

**HUNTSMAN**

Enriching lives through innovation

Polyurethanes

# VITROX<sup>®</sup> and RIMLINE<sup>®</sup> composite solutions

Lightweight design with innovative chemistry



# Performance through partnership

With over 20 years' experience in developing class-leading composite resin technologies, Huntsman provides MDI and MDI-based polyurethanes for the automotive industry through our trusted VITROX® and RIMLINE® brands.

As your lightweight materials partner, we will work closely with you to help create high-performance solutions that are cleaner, lighter, stronger, and circular. Our composites technology and expertise give you greater design freedom and lower costs, from initial concept through to final production.

## Why Huntsman polyurethane resins and core systems?



### Cleaner

Minimize odour emissions depending on your market requirements, while complying with global regulations.



### Lighter

Create strong yet lightweight materials that reduce the weight of your car to lower fuel consumption and emissions.



### Faster

Speed up cycle times and gain flexibility in your production processes.



### Circular

Our MDI-based polyurethane technologies enable manufacturers to maintain technical performance while considering bio-based or recycled material content.

# Versatile solutions for car interiors and exteriors

Our MDI and MDI-based polyurethane solutions are developed to help you to improve weight, design, productivity, and performance for your composite applications. By collaborating with you early in the process, we can help you to make products that meet specific properties, while maintaining high-quality standards in passenger safety and comfort.

## Increased productivity:

- High volumes without frequent tool cleaning
- Low material waste
- Tunable snap cure
- Fast curing

## Enhanced performance:

- Helps to achieve high structural performance of the final part
- Temperature resistance
- High resin toughness
- Very good stiffness

## Greater design freedom:

- With complex shape and good edge-filling capability

## Targeted application areas:

- Floor/seat pans
- Truck beds
- Roof modules
- Battery enclosures
- Bonnets/hoods
- Load floors
- Parcel trays
- Sunshades

THE PROPERTIES LISTED ABOVE CAN BE ACHIEVED WHEN COMBINED WITH A SUITABLE PROCESS AND DESIGN



# The art of lightweight design: VITROX<sup>®</sup> and RIMLINE<sup>®</sup> polyurethane solutions

Our VITROX<sup>®</sup> solution is a novel cross-linked isocyanate resin with tunable Tg 100-140°C and flexible, adjustable open times for accurate control over parts processing and high toughness levels.

Our proven RIMLINE<sup>®</sup> solution is formulated as a standard cross-linked polyurethane, enabling high toughness and durability combined with a high reactivity and fast cure.

## 1 NEW VITROX<sup>®</sup> RTM

polyurethane system developed for interior and drive train components, such as leaf springs, seat structures, and EV battery cases

## 2 VITROX<sup>®</sup> HC

polyurethane system developed for Advanced Honeycomb (HC) applications, such as instrument panels, truck beds, bonnets/hoods as well as convertible roofs

## 3 VITROX<sup>®</sup> PUL

advanced polyurethane system developed for Pultrusion (PUL) manufacturing process

## 4 NEW RIMLINE<sup>®</sup> FC

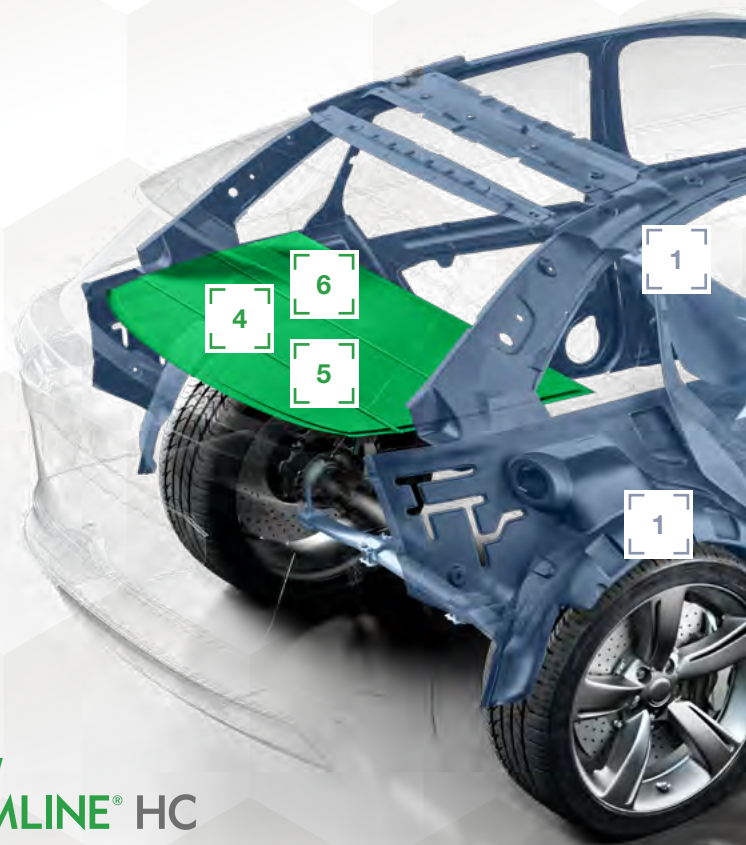
polyurethane system developed for rigid foam to be used as core material in manufacturing of sandwich composite structures

## 5 NEW RIMLINE<sup>®</sup> HC

polyurethane resin system developed for interior sandwich components with paper honeycomb core (HC), such as load floors and interior trims

## 6 RIMLINE<sup>®</sup> PUL

polyurethane resin system developed for Pultrusion (PUL) manufacturing process





**Composite Spray Moulding (CSM) – lightweight and durable**

Honeycomb technology enables complex structural part design. Its low-cost and rapid processing window achieves cycle times between 1-2 minutes with selected glass or carbon fibre, thermoplastic or paper core.

**RTM/HP-RTM/WCM – advanced design and processability**

Wet Compression Moulding (WCM) – Resin Transfer Moulding (RTM) and the fast adoption of High Pressure RTM (HP-RTM) enable you to manufacture integrated, lightweight structures with cycle times of less than 10 minutes. We offer a fully formulated system that offers low initial mixed resin viscosity with good wetting characteristics and low VOC emissions. New systems are offered with or without Internal Mould Release (IMR) and have a tunable catalyst level tailored to your needs.

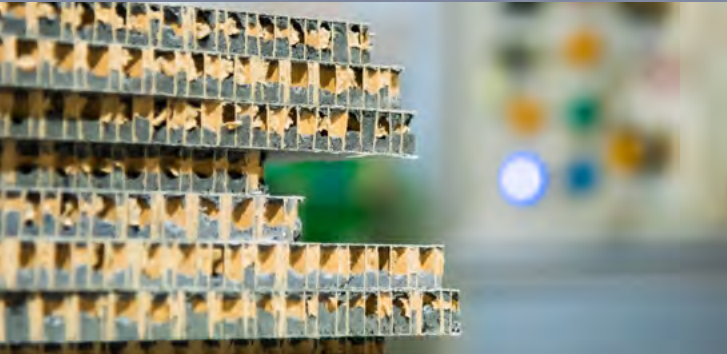
**Pultrusion – cost-efficient mass production**

Pultrusion’s cost-efficient manufacturing method enables lightweight replacement solutions for existing vehicle and industrial metal parts. With excellent part-to-part repeatability and PU injectable resin systems, pultrusion delivers parts with low volatile organic compound (VOC) emissions in a highly productive continuous process that is able to produce parts with complex cross-sections for demanding designs.

# Developed for a cleaner, lightweight future

MDI-based solutions enable manufacturers to improve operational efficiency, reduce environmental impact, and create lightweight, cleaner, and more durable composite end-products that meet performance expectations.

While composite material solutions offer many invaluable benefits for automotive production in general, they are particularly relevant within key sectors such as electrification of the drive train, autonomous vehicles, New Mobility and Mega Platforms.



## Why MDI-based composites?

- Lightweight
- Greater design freedom
- Tunable physical properties
- Low emission and odour
- Flexible manufacturing process

up to **10x**

reduced component weight

## Far more than PU systems

Our global network includes strategically located system houses and key manufacturing hubs worldwide with dedicated local associates. In addition, we have well-equipped competence centres in Europe, Asia and the United States of America with state-of-the-art prototyping and physical testing capabilities.

## How can we help?

At Huntsman, we build partnerships with our customers based on knowledge, trust, and experience. With our broad product portfolio and dedicated technical support, we can help you select the system best suited to your requirements. Across our research and development centres, customers have access to:

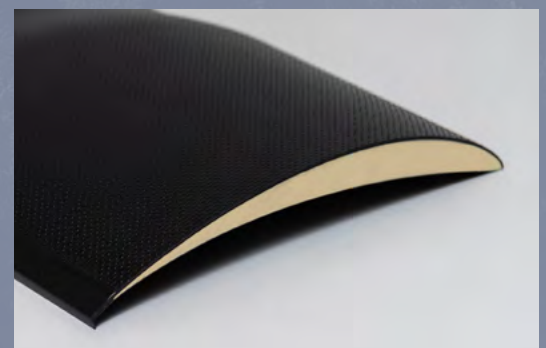
- Extensive characterisation equipment for mechanical testing of resins, composites, and thermomechanical properties
- Dedicated Composite Spray Moulding, HP-RTM and Pultrusion set-ups to develop customer specific formulations
- On-site testing and staff training

Contact us today:

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Scan here to  
submit an inquiry





# Towards sustainability

As we move towards a more carbon neutral and circular society, automotive businesses are searching for alternative resources to fossil-based chemistry. This involves moving towards renewable bio-based, recycled materials and low carbon e-mobility. At Huntsman, we are dedicated to the development of sustainable solutions that can support the automotive industry's environmental ambitions.

As a signatory to the United Nations Global Compact (UNGC) – the world's largest voluntary corporate citizenship initiative – our work is guided by the UN's 17 Sustainable Development Goals. All 17 UN Sustainable Development Goals are important to our business – with three of particular relevance to our VITROX® and RIMLINE® product lines.

**8** DECENT WORK AND ECONOMIC GROWTH



Enabling higher productivity

**12** RESPONSIBLE CONSUMPTION AND PRODUCTION



Optimal use of resources, improved productivity and lightweight design

**13** CLIMATE ACTION



Reduce fuel consumption

For further information please contact your automotive team for your region:

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Hazards, toxicity and behavior of the products may differ when used with other materials and are dependent on the manufacturing circumstances or other processes. Such hazards, toxicity and behavior should be determined by the user and made known to handlers, processors and end users.

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