BODY SHOP ADHESIVES
STRONGER BONDS 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 body shop assembly development projects and engaging early in program development, we help customers optimize designs, identify cost savings and reduce complexity.

CONTENT

BODY SHOP ADHESIVES

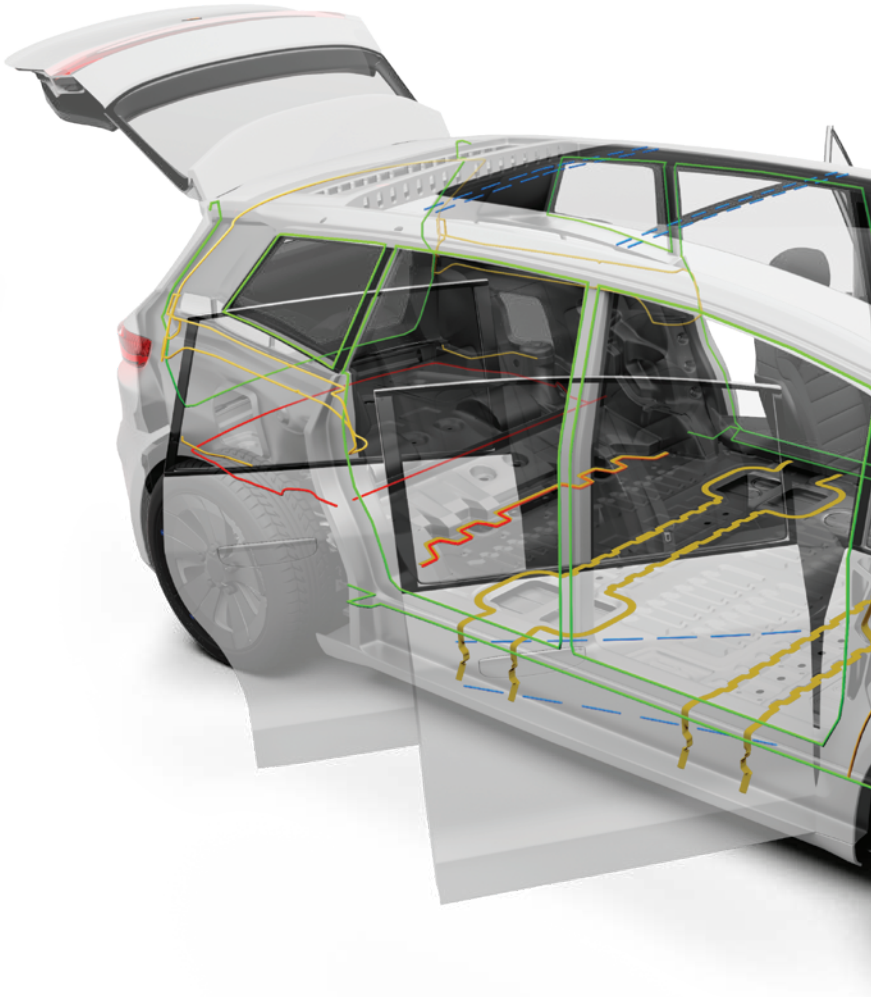
Application Overview

LIGHTER, STRONGER, SAFER, GREENER

Sustainable vehicle design has become a major factor in car production. Performance, economic, legislative and environmental targets all influence OEM thinking and are driving the need for durable body shop adhesives that can improve stiffness, crash durability and fatigue performance - as well as contribute to weight reduction.

As body shop joining has evolved from purely mechanical fastening techniques to hybrid joining including extensive use of adhesives, our versatile, one-component SikaPower® product range has become the go-to solution for new vehicle production including the challenges introduced in joining the same, new or different combinations of materials.

Crash resistance performance of a vehicle becomes highly visible only in the event of a crash. In this case it is vitally important that structural adhesives provide exceptional impact resistance to withstand dynamic stresses during collision events by absorbing as much energy as possible. SikaPower® products are formulated specifically for these challenging applications.



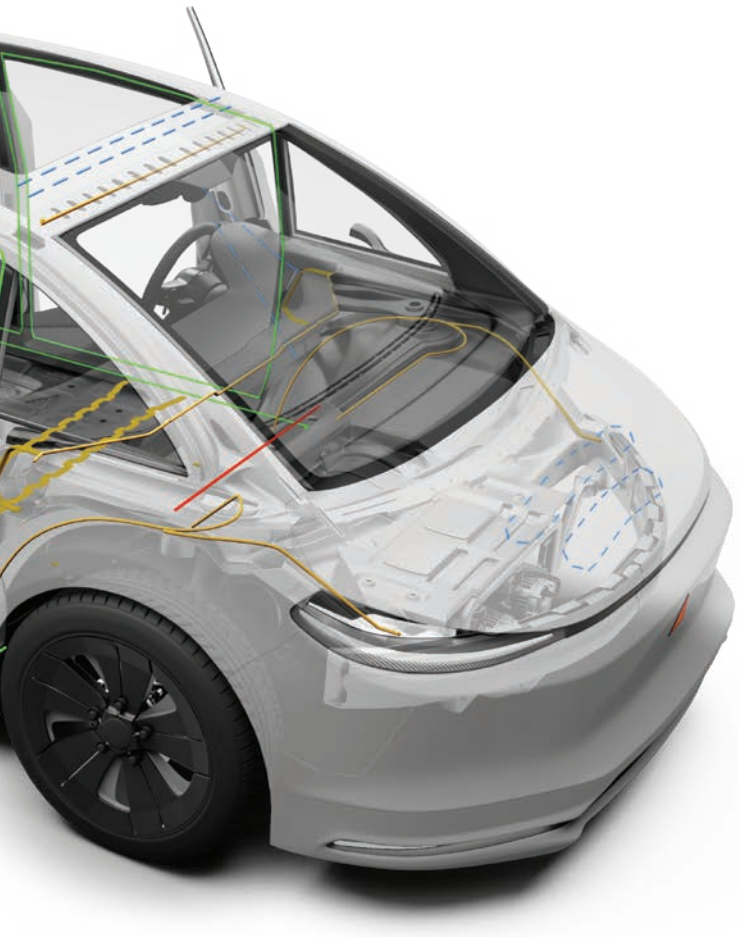
SIKAPOWER BODY SHOP ADHESIVES

Our body shop adhesive product portfolio covers all bonding requirements; structural, crash resistant, hem flange and our newest mixed material bonding products that address specifically Delta/Alpha challenges.

- SikaPower®-480, -492 and -494 structural adhesives
- SikaPower®-487, -493, -497 and -498/3 and -499 crash resistant
- SikaPower®-468 G, -492 G, -493 G, -494 G and -550 G hem-flange
- SikaPower® -510 G MBX and -533 MBX enable mixed material bonding

ANTI-FLUTTER ADHESIVES & SEALANTS

Application Overview



PRODUCT KEY

- Structural adhesives
- Crash resistant adhesives
- Hem-flange adhesives
- Anti-flutter adhesives
- Sealants

SIKASEAL ANTI FLUTTER ADHESIVES

SikaSeal® rubber based products are typically used on body structure areas, roof rails and hang-on parts such as doors, hoods and tailgates.
At the OEM, or at the tier, our full line portfolio covers the entire vehicle, with products specifically formulated and tested to avoid bond-line-read-through (BLRT).

- SikaSeal®-700 - non expanding
- SikaSeal®-710 LS2 - medium expending
- SikaSeal®-710 SR - high sag resistance
- SikaSeal®-712 - high corrosion resistance
- SikaSeal®-730 UWS - universal weld sealer

All SikaSeal® materials can be applied as continuous bead, spotted bead or dot, or as a combination of all three applications.

>25 MILLION VEHICLES MADE LIGHTER, STRONGER AND SAFER EACH YEAR

Each year our body shop adhesives help make more than 25 million vehicles lighter, stronger and safer, enabling weight reduction without impacting vehicle dynamics and safety, a critical engineering challenge. Crash resistant bonding is now the most important joining process in the body shop, due to the direct influences of the car body structure sections during a crash event. SikaPower® products fulfill or exceed the customer requirements.

BODY SHOP ADHESIVES

Benefits Beyond the Bond

STRONGER BONDS START WITH SIKA as evidenced by decades of high performance applications and more than 25 million vehicles assembled annually at leading OEMs. Our full range portfolio of SikaPower® and SikaSeal® adhesives is used throughout the vehicle and services all body shop categories; crash resistant, structural, hemming and anti-flutter products. Achieving good bonds, however, is not only determined by the products alone. They begin early in the design process with partnerships, in-depth understanding of design challenges, targeted performance parameters and substantial review of the materials to be joined. The end result is better relationships, and better vehicles.

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1 Crash beams without (left) and with SikaPower® (right)
2 Car body in robotic cell
3 SikaPower® application at shock tower

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CRASH RESISTANT BONDING

SikaPower® crash resistant adhesives contribute to a significant increase in energy absorption during crash events, which makes them an ideal solution in comparison to traditional metal joining techniques. Superior impact peel values and reduction of car body intrusion space make SikaPower® products an increasingly effective bonding solution for high-performance vehicles. Lab tests on crash beams confirm intrusion reduction of 20% with the use of SikaPower® crash resistant adhesives.

STRUCTURAL BONDING

Structural bonding with SikaPower® delivers a long list of performance and process benefits, including increased car body stiffness, excellent oil absorption, wash-out resistance, long-term corrosion resistance, a substantial reduction in the number of spot weld points and long shelf life.

HEM-FLANGE BONDING

Although typically used with hang-on parts, the inclusion of glass beads also makes SikaPower® products suitable for use in body structures for hem-flange bonding. The advantage of the glass beads includes “zero gap” avoidance, which leads to better adhesion, mechanical performance, aging and corrosion properties.

ANTI-FLUTTER MATERIALS

In anti-flutter and spot welding paste sealing applications, SikaSeal® adhesives provide excellent adhesion to standard OEM steel and aluminum substrates. They offer vibration free panel isolation joining, while also protecting durable metals against age-related corrosion from the elements. SikaSeal® adhesives are outstanding in preventing bond-line-read-through (BLRT) and do not reduce the strength of welding spots. They can also be utilized as a spot welds paste adhesive.

LIGHTER WEIGHT

SikaPower® – Car Body Improvement

WEIGHT REDUCTION

From our first developments more than two decades ago, SikaPower adhesives are now in their fifth generation of innovation. We offer an extensive product range addressing each area of performance expectation for body assembly, including today's and future demands for mixed material bonding.

100 kg of potential weight reduction per car (up to 10%) can be achieved with SikaPower® and SikaPower® MBX solutions.

MIXED MATERIAL BONDING EXPERTISE

Sika's unique SikaPower® structural adhesives and our engineering process in understanding Delta Δ Alpha α (different coefficients of mixed material expansion / contraction), enable mixed material bonding of lighter materials including aluminum and carbon fiber reinforced plastic, with traditional high-strength steels.

SikaPower® BODY SHOP CRASH & STRUCTURAL ADHESIVES

	Crash					Lap Shear Strength	
	Impact Peel (N/mm)	Aluminum	Mixed Material Bonding	Glass Transition Temperature	Wash out resistance	on 0.8 mm MPa	on 1.5 mm MPa
SikaPower®-468 G	15	+		105°C	+	17	30
SikaPower®-480	20	+		110°C	++	17	30
SikaPower®-492	30	+		105°C	++	20	30
SikaPower®-493	40	++	+	105°C	++	19	28
SikaPower®-494	30	++	+	100°C	++	20	30
SikaPower®-487	35	++	+	100°C	+	20	30
SikaPower®-497	40	++	+	115°C	+	20	32
SikaPower®-498/3	40	++	+	100°C	++	20	30
SikaPower®-499	40	++	+	105°C	++	20	30
NEW SikaPower®-550	40	++	+	120°C	+	20	30
NEW SikaPower®-510 MBX	45	++	++	85°C	+	16	22
NEW SikaPower®-533 MBX	45	++	++	95°C	++	20	28

++ Preferred technology + Standard option

SIKASEAL® FULL RANGE PORTFOLIO

Performance You Can't See – Bond-Line-Read-Through Prevention

SIKA OFFERS TAILOR MADE SOLUTIONS TO MULTIPLE BODY SHOP BONDING CHALLENGES

You typically cannot win a race with one entrant, nor can you build the body structure of the future with one product that limits design flexibility. Sika's extensive range of SikaSeal® anti-flutter and mastic products for BiW offers tailored products to specific challenges faced in the design of tomorrows vehicles.

SikaSeal® BODY SHOP ANTI-FLUTTER ADHESIVES

Product	BLRT resistance	Aluminum	Cold pumpable	Sag / wash out	Expansion	
					Low (0-20%)	Medium (20-80%)
SikaSeal®-700	+	+	++	+	+	
SikaSeal®-710 LS2	++	+	++	+		+
SikaSeal®-710 SR	++	+	+	++		+
SikaSeal®-712	++	++	++	+		+
NEW SikaSeal®-730 UWS	+	++	++	+	+	

++ Preferred technology +Standard option

SikaSeal®-730 UWS PROVIDES ONE PRODUCT FOR MULTIPLE SOLUTIONS

SikaSeal®-730 is outstanding in preventing bond-line-read-through (BLRT) and it is a universal adhesive for anti-flutter, mastic and spot weld applications. This product shows excellent adhesion to different aluminum and steel grades.

SikaSeal®-730 is applied in the body shop and expands in the e-coat oven. The product can be used in overhead and regular applications. It is suitable for use as spot welding, mastic and anti-flutter adhesive in all areas of the car body, especially on the hang-on parts and in the roof area.

SikaSeal®-730 UWS	
Color	Gray
Specific Gravity [g/cm^3]	1.3 +/- 0.1
Viscosity at 20 s^{-1} [Pa*s]	280 – 420
Expansion [%]	20
Hardness Type A	30
Lap Shear Strength [MPa]	0.2
E-Modulus [MPa]	0.1
Shelf Life	6 Months

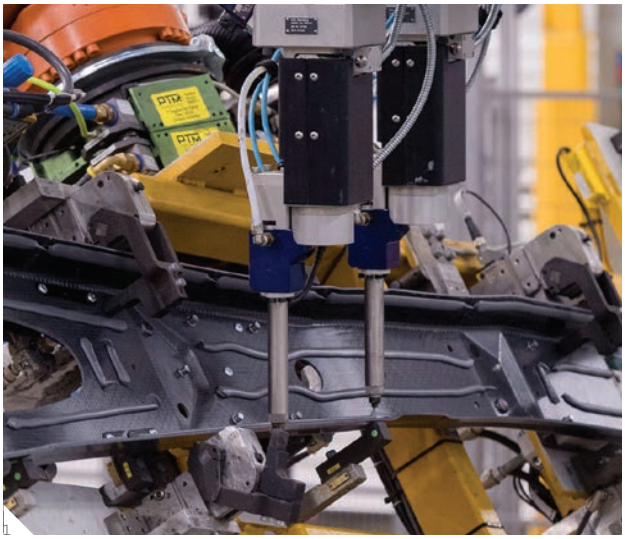
MULTI MATERIAL DESIGN

SikaPower® MBX performance to compensate Delta Alpha

THE SikaPower® PRODUCT PORTFOLIO includes crash resistant, structural and e-coatable adhesives; all formulated to meet or exceed demanding design performance. All SikaPower® adhesives are available with or without glass spheres, to enable the required minimum bond line distance between substrates and to control bondline adhesive thickness. Common substrates in body shop applications for SikaPower® adhesives include all types of steel, aluminum and carbon fiber reinforced plastics (CFRP), and combinations of these substrates, in mixed material joining. Sika also answers the call for even more unique adhesives for mixed material joining with NEW SikaPower® MBX; formulated specifically to account for the differences in thermal expansion and contraction coefficients that must be considered during both the design and assembly process.

BENEFITS

- Superior performance – hybrid adhesive systems with high-energy absorption
- Excellent aging durability
- Increased car body stiffness – high e-modulus and Tg
- Cost saving and sustainable – reduction of spot welding points
- Excellent wash-out performance
- Superior mixed material bonding



1 Central tunnel bonding (CFRP - steel)
2 Rocker bonding (CFRP - steel)

NEW TECHNOLOGY: MIXED BONDING EXCELLENCE (MBX)

Mixed material joining of steel – aluminum, steel – carbon fiber or aluminum – carbon fiber is possible with SikaPower® Mixed Bonding Excellence (MBX) products, which provides support to resolve Delta-Alpha issues. At the same time it provides galvanic separation that improves protection against corrosion and increases vehicle durability. This technology is unique to Sika.

MBX APPLICATIONS

- Crash-relevant body structures
- Mixed material bonding throughout the vehicle
- Hem-flange applications

CRASH RESISTANT AND REPAIR APPLICATIONS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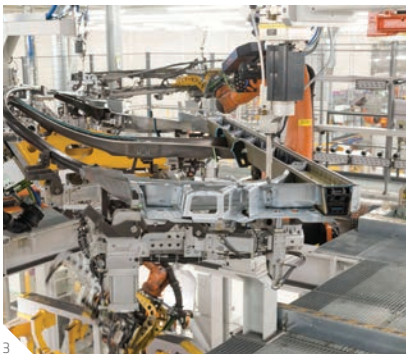
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TYPICAL APPLICATIONS FOR THE SikaPower® CRASH RESISTANT ADHESIVES

1 CENTER TUNNEL AND FLOOR PANEL SECTION
Crash resistant mixed material adhesive application.

2 SIDE WALL AREA
All side wall applications with SikaPower® adhesive.

3 SIDE WALL FRAME
Crash relevant part of the vehicle is bonded with SikaPower®.

Following global automotive megatrends, technical requirements on one component crash durable adhesives are continually increasing. A large variety of bonding surface substrates including many steel types, several aluminum and a growing number of fiber grades are moving performance challenges to higher requirements and specification levels.

SikaPower® MBX technology and advanced car body design are helping the automotive industry to solve the challenges of differences in thermal expansion, typically experienced with mixed material bonding. The solution helps OEMS to realize the technical and commercial benefits of modern car body design. New assembly challenges presented by BEV and hybrid vehicle designs can readily be addressed within our extensive product offering. To stay ahead of the curve, Sika continues to develop the highest performance level BiW adhesives for today's customer needs, and for their future vehicles.

HIGHEST PERFORMANCE FOR CRASH BODY REPAIR - EXCELLENT CRASH PERFORMANCE FOR MAXIMUM SAFETY
Sika technologies also follow the vehicle into service, meeting same quality demands including strength, application properties and corrosion resistance when vehicles enter the repair shop. The high performance product range for repair addresses this OEM requirement and allows vehicles to return to service “as good as new”.

The two component epoxy technology of SikaPower®-477 R provides the highest levels of toughness without compromising on mechanical strength and static load capacity. Sika's toughened epoxy adhesives outperform the state-of-the-art two component epoxy adhesives – either brittle or flexibilized formulations – in terms of durability, fatigue and impact resistance. As a result they are becoming the preferred choice for crash body repair in the automotive aftermarket.

BENEFITS

- Unmatched impact resistance
- Exceptional energy absorption capacity
- High mechanical strength
- Excellent crack resistance
- Superior fatigue performance
- Convenient uTAH cartridge packaging

APPLICATION

- Car body panel repair
- Body structure repair

QUIETER VEHICLES START WITH SIKA

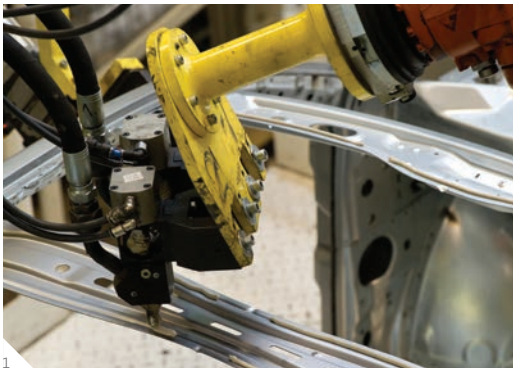
SikaSeal® adhesives are outstanding in preventing bond-line-read-through (BLRT) and do not reduce the strength of welding spots. In anti-flutter and spot welding paste sealing applications, SikaSeal® adhesives provide excellent adhesion to standard OEM steel and aluminum substrates, as well as protecting the metal against age-related corrosion. They can also be utilized as a spot welding paste.

ANTI-FLUTTER ADHESIVES

Unique Solutions to Prevent Bond-Line-Read-Through

SikaSeal® PRODUCTS CARRY UNIQUE CHARACTERISTICS; their contribution to the prevention of bond-line-read-through. The properties of SikaSeal® are based on proprietary building blocks yielding matrix designed materials that compensate for typical read through experienced in joining techniques. Bond-line-read-through prevention, and the compensation for it, becomes even more important as thinner gauge panels and lighter weight materials are introduced in design. Further, Sika advanced understanding of delta-alpha ($\Delta\ \alpha$) effects – including those of our SikaSeal® products – has contributed over decades to the development of our rubber-based technology.

SikaSeal® adhesives are delivered as bulk material and applied by cold or warm pumping equipment. In most cases, piping at the end of the dispensing system, especially between doser and nozzle, is pre-heated in order to ensure the same application properties over all climate seasons. Applications are preferably done automatically by robot but in some cases manual application is implemented as well.



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1 Roof cross member anti-flutter application
2 Finished roof application to the body frame

APPLICATION

- **Doors** Body Structure
- **Hoods** Body Structure
- **Roof** Inter-welds

BENEFITS

- Prevents bond-line-read-through – unique chemical matrix design
- Enables weight saving – allows for use of thinner metal sheets
- Excellent adhesion on different steel and aluminum grades
- Sustainable – cold pumpability = reduced energy demand

MAIN MATERIAL PROPERTIES

- Low or no volumetric expansion
- Cold pumpable
- High resistance against wash out
- Shelf life is product specific, in general > 6 months

INNOVATION, IT STARTS WITH PASSION

AT SIKA, WE BELIEVE that a truly innovative company is one that starts with a culture within which a passion for innovation and creativity thrive. An innovative company should also take a customer-focused view; one that anticipates customer needs with a thorough understanding of key market trends.

LIGHTER
We have a full range of products which enable our customers to make their vehicles lighter. For example, we were the first to engineer body shop adhesives (SikaPower®), which enable mixed-material bonding of lighter materials such as aluminum, carbon fiber reinforced plastic, as well as traditional and high strength steels.

STRONGER AND SAFER
We were the pioneer in vehicle exterior parts bonding with our Sikaflex® + Booster and SikaForce® products and our SikaReinforcer products, which not only help stiffen the vehicle for better overall dynamics but also improve crash performance and increase vehicle occupant safety.

QUIETER
We provide solutions that make vehicles quieter; SikaBaffle® seals noise pathways, while SikaDamp® reduces the body panel vibration that contributes to audible noise in the vehicle. Both products are engineered for best-in-class weight-to-performance ratio. Used together, or separately, our industry leading acoustics solutions improve vehicle occupant comfort.

GREENER
We were the first to establish water-based pre-treatments and polyurethane hotmelts with low monomeric isocyanate content and reactive polyolefin hotmelts free of classification to the automotive interior market – a more environmentally friendly approach that easily outperforms the industry's previous generation of products.

VALUE-ADDED INNOVATION
We continuously develop new, cost-effective solutions, which allow our customers to use less material or reduce complexity in their manufacturing process. SikaPower® structural adhesives, for example, allow the reduction of welds in vehicle body sections, while strengthening overall crash durability. Anticipating megatrends we also offer a full range of solutions for assembly of e-mobility components and vehicles

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

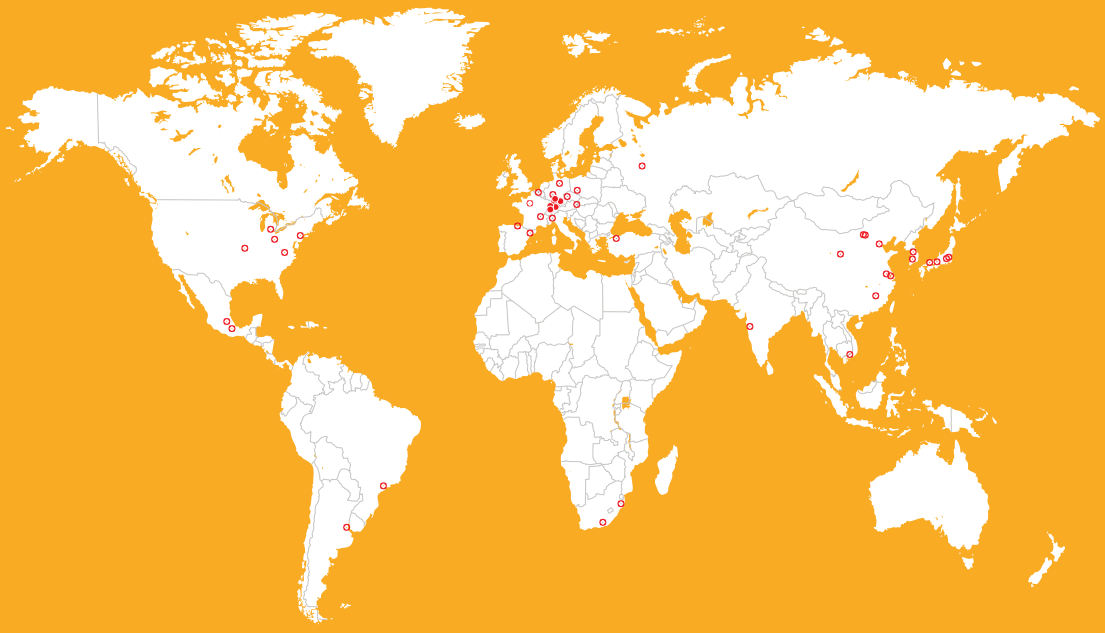
MORE THAN
70 MILLION
CAR WINDOWS ARE BONDED DURING ASSEMBLY USING SIKAFLEX®

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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