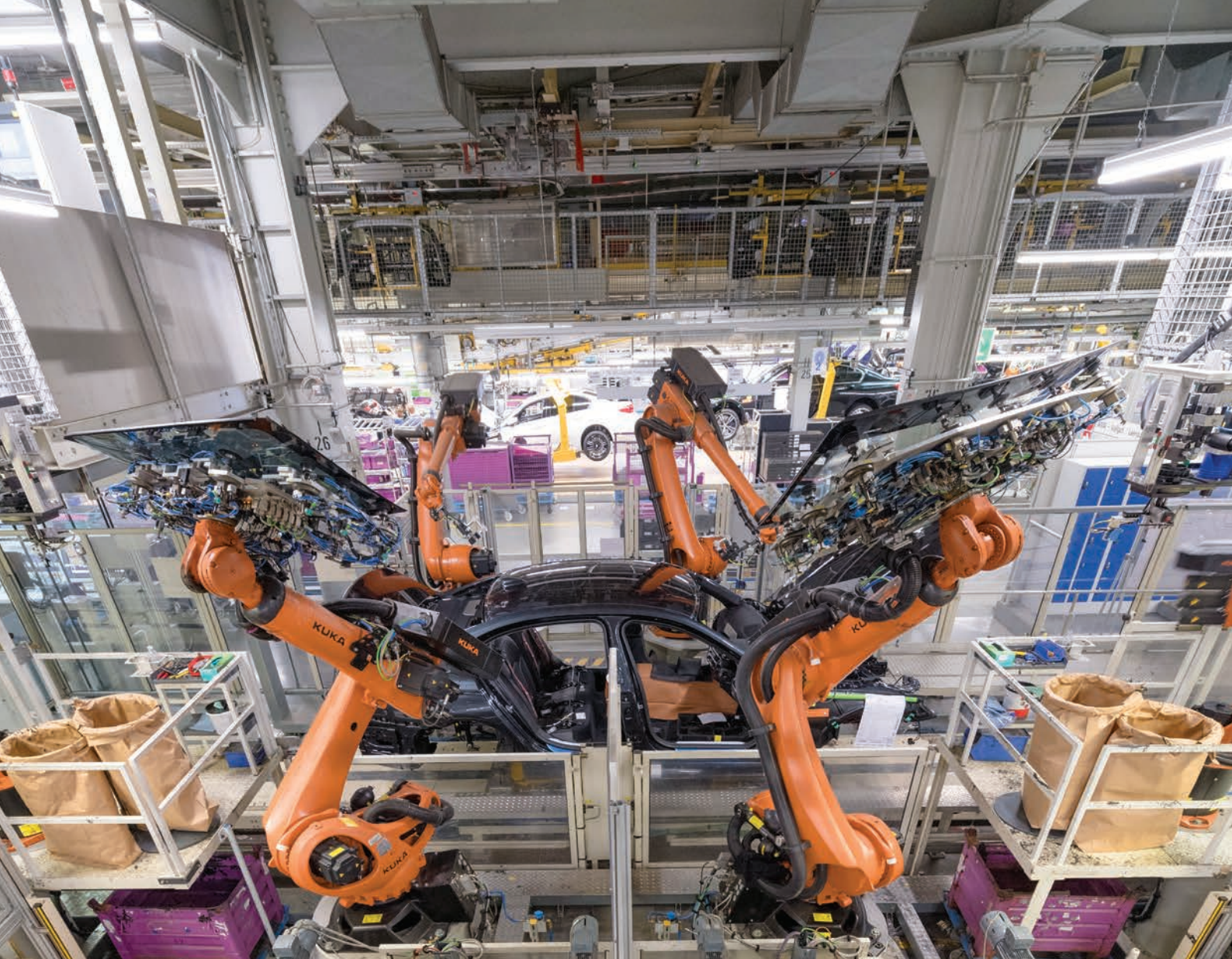


ASSEMBLY LINE ADHESIVES DURABLE BONDS AND SIMPLIFIED PROCESSES START WITH SIKA

LIGHTER | STRONGER | SAFER | QUIETER | GREENER

BUILDING TRUST





YOU NEED TO FIND WAYS TO MAKE YOUR NEXT VEHICLE LIGHTER, STRONGER, SAFER, QUIETER OR GREENER.

SO WHERE DO YOU START?

Start with a trusted partner that can deliver global innovation on a localized scale, wherever and whenever it's needed. Start with a commitment to continuous improvement, and the knowledge that it takes years to become an overnight success. Start with a collaborative approach that can bring together great minds without knocking heads. Start with pioneering innovation that clears a path for the vehicles of the future, no matter what form they take.

START WITH SIKA

With a full suite of bonding, damping, sealing and reinforcing solutions, Sika is a key strategic partner for both OEMs and component suppliers. By collaborating on advanced development projects and engaging early in program development, we help customers optimize designs, identify cost savings and reduce complexity.

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12 Preparing Surfaces for Durable Adhesion

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INNOVATION IN DIRECT GLAZING SYSTEMS

Product Evolution, Process Improvements and Eco-Friendly Solutions

SAFER AND STRONGER VEHICLES START WITH SIKA With more than three decades of experience in providing direct glazing technology to automotive assembly lines and aftermarket fitters, few companies understand direct glazing processes, or PUR chemistry, better than Sika. Embedded in this experience, Sika's eco-friendly innovations in direct glazing systems have continuously contributed to leading edge improvement of vehicle performance and safety as well as manufacturing processes and costs optimization.

Our advanced and production ready systems include:

- Primerless systems for ceramic and paint
- Accelerated systems - Sika®Booster technology
- Bubble-free systems - Patented i-Cure® pre-polymer technology
- High green strength - Fast screen fixation systems
- VOC-free pre-treatments for glass, ceramics, paint and a wide range of plastics

- 1 Automated application of Sikaflex®
- 2 Automated bonding of windshield



APPLICATION

- Automated and manual bonding of windshield, backlights and side windows
- Automated bonding of panoramic and modular roof systems
- Simple solutions for any rework requirements in assembly line applications

BENEFITS

- Sustainability - Reduced VOC content
- Systems offer primerless bonding options to various substrates
- Proven materials offering long term durability
- Accelerated PUR systems offer advantage over competitive solutions

TECHNOLOGY OVERVIEW: DIRECT GLAZING SYSTEMS

Product	Material Properties				
	Suitable Substrates	G Modulus	Application Temperature	Elongation at break	Key Benefits
Primerless 1C-PUR	Glass, paint, e-coat	1.2 – 3.8 MPa	RT – 65°C	150 – 500%	Cost optimization
i-Cure® based 1C-PUR + Sika®Booster	Glass, paint, e-coat, primer, plastics, encapsulations				Process flexibility, VOC reduction
Fast Green Strength 1C-PUR					High initial screen fixation
Low Conductive 1C-PUR					Antenna suitable



>70 MILLION CAR GLASSES ANNUALLY ARE BONDED WITH SIKAFLEX®, INCLUDING 1 IN 4 WINDSHIELDS

SOLVING MIXED MATERIAL BONDING CHALLENGES

Introducing a New Level of Design Flexibility

LIGHTER VEHICLES START WITH SIKA The trend towards lightweight structures in car body construction has made mixed assembly of lightweight and composite materials a common strategy.

Our Sikaflex® and Sikaforce® Ultra High Modulus (UHM), one- and two-component elastic polyurethane adhesive provides OEMs with an innovative alternative to spot welding or applying rigid, inflexible structural adhesives to the body structures. UHM technology creates a new level of design flexibility by allowing engineers to explore innovative uses of lightweight materials, while ensuring designs and materials chosen can comply with all of the requirements for crash-resistance and safety regulations.

This innovative adhesive family provides an industry leading solution to the most challenging assembly line bonding application; providing exceptional performance during crash events, while accommodating the differences in material thermal expansion and contraction properties ($\Delta \alpha$) of the different materials. Further, UHM technology directly contributes to car body stiffness for improved vehicle dynamics. It is based on Sika patented and proprietary *i-Cure*® technology, which allows for curing acceleration through the use of Sika®Booster products. The innovation is a key process enabler for mass production of vehicle architectures with mixed material design.



1
1 Crash resistant bonding of mixed material
2 CFRP roof bonding



APPLICATION

- Aluminum/CFRP roof to steel body bonding
- CFRP to aluminum bonding
- CFRP/CFRP bonding

BENEFITS

- Enables lightweight structure assembly in cold body shop
- High elasticity contributes to excellent crash performance
- Accommodation of $\Delta \alpha$ due to high elongation
- Constant mechanical performance over service temperature range
- Contributes directly to improvement of body stiffness due to high modulus properties

TECHNOLOGY OVERVIEW: MIXED MATERIAL BONDING – Sikaflex®-UHM, SikaBooster® and SikaForce®-UHM

Requirement	Sikaflex®		SikaForce®		Sikaflex®-UHM		SikaForce®-UHM
	1C	+Booster	elastic	structural	1C	+Booster	
Stiffness	X		X	✓	✓		✓
Crash Performance	✓			✓	✓		✓
$\Delta \alpha$ compensation	✓		✓	X	✓		✓
Adhesion to E-coat, Paint and CFRP	✓		✓	X	✓		✓
Cold Curing	✓			✓	✓		✓
Fast Curing	X	✓		✓	X	✓	✓

✓ applicable X not applicable



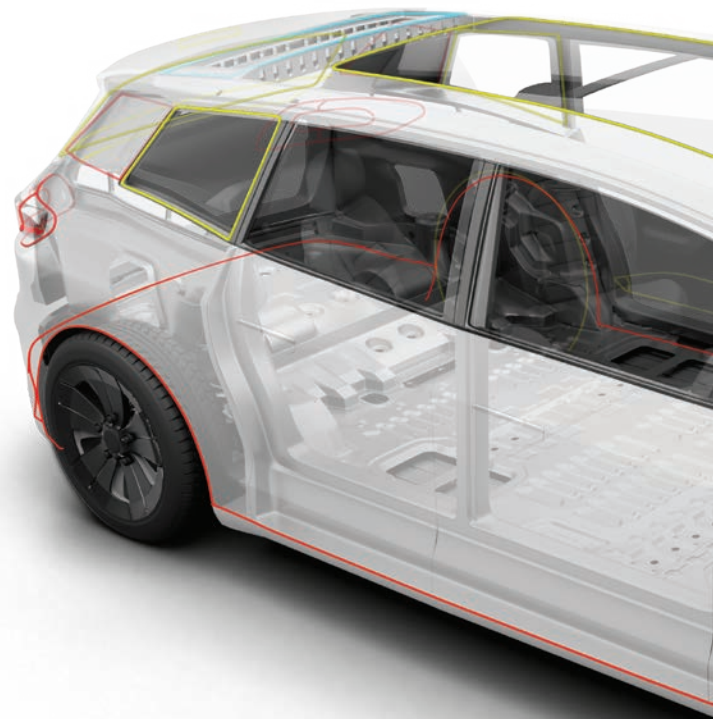
2'000'000 KG
of weight saved annually by using Sikaflex®-UHM

ASSEMBLY LINE ADHESIVES

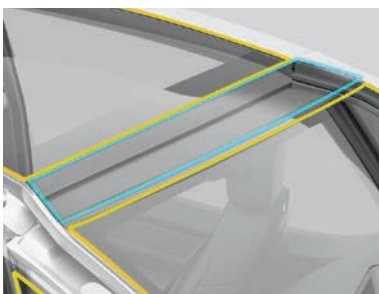
High Performance Systems to address Safety, Performance and Design Flexibility

SIKA OFFERS A FULL RANGE OF BONDING SOLUTIONS FOR DIRECT GLAZING,

as well as component bonding in order to fulfill customer requirements in terms of performance, durability and process capability. Furthermore, Sika is providing innovative solutions for elastic bonding of mixed-material and metal panel stiffening to support vehicle weight reductions. This includes our well known 1-component polyurethane (PUR) (Sikaflex®, SikaTack®), newly developed 2-component PUR (SikaForce®) as well as a full range of pretreatments.







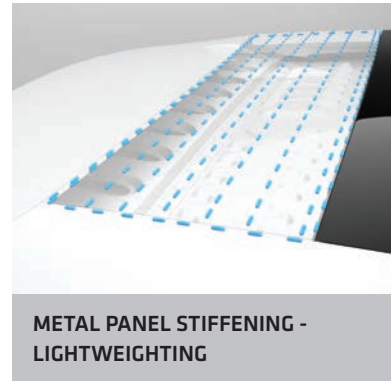
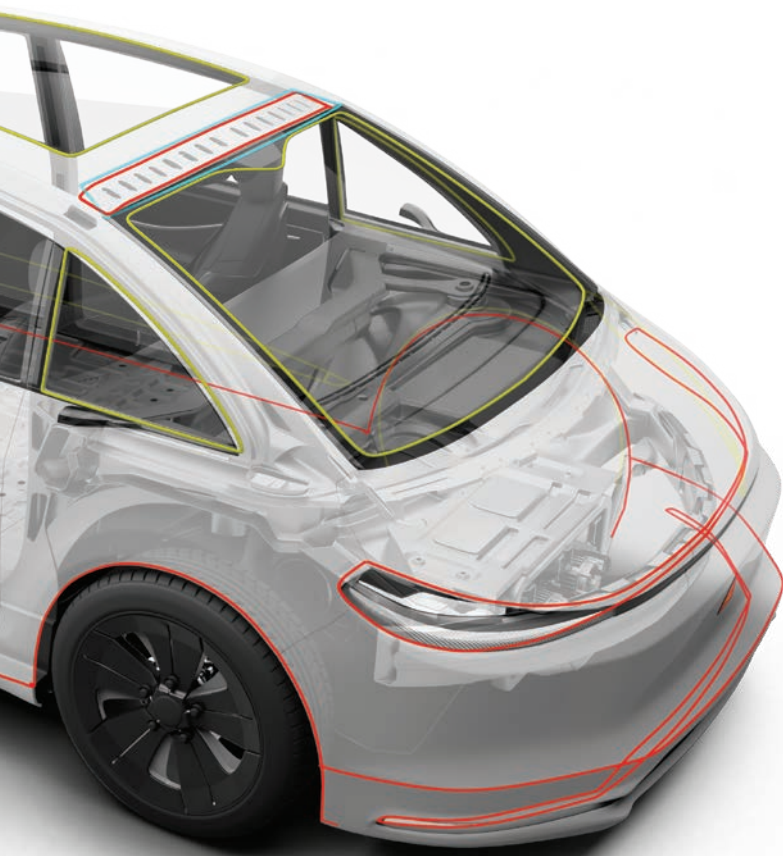
DIRECT GLAZING & GLASS REPLACEMENT



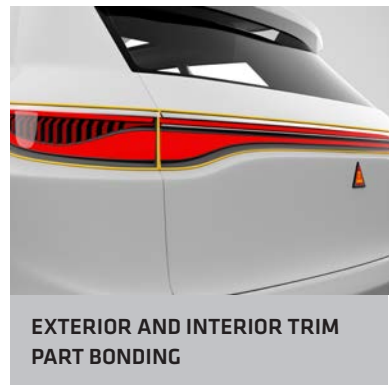
MIXED MATERIAL BONDING

PRODUCT KEY

-  Direct Glazing & Glass Replacement
-  Mixed Material Bonding
-  Metal Panel Stiffening
-  Exterior and Interior Trim Part Bonding



**METAL PANEL STIFFENING -
LIGHTWEIGHTING**



**EXTERIOR AND INTERIOR TRIM
PART BONDING**

- 1, 2 Automotive OEM repair kit
- 3 Manual application of black primer to ceramic windshield

A FULL RANGE OF REPAIR SOLUTIONS
Like all of our adhesive systems, our assembly line product portfolio is available for repair applications. Sika®Aktivator, SikaPrimer® and Sikaflex® products for glass replacement are packed in easy to use kit form and contain everything needed for service in one package. Our SikaForce® products, applied from bulk containers in assembly, are also available to the market in cartridges.



1



2



3

BONDING AND SEALING SOLUTIONS FOR EXTERIOR AND INTERIOR TRIM ASSEMBLY

New Materials - New Options - New Possibilities

LIGHTER AND STRONGER VEHICLES START WITH SIKA Bonding of trim parts directly on the assembly line has opened new possibilities for car body design, while also simplifying and streamlining assembly processes. Sika offers a full range of adhesive and sealant technologies for trim parts assembly especially suited to the challenges presented; Sikaflex® and SikaForce® 1C and 2C polyurethanes, hybrid technologies including silane terminated polymers and our proprietary *i-Cure*® product family.

Typical applications include sealing and bonding of spoilers, antennas, bumpers, tailgates, side-panels, headliners, cockpits and even roof rails. Potential applications are only limited by the designers imaginations.

Of special interest for these products is the drive to reduce body weight, which has led to greater use of alternative materials for assemblies including aluminum, plastics and composites, as well as thinner metal panels.

Another Sika innovation; our well known Sikaflex®-ULM (Ultra Low Modulus) adhesives, specifically introduced for bonding very thin metal panels, without introducing typical read through effects common to adhesive materials. Sikaflex®-ULM leverages the full advantages of our patented *i-Cure*® prepolymer base, providing consistent performance over the wide operating temperature range.



1

1 Exterior bonding application
2 Automated application of Ultra Low Modulus *i-Cure*® based Sikaflex® for DVD



2

APPLICATION

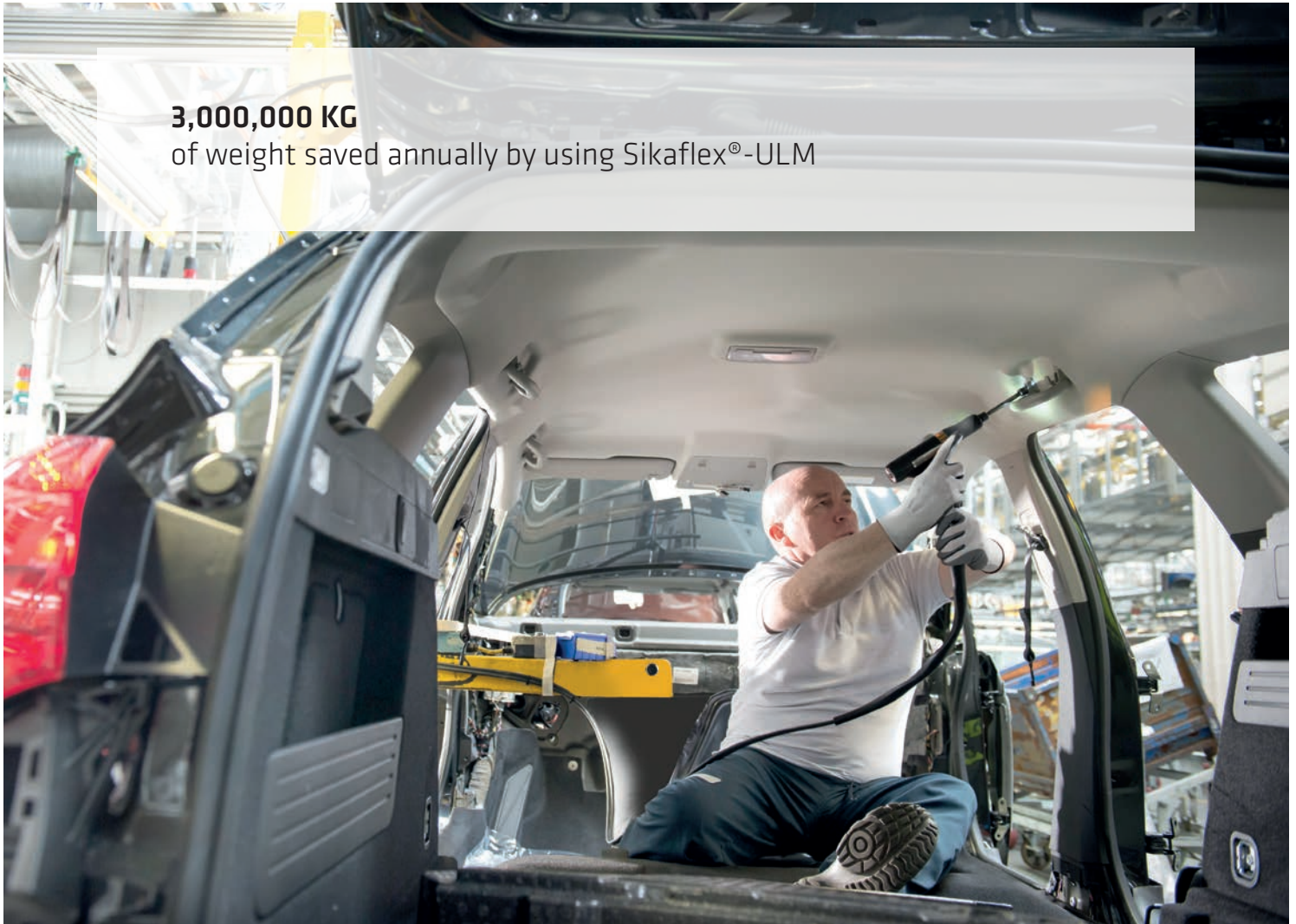
- Multiple assembly operations in exterior and interior trim parts bonding
- Ideal for application on thin metal panels (DVD, Headliner)
- Anti-flutter bonding applications, panel to frame, panel to panel
- Wide range of sealing applications in assembly operations

BENEFITS

- Greater freedom in car body design and assembly techniques
- Products directly applicable to weight reduction strategies
- Excellent and constant performance due to *i-Cure*® technology

TECHNOLOGY OVERVIEW: TRIM PART BONDING AND SEALING

Product	Material Properties					
	Suitable Substrates	Application Field	G Modulus	Application Temperature	Elongation at Break	Key Benefits
Low-Modulus 1C-PUR	E-coat Paints Plastics	Trim Part Bonding	1 – 2.5 MPa	20 – 35°C	250 – 500%	Cost / performance
Sikaflex®-ULM <i>i-Cure</i> ® based 1C-PUR		Trim Part Bonding and Anti-Flutter	0.5 MPa		750%	Non read-through weight reduction
Hybrid 1C-PUR		Trim Part Bonding and Sealing	1.2 – 2 MPa		300 – 500%	MDI-free
UV-resistant 1C-PUR		Sealing	1 – 1.5 MPa		300 – 400%	UV resistant



3,000,000 KG
of weight saved annually by using Sikaflex®-ULM

PREPARING SURFACES FOR DURABLE ADHESION

Innovative Technology for Bonding Challenges

COMPLETE SYSTEM SOLUTIONS START WITH SIKA Sika has a long and rich history of innovation in surface pre-treatment technologies, including introduction of the first black-primerless systems, luminescent primer detection systems and eco-friendly water-based primer systems all formulated with one mission; worry free and assured bond line adhesion for every potential application.

Our full range product portfolio includes:

- Sika®Aktivator solvent based clear primers for direct glazing applications; float glass, ceramic frits and paints
- Sika®Primer for direct glazing applications, pre-treatment for light weight materials including aluminum, metals or CFRP parts as well as PUR-RIM encapsulation
- Sika®Cleaner surface preparation applications; prior to the application of Sika®Aktivator or Sika®Primer
- Sika Long Open Time (LOT) Primers offers the opportunity to move the pre-treatment out of the OEM assembly line

Additionally, as the demand for eco-friendly solutions grows, Sika continuously pushes our long heritage of pretreatment innovation, increasing development efforts for water based Hydroprep product offerings with the newly developed Sika®Hydro Prep®-206, the first water-based and MDI-free long open time black primer on the market.

Sika®Hydro Prep® products contribute to environmental sustainability; its use helps to reduce over 300'000 liters of VOC discharge annually. By design, Sika has the widest and most complete range of water based primers available in the industry today. Eco-friendly, high-performing, and easy to use innovations Start with Sika.



1 "All in one" black primer for glass, ceramic, paints, plastics, SikaPrimer®-217LUM
2 Automated application of water based activator, Sikaflex®-217 LUM



APPLICATION

- Direct glazing - where surface pre-treatment is required
- Enables and enhances mixed material bonding (CFRP, Aluminum, Steel, PC, PP)
- Trim part bonding on multiple materials if / where required

BENEFITS

- Simplify pre-treatment procedures with proven technology
- Improve flexibility in material selection
- Sustainable options - Significant reduction of pre-treatment VOC footprint
- Suitable for manual and automated applications
- Long open time performance on glass ceramics and encapsulations

TECHNOLOGY OVERVIEW: PRE-TREATMENTS – Sika® Aktivator, Sika® Primer, Sika® Cleaner AND Sika® HydroPrep®

Product	Technology	Suitable Substrate	Application Method	Flash Off
Sika®Primer-206 G+P	Solvent based black primer	Glass, ceramic, paint	Manual	10' -24h
Sika®Primer-206 D		Glass, ceramic	Manual	2'-24h
Sika®Primer-209 D		Paint, plastic, CFRP	Manual	10' – 24h
Sika®Primer-209 N		Plastics	Manual	30' – 24h
Sika®Primer-217 LUM		Glass, ceramic, paint, plastic	Manual	10' – 24h
Sika®Primer-219	Solvent based black primer	PUR-RIM encapsulation	Manual & Automated	24h – 3 months
Sika®Primer-506	Solvent based black primer	Glass, ceramic	Manual & Automated	24h – 3 months
Sika®Aktivator-100	Solvent based clear primer	Glass, ceramic, primer	Manual	10' – 2h
Sika®Aktivator-110 LUM;		Glass, ceramic, Primer	Manual	10" – 2h
Sika®Aktivator DS		Glass, ceramic	Manual & Automated	10' – 72h
Sika®Paint Aktivator		Paint	Manual	10' – 6h
Sika®Hydro Prep®-110	Water based black primer	Glass, ceramic	Manual & Automated	2' – 2h
Sika®Hydro Prep®-206	Water based black primer	Glass, ceramic, paint, plastic	Manual	30' – 3 months



THE GLASS REPLACEMENT LEADER

Full Service Portfolio for Professional Glass Replacement

STICK WITH THE LEADER - START WITH SIKA To most drivers, the windshield is just a window to the world. To an automotive engineer, it's part of an important safety system that helps keep occupants safely in the vehicle in the event of a crash and plays an important role in enhancing the structural stiffness of a vehicle. For Sika, both are key elements incorporated into the design of our products, but there is much more to consider regarding vehicle glass replacement.

Glass replacement adhesives must meet stringent standards, like FMVSS 212, which defines performance requirements for passenger crash protection and windshield mounting. Car manufacturers also have their own specifications related to safe drive-away time, modulus, antenna suitability and more; requirements that become 'standard' for glass replacement applications. With our Sika®Aktivator, Sika®Primer, Sikaflex® and SikaTack® products, we support vehicles from the factory floors to the open roads by offering a full range of professional repair products.

Our latest innovation for the automotive glass replacement market is the Sika® PowerCure System. This platform for accelerated adhesives and sealants features an innovative dispenser, dynamic mixer and a full range of accelerated adhesives and sealants. It delivers the precision and performance of the high-end pump systems found on automotive manufacturers' production lines but designed with good flexibility, ergonomic and handling characteristics for manual applications. Providing the fastest curing adhesives with 30 minutes safe drive away time (SDAT) at an unmatched level of comfort for the user, PowerCure is the total solution for sealing and bonding applications.

Outside of windshield bonding, Sika's PowerCure technology is the foundation for further adhesive applications which may need long open time or assured curing under a wide range of climactic conditions - such as battery box bonding in e-mobility production.

TECHNOLOGY OVERVIEW: GLASS REPLACEMENT SYSTEMS - SIKA®POWERCURE AND SIKAFLEX®

Product	Technology	Safe Drive Away Time	Long Open Time	Water-based Pre-treatment
Sika® PowerCure System	1C-PUR accelerated	++	+	+
Sikaflex® -250	1C PUR	+	++	+

++ Preferred technology + Possible option

APPLICATION

- Glass replacement systems for professional users
- Simple solutions for any rework requirements in assembly line applications

- 1 Manual application of OEM Repair PUR on windshield
- 2 Accelerated adhesive system and mixer for PowerCure concept



BENEFITS

- Focus on safety - Repair to original OEM conditions
- Focus on flexibility - Wide variety of technologies and applications
- Focused on users - Excellent system ergonomics and easy handling
- Focus on performance - Shortest SDAT in the industry

START WITH SIKA

MORE THAN

50% OF ALL VEHICLES

USE SIKA PRODUCTS AND TECHNOLOGIES

30 MILLION VEHICLES

PRODUCED ANNUALLY WORLDWIDE CONTAIN SIKA LAMINATION ADHESIVES

25 MILLION PLUS

VEHICLES MADE STRONGER AND SAFER EACH YEAR WITH OUR BODY SHOP ADHESIVES

30% WEIGHT REDUCTION

IN THE CAR BODY CAN BE ACHIEVED WHEN SIKA® PROPRIETARY HIGH-STRENGTH BONDING SOLUTIONS ARE USED IN CONJUNCTION WITH LIGHTWEIGHT MATERIALS AND THINNER MATERIAL CONSTRUCTION

MORE THAN

300,000 LITERS

OF VOCs WERE REDUCED THROUGH THE USE OF SIKA'S PRIMERLESS TO GLASS WATER-BASED PRE-TREATMENT SYSTEMS

MORE THAN

70 MILLION

CAR WINDOWS ARE BONDED DURING ASSEMBLY USING SIKAFLEX®

SIKA HAS

20,000+ EMPLOYEES

IN OVER

100 COUNTRIES

MORE THAN

700 MILLION

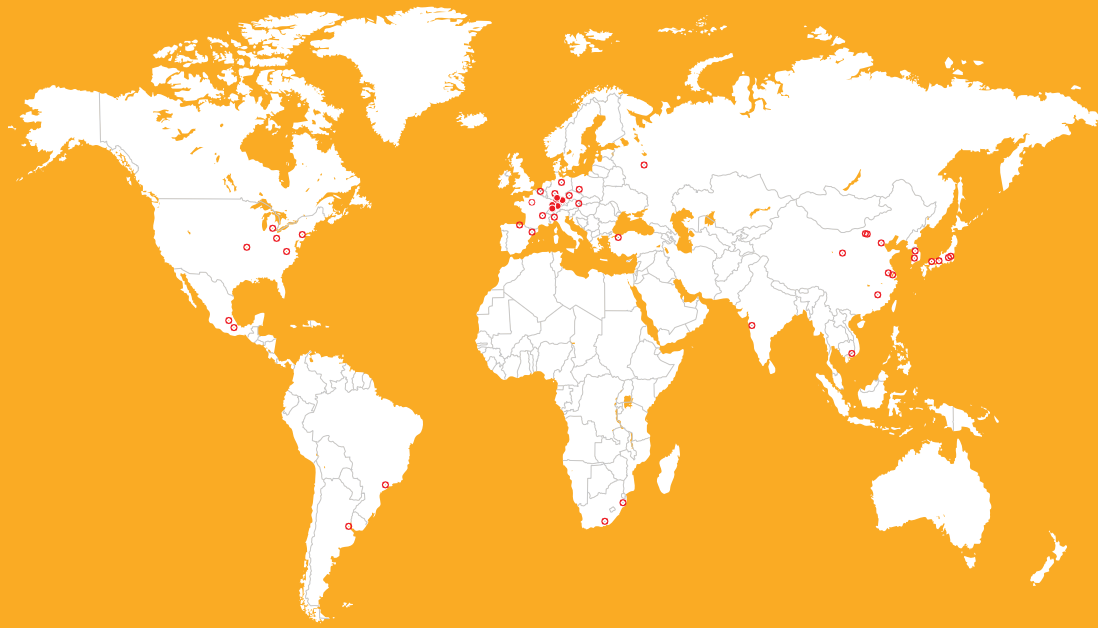
PARTS BASED ON OUR SIKABAFFLE®, SIKADAMP® AND SIKAREINFORCER® TECHNOLOGIES ARE SUPPLIED ANNUALLY TO THE GLOBAL AUTOMOTIVE INDUSTRY

MORE THAN

30%

INTERIOR NOISE REDUCTION IN VEHICLES THANKS TO SIKA'S ACOUSTIC SOLUTIONS

GLOBAL REACH BUT LOCAL PARTNERSHIP



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

