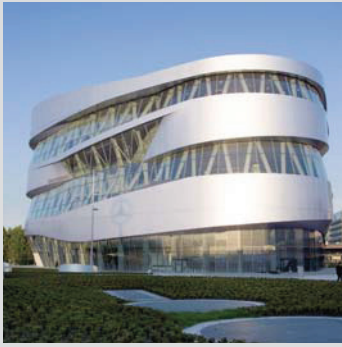


# SYSTEM SOLUTIONS

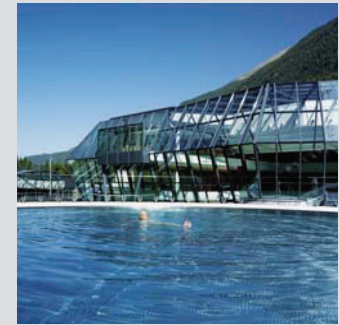
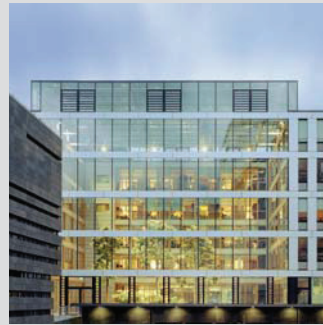
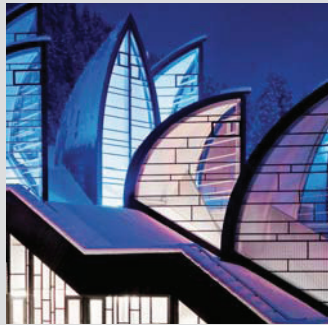
FOR SOPHISTICATED ARCHITECTURE



CURTAIN WALLS / INTEGRATION WINDOWS



**RAICO**



Every façade is different ...



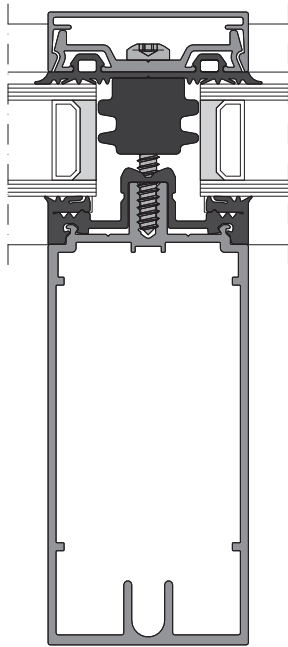
# THERM<sup>+</sup> CURTAIN WALL SYSTEM

One system technology - virtually endless options

Based on its consistent modular design the THERM<sup>+</sup> curtain wall system provides you with nearly unlimited possible combinations of its various components. With this unique flexibility you will find the most suitable, safe, viable and economic solution for every individual project.

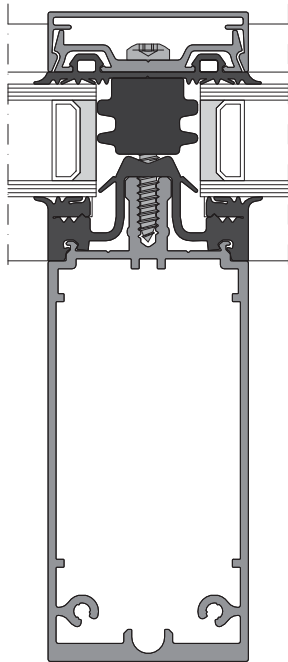


THERM<sup>+</sup> A-V



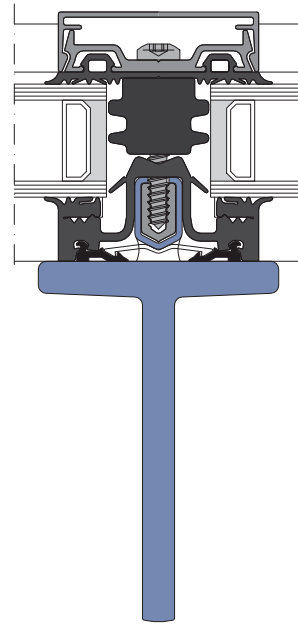
- Thermally insulated curtain wall
- Passive house (certified)
- Structural glazing
- Burglary resistance WK2
- Burglary resistance WK3

THERM<sup>+</sup> A-I



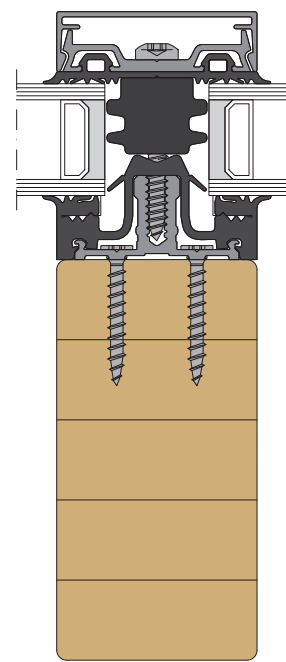
- Thermally insulated curtain wall
- Glass roof down to 2° inclination
- Passive house
- Structural glazing
- Fire resistance EI30
- Burglary WK2
- Burglary WK3

THERM<sup>+</sup> S-I



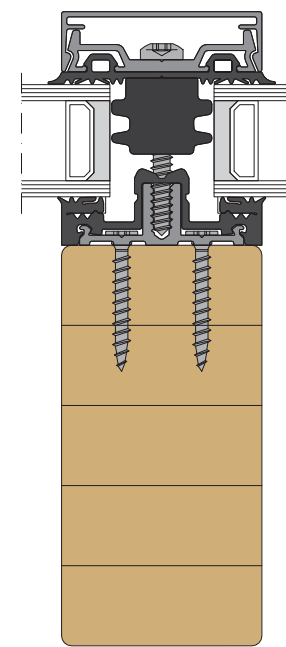
- Thermally insulated curtain wall
- Glass roof down to 2° inclination
- Passive house (certified)
- Structural glazing
- Fire resistance G30
- Burglary WK2
- Burglary WK3

THERM<sup>+</sup> H-I



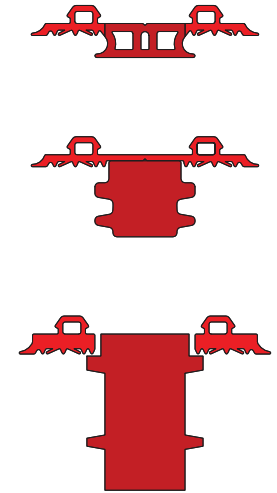
- Thermally insulated curtain wall
- Glass roof down to 2° inclination
- Passive house (certified)
- Structural glazing
- Fire resistance E30
- Fire resistance EI30
- Burglary WK2
- Burglary WK3

THERM<sup>+</sup> H-V



- Thermally insulated curtain wall
- Passive house (certified)
- Structural glazing
- Burglary WK2
- Burglary WK3

INSULATION BLOC



- Exterior gasket with integrated adaptable thermal insulation
- Reliable sealing and effective insulating in one component
- Height 9, 21 or 39 mm for step by step adaptation of the U<sub>f</sub> value
- Efficient energy conservation due to U<sub>f</sub> values down to 0.8 W/m<sup>2</sup>K
- Simple assembly with the pressure profile

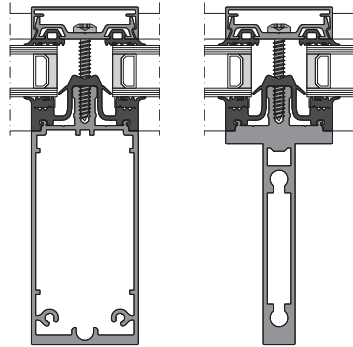
# ALUMINIUM CURTAIN WALL

**THERM<sup>+</sup> A-I**  
**THERM<sup>+</sup> A-V**

The THERM<sup>+</sup> aluminium curtain wall stick systems combine a maximum application range with straight forward planning and manufacture, providing high processing reliability due to the consistent modular technology.

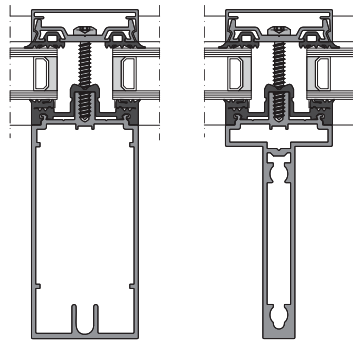
## THERM<sup>+</sup> A-I

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



## THERM<sup>+</sup> A-V

is ideal for very slim and economic curtain wall solutions, featuring reduced gasket dimensions on the interior and an optimised cost-benefit ratio for common façade applications.



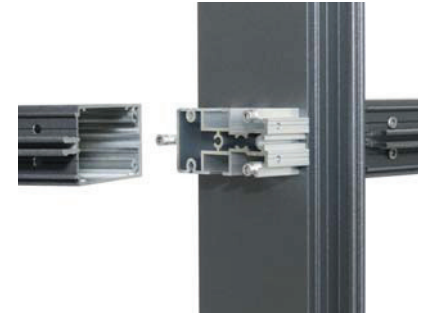
## The special advantages

- Economic solutions and maximum energy conservation due to adaptable thermal insulation with Insulation bloc gaskets, with  $U_f$  values down to  $0.8 \text{ W/m}^2\text{K}$
- Wide selection of structural profiles in box and in tee-shape
- All profiles can be used for mullions and transoms, thus minimizing waste in production and optimising stock
- Perfect optical appearance even when using mullions and transoms of the same depth
- Maximum structural values of the profiles due to optimised design
- Solid T-connections in various options
- Comprehensive range of accessories for all applications

## Technology in detail

A distinctive feature of the THERM<sup>+</sup> aluminium curtain walls is their innovative T-connection technology. Every single detail has been analysed in its development to provide an abundance of advantages:

- The connectors are identical for THERM<sup>+</sup> A-I and THERM<sup>+</sup> A-V and for all system widths
- Easy butt joint with straight profile cuts, no notching required
- Various options for structural requirements and assembly methods
- T-connectors for vertical loads up to 550 kg with german general approval
- Extremely rigid connections due to a spreader-clamping mechanism when fixing with screws
- Ideal for the pre-fabrication of transportable units in the workshop
- Perfect optical T-connections due to an optimum contact between mullion and transom over the entire profile
- The T-connectors can be used as profiles for structural reinforcement, head or sill connections and for profile joints.



## Technical data

	THERM <sup>+</sup> A-I	THERM <sup>+</sup> A-V
System width	50 and 56 mm	50 and 56 mm
Box profile depth	25 - 200 mm	25 - 200 mm
Expansion profile depth	75 - 200 mm	100 - 175 mm
Tee profile depth	50 - 200 mm	50 - 200 mm
Profiles in tee shape	yes, 50 mm	yes, 50 mm
Infill thickness	4 - 64 mm	10 - 64 mm
Glass weight	up to 300 kg	up to 400 kg
Drainage levels	2 or 3	2 or 3
Polygonal assembly	up to 45°	up to 45°
Glass roofs	down to 2° inclination	-
Conservatories	yes	-

## System testing / Approvals / CE system declarations acc. to BS/EN 13830 product standard curtain walling

	THERM <sup>+</sup> A-I	THERM <sup>+</sup> A-V
Thermal insulation	down to $U_f = 0.95 \text{ W/m}^2\text{K}$	down to $U_f = 0.8 \text{ W/m}^2\text{K}$
Wind resistance positive / negative	2500 Pa / 3200 Pa	1,875 / 2,813 kN/m <sup>2</sup>
Resistance against impact	inside I5, outside E5	inside I5, outside E5
Air permeability	AE 1950	AE (>600)
Water tightness static / dynamic	RE 1200	RE 1650
Airborne sound insulation		$R_w (C; C_{tr}) = 41 (-3; -7) \text{ dB}$ $R_w (C; C_{tr}) = 49 (-2; -4) \text{ dB}$
Fall protection	yes, without additional measures	
German general approval	glazing system Z-14.4-454	glazing system Z-14.4-504
German general approval	T-connector Z-14.4-461	T-connector Z-14.4-461

# STEEL CURTAIN WALL

## THERM<sup>+</sup> S-I



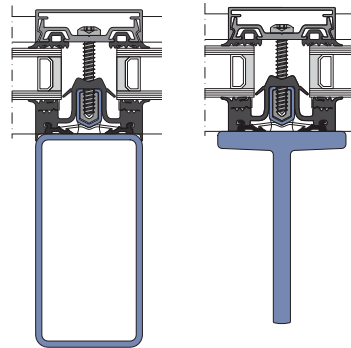
The THERM<sup>+</sup> steel curtain wall system combines the advantages of structural steel profiles with those of a continuous aluminium screw channel. This offers virtually endless design possibilities due to the free choice of steel profiles available on the market, or those individually produced. The special THERM<sup>+</sup> application technology, featuring no metal components in direct surface contact to each other, guarantees the best possible protection against corrosion.

### THERM<sup>+</sup> S-I

for curtain walls, conservatories and sloped glass roofs with an inclination down to 2°, applied on any steel profile from 50 mm width.

### THERM<sup>+</sup> tee-shape steel profiles

are ideal for slim sightline structures with their width of 60 mm and depth of 60, 90 or 120 mm. Further special profiles available on request.



### THERM<sup>+</sup> S-I base profile options

Integrated aluminium screw channel within stainless steel shroud or, when galvanizing, with posterior insertion in a mild steel shroud



### THERM<sup>+</sup> S-I interior gasket options

Type "S" with lateral fixation on a synthetic base profile.



Type "L" with lateral fixation and extension to cover the radius of steel tubes.



Type "D" for direct placement on the steel profile.



### The special advantages

- Efficient thermal insulation, gradually adaptable down to  $U_f = 0.8 \text{ W/m}^2\text{K}$
- Application on any structural steel profile from 50 mm width
- Entire load compensation tested and approved by the German Building Institute, including the weld connections, the glass loads and the screw fixations
- Safe and simple glass load compensation for infill weights up to 800 kg, with additional components up to 1500 kg
- Possibility of heated curtain walls with hot water circulation
- Special system solutions for screwed transom fixture without visible screws

### Technology in detail

Steel with its particular material characteristics and its abundance of profile shapes provides exceptional freedom in building design. The unique attachment of the THERM<sup>+</sup> system has been developed on the basis of practical experience in order to deploy this wide application range for glass façades and at the same time to achieve a safe and secure assembly with 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
- System base profile with stainless steel shroud and integrated aluminium screw channel, for easy fabrication and reliable fixation of all external components
- Ideal for galvanised structures in coastal areas or swimming pools: the special base profile with St 37/2 mild steel shroud and powder-coated screw channel for posterior insertion
- 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



### Technical data

THERM <sup>+</sup> S-I	
System width	50, 56 and 76 mm
For Steel profiles from	50 mm system width
Steel profiles in tee shape	60 mm system width, 60 / 90 / 120 mm depths
Infill thickness	4 - 64 mm
Glass weight	up to 1500 kg
Drainage levels	2 or 3
Polygonal assembly	up to 45°
Glass roofs	down to 2° inclination
Conservatories	yes

### System testing / Approvals / CE system declarations acc. to BS/EN 13830 product standard curtain walling

THERM <sup>+</sup> S-I	
Thermal insulation	down to $U_f = 0.8 \text{ W/m}^2\text{K}$
Wind resistance positive / negative	2000 Pa / 3000 Pa
Air permeability	AE (>600)
Water tightness	RE 1050
Airborne sound insulation	$R_w (C; C_w) = 41 (-3; -7) \text{ dB}$ $R_w (C; C_w) = 51 (-1; -4) \text{ dB}$
Fall protection	yes, without additional measures
German general approval	glazing system Z-14.4-446



# TIMBER CURTAIN WALL

**THERM<sup>+</sup> H-I**  
**THERM<sup>+</sup> H-V**



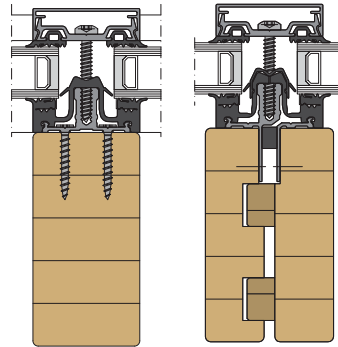
The THERM<sup>+</sup> timber curtain walls provide a thousandfold approved glazing technology for application on structural frames made of any timber based material from 50 mm width. For a sustainable and lasting function the consistent system design assures a strict separation between the structural and design levels made of timber and the functional components made of aluminium and EPDM.

## THERM<sup>+</sup> H-I

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

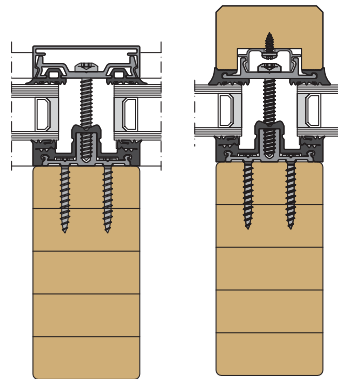
## Coupling mullion

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.



## THERM<sup>+</sup> H-V

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



## Timber cover profiles

can be executed in a sustainable and dependable way with THERM<sup>+</sup>. The glazing technology is based on aluminium and EPDM components. The decorative timber profile is retained by a hidden aluminium profile.

## The special advantages

- Outstanding thermal insulation, gradually down to passive house quality with  $U_f = 0.8 \text{ W/m}^2\text{K}$
- Two aluminium base profile options: with or without guiding extension
- For any timber based profile from 50 mm width
- Entire load compensation tested and approved by the German Building Institute
- Fast and simple screw fixation of the base profile, also possible with the use of an automatic screw gun
- Smooth screw fastening due to the aluminium screw channel
- No components going directly from the exterior into the wood

## Technology in detail

Especially in the case of timber curtain wall, the connection between mullion and transom must fulfil specific requirements. The dead load of the infill units lies in front of the timber structure, and the connectors must compensate for this torsional effect as well as the wind pressure and suction forces. RAICO offers a connector system which has been developed specifically for this application and approved by the German Building Institute.

- Three versions:  
SOLO for glass weights up to 248 kg  
KOMBI for glass weights up to 596 kg  
INTEGRAL for glass weights up to 694 kg
- For THERM<sup>+</sup> H-I and THERM<sup>+</sup> H-V
- For transom depths between 60 and 300 mm
- Minimum preparation: only a notching in the transom and drilled holes in the mullion
- Simplified assembly: fix mullion and transom element, insert transom, secure transom with nail screws, finished.
- Automatic flush position of the transom due to the integrated stop element
- Pre-fabrication of transportable units possible in the workshop
- Perfect T-connections due to pressure between transom and mullion over the entire depth



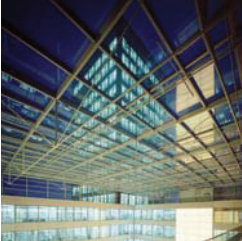
## Technical data

	THERM <sup>+</sup> H-I	THERM <sup>+</sup> H-V
System width	50, 56, 76 mm	50 and 56 mm
For timber profiles from	50 mm system width	50 mm system width
Infill thickness	4 - 64 mm	10 - 64 mm
Glass weight	up to 450 kg	up to 400 kg
Drainage levels	2 or 3	2 or 3
Polygonal assembly	up to 45°	up to 45°
Glass roofs	up to 2° inclination	-
Conservatories	yes	-

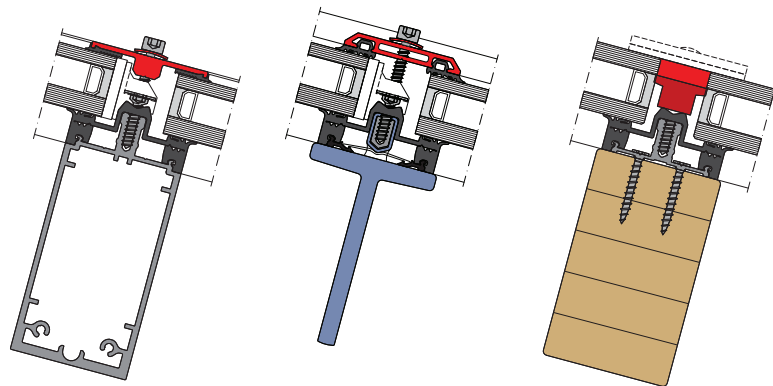
## System testing / Approvals / CE system declarations acc. to BS/EN 13830 product standard curtain walling

	THERM <sup>+</sup> H-I	THERM <sup>+</sup> H-V
Thermal insulation	down to $U_f = 0.8 \text{ W/m}^2\text{K}$	down to $U_f = 0.8 \text{ W/m}^2\text{K}$
Wind resistance positive / negative	2500 Pa / 3200 Pa	2500 Pa / 3750 Pa
Resistance against impact	inside I5, outside E5	inside I5, outside E5
Air permeability	AE 1950	AE
Water tightness static / dynamic	RE 1200	RE 2100
Airborne sound insulation	$R_w (C; C_w) = 41 (-3; -7) \text{ dB}$ $R_w (C; C_w) = 51 (-1; -5) \text{ dB}$	-
Fall protection	yes, without additional measures	
German general approval	glazing system Z-14.4-455	glazing system Z-14.4-516
German general approval	T-connector Z-9.1-621	T-connector Z-9.1-621

# GLASS ROOFS



The curtain wall systems THERM<sup>+</sup> A-I, S-I and H-I for aluminium, steel and timber structures provide ideal characteristics for the erection of glass roofs. The tried and tested RAICO glazing and sealing technology assures a safe and easily executable solution for any construction and roof shape with an inclination of down to 2 degrees.



THERM<sup>+</sup> A-I  
with flat pressure profile

THERM<sup>+</sup> S-I  
with roof pressure profile

THERM<sup>+</sup> H-I  
with silicone joint and  
suction disc

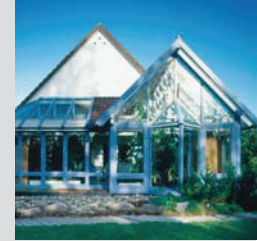
### The special advantages

- The system structure is identical to the THERM<sup>+</sup> standard systems, providing glass roofs with the same characteristics and applications as curtain walling
- Tested with an inclination of only 2 degrees, with outstanding results and classifications
- Accessories such as sun protection devices and building connection components were included in the testing
- The execution is feasible with special beveled pressure profiles, flat pressure profiles, silicone joints or any combination of these
- Openings at the end of the pressure profiles drain screens and prevent stagnant water
- Execution possible in burglary prevention class WK2 and WK3
- For ventilation or smoke and heat control the insertion window WING 105 D, also tested with an inclination of 2 degrees, presents a technically viable and optically perfect solution
- Results for a glass roof tested with an inclination of 2 degrees:
 

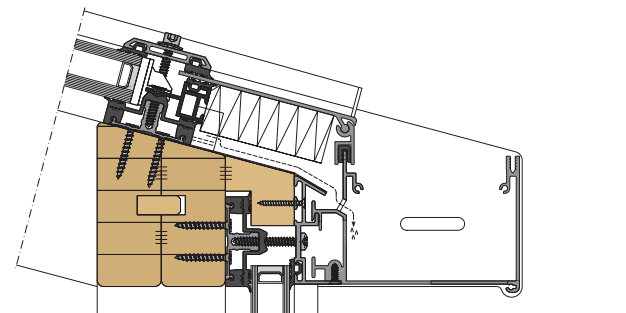
Resistance against wind load	2000 Pa/3000 Pa
Air permeability	AE (> 600 Pa)
Water penetration	RE 1050

# CONSERVATORIES

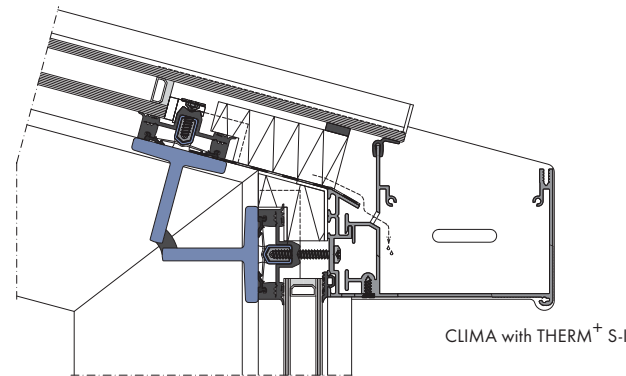
## CLIMA



The CLIMA conservatory system is an extension of the THERM<sup>+</sup> curtain wall system. It offers well-studied detail solutions with perfect optical appearance and the maximum of individual design possibilities. Only a few additional multifunctional items turn the curtain wall system into a complete and comprehensive conservatory system. The execution is feasible in unitised assembly with window units in the vertical area or as a stick system construction.



CLIMA with THERM<sup>+</sup> H-I



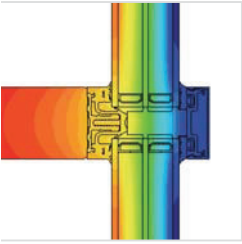
CLIMA with THERM<sup>+</sup> S-I

### The special advantages

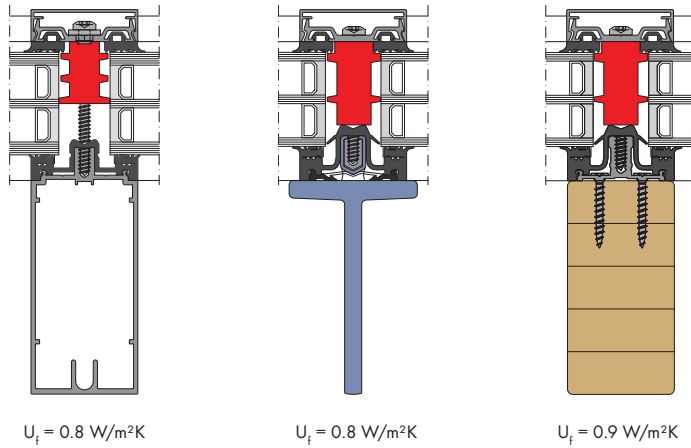
- Maximum processing reliability and functional safety for all conservatory designs
- Only a few multifunctional components enable the entire fabrication without any folded aluminium sheet or special profiles for nearly all conservatory types
- Very attractive design with slim frame widths
- Extremely high quality in mechanical and thermal insulation characteristics
- The execution in unitised or stick system construction offers wide planning freedom for any requirement

- Maximum application safety
- Perfect design in all areas
- Comprehensive range of accessories

# PASSIVE HOUSE CURTAIN WALL



Simply by supplementing Insulation bloc P, a THERM<sup>+</sup> standard curtain wall becomes a passive house curtain wall. Additional cost and work is minimised, allowing for the fitment of energy generating glass façades to passive houses in a generous and economic way. The sophisticated insulation technology makes this quality possible from a system width of only 50 mm.



### The special advantages

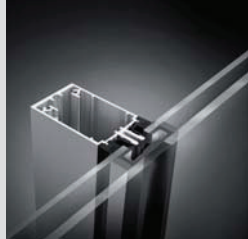
- The systems THERM<sup>+</sup> H-I and THERM<sup>+</sup> H-V are certified by the European Passive House Institute in Darmstadt
- All THERM<sup>+</sup> series achieve peak values in thermal insulation (see table)
- The execution is especially air-tight (blower-door testing)
- Certified with triple glazing of 44 mm infill thickness, argon gas filling and acrylic spacer
- Special accessories such as sealing films or connection panels provide an integral execution in passive house quality
- Application in curtain walls and in glass roofs
- Slim-line design due to peak values from a system width of 50 mm
- All pressure and cover profiles from the standard systems can be applied

### Thermal insulation values

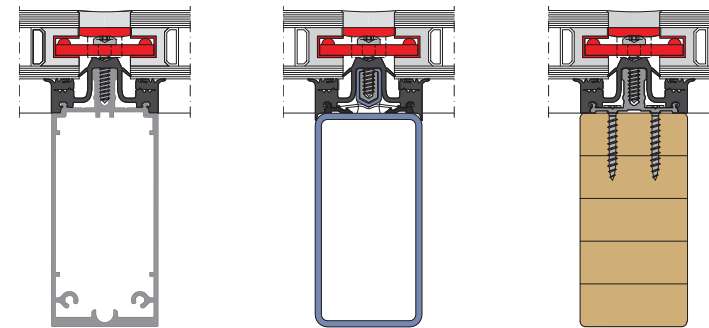
	THERM <sup>+</sup> A-I	THERM <sup>+</sup> A-V	THERM <sup>+</sup> S-I	THERM <sup>+</sup> H-I	THERM <sup>+</sup> H-V
System width	50 and 56 mm	50 and 56 mm	50, 56 and 76 mm	50, 56 and 76 mm	50 and 56 mm
$U_f$ / 64 mm glass	0.95 W/m <sup>2</sup> K	0.8 W/m <sup>2</sup> K*	0.8 W/m <sup>2</sup> K*	0.9 W/m <sup>2</sup> K*	0.9 W/m <sup>2</sup> K*

\*certified by the European Passive House Institute as passive house component

# STRUCTURAL GLAZING CURTAIN WALL

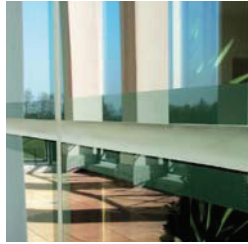


The THERM<sup>+</sup> Structural Glazing curtain walls offer the most slim-line glazing technique. Only a fine silicone joint remains between the double glazed sealed units. The fixation of the interior screen is realized in a simplified, efficient and reliable way by means of a special toggle. The sophisticated insulation design leads to outstanding thermal insulation values, which achieve even passive house quality.



### The special advantages

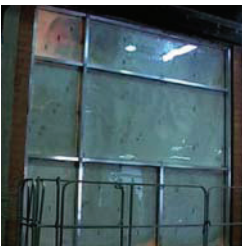
- Can be combined with any of our other system variations, with any pressure profiles and also with suction discs if preferred
- Efficient and safe glass fixation with special structural glazing toggles that engage in an aluminium profile in the edge of the glass spacer
- The Insulation bloc SG provides an exceptional thermal insulation ( $U_f = 1.4 \text{ W/m}^2\text{K}$  with 32 mm glazing,  $0.9 \text{ W/m}^2\text{K}$  with 44 mm glazing) and solid backing for the silicone joint
- Executable with all THERM<sup>+</sup> series in the system widths 50 and 56 mm
- For double or triple glazing, from 32 to 52 mm thickness
- Both vertical and glass roof application available



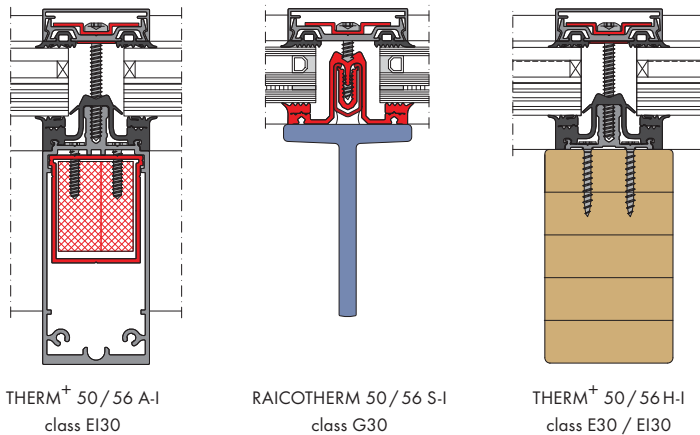
- Feasible with all THERM<sup>+</sup> series
- Very efficient thermal insulation
- System width 50 or 56 mm
- Combination possible with pressure profiles or suction discs



# FIRE RESISTANT CURTAIN WALL



Only minor additions to the THERM<sup>+</sup> base systems are required to execute THERM<sup>+</sup> as a fire resistant curtain wall in various protection classes. The maximum size of the panes provides a new dimension in fire protection: with the tested and approved panes of 1500 x 3000 mm in vertical and horizontal format even storey high glazing is possible. The visual appearance of the fire resistant curtain wall is identical to the standard systems.



## The special advantages

- The design of fire protection curtain wall in aluminium and timber is identical to the standard systems, thus requiring a minimum of additional cost and fabrication effort
- No visual difference between the variations
- All standard structural profiles and interior and exterior gaskets can be applied, leading to production and assembly as efficient as with the standard systems
- Maximum freedom in design with any cover profile
- Additional items to the standard system:
  - Aluminium:** Insertion profile with silicate insert, short pieces of s/s reinforcement for pressure profiles, intumescent fire protection strip in the rebate
  - Steel:** base profile, interior gasket, s/s reinforcement for pressure profile
  - Timber:** short pieces of s/s reinforcement for pressure profiles, intumescent fire protection strip in the rebate

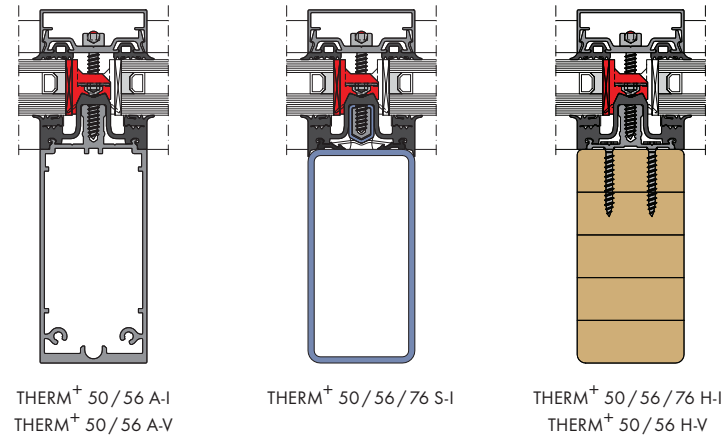
## Technical data:

	THERM <sup>+</sup> A-I	RAICOTHERM S-I	THERM <sup>+</sup> H-I
System width	50 and 56 mm	50 and 56 mm	50 and 56 mm Structural profiles from 60 mm
Fire resistance class	EI30	G30	E30 / EI30
Max. glass formats	1500 x 3000 mm, Horizontal and vertical	1200 x 2000 mm, Horizontal and vertical	1500 x 3000 mm, Horizontal and vertical
General approval	Germany: in process Austria: issued	Issued for Germany, Switzerland and Austria	Germany: in process Austria: issued

# BURGLARY RESISTANT CURTAIN WALL



Complemented by only a few additional system components any of the THERM<sup>+</sup> curtain wall series can be executed with burglary resistant properties in classes WK2 or WK3. For a maximum freedom in design any of the system widths and all pressure profiles with visible screws or with cover profiles as well as the flat pressure profile (WK2) can be applied. For glass roofs the execution in class WK2 and WK3 is possible, too



## The special advantages

- Extension of the standard systems for WK2 only by the use of additional shimming with glass carriers and balls in the screw heads; for WK3 a supplementary pressure profile reinforcement and reinforced screw fixing in the screw channel
- No visual difference between the variations
- Execution identical to the standard system, thus production and assembly as rational as the standard systems
- Wide selection of pressure and cover profiles
- System width and infill thickness as with standard systems
- The execution of glass roofs in class WK2 and WK3 is possible
- The curtain wall can be equipped with the following opening insertion windows in class WK2:
  - Aluminium window FRAME<sup>+</sup>
  - Top-hung projecting window WING 50 SK
  - Top-hung / side-hung / bottom-hung projecting window WING 50 A

- Resistance class WK2 and WK3
- Visual appearance identical to the standard systems
- Only a few additional components
- Many opening windows in WK2 available

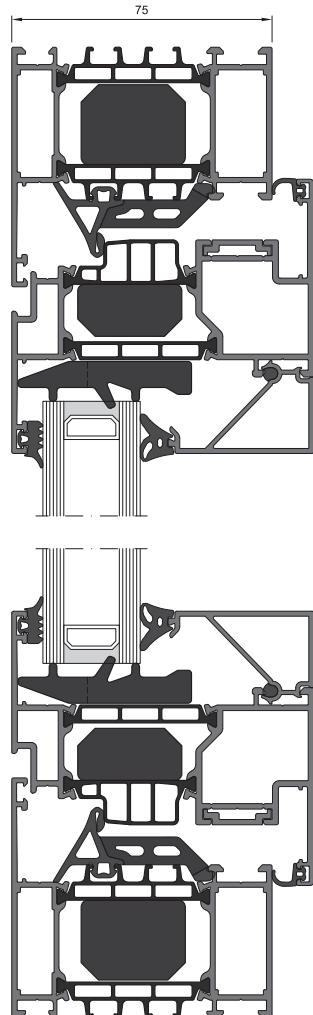


# ALUMINIUM WINDOW

## FRAME<sup>+</sup>

System solutions for sustainable architecture and window production

With its modular composition, innovative system components and adaptable thermal insulation FRAME<sup>+</sup> sets new standards.



### Energy conservation using maximum thermal insulation:

- Innovative insulation bar technology made of our special material THERMORIT with improved thermal properties
- Adaptable  $U_f$  value down to 1.0 W/m<sup>2</sup>K for economic applications as well as maximum energy conservation

### Freedom in design with multiple application possibilities:

- Five variations from a modular system base with a profile range which is compatible for all series
- Extensive design options due to a multitude 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

\*FRAME<sup>+</sup> 75 W-I profiles only available with surface treatment



### FRAME<sup>+</sup> 65 W

System depth 65 mm,  $U_f$  down to 1,7 W/m<sup>2</sup>K, optimised thermal insulation with THERMORIT insulation bar technology

### FRAME<sup>+</sup> 75 W

System depth 75 mm,  $U_f$  down to 1,6 W/m<sup>2</sup>K with THERMORIT insulation bar technology and co-extruded insulating block medial gasket

### FRAME<sup>+</sup> 75 W-I

System depth 75 mm,  $U_f$  down to 1,0 W/m<sup>2</sup>K with THERMORIT insulation bar technology, insulating block medial gasket and insulation inserts

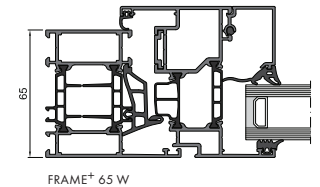
Identical interior and exterior extrusions



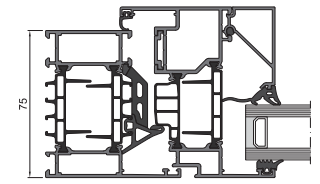
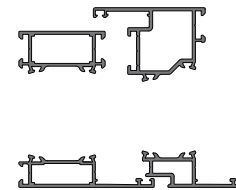
THERMORIT insulation bar options



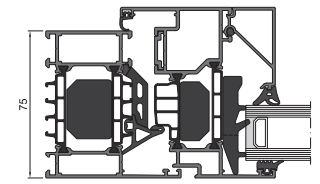
FRAME<sup>+</sup> window series



FRAME<sup>+</sup> 65 W



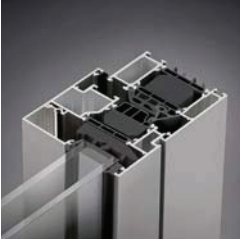
FRAME<sup>+</sup> 75 W



FRAME<sup>+</sup> 75 W-I

The innovative FRAME<sup>+</sup> system concept with its modular composition gives you a choice of three window series. 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. The major benefits of this consistent modular technology are:

- Simplified planning due to the identical profile and application range in every system depth and insulation option
- The processing steps, tools and accessories like corner cleats, gaskets and hardware are identical for all series and provide an efficient production in highest quality, multifunctional and reduced tool deployment and simplified materials management.



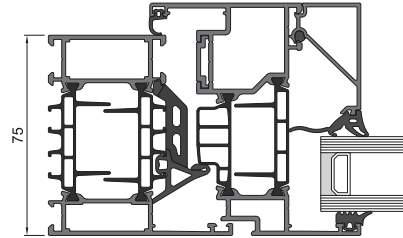
# FRAME<sup>+</sup>

One system - multiple applications

- Punched opening window
- Curtain wall window
- Concealed sash
- Window wall

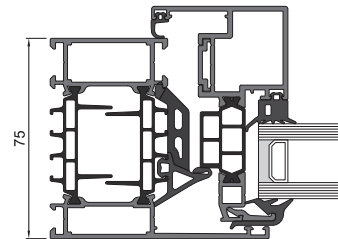
## Aluminium window system FRAME<sup>+</sup>

- System depth 65 or 75 mm
- Adaptable  $U_i$  values down to 1.0 W/m<sup>2</sup>K
- For punched openings or for integration in curtain wall
- Comprehensive range of profiles and accessories for various outer and sash frame options
- Wide choice of structural and expansion mullion profiles
- Available with Meeting stile frames
- Two different applications for FRAME<sup>+</sup> 75 W-I



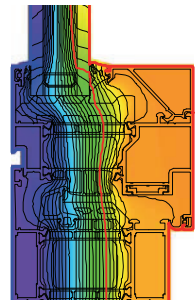
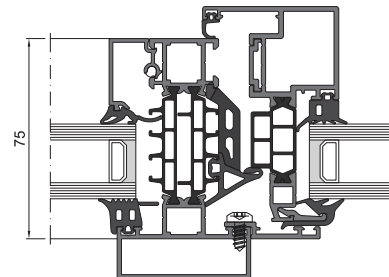
## Option concealed sash FRAME<sup>+</sup>

- High-insulation window with  $U_i$  down to 1.5 W/m<sup>2</sup>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 with Meeting stile frames



## Option window wall FRAME<sup>+</sup> 75 FF

- 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 window with  $U_i$  down to 1.6 W/m<sup>2</sup>K
- Comprehensive diversity of design with various cover profiles from the THERM<sup>+</sup> curtain wall system
- Available with Meeting stile frames



High performance thermal insulation:  
The 10°C isothermal line remains entirely within the frame  
(ext. temp. -10°C, int. temp. 20°C)

# FRAME<sup>+</sup>

Quality in detail

	FRAME <sup>+</sup> 65 W	FRAME <sup>+</sup> 75 W	FRAME <sup>+</sup> 75 W-I	FRAME <sup>+</sup> 75 WB Concealed sash	FRAME <sup>+</sup> 75 FF Window wall
--	-------------------------	-------------------------	---------------------------	--	---

### System values

$U_i$ - Wert in W/m <sup>2</sup> K	1,9 (for width of 117 mm)	1,6 (for width of 117 mm)	1,3 (for width of 117 mm)	1,7 (for width of 82 mm)	1,8 (for width of 76 mm)
Bautiefe	65 mm	75 mm	75 mm	75 mm	75 mm

### Applications

Wandfenster	X	X	X	X	
Fassaden-Einsatzelement	X	X	X	X	
Blockflügel				X	X
Fensterfassade					X

### Application limits\*

Max. Gewicht Dreh-Kipp	130 / 200 kg**	130 / 200 kg**	130 / 200 kg**	130 / 200 kg**	130 / 200 kg**
Max. Gewicht Dreh	130 / 200 kg** / 300 kg**	130 / 200 kg** / 300 kg**	130 / 200 kg** / 300 kg**	130 / 200 kg** / 300 kg**	130 / 200 kg** / 300 kg**
Max. Gewicht verdeckt liegender Beschlag	130 kg	130 kg	130 kg	130 kg	130 kg
Max. Flügelmaße <sup>1</sup>	1600 x 2100 mm / 1100 x 2500 mm	1600 x 2100 mm / 1100 x 2500 mm	1600 x 2100 mm / 1100 x 2500 mm	1450 x 1900 mm / 1100 x 2500 mm	1450 x 1900 mm / 1100 x 2500 mm
Glaseinbaustärke Flügel	12 - 58 mm	22 - 68 mm	22 - 68 mm	24 - 44 mm	24 - 44 mm
Glaseinbaustärke Festverglasung	5 - 46 mm	10 - 56 mm	10 - 56 mm	4 - 50 mm	10 - 56 mm (4,5) 4 - 50 mm (10,5)

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

\*\* 130 kg with standard hardware, 200 kg with reinforced hardware

<sup>1</sup> For permissible sash dimensions see fittings table  
For  $U_i$ -values see the "Thermal insulation" design manual

### Opening options:

- Turn window
- Tilt window
- Turn-tilt window
- Tilt-turn window
- Meeting stile frame

### Hardware options:

- Standard hardware
- Concealed hardware

### Handle / motor options:

- Individual commercial handles (with RAICO integration gear)
- RAICO system handles
- Motor operation

## FRAME<sup>+</sup> : Reliability assured by tested quality

The FRAME<sup>+</sup> window system has undergone rigorous testing according to the product standard for windows EN 14351.1 and achieved in all tested characteristics the highest classification. These values are at the same time the base for simplified CE marking.

### Test configuration

	Aluminium window FRAME <sup>+</sup> W	Window wall FRAME <sup>+</sup> 75 FF	Concealed sash FRAME <sup>+</sup> 75 WB
Air permeability	class 4	class 4	class 4
Resistance to wind load	class C5 / B5	class C5 / B5	class C5 / B5
Water tightness	up to E 1350	up to E 1350	up to E 1350
Operating forces	class 1 and 2	class 1 and 2	class 1 and 2
Capacity for safety devices	fulfilled	fulfilled	fulfilled



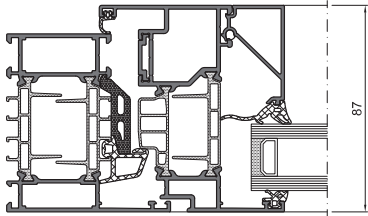


# FRAME<sup>+</sup>

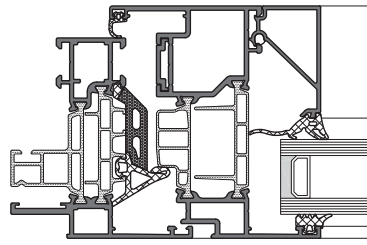
The new freedom in the design of windows

Examples of FRAME<sup>+</sup> aluminium window systems applications.  
The sections are shown in FRAME<sup>+</sup> 75 W, with identical options available in  
FRAME<sup>+</sup> 65 W and FRAME<sup>+</sup> 75 W-I.

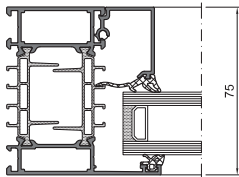
Punched opening window



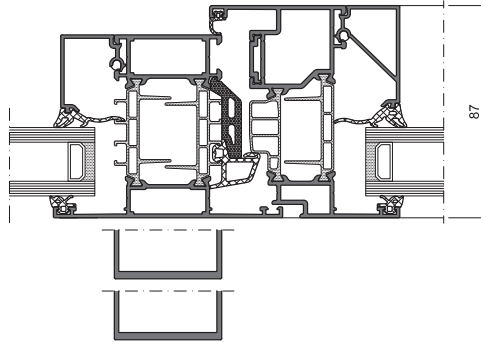
Curtain wall window



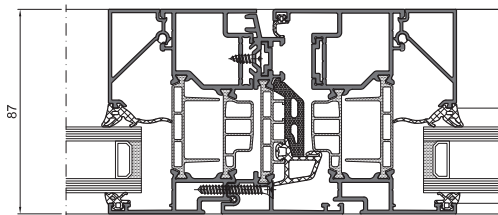
Fixed glazing with insulating block



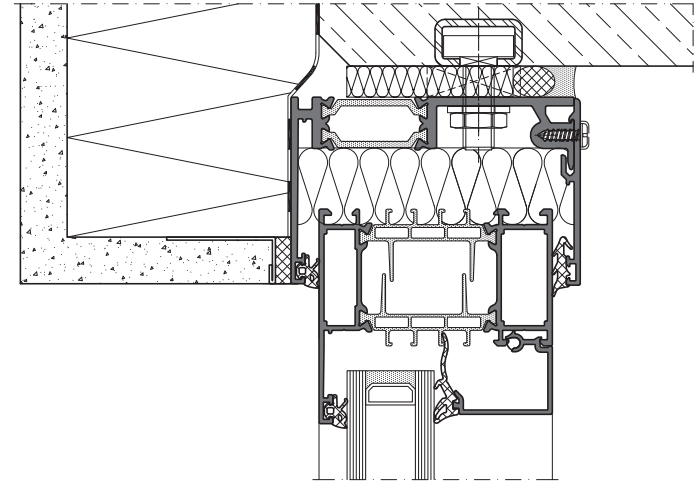
Mullion/transom, sash with fixed glazing



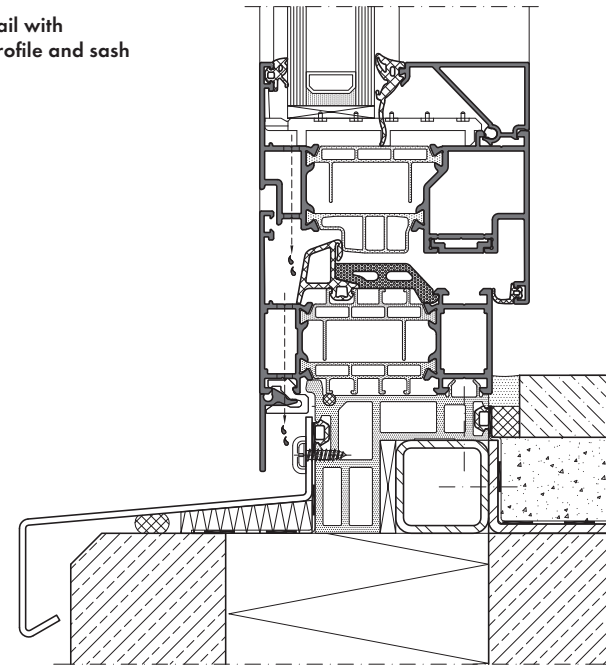
Meeting stile



Head detail with building expansion profile, fixed glazing



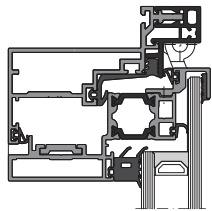
Sill detail with base profile and sash



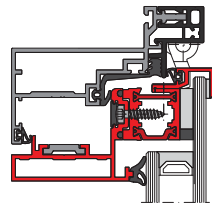
# OUTWARD OPENING WINDOW

## WING 50 A

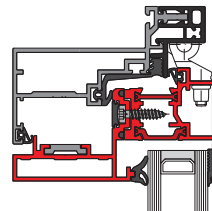
This top-hung, side-hung or bottom-hung window is perfectly adapted to the requirements of both modern architecture and effective ventilation or fume extraction. It features a fine frame width, an extremely wide opening angle of 60° and the choice between structural stepped edge glazing or standard insulating glass. WING 50 A offers an optimum solution in terms of design, technology and economy for outward opening top-hung, side-hung or bottom-hung windows.



WING 50 A-S  
One-piece



WING 50 A-S  
Static adhesion



WING 50 A-R  
Standard glass

### The special advantages

- Outward opening window in its most attractive design with static adhesion
- Economic alternative with standard glass and slim profile design
- Maximum airflow effect due to an opening angle of 60°
- Concealed hinges, mountable on any side
- Ideal for very large or very high sash formats

- Various motor drives
- Available as system for self-fabrication or as pre-assembled units
- Executable as a natural smoke and heat exhaust ventilator in large sizes, tested with a sash size up to 5.2 m<sup>2</sup>

System testing / CE system declarations acc. to BS/EN 14351-1 product standard windows

### Technical data

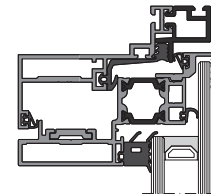
Max. width	2675 mm
Max. height	2200 mm
Max. sash weight	130 Kg (60 kg side-hung)
Opening angle	60°
Infill thickness	24 - 36 mm

Wind resistance	class C5
Air permeability	class 4
Water tightness	class 9A
Airborne sound insulation	R <sub>w</sub> = 43 db(-1,-5)
Burglary resistance	WK2

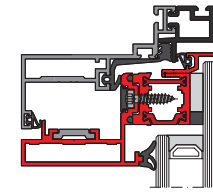
# PROJECTING WINDOW

## WING 50 SK

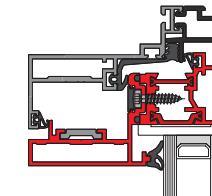
The innovative glazing technology of WING 50 SK features a pure glass surface on the outside with structural stepped edge glazing. As a more economic alternative it can be equipped with standard insulating glass and a special, extremely fine frame profile. Due to a very compact frame design both options lead to extremely slim window structures. With its diverse glazing options WING 50 SK windows offer an ideal solution for any project size and application.



WING 50 SK-S  
One-piece



WING 50 SK-S  
Static adhesion



WING 50 SK-R  
Standard glass

### The special advantages

- Outward opening projecting window with stepped edge glazing, with or without static adhesion
- Economic alternative with standard glass and slim profile design
- For large-sized sashes with a weight up to 150 kg
- No visible screws or glazing beads
- Very slim design: inside 52 mm, outside 50 mm

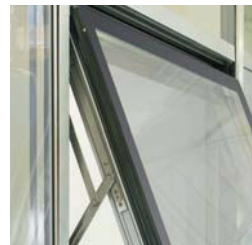
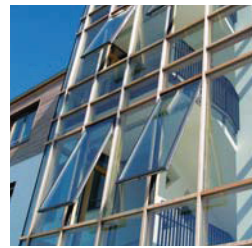
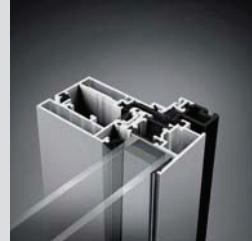
- Advantages in production and logistics due to static bonding of WING 50 SK-S with split sash frame
- Various motor drives and handles available
- Available as a system for self-fabrication or as pre-assembled units
- Executable as a natural smoke and heat exhaust ventilator in large sizes, tested with a sash size up to 3.5 m<sup>2</sup>

System testing / CE system declarations acc. to BS/EN 14351-1 product standard windows

### Technical data

Max. width	2675 mm
Max. height	2675 mm
Max. sash weight	150 Kg
Opening angle	20° / 45° / 50°
Infill thickness	24 - 36 mm

Wind resistance	class C5
Air permeability	class 4
Water tightness	class 9A
Burglary resistance	WK2

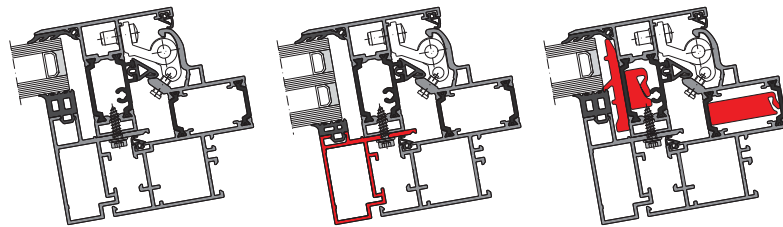


- Concealed projection hardware
- Extremely slim profile design
- Stepped edge glazing or standard glazing
- WK2 burglary resistance option
- Smoke and heat control application option

# ROOF LIGHT WINDOW

## WING 105 D

Its design and technical properties make it a special highlight for glass roofs: WING 105 D features an extremely tight and secure construction, confirmed by outstanding results in product tests with an inclination of only 2°. The very attractive window design doesn't present any glass bead, profile joint or screw on the outside, the turn hinges are entirely concealed within the frame profiles. With its opening angle of up to 90°, large sash dimensions and its possibility of single, double or triple glazing WING 105 D is the perfect opening window for virtually any glass roof.



WING 105 D  
Infill thickness up to 38 mm

WING 105 D  
Infill thickness up to 48 mm

WING 105 D-I  
Highly insulated

### The special 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
- Maximum airflow effect due to an opening angle of 65° (90° available)
- Completely integrated hinges, mountable on any side
- Available as system for self-fabrication or as pre-assembled units
- The perfect complement to the THERM<sup>+</sup> curtain wall systems which are also tested with 2° inclination
- Executable as a natural smoke and heat exhaust ventilator in large sizes, tested with a sash size up to 6.0 m<sup>2</sup>
- New additional option:  
The highly thermal insulated variant WING 105 D-I

### Technical data

Max. width	2700 mm
Max. height	2000 mm
Max. sash weight	165 Kg (60 kg side-hung)
Opening angle	65° (90°)
Infill thickness	9 - 48 mm

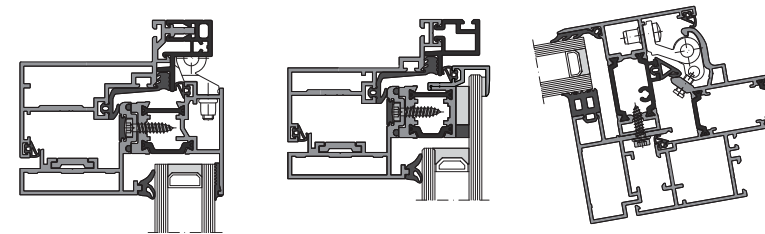
### System testing / CE system declarations acc. to BS/EN 14351-1 product standard windows

Wind resistance	class C5 / B5
Air permeability	class 4
Water tightness	E 1050

# NATURAL SMOKE AND HEAT EXHAUST VENTILATORS

## For smoke control and ventilation

Natural smoke and heat exhaust ventilators according to the latest British/European standard BS EN 12101-2 consist of a jointly tested opening unit with a motorised control system. For maximum diversity, the approved WING windows have been tested for this application with the largest possible sash sizes. As a result even extreme requirements can be fulfilled with RAICO systems. All WING windows for smoke control can also be used without restriction for daily ventilation.



WING 50 A  
Top-hung / side-hung / bottom-hung window

WING 50 SK  
projecting window

WING 105 D  
Roof light window

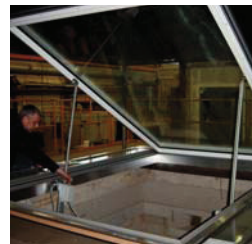
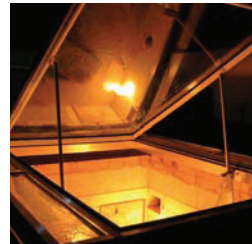
### The special advantages

- Efficient ventilation and smoke evacuation due to wide opening angles of 60° in the curtain wall and up to 90° in glass roofs
- WING 50 A and WING 50 SK either with standard sealed units or structural stepped edge glazing
- Various outward opening types available
- Large window formats possible, up to 5.2 m<sup>2</sup> in the curtain wall and 6.0 m<sup>2</sup> in the glass roof
- System motor drives for highest performance
- Available as system for self-fabrication or as pre-assembled units

### Technical data

(system tests according to BS / EN 12101-2 smoke and heat control systems)

	NRWG WING 50 A	NRWG WING 50 SK	NRWG WING 105 D
Max. width	4000 mm / 1200 mm	2700 mm	4000 mm / 1500 mm
Max. height	1300 mm / 2200 mm	1300 mm	1500 mm / 4000 mm
Max. sash surface	5.2 m <sup>2</sup>	3.5 m <sup>2</sup>	6 m <sup>2</sup>
Max. sash weight	130 Kg (60 kg side-hung)	150 kg	165 kg (60 kg side-hung)
Max. opening angle	60°	20° / 45° / 50°	65° (90°)

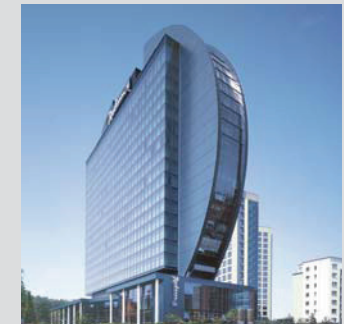
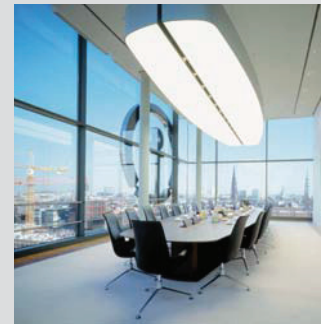
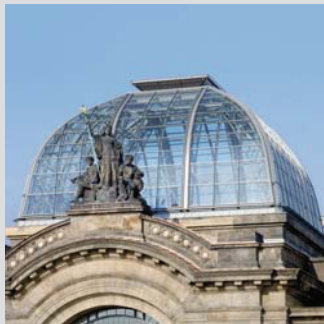
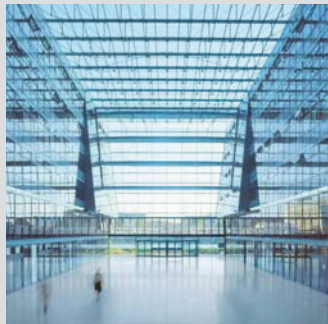


- For curtain walls and glass roofs
- Extremely large sash sizes tested
- Large opening angles
- Windows based on the approved WING systems

- Tested to an inclination of 2°
- Opening angle of 90° available
- Only 37 mm offset against the glass roof
- Smoke and heat control application option







Every façade is different ...

... we provide an individual solution

**RAICO**



# RAICO

## RAICO Bautechnik GmbH

Gewerbegebiet Nord 2  
D-87772 Pfaffenhausen  
Tel. +49 (0)8265-911-0  
Fax +49 (0)8265-911-100  
email: [info@raico.de](mailto:info@raico.de)  
internet: [www.raico.de](http://www.raico.de)

## RAICO SWISS

RAICO Swiss GmbH  
Täferstraße 20  
CH-5405 Baden-Dättwil  
Tel. +41(0)56-4704407  
Fax +41(0)56-4704479  
email: [info@raico.ch](mailto:info@raico.ch)  
internet: [www.raico.ch](http://www.raico.ch)

## RAICO FRANCE

RAICO France S.a.r.l.  
7 rue Icare  
F-67960 Entzheim  
Tél. +33(0)3-88784894  
Fax +33(0)3-88782107  
email: [info@raico.fr](mailto:info@raico.fr)  
internet: [www.raico.fr](http://www.raico.fr)

## RAICO AUSTRIA

RAICO Bautechnik GmbH  
Regionalbüro Ost (Pollham)  
Regionalbüro West (Telfs)  
Tel. +49 (0)8265-911-0  
Fax +49 (0)8265-911-100  
email: [info@raico.at](mailto:info@raico.at)  
internet: [www.raico.at](http://www.raico.at)

## RAICO EAST

RAICO East GmbH  
ul. Bolschaia Spasskaya 12  
Office 8  
Ru-129010 Moscow  
Tél. +7-495-9951159  
Fax +7-495-9951159  
email: [info@raico.ru](mailto:info@raico.ru)  
internet: [www.raico.ru](http://www.raico.ru)

