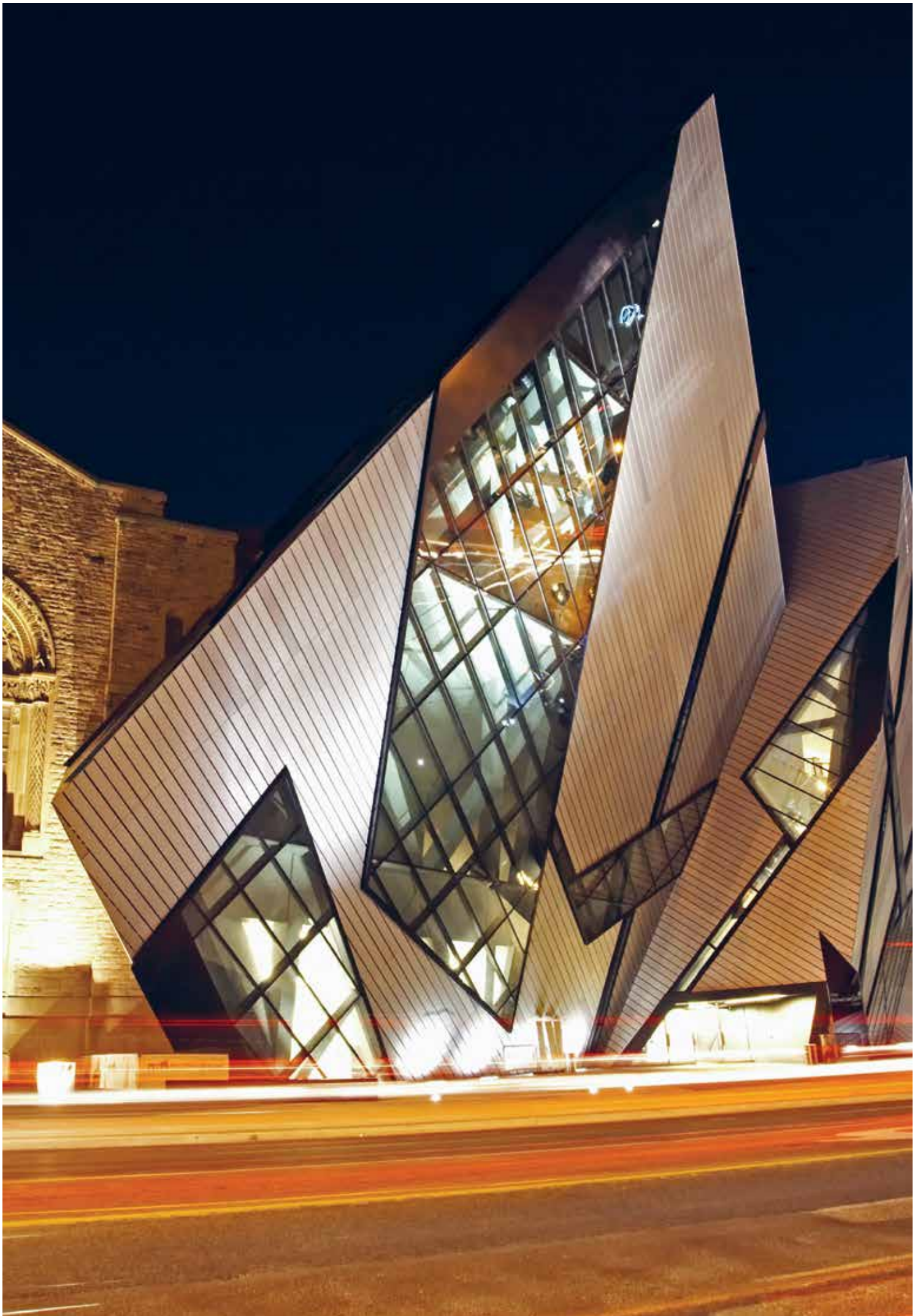




SIKA FFI SEALING AND BONDING IN FACADE AND FENESTRATION



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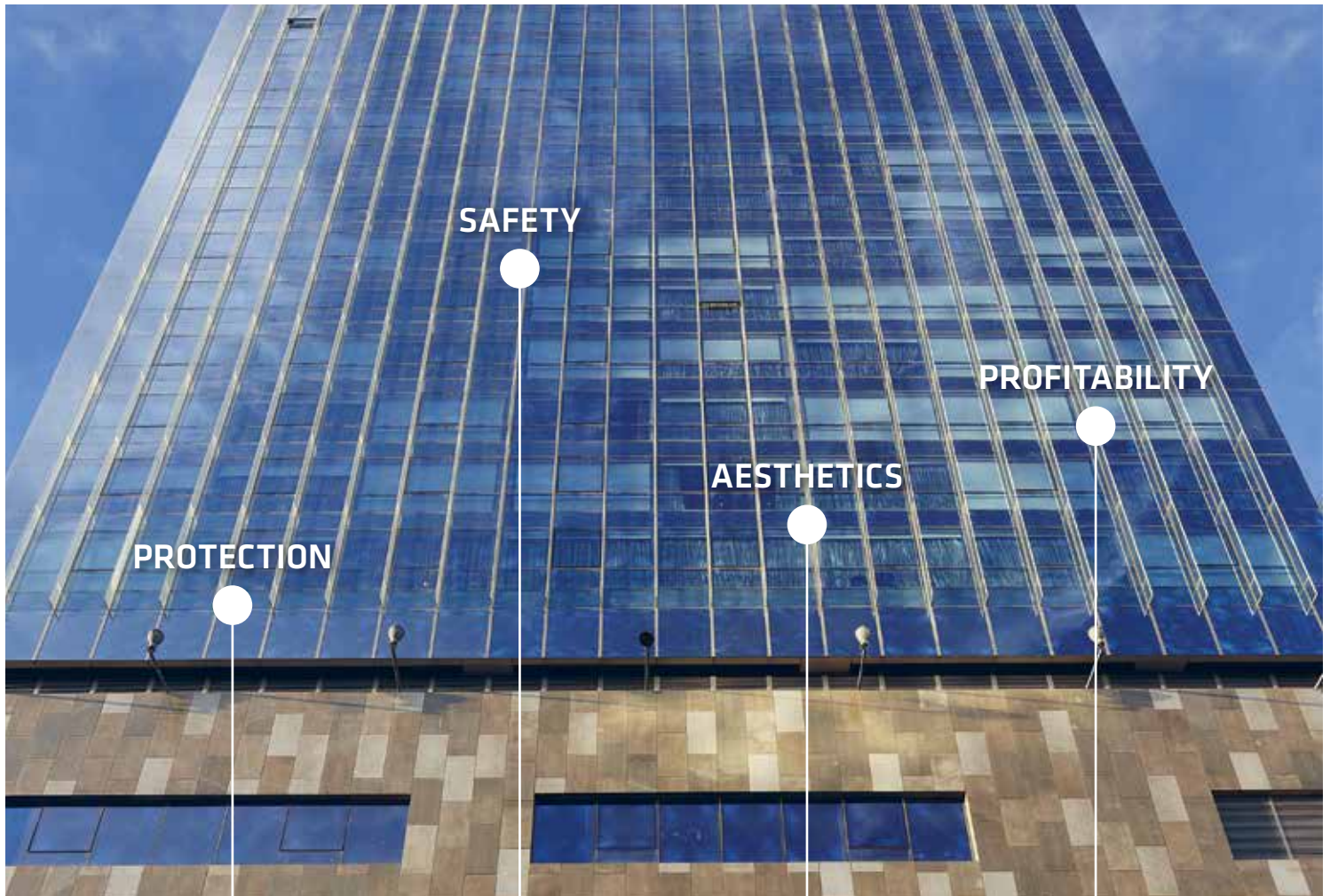
left:

Royal Ontario Museum, Toronto

Extension Michael Lee-Chin Crystal

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

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.



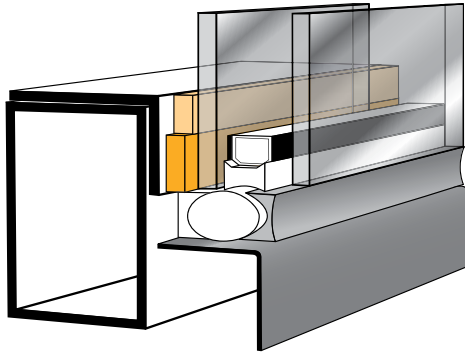
VENTILATED FACADE

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-550 – 2-part structural glazing adhesive, very high mechanical strength, design factor σ_{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

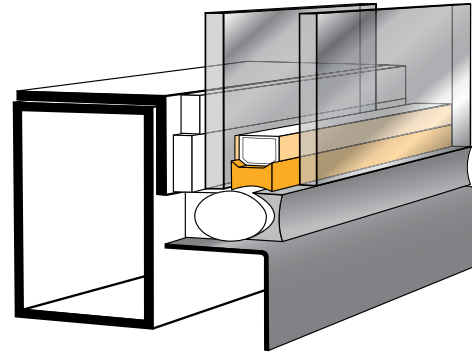
Sikasil® SG-20 – 1-part structural glazing adhesive, high mechanical strength and movement capability, design factor σ_{dyn} 0.17 MPa, ETAG approved, CE marked

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 σ_{dyn} 0.19 MPa, suitable for air- and gas-filled IG units, EN1279-2 and -3 and ETAG approved, CE marked

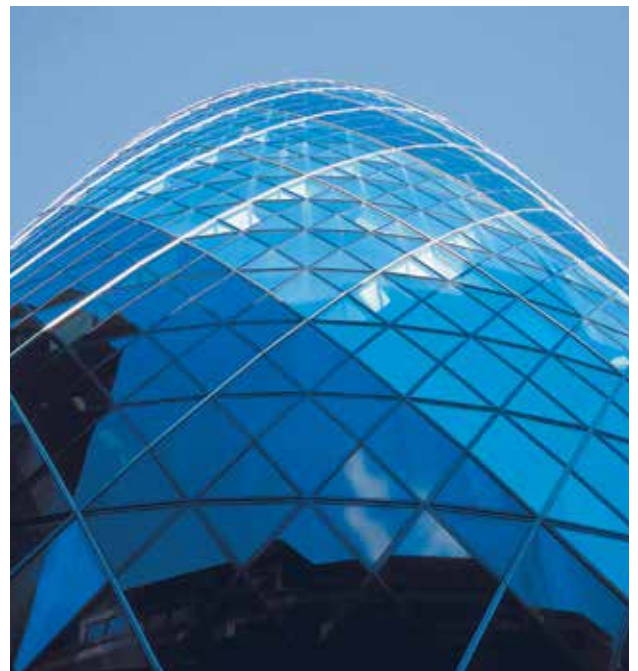
Sikasil® IG-25 – 2-part silicone insulating glass secondary seal, EN-1279-2 and ETAG approved, CE marked

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

www.sika.com/ffi-ig

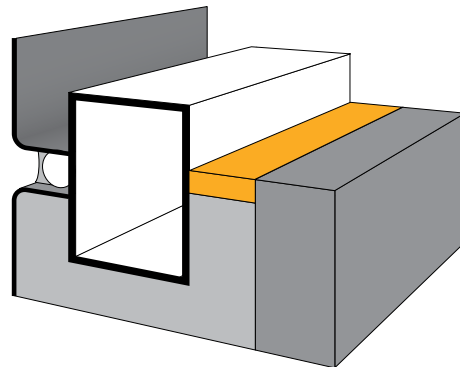
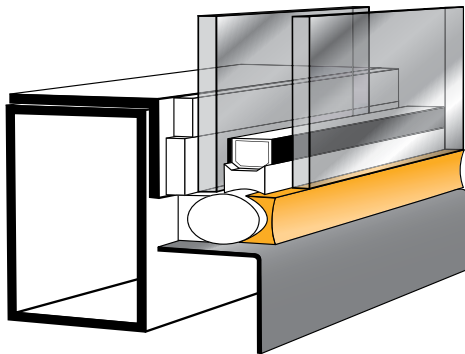


left:
Hotel W, Barcelona, 2006
Architects Ricardo Bofill; **Facade** UTE Facadas

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** 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

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

Sikasil® 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



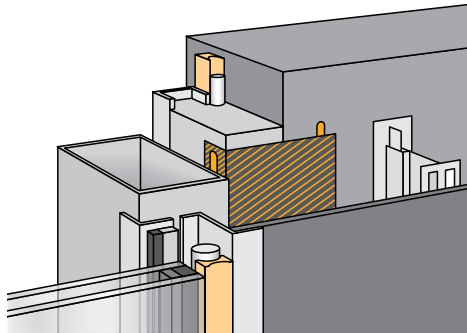
top left:
Axiata Centre (Quill 7), Kuala Lumpur Sentral, 2009
Architects Micheal Ong Chartered Architect; **Facade** CML Sdn Bhd

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® 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.

Recommended Sika products

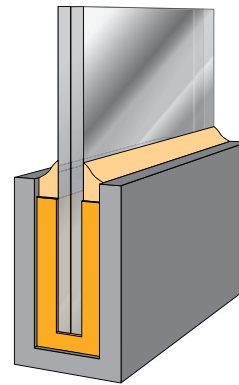
SikaMembran® Universal, Outdoor Plus, Strong
EPDM based vapor control membrane system, CE marked

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



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

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



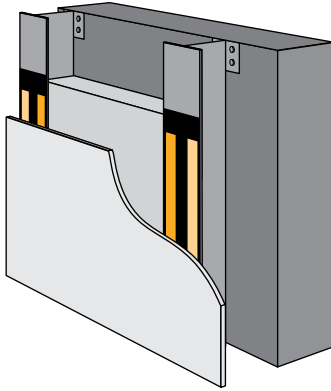
top left:
5 Aldermanbury Square, London, 2005
Architect Eric Parry Architects; **Facade** Lindner-Schmidlin UK

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

bottom right:
ADIA, Abu Dhabi, 2004
Architects Kohn Pederson Fox Associates **Facade** Schmidlin AG (CH)



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.

Recommended Sika products

SikaTack® Panel Adhesive

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

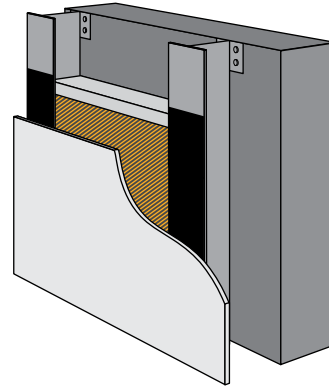
SikaTack® Panel Prefixing Tape

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

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.

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

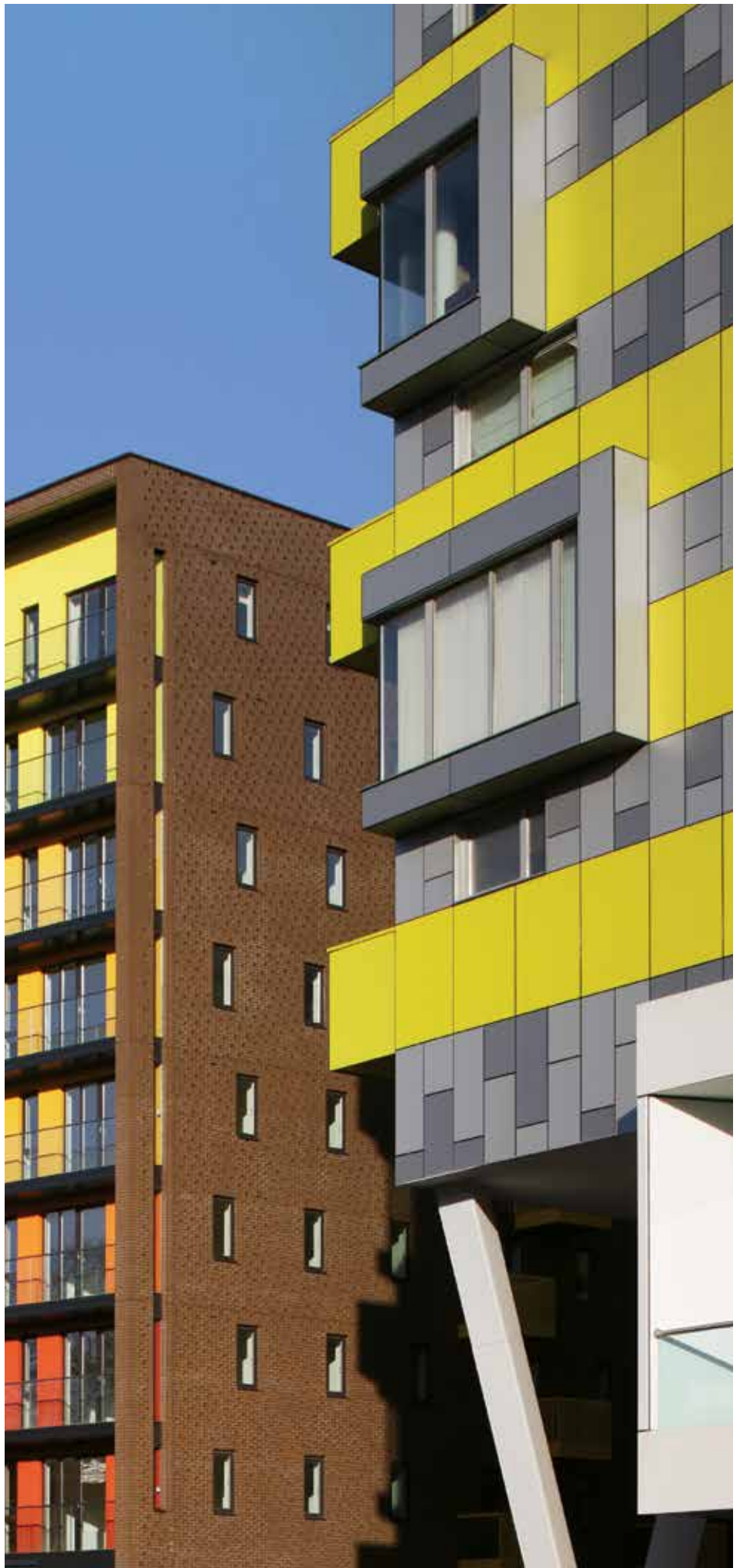
Sika supplies adhesives for the production of sandwich panels combining many kinds of materials for thermal insulation in the spandrel sections. Ask your Sika contact for SikaForce® system solutions.

www.sika.com/ffi-sound

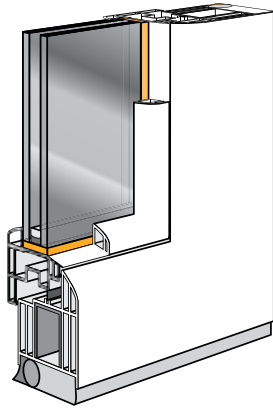
right:
Lifelong Learning Centre Barking, UK
Architect Allford Hall Monaghan Morris; Facade Cladding UK

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.

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

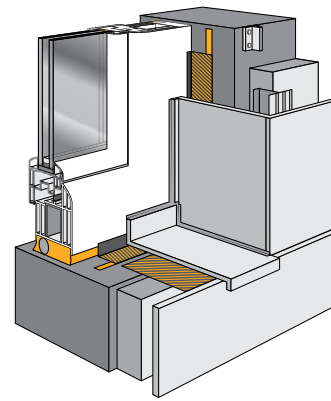
Sika® Glazing Tape Prefix

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, fulfils energy conservation regulations (EnEV) and RAL guidelines



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: 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)

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: 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.

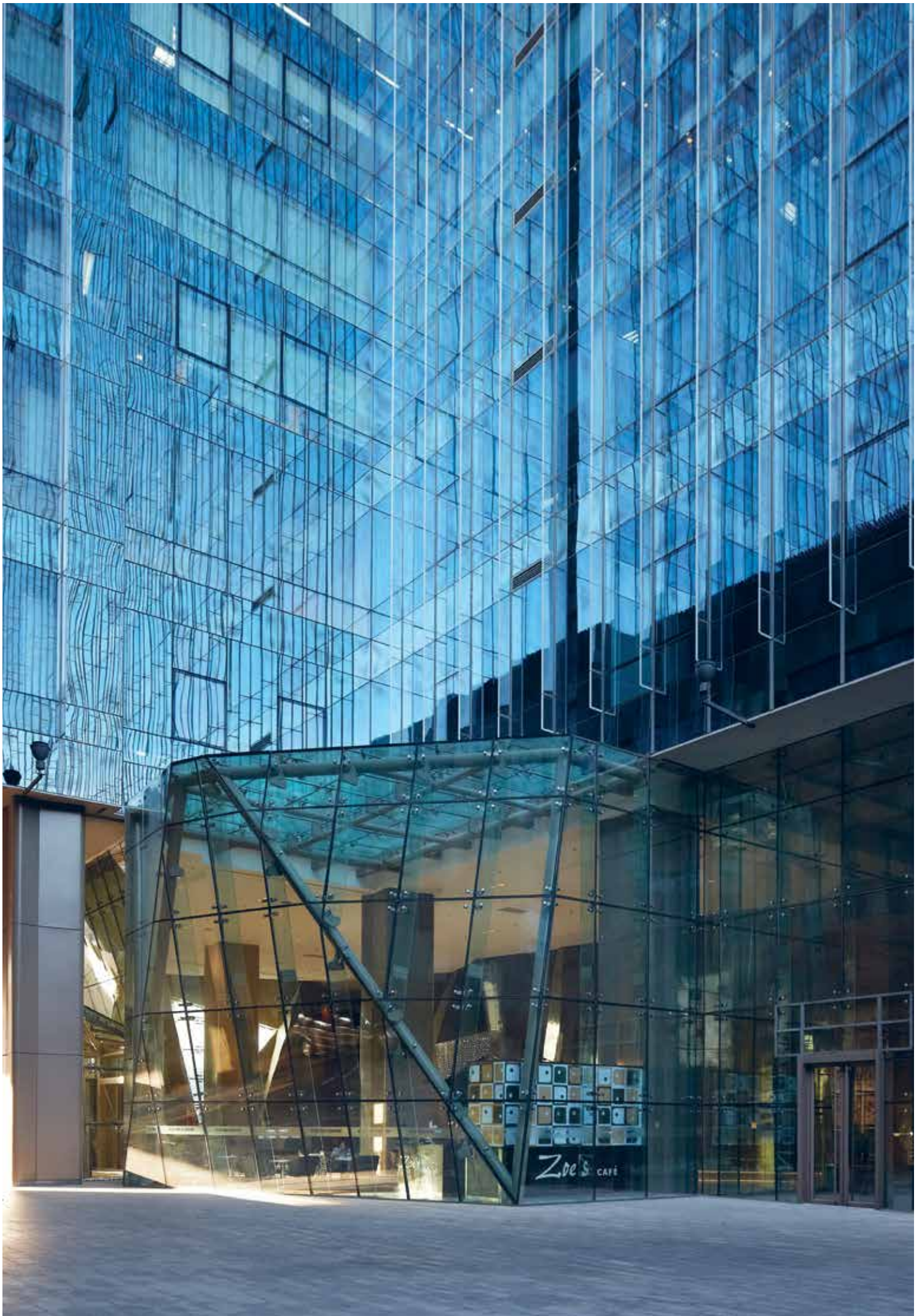
Anchoring

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



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

- Review and consultancy of facade and window systems with regard to suitability for bonding
- Advice on system improvements i.e. material choice or dimensioning

Functional testing

- Support with prototyping
- Functional tests / test plan of entire system for compatibility, adhesion and function

Application technology

- Active consulting, including the selection of right application technology
- Assist in system and equipment engineering / bonding technology
- Support with application and quality procedures

Applicator training

- Preparation of operating manuals for bonding in conformity with ISO
- Factory and on-site training of applicators

External approvals

- Best practice sample preparation



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.

GLOBAL BUT LOCAL PARTNERSHIP



FOR MORE INFORMATION:

For more literature about Sika Facade and Fenestration solutions browse:

www.sika.com/ffi-downloads

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.

Technical Service

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BUILDING TRUST

