

ES 45-Pa Windows

PRODUCT PASS

Date: **05-02-2024**

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 14351-1:2006+A2:2016 (Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets).

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 VARIANTS

Different variants have been grouped based on similar design and following the guidelines of the harmonised standard

Inward opening	
5.1	
5.2	
5.3	

Outward opening	
5.4	
5.5	

4 EXPLANATIONS AND SYMBOLS

H: Element Height

B: Element Width

Fh: Vent Height

Fb: Vent Width

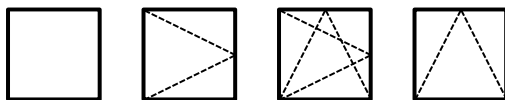
npd: No Performance Declared

CWFT: Classification Without Further Testing

- ⁽¹⁾ Impact resistance only valid with tubular or L-shaped glazing beads
- ⁽²⁾ With additional central gasket
- ⁽³⁾ Test report proves the watertightness and air permeability of a T-connection.
- ⁽⁴⁾ For dimensions of the opening parts: see relevant section for the opening elements.
- ⁽⁵⁾ Deflection to be calculated in function of wind load and allowable deformation.

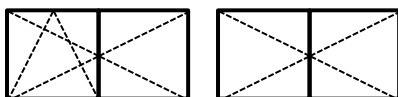
5 PERFORMANCE

5.1 Inward opening



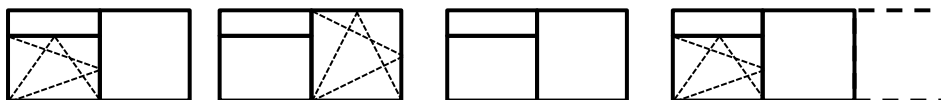
Characteristic			Performance		Notified body - Report	Tested size [mm]
Essential characteristics						
EN 14351-1	4.2	Resistance to wind load	CE2400 (2400 Pa) C5 (2000 Pa)		[1488] – LK06-0948/12/R28NK [1488] – LK08-0948/12/R28NK	1000x2000 1500x1700
	4.5	Watertightness	9A (600 Pa) 7A (300 Pa)		[1488] – LK06-0948/12/R28NK [1488] – LK08-0948/12/R28NK	1000x2000 1500x1700
	4.6	Dangerous substances	In the materials delivered by Reynaers, no dangerous substances as indicated in hEN 14351-1 are used.			
	4.8	Load-bearing capacity of safety devices	Pass		[1488] – LK06-0948/12/R28NK [1488] – LK08-0948/12/R28NK	1000x2000 1500x1700
	4.11	Acoustic performance	Glass 41 (-2;-6)	Window 41 (-1;-5)	[1488] – LA01-0948/12/R29NA	1230x1480
	4.12	Thermal transmittance	Uw to be calculated in function of the project. Pre-calculated U-values for dimensions 1230x1480mm and 1480x2180 can be found in the Uf-value tables. Uf-values are calculated under certification of BCCA: certificate BPCB-420-72-10077/2.			
	4.13	Radiation properties	These properties must be evaluated by the CE-label of the glass			
	4.14	Air permeability	4		[1488] – LK06-0948/12/R28NK [1488] – LK08-0948/12/R28NK	1000x2000 1500x1700
Non-essential characteristics						
EN 14351-1	4.4.1	Reaction to fire	Anodized: A1 Painted: A2 Gaskets: E		EC decision 96/603/EC certificate EFR-21-001664A [0432] – 230006500-6	
	4.7	Impact resistance	5 ⁽¹⁾ I3/E2 ⁽¹⁾		[1488]–LK06im-0948/12/R28NK [1488]–LK03im-0948/12/R28NK	1000x2000 900x1650
	4.16	Operating forces	1		[1488] – LK06-0948/12/R28NK [1488] – LK08-0948/12/R28NK	1000x2000 1500x1700
	4.17	Mechanical strength	4		[1488] – LK06-0948/12/R28NK [1488] – LK08-0948/12/R28NK	1000x2000 1500x1700
	4.18	Ventilation	npd			
	4.19	Bullet resistance (BP version)	npd			
	4.20	Explosion resistance	npd			
	4.21	Resistance to repeated opening and closing	npd			
	4.22	Behaviour between different climates	npd			
	4.23	Burglar resistance (AP version)	npd			

5.2 Inward opening



Characteristic			Performance	Notified body - Report	Tested size [mm]
Essential characteristics					
EN 14351-1	4.2	Resistance to wind load	C3 (1200 Pa)	[1488] – LK03-0948/12/R28NK	900x1650
	4.5	Watertightness	4A (150 Pa) 9A (600 Pa) ⁽²⁾	[1488] – LK03-0948/12/R28NK	900x1650
	4.6	Dangerous substances	In the materials delivered by Reynaers, no dangerous substances as indicated in hEN 14351-1 are used.		
	4.8	Load-bearing capacity of safety devices	Pass	[1488] – LK06-0948/12/R28NK [1488] – LK08-0948/12/R28NK	1000x2000 1500x1700
	4.11	Acoustic performance	npd		
	4.12	Thermal transmittance	Uw to be calculated in function of the project. Pre-calculated U-values for dimensions 1230x1480mm and 1480x2180 can be found in the Uf-value tables. Uf-values are calculated under certification of BCCA: certificate BPCB-420-72-10077/2.		
	4.13	Radiation properties	These properties must be evaluated by the CE-label of the glass		
	4.14	Air permeability	3 / 4 ⁽²⁾	[1488] – LK03-0948/12/R28NK	900x1650
Non-essential characteristics					
EN 14351-1	4.4.1	Reaction to fire	Anodized: A1 Painted: A2 Gaskets: E	EC decision 96/603/EC certificate EFR-21-001664A [0432] – 230006500-6	
	4.7	Impact resistance	I3 / E2 ⁽¹⁾	[1488] – LK03im-0948/12/R28NK	900x1650
	4.16	Operating forces	1	[1488] – LK06-0948/12/R28NK [1488] – LK08-0948/12/R28NK	1000x2000 1500x1700
	4.17	Mechanical strength	4	[1488] – LK06-0948/12/R28NK [1488] – LK08-0948/12/R28NK	1000x2000 1500x1700
	4.18	Ventilation	npd		
	4.19	Bullet resistance (BP version)	npd		
	4.20	Explosion resistance	npd		
	4.21	Resistance to repeated opening and closing	npd		
	4.22	Behaviour between different climates	npd		
	4.23	Burglar resistance (AP version)	npd		

5.3 Inward opening



Characteristic			Performance	Notified body - Report	Tested size [mm]
Essential characteristics					
EN 14351-1	4.2	Resistance to wind load	C3 (1200 Pa) B5 (2000 Pa)	[1488] – LK01-0948/12/R28NK	(5) (4)
	4.5	Watertightness	9A (600 Pa) E900 (900 Pa) ⁽²⁾	[1488] – LK01-0948/12/R28NK	(3) (4)
	4.6	Dangerous substances	In the materials delivered by Reynaers, no dangerous substances as indicated in hEN 14351-1 are used.		
	4.8	Load-bearing capacity of safety devices	Pass	[1488] – LK01-0948/12/R28NK	(4)
	4.11	Acoustic performance	npd		
	4.12	Thermal transmittance	Uw to be calculated in function of the project. Pre-calculated U-values for dimensions 1230x1480mm and 1480x2180 can be found in the Uf-value tables. Uf-values are calculated under certification of BCCA: certificate BPCB-420-72-10077/2.		
	4.13	Radiation properties	These properties must be evaluated by the CE-label of the glass		
	4.14	Air permeability	4	[1488] – LK01-0948/12/R28NK	(3) (4)
Non-essential characteristics					
EN 14351-1	4.4.1	Reaction to fire	Anodized: A1 Painted: A2 Gaskets: E	EC decision 96/603/EC certificate EFR-21-001664A [0432] – 230006500-6	
	4.7	Impact resistance	npd		
	4.16	Operating forces	See relevant test reports for opening parts		
	4.17	Mechanical strength	See relevant test reports for opening parts		
	4.18	Ventilation	npd		
	4.19	Bullet resistance (BP version)	npd		
	4.20	Explosion resistance	npd		
	4.21	Resistance to repeated opening and closing	npd		
	4.22	Behaviour between different climates	npd		
	4.23	Burglar resistance (AP version)	npd		

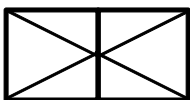
5.4 Outward opening



Characteristic			Performance		Notified body - Report		Tested size [mm]
Essential characteristics							
EN 14351-1	4.2	Resistance to wind load	C4 (1600 Pa) / C5 (2000 Pa) ^(*) CE2400 (2400 Pa)		[1488] – LK09-0948/12/R28NK [1488] – LK02-0948/12/R28NK		1200x1600 760x1600
	4.5	Watertightness	9A (600 Pa) / E900 (900 Pa) ⁽²⁾		[1488] – LK09-0948/12/R28NK		1200x1600
	4.6	Dangerous substances	In the materials delivered by Reynaers, no dangerous substances as indicated in hEN 14351-1 are used.				
	4.8	Load-bearing capacity of safety devices	Pass (350N/60s)		[1488] – LK09-0948/12/R28NK		1200x1600
	4.11	Acoustic performance	Glass: 41 (-2;-6)	Window: 42 (-2;-5)	[1488] – LA02-0948/12/R29NA		1230x1480
	4.12	Thermal transmittance	Uw to be calculated in function of the project. Pre-calculated U-values for dimensions 1230x1480mm and 1480x2180 can be found in the Uf-value tables. Uf-values are calculated under certification of BCCA: certificate BPCB-420-72-10077/2.				
	4.13	Radiation properties	These properties must be evaluated by the CE-label of the glass				
	4.14	Air permeability	3 4		[1488] – LK09-0948/12/R28NK [1488] – LK02-0948/12/R28NK		1200x1600 760x1600
Non-essential characteristics							
EN 14351-1	4.4.1	Reaction to fire	Anodized: A1 Painted: A2 Gaskets: E		EC decision 96/603/EC certificate EFR-21-001664A [0432] – 230006500-6		
	4.7	Impact resistance	I3 / E4 ⁽¹⁾ I2 / E3 ⁽¹⁾		[1488] – LK02im-0948/12/R28NK [1488] – LK04im-0948/12/R28NK		760x1600 800x1450
	4.16	Operating forces	1		[1488] – LK09-0948/12/R28NK		1200x1600
	4.17	Mechanical strength	4		[1488] – LK09-0948/12/R28NK		1200x1600
	4.18	Ventilation	npd				
	4.19	Bullet resistance (BP version)	npd				
	4.20	Explosion resistance	npd				
	4.21	Resistance to repeated opening and closing	npd				
	4.22	Behaviour between different climates	npd				
	4.23	Burglar resistance (AP version)	npd				

(*) With additional locking points

5.5 Outward opening



Characteristic			Performance	Notified body - Report	Tested size [mm]
Essential characteristics					
EN 14351-1	4.2	Resistance to wind load	C3 (1200 Pa)	[1488] – LK04-0948/12/R28NK	800x1450
	4.5	Watertightness	9A (600 Pa) E900 (900 Pa) ⁽²⁾	[1488] – LK04-0948/12/R28NK	800x1450
	4.6	Dangerous substances	In the materials delivered by Reynaers, no dangerous substances as indicated in hEN 14351-1 are used.		
	4.8	Load-bearing capacity of safety devices	Pass (350N/60s)	[1488] – LK09-0948/12/R28NK	1200x1600
	4.11	Acoustic performance	npd		
	4.12	Thermal transmittance	Uw to be calculated in function of the project. Pre-calculated U-values for dimensions 1230x1480mm and 1480x2180 can be found in the Uf-value tables. Uf-values are calculated under certification of BCCA: certificate BPCB-420-72-10077/2.		
	4.13	Radiation properties	These properties must be evaluated by the CE-label of the glass		
	4.14	Air permeability	3 / 4 ⁽²⁾	[1488] – LK04-0948/12/R28NK	800x1450
Non-essential characteristics					
EN 14351-1	4.4.1	Reaction to fire	Anodized: A1 Painted: A2 Gaskets: E	EC decision 96/603/EC certificate EFR-21-001664A [0432] – 230006500-6	
	4.7	Impact resistance	I2 / E3 ⁽¹⁾	[1488] – LK04im-0948/12/R28NK	800x1450
	4.16	Operating forces	1	[1488] – LK09-0948/12/R28NK	1200x1600
	4.17	Mechanical strength	4	[1488] – LK09-0948/12/R28NK	1200x1600
	4.18	Ventilation	npd		
	4.19	Bullet resistance (BP version)	npd		
	4.20	Explosion resistance	npd		
	4.21	Resistance to repeated opening and closing	npd		
	4.22	Behaviour between different climates	npd		
	4.23	Burglar resistance (AP version)	npd		

6 INFORMATION ACOUSTIC PERFORMANCE

6.1 Window Rw (C;Ctr) declaration based on tabulated values

According to annex B of EN 14351-1, when no test results are available, the determination of the acoustic performances can be done as follows:

a) IGU Rw → Window Rw

IGU Rw (dB)	Window Rw (dB)	Required seals
27	30	1
28	31	1
29	32	1
30	33	1
32	34	1
34	35	1
36	36	2
38	37	2
40	38	2

b) IGU Rw+Ctr → Window Rw+Ctr

IGU Rw+Ctr (dB)	Window Rw+Ctr (dB)	Required seals
24	26	1
25	27	1
26	28	1
27	29	1
28	30	1
30	31	1
32	32	2
34	33	2
36	34	2

c) C = -1 dB

d) $Ctr = (Window\ Rw+Ctr) - (Window\ Rw)$

⇒ CE marking Window: Rw (C;Ctr) based on steps a), c) and d)

Example:

IGU Rw = 34 (-1;-4)

→ Window Rw = 35 dB

→ IGU Rw+Ctr = 30 dB → Window Rw+Ctr = 31 dB

→ C = -1 dB

→ Ctr = 31 dB – 35 dB = -4 dB

► CE marking Window: 35 dB (-1;-4), valid for window size 1,23 x 1,48 m

6.2 Extrapolation rules for different window sizes

For windows with other dimensions, the extrapolation rules for test results and tabulated values are indicated in following table:

Window size range		Sound insulation value for window
Test results for test specimen of any size (see 5)	Tabulated values (see 6.1)	
-100% to +50% of test specimen overall area	overall area $\leq 2,7 \text{ m}^2$	Rw and Rw+Ctr are correct
+50% to +100% of test specimen overall area	$2,7 \text{ m}^2 < \text{overall area} \leq 3,6 \text{ m}^2$	Correct Rw and Rw+Ctr with -1 dB
+100% to +150% of test specimen overall area	$3,6 \text{ m}^2 < \text{overall area} \leq 4,6 \text{ m}^2$	Correct Rw and Rw+Ctr with -2 dB
> +150% of test specimen overall area	$4,6 \text{ m}^2 < \text{overall area}$	Correct Rw and Rw+Ctr with -3 dB

UPDATES

05/02/2024

	VARIANTS	Characteristic
Text revision	GENERAL EXPLANATION	
Tested size [mm]	5.1 – 5.5	