



TIRE TESTING

& EVALUATION

NATC is a leader in developmental and production tire testing. From motorcycles to passenger cars to trucks to earthmovers and agricultural equipment, NATC has developed test methods to evaluate and optimize tire and suspension performance over a broad range of on- and off-road conditions. NATC engineers have assisted in carcass design and compound development and specialize in tailoring tests to provide solutions in a timely and effective manner. NATC offers a wide range of performance, durability, and mobility testing. Furthermore, NATC has over 40 years of vehicle and suspension design and development knowledge, and can provide expertise in vehicle-tire system integration. NATC is currently pursuing compliance with ISO 17025.

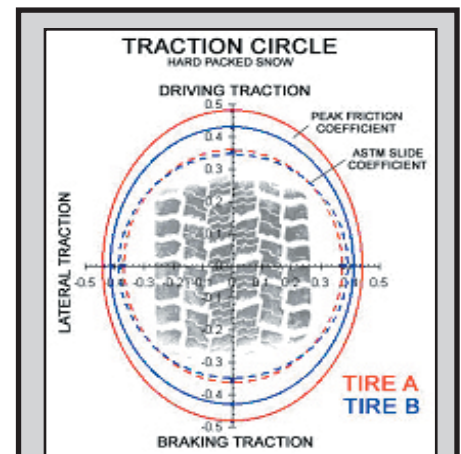
Tire Performance Testing



- Single-Wheel Braking, Driving, and Lateral Traction
- Stopping Distance
- Subjective and Objective Ride and Handling
- Subjective and Objective Noise and Vibration
- Mountability
- Rim Slip
- Bead Roll-Off/Unseating
- Treadwear
- Slalom, Lane Change, and Hydroplaning
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- Cornering Response - J-Turn and Tethered Circle
- Tri-Axial Force Measurement with Non-Rotating Moment Compensating Wheel End Transducers
- Tire Performance Certification
- Testing to ASTM, SAE, ISO, RMA, GM, Ford and Military Standards

Tire Durability/Reliability Testing

- Thermal Profile/Reliability
- Mechanical Reliability
- Multi-mode Durability
- Puncture Resistance
- Cut Resistance
- Cut/Crack Resistance
- Rib/Lug Tear Resistance
- Curbing
- High Speed Operation (150 mph)
- Ton Mile Per Hour
- Sequentially Advanced Accelerated Wear and Durability (SAAWAD)



By utilizing NATC's custom fleet of Dynamic Force Measurement Vehicles (DFMVs), NATC can develop tire traction curves for driving, braking, and lateral traction. These are all the major components in developing the complete tire traction circle.

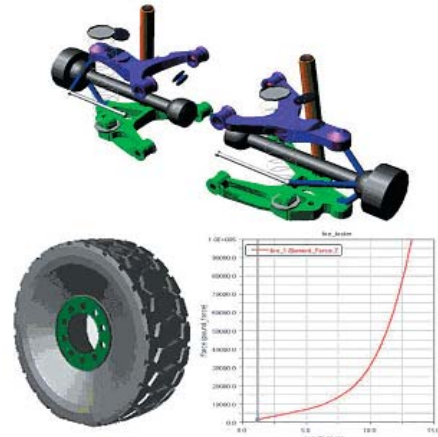
Tire Mobility Testing



- Dynamic Traction - Soft Soils/Winter
- Drawbar Pull System Evaluation
- Closed Circuit Operations
- Marginal Terrain Go/No-Go
- Fording

Measurement/Diagnostic Services

- Tire Deflection and Footprint
- Tire Spring and Damping Rate
- Dynamic Contact Pressure
- Failure Analysis
- Terrain Analysis
- Surface Coefficient Measure
- High Speed Filming



Vehicle-Tire System Integration

- Tire Optimization for Anti-lock Braking (ABS) and Traction Control Systems (TCS)
- Tire/Suspension Optimization
- Run-flat Device Testing
- Central Tire Inflation System (CTIS) Testing
- Tire Pressure Monitoring System (TPMS) Testing
- Fuel Economy
- Computer Model Validation

Driver Training

- Blow-out
- Off-road Traction and Survivability
- On-road Performance Handling
- EVOC Training
- Consumer Education
- Ride and Drive Events

Environmental Conditions Available at NATC

- Paved Surfaces SN 30 to 85 Concrete and Asphalt - Wet and Dry
- Desert Pavement
- Sand - Loose/Dry and Packed/Wet
- Clay - Slippery Surface and Saturated
- Gravel - Solid Base and Soft Base Imbedded
- Mud - Lean Clay Loam and Field Soil
- Winter - Ice: Frozen and Wet
- Snow: Virgin, Soft, Moderate and Hard Packed

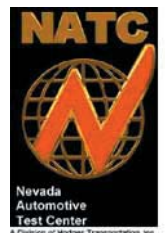


NATC Tests to National and International Standards

- SAE J57 - Sound Level of Truck Tires
- SAE J341 - Truck and Bus Tire Performance
- SAE J345a - Passenger Car Tire Peak and Locked Wheel Braking Traction
- SAE J1060 - Subjective Rating Scale
- SAE J1269, J1270, J1379, J1380 - Rolling Resistance
- SAE J1466 - Passenger Car and Light Truck Tire Dynamic Driving Traction in Snow
- SAE J1981 - Road Hazard
- SAE J1987 - Force and Moment
- SAE J2014 - Military Tires
- SAE J2429 - Free-Rolling Cornering
- ISO 3888 - Obstacle Avoidance
- ISO 2631 - Ride Quality
- RMA Definition for Passenger Car and Light Truck Use in Severe Snow Conditions
- Over 35 ASTM Standards including:
 - E 274 - Skid Resistance
 - E 445 - Stopping Distance
 - F 377 - Braking Force
 - F 408 - Wet Traction Braking
 - F 870, F970 - Tread Footprints
 - F 1016 - Treadwear Data Analysis
 - F 1426 - Irregular Wear Patterns
 - F 1650 - Tire Traction Under Varying Conditions
 - F 1922 - Tire Test Method
 - F 1805 - Standard Test Method for Single Wheel Driving Traction in a Straight Line on Snow and Ice Covered Surfaces

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