



# SIKA MARINE APPLICATION GUIDE

## TEAK DECKING

**BUILDING TRUST**



# CONTENT

**03** General Description

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**04** Types of Teak Deck

---

**04** Joint Dimensioning

---

**06** Procedure of Levelling, Bonding and Caulking of Teak Decks

---

**09** Prefabricated Teak Decks

---

**12** Teak Deck Repair

---

**17** Alternatives to Teak

---

**20** Bonding of Timber Elements



## DECK COVERINGS

### GENERAL DESCRIPTION

Deck coverings are of functional and esthetical importance. Since maritime conditions are harsh, the ship has to be produced not only with the best products but also in accordance with a professional workmanship.

This manual will help to produce durable bonding and sealing solutions. For project related informations we recommend to consult the corresponding national Technical Service.

### TEAK DECK HISTORY

Teak has been used for hundreds of years as a durable deck material.

The hard wood is very durable. Natural antimicrobial and insecticide substances cause an excellent natural anti-rot and weathering resistance.

Alternatives for teak such as iroko, padouk etc. are used in some cases but needs an intensive protection work to assure a long time function. Usually they are used in workboats as thick protective floors.

Regardless of the type of wood used, all require sealants to protect the deck from water penetration that can cause severe damage. This can take the form of unsightly marks along the hull, rotting the woodwork and corroding metal components.

Watertight seals are therefore absolutely essential. Also, in addition to adding structural strength to the subdeck, a wooden deck contributes to the insulation in hot and cool climates alike.

Teak, however, is not a uniform material. Oil, fat, talc and resin-content, as well as porosity and colouration, differ depending on the source and age of the wood.

The following pages detail the correct procedures for the planning, laying, preparing and caulking of teak decks with Sika's Totally Glued Teak Decking System.

## TYPES OF TEAK DECK

The Teak planks vary in dimension. The later have been used for luxury vessel decking's with mechanical fixation. Up to now the 22 mm planks applied with the Sikaflex® bonding technology result in the same durability at a more economic price.

The joint for caulking is realised in two ways:

### 1. SYMETRIC OR ASYMETRIC JOINTS

Advantages:

- Simple manufacturing process

Disadvantages:

- Limited joint depth for restoration or refurbishment grindings
- Higher risk of water penetration between planks and the deck (detachment due to wood swelling)



**IMPORTANT:**  
A bond breaker tape on the bottom of the joint to prevent 3-side adhesion is not necessary.



Symetric



Asymmetric

### 2. DEEP JOINT METHOD

Advantages:

- High grinding (removal) reserve
- Cost saving by using thinner wood planks
- Better adsorption of wood expansion

Disadvantages:

- More complicated working procedure for curved planks



**IMPORTANT:**  
We generally recommend to use the deep joint method whenever possible.



Deep joint

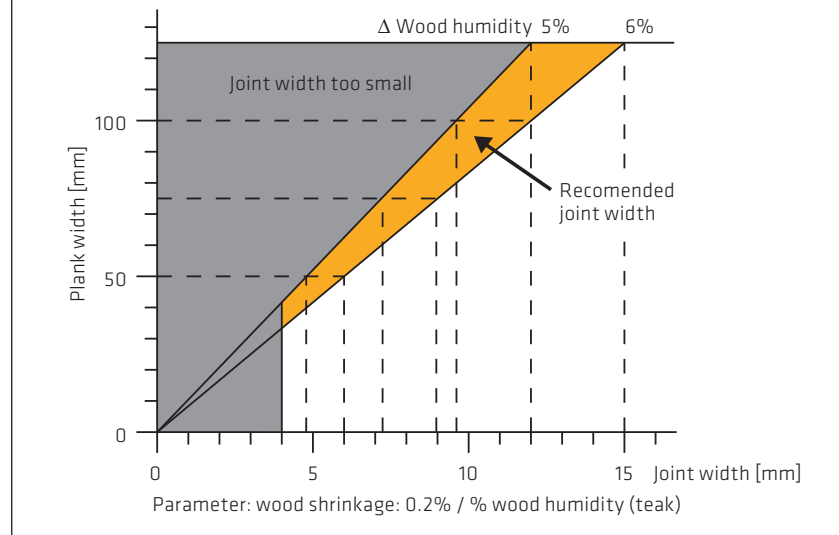
## JOINT DIMENSIONING

The joint width depends on the width of the plank, the humidity of the wood when manufactured and the expected humidity in use of the ship.



**IMPORTANT:**  
The change of wood humidity is under normal conditions (wood humidity max. 12%) in the range of 5% to 6%.

### GENERAL RECOMANDATION FOR JOINT WIDTH (TEAK)



The humidity of the wood can be measured or estimated from the following graph:

### WOOD HUMIDITY (% BY WEIGHT)

	Temperature	10°	15°	20°	25°	30°	35°	40°
	Relative humidity	90 %	21.1	21.0	21.0	20.8	20.0	19.8
85 %		18.1	18.0	18.0	17.9	17.5	17.1	16.9
80 %		16.2	16.0	16.0	15.8	15.5	15.1	14.9
75 %		14.7	14.5	14.3	14.0	13.9	13.5	13.2
70 %		13.2	13.1	13.0	12.8	12.4	12.1	11.8
65 %		12.0	12.0	11.8	11.5	11.2	11.0	10.7
60 %		11.0	10.9	10.8	10.5	10.3	10.0	9.7
55 %		10.1	10.0	9.9	9.7	9.4	9.1	8.8
50 %		9.4	9.2	9.0	8.9	8.6	8.4	8.0
45 %		8.6	8.4	8.3	8.1	7.9	7.5	7.1
40 %		7.8	7.7	7.3	7.3	7.0	6.6	6.3
35 %	7.0	6.9	6.7	6.4	6.2	5.8	5.5	
30 %	6.2	6.1	5.9	5.6	5.3	5.0	4.7	
25 %	5.4	5.3	5.0	4.8	4.5	4.2	3.8	

Source: R. Kaylwert und Angaben des U.S. Forest Products Laboratory, Madison 1951

### CALCULATION EXAMPLE:

Plank width: 50 mm  
 Production condition: wood humidity measured: 7%  
 Expected climatic conditions in use: 30 °C / 70 % r.h  
 Corresponding wood humidity (see table): 12.4 %  
 Maximal change in wood humidity: 12.4 % - 7% = 5.4 %  
 Maximal plank movement (teak) 5.4 % x 0.2 % / % wood humidity change x 50 mm = 0.54 mm  
 Practical excepted joint movement: 10 % of the joint width  
 Calculated joint width: 0.54 mm x 10 = 5.4 mm (practical 6 mm)



**IMPORTANT:**

The minimal joint width is in any case 4 mm. Adjacent joints to walls and profiles should be doubled in size.

## PRECONDITIONS OF TEAK BONDING

The teak quality is essential for an optimal result in respect of functionality and optical aspect.

Standing year rings as well as the absence of alternating spiral growth are essential to assure a uniform plank deformation under the different climates. Laying year rings may in addition lead to a danger of foot injuries due to scale of wood formation.

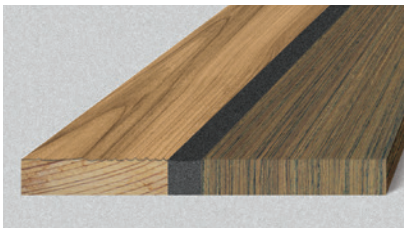


Fig. 1 Left side: laying year rings are not recommended. Right side: standing year rings are best.



## 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

### 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® MultiPrimer Marine using a clean brush, a foam pad or a felt applicator
	Flash off time: 30 minutes (min) to 24 hours (max)



## 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.

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.



**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.

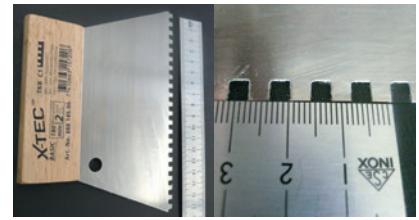


Fig. 9 Hand application picture comb trowel and comb trowel detail



Fig. 8 Carefully applying Sika® Primer-290 DC or Sika® MultiPrimer Marine

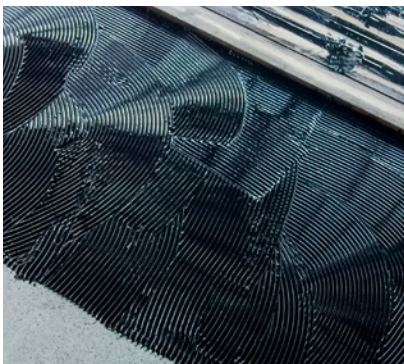


Fig. 3 Sikaflex®-298 applied with a comb spreader

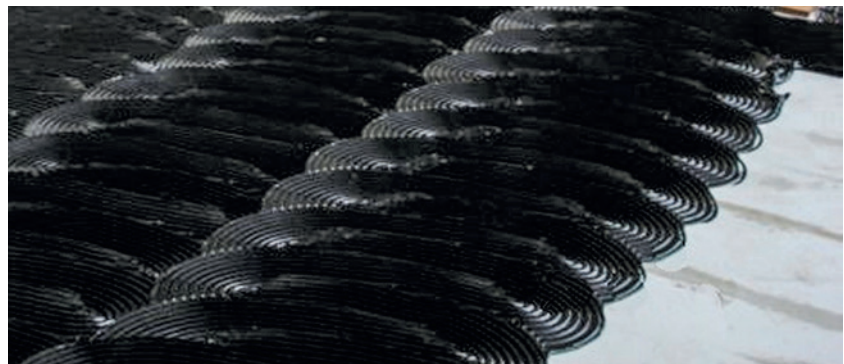


Fig. 5 A teak floor being laid, showing the bedding compound and the weights to hold it in place



Fig. 4 Putting down the decking



Fig. 6 Vacuum press

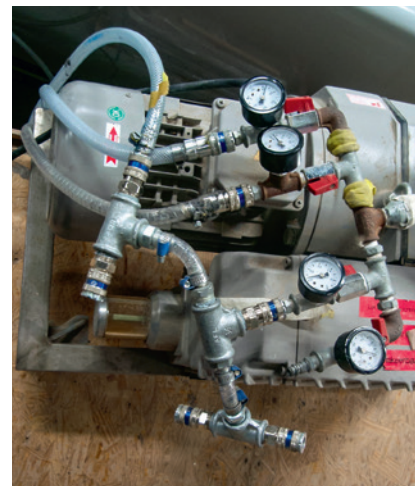


Fig. 7 Vacuum equipment

## 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



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

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. 11 Safe sanding time



Fig. 12 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.

## 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.



Fig. 10 Applying Sikaflex®-290 DC PRO



Fig. 13 Sanding the deck



## 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. 14 Customised teak decking made to measure



Fig. 15 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.

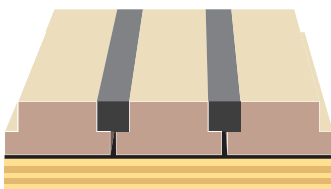
### BACKINGS MAY BE

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

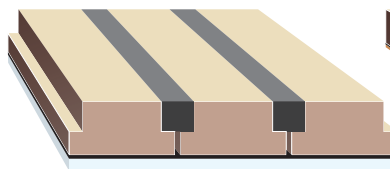


Fig. 16 Deep joint prefabricated teak decking and the strength and flexibility inherent in the adhesive

Plywood or HPL backing



GRP



Without backing

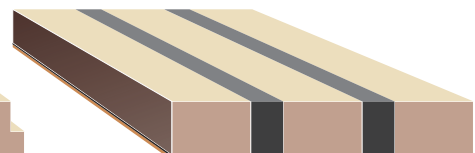


Fig. 17 Typical prefabricated teak deck profiles






## 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

## 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.



## 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. 18 Sealing the edges after renovation with Sikaflex®-295 UV



Fig. 19 Application of Sikaflex®-298



Fig. 20 Holding in place with weights

## TEAK DECK REPAIR

Most quality timber decks are of teak. For this reason, most of the procedures outlined in this manual are focused on that material.

Deciding whether or not a wooden deck needs to be repaired is not always easy. First, it must be established that a joint has failed or that the wood has been damaged sufficiently to cause a problem.

Each and every joint should be closely inspected. Any points at which there is a small gap or crack in the caulk should be marked with distinctive chalk.

Similarly, the wood surface should also be closely examined for undue wear, gashes, splitting or splintering and should be marked with chalk in a similar way.

However, parts or all of damaged planks should be replaced, according to how badly they are damaged.

If joints are mostly in good condition, but are damaged in one or two places, these can be repaired by replacing the local caulk. More extensive damage, may suggest that all of the jointing would need to be replaced.

The following table shows the recommended responses to the outcome of a deck analysis.

	Serious wood damage	Slight wood damage	Wood undamaged
Serious joint damage	Replace deck with new prefabricated or built in-situ deck	Replace all joints, then sand and restore whole deck	Replace all joints
Slight joint damage	Replace damaged joint areas, replace damaged wood areas, then sand and restore whole deck	Replace damaged joint areas, then sand and restore whole deck	Replace damaged joints only
Joints undamaged	Replace damaged wood areas. Sand and restore whole deck	Sand and restore whole deck	Clean the deck. Restore the wood if necessary

Which repair solution will be chosen depends on the state of the deck and the expected result.

## DECK ANALYSIS RESPONSES

Please note that water intrusion between wood and deck may lead to fouling of the wood. It is recommended to control the deck periodically and repair non tight areas before the whole deck is affected or part of the wood detaches from the deck due to the wood expansion with permanent water contact.

### HOW TO DETECT UNTIGHT AREAS?

Wood that has become damaged by water trapped in a failed joint becomes more porous than the wood surrounding it. This can result in the damaged wood changing colour. It also means that it will remain wet after the rest of the deck has dried. Wetting the deck and closely examining the areas that remain wet after the rest has dried, is an effective method for identifying problem areas.



Fig. 21. Discolouration of the wood is a tell-tale sign of a failed or damaged joint in this teak deck

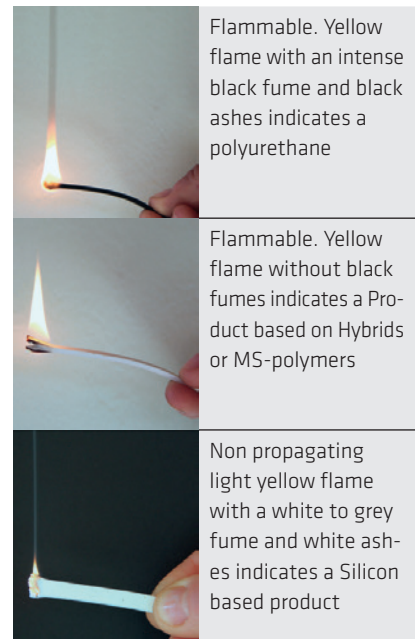
## DETERMINATION OF THE TYPE OF ADHESIVE WHICH WILL BE REPLACED

In the following part all possible repair solutions are described. However to achieve a perfect result, the chemical composition of the original deck caulking material as well as the elastic adhesive of the planks have to be determined if they are not known.

One simple test is to observe the burning behaviour of the sealant or adhesive.

For that a small test piece of the test product will be ignited with a pocket lighter.

The type of flame, the flammability and the smoke gives a good indication of the product base.



If in doubt, consult your local Industry Department.



**IMPORTANT:**  
Never repair a joint simply by cutting the sealant out and replace it with a sealant unless the chemical base is identical.

## REPAIR RECOMMENDATION

If the old joint is soft and sticky we recommend to eliminate the old material completely using a router. Enlarge the joint to ensure a proper wooden surface. After such a removal, **all sealant types** can be newly applied.

## REMOVING OF OLD CAULKING

There are four principal methods for removing old caulking. These are:

- Manual cutting with a sharp knife
- Using an oscillating cutter (Fein Tools) with a chisel-tip blade that is the same width as the joint
- Using an electrically heated rubber-cutting 'rubbercut' tool (Rema)
- Using a router. This method must be used if the old caulking material is not Sikaflex®-290 DC PRO as the sides of the joint will be shaved by the router blade

The method used normally reflects the size and the nature of the job. For a small, one-off job, the manual method would be the cheapest and the simplest method. A large job or a professional repair workshop would likely need to use either the oscillating cutter or the Rubbercut tool for both the time-saving and the quality of the finish.

The router would be used where it is necessary to make sure that there is no residue of the old caulking remaining. This would be especially important when the old caulking material is of unknown chemical composition as it might both have an unwelcome reaction with the new caulking material and have an inferior adherence to the sides of the joint.

OLD JOINT	NEW JOINT		
	PUR	MS / Hybrides	Silicones
PUR	Just cut out the defective joint. Pre-treat the surface to be resealed with Sika® Aktivator-100 and leave it for at least one hour before the application of the new sealant	Not recommended	Not recommended
MS or Hybrid	Not recommended	Seek advice from the manufacturer	Not recommended
Silicone	Not recommended	Not recommended	Cut out the defective material, clean with Isopropyl alcohol and seal the joints after 1 hour flash off time




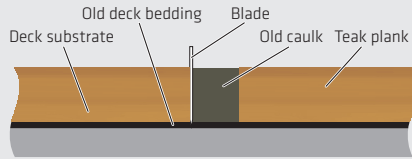

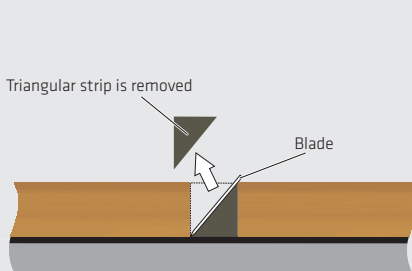



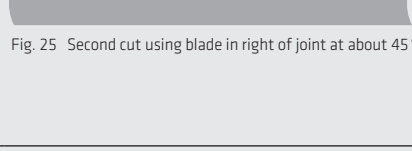

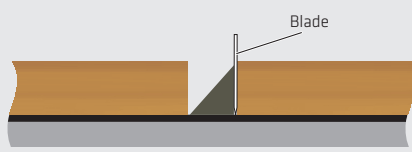

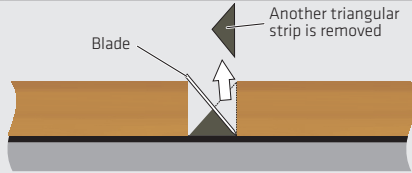

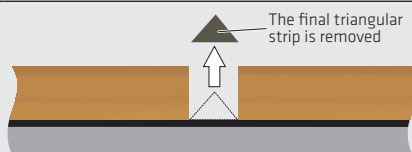
**IMPORTANT:**  
It is important to take care and ensure that the directions of cut is **WITH** the grain

Fig. 22 Always ensure that the direction of cut is with the grain to avoid 'digging-in' damage to the sides of the planks



Fig. 23 Using a craft knife to cut along the part of the joint to be removed

### REMOVAL WITH A SHARP KNIFE

	<p>Insert the blade of a craft knife into one side of the joint perpendicular to the deck surface</p>	
<p>Fig. 24 First cut using blade in left of joint at 90°</p>		
	<p>Cut along the joint taking care to keep the blade straight otherwise the wood might get damaged, or the old caulking will not be completely cut away</p>	
<p>Fig. 25 Second cut using blade in right of joint at about 45°</p>		
	<p>Insert the blade at an angle from the top of one side of the joint to the bottom of the other</p>	
	<p>Cut along the joint taking care to keep the blade at a constant angle. This will remove a triangular bead of old caulking along the length of the joint</p>	
<p>Fig. 26 Third cut using blade in right of cut at 90°</p>		
	<p>Insert the blade vertically at the other side of the joint. Once again, care should be taken to keep the blade straight otherwise the wood might get damaged, or the old caulking will not be completely cut away</p>	
<p>Fig. 26 Third cut using blade in right of cut at 90°</p>		
	<p>Adjust the blade to cut an opposite diagonal, to remove half of the remaining caulk</p>	
<p>Fig. 27 Fourth cut using blade at about 45° to the left</p>		
	<p>Remove the 'A' shaped remainder using a scraper of appropriate width. A hand-chisel of the same width of the joint or slightly less would be ideal for this purpose</p>	
<p>Fig. 28 Fifth cut using a scraper along the bottom of the joint</p>		

### REMOVAL WITH AN ELECTRICAL RUBBERCUT TOOL





	<p>Switch on the Rubbercut tool</p>
	<p>Exert a pressure to the cutting head in the forward direction. The tip will heat up to a temperature which cuts the old caulking</p>
	<p>Insert the tool and advance it along the joint, taking care not to damage the planks at the sides of the joint and in the case of smoking, insert a new cutting blade</p>
	<p>The cut caulking will be ejected out of the joint in a continuous strip</p>



Fig. 32 The rubbercut tool



Fig. 33 Blades for rubbercut

### REMOVAL WITH AN OSCILLATING CUTTER







	<p>Switch on the oscillating cutter. Grind the blade with a grinding stone (from the tool manufacturer).</p>	
<p>Fig. 29 The oscillating cutter</p>		
	<p>Insert the blade in the joint and remove it. For this joints it may be necessary to do this in two steps.</p>	
<p>Fig. 30 Removal of joints</p>		
	<p>The cut caulking will be ejected out of the joint with a continuous strip.</p>	
<p>Fig. 31 Removal blades</p>		



Fig. 34 A triangular cut of the old caulking being removed manually

## REPLACING OF OLD JOINTS

Old and damaged or detached sealants should be replaced to prevent water intrusion in between Teak and Substrate. One of the problems could be a incompatibility of the old sealants with the new joint sealant.

The best solution is to remove the old sealant completely using a guided router and the new sealant adheres to the teak-wood.

If the old sealant cannot be removed completely, an analyse of the old sealant should be done to detect possible incompatibilities between old and new sealant.

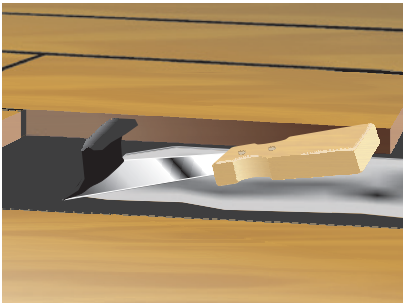




Fig. 35 Old bedding should first be scraped off using a scraper





Fig. 36 A useful and effective vibrating scraper power tool


## REPLACING DEFECTIVE PLANKS


 Completely remove the caulking from the joints around any planks that are to be removed. Identify the damaged planks with a chalk


 Remove the damaged plank, taking care not to damage the substrate. (If a strong adhesive has been used to bed the plank in place, it may be necessary to destroy the first plank removed in any series. The aperture can then be used to insert a shim beneath adjacent planks to enable their removal if necessary.)











 If only part of the plank is to be replaced. Cut off the damaged area using a vibrating saw. Prepare the new plank to the same dimensions as the damaged one


 Remove any old adhesives, bedding or other foreign matter from the substrate and remove the jointing material from around the edge using a craft knife, a scraper and sandpaper to ensure that the exposed edges are completely free of any residue

 Analyse the type of sealant.

 In case of silicone as original sealant, grind the edge of the planks or better using a router with a guide to assure a complete removal of the old sealant

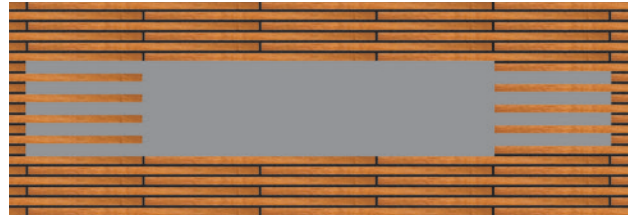
 Dry fit the new plank to make sure that it will locate and align with the existing planks

	Clean, or if necessary, prime the substrate according to the type of material as described in the appropriate procedure
 Primer	Prime all faces of the remaining planking as well as of the new plank (including the hidden side) using Sika® Primer-290 DC or Sika® MultiPrimer Marine
	Drying time: 30 min to 24 h
 298	Apply and spread bedding compound Sikaflex®-298 or Sikaflex®-298 FC at the appropriate depth to the sub deck
	Insert the replacement plank, bedding it in place and aligning and levelling it carefully with existing planking
	Hold the new planking in position using weights, screws or wedges
	Allow the Sikaflex®-298 or Sikaflex®-298 FC to cure for a minimum period of 24 hrs
 290 DC PRO	Apply Sikaflex®-290 DC PRO caulking, ensuring that no air is trapped in the joints and allowing the compound to slightly overfill the gap
	Slightly overfill the joint. Leave it if the deck will be sanded after caulking or use a spatula at 60° angle to press the sealant slightly into the joint.
	Let the Sikaflex® 290 DC PRO cure

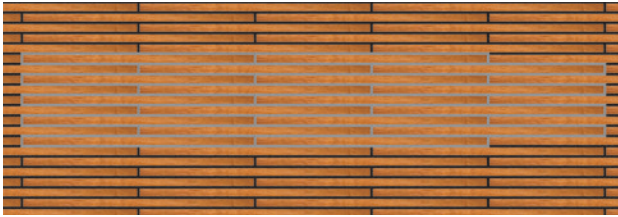
 **IMPORTANT:**  
If the deck should not be grinded, the joint filling process can be done using masking tapes



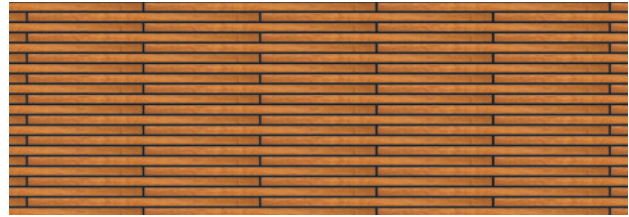
1. Damaged area



2. Removed planks



3. Embedded new planks



4. Repaired deck



Fig. 37 Cutting planks with vibrating knife



Fig. 38 Picture Removal overstanding Sikaflex®-290 DC PRO with a vibrating scraper power tool



Fig. 39 Belt sander

## SANDING OF THE DECK



To reduce sanding time we recommend to remove most of the hardened bead of Sikaflex®-290 DC PRO with an electric vibrating scraper



For efficient sanding results, use an industrial sander. It is recommended to begin with a medium paper at about 80. Suitable sanders are belt sanders, flat plate, or elastically suspended sanders



Connection areas may be sanded with a palm sander



When the surface is uniformly smooth. Change the sanding belt to 120 grit and re-sand the whole area again, keeping the sander aligned with the wood grain as much as possible



Remove all dust with a vacuum cleaner

## REPLACING THE WHOLE DECK

In such case the wood has to be removed and the deck has to be cleaned. Sanding or sandblasting has to be done down to the original substrate. Then install a new deck as outlined in chapter "PROCEDURE OF LEVELLING, BONDING AND CAULKING OF TEAK DECKS".



Fig. 40 palm sander

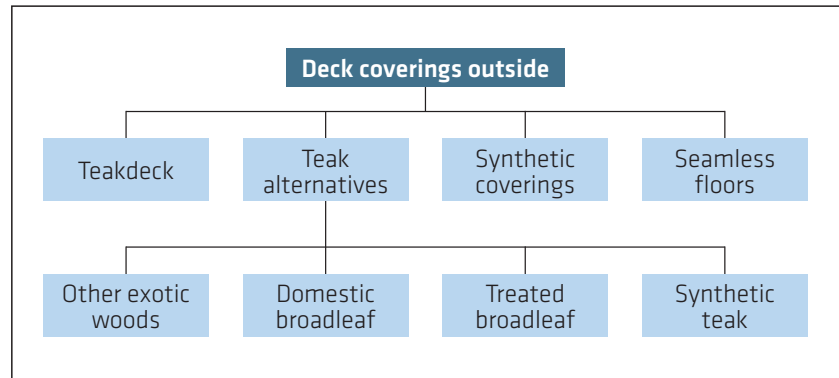


## ALTERNATIVES TO TEAK

Teak has been used for hundreds of years as a durable deck material.

Alternatives for teak such as iroko, padouk etc. are used in some cases but necessitate an intensive protection work to assure a long time function. Usually they are used in workboats as thick protective floors.

Teak deck alternatives are shown in the chart beside



## OTHER WOODS

### ADVANTAGES:

- Not submitted to legislation (FSC-label)
- Good relation price / durability

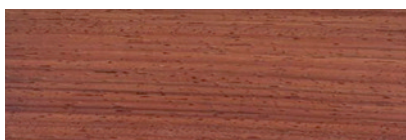
### DISADVANTAGES:

- Durability of these wood is lower than teak
- Shrinkage (hygric) is higher than teak
- No longtime experience in decking's are known
- More irregular grain such as alternating spiral growth etc. Periodical deck control is necessary.

Frequently used woods:



Iroko (Kambala)



Padouk

Others possible alternatives are: oregon pine, afromosia, basralocus, cedro, cordia, kahja, sipo, IPE etc.



### IMPORTANT:

Decks done with these woods may show an irregular hygric movement. Such deck coverings have to be observed frequently and eventually noticed joint detachments have to be repaired immediately

## TREATED BROADLEAF

This type of wood are home-grown broadleaf treated with natural or synthetic resins.

One example of these product types is Kebony. This is a maple wood treated with natural resins.

With this treatment the following characteristics are achieved:

- Durability comparable to teak with the same colour change to grey - brown
- Hardness, abrasion resistance higher than Teak
- Expansion property as teak

Surface preparation and adhesives are identical to chapter "PROCEDURE OF LEVELLING, BONDING AND CAULKING OF TEAK DECKS".



Fig. 41 Kebony new



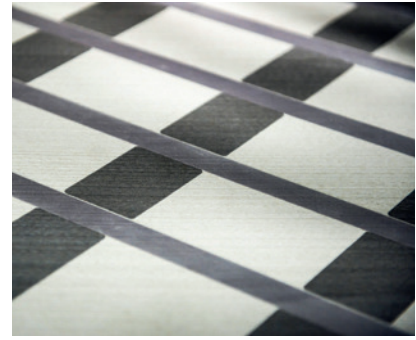
Fig. 42 Kebony aged

Surface preparation are identical to the manufacture of a teak deck (see chapter "PROCEDURE OF LEVELLING, BONDING AND CAULKING OF TEAK DECKS").

## SYNTHETIC (ENGINEERED) TEAK

Synthetic teak consists in thin layers of teak which are bonded together. The advantage of this process is the use of the entire tree. (Heartwood and sapwood).

Further information's have to be requested by the manufacturer.



## SYNTHETIC COVERINGS

These prefabricated decks are made of different plastics. Quality and durability may differ as well as slip resistance and feel. These coverings are mainly used on yachts.





We distinguish between principally three types of synthetic coverings:

- Polyurethane elastomers / GRP backing
- Synthetic rubber composites
- PVC based coverings
- PU resins










Fig. 43 Different designs

## PREPARING PUR BASED DECK COVERINGS






	The covering material must be free from release agents or other media used in the production process. Use appropriate solvent recommended by the manufacturer
	
	On nonporous coverings, the side that is to be bonded should be cleaned with Sika® Aktivator-100, using a clean, lint-free rag or a paper towel. Change the rag frequently!
	Flash-off: 10 minutes (min) to 2 hours (max)

## PREPARATION OF THE DECK

### GRP DECKS






	Heavily soiled surfaces should first be cleaned off with a pure solvent like, Sika® Remover-208, to remove the worst of the soiling
	
	Lightly abrade the contact area with a very fine sanding pad
	Remove the dust with a vacuum cleaner
	Clean the substrate with Sika® Aktivator-100, using a clean, lint-free rag or a paper towel. Change the rag frequently!
	
	Flash-off: 10 minutes (min) to 2 hours (max)

### TIMBER DECKS

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

For the preparation of other substrates, please refer to the Pre-Treatment Charts for Sika Marine Applications.

## BONDING PROCESS

	Apply Sikaflex®-298 on the previously prepared surface and spread using a spreader with 4 mm comb trowel. The thickness layer should be about 1.2 mm, 2x 600 ml saucages per m <sup>2</sup> .
	The covering material must be placed in position within 20-30 minutes of applying the adhesive, therefore the adhesive should be applied only to an area large enough to receive the section of covering that can be fitted in this time. Prevent air entrapment!
	Once the covering has been placed in position it should be rolled down with a rubber roller, working from the centre outwards to expel any entrapped air and push any excess adhesive out to the edges, where it can be removed. It is essential to ensure that no trapped air remains To accelerate the curing process we recommend to apply a mist of water using a paint gun. Do it sparingly as Sikaflex® needs only 1 gram of water per square meter. <b>Caution:</b> If the covering material is laid under tension, the edges must be held or suitably weighted
	Fix the deck with weights or vacuum press over night
	Uncured Sikaflex® may be removed from Tools with Sika® Remover-208. On rough surfaces we recommend to leave the adhesive to cure and remove it mechanically

## PVC-COVERINGS

Most of the alternatives for teak decks are based on PVC. The composition varies for each deckings. PVC coverings contain organic plasticizer. This plasticizer may have an long time interaction with the used adhesive.

Therefore we do not give any recommendation for bonding such products. In such case it is best to get in contact with the distributor in order to receive an adhesive which is recommended by the manufacturer.

**IMPORTANT:**  
Due to the variety of the deck coverings we recommend to seek advice from the procedure of the coverings or contact your local Technical Service department, Sika Industry.

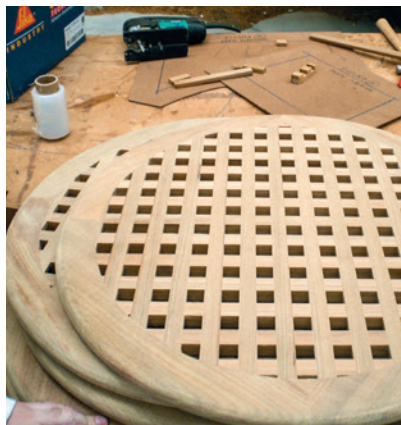
## BONDING OF TIMBER ELEMENTS

In yachts and pleasure craft as well as in ocean-going vessels, stairs, companion-ways and handrails are frequently made from tropical hardwood, chosen both for their durability and their attractive appearance.

The use of screws to attach these fixtures can impair both their durability and their appearance as they are vulnerable to moisture gaining access through the fixing holes. Hardwood components like these can be fixed with adhesives, where the absence of screw holes leaves the wood unimpaired and more resistant. This is of particular importance where the wood is load bearing as in the construction of accommodation ladders.








Bonding also has other benefits. The resilient adhesive layer softens the sound of footsteps and cushions vibrations, the integrity of painted surfaces can be preserved without loss of corrosion protection and the effects of moisture penetration are eliminated.

The Sika products for bonding timber elements are Sikaflex®-298 or Sikaflex®-298 FC (low viscous) for big bonding parts or parts which do not need an instant fixation until the hardening process took place (horizontal applications).







## SUBSTRATE PREPARATION

### GRP








 208	Heavily soiled surfaces should first be cleaned off with Sika® Remover-208 to remove the worst of the soiling
	Lightly abrade the contact area with a very fine sanding pad (abrasive pad very fine)
	Remove the dust with a vacuum cleaner
 SA 205	Treat the substrate with Sika® Aktivator-205, using a clean, lint-free rag or paper towel. Change the rag frequently!
	Flash-off: 10 minutes (min) to 2 hours (max)
 Primer	Apply a thin, continuous coat of Sika® Primer-290 DC or Sika® MultiPrimer Marine using a clean brush or a felt applicator
	Drying time: 30 minutes (min) to 24 hours (max)

### UNTREATED WOOD

	If the surface is soiled, abrade the contact area 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 felt applicator
	Drying time: 30 minutes (min) to 24 hours (max)



## STAINLESS STEEL

 208	Heavily soiled surfaces should first be cleaned off with Sika® Remover-208 to remove the worst of the soiling
	Lightly abrade the contact area with a very fine abrasive pad (abrasive pad very fine)
	Clean with a proper rag or a vacuum cleaner
 SA 100	Pre-treat the substrates with Sika® Aktivator-100, using a clean, lint-free rag or a paper towel. Change the rag frequently!
	Flash-off: 10 minutes (min) to 2 hours (max)
 Primer	Apply a thin, continuous coat of Sika® Primer-290 DC or Sika® MultiPrimer Marine using a clean brush or a felt applicator
	Drying time: 30 minutes (min) to 24 hours (max)

## APPLICATION OF Sikaflex®-298

The choice whether you use Sikaflex®-2xx or -298 depends on the parts to be bonded.

Big horizontal areas are better to bond with Sikaflex®-298 as this low viscous product is easier to apply with a trowel. The bedding process should be made with weights or with a vacuum press.

Smaller parts, inclines on vertical applications, or parts which have to be fixed with a vacuum press are best to be bonded with Sikaflex®-2xx. The higher viscosity of this product prevents a squirring out during vacuum application.




 291i	Apply Sikaflex® with a notched trowel on the prepared surface. Use a notched trowel with 4 mm rectangular notches depending of the roughness of the substrates
 291i	The thickness of the layer depends on the roughness of the surface but has to be at least 1.2 mm (2 sausages 600 ml / m²)
	Apply the timber within the open time of 15 minutes. Fix the components for 24 hours



Fig. 44 Application of Sikaflex®-298



### IMPORTANT:

it is essential that the elements are completely pressed down to the substrate to avoid water penetration underneath the timber element. This may create fouling and subsequent degradation of the wood.

Remove cured excess Sikaflex®-298 with a knife and seal the edge without additional pre-treatment.

If necessary joints on the side of the elements may be sealed with a weathering resistant sealant like Sikaflex®-295 UV.

### DISCLAIMER

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, 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 practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered.

The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users should always refer to the most recent issue of the Sika Product Datasheet for the product concerned, copies of which will be supplied on request.

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[www.sika.no/marine](http://www.sika.no/marine)

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