

# Sikadur-Combiflex® SG System

## High Performance Joint Sealing System

### Product Description

**Sikadur-Combiflex® SG System** is a high performance joint and crack sealing system for construction joints, expansion (movement) joints and connection joints or cracks. The system allows variable and high levels of movement in more than one direction, whilst maintaining a high quality watertight seal.

The **Sikadur-Combiflex® SG System** consists of a modified flexible Polyolefin (FPO) waterproofing tape with advanced adhesion properties and a range of different special Sikadur® epoxy adhesives for use in different types of applications and conditions.

The **Sikadur-Combiflex® SG System** is suitable for use in hot and tropical climatic conditions.

### Uses

Sealing all types of joints and cracks in many different structures and applications including;

- Tunnels and culverts
- Hydro-electric power plants
- Sewage treatment plants
- Basements
- Water retaining structures and drinking water reservoirs
- 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

- Advanced adhesion between the tapes and the adhesives, no activation of the tapes is required on site.
- Fast and 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 different substrate materials
- Weather and water resistant
- UV-resistant
- Available with normal and rapid hardening grades of adhesive
- Root penetration resistant
- Good resistance to many chemicals
- Versatile system suitable for many difficult situations

Construction



## Tests

### Standards / Approvals

Hygiene Institut: Test report No. K-178989-09 drinking water suitability according to KTW-Guideline of the Federal Environment Agency (UBA), July 2009  
Assessment for resistance to root penetration according to CEN/TS 14416

## Product Data

### Form

System consisting of an elastomeric tape and thixotropic paste

### Appearance / Colour

*Sikadur-Combiflex® SG-10/-20 P Tape:*

Flexible light grey membrane

*Sikadur-Combiflex® SG-10/-20 M Tape:*

Flexible light grey membrane with red masking tape for easier application in expansion joints

*Sikadur-Combiflex® CF Adhesive and Sikadur®-31 CF:*

Light grey

*Sikadur®-31 DW:*

Grey

### Packaging

***Sikadur-Combiflex® SG System combi-pack***

Ready to use kit contains:

6 kg Sikadur®-Combiflex® CF Adhesive Type Normal

6 m Sikadur-Combiflex® SG -10 M 150 (thickness 1 mm, width 15 cm)

1 kg Sika® Colma Cleaner (for tool cleaning)

*Sikadur®-Combiflex® CF Adhesive, Sikadur®-31 CF :*

6 kg units (A+B) ready to use (just for Sikadur®-31 CF)

20 kg unit Part A

10 kg unit Part B

*Sikadur®-31 DW*

6 kg units (A+B) ready to use

30 kg unit Part A

10 kg unit part B

*Sikadur-Combiflex® SG-10 P:*

Thickness: 1 mm

Width: 10, 15, 20, 25, 30, 40, 50, 100, 200 cm

Rolls of 25 m

*Sikadur-Combiflex® SG-20 P:*

Thickness: 2 mm

Width: 15, 20, 25, 30, 40, 50, 100, 200 cm

Rolls of 25 m

*Sikadur-Combiflex® SG-10 M:*

Red masking tape

Thickness: 1 mm

Width: 10, 15, 20, 25, 30 cm

Rolls of 25 m

*Sikadur-Combiflex® SG-20 M:*

Red masking tape

Thickness: 2 mm

Width: 15, 20, 25, 30 cm

Rolls of 25 m

## Storage

### Storage Conditions

*Sikadur®-Combiflex® CF Adhesive, Sikadur®-31 CF and Sikadur®-31 DW:*

Store in cool and dry conditions in undamaged, unopened original sealed containers at temperatures between +5°C and +30°C.

*Sikadur-Combiflex® SG-10/-20 P tape:*

Store in cool and dry conditions in undamaged, unopened original sealed containers at temperatures between +5°C and +30°C. Opened and unprotected rolls must be used within 2 months.

*Sikadur-Combiflex® SG-10/-20 M tape (with red masking tape):*

Store in cool and dry conditions in undamaged, unopened original sealed containers at temperatures between +5°C and +30°C. Opened and unprotected rolls must be used within 2 months.

### 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.

*Sikadur-Combiflex® SG-10/-20 P tape:*

36 months from date of production if stored properly in undamaged, unopened original sealed packaging.

*Sikadur-Combiflex® SG-10/-20 M tape (with red masking tape):*

12 months from date of production if stored properly in undamaged, unopened original sealed packaging.

## 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® SG Tape:*

Modified flexible Polyolefin (FPO) with advanced adhesion

### Service Temperature

**Sikadur-Combiflex® SG 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® SG System** (Sikadur-Combiflex® SG Tape glued with Sikadur®-Combiflex® CF Adhesive)

Substrate	Bond Strength
Concrete (dry)	> 2 N/mm <sup>2</sup> (failure in concrete)
Concrete (matt / damp)	> 2 N/mm <sup>2</sup> (failure in concrete)
Steel (blast cleaned)	> 5 N/mm <sup>2</sup>

#### Peel Strength

**Sikadur-Combiflex® SG System:**

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

Results: Strength: > 6 N/mm (2 mm)

Strength: > 4 N/mm (1 mm)

## Chemical Resistance

### Sikadur-Combiflex® SG System

(Sikadur-Combiflex® SG Tape glued with Sikadur®-Combiflex® Adhesive, Sikadur®-31 CF and Sikadur®-31 DW)

#### Long term to:

Water, lime water, cement water, seawater, salt solutions, domestic sewage, bitumen (according to EN 1548), bitumen emulsion coatings (staining possible) 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® SG System** consists of a modified flexible Polyolefin (FPO) waterproofing tape and a Sikadur® epoxy adhesive.

Two types of flexible tapes are available:

- Sikadur-Combiflex® SG-10/-20 M: with red masking tape, mainly used for expansion joints
- Sikadur-Combiflex® SG-10/-20 P: without masking tape

Various types of suitable Sikadur® adhesives 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® SG Tape:*

*Sikadur®-Combiflex® CF Adhesive per metre length:*

Tape width	Tape 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
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.)

<b>Substrate Quality</b>	<p><i>Concrete, stone, mortar, renderings:</i></p> <p>Substrate must be clean, free from oil, grease, laitance or loose particles. Age of concrete 3-6 weeks depending on environmental conditions.</p> <p><i>Construction Steel 37, V2A-Steel (WN 1.4301):</i></p> <p>Clean, free from oil, grease, rust and scale.</p> <p><i>Polyester, epoxy, ceramics, glass:</i></p> <p>Clean, free from oil and grease.</p>
<b>Substrate Preparation</b>	<p><i>Concrete, stone, mortar, rendering:</i></p> <p>These substrates must be mechanically prepared e.g. by blastcleaning, to be free from any cement laitance, damaged concrete, old surface treatments or coatings and then all loose or friable particles must be removed to achieve a contaminant free, open textured surface</p> <p><i>Construction Steel 37:</i></p> <p>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></p> <p>Light grinding followed by thorough vacuum / dust removal. Avoid dew point conditions for application.</p> <p><i>Polyester, epoxy, ceramics, glass:</i></p> <p>Light abrasive roughening followed by thorough vacuum/dust removal. Do not apply to siliconised or silicone oil treated substrates (debonding agent). Avoid dew point conditions for application.</p>
<b>Substrate Temperature</b>	<p><i>Sikadur®-Combiflex® CF Adhesive and Sikadur®-31 CF:</i></p> <p>Type Slow: from +25°C to +45°C</p> <p>Type Rapid: from +5°C to +15°C</p> <p>Type Normal: from +10°C to +30°C</p> <p><i>Sikadur®-31 DW:</i> from +10°C to +30°C</p>
<b>Ambient Temperature</b>	<p><i>Sikadur®-Combiflex® CF Adhesive and Sikadur®-31 CF:</i></p> <p>Type Slow: from +25°C to +45°C</p> <p>Type Rapid: from +5°C to +15°C</p> <p>Type Normal: from +10°C to +30°C</p> <p><i>Sikadur®-31 DW:</i> from +10°C to +30°C</p>
<b>Substrate Moisture Content</b>	<p><i>Cementitious substrates:</i></p> <p>Dry, maximum matt damp.</p> <p>When applied to matt damp concrete, brush the adhesive well into substrate.</p>
<b>Relative Air Humidity</b>	85% maximum (at +25°C)
<b>Dew Point</b>	<p>Avoid condensation.</p> <p>Substrate temperature during application must be at least 3°C above dew point.</p>
<b>Mixing Ratio</b>	<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>

## Mixing

### *Pre-batched units:*

Mix parts A+B together for at least 3 minutes with a mixing spindle attached to a slow speed electric drill (max. 300 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 approximately 1 more minute at low speed to keep air entrapment at a minimum.

Mix only that quantity which can be used within the pot life.



## Application Method / Tools

### *Selection of tape size:*

Selection of the correct tape size (thickness and width) and of a suitable Sika® adhesive 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.

### *Maximum permissible permanent elongation:*

1 mm tape: 10% of the non-adhered tape width

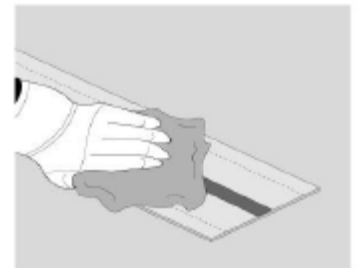
2 mm tape: 25% of the non-adhered tape width

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

### *Application of tape:*

In case of dirt, clean the surface of the Sikadur-Combiflex® SG Tape with a dry or wet cloth. Use water and no solvent for cleaning.

Check the integrity of the Sikadur-Combiflex® SG Tape to ensure that there is no damage from storage or transport (e.g. heavy scratches). Remove any damaged sections if necessary.

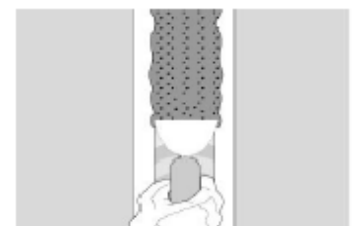


### **Note: No activation on site required.**

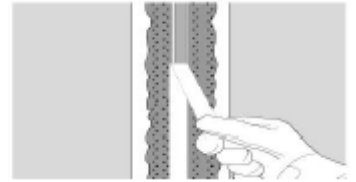
For installation on expansion joints or cracks > 1 mm the centre of the tape must not be "bonded" to the joint filler or substrate. In this situation, apply masking tape on top of the joint / crack and on both outer sides of the prepared joint before applying the adhesive.



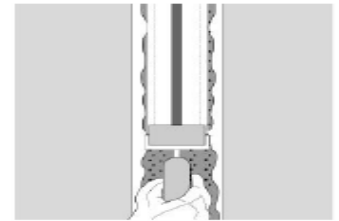
Apply the mixed Sikadur® adhesive on both sides of the joint / crack onto the prepared substrate, using a suitable brush, trowel or spatula. If the concrete substrate is damp, force the adhesive firmly into the substrate. The layer thickness of adhesive should be 1 - 2 mm and the width on each side of the joint / crack at least 40 mm.



Before placing the Combiflex tape remove the masking tape on top of the central 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.



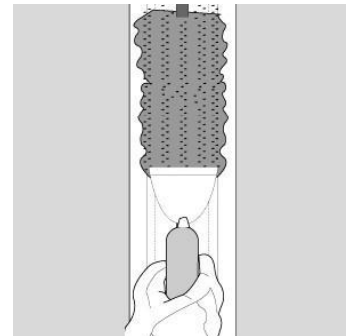
In cases of expansion joints / cracks > 1 mm apply the Sikadur-Combiflex® SG-10/-20 M Tape with the red masking tape facing upwards.

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

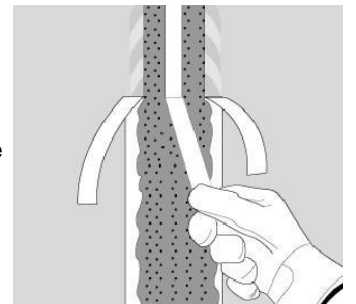
For fixing overhead or in difficult configurations, the tape may be temporarily held in place with Sika® Trocal Adhesive C-705. This adhesive, however, may only be used in the tape centre but never on the areas to be bonded with Sikadur-Combiflex® CF Adhesive, Sikadur®-31 CF or Sikadur®-31 DW.

Let the first layer of the Sikadur®-Combiflex® CF Adhesive, Sikadur®-31 CF or Sikadur®-31 DW tiffen and begin to harden before the top layer is applied.

Apply the top layer of adhesive at a thickness of ~ 1 mm on both sides of the joint / crack, producing a fully covering layer 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 the 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® CF Adhesive, Sikadur®-31 CF or Sikadur®-31 DW which also then provides mechanical protection. In these instances the Sikadur-Combiflex® SG Tape must be applied with the red middle strip facing downwards.

#### *Connection of Sikadur-Combiflex® SG Tape:*

Tape ends are connected by hot air thermal welding. The welding area must be prepared by roughing the surface by scotch brite pads or sand paper.

Roughen the tapes only in the welding area otherwise the bonding effect can be affected.

Overlaps have to be 40 - 50 mm.

Welding parameters, such as speed and temperature shall be established with trials on site, prior to any welding works.

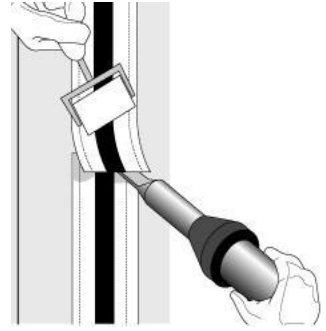
Basic settings: 360-420°C

Hand welding in the overlap area is carried out in three steps.

1. Spot weld the overlap
2. Pre-weld: weld the rear overlap area so that a 20 mm flap (using a 20 mm nozzle) remains for the final welding
3. Final weld; weld the remaining flap.

Guide the roller at a distance of 20 mm parallel to the air outlet of the welding nozzle. Roll the pressure roller fully across the seam.

Note: Solvents such as Sika® Colma Cleaner do not improve the welding properties



#### *Connection of Sikadur-Combiflex® SG Tape with Sika® PVC External Waterbar Type AR (only for construction joints):*

Sikadur-Combiflex® SG Tape must overlap the Sika® Waterbar Type AR by at least a tape width.

Clean the Sikadur-Combiflex® SG Tape with a dry cloth.

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

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

Bond the Sikadur-Combiflex® SG Tape and the Sika® Waterbar together using Sikaflex® -11 FC+ adhesive sealant applied at a thickness of 1-3 mm.

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

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#### **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.

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## Pot life

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)			
Temperature	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 pot life.

## Waiting Time / Overcoating

The Sikadur®-Combiflex® CF Adhesive, Sikadur®-31 CF and Sikadur®-31 DW may be over coated with an epoxy coating. In this case do not smooth the adhesive with detergent.

If the waiting time between application of adhesive and over-coating 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® SG Tape must be secured with a steel plate fixed on one side.

*Limit without support:*

For 5 mm joints at +20°C and max. 1 bar water head a tape of 2 mm thickness has to be installed.

*Bituminous overcoating:*

If a bituminous wearing layer is installed on top of the **Sikadur-Combiflex® SG System** the temperature of the hot mix must not exceed +180°C up to a maximum of 50mm thickness. Up to 10 mm thickness the temperature may be maximum +220°C. If necessary apply in layers and allow them to cool in between.

The Sikadur-Combiflex® SG Tape must be protected from mechanical damage.

The Sikadur-Combiflex® SG Tape cannot be connected to Sikaplan® WT membranes by hot air welding.

For further application information please consult the **Sikadur-Combiflex® SG System** method statement.

<b>Value Base</b>	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.
<b>Local Restrictions</b>	Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data
<b>Health and Safety Information</b>	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.
<b>Legal Notes</b>	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.

All products are manufactured under a management system certified to conform to the requirements of the quality, environmental and occupational health & safety standards ISO 9001, ISO 14001 and OHSAS 18001.



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