

SEALING & BONDING SIKA SOLUTIONS FOR WINDOW INSTALLATION

SIKA'S COMPREHENSIVE FENESTRATION COMPETENCE

BUILDING TRUST





BENEFIT OF OUR SOLUTION

Globally, growing requirements to save energy and to utilize natural resources efficiently are the major driving factors for the development of facades, windows and the entire building envelope. Sika offers innovative and reliable solutions for window manufacturing as well as window installation. Sika adhesive solutions enable a force fitting connection between the pane and the sash frame of windows and help to accelerate the production process of window fabrications and improve the insulating properties of window frames as well.

In addition our portfolio for the window installation with membranes, expansion tapes, foams and sealants ensures tight connections to adjacent constructions and thus completes the construction of windows to meet the requirements of sustainable buildings.

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INTRODUCTION

DUE TO MORE STRINGENT environmental laws and connected incentive programs, rising energy prices and increasing public awareness the insulation of buildings becomes more and more important and is a key element of sustainable constructions. The share of window surface on new buildings has been constantly increasing over time. Modern window technology (double and triple glazing) achieves very high standards regarding thermal insulation. These windows providing excellent thermal insulation have to be installed in a way that matches the overall quality of the building envelope standard. It is pointless to have facades with excellent thermal insulation and high performing windows if these windows are installed unprofessionally. Therefore many countries have introduced standards for window installation such as, for instance, RAL installation guidelines in Germany.

In several European countries various organizations and associations have been founded in order to achieve certain standardization for new sustainable building constructions. They all have the aim that new buildings are constructed in a way to reduce the energy consumption to a minimum.

With a complete product portfolio for window installation and adhesives for window manufacturing Sika contributes to this goal of energy saving buildings.

Sika's range of window installation materials helps to meet the latest requirements and thus protects the environment. Sika sealants, membranes and expansion tapes seal window frames to achieve air proof building envelopes and protect the insulation from water infiltration and save therefore heating or cooling energy.



PROPER WINDOW INSTALLATION – CRUCIAL FOR A TIGHT BUILDING ENVELOPE

The most important issues regarding the proper installation of a window are:

THERMAL INSULATION

A continuous thermal insulation of the building envelope is crucial. Locally missing insulation causes thermal bridges which are the reason for energy loss and thus higher costs for heating and cooling. Especially between window frames and the adjacent building parts the thermal insulating solution must be planned and installed properly without any thermal bridges.

AIR TIGHTNESS

Differences in pressure and wind forces cause buildings to exchange air with the ambience. A building where the window installation only has a good thermal insulation, but an insufficient air tightness will exchange air faster than a tight facade construction. As a result the building will either cool down or heat up faster – depending on the outside climatic conditions – and more energy will be needed to keep a stable inside temperature.

RAIN TIGHTNESS

Water immersion can cause many problems as, for instance, rotting of construction parts, wetting of thermal insulation and a loss of its insulation values which may cause again higher energy consumption.



BUILDING PHYSICS – A MAJOR TOPIC FOR WINDOW INSTALLATION

The risk of damages for many building structures does not only come from effects of external moisture such as rain but from the moisture from inside as well.

Inside a building people and activities like cooking and washing release moisture which leads to a higher humidity and higher vapour pressure inside than outside the building. Through this circumstance the warm air with high water content diffuses from inside the building to the cooler outside.

As soon as the warm air with high water content meets a layer in the building envelope which is colder than the dew point temperature the moisture condensates. The accumulation of this water within the construction can cause damage over a period of time such as fungal attack, decrease of thermal insulations and in worst cases destruction of construction materials.

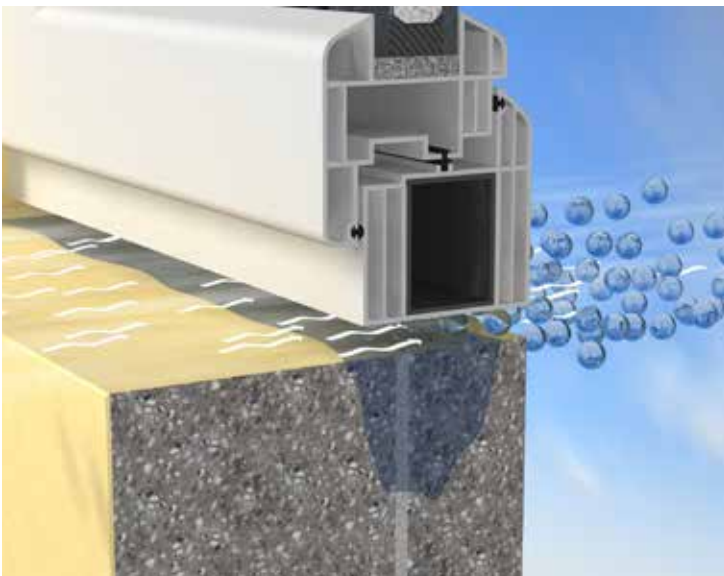
To prevent such damages the interior and exterior sealing must match and should therefore be planned properly.

The building envelope must be sealed externally against water ingress through driving rain and snow with watertight but vapour open waterproofing systems (e.g. SikaMembran® Window Outside). Thus any moisture in the wall structure can escape through the facade to the outside.

Inside the building all building envelope elements and especially the connection joints must be sealed with vapour impermeable solutions (e.g. SikaMembran® Window Inside) to prevent the transport of humidity into the wall construction and to make sure that the construction is protected from moisture and the resulting damages.

In general, the interior seal must be at least as vapor tight as the outer seal.

Attention, in warmer climates with high humidity and cooled buildings the transport of humidity may change from outside to inside. These facts must be taken in consideration during the determination of the construction and the construction materials.



AIR TIGHTNESS IS IMPORTANT FOR SUSTAINABLE BUILDINGS

The air permeability of the building should be measured to ensure that a particular building meets the strict requirements of ecological buildings (passive houses). Green building councils such as DGNB*, LEED* or Minergie* demand partly already a so called blower door test.

A blower door test uses a high powered fan and an air pressure sensing device to measure the air tightness of buildings and locate trouble spots so that they may be repaired in order to improve the energy conservation of the building, decrease indoor air pollution and control indoor environmental quality. The fan is fitted to an exterior door using a customizable airtight frame, the fan blows air out of the building and the pressure sensor measures the indoor air pressure. The resulting pressure difference forces air through all holes and penetrations in the building envelope (flowing from the outside in). The tighter the building (e.g. fewer holes), the less air is needed from the blower door fan to create a change in building pressure.

* DGNB Deutsche Gesellschaft für nachhaltiges Bauen (German Sustainable Building Council)

* LEED Leadership in Energy and Environmental Design (U.S. Green Building Council)

* Minergie Label for sustainable buildings in Switzerland



SIKA PRODUCT PORTFOLIO – COMPREHENSIVE AND YET COMPACT

MEMBRANES

SikaMembran® Window Outside



Vapour permeable, flexible, special membrane for air tight, wind tight and rain tight installation of windows.

KEY FEATURES AND BENEFITS

- Very flexible membrane, ideal for three dimensional fittings
- Double side fleece backing for optional over rendering
- One side equipped with pressure-sensitive tape for efficient installation on window frames
- Fire resistance class B2 according to DIN 4102

SikaMembran® Window Inside



Vapour impermeable, flexible, special membrane for air tight, wind tight and rain tight installation of windows.

KEY FEATURES AND BENEFITS

- Very flexible membrane, ideal for three dimensional fittings
- Double side fleece backing for optional over rendering
- One side equipped with pressure-sensitive tape for efficient installation on window frames
- Fire resistance class B2 according to DIN 4102



EXPANSION TAPE

Sika® ExpansionTape-100



Expansion tape used for thermal insulation between frame and adjacent construction. To seal against driving rain, sealants are required in addition (use SikaHyflex®-220 Window).

KEY FEATURES AND BENEFITS

- Cost optimized expansion tape
- Over paintable with major dispersion paint brands
- High initial adhesive strength for easy installation on window frames
- Fire resistance class B2 according to DIN 4102

Sika® ExpansionTape-600



Expansion tape used for sealing, thermal insulation as well as sound insulation. It is water vapour permeable and seals against wind, dust, spray water and driving rain.

KEY FEATURES AND BENEFITS

- Driving rain tight (≥ 600 Pa)
- Over paintable with major dispersion paint brands
- High initial adhesive strength for easy installation on window frames
- Fire resistance class B1 according to DIN 4102
- Quality and performance external controlled by IFT Rosenheim
- Complies with DIN 18542 BG1



UNIVERSAL TAPE (ALL IN ONE)

Sika® WindowTape One



One expansion tape for the entire window installation with higher performance than Sika® ExpansionTape. It is additionally 100% air tight and there is no extra sealing, insulation or adhesive needed.

KEY FEATURES AND BENEFITS

ONE product solution for the perfect window installation

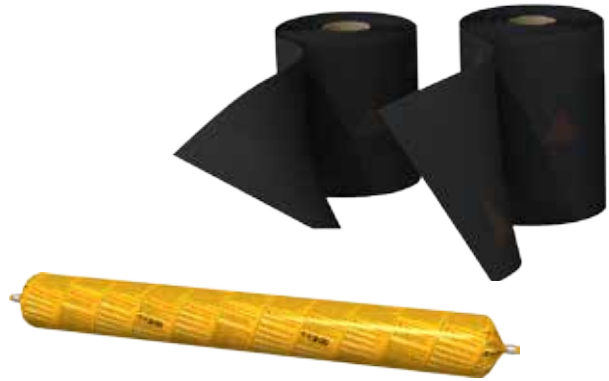
- Driving rain tightness >1000 Pa
- Optimal humidity transport towards outside
- Cost reduced installation (only one product necessary)
- Fulfills energy conservation regulations (EnEV*) and RAL* guidelines
- Fire resistance class B1 according to DIN 4102
- Complies with DIN 18542, BG1/ BGR

* EnEV Energieeinsparverordnung (Energy Conservation Act)

* RAL Deutsches Institut für Gütesicherung und Kennzeichnung (German Institute for Quality Assurance and Certification)

MEMBRANES FOR HIGHER DEMANDS

SikaMembran® SYSTEM FOR CURTAIN WALLING



The high quality system consists of indoor and outdoor membranes, which are bonded with Sikaflex® TF Plus N to the façade element and the building construction. This system is especially suitable for curtain wall facades, wide connections and multi-storey buildings with high demands through wind forces and UV radiation.

KEY FEATURES AND BENEFITS

- UV resistant and therefore suitable for open joints
- High tear resistance which allows wide joints even under severe weather conditions
- Very flexible membrane, ideal for three dimensional fittings
- Membranes with pressure sensitive tapes and fleece surface for over plastering are available
- Fire resistance class B2 according to DIN 4102



SEALANTS, FILLERS AND ANCHORING ADHESIVES

SikaHyflex®-220 Window



1-part, moisture curing, elastic, low modulus sealant. Ideal for perimeter joints of windows and doors and to bond SikaMembran® Window to the wall construction.

KEY FEATURES AND BENEFITS

- Accommodates movements resulting from different thermal expansion coefficients through its high movement capability and low modulus (ISO 11600 F 25 LM)
- Universal use due to wide adhesion spectrum to both porous and non-porous substrates, especially also to PVC
- Durable through good UV resistance and colour stability
- Solvent-free, odourless
- Over paintable

Sika Boom® Series



1-part, highly expansive polyurethane fixing foams to fill the gaps between window frames and adjacent building constructions

KEY FEATURES AND ADVANTAGES

- High thermal insulation
- Flexible to accommodate vibrations and small movements
- Durable with no deformation
- Environmentally friendly, containing no chlorofluorocarbons (CFC) or hydrofluorocarbons (HFC)

Sika AnchorFix®-1



Solvent- and styrene-free, fast curing two part polyester anchoring adhesive for the static fastening of windows (together with anchors).

KEY FEATURES AND ADVANTAGES

- Secure solution: suitable with every wall material
- Standard application guns can be used
- Can be used at low temperatures (till -10 °C)
- High load capacity
- Non-sag, even overhead



SIKA SOLUTIONS – WHERE TO USE WHICH PRODUCT

The following details show some of the various combinations of solutions for sealing windows in an exterior wall with insulation. For monolithic walls, core insulated walls and other constructions the details have to be adjusted accordingly.

Due to the flexibility of SikaMembran® Window, the good expansion capability of Sika® Expansion Tapes and the superior workability of SikaHyflex® sealants even complex details and connections can be tightened properly.

With the choice of materials should also be taken into account the adjacent construction material. Irregular joint widths require other solutions than a thin and uniform joint. With the three types of sealing material (membranes, tapes and sealants) Sika is able to provide for every window installation a suitable solution.

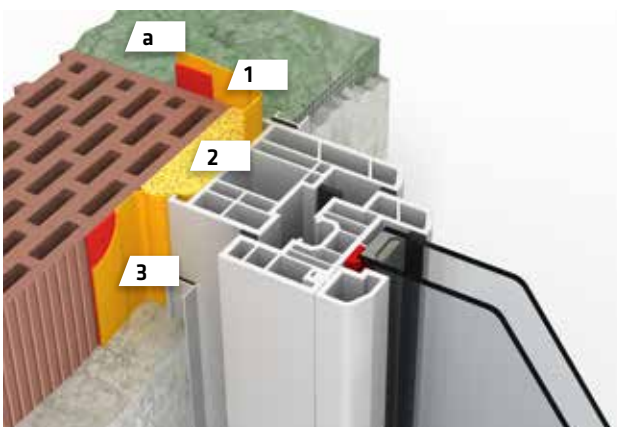
But the adjacent building material has not only influence on sealing. Especially for the fastening of windows or doors it must be known if the wall consists of concrete, light concrete, solid or perforated brick, wood or aerated concrete substrate.



ANCHORING ADHESIVE FOR FASTENING OF WINDOWS

With the anchoring adhesive Sika AnchorFix®-1 and the perforated sleeves Sika provides a fastener solution that is independent of the substrate and ensures a force-fitting connection between stainless or galvanized anchors and the adjacent building construction.

INTERIOR AND EXTERIOR SEALING WITH SikaMembran® Window



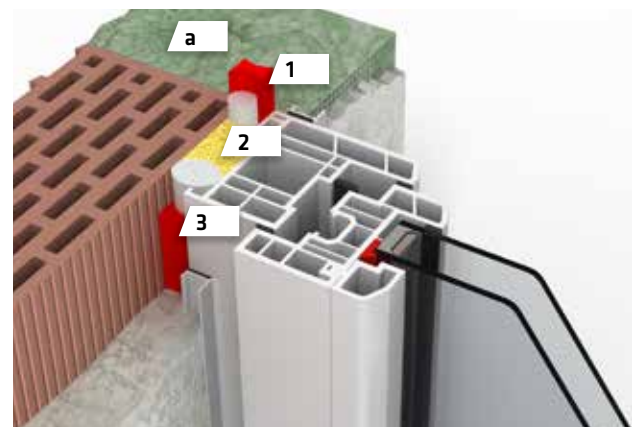
1 SikaMembran® Window Outside bonded with SikaHyflex®-220 Window

2 Sika Boom®

3 SikaMembran® Window Inside bonded with SikaHyflex®-220 Window

a Exterior insulation

INTERIOR AND EXTERIOR SEALING WITH SikaHyflex®



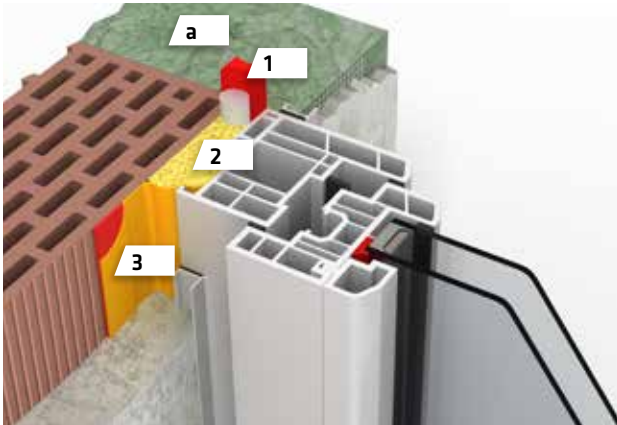
1 SikaHyflex®-220 Window and backing rod

2 Sika Boom®

3 SikaHyflex®-220 Window and backing rod

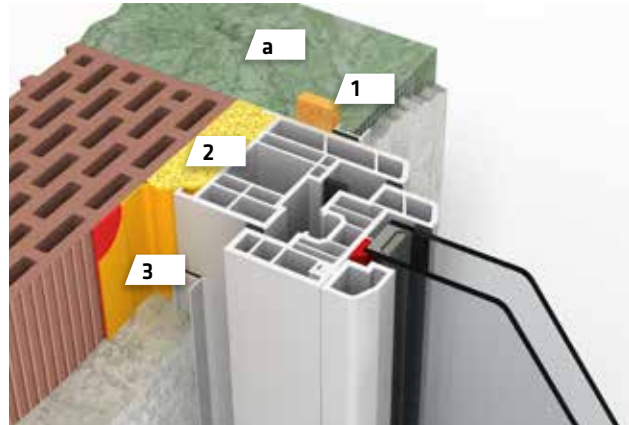
a Exterior insulation

**INTERIOR SEALING WITH SikaMembran® Window,
EXTERIOR SEALING WITH SikaHyflex®**



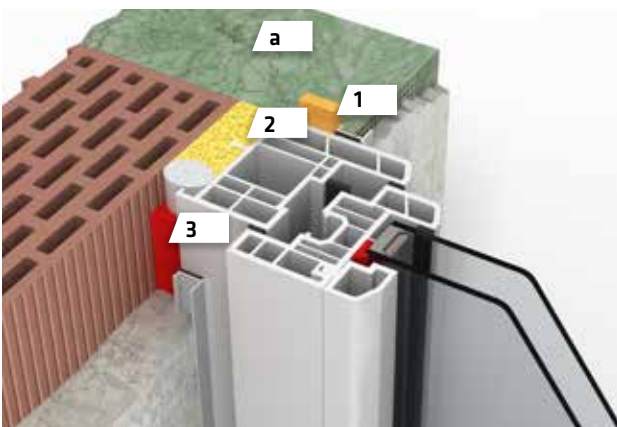
- 1 SikaHyflex®-220 Window and backing rod
- 2 Sika Boom®
- 3 SikaMembran® Window Inside
- a Exterior insulation

**INTERIOR SEALING WITH SikaMembran® Window,
EXTERIOR SEALING WITH Sika® ExpansionTape**



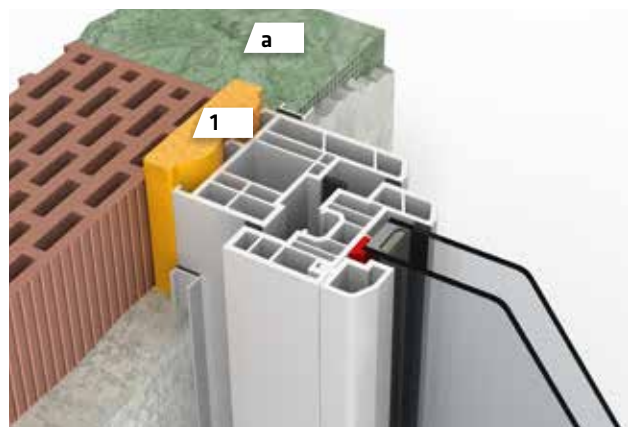
- 1 Sika® Expansion Tape
- 2 Sika Boom®
- 3 SikaMembran® Window Inside bonded with SikaHyflex®-220 Window
- a Exterior insulation

**INTERIOR SEALING WITH SikaHyflex®, EXTERIOR SEALING
WITH Sika® ExpansionTape**



- 1 Sika® Expansion Tape
- 2 Sika Boom®
- 3 SikaHyflex®-220 Window and backing rod
- a Exterior insulation

**Sika® WindowTape One: AIRTIGHT, DRIVING RAIN TIGHT
AND INSULATING AT ONCE**



- 1 Sika® WindowTape One
- a Exterior insulation

STRUCTURAL WINDOW BONDING

Latest glazing technology for windows

BONDING THE INSULATING GLASS units to the window profile is the latest glazing technology for windows. The idea is to use the structural properties of the glass for the window performance. The technology leads to slimmer frames and state of the art energy ratings.

COMPETITIVENESS THROUGH STRUCTURAL WINDOW BONDING

- Less material costs (up to 30%)
- Automated glazing process
- Almost maintenance free windows
- Improvement of thermal insulating values and solar heat gains



STRUCTURAL GLASS BONDING IN PLASTIC WINDOWS

Structural glass bonding in plastic windows makes the windows stiffer and increases productivity.

- Bonding improves the dimensional stability of sash frame, even without steel reinforcement, the design is no longer determined by the size of the steel reinforcement.
- Filigree frame structures for maximum sash frame sizes are possible, more than 2.5 m high and weights up to 130 kg without steel reinforcement are possible.
- Permanent bonding of the glass and frame prevents settling of the window sash, on-site adjustment of the sash frames is no longer necessary. This saves money and increases utility.
- Reduced frame dimensions means more glass, more light, and better thermal insulation.
- Bonding allows an automated glazing process to increase productivity.

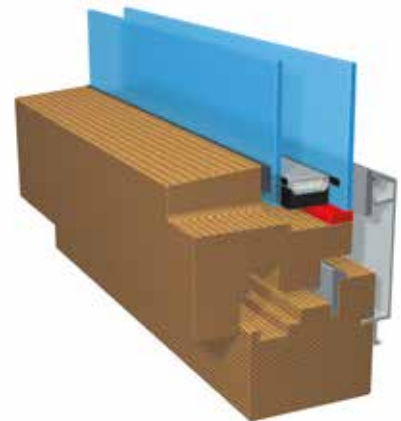


Interior Overlap Bonding with Sikasil® WT Technology

STRUCTURAL GLASS BONDING IN WOOD AND WOOD / ALUMINUM WINDOWS

Structural glass bonding makes wood and wood/aluminium windows competitive.

- Bonding in wood and wood/aluminium windows reduces maintenance costs. Glass covers the sash frame and protects it against weathering. Repainting becomes obsolete.
- Glass can be maximized by less frame material for more light by lower production costs.
- Bonding allows an automated glazing process to increase productivity.

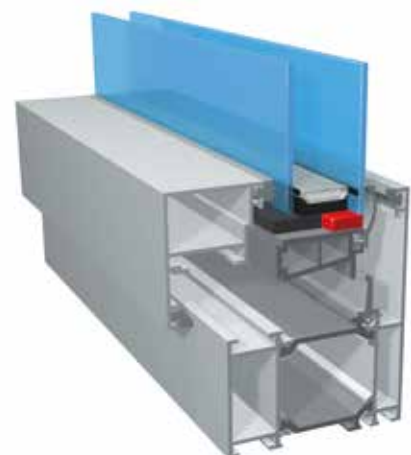


Glass Edge Bonding with Sikasil® WT Technology

STRUCTURAL GLASS BONDING IN ALUMINIUM WINDOWS

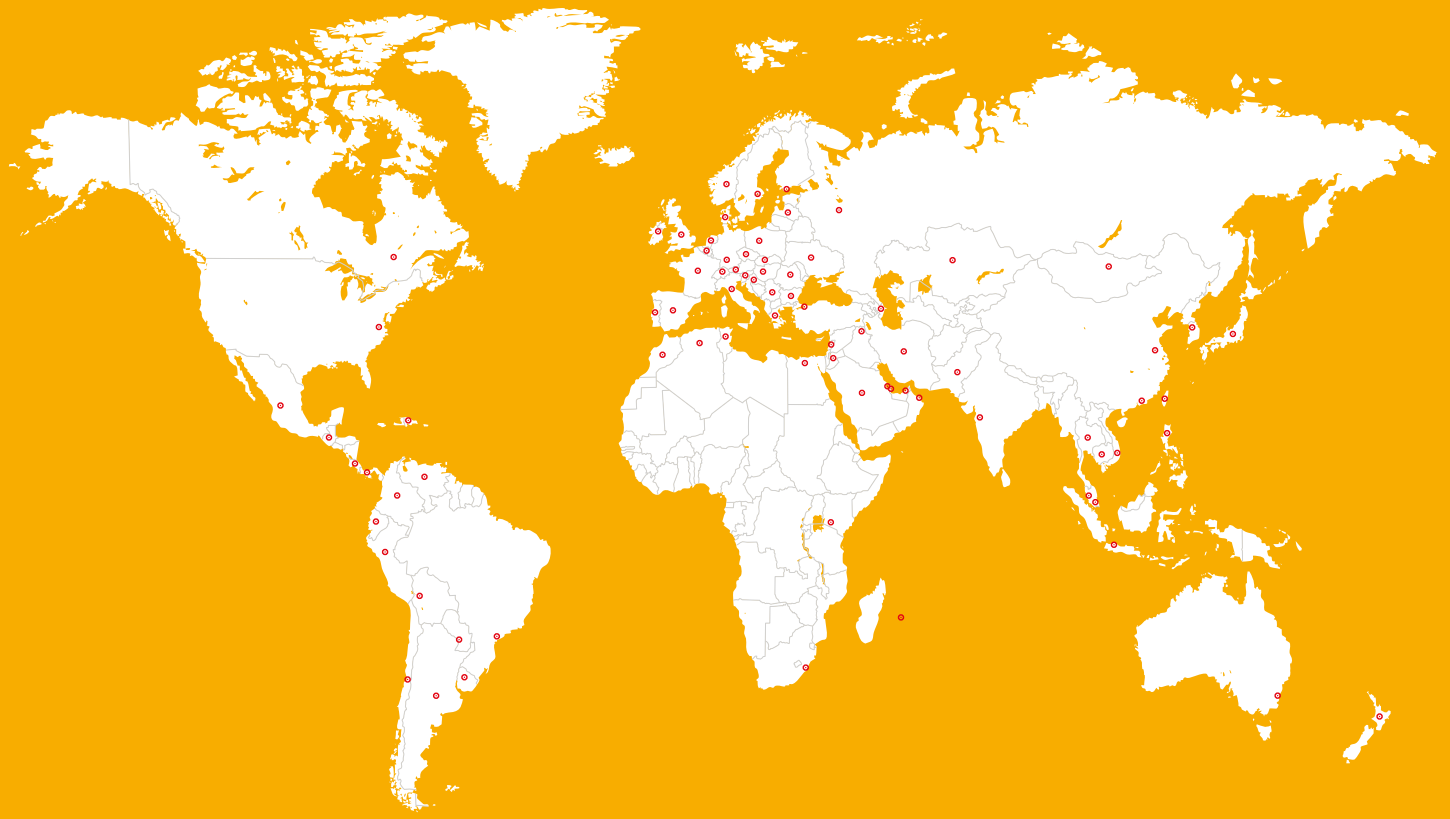
Structural glass bonding in aluminium windows improves insulation and reduces costs.

- Bonded insulated glass units act like thermal breaks.
- Additional thermal breaks in sash profiles can be avoided.
- Reduction of aluminium frame material (up to 25%).
- Bonding allows an automated glazing process to increase productivity.



Glass Edge Bonding with Sikasil® WT Technology

GLOBAL BUT LOCAL PARTNERSHIP



FOR MORE SEALING & BONDING INFORMATION:



WHO WE ARE

Sika AG, Switzerland, is a globally active specialty chemicals company. Sika supplies the building and construction industry as well as manufacturing industries (automotive, bus, truck, rail, solar and wind power plants, façades). Sika is a leader in processing materials used in sealing, bonding, damping, reinforcing and protecting loadbearing structures. Sika's product lines feature highquality concrete admixtures, specialty mortars, sealants and adhesives, damping and reinforcing materials, structural strengthening systems, industrial flooring as well as roofing and waterproofing systems.

Our most current General Sales Conditions shall apply.
Please consult the Data Sheet prior to any use and processing.



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