

System Product Data Sheet

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Identification no:

02 07 03 02 System

Sikadur®-Combiflex® System

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High performance joint sealing system

Product Description

High performance joint sealing system for construction, expansion and connection joints as well as for cracks. When fixed to the joint, allows irregular and high movement in more than one direction, whilst maintaining a high quality seal.

The Sikadur®-Combiflex® System consists of a flexible Hypalon waterproofing tape and a suitable Sikadur® epoxy adhesive.

Uses

Sealing system for expansion, construction and connection joints, as well as for cracks in:

- Tunnels and culverts
- Hydro electric power plants
- Sewage treatment plants
- Roof joints
- Basements
- Water retaining structures and drinking water reservoirs
- Joints between rigid and flexible surfaces
- Around iron, steel and concrete pipes
- Swimming pools

Sealing of:

- Joints with extreme movement
- Building sections where varying settlement is expected
- Cracks

Repair / reinstatement of leaking joint sealing systems such as:

- Waterbars
- Joint sealants etc.

Characteristics / Advantages

- Easy to install
- Suitable for both dry and damp concrete surfaces
- Extremely flexible
- Performs well within a wide range of temperatures
- Excellent adhesion to many materials
- Weather and water resistant
- Fast curing
- Available with normal and rapid hardening grades of adhesive
- Root resistant
- Good resistance to many chemicals
- Versatile system suitable for many difficult situations

Construction



Tests

Approval / Standards

Ofi: Test report No. 300.493 drinking water suitability according to ÖNORM B 5014 / Part 1 (23.06.03).

WRAS: Test report No. M1015006B water byelaws scheme "Items which have passed full test of effect on water quality BS 6920" (19.02.01).

KVS: Test report No. 224.01.99 water contaminating liquids (1999).

Chattfield Applied Research Laboratories: Test report No. RLR.39 performance of Sika® Products exposed to air, water and ozone combinations (21.03.94).

Chattfield Applied Research Laboratories: Test report No. RLR.46 evaluation of Combiflex based on water industry specification No. 4-60-01 March 91 (03.03.94).

Health Laboratory of Canton Zurich: Report No. 1809-5 and 1810-2, drinking water approval (1992).

Product Data

Form

Appearance/ Colours

Sikadur®-Combiflex® Tape and Sikadur®-Hypalon Strip:
Flexible light grey membrane

Sikadur®-Combiflex® Adhesive and Sikadur-31 CF:
Light grey

Sikadur-31 DW:
Grey

Packaging

Sikadur®-Combiflex® (100x1mm)- 50.0 m roll
Sikadur®-Combiflex® (150x1mm)- 25.0 m roll
Sikadur®-Combiflex® (150x2mm)- 20.0 m roll
Sikadur®-Combiflex® (200x1mm)- 25.0 m roll
Sikadur®-Combiflex® (200x2mm)- 20.0 m roll
Sikadur®-Combiflex® (300x2mm)- 20.0 m roll

Storage

Storage Conditions / Shelf Life

Sikadur®-Combiflex® CF Adhesive, Sikadur®-31 CF and Sikadur®-31 DW:
24 months from date of production if stored properly in undamaged unopened original sealed containers in dry conditions at temperatures between +5°C and +30°C.

Sikadur®-Combiflex® Tape and Sikadur®-Hypalon Strip:
36 months from date of production if stored properly in undamaged unopened original sealed containers in dry conditions at temperatures between +5°C and +30°C.

Sika® Colma-Cleaner:
36 months from date of production if stored properly in undamaged unopened original sealed containers in dry conditions at temperatures between +5°C and +30°C.

Technical Data

Chemical Base

Sikadur®-Combiflex® CF Adhesive, Sikadur®-31 CF and Sikadur®-31 DW:
Modified, solvent free, filled 2-part epoxy resin

Sikadur®-Combiflex® Tape and Sikadur®-Hypalon Strip:
Modified Hypalon-Elastomer

Service Temperature

Sikadur®-Combiflex® System:
-30°C min. to +40°C max. in wet conditions
-30°C min. to +60°C max. in dry conditions

Mechanical / Physical Properties

Bond Strength

Sikadur®-Combiflex® System (Sikadur®-Combiflex® Tape or Sikadur®-Hypalon Strip glued with Sikadur®-Combiflex® CF Adhesive)

Substrate	Bond Strength
Concrete (dry)	> 2 N/mm ² (failure in concrete)
Concrete (mat / damp)	> 2 N/mm ² (failure in concrete)
Steel (blastcleaned)	> 5 N/mm ²

Tear off Strength

Sikadur®-Combiflex® System:

Sika® System test: Sikadur®-Combiflex® CF Adhesive applied to mortar prisms followed by extension of the sealing system.

Results: Tape rupture
Elongation: > 400%
Strength: > 4 N/mm²

Peel Strength

Sikadur®-Combiflex® System:

Sika® System test: Sikadur®-Combiflex® Tapes bonded to each other with Sikadur®-Combiflex® CF Adhesive, Sikadur®-31 CF or Sikadur®-31 DW.

Results: Tape rupture
Elongation: > 400%
Strength: > 7 N/mm

Resistance

Chemical Resistance

Sikadur®-Combiflex® System (Sikadur®-Combiflex® Tape or Sikadur®-Hypalon Strip glued with Sikadur®-Combiflex® Adhesive, Sikadur®-31 CF and Sikadur®-31 DW)

Longterm to:

Water, lime water, cement water, seawater, salt solutions, domestic sewage, bitumen, bitumen emulsion coatings etc.

Temporary to:

Light fuel oil, diesel, diluted alkali and mineral acids, ethanol, methanol, petrol etc.

These chemical resistance indications may be used to determine the suitability of the sealing system. Regarding specific short term chemical resistance, please consult our technical service departments.

System Information

System Structure

The Sikadur®-Combiflex® System consists of a flexible Hypalon sealing tape and a Sikadur® epoxy adhesive.

Two types of flexible tapes are available:

- Sikadur®-Combiflex® Tape:
With prepunched edges and red central strip. Mainly used for expansion joints.
- Sikadur®-Hypalon Strip:
Without holes and red central strip.



Three types of Sikadur® epoxy adhesive are available:

- Sikadur® Combiflex® CF Adhesive (Type N and R)
- Sikadur®-31 CF (Type N, R and S)
- Sikadur®-31 DW (mainly used for contact with drinking water)

Note: The system configuration as described must be fully complied with and may not be changed.

Application Details

Consumption

Sikadur®-Combiflex® Tape and Sikadur®-Hypalon Strip:

Sikadur®-Combiflex® Adhesive per metre length

Strip width	Strip thickness	Adhesive consumption*
10 cm	1 mm	~ 0.7 kg/m
15 cm	1 mm	~ 1.0 kg/m
20 cm	1 mm	~ 1.2 kg/m
10 cm	2 mm	~ 0.8 kg/m
15 cm	2 mm	~ 1.1 kg/m
20 cm	2 mm	~ 1.4 kg/m
25 cm	2 mm	~ 1.7 kg/m
30 cm	2 mm	~ 2.0 kg/m

*The consumption can vary dependent on site conditions (surface roughness, size of aggregate etc.)

Substrate Quality

Concrete, stone, mortar, renderings:

Substrate must be clean, free from oil, grease, laitance or loose particles. Age of concrete 3-6 weeks depending on environmental conditions.

Construction Steel 37, V2A-Steel (WN 1.4301):

Clean, free from oil, grease, rust and scale.

Polyester, epoxy, ceramics, glass:

Clean, free from oil and grease.

Substrate Preparation	<p><i>Concrete, stone, mortar, rendering:</i> Blastcleaning or equivalent mechanical means followed by thorough vacuum / dust removal.</p> <p><i>Construction Steel 37:</i> Blastcleaning or equivalent mechanical means followed by thorough vacuum / dust removal. Avoid dew point conditions for application.</p> <p><i>V2A-Steel (WN 1.4301):</i> Light grinding followed by thorough vacuum/dust removal. Avoid dew point conditions for application.</p> <p><i>Polyester, epoxy, ceramics, glass:</i> Light roughening followed by thorough vacuum/dust removal. Do not apply to siliconised substrates. Avoid dew point conditions for application.</p>
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Application Conditions / Limitations

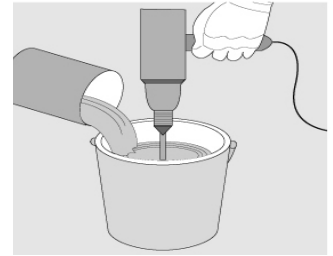
Substrate Temperature	<p><i>Sikadur®-Combiflex® CF Adhesive and Sikadur®-31 CF:</i></p> <p>Type Slow: from +25°C to +45°C Type Rapid: from +5°C to +15°C Type Normal: from +10°C to +30°C</p> <p><i>Sikadur®-31 DW:</i> From +10°C to +30°C</p>
Ambient Temperature	<p><i>Sikadur®-Combiflex® Adhesive and Sikadur®-31 CF:</i></p> <p>Type Slow: from +25°C to +45°C Type Rapid: from +5°C to +15°C Type Normal: from +10°C to +30°C</p> <p><i>Sikadur®-31 DW:</i> From +10°C to +30°C</p>
Substrate Moisture Content	<p><i>Cementitious substrates:</i> Dry, max. mat damp. When applied to mat damp concrete, brush the adhesive well into substrate.</p>
Relative Air Humidity	85% max. (at +25°C)
Dew Point	Avoid condensation.

Application Instructions

Mixing	<p><i>Sikadur®-Combiflex® CF Adhesive and Sikadur®-31 CF:</i></p> <p>Part A : B = 2 : 1 parts by weight or volume</p> <p><i>Sikadur®-31 DW:</i></p> <p>Part A : B = 3 : 1 parts by weight or volume</p> <p>Pre-batched units: Mix parts A+B together for at least 2 minutes with a mixing spindle attached to a slow speed electric drill (max. 500 rpm) until the material becomes smooth in consistency and a uniform grey colour. Avoid aeration while mixing. Then, pour the whole mix into a clean container and stir again for approx. 1 more minute at low speed to keep air entrapment at a minimum. Mix only that quantity which can be used within its potlife.</p>
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Bulk packing, not pre-batched:
First, stir each part thoroughly. Add the parts in the correct proportions into a suitable mixing pail and stir correctly using an electric low speed mixer as above for pre-batched units.



Application Method / Tools

Selection of tape size:

Selection of the correct tape size (thickness and width) depends on the expected performance. If necessary, ask for technical advice. Tapes of 1 mm thickness are suitable for sealing of joints subject to light load only.

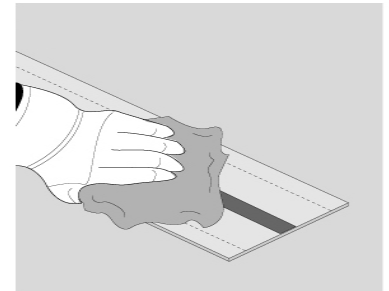
Max. permissible permanent elongation:

1 mm tape: 10% of the non adhered tape width
2 mm tape: 25% of the non adhered tape width

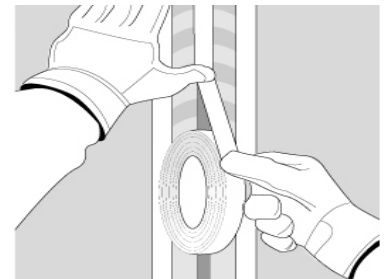
Note: For higher movement, place and fix tape in a loop into the joint.

Application of tape:

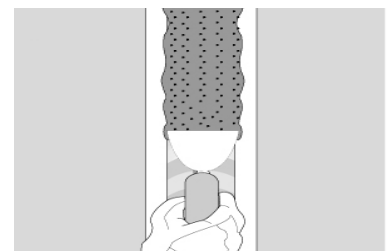
Remove transparent separation foil from the tape. Activate Sikadur®-Combiflex® Tape or Sikadur®-Hypalon Strip on both sides with Sika® Colma-Cleaner, using a rag saturated in Sika® Colma-Cleaner. Wipe thoroughly. Leave to dry for at least 0.5 hour and max. 8 hours.



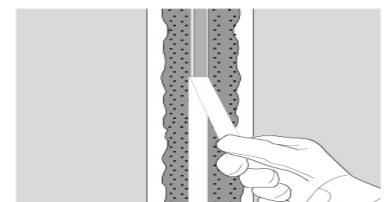
In case of expansion joints or cracks > 1 mm the centre of the tape must not be "bonded" to the substrate. In this case, apply masking tape on top of the joint / crack and on both sides of the joint before applying the adhesive.



Apply thoroughly mixed Sikadur®-Combiflex® Adhesive, Sikadur®-31 CF or Sikadur®-31 DW on both sides of the joint / crack onto the prepared substrate, using a suitable trowel. If the concrete substrate is damp, force the adhesive well into the substrate. Layer thickness of adhesive should be 1 - 2 mm and the width on each side at least 40 mm.



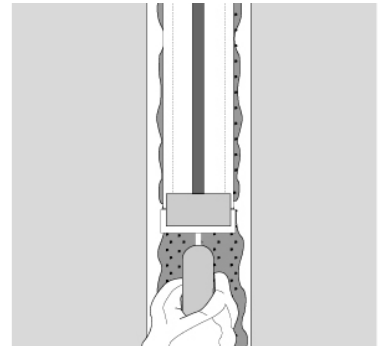
Before placing the Combiflex tape remove the masking tape on top of the expansion joint / crack.



Apply the Combiflex tape within the open time of the adhesive. Press the tape firmly and without trapping air into the adhesive by using a suitable roller. The adhesive should be squeezed out on both sides of the tape by ~ 5 mm.

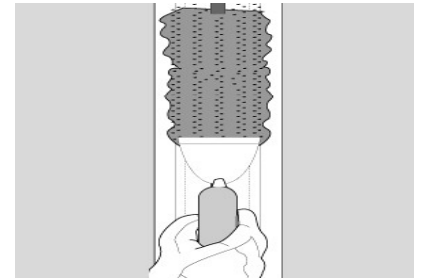
In cases of expansion joints / cracks > 1 mm apply the Sikadur®-Combiflex® Tape with the red middle strip facing upwards.

In cases of high joint movement place the tape as a loop into the joint.

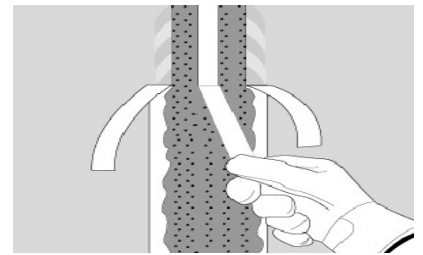


For fixing overhead or in difficult configurations, the tape may be temporarily held in place with Sika® Trocal Adhesive C-705. This adhesive, however may only be used in the tape centre but never on the areas to be bonded with Sikadur®-Combiflex® Adhesive, Sikadur®-31 CF or Sikadur®-31 DW.

Let the base layer of the Sikadur®-Combiflex® Adhesive, and Sikadur®-31 CF resp. Sikadur®-31 DW harden before the top layer is applied. If necessary activate the tape again. Apply the adhesive at a thickness of ~ 1 mm on both sides of the joint / crack, producing a cover which tapers outwards to almost zero.



This is followed by the removal of the red middle strip and the masking tape on both sides to ensure a neat and precise detail.



The adhesive top layer may be smoothed with a brush using a diluted detergent. Allow adhesive to start curing first. Note: Do not use detergent if any coating is to be applied.

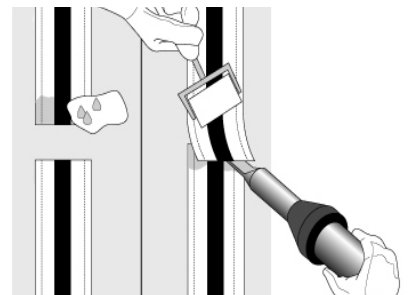
When sealing construction joints or cracks of up to 1 mm width, the tape may be completely covered with Sikadur®-Combiflex® Adhesive, Sikadur®-31 CF or Sikadur®-31 DW which also then provides mechanical protection. In these instances the Sikadur®-Combiflex® Tape must be applied with the red middle strip facing downwards. Use Sikadur®-Combiflex® Tape of 2 mm thickness.

Connection of Sikadur®-Combiflex® Tape or Sikadur®-Hypalon Strip:

Tape ends are connected by hot air thermal welding. This is assisted by simultaneously applying Sika® Colma-Cleaner just before welding.

Overlaps have to be 40 - 50 mm.

Old tapes, e.g. in case of repairs, must be cleaned with wire wool and Sika® Colma-Cleaner, followed by careful hot air welding.



Connection of Sikadur®-Combiflex® Tape or Sikadur®-Hypalon Strip with Sika® PVC External Waterbar Type AR (only for construction joints):

Sikadur®-Combiflex® Tape or Sikadur®-Hypalon Strip must overlap the Waterbar Type AR by at least a tape width.

Clean tape and waterbar with Sika® Colma-Cleaner and let it dry.

Prime the tape and waterbar with Sika® Aktivator and allow to dry (min. 30 minutes, max. 24 hours).

Bond the Combiflex tape and the Sika Waterbar together using Sikaflex®-11 FC adhesive sealant at the thickness of 1 - 3 mm.

Overcoat the contact areas by spatula with Sikaflex®-11 FC.

Cleaning of Tools

Clean all tools and application equipment with Sika® Colma-Cleaner immediately after use. Hardened / cured material (adhesive) can only be mechanically removed.

Potlife

Sikadur®-Combiflex® CF Adhesive (6 kg)		
Temperature	Type Normal	Type Rapid
+5°C	-	~ 60 minutes
+10°C	~ 125 minutes	~ 45 minutes
+15°C	~ 95 minutes	~ 25 minutes
+23°C	~ 50 minutes	-
+30°C	~ 25 minutes	-

Sikadur®-31 CF (0.2 kg)			
	Type Slow	Type Normal	Type Rapid
+5°C	-	-	~ 60 minutes
+10°C	-	~ 145 minutes	~ 55 minutes
+23°C	~ 135 minutes	~ 55 minutes	~ 40 minutes
+30°C	-	~ 35 minutes	-
+35°C	~ 70 minutes	-	-
+45°C	~ 45 minutes	-	-

Temperature	Sikadur-31 DW (0.2 kg)
+23°C	~ 90 minutes

If larger quantities are being mixed the temperature of the adhesive will increase due to the chemical reaction, resulting in a reduced potlife.

Waiting Time / Overcoating

The Sikadur®-Combiflex® Adhesive, Sikadur®-31 CF and Sikadur®-31 DW may be overcoated with an epoxy coating. In this case do not smooth the adhesive with detergent. If the waiting time between application of adhesive and overcoating is to be longer than 2 days, the adhesive must be blinded to excess with quartz sand immediately after application.

Notes on Application / Limitations

If joints are to be subjected to water pressure, the tape must be supported in the joint. Hard foam or joint sealant is recommended.

For exposure to negative water pressure the Sikadur®-Combiflex® Tape and Sikadur®-Hypalon Strip must be secured with a steel plate fixed on one side.

Limit without support: For 5 mm joints at +20°C and max. 0.5 bar water head a tape of 2 mm thickness has to be installed.

If a bituminous wearing layer is installed on top of Sikadur®-Combiflex® System the temperature of the hot mix must not exceed +180°C. Up to 10 mm thickness the temperature may be max. +220°C. If necessary apply in layers and allow to cool in between.

The Sikadur®-Combiflex® Tape and the Sikadur®-Hypalon Strip must be protected from mechanical damage.

Value Base

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

Health and Safety Information

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.

Legal Notes

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 accordance with Sika's recommendations. 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 user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.



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