Construction

Sikadur-Combiflex® SG system

High performance joint sealing system

Product Description

The 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 one or more directions, 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.

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

Characteristics / Advantages

- Advanced adhesion between the tapes and the adhesives, no activation of the tapes is required on site
- Use for both cold and hot water applications
- Fast and easy to install
- Suitable for dry and damp concrete surfaces
- Extremely flexible
- Performs well within a wide range of temperatures
- Excellent adhesion to many different substrate materials
- Weathering and water resistant
- UV-resistant
- Available with normal and rapid hardening grades of the adhesive
- Root penetration resistant
- Good resistance to many different chemicals
- Versatile system suitable for many difficult situations

Tests

Approval / Standards	Hygiene Institute: 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 Performance test at STUVA, 07.11.2011 Water Regulations Advisory Scheme (WRAS), for use with water up to 50°C, 10.01.2013 Building Research Institute for general use, Polish, 19.12.2012 Road and Bridge Research Institute for all transportation and communication structures, Polish, 10.09.2012 Requirements of AS/NZS 4020:2005, compliance to cover cold water application, 29.02.2012 Sikadur-Combiflex SG system (membrane and epoxy) has an approval for both cold and hot water application. Hot water approval can be a prime requirement due to the very high summer temperatures in some areas.

Product Data

Form

Appearance/ Colours	*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®-31 DW:* Grey
Packaging	*Sikadur®-31 DW* 6.60Ltr units (A+B) ready to use 5.00Ltr unit part A 1.60Ltr unit part B 13.2Ltr units (A+B) ready to use 10.00Ltr unit part A 3.20ltr unit part B *Sikadur-Combiflex® SG-10 M:* Thickness: 1 mm Width: 10, 15, 20, 25, 30 cm Rolls of 25 m *Sikadur-Combiflex® SG-20 M:* Thickness: 2 mm Width: 15, 20, 25, 30, cm Rolls of 25 m *Sikadur-Combiflex® SG-10 P:* Thickness: 1 mm Width: 40, 50, 100, 200 cm Rolls of 25 m *Sikadur-Combiflex® SG-20 P:* Thickness: 2 mm Width: 40, 50, 100, 200 cm Rolls of 25 m

Storage

Storage Conditions / Shelf Life

Sikadur®-31 DW:
12 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® SG-10/-20 M tape (with red masking tape)
12 months from date of production if stored properly in undamaged unopened original sealed packaging under cool and dry conditions. Opened and unprotected rolls must be used within 2 month.

Technical Data

Chemical Base

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®-31DW 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

Peel Strength

*Sikadur-Combiflex® SG Syste*m:

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

Results: Strength: > 6 N/mm (2 mm)
Strength: > 4 N/mm (1 mm)

Resistance

Chemical Resistance

Sikadur-Combilfex® SG System (Sikadur-Combiflex® SG Tape glued with 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.

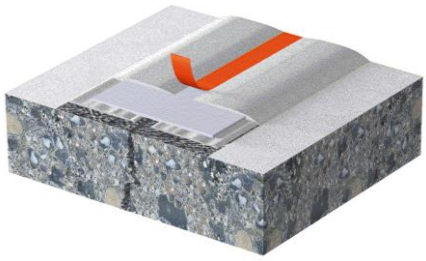
Temporary to:
Light fuel oil, diesel, diluted alkali and mineral acids, ethanol, methanol, petrol etc.

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

Sikadur® adhesive available:

- Sikadur®-31 DW (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®-31DW Adhesive per metre length

Tape width	Tape thickness	Adhesive consumption*
10 cm	1 mm	~ 0.35 Ltr/m
15 cm	1 mm	~ 0.50 Ltr/m
20 cm	1 mm	~ 0.60 Ltr/m
10 cm	2 mm	~ 0.40 Ltr/m
15 cm	2 mm	~ 0.55 Ltr/m
20 cm	2 mm	~ 0.70 Ltr/m
25 cm	2 mm	~ 0.85 Ltr/m
30 cm	2 mm	~ 1.00 Ltr/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.

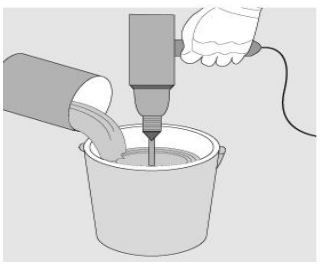
Polyester, epoxy, ceramics, glass:
Clean, free from oil and grease.

Substrate Preparation	*Concrete, stone, mortar, rendering:* These substrates must be mechanically prepared e.g. by blast cleaning, 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 *Construction Steel 37:* Blast cleaning or equivalent mechanical means followed by thorough vacuum / dust removal. Avoid dew point conditions during application. *V2A-Steel (WN 1.4301):* Light grinding followed by thorough vacuum/dust removal. Avoid dew point conditions during application.. *Polyester, epoxy, ceramics, glass:* 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 during application

Application Conditions / Limitations

Substrate Temperature	*Sikadur®-31 DW:* From +10°C to +30°C
Ambient Temperature	*Sikadur®-31 DW:* From +10°C to +30°C
Substrate Moisture Content	*Cementitious substrates:* Dry, max. mat damp. When applied to mat damp concrete, brush the adhesive well into substrate.
Relative Air Humidity	85% max. (at +25°C)
Dew Point .	The substrate must be at least 3°C above the dew Point. Avoid condensation

Application Instructions

Mixing	*Sikadur®-31 DW:* Part A : B = 3 : 1 parts by weight or volume 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 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.  Bulk packing, not pre-batched: First, stir each part thoroughly. Add the parts in the correct proportions into a suitable mixing container and stir correctly using an electric low speed mixer as outlined above for pre-batched units. 

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.

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:

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

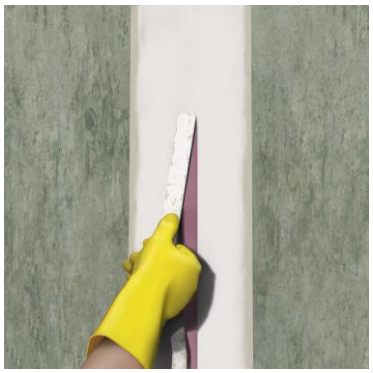
Check the integrity of the Sikadur-Combiflex® SG Tape to ensure that there is no damage from storage or transport (e.g. heavy scratches). Remove any damaged sections if necessary.

Note: No activation is required on site

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® -31DW 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 area.



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

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

In situations with high joint movement, place the tape into the joint as a loop.

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®-31 DW

Let the first layer of the Sikadur®-31 DW stiffen 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.

Remove 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®-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 roughening the surface with scotch brite pads or sand paper**.

Roughen the tapes only in the welding area otherwise their adhesive bond 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 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 waterbar with Sika® Primer-215 (Please consult the Product Data Sheet of Sika® Primer-215)

Bond the Combiflex SG 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

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®-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.

Construction

Notes on Application / Limitations	For further application information please consult the Sikadur-Combiflex® SG method statement. 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 20 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® SG System the temperature of the hot mix must not exceed +180°C up to max. 50mm thickness. 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® SG Tape must be protected from mechanical damage. The Sikadur-Combiflex® SG Tape can not be connected to the Sikaplan WT and Hypalon based (e.g. old Sikadur-Combiflex) membranes by hot air welding.
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.
Local Restrictions	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 Sheet for the exact description of the application fields.
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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