



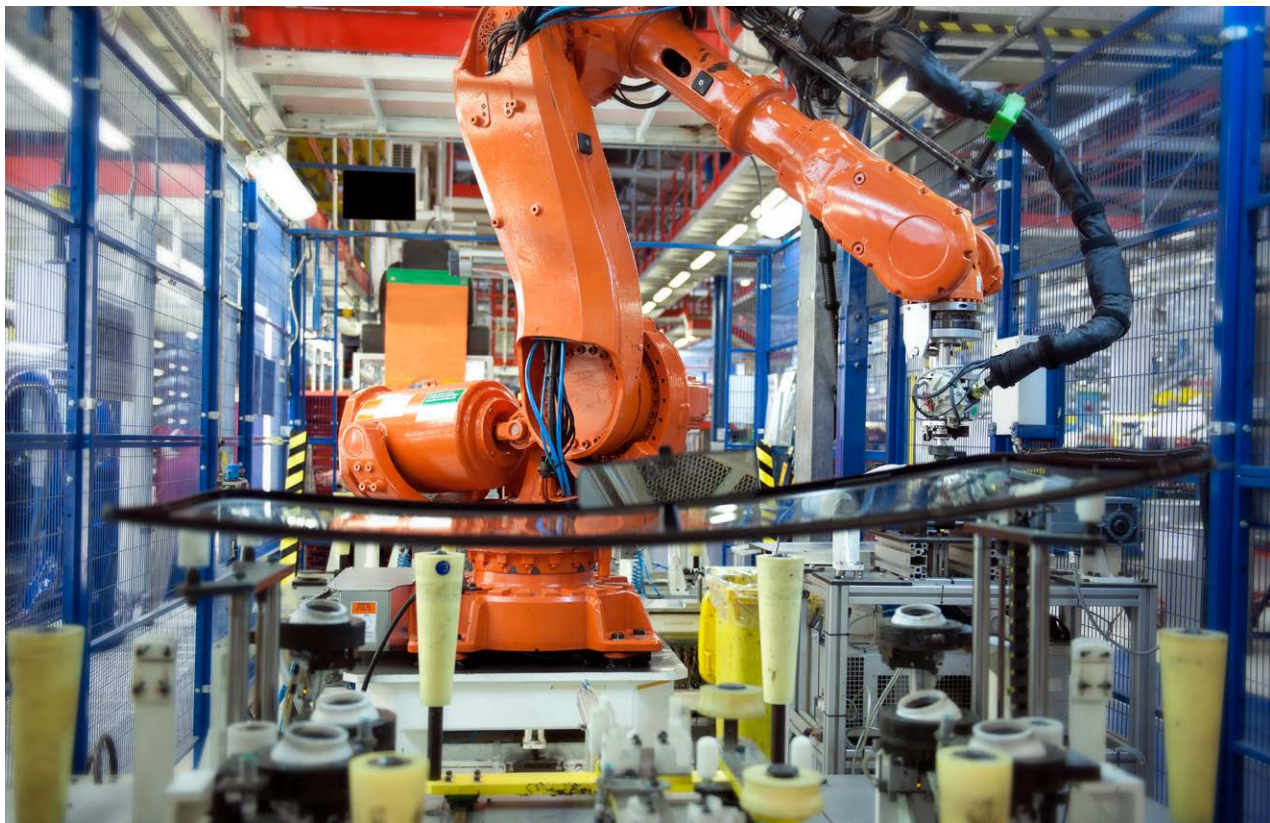
GLASS AND WINDSHIELD BONDING IN TRANSPORTATION IMPROVED EFFICIENCY AND DESIGN

BUILDING TRUST



YOUR PARTNER FROM ENGINEERING TO PRODUCTION

WHY SIKA? Engineers developing commercial vehicles are improving their productivity, vehicle durability, and efficiency by using adhesive bonding in their vehicle design. Sika, with its global footprint, innovative mindset, technical support, and long experience in the automotive industry, is the partner from engineering to the production of advanced vehicle concepts. Our experts help you drive down manufacturing costs by optimizing your production process and employing glass bonding adhesive and sealant technology. **Sika supports customers from the engineering to its integration into production.**

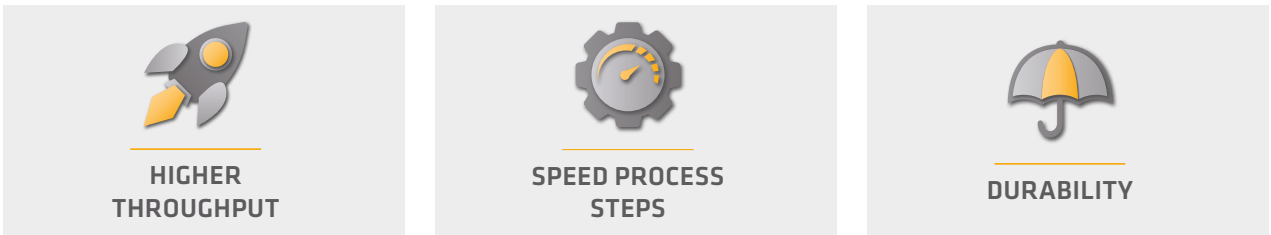


SIKA STRENGTH IN GLASS BONDING

- Tailored offering for bus, truck, rail and SVI
- Fast cure solutions with Sikaflex® Booster solutions
- Unique PowerCure solution for repair and smaller builders
- Automotive expertise and excellent footprint in the rail market
- Ability to service the market through local TS
- Low surface prep solutions with black-primerless bonding

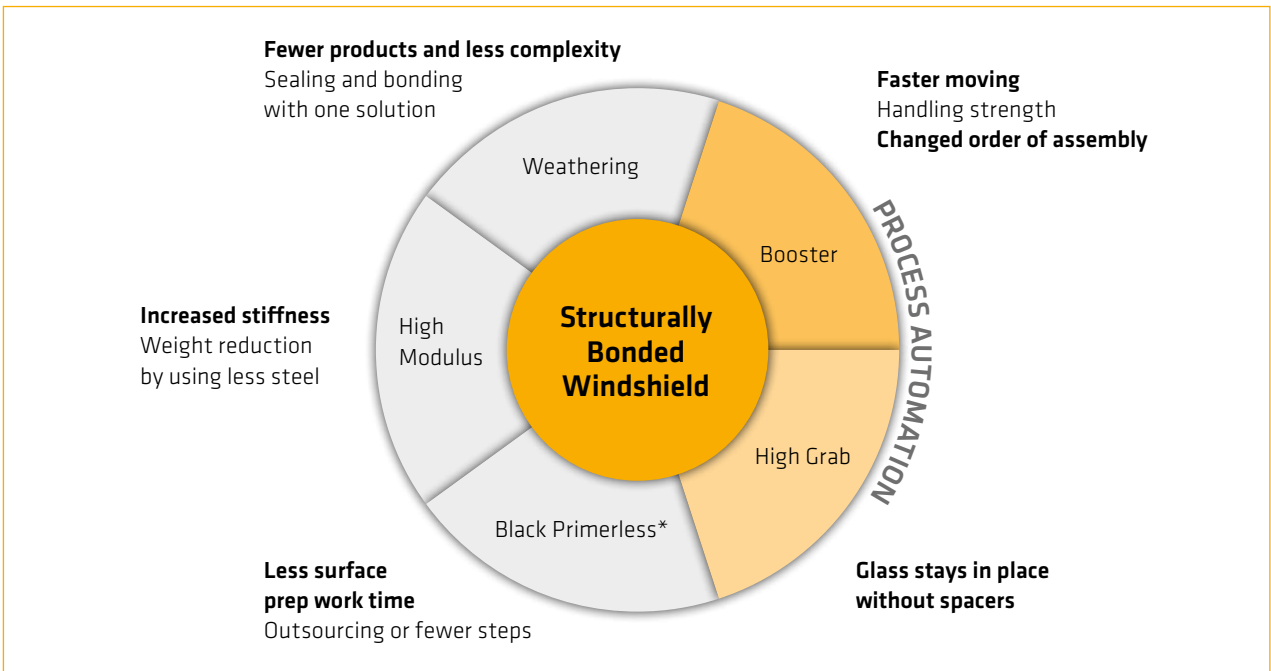
For over 30 years, Sika has been providing commercial vehicle assembly lines with adhesives and joint sealants for direct glazing applications. The solutions vary from standard products to innovative systems with high initial strength and accelerated curing speed.

CUSTOMER REQUIREMENTS



Sika offers a wide range of adhesives to suit various needs for direct glazing applications. Sikaflex® materials can maintain glass in position following installation, allowing the elimination of secondary clips, fixings or tape. Our products can also contain low electrically conductive properties for the elimination of galvanic corrosion/antenna signal loss. The Sikaflex® Booster and PowerCure range offers ultimate solutions for OEMs seeking excellent mechanical properties with the shortest possible full cure time, and provides the opportunity to have the same system accelerated from line application to repair.

YOUR VALUE WITH SIKA'S TECHNOLOGIES



*with SikaAktivator-100

GLASS AND WINDSHIELD BONDING SOLUTIONS

Sika offers a wide range of adhesives to suit your needs for direct glazing applications. Each Sikaflex® or Sikaflex® Booster solution combined with unique properties tailored to customer process needs. This allows maximum efficiency pared with high economy.

YOUR PROCESS REQUIREMENTS	LONG OPEN TIME			FAST CURING		
	COLD APPLIED			WARM APPLIED		
	WEATHERING RESISTANT GLASS ADHESIVE	ALL-IN-ONE ADHESIVE SEALANT	ALL-IN-ONE ADHESIVE SEALANT WITH HIGH CHEMICAL RESISTANCE	FAST CURING GLASS ADHESIVE	HIGH INSTANT GRAB 80°C APPLIED	AUTOMATED GLASS BONDING WITH IMMEDIATE GRAB NEW
SIKA SOLUTION	Sikaflex®-263	Sikaflex®-265	Sikaflex®-268	Sikaflex®-271	Sikaflex®-250 PC	Sikaflex®-276 PC-2
BULK BOOSTER	□	■	■	■	□	■
PowerCure	□	□	■	■	□	□
CHEMISTRY	1C PUR	1C PUR	1C PUR	1C PUR	1C PUR	1C PUR
COLOR	Black	Black	Black	Black	Black	Black
APPLICATION TEMPERATURE	5 – 40°C	10 – 35°C	5 – 40°C	10 – 45°C	85°C	60°C
OPEN TIME	30 min	45 min	40 min	15 min	6 min	10 min
ELONGATION	500%	450%	500%	300%	450%	500%
LAP SHEAR STRENGTH	4.5 MPa	4.5 MPa	4.5 MPa	5 MPa	4 MPa	6 MPa
TENSILE STRENGTH	7 MPa	6 MPa	6 MPa	7 MPa	7 MPa	9 MPa
SUITABLE FOR ...						
- SIDE WINDOWS	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
- WINDSHIELDS	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
- JOINT FILLING	■ ■ ■	■ ■ ■	■ ■ ■	□ □ □	□ □ □	■ ■ □
EN 45545-2 CLASSIFICATION		R1/R7 HL3	R1/R7 HL3			
PRODUCT DESCRIPTION	Glass bonding adhesive specifically designed for the transportation market. It exhibits good application properties and can be used for open joints.	Weathering-resistant direct glazing adhesive and sealant with acceleration option for Transportation market. Good tooling properties and enhanced weathering for exterior joints.	The system with acceleration options is designed for assembly and glass bonding applications in the rail and repair market. It exhibits excellent tooling and application properties and superior resistance to a wide range of cleaning agents. Outstanding weathering resistance allow the use for exterior joints.	The fast curing system can be further accelerated and especially designed for manual and automated direct-glazing application out of bulk packaging in the Transportation OEM market and for repair.	The warm applied product exhibits excellent application properties and high initial strength. It fits bonding applications in automated processes best but can be used for standard non-automated lines as well.	Warm applied glass bonding adhesive with high instant grab for reduced slip down. It can be accelerated and exhibits good weathering resistance.



Always consult the most current local product datasheet. Contact your local Sika company to enquire about product availability or alternative solutions.

JOINT SEALING SOLUTIONS

A wide spectrum of joint sealants is available to meet customer requirements. This includes regional solutions to cover specific needs. Many Sikaflex® joint sealants are appropriate for multipurpose use to bond and seal glass and windshields.

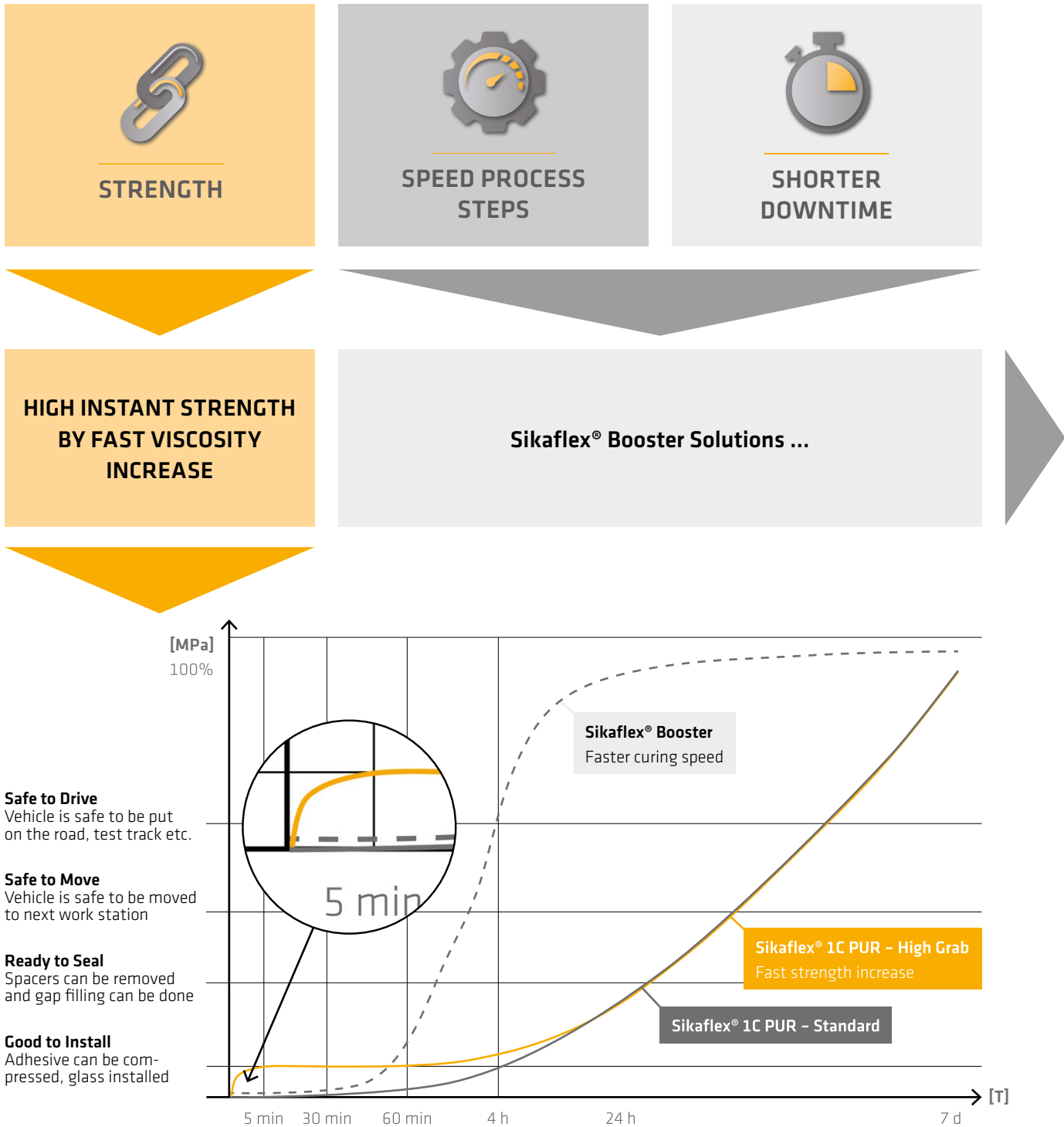
The Sika product portfolio also contains specific solutions with low modulus to prevent stress cracking on organic glass. PowerCure solutions offer fast return to operation in the repair case thanks to the accelerated curing speed.

YOUR PROCESS REQUIREMENTS	LONG OPEN TIME			ACCELERATION OPTION		INSTANT STRENGTH	LABELING FREE
	COLD APPLIED					WARM APPLIED	COLD APPLIED
	WEATHERING RESISTANT SEALANT	WEATHERING RESISTANT SEALANT ADHESIVE	WEATHERING REISTANT GLASS ADHESIVE	ALL-IN-ONE ADHESIVE SEALANT	ALL-IN-ONE ADHESIVE SEALANT	HIGH INSTANT GRAB WITH ACCELERATION OPTION NEW	MULTI-PURPOSE AND LABELING FREE ADHESIVE/SEALANT
SIKA SOLUTION	Sikaflex®-211 WR	Sikaflex®-223	Sikaflex®-263	Sikaflex®-265	Sikaflex®-268	Sikaflex®-276 PC-2	Sikaflex®-521 UV
BOOSTER	□	□	□	■	■	■	□
PowerCure	□	■	□	■	■	□	□
CHEMISTRY	1C PUR	1C PUR	1C PUR	1C PUR	1C PUR	1C PUR	1C STP
APPLICATION TEMPERATURE	5 – 40°C	10 – 35°C	5 – 40°C	10 – 35°C	5 – 40°C	60°C	5 – 40°C
OPEN TIME	20 min	45 min	30 min	45 min	40 min	10 min	20 min
SHORE A HARDNESS	40	30	60	45	55	60	40
ELONGATION	600%	400%	500%	450%	500%	500%	400%
TENSILE STRENGTH	1.8 MPa	2 MPa	7 MPa	6 MPa	6 MPa	9 MPa	1.8 MPa
WEATHERING STABILITY	■ ■ □	■ ■ ■	■ ■ □	■ ■ ■	■ ■ ■	■ ■ □	■ ■ ■
CHEMICAL RESISTANCE	■ □ □	■ □ □	■ □ □	■ ■ □	■ ■ ■	■ □ □	■ □ □
PRODUCT DESCRIPTION	Good weathering performance and good tooling properties. Available with short and long open time.	Weathering resistant low modulus adhesive sealant. Its low modulus allows bonding and sealing of organic glass (PC, PMMA).	Glass bonding adhesive and joint sealant specifically designed for the transportation market. It exhibits good application properties and can be used for open joints.	Weathering resistant direct glazing adhesive and sealant with acceleration option for Transportation market. Good tooling properties and enhanced weathering for exterior joints.	Excellent tooling and application properties, as well as superior resistance to a wide range of cleaning agents. Outstanding weathering resistance allow the use for exterior joints.	Warm applied glass bonding adhesive with high instant exhibits for reduced slip down. It can be accelerated and exhibits good weathering resistance. Therefore, it can be used for exterior joints or one-shot applications.	Weathering resistant Silane Terminated Polymer (STP) adhesive/sealant that bonds well to a wide variety of bonding surfaces. This multipurpose product is suitable for internal and external sealing applications.

Always consult the most current local product datasheet. Contact your local Sika company to enquire about product availability or alternative solutions.

GLASS BONDING TECHNOLOGIES

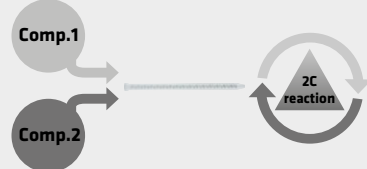
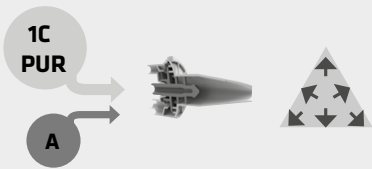
Different glass bonding adhesive technologies are available to suit customer needs – be it a high initial strength to move the component safely to the next step in the process, or achieving a fast curing speed. Sika offers a complete toolbox to cover all of these customer requirements.



Sikaflex® Booster

PROCESSING SPEEDS FROM INDUSTRIAL MANUFACTURING TO REPAIR

Sika offers product systems based on Sikaflex® Booster technology to provide customers with high strength across the board but different curing speeds. SikaBooster® is a curing accelerator that can be turned on or off, changing the curing speed but not the final mechanical product properties. With the PowerCure Dispensing System, Sika also offers Sikaflex® Booster adhesives in sausage packaging, so no bulk dispensing equipment is required.

1C TECHNOLOGY	2C TECHNOLOGY	Sikaflex® BOOSTER TECHNOLOGY
		
CURING FROM OUTSIDE ONLY	CURING FROM INSIDE ONLY	CURING FROM INSIDE AND OUTSIDE
+ Easy handling	+ Fast strength development	+ Fast strength development
+ Reliable performance	+ Many performance specs	+ Same end performance with/without Booster
- Slow curing in cold	- Limited availability in small pack size (waste/cost)	+ Available in bulk and small pack (PowerCure)
	- Performance dependent on mixing accuracy	+ Fail-proof with curing by Booster or air moisture

**BULK DISPENSING -
Booster PUMP (50:1)**



© Reinhard Technik

Sikaflex® Booster can be fully integrated into automated production lines.

SMALL PACK SIZE - PowerCure



- Ergonomic handling for easier access to areas hard to reach with pump system
- Ideal for small jobs that need flexibility
- Accelerated repair solution, also for field repair
- Very low packaging waste thanks to «foil sausage»



The PowerCure Dispensing System allows Sikaflex® Booster Technology to be used at multiple workstations with very low up-front investment.

BE A WINNER!

With PowerCure Adhesives

PROVEN TECHNOLOGY BY NUMEROUS INDUSTRIAL USERS ALL AROUND THE WORLD.

The PowerCure adhesive system delivers the precision and performance of the high-end pump systems found on manufacturers' production lines. It combines a high degree of flexibility and ergonomic, easy handling with minimal waste in a clear, focused design. The use of a single, brushless motor mechanically couples extrusion, dosing and dynamic mixing, and allows users to control extrusion speed on the go without compromise. Providing the fastest curing adhesives at an unmatched comfort level for the user, PowerCure is the total solution for smaller or difficult to reach sealing and bonding applications.

PowerCure DISPENSER

- Ergonomic and simple handling
- As precise as industrial pump dosing and dispensing equipment
- Flexible and mobile use



PowerCure PACKAGING

- Efficient sausage packaging
- Significantly lower volume of waste than any 2C system on the market
- Automatic opening by the PowerCure Dispenser



PowerCure MIXER

- Dynamic and efficient mixer
- Lower volume of waste than static mixers
- High throughput (up to 6ml/s)
- Available as screw-on adapter for custom nozzle design





DESCRIPTION	ORGANIC GLASS ASSEMBLY AND JOINT SEALING	ASSEMBLY ADHESIVE WITH MINIMAL PRE-TREATMENT	ASSEMBLY AND GLASS BONDING WITH HIGH CHEMI- CAL RESISTANCE RE- QUIREMENTS	WINDSHIELD ADHE- SIVE FOR FACTORY AND REPAIR
		NEW		
	Sikaflex®-223	Sikaflex®-554	Sikaflex®-268	Sikaflex®-271
CHEMISTRY	Polyurethane	STP	Polyurethane	Polyurethane
COLOR	Black	Black / White	Black	Black
OPEN TIME (PowerCure)	45 min	15 min	30 min	10 min
TENSILE LAP-SHEAR STRENGTH	1.5 MPa	2.5 MPa	4.5 MPa	5 MPa
WEATHERING RESISTANCE	■ ■ ■	■ ■ □	■ ■ ■	□ □ □
REPAIR	■ □ □	■ ■ □	■ ■ ■	■ ■ ■
PRODUCT DESCRIPTION	Multi-purpose adhesive and sealant suitable for interior and exterior application. Its low modulus allows to bond and seal organic glasses (PC, PMMA).	Assembly adhesive system especially designed to bond large components in industrial assembly. It bonds well to a wide range of substrates with minimal surface preparation.	Adhesive for bonding and joint sealing in commercial-vehicle glazing and assembly bonding applications. It shows outstanding weathering and cleaning agent resistance.	Adhesive for bonding materials relevant for direct glazing such as paints, glass, ceramic frits, painted and e-coated surfaces in commercial-vehicle production and repair.

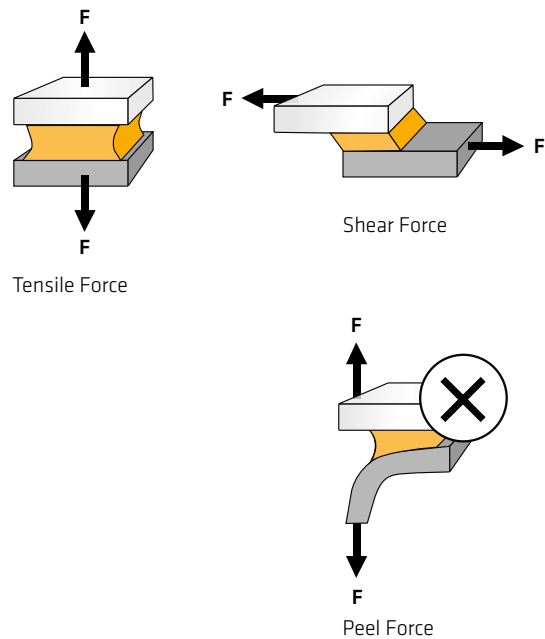
For details consult the most current local Product Datasheet of the product



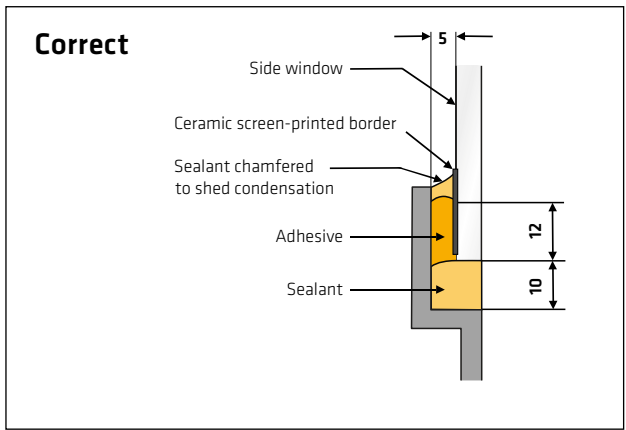
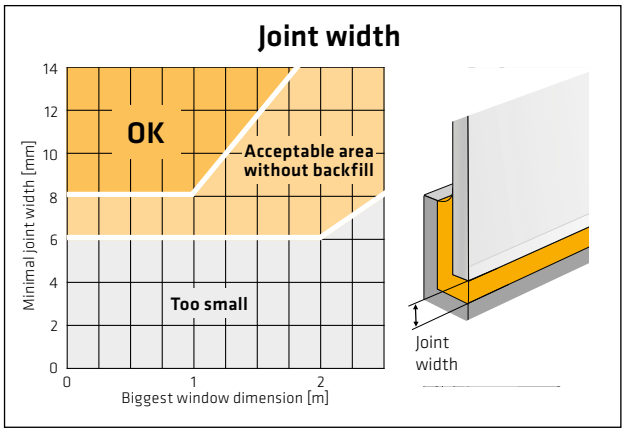
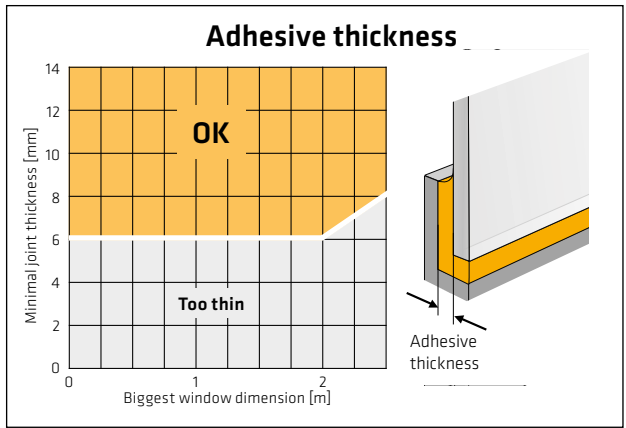
DESIGN GUIDELINES

BONDING DESIGN

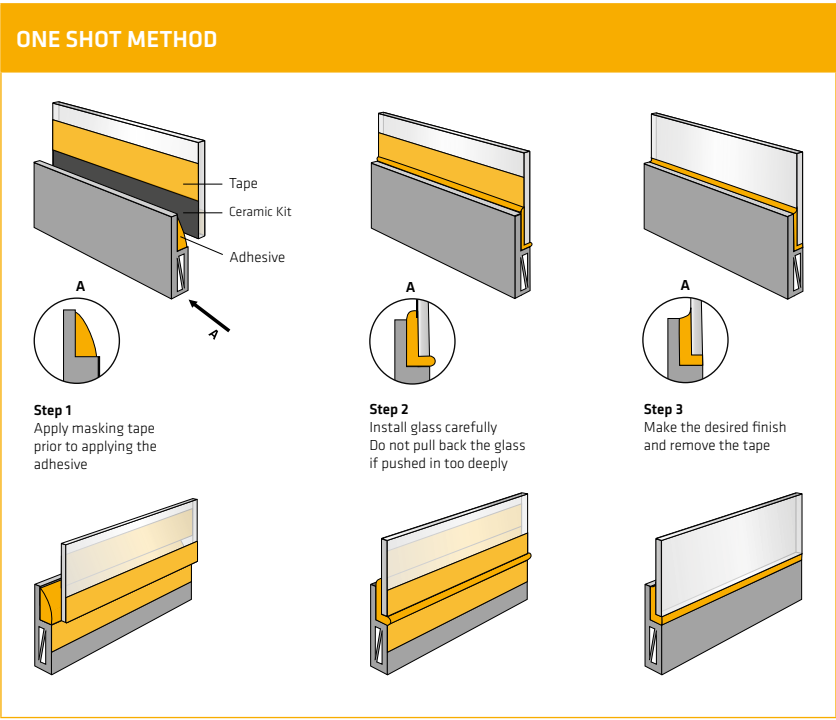
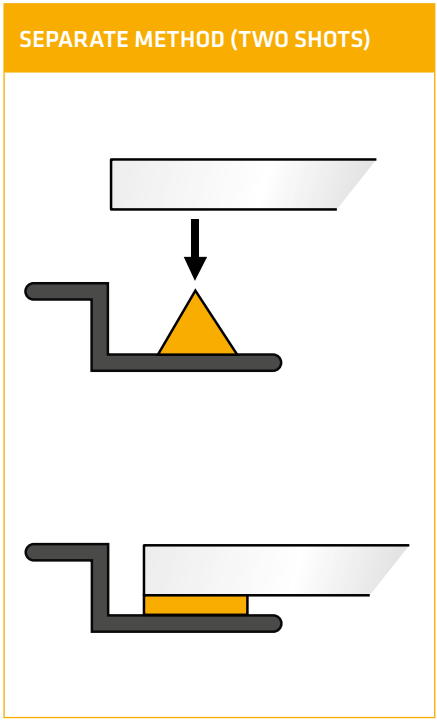
In practice, adhesive joints are exposed to numerous forces (tensile, compression, shear and peel). The strength of the connection depends on the adhesive surface, the internal forces of the adhesive and the parts to be joined, as well as the stress distribution within the substrates. An incorrect design can lead to high tension peaks and thus the failure of the connection. Therefore, when designing, care should be taken that the geometry is suitable for the adhesive. This enables a long service life under the required conditions. An elastic adhesive can only demonstrate its advantages (movement compensation, impact strength, vibration and sound absorption) if the adhesive geometry is correctly designed.



ADHESIVE THICKNESS AND JOINT DESIGN

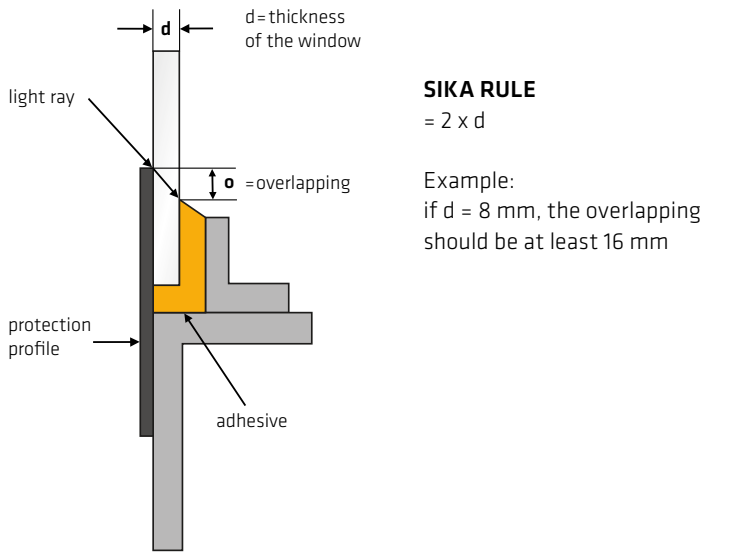


INSTALLATION METHODS



PROTECTION FROM UV

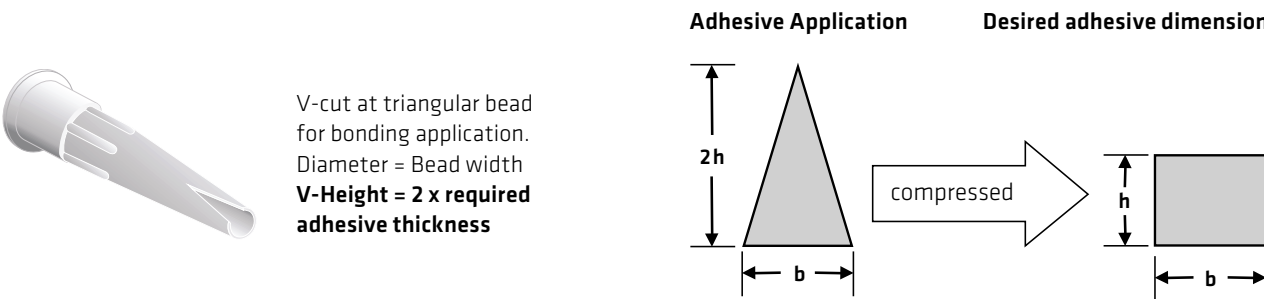
A bond line may be protected with a ceramic frit in the case of mineral glass, or with special sieve print colors for organic glass. Another possibility is the use of exterior non-transparent trims or exterior paint. In this case, we recommend an overlap to avoid detachment due the scattering of UV radiation.



DESIGN GUIDELINES

NOZZLE GEOMETRY

Leaks, tension in the components and other problems must be avoided prior to a bonding application. The correct cutting of adhesive application nozzles reduce sources of error. The adhesive is applied in the correct dimension and can fully develop its functions. The adhesive should always be applied in the form of a triangular bead. This ensures the best possible wetting of the substrates with the adhesive. It avoids interruption in the adhesive bead, insufficient material application due to tolerances in the bonded parts or too thin layers which are too thin to prevent water leaks.



ADHESIVE CONSUMPTION TABLE (JOINT WIDTH)

THICKNESS / HEIGHT (MM)	LINEAR METER PER UP 600 ML			LINEAR METER PER 100 ML ADHESIVE		
	5 mm	10 mm	15 mm	5 mm	10 mm	15 mm
1	120.0	60.0	40.0	20.0	10.0	6.7
2	60.0	30.0	20.0	10.0	5.0	3.3
3	40.0	20.0	13.3	6.7	3.4	2.2
4	30.0	15.0	10.0	5.0	2.5	1.7
5	24.0	12.0	8.0	4.0	2.0	1.3
6	20.0	10.0	6.7	3.3	1.7	1.1
7	17.2	8.6	5.7	2.9	1.5	1.0
8	15.0	7.5	5.0	2.5	1.3	0.8
9	13.4	6.7	4.5	2.2	1.1	0.7
10	12.0	6.0	4.0	2.0	1.0	0.7

SIKA ADDED VALUE

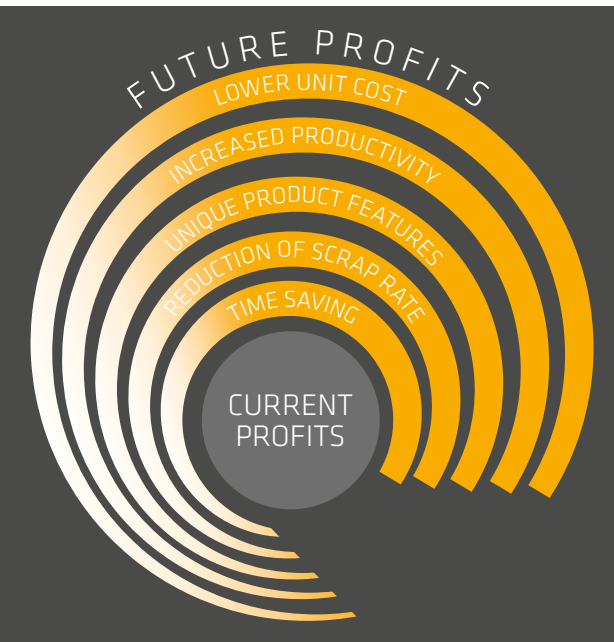
Going beyond the supply of materials and products

Sika is dedicated to providing and maintaining the highest quality and standards with its products and services. All Sika solutions are designed with the customer's success in mind and to establish long-lasting and mutually-beneficial relationships.

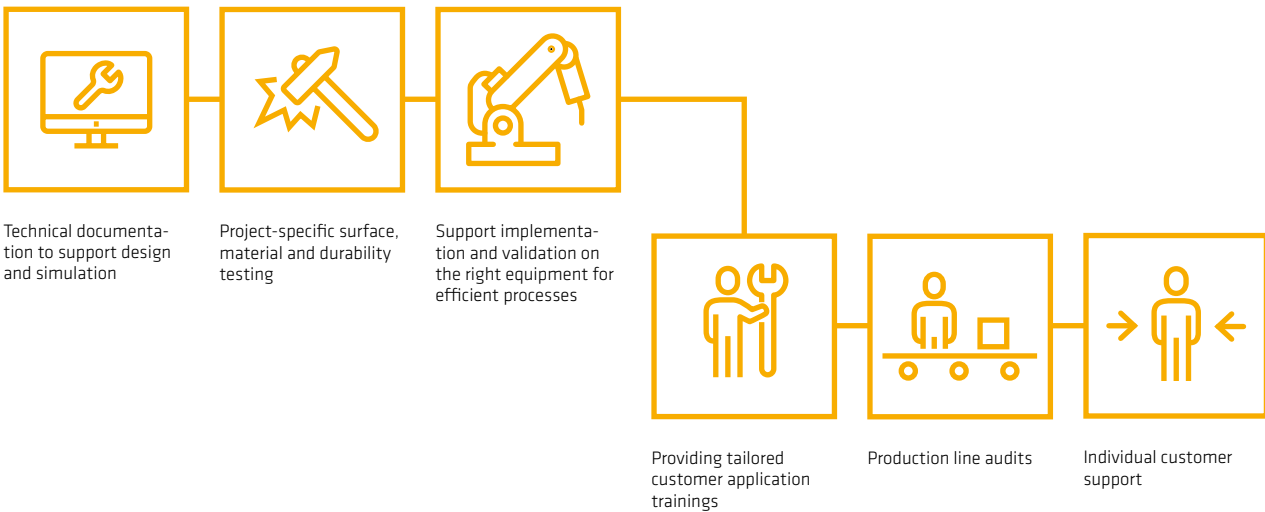
Sika Industry's well-proven solutions are equally complemented with an unmatched level of customer service and technical support. We aim to help our customers produce a better vehicle, improve processes, minimize emissions and support the reduction of overall vehicle manufacturing cost.

SIKA OFFERS ADDED VALUE SOLUTIONS THAT INCREASE YOUR PRODUCTIVITY, REDUCE YOUR COSTS, AND RESULT IN DIFFERENTIATED END PRODUCTS FOR YOUR CUSTOMER.

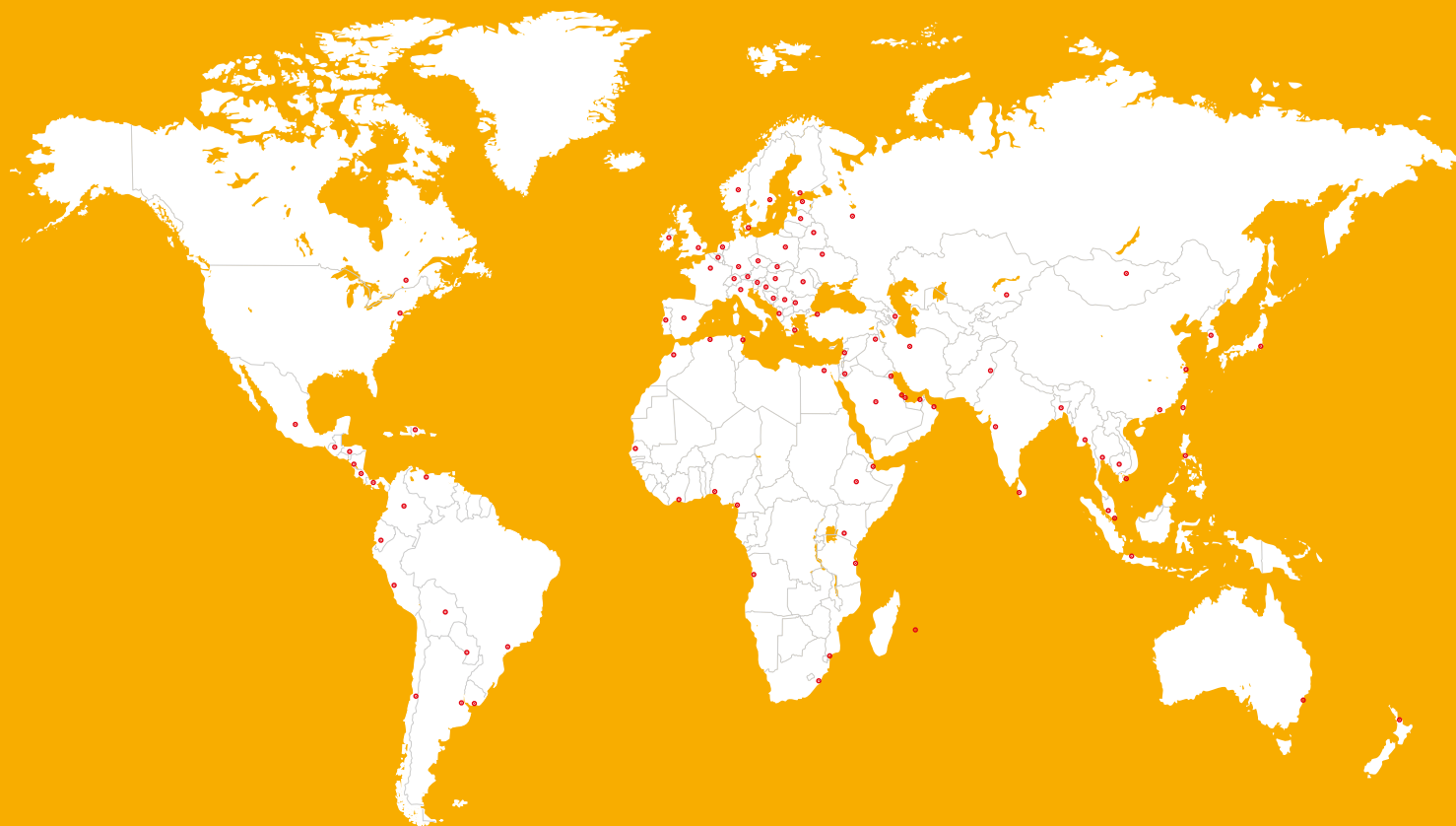
For decades, Sika has been a presence in the global transportation industry for decades, supporting customers with solutions for sealing, assembly bonding and coatings, as well as reinforcement and acoustic solutions. Owners and operators demand ever-lower vehicle running and repair costs combined with improved reliability and durability. Newly developed structural adhesives help to meet these requirements. Government legislation is pushing for lower vehicle emissions. Sika, as a supplier and partner to the global transportation industry, provides a range of state-of-the-art technology solutions to help manufacturers meet these challenges as well.



Our teams help from the idea through to the design stage and until the completion of a project with:



GLOBAL BUT LOCAL PARTNERSHIP



FOR MORE TRANSPORTATION INFORMATION:



www.sika.com/transportation

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.

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



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BUILDING TRUST

