

DOCKETED

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| Docket Number: | 19-BSTD-10 |
| Project Title: | AHAM Kitchen Range Hood Directory Approval |
| TN #: | 232068 |
| Document Title: | APP-TECH Inc. Comments - Recommends Approval of the AHAM Product Directory for Kitchen Range Hoolds as an alternative to the HVI Directory |
| Description: | *** THIS DOCUMENT SUPERSEDES TN 232057 *** |
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Comment Received From: APP-TECH Inc.
Submitted On: 2/18/2020
Docket Number: 19-BSTD-10

Recommends Approval of the AHAM Product Directory for Kitchen Range Hoods as an alternative to the HVI Directory

***** THIS DOCUMENT SUPERSEDES TN 232057 *****

Additional submitted attachment is included below.

Docket Number 19-BSTD-10

APP-TECH Inc. recommends approval of the AHAM Product Directory for Kitchen Range Hoods as an alternative to the HVI Directory.

The California Energy Commission (CEC) allows alternative methods for verifying Kitchen Range Hood performance specifications.

The CEC has several methods of demonstrating compliance with the requirements for listing the performance of regulated devices, in this case Kitchen Range Hoods (Attachment A). The primary listing is usually the CEC Appliance Directory. Acceptable alternatives are federal agency directories or approved trade association directories. Many companies have Kitchen Range Hoods listed in the CEC Appliance Directory, including Broan-Nutone, LLC (Attachment B). It seems silly for Broan to state that listing in more than one directory would be confusing, when, in fact, Broan already has listings in the CEC Appliance Directory, the federal Energy Star directory, and the HVI Directory. According to Section 110.1, any one of these listings is sufficient. Adding another directory alternative will not materially increase confusion. In fact, adding competition may incentivize HVI to improve testing facilities and reduce their backlog.

The CEC revision to Section 150.0 (o) 2.B. in the 2029 Energy Code is incorrect.

ASHRAE 62.2, Table 5.1 that specifies minimum Kitchen exhaust rates has changed in the 2016 version of ASHRAE 62.2. The previous version, in ASHRAE 62.2 – 2010 (Attachment C), only referred to vented range hoods. The 2016 current version (Attachment D) includes different rates for several different Kitchen exhaust systems. It appears that the Kitchen Range Hood verification requirement in Title 24 Part 6, Section 150.0 (o) 2.B. is based on an obsolete requirement.

ASHRAE 62.6 – 2016 as revised and adopted by the CEC has the following requirements (Attachment E) for air-moving equipment used to comply with this standard. Ventilation devices and equipment shall be tested in accordance with ANSI/ASHRAE Standard 51/AMCA 210 (currently the 2016 version). This equipment shall be rated in accordance with the rating procedures of HVI 915, HVI 916, and HVI 920. There is no requirement that Kitchen Range Hoods be listed in any specific directory, such as the HVI Directory.

ASHRAE 62.2 allows for two alternative methods for fan performance verification. Performance: where the ventilation rate is directly measured, or Prescriptive: where directory test results are used to verify expected operation. When the Prescriptive method is used, ASHRAE 62.2 also requires verification of correct duct sizing (Attachment F).

Section 150.0 (o) 2.B. is wrong and contradicts the requirements of the CEC revised ASHRAE 62.2 – 2016 adopted and published by ASHRAE Publications. It also conflicts with the “Local Mechanical Exhaust” HERS Verification form (Attachment G) which was specifically developed

for the 2019 Energy Code. Note that this form requires verification of the Kitchen Exhaust System, not the Kitchen Range Hood!

Emergency Rulemaking Petition

APP-TECH Inc. initiated a request for the CEC to hold an Emergency Rulemaking procedure (Attachment H) to amend Section 150.0 (o) on January 27th 2020. This request also asked the CEC to schedule a pre-rulemaking workshop to obtain public comment on ways to improve these ventilation requirements. A date for this meeting has not yet been set. Interested parties should contact the CEC Executive Director, Drew Bohan, drew.bohan@energy.ca.gov and ask to be notified when this meeting is scheduled.



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16 February 2020

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SECTION 110.1 – MANDATORY REQUIREMENTS FOR APPLIANCES

- (a) Any appliance regulated by the Appliance Efficiency Regulations, Title 20 California Code of Regulations, Section 1601 et seq., may be installed only if the appliance fully complies with Section 1608(a) of those regulations.
- (b) Except for those circumstances described in Section 110.1(c), conformance with efficiency levels required to comply with Part 6 mandatory, prescriptive and performance standards shall be verified utilizing data from either:
1. The Energy Commission's database of certified appliances maintained pursuant to Title 20 California Code of Regulations, Section 1606, and which is available at: www.energy.ca.gov/appliances/database/; or
 2. An equivalent directory published by a federal agency; or
 3. An approved trade association directory as defined in Title 20 California Code of Regulations, Section 1606(h).
- (c) Conformance with efficiency levels required to comply with Part 6 mandatory, prescriptive and performance standards shall be demonstrated either by default to the mandatory efficiency levels specified in Part 6 or by following procedures approved by the Commission pursuant to Section 10-109 of Title 24, Part 1, when:
1. Data to verify conformance with efficiency levels required to comply with Part 6 mandatory, prescriptive and performance standards is not available pursuant to subdivision (b); or
 2. Field verification and diagnostic testing is required for compliance with Part 6 and the Energy Commission has not approved a field verification and diagnostic test protocol that is applicable to the appliance; or
 3. The appliance meets the requirements of Section 110.1(a) but has been site-modified in a way that affects its performance; or
 4. The U.S. Department of Energy has approved a waiver from federal test procedures, pursuant to 10 CFR Section 430.27 or Section 431.401 and that waiver fails to specify how the efficiency of the system shall be determined.

NOTE: Authority: Sections 25213, 25218, 25218.5, 25402 and 25402.1, Public Resources Code. Reference: Sections 25007, 25008, 25218.5, 25310, 25402, 25402.1, 25402.4, 25402.5, 25402.8, and 25943, Public Resources Code



Whole House Fans & Residential Exhaust Fans

Cancel



*Model Number

QDE30WW

Manufacturer

Broan-Nutone, LLC

Add Date

02/05/2016

Brand

Broan

*Regulatory Status

N - Non Federally-Regulated

Fan Type

RR - Residential Range Hood Exhaust Fan

Air Flow CFM

290

Fan Motor Watts

121.8

Air Flow Efficiency (CFM/Watts)

2.38

Reference Number

5. LOCAL EXHAUST

5.1 Local Mechanical Exhaust. A local mechanical exhaust system shall be installed in each kitchen and bathroom. Each local ventilation system shall be either one of the following two:

- a. an intermittent mechanical exhaust system meeting the requirements of Section 5.2 or
- b. a continuous mechanical exhaust system meeting the requirements of Section 5.3.

Exception: Alternative Ventilation. Other design methods may be used to provide the required exhaust rates when approved by a licensed design professional.

5.2 Intermittent Local Exhaust. An intermittently operating, local mechanical exhaust system shall be designed to be operated as needed by the occupant.

5.2.1 Control and Operation. Control devices such as, but not limited to, the following are permissible provided they do not impede occupant control: shut-off timers, occupancy sensors, multiple-speed fans, combined switching, IAQ sensors, etc.

5.2.2 Ventilation Rate. The minimum airflow rating shall be at least the amount indicated in Table 5.1.

5.3 Continuous Mechanical Exhaust. A continuously operating mechanical exhaust system shall be installed to operate without occupant intervention. The system may be part of a balanced mechanical system. See Chapter 10 of Guideline 24¹ for guidance on selection of methods.

5.3.1 Control and Operation. The system shall be designed to operate during all occupiable hours. Readily accessible override control must be provided to the occupant.

5.3.2 Ventilation Rate. The minimum delivered ventilation shall be at least the amount indicated in Table 5.2 during each hour of operation.

5.4 Airflow Measurement. The airflow required by this section is the quantity of indoor air exhausted by the ventilation system as installed and shall be measured using a flow hood, flow grid, or other airflow measuring device.

Exception: The airflow rating, according to Section 7.1, at a pressure of 0.25 in. w.c. (62.5 Pa) may be used, provided the duct sizing meets the prescriptive requirements of Table 5.3 or manufacturer's design criteria.

TABLE 5.1
Intermittent Local Ventilation Exhaust Airflow Rates

| Application | Airflow | Notes |
|-------------|------------------|--|
| Kitchen | 100 cfm (50 L/s) | Vented range hood (including appliance-range hood combinations) required if exhaust fan flow rate is less than 5 kitchen air changes per hour. |
| Bathroom | 50 cfm (25 L/s) | |

TABLE 5.2
Continuous Local Ventilation Exhaust Airflow Rates

| Application | Airflow | Notes |
|-------------|-----------------|--------------------------|
| Kitchen | 5 ach | Based on kitchen volume. |
| Bathroom | 20 cfm (10 L/s) | |

TABLE 5.1 Demand-Controlled Local Ventilation Exhaust Airflow Rates

| Application | Airflow |
|----------------------------|--|
| <u>Enclosed Kitchen</u> | <ul style="list-style-type: none"> <u>Vented range hood (including appliance-range hood combinations):</u> 100 cfm (50 L/s) <u>Other kitchen exhaust fans, including downdraft:</u> 300 cfm (150 L/s) or a capacity of 5 ach |
| <u>Nonenclosed Kitchen</u> | <ul style="list-style-type: none"> <u>Vented range hood (including appliance-range hood combinations):</u> 100 cfm (50 L/s) <u>Other kitchen exhaust fans, including downdraft:</u> 300 cfm (150 L/s) |
| Bathroom | 50 cfm (25 L/s) |

TABLE 5.2 Continuous Local Ventilation Exhaust Airflow Rates

| Application | Airflow |
|------------------|--------------------------------|
| Enclosed Kitchen | 5 ach, based on kitchen volume |
| Bathroom | 20 cfm (10 L/s) |

TABLE 5.3 Prescriptive Duct Sizing

| Duct Type | Flex Duct | | | | | | | | Smooth Duct | | | | | | | |
|---|--|---------|----------|----------|----------|-----------|-----------|-----------|-------------|----------|----------|----------|----------|-----------|-----------|-----------|
| Fan Airflow Rating, cfm @ 0.25 in. of water (L/s @ 62.5 Pa) | 50 (25) | 80 (40) | 100 (50) | 125 (65) | 150 (75) | 200 (100) | 250 (125) | 300 (150) | 50 (25) | 80 (40) | 100 (50) | 125 (65) | 150 (75) | 200 (100) | 250 (125) | 300 (150) |
| Diameter ^a , in. (mm) | Maximum Length ^{b,c,d} , ft (m) | | | | | | | | | | | | | | | |
| 3 (75) | × | × | × | × | × | × | × | × | 5 (2) | × | × | × | × | × | × | × |
| 4 (100) | 56 (17) | 4 (1) | × | × | × | × | × | × | 114 (35) | 31 (9) | 10 (3) | × | × | × | × | × |
| 5 (125) | NL | 81 (25) | 42 (9) | 16 (5) | 2 (0.6) | × | × | × | NL | 152 (46) | 91 (28) | 51 (16) | 28 (9) | 4 (1) | × | × |
| 6 (150) | NL | NL | 158 (48) | 91 (28) | 55 (17) | 18 (5) | 1 (0.3) | × | NL | NL | NL | 168 (51) | 112 (34) | 53 (16) | 25 (8) | 9 (3) |
| 7 (175) | NL | NL | NL | NL | 161 (49) | 78 (24) | 40 (12) | 19 (6) | NL | NL | NL | NL | NL | 148 (45) | 88 (27) | 54 (16) |
| 8 (200) and above | NL | NL | NL | NL | NL | 189 (58) | 111 (34) | 69 (21) | NL | NL | NL | NL | NL | NL | 198 (60) | 133 (41) |

a. For noncircular ducts, calculate the diameter as four times the cross-sectional area divided by the perimeter.

b. This table assumes no elbows. Deduct 15 ft (5 m) of allowable duct length for each elbow.

c. NL = no limit on duct length of this size.

d. × = not allowed; any length of duct of this size with assumed turns and fitting will exceed the rated pressure drop.

5. LOCAL EXHAUST

5.1 Local Mechanical Exhaust. A local mechanical exhaust system shall be installed in each kitchen and bathroom. Non-enclosed kitchens shall be provided with a demand-controlled mechanical exhaust system meeting the requirements of Section 5.2. Each local ventilation system for all other kitchens and bathrooms shall be either one of the following two:

- A demand-controlled mechanical exhaust system meeting the requirements of Section 5.2
- A continuous mechanical exhaust system meeting the requirements of Section 5.3

Exception: Alternative Ventilation. Other design methods may be used to provide the required exhaust rates when approved by a licensed design professional.

5.2 Demand-Controlled Mechanical Exhaust. A local mechanical exhaust system shall be designed to be operated as needed.

5.2.1 Control and Operation. Demand-controlled mechanical exhaust systems shall be provided with at least one of the following controls:

- A readily accessible occupant-controlled ON-OFF control.
- An automatic control that does not impede occupant ON control.

5.2.2 Ventilation Rate. The minimum airflow rating shall be at least the amount indicated in Table 5.1.

5.3 Continuous Mechanical Exhaust. A mechanical exhaust system shall be installed to operate continuously. The system may be part of a balanced mechanical system. See

6.6 Ventilation Opening Area. Spaces shall have ventilation openings as listed in the following subsections. Such openings shall meet the requirements of Section 6.8.

Exception: Attached dwelling units and spaces that meet the local ventilation requirements set for bathrooms in Section 5.

6.6.1 Habitable Spaces. Each habitable space shall be provided with ventilation openings with an openable area not less than 4% of the floor area or less than 5 ft² (0.5 m²).

6.6.2 Toilets and Utility Rooms. Toilets and utility rooms shall be provided with ventilation openings with an openable area not less than 4% of the room floor area or less than 1.5 ft² (0.15 m²).

Exceptions:

1. Utility rooms with a dryer exhaust duct.
2. Toilet compartments in bathrooms.

6.7 Minimum Filtration. Mechanical systems that supply air to an occupiable space through ductwork exceeding 10 ft (3 m) in length and through a thermal conditioning component, except evaporative coolers, shall be provided with a filter having a designated minimum efficiency of MERV 6 or better when tested in accordance with ANSI/ASHRAE Standard 52.2, *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size*⁶, or a minimum Particle Size Efficiency of 50% in the 3.0 to 10 μm range in accordance with AHRI Standard 680, *Performance Rating of Residential Air Filter Equipment*⁷. The system shall be designed such that all recirculated and mechanically supplied outdoor air is filtered before passing through the thermal conditioning components. The filter shall be located and installed in such a manner as to facilitate access and regular service by the owner.

6.7.1 Filter Pressure Drop. New mechanical and distribution systems covered by Section 6.7 shall be designed to accommodate the clean-filter pressure drop as rated using AHRI Standard 680, *Performance Rating of Residential Air Filter Equipment*⁷, for the system design flow. The filter locations shall be labeled with the design airflow and maximum allowable clean-filter pressure drop. The label shall be visible to a person replacing the filter.

6.8 Air Inlets. Air inlets that are part of the ventilation design shall be located a minimum of 10 ft (3 m) from known sources of contamination such as a stack, vent, exhaust hood, or vehicle exhaust. The intake shall be placed so that entering air is not obstructed by snow, plantings, or other material. Forced air inlets shall be provided with rodent/insect screens (mesh not larger than 1/2 in. [13 mm]).

Exceptions:

1. Ventilation openings in the wall may be as close as a stretched-string distance of 3 ft (1 m) from sources of contamination exiting through the roof or dryer exhausts.
2. No minimum separation distance shall be required between windows and local exhaust outlets in kitchens and bathrooms.

3. Vent terminations covered by and meeting the requirements of the *National Fuel Gas Code* (NFPA 54/ANSI Z223.1)⁷ or equivalent.
4. Where a combined exhaust/intake termination is used to separate intake air from exhaust air originating in a living space other than kitchens, no minimum separation distance between these two openings is required. For these combined terminations, the exhaust air concentration within the intake airflow shall not exceed 10%, as established by the manufacturer.

6.8.1 Ventilation Openings. Operable windows, skylights, through-the-wall inlets, window air inlets, or similar devices shall be readily accessible to occupants. Where openings are covered with louvers or otherwise obstructed, openable area shall be based on the free, unobstructed area through the opening.

6.9 Carbon Monoxide Alarms. A carbon monoxide alarm shall be installed in each dwelling unit in accordance with NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*¹⁵, and shall be consistent with requirements of applicable laws, codes, and standards.

7. AIR-MOVING EQUIPMENT

All air-moving equipment used to comply with this standard shall meet the criteria of the following subsections.

7.1 Selection and Installation. Ventilation devices and equipment serving individual dwelling units shall be tested in accordance with ANSI/ASHRAE Standard 51/AMCA 210, Laboratory Methods of Testing Fans for Aerodynamic Performance Rating¹⁶, and ANSI/AMCA Standard 300, *Reverberant Room Method for Sound Testing of Fans*¹⁷, and rated in accordance with the airflow and sound rating procedures of the Home Ventilating Institute (HVI) (HVI 915, *Loudness Testing and Rating Procedure*¹⁸; HVI 916, *Air Flow Test Procedure*¹⁹; and HVI 920, *Product Performance Certification Procedure Including Verification and Challenge*²⁰). Installations of systems or equipment shall be carried out in accordance with manufacturers' design requirements and installation instructions.

7.2 Sound Ratings for Fans. Ventilation fans shall be rated for sound at no less than the minimum airflow rate required by this standard as noted below. These sound ratings shall be at a minimum of 0.1 in. of water (25 Pa) static pressure in accordance with the HVI procedures referenced in Section 7.1.

Exception: HVAC air handlers and remote mounted fans need not meet sound requirements. To be considered for this exception, a remote mounted fan must be mounted outside the habitable spaces, bathrooms, toilets, and hallways, and there must be at least 4 ft (1 m) of ductwork between the fan and the intake grille.

7.2.1 Dwelling-Unit Ventilation or Continuous Local Exhaust Fans. These fans shall be rated for sound at a maximum of 1.0 sone.

7.2.2 Demand-Controlled Local Exhaust Fans. Bathroom exhaust fans used to comply with Section 5.2 shall be rated for sound at a maximum of 3 sones. Kitchen exhaust fans used to comply with Section 5.2 shall be rated for sound

Chapter 10 of ASHRAE Guideline 24⁸ for guidance on selection of methods.

5.3.1 Control and Operation. A readily accessible manual ON-OFF control shall be provided for each continuous mechanical exhaust system. The system shall be designed to operate during all occupiable hours.

Exception: For multifamily dwelling units, the manual ON-OFF control shall not be required to be readily accessible.

5.3.2 Ventilation Rate. The minimum delivered ventilation shall be at least the amount indicated in Table 5.2 during each hour of operation.

5.4 Airflow Measurement. The airflow required by this section is the quantity of indoor air exhausted by the ventilation system as installed and shall be measured according to the ventilation equipment manufacturer's instructions, or by using a flow hood, flow grid, or other airflow measuring device at the mechanical ventilation fan's inlet terminals, outlet terminals, or in the connected ventilation ducts.

Exception: The airflow rating, according to Section 7.1, at a pressure of 0.25 in. of water (62.5 Pa) may be used, provided the duct sizing meets the prescriptive requirements of Table 5.3 or manufacturer's design criteria.

6. OTHER REQUIREMENTS

6.1 Adjacent Spaces and Transfer Air. Measures shall be taken to minimize air movement across envelope components to dwelling units from adjacent spaces such as garages, unconditioned crawlspaces, unconditioned attics, and other dwelling units. Pressure boundary wall, ceiling, and floor penetrations shall be sealed, as shall any vertical chases adjacent to dwelling units. Doors between dwelling units and common hallways shall be gasketed or made substantially airtight.

Supply and balanced ventilation systems shall be designed and constructed to provide ventilation air directly from the outdoors.

6.1.1 Compliance for Attached Dwelling Units. One method of demonstrating compliance with Section 6.1 shall be to verify a leakage rate below a maximum of 0.3 cfm per ft² (150 L/s per 100 m²) of the dwelling unit envelope area (i.e., the sum of the area of walls between dwelling units, exterior walls, ceiling, and floor) at a test pressure of 50 Pa by a blower door test conducted in accordance with either ANSI/ASTM-E779⁴ or ANSI/ASTM-E1827². The test shall be conducted with the dwelling unit as if it were exposed to outdoor air on all sides, top, and bottom by opening doors and windows of adjacent dwelling units.

6.2 Instructions and Labeling. Information on the ventilation design and/or ventilation systems installed, instructions on their proper operation to meet the requirements of this standard, and instructions detailing any required maintenance (similar to that provided for HVAC systems) shall be provided to the owner and the occupant of the dwelling unit. Controls shall be labeled as to their function (unless that function is obvious, such as toilet exhaust fan switches). See Section 13

of ASHRAE Guideline 24⁸ for information on instructions and labeling.

6.3 Clothes Dryers. Clothes dryers shall be exhausted directly to the outdoors.

Exception: Condensing dryers plumbed to a drain.

6.4 Combustion and Solid-Fuel-Burning Appliances

6.4.1 Combustion and solid-fuel-burning appliances must be provided with adequate combustion and ventilation air and installed in accordance with manufacturers' installation instructions; NFPA 54/ANSI Z223.1, *National Fuel Gas Code*⁹; NFPA 31, *Standard for the Installation of Oil-Burning Equipment*¹⁰; or NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid-Fuel Burning Appliances*¹¹, or other equivalent code acceptable to the building official.

6.4.2 Where atmospherically vented combustion appliances or solid-fuel-burning appliances are located inside the pressure boundary, the total net exhaust flow of the two largest exhaust fans (not including a summer cooling fan intended to be operated only when windows or other air inlets are open) shall not exceed 15 cfm per 100 ft² (75 L/s per 100 m²) of occupiable space when in operation at full capacity. If the designed total net flow exceeds this limit, the net exhaust flow must be reduced by reducing the exhaust flow or providing compensating outdoor air. Gravity or barometric dampers in nonpowered exhaust makeup air systems shall not be used to provide compensating outdoor air. Atmospherically vented combustion appliances do not include direct-vent appliances. Combustion appliances that pass safety testing performed according to ANSI/BPI-1200, *Standard Practice for Basic Analysis of Buildings*¹², shall be deemed as complying with Section 6.4.2.

6.5 Airtightness Requirements

6.5.1 Garages. When an occupiable space adjoins a garage, the design must prevent migration of contaminants to the adjoining occupiable space. Air seal the walls, ceilings, and floors that separate garages from occupiable space. To be considered air-sealed, all joints, seams, penetrations, openings between door assemblies and their respective jambs and framing, and other sources of air leakage through wall and ceiling assemblies separating the garage from the residence and its attic area shall be caulked, gasketed, weather stripped, wrapped, or otherwise sealed to limit air movement. Doors between garages and occupiable spaces shall be gasketed or made substantially airtight with weather stripping.

6.5.2 Space-Conditioning System Ducts. All air distribution joints located outside the pressure boundary shall be sealed. HVAC systems that serve occupiable space shall not be designed to supply air to or return air from the garage. HVAC systems that include air handlers or ducts located outside the pressure boundary shall have total air leakage of no more than 6% of total fan flow when measured at 0.1 in. of water (25 Pa) using California Title 24¹³ or equivalent. Method D of ASTM E1554¹⁴ may be used to meet this requirement. If the air handler, ducts, or both are located in the garage, the garage door shall be open to the outside when the duct leakage is tested.

LOCAL MECHANICAL EXHAUST

CEC-CF3R-MCH-32-H (Revised 01/19)

CALIFORNIA ENERGY COMMISSION

**CERTIFICATE OF VERIFICATION**

CF3R-MCH-32-H

Local Mechanical Exhaust

(Page 1 of 3)

| | | |
|-------------------|---------------------|----------------|
| Project Name: | Enforcement Agency: | Permit Number: |
| Dwelling Address: | City: | Zip Code: |

Title 24, Part 6, Section 150.0(o) **Ventilation for Indoor Air Quality**. All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2. Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. **Equation and table numbering on this form corresponds to the numbering for that information in the published ANSI/ASHRAE Standard 62.2-2010.**

A. Local Mechanical Exhaust - General Information

| | | |
|----|----------------------------------|--|
| 01 | Dwelling Unit Name | |
| 02 | Building Type | |
| 03 | Total Kitchen Floor Area | |
| 04 | Kitchen Average Ceiling Height | |
| 05 | Kitchen Total Conditioned Volume | |
| 06 | Kitchen Type | |

B. Local Mechanical Exhaust System – Fan Selection and Duct Design Criteria for Compliance

Local mechanical exhaust fans shall be installed in each kitchen and bathroom. *Delivered local ventilation rates:*

- All local ventilation rates have been measured using a flow hood, flow grid, or other airflow measuring device and meet the requirements of 62.2 Tables 5.1 or 5.2; OR
- The airflow rating at a pressure of 0.25 in. w.c. of a certified fan is assumed because the local ventilation system duct sizing meets the prescriptive requirements of 62.2 Table 5.3, or manufacturer's design criteria.

Table 5.1**Intermittent Local Ventilation Exhaust Airflow Rates**

| Application | Airflow | Notes |
|-------------|---------------------------|---|
| Kitchen | 100 cfm | Vented range hood (including appliance-range hood combinations) |
| | 300 cfm or 5 ACH capacity | Other kitchen exhaust fans, including downdraft |
| Bathroom | 50 cfm | |

Table 5.2**Continuous Local Ventilation Exhaust Airflow Rates**

| Application | Airflow | Notes |
|-------------|---------|-------------------------|
| Kitchen | 5 ACH | Based on kitchen volume |
| Bathroom | 20 cfm | |

Table 5.3**Prescriptive Duct Sizing Requirements**

| Duct Type | Flex Duct | | | | Smooth Duct | | | |
|--------------------------------|------------------------------------|----|-----|-----|-------------|-----|-----|-----|
| | 50 | 80 | 100 | 125 | 50 | 80 | 100 | 125 |
| Fan Rating cfm @ 0.25 in. w.g. | | | | | | | | |
| | Maximum Allowable Duct Length (ft) | | | | | | | |
| Diameter, (in) | Flex Duct | | | | Smooth Duct | | | |
| | | | | | | | | |
| 3 | X | X | X | X | 5 | X | X | X |
| 4 | 70 | 3 | X | X | 105 | 35 | 5 | X |
| 5 | NL | 70 | 35 | 20 | NL | 135 | 85 | 55 |
| 6 | NL | NL | 125 | 95 | NL | NL | NL | 145 |
| 7 and above | NL | NL | NL | NL | NL | NL | NL | NL |

This table assumes no elbows. Deduct 15 ft of allowable duct length for each turn, elbow, or fitting. Interpolation and extrapolation in 62.2 Table 5.3 is not allowed. For airflow values not listed, use the next higher value. This table is not applicable for airflow > 125 cfm.

NL = no limit on duct length of this size.

X = not allowed, any length of duct of this size with assumed turns, elbows, fittings will exceed the rated pressure drop.



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| CERTIFICATE OF VERIFICATION | | CF3R-MCH-32-H |
| Local Mechanical Exhaust | | (Page 2 of 3) |
| Project Name: | Enforcement Agency: | Permit Number: |
| Dwelling Address: | City: | Zip Code: |

C. Kitchen Exhaust System

| | | |
|----|---|--|
| 01 | Manufacturer Name | |
| 02 | System Type | |
| 03 | HVI Directory Listed Model Number | |
| 04 | HVI Directory Listed Rated Airflow | |
| 05 | HVI Directory Listed Sound Rating | |
| 06 | Minimum Airflow (if different than rated airflow) | |
| 07 | Operation Schedule | |
| 08 | Required Minimum Ventilation Rate | |
| 09 | Maximum Sound Rating | |
| 10 | Compliance Statement | |

D. Other Requirements

The items listed below correspond to the information given in ASHRAE 62.2. Refer also to Chapter 4.6 of the Residential Compliance Manual for information describing these requirements in more detail. The signature of the Responsible Person in the declaration statement below certifies that the building complies with these requirements if applicable.

| | | |
|----|---|---|
| 01 | Demand control exhaust systems shall be provided with at least one of the following: 1. A readily accessible occupant-controlled on-off control. 2. An automatic control that does not impede occupant on control. | |
| 02 | Permitted automatic control devices include, but are not limited to: humidity sensors, shut-off timers, occupancy sensors, multiple speed fans, combined switching, IAQ sensors, etc. | |
| 03 | Each continuous mechanical exhaust system shall be provided with a readily accessible manual on-off control. (Multifamily dwellings are exempt from readily accessible requirement.) | |
| 04 | Continuous mechanical exhaust systems shall be designed to operate during all occupiable hours. | |
| 05 | Exhaust fans in separate dwelling units shall not share a common exhaust duct. Exhaust inlets from more than one dwelling unit may be served by a single exhaust fan downstream of all the exhaust inlets if the fan is designated and intended to run continuously or if each inlet is equipped with a back-draft damper to prevent cross-contamination when the fan is not running. | |
| 06 | Verification Status | <input type="checkbox"/> Pass - all applicable requirements are met; or <input type="checkbox"/> Fail - one or more applicable requirements are not met. Enter reason for failure in corrections notes field below; or <input type="checkbox"/> All N/A - This entire table is not applicable |
| 07 | Correction Notes | |

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met unless otherwise noted in the Verification Status and the Corrections Notes in this table.

E. Determination of HERS Verification Compliance

All applicable sections of this document shall indicate compliance with the specified verification protocol requirements in order for this Certificate of Verification as a whole to be determined to be in compliance.

| | |
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| 01 | |
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**CERTIFICATE OF VERIFICATION**

CF3R-MCH-32-H

Local Mechanical Exhaust

(Page 3 of 3)

| | | |
|-------------------|---------------------|----------------|
| Project Name: | Enforcement Agency: | Permit Number: |
| Dwelling Address: | City: | Zip Code: |

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Verification documentation is accurate and complete.

| | |
|----------------------------|---|
| Documentation Author Name: | Documentation Author Signature: |
| Company: | Date Signed: |
| Address: | CEA/HERS Certification Information (if applicable): |
| City/State/Zip: | Phone: |

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

- The information provided on this Certificate of Verification is true and correct.
- I am the certified HERS Rater who performed the verification identified and reported on this Certificate of Verification (responsible rater).
- The installed features, materials, components, manufactured devices, or system performance diagnostic results that require HERS verification identified on this Certificate of Verification comply with the applicable requirements in Reference Appendices RA2, RA3, and the requirements specified on the Certificate of Compliance for the building approved by the enforcement agency.
- The information reported on applicable sections of the Certificate(s) of Installation (CF2R) signed and submitted by the person(s) responsible for the construction or installation conforms to the requirements specified on the Certificate(s) of Compliance (CF1R) approved by the enforcement agency.
- I will ensure that a registered copy of this Certificate of Verification shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Verification is required to be included with the documentation the builder provides to the building owner at occupancy.

BUILDER OR INSTALLER INFORMATION AS SHOWN ON THE CERTIFICATE OF INSTALLATION

Company Name (Installing Subcontractor, General Contractor, or Builder/Owner):

| | |
|--|---------------|
| Responsible Builder or Installer Name: | CSLB License: |
|--|---------------|

HERS PROVIDER DATA REGISTRY INFORMATION

| | |
|--------------------------------------|--|
| Sample Group Number (if applicable): | Dwelling Test Status in Sample Group (if applicable) |
|--------------------------------------|--|

HERS RATER INFORMATION

| | |
|--|------------------------------|
| HERS Rater Company Name: | |
| Responsible Rater Name: | Responsible Rater Signature: |
| <u>Responsible Rater Certification Number w/ this HERS Provider:</u> | Date Signed: |

CF3R-MCH-32-H User Instructions**Section A. Local Mechanical Exhaust - General Information**

1. Dwelling Unit Name: This field is filled out automatically and referenced from the MCH-01
2. Building Type: This field is filled out automatically and referenced from the CF1R.
3. Project Scope: This field is filled out automatically and referenced from the CF1R.
4. Total Kitchen Floor Area: Enter the total floor area for an enclosed kitchen or N/A for a non-enclosed kitchen.
5. Kitchen Average Ceiling Height: Enter the kitchen ceiling height for an enclosed kitchen or N/A for a non-enclosed kitchen.
6. Kitchen Total Conditioned Volume: This field is filled out automatically and calculated based on the kitchen area and ceiling height.
7. Kitchen Type: Enter the type of kitchen (enclosed or non-enclosed).

Section C. Kitchen Exhaust System

1. Manufacturer Name: Enter manufacturer name for the kitchen exhaust system.
2. System Type: Select the type of kitchen exhaust system. Options are vented range hood, downdraft, and other.
3. HVI Directory Listed Model Number: Enter the kitchen exhaust system model number matching the installed equipment and HVI directory.
4. HVI Directory Listed Rated Airflow: Enter the rated airflow listed in the HVI directory for the above model number.
5. HVI Directory Listed Sound Rating: Enter the sound rating listed in the HVI directory for the above model number.
6. Minimum Airflow (if different than rated airflow): Defaults to rated airflow from HVI directory, but editable if exhaust system minimum airflow rate is different than HVI listed value.
7. Operation Schedule: Select the kitchen exhaust system operation schedule. Options are demand control and continuous.
8. Required Minimum Ventilation Rate: This field is filled out automatically and is calculated based on the system operation schedule and type, and kitchen type.
9. Maximum Sound Rating: This field is filled out automatically and is calculated based the system operation schedule.
10. Compliance Statement: This field is filled out automatically based on the installed system HVI listed airflow rate and the minimum required ventilation rate.

Section D. Other Requirements

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. *Verification Status*: If this Section does not apply, then select "All N/A". If the system meets the criteria for *Ducts Located in Conditioned Space* credit then select "Pass", otherwise select "Fail". The latter selection means that the system does not meet the requirements and the CF1R will have to be revised, or the system will need to be modified to meet the requirements.
7. *Correction Notes*: If one or more applicable requirements are not met "Fail" will appear in the row above. When this occurs the rater is required to enter detailed notes here that describe what failed and why.

Request for an Emergency Rulemaking Hearing

Petitioner:

APP-TECH Inc.
235 Blackburn Street
Santa Cruz, CA 95060
(831) 458-0485

Nature of the action requested:

Revise the 2019 Energy Code and supporting CEC documents to assure consistent application of ASHRAE 62.2 (2016) minimum ventilation rates for Residential Buildings and verification of correct equipment installation. These documents are conflicting and sometimes incoherent!

Most importantly, delete changes made to Title-24 Part 6 Section 150.0 (o) that conflict with the CEC adopted (and ASHRAE published) version of ASHRAE 62.2 (2016)

Reasons for this request:

Documentation is inconsistent.

Ventilation requirements in the Standards, ACM instructions, Reference Appendices, CEC version of ASHRAE 62.2, and Residential and Non-residential Compliance Manuals are erratic. For instance, the CEC adopted modified version of ASHRAE 62.2 conflicts with Title-24 Part 6, Section 150.0 (o).

Minimum required ventilation rates for various residential occupancies are
not clearly defined.

The minimum ventilation rate determined according to ASHRAE 62.2 Section 4.1.1 is required for ALL Residential Dwelling Units. These include single family detached low-rise residences, as well as horizontally attached and vertically attached low-rise dwelling units. High-rise residential dwelling units are also covered.

Installation verification is not consistently defined.

For instance, ASHRAE requires mechanical ventilation for all Kitchens and Bathrooms. Section 150.0 (o) 2. B. requires HERS Rater verification only for Kitchen Range Hoods. There is no ASHRAE 62.2 requirement that residential kitchens include a vented range hood. The requirement is for mechanical kitchen exhaust which can be provided by:

Kitchen Exhaust Fans (300 cfm minimum)

Downdraft Kitchen Exhausters (300 cfm minimum) or

Kitchen Range Hoods (100 cfm minimum)

Each of these has a separate listing in the 2020 HVI-Certified Products Directory, as well as other listings such as Bathroom Exhaust Fans. Why make such a big deal out of verifying the performance of a Range Hood, that may not even exist, while ignoring kitchen exhaust systems requiring three times the minimum ventilation rate? Note that ASHRAE also requires prescriptive duct sizing verification for these systems.

Section 150.0 (o) 1. C. requires that mechanical ventilation rates be determined in accordance with ASHRAE 62.2 Sections 4.1.1 and (CEC modified) 4.1.2.

These two rates will be different. The only way to satisfy both requirements is to install a mechanical vent system providing the higher rate. This will always be the rate determined by section 4.1.1! What is the point of developing an option for reducing the ventilation rate based on some imaginary infiltration credit, that should never be utilized?

But wait! The 2019 Residential Performance software is specifying a minimum ventilation rate much lower than the ASHRAE required minimum. One of the reasons the CEC adopted ASHRAE 62.2 as a referenced standard was to absolve the Commission from liability for perceived inadequate ventilation. By altering/reducing those minimum ventilation rates the CEC has reclaimed that legal liability. This is an error that should be corrected ASAP.

HVI Directory or Procedures?

Many of the CEC documents I have reviewed indicate that ventilation equipment is required to be listed in the HVI directory or rated by HVI. However, ASHRAE 62.2 only requires ventilation equipment to be tested in accordance with HVI procedures. Can one satisfy the CEC's prescriptive mechanical ventilation requirements by installing, for instance, an HRV/ERV system that is not listed or tested by HVI? If so, is referring to manufacturer's published data sufficient? Or is some other means of equipment performance verification necessary?

Intermittent Mechanical Ventilation Systems:

ASHRAE 62.2 Section 4.5 has procedures for Variable (intermittent?) Mechanical Ventilation systems. The CEC's 2019 List of Certified Intermittent Mechanical Ventilation Systems, so far, has no entries. Most of these systems can be operated in a constant ventilation mode. May one set up one of these systems as a constant ventilation system for initial HERS inspection and verification purposes, even though they could be operated differently later?

Why is compliance with ASHRAE 62.2 Section 6.5.2 not required? (Section 150.0 (o) 1. H.)

This section seems to refer to CEC HVAC duct system sealing requirements. What was the problem with it?

Blueprint Issue #112.

This Blueprint includes a procedure for verifying performance of high-rise residential dwelling unit ventilation systems utilizing an exhaust fan with inlet device. Is this type of ventilation system still allowed?

Authority to take the action requested:

The authority to take these proposed actions is the Warren-Alquist Act Section 25402 and any other authority cited by the Commission to initially justify adoption of the regulations and procedures in question.

Immediate action requested:

Correct ventilation errors in the Performance software.

Increase the required Performance Method residential ventilation rate to the ASHRAE 62.2 Section 4.1.1 minimums and require all Kitchen and Bathroom ventilation fans to be HERS verified, not just Range Hoods.

Schedule a pre-rulemaking workshop to obtain public comment on ways to improve these ventilation procedures.

I assume that there must have been some perceived problem that led to the development of some of these bizarre 2019 code changes to the ASHRAE requirements. I just have no idea what it might have been. There should be a pre-rulemaking workshop scheduled to obtain public input on potential improvements to the residential ventilation requirements. This meeting should include representatives from the ASHRAE 62.2 committee, the Home Ventilation Institute, and ventilation system manufacturers. It may be that methods will be identified that alleviate some of these problems, without having to resort to an emergency rulemaking. Hopefully these proposed changes will lead to more consistent and logical residential ventilation regulations.



Patrick L. Splitt
President
App-Tech Inc.
(831) 458-0485

27 January 2020