

THERM⁺

Curtain wall systems Aluminium, Steel, Timber



Summary of the
performance characteristics
according to EN 13830

■ **THERM⁺ tested quality: CE compliant and approved by the building authority**

CE requirements fulfilled in the highest classes

All THERM⁺ glass facade systems correspond with the system-dependent requirements of the product standard EN 13830 in very high classifications. The following details correspond with the CE Declaration of Conformity on the basis of the **Product standard for curtain walling EN 13830**. Therefore, THERM⁺ offers the reliability of CE compliant products for curtain walls in the entire EU and in Switzerland.

Building authority approved fastening systems

National requirements may exist in the EU states, which must be additionally fulfilled as well as those regulated in

EN 13830. In Germany this is the case for curtain wall systems, for which the pressure profiles are fastened in the screw channels and for mullion/transom connections, which are fastened using sheet metal screws. In this case a general building authority approval is always required by the DIBt (German Institute for Construction Technology).

These building authority approvals were issued for the clamp connection of the pressure profiles and the mullion/transom connections for all THERM⁺ facade systems.

■ **Notice**

- The following features can be used for CE-Labeling by the manufactures of curtain walls. It is mandatory that only RAICO products has to be used and the production process has to be monitored by an in-house production control system. The whole production process has to be compliant to the RAICO assembly instructions.
- Depending on the panel dimensions of the curtain wall and the structural connections the sound insulation value has to be

calculated separately. The system testimonial can only be used for an overview.

- Depending on the different systems options and the glass thickness the $U_{m,t}$ -value can be adapted step-by-step. The exact values based on DIN EN ISO 10077-2 are documented in the thermal protection documentations by RAICO.

Aluminium curtain wall system THERM⁺ A-I
System width 50/56 mm

■ **Product standard for curtain walling EN 13830: Features and classification for CE-Labeling**

No.	Test type/Standard	Classification/Result	Testing institute/Test no.
4.1	Wind resistance (EN 12179)	Permissible load 1.875 KN/m ² Increased load 2.813 KN/m ²	ift Rosenheim No. 10-000502
4.3	Resistance against impact (if specially requested) (EN 14019)	Interior I5 Exterior E5	ift Rosenheim No. 10-000502
4.4	Air permeability (EN 12153)	AE (>600)	ift Rosenheim No. 10-000502
4.5	Water penetration (EN 12155)	RE 1650	ift Rosenheim No. 10-000502
4.6	Airborne sound insulation (if specially requested) (EN ISO 717-1)	R _w (C;C _{tr}) = 35 (-1;-3) dB R _w (C;C _{tr}) = 40 (-1;-4) dB R _w (C;C _{tr}) = 44 (-2;-5) dB	gbd LAB No. 10_1101_2
4.7	Thermal transmittance (U _{cw} value) (DIN EN ISO 12631)	Calculation with data from RAICO U _{m,t} value tables	DIN EN ISO 12631 (calculation)

■ **Additional approvals and certifications**

Test	Result	Description	Testing institute/Test no.
German general approval: clamping joint for the curtain wall system	- Screw channel of mullion-transom profiles - Pressure profiles - Screws	German general approval for the clamping joint for the curtain wall system THERM ⁺ A-I aluminium curtain wall	DIBt, Berlin No. Z-14.4-454
German general approval: mullion-transom-connections (T-connections)	Connection types with maximal vertical load	German general approval for the T-connections THERM ⁺ A-I aluminium curtain wall	DIBt, Berlin No. Z-14.4-461
Glass roof with 2° inclination: - Air permeability - Water penetration - Wind resistance	Class AE including accessories (e. g. sun protection fixation) Class RE 2550 including accessories (e. g. sun protection fixation) test load 2600 Pa, safety 3900 Pa (e. g. sun protection fixation)	Criteria for glass roofs until 2° inclination fulfilled for all system widths	ift Rosenheim No. 13-002240-PR06
Burglar prevention	Resistance class RC1N for system widths 50 and 56 mm	Test THERM ⁺ A-I according to DIN EN 1627 ff.	gbd LAB No. 17/0571_01
Burglar prevention	Resistance class RC2 for system widths 50 and 56 mm	Test THERM ⁺ A-I according to DIN EN 1627 ff.	gbd LAB No. 17/0571_02
Burglar prevention	Resistance class RC3 for system widths 50 and 56 mm	Test THERM ⁺ A-I according to DIN EN 1627 ff.	gbd LAB No. 17/0571_03
Fall protection	Criteria of TRAV (technical rules for fall proof glazing) fulfilled	TRAV, figure 6: criteria fulfilled	

Aluminium curtain wall system THERM⁺ A-V
 System width 50/56 mm

■ Product standard for curtain walling EN 13830: Features and classification for CE-Labeling

No.	Test type/Standard	Classification/Result	Testing institute/Test no.
4.1	Wind resistance (EN 12179)	Permissible load 1.875 kN/m ² Increased load 2.813kN/m ²	ift Rosenheim No. 10830952
4.3	Resistance against impact (if specially requested) (EN 14019)	Interior I5 Exterior E5	ift Rosenheim No. 10830952
4.4	Air permeability (EN 12153)	AE (>600)	ift Rosenheim No. 10830952
4.5	Water penetration (EN 12155)	RE 1650	ift Rosenheim No. 10830952
4.6	Airborne sound insulation (if specially requested) (EN ISO 717-1)	R _W (C;C _{tr}) = 36 (-1;-4) dB R _W (C;C _{tr}) = 40 (-1;-5) dB R _W (C;C _{tr}) = 45 (-2;-6) dB	gbd LAB No. 10_1101_7
4.7	Thermal transmittance (U _{cw} value) (DIN EN ISO 12631)	Calculation with data from RAICO U _{m,t} value tables	DIN EN ISO 12631 (calculation)
4.8	Fire resistance (EN 13501-2)	EI30 (o ↔ i)	ift Rosenheim No. 14-002042-PR01

■ Additional approvals and certifications

Test	Result	Description	Testing institute/Test no.
German general approval: clamping joint for the curtain wall system	- Screw channel of mullion-transom profiles - Pressure profiles - Screws	German general approval for the clamping joint for the curtain wall system THERM ⁺ A-V aluminium curtain wall	DIBt, Berlin No. Z-14.4-504
German general approval mullion-transom-connections (T-connections)	Connection types with maximal vertical load	German general approval for the T-connections THERM ⁺ A-I aluminium curtain wall	DIBt, Berlin No. Z-14.4-461
Burglar prevention	Resistance class RC1N for system widths 50 and 56 mm	Test THERM ⁺ A-V according to DIN EN 1627 ff.	gbd LAB No. 17/0573_01
Burglar prevention	Resistance class RC2 for system widths 50 and 56 mm	Test THERM ⁺ A-V according to DIN EN 1627 ff.	gbd LAB No. 17/0573_02
Burglar prevention	Resistance class RC3 for system widths 50 and 56 mm	Test THERM ⁺ A-V according to DIN EN 1627 ff.	gbd LAB No. 17/0573_03
Fall protection	Criteria of TRAV (technical rules for fall proof glazing) fulfilled	TRAV, figure 6: criteria fulfilled	
Passive house curtain wall	U _{cw} ≤ 0.8 W/m ² K for system THERM ⁺ A-V 50, 56 with insulating block P	Fulfilment all criteria for compo- nents suitable for passive houses	Passive house institute Dr. Feist certificate

Attachement systems for steel supporting constructions THERM⁺ S-I
System width 50/56/76/96 mm

■ **Product standard for curtain walling EN 13830: Features and classifications for CE-Labeling**

No.	Test type/Standard	Classification/Result	Testing institute/Test no.
4.1	Wind resistance (EN 12179)	Permissible load 2.5 KN/m ² Increased load 3.75 KN/m ²	ift Rosenheim No. 108 43723
4.3	Resistance against impact (if specially requested) (EN 14019)	Interior I5 Exterior E5	ift Rosenheim No. 108 43723
4.4	Air permeability (EN 12153)	AE (>600)	ift Rosenheim No. 108 43723
4.5	Water penetration (EN 12155)	RE 1950	ift Rosenheim No. 108 43723
4.6	Airborne sound insulation (if specially requested) (EN ISO 717-1)	R _w (C;C _{tr}) = 36 (-1;-4) dB until R _w (C;C _{tr}) = 47 (-2;-6) dB	gbd LAB No. 10_1101_11
4.7	Thermal transmittance (U _{cw} value) (DIN EN ISO 12631)	Calculation with data from RAICO U _{m,t} value tables	DIN EN ISO 12631 (calculation)
4.8	Fire resistance (EN 13501-2)	EI30 (o ↔ i)	ift Rosenheim No. 17-002326-PR01

■ **Additional approvals and certifications**

Test	Result	Description	Testing institute/Test no.
German general approval: clamping joint for the curtain wall system	- Connection steel structural profile with system base profile - Glass carriers - Pressure profiles - Screws	German general approval for the fixing system THERM ⁺ steel curtain wall	DIBt, Berlin No. Z-14.4-446
Glass roof with 2° inclination: - Air permeability - Water penetration - Wind resistance	Class AE including accessories (e. g. sun protection fixation) Class RE 2550 including accessories (e. g. sun protection fixation) test load 2600 Pa, safety 3900 Pa (e. g. sun protection fixation)	Criteria for glass roofs until 2° inclination fulfilled for all system widths	ift Rosenheim No. 13-002240-PR05
Burglar prevention	Resistance class RC1N for system widths 50, 56 and 76 mm	Test THERM ⁺ S-I according to DIN EN 1627 ff.	gbd LAB No. 16/1315_01a
Burglar prevention	Resistance class RC2 for system widths 50, 56 and 76 mm	Test THERM ⁺ S-I according to DIN EN 1627 ff.	gbd LAB No. 16/1315_02a
Burglar prevention	Resistance class RC3 for system widths 50, 56 and 76 mm	Test THERM ⁺ S-I according to DIN EN 1627 ff.	gbd LAB No. 16/1315_03a
Fall protection	Criteria of TRAV (technical rules for fall proof glazing) fulfilled	TRAV, figure 6: criteria fulfilled	
Passive house curtain wall	U _{cw} ≤ 0.8 W/m ² K of system THERM ⁺ S-I 50, 56 with insulating block P	Fulfilment all criteria for components suitable for passive houses	Passive house institute Dr. Feist certificate

Attachement systems for steel supporting constructions THERM⁺ FS-I
 System width 50/56 mm

■ Product standard for curtain walling EN 13830: Features and classifications for CE-Labeling

No.	Test type/Standard	Classification/Result	Testing institute/Test no.
4.1	Wind resistance (EN 12179)	Permissible load 2.5 KN/m ² Increased load 3.75 KN/m ²	ift Rosenheim No. 15-003223
4.4	Air permeability (EN 12153)	AE (>600)	ift Rosenheim No. 15-003223
4.5	Water penetration (EN 12155)	RE 1950	ift Rosenheim No. 15-003223
4.6	Airborne sound insulation (if specially requested) (EN ISO 717-1)	R _W (C;C _{tr}) = 34 (-1;-4) dB until R _W (C;C _{tr}) = 47 (-1;-3) dB	gbd LAB Nr. 15/1268_01
4.7	Thermal transmittance (U _{cw} value) (DIN EN ISO 12631)	Calculation with data from RAICO U _{m,t} value tables	DIN EN ISO 12631 (calculation)
4.8	Fire resistance (EN 13501-2)	EI30 (o ↔ i)	ift Rosenheim No. 17-002326-PR01

■ Additional approvals and certifications

Test	Result	Description	Testing institute/Test no.
European technical approval: clamping joint and glass load transmission for the curtain wall system	- Connection steel structural profile with system base profile - T-connection - Glass carriers - Pressure profiles - Screws	European technical approval for the fixing system THERM ⁺ steel curtain wall	OIB, Wien
Glass roof with 2° inclination: - Air permeability - Water penetration - Wind resistance	Class AE including accessories (e. g. sun protection fixation) Class RE 2550 including accessories (e. g. sun protection fixation) test load 2600 Pa, safety 3900 Pa (e. g. sun protection fixation)	Criteria for glass roofs until 2° inclination fulfilled for all system widths	ift Rosenheim No. 15-003223-PR01
Burglar prevention	Resistance class RC1N for system widths 50 and 56 mm	Test THERM ⁺ FS-I according to DIN EN 1627 ff.	gbd LAB No. 16/1314_01
Burglar prevention	Resistance class RC2 for system widths 50 and 56 mm	Test THERM ⁺ FS-I according to DIN EN 1627 ff.	gbd LAB No. 16/1314_02
Burglar prevention	Resistance class RC3 for system widths 50 and 56 mm	Test THERM ⁺ FS-I according to DIN EN 1627 ff.	gbd LAB No. 16/1314_03
Fall protection	Criteria of TRAV (technical rules for fall proof glazing) fulfilled	TRAV, figure 6: criteria fulfilled	
Passive house curtain wall	U _{cw} ≤ 0.8 W/m ² K of system THERM ⁺ FS-I 50, 56 with insulating block PH/P	Fulfilment of all criteria for components suitable for passive houses	Passive house institute Dr. Feist certificate

Attachment systems for wooden support structures THERM⁺ H-I
System width 50/56/76 mm

■ **Product standard for curtain walling EN 13830: Features and classification for the CE-Labeling.**

No.	Test type/Standard	Classification/Result	Testing institute/Test no.
4.1	Wind resistance (EN 13116)	Permissible load 2.5 KN/m ² Increased load 3.75 KN/m ²	ift Rosenheim No. 10-000502
4.3	Resistance against impact (if specially requested) (EN 14019)	Interior I5 Exterior E5	ift Rosenheim No. 10-000502
4.4	Air permeability (EN 12152)	AE (>600)	ift Rosenheim No. 10-000502
4.5	Water penetration (EN 12154)	RE 2100	ift Rosenheim No. 10-000502
4.6	Airborne sound insulation (if specially requested) (EN ISO 717-1)	R _w (C;C _{tr}) = 36 (-1;-3) dB R _w (C;C _{tr}) = 41 (-2;-5) dB R _w (C;C _{tr}) = 46 (-1;-5) dB	gbd LAB No. 10_1101_9
4.7	Thermal transmittance (U _{cw} value) (DIN EN ISO 12631)	Calculation with data from RAICO U _{m,t} value tables	DIN EN ISO 12631 (calculation)
4.8	Fire resistance (EN 13501-2)	EI30 (o ↔ i)	ift Rosenheim No. 16-002772-PR01

■ **Additional approvals and certifications**

Test	Result	Description	Testing institute/Test no.
German general approval: clamping joint for the curtain wall system	- Fixing of base profile - Screw channel of mullion-transom profiles - Pressure profiles - Screws	German general approval for the fixing system THERM ⁺ H-I Timber curtain wall	DIBt, Berlin No. Z-14.4-455
European Technical Approval: SOLO/KOMBI timber mullion- transom connectors	Connector types with max. vertical loads (characteristic resistance)	European Technical Approval for timber mullion-transom connection system THERM ⁺	ETA-Denmark No. ETA-13/0765
Glass roof with 2° inclination: - Air permeability - Water penetration - Wind resistance	Class AE including accessories (e. g. sun protection fixation) Class RE 2550 including accessories (e. g. sun protection fixation) test load 2600 Pa, safety 3900 Pa (e. g. sun protection fixation)	Criteria for glass roofs until 2° inclination fulfilled for all system widths	ift Rosenheim Nr. 13-002240-PR01
Burglar prevention	Resistance class RC1N for system widths 50, 56 and 76 mm	Test THERM ⁺ H-I according to DIN EN 1627 ff.	gbd LAB No. 17/0570_01
Burglar prevention	Resistance class RC2 for system widths 50, 56 and 76 mm	Test THERM ⁺ H-I according to DIN EN 1627 ff.	gbd LAB No. 17/0570_02
Burglar prevention	Resistance class RC3 for system widths 50, 56 and 76 mm	Test THERM ⁺ H-I according to DIN EN 1627 ff.	gbd LAB No. 17/0570_03
Fall protection	Criteria of DIN 18008-4 (technical rules for fall proof glazing) fulfilled	Criteria fulfilled	
Passive house curtain wall	U _{cw} ≤ 0.8 W/m ² K of system THERM ⁺ H-I 50, 56, 76 with insulating block P	Fulfilment all criteria for components suitable for passive houses	Passive house institute Dr. Feist certificate

Attachment systems for wooden support structures THERM⁺ H-V
 System width 50/56/76 mm

■ Product standard for curtain walling EN 13830: Features and classification for the CE-Labeling.

No.	Test type/Standard	Classification/Result	Testing institute/Test no.
4.1	Wind resistance (EN 13116)	Permissible load 2.5 KN/m ² Increased load 3.75 KN/m ²	ift Rosenheim No. 10838884
4.3	Resistance against impact (if specially requested) (EN 14019)	Interior I5 Exterior E5	ift Rosenheim No. 10838884
4.4	Air permeability (EN 12152)	AE (>600)	ift Rosenheim No. 10838884
4.5	Water penetration (EN 12154)	RE 2100	ift Rosenheim No. 10838884
4.7	Thermal transmittance (U _{cw} value) (DIN EN ISO 12631)	Calculation with data from RAICO U _{m,t} value tables	DIN EN ISO 12631 (calculation)

■ Additional approvals and certifications

Test	Result	Description	Testing institute/test no.
German general approval: clamping joint for the curtain wall system	- Fixing of base profile - Screw channel of mullion-transom profiles - Pressure profiles - Screws	German general approval for the fixing system THERM ⁺ H-I timber curtain wall	DIBt, Berlin No. Z-14.4-516
European Technical Approval: SOLO/KOMBI timber mullion- transom connectors	Connector types with characteristic resistance	European Technical Approval for timber mullion-transom connection system THERM ⁺	ETA-Denmark No. ETA-13/0765
Burglar prevention	Resistance class RC1N for system widths 50, 56 and 76 mm	Test THERM ⁺ H-V according to DIN EN 1627 ff.	gbd LAB No. 17/0572_01
Burglar prevention	Resistance class RC2 for system widths 50, 56 and 76 mm	Test THERM ⁺ H-V according to DIN ENV 1627 ff.	gbd LAB No. 17/0572_02
Burglar prevention	Resistance class RC3 for system widths 50, 56 and 76 mm	Test THERM ⁺ H-V according to DIN EN 1627 ff.	gbd LAB No. 17/0572_03
Fall protection	Criteria of DIN 18008-4 (technical rules for fall proof glazing) fulfilled	Criteria fulfilled	
Passive house curtain wall	U _{cw} ≤ 0.8 W/m ² K of system THERM ⁺ H-V 50, 56, 76 with insulating block P	Fulfilment all criteria for components suitable for passive houses	Passive house institute Dr. Feist certificate





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