Total Solutions for Commercial Transportation

Multifunctional systems for the manufacture and repair of bus, truck, rail, recreation, industrial, emergency and agricultural vehicles
Dow Automotive Systems 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 adhesives and sealants help increase a vehicle’s structural integrity. We provide superior sealing solutions; improve acoustical performance for a quieter riding experience; or enhance thermal management for occupant comfort in all-climate environments.

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

With decades of experience in body structural enhancement, Dow Automotive Systems has the experience and expertise to deliver bonding, sealing and direct glazing solutions to the commercial transportation market. And with robust product performance and easy application processes, we can help you deliver strong and durable bonding to your customers.
Key Product Solutions from Dow Automotive Systems

1 Direct glazing solutions
2 Structural and semi-structural adhesives for roofs, floors, body/side panels, luggage compartments, cant rails 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
Bonding technologies from Dow Automotive Systems are designed to meet the specific needs of traditional and hybrid material assembly with the ability to bond dissimilar substrates. Thick bond lines offer high strength, fatigue and crash resistance with excellent elasticity – even after weathering. The potential for reducing weight can also help enable CO₂ emission reduction through improved fuel efficiency.

Our range of adhesives and surface preparation products include:

- **BETAMATE™ glass bonding systems** - for structural and stationary direct glazing, meeting globally mandated requirements for rollover and roof crush
- **BETAMATE™ structural adhesives** - replace mechanical fasteners to help enable increased stiffness for improved crash resistance and reduce vibration to improve acoustical performance – all while reducing weight versus fasteners by up to 20 percent
- **BETAFILL™ polyurethane seam sealants** - help prevent moisture intrusion that can lead to corrosion
- **BETATECH™ solvent-free sealants** - offer exceptional primerless performance on a variety of substrates
- **BETAPRIME™ and BETASEAL™ primers** - enable exceptional surface preparation while minimizing waste

**Global Benefits**

As a leading supplier of materials, technology and service support for vehicle bonding and sealing applications, we offer a globally consistent, reliable and secure material supply. Our offering includes adhesives, direct glazing systems, polyurethanes, sealants, emissions control technology, films, fluids, structural enhancement and acoustical management solutions. And on the front end, our advanced engineering team can design, test and validate the right solution for each customer’s unique assembly operation.

®™Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow
The excellent performance of Dow Automotive Systems direct glazing 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 resistant
- One-step glass primers
- Different primers for various substrates, including cold-rolled galvanised steel, stainless steel, aluminium, thermoplastics, fibre-reinforced plastics and plywood

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

Left: When applied according to manufacturer’s specifications, using the complete combination of cleaners, primers, and adhesives, BETAMATE systems enable vehicles to comply with global barrier, rollover and roof crush safety regulations.

Above: A variety of innovative BETAMATE glass bonding systems support commercial vehicle manufacturing and after-sales repair, helping customers save costs and reduce installation time.
Seam Sealants/Adhesives

Customised solutions from Dow Automotive Systems 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 and BETATECH™ solvent-free 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), PU, 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
Vehicle durability, structural integrity and noise, vibration and harshness (NVH) performance can be enhanced with structural and semi-structural bonding solutions from Dow Automotive Systems.

Compared to welds and mechanical fasteners, our adhesives improve vehicle stiffness and minimize metal fatigue by providing a continuous bond line between substrates. Acoustics also are improved due to reduced vibration. BETAMATE™ structural adhesives can bond dissimilar substrates and are used for:

- Roof and floor bonding
- Body panel bonding
- Luggage compartment and other component bonding

BETAMATE adhesives are available in one-part (1K) and two-part (2K) systems. 1K formulations require oven cure. For commercial transportation, 2K adhesives are recommended because no oven cure is necessary.

Semi-structural adhesives provide both bonding and sealing properties and can adhere to wood, glass, PU, sheet and coated metal. They are also paintable for a Class A finish. Typical applications include:

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

In addition, Dow Automotive Systems is introducing a new line of structural adhesives specially formulated for use with lightweight composites. Soon to be sold under the BETAFORCE™ trademark, these specialty adhesives exhibit high modulus, high elongation, greater shear strength and stable mechanical properties over a wide temperature range.
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 from Dow Automotive Systems are recommended as parts of complete systems for commercial vehicle manufacturing and repair processes.

BETACLEAN cleaners 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 Systems 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.
BETAPRIME™ primers are available in multiple formulations to meet your specific adhesion and substrate requirements. All BETAPRIME primers offer:

- Excellent UV stability
- Ease of use
- Simplified surface activation
- Faster primer/adhesive link-up

Your Dow Automotive Systems representative can help you select the best BETAPRIME primer for your application, or visit www.dowautomotive.com for more information on the features and benefits of our complete line of primers.
Dow Automotive Systems provides the industry’s broadest range of 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

- **BETAFILL™ polyurethane seam sealants and BETATECH™ solvent-free sealants**
  - Seal lightweight construction materials

- **BETALINK™ adhesive**
  - Semi-structural adhesives

- **BETAMATE™ glass bonding systems**
  - Used worldwide for structural bonding and sealing of stationary glass

- **BETAMATE structural adhesives**
  - Replace welds and mechanical fasteners in joining a variety of similar and dissimilar substrates

- **BETAPRIME™ primers**
  - Glass and body primers

### Applications

- **BETAFILL™ and BETATECH™**
  - 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

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

- **BETAMATE™**
  - Windscreens, taillights and quarter light glass for all commercial vehicles
  - Aftermarket

- **BETAMATE structural adhesives**
  - 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

### Benefits

- **BETAFILL™ and BETATECH™**
  - Permanent elasticity
  - Paintable
  - Good coefficient of movement and adhesion between different substrates
  - Water and weather resistant
  - Non-corrosive
  - Brushable
  - Vibration and shock absorbent
  - Silicone free

- **BETALINK™**
  - 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

- **BETAMATE™**
  - Help vehicles meet globally mandated requirements for barrier, rollover and roof crush regulations
  - Improve crashworthiness
  - Enhance structural integrity
  - Reduce contact corrosion
  - 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

- **BETAPRIME™**
  - Primer for glass and paint in OE and aftermarket applications
  - Aftermarket

- **BETAFILL™ and BETATECH™**
  - 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
<table>
<thead>
<tr>
<th>Products</th>
<th>Applications</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BETAWIPE™ activators</td>
<td>Adhesion promoters for plastics</td>
<td>Reactivate remaining “cut-back” PUR, PAAS, PUR and PVC RIM encapsulations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aftermarket</td>
</tr>
<tr>
<td>BETAFILE™ seam sealants are used for seam and panel sealing, gap filling and panel bonding.</td>
<td>• Flash-off time: 10 minutes</td>
<td>Dow Automotive Systems BETAMATE 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.</td>
</tr>
<tr>
<td>Application Characteristics</td>
<td>Product Grade</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Surface Cleaning</strong></td>
<td>BETACLEAN™ 3300</td>
<td>Glass cleaner</td>
</tr>
<tr>
<td></td>
<td>BETACLEAN 3350</td>
<td>Glass, paint, metal cleaner</td>
</tr>
<tr>
<td></td>
<td>BETACLEAN 3500</td>
<td>Uncured adhesive cleaner</td>
</tr>
<tr>
<td></td>
<td>BETACLEAN 3900</td>
<td>General purpose cleaner</td>
</tr>
<tr>
<td></td>
<td>BETABRADE™ F1</td>
<td>Contamination &amp; silicone cleaner</td>
</tr>
<tr>
<td><strong>Surface Treatment</strong></td>
<td>BETAWIPE™ VP 4604</td>
<td>Glass activator for two-step primers</td>
</tr>
<tr>
<td></td>
<td>BETAWIPE 6600T</td>
<td>Solvent-borne glass activator for BETASEAL™ Uni-wipe direct glazing systems</td>
</tr>
<tr>
<td></td>
<td>BETAWIPE Hydro</td>
<td>Water-borne glass activator for BETASEAL Uni-wipe direct glazing systems</td>
</tr>
<tr>
<td></td>
<td>BETAPRIME™ 5061</td>
<td>Multipurpose primer (glass, metal, various substrates)</td>
</tr>
<tr>
<td></td>
<td>BETAPRIME UV</td>
<td>UV stability-enhanced two-step glass primer</td>
</tr>
<tr>
<td></td>
<td>BETAPRIME 1707 A+B</td>
<td>Two-component metal etch primer</td>
</tr>
<tr>
<td><strong>Sealants</strong></td>
<td>BETAFILL™ 10210/211/215</td>
<td>PU-based sealants (white, gray, black)</td>
</tr>
<tr>
<td></td>
<td>BETATECH™ PLUS</td>
<td>Solvent-free PU-based sealants (white, gray, black)</td>
</tr>
<tr>
<td></td>
<td>BETAMATE™ 31</td>
<td>Polyoxypropylene (POP)-based adhesive/sealant, primerless on various substrates, excellent UV stability</td>
</tr>
<tr>
<td></td>
<td>BETAMATE 32</td>
<td>MS polymer-based sealant, primerless on various substrates with excellent UV stability</td>
</tr>
<tr>
<td><strong>Adhesives</strong></td>
<td>BETAMATE 1100N</td>
<td>Low-cost PU-based adhesive system, can be used for back or gap filling</td>
</tr>
<tr>
<td></td>
<td>BETAMATE 7120</td>
<td>PU-based high-viscosity adhesive system, can be used for back or gap filling</td>
</tr>
<tr>
<td></td>
<td>BETAMATE™ 7150</td>
<td>PU-based non-conductive BETASEAL Uni-wipe-compatible adhesive system, can be used for back or gap filling</td>
</tr>
<tr>
<td></td>
<td>BETAMATE 7170</td>
<td>PU-based low-conductive, quick fix (warm applied) BETASEAL Uni-wipe-compatible adhesive system, can be accelerated for curing with BETAMATE ACCEL</td>
</tr>
<tr>
<td></td>
<td>BETAMATE 7185</td>
<td>PU-based, high-viscosity, quick fix (warm applied) adhesive system</td>
</tr>
<tr>
<td></td>
<td>BETAMATE 7425</td>
<td>PU-based, high-viscosity, quick fix (warm applied) BETASEAL™ Uni-wipe-compatible adhesive system</td>
</tr>
<tr>
<td></td>
<td>BETAMATE™ ACCEL</td>
<td>Water paste for accelerating BETAMATE 7170</td>
</tr>
<tr>
<td><strong>Structural Bonding</strong></td>
<td>BETAMATE 7385</td>
<td>Two-component low-viscosity epoxy adhesive</td>
</tr>
<tr>
<td></td>
<td>BETAMATE 2098</td>
<td>Two-component structural bonding/repair epoxy adhesive</td>
</tr>
<tr>
<td><strong>Plastic Bonding</strong></td>
<td>BETALINK K2</td>
<td>Two-component, PU-based, low-strength, low- modulus plastic adhesive</td>
</tr>
<tr>
<td></td>
<td>BETAMATE 2810</td>
<td>Two-component, PU-based, medium-strength, medium-modulus adhesive</td>
</tr>
<tr>
<td></td>
<td>BETAMATE™ 7020/7080</td>
<td>Two-component, PU-based high-strength, high-modulus adhesive</td>
</tr>
<tr>
<td><strong>Special Adhesives</strong></td>
<td>BETALINK 1102</td>
<td>PU-based, white-colored, non-conductive, low-modulus primerless adhesive system mainly used for panel bonding</td>
</tr>
<tr>
<td></td>
<td>BETAMATE 7140</td>
<td>POP-based, black-colored, low-conductive, primerless adhesive system with excellent UV stability</td>
</tr>
</tbody>
</table>
# Surface Preparation Guide

<table>
<thead>
<tr>
<th>Applications</th>
<th>BETACLEAN™ 3300</th>
<th>BETACLEAN™ 3350</th>
<th>BETACLEAN™ 3900</th>
<th>BETAPRIME™ UV</th>
<th>BETAPRIME™ 5061</th>
<th>BETAPRIME™ 5700</th>
<th>BETAPRIME™ 1707</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare Metals and Alloys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass Ceramic</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass without Ceramic</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-Coat/Painted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenolics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composites</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timber</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass Fibre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheet Moulding Compound</td>
<td></td>
<td></td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polycarbonate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dow Automotive Systems, a business unit of The Dow Chemical Company, provides technology- and materials-enabled solutions for interior, exterior, powertrain, vehicle structural enhancement, acoustical management, emissions control and aftermarket applications in the automotive and commercial transportation industries.

www.dowautomotive.com