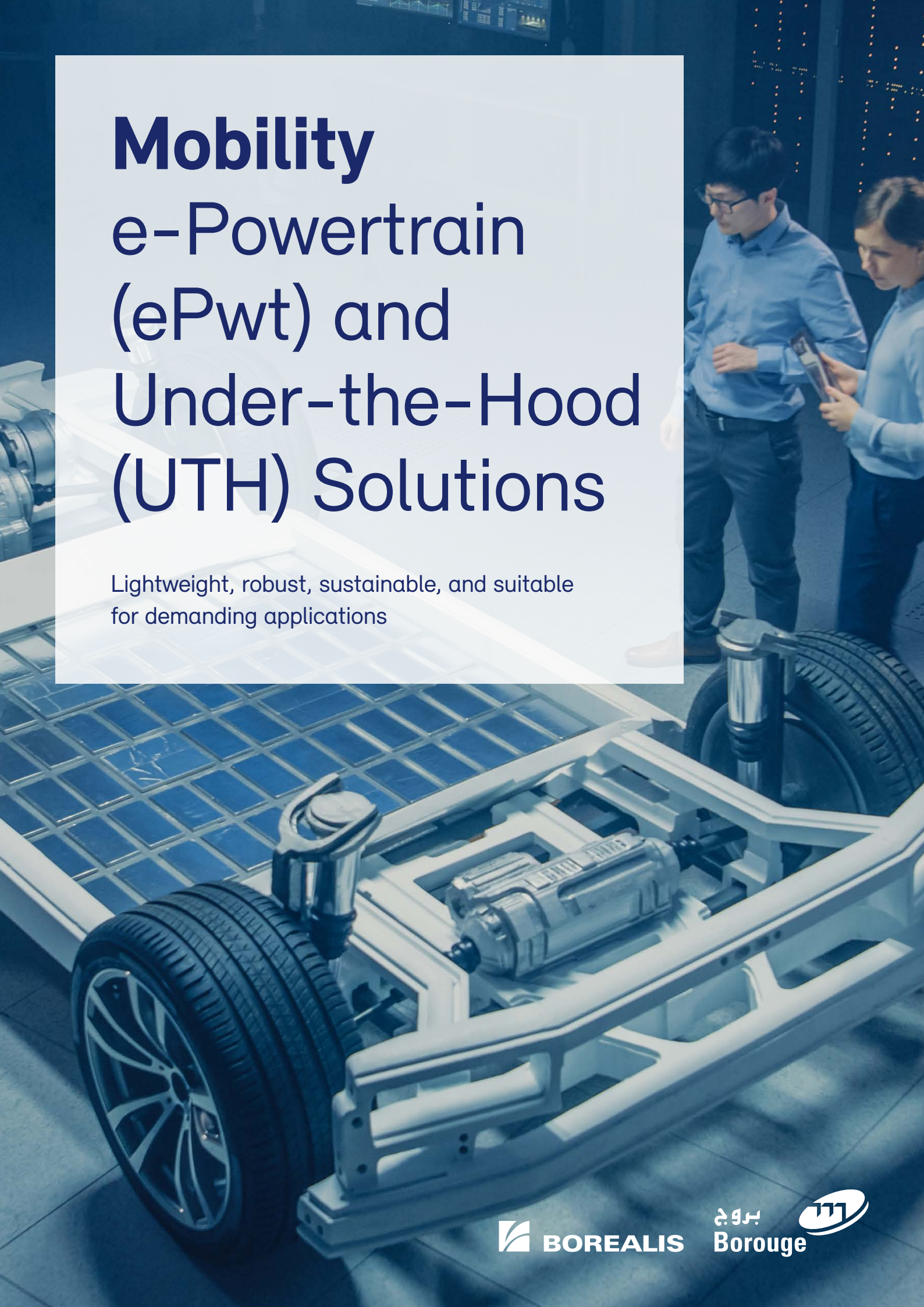

Mobility e-Powertrain (ePwt) and Under-the-Hood (UTH) Solutions

Lightweight, robust, sustainable, and suitable for demanding applications

BOREALIS

بروج Borouge

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Borealis e-Powertrain and Under-the-Hood Solutions for Mobility

Driving Sustainable Mobility Forward

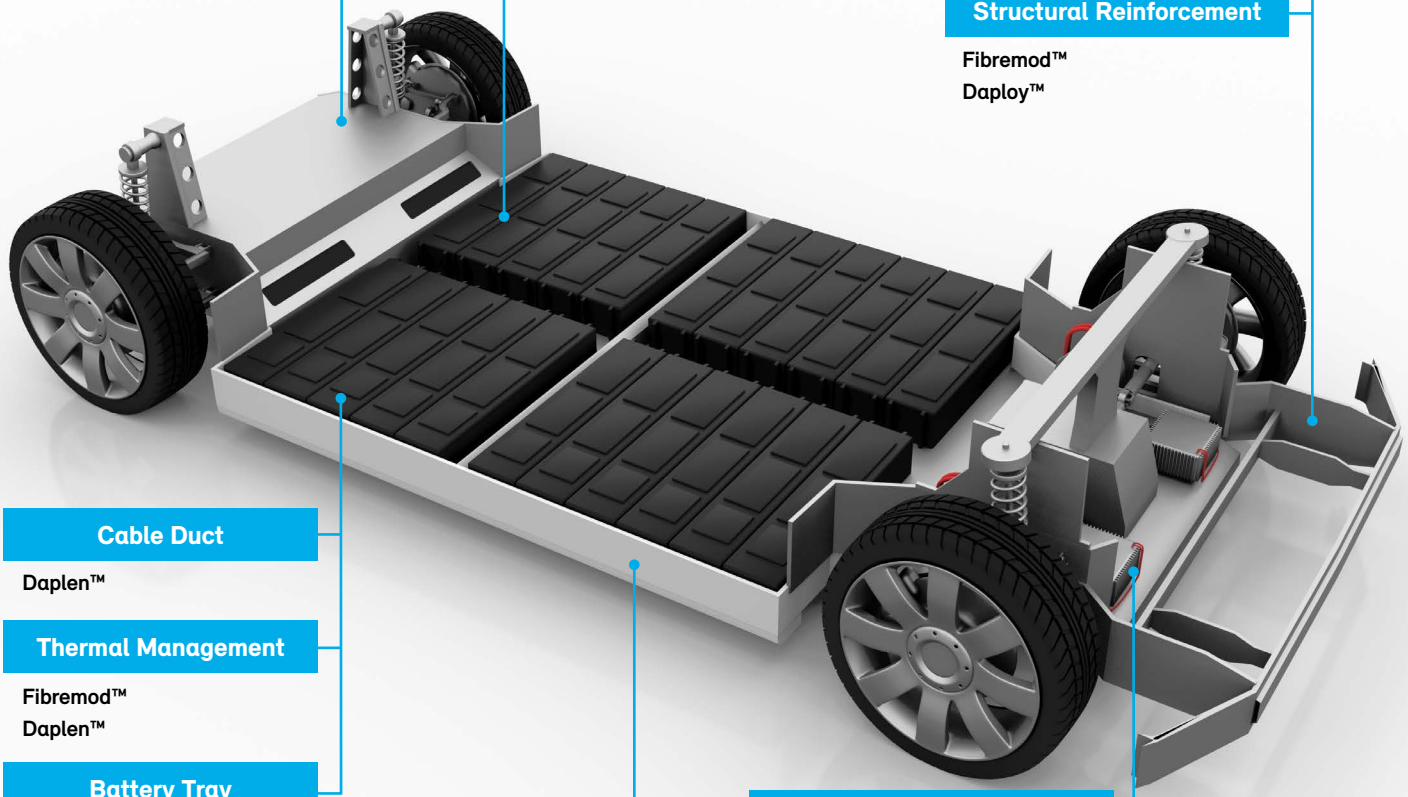
Mobility is at the heart of Borealis. Leveraging decades of expertise and innovation, we deliver advanced polypropylene (PP) solutions designed for the future of mobility. **Our portfolio supports a wide range of e-Powertrain (ePwt) and Under-the-Hood (UTH) applications, including: Battery components, Underbody protection and Crash elements.**

With a strong commitment to sustainability, we help our customers and partners create lighter, safer, and more energy-efficient vehicles – paving the way for a more sustainable tomorrow.

Innovative Materials for Maximum Performance

Our advanced PP polymers and compounds – featured in the Fibremod™ and Borcycle™ portfolios – combine low density, advanced mechanical performance, and flame retardant properties. These features help reduce the material mix in a broad range of ePwt & UTH applications – while advancing circularity across the industry.

Overview of Typical e-Powertrain and Under-the-Hood **Applications**



Bumper Support
Fibremod™
Borcycle™ M

Trunk & Frunk Tray
Fibremod™

E-box, Junction Box
Daplen™
Borcycle™ M

Battery Module Casing
Fibremod™

Cell Holder and Contacting
Fibremod™
Daplen™

Front-end Modules
Daplen™
Borcycle™ M

Crash Box
Fibremod™

Structural Reinforcement
Fibremod™
Daploy™

Cable Duct
Daplen™

Thermal Management
Fibremod™
Daplen™

Battery Tray
Fibremod™
Borealis Compounds

Cleaning and Coolant Tanks
Daplen™
Borcycle™ M

Fan and Fan Shroud
Fibremod™
Borcycle™ M

Under Body Protection
Fibremod™
Daploy™

Under Body Protection
Fibremod™
Daploy™

Materials for ePwt & UTH Solutions

Grade	Density [kg/m³] ISO 1183	MFR 230 °C/2.16 kg [g/10 min] ISO 1133	Flexural modulus [MPa] ISO 178	Tensile strength [MPa] ISO 527-2	Impact, charpy notched 23 °C [kJ/m²] ISO 179/1eA	Impact, charpy notched −20 °C [kJ/m²] ISO 179/1eA	HDT B (0.45 MPa) [°C] ISO 75-2	Typical applications
Dilution Polymers for Long Glass Fiber Reinforced Polypropylene								
BJ380MO	905	80	1,200	25	5	3.5	90	Underbody shielding
BJ400HP	908	100	1,500	28	4	2	95	Front end modules, instrument panel carrier
HK060AE	905	125	1,550	35	1	0.9	91	Front end modules, door module carrier
EE002AE	905	11	1,000	20	65	9	76	Instrument panel carriers
Halogen-Free Flame Retardant PP Compounds								
Fibremod™ FE020HP	1,030	12	2,000	22	3	–	56	Lithium-Ion battery module housing, cell holder or insulation plate
Fibremod™ FE121SF	1,118	14	3,256	51	7	–	152	Lithium-Ion battery module housing
Fibremod™ FD221SF	1,238	5	–	68	10	–	–	Lithium-Ion battery module housing, cell holder or insulation plate
Fibremod™ FF311SF	1,300	16	7,900	85	9	–	160	Lithium-Ion battery module housing, cell holder or insulation plate
FJ081HP	1,026	88	1,980	20	1.4	1.1	107	Top cover of the Lithium-ion battery pack and similar solutions produced in D-LFT process
Long Glass Fiber Reinforced Polypropylene								
Fibremod™ GB402HP	1,240	–	8,400	140	28	32	166	Frontend modulus, tailgate carriers, structural carriers
Fibremod™ GB303HP	1,120	-	6,500	125	20	20	165	Door module carrier, structural carriers, technical components
Fibremod™ GB601HP	1,470	-	15,000	170	25	25	165	Long glass fiber concentrate for structural components
Polypropylene Copolymer								
BE079UB	900	11	950	20	50	9	84	Underbody shielding
BC545MO	908	3.5	1,200	25	15	6	90	Battery case
BD310MO	905	8	–	28	9	4.5	92	Battery case
BC245MO	905	3.5	1,250	25	15	6.5	85	Battery case, cable channels
BC250MO	905	4	1,100	23	25	7.5	80	Fluid containers
BHC5012C	905	0.3	1,350	27	75	4.5	80	Break fluid containers
BHC6030	905	0.55	1,250	28	42	6	50	Fluid lines and hoses
BC612WG	900	5	1,100	24	9	3	70	Washer tank
BG055AI	920	22	1,850	35	3.5	1.5	108	Climate control housings
Polypropylene Homopolymer								
HE125MO	905	12	1,350	34	3.5	–	88	Insulation plate
HF955MO	905	20	2,000	40	2.5	–	115	Cell contacting frame

Grade	Density [kg/m³] ISO 1183	MFR 230 °C/2.16 kg [g/10 min] ISO 1133	Flexural modulus [MPa] ISO 178	Tensile strength [MPa] ISO 527-2	Impact, charpy notched 23 °C [kJ/m²] ISO 179/1eA	Impact, charpy notched −20 °C [kJ/m²] ISO 179/1eA	HDT B (0.45 MPa) [°C] ISO 75-2	Typical applications
Polypropylene Copolymer Mineral Filled								
Borcycle™ MD4481SY	1,200	6	4,700	29	2	–	120	Under-the-hood components
Borcycle™ MD2550SY	1,080	5	2,300	29	3.3	1.3	–	Brackets and reinforcement parts non visible
Borcycle™ MG2401SY	1,090	23	2,600	28	2.3	–	–	Baffle, under the hood applications
MG255AI	1,060	22	3,100	32	2.5	1.6	125	Air ducts, Air conditioning parts, under the bonnet parts
ME266U	1,050	12	2,600	28	5	2	115	Structural interior parts
Polypropylene Homopolymer Mineral Filled								
MD231U	1,050	6	3,300	36	3	1.2	125	Interior parts, climate control parts
MD441U	1,220	6	4,700	32	2.4	1.2	130	Air conditioning parts, under the hood components
ME212U	1,050	13	3,100	32	3	2	120	Interior parts, climate control parts, heater housing
Short Glass Fiber Reinforced Polypropylene								
Borcycle™ GE2331SY	1,050	9	4,100	64	7	5	155	Instrument panel carriers, center console carrier and other structural parts
Fibremod™ GB205U	1,040	2	4,400	80	10	8	154	Centre console carriers, technical components exposed to heat
Fibremod™ WE380HP	1,130	10	4,400	60	11	9	155	Dashboard, engine covers, structural carriers
Fibremod™ WD300UB	1,130	5	4,700	60	8	6.4	160	Air filter housing, structural interior parts
Fibremod™ GD302HP	1,140	4	5,100	65	25	15	150	Rear seat structures, structrual components
Borcycle GD3600SY	1,140	6.5	5,600	75	8.5	–	–	Bumper brackets, head lamp housing, centre console carrier
Fibremod™ GB311U	1,120	2	6,200	100	11	9	159	Air filter housings, head lamp housings, technical components
Fibremod™ GD310U	1,130	10	6,200	105	10	9	162	Fans and shrouds, Interior structural carriers
Fibremod™ GD301FE	1,140	4	6,500	105	12	10	158	Pedal carriers, front-end carriers, lower bumper stiffeners
Fibremod™ GD301HP	1,160	5	7,400	105	9.5	9	160	Door module carrier, fans and shrouds, pedal carrier
Fibremod™ GB307HP	1,180	2.5	8,000	115	11	10	160	Air intake manifold, fans and shrouds, parts of cooling systems
Borcycle™ GB4400SY	1,250	6	8,200	98	9	7	159	Front-end carriers, gear housings, pedal carriers
Fibremod™ GB477HP	1,230	2.5	9,000	127	12	11	163	Front-end carriers, gear housings, pedal carriers, tank hinges
Fibremod™ GD577SF	1,350	3	11,300	160	11	-	–	Front-end carriers, pedals, cross beam, structural parts

Powered by **Innovation and Driven by Megatrends**

Global Mobility Megatrends

Lightweighting, electrification, connectivity, shared mobility, and autonomous driving are reshaping tomorrow's vehicles into intelligent systems rather than simple assemblies of parts.

Under-the-hood (UTH) materials face extreme challenges

- Components near thermal engines must withstand high temperatures and corrosive fluids
- Other parts must endure road salt, dirt, and dust
- Housings for heating, ventilation, and air conditioning (HVAC) systems – the components that manage cabin climate – experience constant shock and vibration at elevated temperatures, while being exposed to fuels and lubricants

Electrification introduces additional requirements and new components, making reliability more critical than ever.

Megatrends

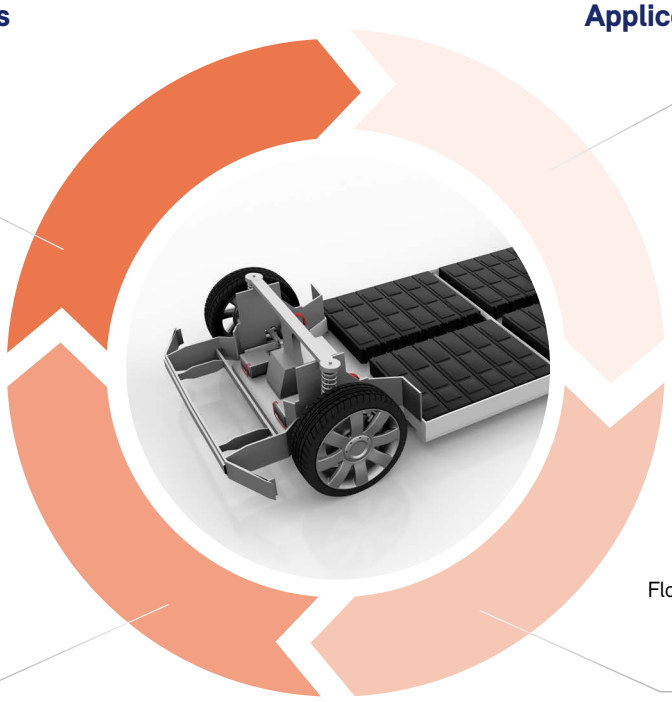
- Lightweight
- Flame retardancy
- Sustainability
- Costs

Physical Properties

High burst pressure
Impact strength
Creep and fatigue
Stiffness

Application Properties

PFAS free



Processability

Flowability
Cycle time
Shrinkage
Wide process window

Stabilization

Halogen Free-
Flame Retardancy (HFFR)
Heat resistance
Chemical resistance

Internal Service Tools

Turning Trends into Tangible Performance: Innovation in Action

Meeting the challenges of global mobility megatrends requires more than advanced materials – it demands anticipation and collaboration. At Borealis we work closely with partners to transform emerging needs into solutions that deliver value from concept to series production.

Our three Innovation Centers make this possible by providing

- New material development and continuous improvements
- Advanced material cards, design and simulation support and material analysis
- Support from batch samples to series production

This integrated approach ensures faster development cycles, tailored performance, and reliable results – in the lab and in the real world.

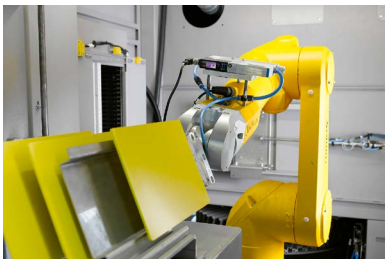
Performance You Can Trust – Today and Beyond

Day-to-day and long-term performance confirm the robustness of our solutions.

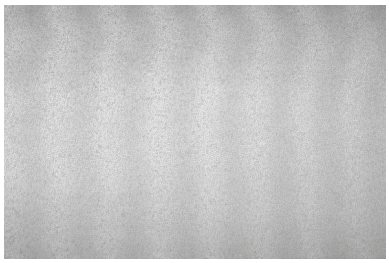
For safe, high-performing e-powertrain and under-the-hood (UTH) applications, Borealis PP compounds deliver:

- Strength and stability under demanding conditions
- Material solutions capable of replacing metals and engineering plastics
- Proven performance for the mobility of the future

Application Testing: Ensuring Reliability in Mobility



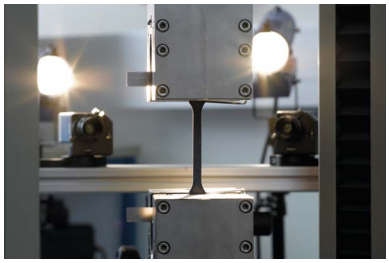
Paint Robot



Tiger Stripe

Emission, Fogging & Odor

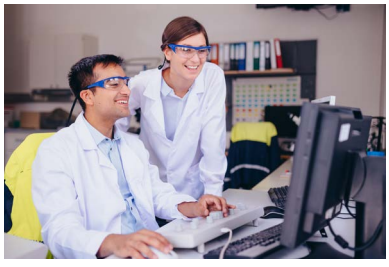
Shrinkage



Material & Application Testing

Analytical and Physical Testing

Advanced Polymer Characterization



Modeling and Simulation

Plastics Conversion Technologies

Turning Trends into Tangible Performance

Reduce **Weight**

Innovating to be lightweight

Borealis makes mobility more sustainable by cutting vehicle weight and boosting energy efficiency. Together with OEMs, TIERs, and partners, we deliver innovations that benefit the industry, drivers, passengers, and the planet, backed by uncompromising quality.

Improve **Sustainability**

Delivering circular economy solutions

Borealis drives a circular economy for plastics by turning waste into valuable resources. Through our advanced mechanical recycled Borcycle™ M, chemical recycled Borcycle™ C, and renewably-sourced Bornewables™, we reduce CO_2 emissions, cut reliance on fossil feedstocks, and recycle post-consumer materials while maintaining high-performance standards.

Save **Costs**

Providing cost-efficient high-performance alternatives

Borealis provides cost-efficient polypropylene (PP) solutions as high-performance alternatives to metals and engineering plastics. Our tailor-made materials are easy to process, even in complex geometries, enabling robust, functional parts with excellent aesthetics, paintability, and scratch resistance.

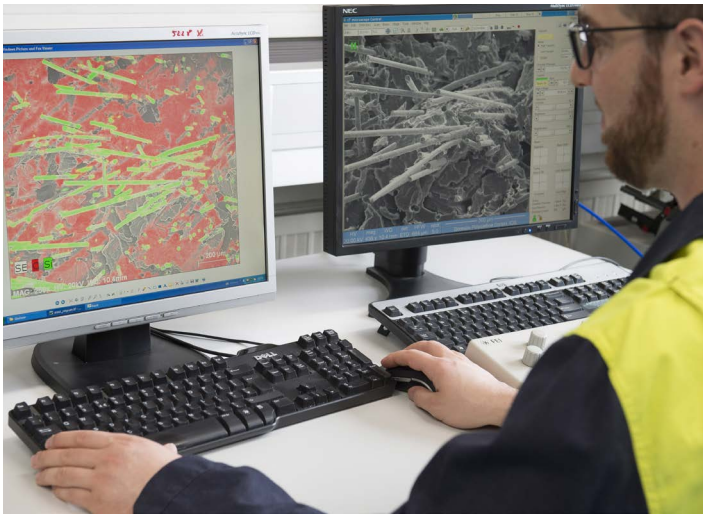
Access **Globally**

Expanding both global footprint and local presence

Borealis operates in over 120 countries, combining a strong global presence with dedicated local support for Mobility OEMs and TIERs. Our expert teams at development centers across Europe, the Americas, Asia, and the Middle East are re-inventing plastics to drive sustainable mobility forward.

Reduce **Weight**

Fibremod™ high-performance glass fiber reinforced PP compounds help the automotive industry reduce weight and processing costs. Our innovative, customized solutions deliver lightweight strength and impact resistance for key applications such as front-end carriers, air intake manifolds, fans, shrouds, and battery trays. Compared to polyamide (PA), a commonly used engineering plastic, Fibremod™ enables lower processing temperatures and energy consumption – supporting more efficient and sustainable production.



Fiber-reinforced polypropylene (PP) compounds are complex materials that require advanced engineering. Borealis has developed computerized tools to predict fiber orientation and simulate application performance, reducing the need for costly testing and prototyping. With state-of-the-art testing standards and a commitment to advancing modeling methods, Borealis helps customers create lightweight, cost-efficient solutions using Fibremod™.

As traditional ePwt & UTH materials like steel and aluminum are gradually replaced by high-performance plastics, Borealis leads the transition with a broad portfolio of PP solutions – from short glass fiber (SGF) to long glass fiber (LGF) compounds – tailored for reinforced ePwt & UTH applications. Borealis was the first to develop and commercialize PP for air intake manifolds, pioneering the industry's shift from polyamide (PA) to PP for this key component.

Fibremod™ GB307HP

Fibremod™ GB307HP is a 35% glass fiber-reinforced polypropylene (PP) compound designed for injection molding of structural parts such as air intake manifolds.

- Lightweight material suitable for engineering plastic replacement
- Cost efficient alternative to PA Copper stabilized
- High thermal resistance and HDT performance
- Burst pressure resistance

Check the Fibremod™ brochure for more information about Fibremod™ technology.

Save **Costs**

As an innovative supplier, Borealis offers a full range of safe, cost-effective, flexible, and environmentally friendly halogen-free flame retardant (HFFR) polyolefin solutions to support the production of lithium-ion battery (LIB) housings and structural components.

Safe

HFFR polypropylene solutions for LIBs enable you to establish:

- Excellent electrical performance with CTI 600V
- Flame retardant – V-0 down to 1.5 mm (UL94)
- Balance stiffness, ductility and flowability

Affordable

HFFR polypropylene for LIBs enables you to:

- Save up to 29% on value due to lower material density (*)
- Achieve over 50 °C lower processing temperature that leads to shorter cycle time and energy consumption
- Achieve good processability with low complexity

Flexible Design

HFFR polypropylene for LIBs offers flexibility and versatility:

- Choose from a variety of HFFR PP grades
- Suitable for battery housings, cell holders, top covers, charging sockets, and more
- Supported by LIB-experienced modeling & simulation experts with proprietary material cards
- Achieve 50-75% lower CO_2 emissions *
- Save up to €260 per tonne on potential carbon tax **
- Contribute to a circular economy and become part of a PP recycling stream

* vs. other used plastics such as PA or PC/ABS. Source: Plasticseurope
** Example: Based on planned CO_2 price of 55€/t by 2025 in Germany. Based on CO_2 footprint of virgin PP vs. virgin PA (6,6)

Visit Electrification & Borealis for more information about our battery solutions.

Improve **Sustainability**

Whether for interior, exterior, e-powertrain, or under-the-hood applications, Borealis offers more sustainable mineral-filled and glass fiber-reinforced solutions. These materials enable higher recycle content, improve recyclability, and support the replacement of conventional polyolefins with circular alternatives – enhancing the environmental footprint of the final product.

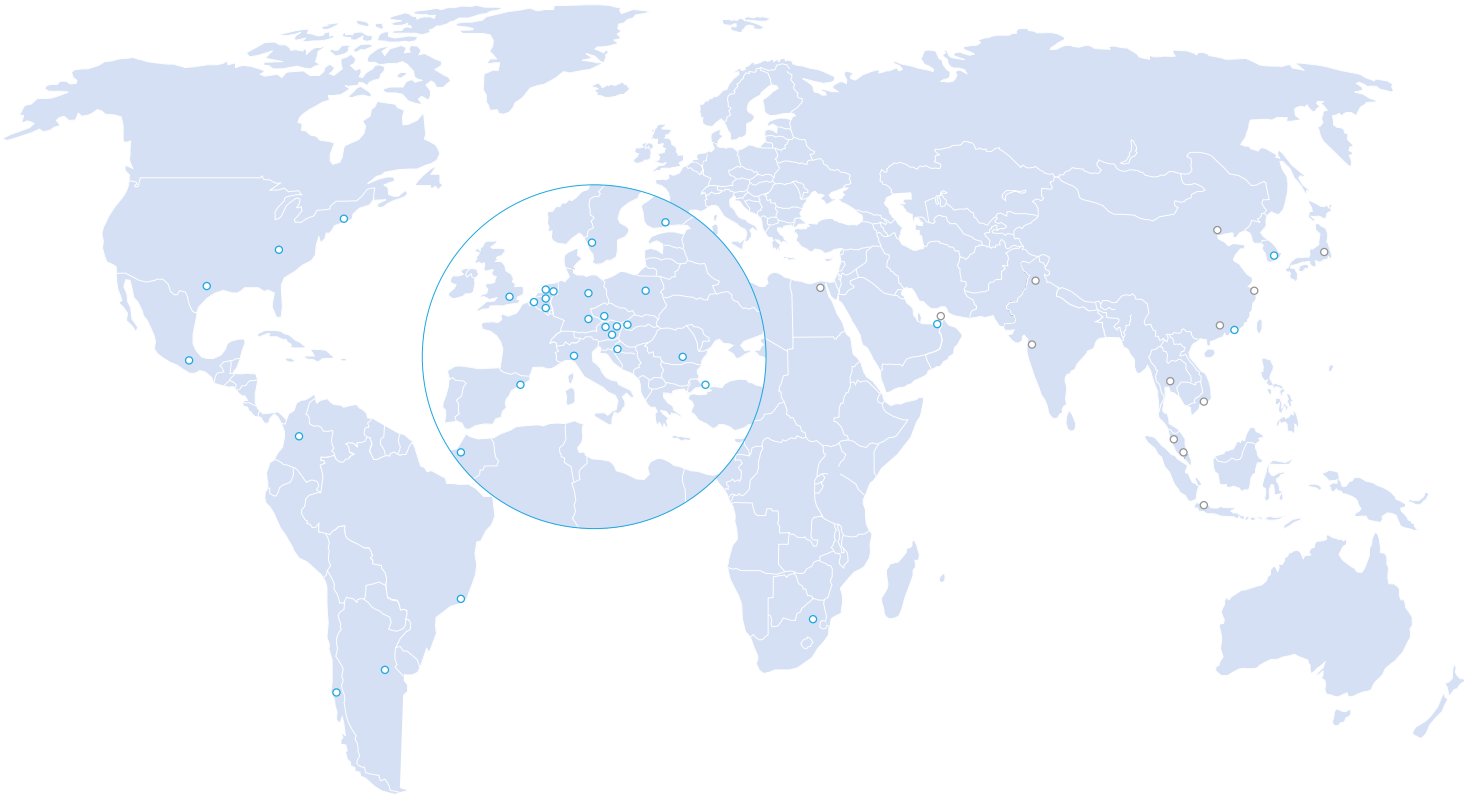
Borcycle™ GD3600SY

Borcycle™ GD3600SY is a 30% glass fiber-reinforced polypropylene (PP) compound containing 65% post-consumer recycle, designed for injection molding of structural, non-visible parts such as brackets, headlamp housings, and center console carriers. It offers an excellent stiffness/impact balance while maximizing the use of recycled content.

- 65% PCR content by weight
- Increases the use of recycled material in the vehicle
- Near-virgin performance properties
- Easy processing

Access **Globally**

As we reinvent essentials for sustainable living, we build on our commitment to safety, people, innovation, technology, and performance excellence. We're accelerating the shift to a circular polyolefin economy and expanding our global footprint to better serve customers worldwide. With operations and development centers across the Americas, Europe, the Middle East, and Asia, we deliver globally aligned solutions as well as market-specific offerings – ensuring we're close to our customers, wherever they are.



○ – Borealis Locations

Head Office
Borealis GmbH

Customer Service Centers
Austria, Belgium, Finland, Türkiye, United States

Production Plants
Austria, Belgium, Brazil, Finland, Germany, Italy, South Korea, Sweden, The Netherlands, United States

Recycling Plants
Austria, Belgium, Bulgaria, Germany

Innovation Centers
Austria, Finland, Sweden

Sales Offices/Representative Offices
Argentina, Brazil, Chile, China, Colombia, Croatia, Czech Republic, France, Mexico, Morocco, Poland, Romania, Slovakia, South Africa, Spain, Türkiye, UAE, UK

○ – Borouge Locations

Head Offices
UAE, Singapore

Innovation/Application Centers
UAE, China

Production Plants
UAE, China

Sales Offices/Representative Offices
China, Egypt, India, Indonesia, Japan, Singapore, Thailand, UAE, Vietnam

Logistics Hubs
China, Malaysia, Singapore, UAE

This graphic is for representational purpose only. Though it was prepared with the greatest possible attention to detail, simplified illustrations may have been applied.

Circular Economy Solutions for Mobility

Join the Circular Revolution!

We can work together to make mobility more circular. Our ever-expanding range of circular material solutions can help you meet your own sustainability targets – without having to compromise on quality or performance.

Choose material solutions based on circular or renewable feedstock instead of fossil fuel-based feedstock.

As reliable partners, Borealis and Borouge are putting their expertise to work to ensure the secure and ample supply of high-quality circular materials on the market. We are committed to increasing the volume of circular materials and solutions significantly.

Maintain premium part performance.

Our circular solutions offer high purity standards and are compliant with industry standards with regard to odor, emissions, and fogging. They also consistently deliver when it comes to aesthetics, including paintability, light and dark color matching, Class-A surfaces, and more.

Use less virgin material but still maintain lighter weight.

Lightweight and low-density materials used in a broad spectrum of mobility applications can be made even more sustainable by replacing virgin materials with grades from our Borcycle™ or Bornewables™ portfolios. In many instances, the foaming process can be used to reduce weight even further.

Increase the amount of recycled content in mobility applications.

The transformative Borcycle™ technology is advancing thanks to our innovation expertise in combination with value chain collaboration. By working together, we are unlocking the potential of recycled material by increasing the percentage of post-consumer recyclate (PCR) content by weight in applications while maintaining stringent performance requirements.

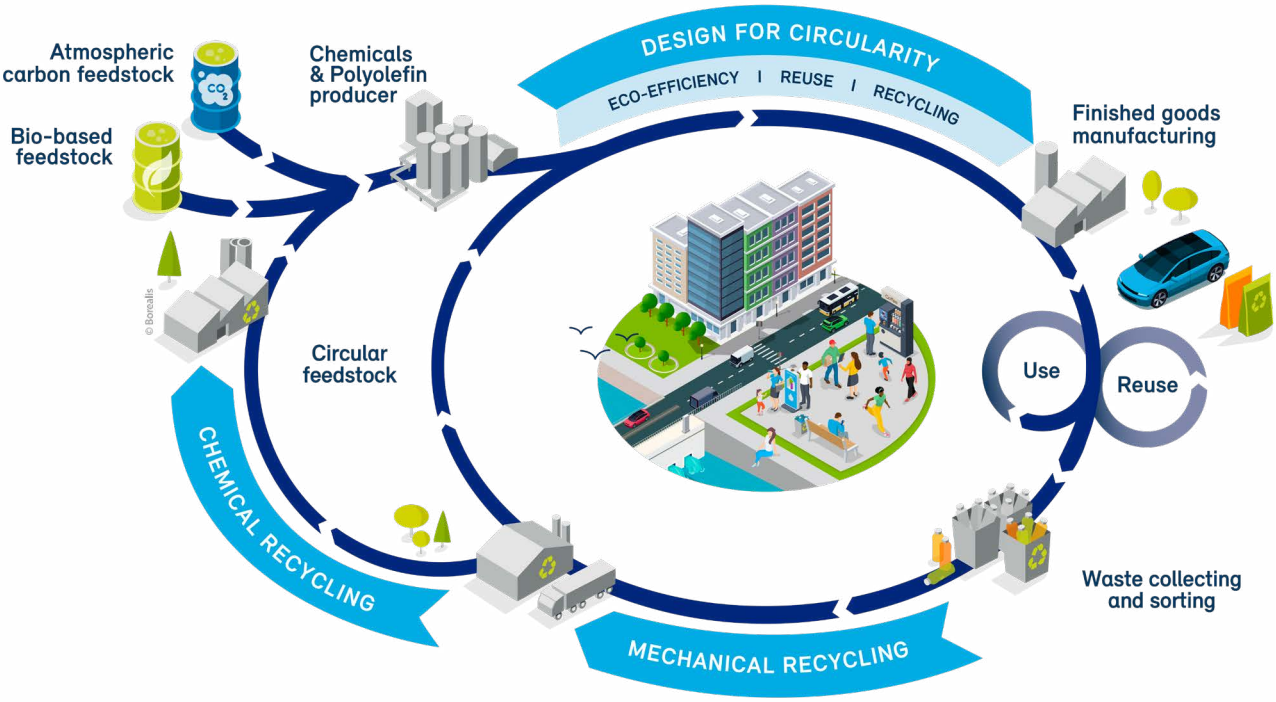
Facilitate easier recyclability of mobility applications.

Part of our vision for a circular economy of plastics entails the development of PP monomaterials which are more easily recycled, and produce higher quality recyclate. Our innovation efforts are focused on design for recyclability and efficiency. Advanced testing facilities at our Innovation Headquarters in Linz, Austria, offer state-of-the-art modeling and simulation, and can assist you in testing the limits of circular materials.

The Borealis **Circular Economy Model**

Polyolefin plastic materials are versatile resources that should be reclaimed and reused. Because plastics are too valuable to ever be wasted, Borealis is committed to driving the transformation to a circular economy of plastics.

The **Borealis circular economy model** depicts the diverse ways in which plastics can be kept in the loop: from renewable feedstocks to design for reuse; from design for recycling, to mechanical and chemical recycling – and then back to renewable feedstocks to close the circle. We use our polyolefins expertise to develop and implement innovative circular economy solutions with added value for our customers in all industry sectors, including mobility.



Borcycle™ M

Borcycle™ M grades are designed to fulfill the most stringent requirements, from stiffness/impact balance to processability, from paintability to good surface aesthetics. In short: our Borcycle™ M portfolio of mechanically recycled grades offers high material quality, but with a lower carbon footprint.

Borcycle™ C

The virgin-level grades found in the **Borcycle™ C** family of chemically recycled solutions are fit for the most demanding applications, including food-contact and healthcare. Borcycle™ C grades are drop-in solutions and ISCC PLUS certified. This means that the origins of these circular materials can be tracked and traced along the entire supply chain.

The **Bornewables™** portfolio offers premium polyolefins made from renewable feedstocks derived entirely from waste and residue streams such as used cooking and vegetable oil. ISCC PLUS certified via mass balance, Bornewables™ grades deliver identical quality to fossil-based materials – while significantly reducing carbon footprint.

myBOREALIS

Are you already using MyBorealis?

All the information you need, when you need it.

As a customer of Borealis, MyBorealis makes your working day easier by putting everything in one place. From order creation and management, to shipment updates, claims processing and technical documentation.

GET ACCESS
https://www.borealisgroup.com/my-borealis

Unlock Borealis' On-Demand Webinars – Mobility Industry Insights at Your Fingertips

GET ACCESS
https://campaigns.borealisgroup.com/on-demand-webinars/#automotive

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