

MEASUREMENT OF FRICTION: ALTRACON SOLUTION

Measurement of friction is a challenge. There are too many parameters, too many environmental conditions which affect the result. Measurement of friction needs just a short process, but it is essential to keep the parameters constant and under control. Other procedures which offer a parameter change over time are not suitable to determine the real coefficient of friction.

The Luxembourg based Altracon offers a High Speed Linear Friction Tester (HSLFT) with the unique possibility to determine friction coefficients of rubber samples on different surfaces and under various operating conditions to predict compound and pattern influences on the grip and traction performance of tires. The latest generation of this precision measurement tool was recently launched. It was designed and constructed in such a way that all relevant tire testing conditions including the environment, the test specimen and the track are conditioned and controlled. A novel, merely for this project developed linear induction motor with high peak performance enables fastest sliding velocities and accelerations. The range of applicable vertical forces covers the full operating range of passenger car and truck tires. Loading and unloading is now done hydraulically and allows with this the stick-slip simulation of a rubber block passing through the footprint.

The specimen will be loaded to the testing surface, which is applied to an exchangeable cassette and will be rubbed over it on a linear path before it is unloaded again. Any testing surface like asphalt and concrete are used, as well as snow and ice surfaces with comparable characteristics to the outdoors. Even the simulation of wet track and aquaplaning conditions is possible. To test on ice and snow surfaces, or to simulate different temperature zones with high or low humidity, the entire system needs to be installed in a controllable climate chamber with deep freezing and heating capability. Ice- and snow tracks with reproducible quality and conditions are produced according a technology which has been developed by Altracon.

Additional equipment, such as an integrated high-speed camera for the



High Speed Linear Friction Tester (HSLFT)

evaluation of slip and block bending, a thermography camera to measure stress or a high-resolution surface scanner for a topographic characterization of applied surfaces can be integrated within the system. This means that also the block pattern tests can be directly linked to the design of a new tire tread structure.

Modules for conditioning, cleaning or scanning of the tracks for wear or samples are also available. The stiff construction of the unit and various multi-mounting ports enable changes and upgrades to be made to the testing environment at any time.

Friction testing with the HSLFT is a huge step forward in the process of tire development. It reduces risk by increasing the number of test cycles, offers the customer a far shorter delay of launching his product by reducing the number of road tests and cuts development costs by creating an indoor all-season tire test environment. Experience shows that it will take only about five days from the beginning of the development of a mixture to the real friction coefficient measured with the HSLFT. Costly road trips for tire rating will be reduced to the final release test of the ready developed tire to do



Measuring head sliding over low track



Measuring head and track table

the fine tuning. The development and construction of expensive mould devices to build test tires for road tests will be significantly reduced, which additionally saves cost and time. This makes the HSLFT to a high efficient development tool, which is proven by the "big three" tire companies. ▲