GENERAL GUIDELINE

SikaTack® PANEL SYSTEM

OCTOBER 2020 / VERSION 04 / SIKA SERVICES AG

Validity until October 2025, unless superseded

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1 PURPOSE AND GENERAL INFORMATION

This document contains recommendations and hints for the application of the SikaTack® Panel System for wall cladding applications. This guideline is relevant for the following products:

- SikaTack® Panel 1-component polyurethane adhesive
- SikaTack® Panel-10 1-component polyurethane adhesive
- SikaTack® Panel-50 1-component silicone adhesive

The information herein is offered for general guidance only. Since structural bonding applications are considered as high risk applications and conditions as well as substrates may vary greatly, customers and applicators must test the suitability of the product for each specific project and contact Sika for advice.

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 INTRODUCTION

The SikaTack® Panel System is an adhesive system for economic and concealed installation of wall cladding. Part of the system is the elastic adhesives, for long and durable bonding of the panels to a suitable substructure. SikaTack® Panel Fixing Tape, a double-sided adhesives tape, keeps the distance between panel and substructure and provides immediate fixation of the panel.

The SikaTack® Panel System has proven its suitability for internal and exterior wall cladding in thousands of façade projects and under various climatic conditions.

3 SYSTEM

Substructure (distance of railing profiles) and joints must be properly dimensioned as changes are no longer possible after assembling and installation or adhesive application, respectively. Basis for calculation of the necessary joint dimensions are the mechanical values of the adhesive and the adjacent building materials, the exposure of the building elements, their construction, possible movements, panel size and weight as well as external loads (wind, temperature, etc.).

Generally, due to the way of installation (triangular bead application and compression afterwards), the joint has a pre-defined dimension of 12 mm width and 3 mm thickness.

3.1 VERTICAL CARRIER RAIL SYSTEM (SUBSTRUCTURE)

The substructure system must be approved by the responsible supervisory body and be in-line with the relevant local requirements and designed accordingly. Furthermore, the requirements and limitations of the panel manufacturer must be respected.

It is not in the responsibility of Sika to provide information or approve designs of substructure systems used.

For the fixation of the substructure (e.g. profiles) on the load bearing building shell, any transfer of loads or movements from the building shell to the vertical substructure and the adhesive joint must be avoided. The substructure must be able to compensate the thermal expansion and other movements of the panels to minimize the stress and elongation applied to the elastic bonding joints. Design and dimension of the substructure depends on the constructional situation and used system.

The vertical profiles (rails) must be aligned parallel and on the same level in order to ensure uniform, stress free adhesion of the cladding panels. The distances between the rails and their width are determined by the load requirements and by the type of panel used.

The material of the rails and the possible finishing (e.g. coatings) must be designed for the application itself and for bonding in specific.

3.2 PANELS

The panel must have proof of the suitability for the intended use (e.g. rainscreen panel) and bonding application ideally with local accreditation (local accreditation body). The requirements and limitations given by the panel manufacturer must be respected.

The gap between the installed panels must be sufficiently wide to avoid compression between each panel due to thermal and other possible movements.

Sufficiently large openings for ventilation must be provided at the top and bottom of the system.

3.3 SCHEMATICALLY PANEL BONDING SITUATION

Single Railing System **Multiple Railing System**

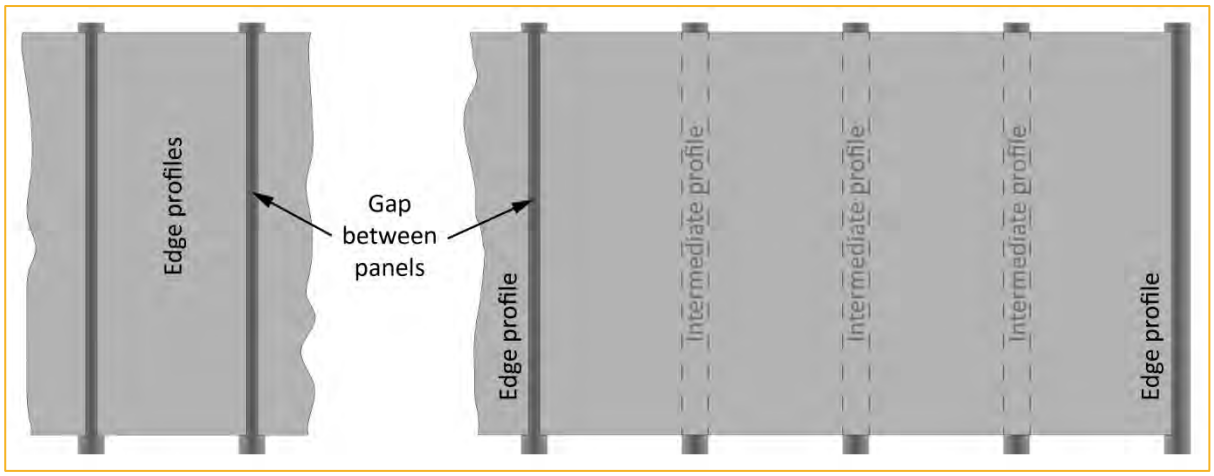


Figure 1: Schematically railing systems

Bonding recommendations, schematically: ▲ is the adhesive bead, ▪ is SikaTack® Panel Fixing Tape (Figure 2 to Figure 5)

Edge profiles

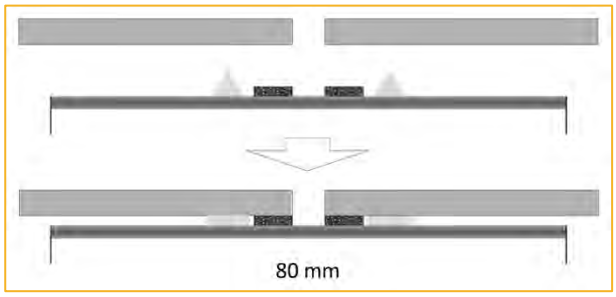


Figure 2: Dilatation taken by the adhesive - edge profile

Intermediate profiles

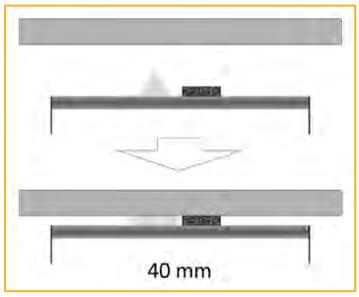


Figure 3: Single bead application - intermediate profile

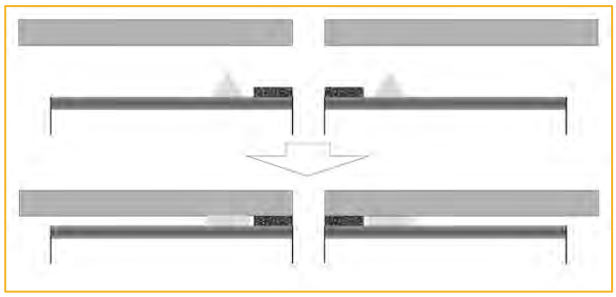


Figure 4: Dilatation taken by the sub-structure - edge profile

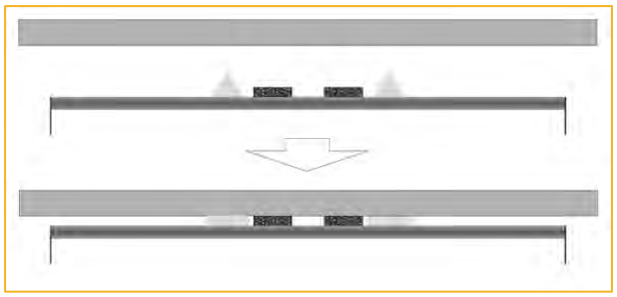


Figure 5: Double bead application - intermediate profile

4 WORKING PLACE CONDITIONS

The working place must be dry and dust-free. The optimum application temperature of the SikaTack® Panel products is between 15 °C and 25 °C. As this may be difficult to comply with on-site construction, the SikaTack® Panel System must be processed within 5 – 40 °C. After installation, the temperature must not fall below 5 °C for five hours.

The temperature of the components to be bonded (façade panels, railing system) must be at least 3 °C higher than the dew point of the air, to avoid condensation on the surfaces. All substrates and adhesives must never be exposed to direct sun radiation, rain, snow or other direct weathering impacts.

5 SURFACE PRE-TREATMENT

To define the pre-treatment for a long lasting bonding, the adhesion on all substrates must be tested before application start.

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

Surfaces must be clean, dry and free from oil, grease, release agents and dust. Do not contaminate pre-treated surfaces during any phase of installation. If contamination occurs, surfaces must be cleaned and pre-treated again.

The optimum temperature for substrate and adhesive is between 15 °C and 25 °C. The adhesion of SikaTack® Panel adhesive must be tested on project-basis on original samples or samples that are produced in the identical way as the original substrate used in the final project. Suitable surface pre-treatments based on the results of the related laboratory report are mandatory to be used.

5.1 APPLICATION OF Sika® Aktivator-205 OR Sika® Aktivator-100

Sika® Aktivator-100 and Sika® Aktivator-205 are activating agents to pre-treat surfaces to improve adhesion on non-porous substrates.

Sika® Aktivator-100 / 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-100 / Sika® Aktivator-205.

1. Moisten a clean, dry, oil-free and lint-free paper with the activator 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.
   - In case of Sika® Aktivator-100: Immediately wipe-off the activator with a clean, dry, oil-free and lint-free paper before it dries.
   - In case of Sika® Aktivator-205: The surface must not be dried subsequently with a paper towel.
2. The required minimum flash-off time are as follows (depending on the temperature in the workshop area):
   - ≥ 15 °C: 10 minutes
   - < 15 °C: 30 minutes
   - maximum flash-off time 2 hours

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 / Sika® Aktivator-205. 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 / Sika® Aktivator-205 shall only be used within one month after opening the can. Discard any Sika® Aktivator-100 / Sika® Aktivator-205 that has become opaque instead of transparent, has yellowed, gelled or separated.

5.2 APPLICATION OF SikaTack® Panel Primer OR Sika® Primer-210

SikaTack® Panel Primer and Sika® Primer-210 shall always be applied after the surfaces have been properly cleaned and / or pre-treated with Sika® activators.

1. Shake SikaTack® Panel Primer thoroughly - at least for 2 minutes. It is a black primer and the container contains a steel ball, which must be clearly heard while shaking. From this sound on keep shaking for at least 1 minute longer.
2. Pour a small amount of SikaTack® Panel Primer or Sika® Primer-210 into a clean container.
   Never dip any applicator into the original primer bottle.
3. Apply one thin but covering coat of SikaTack® Panel Primer / Sika® Primer-210 with a foam applicator or a felt. Make sure that this single application gives adequately dense coverage.
   If the surface is rough, porous, it is easier to use a brush for the application. It is required that the primer layer is a complete, uniform layer. The primer must cover all the area where a former grinding step was performed.
4. Let the primer flash-off for at least 30 minutes at 23 °C. Colder temperatures might require longer flash-off time. On porous substrates the maximum flash-off time is 2 hours.
5. The adhesives shall be applied within 2 hours after the application of SikaTack® Panel Primer / Sika® Primer-210.

If pretreated parts are not bonded or sealed immediately, protect them against subsequent contamination. Apply SikaTack® Panel Primer and Sika® Primer-210 once only. Priming process must not be repeated!

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

6 ADHESIVE APPLICATION

SikaTack® Panel adhesives are applied manually directly from cartridges or unipacks with manual, pneumatic or electric driven piston guns with a triangular nozzle (8 mm height by 10 mm width). The adhesive must be applied evenly and free of bubbles. Application trials help to find the correct application speed which results in the correct, uniform adhesive bead shape and the correct joint dimension.

The panel must be assembled / bonded with the adhesive within 5 minutes less than the products skin time. The skin time (time, passed before the adhesive has formed a skin) stated on the Product Data Sheets are based on controlled laboratory conditions (typically 23 °C / 50 % r.h.). In conditions with higher temperature and/or relative humidity, the skin time will be reduced, and will shorten the available installation time. The skin time must be determined under actual working place conditions (page 10).

At 23 °C the panel must be bond within the following time after the adhesive application:

Table 1: Typical assembly time at 23 °C / 50 % r.h.

Adhesive	SikaTack® Panel adhesive	SikaTack® Panel-10	SikaTack® Panel-50
Assembly time	< 30 minutes	< 45 minutes	< 15 minutes
Skin time (PDS)	35 minutes	60 minutes	20 minutes

In order to ensure a minimum bead dimension of 12 mm x 3 mm it is required to use a nozzle with approx. 10 mm x 8 mm (see Figure 6 and Figure 7).

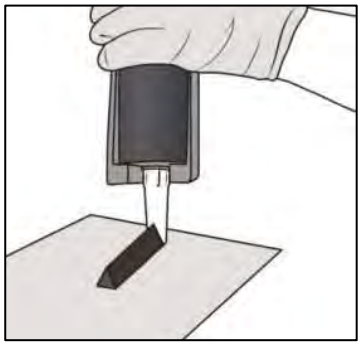


Figure 6: Adhesive bead application

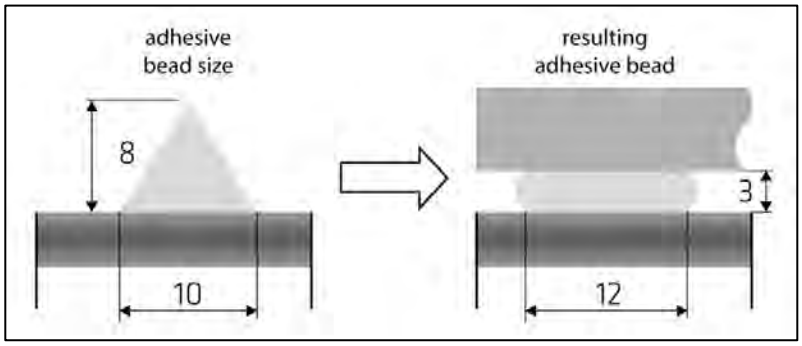
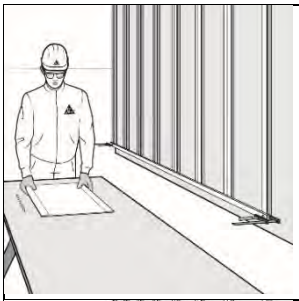
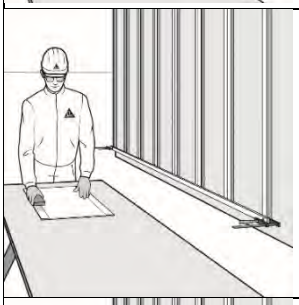
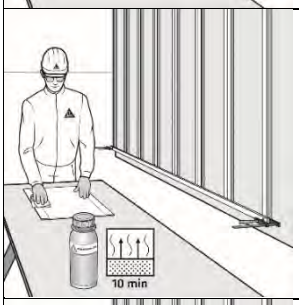
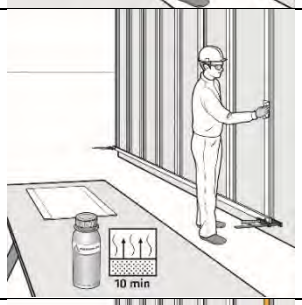
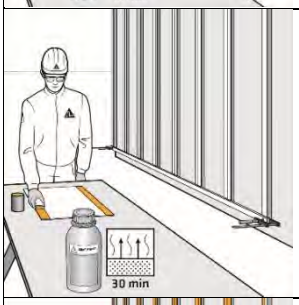
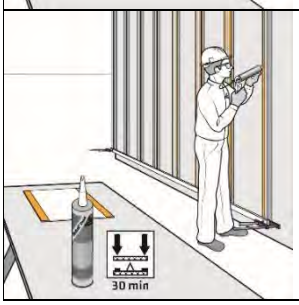
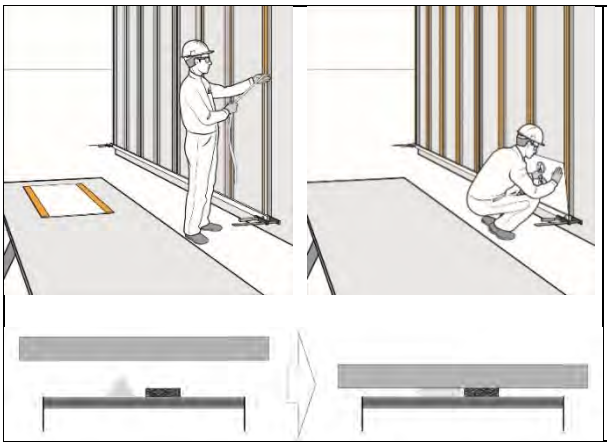


Figure 7: Dimension of nozzle and final adhesive bead

7 APPLICATION STEPS

 	The temperature of the components to be bonded (cladding panels, sub-frame profiles, etc.) must be at least 3 °C higher than the dew point temperature. The temperature must be in the range of 5 °C to maximum 40 °C. Mark precisely where the first panel must be bonded on the substructure or use a reference which is fixed on the substructure. Record all relevant information and temperatures for the application according to the form: "**Customer Template: Daily Record – Cladding Installation**" on page 13.
 	Surfaces must be clean, dry and free from grease. Abrading with abrasive pad (e.g. Scotch Brite very fine) or mechanical grinding of the surfaces (grain 80) might be necessary according to the required pre-treatment. Dust must be removed with a vacuum cleaner. Check if the dust was removed with a lint-free paper towel. In case of residues on the paper, repeat the dust removal with a fresh paper, until no residues remain on the paper.
 	Activate the bond face with Sika® Aktivator-205 / Sika® Aktivator-100 (according to the required pre-treatment). Use a clean lint-free paper towel or cleaning paper and wipe in one direction only. Dirty papers / cloths must be replaced! Allow Sika® Aktivator-205 or -100 to flash-off for at least 10 minutes.
 	Shake SikaTack® Panel Primer thoroughly - at least for 2 minutes. Apply a thin, covering layer of SikaTack® Panel Primer or Sika® Primer-210 uniformly over the whole surface by a melamine foam or a brush in case of prior grinding process. Make sure that all the ground area is fully coated with the primer. It is essential, that the primer film is a constant layer without any holes. Allow a flash-off time of at least 30 minutes.
	Apply SikaTack® Panel Fixing Tape over the whole length of the vertical sections and parallel to the edges. Do not pull off the release liner foil at this time.
	Apply SikaTack® Panel adhesives in a triangular bead by using the triangular nozzle supplied (height 8 mm, width 10 mm). Leave at least 5 mm distance to the SikaTack® Panel Fixing Tape and to the side of the railing profiles.



Remove the release liner from the SikaTack® Panel Fixing Tape.
Place the cladding panel in the required position first, **without** the panel touching the SikaTack® Panel Fixing Tape.
When the panel is in the right position, press it firmly until it has contact to the SikaTack® Panel Fixing Tape.
The time to assembly, is defined by the skin time of the used adhesive and must be respected!

Assembly time at 23 °C / 50 % r.h.:

SikaTack® Panel	< 30 min
SikaTack® Panel-10	< 45 min
SikaTack® Panel-50	< 15 min

8 PANEL REPLACEMENT

Panels may require replacement due to damage to a panel or to access an area behind the façade for renovation work. For a repair and for renovation work, the defective panel, including the adhesive, must be completely removed from the substructure.

- Mechanical cutting tools (e.g. a sharp blade, mechanical jigsaw or handsaw) or a cutting wire with handles (as used for replacing automotive windscreen) can be used for this purpose.
- Ensure that the surrounding area is adequately protected to catch falling debris/chippings and protect the other adjacent cladding panels from damage.
- After removing the panel, SikaTack® Panel Adhesive and SikaTack® Panel Fixing Tape must be completely removed from the surface of the railing substructure and the panel.
  - Use a wide scraper blade to remove the residues of SikaTack® Panel adhesive and SikaTack® Panel Fixing Tape, taking care not to damage the surface of the railing profile or the panel.
  - After most of the adhesive residues have been removed, the railing profile and the bonding area of the panel must be sanded mechanically, using an 80-grain flap sander on a mechanical sander or sanding pad.
- Check the panel for damage after completion and make sure that the railing system has not been deformed during the removal process
- Remove all particles with a lint-free paper towel or ideally with a vacuum cleaner.
- Rail profiles and panels require the same pre-treatment and the same SikaTack® adhesive as originally used, taking into account the project-specific laboratory report.
- Carry out the new installation as described in the above application steps for initial installation in chapter 7.

9 QUALITY ASSURANCE

Perfect results require carrying out each processing step perfectly. Sika therefore recommends that the applicators install a strict quality control system. Quality control is the primary responsibility of the processor or applicator.

9.1 SKIN TIME

The skin time of the SikaTack® Panel adhesive is the limiting factor for the assembly of the panels and is therefore the basis for the assembly time.

The skin time is determined in the following way:

1. Apply with a spatula the adhesive to paper or film in a thickness of about 3 mm to 4 mm and start timer.
2. Test every three minutes whether the adhesive surface has changed by probing with a clean fingertip.

Skin time is the point at which the adhesive no longer leaves visible residues on the glove / finger.

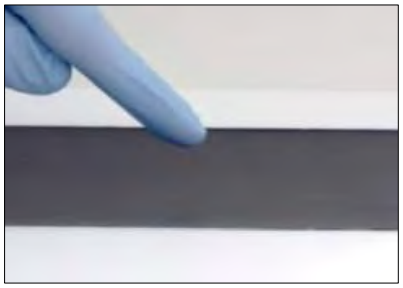


Figure 8: Start timer after adhesive applied / spreaded

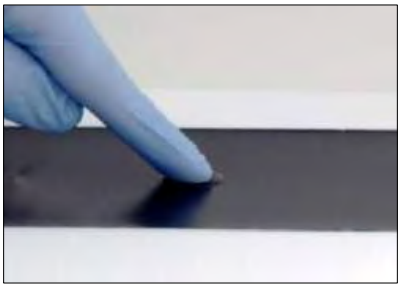


Figure 9: Touch slightly the adhesive with the finger

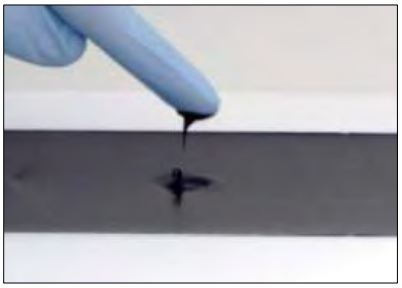


Figure 10: Remove and check for residues

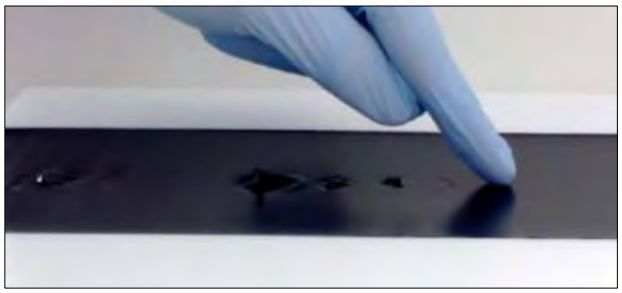


Figure 11: Always change the position for the next test

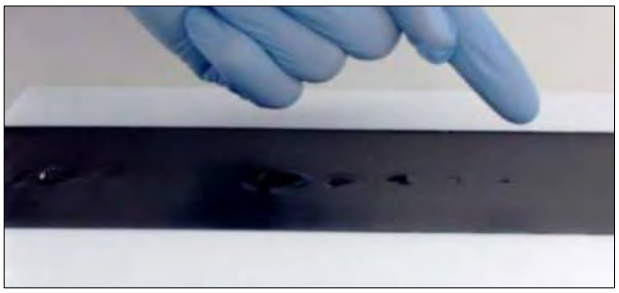


Figure 12: If no residues on your fingers are recognized the skin time has been reached

The skin time and therefore the assembly time given in the Product Data Sheets, was determined under standard climatic conditions (23 °C / 50 % relative humidity). Higher temperature and higher humidity reduce the skin time significantly. This affects the assembly time of the panel on to the adhesive.

9.2 PEEL ADHESION TEST

For testing the adhesion of the SikaTack® Panel adhesive on original substrates:

1. The same pre-treatment procedure as used during the original panel assembly must be considered and applied on the original substrates.
2. Apply a bead of SikaTack® Panel adhesive of at least 150 mm length onto the prepared substrates.
3. Store the test specimens under same conditions as bonded elements for 3 – 7 days.
4. Carry out the test by cutting approx. 30 mm of one end of the fully cured bead from the substrate with a sharp knife or glass scraper.
5. Fold back the loose end at an acute angle of about 30°.
   The bead is held with one hand and pulled away from the surface so maximum tension is maintained manually.
6. Simultaneously a cut is placed every few millimeters at an angle of around 45° several times and while keep on pulling. Make sure that the cut completely goes through the bead to the substrate.
7. Repeat this procedure until at least 50 % of the bead length has been tested.

Note: The adhesion must be built-up after 72 hours curing, i.e. the bead must not detach from the substrate while pulling.

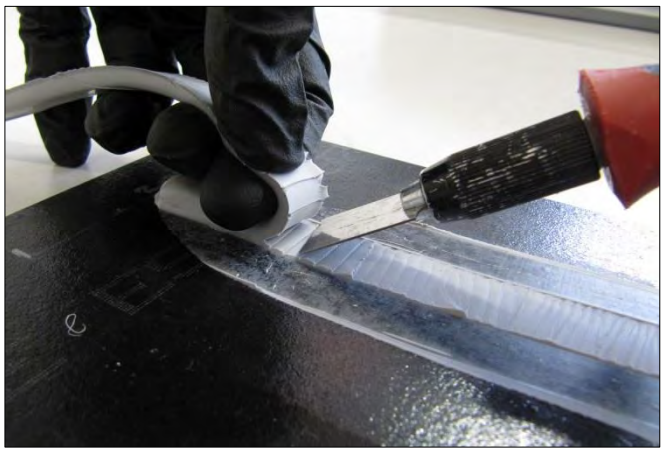


Figure 13: Peel adhesion test

9.3 RECOMMENDED BASIC QUALITY CONTROL SCHEME

Table 3: Scheme for quality control

	Test	Substrate	Frequency	Remark / Detailed Description	Requirement
1	Skin time	n/a	Each time a new adhesive batch is used or stronger changes in application temperature	Required values only valid for 23 °C / 50 % relative humidity	SikaTack® Panel: 30 – 50 min SikaTack® Panel-10: 50 – 70 min SikaTack® Panel-50: 10 – 30 min
2	Peel Adhesion*	Panel & Rail profile	Before start installation of a new project Each time a new adhesive batch is used	3 – 7 days under same conditions as bonded elements are stored	≥ 95 % cohesive failure
3	Visual Inspection	Adhesive & Panel & Rail profile	Each panel assembled	Check for: complete joint filling, joint dimension, primer presence, tapes correct applied and sticking to the substrates, drainage and ventilation ensured, adhesive bead have contact to air humidity	Joint dimensions: thickness 3 mm, width 12 mm Everything must be in line with the requirements

* For the peel adhesion test the original substrates used in project must be tested.

10 CUSTOMER TEMPLATE: DAILY RECORD – CLADDING INSTALLATION

General Information			
Contractor Name		Address	
Project Name		Address	
Name of Applicator	Training obtained: Yes ☐ No ☐ Date of training: _____		
Installation Date		End Date	
Weather	Sunny ☐	Overcast ☐	Rainy ☐
Climate conditions temperature and humidity	Morning: _____ °C _____% r.h.	Midday: _____ °C _____% r.h.	
Substrate Details – Rail profile			
Material of rail profile Brand name		Type	
Surface	Finish Dry ☐ Dust free ☐ Free of grease ☐ Smooth ☐		
Substrate Details – Panel			
Material of panel Brand name		Type	
Dimensions	Max. length: _____ mm Max. width: _____ mm	Thickness: _____ mm	
Surface	Finish Dry ☐ Dust free ☐ Free of grease ☐ Smooth ☐		
Pre-treatment on the Rail profile			
Abrading	Yes☐	Abrasive pad	
Grinding	Yes☐	Grinding paper	
Sika® Aktivator-205	Yes☐	Flash-off time in minutes	
SikaTack® Panel Primer	Yes☐	Flash-off time in minutes	
Sika® Primer-210	Yes☐	Flash-off time in minutes	
Pre-treatment on the Panels			
Abrading	Yes☐	Abrasive pad	
Grinding	Yes☐	Grinding paper	
Sika® Aktivator-205	Yes☐	Flash-off time in minutes	
Sika® Aktivator-100	Yes☐	Flash-off time in minutes	
SikaTack® Panel Primer	Yes☐	Flash-off time in minutes	
Sika® Primer-210	Yes☐	Flash-off time in minutes	

<table>
<tr><th colspan="4">SikaTack® Panel Fixing Tape and SikaTack® Panel adhesive</th></tr>
<tr><td colspan="2">SikaTack® Panel Fixing Tape used? Yes ☐ No ☐</td><td colspan="2">Applied on full length? Yes ☐ No ☐</td></tr>
<tr><td>SikaTack® Panel adhesive</td><td>☐ SikaTack® Panel
☐ SikaTack® Panel-10
☐ SikaTack® Panel-50</td><td>☐ Cartridge
☐ Unipack</td><td>Best before:
Batch no:</td></tr>
<tr><th colspan="4">Assembly Time</th></tr>
<tr><td colspan="4">Assembly time= Difference between adhesive application and bonding time: _____ minutes</td></tr>
<tr><th colspan="4">Quality Control</th></tr>
<tr><td>Skin time</td><td colspan="3">Start time (application of adhesive): _____
Skin time _____minutes, at temperature: _____°C and air humidity: _____% r.h.</td></tr>
<tr><td>Peel adhesion</td><td>Preparation date:
_____
Test date:
_____</td><td colspan="2">Rail profile: ≥ 95% cohesive failure Yes☐ No ☐
Panel: ≥ 95% cohesive failure Yes☐ No ☐</td></tr>
<tr><td rowspan="3">Visual Inspection</td><td>Primer present (used)?
Yes ☐ No ☐</td><td>SikaTack® Panel Fixing Tape used?
Yes ☐ No ☐</td><td>Joint dimension
thickness _____ mm
width _____ mm</td></tr>
<tr><td colspan="3">Overall rating: ok:
Yes ☐ No ☐</td></tr>
<tr><td colspan="3">Observations:</td></tr>
<tr><td colspan="2">Place and date of issue:</td><td colspan="2">Signature:</td></tr>
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Disclaimer

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