

Test Report Summary and Expert Statement

No. 14-002745-PR02

(GAS-A01-04-en-01)

for test report 14-002745-PR01 (PB Z06-A01-04-de-02) and
14-002745-PR01 (PB Z08-A01-04-de-02) dated
27 January 2015

Airborne Sound insulation of Building Elements

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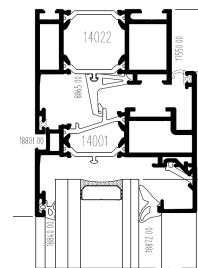


Basis

EN ISO 10140-1:2010+A1:2012
EN ISO 10140-2: 2010
EN ISO 717-1: 2013
14-002745-PR02 (GAS-A01-04-de-01) dated 19.02.2015
Test report for test series no.
12-001107 and 161 43332
Documentation provided by the client

Product	Window system
Designation	heroyal W65
Dimensions	Overall frame dimensions (w × h): 1,230 mm × 1,480 mm
Frame material	Aluminium profiles with thermal break
Type of opening	Tilt and turn
Glazing	Insulating glass unit, various types of glass
Rebate seals	1 external seal (optional), 1 central seal, 1 internal seal
Special features	-
Results	Weighted sound reduction index R_w Spectrum adaptation terms C and C_{tr}

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

Validity

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

Testing the sound insulation does not allow any statement to be made on any further characteristics 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 Expert Statement contains a total of 7 pages:

- 1 Basis of evaluation
- 2 List of test reports
- 3 Characteristics of profile system
- 4 Results

Design variants



from $R_w (C; C_{tr}) = 33 (-2; -5)$ dB
up to $R_w (C; C_{tr}) = 47 (-2; -5)$ dB
according to Section 4.2

ift Rosenheim

23.03.2015

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No. 14-002745-PR02 (GAS-A01-04-en-01) dated 23.03.2015

for test report 14-002745-PR01 (PB Z06-A01-04-de-02) and 14-002745-PR01 (PB Z08-A01-04-de-02) dated 27.1.2015

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1 Basis and Evaluation

1.1 Standards and Instructions

- EN ISO 10140-1: 2010+A1:2012 Acoustics; Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products (ISO 10140-1: 2010+Amd.1:2012). National German standard/s: DIN EN ISO 10140-1: 2012-05
- EN ISO 10140-2: 2010 Acoustics; Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (ISO 10140-2: 2010). National German standard/s: DIN EN ISO 10140-2: 2010-12
- EN ISO 717-1: 2013 Acoustics; Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation. National German standard/s: DIN EN ISO 717-1: 2013-06
- EN ISO 12999-1: 2014 Acoustics; Determination and application of measurement uncertainties in building acoustics - Part 1: sound insulation. National German standard/s: DIN EN ISO 12999-1:2014-09
- 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 German standard/s: DIN EN 14351-1: 2010-08
- DIN 4109: 1989-11 „Sound insulation in buildings; requirements and testing“
- DIN 4109 Bbl. 1/A1: 2003-09 „Sound insulation in buildings; construction examples and calculation methods“

1.2 Test reports

- Test of airborne sound insulation of window elements from test series W65 of company heraal at ift Rosenheim (December 2014), test series in project 14-002745-PR01
- Test of airborne sound insulation of window elements from test series neo 72 of company heraal at ift Rosenheim (April 2012), test series in project 12-001107-PR01
- Test of airborne sound insulation of window elements from test series 110 ES of company heraal at ift Rosenheim (May/July/Nov. 2010), test series 16143332/Z
- Test of airborne sound insulation of window elements from test series 065 of company heraal at ift Rosenheim, test series 162 28958/Z

2 List of test reports

Tested were single tilt and turn windows, composed of aluminium profiles with thermal break in standard dimensions 1,230 mm × 1,480 mm (overall frame dimensions, w × h).

Table 1 below gives an overview of the tested window elements from the profile series heroal W65, 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 reports

No	Profile series	Glazing	$R_{w,P, Glass}$	Test value $R_w (C, C_{tr})$	Verification, Test number
1.	W65	12LSG ¹⁾ /12/6/12/8LSG ¹⁾	49 dB ²⁾	47 (-2; -5) dB	14-002745/Z08
2.	W65	12LSG ¹⁾ /20/8LSG ¹⁾	50 dB ²⁾	45 (-1; -5) dB	14-002745/Z06
3.	neo 72	12LSG ¹⁾ /12/6/12/8LSG ¹⁾	49 dB ²⁾	47 (-2; -5) dB	12-001107/Z01
4.	neo 72	12LSG ¹⁾ /20/8LSG ¹⁾	50 dB ²⁾	47 (-2; -5) dB	12-001107/Z05
5.	110 ES	4/16/4	-	33 (-2; -5) dB	161 43332/Z16
6.	110 ES	12LSG ¹⁾ /20/8LSG ¹⁾	50 dB ²⁾	47 (-2; -6) dB	161 43332/Z21
7.	110 ES	8LSG ¹⁾ /20/6	43 dB ²⁾	41 (-3; -7) dB	161 43332/Z47
8.	110 ES	10/20/4	39 dB ²⁾	39 (-2; -6) dB	161 43332/Z50
9.	110 ES	6/16/4	36 dB ²⁾	36 (-2; -5) dB	161 43332/Z51
10.	110 ES	8LSG ¹⁾ /20/10	47 dB ²⁾	45 (-2; -5) dB	161 43332/Z52
11.	065	12LSG ¹⁾ /24/8LSG ¹⁾	50 dB ²⁾	47 (-1; -4) dB	162 28958/Z6

1) Laminated glass with acoustic laminated film

2) Test value for glazing unit as specified by manufacturer

3 Characteristics of profile system heroal W 65

The profile system heroal W 65 is a further development of the profile series 065 with changed profile cross sections. The profile geometry, thermal barrier and sealing system of the profiles were optimised.

The following sectional drawings of the profiles describe the new profile system heroal W 65 and compare to the profiles from the profile series heroal 065, heroal neo 72 and heroal 110 ES.

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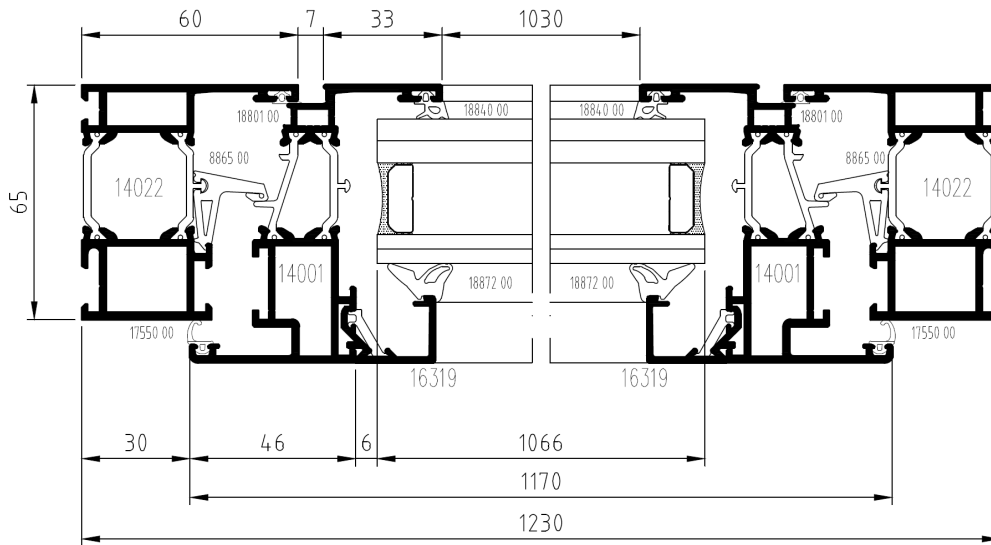


Fig 1 Sectional drawing profile system heroyal W 65

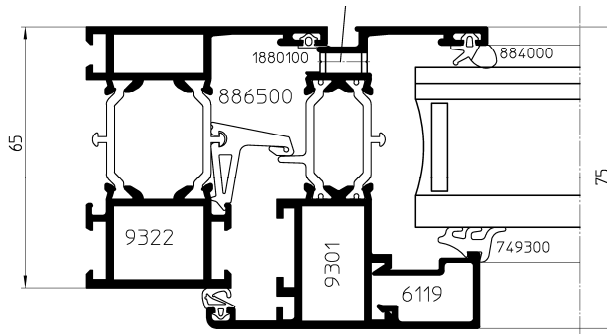


Fig 2 Sectional drawing profile system heroyal 065

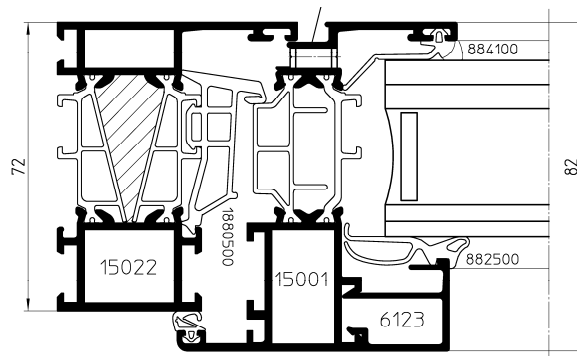


Fig 3 Sectional drawing profile system heroyal 110 ES

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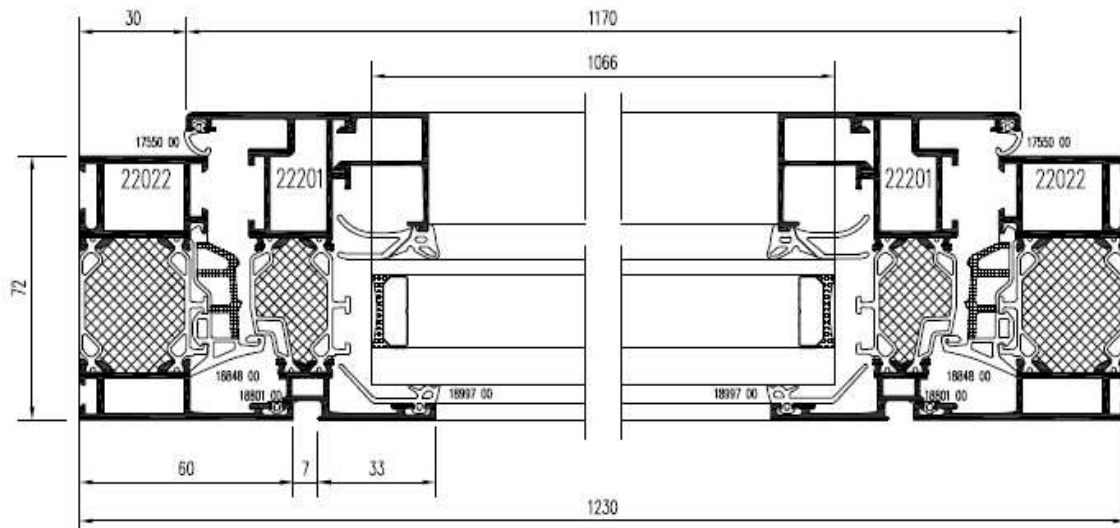
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Fig 4 Sectional drawing profile system heroal neo 72

4 Results

4.1 Assessment of further developed profile details

Comparative sound insulation measurements of the window units composed of profiles from the series W 65, 065, 110 ES and neo 72 equipped with identical / comparable high-performance sound insulation glazing, have shown that the acoustic parameters of the profile series W 65 are partly equivalent, partly lower than those of the other systems. The data were compared up to a weighted sound reduction index $R_w = 47$ dB (laboratory test value). Based on this comparison, the acoustic parameters of the profile series heroal 110 ES were used, some with deduction, in order to evaluate the sound reduction of the system heroal W 65 .

Application/extrapolation based on the expert statement is based on the fact that the design of window elements, dimensions, glazing (configuration, quality of interlayers/bonds, gas filling), set-up, quality and function of seals/gaskets, gap sizes, locking devices, material used (grade/quality and material thickness) as well as all other features are the same as tested.

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Special care must be taken that the quality of series production is the same as that of the tested specimens for the items listed below:

- Rebate seal: uniform casement overlap around perimeter and contact pressure of the rebate seals must be ensured.
- Observe 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 and of the panes of the tested specimens must be the same.
- The type of rebate seals used must be the same as tested and supplied 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 the profile system heroal W 65

Table 2 below lists the acoustic parameters such as the weighted sound reduction index R_w and the spectrum adaptation terms C and C_{tr} for single window elements in standard dimensions (1,230 mm × 1,480 mm) for different glass types.

The values presented are the results obtained from laboratory sound insulation testing (refer to Table 1, Section 2) or were obtained by expert evaluation on the basis of sound insulation measurements.

Table 2 Overview of window systems heroal W 65, 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	38 dB	-2; -6
5.	8LSG ¹⁾ /20/6	41 dB	-3; -7
6.	8LSG ¹⁾ /20/10	44 dB	-2; -5
7.	12LSG ¹⁾ /12/6/12/8LSG ¹⁾	47 dB	-2; -5
8.	12LSG ¹⁾ /20/8LSG ¹⁾	45 dB	-1; -5

1) Laminated glass with acoustic laminated film (Use with three rebate sealing levels ⇒ external rebate seal in frame member)

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4.3 Safety margin according to 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 taken into account to ensure conformity 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 w,P . Including a tolerance of 2 dB , this gives the calculated value $R_{w,R}$.

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

4.4 Accuracy and restrictions of extrapolation

This expert statement was prepared according to the principles of objectivity and to the best of our knowledge. Evidence of sound insulation of the evaluated test specimen can be provided only by measurement of sound insulation as per EN ISO 10140-2.

The specified sound reduction indices do not take into consideration any acoustic inaccuracies in buildings and of building elements as per EN ISO 12999-1. Evaluation is based on comparative measurements. Prerequisite for conformity with the values is consistency in the quality of the materials used as well as in the manufacture, workmanship and assembly/installation of the units as tested.

ift Rosenheim
23.03.2015