“Energy Efficiency in the Building Management”

RAICO Bautechnik GmbH

Volker Massmann, International Sales Manager

Thailand, Bangkok 07th March 2016

ENERGY EFFICIENCY made in Germany

RAICO

Sales force.
On the Track to a Global Player.

Subsidiaries

- Germany
- France
- Austria
- Russia
- Switzerland
- UK

RAICO

RAICO AUSTRIA

RAICO SWISS

RAICO EAST

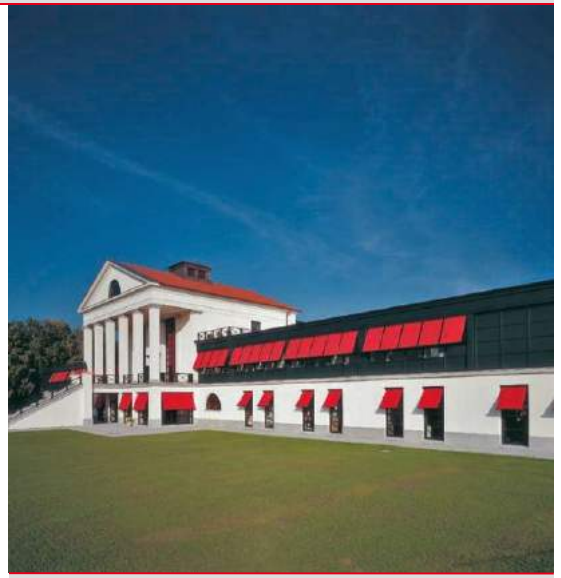
RAICO FRANCE

Customers around the World

- China
- South Korea
- Canada
- Australia
- USA
- Latvia
- and in many other parts of the World

RAICO Bautechnik.
Innovation and Know-how.

- System solutions for sophisticated architecture
- Headquarters in Pfaffenhausen, Germany
- Development and distribution of highly innovated profile systems for customized
  - curtain walls (aluminium, steel, timber)
  - glass roofs (aluminium, steel, timber)
  - windows
  - doors



Curtain walls

Glass roofs

Windows

Doors

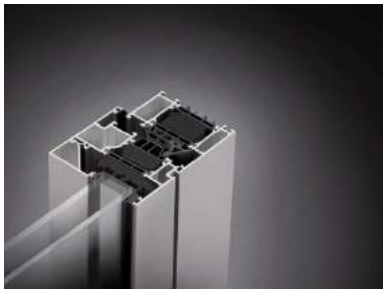
RAICO

RAICO.
System overview.

THERM+
curtain wall systems
glass roof

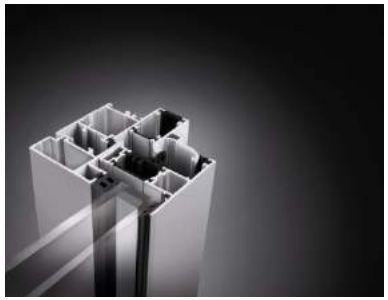


FRAME+
aluminium window
and door system




WING
insertion windows

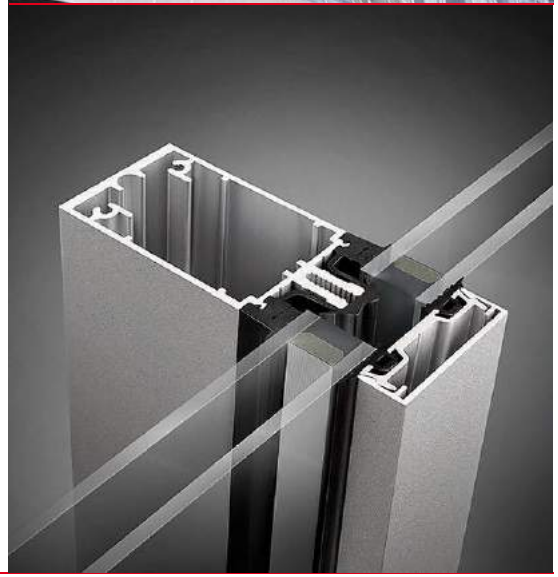




RAICO

THERM+
More than Curtain Walls.

- Modular designed curtain wall system
  - Aluminum (THERM+ A-I and THERM+ A-V)
  - Steel (THERM+ S-I)
  - Timber (THERM+ H-I and THERM+ H-V)
- Thermally insulated curtain wall
- Glass roofs up to 2° inclination
- Passive house certificated curtain walls
- Passive house certificated glass roofs
- Structural glazing
- Fire protection
- Burglary prevention
- Multiple design options
- Economic solution for every individual projects



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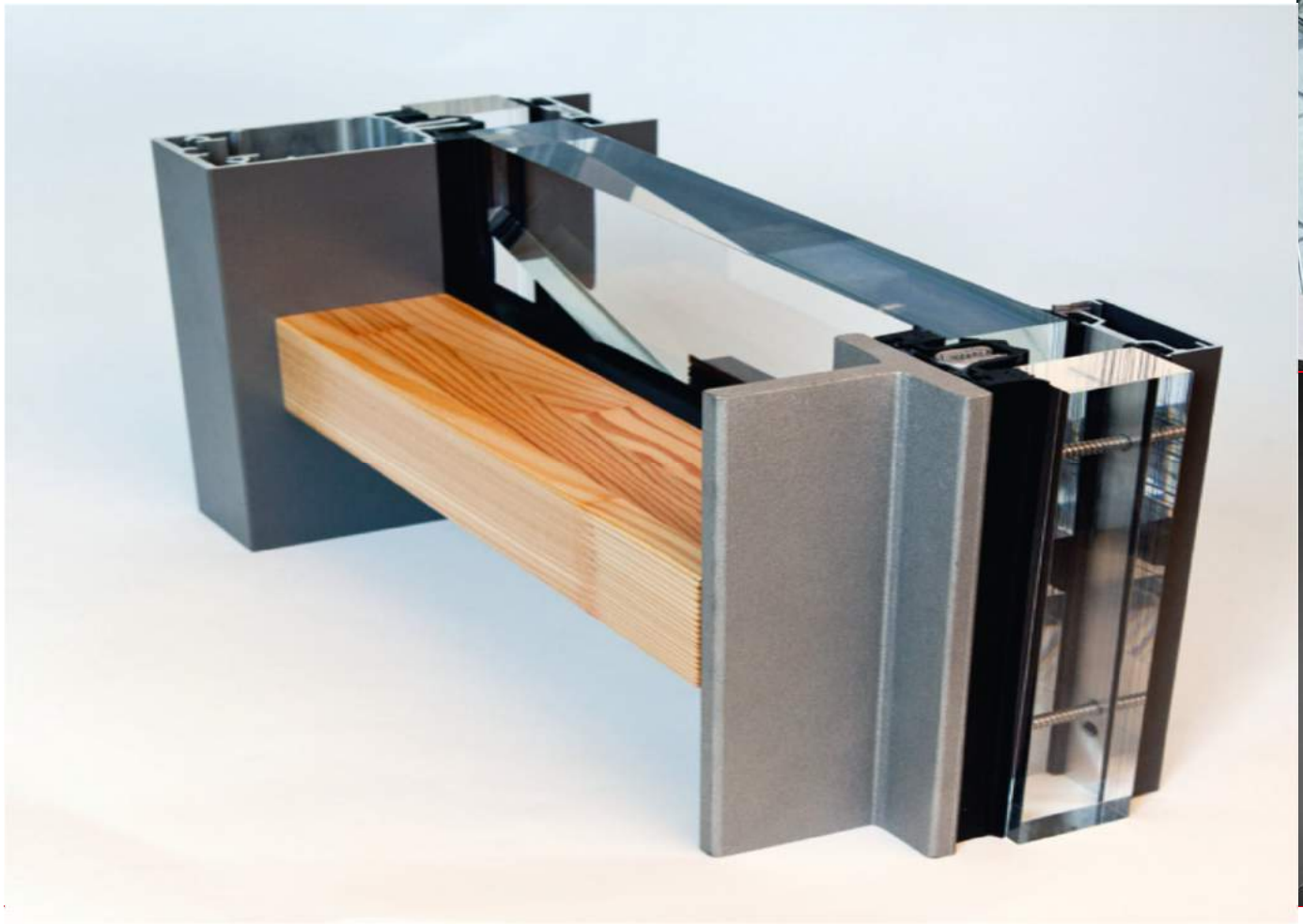
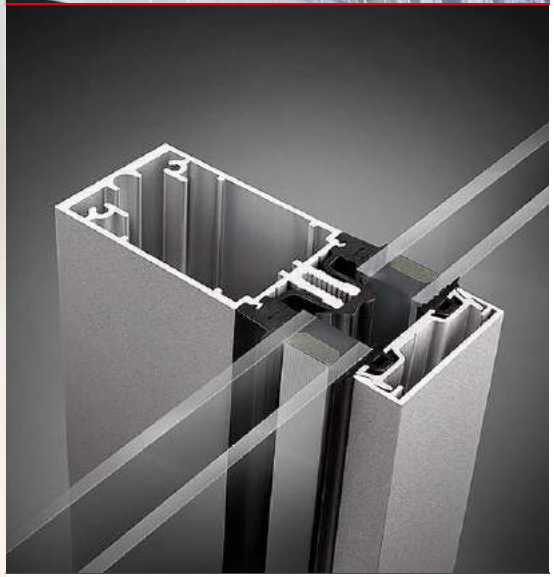
- Modular designed curtain wall system





RAICO

THERM+.
Passive house certified curtain walls.

Passive house certified curtain walls

- Certification for aluminium, timber and steel
- First one world-wide with passive house certificates for aluminium, timber and steel curtain walls
- Certification with RAICO-standard screws
- Application of the special RAICO-synthetic glass carrier

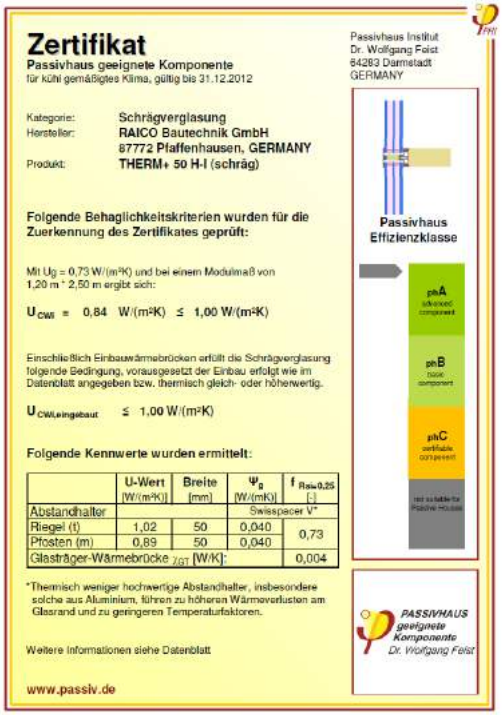
Available in the following widths

- THERM+ A-V 50 and 56 mm
- THERM+ S-I 50 and 56 mm
- THERM+ H-V 50, 56 and 76 mm

U_f = 0,69 W/m²K
U_{cw} = 0,80 W/m²K

RAICO

THERM+.
Passive house certified roofs.



Zertifikat
Passivhaus geeignete Komponente
für kühl gemäßigtes Klima, gültig bis 31.12.2012

Passivhaus Institut
Dr. Wolfgang Feist
64283 Darmstadt
GERMANY

Kategorie: Schrägverglasung
Hersteller: RAICO Bautechnik GmbH
87772 Pfaffenhausen, GERMANY
Produkt: THERM+ 50 H-I (schräg)

Folgende Behaglichkeitskriterien wurden für die Zuerkennung des Zertifikates geprüft:

Mit U_g = 0,73 W/(m²K) und bei einem Modulmaß von 1,20 m * 2,50 m ergibt sich:

U_{CWI} = 0,84 W/(m²K) ≤ 1,00 W/(m²K)

Einschließlich Einbauwärmebrücken erfüllt die Schrägverglasung folgende Bedingung, vorausgesetzt der Einbau erfolgt wie im Datenblatt angegeben bzw. thermisch gleich- oder höherwertig.

$U_{CWLeingebaut}$ ≤ 1,00 W/(m²K)

Folgende Kennwerte wurden ermittelt:

	U-Wert [W/(m²K)]	Breite [mm]	Ψ_g [W/(mK)]	$f_{Rsi,0.25}$ [-]
Abstandhalter			Swisspacer V*	
Riegel (t)	1,02	50	0,040	0,73
Pfosten (m)	0,89	50	0,040	
Glasträger-Wärmebrücke χ_{GT} [W/K]:				0,004

*Thermisch weniger hochwertige Abstandhalter, insbesondere solche aus Aluminium, führen zu höheren Wärmeverlusten am Glasrand und zu geringeren Temperaturfaktoren.

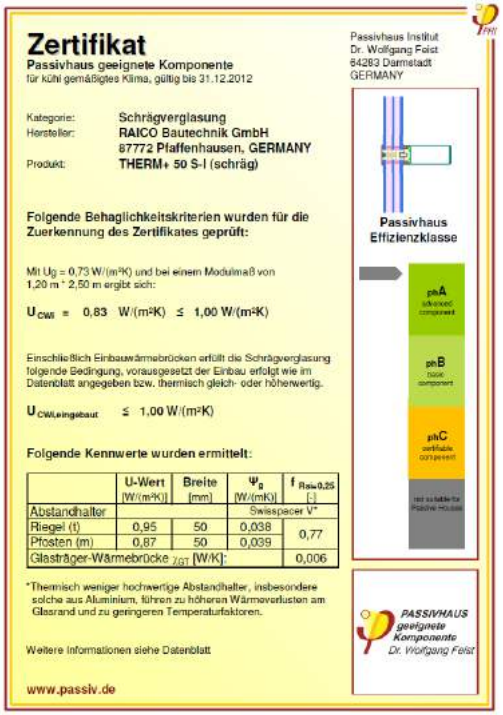
Weitere Informationen siehe Datenblatt

www.passiv.de

Passivhaus Effizienzklasse

phA advanced component
phB basic component
phC certifiable component
not suitable for Passive House

PASSIVHAUS geeignete Komponente Dr. Wolfgang Feist



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Mit U_g = 0,73 W/(m²K) und bei einem Modulmaß von 1,20 m * 2,50 m ergibt sich:

U_{CWI} = 0,83 W/(m²K) ≤ 1,00 W/(m²K)

Einschließlich Einbauwärmebrücken erfüllt die Schrägverglasung folgende Bedingung, vorausgesetzt der Einbau erfolgt wie im Datenblatt angegeben bzw. thermisch gleich- oder höherwertig.

$U_{CWLeingebaut}$ ≤ 1,00 W/(m²K)

Folgende Kennwerte wurden ermittelt:

	U-Wert [W/(m²K)]	Breite [mm]	Ψ_g [W/(mK)]	$f_{Rsi,0.25}$ [-]
Abstandhalter			Swisspacer V*	
Riegel (t)	0,95	50	0,038	0,77
Pfosten (m)	0,87	50	0,039	
Glasträger-Wärmebrücke χ_{GT} [W/K]:				0,006

*Thermisch weniger hochwertige Abstandhalter, insbesondere solche aus Aluminium, führen zu höheren Wärmeverlusten am Glasrand und zu geringeren Temperaturfaktoren.

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www.passiv.de

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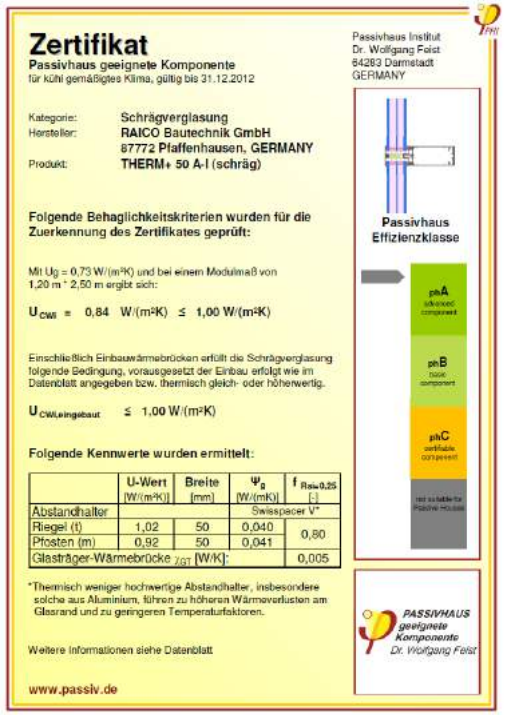
not suitable for Passive House

PASSIVHAUS geeignete Komponente Dr. Wolfgang Feist



Zertifikat
Passivhaus geeignete Komponente
für kühl gemäßigtes Klima, gültig bis 31.12.2012

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GERMANY

Kategorie: Schrägverglasung
Hersteller: RAICO Bautechnik GmbH
87772 Pfaffenhausen, GERMANY
Produkt: THERM+ 50 A-I (schräg)

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Mit U_g = 0,73 W/(m²K) und bei einem Modulmaß von 1,20 m * 2,50 m ergibt sich:

U_{CWI} = 0,84 W/(m²K) ≤ 1,00 W/(m²K)

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$U_{CWLeingebaut}$ ≤ 1,00 W/(m²K)

Folgende Kennwerte wurden ermittelt:

	U-Wert [W/(m²K)]	Breite [mm]	Ψ_g [W/(mK)]	$f_{Rsi,0.25}$ [-]
Abstandhalter			Swisspacer V*	
Riegel (t)	1,02	50	0,040	0,80
Pfosten (m)	0,92	50	0,041	
Glasträger-Wärmebrücke χ_{GT} [W/K]:				0,005

*Thermisch weniger hochwertige Abstandhalter, insbesondere solche aus Aluminium, führen zu höheren Wärmeverlusten am Glasrand und zu geringeren Temperaturfaktoren.

Weitere Informationen siehe Datenblatt

www.passiv.de

Passivhaus Effizienzklasse

phA advanced component
phB basic component
phC certifiable component
not suitable for Passive House

PASSIVHAUS geeignete Komponente Dr. Wolfgang Feist

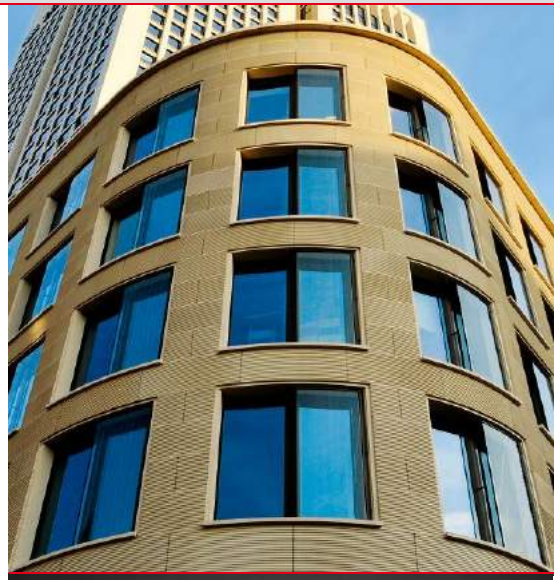
- RAICO is also the first one worldwide with passive house certificates for aluminium, timber and steel roofs.

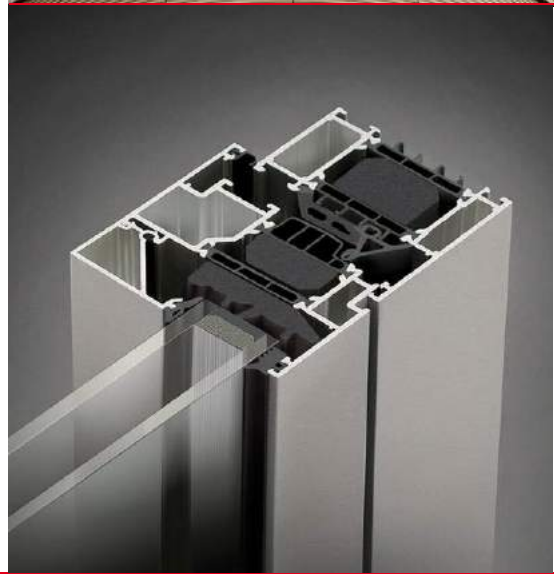
RAICO

FRAME+
To Frame The Climate Protection.

- A modularly designed aluminum window system:
  - FRAME+ 65 W
  - FRAME+ 75 WI
  - FRAME+ 75 WB (concealed sash window)
  - FRAME+ 75 FF (window curtain wall)
  - FRAME+ 75 WA (outward opening)
  - FRAME+ 90 WI/WB (passive house certificated window)
  - FRAME+ 90 WB-T (Aluminum Timber Window)
  - FRAME+ 75 LF-WG (Automatic Ventilation Flap)

- Energy saving by highest insulation.
- Design possibilities by the broad range of profiles and components.
- Efficient fabrication with highest process stability.



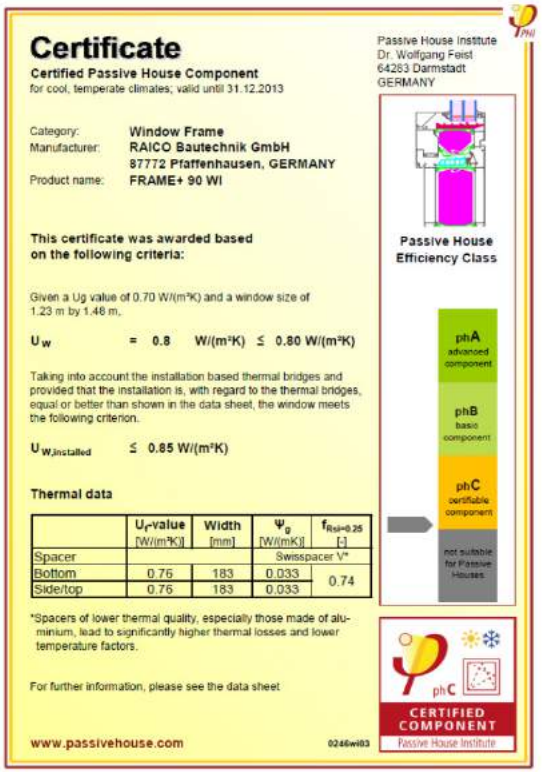


RAICO

FRAME+ 90 WI/WB.

New passive house certified window.

Insert window FRAME+ 90 WI



Certificate

Certified Passive House Component
for cool, temperate climates; valid until 31.12.2013

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
GERMANY

Category: Window Frame
Manufacturer: RAICO Bautechnik GmbH
87772 Pfaffenhausen, GERMANY
Product name: FRAME+ 90 WI

This certificate was awarded based on the following criteria:

Given a Ug value of 0.70 W/(m²K) and a window size of 1.23 m by 1.48 m,

U_w = 0.8 W/(m²K) ≤ 0.80 W/(m²K)

Taking into account the installation based thermal bridges and provided that the installation is, with regard to the thermal bridges, equal or better than shown in the data sheet, the window meets the following criterion.

$U_{w,installed}$ ≤ 0.85 W/(m²K)

Thermal data

	U_f-value [W/(m²K)]	Width [mm]	Ψ_g [W/(mK)]	$f_{Rsi=0.25}$ [-]
Spacer			Swisspacer V*	
Bottom	0.75	183	0.033	0.74
Side/top	0.76	183	0.033	

*Spacers of lower thermal quality, especially those made of aluminium, lead to significantly higher thermal losses and lower temperature factors.

For further information, please see the data sheet

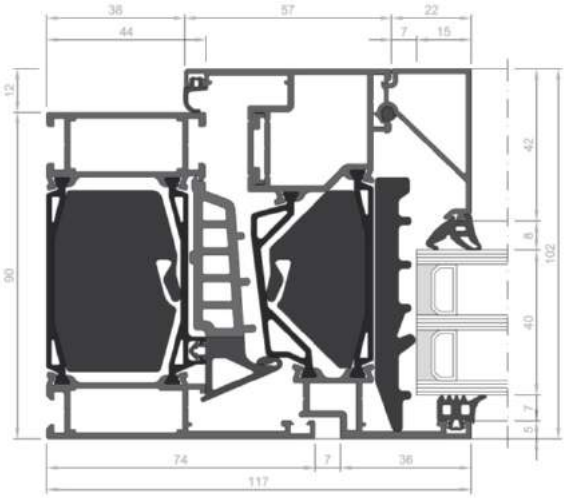
Passive House Efficiency Class

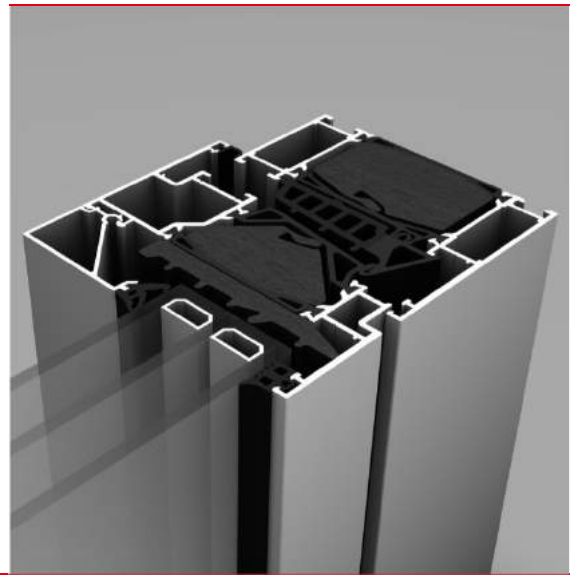
phA advanced component
phB basic component
phC certifiable component
not suitable for Passive Houses

phC CERTIFIED COMPONENT Passive House Institute

www.passivehouse.com 0246wi03

- Aluminium window system with system depth 90 mm.
- Small face widths of 117 resp. 99 mm.
- Maximum energy savings by variable adjustment of the insulation values up to U_f = 0.75 W/(m²K).
- Modular composition without any additional supplements.



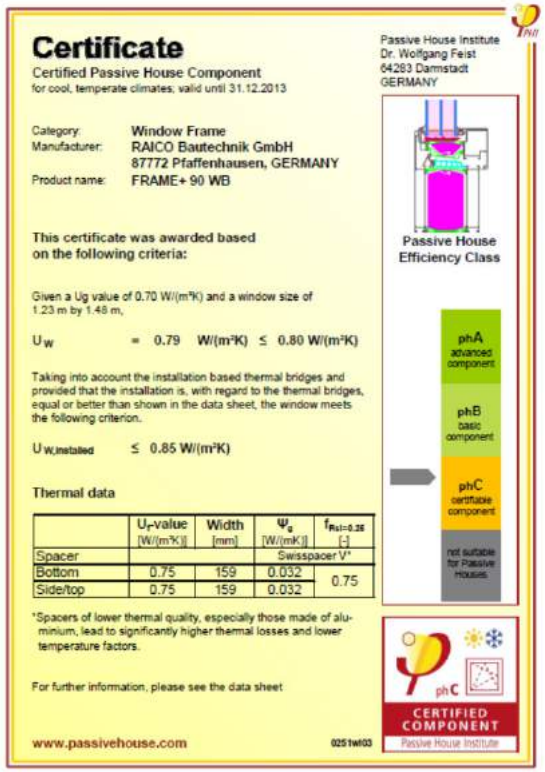


RAICO

FRAME+ 90 WI/WB.

New passive house certified window.

Concealed sash window FRAME+ 90 WB



Certificate

Certified Passive House Component
for cool, temperate climates; valid until 31.12.2013

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
GERMANY

Category: Window Frame
Manufacturer: RAICO Bautechnik GmbH
87772 Pfaffenhausen, GERMANY
Product name: FRAME+ 90 WB

This certificate was awarded based on the following criteria:

Given a Ug value of 0.70 W/(m²K) and a window size of 1.23 m by 1.48 m,

U_W = 0.79 W/(m²K) ≤ 0.80 W/(m²K)

Taking into account the installation based thermal bridges and provided that the installation is, with regard to the thermal bridges, equal or better than shown in the data sheet, the window meets the following criterion.

$U_{W,installed}$ ≤ 0.85 W/(m²K)

Thermal data

	U_f-value [W/(m²K)]	Width [mm]	Ψ_g [W/(mK)]	$f_{Rsi=0.25}$ [-]
Spacer			Swisspacer V*	
Bottom	0.75	159	0.032	0.75
Side/top	0.75	159	0.032	

*Spacers of lower thermal quality, especially those made of aluminium, lead to significantly higher thermal losses and lower temperature factors.

For further information, please see the data sheet

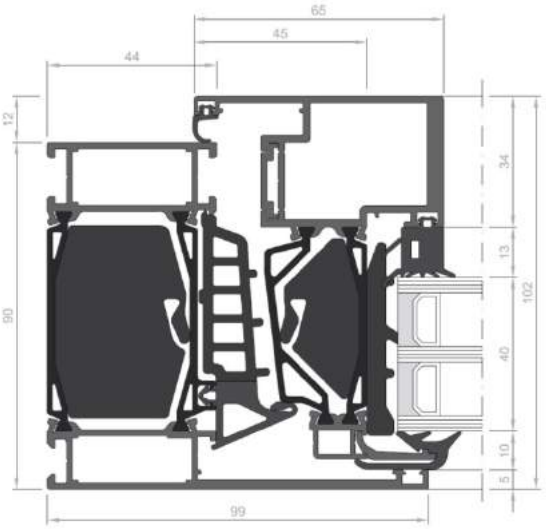
Passive House Efficiency Class

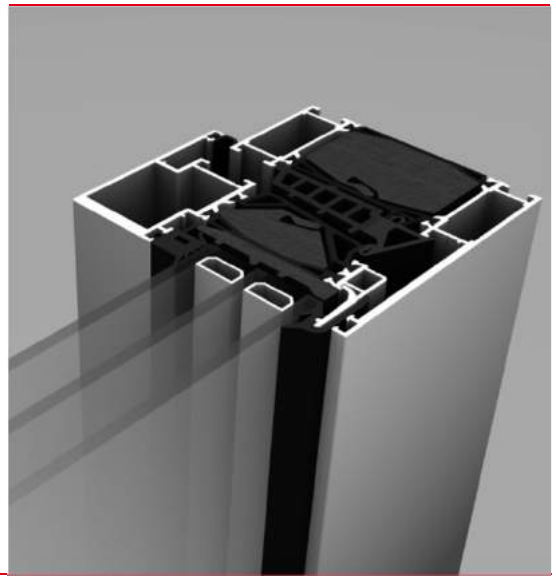
phA advanced component
phB basic component
phC certifiable component
not suitable for Passive houses

phC
CERTIFIED COMPONENT
Passive House Institute

www.passivehouse.com 0251wi03

- Consistent thermal optimization of the modular system.
- Integration of efficient insulation areas.
- Fittings suitable for sashes weighing up to 300 kg.
- Concealed fitting for sashes weighing up to 150 kg.





RAICO

FRAME+ 75 DI

To Frame The Climate Protection.

- A modularly designed aluminum door system :

  - FRAME+ 75 DI

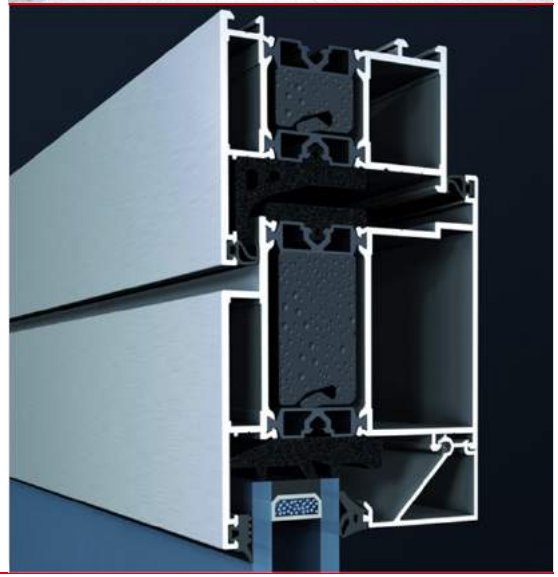
- Energy saving by by highest insulation.

- Building, curtain wall,
  apartment and house construction.

- Manifold design varieties within the system series.

- Study composite profiles ensuring long-lasting functionality.

- Easy processing and innovative conception.



RAICO

FRAME+ 75 DI
3D-Concept.

- High degree of tightness due to innovative sealing concept
  Tested tightness against heavy rainfall
  according to DIN EN 12208:
  - Door inward opening until class 6A (250 Pa)
  - Door outward opening until class 9A (600 Pa)

- Improved insulation of up to U_f = 1,4 W/m²K

- Large dimensions, up to 3.0 m height

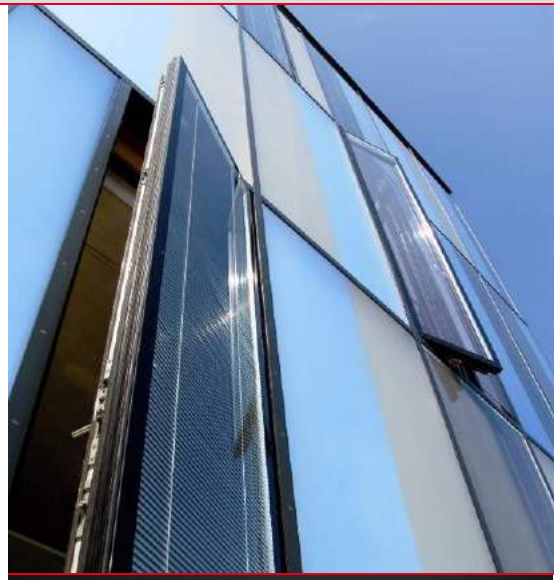


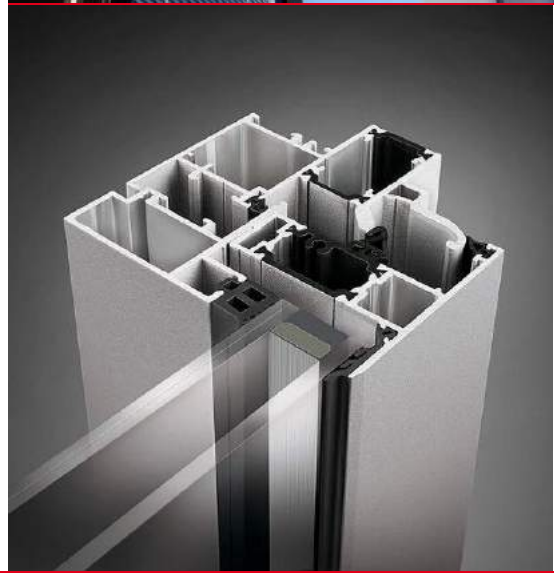
RAICO

WING
The Curtain Wall Window.

- Multiple application possibilities for curtain walls and roofs
- Compact construction
- Different versions

  - WING 50 A — bottom-hung, top-hung, side-hung (outward opening)
  - WING 50 SK — top-hung (outward opening)
  - WING 105 DI — glass roof window
    - up to an inclination of 2 degrees
    - opening angle of max. 90°
  - FRAME+ 100 RI — new glass roof window
  - FRAME+ 120 RI — new glass roof window (wood cladding inside)





RAICO

RAICO references
Germany

RAICO

Forward looking pilot project
“Efficiency house plus with electromobility”, Berlin

RAICO

Lore-Lorentz Passive House School Düsseldorf

RAICO

Prof.-Brandes House, Zoo Dresden

RAICO

Sparkasse Pforzheim

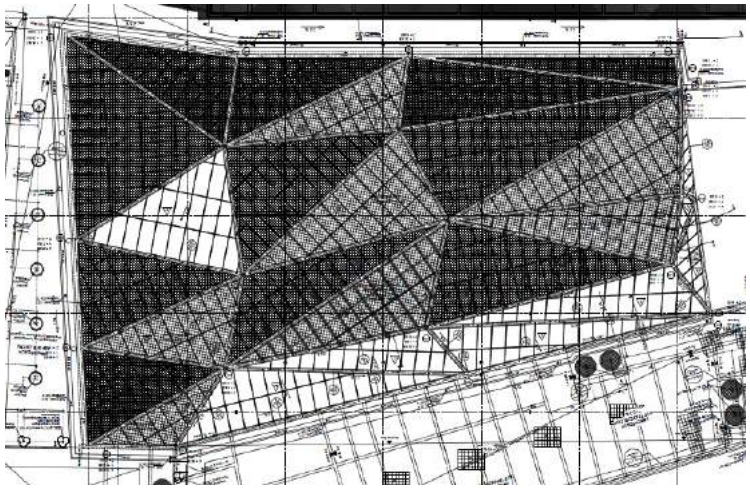
RAICO

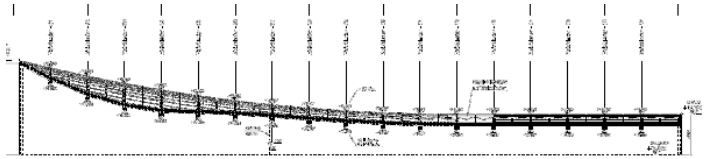
Regional State Bank Oldenburg

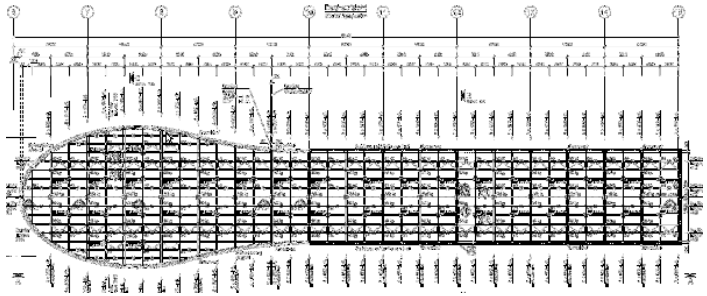
RAICO

Glass Roof …. from the drawing to the result

Therm + Al – SI –HI

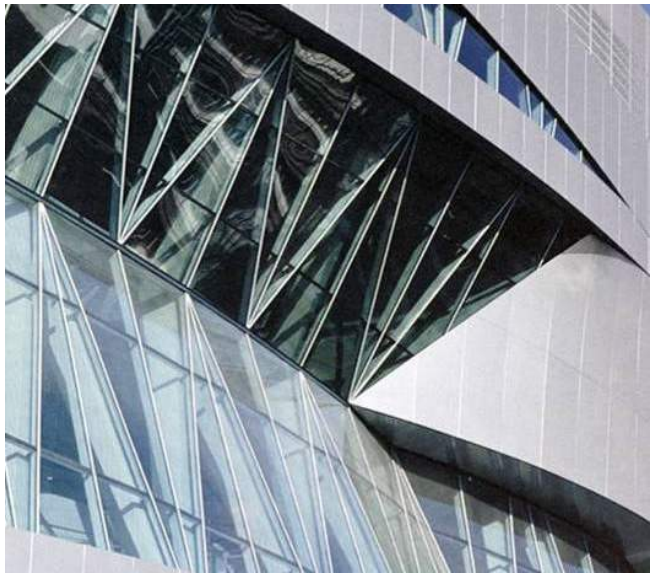


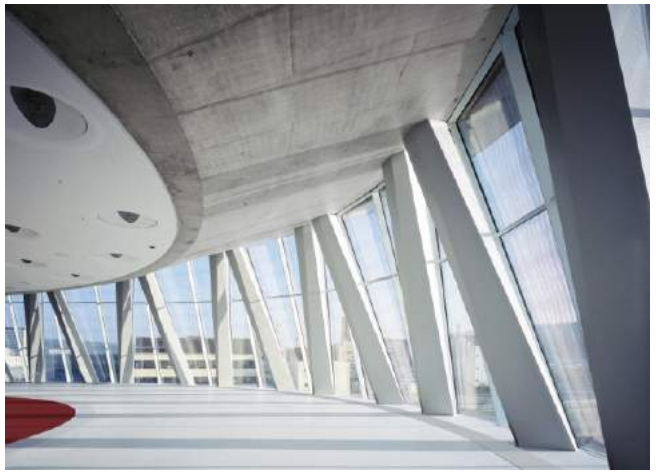




RAICO

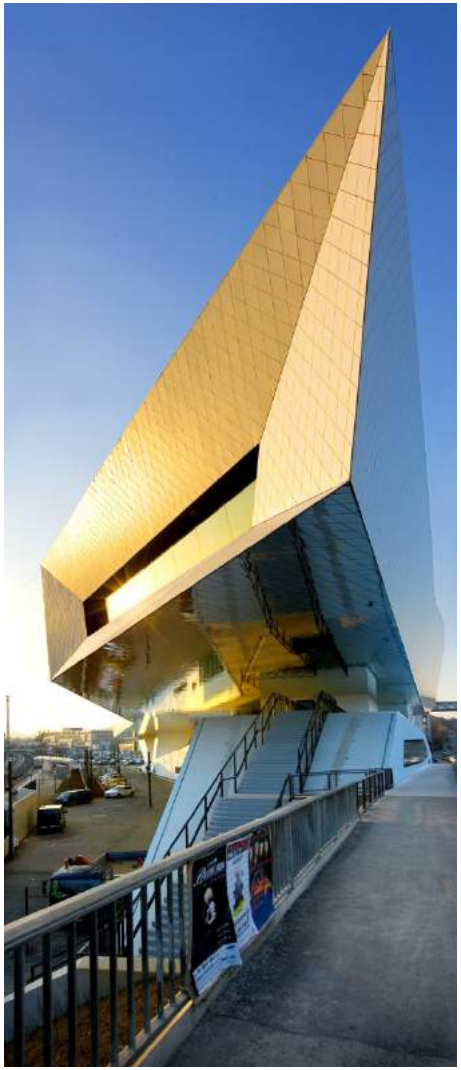
Mercedes-Benz Museum
Stuttgart





RAICO

Porsche Museum
Stuttgart



RAICO

Radisson Blu
Frankfurt/Main

RAICO

Jewish Museum
Berlin

RAICO

Ozeaneum (Oceanographic Museum) Stralsund

RAICO

Capricorn House
Düsseldorf

RAICO

European Bath
Karlsruhe

RAICO

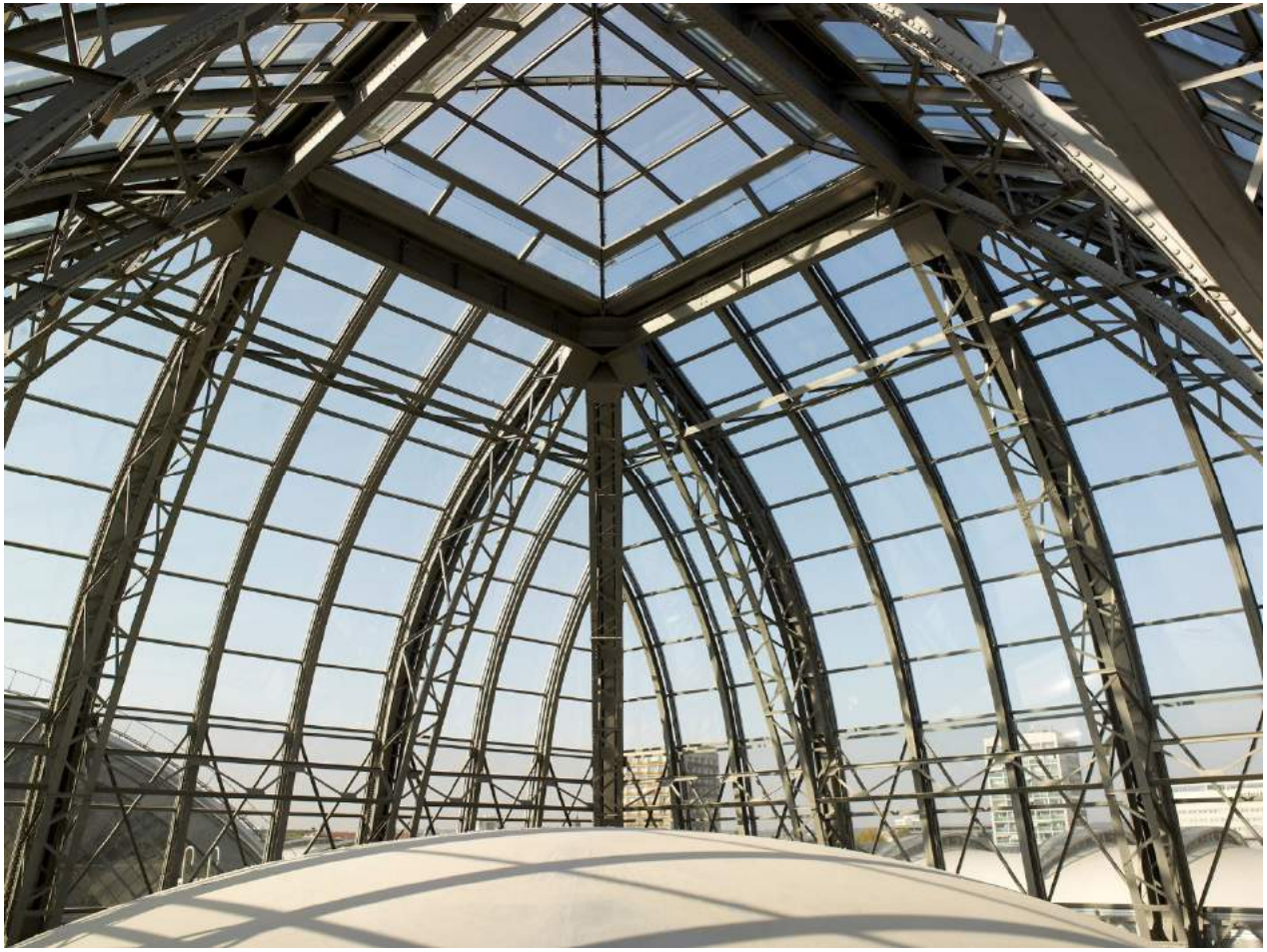
Aachen Munich Insurance
Aachen

RAICO

Amada GmbH
Haan

RAICO

Railway station
Dresden



RAICO

Energy Center
Berlin

RAICO

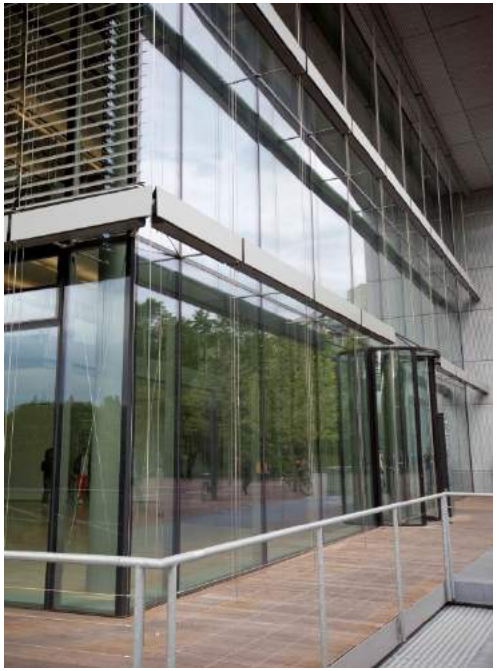
Primary School Neubiberg

RAICO

Exhibition Centre Nuremberg

RAICO

Oeconomicum Düsseldorf



RAICO

Local Court
Neu-Ulm

RAICO

Technical College
Detmold

RAICO

Leica Administration Building
Wetzlar

RAICO

Mechanical Engineering School
Ansbach

RAICO

Mediterraneo Shopping Center Bremerhaven

RAICO

Bible Community
Stuttgart

RAICO

Shopping Mall „Höfe am Brühl“
Leipzig

RAICO

Lippe Pool
Lünen

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Solar Factory Freiburg

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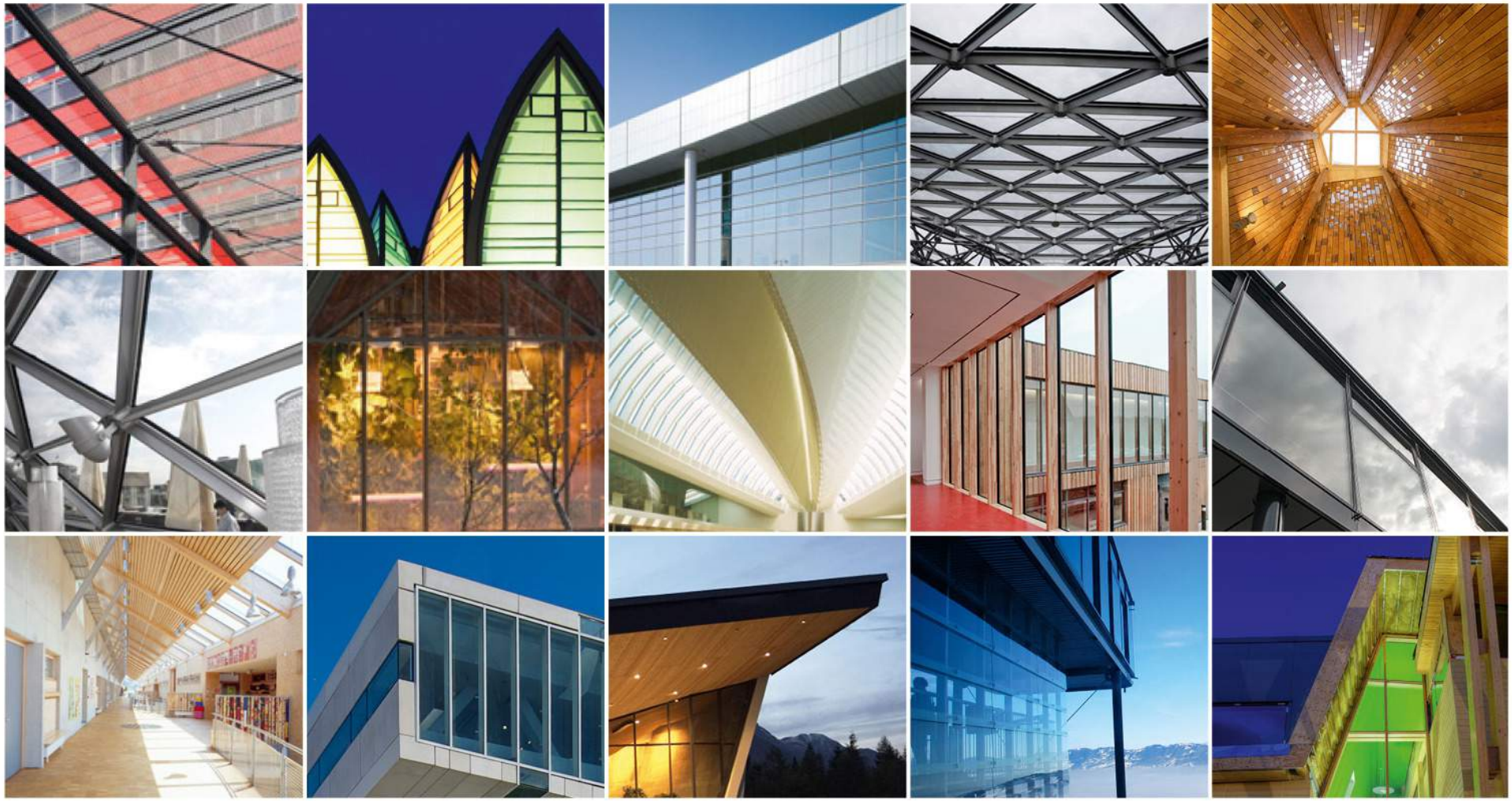
RAICO references
International



RAICO

Headquarters Binderholz
Fügen-Zillertal, Austria

RAICO

Aqua Dome
Längenfeld, Austria

RAICO

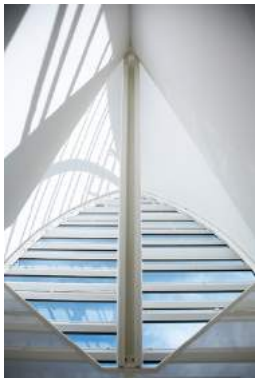
Panorama Restaurant Karren
Dornbirn, Austria

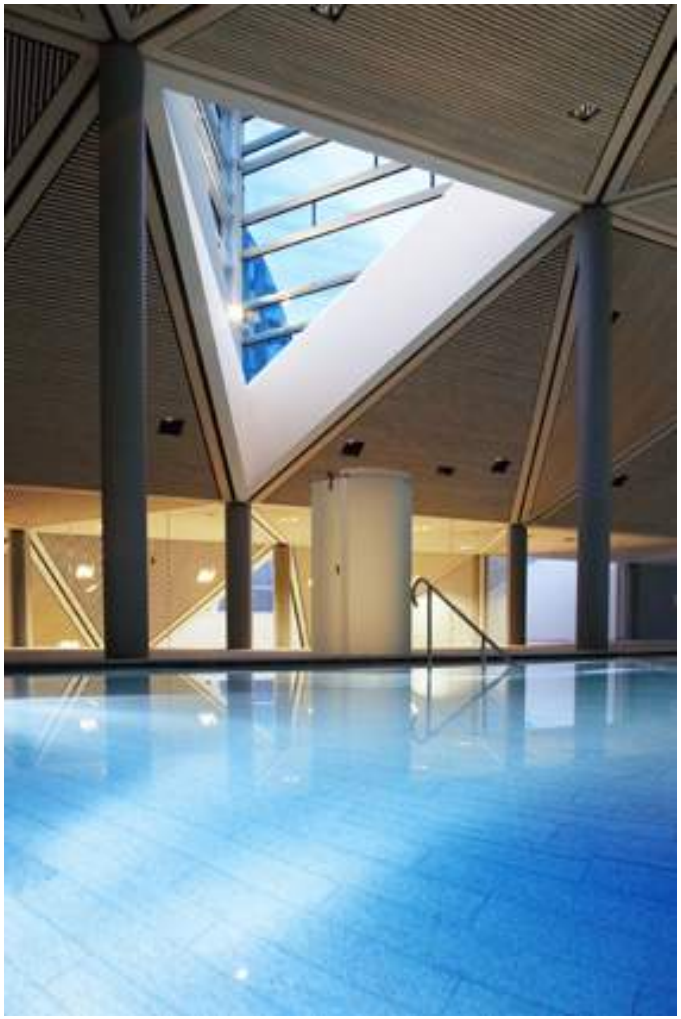
RAICO

Federal Office for Sport BASPO
Magglingen, Swiss

RAICO

Grand Hotel Tschuggen
Arosa, Swiss





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Central Library
Zurich, Swiss

RAICO

Airport Airside Center
Zurich, Swiss

RAICO

Les Mercier, shopping and civic centre
Lausanne, Swiss

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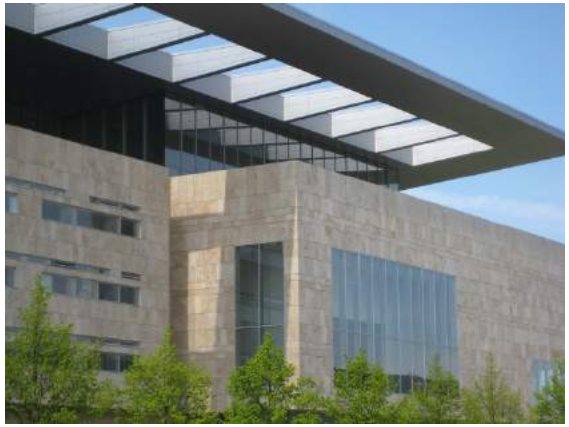
Royal Opera
Copenhagen, Denmark



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International Humanistic University
Moscow, Russia

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Ritz Carlton Hotel
Moscow, Russia

RAICO

Conservatory Pirogovo
Moscow, Russia

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Highrise office building
Yantai, China

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Samsung University
Seoul, Korea

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Office building „Compass House”
Canberra, Australia

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Faculty of Education
Cambridge, UK

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Docks de Paris
Paris, France

RAICO

Villa Méditerranée
Marseille, France

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Dexia Bil Bank
Esch, Luxembourg

RAICO

Airport Luxembourg

RAICO

Maheu&Maheu
Quebec, Canada

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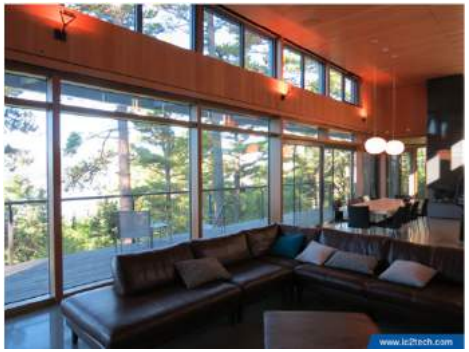
Résidence Cap-aux-Corbeaux
Baie St-Paul, Canada



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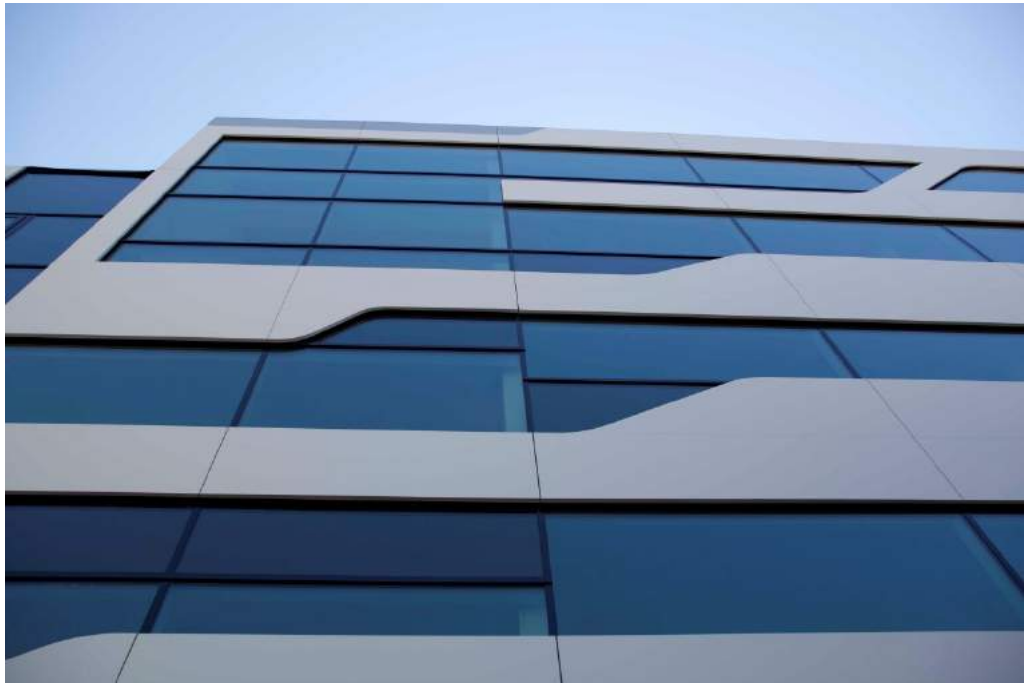
RED BULL World 2
Fuschl am See, Austria

Country House 2
Innsbruck , Austria

RAICO

MED-EL Innsbruck
Innsbruck , Austria



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Benetton
Rom, Italy

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Library of Birmingham
Birmingham, UK

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Galenica
Bern, Swiss

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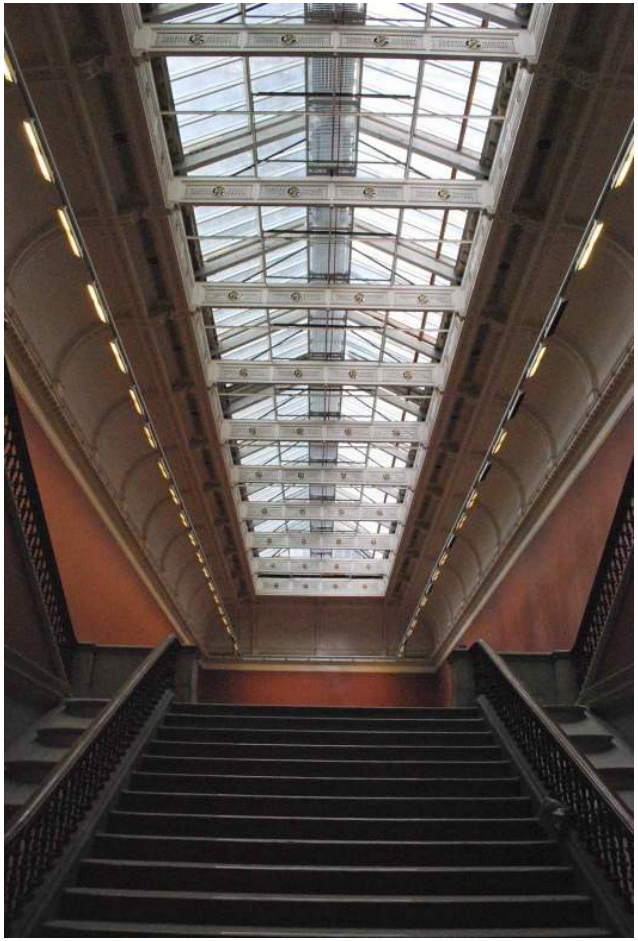
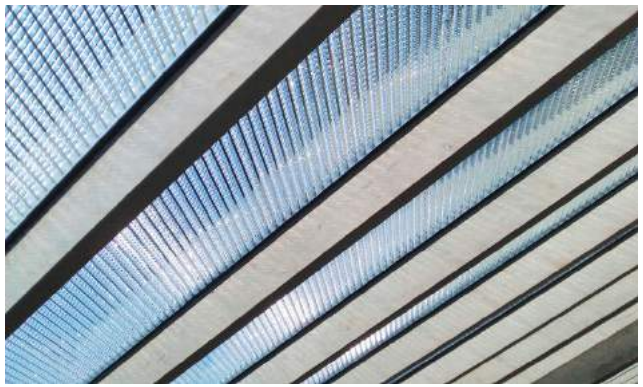
National Gallery
Dublin, Ireland





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International Trade House
Nizhny Novogorod, Russia

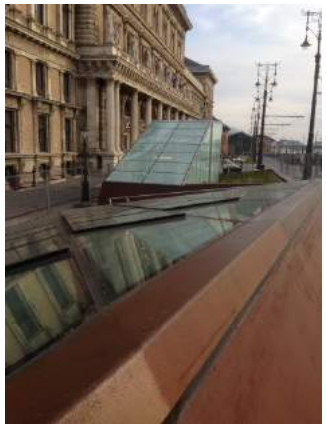
RAICO

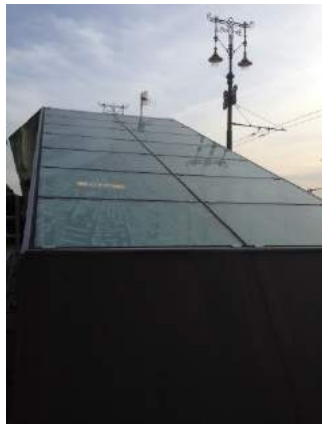
Library and Learning Centre
Melton, Australia

RAICO

Metro Station
Budapest, Hungary





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Indoor Climbing
Bruneck, Italy

Fotos: René Riller

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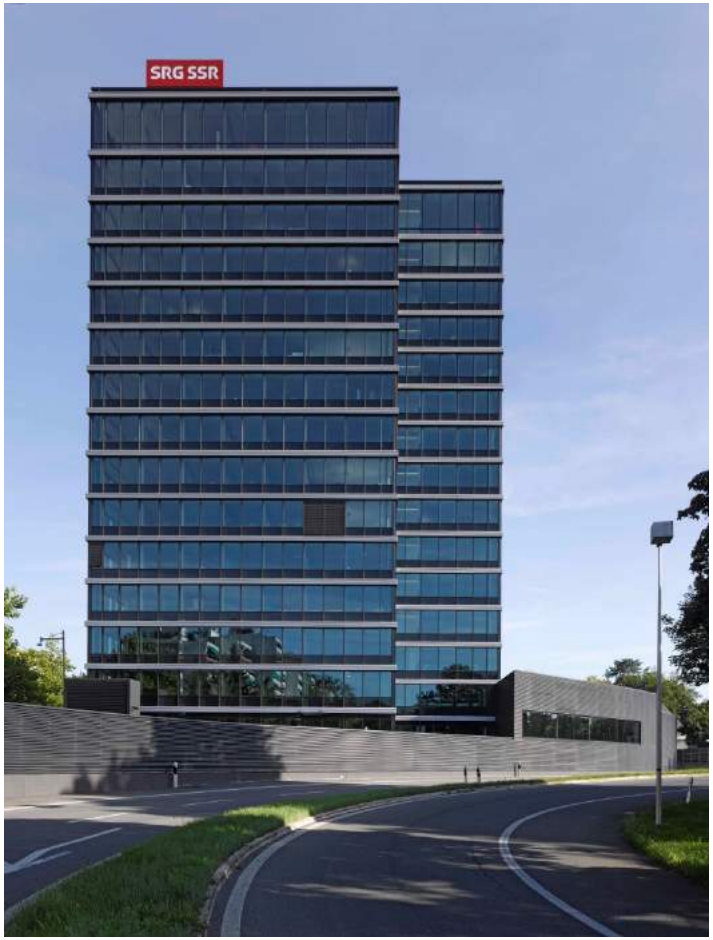
SRG SSR
Bern, Swiss



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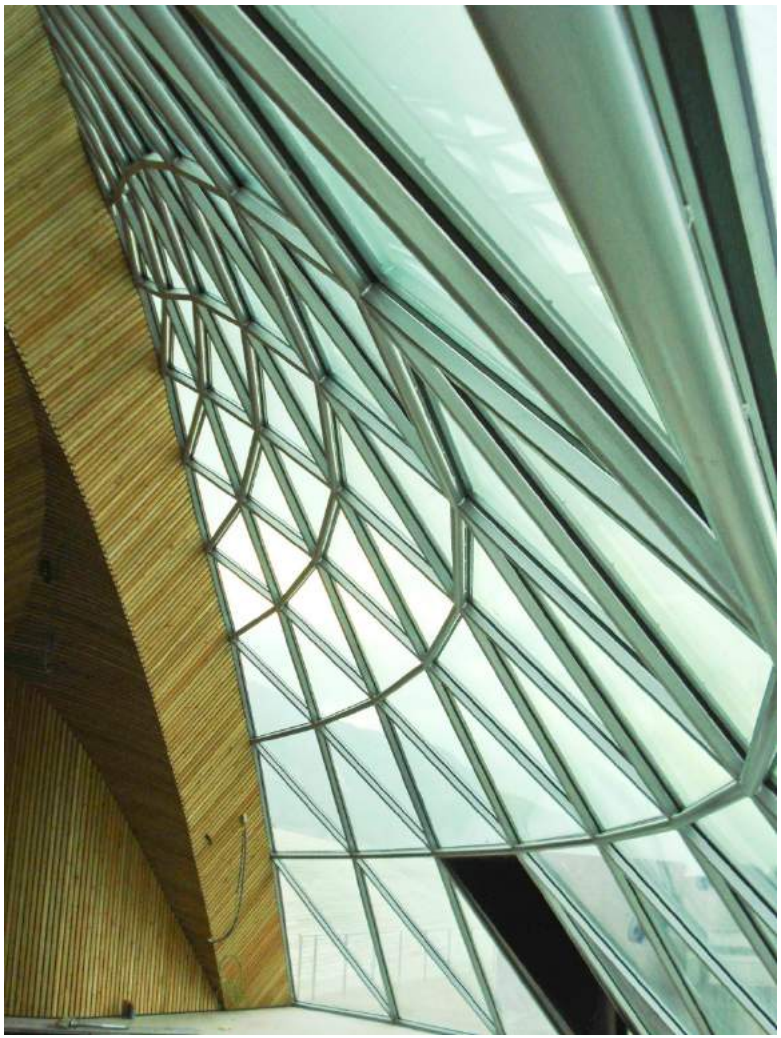
Rossignol
Saint Jean de Moirans, France



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PARC – Peninsula Aquatic Recreation Centre
Frankston, Australia

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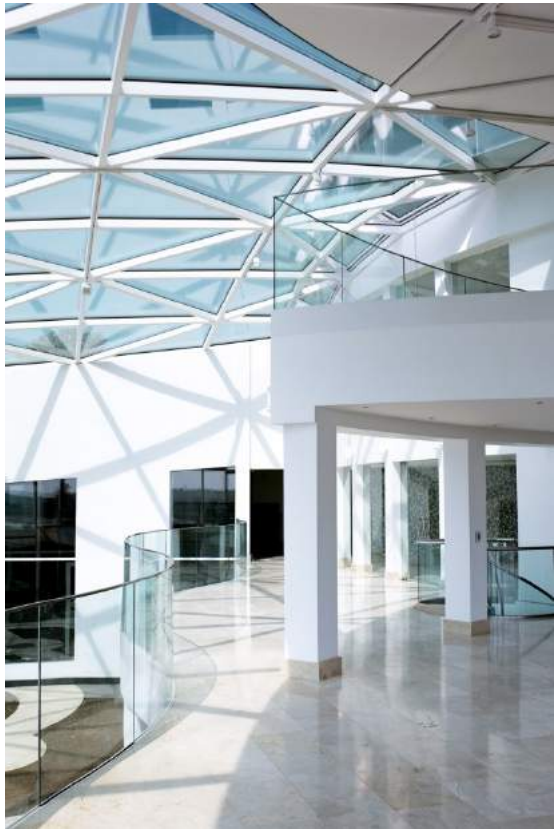
Swinhay Private House
Gloucestershire, UK



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IceQ the 007 feeling
Sölden, Austria

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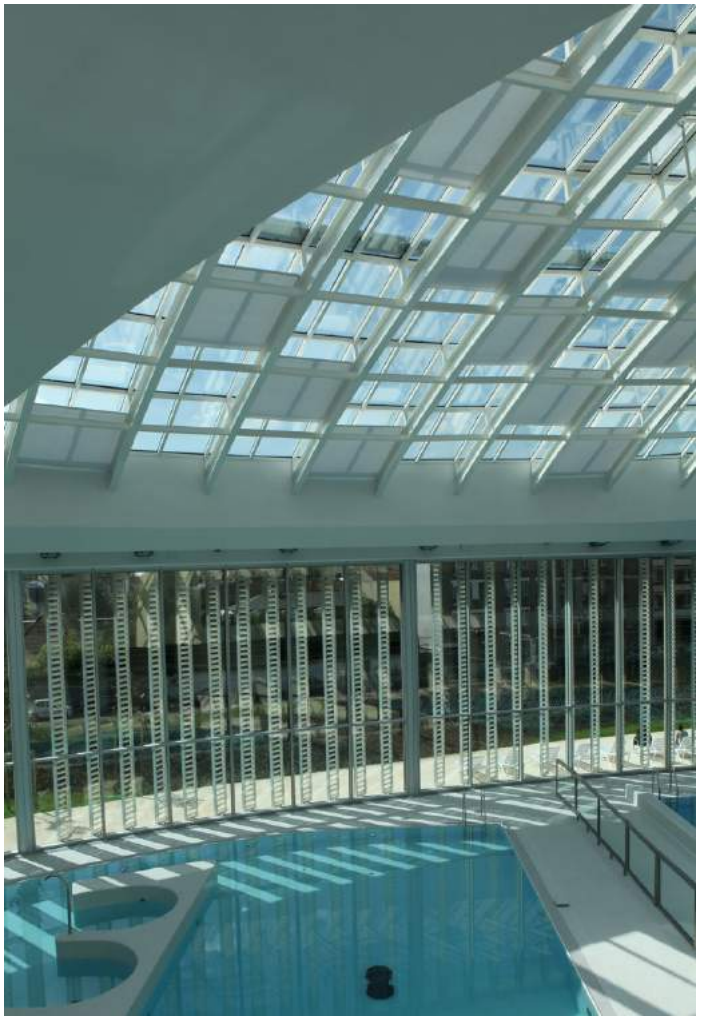
Bath Le Dôme de Vincennes
Vincennes, France



CCB Centre of Chemistry und Biomedicine
Innsbruck, Austria

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Griffin Hall – Northern Kentucky University.
Highland Heights Kentucky, USA.

RAICO

J. Craig Venter Institute (JCVI).
La Jolla, California USA

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Thank you very much for your attention.

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International Sales Manager

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