<table>
<thead>
<tr>
<th>Docket Number:</th>
<th>20-TIRE-01</th>
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<tbody>
<tr>
<td>Project Title:</td>
<td>Tire Efficiency Order Instituting Information Proceeding</td>
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<tr>
<td>TN #:</td>
<td>237132</td>
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<tr>
<td>Document Title:</td>
<td>Smithers Tire Testing Overview</td>
</tr>
<tr>
<td>Description:</td>
<td>N/A</td>
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<tr>
<td>Filer:</td>
<td>System</td>
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<tr>
<td>Organization:</td>
<td>Smithers</td>
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<tr>
<td>Submitter Role:</td>
<td>Applicant Consultant</td>
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<td>Submission Date:</td>
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<td>3/11/2021</td>
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Comment Received From: Smithers
Submitted On: 3/11/2021
Docket Number: 20-TIRE-01

Smithers Tire Testing Overview

Additional submitted attachment is included below.
Tire Testing Capabilities
Smithers: Trusted global partner

Independent third-party laboratory testing and consulting
Incisive strategic consulting, market forecasting and events

Successfully operating for over 90 years

700+ employees

World-class facilities and expertise

We continuously invest in our scientific and engineering talent

Our scientists and engineers are experts in their field.

14 facilities globally
ICE and Electric Vehicles
Supporting development goals today in Europe, Asia, & North America

- Cold soak testing for EV batteries
- Performance testing for fluid transfer systems
- Materials testing
- Wheel testing
- Tire testing
- On-vehicle winter performance testing for tires
- Sensors and electronics testing

Global excellence in material, component, and product performance
Tire Testing Capabilities
Tire Fuel Efficiency

• Rolling Resistance Testing
  • Smithers is the National Tire Reference Lab for Rolling Resistance (NHTSA)
  • Historically supporting tire benchmarking, NHTSA evaluations, labeling, and manufacturer development activities
  • Common testing standards
    • ISO 28580
    • SAE J1269
    • SAE J2452
## Tire Performance Testing

**Government Compliance and Industry Standard Evaluations**

<table>
<thead>
<tr>
<th>Category</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerated Aging</td>
<td>Laser Tread Profilometry (CTWIST)</td>
</tr>
<tr>
<td>Characterization for Tire Modeling</td>
<td>OEM Design Validation</td>
</tr>
<tr>
<td>Competitive Benchmarking</td>
<td>OTR Tire Testing</td>
</tr>
<tr>
<td><strong>Durability &amp; Endurance</strong></td>
<td>PRAT and RCF</td>
</tr>
<tr>
<td>Footprint</td>
<td><strong>Rolling Resistance</strong></td>
</tr>
<tr>
<td>Force &amp; Moment</td>
<td>Snow &amp; Ice Traction</td>
</tr>
<tr>
<td>Indoor Tread Wear</td>
<td>Subjective Ride &amp; Handling</td>
</tr>
<tr>
<td><strong>Inflation Pressure Loss Rate (IPLR)</strong></td>
<td>Tire Labeling Testing</td>
</tr>
</tbody>
</table>
Tire Regulatory Testing

• FMVSS No. 139 covers pneumatic radial tires for light vehicles other than motorcycles and low speed vehicles (GVWR less than or equal to 10,000 lbs). Establishes minimum requirements for:
  • Sidewall labeling
  • Tire strength
  • Resistance to bead unseating
  • Endurance
  • High-speed performance.

• FMVSS No. 119 establishes similar requirements for multipurpose passenger vehicle, truck, bus, trailer, and motorcycle tires.
Tire & Wheel Testing Capabilities

Ravenna, Ohio (USA) | Suzhou (China)
Smithers On-Vehicle Tire Testing

• One of the world’s finest facilities of this type
• Over 800 acres in Michigan’s Upper Peninsula
• Courses prepared to meet customer-specific needs – traction, braking, handling evaluations
• Extreme winter conditions / cold weather evaluations
• Varying course types including packed snow, ice, split mu, deep snow, hills, etc.
• Common test methods
  • ASTM F1805 / UN ECE R117 Snow Tire Traction
  • UN ECE R117 / ISO 18106 C3 Snow Traction
  • Stopping Distance Test & Snow and Ice Handling
Tire Technical Consulting

With over 100 years of collective technical experience in the automotive, tire, and rubber and polymer industries, our scientists can assist with a wide variety of technology challenges.

- Product performance evaluation
- Forensic consulting
- Product failure analysis
- Product and process design
- Patent review and patent investigation
- Compound development and formulation
- Test development
- Competitive analysis
- Cost reduction