

Test Report Summary & Expert Statement

Airborne sound insulation of building components



Report No. 12-001107-PR01

(GAS 01-A01-04-en-01)

Archiving number 13-001632-PR13

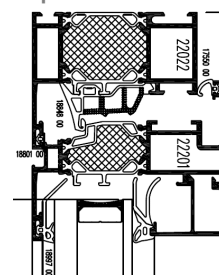
Client heroyal-Johann Henkenjohann
GmbH & Co. KG
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Germany

Product	Window system
Designation	heroyal neo 72
Dimensions	Overall frame dimensions (W × H): 1,230 mm × 1,480 mm
Frame material	Aluminium composite profiles
Type of opening	Tilt and turn
Glazing	Insulating glass unit (IGU), various glass types
Rebate seals	1 external seal (optional), 1 central seal, 1 internal seal
Special features	-

Basis

EN ISO 10140-1: 2010
EN ISO 10140-2: 2010
EN ISO 717-1: 1995+A1: 2006
EN 14351-1 : 2006+A1: 2010
Test reports referring to test series 12-001107-PR01 (GAS 01-A01-04-de-01) dated 15.05.2012 and 16143332 dated 15.12.2010

Representation



Instructions for use

This test report serves to demonstrate the airborne sound insulation of a building element

For Germany the following applies:

- $R_{w,R}$ as per DIN 4109:
(R_w corresponds to $R_{w,P}$,
 $R_{w,R} = R_{w,P} - 2$ dB)
- $R_{w,R}$ for Construction Products List (Bauregelliste)

Validity

The data and results given refer solely to the tested and described test specimen.

Testing to one performance characteristic does not allow any statement to be made on any further characteristic of the present construction regarding performance and quality.

Notes on publication

The ift Guidance Sheet "Conditions and Guidance for the Use of ift Test Documents" applies.

The cover sheet can be used as an abstract.

Contents

The report comprises a total of 7 pages.

- 1 Basis
- 2 Overview of test evidence/reports
- 3 Characteristics of profile system
- 4 Results

Weighted sound reduction index R_w
Spectrum adaptation terms C and C_{tr}

Design variants:



from $R_w (C; C_{tr}) = 33 (-2; -5)$ dB

to $R_w (C; C_{tr}) = 47 (-2; -5)$ dB

as per Section 4.2

ift Rosenheim
27.11.2013

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1 Basis

1.1 Standards and directives/guidelines

- EN ISO 10140-1: 2010 Acoustics; Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products (ISO 10140-1: 2010). National version: DIN EN ISO 10140-1: 2010-12.
- EN ISO 10140-1: 2010 Acoustics; Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (ISO 10140-2:2010) National version: DIN EN ISO 10140-1: 2010-12
- EN ISO 717-1: 1996 + A1: 2006 Acoustics; Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation. National version: DIN EN ISO 717-1: 2006-11
- EN 20140-2 : 1993-05 Acoustics; Measurement of sound insulation in buildings and of building elements - Part 2: Determination, verification and application of precision data
- EN 12758 : 2011-01 Glass in building - Glazing and airborne sound insulation Product descriptions and determination of properties;
- EN 14351-1 : 2006 + A1: 2010 Windows and doors - Product standard, performance characteristics -Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics. National standard: DIN EN 14351-1 : 2010-08
- DIN 4109 : 1989-11 "Sound insulation in buildings; requirements and verifications"
- DIN 4109 Bbl. 1: 1/A1: 2003-09 "Sound insulation in buildings; construction examples and calculation methods, Amendment A1"

1.2 Test evidence/reports

- Airborne sound insulation test of window units from profile series neo 72 from heroyal at the ift Rosenheim (April 2012), test series 12-001107
- Airborne sound insulation test of window units from profile series 110 ES from heroyal at the ift Rosenheim (May/July/November 2010), test series 16143332/Z
- Airborne sound insulation test of insulating glass units from SWA GmbH, test report No. L-LAD 02/142/04 (26.04.2002), presented by client.

2 Overview of test evidence/reports

Object of testing were single tilt-and-turn windows made of aluminium composite profiles of standard dimensions 1,230 mm × 1,480 mm (overall frame dimensions, W × H).

Table 1 below gives an overview of the tested window units from the profile series heroal neo 72 and 110 ES. A detailed description of the test specimens and test methods is contained in the test reports (see column "Test number" and Section 1.2)

Table 1 List of test evidence/reports

No.	Profile series	Glazing	$R_{w,P, \text{glass}}$	Test value R_w (C, C_{tr})	Evidence/report, test number
1.	neo 72	12LSG ¹⁾ /12/6/12/8LSG ¹⁾	49 dB ²⁾	47 (-2; -5) dB	12-001107/Z01
2.	neo 72	12LSG ¹⁾ /20/8LSG ¹⁾	50 dB ²⁾	47 (-2; -5) dB	12-001107/Z05
3.	110 ES	4/16/4	-	33 (-2; -5) dB	161 43332/Z16
4.	110 ES	12LSG ¹⁾ /20/8LSG ¹⁾	50 dB ²⁾	47 (-2; -6) dB	161 43332/Z21
5.	110 ES	8LSG ¹⁾ /20/6	43 dB ²⁾	41 (-3; -7) dB	161 43332/Z47
6.	110 ES	10/20/4	39 dB ²⁾	39 (-2; -6) dB	161 43332/Z50
7.	110 ES	6/16/4	36 dB ²⁾	36 (-2; -5) dB	161 43332/Z51
8.	110 ES	8LSG ¹⁾ /20/10	47 dB ²⁾	45 (-2; -5) dB	161 43332/Z52
9.	-	6LSG ¹⁾ /16/10	44 dB	-	L-LAD 02/142/04 ³⁾

1) Laminated glass with acoustic film

2) Insulating glass value as specified by manufacturer

3) Test report on airborne sound insulation measurement of insulating glass units

3 Characteristics of profile system neo 72

The profile system heroal neo 72 is a thermally improved further development of the profile series 110 ES. The profile details, thermal break and sealing system of the profiles were optimised.

The figures below show the profile sectional drawings of the new profile system heroal neo 72 together with a comparison to the previous profile series 110 ES

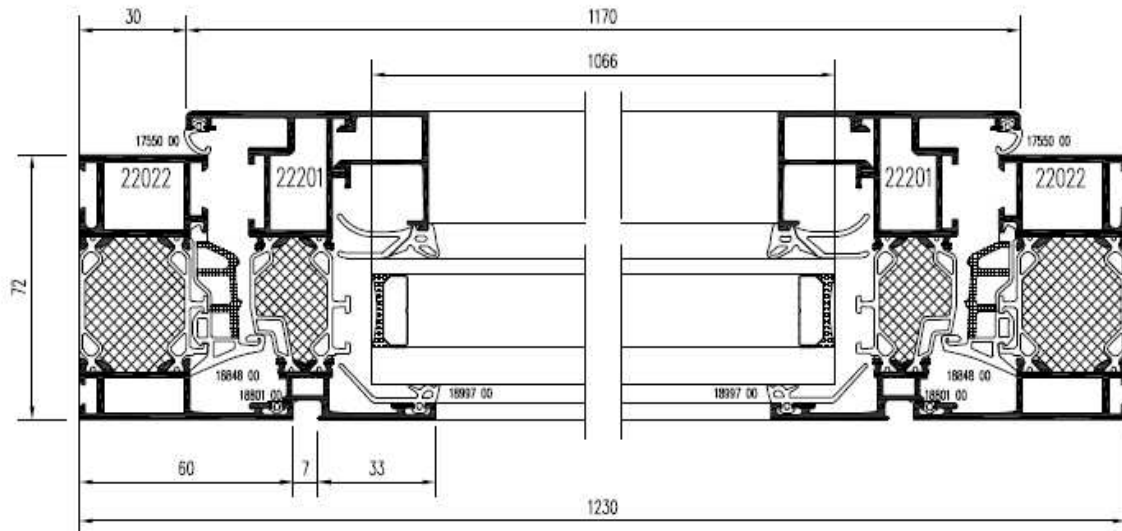


Fig. 1 heroyal neo 72 system with optimised profile details

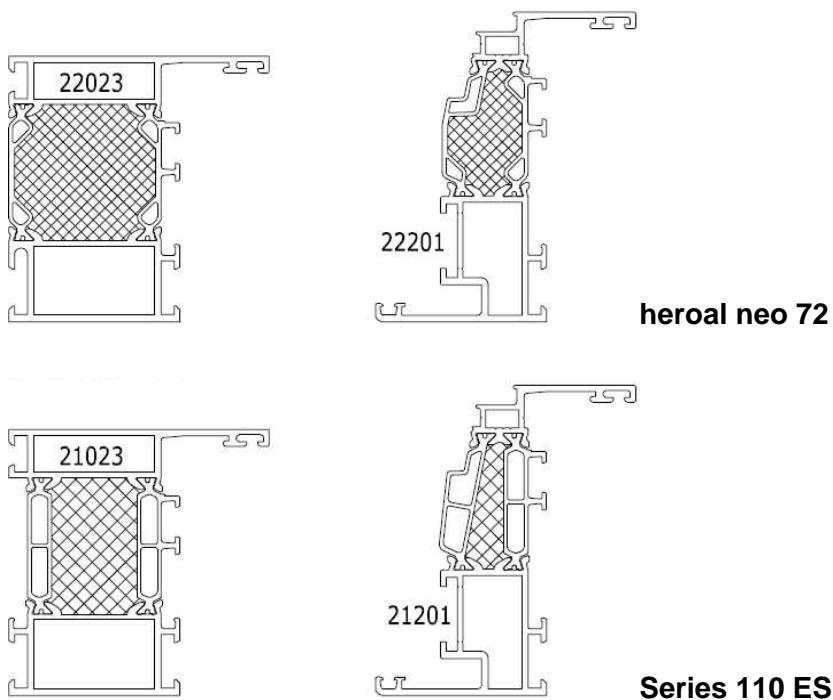


Fig. 2 Comparison of heroyal neo 72 system to series 110 ES

4 Results

4.1 Evaluation of further developed profile details

Comparative sound measurements of window units composed of profiles from the series 110 ES heroyal neo 72 with identical, high-performance sound insulating glazing have shown that the acoustic characteristic values of the profile series 110 ES are also achieved by the thermally improved system neo 72. Comparability was verified up to the weighted sound reduction index $R_w = 47$ dB (laboratory test value). The acoustic characteristic values of the profile series 110 ES can therefore be applied without any deduction to the system neo 72 up to this sound insulation performance.

Application of the expert statement values is subject to the details of the window units, dimensions, glazing (configuration, quality of interlayers/bonds, gas filling), position, quality and function of seals/gaskets, gap sizes, locking devices, materials used (grade/quality and material thickness) as well as any other features, being the same as tested.

Special care must be taken that the quality of the windows produced in series is the same as that of the originally tested samples, for the items listed below:

- Rebate seal: uniform casement overlap around perimeter and contact pressure of rebate seals.
- Number of hinges and locking distance.
- When using LSG glass units: use of laminated panes with highly efficient laminate interlayers: the quality of the glazing must be the same as that of the panes of the test specimens.
- The type of rebate seals used must be the same as tested and from the same manufacturer (refer to test documentation as per Section 1.2). From sound reduction index $R_w \geq 40$ dB (glass types with acoustic laminated pane) an external rebate seal must be inserted into the frame member as third sealing plane.

4.2 Characteristic values of profile system heroyal neo 72

The table below presents the acoustic quantities of weighted sound reduction index R_w and spectrum adaptation terms C and C_{tr} for single window units of standard dimensions (1,230 mm × 1,480 mm) for different glass types:

The data provided are the results obtained in laboratory measurements / are expert statements based on sound insulation measurements (see Table 1 in Section 2).

Tabelle 1 Overview of window system heroyal neo 72, weighted sound reduction index R_w , spectrum adaptation terms C , C_{tr}

No.	Glazing	Test value R_w	C ; C_{tr} (in dB)
1.	4/16/4	33 dB	-2; -5
2.	6/16/4	36 dB	-2; -5
3.	8/16/4	37 dB	-2; -5
4.	10/20/4	39 dB	-2; -6
5.	8LSG ¹⁾ /20/6	41 dB	-3; -7
6.	6LSG ¹⁾ /16/10	43 dB	-3; -7
7.	8LSG ¹⁾ /20/10	45 dB	-2; -5
8.	12LSG ¹⁾ /12/6/12/8LSG ¹⁾	47 dB	-2; -5
9.	12LSG ¹⁾ /20/8LSG ¹⁾	47 dB	-2; -5

1) Laminated glass with acoustic laminated film (applied with 3 rebate sealing planes ⇒ external rebate seal in frame member)

4.3 Calculated value as per DIN 4109

As set out by DIN 4109:1989-11 "Sound insulation in buildings, requirements and verification", tolerances specific to the intended use must be adhered so as to ensure compliance with the respective requirements. For testing of sound insulation as per DIN 4109:1989-11 (suitability test I) the weighted sound reduction index R_w corresponds to the test value $R_{w,P}$. Including a 2 dB tolerance this gives the calculated value $R_{w,R}$.

$$R_{w,R} = R_{w,P} - 2 \text{ dB}$$



4.4 Accuracy and limits of extrapolation/application

The specified sound reduction indices do not take into consideration any acoustic inaccuracies in buildings and of building elements as per DIN EN 20140-2. Assessment is based on comparative measurements. Application/extrapolation is within an accuracy of 2 dB according to the general measurement tolerances set out by DIN EN 20140-2.

The sound insulation of the evaluated test specimen can be verified only by measurement of the sound insulation as per DIN EN ISO 10140-2.

This expert statement was prepared according to the principles of objectivity and to the best of our knowledge.

ift Rosenheim
Laboratory for Building Acoustics
27.11.2013