Polypropylene for Compounding and Mobility

DRIVEN TO PROVIDE NEW LEVELS OF
PERFORMANCE AND **INNOVATION**

Braskem

Surpassing Industry Standards with

High Performance, Sustainable Polypropylene

Braskem's broad polypropylene (PP) portfolio meets the needs of today's sophisticated automotive and compounding applications. Benefits from the proven performance that helps our customers add value to a wide range of innovative downstream solutions include:

- Reduced wall thickness enables using less raw material in achieving lightweighting solutions that lower transportation costs, improve fuel economy, and reduce emissions.
- Unique balance of stiffness, toughness, and flowability offer exceptional competitive advantages for multiple end users.
- Joint technology and innovation platforms that enable our clients to meet and exceed stringent market demands.
- Development of recycled polyolefin grades are an emerging area of active Braskem innovation.

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We are developing the next generation of performance PP that exploits recent advances in catalyst and process technology, combined with polymer science and engineering innovation.

Accelerating **Innovation** and **Client Driven Innovation**

Multiple technologically integrated centers in the United States, Brazil and Germany employ more than 300 specialized professionals who collaborate with clients on joint product and applications development.

These state-of-the-art facilities feature:

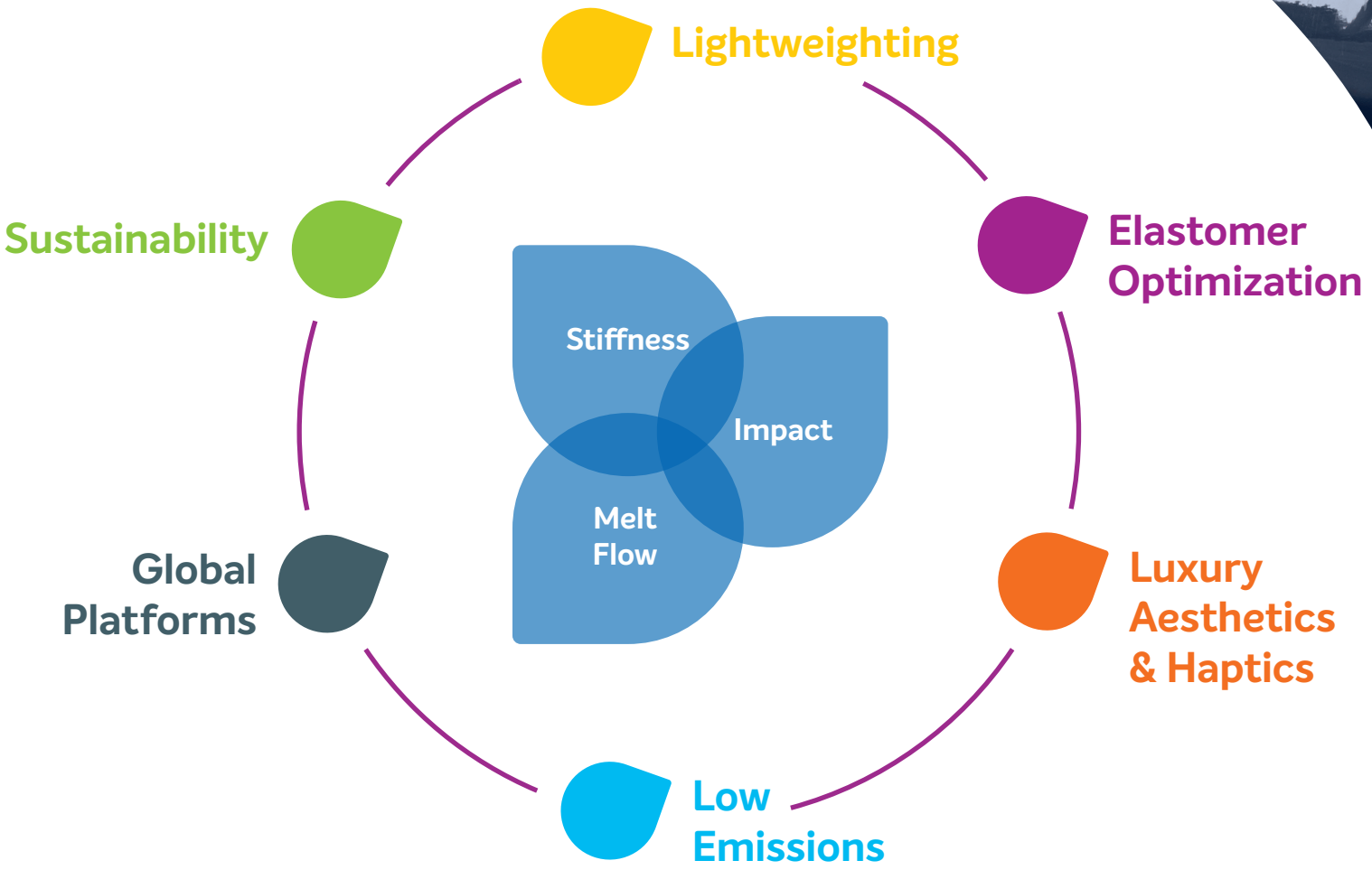
- Pilot-scale equipment that replicates customer production environments for more true-to-life polymer testing
- Compounding and applications operations that create innovative solutions to meet customer needs
- Catalyst labs for developing experimental polymers with enhanced physical properties
- On-site analytical labs that provide tools to understand performance requirements

Client-Driven Innovative Focus

We understand the importance of a competitive and dependable supply of high quality products. Applications often require new levels of performance. Braskem has the capability to provide technical expertise and innovation that meets your product differentiation requirements.

Global Presence

We are focused on being responsive to the needs of our global clients with service levels and supply security unmatched by the competition. At the heart of this responsiveness is geographic diversity that provides reliable sourcing, with production facilities in North America, Germany, and Brazil.


Lightweighting
Elastomer Optimization
Luxury Aesthetics & Haptics
Low Emissions
Global Platforms
Sustainability
Stiffness
Impact
Melt Flow

Elastomer Optimization

Fractional MF ICPs
High Impact/Toughness ICPs
High MF ICPs

Braskem's high toughness, high flow impact copolymers allow producers to explore the production of compounds previously unachievable. This evolution in Braskem's portfolio aims to provide a greater balance of processability and toughness, which adds versatility and flexibility. Benefits include:

- Improved toughness impact copolymers for environments requiring very high impact resistance
- Enhanced properties at low viscosity for compounding flexibility and performance
- Exceptional cold temperature and impact resistance
- Very high toughness for improved flexibility in downstream formulation development

High Impact PP Grades			
Grade	**MFR**	**Flexural Modulus**	**N. Izod (23°C)**
ASTM METHOD Units	**D-1238 (g/10min)**	**D-790 (psi)**	**D-256A (ft-lb/in)**
TI4003F	0.3	210,000	NB
TI4005P2	0.5	210,000	NB
INSPIRE 114	0.5	215,000	NB
TI4007G	0.7	175,000	NB
TI6035NB	3.8	140,000	NB
TI6120Q4	12	115,000	NB
CSP120NA	12.5	165,000	11.9
TI6200Q4	20	115,000	NB
C7079-25RNA	25	155,000	NB
C702-20	18	150,000	3.5
TI6350WV	35	135,00	4.2
C7100-50NA	50	138,00	2.3

Luxury Aesthetics & Haptics

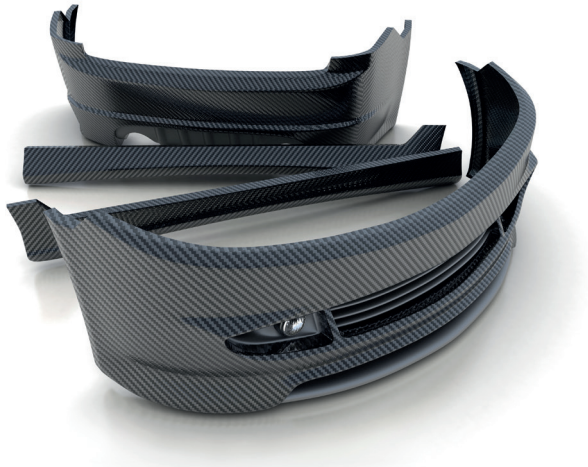
7000 Series ICPs
2000 Series ICPs

The 2000 Series Impact Copolymers are designed to meet industry trends for higher levels of performance.

Expand your compounding design freedom with:

- High stiffness and flow performance
- Reduced emissions
- Low gels
- Suppressed tiger marking
- Critical building blocks for compounds bringing unique combination of final compound properties
- High stiffness matrix in a broad range of viscosities
- Rheology is highly conductive to tiger marking reduction, a common challenge in compound technology

Unique 2000 Series Impact Copolymers			
Grade	**MFR**	**Flexural Modulus**	**N. Izod (23°C)**
ASTM METHOD Units	**D-1238 (g/10min)**	**D-790 (psi)**	**D-256A (ft-lb/in)**
TI2150C	15	235,000	1.5
TI2350C	40	235,000	1
TI2600C	66	235,000	0.9
TI2900C	110	240,000	0.7
TI7900C	120	240,000	0.7
TI71000M	120	260,000	0.7



Lightweighting

High MF HPs & ICPs
High Crystalline HPs

Developed for the automotive compounding market, our high crystallinity homopolymers provide premium levels of stiffness, flowability, compounding flexibility and performance in composites and compounded TPOs.

- High Stiffness for improved product performance
- Unique high flow grade to support excellent processing of the final compound
- Improved VOC performance providing high flow and stiffness
- Global Asset Redundancy

High Crystallinity PP Grades			
Grade	**MFR**	**Flexural Modulus**	**N. Izod (23°C)**
ASTM METHOD Units	**D-1238 (g/10min)**	**D-790 (psi)**	**D-256A (ft-lb/in)**
INSPIRE 6025N	2.5	300,000	0.7
D218	8	315,000	0.7
F350HC2	35	300,000	0.4
F1000HC	115	300,000	0.3
F2700HC	270	300,000	0.3
HEM350B	35	245,000	0.3
TI2150C	15	235,000	1.5
TI2350C	40	235,000	1.0
TI2600C	66	235,000	0.9
TI2900C	110	235,000	0.7
TI7900C	120	240,000	0.7
TI71000M	120	260,000	0.7

PP For Compounding: Composites & LGF								
Grade	**Type**	**MF**	**Flex (psi)**	**Tensile (psi)**	**Elongation (at yield) %**	**Notched Izod @ 23 deg**	**Visbroken**	**Additives**
CP360H	Homopolymer	35	170,000	4,700	11	0.4	Yes	'Barefoot'
HEM350B	Homopolymer	35	245,000	5,400	5	0.3	No	'Barefoot'
TI4350P	Copolymer	35	200,000	3,500	4	1.4	No	Nucleated
F350HC2	HC-Homopolymer	35	300,000	6,000	5	0.4	No	Nucleated
FP650WV	Homopolymer	65	240,000	5,500	8.3	0.3	Yes	Nucleated
TI4700P2	Copolymer	70	180,000	3,900	5	1.2	Yes	Nucleated
TI6800WV	Copolymer	80	155,000	3,000	-	2.3	Yes	Nucleated
C758-80NA	Copolymer	80	200,000	3,730	4.6	1.4	No	Nucleated, anti-stat
TI4900M	Copolymer	115	210,000	4,300	5	0.7	No	Slight Nucleation
F1000HC	HC-Homopolymer	115	300,000	5,950	4.5	0.3	No	Nucleated
CP1200B	Homopolymer	126	180,000	4,700	11	0.3	Yes	'Barefoot'
H155	Homopolymer	1250	217,550	-	-	-	Yes	'Barefoot'
Higher Flow resins that provide the best balance of flow, impact & stiffness								

Low Emissions

Low Emissions Megatheme

- Emerging growth and development in these areas
- Making significant strides in developing and bringing to market recycled polyolefin products
- Innovating and generating unique solutions to the challenge of polymer emissions

Global Platforms

Global Products Megatheme

- Aligning our global product portfolios with regional requirements and capabilities to Better serve our global clients
- We are focused on being responsive to the needs of our global clients with service levels and supply security unmatched by the competition. At the heart of this responsiveness is geographic diversity that provides reliable sourcing, with production facilities in North America, Germany, and Brazil.

Global PP			
Grade	**MFR**	**Flexural Modulus**	**N. Izod (23°C)**
ASTM METHOD Units	**D-1238 (g/10min)**	**D-790 (psi)**	**D-256A (ft-lb/in)**
TI2150C	15	235,000	1.5
TI2350C	40	235,000	1
TI2600C	66	235,000	0.9
TI2900C	110	235,000	0.7
F350HC2	35	300,000	0.4
F1000HC	115	300,000	0.3
CP360H	34	170,000	0.4
TI6800WV	80	155,000	2.3
FT120WV	12	240,000	0.7
H521	3.6	240,000	0.7
H734-52RNA	52	246,500	2.5 kJ/m^2 (Charpy)
FF030F2	3.0	209,000	0.8
INSPIRE 382	70	152,300	1.5 kJ/m^2 (Charpy)
TI4003F	0.3	210,000	NB

Sustainability

Sustainability Megatheme

- Committed to expanding our portfolio to include 300,00 tons of products with recycled context by 2025 and 1 million tons of thermoplastic resins and chemicals with recycled content by 2030.
- By 2030, working to divert 1.5 million tons of plastic waste away from incineration, landfill, or the environment.
- Developing recycled solutions for applications across market segments.

Sustainability Megatheme									
Product Name		**Application**	**Recycled Content**	**Polymer Type**	**Color**	**Melt Flow (g/10 min)**	**Izod (ft-lb/in)**	**Flex Modulus (psi)**	**Food Contact**
DP – R112		Thermoforming	25% PCR	PP COPO	Dark Gray	3	0.8	230,000	This product meets the requirements for certain FDA Food Contact Applications
DP – R117		Injection Molding – Caps & Closures	25% PCR	PP COPO	Dark Gray	16	0.7	220,000	This product meets the requirements for certain FDA Food Contact Applications
DP – R103		Injection Molding – Caps & Closures	50% PCR	PP COPO	Gray	22	0.8	225,000	No
DP – R101		Extrusion	50% PCR	PP COPO	Gray	3	3.6	170,000	No
RPI 0R2 GY		Compounding – Auto/Industrial	100% PCR	PP COPO	Gray	35	1.4	162,000	No
RPH 9H2 BK		Compounding – Auto/Industrial	100% PCR	PP HOMO	Black	6	NA	195,000	No

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With a global vision of the future oriented toward people and sustainability, Braskem is committed to contributing to the value chain for strengthening the Circular Economy.

The petrochemical company's almost 8,000 team members dedicate themselves every day to improving people's lives through sustainable chemicals and plastics solutions. Braskem has an innovative DNA and a comprehensive portfolio of plastic resins and chemical products for diverse segments, such as food packaging, construction, manufacturing, automotive, agribusiness, healthcare, and hygiene, among others. With 40 industrial units in Brazil, the United States, Mexico, and Germany, and exports its products to clients in more than 70 countries.

Braskem America is an indirect wholly owned subsidiary of Braskem S.A. headquartered in Philadelphia. The company is the leading producer of polypropylene in the United States, with six production plants located in Texas, Pennsylvania, and West Virginia, an Innovation and Technology Center in Pittsburgh, and operations in Boston focused on leveraging groundbreaking developments in biotechnology and advanced materials. For more information, visit www.braskem.com/usa.

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