Deck and keel to hull bonding

APPLICATION DESCRIPTION

Arguably the most crucial joint on the vessel is that between the deck and the hull where Sika's resilient, 1-component polyurethane adhesives have many benefits to the designer and boat builder alike.

The naval architect can be confident that a deck and a hull that have been built separately of differing materials can be brought together to form a single unit that is both strong and durable. The tolerances in alignment between the two parts need not be quite as close, because minor discrepancies can be taken up by the gap filling property of the adhesives.

The strength of the adhesives makes mechanical fixings redundant and the resilience absorbs much of the stresses and strains from temperature changes, impact shocks and torsion forces.

All of these factors reduce the design and source costs of the build and remove many design obstacles.

To the boat builder, the assembly techniques are simplified and streamlined.

Applying an adhesive around the joint between deck and hull is far quicker, simpler and easier than laborious GRP laminated joints.

And providing the Sika guidelines are followed ensures a reliable watertight joint, as is not the case with taping methods.

With no mechanical fixings, there is no need to drill holes in the joint area, no need for gaskets, no need to spend the time aligning the holes and no need to insert and tighten the fixings.

For information regarding bondline dimensions, please contact Sika's Technical Service department, who can also provide appropriate values for FEM calculations.

Also, the critical joint between keel and hull is subjected to very high stresses when a boat is under sail and needs to be very strong if it runs aground. So it must be designed and built with great care in order to withstand these stresses.

This particular joint is prone to leaks, which identify themselves by rust streaking and staining on the keel when the boat is out of the water.

DECK TO HULL BONDING PROCEDURES WITH Sikaflex®-292I

PREPARING THE SUBSTRATE

FOR ALUMINIUM

208	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
SA 205	Pre-treat the substrate 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)
SMM	Apply a thin, continuous coat of Sika® MultiPrimer Marine, using a clean brush or a felt applicator
	Drying time: 30 minutes (min) to 24 hours (max)

PREPARING THE SUBSTRATE
FOR 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
	Remove the dust with a vacuum cleaner
SA 205	Pre-treat the substrate 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)
SMM	Apply a thin, continuous coat of Sika® MultiPrimer Marine, using a clean brush or a felt applicator
	Drying time: 30 minutes (min) to 24 hours (max)

OTHER SUBSTRATE

Refer to the actual Sika Pre-Treatment Chart for Marine Applications.

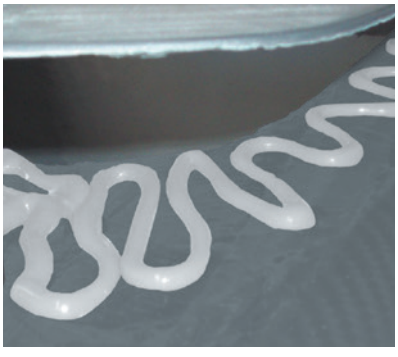
APPLICATION OF Sikaflex®-292I

IMPORTANT:
It is vital to check the accuracy of the fit before applying the adhesive so that the parts do not need to be separated again once they have been brought together

	Place spacers of at least 4 mm deep and about 50 shore A hardness, in position. Alternatively, these can be pressed into the adhesive once applied
292i	Apply Sikaflex®-292i onto the entire periphery of the hull. A continuous zig-zag bead Sikaflex®-292i should be used; the amount applied will depend on the width of the bond face. The adhesive bead must be carried continuously around any cut-outs or clearance holes (e.g. for deck stanchions, pipes, chain plates) to maintain the integrity of the watertight joint
	Assemble the components within 20 minutes of applying the adhesive
	Apply pressure with clamps or other fastening aids to compress the adhesive to the height of the spacers
	Clamps and other fastening aids can be removed after 24 hours. Full service strength is attained after approximately 7 days
208	Uncured Sika® adhesives or sealants must be removed with Sika® Remover-208

IMPORTANT:
Do not use Sika® Aktivator or any other cleaning agent or solvent for cleaning purposes

Hull and deck are brought together



A locating pin ensures perfect alignment

KEEL TO HULL BONDING

PREPARING THE SUBSTRATE
ALUMINUM HULLS (PAINTED WITH 2C PAINT)

208	Heavily soiled surfaces should first be cleaned off with Sika® Remover-208, to remove the worst of the soiling
SA 100	Pre-treat 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)

PREPARING THE SUBSTRATE
FOR 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
	Remove the dust with a vacuum cleaner
SA 205	Pre-treat the substrate 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)
SMM	Apply a thin, continuous coat of Sika® MultiPrimer Marine, using a clean brush or a felt applicator
	Drying time: 30 minutes (min) to 24 hours (max)

STEEL HULLS AND KEELS, COATED WITH TWO-PART CORROSION PROTECTION PAINTS

IMPORTANT:
1-component paints are not suitable to be bonded on it. To control the quality of the paint we recommend cleaning a small part with paint thinner. If the paint resists to the solvent it is suitable and can be bonded as described in the following part. In case of the paint can be dissolved, it has to be removed and replaced by a two-component epoxy paint

SA 100	Pre-treat 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)

A keel is carefully slid into position

The adhesive is applied

IMPORTANT:
With lead keels, the contact area must also be given a coating with a two-part epoxy-resin based protective paint

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

The joint is tooled off and finished

APPLICATION OF Sikaflex®-292I ADHESIVE

	Place elastic spacers of about 10 mm thick and 50 Shore A hardness into position
292i	Apply Sikaflex®-292i in sufficient quantity. Each bead must form a continuous, closed ring, with no gaps. The same applies to the beads around the bolt holes
	The keel must then be lifted into position, carefully observing the open time of Sikaflex®-292i. Then the keel bolts must be tightened as far as the spacer blocks. Any adhesive that is squeezed out of the joint can be tooled to a finish
208	Remove Sika adhesives or sealants with Sika® Remover-208
	After three or four days, the keel bolts can be tightened to their full torque rating. The additional pressure exerted on the adhesive, gives the joint between keel and hull the required degree of torsional stiffness. When the adhesive has fully hardened, the sealed joint can be over-painted in the normal way with any good quality anti-fouling paint. The sealed joint absorbs the dynamic stresses generated in this area and forms a totally watertight bond between keel and hull