

RAICO

The Professionals' Profile

System overview 2015





The Professionals' Profile.

” In everything we do, we never lose sight of what our company characterizes: The man is at the centre of all action. ”



Managing directors
Dr. Stefan Lackner and Manfred Hebel

Dear Ladies and Gentlemen,

with great commitment, creative ideas and individual experiences and skills, our employees contribute to living our corporate slogan "The Professionals' Profile" every day.

People from various countries and different cultures and with different languages and traditions work in our company. They all have only one target: To fill our customers with enthusiasm all over the world.

From the first planning to the realization of the project and beyond, a competent and experienced team supports you in personal contact with a comprehensive service range. That is a consultancy service which is not only particularly appreciated but is also considered to be outstanding. In doing so, our customers are impressed by the high level of competence, sense of responsibility and passion. Mutual appreciation, openness and reliability are decisive factors in the communication and essential part of our corporate values.

To achieve this, they cooperate across all departments, exchange views regularly and benefit mutually from the knowledge and know-how of their colleagues. Concerning all these activities, the main emphasis is put on only one target: The best solution for our customers and their demands and requirements.

Dr. Stefan Lackner

Manfred Hebel

CONTENTS

The Professionals' Profile

THERM⁺ curtain wall system 6



Overview of all systems	8
Aluminium curtain wall	10
Steel curtain wall	12
Timber curtain wall	14
Passive house-curtain wall	16
Glass roof construction	17
Structural Glazing	18
Fire resistance	19
Burglar resistance	20
Approvals / certifications / CE-labelling	21

FRAME⁺ window system 22



Overview of the window system	24
Aluminium window 65 W / 75 WI	25
Aluminium window 75	26
Aluminium window 90	27
Parallel tilt and slide door	28
Ventilation flap	29
Approvals	30

FRAME⁺ door system 32



Overview of the door system 75 DI	34
FRAME ⁺ 75 DI	35
Design variants	36
Floor connection / doorsills	37
Hinges	38
Door locks	39
Burglar resistance	40
Approvals / certifications / CE-labelling	41

WING window system 42



Overview of the window system	44
WING 50 A – Top-hung / Side-hung / Bottom-hung window	46
WING 50 SK – Top-hung projecting window	47
WING 105 DI – Rooflight window	48
Approvals / CE-labelling	49

NEW – Your direct and interactive link to RAICO catalogues!



RAICO interactive!

By scanning the QR-Code (left) log into the download center of RAICO you will get access to all of the product manuals and brochures. Through scanning the QR-Codes on the following pages you go directly to the appropriate catalogue or brochures.



Photo: Arbeitgeberverband HessenChemie



HessenChemie office building – Wiesbaden, GER

THERM⁺

Curtain wall system

System solutions with virtually endless possibilities. Based on its consistent modular design the THERM⁺ curtain wall system provides you with almost unlimited possible combinations using its various components. With this unique flexibility you will find the most suitable, safe, viable and economic solution for every individual project.



PARC – Peninsula, AUS



Office building – Delft, NL



Bauhaus building centre – Berlin, GER



Bristol University – Bristol, UK



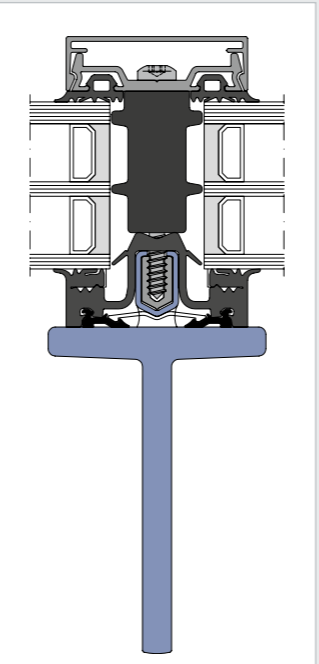
Raiffeisenbank office building – Untersiggenthal, CH



KIT Casino – Karlsruhe, GER


THERM⁺

Overview of all systems



THERM⁺ S-I
Steel curtain wall

The THERM⁺ mullion-transom curtain wall system using steel combines the advantages of set-on-top construction with those offered by curtain wall systems with integrated screw ports. Additionally, the fixture technique of the steel curtain wall system makes it possible to select from standard steel profiles.


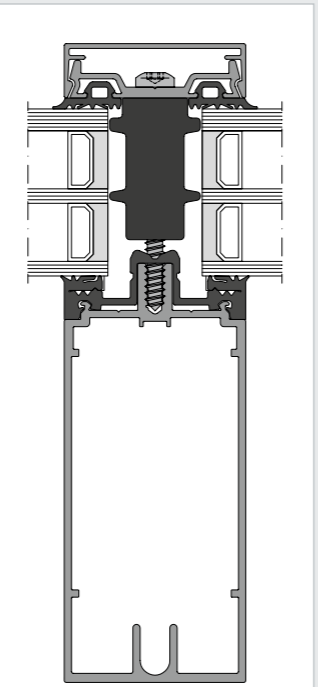


THERM⁺ S-I
Variants:

- Glass roof (2° inclination)
- Fire resistance E30/EW30/EI30

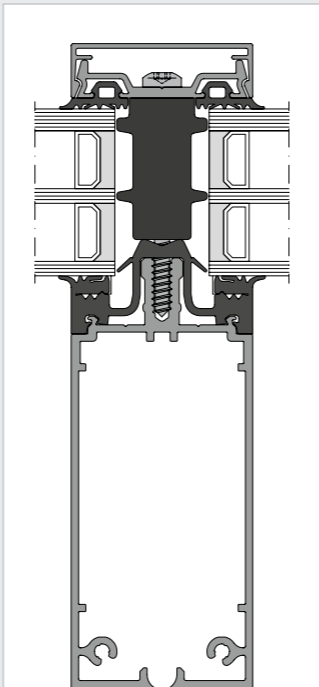
THERM⁺ A-V/A-I
Aluminium curtain wall

The THERM⁺ aluminium curtain wall stick system combines maximum application of the range with straight forward planning and manufacture, providing high processing reliability due to the consistent modular technology.

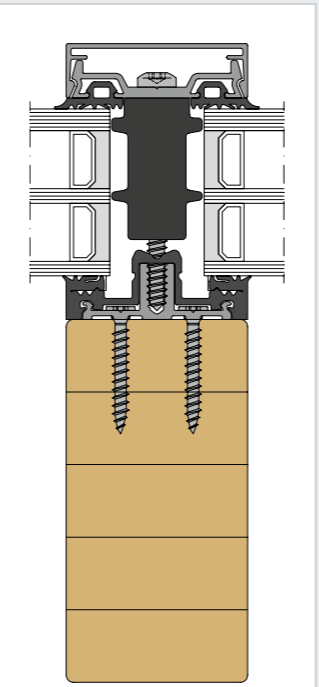
THERM⁺ A-V
Variants:

- Fire resistance EI30
- Reinforced mullion option

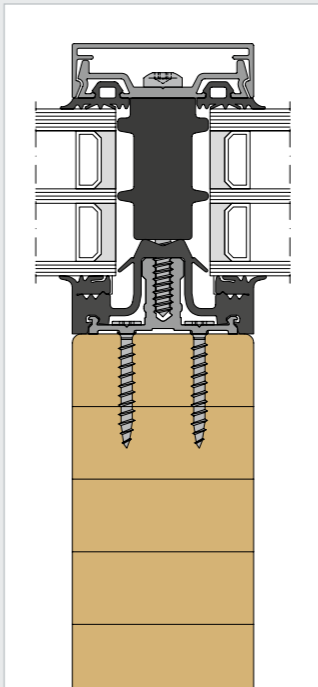


THERM⁺ A-I
Variants:

- Glass roof (2° inclination)



THERM⁺ H-V

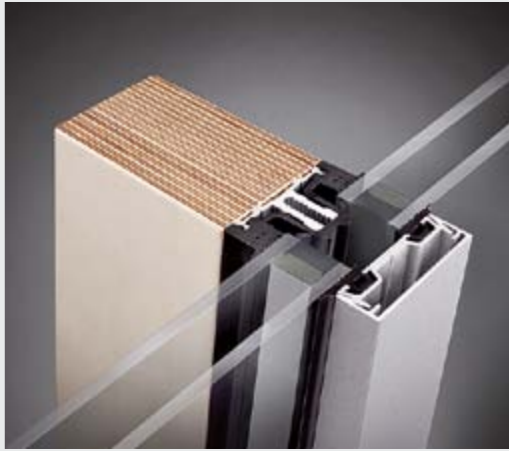


THERM⁺ H-I
Variants:

- Glass roof (2° inclination)
- Fire resistance E30/EW30/EI30

THERM⁺ H-V/H-I
Timber curtain wall

The THERM⁺ timber curtain wall system provides an approved glazing technology application to structural frames made of any timber based material. For a sustainable and lasting function the consistent system design assures strict separation between the structural elements and the functional components of aluminium profile located gaskets.





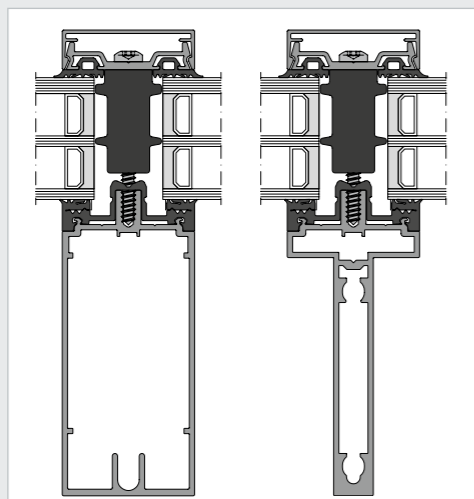
Advantages

- Efficient heat insulation up to passive-house certification with $U_f = 0.80 \text{ W/(m}^2\text{K)}$ (considering screw influence).
- Stepless thermal insulation by means of RAICO Insulation Block Technology.
- Profiles are all suited for mullion and transom usage.
- A large selection of rectangular and T-shaped mullion profiles is available.
- Excellent aesthetics to the flush faced transoms through sharp edge horizontal cuts.
- Numerous options for the T joint connector assembly.
- Maximum inertia values by means of optimised profile design.
- Wide range of system accessories available.
- Integrated drainage system within continuous three level gaskets.

Overview A-V / A-I

THERM+ A-V

Is ideal for slim, economic curtain wall solutions, featuring reduced internal gasket dimensions and an optimised cost benefit ratio for regular façade applications.

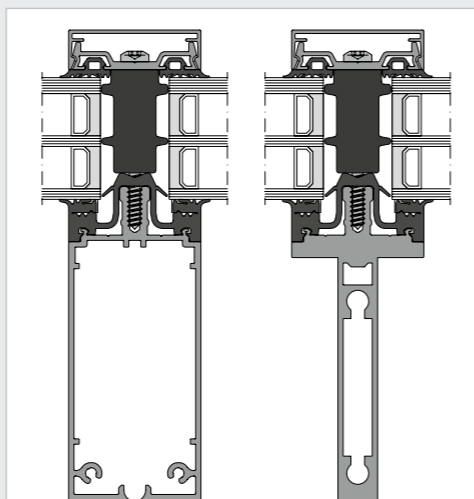


50 A-V with insulating block P

50 A-V with insulating block P and T profile

THERM+ A-I

Offers exceptional freedom of design for curtain wall, conservatories and sloped glass roofs with an inclination down to 2°, even with demanding structural or constructional requirements.



50 A-I with insulating block P

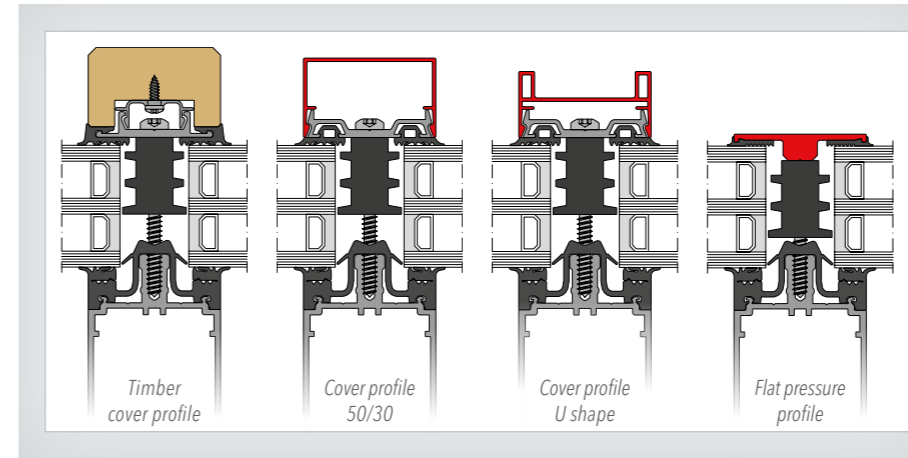
50 A-I with insulating block P and T profile



RAICO interactive!
Here you find the THERM+ Aluminium planning catalogue



Pressure and cover profiles for curtain wall and roof applications



- A large selection of cover cap profiles for both system widths.
- Bespoke profiles available on a short lead time for specific projects.
- Aesthetically pleasing flat pressure profile with only 4 mm glass offset.
- Optimal sealing of the cross-point via special accessories.
- Find more types in the catalogue: THERM+ curtain wall system.

Technical Data

	System width	Rectangular profile depth	Expansion profile depth	T-profile depth	T-profile width	Infill thickness	Glass weight	Drainage levels	Polygonal assembly	Glass roofs	Conservatories
A-V	50/56 mm	25 to 200 mm	100 to 200 mm	50 to 175 mm	50 mm	10 to 64 mm	up to 550 kg	2 or 3	up to 45°	–	–
A-V reinforced	50/56 mm	100 to 200 mm	–	–	–	10 to 64 mm	up to 600 kg	2 or 3	up to 45°	–	–
A-I	50/56 mm	25 to 200 mm	75 to 200 mm	50 to 200 mm	50 mm	4 to 64 mm	up to 600 kg	2 or 3	up to 45°	up to 2° inclination	yes

T-connector – a technical advantage

A distinctive feature of the THERM+ aluminium curtain wall system is the innovative T-connection technology. Every single detail in its development has been analysed to provide an abundance of advantages:

- Identical for THERM+ A-V/A-I in all system widths.
- Easy butt joint with straight profile cuts, no notching required.
- Various options for structural requirements and assembly methods.
- THERM+ A-V is also available with a reinforcement option for high structural requirements.
- Extremely rigid connections due to the spreader-clamp mechanism when screw fixed.
- T-connectors for vertical loads up to 600 kg. (Verified under German Type Approval).
- Aesthetically pleasing joints due to the optimum contact between mullion and transom across the entire profile.
- The T-connector profiles can be used for structural reinforcement, head and sill fixings as well as expansion joint spigots.



Mullion-transom connector



T-connector interior view



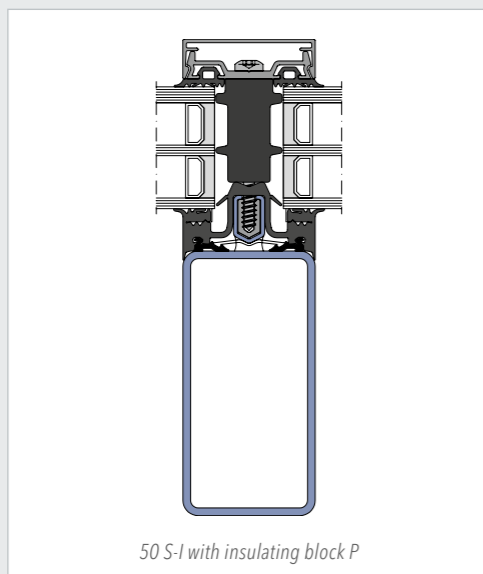
Advantages

- Efficient heat insulation up to passive-house certification with $U_f = 0.78 \text{ W/(m}^2\text{K)}$ (considering screw influence).
- Stepless thermal insulation by means of RAICO Insulation Block Technology.
- Set-on-top construction for any steel support profile with a width from 50 mm.
- Safe and easy glass load transmission for heavy panes up to 800 kg, and with supplementary components up to 1,500 kg.
- Integrated drainage system in continuous three level gasket.

Overview S-I / S-I steel profiles in T shape

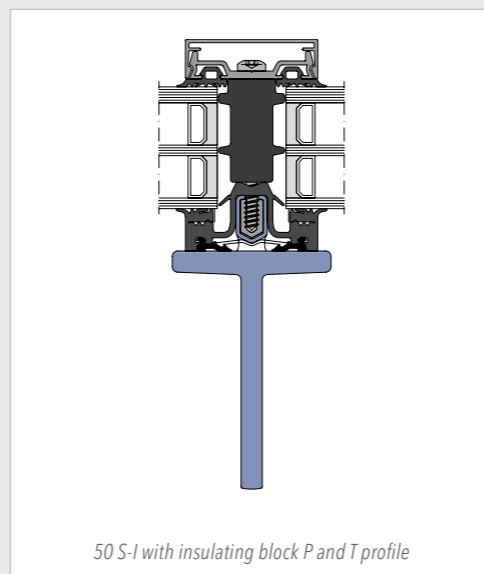
THERM⁺ S-I

For all curtain walling and glass roofs with an inclination down to 2°, with standard steel profiles from 50 mm wide.



THERM⁺ S-I Steel profiles in T-shape

With an elevation width of 60 mm and a depth of 60, 90 or 120 mm, these steel T shaped profiles are ideally suited for sophisticated glazed curtain wall screens. Other custom made profiles are available upon request.



RAICO interactive!
Here you find the
THERM⁺Steel
planning catalogue



Variants

THERM⁺ S-I Base Profile Options

The base profiles are available in pre-rolled stainless steel with integrated aluminium screw port, or in mild steel for galvanised finishes, with a retro fit aluminium screw port.

THERM⁺ S-I Interior Gasket Options

Type "S" with synthetic clip-on gasket retainer profile.

Type "L" as above, but with gasket lips to follow large corner radii of steel profiles.

Type "D" alternative positioning gasket to fix directly onto the steel profile.

Technical Data

	System width	For steel profiles from	Steel profiles in T-shape	Infill thickness	Glass weight	Drainage levels	Polygonal assembly	Glass roofs	Conser-vatories
S-I	50/56/76 mm	50 mm width	60 mm width, 60/90/120 mm depth	4 to 64 mm	up to 1.500 kg	2 or 3	up to 45°	up to 2° inclination	yes

Protection against corrosion – a technical advantage

With its specific material properties, steel offers an extremely rich variety of forms and therefore a diverse range of creative possibilities. The unique patented fixture principle of the THERM⁺ system has been developed from real-life requirements in order to extend those possibilities further without limiting itself to glazed curtain walling, and at the same time to reach a safe but simple assembly as well as providing maximum protection against corrosion.

- Perfect protection against corrosion due to a 3 mm safety distance between structural profile and system base profile, thus no metal components in direct contact with each other (see fig. 1).
- Patented base profile system with stainless steel clad aluminium screw port, for easy fabrication and reliable manufacture.
- Option for galvanised structures in coastal areas or within swimming pool environment: the S235JR mild steel shroud with retro fit powder coated aluminium screw port.
- Spot-welding fixation for reduced production times.
- High screw retention values and smooth screw fastening due to the aluminium screw channel.
- Easy and efficient fabrication with practical system tools.

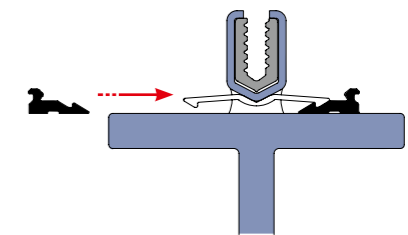


fig. 1: Perfect protection against corrosion





TIMBER CURTAIN WALL

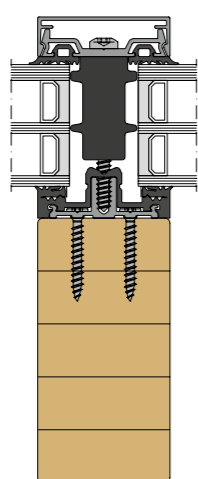
Advantages

- Efficient thermal insulation to Passive House certification with $U_f = 0.80 \text{ W/(m}^2\text{K)}$ (considering screw influence).
- Stepless thermal insulation by means of RAICO Insulation Block Technology.
- Two types of screw fixed aluminium base profiles; with or without profile locator.
- Screw fixings officially endorsed by European Technical Approval, for timber product derivatives having widths of 50 mm.
- Quick and easy fitting of the base profiles. Also suitable for assembly with magazine fed electric screwdrivers.
- No external components penetrate through to the timber frame.
- Integrated drainage system in continuous three level gasket.

Overview H-V / H-I

THERM+ H-V

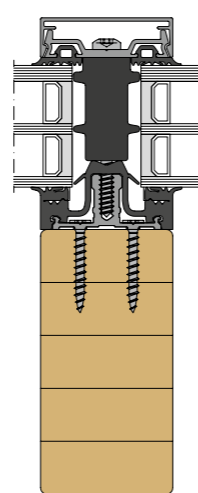
is ideal for slim-line, economical curtain walls, with reduced interior gasket dimensions.



50 H-V with insulating block P

THERM+ H-I

for curtain walls and sloped glass roofs with an inclination down to 2°, thus also ideal for any type of timber-aluminium conservatory.



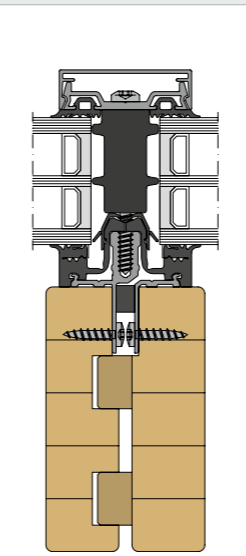
50 H-I with insulating block P



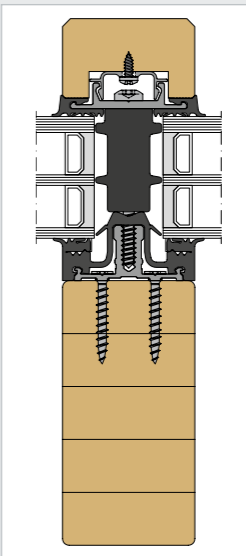
RAICO interactive!
Here you find the
THERM+ Timber
planning catalogue



Variants



Coupling mullion
An ideal aid for efficient assembly. Pre-fabricated frames can be finished in the workshop with split coupling mullions, base profiles, interior gaskets and glass supports. On site these frames are simply coupled, glazed and finished with pressure profiles.



Timber Cover Profiles
can be produced in a sustainable and dependable way with THERM+. The glazing technology is based on aluminium and EPDM components. The decorative timber profile is retained by a concealed profile.

Technical Data

	System width	For timber profiles from	Infill thickness	Glass weight	Drainage levels	Polygonal assembly	Glass roofs	Conservatories
H-V	50/56/76 mm	50 mm width	10 to 64 mm	550/600 kg	2 or 3	up to 45°	-	-
H-I	50/56/76/96 mm	50 mm width	4 to 64 mm	550/600 kg	2 or 3	up to 45°	down to 2° inclination	yes

The RAICO timber connector TC – technology in detail

The connectors between mullion and transoms on timber curtain walling must fulfil additional specific requirements. The dead load of the infill units is positioned in front of the timber structure, and the connectors must compensate for this torsional effect in addition to wind pressure and suction forces:

- Two patented RAICO connector options: SOLO and KOMBI for glass weights up to 481 kg.
- For THERM+ H-V/H-I.
- For transom depth from 60 up to 300 mm.
- Minimum preparation: rebated grooves at each end of the transom and drilled holes to both the mullion and transom.
- Simplified assembly: fix mullions, insert transom, secure transom with nail screws, finished.
- Automatic flush position of the transom due to the integrated stop device.
- Option to prefabricate into transportable units.
- Aesthetically correct joints due to T connector pressure across the profiles.



Timber connector TC SOLO



Timber connector TC KOMBI



RAICO interactive!
Here you find the
THERM+ Timber
connector TC
catalogue





PASSIVE HOUSE CURTAIN WALL

Private house – Schwabmünchen, GER

Photo: Oberbeck & Wehler Architekten

The standard THERM+ system can easily be upgraded to Passive House Certified standard with minimal additional components. Passive House projects can therefore be fitted with energy saving glazing in a generous, cost effective way, independent of their supporting projects.

Advantages

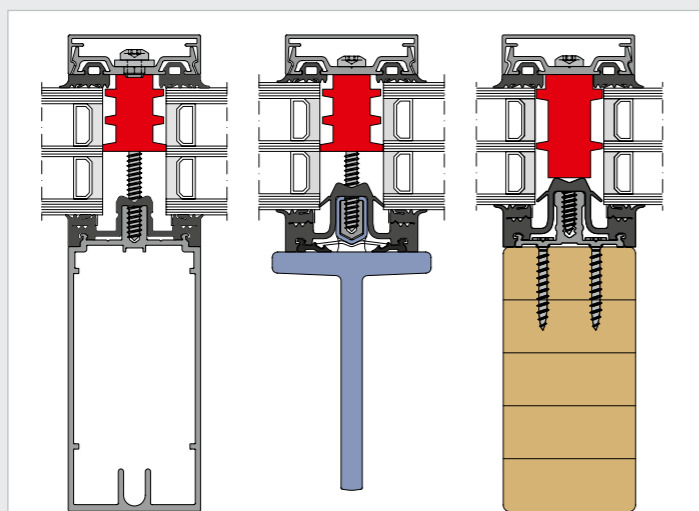
- Certified by the European Passive-House Institute Dr. Feist in Darmstadt.
- Certified with triple glazing, argon gas filling and acrylic spacer.
- Installations achieves high levels of air tightness. (Blower Door Test).
- Specific accessories (sealing membranes and connection panel profiles) maintain integral Passive House quality.
- Application in glass curtain wall and glass roof possible.
- All pressure and cover profiles from the standard systems can be applied.

Passive House Certification based on the latest criteria.

The whole range of THERM+ curtain wall systems has been certified in accordance with the latest criteria set by Dr. Wolfgang Feist's Passive House Institute. The comfort criteria in passive house of

$U_{CW} = 0.80 \text{ W/(m}^2\text{K)}$ is fulfilled by our THERM+ A-V and THERM+ S-I systems available in sight-line widths of 50 and 56 mm, as well as by THERM+ H-V with system widths of 50, 56 and 76 mm.

All certifications have considered the influence of screw fixings using RAICO's standard pressure plate screws and RAICO's own synthetic glass carriers.



U_i down to 0.85 W/(m²K) U_i down to 0.88 W/(m²K) U_i down to 0.87 W/(m²K)

Thermal insulation values

according to DIN EN ISO 10077-2 incl. screw influence

	System width	U_i -value
A-V	50/56 mm	down to 0.85 W/(m ² K)
S-I	50/56 mm	down to 0.88 W/(m ² K)
H-V	50/56/76 mm	down to 0.87 W/(m ² K)
H-I	50/56/76 mm	down to 0.88 W/(m ² K)



RAICO interactive!
Here you find the passive house flyer



GLASS ROOF CONSTRUCTION

Thermal bath – Sinsheim, GER

The curtain wall systems THERM+ A-I, S-I and H-I for aluminium, steel and timber respectively, provide ideal characteristics for sloped glass roof installations. The tried and tested RAICO glazing and sealing technology ensures a safe and easily executable solution for any roof construction and shape with an inclination down to 2° from horizontal.

Advantages

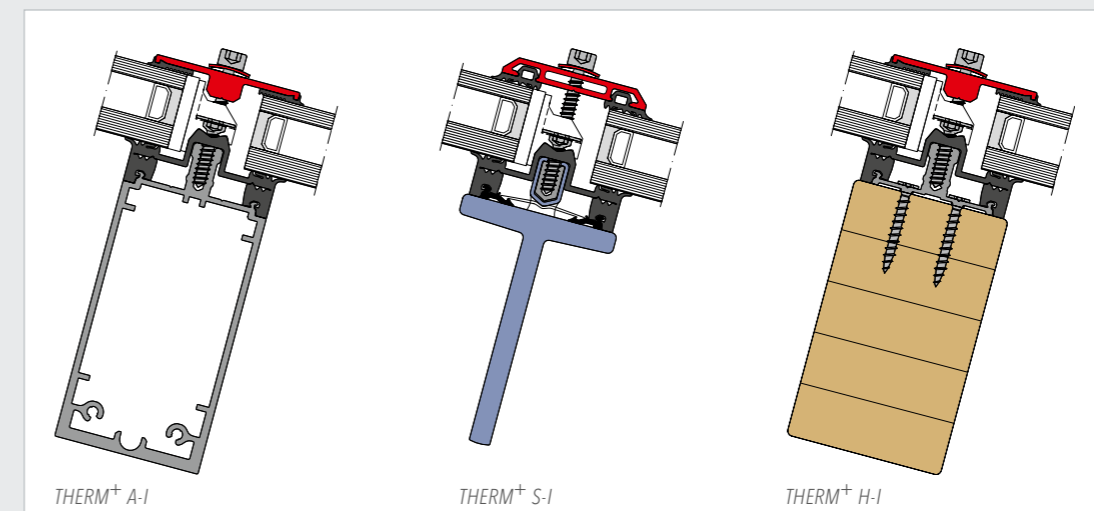
- Tested with an inclination of only 2°, with outstanding results and classifications. (Accessories such as sun protection devices and building connection components were included in the testing).
- The system structure is identical to the THERM+ standard systems.
- The low pitch construction is made feasible with bevelled pressure profiles, flat pressure profiles, silicone joints or any combination of these.
- Outlets at the end of the pressure profiles provide efficient drainage and avoid stagnant water.
- Natural and smoke ventilation can be achieved by inserting our aesthetically pleasing WING 105 DI opening roof-light which has also been tested down to 2° from horizontal.

Wide range of possibilities

The THERM+ glazing system offers a surprisingly wide range of possible variations. By selecting one or more of our base profile systems, identical construction for mullion-transom curtain wall and glass roofs are possible.

Options include an aluminium system offering a large range of support profiles, a set-on-top steel base profile for any commercially available steel support profiles, or a base profile designed to fit on to a range

of timber products. With regard to the curtain wall system, the thermal insulation can be set to any individual requirement by selecting the appropriate accessories without the need to change the base profiles.



THERM+ A-I

THERM+ S-I

THERM+ H-I



RAICO interactive!
Here you find the THERM+ planning manual of glass roof constructions





Photo: AQUA DOME

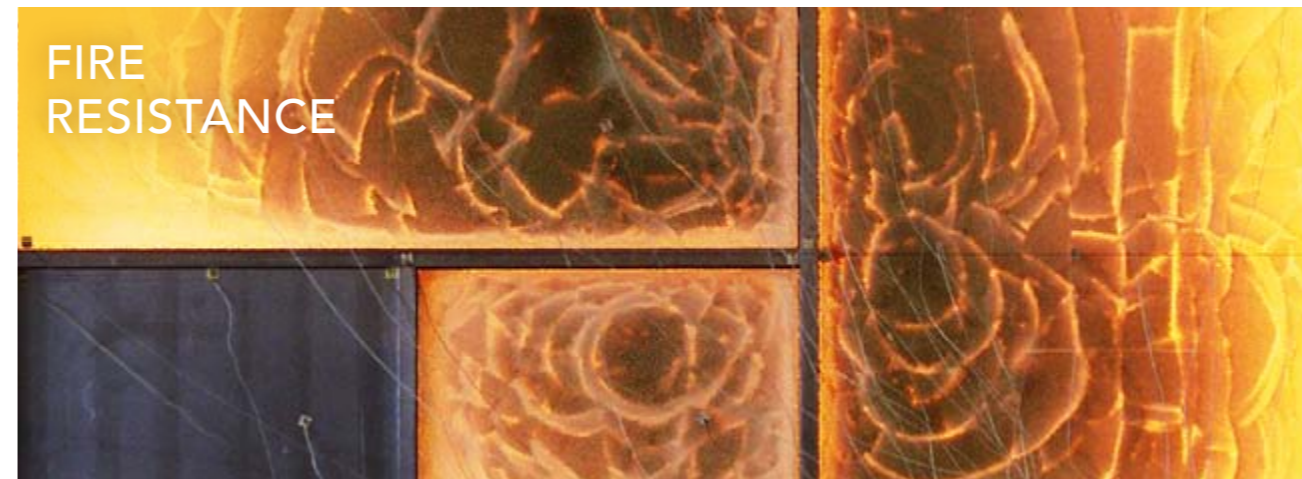
Aqua Dome – Längenfeld, AT

STRUCTURAL GLAZING

The THERM+ Structural Glazing SG2 curtain wall systems feature the most intricate glazing technique. A narrow silicone joint is the only visible line between the insulation glass panes. Retention of the internal pane is enabled easily, quickly and securely with the use of SG glazing toggles. By utilising the SG insulating block, curtain walls achieve outstanding thermal insulation values.

Advantages

- Can be combined with any of our other system variations, with any pressure profiles and also with suction discs.
- Efficient and safe glass fixation with structural glazing toggles.
- High heat insulation up to $U_f = 0,90 \text{ W/(m}^2\text{K)}$ (considering screw influence).
- Available in 50 and 56 mm versions of all THERM+ systems.
- For double or triple glazing, from 32 to 64 mm thickness.



FIRE RESISTANCE

Minor additions to the standard THERM+ system are all that is needed to construct fire resistant curtain wall in a range of protection classes. The maximum size of 1,500 mm x 3,000 mm glazing panels provides a new dimension in fire protection.

Advantages

- The design of fire protection curtain wall is identical to the standard systems, thus requiring a minimum of additional cost and fabrication effort.
- Application of standard gaskets.
- Tested glass dimensions
A-V: up to 1,400 x 3,000 mm.
S-I: up to 1,500 x 3,000 mm.
H-I: up to 1,500 x 3,000 mm.
- No visual difference between the variations.
- All standard structural profiles can be applied.
- Maximum freedom of design with storey height screens.

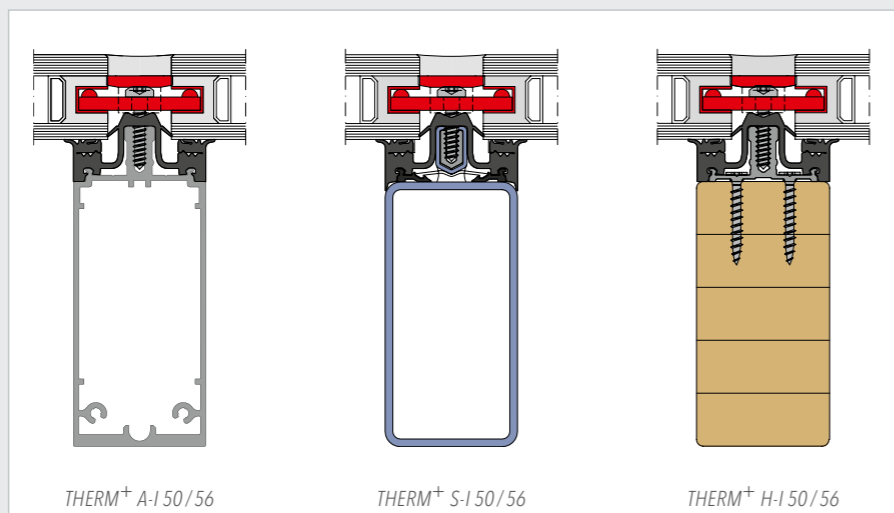
Technical Data

	System width	Fire resistance class	Max. glass formats	General approval
A-V	50/56 mm structural profiles from 50 mm	EI30	1,400 x 3,000 mm	Classification report No. 14-002042-PR01 (ift Rosenheim)
S-I	50/56 mm structural profiles from 60 mm	E30/EW30/EI30	1,500 x 3,000 mm	Classification report No. C-11-003319-PR01 F14-01-de-01
H-I	50/56 mm structural profiles from 60 mm	F30/G30	1,500 x 3,000 mm	German general approval No. Z-70.4-166

Variety of possible combinations

SG2 curtain wall may be combined with any other version of the system, as well as pressure plate / cover caps and suction discs.

SG curtain wall is available in system widths of 50 and 56 mm, suitable for glazing units from 32 to 64 mm thick.



THERM+ A-150/56

THERM+ S-150/56

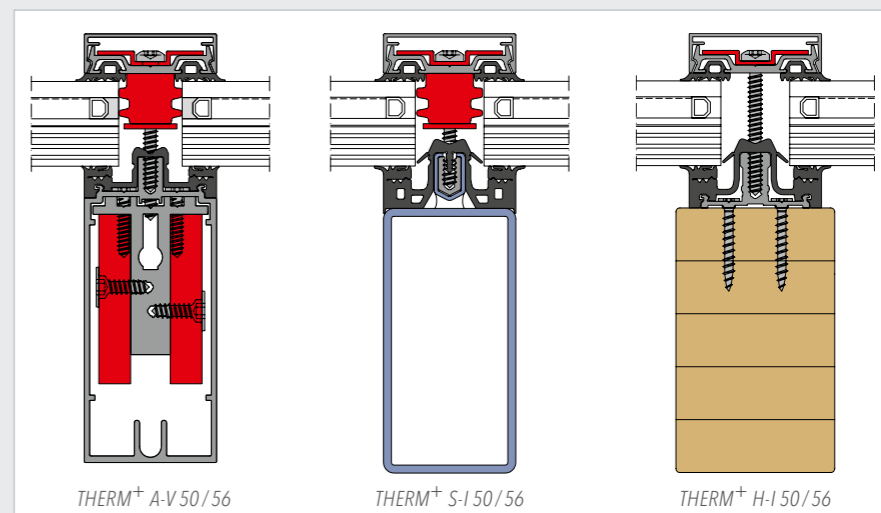
THERM+ H-150/56

Technology in detail

Aluminium: Aluminium glass carrier, short length stainless steel reinforcement to pressure plate, intumescent strip in glazing rebate.

Steel: Aluminium glass carrier, short length stainless steel reinforcement to pressure plate, intumescent strip in glazing rebate.

Timber: Aluminium glass carrier, short length stainless steel reinforcement to pressure plate.



THERM+ A-V 50/56

THERM+ S-I 50/56

THERM+ H-I 50/56



BURGLAR RESISTANCE

All THERM+ curtain wall variants may be made burglar resistant in accordance with the German resistance categories WK2 and WK3 by adding a few supplementary system components. Providing maximum creative possibilities, all system widths and all types of pressure plates with clip on cover caps, visible screw fixings, as well as flat profile pressure plates (in WK2) may be used.

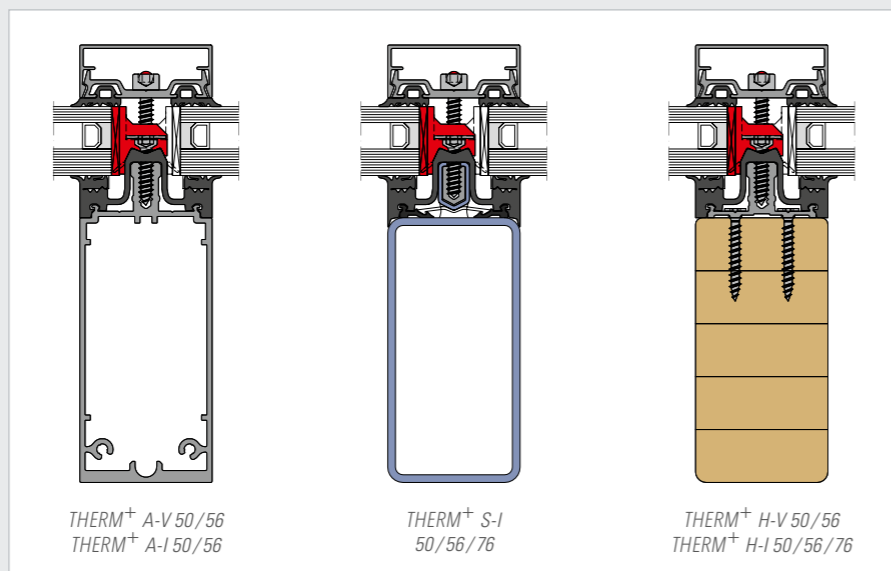
Advantages

- Extension of the standard systems by using additional shims with glass carriers and captivated ball bearing screw heads.
- For WK3 supplementary reinforcement to the pressure profile and captivated ball bearing screw heads.
- No visual difference between the variations.
- Manufacture is identical to the standard system, thus production and assembly is rationalised to the standard system.
- Wide selection of pressure and cover profiles.
- System width and infill thickness as for standard systems.
- The production of glass roofs in class WK2 and WK3 is also available.

Technology in detail

The burglar resistance curtain wall can be equipped with following opening insertion windows in class WK2:

- Aluminium window system FRAME+ (see page 24)
- Top-hung projecting window WING (see page 44)
- Top-hung / side-hung / bottom-hung projecting window WING 50 SK (see page 45)



Approvals / Certification / CE-labelling

based on product standard for curtain walling EN 13830

	THERM+ A-V	THERM+ A-I	THERM+ S-I	THERM+ H-V	THERM+ H-I
Thermal insulation incl. screw influence	up to $U_i=0.80 \text{ W/(m}^2\text{K)}$	up to $U_i=0.97 \text{ W/(m}^2\text{K)}$	up to $U_i=0.78 \text{ W/(m}^2\text{K)}$	up to $U_i=0.80 \text{ W/(m}^2\text{K)}$	up to $U_i=0.81 \text{ W/(m}^2\text{K)}$
Wind resistance	1.875/2.813 kN/m ²	1.875/2.813 kN/m ²	2.5/3.75 kN/m ²	2.5/3.75 kN/m ²	2.5/3.75 kN/m ²
Resistance against impact	interior I5, exterior E5	interior I5, exterior E5	–	interior I5, exterior E5	interior I5, exterior E5
Air permeability	AE (>600)	AE (>600)	AE (>600)	AE (>600)	AE (>600)
Water tightness	RE 1,650	RE 1,650	RE 1.950	RE 2,100	RE 2,100
Airborne sound insulation	$R_w(C;C_{tr})=41(-3;-7) \text{ dB}$ $R_w(C;C_{tr})=49(-2;-4) \text{ dB}$	–	$R_w(C;C_{tr})=41(-3;-7) \text{ dB}$ $R_w(C;C_{tr})=51(-1;-4) \text{ dB}$	–	$R_w(C;C_{tr})=41(-3;-7) \text{ dB}$ $R_w(C;C_{tr})=49(-2;-4) \text{ dB}$
Fall protection (TRAV)	yes, without additional measures				
German general approval	curtain wall system Z-14.4-504	curtain wall system Z-14.4-454	curtain wall system Z-14.4-446	curtain wall system Z-14.4-516	curtain wall system Z-14.4-455
European Technical Approval	–	–	–	T-connector Z-9.1-621	T-connector Z-9.1-621

Test with an inclination of 2°

	THERM+ A-I	THERM+ S-I	THERM+ H-I
Wind resistance	2,000 Pa/3,000 Pa	2,000 Pa/3,000 Pa	2,000 Pa/3,000 Pa
Air permeability	AE (>600)	AE (>600)	AE (>600)
Water tightness	RE 1,050	RE 1,050	RE 1,050



Lohn AG – Baden-Baden, GER

FRAME⁺

Window system

System solutions for architecture and window production

With the award winning FRAME⁺ aluminium window system, RAICO meets architectural demands whilst setting bench marks in the industry for thermal performance requirements. FRAME⁺ offers a convenient range of thermal performance levels for opening lights, fixed glazing and roof-lights where thermal transfer coefficients of $U_f = 0.77 \text{ W/(m}^2\text{K)}$ are possible.



Sparkasse – Pforzheim, GER



Photo: Michael Eglhoff

Umwelt Arena – Spreitenbach, CH

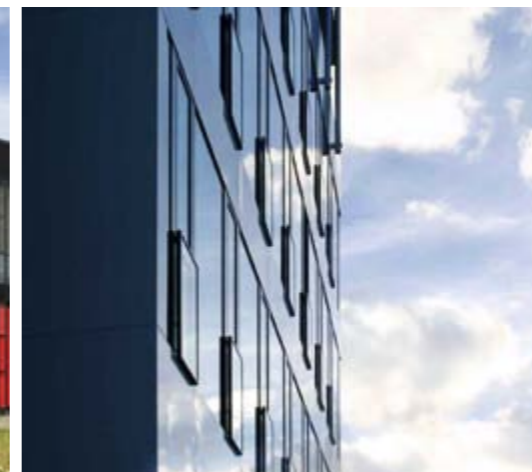


Photo: Matthias Schmid GmbH & Co. KG

B+B hotel – Ulm, GER



MTZ service centre – Oerlenbach, GER



French Consulat General – Stuttgart, GER



Sunyard – Munich, GER

FRAME⁺

Window system overview



Advantages

- Maximum energy savings with variable adjustment of the insulation values down to $U_f = 1.0 \text{ W}/(\text{m}^2\text{K})$.
- Stepless thermal insulation.
- Innovative system components, such as THERMORIT insulation bars featuring distinctly reduced heat transmission values.
- Co-extruded centric gaskets.
- Consistent thermal optimization of the modular system.
- Integration of efficient insulation areas.
- Fittings suitable for sashes weighing up to 300 kg.
- A range of opening options is available.



RAICO interactive!
Here you find the
FRAME⁺ catalogues
of aluminium
windows

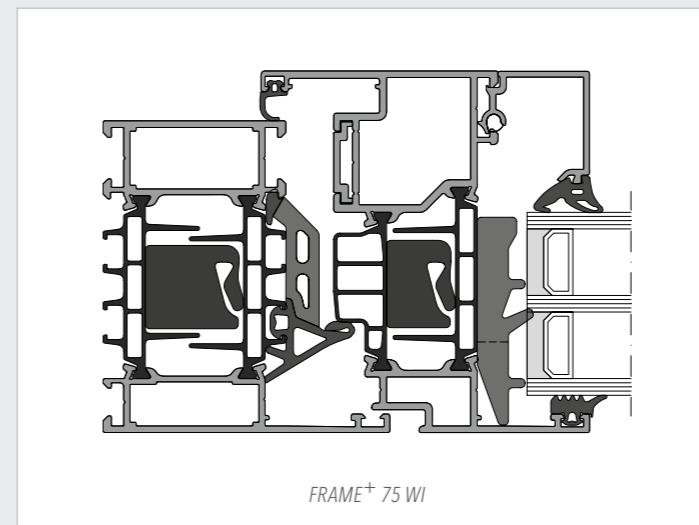


One system – multiple applications

The innovative FRAME⁺ system concept with its modular composition gives you a choice of the following series:

- FRAME⁺ 65 W – system depth 65 mm, U_f values down to $1.7 \text{ W}/(\text{m}^2\text{K})$
- FRAME⁺ 75 WI – system depth 75 mm, U_f values down to $1.0 \text{ W}/(\text{m}^2\text{K})$

The system profiles consist of identical interior and exterior aluminium extrusions and can be adapted to the required depth and thermal insulation by selection of the THERMORIT insulation bars.



Energy conservation using maximum thermal insulation

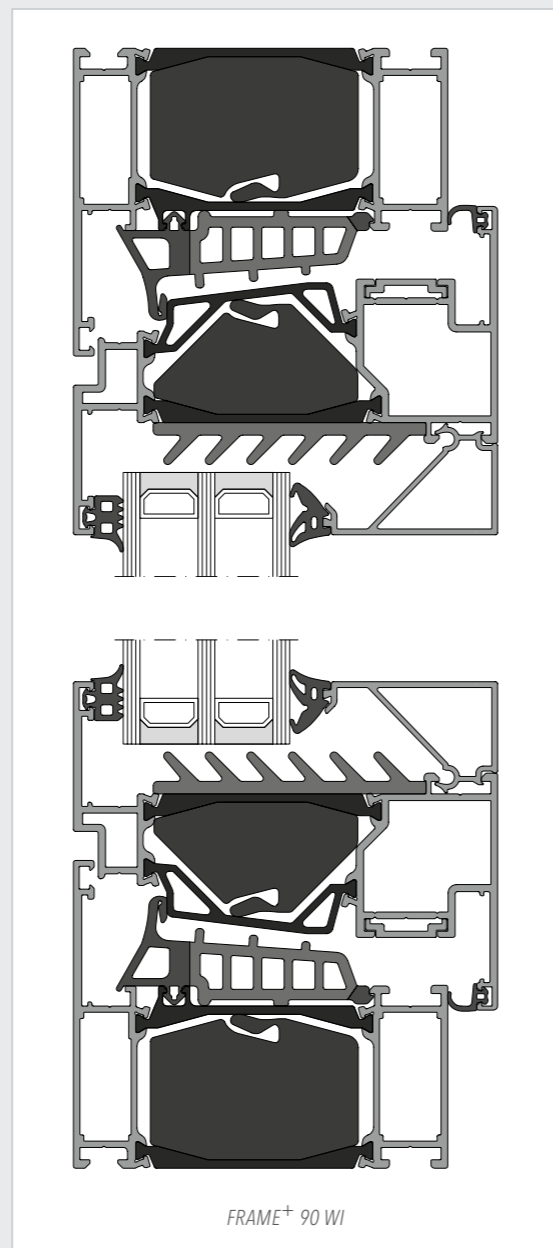
- Innovative THERMORIT insulation bar technology developed in-house for improved thermal properties over traditional polyamide.
- Adaptable U_f value down to $0.77 \text{ W}/(\text{m}^2\text{K})$ for economic applications as well as maximum energy conservation.

Design Freedom with multiple application possibilities

- Six variations from a modular system utilising a profile range that is compatible across the range.
- Extensive design options due to a large range of profiles and accessories.
- Visible or concealed system hardware for various opening types.

High quality and reliable processing

- All thermally broken profiles can be powder coated and anodised, leading to easier and more efficient materials management and production.
- Simplified planning, logistics and fabrication due to a consistent modular composition with identical components, accessories, fittings and multifunctional tools.
- Hardware options:
 - Concealed fittings
Advantages: No visible parts, low maintenance.
 - Surface mounted reinforced hinges as standard
Advantages: Greater sash weights with increased stability.





The broad range of profiles offer many design possibilities, suitable for applications such as dummy mullion sash, casement sash, parallel tilt and slide door, outward opening, structural expansion mullion options, or as a curtain wall insertion element with integration outer frame, window curtain wall and integrated ventilation flap.

FRAME⁺ 75 WB – concealed sash window

- High-insulation windows with $U_f = 1.6 \text{ W/(m}^2\text{K)}$.
- System depth 75 mm.
- Application as window for punched openings or, with outer frame extension, for integration into curtain wall.
- No visible glazing beads.
- Very slim visual appearance.
- Available as a dummy mullion sash.

FRAME⁺ 75 WB

FRAME⁺ 75 FF – window curtain wall

- Window wall system with stick system appearance and an external visual width of only 50 mm.
- Ideal for economic ribbon windows up to storey height.
- High-insulation windows with U_f up to $1.6 \text{ W/(m}^2\text{K)}$.
- Slim curtain wall appearance with sashes or fixed glazing.
- Comprehensive diversity of design with various cover profiles from the THERM⁺ curtain wall system.
- Available as a dummy mullion sash.

FRAME⁺ 75 FF

FRAME⁺ 75 WA – outward opening

- High-insulation windows with U_f down to $1.4 \text{ W/(m}^2\text{K)}$.
- Opening options: bottom-hung, top-hung, side-hung, top-hung projecting.
- Internal or external glazing options.
- Minimal sight lines.
- Available with curtain wall adapter outer frame profile.

FRAME⁺ 75 WA



Advantages

- Maximum thermal insulation and glass infill thicknesses up to 80 mm (in the sash).
- High performance thermal insulation insert with a depth of 60 mm.
- Simplified, more flexible installation into curtain wall
- with range of variable system components.
- Available in system form for self-fabrication, or as prefabricated units.
- Clean and easy corner cleat bonding using innovative adhesive injection method
- into synthetic distribution channel.
- Opening variants: Turn-tilt/Turn/Tilt-turn (tilt first)/Tilt/Parallel tilt and slide door.
- Composite profiles can be powder coated.



RAICO interactive!
Here you find the FRAME⁺ processing catalogue of aluminium windows 90 WI/WB



FRAME⁺ 90 – The new generation of aluminium window systems

Passive House certification based on the latest criteria. FRAME⁺ 90 WI and FRAME⁺ 90 WB are certified in accordance with the latest criteria set down by Dr Feist at the Passive House Institute in Darmstadt without any additional components and with a system depth of 90 mm.

FRAME⁺ 90 WI

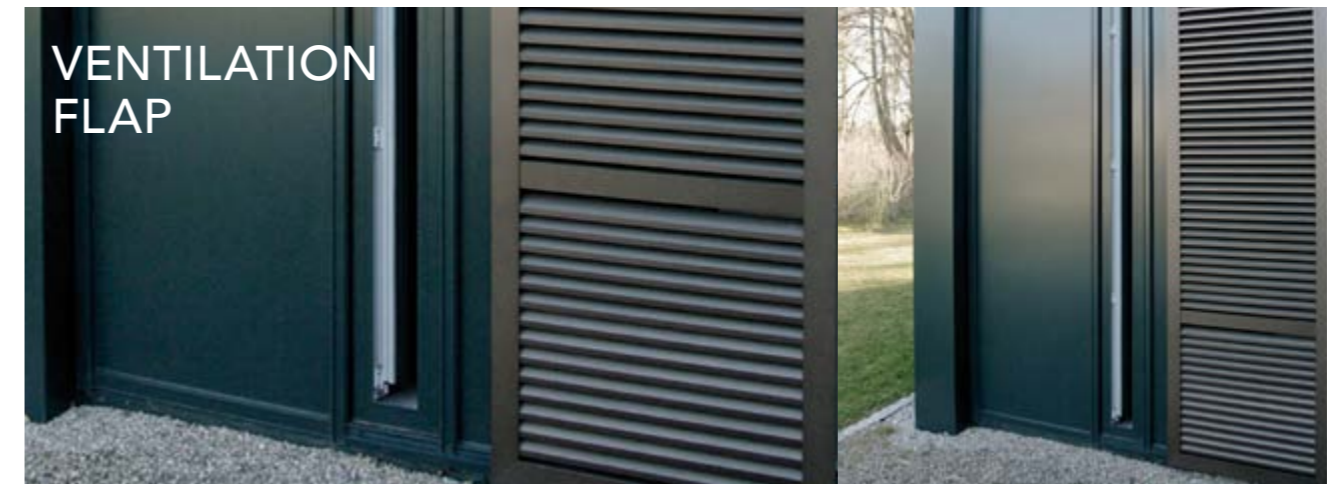
FRAME⁺ 90 WB

$U_f = 0.89 \text{ W/(m}^2\text{K)}$ $U_w = 0.77 \text{ W/(m}^2\text{K)}^*$	$U_f = 0.89 \text{ W/(m}^2\text{K)}$ $U_w = 0.76 \text{ W/(m}^2\text{K)}^*$	$U_f = 1.0 \text{ W/(m}^2\text{K)}$ $U_w = 0.78 \text{ W/(m}^2\text{K)}^*$
FRAME ⁺ 90 WI	FRAME ⁺ 90 WI with connection profile	FRAME ⁺ 90 WB with integration outer frame

*All U_w -values with $U_g = 0.6 \text{ W/(m}^2\text{K)}$, $\Psi_g = 0.031 \text{ W/(mK)}$, dimension 1.23 m x 1.48 m.



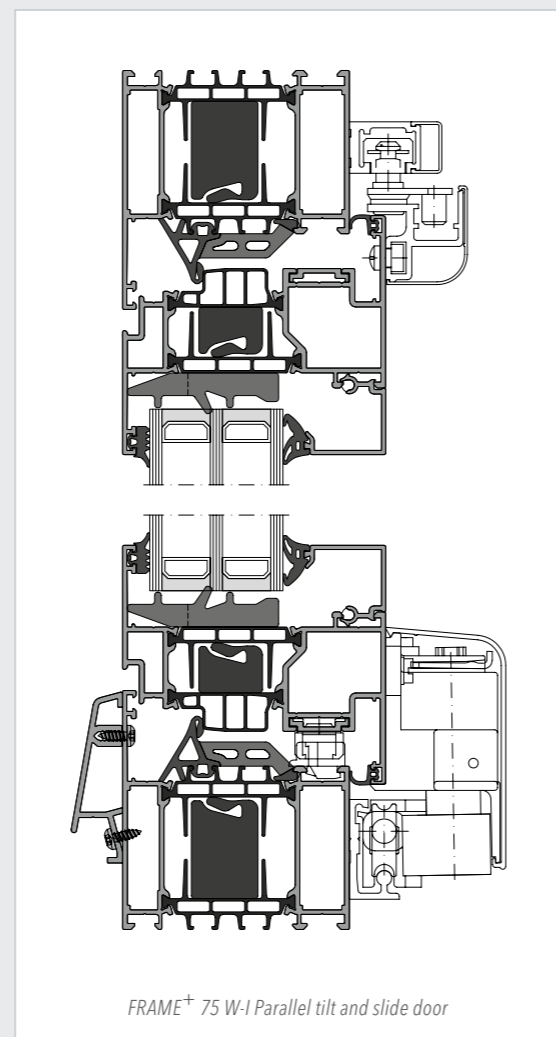
With its choice of space saving opening methods (slide to step through / tilt to provide ventilation) coupled with its outstanding thermal performance and its very high air tightness qualities, the parallel tilt and slide door is ideally suited for use as a terrace or balcony door.



As an extraordinary design element, the new storey height FRAME⁺ 75 LF ventilation flap enriches conservatories and other buildings with an efficient method of providing comprehensive ventilation.

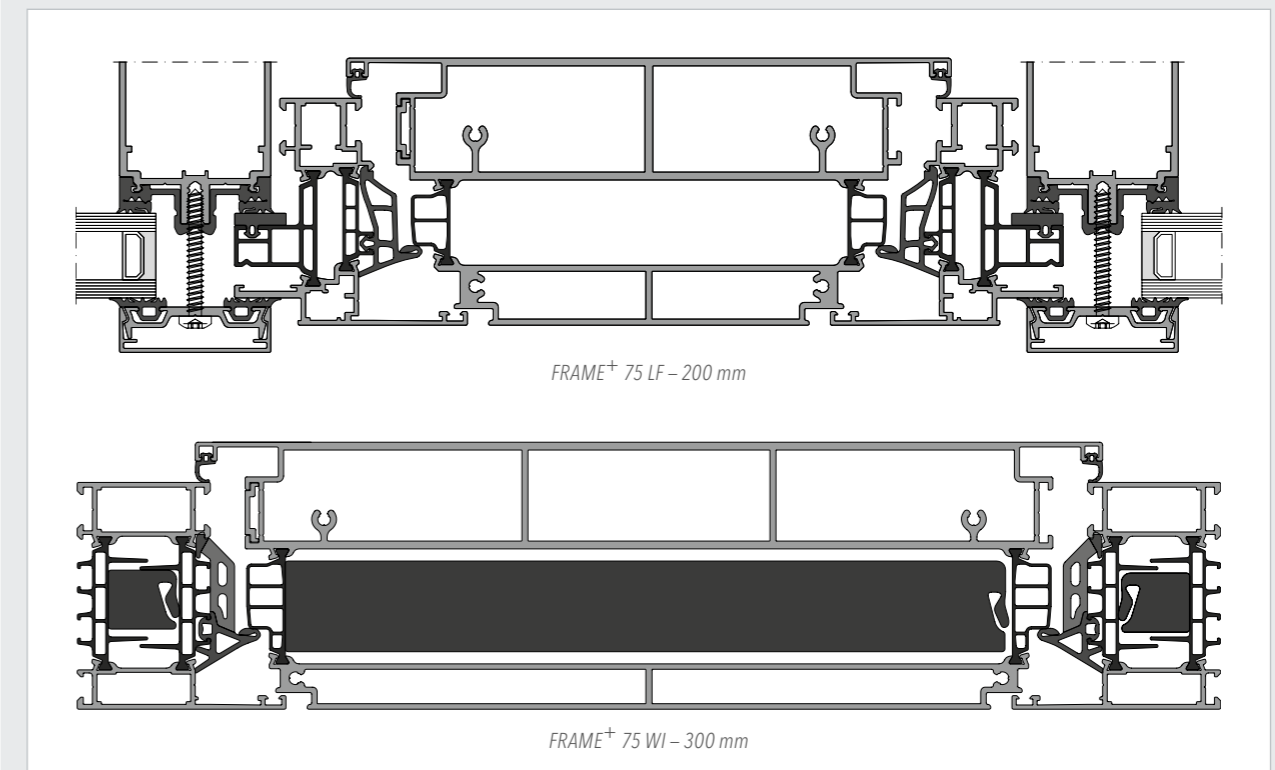
The sliding door from the standard series FRAME⁺

- Outstanding insulating properties.
- Innovative, space-saving runner technology.
- Large openings up to a sash width of 2 m.
- High sash weights up to 200 kg.
- For sash weights over 150 kg, hardware assisted operation for ease of use.
- Excellent ventilating properties using a storm proof tilting position.
- Highly impermeable by circumferential medial gasket technology.
- Broad range of applications for extensive terrace and balcony openings in the private and commercial buildings.



Natural ventilation via narrow storey height elements

- Face width of 200 mm (FRAME⁺ 75 LF) or 300 mm (FRAME⁺ 75 WI).
- Storey height ventilation with a single thermally broken profile without the need for a frame or glazing beads.
- Inside and outside homogeneous, flat surface.
- Burglar and impact resistant fixed opening width of 120 mm (for FRAME⁺ 75 LF).
- U values down to $U_f = 0.86 \text{ W}/(\text{m}^2\text{K})$.
- Available for self-fabrication or as pre-assembled units.



Quality in detail

	FRAME+ 65 W Aluminium window	FRAME+ 75 WI Aluminium window	FRAME+ 75 WB Casement window	FRAME+ 75 FF Window curtain wall	FRAME+ 75 WA Outward opening	FRAME+ 90 WI Aluminium window	FRAME+ 90 WB Aluminium window
System values							
U _f -values passive house						= 0.79 W/(m ² K)	= 0.75 W/(m ² K)
U _f -values ¹	≥ 1.7 W/(m ² K)	≥ 1.0 W/(m ² K)	≥ 1.6 W/(m ² K)	≥ 1.7 W/(m ² K)	≥ 1.4 W/(m ² K)	≥ 0.73 W/(m ² K)	≥ 0.75 W/(m ² K)
System depth	65 mm	75 mm	75 mm	75 mm	75 mm	90 mm	90 mm
Applications							
Punched opening window	X	X	X			X	X
Curtain wall insertion element	X	X	X		X	X	X
Casement sash			X	X			X
Window curtain wall				X			
Application limits*							
Max. weight turn-tilt surface- mounted fitting	130/200kg**	130/200kg**	130/200kg**	130/200kg**	-	130/200kg**	130/200kg**
Max. weight turn surface- mounted fitting	130/200/ 300 kg **	130/200 / 300kg **	130/200/ 300kg **	130/200/ 300kg **	130kg	130/200/ 300kg **	130/200/ 300kg **
Max. weight consealed fitting	150 kg	150 kg	150 kg	150 kg	-	150 kg	150 kg
Max. sash dimensions ²	1,600 x 2,100 mm/ 1,100 x 2,500 mm	1,600 x 2,100 mm/ 1,100 x 2,500 mm	1,450 x 1,900 mm/ 1,100 x 2,500 mm	1,450 x 1,900 mm/ 1,100 x 2,500 mm	2,500 x 2,000 mm/ 2,000 x 2,500 mm	1,600 x 2,100 mm/ 1,100 x 2,500 mm	1,600 x 2,100 mm/ 1,100 x 2,500 mm
Infill thickness sash	12 to 58 mm	22 to 68 mm	24 to 44 mm	24 to 44 mm	22 to 68 mm	34 to 80 mm	40 to 60 mm
Infill thickness fixed glazing	5 to 46 mm	10 to 56 mm	4 to 50 mm	10 to 56 mm (4.5) 4 to 50 mm (10.5)	-	36 to 65 mm	-

¹ Thermal insulation based on DIN ISO 10077-2

² Admissible sash dimensions see diagramm of fittings

* Applications outside these limits, would be subject to an assessment by our Technical Department

** 130 kg with standard fitting up to 200 / 300 kg with reinforced fitting

Tests

The FRAME+ window system has undergone rigorous testing according to the product standard for windows and exterior doors EN 14351.1 and achieved the following classification. These values are at the same time the base for simplified CE marking of windows.

	FRAME+ 65 W Aluminium window	FRAME+ 75 WI Aluminium window	FRAME+ 75 WB Casement window	FRAME+ 75 FF Window curtain wall	FRAME+ 75 WA Outward opening	FRAME+ 90 WI Aluminium window	FRAME+ 90 WB Aluminium window
Air permeability	class 4	class 4	class 4	class 4	class 4	class 4	class 4
Resistance to wind load	class C5/B5	class C5/B5	class C5/B5	class C5/B5	class C4/B4	class C5/B5	class C5/B5
Resistance against impact	class 5	class 5	class 3	class 3	-	class 5	class 5
Water tightness	up to E 1350	up to E 1350	up to E 1350	up to E 1350	up to E 900	up to E 1200	up to E 1200
Operating forces	class 1 and 2	class 1 and 2	class 1 and 2	class 1 and 2	class 1	class 1	class 1
Airborne sound insulation²	R _w (C;C _{tr})= 33(-1;-4)dB R _w (C;C _{tr})= 45(-1;-4)dB	R _w (C;C _{tr})= 33(-1;-4)dB R _w (C;C _{tr})= 45(-1;-4)dB	R _w (C;C _{tr})= 38(-1;-4)dB R _w (C;C _{tr})= 42(-1;-4)dB	R _w (C;C _{tr})= 38(-1;-4)dB R _w (C;C _{tr})= 42(-1;-4)dB	-	R _w (C;C _{tr})= 35(-2;-5)dB R _w (C;C _{tr})= 45(-1;-4)dB	R _w (C;C _{tr})= 35(-2;-5)dB R _w (C;C _{tr})= 45(-1;-4)dB
Mechanical strength	class 4	class 4	class 4	class 4	-	class 4	class 4
Burglar resistance	class WK2	class WK2	class WK2	class WK2	-	class RC 2	class RC 2
Continuous-operational testing EN 14400:2002-10	class 2	class 2	class 2	class 2	class 2	-	-

¹ Tested to RAL GZ 695

² The values are referred to the standard size of 1.23 x 1.48 m



Primary school - Neubiberg, GER

FRAME⁺

Door system

Solutions for buildings, curtain walling and house construction

The FRAME⁺ door system is based on the well proven concept of the FRAME⁺ window series. The door profiles are designed to match the window profiles. In addition, many products from the window range are compatible with the door system. When used as an insert element, the door series can be integrated perfectly into the tried and tested THERM⁺ passive house curtain wall system.



Private home



Autohaus Gieraths - Bergisch Gladbach, GER



medXpert - Eschbach, GER



Umweltarena - Spreitenbach, CH



Messe - Stuttgart, GER



Private home

FRAME⁺

Overview of the 75 DI door system



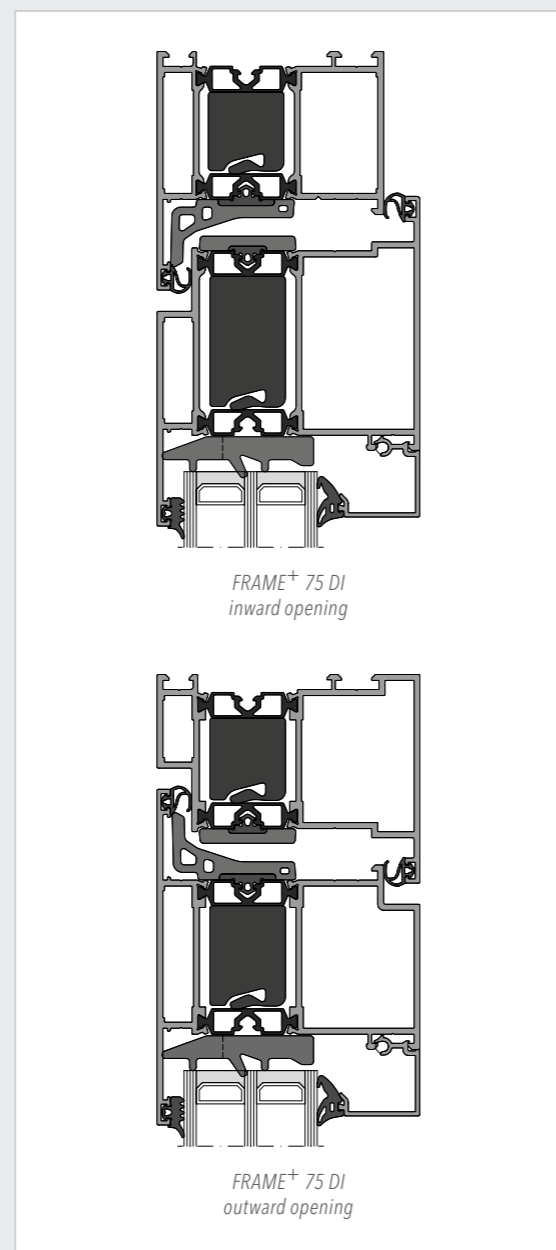
FRAME⁺ 75 DI fulfils all the requirements for a high quality entrance door. Special profile contours enable simple installation. The series is characterised by short production times and efficient manufacturing. Smooth rebate geometries enable fast installation of all types of hardware in the rebate. Large internal chambers within the profiles provide acceptance of all fittings, such as electrical door release mechanisms.

A multitude of design options for that individual look:

Modern doors have to meet a multitude of complex requirements. On the one hand, today's architecture demands nearly unlimited creative possibilities to give building projects distinct individuality, whilst on the other hand, technical requirements become ever more demanding. At the same time, doors must be easy to fabricate and maintain. Against this background, RAICO Bautechnik have developed a new and highly innovative door range for buildings and curtain walling as well as for residential project construction based on the FRAME⁺ window series.

Diverse range

- Inward and outward opening single doors.
- Inward and outward opening double doors.
- Inward and outward opening rebated dummy sidelight doors.
- Optional rebated meeting stiles.
- Integral sidelights and fanlights.
- Outward opening escape doors to EN 179 / 1125.



Advantages

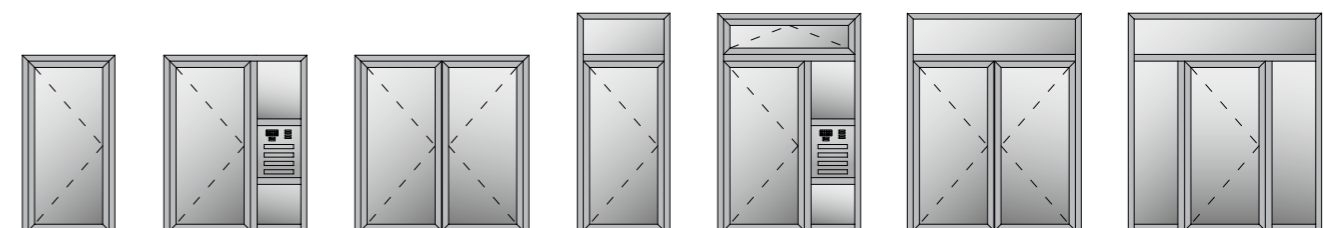
- Featuring U_D values down to 0.69 W/(m²K) to meet Passive House standards.
- Buildings, curtain wall and residential project installations.
- Extensive design options within the series.
- Standard fittings.
- Ease of manufacture with innovative features.
- Sturdy composite profiles ensuring long-lasting functionality.
- Tested to EN 12208 for water tightness:
 - Inward opening door to Class 6A 9A (600 Pa)
 - Outward opening door to Class 8A (450 Pa)

3D-concept

- High degree of tightness due to innovative sealing concept.
- Improved insulation of up to $U_f = 1.4$ W/(m²K).
- Large dimensions, up to 3.0 m height.



Selection of door combinations





Individuality and appearance are of high importance when considering the design of entrance doors, to enable symbiosis with the building. The FRAME⁺ door system offers creative options through the large range of profiles that can be perfectly combined with decorative door panels.



The threshold is one of the most vulnerable parts of an entrance door. In particular, the threshold requires high levels of weather tightness and thermal performance. RAICO has chosen a totally new path to address these problems, and has developed a completely new threshold concept, resulting in an even higher level of impermeability.

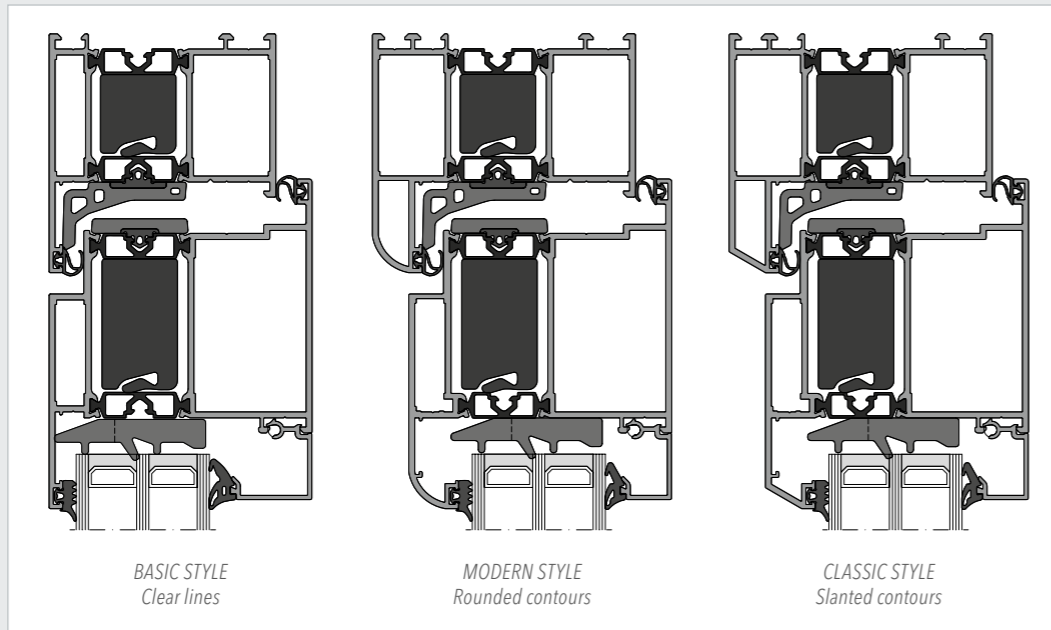
Aluminium front doors with an individual design

Three different design versions offer a wide range of individual design options. Nearly any design – from an expressive linear composition to soft flowing shapes – can be created with the FRAME⁺ door system.

- Three different design types:
Basic Style – lineal profile.
Modern Style – softer edges with curved contours.
Classic Style – distinguished lines with bevelled contours.
- Optional grey gaskets to minimise optical contrasts.
- All design variations are compatible in any combination.



Design variant Basic Style



RAICO interactive!
Here you find the brochure of the door



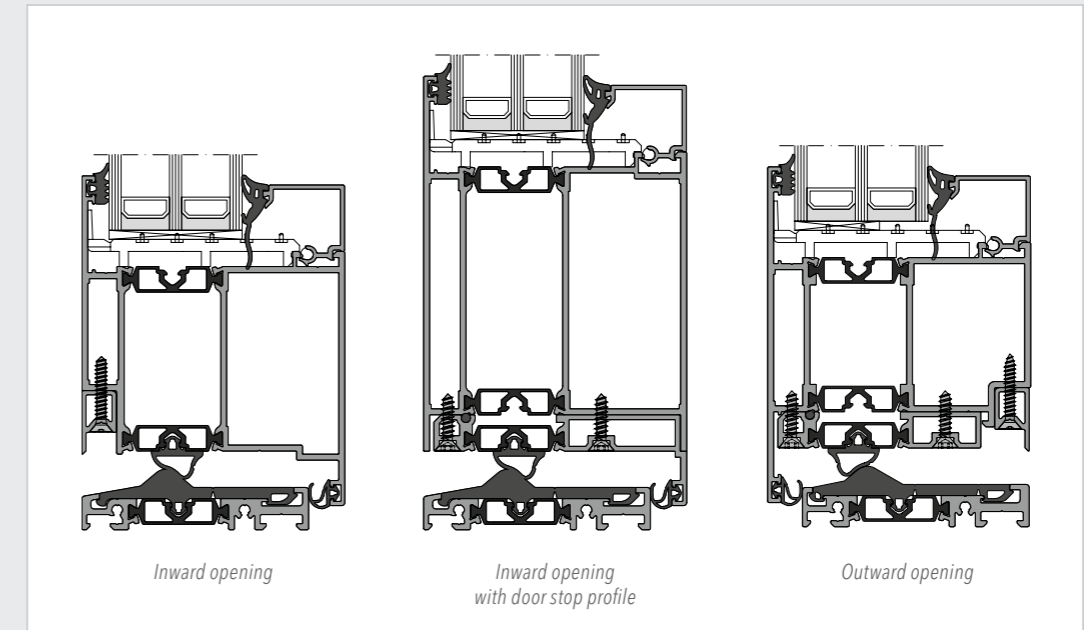
Innovative threshold concept

The door threshold needs to ensure perfect weather tightness. With its excellent insulation within the threshold area, reliable protection against driving rain and draught is guaranteed, reducing expensive heat losses. The low profile ensures comfortable barrier free access.

- Highest degree of weather tightness.
- Barrier free accessibility.
- Excellent insulation to threshold areas, down to 1.6 W/(m²K).
- Retro fit exchangeable threshold connector – easy assembly.
- Thermally separate aluminium threshold with replaceable gasket.
- Threshold base structure options.



Basic Style with doorsill



RAICO interactive!
Here you find the brochure of the door



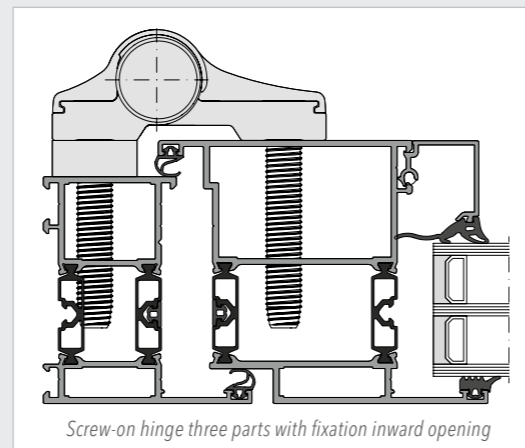


HINGES

Door hinge requirements are highly complex – from both functional and aesthetic perspectives. The FRAME⁺ 75 DI door system fittings fulfil these requirements perfectly. For example, they offer a variety of setting options and can accommodate heavy sash weights as well as provide aesthetically pleasing stainless steel finishes.

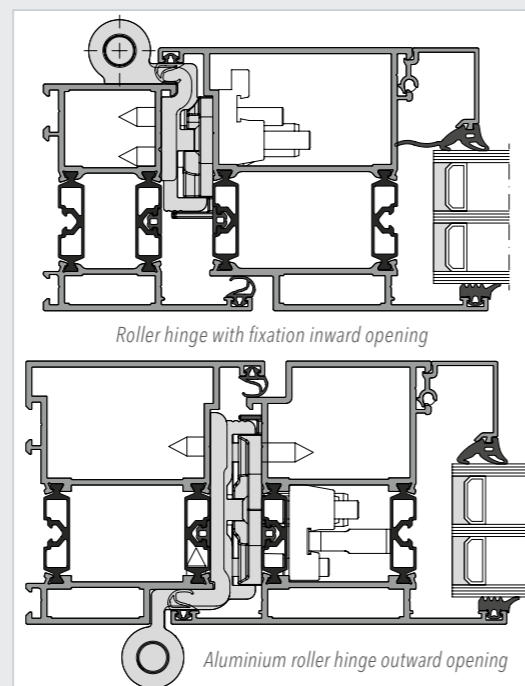
Face fixed flag hinges

- Intricate shapes through optimised dimensions.
- Inward and outward opening options.
- Anchor screw or mounting plate fixings.
- Large colour range in aluminium or stainless steel finish.
- Two and three part hinge options.
- Post installation three way adjustment.
- Maximum weight of 200 kg.



Roller Hinge

- Inward or outward opening profile adapted hinges.
- Direct screw fixing to outer frame without hinge plates.
- Sash fixing utilises a multifunctional hinge body with integral adjustment.
- Large colour range in aluminium or stainless steel finish.
- Generous post installation multi-directional adjustment. (Rebate adjustment +/- 2 mm, height adjustment +/- 3 mm)
- Efficient production utilising pre-assembled hinge parts.
- Material optimisation in the 7 mm rebate enables a very high load capacity up to 250 kg.
- Integrated visual control of hinge adjustment on the sash hinge body.
- Stainless steel option with high load bearing capacity up to 250 kg.
- Air permeability test to class 3.

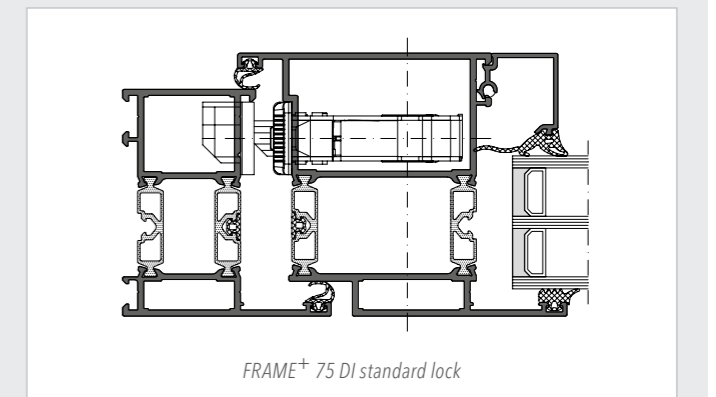


DOOR LOCKS

FRAME⁺ profiles have been designed to accommodate open market standard fittings. Smooth rebate construction enables fast and easy installation of a wide range of products (i.e. concealed door locks) Using a standard milling template for all lock types provides optimised fabrication as well as offering simple replacement or change of use options. A large range of accessories caters for individual customer requirements.

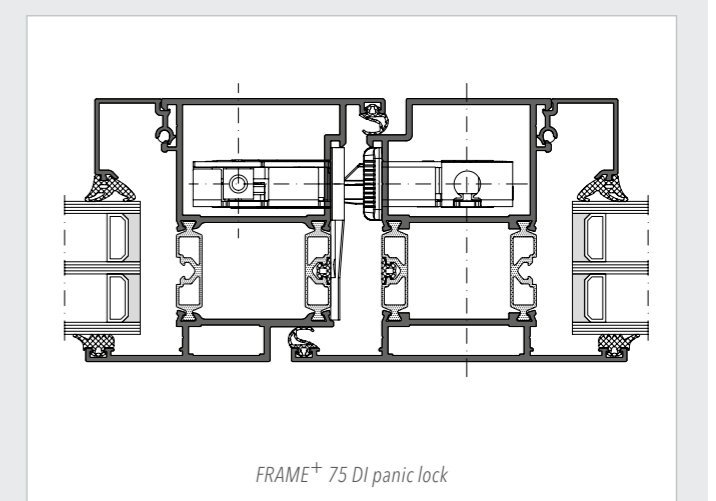
Standard lock for inward or outward opening doors

- Standardised profile processing for locks and strike plates.
- Latch lock / dead locks.
- Multi point locking system with shoot or hook bolts.
- Automatic locking with or without electrical release mechanism.



Emergency exit / panic lock in accordance with EN 179 / 1125

- Emergency exit and panic doors.
- Tested in accordance with EN 179 / 1125 for ability to release.
- Latch lock / dead locks with shift function E.
- Latch lock / dead locks with changeover function B.
- Single and multi point locking.
- Integral electrical release and monitor options.
- Automatic locking to the slave leaf of a pair of doors with full or partial escape mechanism.



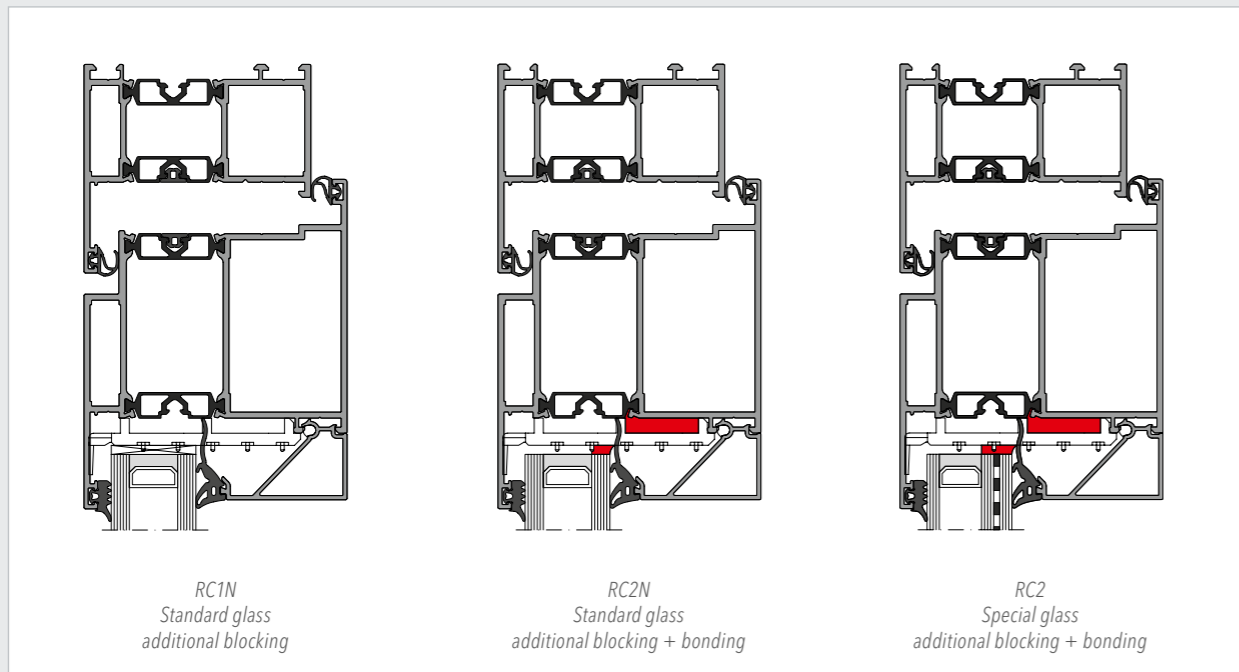


BURGLAR RESISTANCE

Feel secure by night and day. With innovative technology, the RAICO door system can be individually equipped with burglar resistant components to suit your security requirements. With analogue installation options in all design variations, you don't have to forgo any creative freedom.

Optimum safety based on the latest Know-How

Just by adding a few supplementary system components the RAICO door system can be equipped with burglar resistant properties in resistance classes RC1 and RC2. Maximum creative freedom is enabled via analogue installation options with Modern Style and Classic Style design variants.

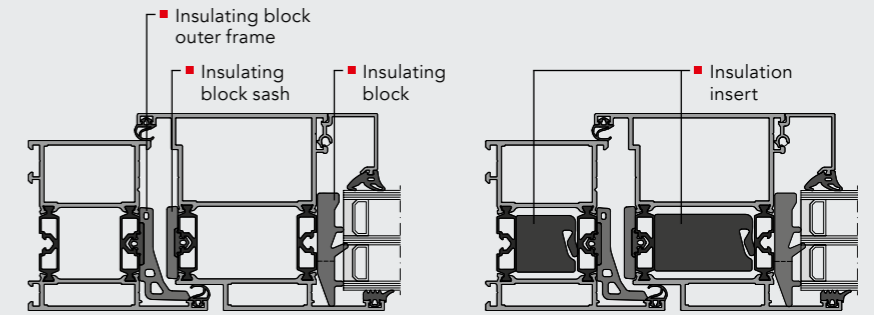


Approvals / Certification / CE-labelling

based on product standard for windows and exterior doors EN 14351-1

Thermal insulation

- Incremental adjustment of insulation values – to meet the project specific requirements.
- Featuring U_D values down to $0.69 \text{ W/(m}^2\text{K)}$ for use in passive-houses.

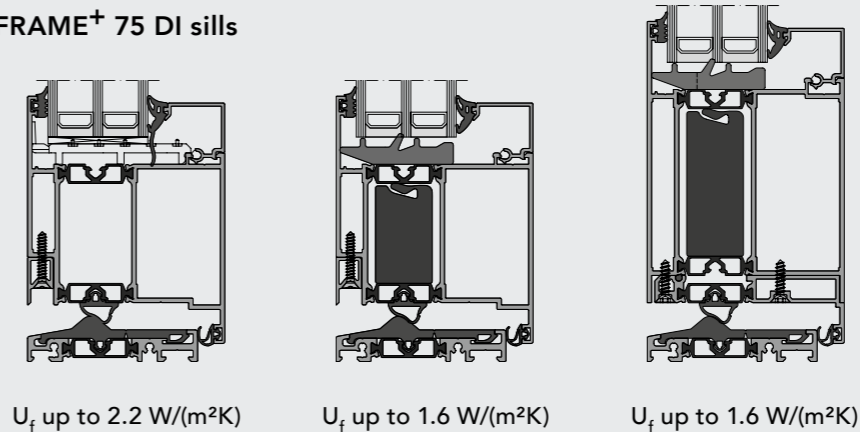


	FRAME+ 75 DI (without insulation insert) up to				FRAME+ 75 DI (with insulation insert) up to			
	standard W/(m ² K)		overlapping wing W/(m ² K)		standard W/(m ² K)		overlapping wing W/(m ² K)	
	inward	outward	inward	outward	inward	outward	inward	outward
Without insulating blocks	2.0	2.0	2.1	2.0	1.6	1.6	1.7	1.7
Insulating block	2.0	2.1	2.0	2.0	1.6	1.7	1.6	1.6
Insulating block outer frame and insulating block sash	1.9	1.9	1.8	1.8	1.4	1.5	1.4	1.4
Insulating block outer frame and insulating block sash and insulating block	1.8	1.8	1.7	1.8	1.3	1.3	1.3	1.4

	FRAME+ 75 DI Single-winged		FRAME+ 75 DI Two-winged	
	inward opening	outward opening	inward opening	outward opening
Air permeability / EN 14351-1	class 4/3 ¹	class 4/3 ¹	class 3/2 ¹	class 4/3 ¹
Resistance to wind load EN 12210	class C4	class C4	class C3	class C3
Water tightness / EN 12208	up to 9A	8A	7A	7A
Operating forces / EN 12217	2	2	2	2
Burglar resistance / EN 1627	class RC2	class RC2	class RC2	class RC2

¹ Value is referred to the execution with roller hinge

FRAME+ 75 DI sills



U_i up to $2.2 \text{ W/(m}^2\text{K)}$

U_i up to $1.6 \text{ W/(m}^2\text{K)}$

U_i up to $1.6 \text{ W/(m}^2\text{K)}$

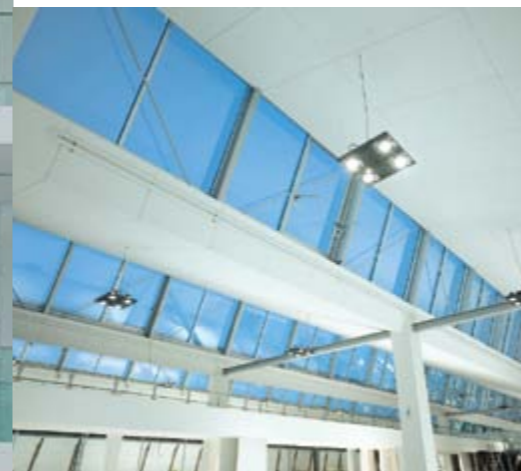


WING

Window systems

Insertion windows

With their comprehensive range of opening types and their numerous design variations the WING integration window systems provide an extremely large spectrum for diverse requirements in curtain wall and glass roofs.



Th. Willy car centre - Bern, CH



Ozeaneum - Stralsund, GER



SchattDecor AG - Thansau, GER



Swinhay - Gloucestershire, UK



Monkey house at zoo - Dresden, GER



Energy centre - Berlin, GER

Sparkasse - Oldenburg, GER

WING

Window system overview

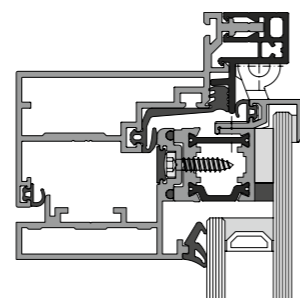
Ventilation System

- Efficient natural and smoke ventilation due to wide opening angles of 60° in curtain walling and up to 90° in glass roofs.
- WING 50 A and WING 50 SK available in framed and stepped edge structurally bonded options.
- Top hung / projecting top hung / side hung / bottom hung outward opening options within curtain wall and glass roofs.
- Large window formats possible, up to 3.5 m² in the curtain wall and 4 m² in the glass roof.
- Range of actuator and motor options for high performance requirements.
- Available for self-fabrication or as pre-assembled units.

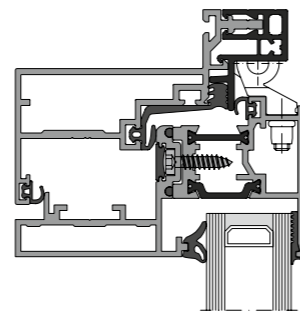
WING 50 A

Top-hung / Side-hung / Bottom-hung windows

Thanks to its narrow sight line widths and patented concealed fittings, the WING 50 A window meets the requirements of modern architecture for natural ventilation as well as a smoke exhaust ventilator.



WING 50 A-S
stepped edge glazing

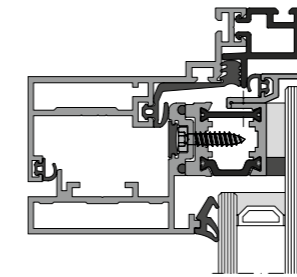
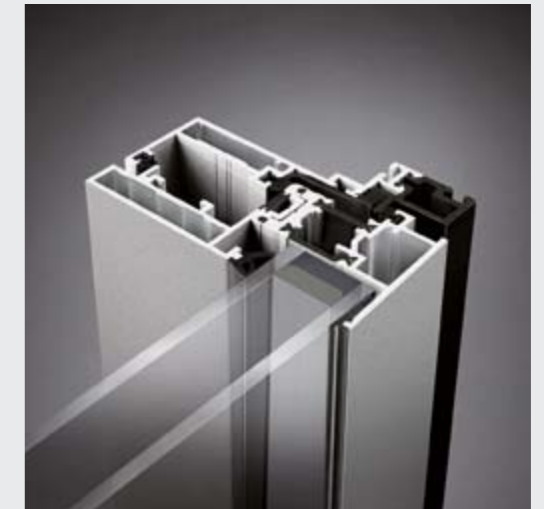


WING 50 A-R
standard glass

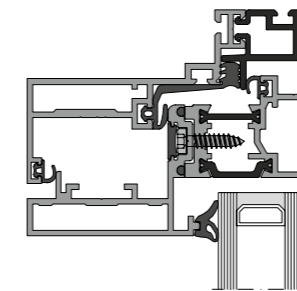
WING 50 SK

Top-hung projecting window

The innovative glazing technology of WING 50 SK features the option of a glass surface on the outside using structurally bonded stepped edge glazing, or a low profile frame with standard sealed units. The compact frame design gives both options an extremely slim window sight line.



WING 50 SK-S
stepped edge glazing

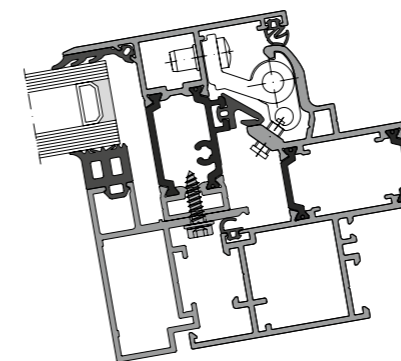
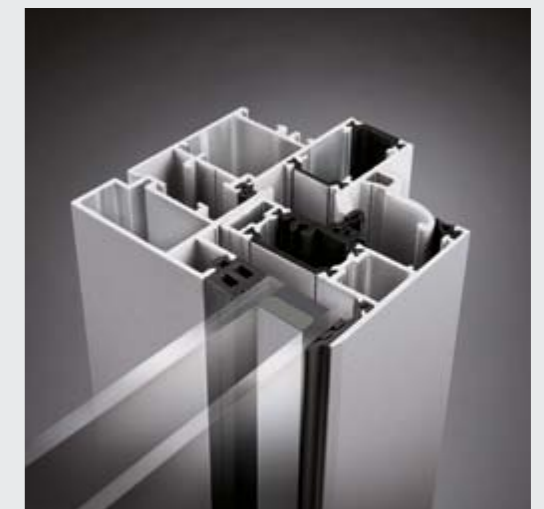


WING 50 SK-R
standard glass

WING 105 DI

Roof light window

With its low profile height, its large sash dimensions and its specific sealing technique, the WING 105DI skylight is the perfect solution for almost any application with an inclination down to 2° from horizontal.



WING 105 DI
infill thickness up to 38 mm



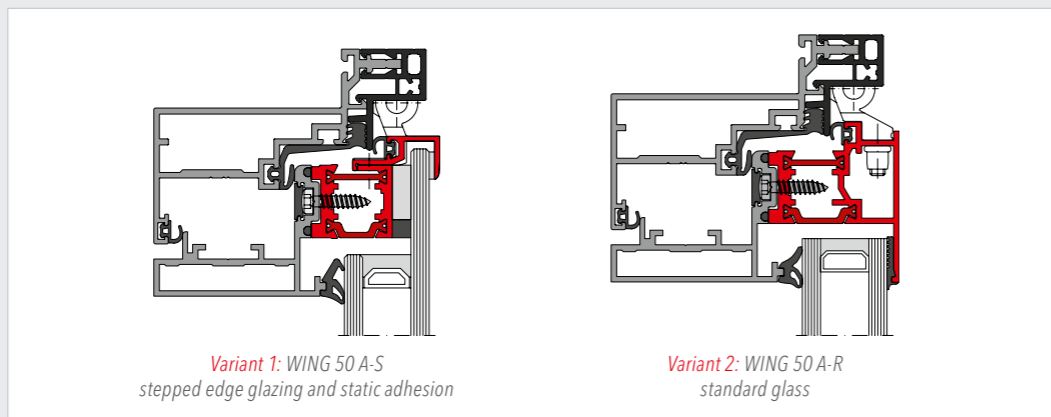
Advantages

- Outward opening window in its most attractive design with stepped edge glazing.
- Economic alternative with standard glass and slim profile design.
- Maximum airflow effect due to an opening angle of 60°.
- Ideal for very large sash formats.
- Concealed hinges, mountable on any side.
- Very slim design: Inside 52 mm, outside 50 mm.
- Advantages in production and logistics due to SG bonding of WING 50 A-S with split sash frame.
- Various motor drives.
- Available as system for self-fabrication or as pre-assembled units.
- Available for natural ventilation as well as a smoke and heat exhaust ventilator in large sash sizes up to 5.2 m².

Technical Data

	Max. width	Max. height	Max. sash weight	Opening types	Infill thickness
WING 50 A	2,700 mm	2,500 mm	150 kg (60 kg side-hung)	60°	24 to 46 mm

- Variant 1: WING 50 A-S with stepped edge glazing.
- Variant 2: WING 50 A-R with standard sealed units and low profile sash frame without glazing beads – the cost saving alternative



RAICO interactive!
Here you find the
WING planning
catalogue



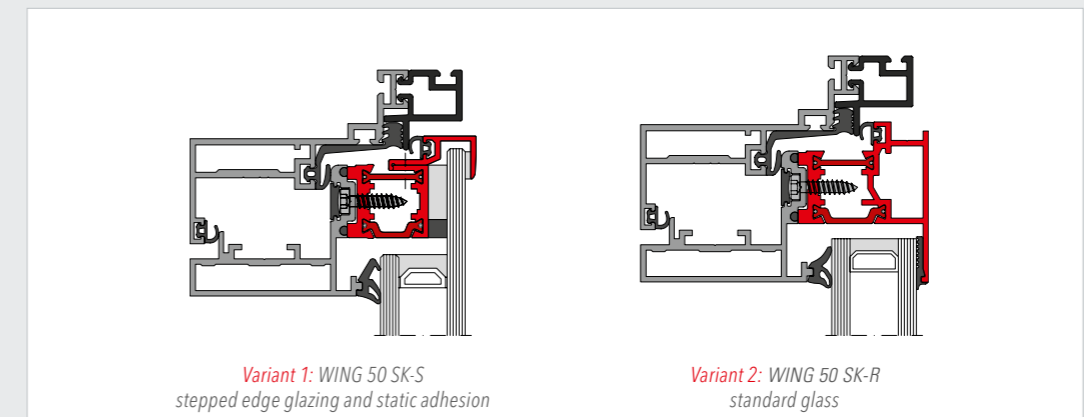
Advantages

- Outward opening projecting window with stepped edge glazing.
- Economic alternative with standard glass and slim profile design.
- No visible screws or glazing beads.
- For large sashes up to 150 kg.
- Very slim design: Inside 52 mm, outside 50 mm.
- Advantages in production and logistics due to SG bonding of WING 50 SK-S with split sash frame.
- Various motor drives and handles available.
- Available as system for self-fabrication or as assembled units.
- Available for natural ventilation as well as a smoke and heat exhaust ventilator in large sash sizes up to 3.5 m².

Technical Data

	Max. width	Max. height	Max. sash weight	Opening types	Infill thickness
WING 50 SK	2,700 mm	2,700 mm	180 kg	20°/30°/45°/50°	24 to 46 mm

- Variant 1: WING 50 SK-S with stepped edge glazing.
- Variant 2: WING 50 SK-R with standard sealed units and low profile sash frame without glazing beads.



RAICO interactive!
Here you find the
WING planning
catalogue



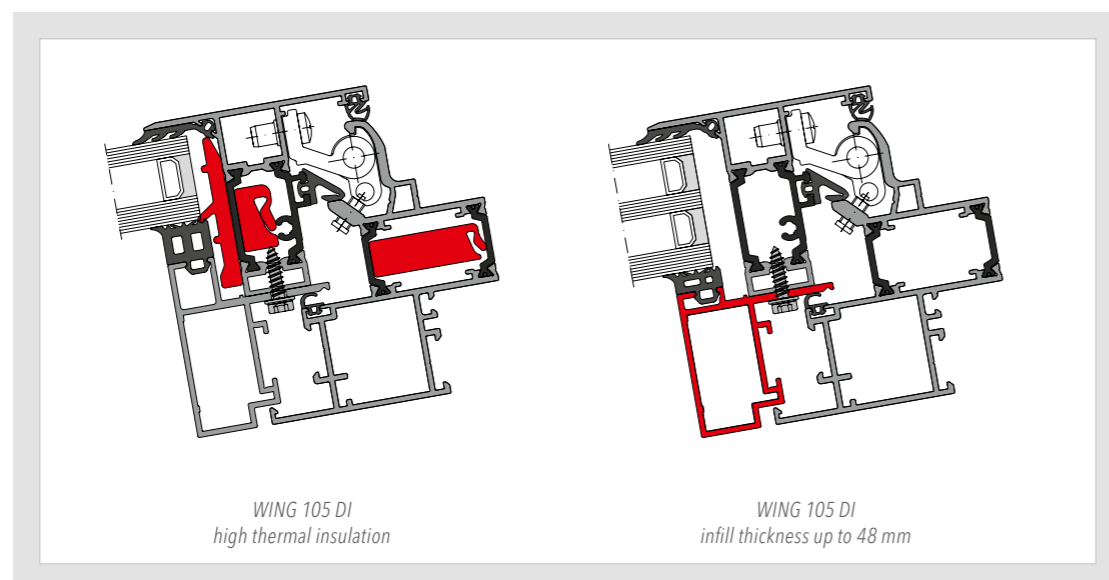


Advantages

- Two-frame sash design without any visible screws or glazing beads on the outside.
- Reliable drainage due to a special profile design and triple sealing system for safe water tightness.
- Completely integrated hinges, mountable on any side.
- Maximum airflow effect due to an opening angle of 65° (90° available).
- Available as system for self-fabrication or as pre-assembled units.
- High thermal insulation option WING 105 DI.
- Designed to complement the THERM+ glass roof systems, even down to 2° inclination.
- Available for natural ventilation as well as a smoke and heat exhaust ventilator in large sash sizes up to 4.0 m².

Technical Data

	Max. width	Max. height	Max. sash weight	Opening types	Infill thickness
WING 105 DI	2,500 mm	2,500 mm	165 kg (110 kg side hung)	65° (90°)	9 to 48 mm



RAICO interactive!
Here you find the
WING planning
catalogue



Approvals / CE-labelling

Approvals

based on product standard for window EN 14351-1

	WING 50 A	WING 50 SK	WING 105 DI*
Wind resistance	class C4	class C4	class C4
Air permeability	class 4	class 4	class 4
Water tightness	E 1,800	E 1,800	E 1,500
Airborne sound insulation	$R_w(C;C_{tr})=43(-1;5)$ dB	$R_w(C;C_{tr})=43(-1;5)$ dB	X
Burglar resistance	WK2	WK2	X
Continuous-operational testing	class 2	class 2	X
Thermal insulation	X	X	$U_f = 2.6 \text{ W/(m}^2\text{K)}$ up to $3.2 \text{ W/(m}^2\text{K)}$

* tested with 2° inclination

Technical Data – single flaps

according to EN 12101-2 smoke and heat control systems

	NRWG WING 50 A		NRWG WING 50 SK	NRWG WING 105 DI
Opening	Bottom / Top-hung	Side-hung	Top-hung projecting	Bottom-hung
Position	90°	90°	90°	25 to 60°
Max. width	2,700 mm	1,400 mm	2,700 mm	2,500 mm
Max. height	2,500 mm	2,400 mm	2,700 mm	2,500 mm
Max. sash surface	3.5 m ²	1.89 m ²	3.5 m ²	4 m ² (position 25 to 30°) 3.75 m ² (position 30 to 60°)
Max. sash weight	150 kg	60 kg	136 kg	165 kg
Max. opening angle	60°	60°	50°	65° (90°)

Technical Data – single flap double

according to EN 12101-2 smoke and heat control systems

	NRWG WING 105 DI		
Opening	Bottom / Top-hung		
Installation conditions	Roof / Barrel roof	Roof / Barrel roof	Saddleback roof
Position	2 to 15°	16 to 30°	2 to 30°
Max. width*	2,500 mm	2,500 mm	2,500 mm
Max. height*	5,000 mm	2,500 mm	5,000 mm
Max. sash surface**	4 m ²	4 m ²	4 m ²
Max. A _v *	7.35 m ²	5.76 m ²	7.35 m ²
Max. sash weight**	165 kg	165 kg	165 kg
Max. opening angle	65° (90°)	65° (90°)	65° (90°)

* Specifications refer to the complete element (two-fold single flap)
** Specifications refer to the wing of the single flap

RAICO 2.0

on the internet and as an App

References at www.Objektiv-Online.de

On our online database you will find all of the projects that are presented in this brochure as well as many other references with detailed information about the RAICO system being used, architect, fabricator, year of construction etc. Do you want your RAICO project to be included in our database? Send an email to marketing@raico.de.



RAICO on facebook

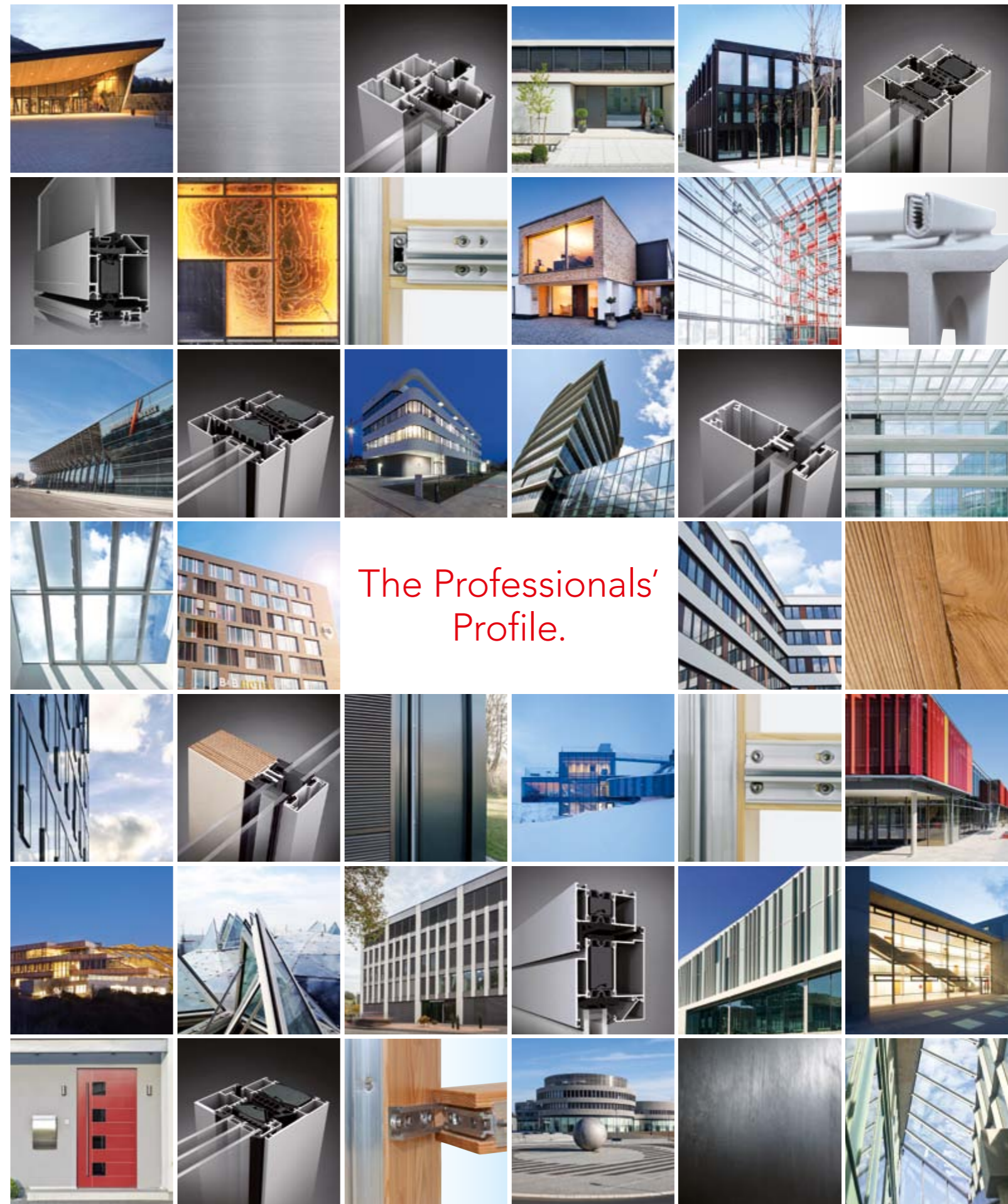
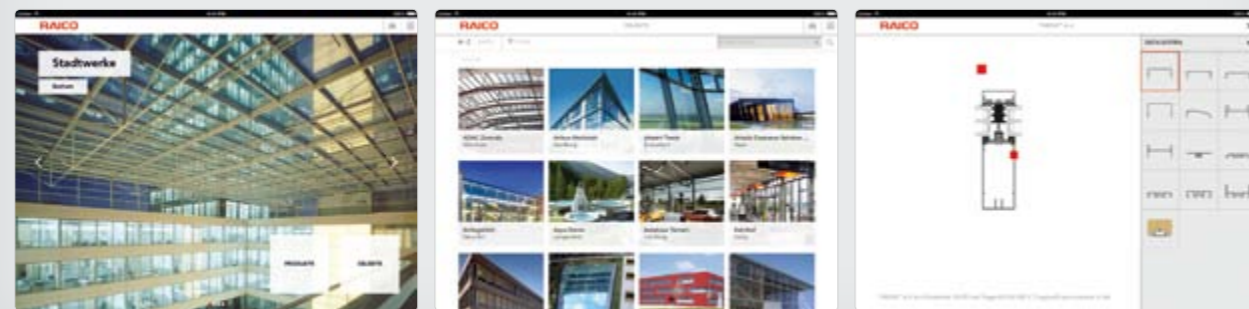
Insights into the company, project reports from site setup through to completion, picture galleries of RAICO's presence at trade fairs and events ensure that a wealth of varied material is available on our facebook page. "Like" us and just see for yourself!



RAICO now available as a free App



RAICO now presents itself on interactive mobile features with our new RAICO App for iPad! In this way you have all important information such as photographs of reference projects and design details at a glance.



The Professionals' Profile.

RAICO Bautechnik GmbH

Gewerbegebiet Nord 2
87772 Pfaffenhausen
Telefon +49 8265 911 0
Telefax +49 8265 911 100
E-Mail info@raico.de
www.raico.de

RAICO Vertriebsbüro Nord

An der Autobahn 40
28876 Oyten
Telefon +49 4207 9097 353
Telefax +49 4207 9097 351
E-Mail info@raico.de
www.raico.de

RAICO France S.à.r.l.

8a rue Icare
67960 Entzheim
Téléphone +33 3 88784894
Téléfax +33 3 88782107
E-Mail info@raico.fr
www.raico.fr

RAICO Austria

Zentrale
Telefon +49 8265 911 0
Telefax +49 8265 911 100
E-Mail info@raico.at
www.raico.at

RAICO UK

Unit 63 Gosport Business Centre
Aerodrome Road
Gosport, PO13 0FQ
Phone +44 1329 848 175
Fax +44 1329 848 701
E-Mail info@raico.org.uk
www.raico.eu

RAICO Swiss GmbH

Delfterstrasse 10
5000 Aarau
Telefon +41 62 738 66 00
Telefax +41 62 738 66 01
E-Mail info@raico.ch
www.raico.ch

RAICO East GmbH

ul. Bolschaia Spasskaya 12
Office 8
129090 Moscow
Phone +7 495 9951159
Fax +7 495 9951159
E-Mail info@raico.ru
www.raico.ru