



GENERAL GUIDELINE

Sikasil® Weather Sealants

22.11.2019 / VERSION 3 / SIKA SERVICES AG / TECHNICAL DEPARTMENT INDUSTRY

TABLE OF CONTENTS

1	Purpose and General Information	3
2	Joint Design and Joint Dimensioning	3
3	Compatibility and Application Limits	4
4	Working Place Conditions	4
5	Surface Pre-Treatment and Masking	5
5.1	Application of Sika® Cleaner G+M and Sika® Cleaner P	5
5.2	Application of Sika® Aktivator-100 or Sika® Aktivator-110 LUM	6
5.3	Application of Sika® Aktivator-205 and Sika® Aktivator-205 LUM	6
5.4	Lumiscent of Sika® Aktivator-110 LUM and Sika® Aktivator-205 LUM	7
5.5	Application of Sika® Primer-210	7
5.6	Masking of areas adjacent to the Joints	7
6	Backer Rod Installation	7
7	Processing and Product Application	7
7.1	Sealant Application, Tooling and Finishing	7
7.2	Removal of Sikasil® Weather sealants	8
8	Field Adhesion Test	8
9	Repair	9

1 PURPOSE AND GENERAL INFORMATION

This document contains general recommendations and hints for the application of Sikasil® WS weather sealants.

All Sikasil® WS products are neutral-curing silicone sealants with a high movement capability and excellent adhesion to a wide range of substrates. The quality and durability of the sealant joint depends on various factors including the preparation of the substrates, application method of the sealant, joint dimensioning etc.

The information herein is offered for general guidance only.

This guideline has to be read in conjunction with the relevant Product Data Sheets and Safety Data Sheets.

For specific information or further advice related to application and products mentioned in this document, contact the Technical Department of Sika Industry.

2 JOINT DESIGN AND JOINT DIMENSIONING

Joints must be properly dimensioned as changes are no longer possible after either construction or sealant application. For optimum performance, the joint width must be designed according to the movement capability of the sealant based on the expected movement. Furthermore, the following joint dimensioning rules for silicone weather sealants must be respected.

Improper joint dimensioning can cause excessive stress on the sealant and/or the substrate causing adhesion or cohesive failure.

Joint Parameter	Dimension Limits
Joint width (A) (see Figure 2)	between 6 mm and 45 mm
Joint depth (B)	between 6 mm and 15 mm
Width/depth ratio (A:B)	between 2:1 and 4:1

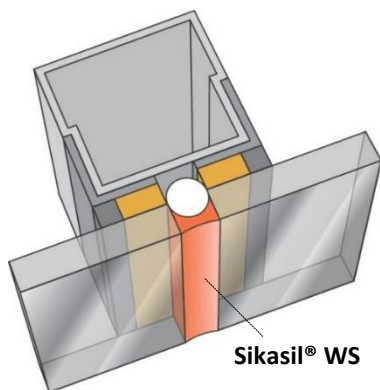


FIGURE 1 Typical WS joint situation. Weather sealant between glass panes (butt joint) is marked red

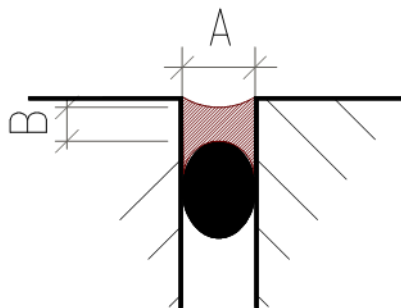


FIGURE 2 Joint width (A) and joint depth (B) of a sealant joint (sealant marked in red)

3 COMPATIBILITY AND APPLICATION LIMITS

Most Sikasil® WS sealants are compatible with other Sikasil® silicone sealants and adhesives.

All sealants and adhesives have to be approved by Sika before using them in direct contact with Sikasil® WS silicones. Where two or more different reactive process material could get in contact, allow the prior material to cure completely before applying the next one.

Do not use Sikasil® weather sealants on pre-stressed polyacrylate and polycarbonate as it may cause environmental stress cracking (crazing).

The compatibility of gaskets, backer rods and other accessory materials with Sikasil® WS silicones must be tested in advance.

The above information is offered for general guidance only. Advice on specific applications will be given on request. Before use of Sikasil® silicone weather sealants, always refer to the most recent Product Data Sheet of the respective product.

4 WORKING PLACE CONDITIONS

Although Sikasil® weather sealants may be applied between 5 °C and 40 °C, the optimum application temperature is between 15 °C and 25 °C. These limits apply to the temperature of the sealant, the substrates as well as the ambient. The temperature of the substrates to be sealed must always be at least 3 °C higher than the dew point temperature of the air, to avoid the risk of condensation.

If Sikasil® weather sealants have to be applied at low temperatures, it has to be ensured that the substrate surfaces are free of condensation or ice.

Sikasil® WS sealants cure by reaction with atmospheric moisture. The reaction thus starts at the surface and proceeds to the core of the joint. The curing speed depends on the relative humidity and the temperature. The lower the air humidity and temperature, the slower the product will vulcanise. Heating above 50 °C e.g. by exposure to direct sun radiation, is not advisable as it may lead to bubble formation.

Joint movements (displacement of bonded parts) before the sealant is cured has to be avoided as it could cause uneven surfaces, cracks and leakages.

Field adhesion tests (see Chapter 8) are recommended.

In order to get the best quality of joint sealings, direct sunlight have to be avoided during application and curing. Temperatures above 50 °C during curing of Sikasil® weather sealants must absolutely be avoided.

5 SURFACE PRE-TREATMENT AND MASKING

The substrate's quality has a major influence on the long lasting bond of sealants.

Surfaces must be clean, dry and free from oil, grease and dust. Do not contaminate cleaned surfaces during any phase of production. If contamination occurs, surfaces have to be cleaned again.

The information in Table 1 is offered for general guidance only. Note: with the exception of clear float glass (untouched, not treated), Sika has to test the adhesion of Sikasil® WS weather sealants on project-basis on original samples or samples that are produced in the identical way as the original substrate used in the final project.

The use of the surface pre-treatment agents recommended in the laboratory report is mandatory; otherwise any warranty is void.

TABLE 1 Overview of suitable pre-treatments for Sikasil® WS products

Substrate	Surface Pre-treatment
Float glass (including tempered, toughened, laminated and tinted types)	Sika® Cleaner G+M or Sika® Cleaner P * or Sika® Aktivator-205 ** or Sika® Aktivator-100 **
Pyrolitically coated glass	
Ceramic-coated (enameled) glass	
Anodized aluminum	
Stainless steel	
Polyester powder-coated aluminum or PVDF-coated aluminum	Sika® Aktivator-205 **
Concrete	Wire brush and Sika® Primer-210
Natural stone	Wire brush and Sika® Primer-210

* For greasy or oily metal surfaces, Sika® Cleaner G+M is recommended instead of Sika® Cleaner P.

** Sika® Aktivator-100 and Sika® Aktivator-205 leave a visible film on the pre-treated surfaces and can change the appearance of the pre-treated substrates. If this is not acceptable, use masking tape to protect visible areas.

5.1 APPLICATION OF Sika® Cleaner G+M AND Sika® Cleaner P

Sika® Cleaner G+M and Sika® Cleaner P are solvent-based cleaning agents. For greasy or oily surfaces use Sika® Cleaner G+M which has a better oil / grease removal capability than Sika® Cleaner P. Both cleaners are used in the following way:

1. Moisten a clean, dry, oil-free and lint-free paper towel with Sika® Cleaner G+M or Sika® Cleaner P and clean the surface. Use every time a fresh paper towel in order to retain the cleansing power and to avoid wiping residues back onto the surface.
2. Then wipe-off the solvent with another clean, dry, oil-free and lint-free paper towel. Wipe off the solvent before it evaporates from the surface because dissolved contaminants would remain behind.
3. Repeat this procedure until the surface is clean.
4. The required minimum flash-off time at 5 – 40 °C is 2 minutes on non-absorbing substrates.
5. If cleaned parts cannot be bonded immediately, protect them against subsequent contamination.
6. If more than two hours have passed since cleaning, always repeat the cleaning process before bonding.

5.2 APPLICATION OF Sika® Aktivator-100 OR Sika® Aktivator-110 LUM

Sika® Aktivator-100 and Sika® Aktivator-110 LUM are activating agents to pre-treat surfaces to improve adhesion on non-porous substrates and shall always be applied after they have been properly cleaned with Sika® Cleaner G+M or Sika® Cleaner P. If in the following paragraph Sika® Aktivator-100 is mentioned the statement is valid for both Sika® Aktivator-100 and Sika® Aktivator-110 LUM.

Sika® Aktivator-100 is not a simple cleaning solvent but contains an adhesion promoter. It leaves active groups on the substrate surface. On some surfaces, this pre-treatment may be visible and change the substrate appearance. Therefore, it is important in critical (visual) application areas to use masking tapes prior to the application of Sika® Aktivator-100.

1. Moisten a clean, dry, oil-free and lint-free paper with Sika® Aktivator-100 and apply it on the surface. Make sure to turn the paper to expose new surface, or replace it regularly in order to avoid wiping any residues back onto the surface.
2. Immediately wipe-off the solvent with a clean, dry, oil-free and lint-free paper. It is important to wipe-off the solvent before it dries.
3. The required minimum flash-off time are as follows (depending on the temperature in the workshop):
 - ≥ 15 °C: 10 minutes
 - < 15 °C: 30 minutes
 - maximum flash-off time 2 hours
4. If pretreated parts are not bonded or sealed immediately, protect them against subsequent contamination. Adhesives need to be applied within 2 hours after the application of Sika® Aktivator-100. Otherwise the procedure as described above can be repeated only once before bonding.

Tightly reseal container with the inner plastic liner immediately after each use. Sika® Aktivator-100 shall only be used within one month after opening the can. Discard any Sika® Aktivator-100 that has become opaque instead of transparent, has yellowed, gelled or separated.

5.3 APPLICATION OF Sika® Aktivator-205 AND Sika® Aktivator-205 LUM

Sika® Aktivator-205 and Sika® Aktivator-205 LUM are activating agents to pre-treat surfaces to improve adhesion on non-porous substrates and shall always be applied after they have been properly cleaned with Sika® Cleaner G+M or Sika® Cleaner P. If in the following paragraph Sika® Aktivator-205 is mentioned the statement is valid for both Sika® Aktivator-205 and Sika® Aktivator-205 LUM.

Sika® Aktivator-205 is not a simple cleaning solvent but contains an adhesion promoter. It leaves active groups on the substrate surface. On some surfaces, this pre-treatment may be visible and change the substrate appearance. Therefore, it is important in critical (visual) application areas to use masking tapes prior to the application of Sika® Aktivator-205.

1. Moisten a clean, dry, oil-free and lint-free paper with Sika® Aktivator-205 and apply it on the surface. Make sure to turn the paper to expose new surface, or replace it regularly in order to avoid wiping any residues back onto the surface.
2. Different from ordinary cleaning agents and Sika® Aktivator-100, the surface treated with Sika® Aktivator-205 must not be dried subsequently with a paper towel.
3. The required minimum flash-off time at 23 °C / 50 % r.h. is 10 minutes. Changes in climate conditions might lead to different flash-off times.
4. If pretreated parts are not bonded / sealed immediately, protect them against subsequent contamination.
5. Adhesives have to be applied within 2 hours after the application of Sika® Aktivator-205. Otherwise the procedure as described above has to be repeated before bonding. Pre-treating procedure can be repeated once only.

Tightly reseal container with the inner plastic liner immediately after each use. Sika® Aktivator-205 shall only be used within one month after opening the can. Discard any Sika® Aktivator-205 that has become opaque instead of transparent, has yellowed, gelled or separated.

5.4 LUMISCENTS OF Sika® Aktivator-110 LUM AND Sika® Aktivator-205 LUM

Both Sika® Aktivator-110 LUM and Sika® Aktivator-205 LUM contain luminescent pigments that allow detecting their presence after the surface pre-treatment. It can be visualized by activating the contained luminescent pigments using a light source with a wavelength of 320 – 420 nm. It is recommended to reduce foreign light such as sunlight or artificial light during the detecting process as well during storage before bonding. Exposure of the pre-treated surface to UV light will degrade the active substances on a faster scale. Luminescent effect will degrade with time.

5.5 APPLICATION OF Sika® Primer-210

Sika® Primer-210 shall always be applied on clean surfaces.

1. Pour a small amount of Sika® Primer-210 into a clean container. Never dip any applicator into the original primer bottle.
2. Apply one thin but covering coat of Sika® Primer-210 with a foam applicator. Make sure that this single application gives adequately dense coverage.
3. Let the primer flash-off. The required minimum flash-off times are as follows (depending on the temperature in the workshop):
 - ≥ 15 °C: 10 minutes
 - < 15 °C: 30 minutes
 - maximum flash-off time on porous substrates is 2 hours
4. If pretreated parts are not bonded or sealed immediately, protect them against subsequent contamination. Adhesives shall be applied within 2 hours after the application of Sika® Primer-210. Apply Sika® Primer-210 once only. Priming process must not be repeated!

Tightly reseal container immediately after each use. Sika® Primer-210 shall only be used within one month after opening the can. Discard any Sika® Primer-210 that has become opaque instead of transparent, has yellowed, gelled or separated.

5.6 MASKING OF AREAS ADJACENT TO THE JOINTS

To assure neat bond lines and protect areas adjacent to the weather sealing joint, use masking tape.

The tape must not touch the pre-treated surface areas to which the silicone has to adhere. After the tooling process remove the masking tape immediately or latest within the skin time, otherwise joints might be damaged.

6 BACKER ROD INSTALLATION

For backfilling, it is recommended to use closed cell, compatible foam backer rods e.g. high-resilience polyethylene foam rods. The diameter of the backer rod has to be at least 25 % bigger than the joint width. Do not use sharp tools which may damage the backer rod surface.

If joints are too shallow for backing material to be inserted, it is recommended to use a polyethylene tape. This acts as a release film (bond breaker), allowing the joint to move and the sealant to stretch freely.

7 PROCESSING AND PRODUCT APPLICATION

7.1 SEALANT APPLICATION, TOOLING AND FINISHING

After suitable joint and substrate preparation Sikasil® weather sealants can be applied. It is important that the sealant fully fills the joint gaps. Sikasil® weather sealants can be applied either by an electrical, manual or pneumatical application gun or a pump system. Follow the instructions given by the gun/pump manufacturer.

Tooling and finishing must be carried out within the skin time of the sealant. The skin time given in the Product Data Sheet is determined under 23 °C / 50 % r.h.. Higher temperature and higher humidity reduce the skin time.

When tooling freshly applied Sikasil® WS products, press the sealant against the joint flanks to achieve a good wetting of the bonding surface. Wetting of tools with tooling agents (e.g. Sika® Tooling Agent N) can improve handling but spraying the tooling agent onto the joints and substrates is not advisable.

7.2 REMOVAL OF SIKASIL® WEATHER SEALANTS

Uncured Sikasil® WS products may be removed from tools and equipment with Sika® Remover-208. Once cured, the material can only be removed mechanically.

Hands and exposed skin shall be washed immediately using Sika® Cleaner-350H cleaning towels or a suitable industrial hand cleaner and water. Do not use solvents on skin.

8 FIELD ADHESION TEST

The field adhesion test is done directly on the jobsite and is a qualitative screening procedure that may help to identify mistakes in the application of the sealant. This includes poor cleaning, incorrect use of primer or missing primer, poor primer application or improper joint filling. To evaluate the sealant adhesion on site, a simple hand pull test (according ASTM C1193) can be used at the job site.

Field adhesion testing have to be documented. It is suggested that five tests for the first 500 meters and one test per 500 meters thereafter are carried out. Alternatively one test per floor / elevation can be undertaken after the initial 5 tests are carried out.

The hand pull test procedure is as follows:

1. Make a knife cut from one side of the joint to the other (perpendicular to the joint).
2. Make two cuts (parallel to the joint) from the horizontal cut approximately 75 mm long, at both sides of the joint, making sure no damage is caused to the substrates surfaces.
3. Hold the loose part of the sealant and pull at a 90° angle.
4. Check the adhesion of the sealant to both substrates separately, even if they are of the same material. This is accomplished by extending the vertical cut along one side of the joint, checking adhesion to the opposite side, and then repeating for the other surface.
5. Pass/fail criteria for each sealant has to be used; 90 % cohesive failure is classified as a pass. If any signs of adhesive failure are observed then the sealant manufacturer has to be contacted and a more detailed examination undertaken.
6. Whilst undertaking the field adhesion test, you shall also inspect the quality of the joint section removed. Check if the sealant completely fills the joint, no voids or air bubbles are present and the sealant joint dimensions are in line with those specified on the drawings. Contact your local Sika representative if you have any concerns related to the sealant adhesion or the quality of installation.
7. Record the test results in a project log book so that the results can be included in the project manual.

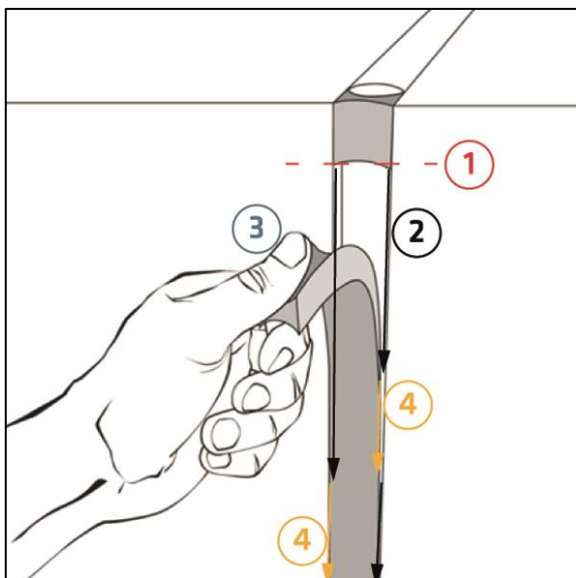


FIGURE 3 Field adhesion test acc. ASTM C1193

9 REPAIR

1. Removal of existing sealant and preparation of joint:

Cut out the existing Sikasil® weather sealants in a way that about 1 - 2 mm of silicone sealant remains on the metal frame or glass pane, as long as the adhesion to these substrates is perfect. If possible don't scratch out the sealant completely, since this could damage the substrate surface. For complicated designs and joint geometries, vibration cutters or similar tools can be used. The cut must be absolutely smooth and must never leave loose sealant parts on the cut surface. Remove the backing material completely.

Do not clean the remaining surface of the sealant if it is resealed immediately after the sealant has been cut out. If the joint is resealed later, it may be necessary to clean with Sika® Cleaner P. Since silicone can absorb solvent, clean very carefully using a cloth only sparingly moistened with Sika® Cleaner P. Allow Sika® Cleaner P to evaporate completely before resealing (i.e. no wet residues remain on the silicone). Do not use any other cleaning or pre-treatment agents for this operation!

2. Application of pre-treatment and sealant see chapter 5 to chapter 8.

Legal Note

The information contained herein and any other advice 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. The information only applies to the application(s) and product(s) expressly referred to herein and is based on laboratory tests which do not replace practical tests. In case of changes in the parameters of the application, such as changes in substrates etc., or in case of a different application, consult Sika's Technical Service prior to using Sika products. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. 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

Key Words

Sikasil® Weather Sealant Application Guidelines

Version given by

