

Specialized Road Wheel Testing

Horizontal Wheel Testing at Accelerated Conditions for Tire Safety Evaluation

The automotive industry is demanding more and more tailor-made tire testing for sport utility, multipurpose and other types of vehicles in order to meet the performance requirements based on various vehicle platforms and climatic conditions. This tougher demand has created a need for more accelerated functional tire testing at higher temperatures and environmental conditions (ex. oxygen, ozone and humidity controlled environments). ARDL's engineering group has recently announced a new concept in endurance testing using a six-head tire-wheel testing machine with environmentally controlled stations. The ARDL "tire-wheel" testing rig integrates six separately controlled temperature/environmental chambers, one for each of the six tires. This approach will allow ARDL's engineering group to provide automotive companies with cost-effective research and development testing for tire safety.

This ARDL horizontal tire test rig features PLC closed-looped controls which allow very precise control of load, speed and temperature. The PLC interface will allow the test engineer to load the test profile and then tag all key test parameters throughout the duration of a test.

High Speed "Indoor" Wheel Testing

- Machine - 67.23" Dia. Drum
- Inflation - as Per New ARDL Test Schedule
- Load - 88% of Max. Load
- Break-in - 2 hrs at 50 mph then cool to 100°F

Tire Speed - 150 MPH (Maximum)

- Typical Chamber Aging Temperatures: -40°C, -10°C, 70°C, 80°C, 90°C and 100°C

Tire Development

- Finite Element Analysis
- Footprint Pressure Distribution Response
- Impact, Force and Moment
- Rolling Resistance -
Using the New ARDL Technique
- Tire Electrical Resistance - Static Build Up
- Dynamic Stiffness Measurement (MTS)
- Tire Slip and Camber



Tire Permeation Testing

Air Permeation Testing

ARDL's air permeation room has a 50-tire capacity as per ASTM F 1112 and GM test specifications. For measuring, ARDL utilizes high accuracy pressure gauges which include custom made attachment stem valves. The controlled padded temperature chamber provides us with the ability for continuous monitoring. Throughout the 90-day or 180-day air permeation test, our qualified engineers perform extended data analysis and reporting, utilizing per minute monitoring and calculations.

Innerliner Permeation Testing

Innerliner permeation is conducted to evaluate the effect of air loss on rolling resistance and ultimately to fuel savings. Less air permeation equals greater fuel savings, as the tires tend to give higher mileage to the vehicle. ARDL has the capability to test tires in different internal cavity gas environments like nitrogen or oxygen with continuously controlled purity levels and can also perform ASTM D 1434 at 21°C and 65°C on innerliners sliced out from tires.



Intercarcass Pressure Testing

Intercarcass pressure is tested to determine the carcass pressure buildup and understand its effect on sidewall delamination in tires. ARDL has the ability to perform intercarcass pressure tests with a 10-tire capacity at controlled temperature and monitored barometric pressure. The capability to simultaneously measure the whole tire permeation and intercarcass pressure variation is also available.

