Expert Statement

No. 10-000381-GAS01-A01-04-en-01

Translation of Expert Statement No. 10-000381-GAS01-A01-04-de-01
dated 20 September 2010

Date of Expert Statement 20. September 2010

Client

Arbor Ahsap Yapi Elemanlari
Atatürk bulvari Köstemir yolu No:74 Silivri

Istanbul
Turkey

Order

Expert statement on
the sound insulation of a window unit

Object

Single tilt-and-turn window composed of wood profiles

Contents

1 Object

With letter dated 09 August 2010, the company Arbor Ahsap Yapi Elemanlari, Istanbul, Turkey, commissioned **ift** Schallschutzzentrum (Centre for Acoustics) to prepare an expert statement on the following:

Determination of the weighted laboratory sound reduction index R_w as well as the spectrum adaptation terms C and C_{tr} for the window unit described in test documentation (test series No 10-000381 dated August 2010), on the basis of product standard EN 14351-1 .

2 Basis

The expert statement is based on:

2.1 Documents provided by the client

[1] View and sectional drawings No. P01 of the client dated 14 July 2010

[2] Measurement data sheet for the acoustic test (test series No. 10-000381) by ift Centre for Acoustics carried out in the order of the company Arbor Ahsap Yapi Elemanlari in August 2010

2.2 Standards and literature/references

[3] DIN 4109 : 1989-11 "Sound insulation in buildings; requirements and testing"

[4] EN 12758 : 2002, "Glass in Building – Glazing and airborne sound insulation - Definitions and determination of properties; German version EN 12758: 2002"

[5] EN 14351-1 : 2006, "Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics" German version EN 14351-1 : 2006"

[6] EN 20,140-2 : 1993, "Acoustics - Measurement of sound insulation in buildings and of building elements - Part 2: Determination, verification and application of precision data (ISO 140-2: 1991); German version EN 20 140-2: 1993"

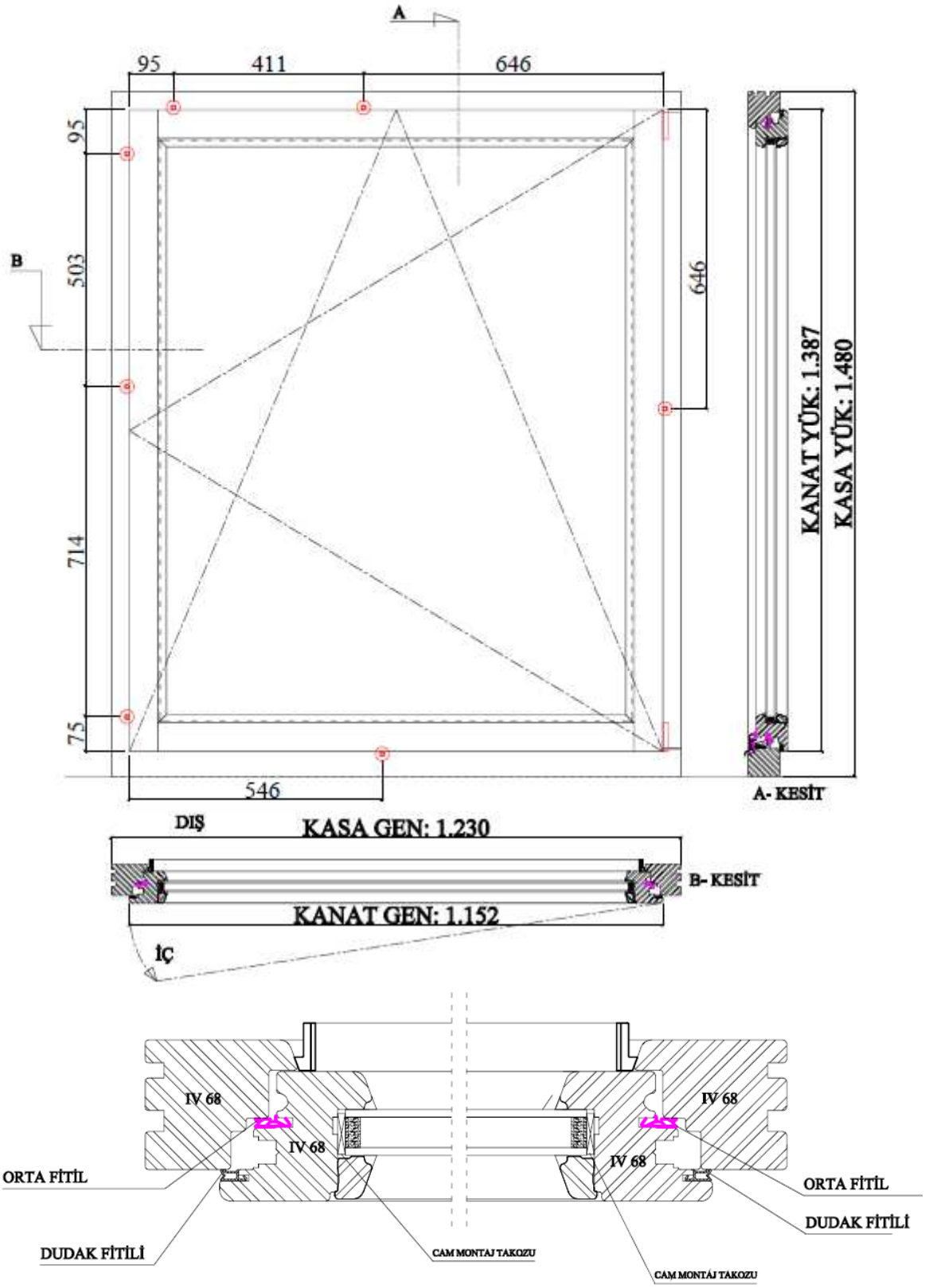
[7] EN ISO 140-3 : 2005, "Acoustics - Measurement of sound insulation in buildings and of building elements - Part 3: Laboratory measurements of impact sound insulation of floors (ISO 140-3: 1995+AM1:2004); German version EN 20 140-3: 1995+A1:2004"

[8] Research report “Revision of DIN 4109, Addendum 1, Table 40“, **ift** Rosenheim, 1999

3 Description

The description of the test specimen with reference to the relevant acoustic properties originates from the test documentation for the test series 10-000381 dated August 2010.

Product	single tilt-and-turn window
Overall frame dimensions (W × H)	1230 mm × 1480 mm
Overall casement dimensions (W × H)	1152 mm × 1385 mm
Frame member	
Profiles	Wood (Type of wood = Meranti)
System	IV 68
Section (W×T)	80 mm × 70 mm
Casement member	
Profiles	Wood (Type of wood = Meranti)
System	IV 68
Section (W×T)	77 mm × 68 mm
Rebate seals	
central	one gasket (Type SP103A / EPDM / Deventer) in casement member
internal	one gasket (Type SP125 / EPDM / Deventer) in casement member
Glazing	
Configuration	6 mm Float – 16 mm cavity – 4 mm Float
Gas filling	Argon
Hardware	
Hinges / bearings	1 stay arm bearing / 1 pivot bearing
Number of locking points	2 at top, 1 on lock side, 2 at bottom, 1 on hinge side
For further details [2]	see test documentation
Air permeability	Proof of air permeability of the window element must be documented by the client in a separate test. For the proof of performance Sound insulation Class 3 for air permeability according to EN 12207 is required. For this statement it is assumed that the window has air permeability class 3 according to EN 12207.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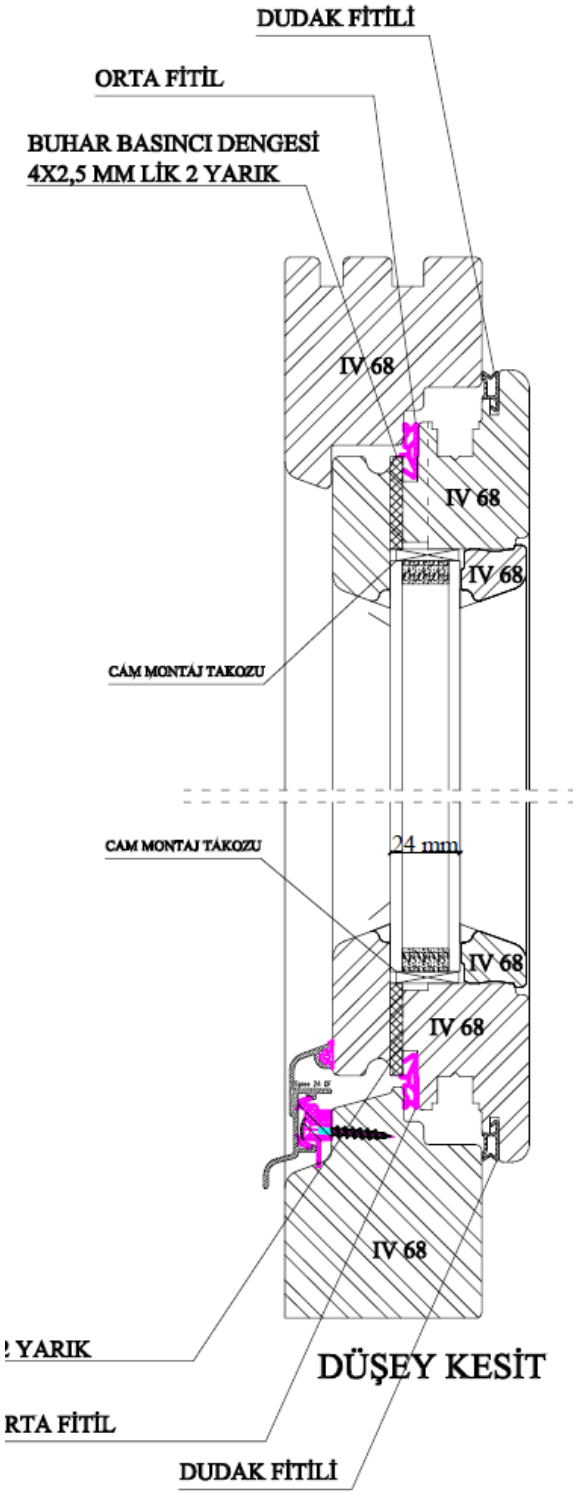

Fig 1 View and sectional drawing
(the thickness of the glass panes shown in these drawings do not correspond to the glazing construction judged here)

4 Evaluation

Evaluation of sound insulation is based on Annex B, Clause B.3 of product standard EN 14351-1.

The verified basis for applying this method is as follows:

Type of window	single window
Type of opening	tilt-and-turn
Gas filling of insulating glass unit	argon
Rebate seal	2 rebate seals continuous around perimeter, (the criteria “smooth, permanently flexible, weather-resistant and easy to replace" were not verified).
Air permeability	Proof of performance Class 3 according to EN 12207 has to be documented by the client with a separate test evidence

Sound reduction of insulating glass unit R_w (C; C_{tr}) = 32 (-2;-4) dB[1)]
Overall frame dimensions 1230 mm × 1480 mm (area S = 1,88 m^2)
Correction for extrapolation rule related to window size
= 0 dB (because S ≤ 2,7 m^2)

[1)] The sound reduction index of the insulating glass unit was determined on the basis of its design characteristics according to EN 12758, Table 1,
For the configuration 6 – 16 cavity (argon) – 4 the above value was obtained.

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5 Results and statement

As set out by Annex B of product standard EN 14351-1 using the specified tables B.1, B.2 and B.3, the sound insulation of the window unit described above was determined as follows

$$R_w\ (C;\ C_{tr}) = 34\ (-1;-4)\ dB$$
$$R_{A,tr} = R_w + C_{tr} = 30\ dB$$

Evidence of sound insulation may require conformity with additional rules and regulations. As set out by DIN 4109: 1989-11 for Germany the calculated value of the weighted sound reduction index $R_{w,R}$ is based on the value R_w obtained from testing with deduction of the 2 dB tolerance.

This expert statement was prepared according to the principles of objectivity and to the best of our knowledge. Evidence of the sound insulation performance of the evaluated test elements can be supplied only by measurement of sound insulation as per EN ISO 140-3.

The specified sound reduction indices do not take into consideration any acoustic inaccuracies in buildings and of building elements as per EN 20140-2. Prerequisite for conformity with the values is consistency in the quality of the material used as well as in the manufacture, assembly and adjustment/setting as tested. It is furthermore subject to the condition that the gaskets used for the rebate seal are smooth, permanently flexible, resistant to weathering and easy to replace.

6 Notes on publication

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

ift Rosenheim
20. September 2010

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