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 very fine abrasive pads.

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 roughening 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 priming adhesion check. Clean zinc coated steel has to be degraded 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: carphoretic 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 ultraviolet light and other aging sources prior to bonding.

3. FRP (Fibre reinforced plastic)
These materials consist of the most of the thermosetting plastics derived from unsaturated polyester, less commonly from epoxy vinylester 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 moldings should be selected for adhesive bonding. The smooth side (gel coat side) may be contaminated by mold 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 bonds 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, PMMMA and PC may contain substances which can be dissolved by the solvents of that are part of the Sikaprim formulation, which can then in some cases lead to issues with adhesion. Thermoplastics are subject to the risk of stress crazing. Thermally formed components must be degassed prior to adhesive bonding process. For transparent or translucent plastics see General Information on this page.

5. PMMA/PC
Scratch resistant coating on PMMA or PC must be removed in the bonding area with sand paper (100 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. Sikaflex®-265 SL/ST/VSL
These are solvent free 2C polyurethane fillers and leveling compounds used to level uneven substrates in ship and boat constructions prior to the installation of e.g. a teak deck system. Do not use solvent to clean cured and ground Sikaflex®-252 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 functional 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 faced 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

1. 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.

2. 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.

3. 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.

4. 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 chemical environment or the bondline 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.

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PROTECTIVE LAYER
Substrate surfaces with high variability like galvanization, anodization, coil coating, varnishing, finishing must be subjected to periodic inspections.
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 the sealing, 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/suitable products as indicated in the table opposite and take priority over the general recommendations provided in this Pre-Treatment Chart.

PRODUCT DATA AND ABBREVIATIONS

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

<table>
<thead>
<tr>
<th>Substrate</th>
<th>Sika® Aktivator 205+</th>
<th>Sika® Primer 206 G+P</th>
<th>Sika® Pre-Cleaning Agent-209 D</th>
<th>Sika® MultiPrimer Marine</th>
<th>Sika® Transfloor-352 SL/ST/VSL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum (AlMg1, AlMg0,5G1)</td>
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<td>Non ferrous materials (copper, brass, bronze, ...)</td>
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<td>Metal with shop primer</td>
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<td>FRP (unsmarinated, polyester) lay-up side</td>
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<td>Sika® Transfloor-352 SL/ST/VSL</td>
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<tr>
<td>Phenolic Plywood</td>
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*EN = Explanatory notes see page 4.

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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 applies only to the application(s) and product(s) expressly referred to herein and is based on laboratory tests which do not replace practical tests. It is not intended for the purposes 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 their intended application and purpose. All claims are subject to our current terms of sale and delivery. Sika shall not refer to the most recent issue of the Sika Product Data Sheet or the Sika Pre-Treatment Chart for legal information, advice or technical data concerning the products, other content of the data sheet is not available or the recommendations provided in this Pre-Treatment Chart.

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 specific solutions are documented in Technical Service reports. These aspects cannot be taken from the table and specifically review the general recommendations provided in this Pre-Treatment Chart.

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**SIKA PRE-TREATMENT CHART FOR SEALING AND BONDING IN MARINE APPLICATIONS**

**VERSION 6 (5/2018)**

**SIKA PRE-TREATMENT CHART FOR SEALING AND BONDING IN MARINE APPLICATIONS**

**VERSION 6 (5/2018)**

**SA-205**

**AP-C**

**GR-V4**

**SA-100**

**SMM**

**SA-2058**

**SA-205**

**ZP**

**SA-100**

**GR-V**

**SP-209 D**

**SMM8**

**SP-290 DC**

**GR-V5**

**SA-205**

**SA-205**

**SMM**

**SA-205**

**SA-205**

**AP-C**

**SMM**

**SA-205**

**SP-290 DC**

**SMM**

**SA-205**

**SA-205**

**SA-100**

**AP-C8**

**SA-205**

**SP-290 DC**

**SA-100**

**SA-100**

**SA-205**

**AP-C**

**SA-205**

**SA-205**

**SMM**

**SMM**

**SA-100**

**SMM**

**SMM**

**SMM**

**SMM**