Sinterline® Technyl® Powders Boost Polimotor 2 with 3D Printing Technology

Designed specifically for laser sintering processes, Solvay’s Sinterline® technology enables a 3D printed plenum with comparable performance to injection molded part

LYON, France Dec. 3, 2015 – Solvay Engineering Plastics, a global leader in advanced polyamide solutions, announced today that the Polimotor 2 engine will feature a 3D printed plenum chamber fabricated through selective laser sintering (SLS). The specific material used to fabricate the Polimotor 2 plenum is a Sinterline® Technyl® polyamide 6 (PA6) powder grade reinforced with a 40 percent loading of glass beads to enhance dimensional stability.

Solvay is the principal material sponsor for the highly anticipated Polimotor 2 project, led by legendary automotive innovator Matti Holtzberg who aims to design and manufacture a next-generation, all-plastic engine for competitive racing in 2016.

“Like the original Polimotor engine concept developed during the eighties, Polimotor 2 is all about highlighting trailblazing polymer technologies, and their potential for revolutionizing automotive performance and manufacturing,” said Holtzberg, who is also president of Composite Castings, LLC, based in West Palm Beach, Fla. “The plenum in the Polimotor 2 concept shares the same basic injection-molded design from the original engine. But we found that a 3D printed version fabricated with Sinterline® Technyl® PA6 technology could perform just as reliably in an engine designed to withstand the rigors of competitive racing.”

Based on the same resin chemistry as Solvay’s proven Technyl® polyamides, Sinterline® PA6 powders are formulated to leverage the benefits of 3D printing for nylon components. Laser sintering and other 3D-printing processes improve productivity by quickly converting digital designs into functional parts without the time or cost required to first build a molding tool and prototype. Thus, they can significantly accelerate the time-to-market for OEMs and Tiers.

Laser sintering applies the energy from a high-precision laser scanner to fuse Sinterline® Technyl® PA6 powders, layer by layer, until they form a finished, highly functional three-dimensional part with enhanced mechanical and thermal properties. Because parts are printed in successive layers, laser sintering can also quickly produce components that integrate complex internal features and functions.

“As the first PA6 powder range designed specifically for selective laser sintering, Sinterline® materials take 3D printing a step further by enabling cutting-edge designs, enhanced performance properties approaching those of injection molded nylon compounds,” said Dominique Giannotta, Sinterline Project Director for Solvay Engineering Plastics. “Polimotor 2’s validation of this advanced material technology underscores the active innovation at work at Solvay Engineering Plastics, and highlights its potential for solving new challenges in commercial automotive designs and on the racetrack.”

An automotive plenum is the pressurized chamber that uniformly distributes the air flow between an engine’s inlet and cylinders. The plenum in the Polimotor 2 engine will share similar specifications to those in today’s production-scale automobiles, which are typically injection-molded nylon with 2-3 mm wall thickness to withstand the 2-4 bars of positive air pressure inside.

Parts printed from Sinterline® Technyl® PA6 powders are capable of performing reliably in a conventional metal turbocharged engine, where radiant temperatures can reach as high as 250°F (121°C). Notably, however, the plenum in the Polimotor 2 concept will encounter comparably lower temperatures between 150°F (66°C) and 200°F (93°C), due to the low thermal conductivity of the engine’s largely plastic composition.
The Polimotor 2 project aims to develop an all-plastic, four-cylinder, double-overhead CAM engine that weighs between 138 to 148 lb (63-67 kg), or about 90 lbs (41 kgs) less than today's standard production engine. In addition to the current plenum application, Holtzberg’s groundbreaking program will leverage Solvay’s advanced polymer technology to develop up to ten engine parts. These include a water pump, oil pump, water inlet/outlet, throttle body, fuel rail and other high-performance components. In addition to Sinterline® Technyl® PA6 powders, Solvay materials targeted for use encompass Amodel® polyphthalamide (PPA), KetaSpire® polyetheretherketone (PEEK), AvaSpire® polyaryletherketone (PAEK), Radel® polyphenylsulfone (PPSU), Ryton® polyphenylene sulfide (PPS) and Tecnoflon® VPL fluoroelastomers.

* Registered trademark of Solvay

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**About Solvay Engineering Plastics**

Engineering Plastics, the global specialist in polyamide-based engineering plastics, has for the past 60 years developed, manufactured and marketed, under the brand Technyl®, a complete range of high performance plastics for the automotive, electrical, construction and consumer goods markets. With a growth strategy bolstered by six production sites worldwide, Engineering Plastics employs its expertise and innovation capabilities in order to more closely serve the needs of its customers, through a global network of technical and R&D centers. Learn more at www.technyl.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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The Polimotor 2 all-plastic engine will feature a 3D printed plenum chamber fabricated with Solvay Engineering Plastics' high-performance Sinterline® Technyl® PA6 powders. Formulated specifically for 3D-printing processes, Solvay's technology can help enable complex designs, enhance productivity and deliver performance approaching that of injection molded nylon compounds. Solvay is the principal material sponsor for the highly anticipated Polimotor 2 project, led by legendary automotive innovator Matti Holtzberg who aims to design and manufacture a next-generation, all-plastic engine for competitive racing in 2016.

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