

Trinseo Plastics
AMERICAS

A large, vibrant graphic of a rainbow, composed of many thin, parallel lines, curving across the top and left side of the page. The colors transition from purple on the left to red, orange, yellow, green, and blue on the right.

WE ARE MAGNUM™

MAGNUM™ ABS Resins
Proven to enhance
productivity and efficiency

Materials. Powering Ideas.

trinseo.com



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MAGNUM™ ABS Resins Different?
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Turning Ideas into Reality

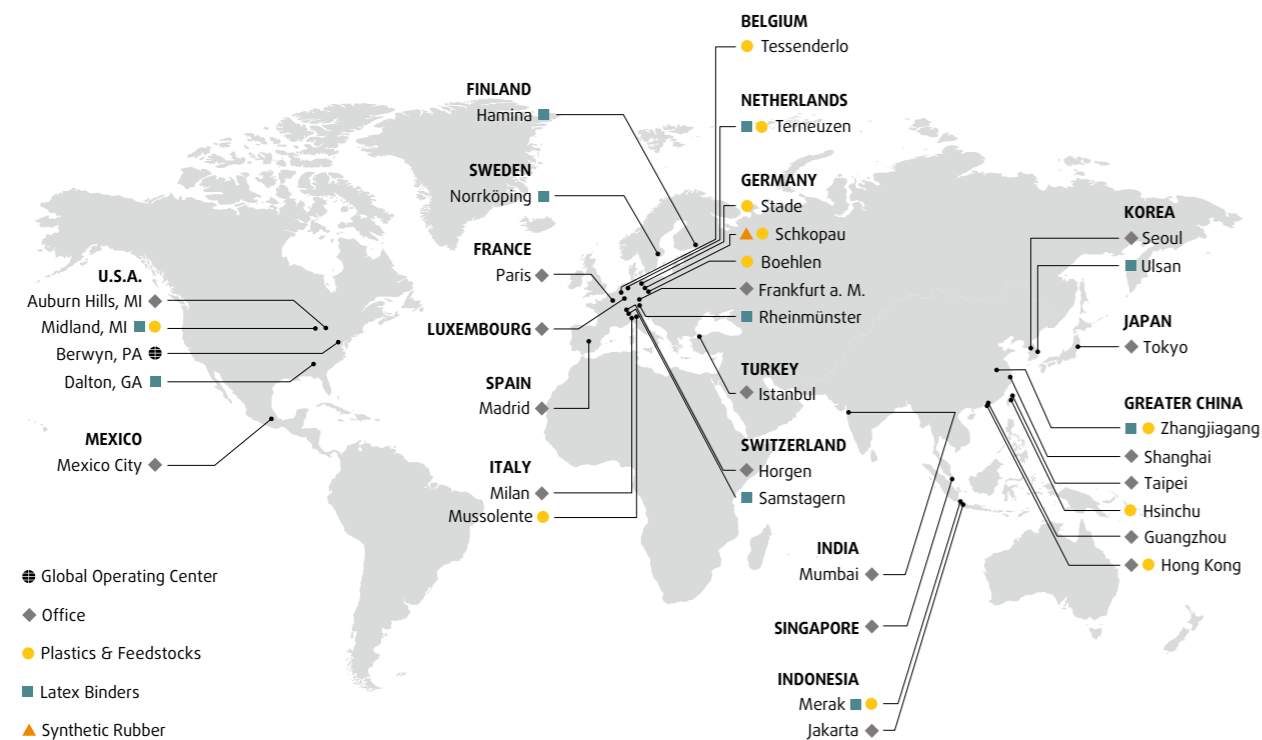
About Trinseo

Trinseo (NYSE: TSE) is a global materials solutions provider and manufacturer of plastics, latex binders, and synthetic rubber. We are focused on delivering innovative and sustainable solutions to help our customers create products that touch lives every day – products that are intrinsic to how we live our lives – across a wide range of end-markets, including automotive, consumer electronics, appliances, medical devices, lighting, electrical, carpet, paper and board, building and construction, and tires.

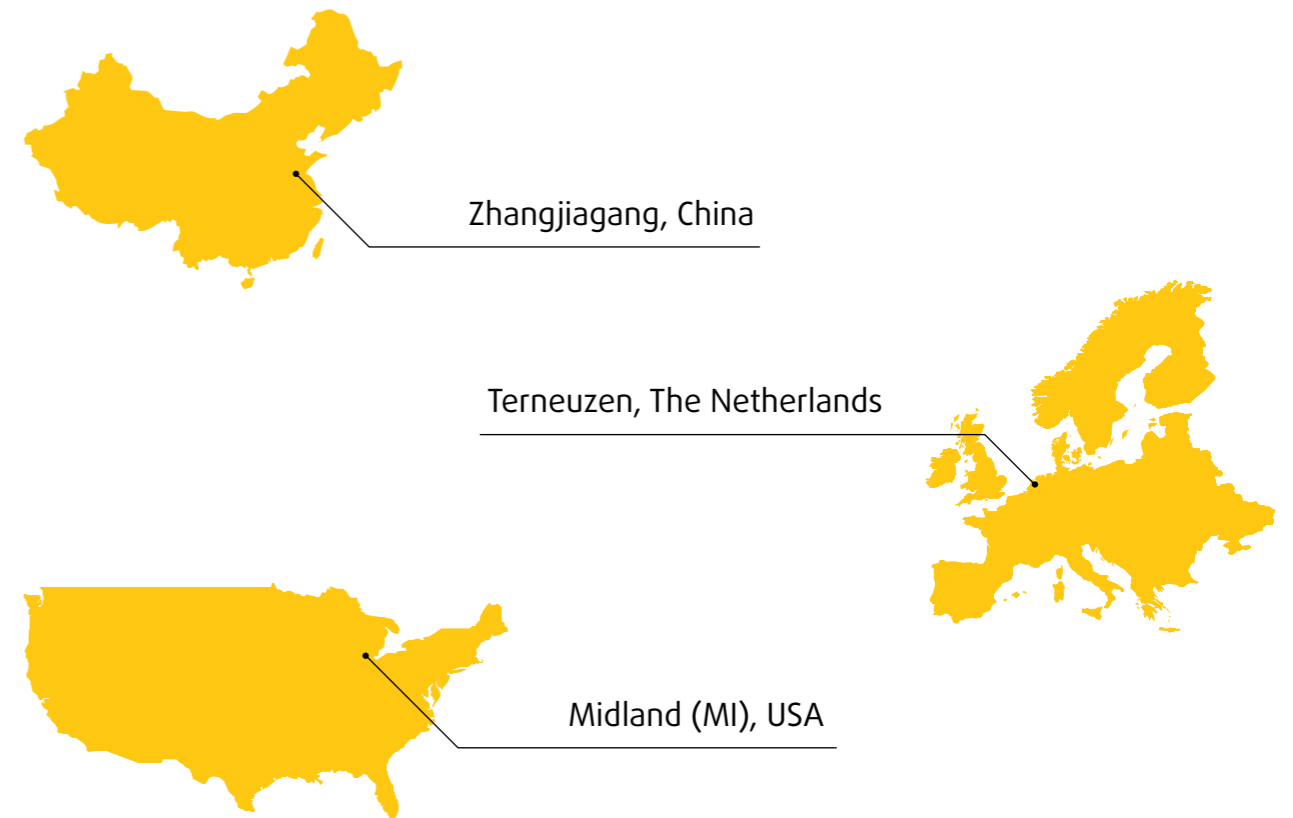
Trinseo Plastics Fast Facts

- More than 70 years of technology and marketplace leadership
- 16 manufacturing sites across Asia, Europe and the USA
- 3 sites manufacturing MAGNUM™ ABS Resins: Zhangjiagang, China; Terneuzen, The Netherlands; and Midland (MI), USA
- Trinseo's complete portfolio of MAGNUM™ ABS Resins meets a broad range of customer needs

Across the Globe



Trinseo's Production Plants Produces High-quality ABS Resins in:



Trinseo's MAGNUM™ ABS Resins Helping differentiate products for end-user satisfaction

We Are MAGNUM™

Durable and tough, easy to process and cost-efficient: ABS is known as a popular solution for a wide range of applications produced for various end-markets. But not all ABS is made the same. Trinseo MAGNUM™ ABS Resins are manufactured with continuous mass polymerization technology as opposed to an emulsion process. This yields a resin with a highly consistent, white color base resulting in a purer polymer and a very cost-efficient resin for self-coloring.

Trinseo supports customers based on four decades of experience in the production and application of mass polymerized MAGNUM™ ABS Resins. As a result of this expertise and the enhanced properties, MAGNUM™ ABS is widely used in automotive, medical devices, consumer electronics, as well as high-end extrusion and thermoforming applications, such as with housings and enclosures that require advanced performance and aesthetics.

Explore the MAGNUM™ ABS product portfolio and benefit from our excellence in purest mass ABS.

What Makes
MAGNUM™ ABS Resins Different?

MAGNUM™ ABS Resins are purer, cleaner and superior. Trinseo's proprietary continuous mass polymerization process results in a more consistent, stable, and reliable product.

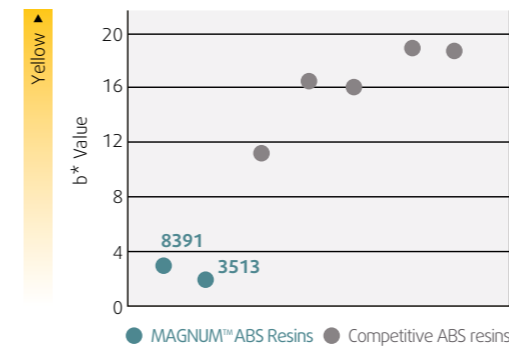
For decades, Trinseo's MAGNUM™ ABS Resins have helped designers and converters worldwide differentiate their applications and provide end-user satisfaction.



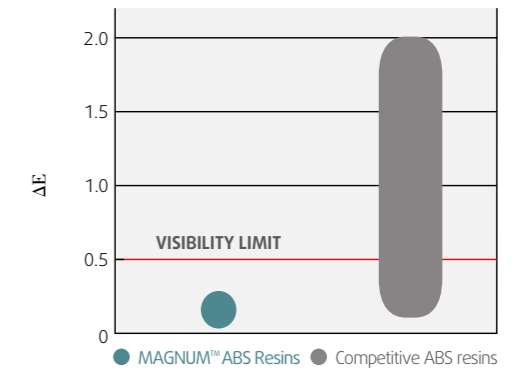
MAGNUM™
mass ABS

MAGNUM™ ABS Resins are manufactured with continuous mass polymerization technology, which makes the resins more advanced and able to bring significant benefits to both injection molding and profile and sheet extrusion applications.

White base color

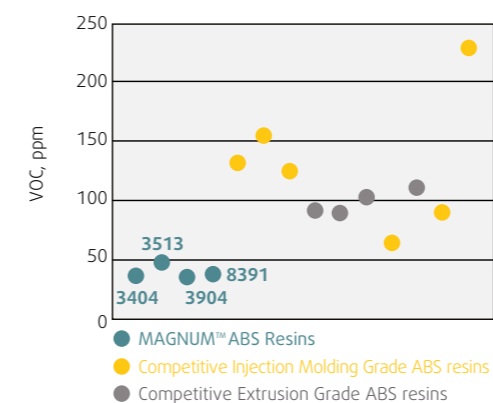


Excellent lot-to-lot consistency

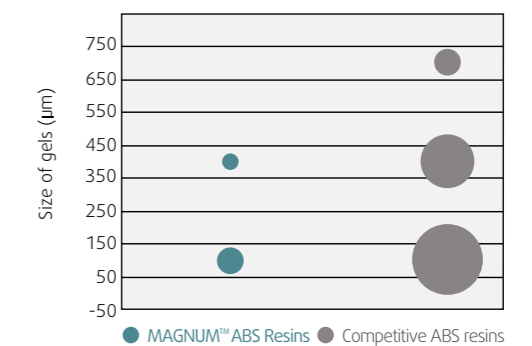


- These are typical properties only and are not to be regarded as sales specifications
- Natural resins colored with a single lot of color concentrate (five colors ranging from white to black)

Low VOC



Low gel level



- Size of bubble represents number of gel count

Market
emulsion ABS



What Does This Mean for Our Customers?

- Reduce coloring cost
- Widen processing window
- Create high-end aesthetics
- Long Lasting Color Quality
- Improve machine utilization



What Does This Mean for Our Customers?

Cost Savings on Coloring

MAGNUM™ ABS Resins are ideal for coloring via color masterbatch, because they are by default available in their natural form. Their consistent white base color is especially critical to enable successful coloring. The advanced properties and features of MAGNUM™ ABS Resins bring significant cost savings to our customers, both through coloring and in other areas.

However, cost savings does not mean compromise on quality. MAGNUM™ ABS Resins allow our customers to save on costs, while enjoying products with excellent aesthetics and quality.

1 Reduced Pigment Cost

One of the benefits of the consistent natural white base color of MAGNUM™ ABS Resins — which is much lighter than most competitive resins — is that less pigment is required to produce white or light colors.

3 Reduced Inventory/ Warehouse Space

Warehouse rental fees can be substantial. When it is not necessary to store a wide range of pre-color resins as safety stock, inventory and warehouse space costs can be significantly reduced.

2 Improved Raw Material Cost

Easy and cost-efficient coloring via color masterbatch can help customers avoid Minimum Order Quantity (MOQ) requirements for small lots of different colors. It also leads to fewer remaining scraps, which reduces raw material costs.

4 Increased Flexibility with Shorter Lead Time

Adopting self-coloring allows customers to avoid keeping and managing many different lots of colors. Customer requests can also be responded to with greater ease and efficiency.



Thermal & Processing Stabilities Widen Processing Windows

MAGNUM™ ABS Resins have excellent thermal stability. Unlike typical competitive ABS resins, MAGNUM™ ABS Resins have been processed successfully at temperatures above 250 °C.

Benefits to Converters

Less Color Shift

Excellent thermal stability lessens color shift. It also opens up the possibility of running a single molding job on different machines, without creating a color change.

Lower Odor

MAGNUM™ ABS Resins have extremely low VOC levels, which means less odor during the manufacturing process, as well as for the end products. Low VOC also helps meet government regulations.

Benefits to Brand Owners

Consistency

By using MAGNUM™ ABS Resins, color differences between different (sized) parts for the same end product are minimized. This increases flexibility in sourcing its parts from different converters.



Low Gloss & Low Gel Levels Create High-End Aesthetics

As they are manufactured using continuous polymerization technology, Trinseo's MAGNUM™ ABS Resins can easily achieve desired gloss levels through processing parameters, such as mold temperature, polymer temperature, and injection molding speed.

Low gel level is another feature of MAGNUM™ ABS Resins, and is essential in producing smooth surfaces for an excellent product appearance.



High UV Light Resistance for Long Lasting Color Quality

Exposure to UV light causes aging and its typical effects are yellowing and surface quality deterioration.

Compared to typical ABS resins, over time MAGNUM™ ABS shows less yellowing (up to 50%) and a better gloss retention at different accelerated weatherability test conditions.

This translates into better aesthetic appearance over time and savings for 2X less UV stabilizer cost.

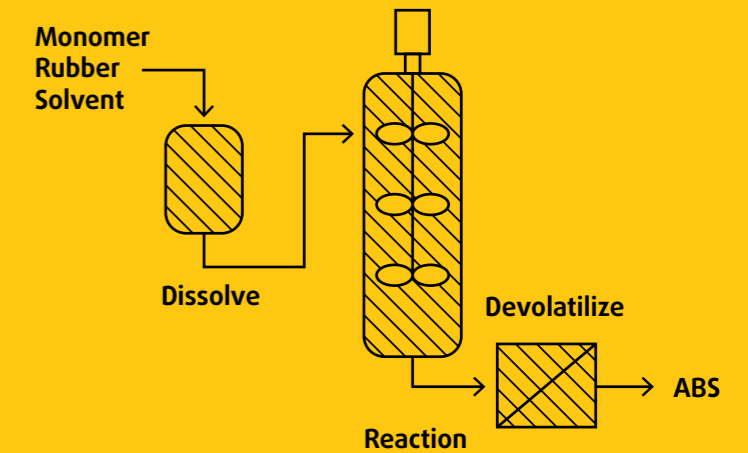


Shorter Pre-Drying Time Improves Machine Utilization

Compared with regular ABS resins, the moisture uptake of MAGNUM™ ABS Resins is lower, which shortens pre-drying time. To converters, reduced pre-drying time means machine utilization can be improved, lowering the overall production cost.

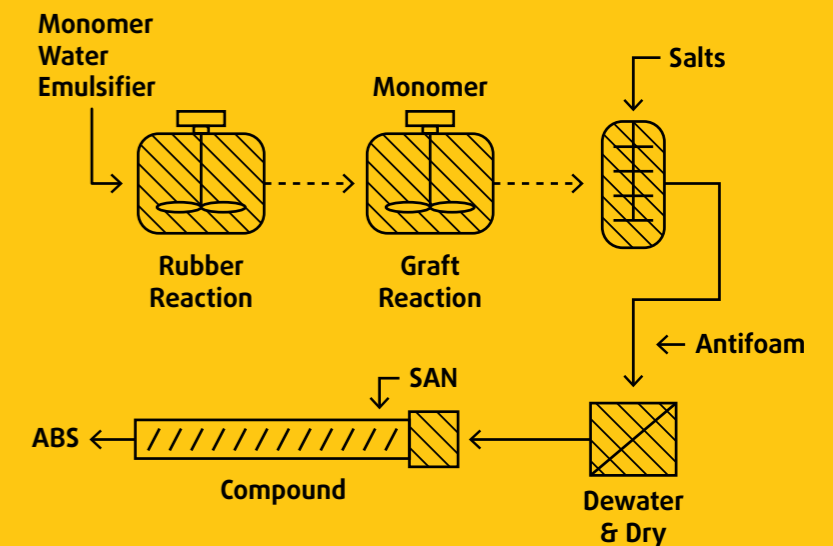
Mass Polymerization Technology

With Trinseo's mass polymerization technology, MAGNUM™ ABS Resins are produced in a continuous process. This provides assurance of a homogeneous and consistent product. This process also uses very few process additives, resulting in a clean, pure material that is essential in the medical market. ABS produced in the mass process is consistent and has low color.



Emulsion Polymerization Process

Traditional emulsion ABS technology uses batch reaction process. This can result in variation among batches, which can be problematic. This process requires many processing additives such as emulsifiers and coagulants. These impurities remain in the ABS at detectable levels. There are many processing steps involved in this process, resulting in higher color.



MAGNUM™ ABS Resins

Advanced Product Grades

Trinseo's MAGNUM™ ABS Resins cater to the different needs of our customers. Our products cover both injection molding and sheet & profile extrusion applications, providing various flow and impact resistance levels. Following are several of our most popular grades.

MAGNUM™ 3404

Extrusion grade

MFR:	6.6
Vicat Soften. Temperature:	216°F/102°C @ 50N; 50°C/h
Notched Izod:	4.3
<ul style="list-style-type: none"> • Medium impact resistant • General purpose 	

MAGNUM™ 3904

Extrusion grade

MFR:	4.5
Vicat Soften. Temperature:	207°F/97°C @ 50N; 50°C/h
Notched Izod:	10
<ul style="list-style-type: none"> • Ultra-high impact resistant 	
<p>One of the highest in the market!</p>	

MAGNUM™ 275

Extrusion/Injection molding grade

MFR:	9
Vicat Soften. Temperature:	210°F/99°C @ 50N; 50°C/h
Notched Izod:	5
<ul style="list-style-type: none"> • Medium impact resistant • General purpose 	

MAGNUM™ 555

Extrusion/Injection molding grade

MFR:	9
Vicat Soften. Temperature:	208°F/98°C @ 50N; 50°C/h
Notched Izod:	8
<ul style="list-style-type: none"> • Very high impact resistant • Medium to high gloss level 	

MAGNUM™ 3513

Extrusion/Injection molding grade

MFR:	8.5
Vicat Soften. Temperature:	213°F/101°C @ 50N; 50°C/h
Notched Izod:	6
<ul style="list-style-type: none"> • Balance of good flow and high impact resistance 	

MAGNUM™ 8391

Injection molding grade

MFR:	28
Vicat Soften. Temperature:	203°F/95°C @ 50N; 50°C/h
Notched Izod:	4.3
<ul style="list-style-type: none"> • Excellent gloss • Very high flow • Medium impact resistant • Available for medical applications 	

MAGNUM™ 3453

Injection molding grade

MFR:	15
Vicat Soften. Temperature:	207°F/97°C @ 50N; 50°C/h
Notched Izod:	4
<ul style="list-style-type: none"> • Medium impact with above medium flow and medium heat resistance 	

MAGNUM™ 8434

Injection molding grade

MFR:	13
Vicat Soften. Temperature:	214°F/101°C @ 50N; 50°C/h
Notched Izod:	5
<ul style="list-style-type: none"> • High gloss and medium-high heat performance, with medium impact resistance 	

MFR (g/10min) with test conditions: 220°C/10kg, Notched Izod (ft-lb/in)

Injection Molding Applications

For injection molding applications, the following advanced features of MAGNUM™ ABS Resins provide distinctive advantages:

- Excellent color stability
- White base color
- Purer and cleaner
- Excellent lot-to-lot consistency
- Excellent thermal stability
- Less time to pre-dry
- Wider processing window
- Low VOC

MAGNUM™ ABS Resins' injection molding grades include:

Grade	Process	MFR (220°C/10kg, g/10 min)	Vicat Soften. Temp. ASTM D1525 (50N; 50°C/h)	Izod Impact, notched, (ft-lb/in)	Features
MAGNUM™ 275	Extrusion/Injection molding grade	9	210°F/99°C	5	• Medium impact resistant • General purpose
MAGNUM™ 555	Extrusion/Injection molding grade	9	208°F/98°C	8	• Very high impact resistant • Medium to high gloss level
MAGNUM™ 3513	Extrusion/Injection molding grade	8.5	213°F/101°C	6	• Balance of good flow and high impact resistance
MAGNUM™ 8391	Injection molding grade	28	203°F/95°C	4.3	• Excellent gloss • Very good flow • Medium impact resistant • Available for medical applications
MAGNUM™ 3453	Injection molding grade	15	207°F/97°C	4	• Medium impact with above medium flow and medium heat resistance
MAGNUM™ 8434	Injection molding grade	13	214°F/101°C	5	• High gloss and medium-high heat performance, with medium impact resistance



Recommended Applications

Trinseo's MAGNUM™ ABS Resins are available in both medium and high impact resistance grades to suit a multitude of application needs:

- Home appliances
- Air conditioners
- Healthcare
- Garden and power tools
- Exercise and sporting equipment
- General injection molding applications



Using MAGNUM™ ABS Resins is proven to provide significant cost savings on coloring while increasing efficiency, yielding richer colors, and enabling a wider range of appearance options – especially light and bright colors.

Sheet & Profile Extrusion Applications

For sheet & profile extrusion applications, the following advantages of MAGNUM™ ABS Resins are essential for a successful product:

- Excellent color stability
- White base color
- Purer and cleaner
- Excellent lot-to-lot consistency
- Excellent impact resistance
- Low gel levels
- Low VOC

MAGNUM™ ABS Resins' sheet & profile extrusion grades include:

Grade	Process	MFR (220°C/10kg, g/10 min)	Vicat Soften. Temp. ASTM D1526 (50N; 50°C/h)	Izod Impact, notched, (ft-lb/in)	Features
MAGNUM™ 275	Extrusion/Injection molding grade	9	210°F/99°C	5	• Medium impact resistant • General purpose
MAGNUM™ 555	Extrusion/Injection molding grade	9	208°F/98°C	8	• Very high impact resistant • Medium to high gloss level
MAGNUM™ 3513	Extrusion/Injection molding grade	8.5	213°F/101°C	6	• Balance of good flow and high impact resistance
MAGNUM™ 3404	Extrusion grade	6.6	216°F/102°C	4.3	• Medium impact resistant • General purpose
MAGNUM™ 3904	Extrusion grade	4.5	207°F/97°C	10	• Ultra-high impact resistant



Recommended Applications

Trinseo's MAGNUM™ ABS Resins are recognized in the market for making quality extrusion sheets, and have been recommended by many high-end extruders internationally. We provide five MAGNUM™ ABS grades with different impact resistance performance to suit numerous application requirements. In fact, the impact resistance level of our MAGNUM™ 3904 is considered to be one of the highest on the market.

The following are some recommended applications for our sheet & profile extrusion grades:

- Bathtubs and shower trays
- Mass transportation interiors
- Caravan/digger/tractor/golf cart roofs
- Carrier tape
- Edgebands
- Advertising and point-of-purchase displays



MAGNUM™ ABS Resins deliver a consistent color and finish, and superior end aesthetics, every time. This success is proven by the experiences of high-end global sheet extruders.

Voices of Our Customers



"Trinseo's MAGNUM™ ABS resins are unique in the marketplace because of their excellent processing characteristics with great product performance. As a result of the mass polymerization process of Trinseo, they are very stable on the line, have very low gel content and are ideal for self-coloring..... we use MAGNUM™ ABS extensively and consider it one of the best materials in the marketplace for the classic finish of body panels, rears, interior trims and protective covers of vehicles."

Mauro Bonaventura
Technical Engineering Manager
VitasheetGroup



"MAGNUM™ ABS is our preferred matt ABS resin because it has more to offer than its outstanding matte surface performance. Thanks to its beneficial properties during production, it helps us succeed in a demanding marketplace and service our customers in the best possible way. On top of the excellent properties of its products, Trinseo offers us consistency of supply, which is a critical success factor in our line of business."

James Murtagh
Technical and R&D Manager
Athlone Extrusions Ltd.



"MAGNUM™ ABS resins from Trinseo are generally recognized as some of the best resins for thermoforming. To live up to the high standards of our customers in the furniture industry, we rely fully on MAGNUM™ ABS for its high purity in combination with high toughness. The consistent quality of the sheets produced with MAGNUM™ ABS also allows us to avoid visual panel control during production. This not only improves our cost efficiency, but also our service level and on-time delivery to our customers."

Willi Klepsch
Founder and former CEO, Senoplast

"Outstanding matte surface performance."

"We rely fully on MAGNUM™ ABS for its high purity in combination with high toughness."

"Consistent quality of the sheets."

"Trinseo offers us consistency of supply, which is a critical success factor in our line of business."

The principles of Responsible Care® and sustainability influence the production of printed literature for Trinseo S.A. and its affiliated companies. As a contribution towards the protection of our environments, Trinseo's printed literature is produced in small quantities and on paper containing recovered/post-consumer fiber and using 100 percent soy-based ink whenever possible.

Product Stewardship

Trinseo and its affiliated companies have a fundamental concern for all who make, distribute, and use their products and for the environment in which we live. This concern is the basis for our Product Stewardship philosophy by which we assess the safety, health, and environmental information on our products so that appropriate steps may be taken to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Trinseo products – from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

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