose of in accordance with local regulations.

## 14. TRANSPORT INFORMATION

**DOT** NOT REGULATED

**TDG** NOT REGULATED

**ICAO/IATA** NOT REGULATED

**IMDG/IMO** NOT REGULATED

## 15. REGULATORY INFORMATION

### U.S. Federal Regulations

#### **SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

#### **SARA 311/312 Hazard Categories**

Acute health hazard	Yes
Chronic health hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

#### **Clean Water Act**

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

#### **CERCLA**

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

### US State Regulations

#### **California Proposition 65**

This product does not contain any Proposition 65 chemicals.

#### **U.S. State Right-to-Know Regulations**

This product does not contain any substances regulated by state right-to-know regulations

### International Inventories

Component	TSCA (United States)	DSL (Canada)	EINECS/ELI NCS (Europe)	ENCS (Japan)	China (IECSC)	KECL (Korea)	PICCS (Philippines)	AICS (Australia)
Sodium carbonate 497-19-8 ( 100 )	X	X	X	X	X	X	X	X

# Sodium Carbonate, Anhydrous

SDS #: 497-19-8  
Revision date: 2015-03-30  
Version 5

Mexico - Grade Moderate risk, Grade 2

WHMIS Hazard Class D2B - Toxic materials, Eye irritation  
Class E : Corrosive to aluminum. Not corrosive to animal skin or carbon steel.



D2B - Toxic



E - Corrosive

## 16. OTHER INFORMATION

NFPA	Health Hazards 2	Flammability 0	Instability 0	Special Hazards -
HMIS	Health Hazards 2	Flammability 0	Physical hazard 0	Personal Protection X

NFPA/HMIS Ratings Legend Severe = 4; Serious = 3; Moderate = 2; Slight = 1; Minimal = 0

### Product Certifications

This product meets the chemical testing specifications defined in the Food Chemicals Codex (FCC), 8th Edition.

This product is certified to NSF/ANSI Standard 60 for use in drinking water treatment at the specified maximum use limit. The MUL (maximum use level) for sodium carbonate, anhydrous is 150 mg/L under NSF/ANSI Standard 60.



OU Kasher Certification



# American Water Works Association

Revision date: 2015-03-30  
Revision note: Minor change

### Disclaimer

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Prepared By:

Tronox Limited

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**End of Safety Data Sheet**



Univar  
3075 Highland Pkwy STE 200  
Downers Grove, IL 60515  
425-889-3400

# SAFETY DATA SHEET

## 1. Identification

**Product identifier:** CAUSTIC SODA 50%

### Other means of identification

**Synonyms:** Sodium Hydroxide

**SDS number:** 000100000088

### Recommended use and restriction on use

**Recommended use:** Not available.

**Restrictions on use:** Not known.

**Emergency telephone number:** For emergency assistance Involving chemicals

call CHEMTREC day or night at: 1-800-424-9300. CHEMTREC INTERNATIONAL Tel# 703-527-3887

## 2. Hazard(s) identification

### Hazard classification

#### Health hazards

Acute toxicity (Oral) Category 4

Skin corrosion/irritation Category 1A

Serious eye damage/eye irritation Category 1

**Environmental hazards** Acute hazards to the aquatic environment Category 3

### Label elements

#### Hazard symbol



---

<b>Signal word</b>	Danger
<b>Hazard statement</b>	Corrosive. Harmful if swallowed. Causes severe skin burns and eye damage.
<b>Precautionary statement</b>	
<b>Prevention</b>	Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Do not breathe dust or mists. Wear protective gloves/protective clothing/eye protection/face protection.
<b>Response</b>	IF INHALED: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. IF SWALLOWED: Call a POISON CENTER/doctor/ if you feel unwell. Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER/doctor. Specific treatment (see this label). Wash contaminated clothing before reuse.
<b>Storage</b>	Store in a closed container. Keep container tightly closed. Store in a well-ventilated place. Store in a dry place. Store locked up.
<b>Disposal</b>	Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.
<b>Other hazards which do not result in GHS classification</b>	None.

### 3. Composition/information on ingredients

#### Substances

Chemical identity	Common name and synonyms	CAS number	Content in percent (%)*
Sodium hydroxide		1310-73-2	>=48 - <=52%
Water		7732-18-5	>=48 - <=52%
Sodium Chloride		7647-14-5	>=0 - <=5%

\* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

### 4. First-aid measures

<b>General information:</b>	CAUTION! First aid personnel must be aware of own risk during rescue!
<b>Ingestion:</b>	Do NOT induce vomiting. Never give liquid to an unconscious person. Get medical attention immediately.
<b>Inhalation:</b>	Move to fresh air. If breathing is difficult, give oxygen. Perform artificial respiration if breathing has stopped. Get medical attention immediately.
<b>Skin contact:</b>	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
<b>Eye contact:</b>	If in eyes, hold eyes open, flood with water for at least 15 minutes and see a doctor.
<b>Most important symptoms/effects, acute and delayed</b>	
<b>Symptoms:</b>	No data available.

#### Indication of immediate medical attention and special treatment needed

**Treatment:** No data available.

### 5. Fire-fighting measures

<b>General fire hazards:</b>	No data available.
<b>Suitable (and unsuitable) extinguishing media</b>	
<b>Suitable extinguishing media:</b>	Use: Powder. In case of fire in the surroundings: all extinguishing agents allowed.
<b>Unsuitable extinguishing media:</b>	No data available.



**Specific hazards arising from the chemical:** No data available.

**Special protective equipment and precautions for firefighters**

**Special fire fighting procedures:** No data available.

**Special protective equipment for fire-fighters:** No data available.

## 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures:** Use personal protective equipment. Keep unauthorized personnel away.

**Methods and material for containment and cleaning up:** Absorb spillage with non-combustible, absorbent material. Dike for later disposal.

## 7. Handling and storage

**Precautions for safe handling:** Use personal protective equipment as required. Use only with adequate ventilation. Container must be kept tightly closed.

**Conditions for safe storage, including any incompatibilities:** No data available.

**8. Exposure controls/personal protection**

**Control parameters**

**Occupational exposure limits**

Chemical identity	Type	Exposure Limit values	Source
Sodium hydroxide	Ceiling	2 mg/m3	US. ACGIH Threshold Limit Values (03 2013)
	Ceil_Tim e	2 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	PEL	2 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	Ceiling	2 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	Ceiling	2 mg/m3	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)
Sodium hydroxide - Particulate.	ST ESL	20 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (02 2013)
	AN ESL	2 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (02 2013)
Sodium hydroxide	Ceiling	2 mg/m3	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (02 2012)

**Appropriate engineering controls** No data available.

**Individual protection measures, such as personal protective equipment**

**General information:** Use personal protective equipment as required. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing to remove contaminants. Discard contaminated footwear that cannot be cleaned. Practice good housekeeping.

**Eye/face protection:** Use personal protective equipment as required. Wear goggles/face shield.

**Skin protection**

**Hand protection:** No data available.

**Other:** No data available.

**Respiratory protection:** No data available.  
**Hygiene measures:** No data available.

## 9. Physical and chemical properties

**Physical state:** Liquid

**Form:** No data available.

**Color:** No data available.

**Odor:** No data available.

**Odor threshold:** No data available.

**pH:** 14

**Melting point/freezing point:** -12 - 10 °C

**Initial boiling point and boiling range:** 105 - 140 °C

**Flash Point:** No data available.

**Evaporation rate:** No data available.

**Flammability (solid, gas):** No data available.

**Upper/lower limit on flammability or explosive limits**

**Flammability limit - upper (%):** No data available.

**Flammability limit - lower (%):** No data available.

**Explosive limit - upper (%):** No data available.

**Explosive limit - lower (%):** No data available.

**Vapor pressure:** No data available.

**Vapor density:** No data available.

**Relative density:** No data available.

**Solubility(ies)**

**Solubility in water:** No data available.

**Solubility (other):** No data available.

**Partition coefficient (n-octanol/water):** No data available.

**Auto-ignition temperature:** No data available.

**Decomposition temperature:** No data available.

**Viscosity:** No data available.

## 10. Stability and reactivity

<b>Reactivity:</b>	No data available.
<b>Chemical stability:</b>	No data available.
<b>Possibility of hazardous reactions:</b>	No data available.
<b>Conditions to avoid:</b>	No data available.
<b>Incompatible materials:</b>	No data available.
<b>Hazardous decomposition products:</b>	No data available.

## 11. Toxicological information

### Symptoms related to the physical, chemical and toxicological characteristics

<b>Ingestion:</b>	No data available.
<b>Inhalation:</b>	No data available.
<b>Skin contact:</b>	No data available.
<b>Eye contact:</b>	No data available.

### Information on toxicological effects

#### Acute toxicity (list all possible routes of exposure)

##### Oral

**Product:** ATEmix (): 353.488372 mg/kg

##### Dermal

**Product:**

Not classified for acute toxicity based on available data.

##### Inhalation

**Product:** No data available.

#### Specified substance(s):

Sodium Chloride LC 50 (Rat, ): > 42 mg/l 2 (reliable with restrictions)

#### Repeated dose toxicity

**Product:** No data available.

#### Skin corrosion/irritation

**Product:** No data available.

#### Serious eye damage/eye irritation

**Product:** No data available.

#### Respiratory or skin sensitization

**Product:** No data available.

#### Carcinogenicity

**Product:** No data available.

**IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:**

No carcinogenic components identified

**US. National Toxicology Program (NTP) Report on Carcinogens:**

No carcinogenic components identified

**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):**

No carcinogenic components identified

**Germ cell mutagenicity**

**In vitro**

**Product:** No data available.

**In vivo**

**Product:** No data available.

**Reproductive toxicity**

**Product:** No data available.

**Specific target organ toxicity - single exposure**

**Product:** No data available.

**Specific target organ toxicity - repeated exposure**

**Product:** No data available.

**Aspiration hazard**

**Product:** No data available.

**Other effects:** No data available.

**12. Ecological information**

**Ecotoxicity:**

**Acute hazards to the aquatic environment:**

**Fish**

**Product:** No data available.

**Specified substance(s):**

Sodium hydroxide LC 50 (Western mosquitofish (*Gambusia affinis*), 24 h): 125 mg/l Mortality  
LC 50 (Guppy (*Poecilia reticulata*), 24 h): 145 mg/l Mortality LC 50 (Goldfish (*Carassius auratus*), 24 h): 160 mg/l Mortality LC 50 (Bony fish superclass (*Osteichthyes*), 48 h): 33 - 100 mg/l Mortality LC 50 (Western mosquitofish (*Gambusia affinis*), 48 h): 125 mg/l Mortality

**Aquatic invertebrates**

**Product:** No data available.

**Specified substance(s):**

Sodium hydroxide EC 50 (Water flea (*Ceriodaphnia dubia*), 48 h): 34.59 - 47.13 mg/l  
Intoxication LC 50 (Common shrimp, sand shrimp (*Crangon crangon*), 48 h): 33 - 100 mg/l Mortality LC 50 (Cockle (*Cerastoderma edule*), 48 h): 330 -

1,000 mg/l Mortality

**Chronic hazards to the aquatic environment:**

**Fish**

**Product:** No data available.

**Aquatic invertebrates**

**Product:** No data available.

**Toxicity to Aquatic Plants**

**Product:** No data available.

**Persistence and degradability**

**Biodegradation**

**Product:** No data available.

**BOD/COD ratio**

**Product:** No data available.

**Bioaccumulative potential**

**Bioconcentration factor (BCF)**

**Product:** No data available.

**Partition coefficient n-octanol / water (log Kow)**

**Product:** No data available.

**Mobility in soil:**

No data available.

**Known or predicted distribution to environmental compartments**

Sodium hydroxide No data available.

Water No data available.

Sodium chloride No data available.

**Known or predicted distribution to environmental compartments**

Water No data available.

**13. Disposal considerations**

**Disposal instructions:** No data available.

**Contaminated packaging:** No data available.

**14. Transport information**

**DOT**

UN number: UN 1824  
UN proper shipping name: Sodium hydroxide solution  
Transport hazard class(es)  
Class: 8  
Label(s): 8  
Packing group: II  
Marine Pollutant: Not regulated.

Special precautions for user: –

**IMDG**

UN number: UN 1824  
UN proper shipping name: SODIUM HYDROXIDE SOLUTION  
Transport hazard class(es)  
Class: 8  
Label(s): 8  
EmS No.: F-A, S-B  
Packing group: II  
Marine Pollutant: Not regulated.  
Special precautions for user: –

**IATA**

UN number: UN 1824  
Proper Shipping Name: Sodium hydroxide solution  
Transport hazard class(es):  
Class: 8  
Label(s): 8  
Packing group: II  
Environmental hazards: Not regulated.  
Special precautions for user: –  
Other information  
Passenger and cargo aircraft: Allowed.  
Cargo aircraft only: Allowed.

**15. Regulatory information**

**US federal regulations US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

None present or none present in regulated quantities.

**CERCLA Hazardous Substance List (40 CFR 302.4):**

Sodium hydroxide Reportable quantity: 1000 lbs.

**Superfund amendments and reauthorization act of 1986 (SARA)**

**Hazard categories**

Not listed.



**SARA 302 Extremely hazardous substance**

None present or none present in regulated quantities.

**SARA 304 Emergency release notification**

<b>Chemical identity</b>	<b>RQ</b>
Sodium hydroxide	1000 lbs.

**SARA 311/312 Hazardous chemical**

<b>Chemical identity</b>	<b>Threshold Planning Quantity</b>
Sodium hydroxide	500 lbs
Sodium Chloride	500 lbs

**SARA 313 (TRI reporting)**

None present or none present in regulated quantities.

**Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)**

Sodium hydroxide Reportable quantity: 1000 lbs.

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):**

None present or none present in regulated quantities.

**US state regulations**

**US. California Proposition 65**

No ingredient regulated by CA Prop 65 present.

**US. New Jersey Worker and Community Right-to-Know Act**

Sodium hydroxide Listed

**US. Massachusetts RTK - Substance List**

Sodium hydroxide Listed

**US. Pennsylvania RTK - Hazardous Substances**

Sodium hydroxide Listed

**US. Rhode Island RTK**

Sodium hydroxide Listed

<b>Inventory Status:</b> Australia AICS:	Not in compliance with the inventory.
Canada DSL Inventory List:	Not in compliance with the inventory.
EU EINECS List:	Not in compliance with the inventory.
EU ELINCS List:	Not in compliance with the inventory.
Japan (ENCS) List:	Not in compliance with the inventory.
EU No Longer Polymers List:	Not in compliance with the inventory.
China Inv. Existing Chemical Substances:	Not in compliance with the inventory.
Korea Existing Chemicals Inv. (KECI):	Not in compliance with the inventory.
Canada NDSL Inventory:	Not in compliance with the inventory.
Philippines PICCS:	Not in compliance with the inventory.
US TSCA Inventory:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	Not in compliance with the inventory.
Japan ISHL Listing:	Not in compliance with the inventory.
Japan Pharmacopoeia Listing:	Not in compliance with the inventory.

**16. Other information, including date of preparation or last revision**

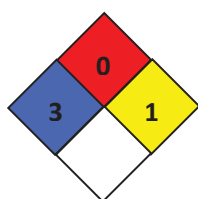
**HMIS Hazard ID**

<b>Health</b>	*	<b>3</b>
<b>Flammability</b>	<b>0</b>	
<b>Physical hazards</b>	<b>1</b>	
<b>PERSONAL PROTECTION</b>		<b>B</b>

B - Safety Glasses & Gloves

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe; \*Chronic health effect

**NFPA Hazard ID**



	Flammability
	Health
	Reactivity
	Special hazard.

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

<b>Issue date:</b>	04/29/2015
<b>Revision date:</b>	No data available.
<b>Version #:</b>	1.2
<b>Further information:</b>	No data available.





## SAFETY DATA SHEET

### Sodium Hypochlorite

#### 1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

PRODUCT NAME	Sodium Hypochlorite
SYNONYMS, TRADE NAMES	Bleach, , Hypo, , Everchlor, , Chloros, , Hispec, , Bridos, , Bleacol, , Vo-redox 9110,
SUPPLIER	UNIVAR LTD 46 Peckover Street BRADFORD West Yorkshire United Kingdom BD1 5BD Tel: +44 1274 377000 Fax: +44 1274 377001 sds@univareurope.com
SDS No.	S024
Emergency Contact Number (Office Hours)	+441274 377070
Emergency Contact Number (Outside Office Hours)	+441865 407333

#### 2 HAZARDS IDENTIFICATION

Causes burns. Contact with acids liberates toxic gas.

CLASSIFICATION C;R34. R31.

#### 3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content	Classification
SODIUM HYPOCHLORITE SOLUTION, ... % Cl ACTIVE	231-668-3	7681-52-9	10-25%	C;R34 R31 N;R50

The Full Text for all R-Phrases are Displayed in Section 16

#### 4 FIRST-AID MEASURES

##### INHALATION

Remove victim immediately from source of exposure. Keep the affected person warm and at rest. Get prompt medical attention.

##### INGESTION

NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Rinse mouth thoroughly. Get medical attention immediately!

##### SKIN CONTACT

Remove affected person from source of contamination. Remove contaminated clothing. Wash the skin immediately with soap and water. Get medical attention promptly if symptoms occur after washing.

##### EYE CONTACT

Remove victim immediately from source of exposure. Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention immediately. Continue to rinse.

#### 5 FIRE-FIGHTING MEASURES

##### EXTINGUISHING MEDIA

This product is not flammable. Use fire-extinguishing media appropriate for surrounding materials.

REVISION DATE: 9th August 2007

## Sodium Hypochlorite

### SPECIFIC HAZARDS

Chlorine. Oxygen.

### PROTECTIVE MEASURES IN FIRE

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

## 6 ACCIDENTAL RELEASE MEASURES

### PERSONAL PRECAUTIONS

Wear protective clothing as described in Section 8 of this safety data sheet.

### ENVIRONMENTAL PRECAUTIONS

Do not allow ANY environmental contamination. Spillages or uncontrolled discharges into watercourses must be IMMEDIATELY alerted to the Environmental Agency or other appropriate regulatory body.

### SPILL CLEAN UP METHODS

DO NOT TOUCH SPILLED MATERIAL! Stop leak if possible without risk. Absorb in vermiculite, dry sand or earth and place into containers. Flush with plenty of water to clean spillage area.

## 7 HANDLING AND STORAGE

### USAGE PRECAUTIONS

Avoid spilling, skin and eye contact.

### STORAGE PRECAUTIONS

Store in tightly closed original container in a dry, cool and well-ventilated place. Keep in original container.

### STORAGE CLASS

Corrosive storage.

## 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

### INGREDIENT COMMENTS

WEL = Workplace Exposure Limits

### PROTECTIVE EQUIPMENT



### PROCESS CONDITIONS

Provide eyewash, quick drench.

### ENGINEERING MEASURES

Provide adequate ventilation. Observe Workplace Exposure Limits and minimise the risk of inhalation of vapours.

### RESPIRATORY EQUIPMENT

No specific recommendation made, but respiratory protection may still be required under exceptional circumstances when excessive air contamination exists.

### HAND PROTECTION

Use suitable protective gloves if risk of skin contact.

### EYE PROTECTION

If risk of splashing, wear safety goggles or face shield.

### OTHER PROTECTION

Wear appropriate clothing to prevent any possibility of skin contact.

### HYGIENE MEASURES

DO NOT SMOKE IN WORK AREA! Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes wet or contaminated. Promptly remove any clothing that becomes contaminated. When using do not eat, drink or smoke.

## 9 PHYSICAL AND CHEMICAL PROPERTIES

### APPEARANCE

Liquid

REVISION DATE: 9th August 2007

**Sodium Hypochlorite**

COLOUR	Green yellow		
SOLUBILITY	Completely soluble in water		
BOILING POINT (°C)	>100	MELTING POINT (°C)	-17
RELATIVE DENSITY	1.20 - 1.27	pH-VALUE, CONC. SOLUTION	>12

**10 STABILITY AND REACTIVITY**

## STABILITY

Stable under normal temperature conditions.

## CONDITIONS TO AVOID

Avoid excessive heat for prolonged periods of time. Avoid contact with acids.

## MATERIALS TO AVOID

Strong acids. Ammonia or amines. Hydrocarbons.

## HAZARDOUS DECOMPOSITION PRODUCTS

Fire creates: Chlorine.

**11 TOXICOLOGICAL INFORMATION**

TOXIC DOSE 1 - LD 50                      8910 mg/kg (oral rat)

## INHALATION

May cause damage to mucous membranes in nose, throat, lungs and bronchial system.

## INGESTION

May cause burns in mucous membranes, throat, oesophagus and stomach.

## SKIN CONTACT

May cause serious chemical burns of the skin.

## EYE CONTACT

Causes burns.

**12 ECOLOGICAL INFORMATION**

## MOBILITY

The product is soluble in water.

**13 DISPOSAL CONSIDERATIONS**

## GENERAL INFORMATION

Do not puncture or incinerate even when empty.

## DISPOSAL METHODS

Dispose of waste and residues in accordance with local authority requirements.

**14 TRANSPORT INFORMATION**

UK ROAD CLASS	8		
PROPER SHIPPING NAME	SODIUM HYPOCHLORITE SOLUTION, ... % CI ACTIVE		
UN NO. ROAD	1791	UK ROAD PACK GR.	III
ADR CLASS NO.	8	ADR CLASS	Class 8: Corrosive substances.
ADR PACK GROUP	III	ADR LABEL NO.	8
HAZCHEM CODE	2X	RID CLASS NO.	8

REVISION DATE: 9th August 2007

**Sodium Hypochlorite**

RID PACK GROUP	III	UN NO. SEA	1791
IMDG CLASS	8	IMDG PACK GR.	III
MARINE POLLUTANT	No.	UN NO. AIR	1791
AIR CLASS	8	AIR PACK GR.	III

**15 REGULATORY INFORMATION**

## LABELLING



Corrosive

CONTAINS SODIUM HYPOCHLORITE SOLUTION, ... % CI ACTIVE

## RISK PHRASES

R31 Contact with acids liberates toxic gas.  
R34 Causes burns.

## SAFETY PHRASES

P6 Warning! Do not use with other products. May release dangerous gases (chlorine).  
S1/2 Keep locked up and out of the reach of children.  
S28 After contact with skin, wash immediately with plenty of water.  
S45 In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).  
S50 Do not mix with acid.

## STATUTORY INSTRUMENTS

Chemicals (Hazard Information and Packaging) Regulations.

## APPROVED CODE OF PRACTICE

Safety Data Sheets for Substances and Preparations. Classification and Labelling of Substances and Preparations Dangerous for Supply.

## GUIDANCE NOTES

Workplace Exposure Limits EH40. CHIP for everyone HSG(108).

**16 OTHER INFORMATION**

REVISION DATE 9th August 2007

REV. NO./REPL. SDS GENERATED 07

SDS NO. S024

## SAFETY DATA SHEET STATUS

Approved.

DATE 9th August 2007

SIGNATURE Jitendra Panchal

## RISK PHRASES IN FULL

R31 Contact with acids liberates toxic gas.  
R34 Causes burns.  
R50 Very toxic to aquatic organisms.





**GE Betz**

GE Betz, Inc.  
4636 Somerton Road  
Trevose, PA 19053  
Business telephone: (215) 355-3300

Material Safety Data Sheet

Issue Date: 07-FEB-2006

**EMERGENCY TELEPHONE (Health/Accident): (800) 877-1940**

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## 1 PRODUCT IDENTIFICATION

PRODUCT NAME:

**SPECTRUS BD1500**

PRODUCT APPLICATION AREA:

**WATER-BASED DEPOSIT CONTROL AGENT.**

## 2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

### HAZARDOUS INGREDIENTS:

This product is not hazardous as defined by OSHA regulations.

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

## 3 HAZARDS IDENTIFICATION

\*\*\*\*\*

### EMERGENCY OVERVIEW

#### CAUTION

May cause slight irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard is not applicable  
Emergency Response Guide is not applicable  
Odor: Slight; Appearance: Colorless, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

\*\*\*\*\*

#### POTENTIAL HEALTH EFFECTS

**ACUTE SKIN EFFECTS:**

Primary route of exposure; May cause slight irritation to the skin.

**ACUTE EYE EFFECTS:**

May cause moderate irritation to the eyes.

**ACUTE RESPIRATORY EFFECTS:**

Mists/aerosols may cause irritation to upper respiratory tract.

**INGESTION EFFECTS:**

May cause slight gastrointestinal irritation.

**TARGET ORGANS:**

No evidence of potential chronic effects.

**MEDICAL CONDITIONS AGGRAVATED:**

Not known.

**SYMPTOMS OF EXPOSURE:**

May cause redness or itching of skin.

## 4 FIRST AID MEASURES

**SKIN CONTACT:**

Wash thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

**EYE CONTACT:**

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

**INHALATION:**

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

**INGESTION:**

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

**NOTES TO PHYSICIANS:**

No special instructions

## 5 FIRE FIGHTING MEASURES

**FIRE FIGHTING INSTRUCTIONS:**

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

**EXTINGUISHING MEDIA:**

dry chemical, carbon dioxide, foam or water

**HAZARDOUS DECOMPOSITION PRODUCTS:**

Thermal decomposition (destructive fires) yields elemental oxides.

**FLASH POINT:**

> 200F > 93C SETA(CC)

## 6 ACCIDENTAL RELEASE MEASURES

**PROTECTION AND SPILL CONTAINMENT:**

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

**DISPOSAL INSTRUCTIONS:**

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

**7 HANDLING & STORAGE****HANDLING:**

Alkaline. Do not mix with acidic material.

**STORAGE:**

Keep containers closed when not in use. Reasonable and safe chemical storage.

**8 EXPOSURE CONTROLS / PERSONAL PROTECTION****EXPOSURE LIMITS**

This product is not hazardous as defined by OSHA regulations.

**ENGINEERING CONTROLS:**

adequate ventilation

**PERSONAL PROTECTIVE EQUIPMENT:**

Use protective equipment in accordance with 29CFR 1910 Subpart I

**RESPIRATORY PROTECTION:**

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

**SKIN PROTECTION:**

neoprene gloves-- Wash off after each use. Replace as necessary.

**EYE PROTECTION:**

splash proof chemical goggles

**9 PHYSICAL & CHEMICAL PROPERTIES**

Specific Grav. (70F,21C)	1.020	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	31	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-1		
Viscosity(cps 70F,21C)	30	% Solubility (water)	100.0

Odor	Slight
Appearance	Colorless
Physical State	Liquid
Flash Point	SETA(CC) > 200F > 93C
pH As Is (approx.)	12.5
Evaporation Rate (Ether=1)	< 1.00

NA = not applicable      ND = not determined

## 10 STABILITY & REACTIVITY

### STABILITY:

Stable under normal storage conditions.

### HAZARDOUS POLYMERIZATION:

Will not occur.

### INCOMPATIBILITIES:

May react with strong oxidizers.

### DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

### INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"A"

## 11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT: >2,000 mg/kg  
NOTE - Estimated value  
Dermal LD50 RABBIT: >2,000 mg/kg  
NOTE - Estimated value  
Inhalation LC50 RAT: >20 mg/L/hr  
NOTE - Estimated value

## 12 ECOLOGICAL INFORMATION

### AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Static Acute Bioassay  
0% Mortality= 2000 mg/L  
Fathead Minnow 96 Hour Static Bioassay with 48-Hour Renewal  
0% Mortality= 2000 mg/L  
Menidia beryllina (Silversides) 96 Hour Static Acute Bioassay  
0% Mortality= 5000 mg/L  
Mysid Shrimp 96 Hour Static Acute Bioassay  
25% Mortality= 5000; No Effect Level= 2500 mg/L  
Rainbow Trout 96 Hour Static Renewal Bioassay  
No Effect Level= 3000 mg/L

### BIODEGRADATION

BOD-28 (mg/g): 5  
BOD-5 (mg/g): 4  
COD (mg/g): 341  
TOC (mg/g): 80

## 13 DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :  
D002=Corrosive(pH).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

## 14 TRANSPORT INFORMATION

DOT HAZARD: Not Applicable  
UN / NA NUMBER: Not applicable  
DOT EMERGENCY RESPONSE GUIDE #: Not applicable

## 15 REGULATORY INFORMATION

### TSCA:

All components of this product are listed in the TSCA inventory.

### CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

### FOOD AND DRUG ADMINISTRATION:

21 CFR 176.170 (components of paper and paperboard in contact with aqueous and fatty foods)

### USDA FOOD PLANT APPROVALS:

This product is composed of ingredients previously approved by USDA to meet G5 and G7 classification and may be used in water for cooking/cooling or in boiler or cooling systems with no food contact.

### SARA SECTION 312 HAZARD CLASS:

Product is non-hazardous under Section 311/312

### SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

### SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

### CALIFORNIA REGULATORY INFORMATION

#### CALIFORNIA SAFE DRINKING WATER AND TOXIC

#### ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituents present

### MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

## 16 OTHER INFORMATION

### NFPA/HMIS

### CODE TRANSLATION

Health	1	Slight Hazard
Fire	0	Minimal Hazard
Reactivity	0	Minimal Hazard
Special	ALK	pH above 12.0
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

### CHANGE LOG

	EFFECTIVE		
	DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	14-JUL-1997		** NEW **
	09-SEP-1998	15	14-JUL-1997
	15-SEP-1998	15	09-SEP-1998
	25-JUN-1999	11	15-SEP-1998
	02-APR-2001	12	25-JUN-1999
	25-JUN-2001	15	02-APR-2001
	05-OCT-2001	4, 16	25-JUN-2001
	10-JAN-2002	15	05-OCT-2001
	18-JAN-2002	15	10-JAN-2002
	07-FEB-2006	12	18-JAN-2002



# Material Safety Data Sheet

Issue Date: 29-OCT-2012  
Supercedes: 27-JUL-2011

STEAMATE PAS6074

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## 1 Identification

**Identification of substance or preparation**  
STEAMATE PAS6074

**Product Application Area**  
Steam condensate treatment.

**Company/Undertaking Identification**  
GE Betz, Inc.  
4636 Somerton Road  
Trevose, PA 19053  
T 215 355-3300, F 215 953 5524

**Emergency Telephone**  
(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300    Prepared on: 29-OCT-2012

## 2 Hazard(s) identification

\*\*\*\*\*

### EMERGENCY OVERVIEW

#### DANGER

Corrosive to skin. Absorbed by skin. Potential skin sensitizer.  
Corrosive to the eyes. Irritation of the upper respiratory tract.  
Prolonged exposure may cause dizziness and headache.

DOT hazard: Corrosive to skin, Combustible  
Odor: Amine; Appearance: Colorless To Light Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, or foam--Water spray should be used only to cool fire-exposed containers and disperse vapors.

\*\*\*\*\*

### POTENTIAL HEALTH EFFECTS

#### ACUTE SKIN EFFECTS:

Primary route of exposure; Toxic; Corrosive to skin. Absorbed by skin. Potential skin sensitizer.

#### ACUTE EYE EFFECTS:

Corrosive to the eyes.

#### ACUTE RESPIRATORY EFFECTS:

Primary route of exposure;Irritation of the upper respiratory tract. Prolonged exposure may cause dizziness and headache.

**INGESTION EFFECTS:**

May cause severe irritation or burning of mouth, throat, and gastrointestinal tract with severe chest and abdominal pain, nausea, vomiting, diarrhea, lethargy and collapse. Possible death when ingested in large doses or aspirated.

**TARGET ORGANS:**

Prolonged or repeated exposures may cause toxicity to the liver, kidney, nervous system, and blood, CNS depression and tissue necrosis.

**MEDICAL CONDITIONS AGGRAVATED:**

Pre-existing skin disorders and chronic respiratory disease.

**SYMPTOMS OF EXPOSURE:**

Inhalation may cause irritation of mucous membranes and respiratory tract. Skin contact causes severe irritation or burns.

### 3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

**HAZARDOUS INGREDIENTS:**

Cas#	Chemical Name	Range (w/w%)
108-91-8	CYCLOHEXYLAMINE Flammable; corrosive; Category 2 suspected reproductive toxicant	15-40
110-91-8	MORPHOLINE Flammable liquid; Cat-1B skin corrosive; IARC=3 (carcinogen status not classifiable)	7-13
141-43-5	MONOETHANOLAMINE Combustible; Cat-1B skin corrosive	7-13
7173-62-8	N-9-OCTADECENYL-1,3-PROPANEDIAMINE Corrosive (skin and eyes)	7-13
112-90-3	9-OCTADECEN-1-AMINE, (Z)- Corrosive (skin)	1-5

### 4 First-aid measures

**SKIN CONTACT:**

URGENT! Wash thoroughly with soap and water. Remove contaminated clothing. Get immediate medical attention. Thoroughly wash clothing before reuse.

**EYE CONTACT:**

URGENT! Immediately flush eyes with water for 30 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical

attention.

**INHALATION:**

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.

**INGESTION:**

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Rinse mouth with plenty of water. Dilute contents of stomach using 4-10 fluid ounces (120-300 mL) of milk or water.

**NOTES TO PHYSICIANS:**

Material is corrosive. It may not be advisable to induce vomiting. Possible mucosal damage may contraindicate the use of gastric lavage. Aspiration into the lungs will result in chemical pneumonia and may be fatal.

## 5 Fire-fighting measures

**FIRE FIGHTING INSTRUCTIONS:**

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

**EXTINGUISHING MEDIA:**

dry chemical, carbon dioxide, or foam--Water spray should be used only to cool fire-exposed containers and disperse vapors.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

oxides of carbon and nitrogen, ammonia and volatile amines

**FLASH POINT:**

131F 55C P-M(CC)

## 6 Accidental release measures

**PROTECTION AND SPILL CONTAINMENT:**

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Remove ignition sources. Flush area with water. Spread sand/grit.

**DISPOSAL INSTRUCTIONS:**

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

## 7 Handling and storage

**HANDLING:**

Flammable. Corrosive to skin and eyes. Corrosive to metal.

**STORAGE:**

Store between 40 and 100F ( 4 and 38C). Keep containers closed when not in use. Store in cool ventilated location. Store away from oxidizers. Keep away from flames or sparks. Protect from freezing. If frozen, thaw completely and mix thoroughly prior to use. Avoid atmospheric exposure. Store away from acids.

## 8 Exposure controls / personal protection



## EXPOSURE LIMITS

### CHEMICAL NAME

#### CYCLOHEXYLAMINE

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.  
TLV (ACGIH): TWA = 10 PPM; A4

#### MORPHOLINE

PEL (OSHA): 20 PPM (30PPM-STEL)-SKIN  
TLV (ACGIH): 20 PPM (30PPM-STEL)-SKIN-A4

#### MONOETHANOLAMINE

PEL (OSHA): 3 PPM (6 MG/M3)  
TLV (ACGIH): TWA = 3 PPM; STEL = 6 PPM

#### N-9-OCTADECENYL-1,3-PROPANEDIAMINE

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.  
TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

#### 9-OCTADECEN-1-AMINE, (Z)-

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.  
TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

## 8) EXPOSURE CONTROLS/PERSONAL PROTECTION (continued)

### ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

### PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

#### RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE. USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS. If air-purifying respirator use is appropriate, use organic vapor cartridges and any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.

#### SKIN PROTECTION:

gauntlet-type butyl gloves, chemical resistant apron-- Wash off after each use. Replace as necessary.

#### EYE PROTECTION:

splash proof chemical goggles, face shield

## 9 Physical and chemical properties

Spec. Grav. (70F, 21C)	0.976	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	-4	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-20		
Viscosity(cps 70F, 21C)	24	% Solubility (water)	100.0

Odor		Amine	
Appearance		Colorless To Light Yellow	
Physical State		Liquid	
Flash Point	P-M(CC)	131F	55C
pH As Is (approx.)		> 13.0	
Evaporation Rate (Ether=1)		< 1.00	

Percent VOC: 40.0

NA = not applicable ND = not determined

## 10 Stability and reactivity

### CHEMICAL STABILITY:

Stable under normal storage conditions.

### POSSIBILITY OF HAZARDOUS REACTIONS:

Friction, heat or other sources of ignition may cause a violent reaction releasing heat and toxic fumes. Contact with oxidizers may cause fire or explosion. Contact with strong acids may cause a violent reaction releasing heat.

### INCOMPATIBILITIES:

May react with acids or strong oxidizers.

### DECOMPOSITION PRODUCTS:

oxides of carbon and nitrogen, ammonia and volatile amines

## 11 Toxicological information

Oral LD50 RAT: 560 mg/kg

NOTE - Calculated value

Dermal LD50 RABBIT: 890 mg/kg

NOTE - Calculated value

## 12 Ecological information

### AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Static Renewal Bioassay

LC50= 1.8; No Effect Level= 1 mg/L

Fathead Minnow 96 Hour Static Renewal Bioassay

LC50= 1.3; No Effect Level= 1 mg/L

Rainbow Trout 96 Hour Static Renewal Bioassay

LC50= 1.4; No Effect Level= 1 mg/L

### BIODEGRADATION

No Data Available.

## 13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :  
D001=Ignitable;D002=Corrosive(pH).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

## 14 Transport information

Transportation Hazard: Corrosive to skin, Combustible

DOT: AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.(CYCLOHEXYLAMINE, MORPHOLINE)

8(3), UN2734, PG II  
 DOT EMERGENCY RESPONSE GUIDE #: 132  
 Note: Some containers may be DOT exempt, please check BOL for exact container classification  
 IATA: AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.(CYCLOHEXYLAMINE, MORPHOLINE)  
 8(3), UN2734, PG II  
 IMDG: AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.(CYCLOHEXYLAMINE, MORPHOLINE)  
 8(3), UN2734, PG II

## 15 Regulatory information

### TSCA:

All components of this product are included on or are in compliance with the U.S. TSCA regulations.

### CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

6,185 gallons due to CYCLOHEXYLAMINE;

### NSF Registered and/or meets USDA (according to 1998 Guidelines):

Registration number: Not Registered

### SARA SECTION 312 HAZARD CLASS:

Immediate (acute); Delayed (Chronic); Fire

### SARA SECTION 302 CHEMICALS:

CAS#	CHEMICAL NAME
108-91-8	CYCLOHEXYLAMINE

### SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

### CALIFORNIA REGULATORY INFORMATION

#### CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):

This product contains one or more ingredients known to the state of California to cause cancer and reproductive toxicity.

### MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

## 16 Other information

### HMIS vII

### CODE TRANSLATION

Health	3	Serious Hazard
Fire	2	Moderate Hazard
Reactivity	0	Minimal Hazard
Special	CORR	DOT corrosive
(1) Protective Equipment	D	Goggles, Face Shield, Gloves, Apron

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

### CHANGE LOG

EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
-----	-----	-----

MSDS status: 24-MAR-2011  
27-JUL-2011 14  
29-OCT-2012 12

\*\* NEW \*\*  
24-MAR-2011  
27-JUL-2011

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Product form	: Substance
Substance name	: Sulfuric Acid, ACS
CAS No	: 7664-93-9
Product code	: LC25550
Formula	: H <sub>2</sub> SO <sub>4</sub>
Synonyms	: battery acid / brown acid / brown oil of vitriol / dihydrogen sulfate / dipping acid / electrolyte acid / nordhausen acid / oil of vitriol / sulphuric acid
BIG no	: 14049

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	: Industrial use Laboratory chemical Battery: component
------------------------------	---

#### 1.3. Details of the supplier of the safety data sheet

LabChem Inc  
Jackson's Pointe Commerce Park Building 1000, 1010 Jackson's Pointe Court  
Zelienople, PA 16063 - USA  
T 412-826-5230 - F 724-473-0647  
[info@labchem.com](mailto:info@labchem.com) - [www.labchem.com](http://www.labchem.com)

#### 1.4. Emergency telephone number

Emergency number	: CHEMTREC: 1-800-424-9300 or 011-703-527-3887
------------------	--

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Skin Corr. 1A H314  
Eye Dam. 1 H318

Full text of H-phrases: see section 16

#### 2.2. Label elements

##### GHS-US labelling

Hazard pictograms (GHS-US)



GHS05

Signal word (GHS-US)

: Danger

Hazard statements (GHS-US)

: H314 - Causes severe skin burns and eye damage

Precautionary statements (GHS-US)

: P260 - Do not breathe mist, vapours, spray  
P264 - Wash exposed skin thoroughly after handling  
P280 - Wear protective gloves, protective clothing, eye protection, face protection  
P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting  
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower  
P304+P340 - IF INHALED: remove victim to fresh air and keep at rest in a position comfortable for breathing  
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P310 - Immediately call a POISON CENTER or doctor/physician  
P363 - Wash contaminated clothing before reuse  
P405 - Store locked up  
P501 - Dispose of contents/container to comply with local, state and federal regulations

# Sulfuric Acid, ACS

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 2.3. Other hazards

Other hazards not contributing to the classification : None.

### 2.4. Unknown acute toxicity (GHS-US)

Not applicable

## SECTION 3: Composition/information on ingredients

### 3.1. Substance

Substance type : Mono-constituent

Name	Product identifier	%	GHS-US classification
Sulfuric Acid, ACS (Main constituent)	(CAS No) 7664-93-9	96	Skin Corr. 1A, H314 Eye Dam. 1, H318

Full text of H-phrases: see section 16

### 3.2. Mixture

Not applicable

### 4.1. Description of first aid measures

- First-aid measures general : Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.
- First-aid measures after inhalation : Remove the victim into fresh air. Immediately consult a doctor/medical service.
- First-aid measures after skin contact : Wash immediately with lots of water (15 minutes)/shower. Do not apply (chemical) neutralizing agents. Remove clothing while washing. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage. Consult a doctor/medical service. If burned surface > 10%: take victim to hospital.
- First-aid measures after eye contact : Rinse immediately with plenty of water for 15 minutes. Take victim to an ophthalmologist. Do not apply neutralizing agents.
- First-aid measures after ingestion : Rinse mouth with water. Do not induce vomiting. Do not give activated charcoal. Immediately consult a doctor/medical service. Call Poison Information Centre ([www.big.be/antigif.htm](http://www.big.be/antigif.htm)). Take the container/vomit to the doctor/hospital. Ingestion of large quantities: immediately to hospital. Do not give chemical antidote.

### 4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries after inhalation : Dry/sore throat. Coughing. Irritation of the respiratory tract. Irritation of the nasal mucous membranes. ON CONTINUOUS EXPOSURE/CONTACT: Corrosion of the upper respiratory tract. FOLLOWING SYMPTOMS MAY APPEAR LATER: Possible laryngeal spasm/oedema. Risk of pneumonia. Risk of lung oedema. Respiratory difficulties.
- Symptoms/injuries after skin contact : Caustic burns/corrosion of the skin.
- Symptoms/injuries after eye contact : Corrosion of the eye tissue. Permanent eye damage.
- Symptoms/injuries after ingestion : Nausea. Abdominal pain. Blood in stool. Blood in vomit. Burns to the gastric/intestinal mucosa. AFTER ABSORPTION OF HIGH QUANTITIES: Shock.
- Chronic symptoms : ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Red skin. Dry skin. Itching. Skin rash/inflammation. Affection/dyscolouration of the teeth. Inflammation/damage of the eye tissue.

### 4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Unsuitable extinguishing media : EXTINGUISHING MEDIA FOR SURROUNDING FIRES: Water. Water spray.

### 5.2. Special hazards arising from the substance or mixture

- Fire hazard : DIRECT FIRE HAZARD. Non combustible. INDIRECT FIRE HAZARD. Reactions involving a fire hazard: see "Reactivity Hazard".
- Explosion hazard : INDIRECT EXPLOSION HAZARD. Reactions with explosion hazards: see "Reactivity Hazard".
- Reactivity : Violent exothermic reaction with water (moisture): release of corrosive gases/vapours. Reacts on exposure to water (moisture) with (some) metals: release of highly flammable gases/vapours (hydrogen). On heating/burning: release of toxic and corrosive gases/vapours (sulphur oxides). Reacts violently with (some) bases: heat release resulting in increased fire or explosion risk. Reacts with many compounds e.g.: with (strong) reducers, with organic material and with combustible materials: (increased) risk of fire/explosion.

# Sulfuric Acid, ACS

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 5.3. Advice for firefighters

- Precautionary measures fire : Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: seal off low-lying areas. Exposure to fire/heat: have neighbourhood close doors and windows.
- Firefighting instructions : Cool tanks/drums with water spray/remove them into safety. When cooling/extinguishing: no water in the substance. Dilute toxic gases with water spray.
- Protection during firefighting : Heat/fire exposure: compressed air/oxygen apparatus.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

- Protective equipment : Gloves. Face-shield. Corrosion-proof suit. Large spills/in enclosed spaces: compressed air apparatus. Large spills/in enclosed spaces: gas-tight suit. See "Material-Handling" to select protective clothing.
- Emergency procedures : Mark the danger area. No naked flames. Keep containers closed. Avoid ingress of water in the containers. Wash contaminated clothes. Large spills/in confined spaces: consider evacuation. In case of hazardous reactions: keep upwind. In case of reactivity hazard: consider evacuation.

#### 6.1.2. For emergency responders

- Protective equipment : Equip cleanup crew with proper protection.
- Emergency procedures : Stop leak if safe to do so. Ventilate area.

### 6.2. Environmental precautions

Prevent soil and water pollution. Prevent spreading in sewers.

### 6.3. Methods and material for containment and cleaning up

- For containment : Contain released substance, pump into suitable containers. Consult "Material-handling" to select material of containers. Plug the leak, cut off the supply. Dam up the liquid spill. Hazardous reaction: measure explosive gas-air mixture. Reaction: dilute combustible gas/vapour with water curtain. Take account of toxic/corrosive precipitation water. Heat exposure: dilute toxic gas/vapour with water spray.
- Methods for cleaning up : Take up liquid spill into inert absorbent material, e.g.: dry sand/earth/vermiculite. Scoop absorbed substance into closing containers. Carefully collect the spill/leftovers. Damaged/cooled tanks must be emptied. See "Material-handling" for suitable container materials. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

### 6.4. Reference to other sections

No additional information available

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

- Precautions for safe handling : Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Keep the substance free from contamination. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Never add water to this product. Never dilute by pouring water to the acid. Always add the acid to the water. Keep away from naked flames/heat. Observe very strict hygiene - avoid contact. Keep container tightly closed. Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection.
- Hygiene measures : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product.

### 7.2. Conditions for safe storage, including any incompatibilities

- Incompatible products : Strong bases. metals. combustible materials.
- Heat and ignition sources : KEEP SUBSTANCE AWAY FROM: heat sources.
- Prohibitions on mixed storage : KEEP SUBSTANCE AWAY FROM: combustible materials. reducing agents. (strong) bases. highly flammable materials. metals. cellulosic materials. organic materials. alcohols. amines. water/moisture.
- Storage area : Store in a dry area. Ventilation at floor level. Keep locked up. Provide for a tub to collect spills. Unauthorized persons are not admitted. Meet the legal requirements.
- Special rules on packaging : SPECIAL REQUIREMENTS: closing. dry. clean. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.

# Sulfuric Acid, ACS

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Packaging materials : SUITABLE MATERIAL: stainless steel. carbon steel. polyethylene. polypropylene. glass. stoneware/porcelain. MATERIAL TO AVOID: monel steel. lead. copper. zinc.

### 7.3. Specific end use(s)

No additional information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Sulfuric Acid, ACS (7664-93-9)		
ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup>
OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup>

### 8.2. Exposure controls

Appropriate engineering controls : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Provide adequate general and local exhaust ventilation.

Materials for protective clothing : GIVE EXCELLENT RESISTANCE: butyl rubber. polyethylene. tetrafluoroethylene. GIVE LESS RESISTANCE: neoprene. PVC. viton. GIVE POOR RESISTANCE: natural rubber. nitrile rubber. PVA.

Hand protection : Gloves.

Eye protection : Face shield.

Skin and body protection : Corrosion-proof clothing.

Respiratory protection : Gas mask with filter type E at conc. in air > exposure limit.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state : Liquid

Appearance : Liquid.

Molecular mass : 98.08 g/mol

Colour : Pure substance: colourless;Unpurified: yellow to brown

Odour : Almost odourless

Odour threshold : > 1 mg/m<sup>3</sup>

pH : No data available

Relative evaporation rate (butylacetate=1) : No data available

Melting point : 10 °C

Freezing point : No data available

Boiling point : 288 °C

Flash point : Not applicable

Auto-ignition temperature : No data available

Decomposition temperature : > 340 °C

Flammability (solid, gas) : No data available

Vapour pressure : < 1.0 hPa

Relative vapour density at 20 °C : 3.4

Relative density : 1.8

Density : 1840 kg/m<sup>3</sup>

Solubility : Exothermically soluble in water. Soluble in ethanol.  
Water: Complete

Log Pow : -2.20 (Estimated value)

Log Kow : No data available

Viscosity, kinematic : No data available

Viscosity, dynamic : No data available

Explosive properties : No data available.

Oxidising properties : No data available.

Explosive limits : No data available

### 9.2. Other information

VOC content : Not applicable



# Sulfuric Acid, ACS

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Other properties : Gas/vapour heavier than air at 20°C. Clear. Hygroscopic. Slightly volatile. Substance has acid reaction.

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

Violent exothermic reaction with water (moisture): release of corrosive gases/vapours. Reacts on exposure to water (moisture) with (some) metals: release of highly flammable gases/vapours (hydrogen). On heating/burning: release of toxic and corrosive gases/vapours (sulphur oxides). Reacts violently with (some) bases: heat release resulting in increased fire or explosion risk. Reacts with many compounds e.g.: with (strong) reducers, with organic material and with combustible materials: (increased) risk of fire/explosion.

#### 10.2. Chemical stability

Unstable on exposure to moisture.

#### 10.3. Possibility of hazardous reactions

Reacts violently with water. Reacts violently with (some) bases: release of heat.

#### 10.4. Conditions to avoid

Incompatible materials. Moisture.

#### 10.5. Incompatible materials

Water. Strong bases. Organic compounds. metals. Halogens. cyanides. combustible materials.

#### 10.6. Hazardous decomposition products

Sulfur compounds.

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

Acute toxicity : Not classified

Sulfuric Acid, ACS ( \f )7664-93-9	
LD50 oral rat	2140 mg/kg bodyweight (Rat; Experimental value)

Skin corrosion/irritation : Causes severe skin burns and eye damage.

Serious eye damage/irritation : Causes serious eye damage.

Respiratory or skin sensitisation : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Sulfuric Acid, ACS (7664-93-9)	
Additional information	Strong inorganic acid mists containing sulfuric acid are carcinogenic to humans
IARC group	1 - Carcinogenic to humans
National Toxicology Program (NTP) Status	2 - Known Human Carcinogens

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Symptoms/injuries after inhalation : Dry/sore throat. Coughing. Irritation of the respiratory tract. Irritation of the nasal mucous membranes. ON CONTINUOUS EXPOSURE/CONTACT: Corrosion of the upper respiratory tract. FOLLOWING SYMPTOMS MAY APPEAR LATER: Possible laryngeal spasm/oedema. Risk of pneumonia. Risk of lung oedema. Respiratory difficulties.

Symptoms/injuries after skin contact : Caustic burns/corrosion of the skin.

Symptoms/injuries after eye contact : Corrosion of the eye tissue. Permanent eye damage.

Symptoms/injuries after ingestion : Nausea. Abdominal pain. Blood in stool. Blood in vomit. Burns to the gastric/intestinal mucosa. AFTER ABSORPTION OF HIGH QUANTITIES: Shock.

Chronic symptoms : ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Red skin. Dry skin. Itching. Skin rash/inflammation. Affection/discolouration of the teeth. Inflammation/damage of the eye tissue.

### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general : Classification concerning the environment: not applicable.

Ecology - air : Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).

# Sulfuric Acid, ACS

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Ecology - water : Mild water pollutant (surface water). Ground water pollutant. Maximum concentration in drinking water: 250 mg/l (sulfate) (Directive 98/83/EC). Harmful to fishes. Harmful to invertebrates (Daphnia). Toxic to plankton. pH shift. Inhibition of activated sludge.

Sulfuric Acid, ACS (7664-93-9)	
LC50 fishes 1	42 mg/l (96 h; Gambusia affinis)
EC50 Daphnia 1	29 mg/l (24 h; Daphnia magna)
LC50 fish 2	49 mg/l (48 h; Lepomis macrochirus)
TLM fish 1	42 mg/l (96 h; Gambusia affinis)
Threshold limit other aquatic organisms 1	6900 mg/l (24 h; Pseudomonas fluorescens)

### 12.2. Persistence and degradability

Sulfuric Acid, ACS (7664-93-9)	
Persistence and degradability	Biodegradability: not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable
BOD (% of ThOD)	Not applicable

### 12.3. Bioaccumulative potential

Sulfuric Acid, ACS (7664-93-9)	
Log Pow	-2.20 (Estimated value)
Bioaccumulative potential	Bioaccumulation: not applicable.

### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

Effect on ozone layer :

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Waste disposal recommendations : Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Recycle/reuse. Remove for physico-chemical/biological treatment. Remove to an authorized dump (Class I). Treat using the best available techniques before discharge into drains or the aquatic environment. Use appropriate containment to avoid environmental contamination.

Additional information : LWCA (the Netherlands): KGA category 01. Hazardous waste according to Directive 2008/98/EC.

Ecology - waste materials : Avoid release to the environment.

## SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1830 Sulfuric acid with more than 51 percent acid, 8, II

UN-No.(DOT) : UN1830

DOT Proper Shipping Name : Sulfuric acid  
with more than 51 percent acid

Department of Transportation (DOT) Hazard Classes : 8 - Class 8 - Corrosive material 49 CFR 173.136

Hazard labels (DOT) : 8 - Corrosive



# Sulfuric Acid, ACS

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Packing group (DOT)	: II - Medium Danger
DOT Special Provisions (49 CFR 172.102)	: A3 - For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with absorbent material in tightly closed metal receptacles before packing in outer packagings. A7 - Steel packagings must be corrosion-resistant or have protection against corrosion. B3 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks and DOT 57 portable tanks are not authorized. B83 - Bottom outlets are prohibited on tank car tanks transporting sulfuric acid in concentrations over 65.25 percent. B84 - Packagings must be protected with non-metallic linings impervious to the lading or have a suitable corrosion allowance for sulfuric acid or spent sulfuric acid in concentration up to 65.25 percent. IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized. N34 - Aluminum construction materials are not authorized for any part of a packaging which is normally in contact with the hazardous material. T8 - 4 178.274(d)(2) Normal..... Prohibited TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively. TP12 - This material is considered highly corrosive to steel.
DOT Packaging Exceptions (49 CFR 173.xxx)	: 154
DOT Packaging Non Bulk (49 CFR 173.xxx)	: 202
DOT Packaging Bulk (49 CFR 173.xxx)	: 242
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: 1 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: 30 L
DOT Vessel Stowage Location	: C - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel.
DOT Vessel Stowage Other	: 14 - For metal drums, stowage permitted under deck on cargo vessels

### Additional information

Other information : No supplementary information available.

### ADR

Transport document description	: UN 1830 Sulphuric acid, 8, II, (E)
Packing group (ADR)	: II
Class (ADR)	: 8 - Corrosive substances
Hazard identification number (Kemler No.)	: 80
Classification code (ADR)	: C1
Danger labels (ADR)	: 8 - Corrosive substances



Orange plates :

Tunnel restriction code : E

### Transport by sea

UN-No. (IMDG)	: 1830
Class (IMDG)	: 8 - Corrosive substances
EmS-No. (1)	: F-A

# Sulfuric Acid, ACS

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

EmS-No. (2) : S-B

### Air transport

UN-No.(IATA) : 1830  
Class (IATA) : 8 - Corrosives  
Packing group (IATA) : II - Medium Danger

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

Sulfuric Acid, ACS (7664-93-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
RQ (Reportable quantity, section 304 of EPA's List of Lists) :	1000 lb
SARA Section 302 Threshold Planning Quantity (TPQ)	1000 lb
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

### 15.2. International regulations

#### CANADA

Sulfuric Acid, ACS (7664-93-9)	
WHMIS Classification	Class E - Corrosive Material

### EU-Regulations

#### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Skin Corr. 1A H314  
Full text of H-phrases: see section 16

#### Classification according to Directive 67/548/EEC or 1999/45/EC

C; R35  
Full text of R-phrases: see section 16

### 15.2.2. National regulations

Sulfuric Acid, ACS (7664-93-9)	
Listed on IARC (International Agency for Research on Cancer) Listed as carcinogen on NTP (National Toxicology Program)	

### 15.3. US State regulations

No additional information available

## SECTION 16: Other information

Revision date : 11/01/2014

Full text of H-phrases: see section 16:

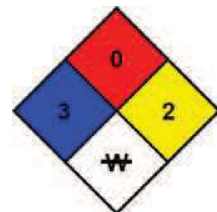
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Skin Corr. 1A	Skin corrosion/irritation, Category 1A
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage

NFPA health hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 2 - Normally unstable and readily undergo violent decomposition but do not detonate. Also: may react violently with water or may form potentially explosive mixtures with water.

NFPA specific hazard : W - Unusual reactivity with water. This indicates a potential hazard using water to fight a fire involving this material. When a compound is both water-reactive and an oxidizer, the W/bar symbol should go in this quadrant and the OX warning is placed immediately below the NFPA diamond.



# Sulfuric Acid, ACS

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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### HMIS III Rating

Health	: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given
Flammability	: 0 Minimal Hazard
Physical	: 2 Moderate Hazard
Personal Protection	: H

SDS US (GHS HazCom 2012)

*Information in this SDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and LabChem Inc assumes no liability resulting from the use of this SDS. The user must determine suitability of this information for his application.*

**Technical Bulletin****SURFONIC<sup>®</sup> N-95 Surfactant****GENERAL NAME** Nonoxynol-9**PRODUCT DESCRIPTION**

SURFONIC N-95 surfactant is the 9.5-mole ethoxylate of nonylphenol. It is a water soluble, nonionic surface-active agent which is compatible with other nonionic surfactants and with most anionic and cationic surfactants.

**APPLICATIONS**

- wetting agents
- penetrants
- dispersants
- detergents
- solubilizing agents
- emulsifiers

**SALES SPECIFICATIONS**

<b>Property</b>	<b>Specifications</b>	<b>Test Method*</b>
Appearance	Clear and substantially free of suspended matter	ST-30.1
Cloud point, °C (1% aqueous)	52 - 56	ST-9.1, 5.2.1
Color, Pt-Co	100 max.	ST-30.12
pH, 1% in 10:6 IPA:H <sub>2</sub> O	6.5 - 7.5	ST-31.36,F
Water, wt%	0.2 max.	ST-31.53,5

\*Methods of Test are available from Huntsman Corporation upon request.

**TYPICAL PROPERTIES****Chemical Properties**

Molecular Weight (theoretical)	638
EO Content, wt% (theoretical)	65.5
HLB Value	13.1
Hydroxyl Number (theoretical)	88
Water Solubility	Soluble

**Regulatory Information**

DOT/TDG Classification	Not Regulated
HMIS Code	1-1-0
CAS Number	9016-45-9
TSCA Inventory	Yes
WHMIS Classification	D2B
Canadian DSL	Yes

**Physical Properties**

Flash point, PMCC, °F	460
Flash point, PMCC, °C	238
Pour point, °F	40
Pour point, °C	4
Density, g/ml at 25°C (77°F)	1.055
Weight, lbs/US gal at 25°C (77°F)	8.79
Viscosity, kinematic	
cSt at 25°C (77°F)	278
cSt at 37.8°C (100°F)	112
Vapor Pressure, Torr, 25°C (77°F)	<1x10 <sup>-5</sup>
Critical Micelle Concentration, ppm at 25°C	48
Surface Tension, dynes/cm, 0.10% at 25°C	30

**TOXICITY AND SAFETY**

For information on the toxicity and safe handling of this product, read the Material Safety Data Sheet prior to use of the product.

**HANDLING AND STORAGE**

SURFONIC N-95 surfactant may be satisfactorily stored in carbon steel tanks using steel pipes and pumps. Caution must be exercised, however, to keep the material in the anhydrous state to prevent severe corrosion to the carbon steel tank and related equipment. A drier on the breathing nozzle is recommended to help maintain anhydrous conditions in the storage tank.

For longer term color stability, it is recommended that the product be stored under an inert atmosphere. Solid sediment may form upon standing. There should be circulation in the storage vessel to keep solids suspended.

Low pressure steam coils in storage tanks and steam tracing of transfer lines should be provided in cases where low environmental temperatures may make pumping of the product difficult.

**SHIPPING DATA**

Product is available in tank cars, tank trucks and drums of 470 pounds (205 kilograms) net weight. Small samples are available by contacting our sample department at 1-800-662-0924.

**BIODEGRADABILITY AND ENVIRONMENTAL SAFETY**

SURFONIC<sup>®</sup> N-series surfactants and related products have been shown to undergo 90% to 100% loss of surface activity (primary biodegradation) under the Semi-continuous Activated Sludge Method and over 90% removal in sewage treatment plants.

Environmental concentrations of nonylphenol (NP) and ethoxylate (NPE) in a survey of rivers across the U.S. receiving treated or untreated wastewater are mostly (60-75%) below their detection limits (0.1 microgram/kg or ppb for NP, NPE<sub>1</sub> and NPE<sub>2</sub>; 1.6 ppb for the aggregate of NPE<sub>3-17</sub>). Highest levels found of NP, NPE<sub>1</sub> and NPE<sub>2</sub> were about 1 ppb, (about 15 ppb for NPE<sub>3-17</sub>). These maximum observed levels are 1 to 2 orders of magnitude below known acute or chronic toxicity toward aquatic organisms.

We conclude from this and other published information that our SURFONIC<sup>®</sup> N-series products and other NPE are satisfactorily biodegraded when treated in conventional secondary treatment plants, and no persistence or accumulation of NPE or environmental harm due to NPE is occurring. Comparison of the toxicity threshold of the most hazardous metabolite of nonylphenol ethoxylates, nonylphenol, and its actual concentration in the environment demonstrates a sizable safety margin. Cleaning products containing NPE may be disposed of safely by flushing down the drain with water.

General References

1. Swisher, R. D., Surfactant Biodegradation, Marcel Dekker, 1987.
2. Talmage, S. S., Environmental and Human Safety of Major Surfactants: Alcohol Ethoxylates and Alkylphenol Ethoxylates, a report to the Soap and Detergent Association, Lewis Publishers, 1994.

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**Therminol® VP1 Heat Transfer Fluid**

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	04/20/2017	150000093459	Date of first issue: 09/06/2016
SDSUS / PRD / 0001			

**SECTION 1. IDENTIFICATION**

Product name : Therminol® VP1 Heat Transfer Fluid

Product code : 34152-00, P3415201, P3415204, P3415205, P3415203, P3415202, P3415200, E3415201

**Manufacturer or supplier's details**

Company name of supplier : Eastman Chemical Company

Address : 200 South Wilcox Drive  
Kingsport TN 37660-5280

Telephone : (423) 229-2000

Emergency telephone : CHEMTREC: +1-800-424-9300, +1-703-527-3887 CCN7321  
For emergency transportation information, in the United States:  
call CHEMTREC at 800-424-9300 or call 423-229-2000.

**Recommended use of the chemical and restrictions on use**

Recommended use : Heat transfer fluids

Restrictions on use : None known.


**SECTION 2. HAZARDS IDENTIFICATION****GHS Classification**

Acute toxicity (Inhalation) : Category 4

Skin irritation : Category 2

Specific target organ systemic toxicity - single exposure : Category 3 (Respiratory system)

**GHS label elements**

Hazard pictograms : 

Signal Word : Warning

Hazard Statements : H315 Causes skin irritation.  
H332 Harmful if inhaled.  
H335 May cause respiratory irritation.

Precautionary Statements : **Prevention:**



## Therminol® VP1 Heat Transfer Fluid

Version 1.1      Revision Date: 04/20/2017      SDS Number: 150000093459      Date of last issue: -  
 Date of first issue: 09/06/2016  
 SDSUS / PRD / 0001

P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.  
 P264 Wash skin thoroughly after handling.  
 P271 Use only outdoors or in a well-ventilated area.  
 P280 Wear protective gloves.

**Response:**

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.  
 P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.  
 P332 + P313 If skin irritation occurs: Get medical advice/ attention.

P362 Take off contaminated clothing and wash before reuse.

**Storage:**

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.  
 P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Other hazards**

None known.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS****Ingredients**

Chemical name	CAS-No.	Concentration (% w/w)
diphenyl oxide	101-84-8	73.5
Biphenyl; diphenyl	92-52-4	26.5

**SECTION 4. FIRST AID MEASURES**

If inhaled : Remove person to fresh air and keep comfortable for breathing.  
 If breathing is difficult, give oxygen.  
 Consult a physician if necessary.

In case of skin contact : Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.  
 If skin irritation occurs: Get medical advice/ attention.  
 Wash contaminated clothing before reuse.

In case of eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.  
 Get medical attention if symptoms occur.

If swallowed : IF SWALLOWED: Immediately call a POISON CENTER/doctor.  
 Do NOT induce vomiting.  
 Rinse mouth.  
 Never give anything by mouth to an unconscious person.

**Therminol® VP1 Heat Transfer Fluid**

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	04/20/2017	150000093459	Date of first issue: 09/06/2016
SDSUS / PRD / 0001			

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Most important symptoms and effects, both acute and delayed : Causes skin irritation.  
Harmful if inhaled.  
May cause respiratory irritation.

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**SECTION 5. FIRE-FIGHTING MEASURES**

Suitable extinguishing media : Water spray  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical  
Foam

Unsuitable extinguishing media : Do not use a solid water stream as it may scatter and spread fire.

Hazardous combustion products : Hazardous decomposition products due to incomplete combustion  
Carbon oxides

Further information : Use a water spray to cool fully closed containers.  
Do not allow run-off from fire fighting to enter drains or water courses.

This product is not classified as a fire-resistant heat transfer fluid. Precautions to avoid sources of ignitions should be taken.

Special protective equipment for fire-fighters : Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.

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**SECTION 6. ACCIDENTAL RELEASE MEASURES**

Personal precautions, protective equipment and emergency procedures : Ventilate the area.  
Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.  
Avoid contact with skin and eyes.  
Material can create slippery conditions.  
Wear appropriate personal protective equipment.  
Local authorities should be advised if significant spillages cannot be contained.

Environmental precautions : Clear up spills immediately and dispose of waste safely.  
Avoid release to the environment.  
Collect spillage.

Methods and materials for containment and cleaning up : Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).  
Prevent runoff from entering drains, sewers, or streams.

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**Therminol® VP1 Heat Transfer Fluid**

Version      Revision Date:      SDS Number:      Date of last issue: -  
 1.1          04/20/2017          150000093459      Date of first issue: 09/06/2016  
 SDSUS / PRD / 0001

**SECTION 7. HANDLING AND STORAGE**

- Advice on safe handling** : Do not breathe vapors or spray mist.  
 Handle product only in closed system or provide appropriate exhaust ventilation at machinery.  
 In case of insufficient ventilation, wear suitable respiratory equipment.  
 Keep away from flames and sparks.  
 Wear appropriate personal protective equipment.  
 Avoid contact with skin, eyes and clothing.  
 Wash thoroughly after handling.  
 Wash contaminated clothing before reuse.  
 Drain or remove substance from equipment prior to break-in or maintenance.  
 Handle in accordance with good industrial hygiene and safety practice.
- Conditions for safe storage** : Store locked up.  
 Keep container tightly closed in a dry and well-ventilated place.  
 Keep in a cool place away from oxidizing agents.

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Ingredients with workplace control parameters**

Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
diphenyl oxide	101-84-8	TWA (Vapor)	1 ppm	ACGIH
		STEL (Vapor)	2 ppm	ACGIH
		TWA (Vapor)	1 ppm 7 mg/m <sup>3</sup>	NIOSH REL
		TWA (Vapor)	1 ppm 7 mg/m <sup>3</sup>	OSHA Z-1
Biphenyl; diphenyl	92-52-4	TWA	0.2 ppm	ACGIH
		TWA	0.2 ppm 1 mg/m <sup>3</sup>	NIOSH REL
		TWA	0.2 ppm 1 mg/m <sup>3</sup>	OSHA Z-1
		TWA	0.2 ppm 1 mg/m <sup>3</sup>	OSHA P0

- Engineering measures** : Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

**Therminol® VP1 Heat Transfer Fluid**

Version      Revision Date:      SDS Number:      Date of last issue: -  
 1.1          04/20/2017          150000093459      Date of first issue: 09/06/2016  
 SDSUS / PRD / 0001

---

**Personal protective equipment**

- Respiratory protection : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary.  
 Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable.  
 If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.
- Hand protection
- Remarks : Wear suitable gloves. When handling hot material, use heat resistant gloves.
- Eye protection : Wear safety glasses with side shields (or goggles).
- Skin and body protection : Wear suitable protective clothing.
- Protective measures : Ensure that eye flushing systems and safety showers are located close to the working place.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
- 

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

- Appearance : liquid
- Color : colorless
- Odor : characteristic
- Melting point/range : 12 °C
- Boiling point/boiling range : 257 °C  
 (1,013 hPa)
- Flash point : 110 °C  
 Method: Pensky-Martens closed cup
- 124 °C  
 Method: Cleveland open cup
- Relative density : 1.06 (25 °C)
- Density : 1,060 kg/m<sup>3</sup> (25 °C)
- Solubility(ies)  
 Water solubility : 0.025 g/l
-



**Therminol® VP1 Heat Transfer Fluid**

Version      Revision Date:      SDS Number:      Date of last issue: -  
1.1          04/20/2017          150000093459      Date of first issue: 09/06/2016  
SDSUS / PRD / 0001

---

Acute inhalation toxicity      : LC50: Remarks: No data available

Acute dermal toxicity      : LD50 Dermal (Rabbit, Male and Female): > 7,940 mg/kg  
Assessment: Not classified

**Biphenyl; diphenyl:**

Acute oral toxicity      : LD50 Oral (Rat, male): > 2,180 mg/kg  
Assessment: The component/mixture is low toxic after single ingestion.

Acute inhalation toxicity      : LC50 (Rat, male and female): > 3.47 mg/l  
Exposure time: 1 h  
Assessment: The substance or mixture has no acute inhalation toxicity

**Skin corrosion/irritation**

Causes skin irritation.

**Product:**

Species: Rabbit  
Exposure time: 24 h  
Assessment: Causes skin irritation.  
Result: slight

**Ingredients:****diphenyl oxide:**

Species: Rabbit  
Exposure time: 4 h  
Result: none

**Biphenyl; diphenyl:**

Species: Rabbit  
Result: slight

Species: Humans

Assessment: Irritating to skin.  
Result: strong

**Serious eye damage/eye irritation**

Not classified based on available information.

**Product:**

Species: Rabbit  
Result: No eye irritation  
Exposure time: 24 h  
Assessment: Not classified

**Ingredients:****diphenyl oxide:**

Species: Rabbit

**Therminol® VP1 Heat Transfer Fluid**

Version 1.1      Revision Date: 04/20/2017      SDS Number: 150000093459      Date of last issue: -  
Date of first issue: 09/06/2016  
SDSUS / PRD / 0001

---

Result: corneal opacity  
Exposure time: 4 h  
Assessment: irritating

Result: slight to moderate

**Biphenyl; diphenyl:**

Species: Rabbit  
Result: slight irritation

Species: Humans  
Result: strong  
Assessment: Irritating to eyes.

**Respiratory or skin sensitization**

Skin sensitization: Not classified based on available information.  
Respiratory sensitization: Not classified based on available information.

**Ingredients:****diphenyl oxide:**

Test Type: Skin Sensitization  
Species: Guinea pig  
Assessment: Not classified  
Method: OECD 406: Guinea pig sensitization  
Result: non-sensitizing

Test Type: Human experience  
Species: Humans  
Assessment: Not classified  
Method: Human Repeat Insult Patch Test  
Result: non-sensitizing

**Biphenyl; diphenyl:**

Test Type: OECD 406: Guinea pig sensitization  
Species: Guinea pig  
Assessment: Not classified  
Result: Does not cause skin sensitization.

**Germ cell mutagenicity**

Not classified based on available information.

**Product:**

Genotoxicity in vitro      : Test Type: Salmonella typhimurium assay (Ames test)  
Metabolic activation: +/- activation  
Method: Bacterial Reverse Mutation Assay  
Result: negative

   : Test Type: Chromosome aberration test in vitro  
Metabolic activation: +/- activation  
Method: In vitro Mammalian Chromosome Aberration Test  
Result: negative

Genotoxicity in vivo      : Test Type: Mammalian Erythrocyte Micronucleus Test

**Therminol® VP1 Heat Transfer Fluid**

Version      Revision Date:      SDS Number:      Date of last issue: -  
 1.1          04/20/2017          150000093459      Date of first issue: 09/06/2016  
 SDSUS / PRD / 0001

---

Species: Mouse  
 Method: Mammalian Erythrocyte Micronucleus Test  
 Result: negative

**Ingredients:****diphenyl oxide:**

Genotoxicity in vitro

- : Test Type: Salmonella typhimurium assay (Ames test)  
 Metabolic activation: +/- activation  
 Method: Bacterial Reverse Mutation Assay  
 Result: negative
- : Test Type: Mutagenicity - Mammalian  
 Metabolic activation: +/- activation  
 Method: In vitro Mammalian Cell Gene Mutation Test  
 Result: negative
- : Test Type: Mutagenicity - Mammalian  
 Metabolic activation: +/- activation  
 Method: In vitro Mammalian Chromosome Aberration Test  
 Result: negative
- : Test Type: Mutagenicity - Mammalian  
 Metabolic activation: +/- activation  
 Method: OECD Guideline 482  
 Result: negative

**Biphenyl; diphenyl:**

Genotoxicity in vitro

- : Test Type: Salmonella typhimurium assay (Ames test)  
 Metabolic activation: +/- activation  
 Method: Bacterial Reverse Mutation Assay  
 Result: negative
- : Test Type: Mutagenicity - Mammalian  
 Metabolic activation: + activation  
 Method: In vitro Mammalian Cell Gene Mutation Test  
 Result: positive
- : Test Type: Chromosome aberration test in vitro  
 Metabolic activation: +/- activation  
 Method: In vitro Mammalian Chromosome Aberration Test  
 Result: negative
- : Test Type: Mutagenicity - Mammalian  
 Method: OECD Guideline 482  
 Result: negative

Genotoxicity in vivo

- : Species: Mouse (Male and Female)  
 Method: Mammalian Erythrocyte Micronucleus Test  
 Result: negative
- Species: Rat (male)  
 Method: Mammalian Bone Marrow Chromosome Aberration Test



**Therminol® VP1 Heat Transfer Fluid**

Version      Revision Date:      SDS Number:      Date of last issue: -  
 1.1          04/20/2017          150000093459      Date of first issue: 09/06/2016  
 SDSUS / PRD / 0001

---

Result: negative

**Carcinogenicity**

Not classified based on available information.

**Ingredients:****Biphenyl; diphenyl:**

Species: Rat, (male and female)

Application Route: Ingestion

Method: OECD Test No. 453: Combined Chronic Toxicity/Carcinogenicity Studies

Remarks: Expert judgment

Not classified

**IARC**

No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**OSHA**

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**NTP**

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**Reproductive toxicity**

Not classified based on available information.

**Product:**

Effects on fetal development : Species: Rat  
 Application Route: oral (gavage)  
 500 mg/kg  
 < 50 mg/l  
 Method: OECD Test No. 414: Prenatal Developmental Toxicity Study  
 Remarks: Based on available data, the classification criteria are not met.

**Ingredients:****diphenyl oxide:**

Effects on fertility :

Remarks: No known significant effects or critical hazards.

Effects on fetal development : Species: Rat  
 Application Route: oral (gavage)  
 500 mg/l  
 > 50 mg/kg  
 Method: OECD Test No. 414: Prenatal Developmental Toxicity Study  
 Remarks: Read-across from a similar material

**Therminol® VP1 Heat Transfer Fluid**

Version      Revision Date:      SDS Number:      Date of last issue: -  
 1.1          04/20/2017          150000093459      Date of first issue: 09/06/2016  
 SDSUS / PRD / 0001

---

Reproductive toxicity - Assessment : Based on available data the classification criteria are not met. Not classified as hazardous.

**Biphenyl; diphenyl:**

Effects on fertility

:  
 Species: Rat  
 Sex: male and female  
 Application Route: Ingestion  
 NOAEL: 40 mg/kg,  
 F1: 40 mg/kg,  
 F2: 40 mg/kg,  
 Remarks: There is no evidence to indicate potential for adverse reproductive effects in humans.

Effects on fetal development : Species: Rat  
 Application Route: oral (gavage)  
 500 mg/kg  
 Method: OECD Test No. 414: Prenatal Developmental Toxicity Study

Reproductive toxicity - Assessment : Based on available data the classification criteria are not met. Not classified as hazardous.

**STOT-single exposure**

May cause respiratory irritation.

**Product:**

Routes of exposure: Inhalation  
 Assessment: Irritating to respiratory system.

**Ingredients:****diphenyl oxide:**

Routes of exposure: Inhalation  
 Assessment: Based on available data, the classification criteria are not met.

**Biphenyl; diphenyl:**

Routes of exposure: Inhalation  
 Target Organs: Respiratory system  
 Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

**STOT-repeated exposure**

Not classified based on available information.

**Product:**

Routes of exposure: Oral  
 Assessment: Not classified

**Ingredients:****diphenyl oxide:**

Assessment: Based on available data, the classification criteria are not met.

**Therminol® VP1 Heat Transfer Fluid**

Version      Revision Date:      SDS Number:      Date of last issue: -  
1.1          04/20/2017          150000093459      Date of first issue: 09/06/2016  
SDSUS / PRD / 0001

---

**Biphenyl; diphenyl:**

Target Organs: Kidney, Liver, Urinary bladder

Assessment: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

**Repeated dose toxicity****Product:**

Species: Rat, Male and Female

NOAEC: 0.051 mg/l

Application Route: Inhalation study:

Exposure time: 90 days

Species: Rat

LOAEL (Lowest observed adverse effect level): 500 mg/l

Application Route: by gavage

**Ingredients:****diphenyl oxide:**

Species: Rat, male and female

NOAEL (No observed adverse effect level): 301 mg/kg

Application Route: Oral Study

Exposure time: 90 days

Remarks: (highest dose tested)

Species: Rat, male and female

NOAEL (No observed adverse effect level): 1000 mg/kg

Application Route: Dermal Study

Exposure time: 90 days

Remarks: (highest dose tested)

Species: Rat, male and female

NOAEL: 139 mg/m<sup>3</sup>

Application Route: inhalation (vapor)

Exposure time: 28 days

Remarks: (highest dose tested)

**Biphenyl; diphenyl:**

Species: Rat, male and female

NOAEL: 39 mg/kg

Application Route: in feed

Exposure time: 2 year

Method: OECD Test No. 453: Combined Chronic Toxicity/Carcinogenicity Studies

Target Organs: Blood, Kidney, Liver

Species: Rabbit

NOAEL: > 2,000 mg/kg

Application Route: Dermal

Exposure time: 28 days

Remarks: No significant adverse effects were reported

**Therminol® VP1 Heat Transfer Fluid**

Version      Revision Date:      SDS Number:      Date of last issue: -  
 1.1          04/20/2017          150000093459      Date of first issue: 09/06/2016  
 SDSUS / PRD / 0001

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**Aspiration toxicity**

Not classified based on available information.

**Product:**

Not classified

**Information on likely routes of exposure****Product:**

Inhalation                                 : Remarks: Harmful if inhaled.  
   May cause respiratory irritation.

Skin contact                                : Remarks: Causes skin irritation.

Eye contact                                 : Remarks: None known.

Ingestion                                    : Remarks: May be harmful if swallowed.

---

**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity****Product:**

Toxicity to fish                             : LC50 (Oncorhynchus mykiss (rainbow trout)): 7.6 mg/l  
   Exposure time: 96 h

Toxicity to daphnia and other         : LC50 (Daphnia magna (Water flea)): 2.4 mg/l  
 aquatic invertebrates                    Exposure time: 48 h

Toxicity to algae                           : EC50 (Selenastrum capricornutum (green algae)): 1.3 mg/l  
   Exposure time: 72 h

**Ingredients:****diphenyl oxide:**

Toxicity to fish                             : LC50 (Oncorhynchus mykiss (rainbow trout)): 4.2 mg/l  
   Exposure time: 96 h

Toxicity to daphnia and other         : LC50 (Daphnia magna (Water flea)): 1.7 mg/l  
 aquatic invertebrates                    Exposure time: 48 h

Toxicity to algae                           : EC50 (Pseudokirchneriella subcapitata (algae)): 2.5 mg/l  
   Exposure time: 72 h

**Biphenyl; diphenyl:**

Toxicity to fish                             : EC50 (Pimephales promelas (fathead minnow)): 3 mg/l  
   Exposure time: 96 h

Toxicity to daphnia and other         : EC50 (Daphnia magna (Water flea)): 0.36 mg/l  
 aquatic invertebrates                    Exposure time: 48 h

Toxicity to algae                           : EC50 (Chlorella pyrenoidosa): 1.3 mg/l

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**Therminol® VP1 Heat Transfer Fluid**

Version      Revision Date:      SDS Number:      Date of last issue: -  
 1.1          04/20/2017          150000093459      Date of first issue: 09/06/2016  
 SDSUS / PRD / 0001

Exposure time: 72 h

NOEC (Chlorella pyrenoidosa): 0.66 mg/l  
 Exposure time: 72 h

M-Factor (Acute aquatic toxicity) : 1

Toxicity to fish (Chronic toxicity) : NOEC (Oncorhynchus mykiss (rainbow trout)): 0.229 mg/l  
 Exposure time: 96 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.17 mg/l  
 Exposure time: 21 d

M-Factor (Chronic aquatic toxicity) : 1

**Persistence and degradability****Product:**

Biodegradability : Result: Inherently biodegradable.  
 Method: Inherent Biodegradability: Modified SCAS Test

Biochemical Oxygen Demand (BOD) : Remarks: No data available

Chemical Oxygen Demand (COD) : Remarks: No data available

BOD/COD : Remarks: No data available

**Ingredients:****diphenyl oxide:**

Biodegradability : Result: Readily biodegradable.  
 Method: Ready Biodegradability: Modified MITI Test (I)

Biochemical Oxygen Demand (BOD) : Remarks: No data available

Chemical Oxygen Demand (COD) : Remarks: No data available

**Biphenyl; diphenyl:**

Biodegradability : Result: Readily biodegradable.  
 Method: Ready Biodegradability: Modified MITI Test (I)

**Bioaccumulative potential****Ingredients:****diphenyl oxide:**

Bioaccumulation : Species: Cyprinus carpio (Carp)

**Therminol® VP1 Heat Transfer Fluid**

Version 1.1      Revision Date: 04/20/2017      SDS Number: 150000093459      Date of last issue: -  
 Date of first issue: 09/06/2016  
 SDSUS / PRD / 0001

---

Bioconcentration factor (BCF): 49 - 594  
 Method: OECD Test Guideline 305

Species: *Oncorhynchus mykiss* (rainbow trout)  
 Bioconcentration factor (BCF): 196

**Biphenyl; diphenyl:**

Bioaccumulation : Bioconcentration factor (BCF): 1,900

**Mobility in soil****Ingredients:****diphenyl oxide:**

Distribution among environmental compartments : Koc: 1960, log Koc: 3.3

**Biphenyl; diphenyl:**

Distribution among environmental compartments : Medium: Soil  
 Koc: 1546, log Koc: 3.19  
 Method: OECD Test No. 106: Adsorption - Desorption Using a Batch Equilibrium Method

**Other adverse effects**

No data available

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**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**

Waste from residues : Dispose of in accordance with local regulations.

This material when discarded may be a hazardous waste as that term is defined by the Resource Conservation and Recovery Act (RCRA), 40 CFR 261.24, due to its toxicity characteristic. This material should be analyzed in accordance with Method 1311 for the compound D018 BENZENE.

Consult 40 CFR 268.40 or appropriate local regulations for concentration based standards.

This product meets the criteria for a synthetic used oil under the U.S. EPA Standards for the Management of Used Oil (40 CFR 279). Those standards govern recycling and disposal in lieu of 40 CFR 260 -272 of the Federal hazardous waste program in states that have adopted these used oil regulations. Consult your attorney or appropriate regulatory official to be sure these standards have been adopted in your state. Recycle or burn in accordance with the applicable standards. Eastman Chemical Company operates a used fluid return program for certain fluids under these used oil standards. Contact your Sales Representative for details.

**Therminol® VP1 Heat Transfer Fluid**

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	04/20/2017	150000093459	Date of first issue: 09/06/2016
SDSUS / PRD / 0001			

---

**SECTION 14. TRANSPORT INFORMATION****International Regulations****IATA-DGR**

UN/ID No.	: UN 3082
Proper shipping name	: Environmentally hazardous substance, liquid, n.o.s. (Diphenyl Ether, biphenyl)
Class	: 9
Packing group	: III
Labels	: Miscellaneous
Packing instruction (cargo aircraft)	: 964
Packing instruction (passenger aircraft)	: 964

**IMDG-Code**

UN number	: UN 3082
Proper shipping name	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Diphenyl Ether, biphenyl)
Class	: 9
Packing group	: III
Labels	: 9
EmS Code	: F-A, S-F
Marine pollutant	: yes

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**Domestic regulation****49 CFR**

UN/ID/NA number	: UN 3082
Proper shipping name	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (biphenyl)
Class	: 9
Packing group	: III
Labels	: Class 9 - Miscellaneous Dangerous Goods
ERG Code	: 171
Marine pollutant	: yes(diphenyl)
Remarks	: Shipping in package sizes of less than 5 L (liquids) or 5 KG (solids) may lead to a non-regulated classification.

**SECTION 15. REGULATORY INFORMATION****EPCRA - Emergency Planning and Community Right-to-Know****CERCLA Reportable Quantity**

**Therminol® VP1 Heat Transfer Fluid**

Version      Revision Date:      SDS Number:      Date of last issue: -  
 1.1          04/20/2017          150000093459      Date of first issue: 09/06/2016  
 SDSUS / PRD / 0001

Ingredients	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
biphenyl	92-52-4	100	377.36

**SARA 311/312 Hazards** : Acute Health Hazard

**SARA 302** : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313** : The following components are subject to reporting levels established by SARA Title III, Section 313:

Biphenyl; diphenyl                      92-52-4                      26.5 %

**The ingredients of this product are reported in the following inventories:**

DSL : On the inventory, or in compliance with the inventory

AICS : On the inventory, or in compliance with the inventory

ENCS : On the inventory, or in compliance with the inventory

ISHL : On the inventory, or in compliance with the inventory

KECI : On the inventory, or in compliance with the inventory

PICCS : On the inventory, or in compliance with the inventory

IECSC : On the inventory, or in compliance with the inventory

TSCA : On the inventory, or in compliance with the inventory

**TSCA list**

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

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**SECTION 16. OTHER INFORMATION**

**Full text of other abbreviations**

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC -



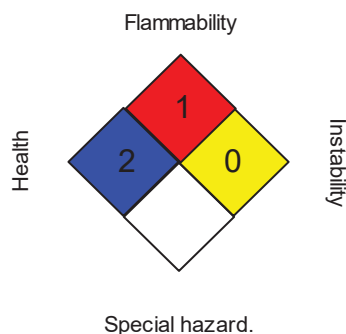
## Therminol® VP1 Heat Transfer Fluid

Version      Revision Date:      SDS Number:      Date of last issue: -  
 1.1          04/20/2017          150000093459      Date of first issue: 09/06/2016  
 SDSUS / PRD / 0001

International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

## Further information

## NFPA:



## HMIS® IV:

HEALTH	1	2
FLAMMABILITY	1	
PHYSICAL HAZARD	0	

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks.

Sources of key data used to compile the Material Safety Data Sheet : [www.therminol.com/products/](http://www.therminol.com/products/)

Revision Date : 04/20/2017

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**Therminol® VP1 Heat Transfer Fluid**

Version	Revision Date:	SDS Number:	Date of last issue: -
1.1	04/20/2017	150000093459	Date of first issue: 09/06/2016

SDSUS / PRD / 0001

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US / Z8

# SAFETY DATA SHEET

## TSP Trisodium Phosphate

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION:

**MANUFACTURER:** Griffin Bros., Inc.  
P.O. Box 7719  
Salem, OR 97303  
(800) 456-4743

**INFORMATION:**

**EMERGENCY PHONE:** CHEMTREC: (800) 424-9300

**PRODUCT NAME:** Trisodium Phosphate

**PRODUCT NUMBER:** G-531

**DATE PREPARED:** 03/03/2015

**LAST REVISION:** 07/18/2015

**Uses:** Substance used as such, in formulation or in formulation of products for :  
Detergent, Treatment of textiles and leather,  
Metal treatment, Water treatment,  
Formulation Fertilizer , Laboratory  
chemicals, Ceramics, Dyes etc.

PURE:  LIQUID:

MIXTURE:  SOLID:

### 2. HAZARDOUS IDENTIFICATION:

**EMERGENCY OVERVIEW:** Corrosive

**GHS CLASSIFICATION:** Skin: (Category 2), Eyes: (Category 2A), STOT – Single Exposure (Category 3) Respiratory

**GHS Label elements, including precautionary statements**

**SIGNAL WORD:** Warning **PICTOGRAM:**



**HAZARD STATEMENT(S):**

H315: Causes skin irritation  
H319: Causes serious eye irritation  
H335: May cause respiratory irritation

**PRECAUTIONARY STATEMENT(S):**

P261: Avoid breathing spray, mist, fume, gas, dust, vapours  
P280: Wear protective gloves, protective clothing, eye protection, face protection  
P302+P352: IF ON SKIN: Wash with plenty of hands, forearms and face  
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P332+P313: IF SKIN irritation occurs: Get medical advice/attention  
P337+P313: IF EYE irritation persists: Get medical advice/attention

### 3. COMPOSITION/INFORMATION ON INGREDIENTS:

Chemical Name	CAS #	Wt. Range %
TRISODIUM PHOSPHATE	10101-89-0	>= 98.5
Balance of formula is Proprietary Non-hazardous materials	- -	Balance

### 4. FIRST AID MEASURES:

**GENERAL ADVICE:** Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**EYE CONTACT:** Immediately flush eyes with water for at least 15 minutes. Hold eyelids open while flushing the eyes.

**INHALATION:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.  
Get medical attention immediately.

**INGESTION:** If swallowed, do NOT induce vomiting. Give victim lots of water or milk. Get medical attention immediately.  
Never give anything by mouth to an unconscious or convulsing person.

**SKIN CONTACT:** Wash with soap and water. Change contaminated clothing. Get medical attention if irritation develops or persists.

**AGGRAVATED MEDICAL CONDITIONS:** Pre-existing eye, skin or respiratory conditions.

**SUPPLEMENTAL HEALTH INFORMATION:** The effects of long-term, low-level exposure to this product have not been determined. Safe handling of this material on a long-term basis should emphasize the avoidance of all effects from repetitive acute exposures.

### 5. FIRE FIGHTING MEASURES:

**EXTINGUISHING MEDIA:** Use extinguishing media appropriate for surrounding fire.

**SPECIAL FIRE FIGHTING PROCEDURES:**

Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece in positive pressure mode. Move containers from fire area if it can be done without risk. Use water to keep fire-exposed containers cool.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** None known.

**COMBUSTION PRODUCTS:** None known.

### 6. ACCIDENTAL RELEASE MEASURES:

**STEPS TO BE TAKEN IN CASE MATERIAL IS SPILLED OR RELEASED:** Pick up and arrange disposal without creating dust. Sweep up and shovel. DO NOT add water to spilled material. DO NOT use floor sweeping compounds to clean up spills. Every attempt should be made to avoid mixing spilled material with other chemicals or debris when cleaning up. Keep in suitable, closed containers for disposal.

## 7. HANDLING AND STORAGE:

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Do not handle until all safety precautions have been read and understood. Do not allow product to get wet. If liner is present, tie after each use. Use good personal hygiene when handling this product. Wash hands after use, before smoking, or using the toilet. Wear personal protection as required per safety program. Follow all SDS/label precautions even after container is emptied because it may retain product residues.

**OTHER PRECAUTIONS:** For industrial and institutional use only. Keep away from children. Keep containers closed while not in use.

## 8. EXPOSURE CONTROL/PERSONAL PROTECTION:

### EXPOSURE CONTROLS:

Chemical Name	OSHA PEL		ACGIH TLV	
	TWA	STEL	TWA	STEL
TRISODIUM PHOSPHATE	Respirable: 5 mg/m <sup>3</sup> . Inhalable: 15mg/m <sup>3</sup>		Respirable: 3 mg/m <sup>3</sup> . Inhalable: 10 mg/m <sup>3</sup>	

### PERSONAL PROTECTIVE EQUIPMENT

**RESPIRATORY PROTECTION:** Use respiratory protection mask according to NIOSH/MSHA. Respiratory protection programs must comply with 29 CFR 1910.134.

**VENTILATION:** Local exhaust sufficient to keep exposure below TLV.

**WORK/HYGENIC PRACTICES:** Use good personal hygiene when handling this product. Wash hands after use, before smoking, or using the toilet.

**EYE PROTECTION:** Use chemical safety goggles and/or full face shield when splashing is possible. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work areas

**PROTECTIVE GLOVES:** Rubber, Neoprene, Nitrile, Polyvinyl chloride (PVC), Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product.

**OTHER PROTECTIVE EQUIP:** Boots, apron, lab coat or coveralls of impervious material, as appropriate to avoid skin contact.

**ENGINEERING CONTROLS:** Facilities storing or utilizing this material should be equipped with an eye wash facility and safety shower.

## 9. PHYSICAL AND CHEMICAL PROPERTIES:

### INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES:

a) Appearance: White granular powder	k) Vapor pressure (mm/hg): No data available
b) Odor: Odorless	l) Vapor density (Air = 1): No data available
d) pH: 11.7 - 12.5 at 50 g/l at 20 °C (68 °F)	m) Relative density (Specific Gravity): Not applicable
e) Melting point/freezing point: No data available	n) Water solubility: 21g / 100g saturated solution @ 25 °C
f) Initial boiling point and boiling range: Not applicable	p) Auto-ignition temperature: n/a
g) Flash point: n/a Method Used: n/a	r) Viscosity: n/a
h) Evaporation rate: No data available	-) Pounds Per Gallon: Not applicable
j) Upper/lower flammability or explosive limits: UEL: n/a LEL: n/a	OTHER: No other data is available for this product. . . .

## 10. STABILITY AND REACTIVITY:

**STABLE:** Stable under recommended storage conditions.

**INCOMPATIBILITY:** Take care when using on aluminum. This material could be corrosive to aluminum surfaces because of the high pH.

**HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:** oxides of carbon

**HAZARDOUS POLYMERIZATION:** Will Not Occur

**CONDITIONS TO AVOID:** Do not get water/moisture inside container, product is hygroscopic. Avoid contact with incompatible materials.

## 11. TOXICOLOGICAL INFORMATION:

### Laboratory data

Data from ICL Performance LP single-dose (acute) animal studies with this material are given below:

**ORAL – RAT LD50:** 6,500 mg/kg; practically non-toxic

**DERMAL – RABBIT LD50:** > 7940 mg/kg; practically non-toxic

**EYE IRRITATION – RABBIT (4-HR EXP.):** corrosive

**SKIN IRRITATION – RABBIT:** 3.3 / 8.0; moderately irritating

The anhydrous form of this material produced no mutagenic effects in standard assays using fruit flies.

This material has been defined as a hazardous chemical under criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200)

## 12. ECOLOGICAL INFORMATION:

The following data have been classified using criteria adopted by the European Economic Community (ECC) for aquatic organism toxicity.

**INVERTEBRATE:** 48-hr EC50 Daphnia magna: >1000 mg/L; Practically Non-toxic

**WARMWATER FISH:** 96-hr LC50 Bluegill sunfish: 440 mg/L; Practically Non-toxic

**COLDWATER FISH:** 96-hr LC50 Rainbow Trout: 260 mg/L; Practically Non-toxic

## 13. DISPOSAL CONSIDERATIONS:

This material when discarded in pure form is not a hazardous waste as defined by 40 CFR 261, the Resource Conservation and Recovery Act (RCRA). Dry materials may be landfilled or recycled in accordance with local, state, and federal regulations. If materials have become contaminated with other substances, dispose of in accordance with local, state, and federal regulations.

**14. TRANSPORT INFORMATION:**

Regulation	UN No.	Proper Shipping Name	Transport Hazard Class(es)	Packing Group
US DOT	-	Non-Regulated Material, Solid	-	-

ERG No.: N/A

**15. REGULATORY INFORMATION:** No data available**16. OTHER INFORMATION:**

HMIS INFORMATION: HEALTH: 1 FLAMMABILITY: 0 PHYSICAL HAZARD: 0 PROTECTIVE: B  
 NFPA INFORMATION: TOXICITY: 1 FIRE: 0 REACTIVITY: 0 SPECIAL: N

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### 1. Company and Product Identification

1.1	Identification – Product Name:	<b>Vitec<sup>®</sup> 4000</b>
1.2	Other means of identification	Organic Acid, terpolymer
1.2	Synonym:	Mixture, none
1.3	Recommended Use Of The Chemical and Restrictions On Use:	Reverse osmosis membrane antiscalant Use only as directed on the label.
1.4	Name, Address, And Telephone Number Of The Manufacturer, Or Other Responsible Party:	<b>AVISTA TECHNOLOGIES</b> 140 Bosstick Street San Marcos, CA 92069 (760) 744-0536
1.5	Competent Person email address	klindsey@avistatech.com
1.5	24 Hour Emergency No.:	1-800-424-9300 (United States) 1-202-483-7616 (International Collect)



CERTIFIED BY NSF INTERNATIONAL TO NSF/ANSI 60 AS STANDARD DRINKING WATER TREATMENT CHEMICAL FOR USE IN REVERSE OSMOSIS SYSTEMS AT A MAXIMUM LEVEL OF 7 mg/l.

### 2. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW:** *This product is amber to light yellow water-based solution with a mild odor. This product may irritate contaminated tissue. This product is neither reactive nor flammable. Emergency responders must wear personal protective equipment and have appropriate fire-extinguishing protection) suitable for the situation to which they are responding.*

	Physical Hazards Summary	None
	Potential Health Hazards Summary	Acute Oral Toxicity, category 4 Skin irritation, category 2B Eye irritation category 2 B STOT repeated exposure category 2
	Potential Ecological Effects Summary	None
2.1	Classification Of Product	
	U.S. OSHA classification	Skin, eye irritant
	Classification as per EC 1272/2008 (CLP/GHS)	Acute Oral Toxicity, category 4 Skin irritation, category 2B Eye irritation category 2 B STOT repeated exposure category 2 Xn Harmful
	WHMIS classification	E, corrosive

Hazardous Materials Information System (HMIS) Rating

<b>Health</b>	<b>1</b>
<b>Flammability</b>	<b>0</b>
<b>Physical Hazard</b>	<b>0</b>
<b>Protective Equipment</b>	<b>C</b>

2.2 Label Elements OSHA/GHS

General Warnings	P101	If medical advice is needed, have product container or label at hand.
	P102	Keep out of reach of children.
	P103	Read label before use
Signal Word	WARNING!	
Hazard statements	H302	Harmful if swallowed
	H 312	Harmful in contact with skin
	H315 + H320	Causes skin or eye irritation
Precautionary statements	P271	Use only outdoors or in a well-ventilated area.
	P281	Use personal protective equipment as required.
	P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
	P302/P352	
	P337 + P313	IF ON SKIN: Wash with plenty of soap and water.
	P404	If eye irritation persists: Get medical advice/attention. Store in a closed container.

Hazard pictograms



2.3 Unclassified Hazards None

2.4 Ingredients with unknown acute toxicity None

### 3. COMPOSITION and INFORMATION ON INGREDIENTS

Chemical name CAS # EINECS #	% w/w	US OSHA	GHS/EU CLP	WHMIS
Acrylic Polymer Proprietary	10-20	Low Hazard	Unknown	Not classified
Proprietary Chelate Agent Proprietary Proprietary	1-10	Corrosive	Acute Oral Toxicity, category 4 Skin irritation, category 2B Eye irritation category 2 B STOT repeated exposure category 2 /Xn Harmful; R 22-36-38; S2-13-24-25-26-36-46 Keep out of reach of children. Keep away from food, drink and animal	E, corrosive

feeding stuffs. Avoid contact with skin. Avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing. If swallowed, seek medical advice immediately and show this container or label

Water or other chemicals do not contribute to any additional hazards of this product	balance	N/A	N/A	N/A
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NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

## 4. FIRST-AID MEASURES

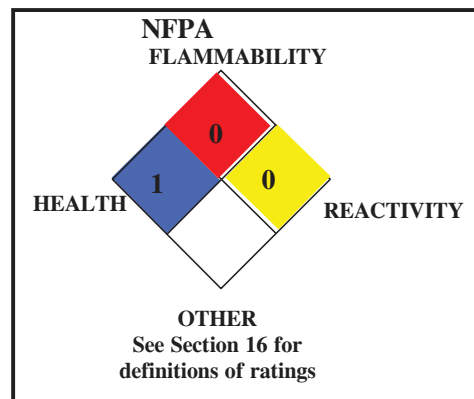
- 4.1 Description of Necessary Measures
- Skin exposure: If this product contaminates the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim should seek immediate medical attention if any adverse exposure symptoms develop.
  - Eye exposure: If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek medical attention.
  - Inhalation: If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.
  - Ingestion: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING. Have victim rinse mouth with water, if conscious. Never induce vomiting or give a diluent (e.g., water) to someone who is unconscious, having convulsions, or unable to swallow. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.
- 4.2 Most Important Symptoms/Effects:
- Immediate: Inhalation exposure may cause coughing or sneezing. Symptoms of skin and eye contact may include redness and irritation. Ingestion may cause stomach pains, cramps, and gastritis.
- Delayed: Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). Symptoms may include tingling, redness, and visible injury.
- 4.3 Indication Of Immediate Medical Attention And Special Treatment Needed, If Necessary:
- TARGET ORGANS:** Acute: Skin, eyes. Chronic: Skin.

Victims of chemical exposure must be taken for medical attention if any adverse effects occur. Rescuers should be taken for medical attention if necessary. Take a copy of label and MSDS to physician or health professional with victim.



## 5. FIRE-FIGHTING MEASURES

Flammable properties    Non-flammable aqueous solution



Flash Point °C (°F): Not applicable.

Autoignition Temperature °C (°F): Not applicable.

Flammable Limits (in air by volume, %):

Upper: Not applicable.

Lower: Not applicable.

- |             |   |  |             |     |                |     |      |     |              |     |       |     |       |     |
|-------------|---|--|-------------|-----|----------------|-----|------|-----|--------------|-----|-------|-----|-------|-----|
| 5.1         | Suitable And Unsuitable Extinguishing Media:                    | This material will not contribute to the intensity of a fire. Use extinguishing material suitable to the surrounding fire.   |             |     |                |     |      |     |              |     |       |     |       |     |
|             |   | <table border="0" style="width: 100%;"> <tr> <td>Water spray</td> <td style="text-align: center;">YES</td> <td>Carbon dioxide</td> <td style="text-align: center;">YES</td> </tr> <tr> <td>Foam</td> <td style="text-align: center;">YES</td> <td>Dry chemical</td> <td style="text-align: center;">YES</td> </tr> <tr> <td>Halon</td> <td style="text-align: center;">YES</td> <td>Other</td> <td style="text-align: center;">YES</td> </tr> </table> | Water spray | YES | Carbon dioxide | YES | Foam | YES | Dry chemical | YES | Halon | YES | Other | YES |
| Water spray | YES   | Carbon dioxide   | YES         |     |                |     |      |     |              |     |       |     |       |     |
| Foam        | YES   | Dry chemical   | YES         |     |                |     |      |     |              |     |       |     |       |     |
| Halon       | YES   | Other  | YES         |     |                |     |      |     |              |     |       |     |       |     |
| 5.2         | Specific Hazards Arising From Chemical:                         | When involved in a fire, this material may decompose and produce irritating fumes and toxic gases (e.g., carbon monoxide, carbon dioxide, and phosphorous oxides).   |             |     |                |     |      |     |              |     |       |     |       |     |
|             |   | <u>Explosion Sensitivity to Mechanical Impact</u> : Not applicable.  |             |     |                |     |      |     |              |     |       |     |       |     |
|             |   | <u>Explosion Sensitivity to Static Discharge</u> : Not applicable.   |             |     |                |     |      |     |              |     |       |     |       |     |
| 5.3         | Special Protective Equipment And Precautions For Fire-Fighters: | Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.   |             |     |                |     |      |     |              |     |       |     |       |     |

## 6. ACCIDENTAL RELEASE MEASURES

- |     |   |  |
|-----|---|--|
| 6.1 | Personal Precautions                                  | Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people.  |
|     | Protective equipment                                  | For small releases (< 5 gallons), clean up spilled liquid wearing gloves, goggles, faceshield, and suitable body protection. The minimum Personal Protective Equipment recommended for response to non-incident releases (more than 5 gallons) should be Level B: triple-gloves (neoprene gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and Self-Contained Breathing Apparatus.           |
|     | Emergency procedures                                  | Monitoring must indicate that exposure levels are below those provided in Section 3 (Composition and Information on Ingredients) and that oxygen levels are above 19.5% before anyone is permitted in the area without Self-Contained Breathing Apparatus.   |
| 6.2 | Methods and Materials for Containment and Cleaning Up | Soak up or wet vacuum spilled liquid. Neutralize residue with sodium bicarbonate or other neutralizing agent for dilute acids. Decontaminate the area thoroughly. Test area with litmus paper to ensure neutralization. Place all spill residues in a suitable container. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or appropriate local standards (see Section 13, Disposal Considerations). |

## 7. HANDLING and STORAGE

- 7.1 Precautions for Safe Handling All employees who handle this material should be trained to handle it safely. Open containers carefully on a stable surface. Empty containers may contain residual liquid; therefore, empty containers should be handled with care.
- As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat or drink while handling this material. Avoid generating mists and sprays of this product. Remove contaminated clothing immediately.
- During equipment maintenance follow practices indicated in Section 6 (Accidental Release Measures) to decontaminate equipment or clean-up small spills. Make certain that application equipment is locked and tagged-out safely if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures or appropriate local standards.
- 7.2 Conditions For Safe Storage Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials. Material should be stored in secondary containers, or in a diked area, as appropriate. Storage and use areas should be covered with impervious materials. Keep container tightly closed when not in use. If appropriate, post warning signs in storage and use areas. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.
- Incompatibilities Strong bases, amines, strong oxidizers, very strong acids, water reactive materials. It may react with metals to generate hydrogen gas. The product may release toxic gases if in contact with sulfides or sulfites.

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

### 8.1 Control Parameters

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR					
		ACGIH-TLV		OSHA-PEL			OTHER
		TWA mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>	TWA mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>	IDLH mg/m <sup>3</sup>	
Acrylic Polymer	Proprietary	NE	NE	NE	NE	NE	NE
Chelate compound	Proprietary	NE	NE	NE	NE	NE	NE

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

- 8.2 Appropriate Engineering Controls. Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in this Section or as low as reasonably achievable. Ensure eyewash/safety shower stations are available near areas where this product is used.
- 8.3 Personal Protective Equipment
- Respiratory protection: None needed under normal conditions of use. Use NIOSH approved respirators if ventilation is inadequate to control mists or vapor. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the applicable local standards. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-face piece pressure/demand SCBA or a full-face piece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).
- Eye protection: Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133. Splash goggles with a faceshield may be needed if splash hazards exist.
- Hand protection: Wear chemical impervious gloves (e.g., Solvex™, Neoprene).
- Body protection: If needed, use body protection appropriate for task (e.g., Tyvek suit, rubber apron) to protect from splashes and sprays.

## 9. PHYSICAL and CHEMICAL PROPERTIES

Appearance	This product is amber to light yellow water-based solution with a mild odor.		
Odor		Odor Threshold	N/A
Melting Point °C (°F)	Similar to water	pH (as supplied)	4.5 – 6.5
Initial Boiling Point °C (°F)	100	Boiling Point Range °C (°F)	N/A
Flammability	Non-flammable	Evaporation Rate (water = 1)	Similar to water
Vapor Density (air = 1)	Similar to water	Vapor Pressure mm Hg @ 20°C:	18
Solubility (in water)	Soluble	Relative density (water = 1)	1.1 – 1.2
Viscosity	Similar to water	Oil-Water Partition Coefficient	N/A
Decomposition Temperature	N/A		
How To Detect This Substance (Warning Properties):	The color and odor may act as warning properties associated with this product.		

## 10. STABILITY and REACTIVITY

10.1	Reactivity	Not considered reactive.
10.2	Chemical Stability	Stable
10.3	Possibility of hazardous reactions	Hazardous polymerization will not occur.
10.4	Conditions to avoid	Avoid mixing with incompatible materials.
10.5	Incompatible Materials	Strong bases, amines, strong oxidizers, very strong acids, water reactive materials. It may react with metals to generate hydrogen gas. The product may release toxic gases if in contact with sulfides or sulfites.
10.6	Hazardous Decomposition Products	Thermal decomposition of this product may generate carbon monoxide, carbon dioxide, and phosphorus oxides.

## 11. TOXICOLOGICAL INFORMATION

11.1	Information on Toxicological Effects			
	Toxicity data for hazardous ingredients	Oral LD <sub>50</sub> mg/kg	Dermal LD <sub>50</sub> mg/kg	Inhalation LD <sub>50</sub> mg/kg
	Acrylic Polymer	LD <sub>50</sub> (oral, rat) > 5000 mg/kg	LD <sub>50</sub> (dermal, rabbit) > 2000 mg/kg	N/A
		Eye irritation-rabbit: inconsequential irritation Skin irritation-rabbit: practically non-irritating		
	Chelate compound	LD <sub>50</sub> (oral, mouse) = 1800 mg/kg	N/A	N/A
		TDL <sub>o</sub> (intraperitoneal, mouse) = 200 mg/kg/female 7 days post; Teratogenic effects TDL <sub>o</sub> (intraperitoneal, mouse) = 40 mg/kg/female 7 days post; Reproductive effects TDL <sub>o</sub> (subcutaneous, mouse) = 200 mg/kg/female 13 days after conception; Reproductive: Specific Developmental Abnormalities; musculoskeletal system TDL <sub>o</sub> (subcutaneous, mouse) = 1400 mg/kg/female 11-17 days after conception; Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g. stunted fetus), Specific Developmental Abnormalities: Abnormalities: musculoskeletal system.		
	Potential routes of exposure	Inhalation, skin contact, eye contact		
	Potential effects of acute over-exposure	Inhalation exposure may cause tingling, coughing, sneezing, and difficulty breathing. Symptoms of skin and eye contact may include redness and irritation. Ingestion may cause stomach pains, cramps, and gastritis.		
	Potential effects of chronic over-exposure	Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). Symptoms may include tingling, redness, and visible injury.		
	Symptoms of over-exposure	Immediate: Inhalation exposure may cause tingling, coughing, sneezing, and difficulty breathing. Symptoms of skin and eye contact may include redness and irritation.		

		Ingestion may cause stomach pains, cramps, and gastritis. Delayed: Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). Symptoms may include tingling, redness, and visible injury.				
	Conditions aggravated by over-exposure	Preexisting dermatitis, other skin conditions, and respiratory conditions may be aggravated by exposures to this product.				
	Recommendations to physicians:	Treat symptoms and eliminate exposure.				
	Irritation	YES This product can be irritating to contaminated tissue.				
	Sensitization	NO				
	Carcinogenicity	NTP	IARC	US OSHA	CAL OSHA	67/548 EEC Annex 1
		NO	NO	NO	NO	NO
	Mutagenicity	NO				
	Reproductive toxicity	NO				
	Biological Exposure Index	N/A				
	Other potential health effects	Currently, there are no Biological Exposure Indices (BEIs) for any component of this product.				

## 12. ECOLOGICAL INFORMATION

*ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.*

12.1	Ecotoxicity	LC <sub>50</sub> , mg/L	EC <sub>50</sub> , mg/L
	<b>ACRYLIC POLYMER</b>		
	Aquatic	LC <sub>50</sub> ( <i>Salmo gairdneri</i> ) > 1100 mg/L/ 96 hours	EC <sub>50</sub> (algae) = 72.4 mg/L/ 72 hours EC <sub>50</sub> ( <i>Daphnia magna</i> ) > 1040 mg/L/ 48 hours
	Terrestrial	N/A	N/A
	<b>CHELATE COMPOUND</b>		
	Aquatic	LC <sub>50</sub> (freshwater fish) > 1000 mg/L LC <sub>50</sub> (Rainbow trout, 48 h) > 3440 mg/L	EC <sub>50</sub> (freshwater invertebrate) > 1000 mg/L EC <sub>50</sub> (Algae inhibition) > 1000 mg/L EC <sub>50</sub> ( <i>Daphnia magna</i> ) 265 mg/L EC <sub>50</sub> (Algae inhibition, 96 hr) 860 mg/L
	Terrestrial	N/A	N/A
12.2	Persistence and Degradability	The components of this product decompose in soil and water.	
12.3	Bioaccumulative Potential	The components of this product are not expected to bioaccumulate.	
12.4	Mobility in Soil	When spilled onto soil, this product will infiltrate downward, the rate being greater with lower concentration because of reduced viscosity. During transport through the soil, this product will dissolve some of the soil material, in particular, carbonate-based materials.	
12.5	Other Adverse Ecological Effects	This product may be harmful to aquatic life <u>if large volumes</u> of it are released into an aquatic environment.	

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### 13. DISPOSAL CONSIDERATIONS

Preparing Wastes of this Product for Disposal	Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with local regulations. This product, if unaltered by the handling, may be disposed of by treatment at a permitted facility or as advised by your local waste regulatory authority.
Disposal of Contaminated Packaging	Cleaned containers can be recycled or disposed of as non-contaminated waste, if authorized by your local authorities. Dispose of containers as required by local regulations.
U.S. EPA Waste Number	Not applicable.

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### 14. TRANSPORTATION INFORMATION

THIS MATERIAL IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

14.1	UN Number	Not applicable
14.2	UN Proper Shipping Name	Not applicable
14.3	Transport Hazard Class(es)	Not applicable
	Transport label(s) required	Not applicable
14.4	Packing Group	Not applicable
14.5	Marine Pollutant	Not applicable
	NA Emergency Response Guide Number (2008)	Not applicable
14.6	Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)	Not applicable
14.7	Special Transport Precautions	Not applicable
	National Motor Freight Classification	#70

#### International Air Transport Association

	UN Number	Not applicable
	UN Proper Shipping Name	Not applicable
	Transport Hazard Class(es)	Not applicable
	Transport label(s) required	Not applicable
	Packing Group	Not applicable
	IATA Emergency Response Code	Not applicable
	Excepted Quantity	Not applicable
	Packaging Instructions	Not applicable

#### International Maritime Organization

	UN Number	Not applicable
	UN Proper Shipping Name	Not applicable
	Transport Hazard Class(es)	Not applicable
	Transport label(s) required	Not applicable
	Packing Group	Not applicable
	Marine Pollutant	Not applicable
	NA Emergency Response Guide Number (2008)	Not applicable
	Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)	Not applicable

## 15. SAFETY, HEALTH and ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT

PROGRAM	Chelate Compound
<b>US EPA PROGRAMS</b>	
Clean Air Act Hazardous Air Pollutants	NO
Safe Drinking Water Act	NO
RCRA F, K, P, U or D-lists	NO
SARA 302 RQ	NO
SARA 302 TPQ	NO
SARA 313 LISTED	NO
<b>SARA CHEMICAL CATEGORIES</b>	
SARA 311/312 ACUTE	YES
SARA 311/312 CHRONIC	NO
SARA 311/312 FIRE	NO
SARA 311/312 PRESSURE	NO
SARA 311/312 REACTIVITY	NO
EPA EXTREMELY HAZARDOUS SUBSTANCE	NO
<b>CALIFORNIA SAFE DRINKING WATER ACT (Proposition 65)</b>	
This product does not contain any chemical listed on the California Safe Drinking Water Act list (Proposition 65)	
<b>US OSHA PROGRAMS</b>	
PEL	NO
PSM	NO
<b>CHEMICAL SECURITY PROGRAMS</b>	
DHS CFATS	NO
<b>CHEMICAL WEAPONS CONVENTION</b>	
	NO
<b>US DRUG ENFORCEMENT ADMINISTRATION</b>	
DEA Controlled Substances	NO
<b>CHEMICAL INVENTORY PROGRAMS</b>	
WHMIS	E
DSL	YES
NDSL	N/A
REACH Pre-registered List	YES
TSCA	YES
European Inventory of Existing Commercial Chemical Substances (EINECS)	YES
EU No-Longer Polymers List (NLP)	YES
EEC Classification Packaging, and Labeling of Dangerous Substances(Annex 1)	Xn Harmful
Philippines	YES
Japan	NO
Australia	YES
Korea	YES
China	NO
New Zealand Inventory of Chemicals	YES

## 16. OTHER INFORMATION

16.1	Original Preparation	14 Nov 2005; update 11 April 2011
16.2	Revision History	21 Feb 2013 Reformatted to GHS Requirements
16.3	Prepared by	ADVANCED CHEMICAL SAFETY, Inc. PO Box 152329 San Diego, CA 92195 (858)-874-5577
16.4	Date of Printing	April 28, 2015

## DEFINITIONS OF TERMS

16.5	A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:	
	Section 2	<p><b>GHS:</b> Global Harmonization System  <b>OSHA:</b> U.S. Occupational Safety and Health Administration.  <b>CLP:</b> Classification and Packaging  <b>WHMIS:</b> Workplace Hazardous Materials Information System  <b>STOT:</b> Specific Target Organ Toxicity</p>
	Section 3	<p><b>CAS #:</b> Chemical Abstract Service index number  <b>EINECS #:</b> European Chemical Substances Information System index number</p>
	Section 5	<p><b>NFPA:</b> National Fire Protection Association  <b>Health Hazard: 0</b> (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); <b>1</b> (materials that on exposure under fire conditions could cause irritation or minor residual injury); <b>2</b> (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); <b>3</b> (materials that can on short exposure could cause serious temporary or residual injury); <b>4</b> (materials that under very short exposure could cause death or major residual injury). <b>Flammability Hazard</b>  <b>Reactivity Hazard:</b> Refer to definitions for "Hazardous Materials Identification System".</p> <p><b>Flash Point:</b> Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air.  <b>Autoignition Temperature:</b> The minimum temperature required to initiate combustion in air with no other source of ignition.  <b>LEL:</b> The lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. <b>UEL:</b> The highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.</p>
	Section 8	<p><b>ACGIH</b> - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.  <b>TLV</b> - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (<b>TWA</b>), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (<b>C</b>). Skin absorption effects must also be considered  <b>PEL</b> - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (<u>Federal Register</u>: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.  <b>IDLH</b> - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. <b>The DFG - MAK</b> is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. <b>NIOSH</b> is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (<b>OSHA</b>). NIOSH issues exposure guidelines called <b>Recommended Exposure Levels (RELs)</b>. When no exposure guidelines are established, an entry of <b>NE (Not Established)</b> is made for reference.</p>
	Section 11	<p><b>LD<sub>50</sub></b> : Lethal Dose (solids &amp; liquids) which kills 50% of the exposed animals;  <b>LC<sub>50</sub></b> : Lethal Concentration (gases) which kills 50% of the exposed animals;  <b>ppm:</b> Concentration expressed in parts of material per million parts of air or water;  <b>mg/m<sup>3</sup></b> : Concentration expressed in weight of substance per volume of air;  <b>mg/kg:</b> Quantity of material, by weight, administered to a test subject, based on their body weight in kg  <b>IARC</b> - the International Agency for Research on Cancer;  <b>NTP</b> - the National Toxicology Program,  <b>RTECS</b> - the Registry of Toxic Effects of Chemical Substances,  <b>OSHA and CAL/OSHA.</b>  IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used.  <b>TDL<sub>0</sub></b>, the lowest dose to cause a symptom and  <b>TCLo</b> the lowest concentration to cause a symptom;  <b>TDo, LDL<sub>0</sub></b>, and <b>LDo</b>, or <b>TC, TCo, LCL<sub>0</sub></b>, and <b>LCo</b>, the lowest dose (or concentration) to cause lethal or toxic effects.  <b>BEI</b> - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.</p>
	Section 12	<p><b>LC<sub>50</sub>:</b> The lowest concentration in water which kills 50% of the test subjects.  <b>EC<sub>50</sub>:</b> The Effect Concentration in water at which 50% of the test species is affected.</p>
	Section 13	<p><b>US EPA Hazardous Waste Codes:</b> refer to 40 CFR 261.20</p>
	Section 14	<p><b>DOT:</b> US Department of Transportation  <b>IATA:</b> International Air Transport Association  <b>IMO:</b> International Maritime Organization  <b>MARPOL:</b> International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978  <b>IBC Code</b> : Merchant Shipping Code</p>
	Section 15	<p><b>RCRA:</b> US Resource Conservation and Recovery Act  <b>SARA:</b> US Superfund Amendments and Reauthorization Act  <b>PSM:</b> US OSHA Process Safety Management  <b>CFATS:</b> US Department of Homeland Security Chemical Facility Anti-terrorism Standard  <b>DSL:</b> Canadian Domestic Substances List  <b>NDSL:</b> Canadian Non-Domestic Substances List  <b>REACH:</b> European Registration, Evaluation, Authorization and Restriction of Chemicals list  <b>TSCA:</b> US Toxic Substances Control Act</p>



# SAFETY DATA SHEET

Xylene



## Section 1. Identification

<b>GHS product identifier</b>	: Xylene
<b>Chemical name</b>	: Xylene
<b>Synonyms</b>	: Xylol; Mixed Xylenes; Xylene Isomers and Ethylbenzene; Dimethylbenzenes and Ethylbenzene; Industrial-grade Xylene (meets ASTM D-364 Specifications); Nitration-grade Xylene (meets ASTM D-843 Specifications); CITGO® Material Code: 07306
<b>Code</b>	: 07306
<b>Supplier's details</b>	: CITGO Petroleum Corporation P.O. Box 4689 Houston, TX 77210 sdsvend@citgo.com
<b>Emergency telephone number</b>	: Technical Contact: (832) 486-4000 Medical Emergency: (832) 486-4700 CHEMTREC Emergency: (800) 424-9300 (United States Only)

## Section 2. Hazards identification

<b>OSHA/HCS status</b>	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Classification of the substance or mixture</b>	: FLAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY: INHALATION - Category 4 SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A CARCINOGENICITY: INHALATION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) [ears] - Category 2 ASPIRATION HAZARD - Category 1

### GHS label elements

#### Hazard pictograms



#### Signal word

: Danger

#### Hazard statements

: Flammable liquid and vapor.  
Harmful if inhaled.  
Causes serious eye irritation.  
Causes skin irritation.  
Suspected of causing cancer if inhaled.  
May be fatal if swallowed and enters airways.  
May cause respiratory irritation.  
May cause damage to organs through prolonged or repeated exposure. (ears)

### Precautionary statements

#### Prevention

: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Do not breathe vapor. Wash hands thoroughly after handling.



## Section 2. Hazards identification

<b>Response</b>	: Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.
<b>Storage</b>	: Store locked up. Store in a well-ventilated place. Keep cool.
<b>Disposal</b>	: Dispose of contents and container in accordance with all local, regional, national and international regulations.
<b>Supplemental label elements</b>	: Avoid contact with skin and clothing. Wash thoroughly after handling.
<b>Hazards not otherwise classified</b>	: Prolonged or repeated contact may dry skin and cause irritation.

## Section 3. Composition/information on ingredients

<b>Substance/mixture</b>	: Substance
<b>Chemical name</b>	: Xylene
<b>Other means of identification</b>	: Xylol; Mixed Xylenes; Xylene Isomers and Ethylbenzene; Dimethylbenzenes and Ethylbenzene; Industrial-grade Xylene (meets ASTM D-364 Specifications); Nitration-grade Xylene (meets ASTM D-843 Specifications); CITGO® Material Code: 07306

### CAS number/other identifiers

**CAS number** : 1330-20-7

Ingredient name	%	CAS number
Xylenes, mixed isomers	60 - 100	1330-20-7
Ethylbenzene	10 - 30	100-41-4
Cumene	0.1 - 1	98-82-8

\* = Various    \*\* = Mixture    \*\*\* = Proprietary

Any concentration shown as a range is to protect confidentiality or is due to process variation.

**Occupational exposure limits, if available, are listed in Section 8.**

## Section 4. First aid measures

### Description of necessary first aid measures

<b>Eye contact</b>	: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
<b>Inhalation</b>	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that gas or vapor is still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
<b>Skin contact</b>	: Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

## Section 4. First aid measures

- Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute

#### Potential acute health effects

- Eye contact** : Causes eye irritation. Causes serious eye irritation.
- Inhalation** : Harmful if inhaled. May cause respiratory irritation.
- Skin contact** : Causes skin irritation. Defatting to the skin.
- Ingestion** : May be fatal if swallowed and enters airways. Irritating to mouth, throat and stomach.

#### Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:  
pain or irritation  
watering  
redness
- Inhalation** : Adverse symptoms may include the following:  
respiratory tract irritation  
coughing
- Skin contact** : Adverse symptoms may include the following:  
irritation  
redness  
dryness  
cracking
- Ingestion** : Adverse symptoms may include the following:  
nausea or vomiting

### Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : If ingested, this material presents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended. Consider activated charcoal and/or gastric lavage. If patient is obtunded, protect the airway by cuffed endotracheal intubation or by placement of the body in a Trendelenburg and left lateral decubitus position.
- Specific treatments** : Treat symptomatically and supportively.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that gas or vapor is still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

- Specific hazards arising from the chemical** : Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

### Extinguishing media

## Section 5. Fire-fighting measures

- Suitable extinguishing media** : Use caution when applying carbon dioxide in confined spaces. SMALL FIRE: Steam, CO<sub>2</sub>, dry chemical or inert gas (e.g., nitrogen). LARGE FIRE: Use foam, water fog or water spray. Water fog and spray are effective in cooling containers and adjacent structures. However, water can cause frothing and/or may not extinguish the fire. Water can be used to cool the external walls of vessels to prevent excessive pressure, ignition or explosion.
- Unsuitable extinguishing media** : Do not use water jet.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide
- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

### Methods and materials for containment and cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

## Section 7. Handling and storage

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not swallow. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container. Non equilibrium conditions may increase the fire hazard associated with this product. Always bond receiving containers to the fill pipe before and during loading. Always confirm that receiving container is properly grounded. Bonding and grounding alone may be inadequate to eliminate fire and explosion hazards. Carefully review operations that may increase the risks such as tank and container filling, tank cleaning, sampling, gauging, loading, filtering, mixing, agitation, etc. In addition to bonding and grounding, efforts to mitigate the hazards may include, but are not limited to, ventilation, inerting and/or reduction of transfer velocities. Always keep nozzle in contact with the container throughout the loading process. Do NOT fill any portable container in or on a vehicle.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
- Bulk Storage Conditions: Maintain all storage tanks in accordance with applicable regulations. Use necessary controls to monitor tank inventories. Inspect all storage tanks on a periodic basis. Test tanks and associated piping for tightness. Maintain the automatic leak detection devices to assure proper working condition.

## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
Xylenes, mixed isomers	<p><b>ACGIH TLV (United States, 4/2014).</b>            TWA: 100 ppm 8 hours.            TWA: 434 mg/m<sup>3</sup> 8 hours.            STEL: 150 ppm 15 minutes.            STEL: 651 mg/m<sup>3</sup> 15 minutes.</p> <p><b>OSHA PEL (United States, 2/2013).</b>            TWA: 100 ppm 8 hours.            TWA: 435 mg/m<sup>3</sup> 8 hours.</p>
Ethylbenzene	<p><b>ACGIH TLV (United States, 4/2014).</b>            TWA: 20 ppm 8 hours.</p> <p><b>OSHA PEL (United States, 2/2013).</b>            TWA: 100 ppm 8 hours.            TWA: 435 mg/m<sup>3</sup> 8 hours.</p>
Cumene	<p><b>ACGIH TLV (United States, 4/2014).</b>            TWA: 50 ppm 8 hours.</p> <p><b>OSHA PEL (United States, 2/2013). Absorbed through</b></p>

## Section 8. Exposure controls/personal protection

	<b>skin.</b> TWA: 50 ppm 8 hours. TWA: 245 mg/m <sup>3</sup> 8 hours.
Xylenes, mixed (parent)	<b>ACGIH TLV (United States)</b> 6 ppm (25 mg/m <sup>3</sup> ) 8 hour(s) Notes: The TLV for the hydrocarbon solvent is based on the procedure described in Appendix H ("Reciprocal Calculations Method for Certain Refined Hydrocarbon Solvent Vapors") of the ACGIH TLVs® and BEIs® guidelines. The GGVMixture (ACGIH TLV) is based on Column B (McKee et al., 2005) of Table 1 ("Group Guidance Values") of Appendix H.
<b>Appropriate engineering controls</b>	: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.
<b>Environmental exposure controls</b>	: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, vapor controls, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.
<b><u>Individual protection measures</u></b>	
<b>Hygiene measures</b>	: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
<b>Eye/face protection</b>	: Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles. Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If inhalation hazards exist, a full-face respirator may be required instead.
<b><u>Skin protection</u></b>	
<b>Hand protection</b>	: Avoid skin contact with liquid. Chemical-resistant gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Recommended: Heavy duty, industrial grade chemically resistant gloves constructed of nitrile, neoprene, polyethylene, fluoroelastomer rubber or polyvinyl chloride as approved by glove manufacturer. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. Leather gloves are not protective for liquid contact.
<b>Body protection</b>	: Avoid skin contact with liquid. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
<b>Other skin protection</b>	: Avoid skin contact with liquid. Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Leather boots are not protective for liquid contact.
<b>Respiratory protection</b>	: Avoid inhalation of gases, vapors, mists or dusts. Use a properly fitted, air-purifying or supplied-air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If an air purifying respirator is appropriate, use one equipped with cartridges rated for organic vapors.



## Section 9. Physical and chemical properties

<b>Physical state</b>	: Liquid.
<b>Color</b>	: Transparent, colorless.
<b>Odor</b>	: Sweet, pungent aromatic hydrocarbon.
<b>pH</b>	: Not available.
<b>Melting point</b>	: -48°C (-54.4°F)
<b>Boiling point/boiling range</b>	: 138°C (280.4°F)
<b>Flash point</b>	: Closed cup: 27°C (81°F)(Typical)
<b>Evaporation rate</b>	: 0.8 (n-butyl acetate. = 1)
<b>Lower and upper explosive (flammable) limits</b>	: Lower: 1% Upper: 7%
<b>Vapor pressure</b>	: 0.93 kPa (7 mm Hg) [room temperature]
<b>Vapor density</b>	: 3.7 [Air = 1]
<b>Relative density</b>	: 0.87
<b>Density lbs/gal</b>	: 7.25 lbs/gal
<b>Gravity, °API</b>	: Estimated 31 @ 60 F
<b>Solubility</b>	: Very slightly soluble in the following materials: cold water.
<b>Auto-ignition temperature</b>	: 432°C (809.6°F)

## Section 10. Stability and reactivity

<b>Reactivity</b>	: Not expected to be Explosive, Self-Reactive, Self-Heating, or an Organic Peroxide under US GHS Definition(s).
<b>Chemical stability</b>	: The product is stable.
<b>Possibility of hazardous reactions</b>	: Under normal conditions of storage and use, hazardous reactions will not occur.
<b>Conditions to avoid</b>	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas. Do not store with strong oxidizing agents.
<b>Incompatible materials</b>	: Reactive or incompatible with the following materials: oxidizing materials
<b>Hazardous decomposition products</b>	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Xylenes, mixed isomers	LC50 Inhalation Vapor	Rat	5000 ppm	4 hours
	LC50 Inhalation Vapor	Rat	6700 ppm	4 hours
	LD50 Oral	Mouse	2119 mg/kg	-
	LD50 Oral	Rat	4300 mg/kg	-
Ethylbenzene	LD50 Oral	Rat	4300 mg/kg	-
	LD50 Dermal	Rabbit	>5000 mg/kg	-
Cumene	LD50 Oral	Rat	3500 mg/kg	-
	LC50 Inhalation Vapor	Mouse	10 g/m <sup>3</sup>	7 hours
	LD50 Dermal	Rabbit	12300 uL/kg	-
	LD50 Oral	Rat	2.9 g/kg	-
	LD50 Oral	Rat	4000 mg/kg	-

## Section 11. Toxicological information

**Conclusion/Summary** : **Xylenes, mixed isomers**: Overexposure to xylene may cause upper respiratory tract irritation, headache, cyanosis, blood serum changes, CNS damage and narcosis. Effects may be increased by the use of alcoholic beverages. Evidence of liver and kidney impairment were reported in workers recovering from a gross over-exposure.

### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Xylenes, mixed isomers	Skin - Mild irritant	Rat	-	8 hours 60 microliters	-
	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams	-
Ethylbenzene	Skin - Moderate irritant	Rabbit	-	100 Percent	-
	Skin - Mild irritant	Rabbit	-	24 hours 15 milligrams	-
Cumene	Eyes - Mild irritant	Rabbit	-	86 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 10 milligrams	-

**Skin** : **Xylenes, mixed isomers**: May cause skin irritation.

**Eyes** : **Xylenes, mixed isomers**: May cause eye irritation.

**Respiratory** : **Xylenes, mixed isomers**: May cause respiratory irritation.

### Sensitization

**Skin** : No additional information.

**Respiratory** : No additional information.

### Mutagenicity

**Conclusion/Summary** : No additional information.

### Carcinogenicity

**Conclusion/Summary** : **Ethylbenzene**: Findings from a 2-year inhalation study in rodents conducted by NTP were as follows: Effects were observed only at the highest exposure level (750 ppm). At this level the incidence of renal tumors was elevated in male rats (tubular carcinomas) and female rats (tubular adenomas). Also, the incidence of tumors was elevated in male mice (alveolar and bronchiolar carcinomas) and female mice (hepatocellular carcinomas). IARC has classified ethyl benzene as "possibly carcinogenic to humans" (Group 2B).

### Classification

Product/ingredient name	OSHA	IARC	NTP
Xylenes, mixed isomers	-	3	-
Ethylbenzene	-	2B	-
Cumene	-	2B	Reasonably anticipated to be a human carcinogen.

### Reproductive toxicity

**Conclusion/Summary** : **Ethylbenzene**: Studies in laboratory animals indicate limited evidence of renal malformations, resorptions, and developmental delays following high levels of maternal exposure. The relevance of these findings to humans is not clear at this time.

### Teratogenicity

**Conclusion/Summary** : No additional information.

### Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Ethylbenzene	Category 3	Not applicable.	Respiratory tract irritation
Cumene	Category 3	Not applicable.	Respiratory tract irritation

### Specific target organ toxicity (repeated exposure)

## Section 11. Toxicological information

Name	Category	Route of exposure	Target organs
Ethylbenzene	Category 2	Inhalation	ears

### Aspiration hazard

Name	Result
Ethylbenzene	ASPIRATION HAZARD - Category 1

**Information on the likely routes of exposure** : Routes of entry anticipated: Dermal, Inhalation.

### Potential acute health effects

- Eye contact** : Causes eye irritation. Causes serious eye irritation.
- Inhalation** : Harmful if inhaled. May cause respiratory irritation.
- Skin contact** : Causes skin irritation. Defatting to the skin.
- Ingestion** : May be fatal if swallowed and enters airways. Irritating to mouth, throat and stomach.

### Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : Adverse symptoms may include the following:  
pain or irritation  
watering  
redness
- Inhalation** : Adverse symptoms may include the following:  
respiratory tract irritation  
coughing
- Skin contact** : Adverse symptoms may include the following:  
irritation  
redness  
dryness  
cracking
- Ingestion** : Adverse symptoms may include the following:  
nausea or vomiting

### Potential chronic health effects

- General** : May cause damage to organs through prolonged or repeated exposure. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.
- Carcinogenicity** : Suspected of causing cancer if inhaled. Risk of cancer depends on duration and level of exposure.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

## Section 12. Ecological information

### Toxicity



## Section 12. Ecological information

Product/ingredient name	Result	Species	Exposure	
Xylenes, mixed isomers	Acute EC50 90 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours	
	Acute LC50 8.5 ppm Marine water	Crustaceans - Palaemonetes pugio - Adult	48 hours	
	Acute LC50 8500 µg/l Marine water	Crustaceans - Palaemonetes pugio	48 hours	
	Acute LC50 15700 µg/l Fresh water	Fish - Lepomis macrochirus - Juvenile (Fledgling, Hatchling, Weanling)	96 hours	
	Acute LC50 19000 µg/l Fresh water	Fish - Lepomis macrochirus	96 hours	
	Acute LC50 13400 µg/l Fresh water	Fish - Pimephales promelas	96 hours	
	Acute LC50 16940 µg/l Fresh water	Fish - Carassius auratus	96 hours	
	Acute EC50 4600 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours	
	Acute EC50 3600 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours	
	Acute EC50 2930 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours	
Ethylbenzene	Acute LC50 5200 µg/l Marine water	Crustaceans - Americamysis bahia	48 hours	
	Acute LC50 4200 µg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours	
	Chronic NOEC 1000 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours	
	Cumene	Acute EC50 2600 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours
		Acute EC50 7400 µg/l Fresh water	Crustaceans - Artemia sp. - Nauplii	48 hours
		Acute EC50 10600 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
		Acute LC50 2700 µg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours

**Conclusion/Summary** : Not available.

### Persistence and degradability

**Conclusion/Summary** : Not available.

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
Xylenes, mixed isomers	3.12	8.1 to 25.9	low
Ethylbenzene	3.6	-	low
Cumene	3.55	94.69	low

### Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive

## Section 13. Disposal considerations




atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

**RCRA classification** : D001, D018

**United States - RCRA Toxic hazardous waste "U" List**

Ingredient	CAS #	Status	Reference number
Xylene	1330-20-7	Listed	U239

## Section 14. Transport information

	DOT Classification	IMDG	IATA
<b>UN number</b>	UN1307	UN1307	UN1307
<b>UN proper shipping name</b>	RQ, Xylenes, 3, UN 1307, PG III	RQ, Xylenes, 3, UN 1307, PG III	RQ, Xylenes, 3, UN 1307, PG III
<b>Transport hazard class(es)</b>	3 	3 	3 
<b>Packing group</b>	III	III	III
<b>Environmental hazards</b>	No.	No.	No.
<b>Additional information</b>	<p><b>Reportable quantity</b> 125 lbs / 56.749 kg [17.232 gal / 65.229 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.</p> <p><b>Packaging instruction</b> <b>Passenger aircraft</b> Quantity limitation: 60 L</p> <p><b>Cargo aircraft</b> Quantity limitation: 220 L</p>	-	<p><b>Passenger and Cargo Aircraft</b> Quantity limitation: 60 L <b>Cargo Aircraft Only</b>Quantity limitation: 220 L</p>

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

## Section 15. Regulatory information

- U.S. Federal regulations** : **United States inventory (TSCA 8b)**: All components are listed or exempted.  
**Clean Water Act (CWA) 307**: Ethylbenzene; Toluene; Benzene; Naphthalene  
**Clean Water Act (CWA) 311**: Xylene  
 This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.

### SARA 302/304

#### Composition/information on ingredients

**SARA 304 RQ** : Not applicable.

### SARA 311/312

**Classification** : Fire hazard  
 Immediate (acute) health hazard  
 Delayed (chronic) health hazard

#### Composition/information on ingredients

Name	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Xylenes, mixed isomers	Yes.	No.	No.	Yes.	Yes.
Ethylbenzene	Yes.	No.	No.	Yes.	Yes.
Cumene	Yes.	No.	No.	Yes.	Yes.

### SARA 313

	Product name	CAS number	%
<b>Form R - Reporting requirements</b>	Xylenes, mixed isomers	1330-20-7	<90
	Ethylbenzene	100-41-4	<30
<b>Supplier notification</b>	Xylenes, mixed isomers	1330-20-7	<90
	Ethylbenzene	100-41-4	<30

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

### State regulations

- Massachusetts** : The following components are listed: XYLENE  
**New York** : The following components are listed: Xylene (mixed)  
**New Jersey** : The following components are listed: XYLENES; BENZENE, DIMETHYL-  
**Pennsylvania** : The following components are listed: BENZENE, DIMETHYL-  
**California Prop. 65**

**WARNING:** This product contains a chemical known to the State of California to cause cancer.

**WARNING:** This product contains less than 1% of a chemical known to the State of California to cause birth defects or other reproductive harm.

Ingredient name	%	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Ethylbenzene	<30	Yes.	No.	41 µg/day (ingestion) 54 µg/day (inhalation)	No.
Cumene	<1	Yes.	No.	No.	No.
Toluene	<0.1	No.	Yes.	No.	7000 µg/day (ingestion)
Benzene	<0.01	Yes.	Yes.	6.4 µg/day (ingestion) 13 µg/day	24 µg/day (ingestion) 49 µg/day (inhalation)

## Section 15. Regulatory information

Naphthalene	<0.0001	Yes.	No.	(inhalation) Yes.	No.
-------------	---------	------	-----	----------------------	-----

### International regulations

#### International lists

- : **Australia inventory (AICS)**: All components are listed or exempted.
- : **China inventory (IECSC)**: All components are listed or exempted.
- : **Japan inventory**: All components are listed or exempted.
- : **Korea inventory**: All components are listed or exempted.
- : **Malaysia Inventory (EHS Register)**: All components are listed or exempted.
- : **New Zealand Inventory of Chemicals (NZIoC)**: All components are listed or exempted.
- : **Philippines inventory (PICCS)**: All components are listed or exempted.
- : **Taiwan inventory (CSNN)**: All components are listed or exempted.

#### Canada inventory

- : All components are listed or exempted.

#### EU Inventory

- : All components are listed or exempted.

#### WHMIS (Canada)

- : Class B-2: Flammable liquid
- : Class D-2A: Material causing other toxic effects (Very toxic).
- : Class D-2B: Material causing other toxic effects (Toxic).

## Section 16. Other information

### National Fire Protection Association (U.S.A.)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

### History

**Date of issue/Date of revision** : 6/29/2015.

### Key to abbreviations

- : ATE = Acute Toxicity Estimate
- : BCF = Bioconcentration Factor
- : GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- : IATA = International Air Transport Association
- : IBC = Intermediate Bulk Container
- : IMDG = International Maritime Dangerous Goods
- : LogPow = logarithm of the octanol/water partition coefficient
- : MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
- : UN = United Nations

### Notice to reader

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## Section 16. Other information

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CITGO is a registered trademark of CITGO Petroleum Corporation

# **Mojave Solar LLC**

42134 Harper Lake Road  
Hinkley, California 92347

Phone: 760 308 0400

## **Appendix L**

### **2019 HAZ-6 owner, vendors and operation's company certification statements**

#### **Mojave Solar Project Annual Compliance Report San Bernardino County, California**

#### **2019 Reporting Period**

I, Fernando Nieves, Project Manager

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

**Desert Environmental Services Inc.**

for employment at;

**Mojave Solar LLC, Hinkley, CA.**

have been conducted as required by the California Energy Commission Decision for the above- named project.

*Fernando Nieves*

Fernando Nieves

Dated this 5 day of February , 2020

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

# Mojave Solar LLC

**Atlantica**  
Sustainable Infrastructure

Mojave Solar Project  
42134 Harper Lake Road  
Phone: 760-308-0400  
Hinkley, California 92347

Attn: California Energy Commission

**Submitted Electronically**

## Affidavit of Compliance for Project Owners

I, Kimberly Tarzian, Human Resource Manager

---

do hereby certify that background investigations to ascertain the accuracy of the identity  
of all employees of

Mojave Solar LLC, ASI Operations LLC

---

for employment at

Mojave Solar Project, 42134 Harper Lake Rd. Hinkley, CA

---

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the  
above- named project.

  
(Signature of officer or agent)

Dated this 27 day of February 2020

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT  
SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE  
FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT  
MANAGER



# **Mojave Solar LLC**

42134 Harper Lake Road  
Hinkley, California 92347

Phone: 760 308 0400

## **Appendix M**

### **2019 WASTE-9 waste manifests**

#### **Mojave Solar Project Annual Compliance Report San Bernardino County, California**

#### **2019 Reporting Period**

# ABENGOA

## NORTH AMERICA



### Mojave Solar Project

42134 Harper Lake Road  
Hinkley, California 92347

Phone: 760 308-0400

February 15, 2019

**By US Mail**

DTSC Generator Manifests  
Department of Toxic Substances Control  
P.O. Box 400  
Sacramento, CA 95812-0400

Generator ID # CAR000242040

Dear Sirs or Madame,

As you know, Abengoa Solar (ASIO) manages the Mojave Solar Project for Mojave Solar LLC (MS LLC) Generator ID # CAR000242040.

On behalf of MS LLC, attached please find manifests for Waste Tracking numbers:

From North State Environmental

019299112 JJK

Please note, correspondence should be sent to the attention of:

Jose Manuel Bravo Romero  
Manager, Quality and Environment  
Department  
Mojave Solar Project  
42134 Harper Lake Road  
Hinkley, California 92347  
(303) 378-7302  
jmanuel.bravo@abengoa.com

Sincerely,

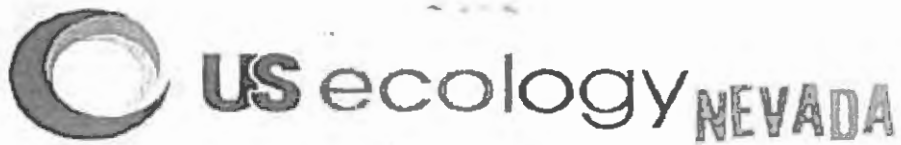
Jose Manuel Bravo Romero.  
Manager, Permitting, Q&E Department.

Attachments: Hazardous Waste Manifest

Please print or type.

Form Approved OMB No. 2050-0039

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator ID Number <b>C A R O O D 2 4 2 0 4 0</b>	2. Page 1 of <b>1</b>	3. Emergency Response Phone <b>909-875-9288</b>	4. Manifest Tracking Number <b>019299112 JJK</b>			
5. Generator's Name and Mailing Address <b>Mojave Solar LLC 42134 Haper Lake Rd. Hinkley CA 92347</b>			Generator's Site Address (if different from mailing address)					
Generator's Phone: <b>303-378-7302</b>			Attn: <b>Jose Manuel Bravo Romero</b>					
6. Transporter 1 Company Name <b>North State Environmental</b>			U.S. EPA ID Number <b>C A R O O 0 2 0 6 0 8 6</b>		U.S. EPA ID Number			
7. Transporter 2 Company Name			U.S. EPA ID Number		U.S. EPA ID Number			
8. Designated Facility Name and Site Address <b>US Ecology, Inc. Hwy 95, 11 miles south of Beatty NV 89003</b>			U.S. EPA ID Number <b>N V T 3 3 0 0 1 0 0 0 0</b>		U.S. EPA ID Number			
Facility's Phone: <b>(775) 553-2203</b>								
GENERATOR	9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No. Type		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes	
	X	1. <b>RD, NA3077, Hazardous waste solids, n.o.s., (silver, lead), 9, III (D008, D011)</b>	1	CM	10	Y	D008	D011 181
		2.						
		3.						
		4.						
14. Special Handling Instructions and Additional Information 1. Profile# pending			<b>ERG1</b>		1: <b>1X10Y CM</b>		2: 3: 4:	
15. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations, if export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.								
Generator's/Officer's Printed/Typed Name <b>JOSE M BRAVO</b>			Signature <i>[Signature]</i>		Month Day Year <b>4 25 19</b>			
TRANSPORTER INTL	16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S.			Port of entry/exit: Date leaving U.S.				
	17. Transporter Acknowledgment of Receipt of Materials							
TRANSPORTER	Transporter 1 Printed/Typed Name <b>KEY CO</b>		Signature <i>[Signature]</i>		Month Day Year <b>2 15 19</b>			
	Transporter 2 Printed/Typed Name		Signature		Month Day Year			
DESIGNATED FACILITY	18. Discrepancy							
	18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection							
	18b. Alternate Facility (or Generator)				Manifest Reference Number:		U.S. EPA ID Number	
	Facility's Phone:							
18c. Signature of Alternate Facility (or Generator)							Month Day Year	
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)								
1. <b>H03A</b>		2.		3.		4.		
20. Designated Facility Owner or Operator Certification of receipt of hazardous materials covered by the manifest except as noted in item 18a								
Printed/Typed Name <b>[Signature]</b>			Signature <i>[Signature]</i>			Month Day Year <b>12 25 19</b>		



Ticket: 201894

US Ecology Nevada  
11 Miles South of Beatty  
Beatty, NV 89003

Vehicle: 10  
Manifest #: 019299112JJK

Date: 2/25/2019  
Time In: 08:04 AM  
Time Out: 09:29 AM

In: 50620 lb  
Out: 37520 lb  
Net: 13100 lb

Net Tons: 6.55 tons  
Net Kg: 5942 kilograms

**ABENGOA**

**NORTH AMERICA**



**Mojave Solar Project**

42134 Harper Lake Road  
Hinkley, California 92347

Phone 760 308-0400

May 13, 2019

**By US Mail**

DTSC Generator Manifests  
Department of Toxic Substances Control  
P.O. Box 400  
Sacramento, CA 95812-0400

Generator ID # CAR000242040

Dear Sirs or Madame,

As you know, Abengoa Solar (ASIO) manages the Mojave Solar Project for Mojave Solar LLC (MS LLC) Generator ID # CAR000242040.

On behalf of MS LLC, attached please find manifests for Waste Tracking numbers:

*DESERT ENVIRONMENTAL*  
From ~~North State Environmental~~

Please note, correspondence should be sent to the attention of:


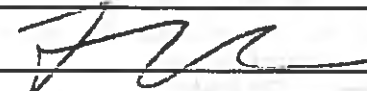
017840140 JJK  
017840103 JJK

Jose Manuel Bravo Romero  
Manager, Quality and Environment  
Department  
Mojave Solar Project  
42134 Harper Lake Road  
Hinkley, California 92347  
(303) 378-7302  
jmanuel.bravo@abengoa.com

Sincerely,

Jose Manuel Bravo Romero.  
Manager, Permitting, Q&E Department.

Attachments: Hazardous Waste Manifest

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number <b>CAR000242040</b>	2. Page 1 of <b>1</b>	3. Emergency Response Phone <b>(760) 684-0900</b>	4. Manifest Tracking Number <b>017840140 JJK</b>	
5. Generator's Name and Mailing Address <b>Mojave Solar LLC 42134 Harper Lake Road, Hinkley CA 92347 636 519-3623</b>			Generator's Site Address (if different than mailing address)			
6. Transporter 1 Company Name <b>Desert Environmental Services Inc.</b>			U.S. EPA ID Number <b>CAR000074542</b>			
7. Transporter 2 Company Name <b>Industrial Waste Utilization</b>			U.S. EPA ID Number <b>CAR000585293</b>			
8. Designated Facility Name and Site Address <b>Recicladora Temarry de Mexico SA DE CV Carr. FED No. 2 Mex-Tij. San Diablo Km 121 Tecate BC, MX 21530</b>			U.S. EPA ID Number <b>MXC130619001</b>			
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit WL/Vol.	13. Waste Codes
		No.	Type			
1.	<b>UN1915 Waste Cyclohexanone (commodity pack 3,III)</b>					<b>DD01 U057 331</b>
2.						
3.						
4.						
14. Special Handling Instructions and Additional Information  <b>1. R19-24291 Wear proper P.P.E.</b>						
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.						
Generator's/Offoror's Printed/Typed Name <b>MARVIN E. LOPEZ</b>		Signature 		Month <b>5</b>	Day <b>10</b>	Year <b>19</b>
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S.		Port of entry/exit: Date leaving U.S.:				
17. Transporter Acknowledgment of Receipt of Materials						
Transporter 1 Printed/Typed Name <b>FRIEDRICH NIEUFS</b>		Signature 		Month <b>5</b>	Day <b>10</b>	Year <b>19</b>
Transporter 2 Printed/Typed Name		Signature		Month	Day	Year
18. Discrepancy						
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection						
18b. Alternate Facility (or Generator) Manifest Reference Number: U.S. EPA ID Number						
18c. Signature of Alternate Facility (or Generator) Month Day Year						
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)						
1.		2.		3.		4.
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a						
Printed/Typed Name		Signature		Month	Day	Year



1. Generator ID Number <b>CAR000242040</b>	2. Page 1 of <b>1</b>	3. Emergency Response Phone <b>(760) 684-0999</b>	4. Manifest Tracking Number <b>017840140 JJK</b>
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5. Generator's Name and Mailing Address: **Mojave Solar LLC**  
**42134 Harper Lake Road, Hinkley CA 92347**  
**636 519-3623**

Generator's Site Address (if different than mailing address):

6. Transporter 1 Company Name: **Desert Environmental Services Inc.** U.S. EPA ID Number: **CAR000074542**

7. Transporter 2 Company Name: **Industrial Waste Utilization** U.S. EPA ID Number: **CAD980585293**

8. Designated Facility Name and Site Address: **Recicladora Temarry de Mexico SA DE CV**  
**Carr. FED No. 2 Mex-Tij. San Diablo Km 121**  
**Tecate BC, MX 21530**

Facility's Phone: **MXC130619001**

U.S. EPA ID Number: **MXC130619001**

9a HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes	
		No.	Type				
X	1. <b>UN1915 Waste Cyclohexanone (commodity pack) 3,III</b>	001	DF	20	P	DD01	U051
	2.					331	
	3.						
	4.						

14. Special Handling Instructions and Additional Information:  
**I. R19-24291**  
**Wear proper P.P.E.**  
**\* Bill to 54 Bcol**  
**020514/19E/18**

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offendor's Printed/Typed Name: **Maria E. Lopez** Signature: *[Signature]* Month: **5** Day: **10** Year: **19**

16. International Shipments:  Import to U.S.  Export from U.S. Port of entry/exit: **OTM MEXICO** Date leaving U.S.: **05-22-19**

17. Transporter Acknowledgment of Receipt of Materials: Transporter 1 Printed/Typed Name: **FERNANDO NIEVES** Signature: *[Signature]* Month: **5** Day: **10** Year: **19**

Transporter 2 Printed/Typed Name: **W. Thacher** Signature: *[Signature]* Month: **5** Day: **13** Year: **19**

18. Discrepancy: 18a. Discrepancy Indication Space:  Quantity  Type  Residue  Partial Rejection  Full Rejection

18b. Alternate Facility (or Generator): Manifest Reference Number: U.S. EPA ID Number: **RECEIVED 5-3-19**

18c. Signature of Alternate Facility (or Generator): Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems):  
**H000**

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in item 18a. Printed/Typed Name: **Jesus Guzman** Signature: *[Signature]* Month: **05** Day: **22** Year: **19**

GENERATOR

TRANSPORTER INTL

SIGNATED FACILITY

DESIGNATED FACILITY TO GENERATOR





10418

Print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number <b>CAR000242040</b>	2. Page 1 of <b>2</b>	3. Emergency Response Phone <b>(760) 684-0999</b>	4. Manifest Tracking Number <b>017840103 JJK</b>
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5. Generator's Name and Mailing Address <b>Mojave Solar LLC</b> <b>42134 Harper Lake Road, Hinkley CA 92347</b> <b>636 519-3623</b>	Generator's Site Address (if different than mailing address) <b>017840103 JJK</b>
--	--

6. Transporter 1 Company Name <b>Desert Environmental Services Inc.</b>	U.S. EPA ID Number <b>CAR000074542</b>
--	---

7. Transporter 2 Company Name <b>Industrial Waste Utilization Inc.</b>	U.S. EPA ID Number <b>CA0780585293</b>
---	---

8. Designated Facility Name and Site Address <b>AA Sydco, LLC.</b> <b>2264 E. 13th St. Yuma, AZ. 85365</b> <b>(928) 783-3676</b>	U.S. EPA ID Number <b>AZR000520304</b>
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9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit WL/Vol.	13. Waste Codes
		No.	Type			
1.	<b>Non-RCRA Hazardous Waste Liquid (Sodium Bisulfate) (OILY WATER, HFF)</b>	005	DM	250	G	291
2.	<del>Non RCRA Hazardous Waste Liquid (Latex Paint)</del> (F1)					
3.	<del>Non RCRA Hazardous Waste Liquid (Anionic Flocculant)</del> (F1)					
4.	<b>Non RCRA Hazardous Waste Solids (City Debris) (FERRIC CHLORIDE, R405)</b>	002	CY	900	P	352

14. Special Handling Instructions and Additional Information 1. <b>L37171-LL1</b> 2. <del>L37169-LL1</del> 3. <b>L37175-LL1</b> 4. <b>S37170-SL1</b> <b>Wear proper P.P.E.</b>
---

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name <b>MARIA E. LOPEZ</b>	Signature <i>Maria Lopez</i>	Month Day Year <b>5/10/19</b>
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16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S.	Port of entry Date leaving U.S.
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17. Transporter Acknowledgment of Receipt of Materials Transporter 1 Printed/Typed Name <b>FERDINAND NIEVES</b>	Signature <i>Ferdinand Nieves</i>	Month Day Year <b>5/10/19</b>
---	--------------------------------------	----------------------------------

Transporter 2 Printed/Typed Name <b>Pat Thacker</b>	Signature <i>Pat Thacker</i>	Month Day Year <b>5/13/19</b>
--	---------------------------------	----------------------------------

18. Discrepancy 18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection	Manifest Reference Number:
---	----------------------------

18b. Alternate Facility (or Generator) Facility's Phone	U.S. EPA ID Number
18c. Signature of Alternate Facility (or Generator) <b>RECEIVED</b> <i>Pat Thacker</i>	Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. <b>H141</b> 2. _____ 3. _____ 4. <b>H141</b>

20. Designated Facility Owner or Operator Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a Printed/Typed Name <b>A. HADEN</b>	Signature <i>A. Haden</i>	Month Day Year <b>5/14/19</b>
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# DESERT ENVIRONMENTAL SERVICES INC.

15330 CHOLAME RD UNIT D, VICTORVILLE, CA 92392 | (760) 949-1110 | DESERTFR@VERIZON.NET

18708

## INVOICE

Shipped Via Desert Environmental Services  
 EPAID# CAR000074542  
 Consolidated Waste ID# 4150  
 CA# 0282014  
**GENERATOR**  
 Name Mojave Solar LLC  
 Address 42134 Hankley Lake Rd  
 City, State ZIP Hankley, CA 92347  
 Phone \_\_\_\_\_  
 EPA# CAR000242040  
 Purchase Order # \_\_\_\_\_

**Consolidated Non-RCRA Hazardous Waste SHIPPED TO:**

Name Advanced Environmental   
 Address 13579 Whittram Ave.  
 City, State ZIP Fontana, CA 92335  
 EPA ID # CAT080025711  
 Name Veolia Environmental   
 Address 1704 W. First St.  
 City, State, ZIP Asuza, CA 91702  
 EPA ID # CAD008302903  
 Name AA Sydcot, LLC.   
 Address 1925 S. Factor Ave.  
 City, State, Zip Yuma, AZ 85365  
 EPA ID # AZR000501510

MANIFEST NUMBER	QTY	DESCRIPTION	PRICE EA.	TOTAL
		Flammable Liquids		
		NON-RCRA Solids		
<u>NH218708</u>	<u>300</u>	NON-Haz Liquids	<u>.65</u>	<u>195-</u>
		NON-Haz Solids		
		Latex Paint		
<u>0178401033JK</u>	<u>50M</u>	Anti Freeze/Oily Water	<u>175-</u>	
		Used Oil		
		Used Oil Filters		
		Filter Cake		
		Clarifier/Wash Rack		
		Empty Drums Removal		
		Universal Waste		
<u>017840140WK</u>	<u>1 DF</u>	<u>Cyclohexane</u>		
MANIFEST NUMBER	QTY	CONSOLIDATED WASTE	PRICE EA.	TOTAL
		Anti Freeze		
		Oily Debris		
		Oily Water		
<u>017840101JK</u>	<u>250</u>	Used Oil	<u>.25</u>	<u>62.50</u>
MANIFEST NUMBER	QTY	MATERIALS	PRICE EA.	TOTAL
		Labels		
	<u>2 Bx/10m</u>	New Drums/CYB/Totes	<u>125/40</u>	<u>250/400</u>
	<u>2</u>	Manifest/Profile		
		New Absorbent		
OTHER CHARGES				
	<u>6/100/40</u>	Transportation	<u>6.44</u>	<u>386.40</u>
	<u>21</u>	Labor		
		Truck		
<u>LTL charge</u>	<u>28x/7m</u>	Freight Total	<u>125/40</u>	<u>290/280</u>
		PPE		
		Bin Rental		
		Stop Fee		
		Washout		

Please remit payment to:  
 Desert Environmental Services Inc.  
 12127 Mall Blvd. Suite A 389  
 Victorville, CA 92392  
 We accept Visa, MC & Discover

Used oil is transported only to a facility that is lawfully operating in accordance with a hazardous waste facility permit or interim status document issued to the Federal Act.

**SUB TOTAL** \_\_\_\_\_  
**SALES TAX %** \_\_\_\_\_  
**CREDITS/PAYMENTS** \_\_\_\_\_  
**PLEASE PAY THIS AMOUNT** \_\_\_\_\_

TERMS: NET 30 DAYS

Generator is responsible for proper identification of Waste Stream. If improperly identified generator agrees to pay all testing, transportation and disposal charges incurred.

DATE 5-10-2019 GENERATOR Mojave Solar LLC DRIVER [Signature]  
 White: Transporter Copy Yellow: Accounting Pink: Generator

# ABENGOA



## Mojave Solar Project

42134 Harper Lake Road  
Hinkley, California 92347

Phone 760-308 0400

May 15, 2019

By US Mail

DTSC Generator Manifests  
Department of Toxic Substances Control  
P.O. Box 400  
Sacramento, CA 95812-0400

Generator ID # CAR000242040

Dear Sirs or Madame,

As you know, Abengoa Solar (ASIO) manages the Mojave Solar Project for Mojave Solar LLC (MS LLC) Generator ID # CAR000242040.

On behalf of MS LLC, attached please find manifests for Waste Tracking numbers:

~~DESERT ENVIRONMENTAL~~  
From North State Environmental

017840167 JJK

Please note, correspondence should be sent to the attention of:

Jose Manuel Bravo Romero  
Manager, Quality and Environment  
Department  
Mojave Solar Project  
42134 Harper Lake Road  
Hinkley, California 92347  
(303) 378-7302  
jmanuel.bravo@abengoa.com

Sincerely,

Jose Manuel Bravo Romero.  
Manager, Permitting, Q&E Department

Attachments. Hazardous Waste Manifest

Please print or type. (Form designed for use on 6-line (12-pitch) typewriter)

Form Approved OMB No. 2050-0039

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator ID Number <b>CAR000242040</b>	2. Page 1 of <b>1</b>	3. Emergency Response Phone <b>(760) 243-7619</b>	4. Manifest Tracking Number <b>017840167 JJK</b>			
5. Generator's Name and Mailing Address <b>Mojave Solar, LLC 14234 Harper Lake Road Hinkley, CA 92347</b>			Generator's Site Address (if different than mailing address)					
Generator's Phone: <b>760 308-0400</b>			U.S. EPA ID Number					
6. Transporter 1 Company Name <b>Desert Environmental Services Inc.</b>			U.S. EPA ID Number <b>CAR000071542</b>					
7. Transporter 2 Company Name			U.S. EPA ID Number					
8. Designated Facility (Name and State) <b>Waste Utilization US Ecology Nevada, Inc. Highway 95 Boatsy, NV, 85003</b>			U.S. EPA ID Number <b>NV 132001000</b>					
Facility's Phone: <b>702 239-3913</b>			U.S. EPA ID Number					
GENERATOR	9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes	
			No.	Type				
	1	(Waste Hydraulic Oil) Not-RCRA Hazardous Waste Liquids	001	TP	300	g	223	
	2							
	3							
4								
14. Special Handling Instructions and Additional Information  <b>A) 070131570-21679 (1 = TP)</b>								
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.								
Generator's/Offendor's Printed/Typed Name <b>X MARIAN EUGENE LIPSON</b>					Signature <i>[Signature]</i>		Month Day Year <b>5 15 19</b>	
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Part of entry/exit: <input checked="" type="checkbox"/> Date leaving U.S.: <b>5/15/19</b>								
17. Transporter Acknowledgment of Receipt of Materials								
Transporter 1 Printed/Typed Name <b>JEFF WOODS</b>					Signature <i>[Signature]</i>		Month Day Year <b>5 15 19</b>	
Transporter 2 Printed/Typed Name <b>ART MAYER</b>					Signature <i>[Signature]</i>		Month Day Year <b>5 15 19</b>	
18. Discrepancy								
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection								
Manifest Reference Number:								
16b. Alternate Facility (or Generator)						U.S. EPA ID Number		
Facility's Phone:						U.S. EPA ID Number		
16c. Signature of Alternate Facility (or Generator)						Month Day Year		
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)								
1	2	3	4	5	6	7	8	9
<b>H034</b>								
Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a						Month Day Year		
Printed/Typed Name <b>[Signature]</b>						Signature <i>[Signature]</i>		
						Month Day Year <b>5 15 19</b>		







**US ecology NEVADA**

Ticket: 206874

US Ecology Nevada  
11 Miles South of Beatty  
Beatty, NV 89003

Vehicle: 2018

Manifest #: NH218799

Date: 6/26/2019

Time In: 11:18 AM

Time Out: 12:32 PM

In: 44420 lb

Out: 28000 lb

Net: 16420 lb

Net Tons: 8.21 tons

Net Kg: 7448 kilograms

**ABENGOA**

**NORTH AMERICA**



**Mojave Solar Project**

42134 Harper Lake Road  
Hinkley, California 92347

Phone 760 308-0400

May 13, 2019

**By US Mail**

DTSC Generator Manifests  
Department of Toxic Substances Control  
P.O. Box 400  
Sacramento, CA 95812-0400

Generator ID # CAR000242040

Dear Sirs or Madame,

As you know, Abengoa Solar (ASIO) manages the Mojave Solar Project for Mojave Solar LLC (MS LLC) Generator ID # CAR000242040.

On behalf of MS LLC, attached please find manifests for Waste Tracking numbers:

*DESERT ENVIRONMENTAL*  
From ~~North State Environmental~~

017840101 JJK

Please note, correspondence should be sent to the attention of:

Jose Manuel Bravo Romero  
Manager, Quality and Environment  
Department  
Mojave Solar Project  
42134 Harper Lake Road  
Hinkley, California 92347  
(303) 378-7302  
jmanuel.bravo@abengoa.com

Sincerely,

Jose Manuel Bravo Romero  
Manager, Permitting, Q&E Department.

Attachments: Hazardous Waste Manifest (Consolidated)

<b>HAZARDOUS WASTE MANIFEST</b>	1. Generator ID Number <b>CAR000074542</b>	2. Page 1 of <b>1</b>	3. Emergency Response Phone <b>(760) 684-0999</b>	4. Manifest Tracking Number <b>017840101 JJK</b>
---------------------------------	---	-----------------------	--	---

Generator's Name and Mailing Address <b>Desert Environmental Services Inc.</b> <b>12127 Mall Blvd Suite A 389 Victorville, CA 92392</b> Generator's Phone: <b>760 243 7619</b>	Generator's Site Address (if different than mailing address) <b>15330 Cholame Rd Unit D</b> <b>Victorville, CA 92392</b>
---	--

6. Transporter 1 Company Name <b>Desert Environmental Services Inc.</b>	U.S. EPA ID Number <b>CAR000074542</b>
7. Transporter 2 Company Name	U.S. EPA ID Number

8. Designated Facility Name and Site Address <b>ADVANCED ENVIRONMENTAL INC</b> <b>13579 Whittram Ave. Fontana, CA 92335</b> Facility's Phone: <b>(909)356-9025</b>	U.S. EPA ID Number <b>CAT080025711</b>
---	---

9a HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
		No	Type			
1.	<b>(Used motor oil)</b> <b>Non RCRA Hazardous Waste Liquids</b>	<b>001</b>	<b>TT</b>	<b>250</b>	<b>G</b>	<b>721</b>
2.						
3.						
4.						

14. Special Handling Instructions and Additional Information <b>Wear proper P.P.E. 1) (1xTT)</b>
---

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I export shipment and I am the Primary Exporter. I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name	Signature	Month Day Year <b>5 10 19</b>
--	-----------	----------------------------------

16. International Shipments	<input type="checkbox"/> Import to U.S.	<input type="checkbox"/> Export from U.S.	Port of entry/exit:	Date leaving U.S.:
-----------------------------	---	---	---------------------	--------------------

17. Transporter Acknowledgment of Receipt of Materials				
Transporter 1 Printed/Typed Name <b>Gabriel Arteaga</b>	Signature	Month Day Year <b>5 10 19</b>		
Transporter 2 Printed/Typed Name	Signature	Month Day Year		

18. Discrepancy					
18a. Discrepancy Indication Space	<input type="checkbox"/> Quantity	<input type="checkbox"/> Type	<input type="checkbox"/> Residue	<input type="checkbox"/> Partial Rejection	<input type="checkbox"/> Full Rejection
Manifest Reference Number:					

18b. Alternate Facility (or Generator)	U.S. EPA ID Number
Facility's Phone:	
18c. Signature of Alternate Facility (or Generator)	Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)			
1.	2.	3.	4.

20. Designated Facility Owner or Operator Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a		
Printed/Typed Name	Signature	Month Day Year

GENERATOR  
TRANSPORTER  
DESIGNATED FACILITY



**ABENGOA**

**NORTH AMERICA**



**Mojave Solar Project**

42134 Harper Lake Road  
Hinkley, California 92347

Phone 760 308-0400

June 6, 2019

**By US Mail**

DTSC Generator Manifests  
Department of Toxic Substances Control  
P.O. Box 400  
Sacramento, CA 95812-0400

Generator ID # CAR000242040

Dear Sirs or Madame,

As you know, Abengoa Solar (ASIO) manages the Mojave Solar Project for Mojave Solar LLC (MS LLC) Generator ID # CAR000242040.

On behalf of MS LLC, attached please find manifests for Waste Tracking numbers:

From Desert Environmental

017840149 JJK

Please note, correspondence should be sent to the attention of:

Jose Manuel Bravo Romero  
Manager, Quality and Environment  
Department  
Mojave Solar Project  
42134 Harper Lake Road  
Hinkley, California 92347  
(303) 378-7302  
[jmanuel.bravo@abengoa.com](mailto:jmanuel.bravo@abengoa.com)

Sincerely,

Jose Manuel Bravo Romero.  
Manager, Permitting, Q&E Department.

Attachments: Hazardous Waste Manifest

1. Generator ID Number <b>CAR000074542</b>	2. Page 1 of <b>1</b>	3. Emergency Response Phone <b>(760) 684-0999</b>	4. Manifest Tracking Number <b>017840149 JJK</b>
---	--------------------------	--	---

Generator's Name and Mailing Address <b>Desert Environmental Services Inc.</b> 12127 Mall Blvd Suite A 389 Victorville, CA 92392 760 243 7619	Generator's Site Address (if different than mailing address) <b>15330 Cholame Rd Unit D Victorville, CA 92302</b>
--	--

6. Transporter 1 Company Name <b>Desert Environmental Services Inc.</b>	U.S. EPA ID Number <b>CAR000074542</b>
--	---

7. Transporter 2 Company Name	U.S. EPA ID Number
-------------------------------	--------------------

B. Designated Facility Name and Site Address <b>ADVANCED ENVIRONMENTAL INC</b> 13579 Whittram Ave. Fontana, CA 92335 (909)356-9025	U.S. EPA ID Number <b>CAT080025711</b>
---	---

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
		No.	Type			
1.	(Used motor oil) Non RCRA Hazardous Waste Liquids					
2.						
3.						
4.						

6-6-2019  
THIS IS A CONSOLIDATED  
MANIFEST.  
ARTEAGA'S PORTION IS  
250 GALLONS PER INVOICE  
C219266.

Special Handling Instructions and Additional Information  
**Wear proper P.P.E. 1) (1xTT)**

5. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national regulations. I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is accurate.

Generator's/Officer's Printed/Typed Name	Signature
5 International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S.	Port of Origin Date of Shipment

7. Transporter Acknowledgment of Receipt of Materials	Signature	Month	Day	Year
Transporter 1 Printed/Typed Name <b>Gabriel Arteaga</b>				
Transporter 2 Printed/Typed Name	Signature	Month	Day	Year

8. Discrepancy	Manifest Reference Number:
a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection	

b. Alternate Facility (or Generator)	U.S. EPA ID Number
City's Phone	
c. Signature of Alternate Facility (or Generator)	Month Day Year

Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)			
2.	3.	4.	

Designated Facility Owner or Operator Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a	Signature	Month	Day	Year
---	-----------	-------	-----	------



# DESERT ENVIRONMENTAL SERVICES INC.

1 (760) 243-7619 | DESERTFR@VERIZON.NET

419266

## INVOICE CONSOLIDATED WASTE

Shipped Via Desert Environmental Services  
 EPAID# CAR000074542  
 Consolidated Waste ID# 4150  
 CA# 0282014  
 MC# 8381  
 DOT# 2733323

MANIFEST NUMBER	QTY	WASTE DESCRIPTION	WASTE CODE	PRICE	TOTAL
<u>1124111</u>	<u>250</u>	Used Oil	221		
		Oily Water	223		
		Antifreeze	134		
		Oily Debris	352		
		Undrained Metal Oil Filters	352		
		Cartridge/ Paper Filters	352		
		Drained/Punctured Metal Oil Filters			
<b>BOL #</b>		Labels			
<b>SUPPLIES</b>		Drums			
<b>OTHER CHARGES</b>		Transportation Drum			
		Labor			
		Stop Fee			
<b>OTHER HAZARDOUS WASTE</b>					

**GENERATOR**  
 Name/DBA Advanced Environmental  
 Address 13579 Whittram Ave  
 City, State ZIP Fontana, CA  
 Phone # \_\_\_\_\_  
 EPA I.D. # CAT080025711  
 P.O. # \_\_\_\_\_  
 Email \_\_\_\_\_

**Consolidated Non-RCRA Hazardous Waste SHIPPED TO:**  
 Name Advanced Environmental   
 Address 13579 Whittram Ave.  
 City, State ZIP Fontana, CA 92335  
 EPA ID # CAT080025711

Name AA Sydcot, LLC.   
 Address 1925 S. Factor Ave.  
 City, State, Zip Yuma, AZ 85365  
 EPA ID # AZR000501510  
 Name Demunno-Kerdoon   
 Address 2000 N. Alameda St  
 City, State, ZIP Compton, CA 90222  
 EPA ID # CAT080013352

**Other Hazardous Waste SHIPPED TO:**  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Please remit payment to:**  
 Desert Environmental Services Inc.  
 12127 Mall Blvd, Suite A 389  
 Victorville, CA 92392  
 We accept Visa, MC & Discover

**FOR PICKUPS PLEASE CALL 760-243-7619**

**SUB TOTAL**  
**CREDITS/PAYMENTS**  
**PLEASE PAY THIS AMOUNT**

TERMS: NET 30 DAYS

**IMPORTANT NOTICE REGARDING THE DISPOSITION OF YOUR USED OIL**  
 PLEASE SIGN AFTER READING

Desert Environmental Services, Inc. hereby advises Advanced Environmental (Used Oil Generator) that Advanced Environmental (Generator's) shipment of used oil may be transported to a facility that is required to comply with federal regulations applicable to management of used oil, but that is not required to comply with the more stringent requirements applicable to hazardous waste management facilities. California facilities that handle or process used oil are required to meet those more stringent requirements, and some out-of-state facilities that process used oil also meet those requirements. These include more stringent leak detection and prevention requirements, engineering certifications of tank integrity, and financial assurances for closure and accidental releases. It is lawful to send used oil to out-of-state facilities that comply only with federal used oil management standards and not these more stringent requirements.

This notification is for information purposes only.

Desert Environmental Services, Inc. (signed, Transporter) Date: 1-16-19  
Michael E. ... (signed, Generator) Date: 1-16-19

Generator is responsible for proper identification of Waste Stream. If improperly identified generator agrees to pay all testing, transportation and disposal charges incurred.

DATE 1/16/19 GENERATOR Advanced Environmental DRIVER [Signature]  
 White: Original    Canary: Accounting    Pink: Manifest    Gold: Generator

**ABENGOA**

**NORTH AMERICA**



**Mojave Solar Project**

42134 Harper Lake Road  
Hinkley, California 92347

Phone 760 308 0400

June 7, 2019

**By US Mail**

DTSC Generator Manifests  
Department of Toxic Substances Control  
P.O. Box 400  
Sacramento, CA 95812-0400

Generator ID # CAR000242040

Dear Sirs or Madame,

As you know, Abengoa Solar (ASIO) manages the Mojave Solar Project for Mojave Solar LLC (MS LLC) Generator ID # CAR000242040.

On behalf of MS LLC, attached please find manifests for Waste Tracking numbers:

From Desert Environmental Services Inc.

015570956 JJK  
017840138 JJK

Please note, correspondence should be sent to the attention of:

Jose Manuel Bravo Romero  
Manager, Quality and Environment  
Department  
Mojave Solar Project  
42134 Harper Lake Road  
Hinkley, California 92347  
(303) 378-7302  
jmanuel.bravo@abengoa.com

Sincerely,

Jose Manuel Bravo Romero.  
Manager, Permitting, Q&E Department.

Attachments: Hazardous Waste Manifest







1. Generator ID Number <b>CAR000242040</b>	2. Page 1 of <b>1</b>	3. Emergency Response Phone <b>(760) 684-0999</b>	4. Manifest Tracking Number <b>017840138 JJK</b>
---	--------------------------	--	---

5. Generator's Name and Mailing Address: **Mojave Solar LLC**  
**42134 Harper Lake Road, Hinkley CA 92347**  
**636 519-3623**

Generator's Site Address (if different than mailing address):

Generator's Phone:

6. Transporter 1 Company Name: **Desert Environmental Services Inc.** U.S. EPA ID Number: **CAR000074542**

7. Transporter 2 Company Name: ~~Desert Environmental Services Inc.~~ U.S. EPA ID Number: ~~CAR000074542~~

8. Designated Facility Name and Site Address: **Veolia ES Technical Solutions**  
**1704 W First Azusa, Ca 91702**  
**(800) 395 6726**

Facility's Phone:

U.S. EPA ID Number: **CAD008302903**

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
		No.	Type			
X	<b>UN3077 Environmentally Hazardous Substance, Solids, N.O.S., 9, PG III (Potassium Cyanide)</b>	<b>001</b>	<b>DF</b>	<b>20</b>	<b>P</b>	<b>D003 P098 181</b>

14. Special Handling Instructions and Additional Information: **1. 464249**

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby certify that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offoror's Printed/Typed Name: **X. MARIA E. LOPEZ** Signature: *[Signature]* Month: **6** Day: **7** Year: **19**

16. International Shipments:  Import to U.S.  Export from U.S. Port of entry/exit: \_\_\_\_\_ Date leaving U.S.: \_\_\_\_\_

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: **JEFF WATSON** Signature: *[Signature]* Month: **6** Day: **7** Year: **19**

Transporter 2 Printed/Typed Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Month: \_\_\_\_\_ Day: \_\_\_\_\_ Year: \_\_\_\_\_

18. Discrepancy

18a. Discrepancy Indication Space:  Quantity  Type  Residue  Partial Rejection  Full Rejection

Manifest Reference Number: \_\_\_\_\_ U.S. EPA ID Number: \_\_\_\_\_

18b. Alternate Facility (or Generator): \_\_\_\_\_ U.S. EPA ID Number: \_\_\_\_\_

Facility's Phone: \_\_\_\_\_

18c. Signature of Alternate Facility (or Generator): *[Signature]* Month: \_\_\_\_\_ Day: \_\_\_\_\_ Year: \_\_\_\_\_

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1. **H111** 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: **Severu Chan** Signature: *[Signature]* Month: **6** Day: **14** Year: **19**



# DESERT ENVIRONMENTAL SERVICES INC.

15330 CHOLAME RD. UNIT D, VICTORVILLE, CA 92392 | (760) 949-1110 | DESERTFR@VERIZON.NET  
596-2574

**18745**

## INVOICE

Shipped Via Desert Environmental Services  
 EPAID# CARD00074542  
 Consolidated Waste ID# 4150  
 CA# 0282014  
**GENERATOR**  
 Name MOJAVE SOLAR, LLC.  
 Address 42134 HARPER LAKE ROAD  
 City, State ZIP HINKLEY, CA 92347  
 Phone (760) 308-3787  
 EPA# CAR 000242046  
 Purchase Order # \_\_\_\_\_

MANIFEST NUMBER	QTY	DESCRIPTION	PRICE EA.	TOTAL
		Flammable Liquids		
		NON-RCRA Solids		
		NON-Haz Liquids		
		NON-Haz Solids		
		Latex Paint		
		Anti Freeze/Oily Water		
		Used Oil		
		Used Oil Filters		
		Filter Cake		
		Clarifier/Wash Rack		
		Empty Drums Removal		
		Universal Waste		

**Consolidated Non-RCRA Hazardous Waste SHIPPED TO:**

Name Advanced Environmental   
 Address 13579 Whittram Ave.  
 City, State ZIP Fontana, CA 92335  
 EPA ID # CAT080025711

<u>Q1784613811K</u>	<u>1 DR</u>	<u>POTASSIUM NITRATE</u>	<u>195</u>	<u>195</u>
<u>Q1557095631K</u>	<u>6 DR</u>	<u>USED OIL</u>	<u>200</u>	<u>1200</u>

Name Veolia Environmental   
 Address 1704 W. First St.  
 City, State, ZIP Asuza, CA 91702  
 EPA ID # CAD008302903

MANIFEST NUMBER	QTY	CONSOLIDATED WASTE	PRICE EA.	TOTAL
		Anti Freeze		
		Oily Debris		
		Oily Water		
		Used Oil		

Name AA Sydcol, LLC.   
 Address 1925 S. Factor Ave.  
 City, State, Zip Yuma, AZ 85365  
 EPA ID # AZR000501510

MANIFEST NUMBER	QTY	MATERIALS	PRICE EA.	TOTAL
		Labels		
		New Drums/CYB/Totes		
	<u>2 EA</u>	Manifest/Profile		
		New Absorbent		

MANIFEST NUMBER	QTY	OTHER CHARGES	PRICE EA.	TOTAL
		Transportation		
		Labor		
		Truck		
		Freight Total		
		PPE		
		Bin Rental		
		Stop Fee		
		Washout		

**Please remit payment to:**  
 Desert Environmental Services Inc.  
 12127 Mall Blvd. Suite A 389  
 Victorville, CA 92392  
 We accept Visa, MC & Discover

Used oil is transported only to a facility that is lawfully operating in accordance with a hazardous waste facility permit or interim status document issued to the Federal Act.

**SALES TAX %** \_\_\_\_\_

**CREDITS/PAYMENTS** \_\_\_\_\_

**PLEASE PAY THIS AMOUNT** 1,345

**SUB TOTAL** 1,345

**TERMS: NET 30 DAYS**

**Generator is responsible for proper identification of Waste Stream. If improperly identified generator agrees to pay all testing, transportation and disposal charges incurred.**

**DATE** 6/7/2019

**GENERATOR** [Signature]

**DRIVER** [Signature]

White: Transporter Copy

Yellow: Accounting

Pink: Generator



# Mojave Solar LLC

**Atlantica**  
Sustainable Infrastructure

Mojave Solar Project  
42134 Harper Lake Road  
Phone: 760-308-0400  
Hinkley, California 92347

Department of Toxic Substances Control  
P.O. Box 400  
Sacramento, CA 95812-0400

**By US Mail**

October 10, 2019

Generator ID # CAL000242040

Dear Sirs or Madame,

As you know, **Abengoa Solar Industrial Operations (ASIO)** manages the Mojave Solar Project for Mojave Solar LLC (MS LLC) Generator ID # CAR000242040.

On behalf of MS LLC, attached please find the Hazardous Manifests from the shipped waste.

017840247JJK, 017840248JJK and 017840249JJK.

Please note, correspondence should be sent to the attention of the undersigned

Sincerely,

---

Jose Manuel Bravo Romero.



Manager, Compliance, Permitting, Q&E Department.  
Mojave Solar LLC  
42134 Harper Lake Road  
Hinkley, CA 92347

Attachments: Manifests.

**UNIFORM HAZARDOUS WASTE MANIFEST** 1. Generator ID Number: **CAR000242040** 2. Page 1 of **2** 3. Emergency Response Phone: **(760) 985-8646** 4. Manifest Tracking Number: **017840247 JJK**

5. Generator's Name and Mailing Address: **Mojave Solar LLC**  
**42134 Harper Lake Road, Hinkley CA 92347**  
 Generator's Site Address (if different than mailing address):  
 Generator's Phone: **636 519-3623**

6. Transporter 1 Company Name: **Desert Environmental Services Inc.** U.S. EPA ID Number: **CAR000298737**

7. Transporter 2 Company Name: **Industrial Waste Utilization** U.S. EPA ID Number: **CAD980585293**

8. Designated Facility Name and Site Address: **Recicladora Temarry de Mexico SA DE CV**  
**Carr. FED No. 2 Mex-Tij. San Diablo Km 121**  
**Tecate BC, MX 21530**  
 U.S. EPA ID Number: **MXC130619001**  
 Facility's Phone:

9a HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
		No.	Type					
1	<b>NA3082, Environmentally Waste Hazardous Substance Liquid, 9, PG III</b>		<b>TP DOT PT</b>	<b>400</b>	<b>6</b>	<b>331</b>		
2								
3								
4								

14. Special Handling Instructions and Additional Information:  
**A) R19-26956 (1 X PT) ERG #171 (+HEAMINOL)**  
**Wear proper PPE**

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Officer's Printed/Typed Name: **JOSE MANUEL BLOD** Signature: *[Signature]* Month: **10** Day: **9** Year: **19**

16. International Shipments:  Import to U.S.  Export from U.S. Port of entry/exit: **2506** Date leaving U.S.: **10 24 19**

17. Transporter Acknowledgment of Receipt of Materials  
 Transporter 1 Printed/Typed Name: **Ramon Pulido** Signature: *[Signature]* Month: **10** Day: **9** Year: **19**  
 Transporter 2 Printed/Typed Name: **Bob Harker** Signature: *[Signature]* Month: **10** Day: **11** Year: **19**

18. Discrepancy  
 18a. Discrepancy Indication Space:  Quantity  Type  Residue  Partial Rejection  Full Rejection

18b. Alternate Facility (or Generator): Manifest Reference Number: U.S. EPA ID Number:  
 Facility's Phone: **RECEIVED 11-26-19**  
 18c. Signature of Alternate Facility (or Generator): *[Signature]* Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems):  
**HOZO** 2 3 4

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a  
 Printed/Typed Name: **Fernando Moran** Signature: **Fernando** Month: **10** Day: **24** Year: **19**





<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator ID Number <b>CAR000242040</b>	2. Page 1 of <b>1</b>	3. Emergency Response Phone <b>(760) 684-0999</b>	4. Manifest Tracking Number <b>017840248 JJK</b>	
		5. Generator's Name and Mailing Address <b>Mojave Solar LLC</b> <b>42134 Harper Lake Road, Hinkley CA 92347</b> Generator's Phone: <b>636 519-3623</b>			Generator's Site Address (if different than mailing address)	
6. Transporter 1 Company Name <b>Desert Environmental Services Inc.</b>		U.S. EPA ID Number <b>CAR000298737</b>				
7. Transporter 2 Company Name <b>Industrial Waste Utilization</b>		U.S. EPA ID Number <b>CAD090595293</b>				
8. Designated Facility Name and Site Address <b>AA Sydecol, LLC</b> <b>2264 E. 13th St. Yuma, AZ. 85365</b> Facility's Phone: <b>(928) 783-3676</b>		U.S. EPA ID Number <b>AZR000520304</b>				
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit WL/Vol.	13. Waste Codes
		No.	Type			
1.	Non-RCRA Hazardous Waste Liquid (Sodium Bisulfate)	001	DF	100	P	
2.	Non RCRA Hazardous Waste <del>Solid</del> Solid (Anionic Flocculant)	001	DF	200	P	
3.	Non RCRA Hazardous waste, liquid (Anionic Flocculant)	001	DF	55	G	
4.						
14. Special Handling Instructions and Additional Information <b>1. 1. L37171-LL1 (1x55DM)</b> <b>2. 1.37175-LL1 (1x55DM)</b> <b>Wear proper PPE</b>						
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.						
Generator's/Officer's Printed/Typed Name <b>[Signature]</b>			Signature <b>[Signature]</b>		Month Day Year <b>10 9 19</b>	
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Date leaving U.S.: _____						
17. Transporter Acknowledgment of Receipt of Materials						
Transporter 1 Printed/Typed Name <b>[Signature]</b>			Signature <b>[Signature]</b>		Month Day Year <b>10 7 19</b>	
Transporter 2 Printed/Typed Name			Signature		Month Day Year	
18. Discrepancy						
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection						
Manifest Reference Number: _____						
18b. Alternate Facility (or Generator)				U.S. EPA ID Number		
Facility's Phone: _____						
18c. Signature of Alternate Facility (or Generator)					Month Day Year	
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)						
2.		3.		4.		
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a						
Printed/Typed Name			Signature		Month Day Year	



<b>HAZARDOUS WASTE MANIFEST</b>	1. Generator ID Number <b>CAR000242040</b>	2. Page 1 of <b>1</b>	3. Emergency Response Phone <b>(760) 985-8646</b>	4. Manifest Tracking Number <b>017840249 JJK</b>
---------------------------------	---	-----------------------	--	---

5. Generator's Name and Mailing Address: **Mojave Solar LLC**  
**42134 Harper Lake Road, Hinkley CA 92347**  
 Generator's Phone: **636 519-3623**

Generator's Site Address (if different than mailing address):

6. Transporter 1 Company Name: **Desert Environmental Services Inc.** U.S. EPA ID Number: **CAR000298737**

7. Transporter 2 Company Name: **Industrial Waste Utilization** U.S. EPA ID Number: **CAD980585293**

8. Designated Facility Name and Site Address: **Recicladora Temarry de Mexico SA DE CV**  
**Carr. FED No. 2 Mex-Tij. San Diablo Km 121**  
 Facility's Phone: **Tecate BC. MX 21530**

U.S. EPA ID Number: **MXC130619001**

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit WL/Vol.	13. Waste Codes
		No.	Type			
1.	UN1950, Waste Aerosols 2.1,(not exceeding 1 L.),	002	KS DM	400	P	331
2.	<del>UN1950, Waste Aerosols 2.1,(not exceeding 1 L.),</del>					
3.						
4.						

14. Special Handling Instructions and Additional Information:  
**A) R18-1805 (2X 55dm) ERG #126**  
**Wear proper PPE (1X 55 DM)**

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offero's Printed/Typed Name: **Jose M. Moran** Signature: *[Signature]* Month: **11** Day: **09** Year: **19**

16. International Shipments:  Import to U.S.  Export from U.S. Port of entry/exit: **2506** Date leaving U.S.: **10 24 19**

17. Transporter Acknowledgment of Receipt of Materials: Transporter 1 Printed/Typed Name: **Ramon Pulido** Signature: *[Signature]* Month: **10** Day: **09** Year: **19**

Transporter 2 Printed/Typed Name: **Vit Trujillo** Signature: *[Signature]* Month: **10** Day: **11** Year: **19**

18. Discrepancy: 18a. Discrepancy Indication Space:  Quantity  Type  Residue  Partial Rejection  Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator): U.S. EPA ID Number: **RECEIVED 11-19-19**

18c. Signature of Alternate Facility (or Generator): *[Signature]* Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems):  
 1. **H020** 2. **X** 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a  
 Printed/Typed Name: **Fernando Moran** Signature: **Fernando** Month: **11** Day: **24** Year: **19**







# DESERT ENVIRONMENTAL SERVICES INC.

15330 CHOLAME RD. UNIT D, VICTORVILLE, CA 92392 | (760) 949-1110 | DESERTFR@VERIZON.NET

218910

## INVOICE

Shipped Via Desert Environmental Services

EPAID# CAR000074542

Consolidated Waste ID# 4150

CA# 0282014

### GENERATOR

Name MANAGE SOLUTIONS LLC.

Address 42134 Hammer Lake Dr.

City, State ZIP Hinkley CA 92347

Phone 923-928-8500

EPA# HR001120110

Purchase Order # 45009100327

### Consolidated Non-RCRA Hazardous Waste SHIPPED TO:

Name Advanced Environmental

Address 13579 Whittram Ave.

City, State ZIP Fontana, CA 92335

EPA ID # CAT080025711

Name Veolia Environmental

Address 1704 W. First St.

City, State, ZIP Asuza, CA 91702

EPA ID # CAD008302903

Name AA Sydcol, LLC.

Address 1925 S. Factor Ave.

City, State, Zip Yuma, AZ 85365

EPA ID # AZR000501510

MANIFEST NUMBER	QTY	DESCRIPTION	PRICE EA.	TOTAL
		Flammable Liquids		
<u>017840248 JJK</u>		NON-RCRA Solids	<u>175/ea</u>	
		NON-Haz Liquids		
		NON-Haz Solids		
		Latex Paint		
		Anti Freeze/Oily Water		
		Used Oil		
		Used Oil Filters	<u>105/ea</u>	<u>125-</u>
		Filter Cake		
		Clarifier/Wash Rack		
		Empty Drums Removal	<u>200/ea</u>	<u>200-</u>
		Universal Waste		
<u>017840247 JJK</u>	<u>1</u>	UNIDENTIFIED LIQ	<u>400/tntr</u>	<u>400-</u>
<u>017840248 JJK</u>	<u>1</u>	NON-RCRA SODIUM BISULFATE	<u>200/DR</u>	<u>200-</u>
<u>017840249 JJK</u>	<u>1</u>	UNIDENTIFIED AEROSOLS	<u>335/DR</u>	<u>335-</u>
MANIFEST NUMBER	QTY	CONSOLIDATED WASTE	PRICE EA.	TOTAL
		Anti Freeze		
		Oily Debris		
<u>017840248 JJK</u>	<u>1</u>	Oily Water	<u>82-</u>	<u>82-</u>
		Used Oil		
MANIFEST NUMBER	QTY	MATERIALS	PRICE EA.	TOTAL
		Labels	<u>40/DR</u>	
	<u>1</u>	New Drums/CYB/Totes	<u>40/125</u>	<u>125-</u>
		Manifest/Profile		
		New Absorbent		
OTHER CHARGES				
		Transportation	<u>125/ea</u>	<u>125-</u>
	<u>24</u>	Labor /HR/TECH	<u>40/ea</u>	<u>180-</u>
	<u>8</u>	Truck Box Truck	<u>65/hr</u>	<u>520-</u>
		Freight Total		
		PPE		
		Bin Rental		
		Stop Fee		
		Washout		

**SUB TOTAL** 2292-

Please remit payment to:  
Desert Environmental Services Inc.  
12127 Mall Blvd. Suite A 389  
Victorville, CA 92392  
We accept Visa, MC & Discover

Used oil is transported only to a facility that is lawfully operating in accordance with a hazardous waste facility permit or interim status document issued to the Federal Act

**SALES TAX %**   
**CREDITS/PAYMENTS**   
**PLEASE PAY THIS AMOUNT** 2292-

TERMS: NET 30 DAYS

Generator is responsible for proper identification of Waste Stream. If improperly identified generator agrees to pay all testing, transportation and disposal charges incurred.

DATE 10-9-19 GENERATOR [Signature] DRIVER R. Pulido  
White: Transporter Copy Yellow: Accounting Pink: Generator



# Atlantica

Sustainable Infrastructure

## Mojave Solar LLC

42134 Harper Lake Road  
Hinkley, California 92347  
Phone: 760-308-0400

October 23, 2019

By US Mail

DTSC Generator Manifests  
Department of Toxic Substances Control  
P.O. Box 400  
Sacramento, CA 95812-0400

Generator ID # CAR000242040

Dear Sirs or Madame,

As you know, Abengoa Solar (ASIO) manages the Mojave Solar Project for Mojave Solar LLC (MS LLC) Generator ID # CAR000242040.

On behalf of MS LLC, attached please find the Hazardous manifests from the shipped waste.

From Desert Environmental Services Inc.  
017840358 JJK

Please note, correspondence should be sent to the attention of the undersigned

Sincerely,

Jose Manuel Bravo Romero  
Manager, Compliance, Permitting Q&E Department  
42134 Harper Lake Road  
Hinkley, California 92347  
(303) 378-7302  
jmanuel.bravo@atlanticayield.com

Attachments: Hazardous Waste Manifest

Trailer # 3

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved OMB No. 2050-0039

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator ID Number <b>CAR000242040</b>	2. Page 1 of <b>1</b>	3. Emergency Response Phone <b>(760) 243-7619</b>	4. Manifest Tracking Number <b>017840358 JJK</b>	
5. Generator's Name and Mailing Address <b>Mojave Solar I.I.C.</b> <b>42134 Harper Lake Road, Hinkley CA 92347</b> <b>636 519-3623</b>						
Generator's Site Address (if different than mailing address)						
6. Transporter 1 Company Name <b>Desert Environmental Services Inc.</b>				U.S. EPA ID Number <b>CAR000298737</b>		
7. Transporter 2 Company Name				U.S. EPA ID Number		
8. Designated Facility Name and Site Address <b>U.S. Ecology Inc.</b> <b>Hwy 95 12 Miles South of Beatty, NV 85003</b>				U.S. EPA ID Number		
Facility's Phone: <b>(800) 339-3943</b>				U.S. EPA ID Number <b>NVT330010000</b>		
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit WU/Vol.	13. Waste Codes
		No.	Type			
1	<b>NA3077, "RQ" Hazardous waste Solids, N.O.S. 9, PG III (Broken Mirrors with lead)</b>	<b>001</b>	<b>CM</b>	<b>1200</b>	<b>P</b>	<b>D008 K1</b>
2						
3						
4						
14. Special Handling Instructions and Additional Information <b>1) 070247609-1 (1x15Y CM) D008 ERG # 171</b>						
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.						
Generator's/Offeror's Printed/Typed Name <b>John L. Brown</b>				Signature <i>[Signature]</i>		Month Day Year <b>11 02 15</b>
16. International Shipment: <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Date leaving U.S.: _____						
17. Transporter Acknowledgment of Receipt of Materials						
Transporter 1 Printed/Typed Name <b>George Hernandez</b>				Signature <i>[Signature]</i>		Month Day Year <b>10 22 19</b>
Transporter 2 Printed/Typed Name				Signature		Month Day Year
18. Discrepancy						
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection						
Manifest Reference Number: _____ U.S. EPA ID Number _____						
18b. Alternate Facility (or Generator) Facility's Phone: _____ Signature of Alternate Facility (or Generator) <i>[Signature]</i> Month Day Year _____						
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)						
<b>A132</b>						
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in item 18a						
Printed/Typed Name <b>Brenda Indura</b>				Signature <i>[Signature]</i>		Month Day Year <b>11 03 19</b>