BUS AND COACH
INNOVATIVE TECHNOLOGY FOR CUSTOMER SOLUTIONS
The global bus and coach industry is a dynamic and challenging environment. Bus and coach operators demand ever lower vehicle operating and repair costs combined with improved reliability and durability. Government legislation is regulating lower vehicle emissions and improved passenger and driver safety. Sika, as supplier and partner to the global bus and coach industry, provides a range of state of the art technology solutions to assist manufacturers in meeting these challenges. As a speciality company for chemical products, we concentrate on our core competencies: bonding, sealing, damping and reinforcing.

As a globally operating company, we are partner to our customers worldwide. Sika is represented with its own subsidiaries in all bus and coach producing countries, thus ensuring first-class order handling and delivery, as well as application, technical and commercial support.
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10 Front and Rear Module
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**BUS AND COACH MANUFACTURERS** utilise a wide range of materials and processes in the assembly of the body structure. Sika provides a range of material technologies ideally suited to these challenging and diverse environments.

SikaPower® structural adhesives are easy to combine with other joining technologies. Flexibility, durability and a reduction in the number of spot welding points are just some of the advantages provided by this sealing and bonding technology. SikaPower® body shop adhesives and sealants are heat-curing products based on one- and two-component PUR-epoxy hybrid technology. SikaPower® products are available with a wide range of mechanical properties to suit the requirements of applications as diverse as anti-flutter, hem flange, stiff structural bonding and crash resistant spot weld applications.

**FLEXIBILITY, DURABILITY AND A REDUCTION IN THE NUMBER OF SPOT WELDING POINTS ARE JUST SOME OF THE ADVANTAGES PROVIDED BY THIS SEALING AND BONDING TECHNOLOGY.**
TECHNOLOGICAL BENEFITS

- Adhesion to oiled metals without pretreatment or degreasing
- Excellent ageing and long term durability
- Superb wash-out resistance
- Low bake curing to improve object temperature variations
- Solvent and PVC free
- One- and two-component systems to suit OEM’s process requirements

WHY USE STRUCTURAL ADHESIVES?

- Enhances component stiffness to facilitate weight reduction and improvements in fuel economy
- Improves component crash resistance to enable improved vehicle safety
- Minimises risk of water leakage
- Reduces noise, vibration and harshness
- Enables use of optimum substrate for each application via elimination of the requirements of weld compatibility

FUTURE TRENDS FOR BODY STRUCTURE

- Increased use of automotive OEM E-coat/KTL process for bus and coach manufacturers
- Use of advanced composites for structural applications
- Lower temperature bake conditions for corrosion protection oven for low to medium volume manufacturers
BUS AND COACH OPERATORS expect high levels of durability from their vehicles. Resistance to impact, extreme temperature conditions and round the clock operation make extreme demands on all areas of the vehicle. Sika has formulated a range of elastic bonding solutions for floor and side panel assembly to enable vehicle manufacturers to satisfy these challenging demands.

Sikaflex® provides high-performance elastic assembly within an easy to use one-component formulation. Sikaflex® hybrid technology provides the high performance of Sikaflex® polyurethane systems combined with reduced substrate preparation and improved ecological benefits. Sikaflex® with Booster provides the high-performance attributes of Sikaflex®, combined with rapid full cure due to the combination with Sika’s proprietary Booster system. SikaForce® two-component polyurethane combines high strength with good flexibility. Sikafast® two-component methyl methacrylate and ADP (Acrylic Double Performance) structural adhesives provide high strength and excellent impact resistance with low surface preparation. SikaPower® body shop structural adhesives and sealants are heat-curing products based on one- and two-component PUR-epoxy hybrid technology.
**TECHNOLOGICAL BENEFITS**

- Improved impact resistance
- Enhanced aesthetics and aerodynamics via elimination of visible fixings
- No damage to corrosion protection system
- Excellent resistance to harsh climatic conditions
- Improved water and moisture leak resistance
- Improved sound and vibration damping

**WHY USE ADHESIVES?**

- Bonded assemblies are better able to withstand shock and impact, minimising repair costs and frequency
- Use of adhesives and sealants does not damage the vehicle corrosion protection layer, therefore reducing the likelihood of repair
- Adhesive systems absorb vibration, improving interior and exterior vehicle noise levels
- Bonding shows aesthetic and process advantages against mechanical fixing methods

**FUTURE TRENDS FOR FLOOR AND SIDE PANELS**

- Increased use of advanced composites
- Use of more environment-friendly paint systems
- Possible implementation of challenging side impact safety legislation
**ROOF BONDING**

**BUS AND COACH MANUFACTURERS** face particularly tough challenges for construction of roof assemblies for modern bus and coach vehicles.

Apart from obvious requirements for long term durability and resistance to harsh climates, additional requirements include lowest possible weight (vehicle handling and fuel economy), highest possible strength (roll-over resistance for occupant safety) and increased functional complexity (air conditioning units, sunroof apertures). Sika has developed a range of specialty formulations with ideal characteristics to enable vehicle OEMs to meet these requirements with optimum quality, consistency and cost.

Sikaflex® provides high-performance elastic assembly with an easy to use one-component formulation. SikaForce® two-component provides the high performance of polyurethane systems combined with long open time and process advantages. SikaPower® structural adhesives and sealants are heat-curing products for metal bonding applications based on one- and two-component PUR-epoxy hybrid technology.

Modern roofs bonded with Sikaflex® enable good and durable sealing as well as cost effectiveness.
TECHNOLOGICAL BENEFITS

Enhanced aesthetics and aerodynamics via elimination of visible fixings
No damage to corrosion protection system
Excellent resistance to harsh climatic conditions
Reduced weight versus mechanical fastener based systems
Improved water and moisture leak resistance
Improved sound and vibration damping

WHY USE BONDED ROOF PANELS?

Bonded assemblies enable weight reduction versus mechanically fastened systems at the top of the vehicle, enabling weight reduction (better fuel economy and emissions) and optimising vehicle driving characteristics and active safety
Use of adhesives and sealants does not damage the vehicle corrosion protection layer, therefore reducing the likelihood of repair
Adhesive systems absorb vibration, improving interior and exterior vehicle noise levels
Bonded and sealed systems provide enhanced water leakage resistance to minimise vehicle repair frequency and time

FUTURE TRENDS FOR ROOF PANELS

Increased use of advanced composites
Use of more environment-friendly paint systems
Increased requirements for vehicle roll-over protection

Bonded air conditioning device on roof
Bonding of aluminium roof onto aluminium frame
Bonded aluminium roof

Bonding of aluminium roof onto aluminium frame
Bonded air conditioning device on roof
Bonded aluminium roof
THE LAST TEN YEARS have seen a dramatic improvement in the aerodynamics and styling of bus and coach vehicles. The front and rear modules of modern vehicles are two of the most visible indicators of such changes.

The use of thermoset composites is now common for such applications, and has enabled dramatic changes in vehicle styling and aerodynamic behaviour to be achieved. In addition to these changes, such applications must comply with ever tougher durability, impact and ease-of-assembly requirements. Sika has formulated a range of materials to exceed customer requirements for this challenging application.

Sikaflex® provides high-performance elastic assembly within an easy to use one-component formulation. Sikaflex® hybrid technology provides the high performance of Sikaflex® polyurethane systems combined with reduced substrate preparation and improved ecological benefits. Sikaflex® with Booster provides the high-performance attributes of Sikaflex®, combined with rapid full cure due to the combination with Sika’s proprietary Booster system. SikaFast® two-component methyl methacrylate structural adhesives provide high strength and excellent impact resistance with low surface preparation.

Bonding of glass fibre reinforced plastic (GRP) masks provides tremendous benefits compared to other fixation methods.
TECHNOLOGICAL BENEFITS

- Improved moisture and water sealing
- Enhanced sound and vibration damping
- Rapid assembly
- High-performance adhesion
- Excellent impact resistance
- Ability to withstand different CLTE (Coefficient of Linear Thermal Expansion) between thermoset composites and metals

WHY BOND FRONT AND REAR MASK APPLICATIONS?

- Bonded assemblies enable weight reduction versus mechanically fastened systems enabling better fuel economy and emissions
- Use of adhesives and sealants does not damage the vehicle corrosion protection layer, therefore reducing the likelihood of repair
- Adhesive systems absorb vibration, improving interior and exterior vehicle noise levels
- Bonded and sealed systems provide enhanced water leakage resistance to minimise vehicle repair frequency and time

FUTURE TRENDS FOR FRONT AND REAR MASK APPLICATIONS

- Greater use of advanced composites
- Possible use of thermoplastic composites such as GMT (Glass mat reinforced Thermoplastic Composite) and LFI (Long Fibre Injection)
FOR OVER 20 YEARS, Sika has been providing bus and coach, automotive, truck and rail OEM assembly lines with adhesive and sealant solutions for sealing, bonding and direct glazing.

Primeless, manual and automated pretreatment options are available to fit the needs of a variety of OEM application processes in order to create significant cost savings and manufacturing process simplification.

Sika offers a wide range of adhesive technologies to suit all direct glazing applications. Specific Sikaflex® solutions are available to suit cold, warm and hot application processes. Proprietary Sikaflex® materials are capable of retaining the glass in position following installation, allowing for elimination of secondary clips, fixings and tape. Sikaflex® materials can also provide low electrically conductive properties for elimination of galvanic corrosion/antenna signal loss. The SikaTack® Plus Booster range provides the ultimate solution for OEMs seeking excellent mechanical properties with the shortest possible full cure time. Unlike traditional two-component systems, this boosted one-component system has the significant benefit of full material cure irrespective of the presence of the accelerator paste, providing enhanced process/quality consistency and security.
TECHNOLOGICAL BENEFITS

- Sika has tried and tested primerless to glass technology
- Primerless to paint
- Accelerated with Sika with Booster for rapid full cure
- Low conductivity
- High initial green strength
- Hot applied systems to eliminate secondary clips, fixings and tape

WHY DIRECT GLAZE?

- Increased body stiffness for enhanced roll-over strength and improved occupant impact protection
- Enhanced aerodynamics versus gasket glazed systems to improve fuel economy and vehicle emissions
- Higher body stiffness to reduce noise, vibration and harshness within the vehicle body

FUTURE TRENDS FOR DIRECT GLAZING

- Increased use of thermoplastic side glazing systems for enhancements in weight reduction and crash resistance
- Elimination of primers and surface pretreatments
VEHICLE OWNER OPERATORS HAVE driven a significant increase in interior comfort and functionality in recent years, requiring the use of an increasingly diverse mix of interior plastics and fabrics.

Performance requirements for interior components have increased, with higher operational temperature requirements, improved emissions/environmental performance needs and reduced component cost/cycle time in production. Sika has developed several hot melt, solvent-based and water-based solutions to create strong adhesion to many substrates. SikaMelt®, SikaTherm® and SikaSense® technologies are used in the lamination and bonding of a variety of interior applications including instrument panels, interior door trims, carpets, pillar trims, headliners, centre consoles, stowage bins and seat assemblies.

SikaMelt® offers customers a range of formulations to meet a variety of substrate and process requirements. SikaMelt® provides good initial green strength without pretreatment, and is ideal for high-speed assembly operations.

SikaTherm® water-based adhesives are high-performance single and dual component polyurethane dispersion systems suitable for manual or automated application. SikaTherm® formulations are suitable for pressure and vacuum lamination, and are capable of meeting the highest durability and long term ageing standards.

SikaSense® are solvent- and water-based adhesives used for floor covering applications and sound damping applications.
**TECHNOLOGICAL BENEFITS SikaMelt®**

<table>
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<tr>
<th>Benefit</th>
<th>Description</th>
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<tr>
<td>Low application weights</td>
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<td>Low reactivation temperatures</td>
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<td>High strength</td>
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<td>Good heat resistance</td>
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<td>Low fogging and carbon emission values</td>
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<td>Dry-cleaning resistant</td>
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<td>Fast tack development times</td>
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<td>Good adhesion to polypropylene</td>
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**WHY USE SIKA INTERIOR TRIM ADHESIVES?**

<table>
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<tr>
<th>Reason</th>
<th>Description</th>
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<tr>
<td>No visible fixings</td>
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<td>Improved impact resistance and occupant safety</td>
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<td>Broad substrate compatibility for use of low cost materials in non-visible applications, thereby reducing overall component cost</td>
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<td>Lower vehicle weight via use of load distributing adhesive systems</td>
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<td>Reduced interior noise and vibration</td>
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**TECHNOLOGICAL BENEFITS SikaTherm®**

<table>
<thead>
<tr>
<th>Benefit</th>
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<tr>
<td>Single- and dual-sided adhesive application</td>
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<td>Low reactivation temperatures</td>
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<td>High strength</td>
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<td>Good heat resistance</td>
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<td>Low fogging and carbon emission values</td>
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<td>Short flash off times</td>
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<td>Good weather resistance</td>
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<td>Fast tack development times</td>
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<td>Broad substrate compatibility</td>
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**FUTURE TRENDS FOR INTERIOR TRIM**

<table>
<thead>
<tr>
<th>Trend</th>
<th>Description</th>
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<tr>
<td>Increased use of polypropylene composites (talc, glass, wollastonite, etc.)</td>
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<td>Higher occupant impact protection standards</td>
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<td>Greater restrictions on the use of materials containing solvents and volatile organic compounds</td>
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<td>Enhanced recycling requirements for end-of-life vehicles</td>
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<tr>
<td>Reduced interior noise and vibration</td>
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BUS AND COACH OPERATORS AND GOVERNMENT bodies are demanding ever lower standards of interior and exterior vehicle noise.

Sika has formulated a high-technology solution to facilitate significant reductions in vehicle noise via absorption of vibration within the vehicle body.

SikaDamp® spray-on technology is a unique, spray-applied damping solution designed to minimise interior noise through a flexible one-layer application. The spray-on material adheres to the electrode position coating to ensure maximum corrosion protection. The applied spray-on damper is heat cured and can be used prior to application of under body coating or exposure to paint bake ovens.
**TECHNOLOGICAL BENEFITS**

<table>
<thead>
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<th>Benefits</th>
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<tbody>
<tr>
<td>Reduction in noise and vibration</td>
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<td>Reduction in vehicle weight</td>
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<td>Clean, accurate and consistent application</td>
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<td>Excellent corrosion protection</td>
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<td>Flexible and adjustable application properties</td>
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**WHY USE NVH (NOISE, VIBRATION AND HARSHNESS) SOLUTIONS?**

<table>
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<tr>
<th>Benefits</th>
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<tbody>
<tr>
<td>Improved vehicle user comfort</td>
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<td>Enhanced compliance to vehicle noise regulations</td>
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<td>Improved fuel economy through weight reduction</td>
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**FUTURE TRENDS FOR BUS/COACH NVH SOLUTIONS**

<table>
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<th>Trends</th>
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<tr>
<td>More stringent requirements for lower exterior vehicle noise</td>
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<tr>
<td>Greater operator demands for lower interior noise and vibration</td>
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SIKA DEVELOPS BONDING, SEALING, DAMPING AND REINFORCING solutions in close co-operation with our customers in the bus industry.
To Sika, this means not only developing best in class technology solutions to match our customers technical and commercial requirements, but also ensuring appropriate performance throughout the design, prototyping, validation and full production phases. Specialists in Sika’s R&D (Research & Development), Technical Service, Systems Engineering and Application Technology concentrate on devising Research & Development appropriate client oriented solutions.

TECHNOLOGY CENTRES
Sika Technology Centres are focused on the development of new materials. This allows Sika to actively promote technology development within the bus market, and to add value to the activities of our customers.

TECHNICAL SERVICE
Sika Technical Service teams are located around the world, and are dedicated to provide best practice selection, validation and application of Sika materials. By being located close to our customers, Sika Technical Service can ensure optimum local language communication and understanding throughout the technical application development process to ensure best possible results for our customers.

CAD/CAE SUPPORTED DEVELOPMENT
Sika concentrates on Computer Aided Design and Engineering of structurally reinforcing process materials. As our customers increasingly use static and dynamic simulation tools to design, develop and validate new vehicle structures, Sika has the expertise and competence to support vehicle development programmes in the appropriate software coding utilised by our customers.

SYSTEM ENGINEERING
Application Technology is a key success factor in the use of adhesives and sealants. Sika’s System Engineering Competence Centre focuses on this important task and develops application parameters and systems aimed at holistic solutions for our clients. This includes pumping and application systems as well as automated robotic equipment specifically designed to meet individual customer needs.

ACOUSTIC TEST CENTRE
In our Acoustic Test Centre we are able to evaluate and optimise the acoustic performance of our products. The ability of this facility to house very large vehicle structures, combined with sophisticated equipment such as a chassis dynamometer, wind testing rig and E-coat/KTL oven, provides our customers with ideal support to achieve dependable and accurate results in vehicle development programmes.

LOCAL SERVICE AND SUPPORT
With major sales, service and logistics operations around the globe, Sika provides customers with world scale customer service, sales and logistics support via local dedicated teams in local languages.
GLOBAL BUT LOCAL PARTNERSHIP

WHO WE ARE
Sika AG, Switzerland, is a globally active specialty chemicals company. Sika supplies the building and construction industry as well as manufacturing industries (automotive, bus, truck, rail, solar and wind power plants, facades). Sika is a leader in processing materials used in sealing, bonding, damping, reinforcing and protecting loadbearing structures. Sika’s product lines feature high-quality concrete admixtures, specialty mortars, sealants and adhesives, damping and reinforcing materials, structural strengthening systems, industrial flooring as well as roofing and waterproofing systems.

FOR MORE BUS & COACH INFORMATION:
www.sika.com/bus-coach

Our most current General Sales Conditions shall apply. Please consult the most current local Product Data Sheet prior to any use.