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WATERPROOFING WAREHOUSE

Construction

Sikadur-Combiflex®

REVISED JULY 2002

Sealing system for cracks and problem joints with large movements

DESCRIPTION

The Sikadur-Combiflex joint sealing system consists of two products:
- Sikadur-31 Adhesive (Normal, Long Potlife or Rapid), and
- Combiflex (SikaNorm-Hypalon).

Sikadur-31 Adhesive is epoxy resin based and establishes a strong bond to the substrate and the Combiflex (SikaNorm-Hypalon) is a highly elastic, rot-proof and chemically and UV resistant sheet membrane with a thickness of 1 mm or 2 mm.
Sikadur-Combiflex can be applied on dry or damp substrates. It shows remarkable adhesion to concrete, iron and steel and is perfect for joints with very large expansion. Sikadur-Combiflex is also weather and waterproof. The Sikadur-Combiflex system is approved for potable water contact.

USES

- Sealing internal joints in new or refurbished concrete water tanks, reservoirs, pipelines, sewers and swimming pools.
- Joints in bunds and tanks for heating oil and fuel oil, etc.
- Sealing underwater joints in situ.
- Sealing joints in large decks of multi-storey car parks.
- Sealing joints in tunnels, silos and roofs.
- Sealing and repairing joints that have more movement than can be accommodated by conventional elastomeric wet applied sealants.

ADVANTAGES

- Applicable on dry and damp surfaces
- Quick hardening in low temperatures
- Three adhesive types for application between 5˚C and 45˚C
- For large expansion joints or cracks
- Of permanent elasticity even at low temperatures
- Weather resistant
- Water resistant
- Rot resistant
- Resistance against many chemicals
- Excellent adhesion to most conventional building materials
- Perforations along edges of Combiflex provide “rivet effect” and adds mechanical fixing to augment chemical bond
- No need to remove failed sealant from old joints before use.

STORAGE AND SHELF LIFE

Combiflex (SikaNorm-Hypalon)
In original packings minimum shelf life of 1½ years.

Sikadur-31 Adhesive
Minimum shelf life approximately 3 years.
Store under controlled conditions in original containers
(min. 5˚C, max. 35˚C temperature range).

INSTRUCTIONS FOR USE

Surface Preparation
The concrete surface should be mechanically cleaned with an abrading machine. The laitance must be removed to establish good adhesion. All surfaces must be clean, sound and free from any oil, grease or other contaminants (eg. old coatings, curing membranes and form release oil residues). Concrete should be at least 3 weeks old.

Thoroughly wipe both sides of the Hypalon tape with Sika Colma Cleaner on a clean tissue. Do not use too much solvent. Waiting time before placing: minimum 1 hour, maximum 8 hours.

Application (refer drawings on page 3)

Apply the wall mixed Sikadur-31 both sides along the joint or crack on the prepared substrate with a spatula or notched trowel. Layer thickness 1 to 2 mm. On either side of the joint or crack 30 to 40 mm of the Hypalon tape must be embedded in Sikadur-31 adhesive and the adhesive should extend at least 3 mm past the edge of the tape. If substrate is damp adhesive to be well worked into the surface. (Refer Sikadur-31 data sheet for full information).

When sealing cracks or narrow joints the Hypalon tape is to be left unstuck over the crack for a minimum width of 20 mm (use masking tape; remove before placing Hypalon tape.)

Place the cleaned activated and well aired Hypalon tape immediately into the adhesive layer with the masking tape facing upwards and press well in with a roller.

For joints 20 mm wide drape the Hypalon tape suitably into the joint so that slack tape is left to take up joint movement (refer type 'A' joint). Finally cover the inserted Hypalon tape laterally with Sikadur-31 Adhesive to provide 1-2 mm cover.

When the adhesive has begun to set remove masking tape.

Should the Hypalon tape have to be welded into longer pieces('t'-pieces etc.) solvent weld or hot air weld.

This joint sealing method can be carried out horizontally, vertically or overhead, however it should be noted that Sikadur-31 is not a contact adhesive and some support of the uncured strip may be required on vertical and overhead surfaces.

Welding Hypalon lap joints

The minimum lap is 40 mm. The lap areas should be clean and dry free from grease or dust. Before welding the lap should be cleaned with Sika Colma Cleaner. Site tests to verify welding techniques are advisable. The laps should be fully sealed and not be able to be parted with a screw driver blade.

Hot air welding: as the hot air is being applied into the lap through a slot nozzle, the lap must be rolled flat using a solid rubber pressure roller. The hot air temperature, the ambient weather conditions and the speed of welding all have to be taken into account so that the Hypalon is neither scorched (associated with a large quantity of smoke and discoloration of the Hypalon) nor under-heated with no weld forming. A suitable hot air gun is a Leister-Kombi "Triac".

Solvent Welding: only for use above 15˚C and when the Relative Humidity is not very high and for non-water immersedapplications. Use a small flat paint brush about 10 mm thick by 20 mm wide. The bristles should not be glued but preferably vulcanised or set in epoxy.

What is "The Welding Solvent": The welding solvent soaked brush bristles are passed through the lap joint liberally depositing the welding solvent in the lap joint. As soon as the solvent is applied in the lap, the lap should be pressed down with a rubber pressure roller and a weight left on the lap for a few hours until it gains enough strength to be handled.

Activator welding: is used when old fully vulcanised Hypalon is to be welded to new Hypalon. A combination of hot air welding with Sika Hypalon Welding Solvent is used to form a homogeneous bond. Before the weld is made the bond area on the full vulcanised Hypalon must be fully cleaned and the oxidised surface removed using steel wool soaked in Hypalon Welding Solvent. Full bond strength takes 24 hours to be achieved.

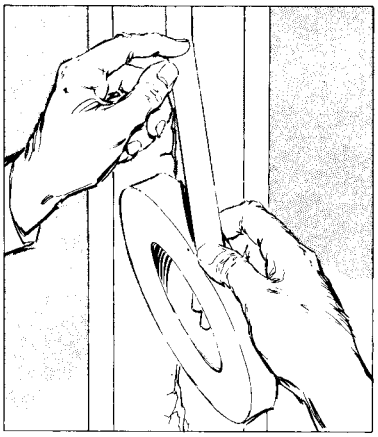
Cleaning

Uncured material may be cleaned from application tools, etc. by using Sika Colma Cleaner (flammable solvent). Cured material can only be removed mechanically.

To capitalise upon the efficiency built into the unique, simple-to-install Combiflex joint sealing system, Sika recommends that you follow these steps:

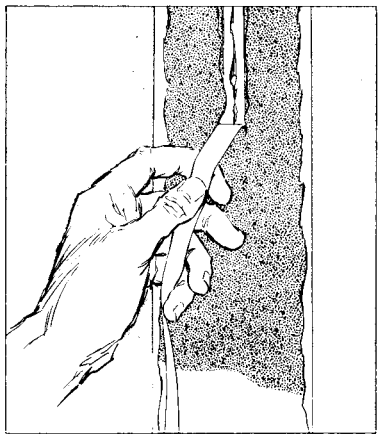
1 Clean surface at least 75 mm on each side of joint/ crack. Deteriorated substrate should be removed, but substrate should be smooth.

2 Activate Combiflex sheeting with cloth dampened with Sika Colma Cleaner. Liquid aids clean up and starts vulcanisation process.

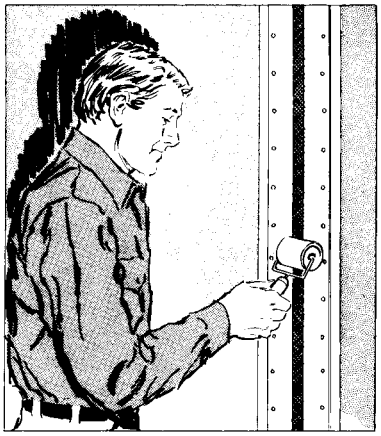


3 Apply masking tape over crack. Omit this step for large (Type "A") joints. If neatness is a factor, use additional masking tape to give you clean edges.

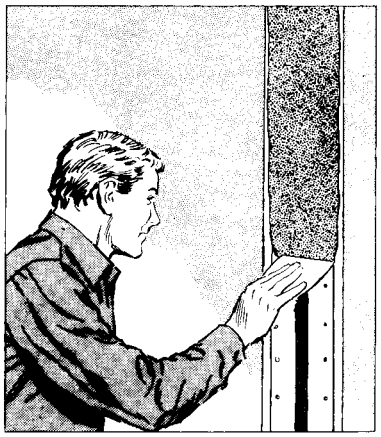
4 Apply Sikadur-31 Adhesive approximately 1 to 2 mm thick and approximately 30 to 40 mm on either side of joint or crack.



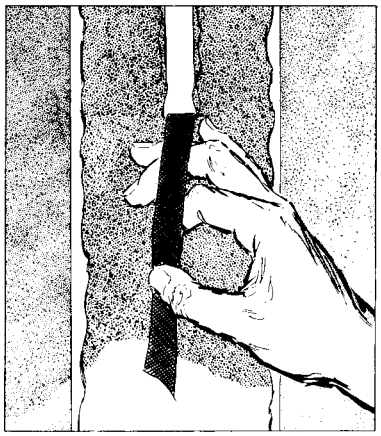
5 Remove masking tape (Type "B" joints only) before Sikadur-31 epoxy adhesive is tack-free.



6 Roll in Hypalon tape firmly. Allow sheeting to drape in joint slot for wide (Type "A") joints. Be sure to allow at least 1 hour from time of activating your Hypalon tape.



7 Apply top layer of Sikadur-31 Adhesive over entire width of sheeting (Type "B"). For wide joints (Type "A"), apply Sikadur-31 a minimum of 30 mm from outer edge of sheeting. Do not cover draped portion. Adhesive should seal outer edge by at least 3 mm.



8 Remove red expansion strip before Sikadur-31 Adhesive can cure. (Normally within 20 minutes at 25°C.) Also remove edging of masking tape at this time.

The uses for the versatile Combiflex System are virtually unlimited. They start with these 2 basic systems:

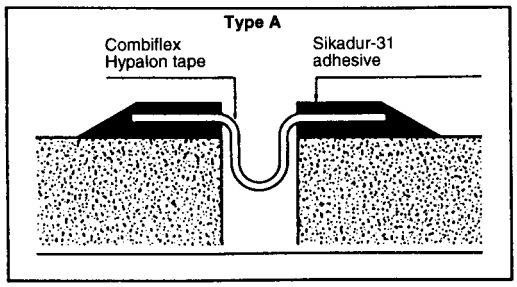


Fig. 1 - For wide joints. Note: Measures should be taken to prevent debris collecting within the Combiflex draped in horizontal joints as it may puncture the Hypalon tape or prevent the joint from closing. eg. Fill with a flexible/compressible PU foam such as open cell PU joint sealant backer rod.

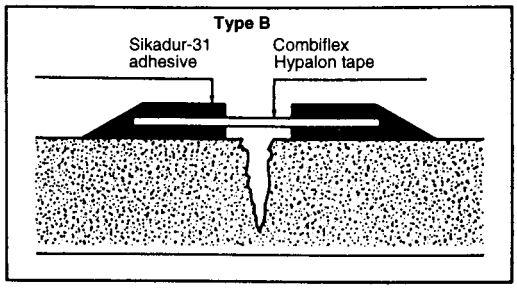


Fig. 2 - For narrow joints and cracks with low movement.

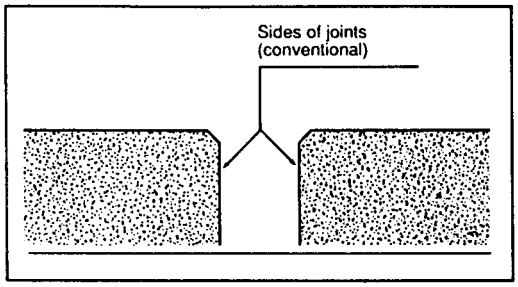


Fig. 3 - With conventional joint seals, the critical place is almost always the sides of the gap because they are difficult to prepare and cannot be thoroughly inspected. This gave rise to the idea of moving the bond area to the outside, ie. to the surface of the structural element.

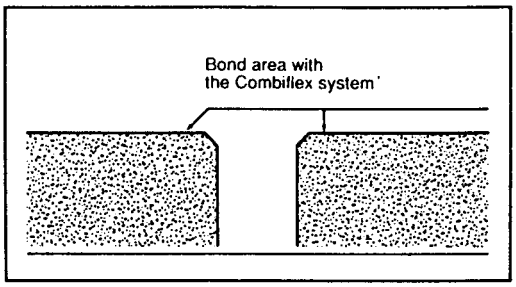


Fig. 4 - Here an ideal bond area can be created and proper inspection is possible.

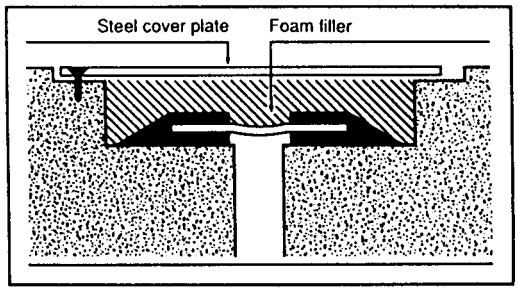


Fig. 5 - Many kinds of cover are available where greater mechanical strength is needed.

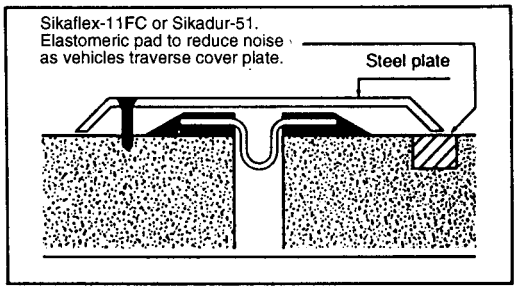


Fig. 6 - Non-recessed joint using another variation of a cover plate for traffic area.

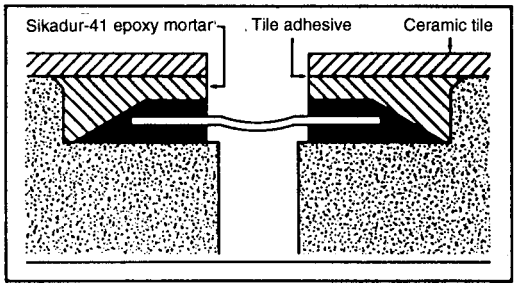


Fig. 7 - If the sheet cannot be located at the surface for mechanical, visual, or other reasons, it may be set back in a recess. As above for a swimming pool expansion joint.

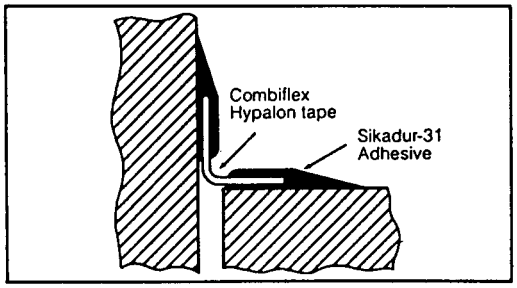


Fig. 8 - Wall to floor or ring beam or inverted configuration for a soffit joint.

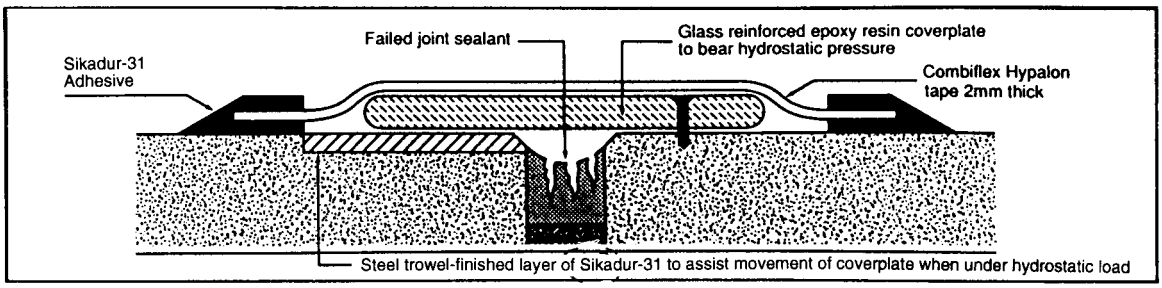


Fig. 9 - Typical "floor" joint design that has been used in Western Australia and the Northern Territory to reseal leaking concrete water tanks with a 7 metre head of water. This joint design has given more than 8 years service to date without a leak.

TECHNICAL DATA (TYPICAL)

Colour	Light Grey (both Sikadur-31 and Hypalon tape)
Density @ 20˚C **Weight per unit area** **Weight per unit area**	Sikadur-31 Adhesive 1.6 kg/litre approx. Sikadur-Combiflex tape 1 mm thick 1.5 kg/m² Sikadur-Combiflex tape 2 mm thick 3.0 kg/m²

Potlife (2 kg mix) Sikadur-31 Adhesive	Temp.	Long Potlife	Normal	Rapid
	35˚C	60 mins approx.	22 mins approx.	–
	20˚C	130 mins approx.	55 mins approx.	16 mins approx.
	5˚C	–	–	38 mins approx.

Limits

- Applicable on moist concrete (no water puddles) with Sikadur-31
- Clean Hypalon at least 1 hour/maximum 8 hours with Sika Colma Cleaner before all applications
- Rapid type at temperatures from 5˚C to +15˚C
- Normal type at temperatures from +10˚C to +30˚C
- Long Potlife Sikadur-31 20˚C to 45˚C
- Below 15˚C ambient temperature and when the humidity is very high and for water immersed joints Hypalon should be hot air welded not solvent welded
- In heavy traffic areas (eg. parking decks) steel cover plates should be used over Combiflex joints
- Consult Sikadur-31 data sheet for full product details.

Coverage	Per linear metre Hypalon tape 0.4 to 0.7 kg Sikadur-31 Adhesive

Adhesive strength (DIN 53232)		
On dry concrete	4.0 MPa approx.	
On moist concrete	4.0 MPa approx.	rupture of concrete
On sandblasted steel	6.0 MPa approx.	rupture of Hypalon

Hypalon tape mechanical properties (10 days, 20˚C, 65% R.H.)	
Tensile strength	4.5 MPa approx.
Elongation at break	400% approx.
Shearing strength	4.5 MPa approx.

Pulsation resistance (Sika test)	(approx. 5% expansion approx. 4 cycles per sec.) >100,000 cycles**
Vibration resistance (Sika test)	(approx. 5% expansion approx. 120 cycles per sec.) >50,000 cycles**
Water pressure resistance	Depending on joint design up to 170 kPa
Temperature of embrittlement	–40˚C
Packaging	Sikadur-31 (Long Potlife, Normal and Rapid grades) in pre-weighed packs of 5 kg. Sikadur-Combiflex Tape is supplied in standard lengths of 20 or 25 metres and standard widths of 100 cm, 150 mm and 200 mm. Available in thicknesses of 1 and 2 mm. Other widths of Combiflex Tape are available to order in widths up to 1 metre. Sika Colma Cleaner is suppied in 1 litre and 20 litre drums (flammable). Sika Hypalon Welding Solvent is supplied in a 1 litre can.

** No noticeable change, tests stopped

Construction

IMPORTANT NOTIFICATION

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 and conditions of sale. Users should always refer to the most recent issue of the Technical Data Sheet for the product concerned, copies of which will be supplied on request.

PLEASE CONSULT OUR TECHNICAL DEPARTMENT FOR FURTHER INFORMATION.

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