

Total Solutions for Commercial Transportation

*Multifunctional systems for the manufacture and repair of bus, truck,
rail, recreation, industrial, emergency and agricultural vehicles*





ESTACIÓ

3 L-1

SECCIÓ
XAPA

Commercial vehicle expertise

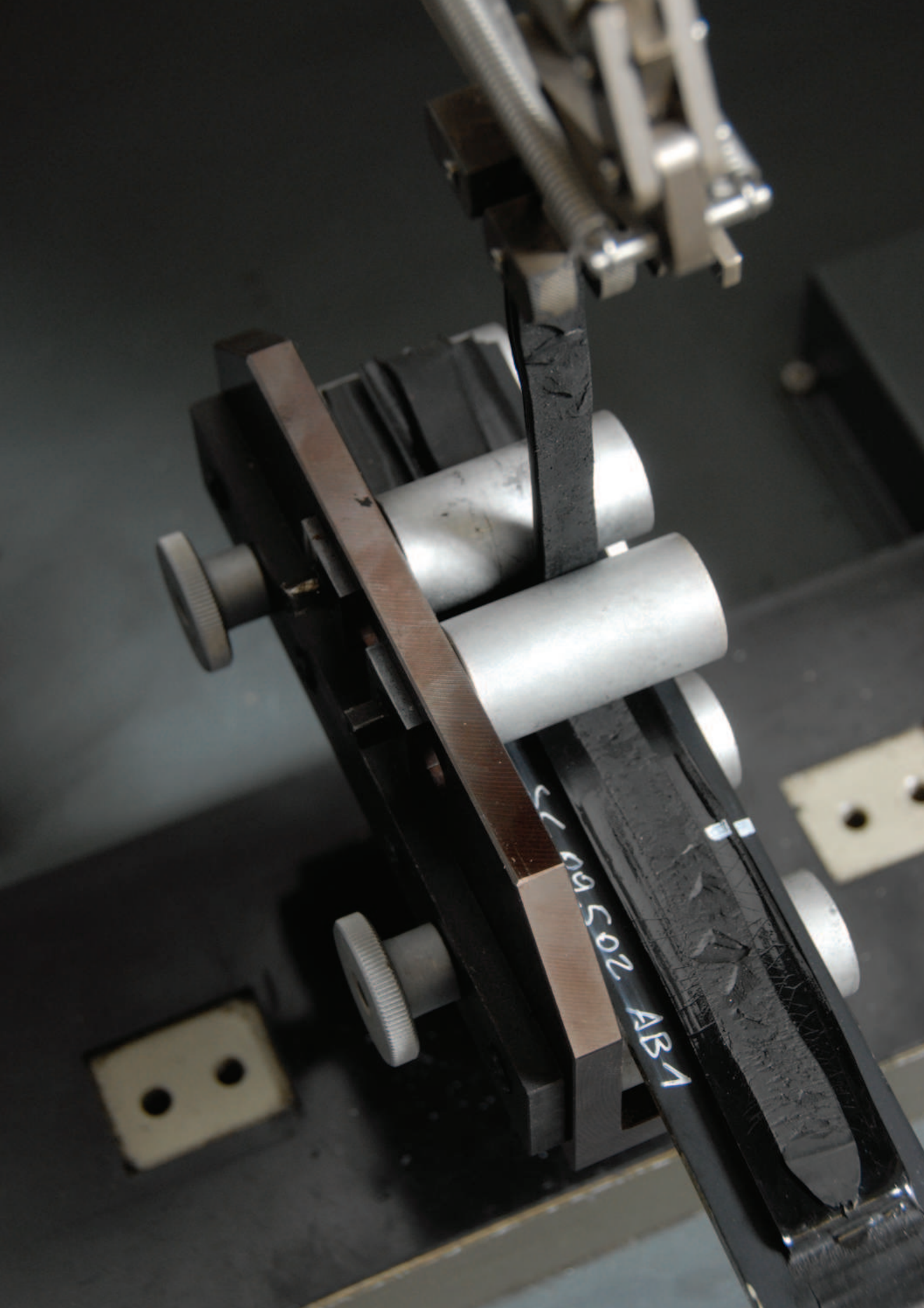
Dow Automotive provides manufacturers of commercial vehicles with total solutions that perform for interior, exterior, powertrain and under-the-bonnet applications. Our market areas of expertise include:

- Buses/motor coaches
- Rail cars and coaches
- Medium- and heavy-duty truck cabs, sleepers and trailer bodies
- Recreational and leisure vehicles
- Emergency vehicles
- Industrial/agricultural equipment
- Aftermarket repair

Our materials expertise can help increase a vehicle's structural integrity without added weight or cost; improve acoustical performance for a quieter riding experience; or enhance thermal management for occupant comfort in all-climate environments.

Additional benefits of Dow Automotive solutions are interdependent upon our variety of multifunctional systems, which generate value across the entire vehicle.





5160502
AB1

Total solutions

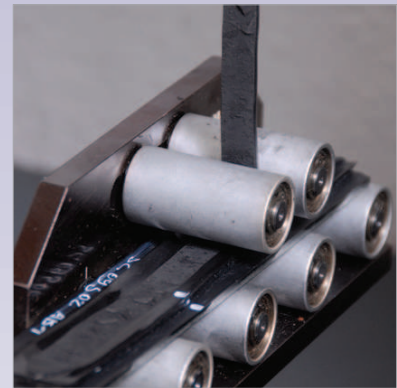
Our solutions portfolio is broader than ever and is supplied worldwide. All products are designed to be used alone or in combination to create custom solutions that improve process efficiency, reduce weight, enhance vehicle performance and assure passenger comfort. Our industry-leading offerings include:

- Plastics
- Glass bonding systems
- Vehicle body structure enhancements
- Acoustical management and noise, vibration and harshness (NVH) systems
- Adhesive and sealant technologies
- Films
- Fluids
- Emissions control technology (diesel particulate filters)

Dow Automotive also offers localised product distribution and appropriate application training through our aftermarket group to ensure that vehicles maintain their structural integrity and Class A appearance long after they leave the factory. Our business is uniquely back-integrated into the supply stream, which helps ensure quality, consistency and availability of materials.



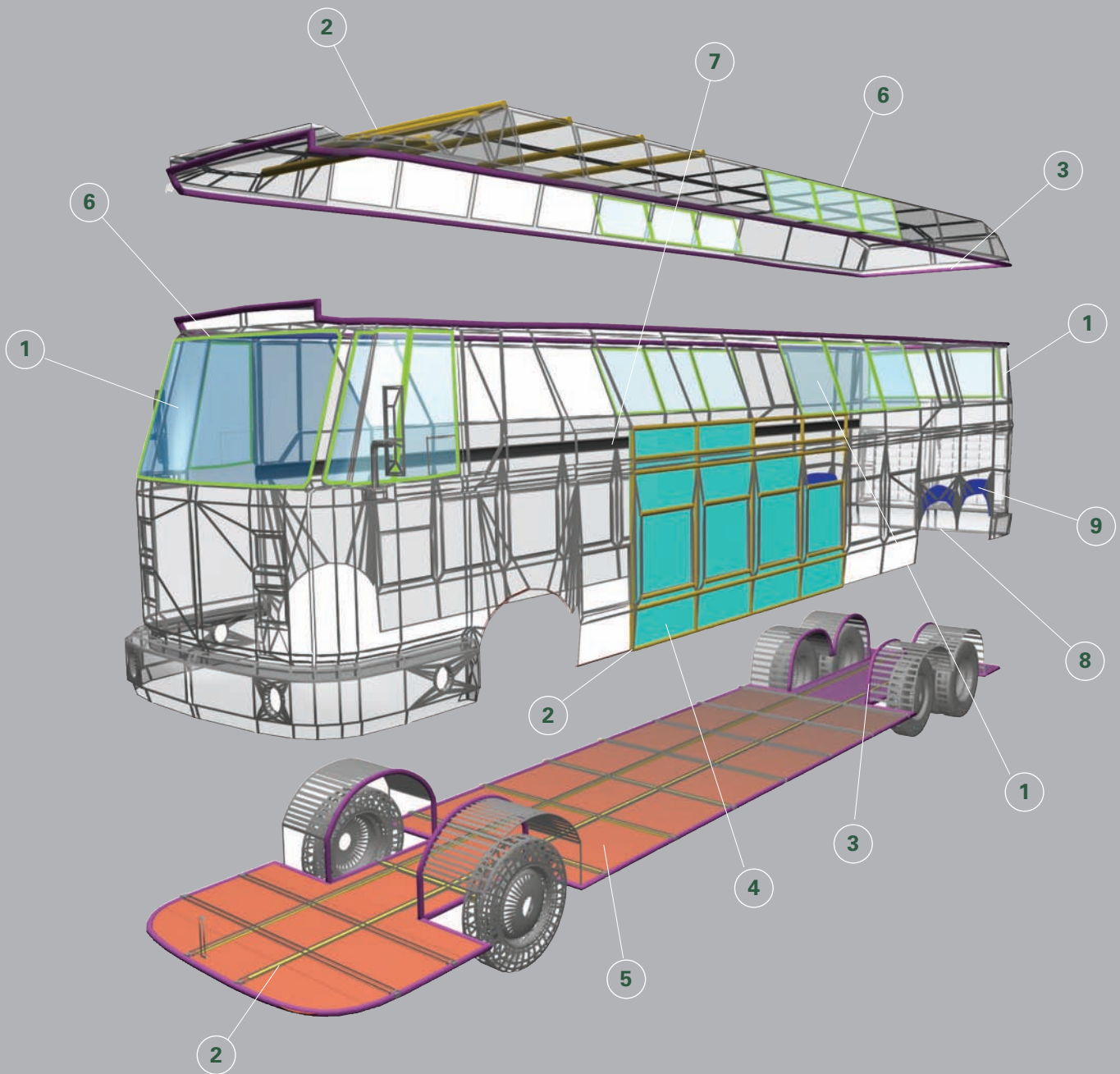
Peel strength tests enable Dow Automotive experts to quantitatively compare cut bead performance.



Dow Automotive testing facilities can replicate most manufacturing and real-world conditions for all vehicle types.



Knife test on float glass shows resiliency of cut bead.



Key product solutions from Dow Automotive

- 1) Direct glazing/glass bonding solutions
- 2) Structural adhesives for roof, floor, body panel and other component bonding
- 3) Sealer systems for seam sealing, gap filling and underbody coating
- 4) Acoustical/structural foams that provide acoustical or energy management properties
- 5) Acoustical damping systems for underbody coating and sealing with inherent acoustical management properties
- 6) Semi-structural adhesives for roofs, side panels, luggage compartments, floors and cant rails
- 7) Thermoplastic and thermoset applications
- 8) Diesel particulate filters
- 9) Reinforcing composites

Advancements for the manufacture and repair of commercial vehicles

For the manufacture of commercial vehicles, Dow Automotive offers an extensive portfolio of solutions based on more than 40 years of experience in the transportation market. From front bumpers to roof panels to underbody coatings, Dow Automotive has the products and evolving technologies needed to:

- Meet regional fire, smoke and flame passenger rolling stock regulations
- Improve fuel economy and range via weight savings
- Lower manufacturing costs and improve efficiencies
- Address NVH, comfort and performance issues
- Reduce preparation steps
- Improve throughput and efficiency gains
- Improve overall vehicle structural support and stiffness
- Extend vehicle life
- Improve aesthetics

We also provide a full product range so commercial vehicles can be fully restored to their original specifications for safety, comfort and performance. Dow Automotive aftermarket products help maintain original equipment manufacturer (OEM) standards for structural enhancement and acoustical and thermal management.

Aftermarket systems are available for:

- Direct glazing
- Bonding
- Sound damping
- Sealing
- Plastics repair
- Reinforcing
- Gap filling



Glass bonding systems from Dow Automotive enable repaired windscreens to support a vehicle's structural integrity and return it to original manufacturer specifications.



Dow Automotive structural adhesives can be used for aftermarket body repair on a variety of substrates.



For plastic bonding and repair, a complete line of cleaners, primers and adhesives help vehicles meet aesthetic and performance standards.



Glass bonding solutions

The superior performance of Dow Automotive glass bonding systems, used worldwide for structural bonding and sealing of stationary glass, helps meet globally mandated safety requirements for barrier and roof crush regulations. Our cleaners, primers and adhesives provide a wide range of mechanical properties to suit all vehicle requirements, and are compatible with all production processes, including cold- and warm-applied systems.

Technologies include:

- Primerless to paint
- Non-conductive
- High modulus
- Quick fix
- Fast curing
- One- and two-part systems
- UV resistance
- One-step glass primers
- Different primers for various substrates, including cold-rolled galvanised steel, stainless steel, aluminium, thermoplastics, fibre-reinforced plastics and plywood



When applied according to manufacturer's specifications, using cleaner and primer, BETAMATE™ systems enable vehicles to comply with global barrier, rollover and roof crush safety regulations.



BETAMATE glass bonding systems are developed to provide specific advantages for the entire spectrum of commercial vehicle substrates and coatings.



A variety of innovative BETAMATE glass bonding systems support commercial vehicle manufacturing and repair, helping customers save costs and reduce installation time.



Structural bonding solutions

Dow Automotive has a long history of providing high-quality structural adhesives to the commercial transportation industry. Our structural adhesives improve static and dynamic vehicle stiffness over time, and minimise metal fatigue by providing a continuous bond line between similar and dissimilar mating components. In addition, BETAMATE™ structural adhesives provide an option to overcome weld access limitations.

Dow Automotive offers a variety of formulas, such as:

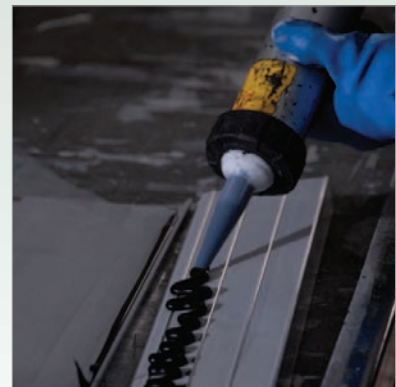
- General purpose structural adhesives
- Induction-gellable hem flange adhesives for quick fixing
- Glass bead-containing adhesives to maintain bond line thickness and provide mechanical interlocking of hems
- Improved-toughness structural adhesives
- Two-component structural adhesives



BETAMATE structural adhesives reduce vibration by stiffening overall vehicle structure.



Acoustics are also improved by the use of BETAMATE structural adhesives in applications like the roof bonding (above) and the floor bonding (shown here).



Applications such as the luggage door are secured by BETAMATE structural adhesives to ensure solid service during frequent and long-term use.



Semi-structural adhesives

Included in the wide range of Dow Automotive solutions are semi-structural adhesives, which bring both bonding and sealing capabilities to commercial vehicle manufacturing and repair processes. Offering permanent elasticity and good adhesion to a wide variety of substrates, semi-structural adhesives are also over-paintable for Class A finish with most paint systems.

Protecting the vehicle against dirt, dust, moisture and fumes, semi-structural adhesives, such as BETALINK™ adhesive, also provide acoustical and thermal management advantages, road/engine noise absorption and weight reduction when compared to similar materials.

Typical applications include:

- Aluminium roof sheets
- Painted aluminium cant rails
- Composite or aluminium side panels
- Luggage compartments
- Floors/carpets



Semi-structural adhesives from Dow Automotive can be used on a variety of substrates, including sheet and coated metal, glass, polyurethane and wood.



BETALINK adhesive is formulated for internal and external commercial vehicle applications.



BETALINK adhesive is an excellent choice for many applications in commercial vehicle manufacturing and repair.



Body protection/sealants

Dow Automotive sealants not only protect passenger compartments from dirt, dust, moisture, fumes, corrosion and paint chipping, but also provide acoustical and thermal management advantages. Custom formulations applied to seams, joints, roofs, floor underbody and wheel wells improve acoustics by reducing vibration and contribute to thermal management by addressing cabin temperature issues.

Products include:

- Body shop sealants
- Paint shop sealants
- Sealants placed over interior passenger compartment body sheet metal joints around door and trunk openings
- A range of formulations that makes it financially feasible to use our sealants for both paintable and non-paintable applications



Dow Automotive bonding and sealing solutions protect interior compartments from external dirt and noise.



Structural, acoustical and thermal benefits are also achieved with sealing solutions.



Sealing vehicle body joints and seams provides added protection against corrosion.



2010
THERMALL



Dow Automotive

GR10
GR15
GR18
GR20
GR25
GR30
GR35
GR40
GR45
GR50
GR55
GR60
GR65
GR70
GR75
GR80
GR85
GR90
GR95
GR100

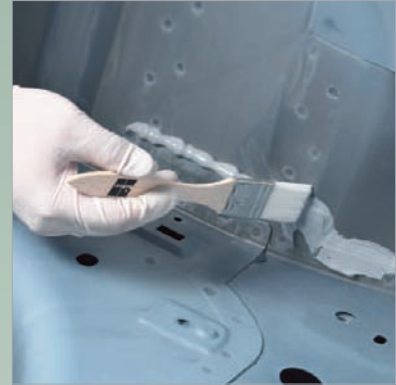
Seam sealants/adhesives

Customised solutions from Dow Automotive for sealing, filling and bonding lightweight materials provide significant long-term advantages. Available in black, grey and white, these single-component, moisture-curing polyurethanes, like BETAFILL™ seam sealants, provide permanent elasticity and good adhesion to a wide variety of substrates. In some cases, wipes, cleaners and primers are required, but seam sealants/adhesives can be applied primerless on many substrates, including coated sheet steel, glass-reinforced plastics (GRP), polyurethane, polycarbonate and wood.

Typical commercial applications include:

- Internal seam joints between panels
- Seam sealing on GRP roof panels
- Sealing aluminium fabrications
- Gap filling between panels

- Cosmetic finishing of internal/external joints
- Sealing of lightweight construction materials
- Bedding compounds to absorb shock and vibration
- Sealing of wood, metal, plastic door frames and window fittings
- Bulkhead sealing and door skin fixing
- Wheel arch sealing



Advanced materials technologies enable Dow Automotive to provide a wide range of seam sealant and adhesive solutions based on specific customer requirements.



Sealing vehicle body joints and seams provides added protection against corrosion while also protecting interior compartments from dust, dirt and moisture.



Sealants from Dow Automotive also achieve bonding, acoustic and thermal improvements in commercial vehicle applications.



Cleaners, primers and activators

To achieve optimum results from adhesives and sealers, proper surface preparation is required so that a chemical bond can form between substrates. Specific grades of BETACLEAN™ cleaners, BETAPRIME™ primers and BETAWIPE™ activators are recommended as parts of complete Dow Automotive systems for commercial vehicle manufacturing and repair processes.

BETACLEAN cleaners from Dow Automotive are designed to eliminate contaminants such as rust, dirt, grease and oil prior to surface priming for adhesive repair, sealing, filling and bonding. Additionally, BETACLEAN can be used to remove excess uncured adhesives from a variety of finished and unfinished surfaces.

BETAPRIME primers from Dow Automotive are used to encourage crosslinking between substrates and adhesive compounds. BETAPRIME also offers excellent UV stability and inhibits substrate corrosion.

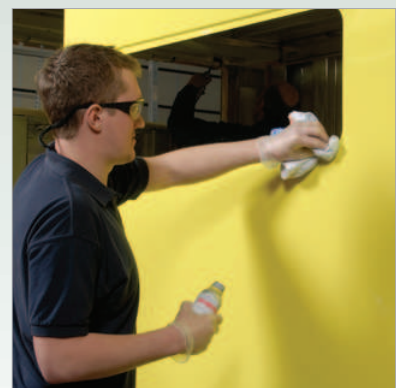
BETAWIPE activators are also recommended for specific substrates and applications. Used in the glass bonding process and also with semi-structural adhesive applications, BETAWIPE provides surface cleaning advantages, which help improve crosslinking and bonding.



BETACLEAN provides advanced surface preparation and is a vital part of the adhesive process for glass bonding, as well as sealing and bonding of body panel repairs.



Used as part of a complete glass bonding system, BETAPRIME is also used as an adhesion promoter on body surfaces in conjunction with BETAMATE™ structural adhesives.



Apply BETAWIPE with a continuous movement to clean and activate surfaces as part of a complete Dow Automotive adhesive system.

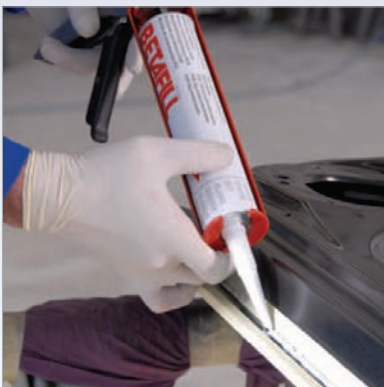
Product matrix

Dow Automotive provides the industry's broadest range of plastics, adhesives, sealants and acoustical, structural and thermal management solutions. Our goal is to utilise our extensive experience to exceed your requirements, meet appropriate regulations, reduce costs and accelerate time to market. Detailed product information is also available in our materials finder located at www.dowautomotive.com.

Products	Applications	Benefits
<p>BETABRACE™ reinforcing composites</p> <p>A woven glass mat, adhesive polymer and release paper for use on sheet metal and thermoset surfaces</p>	<ul style="list-style-type: none"> Applied in fabrication, body or paint shops to reinforce shock towers, wings, bonnets, side mirrors interior roof panels and handles, floorpans, tailgates and parcel shelves 	<ul style="list-style-type: none"> Improved flexural and distortion strength, impact and fatigue resistance Can eliminate bass boom No added weight or cost of steel supporting structures
<p>BETACLEAN™ cleaners</p>	<ul style="list-style-type: none"> Glass surfaces Bonding surfaces Encapsulations (PUR-RIM, PVC) Painted surfaces including PAAS Aftermarket 	<ul style="list-style-type: none"> Conform to OEM specifications for glass bonding Safe and fast glass cleaning to facilitate faster primer/adhesive link-up
<p>BETADAMP™ acoustical damping systems</p> <p>Sprayable, vibration-damping coatings; low-density, expandable, impact-absorbing coatings; pressure-sensitive constrained layer dampers (butyl rubber laminated to aluminium)</p>	<ul style="list-style-type: none"> Applied to underbody and floorpan with industry-standard production equipment 	<ul style="list-style-type: none"> Chip- and corrosion-resistant coating systems optimise cost, weight and acoustical performance on existing and new vehicle platforms Constrained layer dampers dissipate the vibrational energy of the sheet metal to which they are adhered
<p>BETADAMP™ BETAPHON™ extrudable vibration-damping coatings</p>	<ul style="list-style-type: none"> Applied robotically to areas where high vibration damping is required, including doors and roofs 	<ul style="list-style-type: none"> Offer an automated alternative in the body shop or stamping plant to manually applied damping pads
<p>BETAFILL™ polyurethane seam sealants</p> <p>Seal lightweight construction materials</p>	<ul style="list-style-type: none"> Used as bedding compounds to absorb shocks and vibrations Seal wood, metal, plastic door frame and window sill fittings Used for bulkhead sealing, door-skin fixing Seal mud guards and wheel arches 	<ul style="list-style-type: none"> Permanent elasticity Paintable Good coefficient of movement and adhesion between different substrates Water and weather resistant Non-corrosive Brushable Vibration and shock absorbant Silicone free

Products	Applications	Benefits
<p>BETAFOAM™ NVH systems Low-density, injectable formulations for high-performance acoustical seals</p> <p>High-density formulations for structural components</p> <p>Low-MDI formulations (with relieved ventilation requirements) for application in post paint or general assembly</p>	<ul style="list-style-type: none"> • Injected into vehicle cavities to form reliable acoustical seals and/or manage impact forces in frame structures 	<ul style="list-style-type: none"> • Acoustically seal to prevent noise from resonating through vehicle cavities • Improve body rigidity and crashworthiness
<p>BETAGUARD™ sealants Body, trim and paint shop sealers</p>	<ul style="list-style-type: none"> • Anti-flutter sealant between inner and outer body panels • Interior sealer for floorpan area and engine compartments • Exterior sealer for underbody seams, bonnet, door hem flanges • Underbody and anti-chip coating 	<ul style="list-style-type: none"> • Paintable surface promotes Class A finish • Protect passenger compartment from moisture, dirt, dust, fumes • Reduce vibration to help improve vehicle acoustics
<p>BETALINK™ adhesive Semi-structural adhesives</p>	<ul style="list-style-type: none"> • Aluminium roof sheets • Painted aluminium cant rails • Composite or aluminium side panels • Luggage compartments • Floors/carpets 	<ul style="list-style-type: none"> • Acoustical and thermal management • Road/engine noise sound absorption • Protects the vehicle against dirt, dust, moisture and fumes • Weight reduction when compared to similar materials • Paintable for Class A finish • Can be applied to a wide range of substrates
<p>BETAMATE™ glass bonding systems Used worldwide for structural bonding and sealing of stationary glass</p>	<ul style="list-style-type: none"> • Windscreens, taillights and quarter light glass for all commercial vehicles. • Aftermarket 	<ul style="list-style-type: none"> • Help vehicles meet globally mandated requirements for barrier, rollover and roof crush regulations • Improve crashworthiness • Enhance structural integrity • Reduce contact corrosion
<p>BETAMATE structural adhesives Replace welds and mechanical fasteners in joining a variety of similar and dissimilar substrates</p>	<ul style="list-style-type: none"> • Roof, panel and floor bonding • Hem flanges • Replace or reinforce weld joints in engine compartments, cockpits, roof panels • Reinforce rails and other load-bearing members • Bond structural headliners directly to roof • Aftermarket 	<ul style="list-style-type: none"> • Reduce fatigue and failure commonly found around spot welds and fasteners • Seal against environmental conditions that cause corrosion • Reduce vibration by stiffening overall vehicle structure, so acoustics are also improved • Bond dissimilar substrates
<p>BETAPRIME™ primers Glass and body primers</p>	<ul style="list-style-type: none"> • Primer for glass and paint in OE and aftermarket applications • Aftermarket 	<ul style="list-style-type: none"> • Excellent UV stability • Ease of use • Packaging designed to reduce waste and improve efficiency • System simplifies activation of the bonding surface • Faster primer/adhesive link-up • Conform to OEM specifications

Products	Applications	Benefits
<p>BETAWIPE™ activators Adhesion promoters for plastics</p>	<ul style="list-style-type: none"> • Reactivate remaining “cut-back” PUR, PAAS, PUR and PVC RIM encapsulations • Aftermarket 	<ul style="list-style-type: none"> • Flash off time: 10 minutes
<p>Diesel particulate filters Filters for light-, medium- and heavy-duty diesel engines</p>	<ul style="list-style-type: none"> • Help meet increasingly stringent global diesel engine emissions regulations 	<ul style="list-style-type: none"> • Enable improved engine performance • Improve overall cost efficiencies • High-performance and high-endurance materials
<p>DOW brake fluids™</p>	<ul style="list-style-type: none"> • Motor vehicles • Aftermarket 	<p>Improved:</p> <ul style="list-style-type: none"> • Powertrain performance • Corrosion protection • Compatibility with braking system components • Long-term stability
<p>Thermoplastics and thermosets</p>	<ul style="list-style-type: none"> • Body panels • Front and rear systems • Surrounds • Wheel covers • Grilles • Moulding, cladding • Trim 	<p>Improved:</p> <ul style="list-style-type: none"> • Impact resistance • Corrosion resistance • Energy management • Vehicle aesthetics and styling options
<p>UCON™ compressor lubricants</p>	<ul style="list-style-type: none"> • Mobile air compressors for OEM and aftermarket • Compressor lubrication • Assembly lubricant • Air conditioning recharges • Aftermarket 	<ul style="list-style-type: none"> • Equal or better lubricity performance than double end-cap products at a lower price • Improved performance and compatibility with a variety of air compressor technologies



BETA-FILL™ seam sealants are used for seam and panel sealing, gap filling and panel bonding.



BETA-PRIME™ primer is applied to the roof surface prior to the application of BETA-MATE™ structural adhesive.



Dow Automotive BETA-MATE glass bonding systems help seal stationary glass, adding to the vehicle's structural strength and protecting the interior cabin from dirt and other environmental elements.

18

FE

We listen. We deliver.



Dow Automotive

Dow Automotive
1250 Harmon Road
Auburn Hills, Michigan 48326
USA
Phone: +1-248-391-6300
Toll free: +1800-441-4369
Fax: +1-248-391-6417
E-mail: dowautomotive@dow.com
www.dowautomotive.com

Dow Automotive
Dow Europe GmbH
Freienbach Branch
Wolleraustrasse 15-17
8807 Freienbach
Switzerland
Phone: +41-(0)55-416-81-11
Toll free: 00800 3 694 6367*
In Finland: 990 3 694 6367
In Italy: 800 783 825
Fax: +41-(0)55-416-82-20

*Toll free from Austria, Belgium, Denmark, France, Germany, Hungary, Ireland, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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

Form No. EUR 299-50574-1007 HMC/FG

NOTICE: No freedom from any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change over time, the Customer is responsible for determining whether products and the information in this document are appropriate for the Customer's use and for ensuring that the Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Dow assumes no obligations or liability for the information in this document. No warranties are given.



Product Selector Guide



Commercial transportation

Application Characteristics	Product Grade	Description
Surface Cleaning	BETACLEAN™ 3300 cleaner BETACLEAN 3350 BETACLEAN 3900 BETABRADE™ F1 cleaner	Glass pretreatment Metal and general purpose cleaner Glass and general purpose cleaner Contamination & silicone remover
Surface Conditioning	BETAWIPE™ 6600 activator* BETAWIPE 3700 BETAPRIME™ 5700 primer BETAPRIME 5500 BETAPRIME 5023 BETAPRIME 5404 BETAPRIME™ VP01709 BETAPRIME 1707 A+B	BETASEAL™ Uni-wipe glass bonding system activator New multifunctional activator New multifunctional primer One-step glass primer 2K long open time glass primer Paint and plastics primer Paint and plastics primer (opaque version) 2K bare metal etch primer
Sealants	BETAFILL™ 10210/11/15 seam sealant	PU-based sealant in white, grey or black with built-in adhesion promoter
Adhesive Sealants	BETALINK™ 1102 adhesive BETAMATE™ 7140 adhesive BETAMATE 1100	PU-based NC white adhesive with built-in adhesion promoter POP-based NC white, UV-resistant adhesive with built-in adhesion promoter PU-based MM LC, black, UV-resistant adhesive
Bonding	BETASEAL 7120 adhesive BETAMATE 7197 BETAMATE 7185 BETAMATE™ 7425* BETAMATE 2710	PU-based high-viscosity standard adhesive PU-based medium-viscosity, high modulus NC multifunctional adhesive PU-based high-viscosity, standard adhesive with QUICK FIX effect PU-based medium-viscosity, Uni-wipe adhesive with built-in adhesion promoters 2K PU-based high-viscosity MM NC adhesive
Structural Bonding	BETAMATE 7385 BETAMATE 2096	2K low-viscosity epoxy adhesive 2K low-viscosity crash-durable structural bonding epoxy
Plastic Bonding	BETALINK K2 BETAMATE™ 2810 BETAMATE 7020/7080 BETAMATE LESA	2K PU-based low strength/low modulus 2K PU-based medium strength/MM 2K PU-based high strength/high modulus 2K low energy substrate adhesive

MM - Medium modulus

NC - Non-conductive

LC - Low conductive

2K - Two-component

PU - Polyurethane

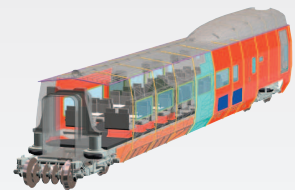
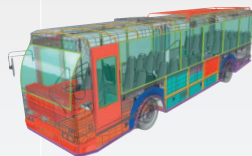
POP - Polyoxypropylene

*Part of the BETASEAL Uni-wipe glass bonding system

Dow Automotive Product Specification Guide

Commercial transportation

- Direct glazing/glass bonding solutions
- Structural adhesives for roof, floor, body panel and other component bonding
- Sealer systems for seam sealing, gap filling and underbody coating
- Acoustical/structural foams that provide acoustical or energy management properties
- Acoustical damping systems for underbody coating and sealing with inherent acoustical management properties
- Reinforcing composites for shock towers, wings, bonnets, roofs and other applications
- Thermoplastic and thermoset applications
- Diesel particulate filters





Surface Preparation Guide



Commercial transportation

Applications	Cleaning Preparation			Priming Preparation			
	BETACLEAN™ 3300	BETACLEAN 3350	BETACLEAN 3900	BETAPRIME™ 1707 Etch Primer	BETAPRIME 5500 Glass & Plastic Primer	BETAPRIME 5071/5023 Long Open Time Primer	BETAPRIME 5004 UV Resistant
Bare Metals & Alloys, Extrudables, Rolls or Sheets		•		•			
Glass Ceramics	•		•		•	•	
Glass without Ceramic	•		•		•		•
Painted and/or Primed Surfaces	•		•		•		
Cathodic Electrodeposition Coatings			•		•		
Phenolics		•			•		
Composites		•	•		•		
Timber		•			•		
Glass Fibre		•	•		•		
Sheet-moulding Compound		•	•		•		
Polycarbonate	•				•		
Acrylonitrile Butadiene Styrene		•			•		

Performance subject to trials. Metals may need abrasion to remove surface corrosion.