

Solvay's Torlon® PAI Delivers High Strength, Wear Resistance in High-Performing Clutch System from FTE Automotive

Torlon® PAI used to fabricate sealing rings and locking mechanism in FTE Automotive's innovative new dual concentric slave cylinder

BERLIN, Germany, Dec. 7, 2015 – Solvay Specialty Polymers, a leading global supplier of high-performance thermoplastics, announced today at the 14th annual CTI Symposium (Booth H06) that Solvay's Torlon® polyamide-imide (PAI) technology forms several key components in a high-performing dual concentric slave cylinder (dCSC) developed by FTE Automotive, a premier producer of automotive drivetrain and brake systems. Signaling the first time Solvay's Torlon® materials have been specified for this type of application, FTE Automotive's dCSC forms the heart of the new SGM X44F Dual Clutch Transmission from a leading automaker, SAIC General Motors Co., Ltd. The transmission was successfully launched on the 2015 Chevrolet Cruze platform for vehicles produced and sold in China.

The critical core of an automotive clutch system, concentric slave cylinders are positioned directly around the drive shaft and on the clutch. They are consequently subject to extreme loads each time a car shifts gear. FTE Automotive offers various CSC designs for light and heavy commercial vehicles that, depending on the application, are more typically fabricated from aluminum or engineering polymers.

"The intrinsically high wear-resistance of Torlon® PAI makes it a natural candidate for seal rings and other high-wear applications in both dual clutch and automatic transmissions," said Brian Baleno, global automotive business development manager for Solvay Specialty Polymers. "A parallel trend is the increasingly frequent replacement of needle bearings with bearings made of Torlon® polymers. This conversion allows space savings of about 2.5 mm, which allows engineers to downsize metal castings and thereby achieve significant weight reduction without compromising on performance or reliability."

Both hydraulic chambers within FTE Automotive's dCSC each incorporate two seal rings made of Torlon® 4275 to ensure reliable and durable performance over the transmission's lifetime. The seal rings have small cross-sections with relatively large diameters. Yet, due to Torlon PAI's elongation properties, they maintain flexibility for easy assembly.

Formulated to provide an excellent combination of wear resistance and dimensional stability, Torlon® 4275 PAI allows the seal rings to ensure consistent contact with the cylinder's chamber walls to maintain cleanliness in the transmission's high-cycle, high-pressure environment while minimizing friction. The material provides a durable, tight seal to allow FTE Automotive's new dCSC to operate reliably despite constant exposure to dirt, dust and debris, automotive transmission fluids and temperatures cycling between -40°C and 160°C (-40°F and 320°F).

FTE Automotive chose a different grade, Torlon® 7130 PAI reinforced with 30 percent carbon fiber loading, to fabricate an innovative locking device that maintains precise radial positioning within the dCSC throughout the transmission's life cycle requirements, while contributing very little friction and exhibiting extremely low wear. In addition, the excellent lubricity and excellent fatigue resistance of this grade enables the locking device to withstand millions of loading cycles from the torsional excitation of the clutch

“FTE Automotive engineers are constantly challenged to find the line between innovative yet highly reliable automotive solutions,” said Tim Marion, engineering manager at FTE Automotive. “Solvay’s Torlon® PAI is emblematic of this balance and we expect to see the material specified in more applications like our advanced dCSC system. The polymer delivers an outstanding combination of strength and wear resistance that allows it to stand up in extremely demanding automotive environments.”

As a class of materials, Solvay’s Torlon® PAIs combine the exceptional performance of thermoset polyimides with the melt-processing advantage of thermoplastics. Wear-resistance grades offer unsurpassed performance in both dry and lubricated environments. High-strength grades retain their superb toughness, strength and stiffness up to 275°C (527°F), making Solvay’s material the industry’s highest performing thermoplastic. Its broad chemical resistance includes strong acids and most organics.

Held in Berlin’s Estrel Hotel from December 7-10, the 14th Annual International CTI Symposium and its adjoining exhibition is the international industry event for professionals seeking the latest developments in automotive transmissions and drives for passenger cars and commercial vehicles.

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About FTE Automotive

The FTE automotive Group is your competent partner in the sector of development and production of drive train and brake system applications for the automotive industry. The company is located in all important continents and one of the leading OE-suppliers for passenger cars and commercial vehicles worldwide.

About Solvay Specialty Polymers

Solvay Specialty Polymers manufactures over 1500 products across 35 brands of high-performance polymers – fluoropolymers, fluoroelastomers, fluorinated fluids, semi-aromatic polyamides, sulfone polymers, aromatic ultra-high performance polymers, high-barrier polymers and cross-linked high-performance compounds – for use in Aerospace, Alternative Energy, Automotive, Healthcare, Membranes, Oil and Gas, Packaging, Plumbing, Semiconductors, Wire & Cable, and other industries. Learn more at www.solvayspecialtypolymers.com.

As an international chemical group, **SOLVAY** assists industries in finding and implementing ever more responsible and value-creating solutions. Solvay generates 90% of its net sales in activities where it is among the world’s top three players. It serves many markets, varying from energy and the environment to automotive and aeronautics or electricity and electronics, with one goal: to raise the performance of its clients and improve society’s quality of life. The group is headquartered in Brussels, employs about 26,000 people in 52 countries and generated 10.2 billion euros in net sales in 2014. Solvay SA (**SOLB.BE**) is listed on **NYSE Euronext** in Brussels and Paris (Bloomberg: **SOLB:BB** - Reuters: **SOLB.BR**).

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Solvay's Torton[®] polyamide-imide (PAI) technology forms several key components in a high-performing dual concentric slave cylinder (dCSC) developed by FTE Automotive, a premier producer of automotive drive train and brake systems. Photo courtesy of FTE Automotive.