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Tenneco plans Endurica lab growth

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MILAN, Ohio—Automotive supplier Tenneco Inc. is planning to continue expanding its material testing lab at its Milan technical center through 2019.

The company's Clevite Elastomers brand, which licenses Endurica L.L.C.'s software, will grow its material testing lab in the neighborhood of double its current size, said Steve Pohlman, Tenneco vice president and general manager of global elastomers.

"The biggest thing we have out here is mainly the Endurica lab," Pohlman said. "They're doing a good job with it and we're going to continue to invest in it. Our customers are very happy with it."

The materials testing lab runs tests to feed into the Endurica software, used to determine the fatigue life of rubber products, said Joshua Goossens, elastomer materials engineering manager for Tenneco.

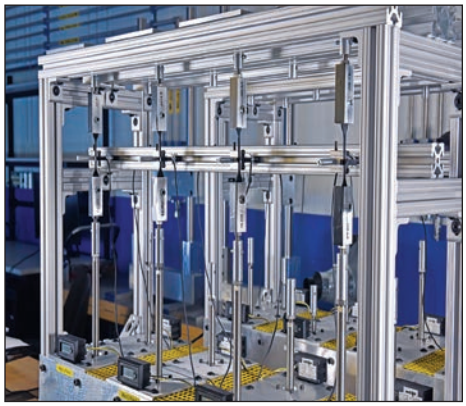
"What's unique about Endurica is that, for many materials like steel, aluminum, various plastics, you've been able to simulate the fatigue life of products made from those materials for many years," Goossens said. "But the base science in understanding rubber fatigue, all the components of the various scientific theories were not put together until a gentleman, while doing his Ph.D., wrapped it all up and solved how to have a finite element solution for rubber fatigue."

The software uses critical plane analysis to give predictions until complex load cases, and includes testing methods and instrumentation to measure rubber fatigue in simulation. The data fed into the software requires new material tests, some new to Tenneco as of a few years ago, and some new to the industry entirely, Goossens said.

One of those tests uses an intrinsic strength analyzer, the first of its kind, which directly measures the force to break down the polymer chain, Goossens said.

"You're directly measuring by physical means the force to cause a tear to propagate at the molecular level," he said.

The lab includes other testing machines such as tensile, compression and shear capabilities, along with other measurements intended to support the company's focus on noise, vibration and harshness in automotive design. The Endurica software uses results of those tests, such as the shear planar tension specimen used to determine fundamental fatigue crack growth rate, to simulate rubber product fatigue life, Goossens said.



Above Right: Engineer Joe Cerri conducts testing for Endurica simulations. Above: Elastomeric materials under testing.

"From the tests that are new, those were done by Endurica as part of creating the software," he said. "Some of the tests aren't so much new as they've been refined to increase their accuracy to a useful level—especially on the fatigue crack growth."

The amount of variations in those test procedures made the results of that test scientifically worthless, he

said. With the additions that are new to the industry, it raises the test's accuracy to the point that it can be used in simulations

Global engineering

Tenneco invested in the Endurica software last year in an effort to boost speed and accuracy in product testing, Pohlman said.

Tenneco's testing capabilities in Milan, which employs about 80, will be mirrored in its Suzhou, China, facility to expand the company's ability to take on engineering opportunities. Though the Milan facility currently has more capabilities, projects already leverage cooperation between the two facilities, Pohlman said.

"We're sharing projects, they go back and forth," he said. "Projects we do here today, we've shifted work into China, kind of like virtual engineering 24/7. That's what we're really looking toward."

Both facilities are working on their own independent projects as well, with the Suzhou facility taking on domestic projects, Pohlman said.

"We want them to be a self-sufficient engineering group," he said.

Tenneco also has engineering capabilities in Cotia, Brazil, and the company hopes to continue to expand its global engineering resources, he said.

"There will be more to follow here in the future about expanding those opportunities, probably within the next 12-18 months, we'll be doing some expansions from an engineering perspective," he said. "We're growing and we'll continue to grow. (The Milan facility) is a very important place for us as we continue to grow our business."

Going forward, the Milan center will add both new capabilities and employees, he said.

Adding extensive testing capabilities improves Tenneco's working relationships with its clients and shortens the time to a final product, said Ben Patel, Tenneco chief technology officer.

Senior Technician David Cline works with Tenneco's new material injection press.

"The tools we're bringing allow us to develop the partnerships such that they don't have to do the extra testing," Patel said. With Tenneco's components, they're able to send along the work and data that went into the product, which limits uncertainty on which product fits the application. "That's the good part of not having to go back and forth continually."

Testing, like what's done in the Endurica lab, is a way that Tenneco is using technology to make more reliable products, as a lot of test data can be generated more cost-effectively now, Patel said.

"Nobody wants to live in this guess-and-test world anymore. It's too expensive in both time and money," he said. "You can either use sensors on vehicles to predict failures or predictive maintenance against a failure, or you can simulate multiple lives under so many different conditions that you can do on a computer what you could never do in real life, just from a cost and time standpoint. That's becoming where the game is moving."

The reliability of testing and supply of data help customers use the right product for the application, solving problems in a way that improves client relationships, said Pohlman.

"If we do the things right with customers to help them increase their sales and increase their reliability for customers and how customers feel about them, it's going to complement us," Pohlman said. "We see that. If we help them, it's going to help us."

The Milan facility also houses Tenneco's dual material injection press, which can produce components with two different elastomeric compounds in a single part. It also features a custom-designed modular mold system to produce prototype parts cost-effectively and efficiently.

Tenneco added the dual press about a year ago with a significant investment, and it gives the company the capability to work with customers with different dynamics and characteristics, said Pohlman. The company is installing a similar press at the Suzhou facility as well.

"A lot of focus is going on to make sure we look for new opportunity with customers," he said.