For a Total Solution to all of your Materials Testing Needs

Dexter Axle upgrades frame for modulus testing

Dexter Axle Company was founded in 1960 by Leonard Dexter in Elkhart, Indiana, and has since grown to be the industry leader. With nine manufacturing facilities, an international distribution network, and over 1700 employees, Dexter is the premier supplier of running gear and components to the trailer industry. Dexter Axle is committed to uncompromised quality, continuous improvement, and superior customer service. The company has invested heavily in manufacturing and testing technology. Dexter's in-house laboratories perform rigorous metallurgical, stress, and fatigue testing. This dedication to testing led to the retrofit and upgrade of a compression testing frame at the company's Fremont, Indiana, manufacturing plant. Using the MTESTWindows™ Materials Testing System from ADMET, Inc., Dexter Axle was able to update an electro-mechanical testing frame to perform complex modulus compression tests on rubber cord axle components.

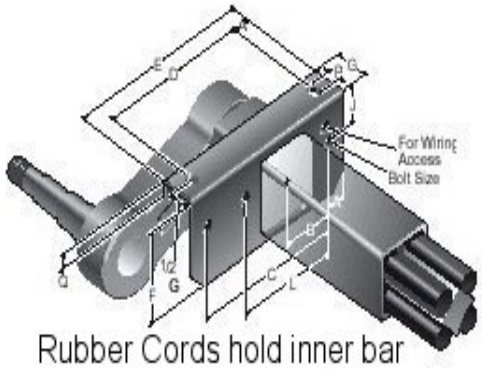
Dexter Axle's manufacturing plant in Fremont, Indiana, builds axle assemblies ranging from 500 lb. load units for utility trailers to 25,000 lb. load units for semi trailers. The plant assembles finished axle sets that are ready for installation in suspension systems or for mounting to a frame.

The company performs routine tests of daily in-process manufacturing friction welds on axle assemblies using a Reihle electromechanical tensile testing machine. "The old machine was fine for friction weld bend tests," said James Bryan, Dexter Axle quality technician. "We would dial the speed down and bend the sample until it bottomed out in the fixture."

The results were simple to interpret. The weld would either fail or hold. If the material bent and the weld did not break, the weld passed.

However, Dexter Axle's main line of heavy duty axles, Torflex, uses rubber components that are integral to the product's performance. Management decided that the rubber cord should be tested upon receipt at the facility. As a result, Bryan was asked to test one or two rubber core samples from each case.

Torflex, a rubber torsion axle assembly, provides a smooth, quiet ride when installed in independent suspensions. The Torflex axle is a square tube with four rubber cords on each side that hold a square inner bar that absorbs the energy from the road. The cords provide a reliable, maintenance-free, torsion-suspension system.



Rubber Cords hold inner bar

SOLUTION OVERVIEW

Industry: Utility and semi trailer axles
ADMET Product: MTESTWindows
Application: Modulus testing of rubber cord
Customer: Dexter Axle Company

A modulus test was designed for the Torflex assembly. It required more exact control of the testing frame and more sophisticated measurements.

In testing the rubber cord, the technician measures the cross section of the rubber sample to get the mean diameter and then divides the mean diameter in half. The technician then loads and unloads the sample twice at one inch per minute. Subsequently, the speed is reduced to ½ inch per minute and the load at ½ the measured diameter is recorded.

"At the beginning I was using the manual system. It was very difficult to accurately control the different speeds. Our results were all over the map and I had no confidence in the results," commented Bryan.

Retrofit enables modulus testing

The solution was to retrofit the Reihle frame with, MTESTWindows™, a PC/Windows based test system from ADMET, Inc. Dexter Axle had some experience with ADMET since the headquarters manufacturing operation in Elkhart had earlier retrofitted a testing machine. The lab technician in Elkhart recommended ADMET and Bryan made the arrangements for installation.

By adding MTESTWindows, and replacing the motor amplifier, ADMET was able to upgrade the Reihle frame to handle the modulus tests.

Now, using MTESTWindows both to control the testing process and record the results for the bend and modulus tests, Bryan and quality control inspectors conduct up to 100 tests per week.

They are able to perform the modulus test with a high degree of confidence in the results. "Now we get results that we can rely on and we can easily transfer them to our Statistical Quality Control system or to a spreadsheet," added Bryan.

The system came with some unanticipated side benefits. It frees up Bryan's time allowing him to easily train QC technicians to oversee the modulus testing. In addition, MTESTWindows manages the entire testing cycle. Said Bryan, "Previously, I was completely tied to the machine during the test. Now, I can log information from earlier tests or do something else. It even shuts itself down at the end of the cycle."

MTESTWindows tracks and reports all tests

Since MTESTWindows is designed to work with load frames, it gathers and reports all test data for commonly used mechanical tests. It plots stress vs. strain curves as the tests are in process. Key test parameters, such as peak load/stress, offset yield, modulus of elasticity and other measures are also reported.

MTESTWindows saves raw test data and results so multiple tests can be easily compared. Its X-Y plot capabilities and ability to export data in standard formats make it easy to integrate with other data analysis and laboratory management systems. MTESTWindows includes inputs for load, crosshead position and axial strain with options for a transverse strain channel and servo control. Load accuracy exceeds ASTM E-4 standards.

The MTESTWindows software has minimal system requirements and works on all Microsoft Windows operating systems (Windows 95 and higher).

For More Information

For more information about ADMET products or services, please call us at 800-667-3220 in the US or Canada, email sales@admet.com or visit our Web site at http://www.admet.com.

Dexter Axle Company can be reached at 574-295-7888, info@dexteraxle.com or http://www.dexteraxle.com.