SEALING & BONDING
JOINT SEALANTS FOR BUILDING ENVELOPE WATERPROOFING

BUILDING TRUST

JOINT SEALANTS FOR A WATER-PROOF BUILDING ENVELOPE

Sika is a global player based in 91 countries with many years of experience and top references in building envelope solutions from basement to roof. With our innovative & best in class products and a wide portfolio we can always offer you the perfect solution for your building.

Sealants amount to approximately 1% of the construction costs of a typical large building project. In the case of water leakage, however, the refurbishment costs are many times that of the initial installation. In a globalized market with increasing numbers of construction materials and suppliers, tight budgets and high requirements in energy efficiency and profitability, it is crucial to have a reliable and competent partner. Consult Sika and let us provide you best in class sealants for your building.

CONTENT

WHERE ARE BUILDINGS MOST VULNERABLE TO WATER INGRESS? AT THE JOINTS!

AT THE JOINT THE DIFFERENT BUILDING ELEMENTS, MATERIALS AND TRADES MEET. WHEN THINKING OF WATER-PROOFING, THINK ABOUT THE JOINT SOLUTION FIRST!

THE BUILDING BLOCKS OF your construction, like the concrete slab, the glass facade element, the roofing membrane, the metal cover, etc., generally do not let water enter the building. It is at the joints where your building is weakest to leakage. Only correctly specified and professionally applied high quality joint sealants will manage to keep your building sustainably tight during its entire lifespan.

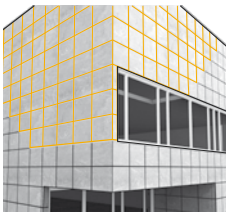
1

Glass-glass joint

2

Glass-metal joint

3



Natural stone joints

4

Translucent joints

5

Concrete joints

6

Connection joints

JOINT DESIGN FOR LONG-LASTING & TIGHT BUILDING ENVELOPE JOINTS

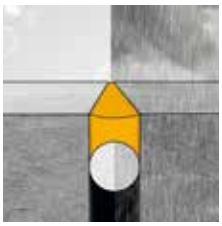
THE FACADE IS THE FACE of your building. In contemporary architecture the facade is of special interest expressed by large dimensions, unconventional shapes and high material diversity. Joint design is demanding and prone to mistakes. For integral joint specification, following some rough guidelines will result in a long-lasting and tight building envelope.

JOINT WIDTH

The joint width is calculated from the dimensions and thermal expansion coefficients of the facade elements and the maximum and minimum temperature your facade will be exposed to.
The maximum and minimum joint width defines which movement capability the joint sealant will need to be able to withstand the daily and seasonal cyclic thermal loads. To simplify your choice, sealants are classified according to their movement class by several standards. The most common ones are listed on the next page.

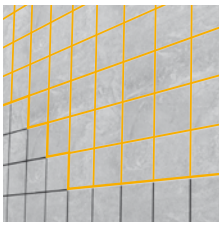
MATERIALS TO BE JOINED

Depending on the design of your facade, it may consist of facade elements of different materials like concrete, glass, metal, brick or stone, just to mention the most common. These elements have to be sealed to each other but also to other waterproofing products like membranes or structural glazing elements consisting of glass, metal frame and silicone adhesives. The sealant must show sufficient adhesion to the materials involved in the joint and at the same time must be compatible with all materials to avoid discoloration, loss of adhesion over time or any changes of properties.



ENVIRONMENTAL EXPOSURE

Environmental conditions have an impact on the service life and performance of the sealant. Conditions like the level of UV radiation or the chemical environment the sealant is exposed to must be considered when choosing the product. Additionally, when sealing between the inside and outside of the building the vapor permeability of the sealant must be considered to avoid accumulation of water in the walls. The general rule is to use a sealant with lower vapor permeability on the warm side of the wall, as warm air is generally more humid than cold air.



APPEARANCE

Ugly joints are like scares on the facade. Therefore, when specifying the joint sealant, the visual appearance of the joint must be considered. Besides the color match to the facade elements and the toolability of the sealant, there is also staining on natural stone or streaking on glass to be considered. Staining and streaking can damage the appearance of the whole facade and are irreversible. In this case stone and glass would have to be replaced. Hence, save money by using non-staining and non-streaking products where required.

ADVANTAGES:

- Sika offers know-how and a broad range of solutions to meet all waterproofing requirements of your building, from basment to roof. The best waterproofing results are achieved when choosing all solutions from one hand.
- Building envelope sealants and structural glazing adhesives are some of Sika's core businesses with a long tradition, top global references and sound expertise.
- Sika sealants have best-in-class handling properties. As a long standing partner of applicators world wide, we know what they need to do for a perfect job and how to surprise their customers.

Making mistakes specifying joint sealants eventually will lead to leakage within the building envelope with significant impact on operation and maintenance costs of your building. Avoid making mistakes where your building is most vulnerable.

MOST RELEVANT STANDARDS FOR JOINT SEALANT SPECIFICATION

In a globalized world, standards and regulations become increasingly important. They act as common ground where design and specification sometimes are done far away from the future location of the building and where building materials are sourced locally and globally.

There are classification and test standards. Classification standards specify the types and classes of sealants used in building construction according to their application and characteristics. Sealants are characterized according to the performance they achieved in a number of test standards. In general, these tests simulate the conditions under which the sealants will have to perform in your facade e.g. thermal and mechanical cyclic testing by the Hockman cycle.

In the following overview, classification of construction sealants according to the 3 most relevant classification standards is described.

MOST RELEVANT SEALANT CLASSIFICATION STANDARDS AT A GLANCE

Classification standards	ISO 11600	EN 15651	ASTM C 920
Region of use	Europe, Pacific, Middle East	Europe	United States, Canada, Latin America, Middle East, Asia
Legally	Voluntary	Mandatory in EU for CE marking	Voluntary
Classification	**Glazing sealants: G** Class 25: 25 LM / 25 HM Class 20: 20 LM / 20 HM	**Type** EN15651-1 F = Facade elements EN15651-2 G = Glazing EN15651-3 S = Sanitary joints EN15651-4 P = Pedestrian walkways	**Type** S = Single component M = Multi component **Grade** P = Pourable or self levelling NS = Non-sag or gunnable
	Construction sealants: F Class 25: 25 LM / 25 HM Class 20: 20 LM / 20 HM Class 12.5:12.5 E / 12.5 P Class 7.5 P	**Application** EXT = External INT = Internal CC = Cold climate	**Class** Class 100/50 = 100% elongation & 50% compression Class 50; 35; 25; 12.5 = % elongation & compression
	Use LM = Low modulus HM = High modulus E = Elastic P = Plastic	**Movement capability** Analogue ISO 11600	**Use** NT = Non-traffic areas M = Tested on mortar substrates G = Tested on glass substrates A = Tested on aluminium substrates O = Tested on other substrates
Explanations & examples	**Class 25** means that the joint sealant can be specified for joints with +/-25% movement. To reach this class the joint sealant has passed several ISO testing procedures regarding elongation, compression at different temperatures and environmental conditions. **Low modulus** joint sealants are used for facade joints & in climates with cold weather. **High modulus** sealants are used for floor joints. In warm climates, high modus sealants can also used in the facade.	**EN15651-1 F EXT-INT CC 25 LM** EN15651-1 F = Sealant for facade elements EXT-INT = Exterior & interior application CC = Cold climate application 25 = Movement capability of ± 25% LM = Low modulus	**ASTM C920 class 25 Type S Grade NS Use M. A. NT** ASTM C920 class 25 = ± 25% movement capability Type S = Single component Grade NS = Non-sag, gun applied Use M = Mortar substrate A = Aluminum substrate NT = Not for traffic areas

- The different movement classes of the different standards cannot be compared with each other as the testing procedures are different.
- Staining behaviour of sealants on natural stone and other porous substrates is evaluated according to ASTM C 1248 and ISO 16938-1.
- Sika joint sealants have all major approvals and can be specified and applied globally.
- Sika sealants are produced at different sites world wide and are internally and externally tested and monitored. This is how Sika can assure best quality & logistics for your project.

CHOOSING THE RIGHT PRODUCTS FOR YOUR BUILDING ENVELOPE JOINTS

SIKA HAS A BROAD portfolio of products to ensure that your building envelope joints are sustainably air and water tight. The best performance for your application is the key issue, therefore Sika produces high quality products in all major technologies.

AVOID MAKING MISTAKES WHERE YOUR BUILDING IS MOST VULNERABLE TO LEAKAGE – CHOOSE SIKA.

SIKA RECOMMENDS:

- For non-porous substrates like metal and glass, choose Sika's innovative silicone range.
- For porous substrates like concrete, bricks and masonry, choose Sika's advanced polyurethane sealants.
- For applications where a wide adhesion range is required like for window installations, the unique silane-modified-polymer sealants are best suitable.

Sika has a long history in building envelope joint sealants. All Sika products are the fruit of many years of experience, outstanding R&D capabilities, continuous adaptation and improvement to modern construction materials and practices and state of the art production sites. As we are globally present, we can respond to your needs and local requirements wherever your are realizing projects.

Using Sika products is a decision for competence, performance, security and a reliable partner.

NON-POROUS SUBSTRATES: GLASS AND METAL SEALANTS

Product	Movement capability		VOC Emission Classification	Non-Staining/ Non-Streaking	Translucent	Approved for direct SG/IG contact
	ASTM C 920 Class	ISO 11600 Class				
SikaHyflex®-905	100/50	25 LM	Solvent free / LEED v4	Yes / Yes	No	Yes
SikaHyflex®-605	50	25 LM	EC1 R, solvent free, LEED v4	No / Yes	No	Yes
SikaHyflex®-305 EU*	50	25 LM	Solvent free / LEED v4	No / No	No	Yes
SikaHyflex®-105	35	25 LM	Solvent free / LEED V4	No / No	No	No
SikaHyflex®-355	35	25 LM	Solvent free / LEED v4	Yes / Yes	No	No
SikaHyflex®-600	25	25 LM	EC1 PLUS R, solvent free, LEED v4	No / No	Yes	Yes
SikaHyflex®-300 EU*	25	25 LM	Solvent free, LEED v4	No / No	Yes	Yes

*SikaHyflex®-305 AP and SikaHyflex®-300 AP exhibit the same performance and characteristics as the EU versions, but do not necessarily carry all the (European) certifications.

POROUS SUBSTRATES: CONCRETE AND MASONRY SEALANTS

Product	Movement capability		VOC Emission Classification
	ASTM C 920 Class	ISO 11600 Class	
SikaHyflex®-250 Facade	100/50	25 LM	EC1PLUS R, solvent free, M1, LEED v4
Sikaflex®-1A Plus	50	25 LM	EC1PLUS R, solvent free, M1, LEED v4
Sikaflex® AT-Facade	25*	25 LM	EC1PLUS R, solvent free, LEED v4
SikaHyflex®-160 Construction Sikaflex® Construction+	35	25 HM	EC1PLUS R, solvent free, LEED v4
Sikaflex®-1A	35	25 HM*	
SikaHyflex®-140 Construction	25	25 HM	LEED v4
Sikaflex® Precast	25	25 HM	

* Internally measured

WIDE ADHESION PROFILE: CONNECTION SEALANTS

Product	Movement capability		VOC Emission Classification
	ASTM C 920 Class	ISO 11600 Class	
SikaHyflex®-220 Window	25*	25 LM	EC1PLUS R, solvent free, LEED v4
SikaHyflex®-225 Connection	25*	25 LM	EC1PLUS R, solvent free, LEED v4, phthalate free
Sikaflex® AT-Connection	25*	25 HM	EC1PLUS R, solvent free, LEED v4
SikaHyflex®-105	35	25 LM	Solvent free, LEED v4,

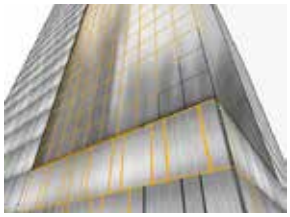
* Internally measured

For window, door and other installations, the sealants must show good adhesion to a wide range of materials mainly concrete and masonry, but also painted wood, coated or galvanized aluminium, steel or PVC. The sealants are applied in the facade but also inside the building where volatile organic content (VOC) and other sealant components like phthalates, tin catalysts and isocyanates may become an issue, depending on the local regulations or green building requirements. Sika has sealants and primers that meet all these requirements!

Our installation sealants are widely used for interior sealing as they have a much higher movement capability and better adhesion than acrylics and can be overpainted. Mainly in wood construction joints are exposed to higher movement due to seasonal humidity variations.

Sikaflex® AND SikaHyflex® – DESIGNED FOR BUILDING ENVELOPE WATERPROOFING

SEALANTS DEDICATED TO GLASS, METAL, NATURAL STONE FACADE JOINTS

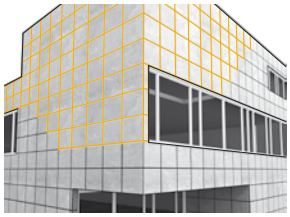
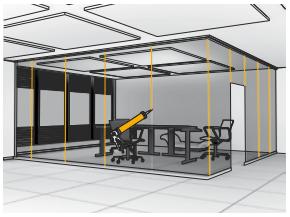
Type	SikaHyflex®-905	SikaHyflex®-605
		
Movement capability	ASTM C920 class **100/50**	ASTM C920 class **50**
	ISO 11600 class **25 LM**	ISO 11600 class **25 LM**
Benefits	Non staining Non streaking Approved for structural glazing adhesive contact	Non streaking Approved for structural glazing adhesive contact
Technical approvals	EN 15651-1 EN 15651-2 ISO 11600 F ISO 11600 G ASTM C 920 ISO 16938-1 ASTM C 1248	EN 15651-1 EN 15651-2 ISO 11600 F ISO 11600 G ASTM C 920 ISO 16938-1 ASTM C 1248
Environment, health & safety approvals	Silicone, neutral cure Solvent free	Silicone, neutral cure Low emission, low odor Solvent free
	LEED v4 Attestation	EMICODE EC1 R LEED v4 Attestation

SIKA SEALANTS WILL LET YOUR APPLICATORS DO AN EFFICIENT, RELIABLE AND ATTRACTIVE JOINT SEALING JOB.

ADVANTAGES:

- Low application forces for efficient application
- No sag behaviour, so the product stays where it was applied
- Short cut-off string, so the facade elements are not messed up and no time is lost from cleaning
- Good body and tack-free surface making it easy to tool and achieve a visually attractive surface finish
- Low smell and low VOC making the application of Sika sealants a pleasure

SIKA SEALANTS ARE THE FIRST CHOICE OF APPLICATORS WORLD WIDE!

SikaHyflex®-305 EU	SikaHyflex®-355	SikaHyflex®-600	Sikaflex®-300 EU
			
ASTM C920 class **50**	ASTM C920 class **35**	ASTM C920 class **25**	ASTM C920 class **25**
ISO 11600 class **25 LM**	ISO 11600 class **25 LM**	ISO 11600 class **25 LM**	ISO 11600 class **25 LM**
Very good adhesion to a wide range of substrates Approved for structural glazing adhesive contact	Non staining, especially for natural stone facades Non streaking	Translucent/metallic look Approved for structural glazing adhesive contact	Translucent/metallic look Very good adhesion to a wide range of substrates Approved for structural glazing adhesive contact
EN 15651-1 EN 15651-2 ISO 11600 F ISO 11600 G ASTM C 920	EN 15651-1 EN 15651-2 ISO 11600 F ISO 11600 G ASTM C 920 ISO 16938-1 ASTM C 1248	EN 15651-1 EN 15651-2 ISO 11600 F ISO 11600 G ASTM C 920	EN 15651-1 EN 15651-2 ISO 11600 F ISO 11600 G ASTM C 920
Silicone, neutral cure Solvent free	Silicone, neutral cure Solvent free	Silicone, neutral cure Low emission, low odor Solvent free	Silicone, neutral cure Solvent free
LEED v4 Attestation	LEED v4 Attestation	EMICODE EC1 PLUS R LEED v4 Attestation	LEED v4 Attestation

Sika is more than just an ordinary silicone compounder. Sika develops and produces competitive and best in class formulations for a wide range of applications such as automotive, structural glazing and weather sealing. Sika has unique building blocks and polymerization mechanisms and can adjust the properties needed, from super tough to highly elastic.

SEALANTS DEDICATED TO CONCRETE AND MASONRY FACADE JOINTS

Type	SikaHyflex®-250 Facade Sikaflex®-1A Plus	Sikaflex® AT-Facade
		
Movement capability	ASTM C920 class **100/50** (Sikaflex®-1A Plus: 50)	ASTM C920 class **25***
	ISO 11600 class **25 LM**	ISO 11600 class **25 LM**
Benefits	Very good weathering resistance Suitable for EIFS – low stress to substrate Non staining	Very good weathering resistance Primer free adhesion to many porous and non-porous substrates
Technical approvals	EN 15651-1 ISO 11600 F ASTM C 920 DIN 18540 ISO 16938-1 ASTM C 1248 on marble	EN 15651-1 ISO 11600 F DIN 18540
Environment, health & safety approvals	Sika *i*-Cure technology Isocyanates <0.1% Solvent free	Sika SMP technology Isocyanate free Solvent free
	EMICCODE EC1 PLUS R M1 Certificate LEED v4 Attestation	EMICCODE EC1 PLUS R LEED v4 Attestation

* Internally measured

Sika polyurethane *i*-Cure technology has several advantages compared to MS, silicone and conventional polyurethane sealant technology:

- Better adhesion to porous substrates
- Superior tear propagation resistance
- Suitable for use on damp substrates, for example, after rainfall

Powered by *i*-Cure® Technology

i-Cure is Sika's innovative solution for bubble free curing sealants.

SikaHyflex®-160 Construction Sikaflex® Construction+	Sikaflex®-1A	SikaHyflex-140 Construction	Sikaflex® Precast
			
ASTM C920 class **35**	ASTM C920 class **35**	ASTM C920 class **25**	ASTM C920 class **25**
ISO 11600 class **25 HM**	ISO 11600 class **25 HM**	ISO 11600 class **25 HM***	ISO 11600 class **25 HM**
Good adhesion to porous substrates Durable and reliable	Good weathering resistance Bonds well to primed Sika PVC membranes	Good adhesion to porous substrates	Good adhesion to porous substrates
EN 15651-1 ISO 11600 F ASTM C 920	ASTM C 920 Fed Spec TT-S-0023C, Type II, Class A	ASTM C 920	ASTM C 920
Sika *i*-Cure technology Isocyanates <0.1% Solvent free	Sika PUR technology	Sika *i*-Cure technology Isocyanates <0.1%	Sika *i*-Cure technology Isocyanates <0.1%
LEED v4 Attestation	LEED v4 Attestation		

Sika is one of the world's largest producers of polyurethane based sealants, adhesives and coatings. Sika polyurethanes are omipresent in construction and industrial applications. Our products are widely used in structural and civil engineering but also in production and assembly of goods for marine, aviation and automotive. With decades of experience, know-how and permanent innovation, Sika is the first choice for high performance polyurethane products.

JOINT SEALANTS DEDICATED TO CONNECTION JOINTS

Type	SikaHyflex®-220 Window
	
Movement capability	ASTM C920 class **25***
	ISO 11600 class **25 LM**
Benefits	Low extrusion force Low stress to substrate Primer free adhesion to many porous and non-porous substrates, including PVC Overpaintable
Technical approvals	EN 15651-1 ISO 11600 F
Environment, health & safety approvals	Sika SMP technology Isocyanate free Solvent free
	EMICCODE EC1 PLUS R LEED v4 Attestation

* Internally measured

Sika generally advises the use of primers before the joint sealant is applied. Primers stabilize and strengthen the substrate surface and give the sealant an ideal bonding interface for long-lasting and strong adhesion.

Polyurethane and silane-modified-polymer sealants can be overpainted. Paints show good adhesion however they seldom have the movement capability of the sealant. Therefore Sika generally does not advise facade sealants to be overpainted.

SikaHyflex®-225 Connection	Sikaflex® AT-Connection	SikaHyflex®-105
		
ASTM C920 class **25***	ASTM C920 class **25***	ASTM C920 class **35**
ISO 11600 class **25 LM**	ISO 11600 class **25 HM**	ISO 11600 class **25 LM**
Good tooling properties Low stress to substrate Primer free adhesion to many porous and non-porous substrates Overpaintable	Excellent tooling properties Primer free adhesion to many porous and non-porous substrates Overpaintable	Good weathering resistance Easy to smooth Good adhesion to different substrates
EN 15651-1 ISO 11600 F	EN 15651-1 ISO 11600 F	EN 15651-1 EN 15651-2 ISO 11600 ASTM C 920
Sika SMP technology Isocyanate free Solvent free Phthalate free	Sika SMP technology Isocyanate free Solvent free	Silicone, neutral cure Solvent free
EMICCODE EC1 PLUS R LEED v4 Attestation	EMICCODE EC1 PLUS R LEED v4 Attestation	LEED v4 Attestation

Avoid problems, build trust, use Sika! Sika silane-modified-polymer sealants are based on in-house engineered and produced prepolymers. This gives us the possibility to tailor best products for your joints. These sealants differ from common modified silicone (MS) products through their better application and tooling properties, superior adhesion and outstanding elastic recovery behavior.

ENSURING GOOD ADHESION

Primers for all Materials and Applications

JOINT PRETREATMENT –
PRIMERS, ACTIVATORS AND CLEANERS

Strong and durable adhesion of the sealant to the substrate is the essence of joint sealing. No adhesion means water ingress. Therefore, we recommend to pretreat the joints before sealant application. The effort and cost of pretreatment before the initial sealant application is very small with regard to the gain in durability and service life of the joint.

Good adhesion is achieved by several means on the different substrates:

- For **porous** substrates the primer closes the porosity, strengthens the surface, reduces the surface roughness and prevents water penetration at the substrate-sealant interface. For joints with periodic water immersion, the pretreatment with a primer is mandatory.
- For **non-porous** substrates the treatment is chosen according to the material:
  - **Metals and powder coated metals:** Besides cleaning and removing processing agents from the surface, activators leave adhesion promotors on the surface to ensure good wetting and adhesion. Cleaners are special solvents to clean the substrate surface. Primers are used to prevent corrosion at the interface of the metal and sealant.
  - **Plastics:** Generally the adhesion of sealants to plastics is often poor, independent of the sealant technology. Therefore, a pretreatment is needed often with activator and primer. The pretreatment changes the surface energy to enable durable adhesion.
  - **Glass:** Generally glass only needs to be correctly cleaned by a good cleaner before sealant application. Sika silicone weather sealants have excellent adhesion to glass. If primers or activators are used this must be done with great care as the adhesion promotors in the primers and activators may leave a visible film on the glass surface.

Primer application does not replace the usual joint preparation. Before the primer and sealant application, the joint must be well cleaned from all processing agents, dirt and dust.
In case of concrete, the laitance must be removed by grinding. The substrate surface must be capable to withstand the elastic forces from the sealant movement. If this rule is disobeyed, the substrate will crack near the surface. Therefore a serious substrate preparation is essential.

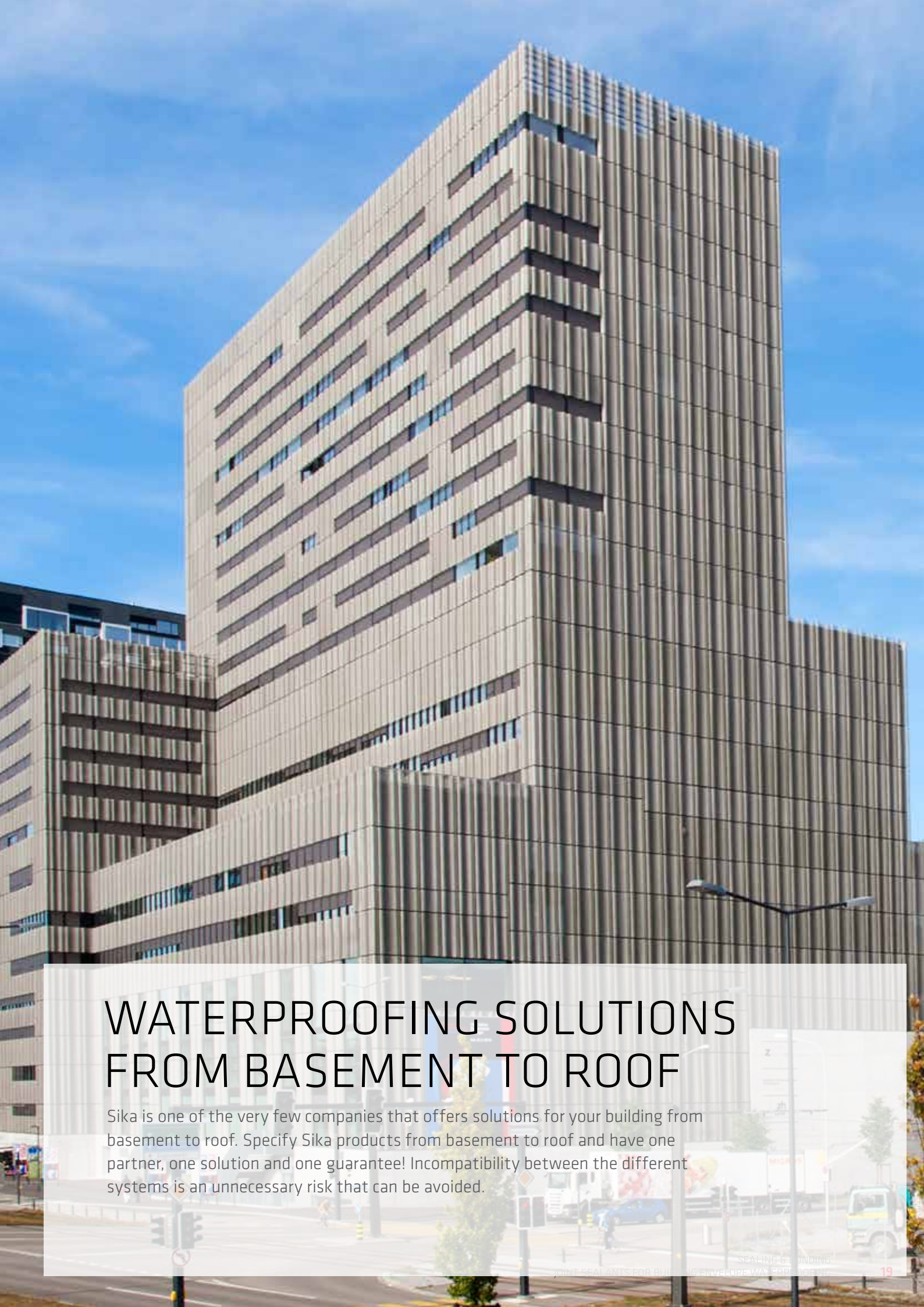
Sika has a wide range of primers and activators for the different substrates and the know-how to consult you. Please contact the local sales force for pretreatment recommendation and testing.

ADHESION IS THE KEY TO STRONG AND DURABLE JOINT SEALING.

CHOOSING THE CORRECT PRIMER

Product	Chemistry	Porous	Non porous		
		Concrete, masonry & raw wood	Metals	Plastics & Coatings	Glass
Sika® Primer-3N	Solvent based Epoxy	X	X	X for coatings	
Sika® Primer-4W	Water based 2C Epoxy	X	(X)		
Sika® Primer-215	Solvent based PU		X	X	
Sika® Primer-790	Solvent based silane		X for SIL sealants		
Sika® Aktivator-100	Solvent based		X for PVDF		
Sika® Aktivator-205	Solvent based		X		
Sika® Cleaner P	Solvent based		X		X
Sika® Cleaner G&M	Solvent based		X		X

Generally primers and activators and cleaners are related to the substrate and not to the sealant technology. All our sealants are compatible with our primers.



WATERPROOFING SOLUTIONS FROM BASEMENT TO ROOF

Sika is one of the very few companies that offers solutions for your building from basement to roof. Specify Sika products from basement to roof and have one partner, one solution and one guarantee! Incompatibility between the different systems is an unnecessary risk that can be avoided.

WATERPROOFING SOLUTIONS FROM BASEMENT TO ROOF

1

Basement waterproofing

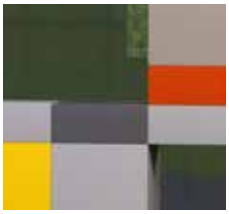
2

Invisible facade protection

3

Structural glazing

4



Panel bonding

5

Liquid roof waterproofing

6

Single-ply membrane roof waterproofing

7

Sustainability

SIKA SOLUTIONS FOR CONCRETE BASEMENTS

Sustainable and Durable Waterproofing

UNDERGROUND CONSTRUCTIONS NEED TO be protected from ground water and humidity. Effectively protecting basements and below ground civil engineering structures has increased the durability and service life of the structures, widened the possibilities of use and increased the living comfort.

As the global leader in providing structural waterproofing solutions, Sika has the most complete and comprehensive range of fully integrated and compatible systems that have a proven record for many decades all over the world. Our systems comply to all leading national and international standards giving clearly defined performance characteristics and security to specifiers, contractors and project owners.

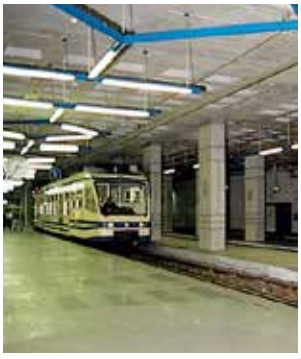
EXAMPLES OF BELOW GROUND CONSTRUCTION

RESIDENTIAL BUILDINGS

COMMERCIAL OFFICE BUILDINGS

ARCHIVES/LIBRARIES

UNDERGROUND PARKING AREA



METRO STATIONS

SERVICE ROOMS

RETAIL UNITS AND WAREHOUSES

LEISURE FACILITIES

Today, new building owners generally request high demand for quality, reliability and durability. The lack of watertightness severely reduces the long-term durability of a building as that humidity gradually deteriorates the concrete and consequently leads to expensive structural repair works besides the cost of interior finishes and goods and operational downtime. Sika waterproofing experts are able to support you to minimize the total cost of ownership by selection of the appropriate waterproofing method and its correct installation on site.

A waterproofing system typically amounts to less than 1% of the total constructions cost, yet the selection of a high quality waterproofing solution can easily save this amount in future maintenance and repair costs over the service life

of the structure. Basement waterproofing is a serious matter as there is very limited access in case of damage during service life.

Sika provides a full range of technologies and systems used for below ground waterproofing ranging from highly flexible membrane systems to watertight concrete admixtures. All of these solutions are designed to be used together to meet the specific needs and requirements of owners, architects, engineers and contractors on site. To define the appropriate waterproofing strategy and type of system for a specific project, it is important to consider the project requirements of the owner regarding functionality, future use and the expected service life.

The British standards BS 8102-2009 describes different levels of watertightness which defines the possible utilisation of the underground structure.

GRADE OF WATERTIGHTNESS

Grade	Classification	Description	Examples of use
1	Basic utility	■ Some seepage and damp areas tolerable	■ Underground car parks ■ Plant rooms ■ Workshops
2	Better utility	■ No water penetration ■ Some damp areas tolerable ■ Ventilation may be required	■ Underground car parks ■ Storage areas ■ Workshops
3	Habitable	■ No water penetration acceptable ■ Ventilation and dehumidification required	■ Ventilated residential units and offices ■ Restaurants and commercial areas ■ Leisure facilities
3 Plus	Habitable Plus	■ No water vapour penetration ■ Totally dry environment ■ Protection against chemical and gas attack	■ Residential areas ■ Computer rooms ■ Archives

OVERVIEW OF SIKA BASEMENT WATERPROOFING SOLUTIONS

Sika system	Sika brands	Grade of watertightness	Concrete protection	Advantages
Mortars & coatings	■ SikaTop® ■ SikaSeal® ■ Sika® Igolflex®	1 – 2	Limited	■ Cost effective ■ Simple & fast to apply
Watertight concrete	■ Sika ViscoCrete® ■ Sika® WT-100 /-200 ■ Sika® Control ■ Sika® Joint Sealing Solutions	1 – 3	Low	■ Very cost effective ■ Simple & fast construction ■ High durability
Liquid applied membranes	■ Sikalastic®-801 / -801 SL ■ Sikalastic®-841 ST	1 – 3 Plus	Very high	■ High performance & durability ■ Easy detailing solutions
Fully bonded sheet membrane	■ SikaProof® A & P ■ SikaBit® S & T	1 – 3 Plus	High	■ Highly efficient ■ High performance & durability ■ Easy to apply
Compartmentalized membrane system	■ Sikaplan® WP ■ Sikaplan® WT ■ Sika® Waterbars WP/WT	1 – 3 Plus	Very high	■ Highly waterproofing security ■ Integrated system redundancy ■ Very high performance ■ High durability & reliability
Repair & Refurbishment Solutions	■ SikaFuko® ■ Sika® Injections	None	High	■ Easy and fast local repair ■ No excavation necessary ■ Durable repair

INVISIBLE FACADE PROTECTION – FOR POROUS FACADE MATERIALS

FACADES MADE OF RAW building materials like concrete, brick or stone are an essential part of minimalistic architecture. These materials are porous and prone to take up water together with dirt and deteriorating ions such as chlorides and sulphates originating from combustion processes.

By applying a hydrophobic impregnation on these raw and porous substrates, the facade can efficiently be protected against moisture uptake without altering the aesthetics of the original structure. This also reduces the thermal conductivity of the walls and significantly increases the room climate.

The surface tension of non-treated mineral substrates is higher than that of liquid water. Therefore, the water molecules spread on the mineral surface rather than form a droplet. The hydrophobic impregnation significantly lowers the surface energy. Now the water molecules prefer to stay together and the water is repelled off the surface and does not enter the pores. Dirt and deteriorating ions are left on the surface and are easily washed off. Hydrophobic impregnations are generally based on silanes, siloxanes, siliconates or blends of these materials.

MAKING YOUR FACADE BEAUTIFUL AGAIN: CLEANER RANGE

Product	Mould removal	Organic cleaner	Mineral cleaner	Surface strengthening	Cement & efflorescence cleaner
Sikagard®-715 W	+++	++	–	–	–
Sikagard®-719 W	–	+++	–	–	–
Acid Cleaner*	–	–	+++	–	+++
Sikagard®-905 W	–	–	–	+++	–

* Consult your local Sika representative for appropriate acid cleaners

+++ Long term effect / very efficient
++ Suitable
+ Short term effect
– Not suitable

INVISIBLE PROTECTION FOR LONG-LASTING BEAUTIFUL FACADES: HYDROPHOBIC RANGE

Product	Consistency	VOC	Concrete	Brick	Natural & artificial stone	Cement renders	Paintable
Sikagard®–740 W	Emulsion	Low	+++	–	–	–	Yes
Sikagard®–703 W	Emulsion	Low	–	++	+	+++	Yes
Sikagard®–71 W	Solution	Low	–	+	++	++	No
Sikagard®–730 Thixo	Cream	Low	+++	+++	+++	+++	Yes
Sikagard®–700 S	Solution	–	–	+++	+++	+++	Yes

Hydrophobic facade treatment and facade joint sealing is generally done by different trades. Therefore, it is important to specify the Sika® Primer-3N to increase the adhesion if the hydrophobic treatment has been done before the joint sealing. If the hydrophobic treatment is done after joint sealing do not specify Sikagard®-700 S as the solvent-based product will reduce the sealants performance.

SOLUTIONS FOR RISING DAMP – WHEN INITIAL WATERPROOFING WAS NEGLECTED

IN MANY MARKETS REFURBISHMENT plays by far the major role in the construction industry. From an architectural perspective, renovation is a fascinating balance between honoring and preserving the past and introducing new design elements and the conveniences of a modern living standard. Thereby, many situations are given and reveal themselves only during the works and solutions have to be found on a daily basis.

Sika has several product ranges dedicated to refurbishment, where long-lasting and preserving answers are required.
In the lower facade, rising damp is a common problem in old buildings. The water from the underground rises within the walls, driven by capillary forces, to the ground level and then evaporates into the environment, thereby slowly and continuously destroying the facade.

There are several ways to address the rising damp issue. The Sika solution chemically closes the capillaries and pathway of the rising water. This approach is permanent, efficient and can be easily applied also in difficult construction situations.

THE Sikamur® SYSTEM IS A HOLISTIC SOLUTION TO FACADE DAMAGE THROUGH RISING DAMP AND EXTERNAL HUMIDITY.

- **Sikamur® Injectocream-100:** Prevents capillary rise of water
- **Sikamur® Dry:** Replastering mortar that enhances water evaporation remaining in the walls of the lower facade
- **Sikamur® Finish:** Finishing mortar that allows fast evaporation of water
- **Finishing paint:** Highly vapour permeable enabling water evaporation
- **Invisible protection:** Any of the Sikagard® hydrophobic impregnations

STRUCTURAL GLAZING – HIGH-TECH SOLUTIONS FOR THE PERFECT FACADE

GLASS FACADES ARE an integral part of modern architecture. With a glass curtain wall construction, an ideal balance is found between aesthetic appeal and energy efficiency.

Glass curtain walls consist of facade elements. The elements are factory produced and mounted to the carrier structure of the building. Eventually, weather sealants seal the respective elements. The glass facade elements are produced by bonding glass panels to the metal adapter profile with silicone adhesives. The elastic joints produced with Sikasil® SG silicone adhesives accommodate movements of the construction elements resulting from temperature changes, moisture, shrinkage of construction materials, sound, wind and vibrations permanently.

4 PRINCIPLE CURTAIN WALL TECHNOLOGIES:

FOUR SIDED STRUCTURAL GLAZING

Optimum transparency and frameless appearance

Four-sided structural glazing is impressive because of its monolithic, frameless appearance. The large-format glass panels are bonded on all 4 sides to an adapter profile and have no visible frame.

TWO SIDED STRUCTURAL GLAZING

Optimum safety by mechanical fixing

Two-sided structural glazing offers transparency and maximum safety. The glass panels are bonded on the vertical sides and are mechanically fixed on bottom and top to an adapter profile.

POINT FIXED GLAZING

The lightness of glazing by point fixed glazing

For maximum transparency of the glass panels on the facade and inside the building, the glasses are either mechanically fixed or high-strength bonded to metal fasteners.

STRUCTURAL WINDOW BONDING

Slim design by structural window bonding

Structurally bonding the insulating glass unit into the sash frame has 4 big advantages: Increased transparency by allowing slim sash design, best thermal and sound insulation, increased service life by minimized peak stress and high window stiffness and minimal maintenance.

DURABLE, SAFE AND ECONOMIC FACADES WITH SIKA.

MAKING YOUR CONCEPT POSSIBLE – SIKA STRUCTURAL GLAZING SILICONES

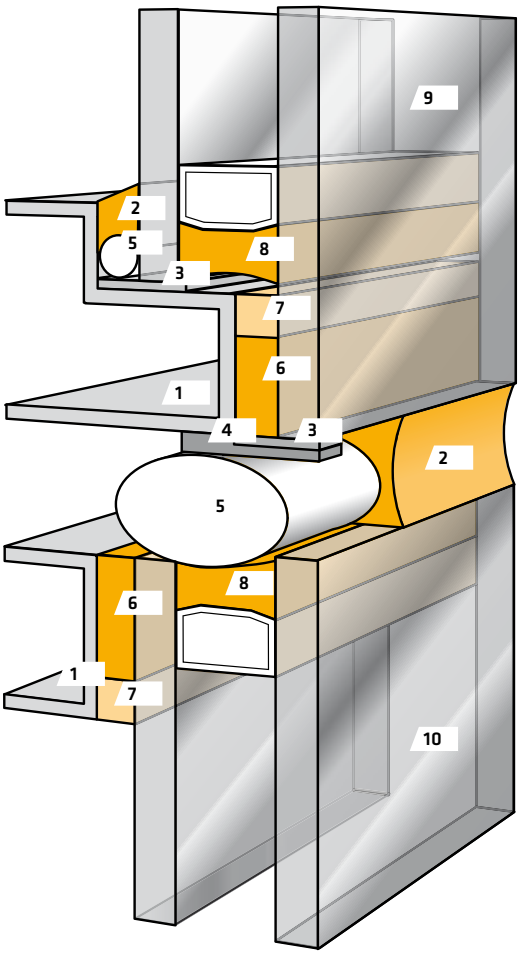
THE SYSTEM PRINCIPLE

The structural glazing silicones Sikasil® SG and insulating glass secondary sealants Sikasil® IG are highly specialized products dedicated to structural glazing and insulating glass application and offering you unique possibilities for design, energy efficiency and durability of your facade.

The Sikasil® SG and IG silicones convince by their properties:

- Durable and extremely strong
- Outstanding weathering and ageing resistance
- Extremely good UV and oxidation stability
- Good chemical resistance
- Resistant and flexible with extreme temperature fluctuations from -50°C to +150°C
- Low shrinkage in vulcanization
- Long-term resistance to continuous rain

Sika is one of the market leaders in sealants and adhesives for curtain wall production. We supply the leading curtain wall fabricators world wide. Our Sikasil® SG and IG silicones are present in many facades worldwide – visit our reference brochure



1 Adapter profile
2 Weatherseal
3 Setting block
4 Mechanical support
5 Backing material
6 Structural glazing joint
7 Spacer tape
8 Secondary edge seal
9 Stepped insulating glass unit
10 Symmetric insulating glass unit

FACADE PANEL CLADDING – SMOOTH AND ELEGANT

THE FACADE IS ONE of the most defining elements of your building. Luckily there are so many ways to design the facade nowadays ranging from naked concrete to fixed panels of ventilated facade systems. For panel fixation Sika has an adhesive system for an invisible and durable fixation.

SikaTack® Panel IS A RELIABLE AND PROVEN SYSTEM WITH OVER 20 YEARS OF EXPERIENCE!

With the SikaTack® Panel System, unsightly screws or rivets for fixing the panels are no longer necessary and the panels can reveal their true beauty. Compared to hidden mechanical fixations, the SikaTack® Panel System can save you up to 40% costs.

SikaTack® Panel System IS A HOLISTIC SOLUTION FOR WALL CLADDING:

- SikaTack® Panel polyurethane and silicone adhesives show tenacious adhesion to a variety of panel substrate types and permanent elasticity allowing panel accommodation due to natural differential movement of the building.
- Efficient, rapid and safe panel installation due to immediate fixation with SikaTack® Panel Fixing Tape
- Optimum support in planning, panel preparation and installation through local partners or technical Sika sales force

Project name: City Square Mortsel
Architect : Abscis Architecten
Product : EQUITONE [tectiva] TE 80

WHEN LESS IS MORE – INVISIBLE PANEL FIXATION

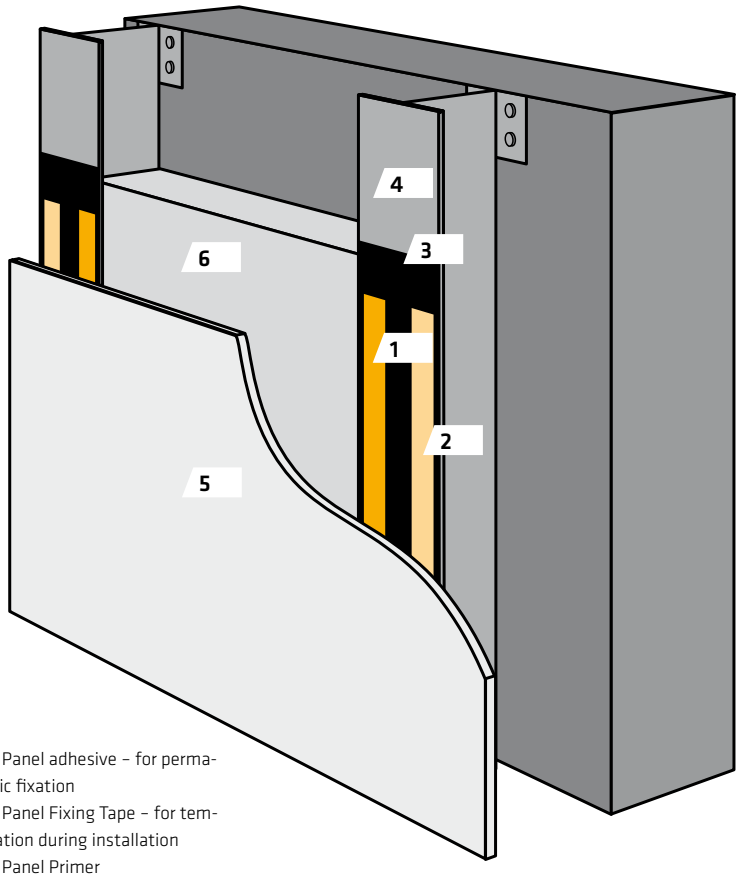
THE SYSTEM PRINCIPLE

FOR INTERIOR AND EXTERIOR WALL CLADDING

With the SikaTack® Panel Adhesive System, cladding finishes can be invisibly fixed to a carrier frame allowing the designer to design without any unsightly fixings. The big advantage over mechanical fixation systems is the elastic nature of SikaTack® Panel Adhesives that accommodates the natural differential movements of varying building materials. SikaTack® Panel Adhesive System is compatible to many panels ranging from cement based cladding panels to metal and powder coated substrates. Ask us about the panel you intend to use!

FOR VENTILATED RAINSCREEN CLADDING

Rain can be forced through the joints and openings of a typical building facade through wind or external and internal pressure differences. Ventilated rainscreen cladding overcomes this problem by pressure equalization and ensures weather tightness of the facade. Rainscreen cladding is a proven concept with many years' experience in the development of relatively easily installed lightweight systems.



1 SikaTack® Panel adhesive – for permanent elastic fixation
2 SikaTack® Panel Fixing Tape – for temporary fixation during installation
3 SikaTack® Panel Primer
4 Rail system – carrier for panel for fixation
5 Facade panel
6 Insulation material

Facade design and installation with SikaTack® Panel System must be done with the support of our technical sales force. Please contact us with your panel cladding project to ensure a beautiful, safe and durable facade.

LIQUID APPLIED MEMBRANES – SEAMLESS ROOFING SOLUTIONS

WHERE IS YOUR ROOF MOST vulnerable to leakage? At the joints! Avoiding joints or seams is beneficial where complex structures need to be made waterproof.

Sika liquid applied membrane (LAM) systems allow you to realize your concepts and projects, including unique or unusual designs. Our systems are applied in new construction and in refurbishment, always when conventional solutions do not provide sufficient flexibility and security.

THE KEY FEATURES OF SIKA LAM SYSTEMS ARE:

- LAM is the best choice for renovation and repair of leaking roofs. It is easily applied in almost any angles and on many substrates like bitumen often found on old roofs.
- LAM is unique for waterproofing a roof with penetrations like pipes or fixations.
- LAM offers high application security as it is applied cold (flameless) compared to bitumen.
- Sika offers on-site trainings, quality control and long-term guaranty*!

Sika can look back on a history of half a century in supplying long-lasting LAM systems. We belong to the founder generation in the '60s and today we are the global leader in a strongly growing market segment.

*For Sika approved applicators quality inspections on-site are available.

AVOIDING JOINTS – REDUCING RISK

TO OFFER THE PERFECT SOLUTION FOR YOUR APPLICATION WE HAVE SEVERAL LAM TECHNOLOGIES:

Water based, 1 component:	Polyurethane, 1 component:	Polyurethane – Polyurea hybrid, 2 component:
■ Odorless ■ Solvent free ■ Environmentally friendly ■ UV-resistant ■ Spray or roll ■ Economic	■ Ready to use – no mistakes with mixing ■ Early rain resistant ■ Highly durable ■ Low odor ■ Spray or roll	■ Very early rain resistant ■ Very fast application – base and top coat only in one day ■ Low odor ■ Solvent free ■ 100% solids
Products:		
■ Sikalastic®-560	■ Sikalastic®-612/-614/-618/-641 ■ SikaRoof® MTC 12/15/18/22	■ Sikalastic®-851 R

OUR SYSTEMS ARE CLASSIFIED ACCORDING TO THE LIFE EXPECTATION*:

5 – 10 years	10 – 15 years	20 years	Life expectation*
■ MTC-12 ■ Sikalastic®-560 ■ Sikalastic®-614/-614/-618	■ MTC-15	■ MTC-18 ■ MTC-22 ■ Sikalastic®-851 R ■ Sikalastic®-641	

*The life expectation is based on ETAG 005 certification.

ROOFING – SIKA MEMBRANE SOLUTIONS

IN MODERN CONSTRUCTION, ROOFS can have many different functions from a exposed, plain and unused surface to a covered and used garden or parking space. The different utilisations require specific system solutions and know-how. Sika is a major supplier of roofing solutions and our Sarnafil® and Sikaplan® systems allow you to realize your roof concept.

SIKA SYSTEM SOLUTIONS

EXPOSED ROOF

- Mechanically fastened on a steel deck
- Mechanically fastened on a concrete deck
- Adhered system on various decks

GRAVEL BALASTED ROOFS

- Warm roofs – membrane on insulation
- Inverted systems - membrane below insulation

GREEN ROOF

- Extensive green roof – low maintenance garden
- Intensive green roof – roof garden

UTILITY ROOF

- Pedestrian traffic roof
- Car traffic roof
- Solar roof

WORK WITH THE LEADER – CHOOSE SIKA ROOFING SOLUTIONS

Sika roof membranes are based on PVC and FPO. PVC has the longest track record for more than 50 years. Its technology is very well established all over the world.

FPO known for its outstanding ecological profile and its high chemical resistance is suitable for all different roofing applications. Sika has a proven track record for more than 25 years monitored by an external independent institute.

OVERVIEW OF SIKA MEMBRANE SYSTEMS

Design	Advantage	Sika products
Homogeneous membranes	Highly flexible, ideal for details	■ Sika-Trocal® S ■ Sikaplan® D ■ Sarnafil® T66-15D
Membranes with glassfiber mat inlay	Dimension stability	■ Sarnafil® TG 66/G410 ■ Sikaplan® SGmA
Membranes with glassfiber mat inlay and felt backing	Adhered systems and high aestetics	■ Sarnafil® TG 76 Felt/G410 Felt ■ Sikaplan® SGK
Reinforced membranes with fully embedded fabric or a scrim	High strength for mechanical fixation	■ Sarnafil® S 327 ■ Sarnafil® TS 77 ■ Sikaplan® G/VG/VGWT

To resist wind uplift the membranes are either mechanically fastened or fully adhered to the roofing structure. Mechanical fastening offers a fast and cost efficient application whereas an adhered solution meets high aesthetic requirements and freedom to design a complex roof shapes. However independent of the technology, design and fastening the water tightness of a roof strongly depends on the correct membrane application.

For each application a specific system set up is required. Sika has the products, accessories and know-how for safe and durable waterproofing of the roof.

Please contact us for support in roof design, choice of best solution, membrane application and guarantee. Sika – from basement to roof.

WHERE ARE ROOFS MOST VULNERABLE TO WATER INGRESS? AT THE JOINTS!

REFURBISMENT

- Bitumen roof
- Metal roof
- Polymeric roof

SPECIALTIES

- Logos and graphics
- Color range

SIKA – CONTRIBUTION TO SUSTAINABLE CONSTRUCTION

More Value – Less Impact

Providing high-performance solutions – to the benefit of our customers and sustainable development
Sika is dedicated to sustainable development. We take responsibility to provide sustainable solutions in order to improve material, water and energy efficiency in construction and industry. Sika strives to create value for all its stakeholders with its products, systems and solutions along the whole value chain and throughout the entire life span of its products.

The value created by far outweighs the impacts associated with production, distribution and use. Sika is committed to measure, improve and communicate sustainable value creation. "More value, less impact" refers to the company's life cycle approach and commitment to maximize the value of its solutions to all stakeholders while reducing resource consumption and impacts on the environment.

MORE VALUE – ENERGY SAVING

Tight building envelope saves resources and increases the quality of living
At first glance, Sealing and Bonding solutions contribute little to the environmental impacts caused by the construction of a building but are actually essential for air- and watertight building envelopes. Their proper use, performance, quality and longevity are of great importance to the total environmental performance of a building during its whole Service life.

A professional window installation with high performance sealants and membranes reduces the energy loss by up to 80% compared to a leaking window installation. Reducing air leakage and preventing wet insulation consequently reduces the energy demand for heating and cooling. This was quantified by a study performed by the University of Applied Science for Architecture, Wood and Construction in Biel, Switzerland.

MORE VALUE – GREEN BUILDING CONTRIBUTION

For specific information regarding Green Building Programs, please contact your local Sika organization. Relevant contributions can be as follows:

Green Building Programs	Contribution		
	Low emissions	Tight Building Envelope	Environment and Resources
LEED ® (Leadership in Energy and Environmental Design)	**LEED v2009:** • IEQc 4.2: Low emitting materials **LEED v4:** • EQc 2: Low emitting materials • MRc 2: Building product disclosure & optimization (EPD) • MRc 5: Building product disclosure & optimization (material ingredients)	**LEED v4:** • LEED® v4: EAc Credit 7 – LEED Homes	**LEED v4:** • MRc 2: Building product disclosure & optimization (EPD) • MRc 5: Building product disclosure & optimization (material ingredients)
BREEAM ® (Building Research Establishment Environmental Assessment Method)	**BREEAM UK:** • Hea 02: Indoor air quality	**BREEAM UK:** • Ene 01 Reduction of energy use and carbon emissions cycle impacts	**BREEAM UK:** • Mat 01: Life cycle impacts
DGNB (Deutsches Gütesiegel für Nachhaltiges Bauen)	**DGNB 2015:** • SOC 1.2: Indoor air quality	**DGNB 2015:** • TEC 1.3: Building Envelope Quality – Protection against Interstitial Condensation	**DGNB 2015:** • ENV 1.2: Low environmental impact

LESS IMPACT – INDOOR AIR QUALITY

Sika Sealing and Bonding products fulfill high standards.
People spend more than 80% of their time in indoor environments: home, office, retail, leisure, education and transportation. There are various governmental and industry initiatives around the globe to reduce VOC (Volatile Organic Compounds) emissions from building materials and improve the indoor air quality. VOCs have been identified as having potential long term health impact and an adverse effect on the environment. Sika provides sealants with very low emissions, which ensure a good indoor air quality. All new Sika sealants are developed in order to comply or even to exceed the different local requirements.

SikaHyflex®, Sikaflex® and SikaBond® sealants and adhesives comply with the most stringent standards with regard to controlling the emission of VOCs like:
- Germany: EMICODE EC 1 PLUS R
- France: AFFSET A+
- Finland: M1
- USA: SCAQMD Rule #1168

A complete list of the tested sealants and adhesives and their approvals are available from your Sika local organization.

LESS IMPACT – LOW IMPACT PRODUCTS

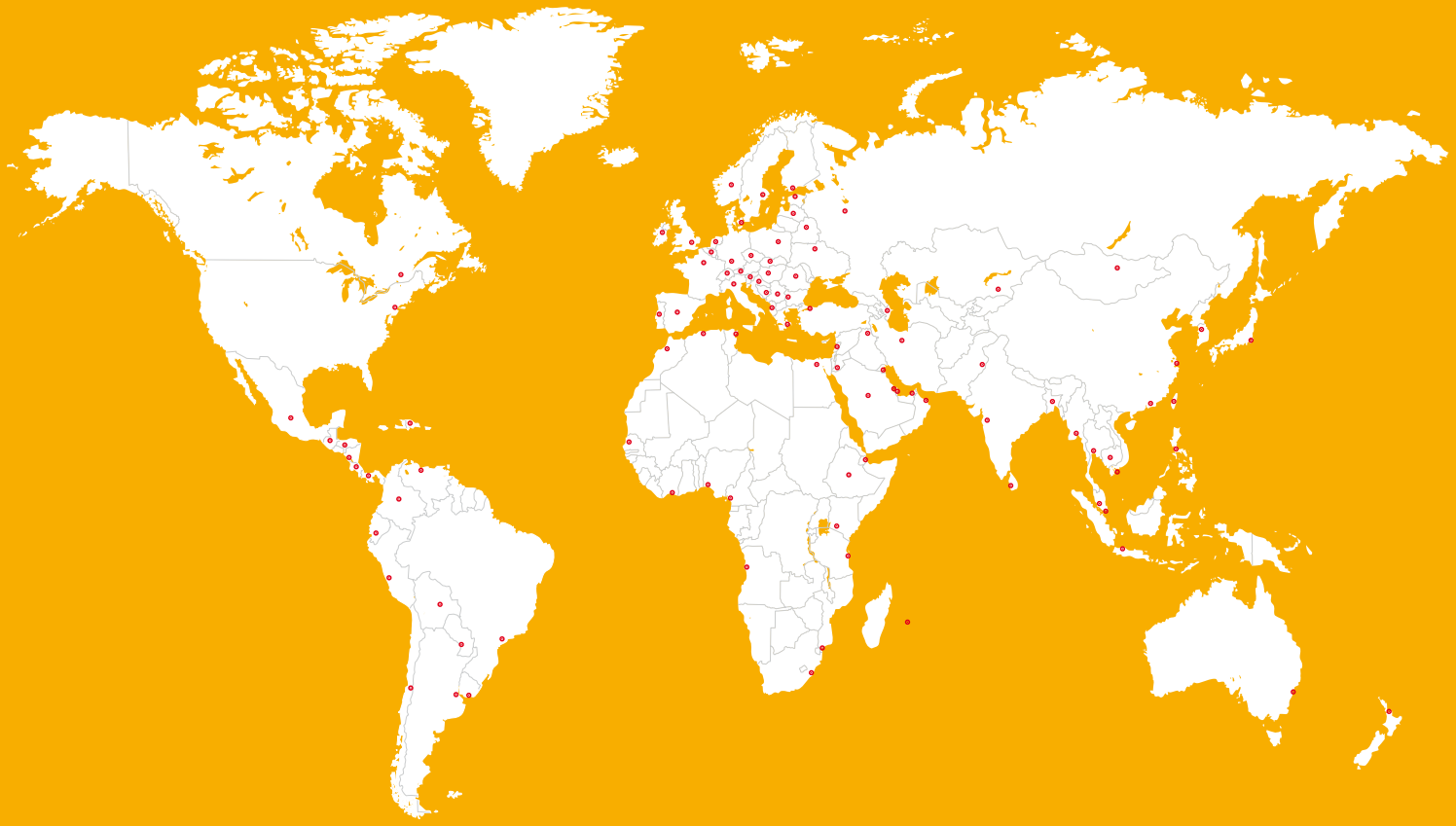
Sika Sealing and Bonding technologies evaluated with LCA and EPD
Sika offers sealing and adhesive products based on all major technologies, such as polyurethane (PU), silicones, silane-modified-polymers (SMP) and water based acrylates.
Cradle-to-gate Life Cycle Assessment (LCA) and Environmental Product Declaration (EPD) are powerful tools to measure, rate, improve and disclose the environmental performance across the value chain. Therefore, Sika systematically carries out comprehensive LCAs for all major technologies and products in accordance with ISO 14040 series and EN 15804 standards.

LCAs show no major difference between the technologies. The three main sealant technologies (Polyurethane, Silicones, SMP), which are generally used for weather sealing, show – depending on the quality of the product – similar results. Each technology has its "preferred" substrate. Non-reactive water based systems like acrylics have lower environmental impacts but are mainly used for indoor applications due to lower performance in movement, adhesion and weatherability. Hence, no technology can be determined as most sustainable.

Choose the best technology for your application and seal your building well.

For further information on Sealing and Bonding LCAs and EPDs, please contact your local Sika organization.

GLOBAL BUT LOCAL PARTNERSHIP



FOR MORE SEALING & BONDING INFORMATION:

WE ARE SIKA
Sika is a specialty chemicals company with a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing and protecting in the building sector and the motor vehicle industry. Sika's product lines feature concrete admixtures, mortars, sealants and adhesives, structural strengthening systems, industrial flooring as well as roofing and waterproofing systems.

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