

# Fibremod™ Carbon PP 2G – the next generation

## Two new additions to the Fibremod™ Carbon PP portfolio offer improved surface appearance and better dimensional stability

In 2016, Borealis and Borouge launched the revolutionary Fibremod™ Carbon product family based on second-use carbon fibre. Lighter weight Fibremod Carbon PP solutions enable significant part weight reduction, functionalisation, and the modularisation of components. The Fibremod Carbon portfolio has been able to establish itself as a more environmentally acceptable alternative to conventional carbon fibre because it helps OEMs and Tiers use valuable material resources more wisely in addition to contributing to a lower overall CO<sub>2</sub> footprint.

Borealis now offers even better surface aesthetics and mechanical properties by developing **two new low density material solutions**.

These second-generation Fibremod Carbon grades retain the unsurpassed stiffness and durability of the original compounds while offering improved surface appearance and better dimensional stability:

- **Fibremod™ CG210SY**, with 20% carbon fibre
- **Fibremod™ CD211SY**, a hybrid concept made with 10% talc and 10% carbon fibre

Other important advantages offered by the two new grades include good paint adhesion and high flowability. Both are intended for use in structural parts and body panel applications, including fenders and tailgate skins. Both Fibremod CG210SY and Fibremod CD211SY are produced in Europe, yet available globally. Further grades are currently under development for use in painted and unpainted parts, thus expanding the range of potential applications in future.



“After launching our first generation of Fibremod Carbon grades, we quickly recognized a strong demand for applications we had not originally envisioned: body panels, and other structural interior applications with complex geometry, and with class-A painted surfaces. We are innovating along with our customers and value-chain partners and expanding our Fibremod Carbon portfolio to offer additional lighter weight, durable solutions with enhanced surface aesthetics.”

Nicholas Kolesch,  
Borealis Head of Automotive Marketing

# PRODUCT NEWS

Physical Properties	Fibremod CG210SY PPCF20	Fibremod CD211SY PPCF10T10	Unit	Method
Density	1000	1020	kg/m <sup>3</sup>	ISO 1183
MFR 230°C/2.16 kg	25	10	g/10	ISO 1183
Tensile modulus (1 mm/min)	9700	5000	MPa	ISO 527-2
Tensile strength (50 mm/min)	85	40	MPa	ISO 527-2
Tensile strength at break	2	5	%	ISO 527-2
Charpy V-notched +23°C/-20°C	6/5	6/4	kJ/m <sup>2</sup>	ISO 179
Charpy unnotched +23°C	40	30	kJ/m <sup>2</sup>	ISO 179
Characteristics	Surface optimised	Surface optimised and improved warpage behaviour		

Figure 1: Table of Mechanical Performance: Fibremod™ CG210SY and Fibremod™ CD211SY

## Application highlight: NIO

NIO, the most successful electrical vehicle maker in China, seeks to provide the best possible user experience in their premium EVs. Borealis Fibremod™ CB201SY was selected for use in the centre console carrier of the new NIO ES8 SUV because it enables a part weight reduction of more than 10% when compared to PP LGF30.

It also offers far more design freedom than customary for a relatively complex injection moulded part, along with good dimensional stability and high stiffness. The useful and unique design feature in the form of a storage space in the centre console is a perfect fit for this creative and cheerful model.



Image 1: NIO Centre Console bracket



Image 2: © NIO ES8 SUV

## About Fibremod Carbon

Fibremod Carbon grades offer an outstanding combination of stiffness, strength and affordability. Compounds made with Fibremod Carbon can achieve a stiffness of up to 16,700 MPa.

Using Fibremod Carbon also helps achieve superior performance when compared to conventional lightweight metals like aluminium and magnesium, and polyamide (PA) solutions. When compared to steel, for example, Fibremod Carbon offers a lightweighting potential of more than 60%. This means that components can be developed with similar or even higher stiffness and lower weight.

For structural parts, the geometry can be adapted to best utilize the gain in stiffness, resulting in further weight-saving potential.

Borealis continues to refine its sophisticated application testing methods and standards. Combining these with our proprietary modelling and simulation methodologies enables us to offer extensive support in the development and implementation of applications. This minimizes the need for expensive prototyping and physical testing on the part of the customer.

Grade	Description	Special Benefits	Applications
Fibremod™ CG210SY	20% carbon fibre	Improved surface aesthetics	Structural parts and body panel applications, incl. fenders, tailgate skins
Fibremod™ CD211SY	hybrid concept made of 10% talc/10% carbon fibre	Better surface quality	Structural parts and body panel applications, incl. fenders, tailgate skins
Fibremod™ CB201SY	20% carbon fibre reinforced	Maximized performance strength-to-weight saving ratio	Door module carriers, engine components, centre console carrier, other automotive structural parts
Fibremod™ CB301SY	30% carbon fibre	Up to 40% weight saving potential when compared to other light weight materials currently in use	Door module carriers, structural seat parts, engine components, other automotive structural parts
Fibremod™ CD302SY	30% carbon fibre	More than 30% weight reduction when compared with PPGF40. Increased value perception through higher stiffness and torsion resistance	Tank hinges, other automotive structural parts
Fibremod™ CB401SY	40% carbon fibre	Ultra-high stiffness for lighter weight, high performance plastics applications	Door module carriers, structural seat parts, engine components, tailgate carriers, other automotive structural parts

Figure 2: The Fibremod Carbon portfolio

Additional information on processing guidelines, storage, safety and more may be found on the respective product data sheets. Please contact your Borealis or Borouge Sales Representative for further support.

## About Borealis 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.



Image 3: Carbon is the new black

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**About Borealis** 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 6,800 employees and operates in over 120 countries. Borealis generated EUR 8.3 billion in sales revenue and a net profit of EUR 906 million in 2018. 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.

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