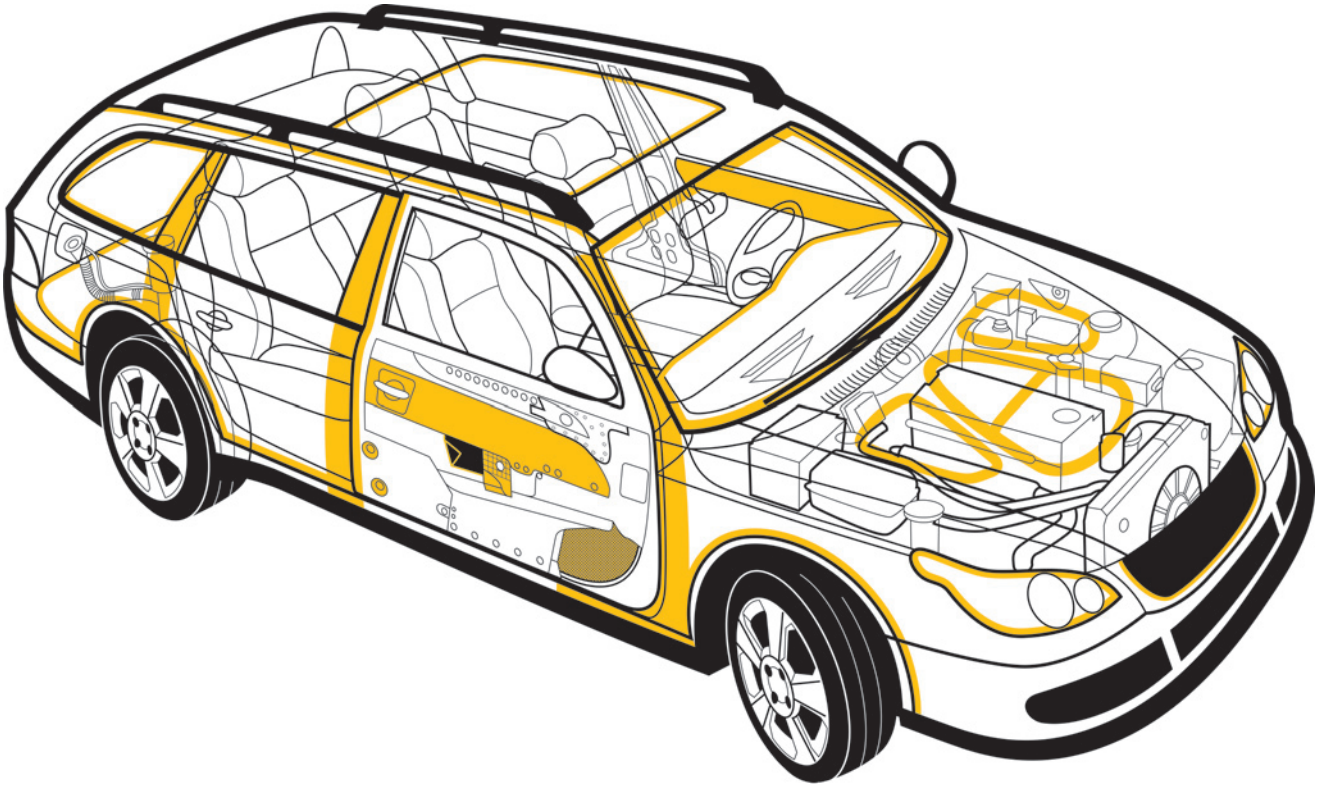
Industry

Automotive OES
Exterior Bonding Solutions

Creating Solutions
for Increased Productivity

Sika is a supplier and development partner to the automotive industry. Our state-of-the-art technologies provide solutions for increased structural performance, added acoustic comfort, and improved production processes. As a specialty company for chemical products, we concentrate on our core areas of expertise:

Bonding – Sealing – Damping – Reinforcing. As a globall operating company, we are partner to our customers worldwide. Sika is represented with its own subsidiaries in all automotive-producing countries, guaranteeing an efficient and fast local service.

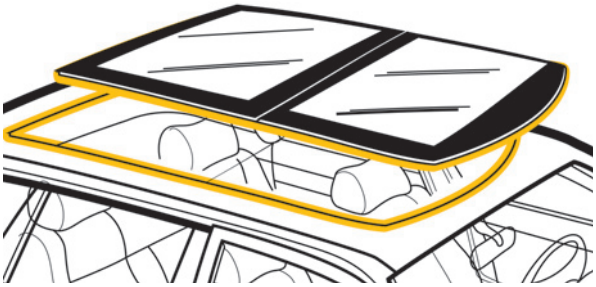


Content

Exterior Bonding Solutions
for Automotive Manufacturers

The exterior design is an important element in the decision for purchasing an automobile. Bonding technology for the windscreens, sun roofs and headlights is an essential part of ensuring an aerodynamic design, attractive appearance, good visibility, and safety, while also meeting the highest environmental standards and demands from manufacturing.

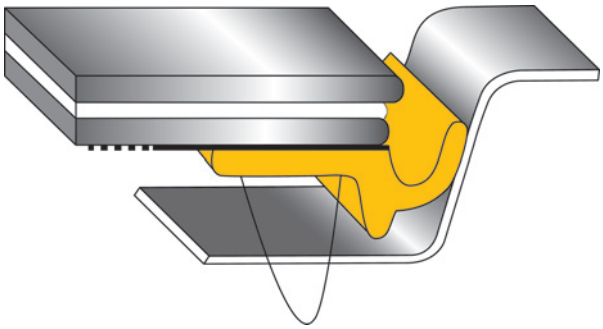
Sikaflex®, SikaTack®, Sikasil®, SikaFast® and SikaForce® stand for tailor-made, efficient and proven solutions for the automotive industry. Our global team of specialists support our customers in designing and optimizing the production processes.



Direct Glazing of Roof systems

Component Bonding

Headlight bonding



Flush Glazing / Polyurethane Extrusion

Direct Glazing of Roof Systems

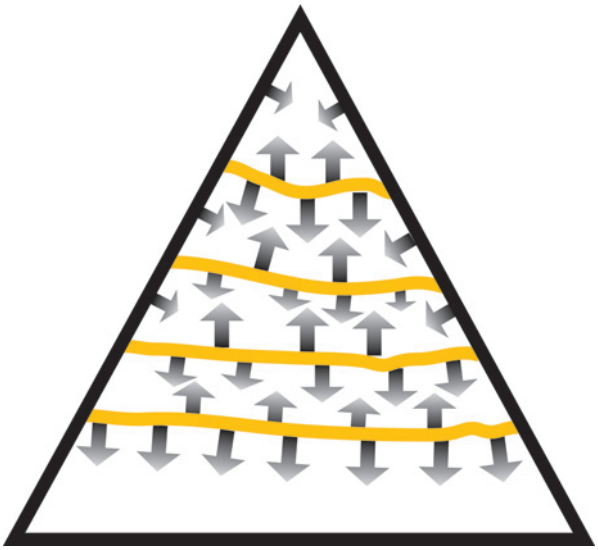
Sika offers the full range of technologies for roof bonding to provide reliable bonding solutions. High green strength and fast adhesion build up is required in order to keep the bonding process as efficient as possible as well as a durable and water-tight roof system. Sika offers the latest pre-treatment technologies in order to keep up with the most advanced roof designs and demanding processes. Sika also has the highest ecological standards for pre-treatment and the adhesives.

In today's fast paced automotive business, roof systems are bonded and then transported to the OEM within a very short time. The strength during the initial curing (green strength) is essential in ensuring the reliability and efficiency of the bonding system. Sika offers three different types of technologies for roof bonding:

- One-component polyurethane: Sikaflex®-250 PC and Sikaflex®-265 DG-1
- Accelerated one-component polyurethane: SikaTack® Plus Booster
- Two-component polyurethane: SikaForce®-7550

Benefits

- High flexibility in combination with a high level of strength
- Compensation of production tolerances
- High initial green strength and adhesion build-up
- Excellent durability following the most severe climatic tests
- Long term experience in primerless to glass and paint technology
- Ecologically friendly pre-treatment systems
- Accelerated with Sika® Booster for rapid full cure
- In partnership with the latest adhesive and technology developments at the OEMs
- Technical expertise and know how bonding PC (polycarbonate), PP (polypropylene), and other thermoplastics



Sika Booster Technology

How the Booster Technology Works

Sika Booster Paste is distributed in a 1 to 2% mixing ratio through out the adhesive bead in layers. The number of booster layers is dependent on the mixer used, where more layers result in a faster reaction. As SikaTack® Plus is a moisture-curing adhesive, it will still harden without the booster paste. The addition of the Booster paste simply distributes moisture through out the adhesive bead which accelerates the "One-component" reaction, resulting in a completely cured through adhesive bead within a few hours.

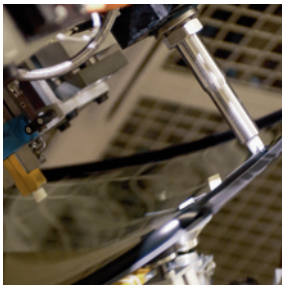
Future Trends for Direct Glazing

- Increase in size of glass roofs contributing to overall design of the vehicle
- Increased demand on product output and efficiency of delivery (First In First Out)
- Increased use of thermoplastic systems allowing weight reduction and improved crash resistance
- Elimination of primers and simplification of surface treatment, while still retaining long term durable adhesion following severe climate conditions

Technology Overview Table

	Sikaflex®-250 PC	Sikaflex®-265 DG-1	SikaTack® Plus	SikaTack® Plus Booster	SikaForce® - 7550
1 component	+	+	+	one-component + accelerator	
2 component					+
Fast Curing	No	No	No	Yes	No
Non-sagging properties	very good	excellent	good	good	good
Green Strength	good	good	good	excellent	excellent
Initial Grip	very good	excellent	good	good	good
G modulus	low	medium	low	low	high
Tack-free Time (min.)	10	30	30	15	
Open Time (min.)	5	10	15	5	5
Black Primerless to glass and paint*	Yes	No	Yes	Yes	Yes

* Actual substrates must always be tested.



Sikaflex® application on a windscreen

Rooftop bonded with Sikaflex®

Sunroof bonded with Sikaflex®

Sunroof bonded with SikaTack® Plus Booster

Headlight Bonding

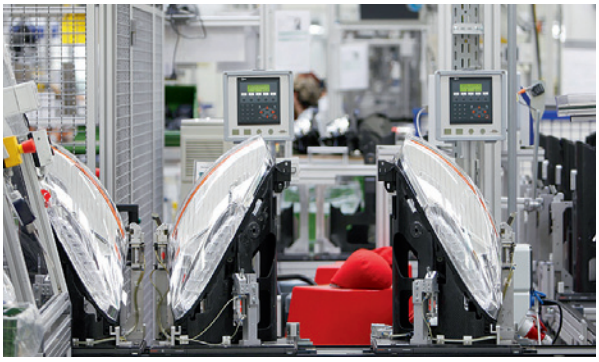
Sika has been bonding headlights since the mid 90's, when the lens changed from inorganic glass to PC (polycarbonate). Since this time, headlights have increased significantly in size and are an essential part of the car design. Sikaflex® and Sikasil® have excellent adhesion to the PC lens, its coatings, and the PP and PBT housings used in headlight bonding resulting in exceptionally high quality. The initial high strength of the Sikaflex® one-component warm melt technology and the two-component Sikasil® technology allows the leakage test to be done in a very short time providing increased efficiency and quality control. The high strength and elastic properties make it an excellent choice for bonding PC and PP.

Benefits of Sikaflex® and Sikasil® for Headlight Bonding

- High initial green strength for a fast quality control test
- Easy and efficient dispensing properties
- Best long-term adhesion and elasticity quality that keeps the headlight water tight
- Elastic – absorbs shock and prevents stress cracking from occurring
- Minimal fogging

Future Trends for Headlight Bonding

- Increase in size of headlights
- Increased demand on product output and efficiency of delivery (First In First Out)
- Increased use of coatings for PC (polycarbonate), such as anti-fogging and UV coatings
- Simplyfication of surface treatments, while still retaining long term durable adhesion following servere climate conditions



Production of headlights with Sikaflex®

Headlight bonded with Sikaflex®

VW Golf 5 headlight bonded with Sikaflex®

Application of Sikaflex®-630 HD on PP body of headlight

Cadillac LED headlight bonded with Sikaflex®

Best Recommended Sikaflex® Products

Sikaflex®-630 HD
Warm applied system; one-component, very high green strength enabling the leakage test to be done very quickly; very good high temperature resistance; in use for over 10 years with excellent quality results

Sikaflex®-632 WM
Warm applied system; one-component, high green strength enabling the leakage test to be done quickly with very light fixation; very good high temperature resistance; very fast dispensing properties that can keep up with the demanding headlight manufacturing process

Best Recommended Sikasil® Products

Sikasil® AS-785
Two-component, very high green strength enabling the leakage test to be done quickly; excellent high temperature resistance; very fast dispensing properties that can keep up with the demanding headlight manufacturing process

Sikasil® AS-790
Two-component silicone, exceptionally high green strength enabling the leakage test to be done very quickly; excellent high temperature resistance; very fast dispensing properties that can keep up with the demanding headlight manufacturing process

Technology Overview Table

	Polyurethane		Silicone	
	Sikaflex®-630 HD	Sikaflex®-632 WM	Sikasil® AS-785	Sikasil® AS-790
1 component	+	+		
2 component			+ +	
Adhesion to PC No pre-treatment	+	+	+	+
Adhesion to PP and PB-T with Plasmatreat	+	+	+	+
Adhesion to PP and PB-T With corona & flame treatment			+	+
Heat resistance	very good	very good	excellent	excellent
Application temperature	95°C	60°C - 95°C	Room Temp.	Room Temp.
Approximate time to leakage test	2 - 10 min.*	2 - 25 min.*	8 - 12 min.*	2 - 5 min.*

* Time to pass leakage test depends on pressure and design

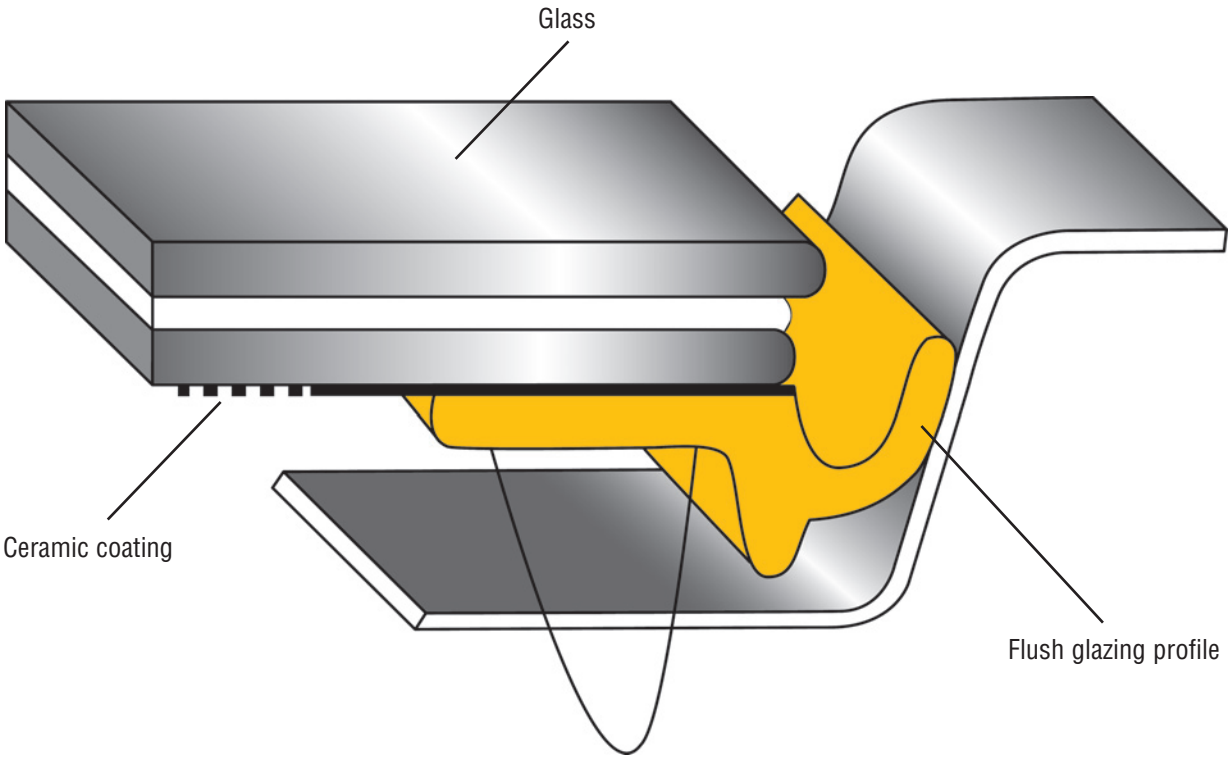
Flush Glazing / Polyurethane Extrusion

For over 20 years Sika has been providing automobiles and many other vehicles with the latest technology in direct glazing. Many OEMs specify a polyurethane extrusion along the perimeter of the windscreen in order to maintain the correct distance between the windscreen and car body. This polyurethane extrusion provides a flush design which improves the aerodynamics and decreases wind noise, as well as improving vehicle style. The benefit of a polyurethane extruded profile, in comparison to other types, is that it can be modified quickly and simply in order to meet any design changes during the development stage.

Sikaflex®-250 DV-2 and Sikaflex®-250 DV-3 are one component moisture cure polyurethane adhesives which fulfil the specific need for the extrusion of flush glazing materials on auto windscreens.

The Sikaflex® Technology Provides

- Excellent non-sagging properties allowing a longer profile
- Fast cure through behaviour
- Easy and simple pre-treatment process allowing for process savings
- Excellent UV and weather resistance



Flush Glazing / PUR Extrusion

Future Trends for Flush Glazing / Polyurethane Extrusion

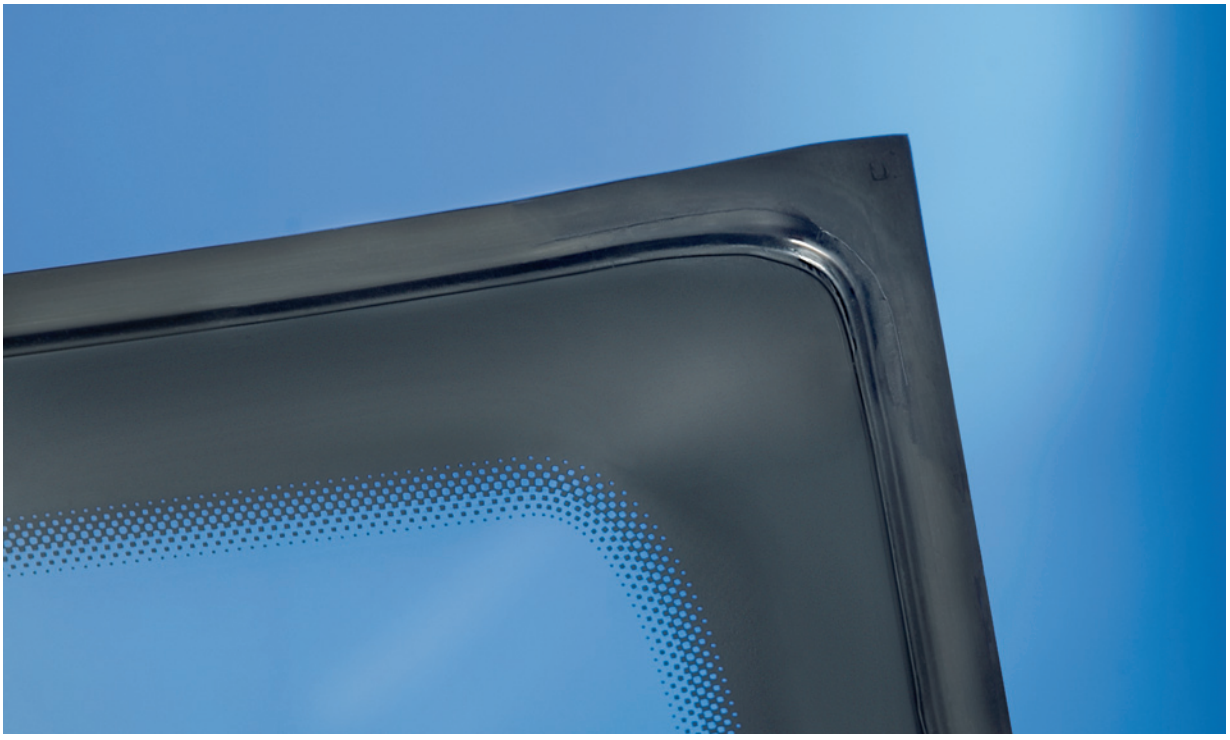
- Increased demand on product output and efficiency of delivery (First In First Out)
- Elimination of primers and simplification of surface pre-treatments, while still retaining long term durable adhesion following severe climate conditions

Best Recommended Sika Products

Features & Benefits

Sikaflex®-250 DV-2
One-component polyurethane, excellent non-sagging properties; allowing for a precise and clean profile

Sikaflex®-250 DV-3
One-component polyurethane, excellent non-sagging properties; excellent adhesion properties allows it to be used black primerless; allowing for a precise and clean profile



Flush Glazing / PUR Profile with Sikaflex®-250 DV-2 on the Opel windscreen

Component Bonding

Sika has a wide range of fast reacting, high strength, adhesive systems for bonding spoilers, apertures, and other structural components of the automobile that must fulfil very high standards. Sikaflex®, SikaFast® and SikaForce® are proven technologies that are able to withstand severe climatic conditions, as well as provide high initial green strength allowing a very fast and efficient assembly process. For bonding glass, ceramic, and metal components, Sikaflex® technology is widely chosen because of its initial high green strength and being an easy to use one-component system.

When increased curing speed or simplification of pre-treatment methods is required, SikaFast® or SikaForce® is the ideal choice. For bonding thermoplastic components, SikaForce® is widely chosen because of its excellent adhesion, in most cases without pre-treatment, and having the ideal strength and elastic properties for structural bonding. The innovative mixture of light-weight construction methods currently used in the automotive industry requires the right balance of rigidity and flexibility.

Benefits of Sika Products for Painted Metal and Glass Substrates

- Good mechanical properties
- Elastic and energy absorbing for dynamic stress
- High initial green strength which enables holding small parts in place
- Excellent durability following the most severe climatic tests

Sika Products for Thermoplastic Substrates

- Moderate to high strength with right amount of flexibility
- No risk of marking on thin plastic materials
- Broad adhesion range on various kinds of plastics and resins
- None or minimal pre-treatment required to many plastic substrates
- High green strength with short cycle times
- Excellent durability following the most severe climatic tests

Spoiler Bonding

Spolier bonded with SikaForce®

Future Trends for Component Bonding

- Increased demand on product output and efficiency.
- Increased use of thermoplastic components
- Elimination of primers and surface pre-treatments for glass and metal substrates

Best Recommended Sika Products for Painted Metal and Glass Substrates

Features & Benefits

Sikaflex®-250 PC
One-component polyurethane; warm applied system; high initial green strength which holds small parts in place; widely OEM approved; good mechanical properties; excellent adhesion characteristics

Sikaflex®-260 N
One-component polyurethane; room temperature applied system; high initial green strength which holds small parts in place; good mechanical properties; excellent adhesion characteristics

Best Recommended Sika Products Thermoplastic Substrates

Features & Benefits

SikaFast® ADP acrylic adhesives
Two-component acrylic; high mechanical properties; fast curing with long open times; excellent adhesion properties; low odour

SikaForce®-7570
Two-component flexible polyurethane; low modulus and good final strength properties; fast curing; suitable elasticity capable of withstanding high dynamic stress

SikaForce®-7777
Two-component structural polyurethane; high modulus and final strength properties; fast curing; suitable elasticity capable of withstanding high dynamic stress

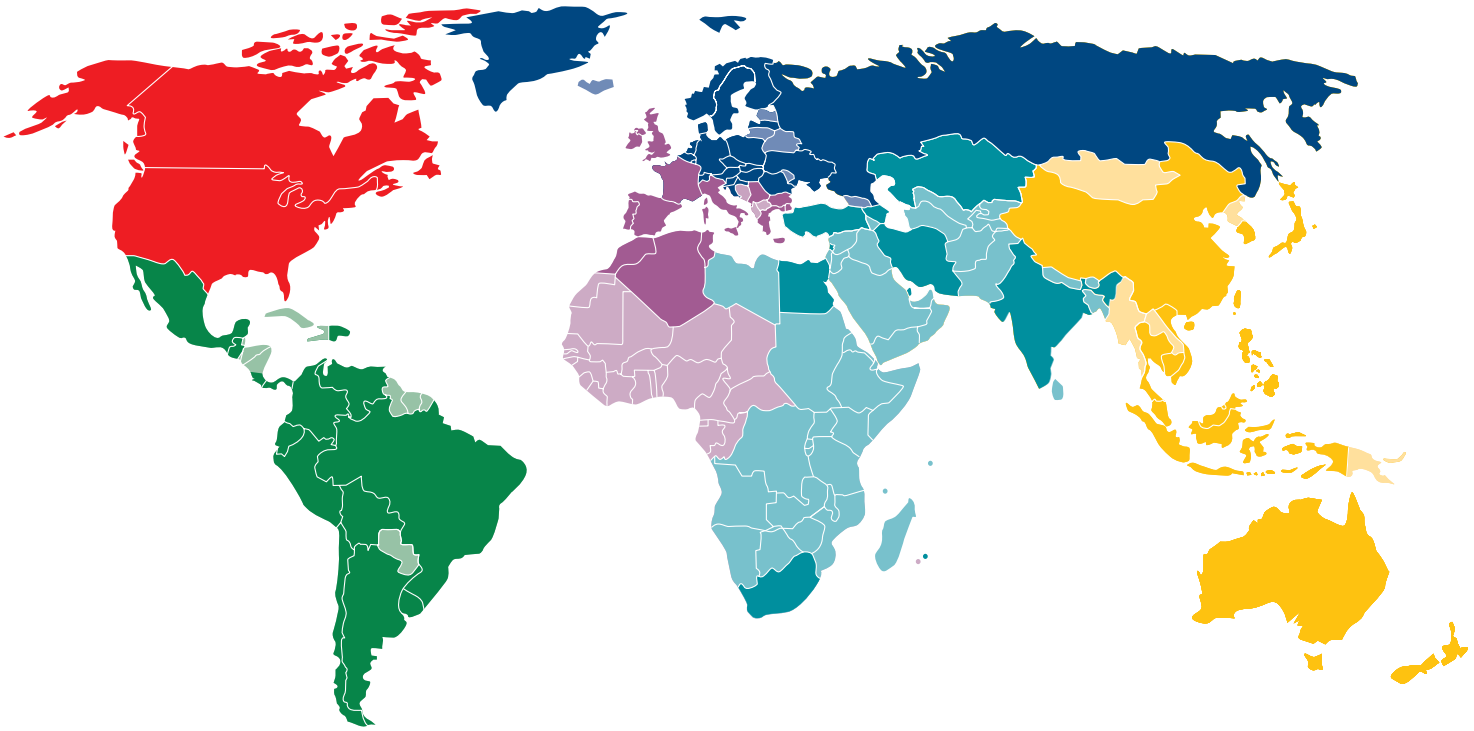
Suitable Substrates

	PC	ABS	PBT	LFI / PU	PMMA	PA*	SMC/GRP
SikaForce®-7570	+	+	+	+	+	+	+
SikaForce®-7777	+	+	+	+		+	+

Actual substrates must always be tested.

* physical pre-treatment

Sika
Worldwide



- 5 continents
- over 70 countries
- 90 production and marketing companies
- more than 12,000 employees

www.sika–automotive.de

Responsible Care

Zertifiziertes Qualitätssystem ISO 9001/EN 29001 seit 1986

Certified Management System ISO/TS 16949

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