

Rethinking automotive design with lightweight material solutions based on Borealis Fibremod™ Carbon and Daploy™

New commercial applications featured at this year's VDI conference Plastics in Automotive Engineering (PIAE)

Borealis and Borouge, leading providers of innovative, value-creating plastics solutions, announce further advancements in their proprietary, polypropylene-based solutions developed to support the rapidly transforming global automotive industry. Novel applications based on Borealis grade portfolios, including Fibremod™ Carbon Fibre Polypropylene (CFPP), and Daploy™ High Melt Strength (HMS) polypropylene (PP), will be showcased at the VDI conference Plastics in Automotive Engineering (PIAE) in Mannheim, Germany in March. Borealis and Borouge have also announced several important investments in their own PP production facilities, including compounding plants in China and the US, which shall ensure the global availability of their innovative PP compounds.

Fibremod™ CFPP: material innovation leads to commercial applications

The fibre-reinforced PP grades in the Borealis Fibremod™ family are engineered to achieve lightweight, integrated, and high-performing solutions. The recently launched range of Fibremod CFPP grades offers these benefits and more. CFPP is thus a suitable replacement material solution for many conventional engineering plastics used in the automotive industry. Borealis CFPP grades are lightweight and exhibit extreme stiffness; they also boast excellent processability. Unlike polyamides (PA), CFPP is not hygroscopic, meaning it does not absorb moisture. Compared to other plastics, CFPP products help minimise 'squeak and rattle' noises.

The recently launched CFPP product **Fibremod™ CF061SY**¹ has been used by a leading North American OEM to make the A-pillar brackets on a top-selling commercial vehicle. Although only 6% carbon fibre-filled, the product offers a stiffness of approximately 4000 MPa, and a density of 0.93 g/cm³. Using Fibremod CF061SY has enabled this leading OEM to achieve significant weight savings without having to compromise on performance requirements. This first commercial application of Fibremod CFPP was honoured as a finalist at the 2017 Society of Plastics Engineers (SPE) Automotive Innovation Awards in Detroit, USA.

Another Fibremod Carbon application was recognised at the SPE Automotive Composites Conference. The prestigious “Materials Innovation” award went to Magna Exteriors for their lightweight class-A fender made possible by Fibremod Carbon. Having modified an existing tool capable of producing a viable thermoplastic alternative to a conventional metal-stamped part, Magna Exteriors ultimately selected a Borealis Fibremod Carbon development grade containing 10% carbon fibre-reinforced engineered PP. This enables the manufacturer to achieve both the exterior part impact performance required for crash and pedestrian safety, and the high-quality look of a class-A painted part. Yet because the part is made of reclaimed Fibremod Carbon Fibre, the body panel weighs 30% to 40% less than conventional aluminium panels, and enables zero gap performance with very low CLTE when compared to other engineering plastics. This makes the exterior application more recyclable, lighter weight, and thus more sustainable.



Photo: Class-A fender produced with Borealis Fibremod Carbon by Magna Exteriors
Photo: © Borealis

Ultra-lightweight air ducts thanks to Daploy™ HMS PP

When it comes to manufacturing, Daploy™ offers processing benefits such as high melt strength, superior foamability, and high extensibility. Lightweight foam solutions made possible by Daploy HMS PP enable OEMs and their Tier 1 partners to fulfil the increasingly stringent industry requirements for CO₂ emissions, and make vehicles more ecologically friendly. For example, in the foam blow moulding process, Daploy is a zero-waste material where in-process recycling is an option.

¹ Typo in grade name corrected on 12 June 2018

A leading Japanese plastics manufacturer and processor used **Daploy WB140HMS** in the foamed blow moulding process to produce automotive air ducts. The combination of innovative production processes and the use of Daploy WB140HMS results in part weight savings of up to 80%, which in turn leads to overall improved fuel efficiency and lower CO₂ emissions. Compared to conventional solid ducts made of urethane foam, the new foamed blow moulded air ducts exhibit improved insulation and reduced dew condensation. This helps improve the efficiency of the air conditioning unit. Overall, the winning combination of ultra-lightweighting, energy efficiency, and cruising range extension is particularly compelling when applied to electric and hybrid vehicles.

Investing in global PP production capacity

PP compounds are currently the fastest-growing polymer material in the automotive industry. Their inherent advantages – including low density and recyclability – make them the material of choice for automakers aiming to produce vehicles that are lighter, energy efficient, and therefore more sustainable.

“In a future in which electrification, autonomous vehicles, and Mobility as a Service may prevail, PP compounds are enablers for change,” says Nicholas Kolesch, Borealis Head of Marketing, Automotive. “They will remain indispensable when it comes to lightweighting, design freedom, and flexibility for future vehicles. Our own global expansion efforts are focused on supporting the industry in this period of rapid transformation.”

To boost global PP production, Borealis and Borouge continue to invest in their production facilities around the world. For example, the Borouge Shanghai compound manufacturing plant, which originally went on stream in 2010 with an annual capacity of 50,000 tonnes, received two new production lines in 2015 which increased capacity to 90,000 tonnes per annum. Borouge recently announced that they have entered the front end engineering and design (FEED) stage for yet another expansion, with a plant capacity increase to 125,000 tonnes per year with the addition of another two compounding lines.

In 2017, Borealis announced plans to further expand its North American presence through the construction of a new compounding plant in North Carolina, which will produce up to 30 kilotonnes per annum of Daplen and Fibremod™ PP compounds for the automotive industry. Commercial production is anticipated to begin in early 2019, and will augment the existing Borealis compounding asset in New Jersey, US.

Visit us in Germany from 14-15 March 2018 at Stand 54 at the International Plastics in Automotive Engineering (PIAE) conference presented by VDI Mannheim.

Learn more about how Borealis and Borouge are Driving Tomorrow with our innovative Fibremod PP, Fibremod Carbon PP, Daplen TPO and Daploy HMS PP portfolios.

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For further information, please contact:

Virginia Mesicek
External Communications Manager
tel.: +43 (0) 1 22 400 772 (Vienna, Austria)
e-mail: virginia.mesicek@borealisgroup.com

Borealis and Borouge Automotive: Driving Tomorrow

For over 50 years, Borealis has been a leading supplier of innovative polyolefin plastic materials for engineering applications in the automotive industry. Using its unique and proprietary Borstar® technology and its Fibremod™ post-reactor technology for fibre reinforced polypropylene (PP) compounds, Borealis delivers ideal replacement solutions for conventional materials such as metal, rubber and engineering polymers. Borealis continues to discover new material solutions which help facilitate lightweight construction and thus play an important role in enhancing energy efficiency. In automotive vehicles, Borealis' leading-edge polyolefin plastic materials are used in a wide range of exterior, interior, and under-the-bonnet applications, including bumpers, body panels, trims, dashboards, door claddings, climate control and cooling systems, air intake manifolds and battery cases.

About Borealis and Borouge

Borealis is a leading provider of innovative solutions in the fields of polyolefins, base chemicals and fertilizers. With its head office in Vienna, Austria, the company currently has around 6,600 employees and operates in over 120 countries. Borealis generated EUR 7.5 billion in sales revenue and a net profit of EUR 1,095 million in 2017. Mubadala, through its holding company, owns 64% of the company, with the remaining 36% belonging to Austria-based OMV, an integrated, international oil and gas company. Borealis provides services and products to customers around the world in collaboration with Borouge, a joint venture with the Abu Dhabi National Oil Company (ADNOC).

Borealis and Borouge aim to proactively benefit society by taking on real societal challenges and offering real solutions. Both companies are committed to the principles of Responsible Care®, an initiative to improve safety performance within the chemical industry, and work to solve the world's water and sanitation challenges through product innovation and their Water for the World programme.

For more information visit:

www.borealisgroup.com | www.borealisdrivingtomorrow.com
www.borouge.com
www.waterfortheworld.net

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