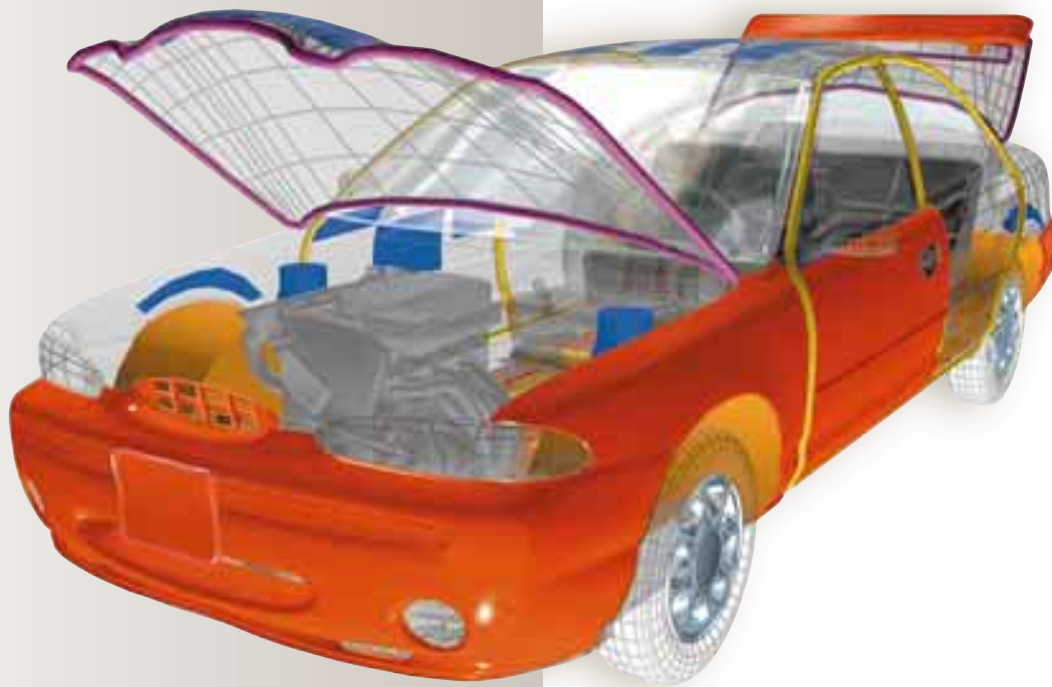




**Dow Automotive**

*Surrounded* by S t r e n g t h and S t y l e.



E X T E R I O R S



# *Evolving...* a D y n a m i c Industry

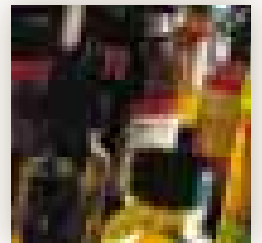
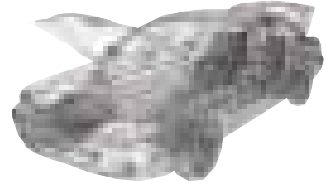
Dow Automotive continues to keep pace with the automotive industry, changing and adapting to meet and exceed your needs globally. We're developing our materials, systems and services to provide innovative responses to your automotive exterior challenges.

We've spent nearly 100 years in the transportation industry as part of The Dow Chemical Company. With the addition of Essex Specialty Products, Inc. and its business affiliates, including Gurit-Essex AG and its business groups, Dow Automotive has the industry knowledge and the global reach to impact all vehicle segments in the automotive market.

Beyond providing the best material for your exterior applications, Dow Automotive design, engineering and technical experts can help you reduce costs and weight; advance styling and finish; and improve durability, dimensional stability and weatherability.

Our broad knowledge in predictive analysis, engineering, testing and part design, coupled with expertise in injection molding, raw materials science and product development, helps us take exterior ideas and opportunities from concept to completion.

# *Evolving*





## *Materials...* to Enhance Strength and Style



Offering the broadest materials portfolio in the industry, Dow Automotive has long been a trusted supplier. Our materials have helped shape and reshape automotive exteriors for over 15 years. And our expertise has helped adapt exciting and innovative applications, including the industry's first plastic door panels, large, intricately molded body panels, highly complex front and rear energy absorption systems, glass bonding systems, truck boxes and exterior trim.

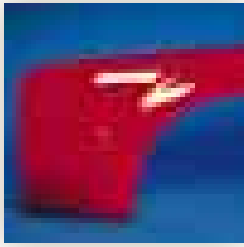
Along with RIM polyurethanes and a growing family of thermoplastic olefin (TPO) materials, we can provide valuable technical expertise and assistance.

Dow Automotive has earned the respect of the automotive industry by making our materials do remarkable things. This unique capability has made us the supplier of choice for many exterior vehicle applications that require:

- Cost and weight reduction
- Styling and aesthetic considerations
- Dimensional stability and CLTE  
(Coefficient of Linear Thermal Expansion) management
- Weatherability and durability

# *Materials*





### *Leading exterior applications*

For exterior applications, there's no question that you can gain significant advantages with materials from Dow Automotive. Our evolving materials and technology enable plastics to increasingly mimic steel in terms of strength, and out-perform steel in terms of styling. And now there are additional benefits, including weight and cost reduction and durability. Contact Dow Automotive to discuss your next exterior challenge and we'll be happy to deliver your advantage.

### *Cost and weight reduction*

Perhaps the biggest challenge for exterior applications is the greater industry and legislative (CAFE) pressure to reduce weight and cost. At Dow Automotive, we're continually striving to make our plastics perform at least as well as steel, if not better in some cases.

For example, our reaction moldable polymers for fascia, body and door panels, bumper beams and exterior trim components, are 40 percent lighter than steel and 25 percent lighter than other plastics. Recent developments in flow rate processability have made it possible to create bigger and stronger RIM parts. And our new blow-moldable-grade ABS for spoilers offers improved handling and processing with fewer hours required to prep for painting, which improves efficiency and lowers manufacturing costs.

### *Exterior applications*

*Roof Panels*

*Body Panels*

*Door Panels*

*Exterior Trim*

*Fascia*

*Front/Rear Systems*

*Mirror Systems*

*Lighting Covers and Surrounds*

*Wheel Covers*

*Grilles*

*Cladding*

*Rocker Panels*

*Acoustical/Structural Management Systems*

*Sealing Systems*

*Door Handles*

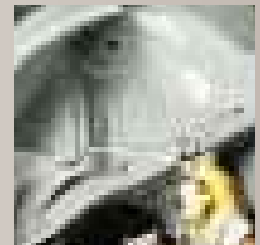
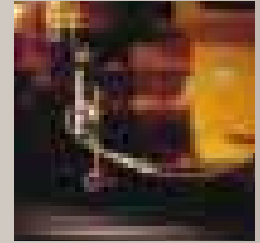
*Window Encapsulation*



### *Styling and aesthetic opportunities*

As plastics continue to become a material of choice in exterior applications, issues of styling and paintability must be addressed. In addition to weight and cost reduction, Dow Automotive is pursuing alternatives to paint and traditional paint processes, which can offer environmental benefits as well as cost and manufacturing efficiencies.

Dow Automotive's TPO polypropylene can give body panels a high-gloss, Class A finish for fascia, side moldings, claddings, truck boxes and tops of rails. SPECTRIM\* polymers offer Class A, high-gloss finishes for body panels, vertical panels and truck fenders. Dow is also evaluating alternative solutions to film laminates, which could enhance future opportunities to recycle substrates and other laminated parts.



### *Dimensional stability*

Dow Automotive's extensive experience with materials and exterior applications offers significant advantages when you must manage issues of dimensional stability, strength and CLTE. As parts become larger and more complex, dimensional stability will continue to be a top priority for safety, aesthetic and functional purposes.

PULSE\* engineering resins, for example, are formulated to withstand high and low temperature extremes and fluctuations while providing top performance in tough applications, from single-piece items like body panels and bumper beams, to intricate components like exterior trim, retainers and wheel covers. PREVAIL\* engineering resins for exterior applications can withstand low-temperature impact strength at temperatures as low as -40°F. And BETABRACE™ reinforcing composites improve structural strength and impact resistance without the added weight and cost typically associated with steel reinforcements.

### *Weatherability and durability*

From the exterior finish to the underside coatings, the basic measures of exterior success are weatherability and durability. The effects of rocks, snow, sun and moisture must all be anticipated in design and materials selection.

BETADAMP™ acoustical damping systems are chip- and corrosion-resistant systems to help optimize cost, weight and acoustical performance for underbody and floorpan applications. BETAGUARD™ sealants for exterior systems can be applied to the underbody, underbody seams and hood to resist chipping, moisture, dirt, dust and vibration. And BETAMATE™ structural adhesives seal against environmental conditions that cause corrosion on doors, hoods, and deck lid hem flanges.

# Exteriors Product Matrix

Dow Automotive provides complete integrated solutions supported by a full line of multifunctional materials, products and systems that are specific to exteriors applications.

<i>Products</i>	<i>Applications</i>	<i>Benefits</i>
AFFINITY* polyolefin plastomers	Exterior molding, claddings, spoilers	<ul style="list-style-type: none"> <li>Improved melt strength, flowability, good processability and higher shear sensitivity</li> </ul>
BETABRACE™ reinforcing composites	<ul style="list-style-type: none"> <li>Reinforce shock towers, fenders, hoods, side mirrors, door handles, deck lids, floorpans, tailgates, roofs, package shelves</li> </ul>	<ul style="list-style-type: none"> <li>Improved flexural strength; distortion, impact, and fatigue resistance</li> <li>Eliminate bass boom in certain applications. No added weight or cost of steel supporting structures</li> </ul>
BETADAMP™ acoustical damping systems	<ul style="list-style-type: none"> <li>Applied to underbody and floorpan</li> </ul>	<ul style="list-style-type: none"> <li>Chip- and corrosion-resistant coating systems optimize cost, weight, and acoustical performance</li> <li>Constrained layer dampers dissipate the vibrational energy of the sheet metal to which it is adhered</li> </ul>
BETAGUARD™ sealants	<ul style="list-style-type: none"> <li>Anti-flutter sealants between inner and outer body panels; exterior sealer for underbody seams and hood, deck lid and door hem flanges; underbody and anti-chip coating</li> </ul>	<ul style="list-style-type: none"> <li>Protect passenger compartment from moisture, dirt, dust, fumes</li> <li>Reduce vibration to help improve vehicle acoustics</li> </ul>
BETAMATE™ structural adhesives	<ul style="list-style-type: none"> <li>Door, hood and deck lid hem flanges; rails and other load-bearing members</li> </ul>	<ul style="list-style-type: none"> <li>Reduce fatigue and failure commonly found around spot welds and fasteners</li> <li>Seal against environmental conditions that cause corrosion</li> <li>Reduce vibration by stiffening overall vehicle structure, so acoustics may also be improved</li> </ul>
BETASEAL™ glass bonding systems	<ul style="list-style-type: none"> <li>Windshields, sunroofs, backlites and quarter glass</li> </ul>	<ul style="list-style-type: none"> <li>Help vehicles meet Federal Motor Vehicle Safety Standards (FMVSS) and other globally mandated requirements for barrier, rollover and roof crush requirements</li> </ul>
CALIBRE* polycarbonate resins	<ul style="list-style-type: none"> <li>Lens covers for headlamps and taillights</li> </ul>	<ul style="list-style-type: none"> <li>Ideal for parts requiring load-bearing capability or energy management and can be modified to enhance special performance requirements including color, ignition resistance, UV stability and improved mold release</li> </ul>

## *Products*

DERAKANE\*  
epoxy vinyl ester resins

## *Applications*

- Truck beds, bumper beams, side impact supports

## *Benefits*

- Known for chemical resistance, excellent wetting, toughness and high temperature properties

DOW Polyethylene  
RESiNS\*

- Bumper fascia

- Good impact-stiffness balance
- Improved paintability

INSPIRE\*  
performance polymers

- Bumper fascia and side cladding

- High-stiffness resins for reduced wall thickness
- Enhanced fit and finish
- Can be customized

MAGNUM\*  
ABS (acrylonitrile butadiene  
styrene) resins

- Exterior trim, wheel covers, mirror housings, door panels

- Offer heat stability, chemical resistance, toughness and impact resistance
- Ideal for components needing molded-in color

PELLETHANE\*  
thermoplastic polyurethane  
elastomers

- Exterior components including grilles, molding, cladding, spoilers

- Provide excellent clarity, chemical resistance and flexibility

PREVAIL\*  
engineering resins

- Exterior molding, cladding, spoilers, fascias

- Provide combination of flexibility and toughness, along with low-temperature impact strength, even at temperatures as low as -40°F

PULSE\*  
engineering resins

- Body panels, exterior trim, bumper beams, wheel covers

- Provide top performance in tough applications, from single-piece items to intricate components
- Ideal for energy management solutions and can withstand high and low temperature extremes and rapid, repeated fluctuations

RETAIN\*  
recycled containing resins

- Covered or painted exterior trim applications including luggage racks, body side moldings, light and mirror housings, wheel covers, grilles, exterior trim

- Achieve performance and aesthetics using eco-friendly recycled products that include 25% post-consumer recycled content

SPECTRIM\*  
reaction moldable polymers

- Fascia, body and door panels, window encapsulation, bumper beams, exterior trim components

- Strength, design flexibility, toughness/gravel resistance and excellent painted DOI

# Delivering...S u c c e s s

Starting with great ideas and following through with innovative materials is only part of Dow Automotive's overall offering. It's also the ability to optimize solutions through extensive technical capabilities and the desire to work cooperatively with you, our customers, and all resources at our disposal, that enables us to achieve success—for you, and for us.

We are happy to work with you at any level—from a simple materials purchase decision to a relationship that utilizes our full-service supplier capability. However, Dow Automotive believes that the more things we can take off your hands, the more overall value we can add to your organization.

From design through product launch, we can support your exterior projects by developing the technology, systems engineering and product support to satisfy current and future vehicle programs. Extensive in-house capabilities for FE predictive analysis (from your downloaded design data or from our own designs), CAE and CAD, as well as other testing and validation technologies, allow us to evaluate the performance of our materials and systems in simulated and actual driving conditions.

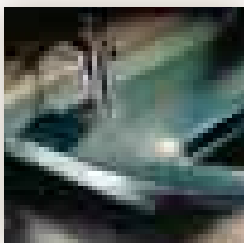
Dow Automotive also provides program management and engineering expertise to assist in program implementation. On-site support at your facilities, along with support from our internal functional groups (engineering, quality, manufacturing engineering, cost estimating, purchasing, customer service, etc.), assures you that our products and systems will meet or exceed your design and engineering requirements. In fact, Dow Automotive has the capability to provide turnkey systems. We can:

- Identify need, challenge or opportunity
- Design, engineer, test and validate a solution
- Specify, optimize or develop a material
- Handle logistics—all the way from raw materials at a tank farm, to containers—and transport to your facility
- Design dispense equipment and manufacturing surroundings relating to process
- Support production start-up
- Manage supply chain

Moreover, we can provide consistent, aligned resources to you on a global basis. Through facilities in nearly 40 cities on six continents, Dow Automotive provides R&D, manufacturing, sales and marketing and field service support worldwide.

From great ideas to materials and systems solutions that ensure our mutual success—Dow Automotive is a good place to start. Challenge us—anytime, anywhere.

We're Dow Automotive. Throughout the vehicle. Throughout the world.





*We listen. We deliver.*



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Dow Automotive is a business unit  
of The Dow Chemical Company and its subsidiaries.