

## PROCEDURE OF LEVELLING, BONDING AND CAULKING OF TEAK DECKS

### GENERAL WORKING CONDITIONS

The preferred working conditions for applying sealant to decking are as follows:

- Outside temperature 5 °C to 35 °C and maximal 75 % relative humidity
- Avoid increasing temperature during the first day
- Avoid exposure to direct sunlight and rain
- Prevent exposure to the elements for a minimum of 8 hours after the last step of the process
- Ensure adequate ventilation if necessary
- Avoid dirt, dust, oil, fat, grease, water during all processes as these can cause adhesion failure

### SURFACE PREPARATION AND PRIMER APPLICATION

Timber decks are usually applied on top of a sub deck of steel, aluminum, polyester GRP or wood. Aluminum and steel decks may be deformed by the welding process and require a levelling process whereas wooden and polyester GRP decks are normally even by nature.



Fig. 2 Typical welds and weld splatter of a steel deck

### ALUMINUM OR STEEL DECKS



**Steel:** the surface must be grinded or sand-blasted to remove rust, loose particles, flaked paint, contaminants, etc.

When complete, remove all dust with a vacuum cleaner

**Aluminum:** This surface should be slightly sweep-blasted or sanded



SA 205

Treat the surface with Sika® Aktivator-205 using a clean, lint free rag or a paper towel. Change the rag frequently



Flash off: 10 minutes (min) to 2 hours (max)



Take care to avoid dust, dirt or other contaminants until the next step has been carried out



ZP

- Check the air humidity and temperature and apply the product only if the surface temperature is higher than indicated in table on page 8 (Minimal substrate temperature to avoid water condensation). Respect the lower temperature limit.

- Surface and air temperature has to be between 10 °C and 35 °C.

- Mix the two parts of SikaCor® ZP Primer for 3 minutes, using an electric paddle mixer. Scrape the sides and the bottom of the container and mix for another 30 seconds. Do not split pre-packed cans. Use full kits only.

- Always monitor the pot life (1 hour at 30 °C, 3 hours at 10 °C).

- Apply SikaCor® ZP Primer with a short hair roller. SikaCor® ZP Primer consumption, approx 200g / m<sup>2</sup>.



Drying time before next application:

10 °C:	5 to 14 hours
20 °C:	3 to 14 hours
30 °C:	2 to 14 hours

Protect the area until SikaCor® ZP Primer has hardened.

If the area is contaminated, vacuum clean again and then treat thoroughly using Sika® Aktivator-205.

If drying time exceeds the maximum 3 days flash off time, abrade the surface with a rotating sanding machine using P36 grit and vacuum clean thoroughly. Then reapply the SikaCor® ZP Primer.

### GLASS FIBRE REINFORCED PLASTIC DECKS



208

Heavily soiled surfaces should be cleaned off first with a pure solvent (Sika® Remover-208) to remove the worst of the soiling



Lightly abrade the contact area with a sanding pad



Remove the dust with a vacuum cleaner



SA 205

Treat the substrate with Sika® Aktivator-205, using a clean, lint-free rag or a paper towel. Change the rag frequently!



Flash off time: 10 minutes (min) to 2 hours (max)



SMM

Apply a thin coat of Sika® Multi-Primer Marine using a clean brush, a foam pad or a felt applicator



Flash off time: 30 minutes (min) to 24 hours (max)



Fig. 3 Applying SikaCor® ZP Primer with a roller

## DECK LEVELLING

Steel and aluminum decks are usually deformed by the welding process. They need to be levelled before applications of the teak panels. Levelling is carried out using SikaTransfloor®-352 SL (self levelling) or SikaTransfloor®-352 ST (slight thixotropic). SikaTransfloor®-352 SL should be used on even decks SikaTransfloor®-352 ST is more thixotropic and can be used for decks with a shear of 3 degrees.

SikaTransfloor®-352 SL and SikaTransfloor®-352 ST show excellent adhesion to the SikaCor® ZP Primer. It represents a lightweight two-component polyurethane based system that cures to a smooth and efficient sound damping layer.

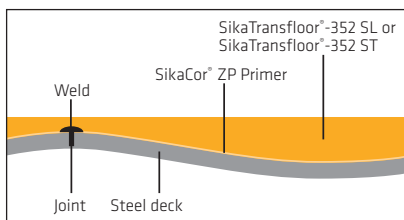


Fig. 4 Cross-sectional detail of deck showing levelling of high spots (weld) and uneven surface



**IMPORTANT:**  
Condensation or water droplets on the levelled deck will cause adhesion failure; always monitor the dew point.

### APPLICATION TEMPERATURE

The temperature (substrate / product / air) should be between 10 °C to 35 °C

In case of unfavourable climatic conditions, humidity in the air may condensate on a colder surface. Therefore the substrate temperature has to be controlled and should be equal or higher than indicated in the following graph (see page 7).

## THE DECK LEVELLING PROCESS



352 SL or ST

Stir component A and add component B of SikaTransfloor®-352 SL or SikaTransfloor®-352 ST.



Mechanically mix for three minutes at a medium speed. Avoid air entrapment.



Fig. 5 Mixing SikaTransfloor®-352



Immediately transfer the entire contents of the SikaTransfloor®-352 (SL/ST) mixture to another container, scraping the sides and bottom. Mix the new container for another minute before transferring the mixture onto the deck. Never scrape the remaining contents out of a pail onto the deck as this may not be completely mixed. Instead transfer any remnants to the next pail in the process and mix in with a new quantity. Repeat this as many times as required



Fig. 6 Transferring the SikaTransfloor®-352 (SL/ST) to another container



Pour the SikaTransfloor®-352 (SL/ST) mixture onto the area to be applied. Always observe the working time restrictions: 45 minutes at 10 °C, 35 minutes at 20 °C and 25 minutes at 30 °C



Fig. 7 Pouring the SikaTransfloor®-352 (SL/ST) to the floor



Spread the mixed SikaTransfloor®-352 (SL/ST) onto the deck using a bar or straight edge at a thickness just exceeding the highest elevation point of the steel or aluminium deck. Do not apply at a thickness over 30 mm. If this should be necessary, the operation must be carried out in several consecutive processes with intermediate sanding of the cured SikaTransfloor®-352 (SL/ST) surface followed by vacuum cleaning. Working conditions: 10 °C to 35 °C and 80 % r.h. max.



Fig. 8 Spreading the SikaTransfloor®-352 (SL/ST)



Drying time: The SikaTransfloor®-352 (SL/ST) coating can be walked over after 24 hours and is ready for the next stage in the process



## DECK BONDING AND BEDDING

Application on levelled surface with SikaTransfloor®-352 SL or SikaTransfloor®-352 ST.

Proceed with sanding the surface of cured SikaTransfloor®-352 (SL/ST) prior to application of the bonding / bedding compound Sikaflex®-298 or Sikaflex®-298 FC. In the time between the curing of the levelling compound and applying the bedding compound, the surface of the SikaTransfloor®-352 (SL/ST) must be kept free of soiling from footprints, dirt, dust, grease, fat, oil and other contaminants. The sanding process should be carried out using appropriate belt-sanding equipment with an 80 grit paper and followed by a thorough vacuum cleaning.

### APPLICATION ON OTHER SUBSTRATES

If levelling with SikaTransfloor®-352 (SL/ST) is not required, planks should be offered up and their positions should be marked. When all have been marked, the planks should be removed ready for the primer.

	For all woods: Apply a thin continuous coat of Sika® Primer-290 DC or Sika® MultiPrimer Marine using a roller or spray equipment
	Flash off times: 30 min to 24 hours

Ideally the surface as well as the joint is primed if the planks are embedded and the sealing of the joint is executed in a short time period.



Fig. 9 Applying Sika® Primer-290 DC or Sika® MultiPrimer Marine to a teak deck with a roller (hidden side)

Application temperature	10 °C (50 °F)	20 °C (68 °F)	30 °C (86 °F)
Pot life SikaCore® ZP Primer	3 h	2 h	1 h
Waiting time before application of SikaTransfloor®-352 ST or SL	5 h - 14 h	3 h - 14 h	2 h - 14 h
Working time SikaTransfloor®-352 ST and -352 SL	45 min approx.	35 min approx.	25 min approx.
Waiting time before installation of timber decking with Sikaflex®-298	up to 14 days	up to 14 days	up to 14 days

Working / waiting / drying time for SikaCore® ZP Primer, SikaTransfloor®-352 (SL/ST)

### MINIMAL SUBSTRATE TEMPERATURE TO AVOID WATER CONDENSATION ON THE SURFACE<sup>1)</sup>

	Air humidity	< 50 %	50 %	60 %	70 %	80 %	90 %
Air temperature	5 °C	0	0	0	3	5	7
	10 °C	3	3	6	8	10	11
	15 °C	8	8	10	13	15	16
	20 °C	12	12	15	17	19	21
	25 °C	17	17	20	22	24	26
	30 °C	21	21	24	27	29	31

<sup>1)</sup> calculated by the dew point plus 3 °C security

■ gray = not allowed condition  
■ yellow = allowed condition

Example air temperature 10 °C / relative humidity 60 % result: minimal surface temperature: 6 °C : conclusion: not allowed working conditions (minimal 10 °C).

## APPLICATION OF Sikaflex®-298 AND EMBEDDING OF THE PLANKS

Sikaflex®-298 or Sikaflex®-298 FC is a low viscous, exceptionally strong flexible one-component adhesive which is applied with a 4 mm comb trowel. The consumption should be around 1.2 liters (2x 600 ml sausages) per m<sup>2</sup>. The quantity has to be adjusted according to the surface texture. In any case the planks have to be embedded totally without any air pockets between substrate and planks.



Fig. 10 Carefully applying Sika® Primer-290 DC or Sika® MultiPrimer Marine

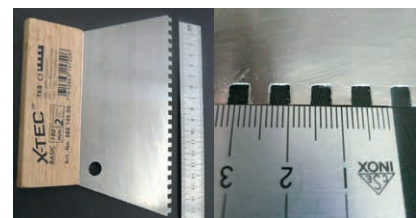


Fig. 11 Hand application picture comb trowel and comb trowel detail



#### IMPORTANT:

Only cover an area that will allow adequate time for a manageable quantity of deck planking to be placed before a skin forms on the adhesive (see Product Data-sheet).

Hold the planks in place by mechanical means such as weights / sandbags or by vacuum pressing.

The fixation may be released after 24 hours. If a shorter waiting time is needed or in case of low temperature / humidity we recommend spraying sparingly a mist of water over the surface just before placing the planks. The needed water quantity is only about 1 gram water per square meter of Sikaflex®-298.

In such a case the fixation time is reduced to some hours.



Fig. 12 Sikaflex®-298 applied with a comb spreader



Fig. 14 A teak floor being laid, showing the bedding compound and the weights to hold it in place



Fig. 13 Putting down the decking



Fig. 15 Vacuum press



Fig. 16 Vacuum equipment

## DECK CAULKING WITH Sikaflex®-290 DC PRO

As soon as the teak planks are fixed, the caulking may be done.

### PRIMING THE SUBSTRATE SEAMS

Priming of the planks is an absolutely vital step in the process of caulking with Sikaflex®-290 DC PRO.



If the planks are not already primed, this operation has to be done using a brush in a smaller size than the joint width



In order to achieve long-term adhesion of Sikaflex®-290 DC PRO to the sides of the joints, meticulous preparation of the seams is required. Remove all dirt with a vacuum cleaner.



Primer

Apply a thin coat of Sika® Primer-290 DC or Sika® MultiPrimer Marine to the edges of the joint seams. It can be applied by brush or spray in one coating operation. Application temperature: 10 °C to 35 °C



Drying time:  
10 °C to 35 °C: 30 min to 24 hours



#### IMPORTANT:

If the caulking process is followed not later than one day after the bedding, priming can be done simultaneous for both working steps (plank priming including seams). Take care to avoid soiling of the teak before caulking has been done

## APPLICATION OF Sikaflex®-290 DC PRO DECK CAULKING COMPOUND



Before any work commences, ensure that the temperature of the wood does not exceed 35 °C



In addition, the ambient temperature during application should be constant or falling and ideally within the range of 5 °C and 35 °C



290 DC PRO

Apply Sikaflex®-290 DC PRO ensuring that air is prevented from entering the seam by placing the tip of the nozzle against the bottom of the joint and keeping the gun at an angle of about 60°. If narrow joints need to be caulked a specially designed nozzle may be required. Use a handgun, a piston-driven airgun or a battery operated gun. Continue to apply along the seam so that the joint appears to slightly overfill behind the nozzle, but maintain a constant motion



After applying Sikaflex®-290 DC PRO but before skinning occurs, compress the excess material onto the surface of the deck using a slightly flexible spatula at an angle of 60°. This produces a convex appearance of the joint and fills the seam completely (see Fig. 19)



Protect the joints from rain and direct sunlight prior, during and after caulking, for a period of at least eight hours. Do not use excess material from the spatula to prevent bubbles in the joint



Sikaflex®-290 DC PRO is ready for sanding following the conditions outlined on the bar chart in Fig. 18

Relative air humidity	Air Temperature (°C)		
	10 °C	20 °C	30 °C
25 %	5.5 days	4.5 days	3.5 days
50 %	4 days	3.5 days	3 days
75 %	4 days	3 days	2 days

Fig. 18 Safe sanding time



Fig. 19 Compressing Sikaflex®-290 DC PRO with a spatula

## DECK SANDING

For efficient sanding results, use an industrial sander. It is recommended to begin with a medium paper at about 80 grit, progressing up to 120 grit. Suitable sanders are belt sanders, flat plate, or elastically suspended sanders. Sanding should be carried out in line with the seams. The waiting time between application of Sikaflex®-290 DC PRO and sanding is indicated in Fig 18.

## FINISHING

It is not recommended that a finish such as a varnish be applied to the exterior teak deck as these can contain solvents or plasticizers which can adversely affect the cured Sikaflex®-290 DC PRO or the drying of the lacquer. Varnishes do not often exhibit the flexible characteristics of a caulk, and so the finish may also show cracks, which could render the deck unsightly.

See also chapter "MAINTENANCE OF TEAK DECKS" on page 14.



Fig. 20 Sanding the deck



Fig. 17 Applying Sikaflex®-290 DC PRO

## PREFABRICATED TEAK DECKS

Many shipyards appreciate the use of prefabricated teak decks because they can be manufactured off-site, rather than on board where the process can block other activities. Prefabricated panels are efficient in their versatility to be produced in various shapes, quickly or on demand; as soon as the panel manufacturer has obtained the dimensions of the boat deck production can be started, thus saving substantially on labour costs. The prefabricated panels are also very easy to handle and to bond to the deck.



Fig. 21 Customised teak decking made to measure



Fig. 22 A prefabricated teak deck is laid out in preparation for fitting

## TYPES OF PREFABRICATED TEAK DECKS

In modern boat-building wooden decorative decks are often constructed in the form of prefabricated panels bonded or bedded onto the sub deck. This method is often favoured for time and cost savings.

These kinds of panels are either made to measure (custom made) from a template fitting the prescribed deck section, or are cut out of unidirectional panels. Prefabricated teak deck panelling comes either with or without a backing.

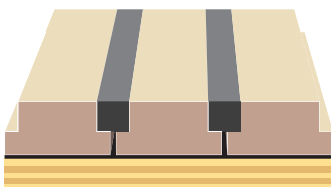
### BACKINGS MAY BE

- Marine plywood in different thickness
- HPL (flat laminate)
- Fiberglass lamination with epoxy resins

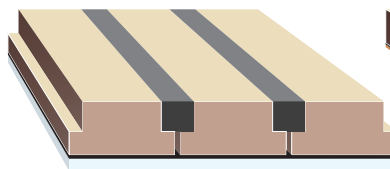


Fig. 23 Deep joint prefabricated teak decking and the strength and flexibility inherent in the adhesive

Plywood or HPL backing



GRP



Without backing

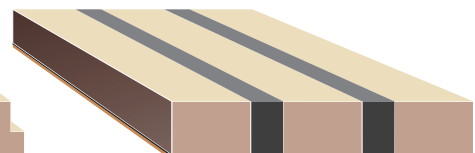


Fig. 24 Typical prefabricated teak deck profiles






## BONDING OF THE PREFABRICATED ELEMENTS

To bond or bed the prefabricated panels, use one-component polyurethane adhesives such as Sikaflex®-298 or Sikaflex®-298 FC.





The adhesive has to act as an additional layer in between the sub deck and the panel in order to waterproof the overall surface of the deck. As a prefabricated feature deck does not have to be drilled for screws and bolts there is no puncturing of the layer and therefore no risk of water leakage which could damage the sub-deck.

## SUBSTRATE PREPARATION





### FIBREGLASS BACKINGS

 208	Heavily soiled surfaces should first be cleaned off with a pure solvent (Sika® Remover-208) to remove the worst of the soiling
	Lightly abrade the contact area with an abrasive pad very fine
	Remove the dust with a vacuum cleaner
 Primer	Treat the substrate with Sika® Primer-290 DC or Sika® MultiPrimer Marine, using a clean brush or roller
	Waiting time until deck bonding: 30 minutes (min) to 24 hours (max)




### TIMBER OR PLYWOOD BACKINGS

	Abrade the contact area on the deck with a sanding pad (80 / 100 grit)
	Remove the dust with a vacuum cleaner
 Primer	Apply a thin, continuous coat of Sika® Primer-290 DC or Sika® MultiPrimer Marine using a clean brush or a roller applicator
	Drying times: Sika® Primer-290 DC or Sika® MultiPrimer Marine 30 min to 24 hours




### WITH HPL-BACKINGS

	Abrade the contact area on the deck with a sanding pad (60-80 grit)
	Remove the dust with a vacuum cleaner
 Primer	Apply a thin, continuous coat of Sika® Primer-290 DC or Sika® MultiPrimer Marine using a clean brush or a roller
	Waiting time until deck bonding for Sika® Primer-290 DC or Sika® MultiPrimer Marine 30 min to 24 hours








### WITHOUT BACKINGS

	Remove the dust with a vacuum cleaner
 Primer	Apply a thin, continuous coat of Sika® Primer-290 DC or Sika® MultiPrimer Marine using a clean brush or a roller
	Waiting time until deck bonding for Sika® Primer-290 DC or Sika® MultiPrimer Marine 30 min to 24 hours

### TWO-COMPONENT COATING ON METALS

	Ensure that the treated metal deck is compatible with Sikaflex®-298. Test the paint with a solvent like acetone or a commercial available silicon remover or paint thinner. If the paint can be removed, sandblast off the paint down to the metallic surface and use SikaCor® ZP Primer
 SA 100	Treat the substrate with Sika® Aktivator-100, using a clean lint free rag or paper towel. Change the rag frequently!
	Waiting time until deck bonding: 10 minutes (min) to 2 hours (max)

### ALUMINUM OR STEEL DECKS

	<b>Steel:</b> the surface must be ground or sand-blasted to remove rust, loose particles, flaked paint, contaminants, etc. When complete, remove all dust with a vacuum cleaner <b>Aluminum:</b> This surface should be slightly sweep-blasted
	Thoroughly vacuum clean the surface
 SA 205	Treat the surface with Sika® Aktivator-205 with a lint free paper towel
	Flash-off: 10 minutes (min) to 2 hours (max)
	Avoid dust or other contamination until the next step has been carried out
 ZP	Apply a continuous coating to the surface of SikaCor® ZP Primer within 2 hours of the Sika® Aktivator-205 treatment. Use a clean brush or a roller at a consumption of approx. 200 gm / m <sup>2</sup> or 80 µm thickness.
	Waiting time until deck bonding: 10 °C minimal 5 to 14 hours 20 °C minimal 3 to 14 hours 30 °C minimal 1 to 14 hours

## APPLICATION AND POSITIONING OF THE PREFABRICATED DECK ELEMENTS

Sikaflex®-298 or Sikaflex®-298 FC is a low viscosity, exceptionally strong flexible one-component adhesive which is applied with a 4-5 mm comb trowel. The consumption should be around 1.2 litres (2x 600 ml sausages) per m<sup>2</sup>. The quantity has to be adjusted according to the surface texture. In any case the planks have to be embedded totally without any air pockets between substrate and planks.

Remove the air after the element was laid down with a steel roller. Start in the middle of the deck towards the edge of the element (See Fig. 11).

## BONDING PROCESS



298

Apply the adhesive to the previously prepared surface and spread it using a spreader with 4 mm triangular notches. The bed thickness may vary depending on the thickness of any gap that needs to be filled



If HPL or GRP-laminates have to be bonded, spray a light mist of water on the Sikaflex® prior to positioning the panels (about 1 g / m<sup>2</sup>). If one of the bonded partners is wood, the application of a water mist is not necessary but sometimes useful to accelerate the cure at lower temperature  
The deck panel must be positioned accurately and pressed firmly into place Use a roller to eliminate air pockets



208

Uncured Sika adhesives or sealants should be removed with Sika® Remover-208 on non porous substrates. On porous substrates let harden the Sikaflex® soiled on teak and eliminate it mechanically



Clamps, weights or screws (removable once the adhesive has set) can be used to secure the panel. Alternatively, the vacuum press method can be used



After 24 hours the panels can carry their full service load and the temporary fastenings can be removed

## FINISHING

Remaining joints should be caulked as soon as the fixation means are removed. For horizontal joints, Sikaflex®-290 DC PRO can be used. Vertical joints should be caulked with Sikaflex®-295 UV.



### IMPORTANT:

If masking tapes are used, they have to be removed as soon as possible before skinning of the Sikaflex® occurs.



Fig. 25 Sealing the edges after renovation with Sikaflex®-295 UV



Fig. 26 Application of Sikaflex®-298



Fig. 27 Holding in place with weights