



SOLVAY

asking more from chemistry®



Polimotor 2

The Industry's First All-plastic Engine

**SPECIALTY
POLYMERS**

Polimotor 2

In order to cost-effectively meet upcoming CO₂ emissions standards and develop more fuel-efficient cars, automakers worldwide are exploring ways to reduce overall vehicle weight. While thermoplastics have helped reduce vehicle weight through metal replacement in interior, exterior and under-the-hood components, the automotive engine still remains a frontier for plastics technology.

Background

During the early 1980's, legendary automotive innovator Matti Holtzberg launched the Polimotor project, which sought to demonstrate the potential of plastics to reduce engine weight by replacing several traditionally metal components in a 2.3-liter, four-cylinder engine with lightweight, injection-molded, carbon fiber-reinforced thermoplastics. The Polimotor program further demonstrated the viability of its engine by incorporating it into a Lola racing car and entering it for competition in the International Motor Sports Association's Camel Lights series in 1984. The engine performed admirably, completing all races – including a third place finish at the Lime Rock circuit.

Holtzberg, who is also president of Composite Castings, LLC, based in West Palm Beach, Fla., rekindled his program in 2015 as Polimotor 2 to demonstrate just how far plastics technology has evolved since the 1980s. The Polimotor 2 project aims to substantially increase the use of advanced thermoplastics to develop a four-cylinder, double-overhead CAM engine that will weigh around 65kg, which is about 40kg less than today's standard production engine.

Polimotor 2 will focus on replacing metal in an even broader array of engine components, including the water and oil pumps, water inlet/outlet, throttle body, fuel rail, cam sprocket and others. As before, the Polimotor 2 team will prove the viability of their thermoplastic technology by pitting it against conventional engines in competitive racing.

Specialty Polymers

Solvay is the leading materials sponsor for this highly anticipated technical endeavor. The Polimotor 2 project will leverage Solvay's advanced polymer technologies for a wide variety of applications, as detailed in the table below.

Polimotor 2 applications using Solvay's advanced polymer technologies

Application	Polymer	Grade	Description
Cam sprockets	Torlon® PAI	7130	30% carbon fiber, optimal balance of strength, stiffness and fatigue resistance
Oil line scavenger	KetaSpire® PEEK	KT-820 CF30	30% carbon fiber, high modulus, exceptional chemical and fatigue resistance
Water outlet	Amodel® PPA	A-8930 HS	30% glass fiber, heat stabilized, high tensile strength, low creep
Water outlet seal	Tecnoflon® FKM	PL 855	Low-temperature flexibility, exceptional sealing characteristics
Fuel rail	Ryton® PPS	XK-2340	40% glass fiber, alloy compound, high strength, toughness and rigidity
Fuel injector o-rings	Tecnoflon® FKM	VPL 85540	Low-temperature flexibility, exceptional sealing characteristics
Fuel intake runner	KetaSpire® PEEK	KT-880 CF30	30% carbon fiber, filament fusion 3D printing
Plenum chamber	Sinterline® Technyl®	PA powder	40% glass beads, selective laser sintering 3D printing
Oil pump	AvaSpire® PAEK	AV-651 CF30	30% carbon fiber, performance advantage over comparable PEEK
E-water pump	Ryton® PPS	R-4-220	40% glass fiber, highly resistant to heat, moisture and automotive fluids
Cam cover	Radel® PPS	R-5500	High-temperature toughness and dimensional stability

www.solvay.com

SpecialtyPolymers.EMEA@solvay.com | Europe, Middle East and Africa

SpecialtyPolymers.Americas@solvay.com | Americas

SpecialtyPolymers.Asia@solvay.com | Asia Pacific

Safety Data Sheets (SDS) are available by emailing us or contacting your sales representative. Always consult the appropriate SDS before using any of our products. Neither Solvay Specialty Polymers nor any of its affiliates makes any warranty, express or implied, including merchantability or fitness for use, or accepts any liability in connection with this product, related information or its use. Some applications of which Solvay's products may be proposed to be used are regulated or restricted by applicable laws and regulations or by national or international standards and in some cases by Solvay's recommendation, including applications of food/feed, water treatment, medical, pharmaceuticals, and personal care. Only products designated as part of the Solviva® family of biomaterials may be considered as candidates for use in implantable medical devices. The user alone must finally determine suitability of any information or products for any contemplated use in compliance with applicable law, the manner of use and whether any patents are infringed. The information and the products are for use by technically skilled persons at their own discretion and risk and does not relate to the use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right. All trademarks and registered trademarks are property of the companies that comprise Solvay Group or their respective owners.

© 2016 Solvay Specialty Polymers. All rights reserved. D 04/2016 | R 09/2016 | Version 1.1