

# CW 60

## PRODUCT PASS

Date: **22-11-2023**

Language: **English**



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## 1 GENERAL EXPLANATION

The performances indicated in this product pass can be used for a Declaration of Performance (DoP) in accordance with EU Regulation no. 305/2011. The characteristics are in accordance with the harmonized product standard EN 13830:2003 (Curtain walling - Product standard).

At least one performance of an essential characteristic shall be mentioned on the DoP. Non-essential characteristics are not legally required in any European country and thus not mandatory to declare. Where no performance is declared "NPD" (No Performance Declared) can be used.

The performances indicated can be achieved for the configuration and dimensions as tested and when the product is fabricated in accordance with the instructions of Reynaers (system catalogue). It is obviously allowed to declare lower performances; e.g. when resistance to wind load of 1600 Pa was tested, also 1200 Pa can be declared for the same configuration and dimensions.

Higher performances for smaller dimensions, lower performances for larger dimensions, or similar performances for larger dimensions but with the appropriate selection of profiles and/or reinforcements are possible. Validate your performances and deflections, adhering to the maximum admissible dimensions indicated in the system catalogue.

## 2 NOTIFIED BODIES

ID	Name	Address	Country
0074	CENTRE D'EXPERTISE DU BÂTIMENT ET DES TRAVAUX PUBLICS	Domaine De Saint-Paul – 102, Route de Limours 78471 Saint-Remy-Les-Chevreuse Cedex	France
0432	MATERIALPRÜFUNGSAMT NORDRHEIN-WESTFALEN	Auf den Thränen 2 59597 Erwitte	Germany
0679	CENTRE SCIENTIFIQUE ET TECHNIQUE DU BÂTIMENT	84, Avenue Jean Jaurès Champs-sur-Marne F-77447 Marne-la-Vallée Cedex 2	France
0744	SOCOTEC	Les Quadrants – 3, Avenue du Centre – Guyancourt 78182 St-Quentin en Yvelines	France
0749	BELGIAN CONSTRUCTION CERTIFICATION ASSOCIATION	Aarlenstraat 53 1040 Brussel	Belgium
0757	IFT ROSENHEIM	Theodor-Gietl-Strasse 7-9 83026 Rosenheim	Germany
0845	DANISH INSTITUTE OF FIRE AND SECURITY TECHNOLOGY	Jernholmen, 12 2650 Hvidovre	Denmark
0960	SKG-IKOB	Poppenbouwing 56 4191 NZ Geldermalsen	Netherlands
1136	BELGIAN BUILDING RESEARCH INSITUTE	Lombardstraat 42 1000 Brussel	Belgium
1234	EFFECTIS NEDERLAND	Brandpuntlaan Zuid 16, Postbus 554 2665 ZN Bleiswijk	Netherlands
1288	WINTech ENGINEERING LIMITED	Halesfield 2 Telford, Shropshire TF7 4QH	United Kingdom
1309	PRÜFINSTITUT SCHLÖSSER UND BESCHLÄGE, VELBERT	Wallstrasse 41 42551 Velbert	Germany
1488	INSTYTUT TECHNIKI BUDOWLANEJ	ul. Filtrowa 1 00-611 Warszawa	Poland
1671	PEUTZ	Lindenlaan 41, Molenhoek PO Box 66 6585 ZH MOOK	Netherlands
1749	TNO DEFENCE, SECURITY AND SAFETY	Lange Kleiweg 137, Postbus 45 2280 AA Rijswijk	Netherlands
1769	UNIVERSITY OF GENT	Sint-Pietersnieuwstraat 41 9000 Gent	Belgium
2211	INSTITUTO DE INVESTIGAÇÃO E DESENVOLVIMENTO TECNOLÓGICO PARA A CONSTRUÇÃO, ENERGIA, AMBIENTE E SUSTENTABILIDADE	Rua Pedro Hispano Pólo II da Universidade de Coimbra 3030-289 Coimbra	Portugal

### 3 EXPLANATIONS AND SYMBOLS

H: Element Height

B: Element Width

Fh: Vent Height

Fb: Vent Width

npd: No Performance Declared

CWFT: Classification Without Further Testing

<sup>(1)</sup> Indicated wind load = design load

<sup>(2)</sup> Because of the same profile design, characteristics are based on test results for CW50

<sup>(3)</sup> Other dimensions and deformations to be calculated in function of the wind load ( $f_{max} < L/200$ , max 15 mm)

<sup>(4)</sup> Impact resistance was only tested with screw connection between transom and mullion -> Also connections with additional T-connectors are approved

<sup>(5)</sup> Composition of the spandrel part: see test report

## 4 PERFORMANCE

### 4.1 Classifications for CW 60

Characteristic		Performance		Notified body - Report		Tested size [mm]	
EN 13830:2003	Essential characteristics						
	4.1	Resistance to wind load	2400 Pa <sup>(1)</sup>		[0960] – 07.161		See report <sup>(3)</sup>
	4.2	Dead load	See system catalogue for more detailed info about maximum weights for each type of glass support.				
	4.3	Impact resistance	I5 / E5		[1136] – CAR 5010/1		1500x1200 <sup>(4)</sup>
	4.4	Air permeability	AE1200 (1200 Pa)		[0960] – 09.149 <sup>(2)</sup>		See report
	4.5	Watertightness	RE1200 (1200 Pa)		[0960] – 07.161		See report
	4.6	Airborne sound insulation	Glass: 34 (-1;-4) 40 (-2;-7) 48 (-2;-8) 48 (-2;-8) + spandrel <sup>(5)</sup>	Curtain walling 34 (-1;-4) 42 (-2;-7) 47 (-2;-5) 55 (-2;-7)	[1488] – 01/00948/13/R48NA [1488] – 02/00948/13/R48NA [1488] – 03/00948/13/R48NA [1488] – LA/1365d/2006		
	4.7	Thermal transmittance	U <sub>cw</sub> to be calculated according to EN ISO 12631 (see also 6). The U-values of the different profiles are available in separate U-value tables. The U-values of the profiles are calculated under certification of BCCA: certificate BPCB-420-72-10077/2.				
	4.8	Resistance to fire	npd				
	4.9	Reaction to fire	Anodized: A1 Painted: A2 Gaskets: E	EC decision 96/603/EC certificate P155748 [0432] – 230006500-6			
	4.10	Fire propagation	EI60		[1488] – 1323/06		See report
	4.15	Thermal shock resistance	When requested, glass with thermal shock resistance conforming to the appropriate standards has to be chosen.				
	4.17	Resistance to live horizontal loads	When requested, declare the value in kN at sill height. The loads have to be calculated according to national specifications. The allowable loads per T-connection are given in 5.				
	Non-essential characteristics						
4.13	Equipotentiality	All metal parts have to be conductively connected (see also examples in the catalogue and guidelines in Annex A of EN 13830). The electrical resistance has to be measured in accordance with Annex A of EN 13830.					

## 4.2 Classifications for CW 60-HI

Characteristic		Performance		Notified body - Report		Tested size [mm]	
EN 13830:2003	Essential characteristics						
	4.1	Resistance to wind load	2400 Pa <sup>(1)</sup>		[1488] – LK03-00948/15/R86NK <sup>(2)</sup>		See report <sup>(3)</sup>
	4.2	Dead load	See system catalogue for more detailed info about maximum weights for each type of glass support.				
	4.3	Impact resistance	I5 / E5		[1136] – CAR 5010/1		1500x1200 <sup>(4)</sup>
	4.4	Air permeability	AE1950 (1950Pa)		[1488] – LK03-00948/15/R86NK <sup>(2)</sup>		See report
	4.5	Watertightness	RE1950 (1950 Pa)		[1488] – LK03-00948/15/R86NK <sup>(2)</sup>		See report
	4.6	Airborne sound insulation	Glass: 34 (-1;-4) 40 (-2;-7) 48 (-2;-8) 48 (-2;-8) + spandrel <sup>(5)</sup>	Curtain walling 34 (-1;-4) 42 (-2;-7) 47 (-2;-5) 55 (-2;-7)	[1488] – 01/00948/13/R48NA [1488] – 02/00948/13/R48NA [1488] – 03/00948/13/R48NA [1488] – LA/1365d/2006		
	4.7	Thermal transmittance	Ucw to be calculated according to EN ISO 12631 (see also 6). The U-values of the different profiles are available in separate U-value tables. The U-values of the profiles are calculated under certification of BCCA: certificate BPCB-420-72-10077/2.				
	4.8	Resistance to fire	npd				
	4.9	Reaction to fire	Anodized: A1 Painted: A2 Gaskets: E	EC decision 96/603/EC certificate P155748 [0432] – 230006500-6			
	4.10	Fire propagation	EI60		[1488] – 1323/06		See report
	4.15	Thermal shock resistance	When requested, glass with thermal shock resistance conforming to the appropriate standards has to be chosen.				
	4.17	Resistance to live horizontal loads	When requested, declare the value in kN at sill height. The loads have to be calculated according to national specifications. The allowable loads per T-connection are given in 5.				
	Non-essential characteristics						
	4.13	Equipotentiality	All metal parts have to be conductively connected (see also examples in the catalogue and guidelines in Annex A of EN 13830). The electrical resistance has to be measured in accordance with Annex A of EN 13830.				

**4.3 Classifications for CW 60-HL <sup>(2)</sup>**

Characteristic		Performance		Notified body - Report		Tested size [mm]	
EN 13830:2003	Essential characteristics						
	4.1	Resistance to wind load	1200 Pa <sup>(1)</sup>		[0960] – 07.190		See report <sup>(3)</sup>
	4.2	Dead load	See system catalogue for more detailed info about maximum weights for each type of glass support.				
	4.3	Impact resistance	I3 E5		[0960] – 08.111 [1136] – CAR 5010/1		1000x2000 <sup>(4)</sup> 1500x1200 <sup>(4)</sup>
	4.4	Air permeability	A4 (600 Pa)		[0960] – 07.190		See report
	4.5	Watertightness	R7 (600 Pa)		[0960] – 07.190		See report
	4.6	Airborne sound insulation	Glass: 34 (-1;-4) 40 (-2;-7) 48 (-2;-8) Spandrel <sup>(5)</sup>	Curtain walling 33 (-1;-4) 41 (-2;-5) 43 (-1;-4) 54 (-2;-7)	[1488] – LA/1365e/2006 [1488] – LA/1365f/2006 [1488] – LA/1365g/2006 [1488] – LA/1365h/2006		
	4.7	Thermal transmittance	U <sub>cw</sub> to be calculated according to EN ISO 12631 (see also 6). The U-values of the different profiles are available in separate U-value tables. The U-values of the profiles are calculated under certification of BCCA: certificate BPCB-420-72-10077/2.				
	4.8	Resistance to fire	npd				
	4.9	Reaction to fire	Anodized: A1 Painted: A2 Gaskets: E	EC decision 96/603/EC certificate P155748 [0432] – 230006500-6			
	4.10	Fire propagation	npd				
	4.15	Thermal shock resistance	When requested, glass with thermal shock resistance conforming to the appropriate standards has to be chosen.				
	4.17	Resistance to live horizontal loads	When requested, declare the value in kN at sill height. The loads have to be calculated according to national specifications. The allowable loads per T-connection are given in 5.				
	Non-essential characteristics						
	4.13	Equipotentiality	All metal parts have to be conductively connected (see also examples in the catalogue and guidelines in Annex A of EN 13830). The electrical resistance has to be measured in accordance with Annex A of EN 13830.				

#### 4.4 Classifications for CW 60-SC <sup>(2)</sup>

Characteristic		Performance		Notified body - Report		Tested size [mm]	
EN 13830:2003	Essential characteristics						
	4.1	Resistance to wind load	2000 Pa <sup>(1)</sup> 1600 Pa <sup>(1)</sup>		[1136] – CAR 5010/2 <sup>(6)</sup> [0960] – 06.135 <sup>(7)</sup>		See report <sup>(3)</sup>
	4.2	Dead load	See system catalogue for more detailed info about maximum weights for each type of glass support.				
	4.3	Impact resistance	I5 / E5		[0960] – 06.136		1525x1225 <sup>(4)</sup>
	4.4	Air permeability	A 4 (600 Pa)		[1136] – CAR 5010/2 <sup>(5)</sup> [0960] – 06.135 <sup>(6)</sup>		See report
	4.5	Watertightness	RE 1200 (1200 Pa) RE 1050 (1050 Pa)		[1136] – CAR 5010/2 <sup>(5)</sup> [0960] – 06.135 <sup>(6)</sup>		See report
	4.6	Airborne sound insulation	Glass: 32 (-1;-5) 40 (-2;-7) 45 (-3;-8) Spandrel <sup>(4)</sup>	Curtain walling 34 (-1;-3) 42 (-1;-5) 47 (-2;-6) 56 (-1;-5)	[1488] – LA/1220a/2005 [1488] – LA/1220b/2005 [1488] – LA/1220c/2005 [1488] – LA/1220d/2005		
	4.7	Thermal transmittance	Ucw to be calculated according to EN ISO 12631 (see also 6). The U-values of the different profiles are available in separate U-value tables. The U-values of the profiles are calculated under certification of BCCA: certificate BPCB-420-72-10077/2.				
	4.8	Resistance to fire	npd				
	4.9	Reaction to fire	Anodized: A1 Painted: A2 Gaskets: E		EC decision 96/603/EC certificate P155748 [0432] – 230006500-6		
	4.10	Fire propagation	EI60		[1488] – LP-1331/07		See report
	4.15	Thermal shock resistance	When requested, glass with thermal shock resistance conforming to the appropriate standards has to be chosen.				
	4.17	Resistance to live horizontal loads	When requested, declare the value in kN at sill height. The loads have to be calculated according to national specifications. The allowable loads per T-connection are given in 5.				
	Non-essential characteristics						
	4.13	Equipotentiality	All metal parts have to be conductively connected (see also examples in the catalogue and guidelines in Annex A of EN 13830). The electrical resistance has to be measured in accordance with Annex A of EN 13830.				

<sup>(6)</sup> With 034.0100.17

<sup>(7)</sup> With 080.9850.04 and glass edge with silicone

#### 4.5 Classifications for CW 60-DRL

Characteristic		Performance	Notified body - Report	Tested size [mm]	
EN 13830:2003	Essential characteristics				
	4.1	Resistance to wind load	2000 Pa <sup>(1)</sup>	[0960] – 05.167	See report <sup>(3)</sup>
	4.2	Dead load	See system catalogue for more detailed info about maximum weights for each type of glass support.		
	4.3	Impact resistance	I5 / E5	[0960] – 05.168	1500x1200 <sup>(4)</sup>
	4.4	Air permeability	A 4 (600 Pa)	[0960] – 05.167	See report
	4.5	Watertightness	RE 1200 (1200 Pa)	[0960] – 05.167	See report
	4.6	Airborne sound insulation	npd		
	4.7	Thermal transmittance	Ucw to be calculated according to EN ISO 12631 (see also 6). The U-values of the different profiles are available in separate U-value tables. The U-values of the profiles are calculated under certification of BCCA: certificate BPCB-420-72-10077/2.		
	4.8	Resistance to fire	npd		
	4.9	Reaction to fire	Anodized: <b>A1</b> Painted: <b>A2</b> Gaskets: <b>E</b>	EC decision 96/603/EC certificate P155748 [0432] – 230006500-6	
	4.10	Fire propagation	EI30	[0845] – PG12196	See report
	4.15	Thermal shock resistance	When requested, glass with thermal shock resistance conforming to the appropriate standards has to be chosen.		
	4.17	Resistance to live horizontal loads	When requested, declare the value in kN at sill height. The loads have to be calculated according to national specifications. The allowable loads per T-connection are given in 5.		
	Non-essential characteristics				
4.13	Equipotentiality	All metal parts have to be conductively connected (see also examples in the catalogue and guidelines in Annex A of EN 13830). The electrical resistance has to be measured in accordance with Annex A of EN 13830.			



## 5 RESISTANCE TO HORIZONTAL LOADS

The maximum loads on each T-connection can be derived from following table which summarises the results from test report R-066-09-02 Rev 01 (Feldman+Weynand). Following table summarizes the results. The result is each time for 1 connection.

Type of connection	Force direction	Xk/γM (kN)
1. Standard transom/mullion connection	Dead load	0.88
	Wind suction	2.67
	Wind pressure	3.46
	Combined <sup>(1)</sup>	1.59
2. Connection with 021.0283 or 073.7000	Dead load	2.07 <sup>(1)</sup> / 2.16 <sup>(2)</sup> / 2.92 <sup>(3)</sup>
	Wind suction	2.67
	Wind pressure	4.46
	Combined <sup>(1)</sup>	1.59
3. Connection with 073.7510 ~ 073.7516	Dead load	1.99 <sup>(1)</sup> / 3.64 <sup>(2)</sup> / 4.60 <sup>(3)</sup>
	Wind suction	6.23
	Wind pressure	4.88
	Combined <sup>(1)</sup>	3.50 <sup>(4)</sup> / 4.20 <sup>(5)</sup>

<sup>(1)</sup> The force indicated in the table is the maximum force wind suction in combination with the maximum dead load as indicated in the table:

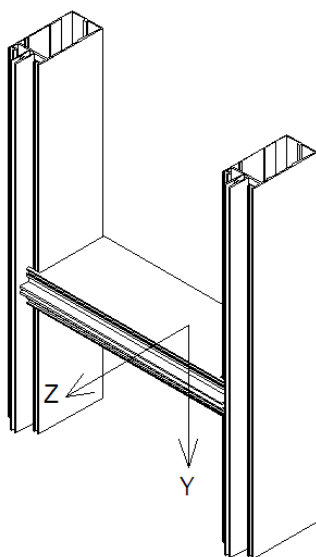
<sup>(1)</sup> Profile depth < 120 mm

<sup>(2)</sup> 120 mm < Profile depth < 200 mm

<sup>(3)</sup> Profile depth > 200 mm

<sup>(4)</sup> Profile depth ≤ 200 mm

<sup>(5)</sup> Profile depth > 200 mm



Dead load                    +Y  
 Wind suction                +Z  
 Wind pressure              -Z  
 Wind suction + dead load +Y +Z

## 6 Thermal transmittance

The U-value of the complete curtain wall should be calculated according to EN ISO 12631.

The thermal transmittance  $U_{cw}$  of a typical curtain wall module should be declared, using the U value for the correct profile section (provided by Reynaers) and the  $U_g$  or  $U_p$  value for the used glazing or panel.

For standard curtain walls,  $U_{cw}$  can be calculated with following formula following the component assessment method from EN ISO 12631 with following formula:

$$U_{cw} = \frac{\sum A_g U_g + \sum A_p U_p + \sum A_f U_f + \sum A_m U_m + \sum A_t U_t + \sum l_{fg} \psi_{fg} + \sum l_{mg} \psi_{mg} + \sum l_{tg} \psi_{tg} + \sum l_{pg} \psi_{pg} + \sum l_{mf} \psi_{mf} + \sum l_{tf} \psi_{tf}}{A_{cw}}$$

Where

$U_g, U_p$  = thermal transmittances of glazing and panels;

$U_f, U_m, U_t$  = thermal transmittances of frames, mullions and transoms;

$\psi_{fg}, \psi_{mg}, \psi_{tg}, \psi_{pg}$  = linear thermal transmittances due to the combined thermal effects of glazing unit or panel and frame or mullion or transom;

$\psi_{mf}, \psi_{tf}$  = linear thermal transmittances due to the combined thermal effects of frame, mullion and frame-transom

$U_f, U_m, U_t$  can be derived from the U-value tables which were made up under certification of BCCA.

The  $\psi$ -value can be calculated using the exact geometries of the connections or glass spacer or can be chosen from tables in Annex B from EN ISO 12631.

The area of the curtain walling can be calculated with formula:

$$A_{CW} = A_g + A_p + A_f + A_m + A_t$$

Where

$A_{CW}$  = area of curtain walling;

$A_g$  = total area of glazing;

$A_p$  = total area of panels;

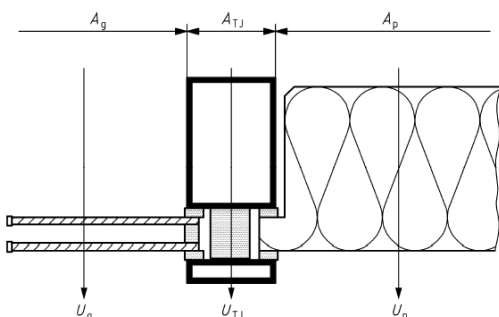
$A_f$  = total area of frame;

$A_m$  = total area of mullions;

$A_t$  = total area of transoms.

For structural clamped and structural glazing systems, the single assessment method is used. The U-value of the curtain wall can then be calculated with following formula:

$$U_{cw} = \frac{\sum A_g U_g + \sum A_p U_p + \sum A_{TJ} U_{TJ}}{\sum A_g + \sum A_p + \sum A_{TJ}} \quad [W/m^2K]$$



Where

A = Area [ $\text{m}^2$ ]

U = U-value (thermal transmittance) [ $\text{W}/\text{m}^2\text{K}$ ]

g = Glazing

p = Panel

TJ = Thermal Joint

In the U-value of the profile section ( $UTJ$  = U-value of thermal joint), the edge effect of the glass is already included and thus this must not be taken into account again.

## UPDATES

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**22/11/2023**

	VARIANTS	Characteristic
Text revision	GENERAL EXPLANATION	
Tested size [mm]	4.1 – 4.5	
01/00948/13/R48NA, 02/00948/13/R48NA, 03/00948/13/R48NA	4.1, 4.2	4.6