

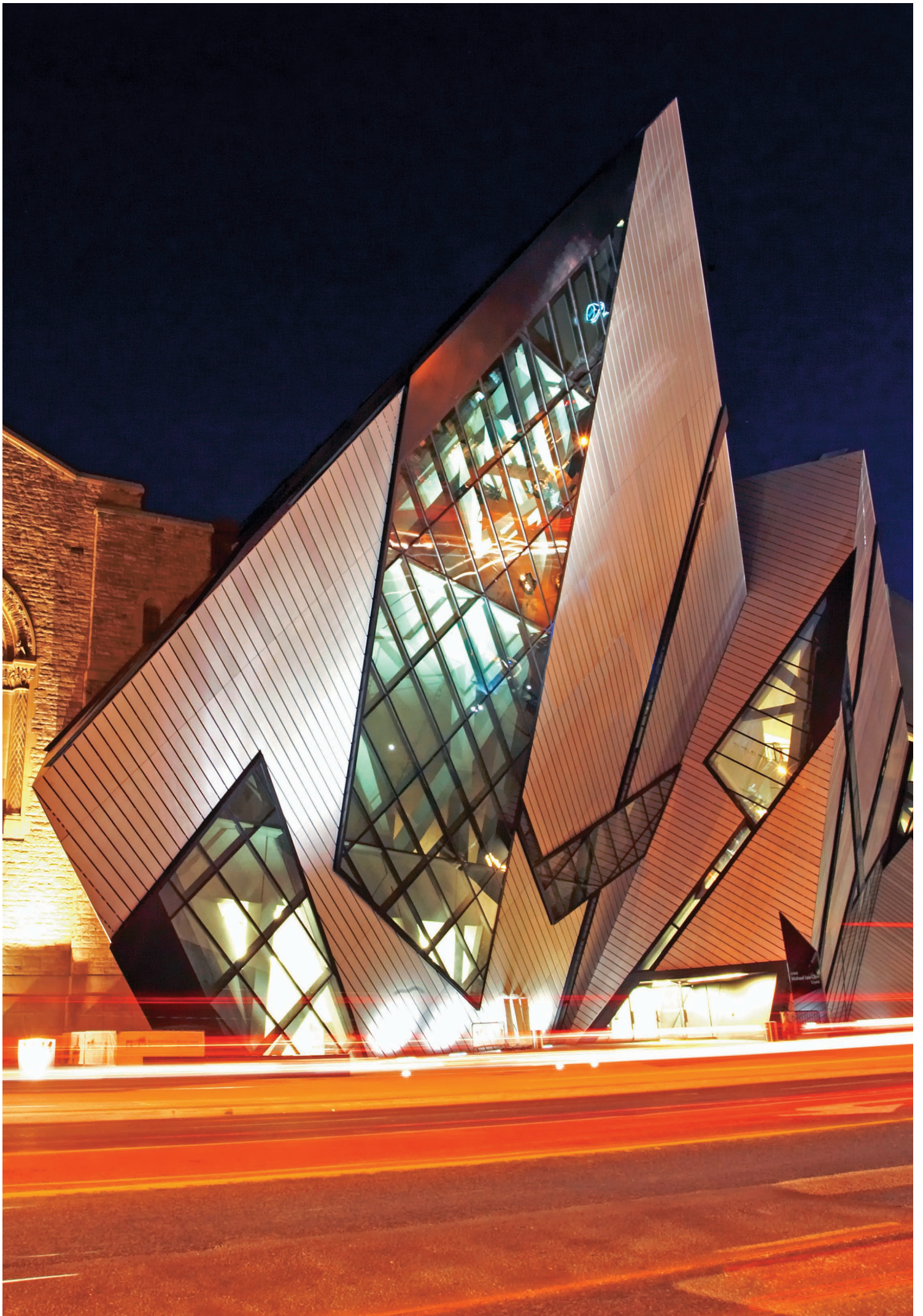


# SIKA FFI SEALING AND BONDING IN FACADE AND FENESTRATION

BUILDING TRUST









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**19** OUR PERFORMANCE – YOUR BENEFITS

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left:

**Royal Ontario Museum, Toronto**

Extension Michael Lee-Chin Crystal

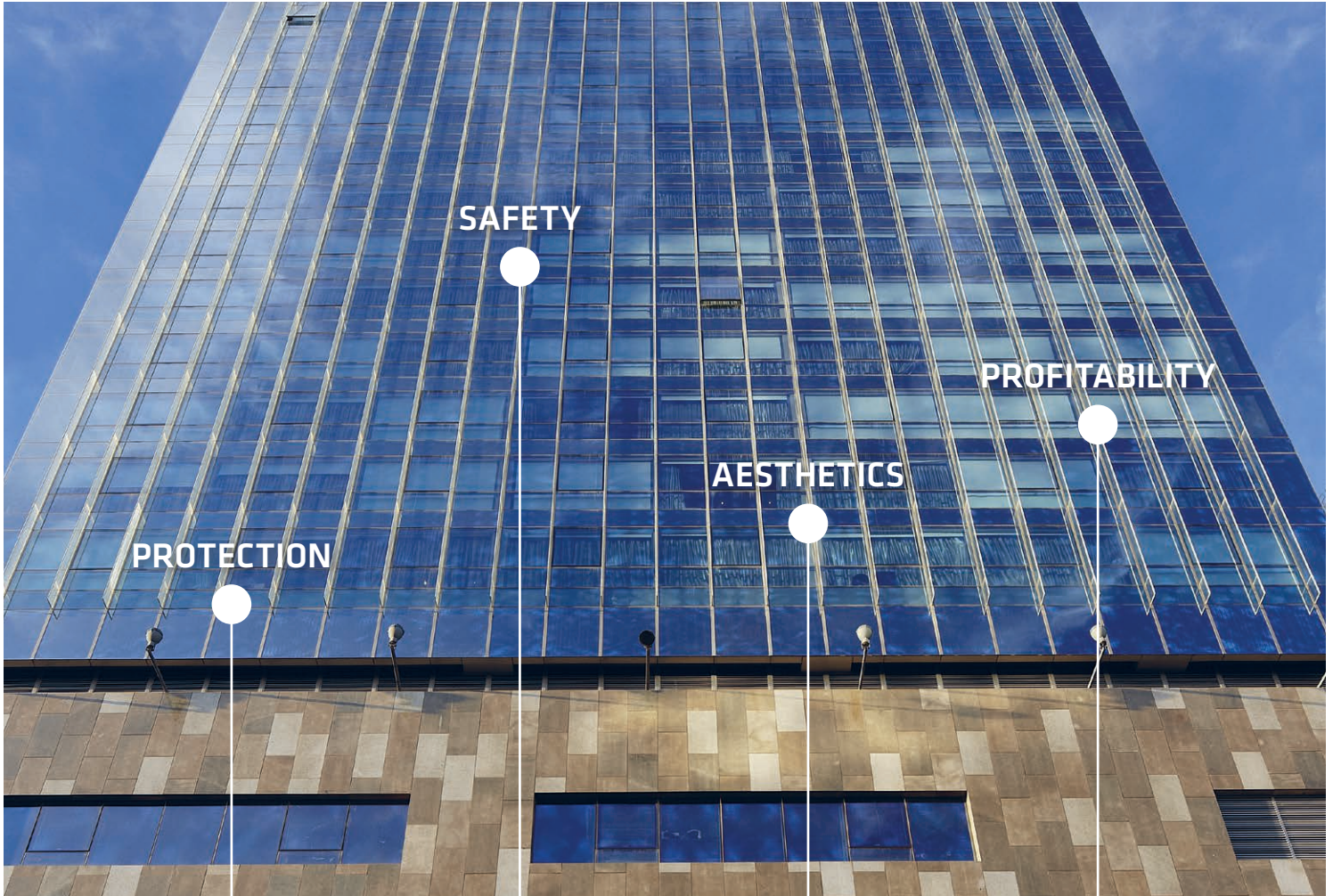
**Architects** Studio Daniel Libeskind; **Facade** Josef Gartner

front:

**Palais de justice de Paris (2017)**

**Architects** Renzo Piano Building Workshop; **Facade** Permasteelisa

# BUILDING ENVELOPE



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

Safety for burglary resistance, fire protection, bomb blast resistance

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

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.



# FACADES

## 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

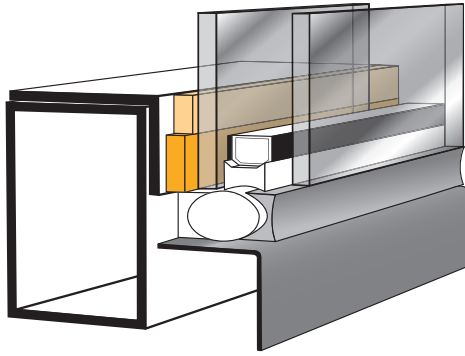
Ventilated facades consist of a wall construction, mainly concrete or steel, with an external (or internal) insulating layer and decorative envelope. The air gap between the insulating and decorative surfaces is used for the ventilation of the facade.

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.





# 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-500** – 2-part structural glazing adhesive, cartridge solution for onsite repair available,  
For Europe: ETAG approved, CE marked  
For America, Asia, Middle East: ASTM approved  
For China: GB approved

**Sikasil® SG-550** – 2-part structural glazing adhesive, very high mechanical strength, design factor  $\sigma_{dyn}$  0.20 MPa, ASTM and ETAG approved, CE marked

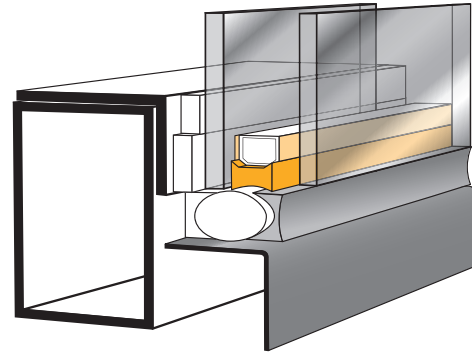
**Sikasil® SG-20** – 1-part structural glazing adhesive, high mechanical strength and movement capability, design factor  $\sigma_{dyn}$  0.17 MPa, ETAG approved, CE marked

**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](http://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** – 2-part silicone insulating glass secondary seal, EN-1279-2  
For Europe: ETAG approved, CE marked  
For America, Asia, Middle East: ASTM approved  
For China: GB approved

**Sikasil® IG-25 HM Plus** – 2-part silicone insulating glass secondary seal, design factor  $\sigma_{dyn}$  0.19 MPa, suitable for air- and gas-filled IG units, EN1279-2 and -3 and ETAG approved, CE marked, ASTM approved

**Sikasil® IG-25** – 2-part silicone insulating glass secondary seal, EN-1279-2 and ETAG approved, CE marked

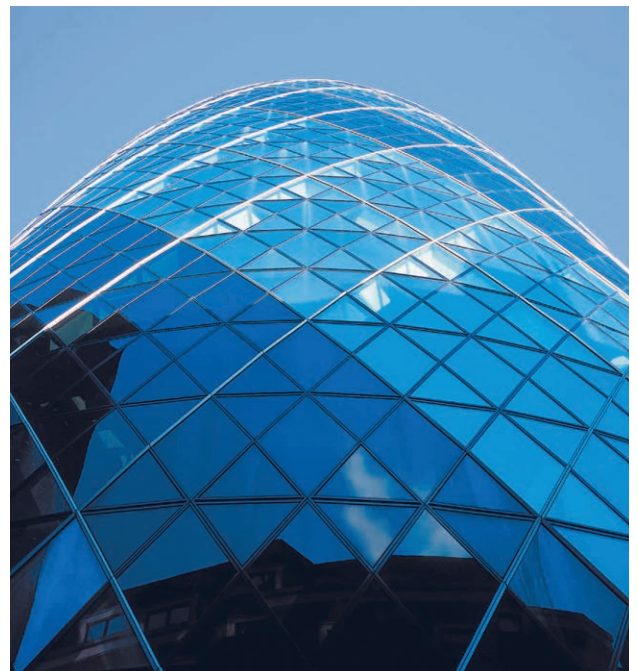
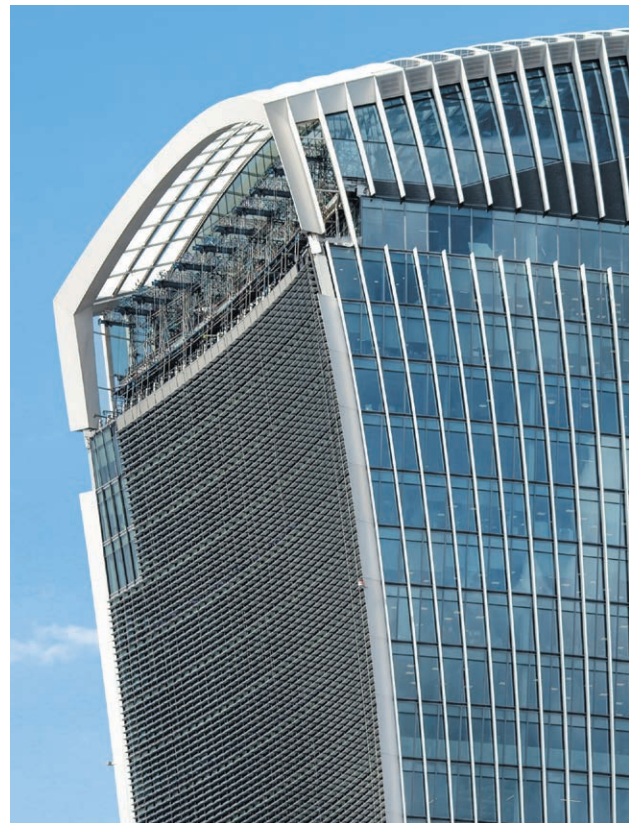
**SikaGlaze IG-5 PIB** – Butyl insulating glass primary seal, suitable for air- and gas-filled IG units, tested against EN 1279-4

### 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 Sika® Spacer Tape HD
- IG sealants tried and tested on all common IG production lines and application machines

[www.sika.com/ffi-ig](http://www.sika.com/ffi-ig)





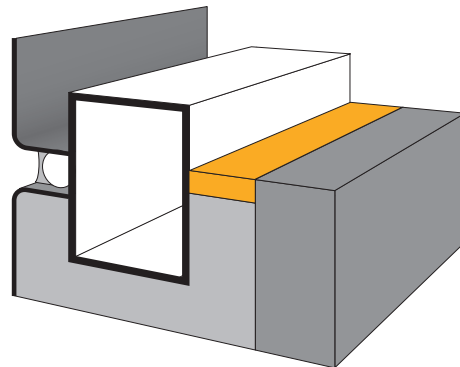
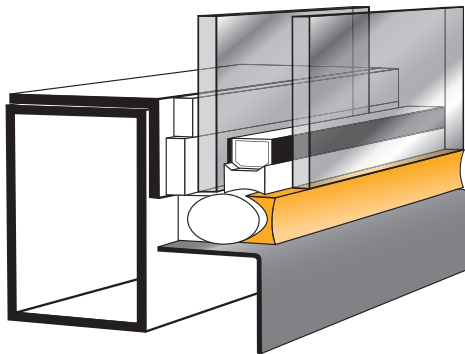
left:  
**Hotel W, Barcelona, 2006**  
**Architects** Ricardo Bofill; **Facade** UTE Facadas

top right:  
**20 Fenchurch Street, 2015**  
**Architects** Rafael Viñoly Architects, Adamson Associates  
**Facade** Permasteelisa, Josef Gartner

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



# WEATHER SEALING AND FIRE RETARDANT SEALING



## 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, CE marked

#### Sikasil® WS-305

1-part silicone weather sealant  
For Europe: CE marked  
For America, Asia, Middle East: ASTM approved

#### Sikasil® WS-355

1-part silicone weather sealant, non-staining on natural stone, ASTM approved, CE marked

## 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® SG and IG
- Sika® Spacer Tape and SikaGlaze IG-5 PIB

[www.sika.com/ffi-ig](http://www.sika.com/ffi-ig)

## FIRE-RESISTANT FACADES

Sika's fire-resistant weathersealant Sikasil®-670 Fire 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®-620 Fire completes the product range for interior application.

### Recommended Sika products

#### Sikasil®-670 Fire

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, CE marked

#### Sikacryl®-620 Fire

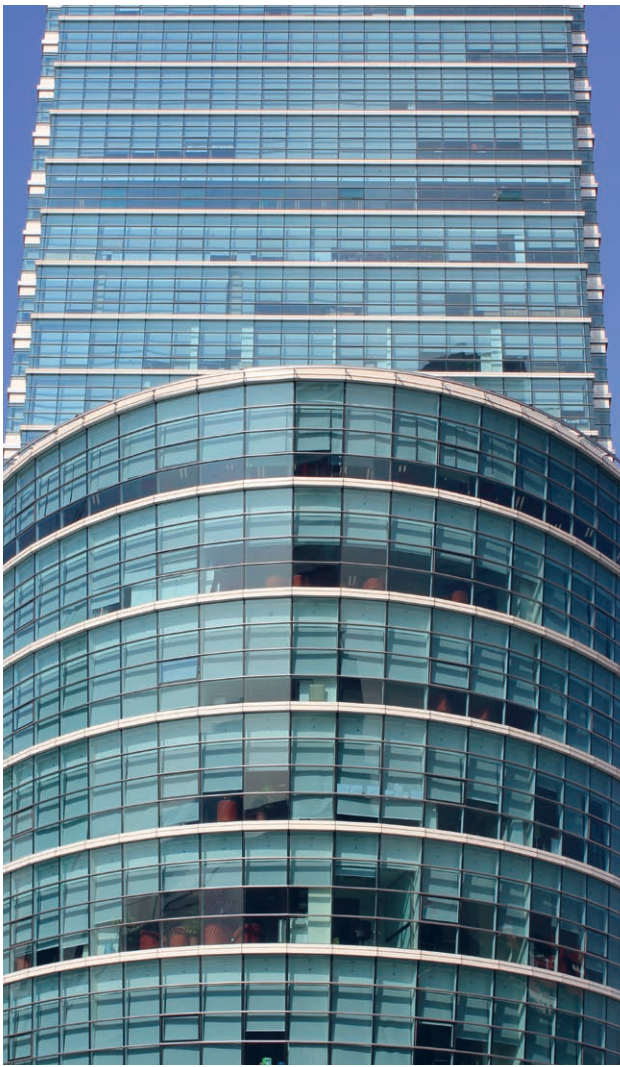
1-part acrylic fire-retardant sealant, UL approved (2 hrs fire-rated), CE marked

## SYSTEM BENEFITS

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

[www.sika.com/ffi-ws](http://www.sika.com/ffi-ws)





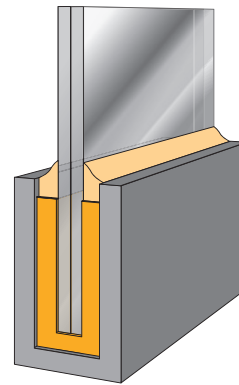
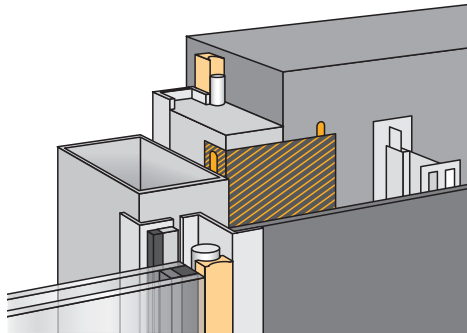
top left:  
**Axiata Centre (Quill 7), Kuala Lumpur Sentral, 2009**  
**Architects** Micheal Ong Chartered Architect; **Facade** CML Sdn Bhd

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



# VAPOR PROOFING AND GLASS WALL GROUTING



## WATER/VAPOR PROOFING

Depending on the climatic conditions both wet sealants (Sikasil® WS silicone or 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.

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### 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®

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### 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](http://www.sika.com/ffi-membrane)

## 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 SikaForce®-335 GG 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.

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### Recommended Sika products

**SikaForce®-335 GG**  
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

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### SYSTEM BENEFITS

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

[www.sika.com/ffi-glass-grout](http://www.sika.com/ffi-glass-grout)

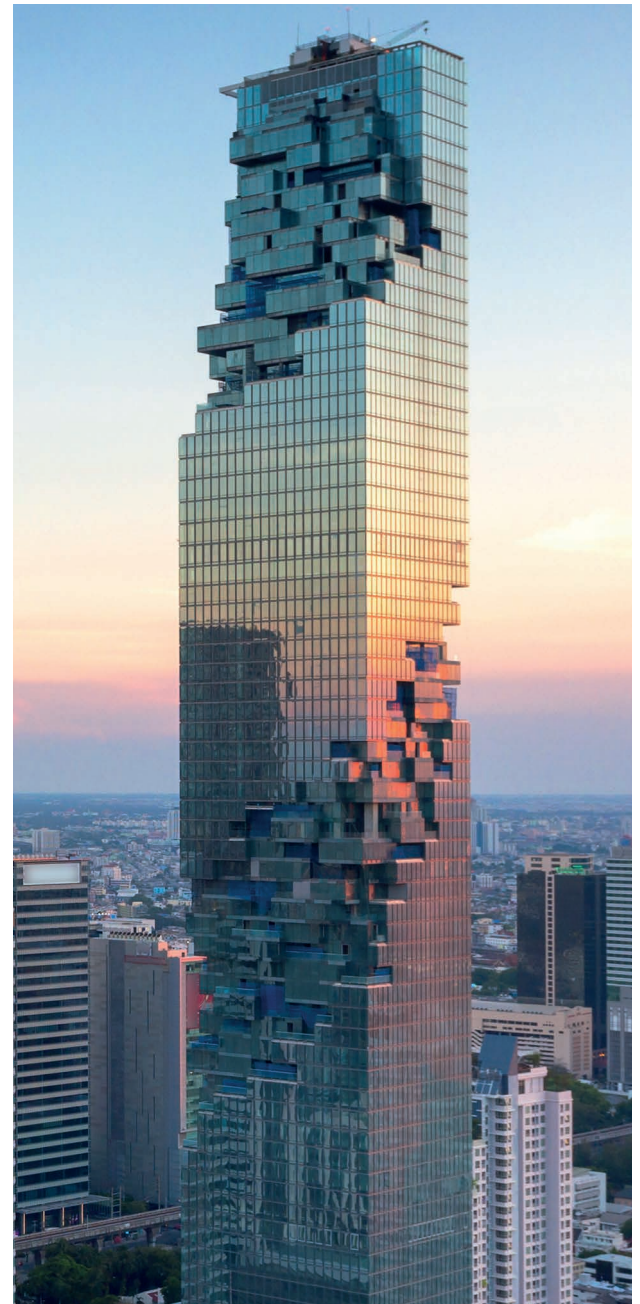




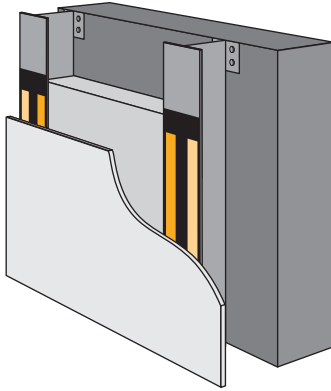
top left:  
**5 Aldermanbury Square, London, 2005**  
**Architect** Eric Parry Architects; **Facade** Lindner-Schmidlin UK

bottom left:  
**Riverbank House, London, 2011**  
**Architects** David Walker Architects; **Facade and balustrades** Josef Gartner

bottom right:  
**MahaNakhon, Bangkok, 2016**  
**Architect** Office for Metropolitan Architecture OMA (NL)  
**Balustrades** by Peterson (TH)



# 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.

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### Recommended Sika products

#### SikaTack® Panel Adhesive

1-part PU adhesive, high shear strength for heavy panels

#### SikaTack® Panel-50 Adhesive

1-part silicone adhesive, flexible at a wide range of temperature for most climatic conditions

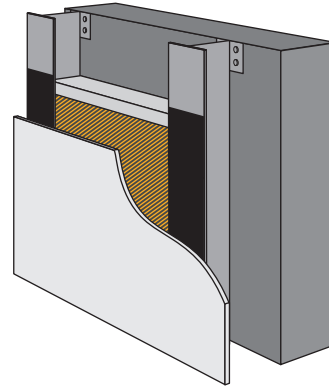
#### SikaTack® Panel Prefixing Tape

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 stress points)
- Resistant to weathering and ageing
- Vibration and movement absorbing fixing system
- Provides creative opportunities for facade design

[www.sika.com/ffi-panel](http://www.sika.com/ffi-panel)



## 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.

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### Recommended Sika products

#### 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

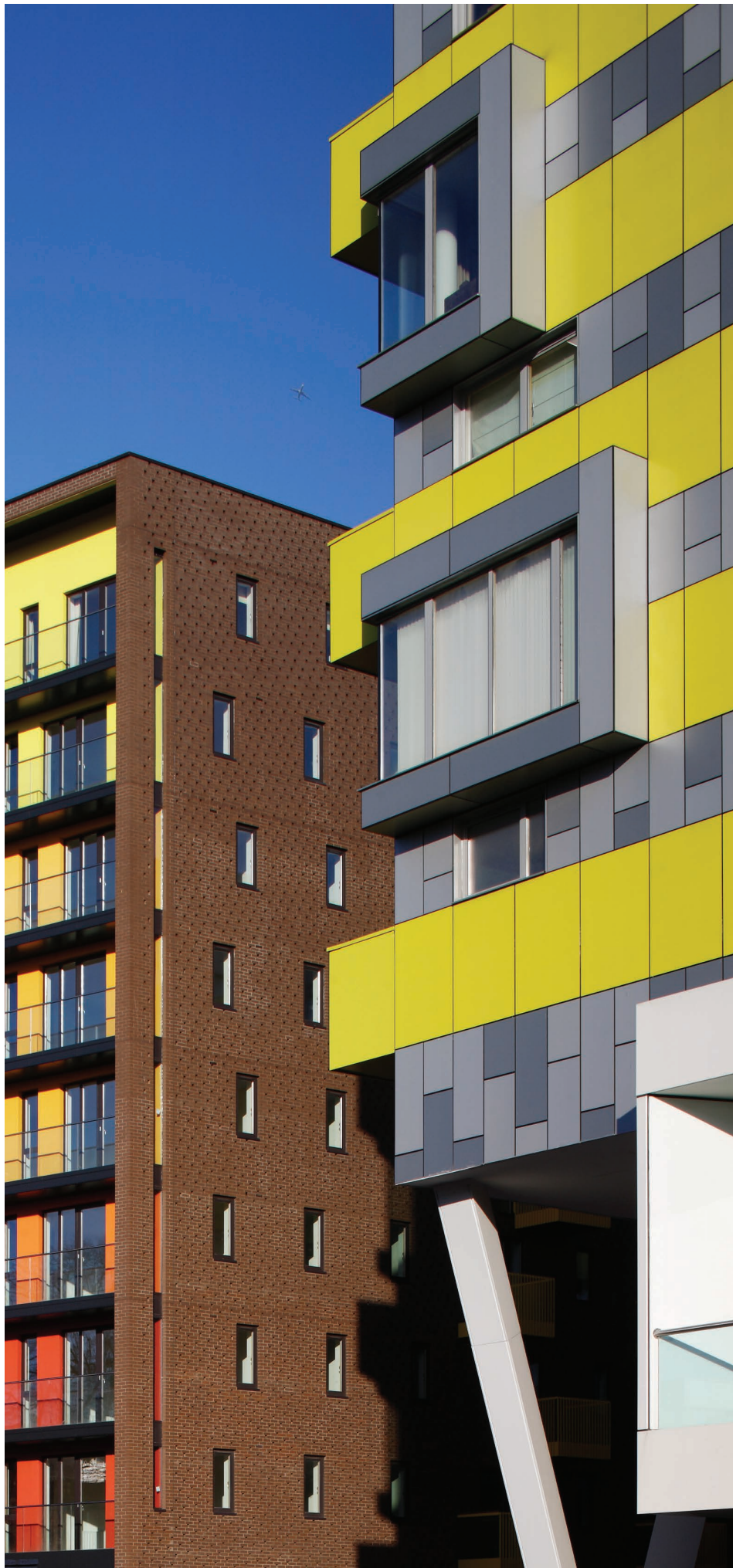
Sika supplies adhesives for the production of sandwich panels combining many kinds of materials for thermal insulation in the spandrel sections. Ask your Sika contact for SikaForce® system solutions.



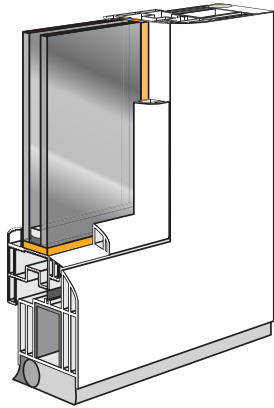
right:  
**Lifelong Learning Centre Barking, UK**  
Architect Allford Hall Monaghan Morris; Facade Cladding UK

top left:  
**Office Building Zurich, 2012**  
Facade Shenyang YuanDa

bottom left:  
**Sony Ericsson UK HQ, Coventry**  
Facade ECL Contracts Ltd.



# WINDOWS



## 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.

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### Recommended Sika products

#### **Sikasil® WT-470, WT-480, WT-485**

2-part silicone adhesives, UV-resistant, with various curing speeds, suitable for manual up to fully automated application

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#### **Sikasil® WT-65**

1-part silicone adhesive, easy to apply

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#### **Sikasil® WT-66 PowerCure**

1-part silicone adhesive, easy to apply, accelerated curing

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#### **SikaFast®-500 series**

2-part acrylates, extremely high modulus, extremely fast curing

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#### **Sika® Glazing Tape Prefix**

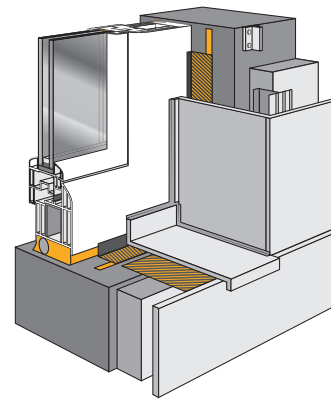
Acrylic adhesive tape, immediate fixation of glass

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## 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](http://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.

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### 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

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#### **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)

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#### **Sika® WindowTape One**

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

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left:  
**Leutschentower, Zurich, Switzerland, 2011**  
**Architect** Bétrix Consolascio; Architekten AG, Zurich  
**Window manufacturer** Baumgartner AG  
**Window type** Wood/aluminum with opening lights bonded with SikaFast®-5201 NT

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

bottom right:  
**Single-family home in Swabian Alps, Germany**  
**Window manufacturer** Walch  
**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: high-strength PU and silicone technologies for stress-free bonding of opaque facade panels.

### Panel lamination

SikaForce®: PU adhesives for production of sandwich panels.

### Panel reinforcement (panel strengthening)

SikaBond®, 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 weather sealant range comprises of specialized low-modulus silicones for glass, metals, natural stones and plastics and 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

SikaForce® 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

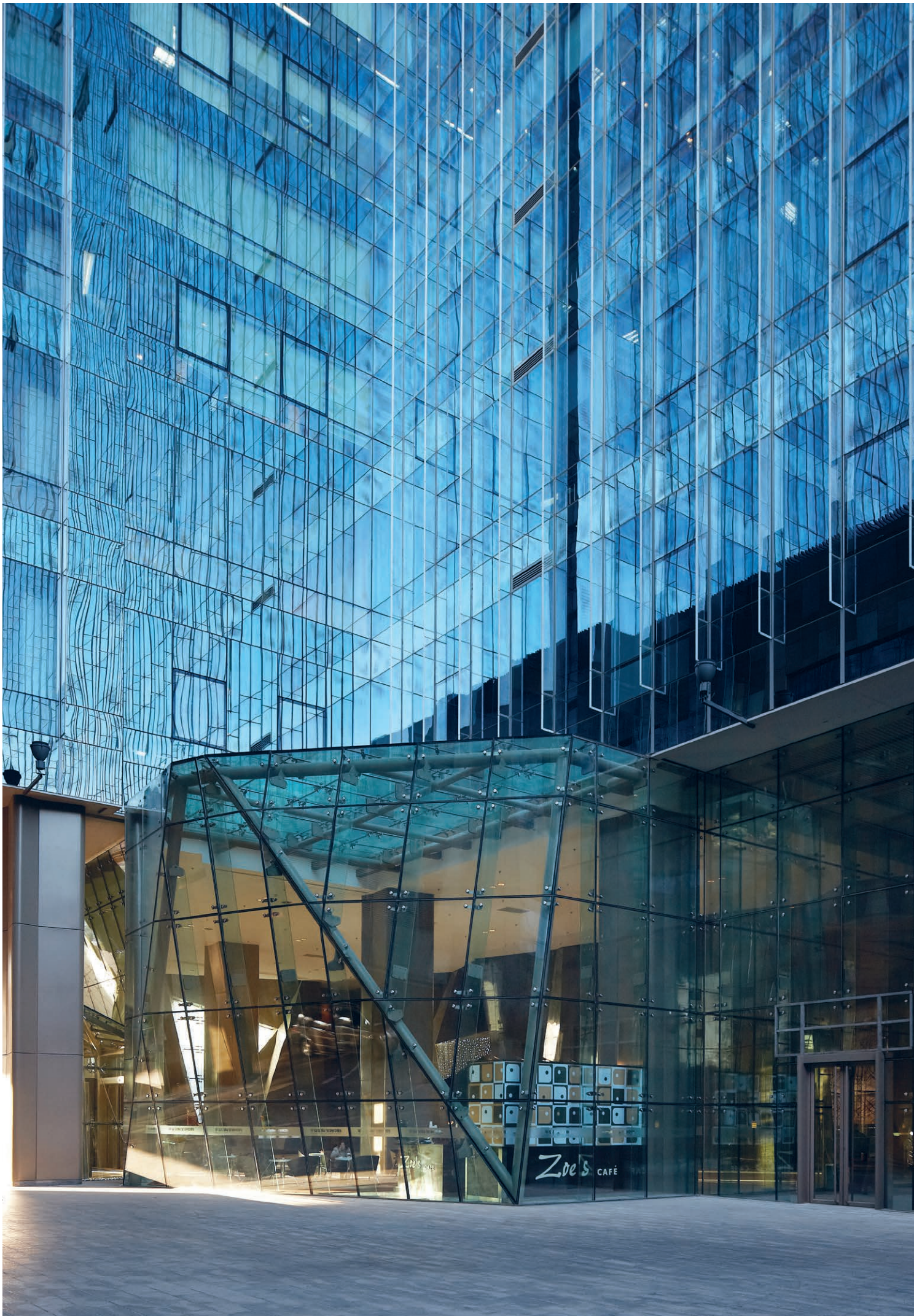
Sika® AnchorFix®: the high-strength and fast-curing solution for chemical anchoring.



top:  
**California Academy of Science, Exhibition and Research Center, San Francisco, 2008**  
Architects Renzo Piano Building Workshop; Facade Josef Gartner

left:  
**Cloud Nine Plaza, Shanghai, 2006**  
Architects Arquitectonica, USA; Facade Shanghai Meite







# OUR PERFORMANCE – YOUR BENEFITS



## PERFORMANCE

## BENEFITS

Construction consultancy	<ul style="list-style-type: none"> <li>■ Review and consultancy of facade and window systems with regard to suitability for bonding</li> <li>■ Advice on system improvements i.e. material choice or dimensioning</li> </ul>
Functional testing	<ul style="list-style-type: none"> <li>■ Support with prototyping</li> <li>■ Functional tests / test plan of entire system for compatibility, adhesion and function</li> </ul>
Application technology	<ul style="list-style-type: none"> <li>■ Active consulting, including the selection of right application technology</li> <li>■ Assist in system and equipment engineering / bonding technology</li> <li>■ Support with application and quality procedures</li> </ul>
Applicator training	<ul style="list-style-type: none"> <li>■ Preparation of operating manuals for bonding in conformity with ISO</li> <li>■ Factory and on-site training of applicators</li> </ul>
External approvals	<ul style="list-style-type: none"> <li>■ Best practice sample preparation</li> </ul>
Online project management	<ul style="list-style-type: none"> <li>■ Easy-to-use online platform <a href="http://www.sika-bonding-excellence.com">www.sika-bonding-excellence.com</a></li> <li>■ Always up-to-date by effective project tracking with realtime visualization of each step of project progress in the workflow.</li> </ul>



### 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

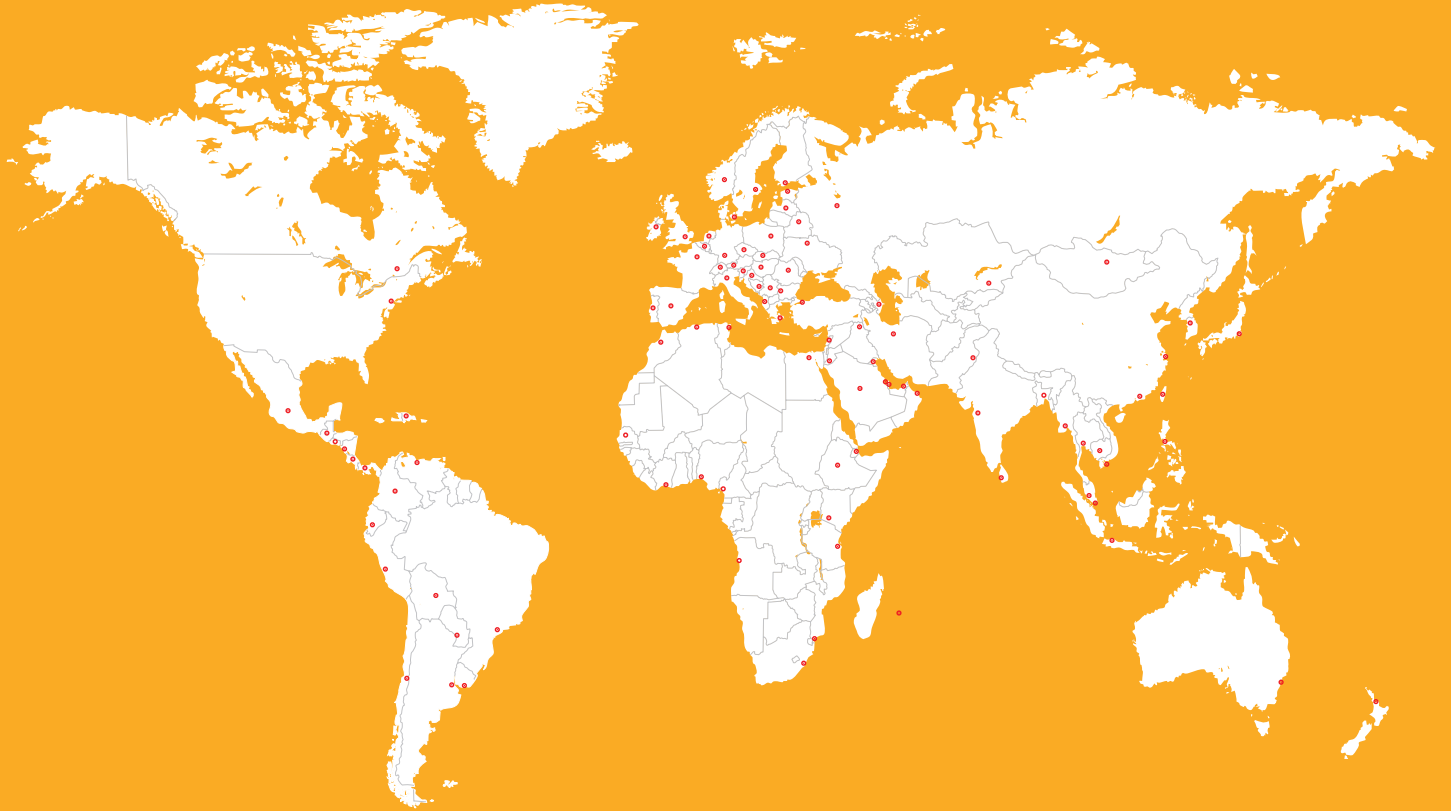
Application oriented adhesives and sealants, as well as innovative construction methods are currently in high demand, which calls for design and application support. At Sika Facade and Fenestration Competence Centres, the most suitable solutions are developed in partnership with our customers to achieve 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. Being located close to our customers, Technical Department of Sika Industry provides fast and reliable project tests based on international or local standards. In comprehensive training sessions in local language Sika can assure optimum communication and understanding for the appropriate product application. Furthermore, Sika supports the build-up of proper QA/QC procedures and systems complying with relevant standards.

# GLOBAL BUT LOCAL PARTNERSHIP



## FOR MORE INFORMATION:

**For more literature about Sika Facade and Fenestration solutions browse:**

[www.sika.com/ffi-downloads](http://www.sika.com/ffi-downloads)

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, flooring as well as roofing and waterproofing systems.

### Technical Service

Sika Services AG  
FFI Competence Centre  
Tüffenwies 16  
CH-8048 Zürich  
Phone +41 58 436 5633  
[it-ses-admin@it.sika.com](mailto:it-ses-admin@it.sika.com)

### Customer Service

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Phone +39 02 516591 205  
Fax +39 02 516591 298  
[it-ses-admin@it.sika.com](mailto:it-ses-admin@it.sika.com)

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Switzerland



[www.sika.com/building-components](http://www.sika.com/building-components)

**BUILDING TRUST**

