

EXPLANATORY NOTES ON SUBSTRATE PREPARATION AND TREATMENT

1. Aluminum

Alloys containing magnesium or silicon may form an unstable layer on the surface. This layer must be removed with a very fine abrasive pad.

2. Aluminum, anodized

For aluminum that has been surface treated, e.g. chromated, anodized or coated, a simple pre-treatment is usually sufficient. Due to the wide variety of anodizing treatments it is necessary to run preliminary tests to check for satisfactory adhesion.

3. Steel, stainless

The terms "stainless steel" and "special steel" encompass a whole group with an important influence on the adhesion behavior. Adhesion might be improved by a prior scuffing step with a very fine abrasive pad.

4. Steel, hot-dip galvanized, electrogalvanized

The surface composition of hot-dip components is not uniform. It is therefore necessary to carry out periodic adhesion checks. Oiled zinc coated steel has to be degreased prior to use. In case of electrogalvanizing the substrate is prepared to a controlled specification and the composition of the surface layer is more or less uniform throughout. Do not use abrasives on electrogalvanized steel.

5. Non-ferrous metals

Metals like brass, copper and bronze are prone to interact with the sealant or adhesive. Therefore it is recommended to contact Sika for advice prior to use.

6. Surface coatings, paint finishes

As a general rule, successful bonding with Sikaflex® products is expected with the following paint systems: cathoretic immersion coatings, powder coatings, epoxy or polyurethane paints. When using the following paint systems: polyvinyl butyral or epoxy resin ester, cohesion is often higher than adhesion to the substrate. Caution: the presence of paint additives may adversely affect adhesion to the paint

surface. Certain coatings can be negatively influenced by weathering. Therefore they have to be protected against UV-light and other aging sources prior to bonding.

7. FRP (fibre reinforced plastic)

These materials consist for the most part of thermosetting plastics derived from unsaturated polyester, less commonly from epoxy vinyl ester or phenol formaldehyde resins. Newly manufactured components have not yet attained full cure, and as such are subject to further shrinkage following their removal from the mold. For this reason only aged or tempered FRP mouldings should be selected for adhesive bonding. The smooth side (gel coat side) may be contaminated by mould release agents which will adversely affect adhesion. The surface of the rough reverse side, which is exposed to the air during manufacturing has to be abraded thoroughly prior to additional surface preparation. Transparent or translucent FRP must follow the current UV-rules, see General Information.

8. Plastics

Some plastics require special physico-chemical treatment before they can be successfully bonded (flame treatment or plasma treatment in combination with chemical pre-treatment). Polypropylene and Polyethylene are two examples. With many plastic blends it is impossible to give specific guidance due to the potential variety of components and internal/external release agents they contain. Some engineered plastics such as ABS, PMMA and PC may contain substances which can be dissolved by the solvents of that are part of the Sika®Primer formulation, which can then in some cases lead to issues with adhesion. Thermoplastics are subject to a risk of stress cracking. Thermally formed components must be destressed prior to adhesive bonding process. For transparent or translucent plastics see General Information on this page.

9. PMMA/PC

Scratch resistant coating on PMMA or PC must be removed in the bonding area with sand paper (120 grit) and pre-treated as defined for non-coated substrates. Note that this last step may impair the mechanical properties of the PMMA/PC. Contact Sika for solutions without removal of the coating. See also further item 9 and consider always the UV-rules mentioned under "Transparent or translucent substrates" and ESC under item General Information.

10. SikaTransfloor®-352 SL/ST/VSL

These are solvent free 2C polyurethane filling and leveling compounds used to level uneven subdecks in ship and boat constructions prior to the installation of e.g. a teak decking system. Do not use solvent to clean cured and ground Sika®Transfloor-352 SL/ST/VSL. Consult the respective PDS for further information.

11. Glass (mineral) / Ceramic screen print

Due to production, some windscreens may have silicone contaminated ceramic screen print or glass. It might be removed by using Sika® Cleaner PCA.

12. Teak / Wood and wood derivatives

The teak quality is essential for an optimal result in respect of functionality and optical aspect. Standing year rings and the absence of alternating spiral growth are essential to assure a uniform plank deformation under different climatic conditions. The recommended joint width depends on the width of the plank and the humidity of the wood when manufactured. Please consider the Sika Marine Application Guide for further information.

13. Phenolic film faces plywood

These are waterproof plywood panels with a yellow or brown film facing. Sika recommends to grind the surface down to the wood in the bonding area and pre-treat as such.

GENERAL INFORMATION Transparent or translucent substrates

With transparent or translucent substrates where the bonded surface is exposed to direct sunlight through the transparent or translucent layer, some form of UV barrier must be incorporated to shield the adhesive bond. This may consist of an opaque cover strip, an optically dense screen printed border or a black primer for semi-transparent substrates such as translucent FRP or screen prints. Due to the high UV exposure for exterior applications the sole use of black primers for UV protection is not sufficient. For interior applications and where the bondline is occasionally exposed to UV-light, a sole black primer for UV protection may be sufficient.

Corrosion protection

All listed pre-treatment products in this chart are not designed to give comprehensive corrosion protection. In most cases primer layers protect the surface to a certain degree. Whether or not this protection is sufficient for specific processes is at the customers sole discretion.

EPDM/SBR

Rubbers can be made from natural caoutchouc or are produced artificially. Therefore nearly endless combinations are possible. For this reason each type of rubber has to be tested separately.

ESC

At present environmental stress cracking (ESC) is one of the most common causes of unexpected brittle failure of thermoplastics, especially amorphous polymers. Key parameters to trigger ESC are: stress, liquid chemicals, environmental exposure. Each bonding process must be verified.

Protective layer

Substrate surfaces with high variability like galvanization, anodization, coil coating, varnishing, finishing must be subjected to periodic inspections.



MARINE SIKA PRE-TREATMENT CHART

FOR SEALING AND BONDING IN MARINE APPLICATIONS

UTILISATION OF SIKA PRE-TREATMENT CHART

The information about the pre-treatment of surfaces in this document serves as a guideline only and must be verified by tests on original substrates. Project specific pre-treatment recommendations, based on laboratory tests, are available from Sika upon request. Always consult additional information.

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

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RECOMMENDATIONS FOR SIKA MARINE RANGE

PRECONDITION:

Surfaces have to be clean, dry and free of oil, grease, dust and loose particles. Depending on the nature of soiling, Sika® Remover-208, Sika® Cleaner P or another suitable cleaning solution may be used. For substrates that are prone to oxidation and/or have a weak surface layer it might be necessary to abrade the surface down to sound material. Verify compatibility with cleaning products.

Substrate	EN*	Sikaflex®-291i Sikaflex®-298			Sikaflex®-295 UV			Sikaflex®-292i Sikaflex®-296 Sikaflex®-268 PC			Sikasil® WS-605 S Sikasil® SG-20 Sika® Firesil Marine N			Sikaflex®-591		
		Mechanical	Adhesion Promoter	Primer	Mechanical	Adhesion Promoter	Primer	Mechanical	Adhesion Promoter	Primer	Mechanical	Adhesion Promoter	Primer	Mechanical	Adhesion Promoter	Primer
Aluminum (AlMg3, AlMgSi1)	1	AP-C	SA-100	SMM	AP-C	SA-205	SMM	AP-C	SA-205	SMM	AP-C	SA-205	AP-C	SA-205		
Aluminum (anodized)	2		SA-100	SMM		SA-100	SMM	AP-C	SA-100	SMM		SA-205			SMM	
Steel (stainless)	3	AP-C	SA-100	SMM	AP-C	SA-205	SMM	AP-C	SA-205	SMM	AP-C	SA-205		SA-205		
Steel (hot dipped, galvanized)	4	AP-C	SA-205	SMM	AP-C	SA-205	SMM	AP-C	SA-205	SMM	AP-C	SA-205		SA-205	SA-100	
Non ferrous materials (copper, brass, bronze,...)	5				AP-C	SA-205	SMM				AP-C ⁸	SA-205 ⁸	SMM ⁸	AP-C	SA-205	SMM
Metal with shop primer	6		SA-100		AP-C ³	SA-100	SMM	AP-C ³	SA-100	SMM		SA-205		SA-205	SCP	
Metal with 2C Ac/PU-paint	6		SA-100			SA-100	SP-206 GP		SA-100	SP-206 GP		SA-205		SA-205	SCP	
FRP (unsaturated polyester) gelcoat side or SMC	7		SA-100		AP-C	SP-209 D		AP-C	SP-209 D		SA-205 ⁷	SMM ⁷	AP-C	SA-205	SCP	
FRP (unsaturated polyester) lay-up side	7	GR-V	SP-290 DC		GR-V	SP-290 DC		GR-V	SA-205	SP-290 DC		SA-205 ⁷		GR-V	SMM	
ABS	8		SP-290 DC			SP-290 DC			SA-205 ⁷					SA-205	SP-290 DC	
Hard PVC	8		SP-290 DC			SP-290 DC			SA-205 ⁷					SA-100	SP-290 DC	
PMMA/PC (without anti scratch coating)	9				AP-V	SP-209 D			AP-C ⁸	SA-205 ⁸						
SikaTransfloor®-352 SL/ST/VSL	10	GR-V ^{4,9}														
Glass (mineral)	11							SA-100	SP-206 GP		SA-100	SCP		SA-100	SA-205	
Ceramic screen print	11							SA-100	SP-206 GP		SA-100			SA-100	SA-205	
Teak	12		SP-290 DC	SMM		SP-290 DC	SMM							SP-290 DC	SMM	
Wood and wood derivates	12		SP-290 DC	SMM		SP-290 DC	SMM			SP-290 DC	SMM			SP-290 DC	SMM	
Phenolic Plywood	13	GR-V ⁵	SP-290 DC	SMM				GR-V ⁵	SP-290 DC	SMM	GR-V ⁵	SP-290 DC	SMM	GR-V ⁵	SP-290 DC	SMM

Substrate	EN*	Sikaflex®-290 DC PRO			SikaTransfloor®-352 SL/ST/VSL			Recommended process		Alternative process	
		Mechanical	Adhesion Promoter	Primer	Mechanical	Adhesion Promoter	Primer				
Aluminum (AlMg3, AlMgSi1)	1				GR-V ¹	SA-205	ZP				
Steel (hot dipped, galvanized)	4				GR-V ²	SA-205	ZP				
Metal with shop primer	6				GR-V	SA-205	ZP				
SikaTransfloor®-352 SL/ST/VSL	10				GR-V ⁴						
Teak	12		SP-290 DC	SMM							
Wood and wood derivates	12		SP-290 DC	SMM							

- Alternative: Grit-blasting with aluminium oxide
- Alternative: Sandblasting
- If shop primer is deteriorated it has to be grinded instead of scuffed (AP-V)
- Do not clean with solvents
- Grind off phenolic layer to bare wood where adhesive or sealant have to be applied
- When Sika® Aktivator-100 is used only combine with Sikaflex®-296 for this application. All other adhesives are not allowed (ensure proper UV protection)
- Sikasil® SG-20 must not be applied here
- Sikasil® WS-605 S and SikaFiresil Marine N must not be applied here
- Up to 14 days no sanding is necessary if the surface is clean and not contaminated

* EN = Explanatory notes see page 4.

PRODUCT DATA AND ABBREVIATIONS

The following product information is an abbreviated version of the current Product Data Sheets.

Sika® Aktivator	-100	-205
Color of container cap	orange	yellow
Color of product	colorless to slight yellow	colorless, clear
Type of product	Adhesion promoter	
Application temperature	The general range is 10 – 35 °C. For specific values always refer to the most recent Product Data Sheet.	
Application	Wipe with a clean and lint-free paper towel (Sika Aktivator®-100 wipe on / wipe off application is required)	
Consumption	Approximately 20 ml/m² (depending on application method).	
Flash-off time (23 °C / 50 % r.h.)	The minimal range of the flash-off time varies from 10 to 30 minutes depending on product, substrate and climatic conditions. For specific values always refer to the most recent Product Data Sheet.	

Sika® Primer	-206 G+P	-209 D	-290 DC	Sika® MultiPrimer Marine
Color of container cap	black	green	blue	grey
Color of product	black	black	transparent, slightly yellow	
Type of product	Primer			
Application temperature	The general range is 10 – 35 °C. For specific values always refer to the most recent Product Data Sheet.			
Preparation for use	Shake bottle vigorously until the mixing balls rattle freely. Then continue shaking for an additional minute.			
Application	Brush / felt / foam applicator			
Consumption	Approximately 50 ml/m² (depending on application method and substrate porosity).			
Flash-off time (23 °C / 50 % r.h.)	The minimal range of the flash-off time varies from 30 to 60 minutes depending on product, substrate and climatic conditions. For specific values always refer to the most recent Product Data Sheet.			

Notice: Sika® activators and primers are moisture reactive systems. In order to maintain product quality it is important to reseal the container immediately after use. With frequent use i.e. opening and closing several times, it is recommend disposing of the product one month after the first opening. With infrequent use, it is recommend disposing of the product 2 months after opening. When selecting a foam applicator, the solvent resistance must be considered. Suitable products include Sika® Cleaner PCA or melamine foam Basotect from BASF.

Abbreviation	Product/Explanation
AP-C	Abrasive Pad very fine (e.g. from Sia or 3M) followed by cleaning step, dry wipe or SCP
AP-V	Abrasive Pad very fine and vacuum cleaning
GR-V	Grinding (60 – 80 grit) and vacuum cleaning
SCP	Sika® Cleaner P
SA-100	Sika® Aktivator-100
SA-205	Sika® Aktivator-205
SMM	Sika® MultiPrimer Marine
SP-206 GP	Sika® Primer-206 G+P
SP-209 D	Sika® Primer-209 D
SP-290 DC	Sika® Primer-290 DC
ZP	Sika® Cor ZP-Primer

Notice: Not all products available globally.

Always consult additional information, such as General Guidelines "Bonding and Sealing with Sikaflex®", current Product Data Sheets, Safety Data Sheets, additional Product and Technical Information, etc. prior to use of the products. Project oriented solutions are documented in Technical Service reports. These solutions can vary from the table opposite and take priority over the general recommendations provided in this Pre-Treatment Chart.

LEGAL DISCLAIMER

The information contained herein and any other advice are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. The information only applies to the application(s) and product(s) expressly referred to herein and is based on laboratory tests which do not replace practical tests. In case of changes in the parameters of the application, such as changes in substrates, etc., or in case of a different application, consult Sika's Technical Service prior to using Sika products. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which can be downloaded on your local sika company website or will be supplied on request.