

Industry



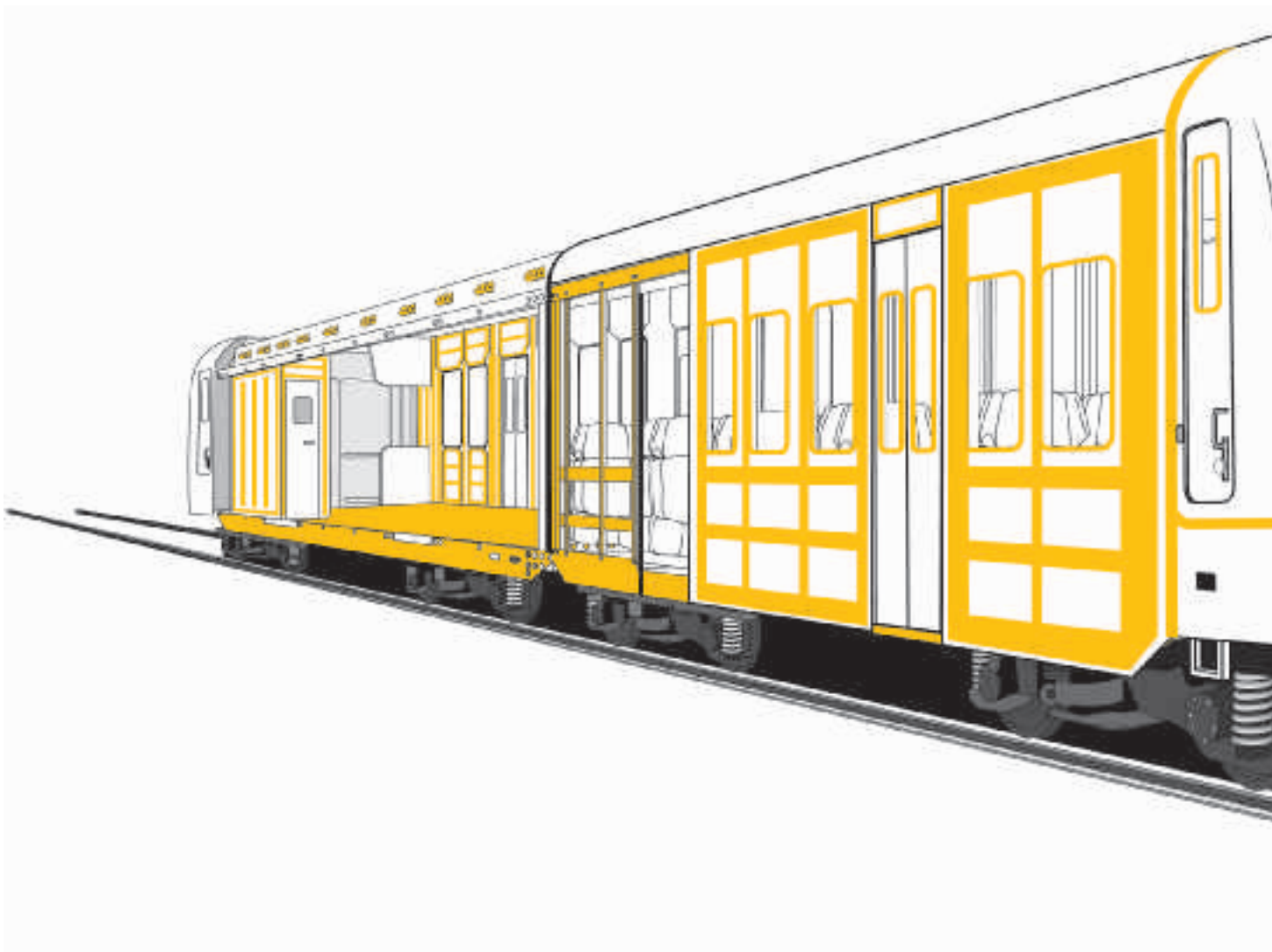
Rail
Leading Innovation
in a Dynamic Industry



Leading Innovation in a Dynamic Industry

The global rail market is a dynamic mix of demanding and highly challenging environments. Rail vehicle manufacturers expect improvements in manufacturing processes, repair solutions and innovation in vehicle design in order to compete. Rail operators need designs leading to higher safety levels for passengers, increased reliability to reduce operating costs and provision of a comfortable, reliable and efficient service.

Sika provides state-of-the-art technological solutions that assist rail vehicle manufacturers and operators in meeting weight reduction and vehicle emission targets for their vehicles. As a global partner to our customers, we at Sika are able to offer precise local solutions quickly, ensuring truly first class order handling, delivery, application development and technical and commercial support. As a specialty company for chemical products, we at Sika concentrate on our core competencies: Bonding, Sealing, Damping and Reinforcing.



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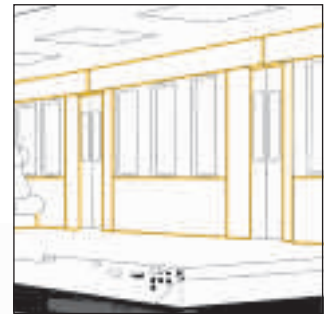
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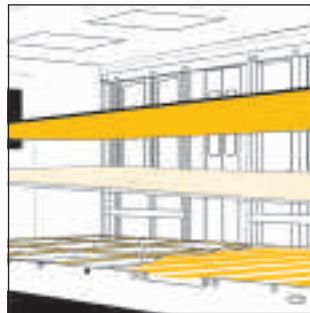
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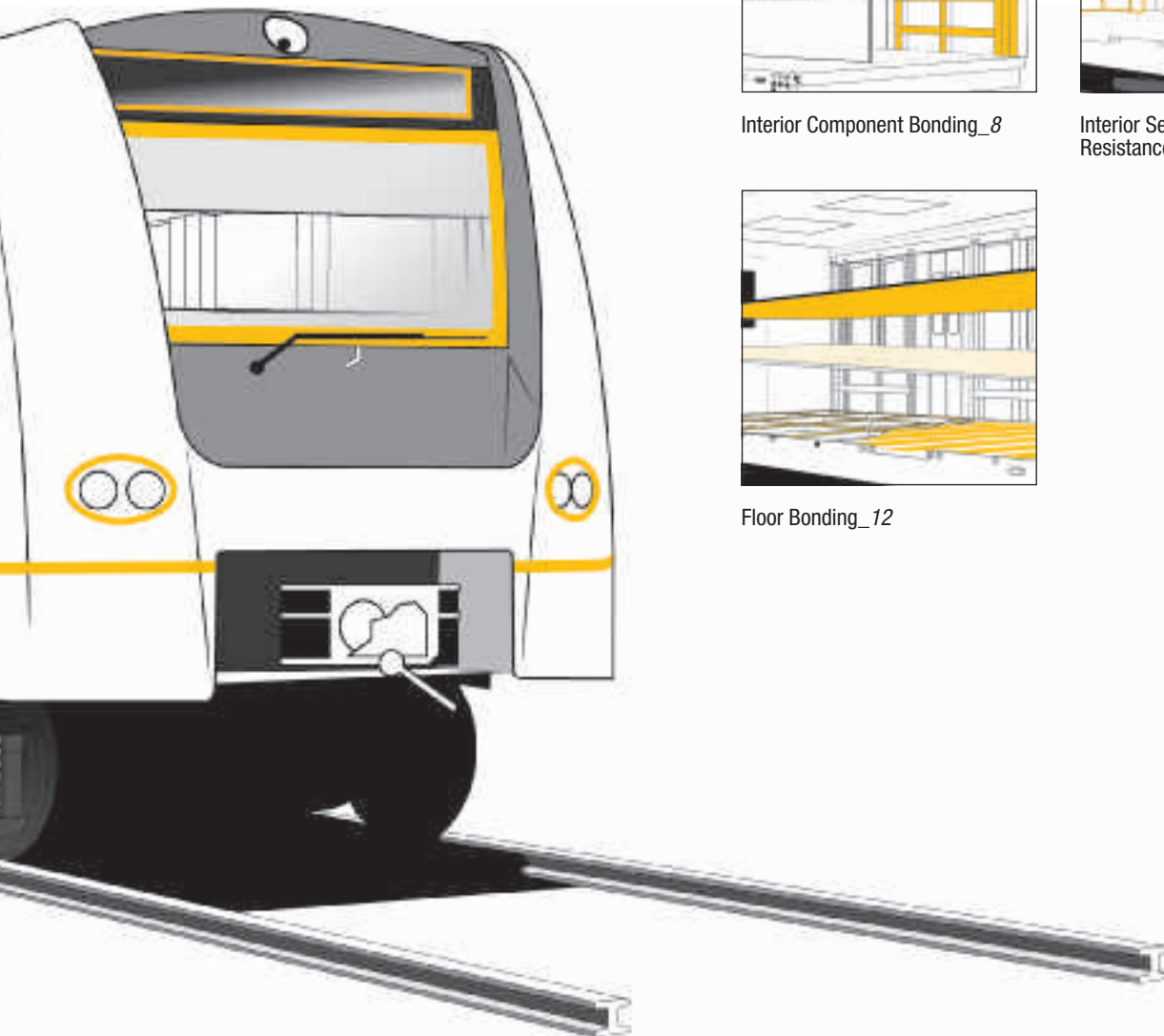
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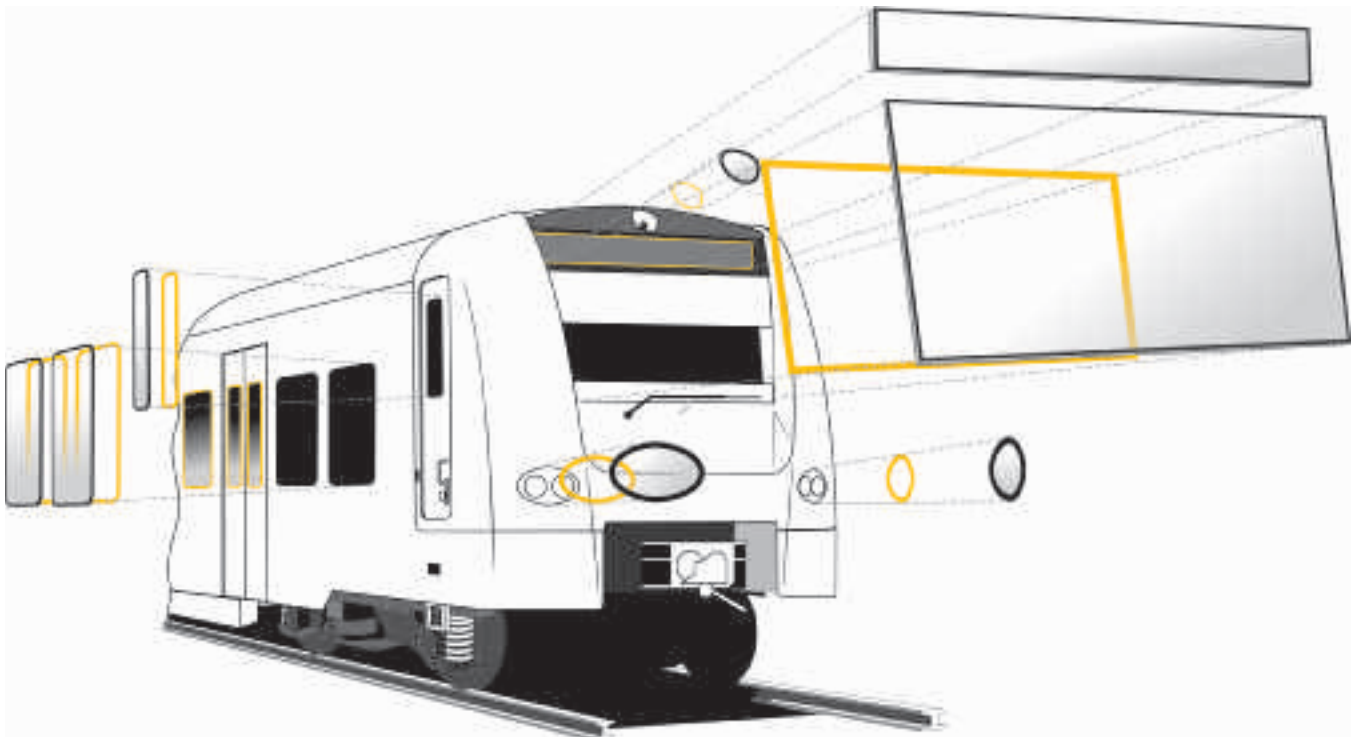
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Direct Glazing

For over 20 years, Sika has been providing rail, bus, coach, automotive and truck OEM assembly lines with adhesive and sealant solutions for direct glazing and sealing. Primerless 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.

Cold or warm applied Sikaflex® systems are capable of retaining glass following installation, eliminating the need for additional clips, fixings and tape. Sika direct glazing adhesives can also provide low electrically conductive properties for elimination of galvanic corrosion. The SikaTack® range of products, with its booster technology, offers the rail vehicle manufacturer the freedom of an easy to use, fast curing, high strength adhesive, showing excellent mechanical properties with the shortest possible cure time. Unlike traditional two-component adhesive systems, this accelerated one-component system has the significant benefit of full product cure, regardless of the presence of the Sika® Booster paste, providing enhanced process quality, consistency and security.





Adhesive is applied



The windscreen is fitted

Why Direct Glaze?

- Increased torsional stiffness of the carriage for increased rollover strength and improved occupant impact protection
- Enhanced aerodynamics in comparison to gasket glazed systems improving fuel economy
- Reduced risk of standing water, reducing corrosion when compared to gasket glazed systems

Technological Benefits

- Proven Sika primerless to glass technology
- Low conductivity
- High initial green strength
- Warm applied systems eliminate secondary fixings, clips and tape

Best Recommended Sika Products

Features & Benefits

Sikaflex® -265

Suitable for both bonding and sealing applications. Extremely easy to use, solvent-free, with large gap filling capabilities. These lead to excellent aesthetics with a smooth surface finish. The rail industry standard direct glazing adhesive

Sikaflex® -250 PC

High green strength warm applied system. Eliminates the requirement for fixings, clips and tape. Widely OEM approved with excellent adhesion characteristics

Sikaflex® -222 UV

UV resistant joint sealant, particularly suitable for smaller gaps

SikaTack® -Plus Booster

Fast curing, high-strength adhesive system. The Sika® Booster cure accelerator speeds up curing process largely independent of the moisture content in the air

Exterior Component Bonding and Sealing

Rail vehicle manufacturers face tough, complex challenges in the design and assembly of the roof and mask systems for modern rail vehicles. High speeds, harsh climates and aerodynamic structural design stresses within the vehicle are all examples of the daily demands placed on elastic adhesives.

Sika provides high performance elastic assembly solutions, with a range of specifically formulated and optimised adhesives, developed to suit the needs of the rail vehicle designer. Sika also offers the rail vehicle manufacturer bonding and sealing solutions that meet both production and process requirements for fast cure, ease of use, consistent quality and cost. Sikaflex® polyurethane and hybrid polyurethane adhesives and sealants provide high performance elastic assembly and sealing of components, with a user-friendly, one-component formulation. Sikaflex® hybrid technology provides the high performance of Sikaflex® polyurethane systems combined with reduced substrate surface preparation. SikaFast® two-component adhesives offer high strength, rapid de-jigging and cure times, good impact resistance, and low substrate surface preparation. The SikaForce® range of products offers semi- and full-structural adhesive solutions for bonding a wide spectrum of substrates used in rail vehicle interior assembly, such as metals, plastics, glass and coated steel.





Various stages of construction using Sikaflex®



Why Seal and Bond Exterior Components?

- Bonded assemblies can provide a lower weight solution than mechanically fastened systems
- Elastic adhesive systems absorb noise and vibration, improving interior and exterior noise levels
- Modular assembly techniques can be applied
- Elastic bonded structures are more able to withstand shock and impact

Technological Benefits

- Improved aesthetics and aerodynamic efficiency
- Excellent resistance to harsh climatic conditions
- Improved water and leak resistance
- Improved sound and vibration damping

Best Recommended Sika Products

Features & Benefits

Sikaflex®-254 Booster

Fast cure, high strength system, good mechanical properties and adhesion. Ideal for bonding of large components

Sikaflex®-252

Easy to use elastic adhesive. Suitable for use in joints subject to dynamic stresses

Sikaflex®-265

Suitable for both bonding and sealing applications. Extremely easy to use, solvent free, with large gap filling capabilities, giving excellent aesthetics with a smooth surface finish

Sikaflex®-222 UV

UV resistant joint sealant, particularly suitable for smaller gaps

Sikaflex®-552

Easy to use UV stable adhesive for bonding and sealing applications. Reduced substrate surface treatment

SikaFast®-3000 Series

Fast curing adhesive with high tensile properties, improved elasticity and impact resistance. Also, excellent adhesion profile with gap filling characteristics

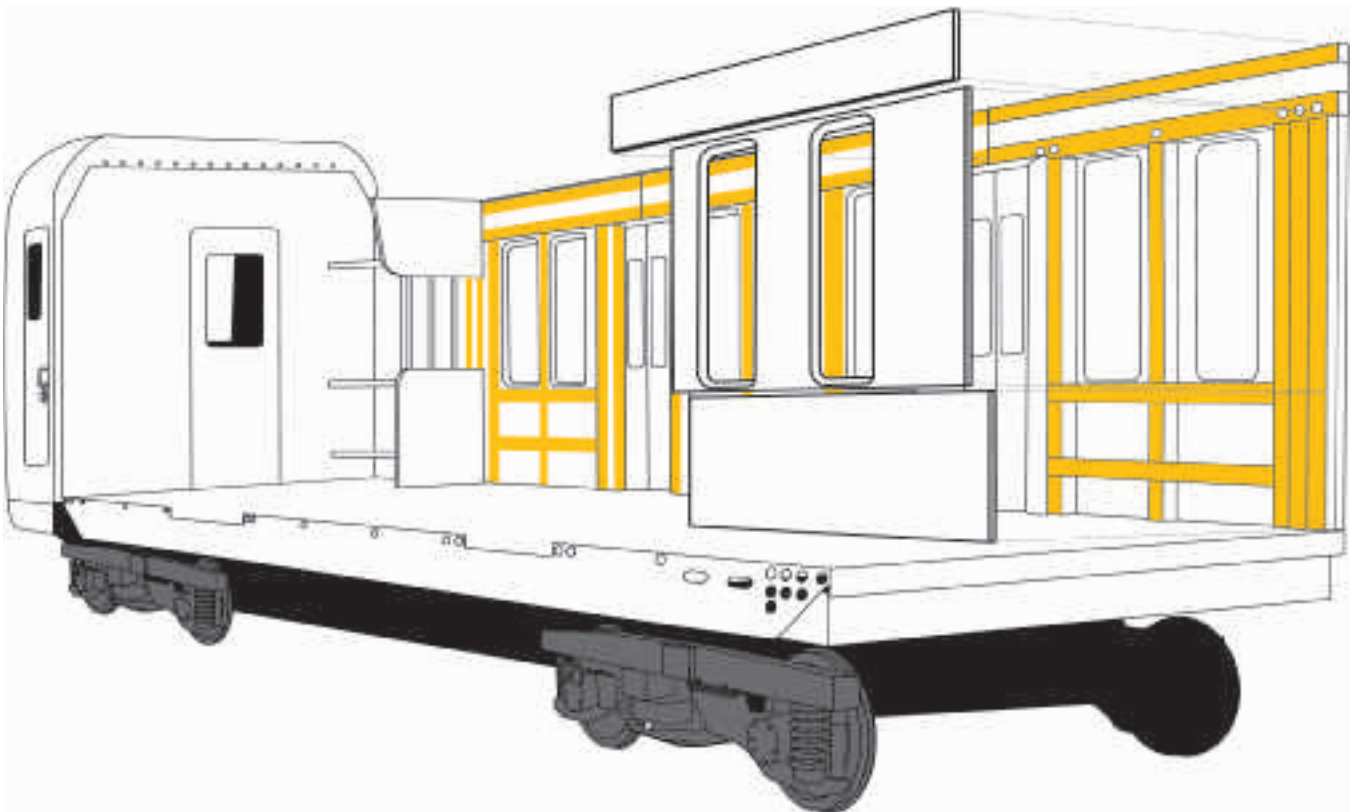
SikaForce®-7550 Series

Two-component, high-strength elastic assembly adhesive, good tooling behaviour and good gap filling properties

Interior Component Bonding

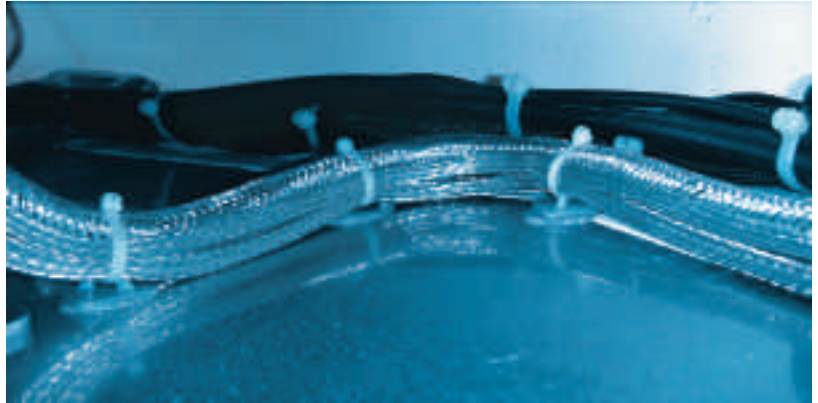
Modern rail vehicle interiors need to have a high durability and life expectancy in order to meet the day-to-day requirements of transporting people in high numbers. Rail vehicle operators need high performance and reliability from their interiors as repairs and breakdowns can be costly and disruptive. Interior panels, brackets, sub-assemblies and lighting systems can all be built rapidly and reliably with Sika adhesives. The combination of fast assembly, rapid cure, flexibility, strength and performance can be achieved using one of a number of proven Sika adhesive systems.

Sikaflex® polyurethane adhesives provide high performance elastic assembly of components, with a user-friendly, one-component formulation. Sikaflex® hybrid technology provides the high performance of Sikaflex® polyurethane systems combined with reduced substrate surface preparation. SikaFast® two-component adhesives offer high strength, rapid de-jigging and cure times, good impact resistance, and low substrate surface preparation. The SikaForce® range of products offers adhesive solutions for bonding a wide spectrum of substrates used in rail vehicle interior assembly. Examples of these include materials such as aluminium, coated steel, glass, glass fibre reinforced plastics (GRP), painted substrates and plastics.





An interior panel is offered up prior to being fixed with Sikaflex®



Applications of SikaFast® bonded clips



Why Use Interior Component Bonding?

- Compatible with all common rail industry substrates
- High impact resistance
- Wide range of cure speeds to suit diverse assembly techniques
- No damage to substrate or structure due to drilling or welding

Technological Benefits

- Capable of bonding dissimilar materials with the avoidance of corrosion
- Rapid sub-component assembly
- Adhesive systems absorb vibration, improving interior vehicle noise levels
- Lower component costs due to the ability of adhesives to bond to different types of plastics, composites or metals that are otherwise difficult to assemble

Best Recommended Sika Products

Features & Benefits

Sikaflex®-252
Easy to use one component elastic adhesive. Suitable for use in joints subject to dynamic stresses

Sikaflex®-254 Booster
Fast cure, high strength system, good mechanical properties and adhesion. Ideal for bonding of larger components

Sikaflex®-552
Easy to use UV stable adhesive for bonding and sealing applications. Reduced substrate surface treatment

SikaFast®-3000 Series
Fast curing adhesives with high tensile properties, improved elasticity and impact resistance. Also, excellent adhesion profile with gap filling characteristics

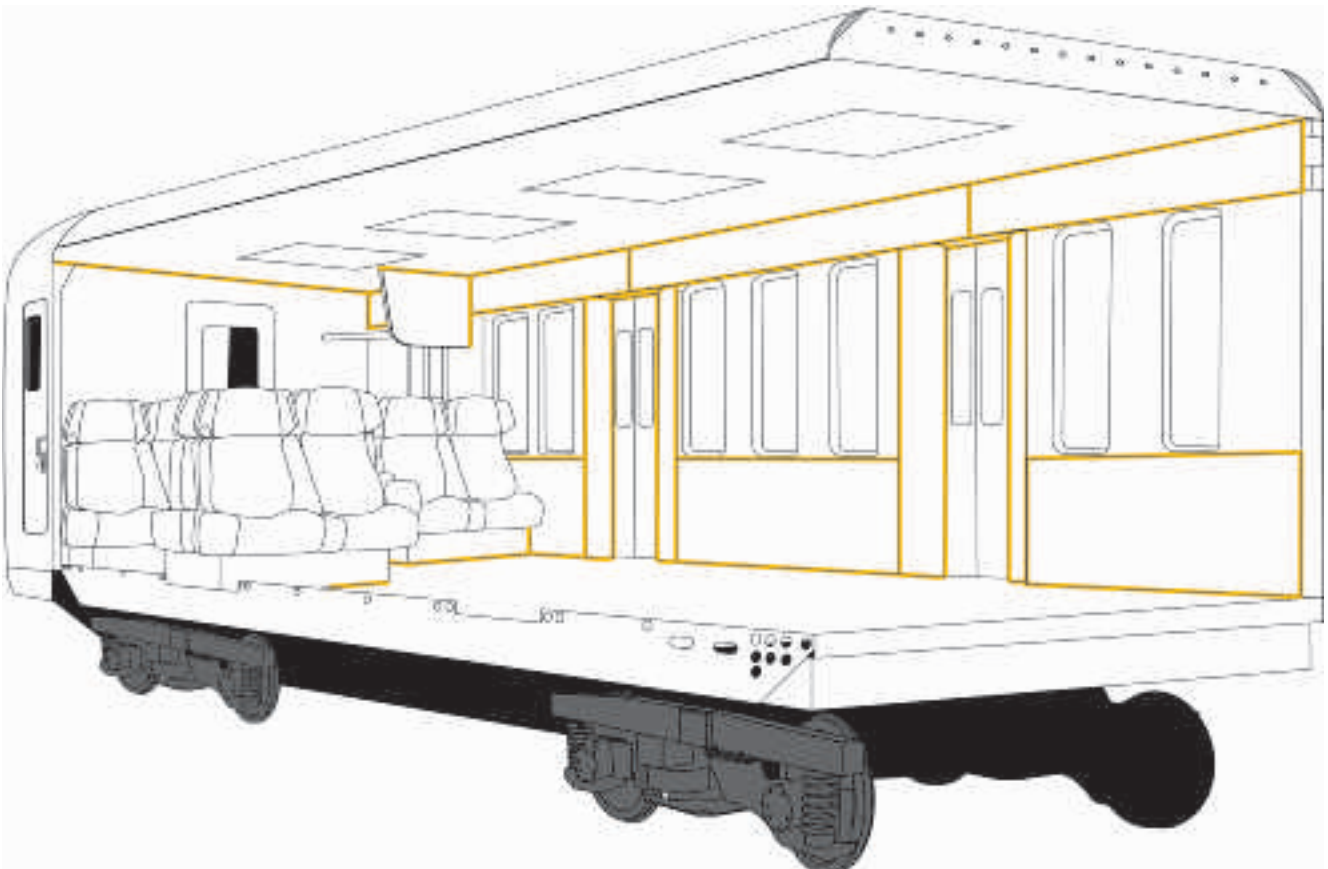
SikaFast®-5000 Series
Fast curing, low odour adhesives designed to substitute welding and other mechanical fastening techniques

SikaForce®-7752 L09
Rapid cure, high stiffness, excellent adhesion profile. Good tooling behaviour and gap filling capability

Interior Sealing and Fire Resistant Applications

The finish and integrity of a rail vehicle is crucial to its long-term durability. A robust, watertight seal protects the wiring looms, vital electronic equipment and other components housed below the floor and behind interior panels. Sika has developed a range of products specifically formulated to offer long-term solutions for permanent elastic seals. With their easy to use one-component formulation, Sikaflex® polyurethane adhesives finish interior components with a high performance elastic seal. Sikaflex® hybrid technology combines the performance of traditional Sikaflex® polyurethane systems, but shows additional characteristics such as reduced substrate surface preparation. SikaFiresil® can also provide a highly elastic flame retardant and UV resistant silicone sealing solution.

In certain applications, it is essential that products show fire resistant characteristics and comply with both local and international railway standards. These standards specify the performance of adhesives and sealants in some of the most exacting environments in the world, both above and below ground. If required these standards can be achieved by specific joint geometries with the inclusion of certain Sika assembly adhesives. Sika has developed a range of easy-to-use products that have been tested to international standards for use in fire resistant applications that still maintain joint strength and durability.





The joint between cab and main chassis, shown from the inside



An interior joint is filled

Why Use Interior Sealing and Fire Resistance Products?

- Improved acoustic environment
- Compliance with international fire standards
- Watertight seals ensure protection of vital electronic and safety equipment
- More efficient air conditioning and heating

Technological Benefits

- High levels of aesthetic finish achievable
- Permanent elastic seals maintain the integrity of a rail vehicle interior
- High levels of fire resistance can be achieved

Best Recommended Sika Products

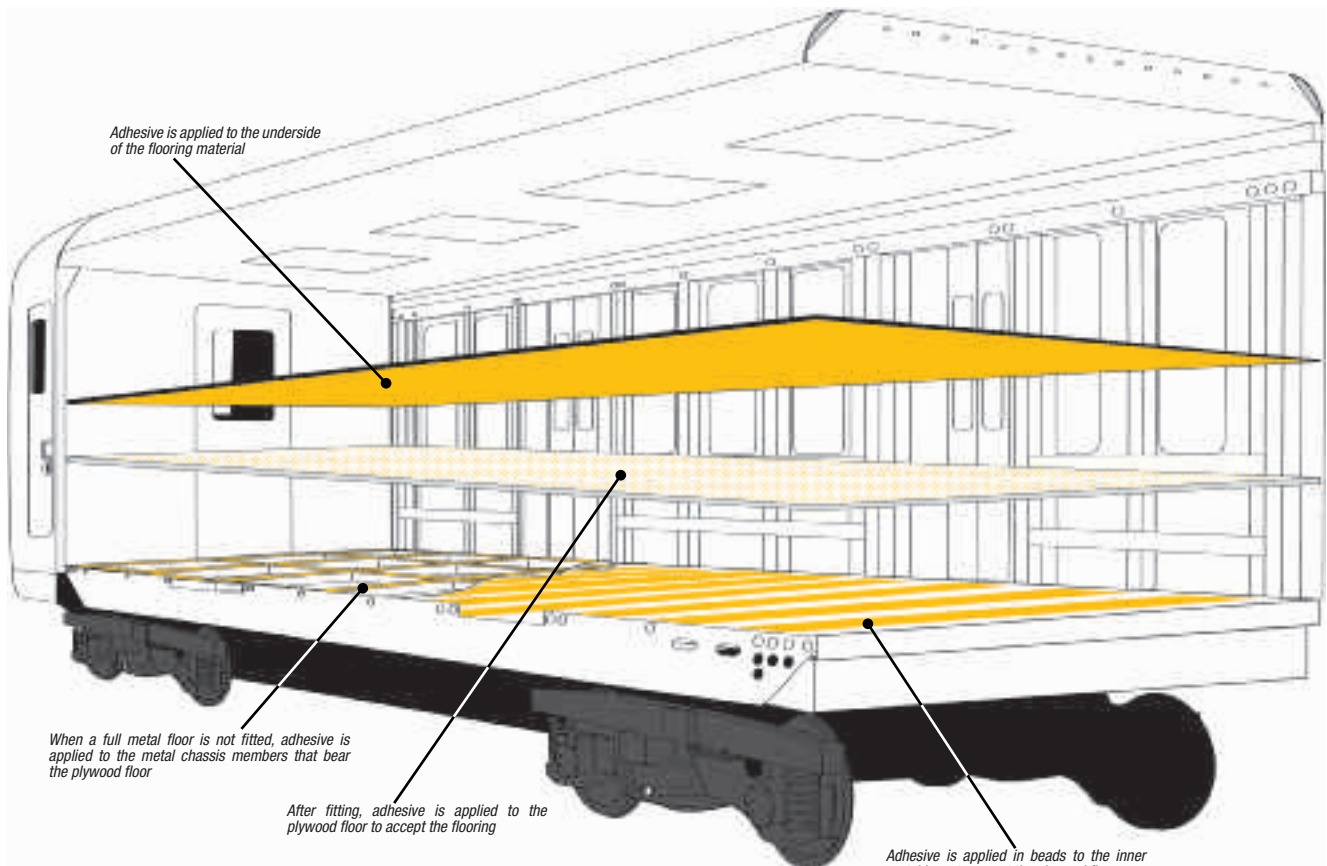
Features & Benefits

- Sikaflex®-221**
High-quality easy-to-use sealant and adhesive, suitable for making permanent elastic seals of high adhesive strength
- Sikaflex®-521 UV**
Joint sealant with excellent UV, ageing and weather resistance. Reduced substrate surface preparation needed. Solvent and VOC free
- Sikaflex®-552**
Easy-to-use, UV stable adhesive for bonding and sealing applications. Reduced substrate surface treatment
- Sikaflex®-852 FR**
Flame retardant adhesive and sealant, bonds well to a wide variety of common rail industry substrates. Meets several rail industry fire standards
- SikaFiresil®**
Silicone sealant with low flame spread characteristics. High fire resistance

Floor Bonding

Modern rail vehicles require the use of a number of high performance flooring materials during manufacture. Travelling comfort, lower vibration and better sound damping are but a few of the specifications that now need to be considered. Sika has formulated a range of elastic solutions for floor bonding applications that enable rail vehicle manufacturers to meet these specifications. With a user-friendly, one-component formulation, Sikaflex® polyurethane adhesives are used for high performance elastic assembly of components. Sikaflex® hybrid technology still has the high performance of Sikaflex® polyurethane systems but is combined with reduced substrate surface preparation. The Sikaflex®-254 Booster system combines the high performance characteristics of Sikaflex® but with rapid full cure. The SikaLastomer® butyl sealants provide excellent sound damping and sealing properties. SikaForce® two-component polyurethane combines high strength and good flexibility.

In today's world, rail vehicle interiors are expected to look stylish, attractive and inviting, and also to be finished to a very high standard. The floor covering used on a rail vehicle contributes significantly to this overall effect and is now one of the key elements in the design of rail vehicle interiors. This material is not solely used where floor traffic is encountered; it is also used to trim adjoining areas such as sidewalls, toilet cubicles and seat brackets. The SikaSense®-4000 product range offers a complete solution for bonding floor coverings to different substrates such as coated steel, aluminium, wood and plastics. These materials have, until now, been very difficult to bond. This range of products is easy to use, has excellent initial 'grab' and long-term adhesion to common flooring substrates. Together with an outstanding resistance to high temperatures and ageing.





Plywood flooring is cut to size and bonded to the chassis using Sikaflex®-254 Booster
The floor is finished with a floorcovering bonded with SikaSense®

Why Use Floor Bonding?

- Avoidance of corrosion, elimination of drilling or piercing of the chassis for mechanical fastener fixing of floor panels
- Water resistant floor construction is achievable, leading to less floor de-lamination and repairs
- Reduced interior noise and vibration levels are achievable

Technological Benefits

- Good sound damping, leading to improved passenger comfort
- Resistant to harsh climatic conditions
- Excellent heat and ageing resistance
- Broad substrate compatibility

Best Recommended Sika Products

Features & Benefits

- Sikaflex®-252**
Easy-to-use elastic adhesive. Suitable for use in joints subject to dynamic stresses
- Sikaflex®-254 Booster**
Fast cure, high-strength system, good mechanical properties and adhesion. Ideal for bonding of large flooring sections
- Sikaflex®-552**
Easy-to-use UV stable adhesive for bonding and sealing applications. Reduced substrate surface treatment
- SikaLastomer®-710**
Butyl sealant with good sound damping properties
- SikaForce®-7780**
Easy to use two-component product developed for floor levelling applications encountered in rail vehicle floors, used prior to floor covering bonding application
- SikaSense®-4600**
Solvent-based contact adhesive for bonding floor covering and trim materials to rail vehicle interiors
- SikaSense®-4300 FD**
High-performance two-component water-based contact adhesive system for bonding common rail vehicle floor covering materials

Focusing on the Customer



Sika develops bonding, sealing, damping and reinforcing solutions in close co-operation with our OEM customer's in the rail industry. To Sika, this means not only developing best in class technology solutions to match our customer's technical and commercial requirements, but to also ensure appropriate performance throughout the design, prototyping, validation and full production phases. Specialists in Sika's R&D, Technical Service, Systems Engineering and Application Technology concentrate on devising 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 rail 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 providing 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.



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 new concepts aimed at holistic solutions for our clients. In this way we partner the development of solutions including pumping and application systems as well as automated robotic equipment specifically designed to meet individual customer needs.

Local Service & 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.

CAD/CAE Supported Development

Sika concentrates on Computer Aided Design and Engineering of structurally reinforcing process materials. As our customers increasingly utilize 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 utilized by our customers.

Sika Worldwide



Sika ensures high quality for its products and services. In each production process, for each workplace and for each employee, the guiding aim is to uphold quality at the highest level. Sika is certified according to the international standards ISO 9001, ISO 14001 and QS 9000.

Please note

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

Some of the processes and techniques portrayed in this brochure are state of the art and are not widely available at the time of publishing.

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