SIKA FFI
SEALING AND BONDING
IN FACADE AND FENESTRATION
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CURTAIN WALL FACADE
A curtain wall facade is a lightweight multifunctional building envelope made of glass (single- or multi-pane units), metal, stone or composite panels. These panels are fixed to a metal subframe, either with pressure plates (capped systems) or bonded with silicone adhesive sealants (structural glazing). This system is mechanically fixed to the main building structure. Curtain wall facades are the state-of-the-art technology for high-rise buildings.

VENTILATED FACADE
Ventilated facades consist of a wall construction, mainly concrete or steel, with an external (or internal) insulating layer and decorative envelope. The air gap between the insulating and decorative surfaces is used for the ventilation of the facade. The decorative panels can be made of a variety of material such as metal, composite materials, ceramics, timber, etc. and offer the architect significant freedom of design.

FACADES

SAFETY
Protection against heat, cold, wind, rain, humidity, noise

PROTECTION
Safety for burglary resistance, fire protection, bomb blast resistance

AESTHETICS
Aesthetics by design freedom, choice of materials, non-staining

PROFITABILITY
Profitability because of durability of materials, energy saving, low maintenance cost

FACADE AND WINDOWS
The building envelope design is a central part of the building’s planning process. The facade not only provides the first visual impression of the building but also impacts the climate control of the building and thus the way we feel in the building.

Therefore the design requirements of the facade are manifold and have become increasingly demanding. The standards for energy saving and gain have become more stringent and will strongly influence future developments. The challenge is to develop sustainable systems and components which meet the requirements of modern design and ensure safe and economical facade and window construction.

Sika continues to develop new products and systems for sealing and bonding facades and windows to meet the demands of systems for the latest technology know-how. Sika aims to develop its sealing and bonding technologies to meet the specific market requirements in close cooperation with leading architects, specifiers and curtain wall and window fabricators.
STRUCTURAL GLAZING AND INSULATING GLASS

STRUCTURAL SEALANT GLAZING
Structural glazing modules are subject to extremely high stresses. They must accommodate wind and snow loads as well as thermal expansion. Furthermore they permanently transfer the forces to the support structure, while also withstanding weathering over many years. High-modulus Sikasil® SG silicone adhesive sealants offer the best properties for this purpose.

Recommended Sika products

- **Sikasil® SG-550** – 2-part structural glazing adhesive, very high mechanical strength, design factor \( \varepsilon_{\text{dyn}} 0.20 \) MPa, ASTM and ETAG approved, CE marked
- **Sikasil® SG-500** – 2-part structural glazing adhesive, cartridge solution for onsite repair available, ETAG approved, CE marked
- **Sikasil® SG-500 CN** – 2-part structural glazing adhesive, cartridge solution for onsite repair available, ASTM approved
- **Sikasil® SG-20** – 1-part structural glazing adhesive, high mechanical strength and movement capability, design factor \( \varepsilon_{\text{dyn}} 0.17 \) MPa, ETAG approved, CE marked
- **Sikasil® SG-18** – 1-part structural glazing adhesive, ASTM approved

SYSTEM BENEFITS
- Strong but flexible fixation of glass units
- Attractive appearance without visible frames
- No shading of glass edges, no thermal stress
- Most energy efficient facade technology

www.sika.com/ffi-sg

INSULATING GLAZING
In insulating glazing, double or triple glazing alike, it is particularly important that no water vapor should penetrate into the space between the panes and, in case of noble gas-filled units, the gas losses should be reduced to a minimum. Thus, a double-sealed edge seal system is state of the art. Sika offers a complete product range for IG edge sealing including primary and secondary sealants, suitable for gas retention of 30+ years.

Recommended Sika products

- **Sikasil® IG-25 HM Plus** – 2-part silicone insulating glass secondary seal, design factor \( \varepsilon_{\text{dyn}} 0.19 \) MPa, suitable for air- and gas-filled IG units, EN1279-2 and -3 and ETAG approved, CE marked
- **Sikasil® IG-25** – 2-part silicone insulating glass secondary seal, EN-1279-2 and ETAG approved, CE marked
- **Sikaglaze® IG-5 PIB** – Butyl insulating glass primary seal, suitable for air- and gas-filled IG units, EN-1279-2 and-3 approved

SYSTEM BENEFITS
- Compatible system approach in IG, SG and WS applications
- Sikasil® IG grades and Sikaglaze® IG-5 PIB available in black and grey
- Perfect color matching of grey Sikasil® IG and Sikaglaze® IG-5 PIB with Sikasil® SG and WS and Sikaku® Spacer Tape HD
- IG sealants tried and tested on all common IG production lines and application machines

www.sika.com/ffi-ig

www.sika.com/ffi-sg

SIKA FFI – OVERVIEW

left:
Hotel W, Barcelona, 2006
Architects Ricardo Bofill; Facade UTE Facadas

top right:
Torre Puig, Barcelona, 2013
Architects Rafael Moneo, Lucho Marcial; Facade Permasteelisa Spain.
First European project with Sikasil® SG-550

bottom right:
30 St Mary Axe, (Swiss Re), London, 2004
Architects Foster & Partners; Facade Schmidtlin AG ECL Contracts Ltd
WEATHER SEALING

The quality and optical appearance of a curtain wall are critically dependent on appropriate weather sealing. The facade elements are ultimately subject to extreme movements due to temperature changes, moisture (in the case of concrete), shrinkage of construction materials (wood, concrete), sound, wind and vibrations, which may affect the joints and adjacent elements. Natural stone elements request compatible non-staining solutions.

Recommended Sika products

**Sikasil® WS-605 S**
1-part silicone weather sealant, non-streaking on glass and metal surfaces, ASTM approved

**Sikasil® WS-305 CN**
1-part silicone weather sealant, ASTM approved

**Sikasil® WS-355**
1-part silicone weather sealant, non-staining on natural stone, ASTM approved

**Sikasil® WS-680 SC**
1-part hybrid weather sealant, suitable for self-cleaning glass

SYSTEM BENEFITS

- Standard grades and specialties available
- Compatible with Sikasil® IG and SG grades
- Available in a great variety of colors
- Perfect color matching with grey Sikasil® IG and IG - Sika® Spacer Tape and SikaGlaze IG-S PIB

www.sika.com/ffi-ws

FIRE-RESISTANT FACADES

Sika’s fire-resistant weathersealant Sikasil® FS-665 for curtain wall facades has been tested to BS476, part 20 with 4 hours fire resistance. The self-levelling version Sikasil® FS-665 SL has been optimized for floor joint applications. Sikacryl® FS-265 completes the product range for interior application.

Recommended Sika products

**Sikasil® FS-665**
1-part silicone fire-retardant sealant, 4 hours fire-rated against BS 476-20, UL approved (2 hrs fire-rated)

**Sikasil® FS-665 SL**
1-part silicone fire-retardant sealant, self-levelling, suitable for wide floor joints, 4 hours fire-rated against BS 476-20

**Sikacryl® FS-265**
1-part acrylic fire-retardant sealant, UL approved (2 hrs fire-rated)

SYSTEM BENEFITS

- Sikasil® FS grades compatible with Sikasil® IG, SG and WS
- Third-party test reports available

www.sika.com/ffi-fire

SIKA FFI – OVERVIEW

top left: Axiata Centre (Quill 7), Kuala Lumpur Sentral, 2009
Architects Michael Ung Chartered Architect; Facade CML Sdn Bhd

top right: Pangu Plaza, Beijing, 2008
Architects C.Y. Lee & Partners, Facade Shanghai Huayi

bottom: CNOOC Building, Beijing, 2005
Architects Kohn Pedersen Fox Associates PC, Facade Josef Gartner

www.sika.com/ffi-ws
VAPOR PROOFING AND GLASS WALL GROUTING

WATER/VAPOR PROOFING
Depending on the climatic conditions both wet sealants (Sikasil® silicone or Sikaflex® PU) or SikaMembran® Systems can be used for movement/connection joints and perimeter sealing around the facades and windows. SikaMembran® Systems are high-quality systems with optimized water/vapor diffusion resistance levels.

GLASS WALL GROUTING
In total vision glazing (TVG, fin glazing) and glass balustrades the glass panes should be fixed to the floor with low punctual stress transfer to the glass. With SikaGlaze® GG-735 the bottom glass edge is embedded in the floor, and thus results in uniform stress distribution. The PU embedding is protected against weathering by Sikasil® WS silicone sealants.

Recommended Sika products
SikaMembran® Universal, Outdoor Plus, Strong
EPDM based vapor control membrane system, CE marked

SikaBond® TF-Plus N
1-part PU membrane adhesive, compatible with SikaMembran®

SYSTEM BENEFITS
- Vapor control system suitable for almost all climatic conditions
- Available in 0.6 mm thickness for easy application
- Available in 1.2 mm thickness for high mechanical resistance

www.sika.com/ffi-membrane

Recommended Sika products
SikaGlaze® GG-735
2-part self-levelling PU grout, compatible with PVB laminate

Sikasil® WS-605 S
1-part silicone weather sealant, compatible with PVB laminate, non-streaking on glass and metal surfaces

SYSTEM BENEFITS
- Stress-free embedding of glass balustrades
- Fast installation
- Compatible and durable solution

www.sika.com/ffi-glass-grout
OPAQUE FACADES

PANEL BONDING
The SikaTack® Panel system consists of an adhesive and prefixing tape and surface pretreatment agents. It can be used both for direct on-site bonding or factory prefabrication. Both technologies provide a great design freedom.

SOUND DAMPING
SikaDamp® and SikaGard® are efficient, easy-to-apply solutions to reduce the noise of structure-borne vibrations or external impacts (rain drops and hail grains) on metal and composite panels.

Recommended Sika products

**SikaTack® Panel Adhesive**
1-part PU adhesive, high shear strength for heavy panels

**SikaTack® Panel Prefixing Tape**
double-sided self-adhesive fixing tape for initial fixing of facade panels

**SYSTEM BENEFITS**
- Economical for rapid fixing
- Uniform tension over the whole facade panel (no tress points)
- Resistant to weathering and ageing
- Vibration and movement absorbing fixing system
- Provides creative opportunities for facade design

www.sika.com/ffi-panel

**SikaDamp®-620**
Elastomer rolls equipped with a thin aluminum flashing

**SikaGard®-6682**
1-part acrylate based sound damping dispersion for spray application

**SYSTEM BENEFITS**
- Efficient sound damping over wide range of temperature (-10 to +60°C)
- Easy to cut into tailor made pieces and to roll onto facade panels (SikaDamp®)
- Spray-on systems available (SikaGard®)

**PANEL LAMINATION**
Sika supplies adhesives for the production of sandwich panels combining many kinds of materials for thermal insulation in the spandrel sections. Ask your Sika contact for SikaForce® system solutions.

www.sika.com/ffi-panel
STRUCTURAL WINDOW BONDING

Window bonding is an innovative technology where the glass is directly bonded to the sash. The glass stiffens the sash and allows weight reduction of sash material and minimizing the sash width. All loads are uniformly transferred to the sash by replacing the setting blocks by an adhesive applied on all four sides. This minimizes the risk of glass breakage.

Recommended Sika products

Sikasil® WT-485
2-part silicone adhesive, UV-resistant, high curing speed for automated application

Sikasil® WT-480
2-part silicone adhesive, high modulus, long mixer open time

Sikasil® WT-470
2-part silicone adhesive, highly flexible, medium curing speed

Sikasil® WT-40
1-part silicone adhesive, easy to apply

SikaFast®-5000 series
2 part acrylates, extremely high modulus, extremely fast curing

Sika® Glazing Tape Prefix
Acrylic adhesive tape, immediate fixation of glass

SYSTEM BENEFITS

- Improvement of thermal insulation
- Increase of approved wind load
- Reduction of production costs
- Reduction of service costs
- Up to 90% lower complaint rate

www.sika.com/windows

WINDOW INSTALLATION

For high performing windows it is crucial to have these windows installed in line with the latest standards for energy efficient window installation such as, e.g., RAL installation guidelines in Germany. Sika offers the appropriate products.

Recommended Sika products

SikaMembran® Window Outside; Window Inside
Vapor permeable, resp. vapor proof, flexible, membrane for air, wind and rain tight window installation, double-side fleece backing for optional over rendering

Sika® ExpansionTape-100; Sika® ExpansionTape-600
Expansion tape for noise and thermal insulation between frame and adjacent construction, high initial adhesive strength for easy installation, ExpansionTape-600 is CE certified (ETA-07/0072)

Sika® WindowTape One
One expansion tape for the whole window installation, suitable for "passive-house" standards, fulfills energy conservation regulations (EnEV) and RAL guidelines

SYSTEM BENEFITS

- Improvement of thermal insulation
- Increase of approved wind load
- Reduction of production costs
- Reduction of service costs
- Up to 90% lower complaint rate

www.sika.com/windows

WINDOWS

left: Leutschentower, Zurich, Switzerland, 2011
Architect: Bettix Consolascio; Architekten AG, Zurich
Window manufacturer: Baumgartner AG
Window type: Wood/aluminum with opening lights bonded with SikaFast®-520 NT

top right: D4 Center Z5, Root, Switzerland, 2011
Architect: Scheitlin-Syfrig Architekten, Lucerne
Window manufacturer: 1hauckler AG
Window type: Wood/aluminum with opening lights bonded with Sikasil® WT-40

bottom right: Single-family home in Swabian Alps, Germany
Window manufacturer: Glueck
Window type: Wood with stepped insulating glass bonded with Sikasil® WT-470
SIKA FACADE TECHNOLOGIES

BONDING TECHNOLOGIES

Structural glazing and Insulating glass edge sealing
Sikasil® SG and Sikasil® IG: high-modulus silicone technology for UV-resistant glass bonding and IG edge sealing.

Panel bonding
SikaTack® Panel System: the high-strength PU technology for stress-free bonding of opaque facade panels.

Panel lamination
SikaForce®: PU adhesives for production of sandwich panels.

Panel reinforcement (panel strengthening)
Sikallond®, SikaFast®, SikaPower®, Sikasil® SG: various products for different bonding technologies for an efficient reinforcement of facade panels and claddings.

Structural window bonding
Sikasil® WT, SikaFast®, Sikaflex®, various products for structural strengthening of window sashes by direct bonding of IG units to the sash made of any kind of material.

SEALING TECHNOLOGIES

Wet joint sealing
Sikasil® WS: the specialized low-modulus silicones for glass, metals, natural stones and plastics. Sikaflex®: the high-end PU and PU-hybrid sealants for movement and connection joints preferably on porous substrates.

Joint membranes
SikaMembran® Systems: the flexible high-quality membranes for joint sealing and vapor proofing in line with the highest requirements of construction physics.

FURTHER TECHNOLOGIES

Glass wall grouting
SikaGlaze® GG: high-strength, self-levelling PU systems for embedding glass panes of glass walls and balustrades.

Sound damping
SikaDamp®, sound damping butyl sheet for roll-on application. SikaGard®, spray-on sound damping solution.

Anchoring
Sika® AnchorFix®, the high-strength and fast-curing solution for chemical anchoring.
OUR PERFORMANCE – YOUR BENEFITS

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<tr>
<th>PERFORMANCE</th>
<th>BENEFITS</th>
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<tbody>
<tr>
<td>Construction consultancy</td>
<td>Review and consultancy of facade and window systems with regard to suitability for bonding</td>
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<tr>
<td></td>
<td>Advice on system improvements i.e. material choice or dimensioning</td>
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<tr>
<td>Functional testing</td>
<td>Support with prototyping</td>
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<td></td>
<td>Functional tests / test plan of entire system for compatibility, adhesion and function</td>
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<tr>
<td>Application technology</td>
<td>Active consulting, including the selection of right application technology</td>
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<td></td>
<td>Assist in system and equipment engineering / bonding technology</td>
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<td></td>
<td>Support with application and quality procedures</td>
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<tr>
<td>Applicator training</td>
<td>Preparation of operating manuals for bonding in conformity with ISO</td>
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<td></td>
<td>Factory and on-site training of applicators</td>
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<tr>
<td>External approvals</td>
<td>Best practice sample preparation</td>
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OUR CORE COMPETENCE - FROM DESIGN TO PROCESS
Sika develops bonding and sealing solutions in close cooperation with its customers in the facade and window industry. To Sika, this means not only developing best-in-class technology solutions to match the customer’s technical and commercial requirements, but also ensuring appropriate performance throughout the design, prototyping, validation and full production phases. Experts in Sika’s R&D, Technical Service and System Engineering specialize in devising unique client-oriented solutions.

DESIGN AND SYSTEM ENGINEERING
Application oriented adhesives and sealants, as well as innovative construction methods are currently in high demand, which calls for design and application support. At Sika FFI Competence Centres, the most suitable solutions are developed in partnership with our customers to achieve the targeted results. Ultimately, this means reduced production costs, greater product reliability, improved aesthetic appeal and faster turn-around times, adding value to the activities of Sika customers.

TECHNICAL SERVICE
Sika Technical Service teams are located around the world, and are dedicated to providing best practice selection, validation and application of Sika materials. By being located close to our customers, Sika Technical Service provides fast and reliable project tests based on international or local standards and can assure optimum local language communication and understanding throughout the technical application development process to ensure the best possible results.

Left: International Finance and Economy Centre, Beijing, 2007
Architects: Rocco Design Ltd., Hong Kong; Facade: Shenyang YuanDa
WHO WE ARE

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 has subsidiaries in 84 countries around the world and manufactures in over 160 factories. Its more than 16,000 employees generate annual sales of CHF 5.14 billion.

FOR MORE INFORMATION:

For more literature about Sika Facade and Fenestration solutions browse:
www.sika.com/ffi-downloads

GLOBAL BUT LOCAL PARTNERSHIP