SG-Bauakustik

Institut für schalltechnische Produktoptimierung

Test Report

No. 1367-001-12 of 29.02.2012

Airborne Sound Insulation in Laboratory, Horizontal-Sliding-Wall-System SF 50 H-S-W

Customer:	Sunflex Aluminium Systeme GmbH Im Ruttenberge 12 57482 Wenden
Test item:	Horizontal-Sliding-Wall-System Make Sunflex, Type SF 50 H-S-W
Task:	Determination of the Airborne Sound Insulation acc. to DIN EN ISO 10140-2 in the Test Stand
Author:	Dipl.-Ing. Stefan Grüll

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LIST OF CONTENTS

1. Test and General Information

1.1 Test

Sunflex Aluminium Systeme GmbH, Wenden, manufactures and sells horizontal-sliding-wall-systems, which can be used as partitions in the interior of buildings but also for closing off heated living quarters from the outside area. The system to be tested, type SF 50 H-S-W, which is a system made of non-thermally insulated aluminium profiles, which is equipped with insulation glass units having a thickness of 36 mm. The wall (four wings) is equipped with ceiling rail track flushed with the system and with vertical EPDM-seals at the wing joints as well as horizontal brush seals at the top and beneath the ceiling rail track and floor.

The System SF 50 H-S-W was installed in the test stand and tested in respect for airborne sound insulation. For this purpose, the construction had to be installed in the test opening with the dimensions width x height = 3.710 mm x 2.175 mm with suppressed flanking transmission acc. to DIN EN ISO 10140-5.

The measured sound reduction index of the test item, manufactured by the Customer, is determined by functional conditions acc. to DIN EN ISO 10140-2.

1.2 Manufacturer of the Test Arrangement

Sunflex Aluminium Systeme GmbH
Im Ruttenberge 12
57482 Wenden

1.3 Customer of the Test

Sunflex Aluminium Systeme GmbH
Im Ruttenberge 12
57482 Wenden

1.4 Measuring Standards

The measurements were established according to the following standards and directives:

- DIN EN ISO 10140-1 „Acoustics – Laboratory measurement of sound insulation of building elements – Part 1: Application rules for specific products“
  (ISO 10140-1:2010); German version EN ISO 10140-1:2010

- DIN EN ISO 10140-2 „Acoustics – Laboratory measurement of sound insulation of building elements – Part 2: Measurement of airborne sound insulation“
  (ISO 10140-2:2010); German version EN ISO 10140-2:2010

- DIN EN ISO 10140-4 „Acoustics – Laboratory measurement of sound insulation of building elements – Part 4: Measurement procedures and requirements“
  (ISO 10140-4:2010); German version EN ISO 10140-4:2010

- DIN EN ISO 10140-5 „Acoustics – Laboratory measurement of sound insulation of building elements – Part 5: Requirements for test facilities and equipment“
  (ISO 10140-5:2010); German version EN ISO 10140-5:2010

- DIN EN ISO 717-1 „Acoustics – Rating of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation”
  (ISO 717-1:1996 + AM1:2006); German version EN ISO 717-1:1996 + A1:2006

2. Test Item Setup and Test Arrangement

2.1 Laboratory

The specified element was installed by the fitters of the manufacturer for the determination of the airborne sound insulation in the test stand belonging to the institute with suppressed flanking transmission according to

DIN EN ISO 10140-5.

The maximum sound reduction index $R`_{max}$ of the test stand with installation of a lightweight wall Type A acc. to DIN EN ISO 10140-5, Appendix A.2.2.1.1 is:

f_{Terz} in Hz	50	63	80	100	125	160	200	250	315	400	500
$R`_{max}$ in dB	29,2	40,8	34,6	44,1	44,3	49,6	55,7	59,6	61,6	63,8	68,1

f_{Terz} in Hz	630	800	1000	1250	1600	2000	2500	3150	4000	5000
$R`_{max}$ in dB	70,6	72,0	75,1	74,6	73,2	73,3	78,7	83,0	86,2	90,5

The weighted sound reduction index is:

$R`_{w, max}$ = 68 dB.

The surrounding wall of the horizontal-sliding-wall-system was installed by skilled personnel of the testing institute. In order to achieve an adequate high sound insulation, the wall panels, approx. d = 500 mm overall wall thickness, were installed with separate metal stands on both sides of the joint.

2.2 Test Setup

The tested element was an horizontal-sliding-wall-system made of aluminium profiles having a thickness of 55 mm and ceiling track rail as well as side blind frame and 4 wings equipped with insulated glass units having a thickness of 36 mm. The sliding wings were guided by two running assemblies sliding in a ceiling track rail. The side wall connection was made by a blind frame.

The dimensions of the complete element is approx. width x height = 3.710 mm x 2.175 mm. The surface area is approx. S = 8,07 m².

The glazing units indicate the following design features shown at the identification marking of the manufacturer (CONSAFIS Beratungs GmbH, Bocholt):

Assembly: Float, d = 10 mm
SZR 18 mm
Schall-VSG, d = 8 mm (4.4.1)

The following constructional system was tested:

Horizontal-Sliding-Wall-System SF 50 H-S-W

The detailed setup of the construction is evident from the drawings of the manufacturer, Annexes 1 thru 3.

The joints between the ceiling rail and the floor rail and the test opening were sealed with silicon mass.

Annexes 4 and 5 include a photo documentation of the setup in the Laboratory. Annex 6 shows a principle diagram of the test arrangement.

3. Measurement and Measurement Implementation

The measurement of the weighted sound reduction index of the horizontal-sliding-wall-system R_w in dB was carried out in accordance with the specifications of the standard

- DIN EN ISO 10140-2
  „Laboratory measurement of sound insulation of building elements“
  Part 2: „Measurement of airborne sound insulation“

The setup of the measurement, as well as a measurement description, is evident from Annex 7 of this Test Report.

4. Measurement Results

The weighted sound reduction index of the setup tested on 23.02.2012 being installed in functional condition was determined without influence of the flanking components as follows:

Test Item	**Sound Reduction Index R_w in dB**
Horizontal-Sliding-Wall-System SF 50 H-S-W, setup see section 2.2 and Annexes 1 thru 3	**19**

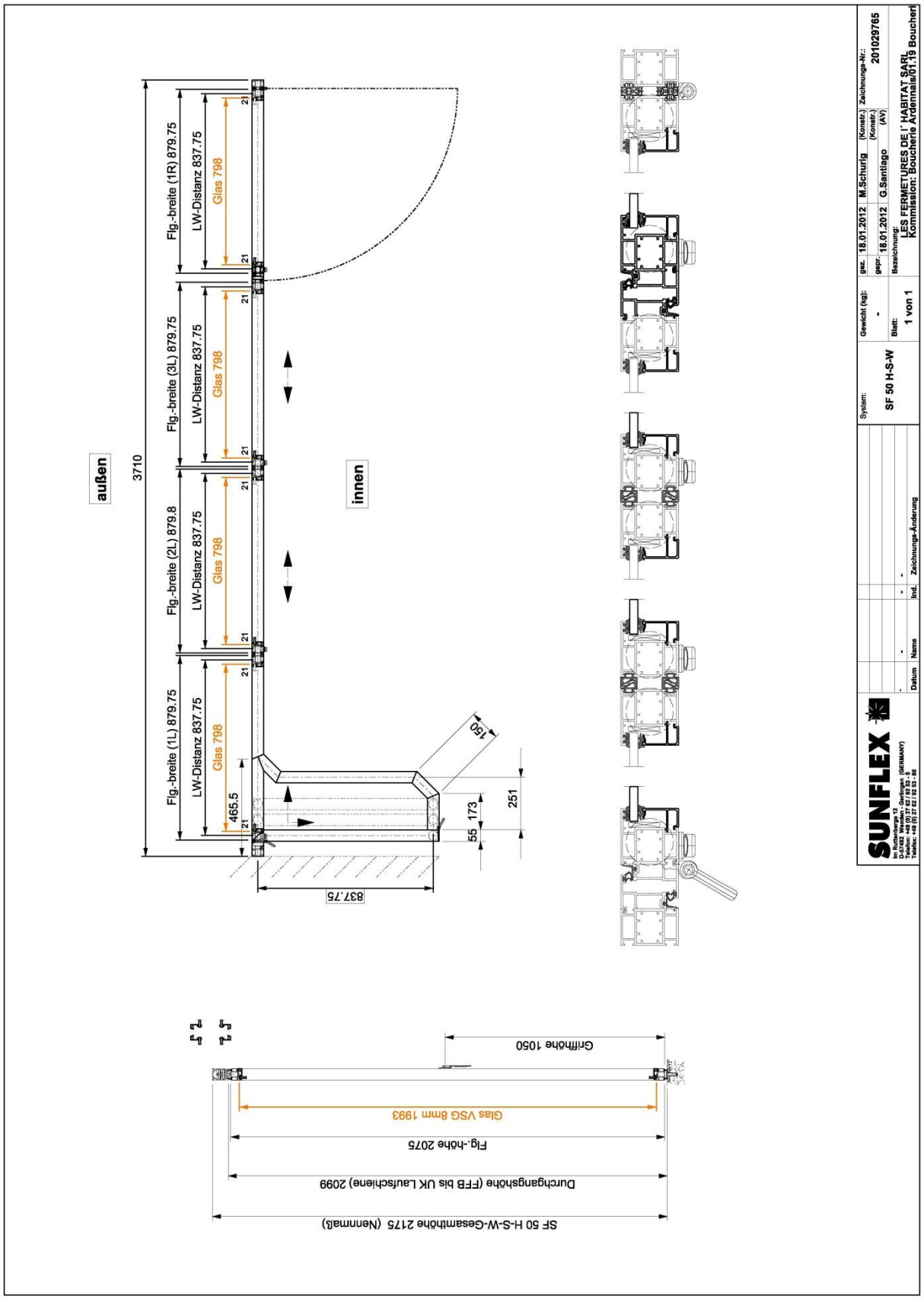
The frequency dependent curve progression of the sound reduction index is evident from Annex 8.

The measurement results show test stand values. In case of plane application a derivative margin of 2 dB should be taken into account.

Mülheim an der Ruhr, 29.02.2012

Stefan Grüll

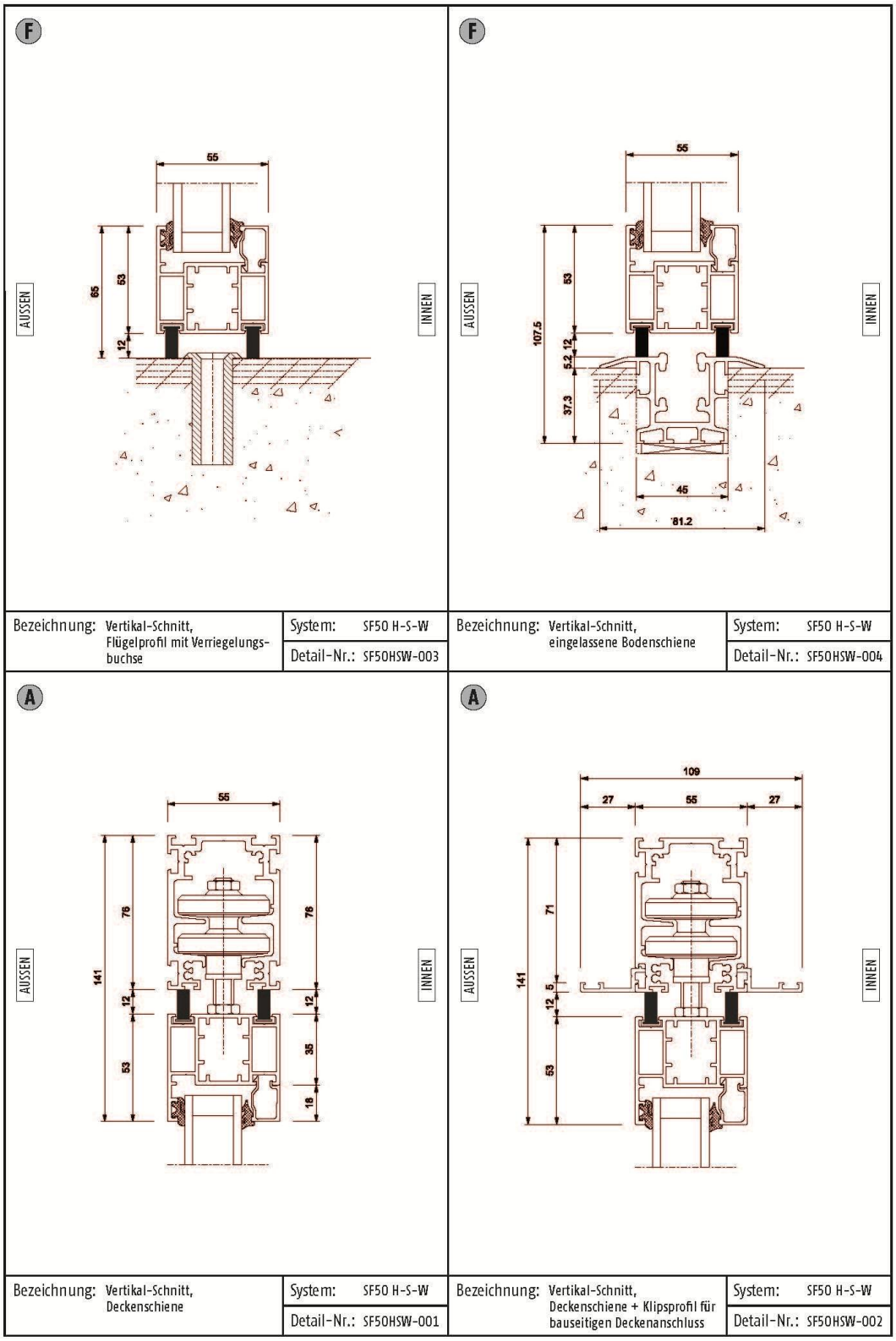
Customer`s Drawing	Annex 1



Test Report No.: 1367-001-12
SG-Bauakustik
Institut für schalltechnische Produktoptimierung
Mainstraße 15
45478 Mülheim an der Ruhr, den 29.02.2012 Stefan Grüll

Horizontal-Schiebe-Wand-System SF 50 H-S-W

SUNFLEX



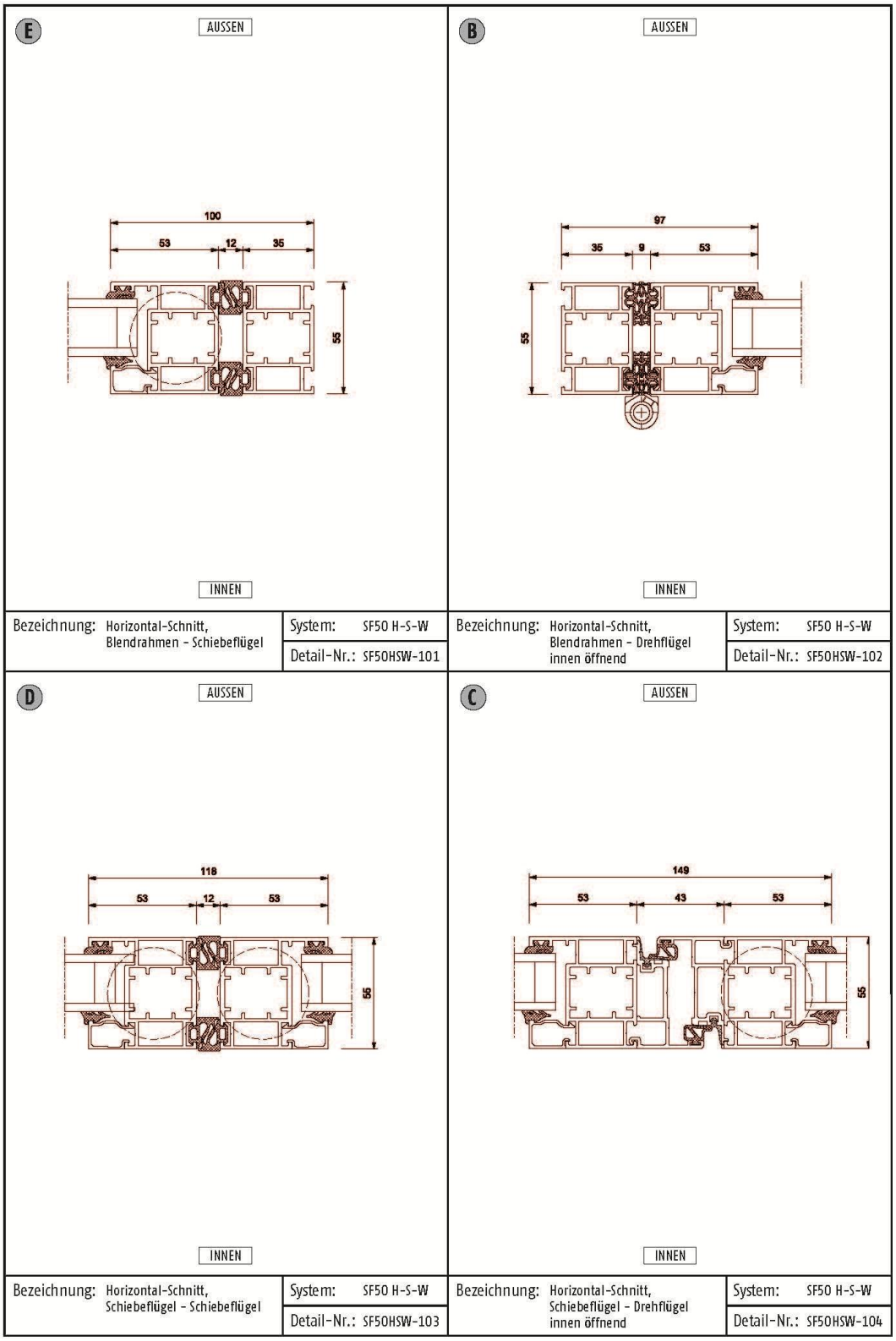
Technische Änderungen und Irrtümer vorbehalten.

14.4

Test Report No.: 1367-001-12
SG-Bauakustik
Institut für schalltechnische Produktoptimierung
Mainstraße 15
45478 Mülheim an der Ruhr, den 29.02.2012 Stefan Grüll

Horizontal-Schiebe-Wand-System SF 50 H-S-W

SUNFLEX



Bezeichnung: Horizontal-Schnitt, Blendrahmen - Schiebeflügel	System: SF50 H-S-W	Bezeichnung: Horizontal-Schnitt, Blendrahmen - Drehflügel innen öffnend	System: SF50 H-S-W
	Detail-Nr.: SF50HSW-101		Detail-Nr.: SF50HSW-102
Bezeichnung: Horizontal-Schnitt, Schiebeflügel - Schiebeflügel	System: SF50 H-S-W	Bezeichnung: Horizontal-Schnitt, Schiebeflügel - Drehflügel innen öffnend	System: SF50 H-S-W
	Detail-Nr.: SF50HSW-103		Detail-Nr.: SF50HSW-104

Technische Änderungen und Irrtümer vorbehalten.

14.5

Test Report No.: 1367-001-12
SG-Bauakustik
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Mainstraße 15
45478 Mülheim an der Ruhr, den 29.02.2012 Stefan Grüll

Photo Documentation	Annex 4

Fig. 1: Horizontal-Sliding-Wall-System SF 50 H-S-W, View Transmission Room

Fig. 2: Horizontal-Sliding-Wall-System SF 50 H-S-W, View Transmission Room, Detail connection ceiling

Test Report No.: 1367-001-12
SG-Bauakustik
Institut für schalltechnische Produktoptimierung
Mainstraße 15
45478 Mülheim an der Ruhr, den 29.02.2012 Stefan Grüll

Fig. 3: Horizontal-Sliding-Wall-System SF 50 H-S-W, View Receiving Room

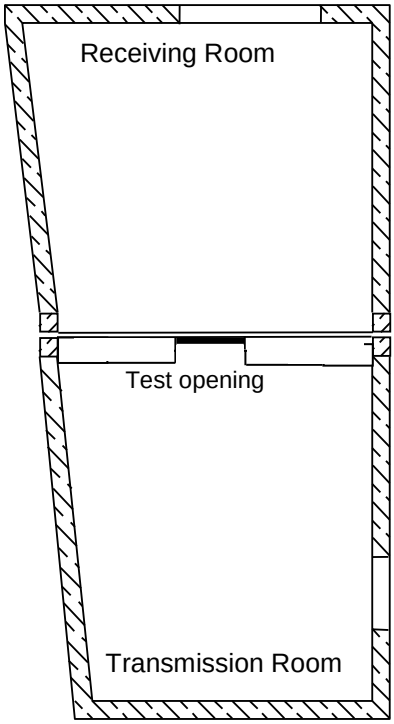
Fig. 4: Horizontal-Sliding-Wall-System SF 50 H-S-W, View Receiving Room, Detail connection below

Description of the Measurement Rooms

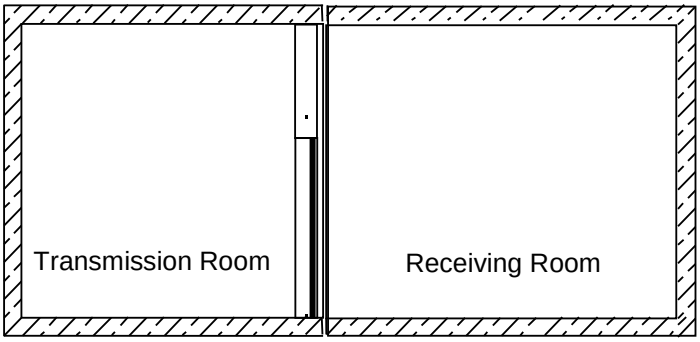
Annex 6

Principle Diagram

Ground view



Vertical Section



Mountings:
- Ceiling - Reinforced concrete ceiling d = 14 cm, spaces with latex paint, Site-specific mass m_F = 322 kg/m^2
- Floor - Reinforced concrete plate d = 20 cm, straightened, Site-specific mass m_F = 460 kg/m^2
- Walls - Masonry d = 24 cm, site-specific mass m_F = 384 kg/m^2

Ambient air: Ambient air conditions during the measurement on 23.02.2012
- Air temperature T_L = 19,5°C
- Relative humidity rF = 56,1%

Room Conditions		Transmission Room	Receiving Room
Breadth	[m]	4.10 – 4.70	4.70 – 5.32
Length	[m]	4.48	4.38
Height	[m]	3.76	3.76
Volume V	[m^3]	72.5	81.1
Rev. time	$\overline{T}_m$ [s]	1.26	1.31

Test Report No.: 1367-001-12
SG-Bauakustik
Institut für schalltechnische Produktoptimierung
Mainstraße 15
45478 Mülheim an der Ruhr, 29.02.2012 Stefan Grüll

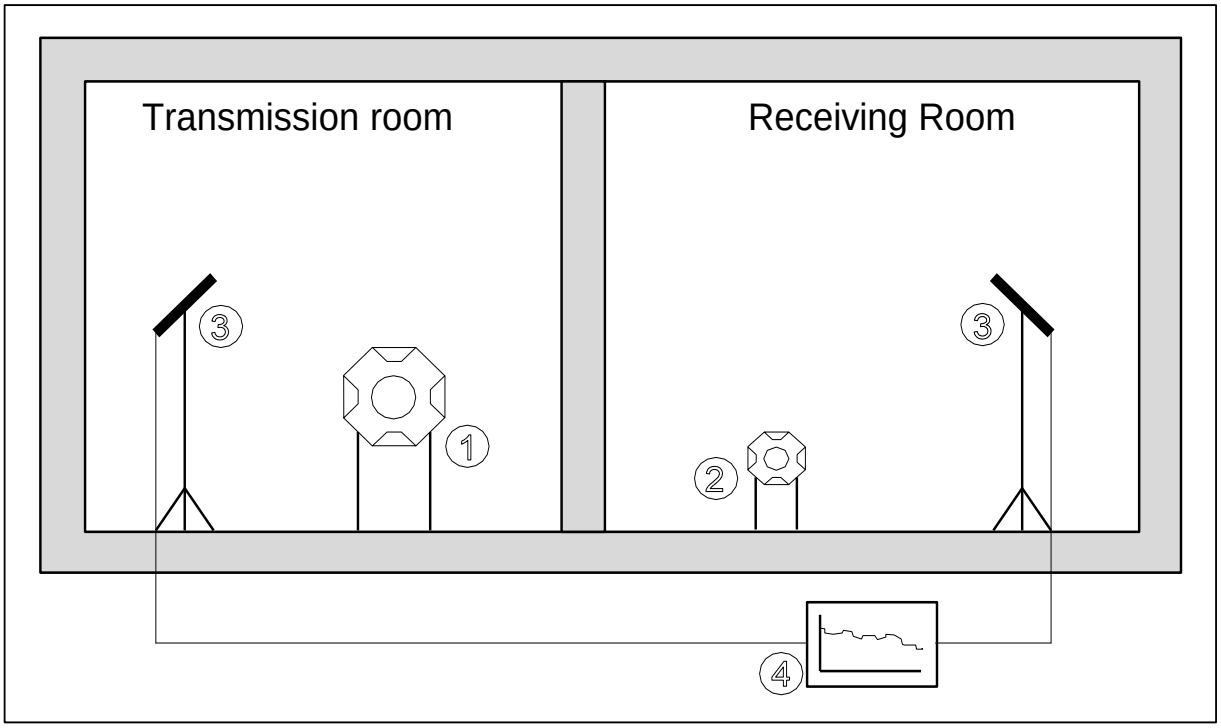
Airborne Sound Insulation acc. to DIN EN ISO 10140-2 in the Laboratory	Annex 7

Description of the Implementation of an Airborne Sound Measurement, evaluated through a Measuring Device with Process Computer

Customer: Sunflex Aluminium Systeme GmbH, Im Ruttenberge 12, 57482 Wenden

Object: Horizontal-Sliding-Wall-System Sunflex, Type SF 50 H-S-W

1. Measuring Setup



	Unit Designation/ Type	Series number	Date of last check/calibrated until	Last calibration
1	Dodecahedron loudspeakers for radiation of third octave band noise	DL 1	04.06.2009/-	-
2	Dodecahedron loudspeakers for radiation of third octave band noise	DL 2	-	-
3	Condenser microphones: M1: Norsonic, Type 1220	14761	20.01.2010/31.12.2012	23.02.2012
	V1: Norsonic, Type 1201	17598	20.01.2010/31.12.2012	23.02.2012
	M2: Norsonic, Type 1220	38648	20.01.2010/31.12.2012	23.02.2012
	V2: Norsonic, Type 1201	20062	20.01.2010/31.12.2012	23.02.2012
4	Sound level analyzer: Norsonic, Type 121	29837	20.01.2010/31.12.2012	23.02.2012

2. Measurement Implementation

For the determination of the airborne sound insulation, electroacoustic generated third octave band noise is radiated in the transmission room via a dodecahedron loudspeaker. In the frequency range between 50 Hz and 5.000 Hz the margin values generated, are simultaneously measured and recorded in two channels in the transmission and receiving room, via two condenser microphones in third octave band steps. From these values and the rev. time, the sound insulation margins, in the individual frequency bands, are determined according to DIN EN ISO 717-1. The weighted sound reduction index R_w is determined as an individual value, with the integrated process computer of the sound level analyzer.

Test Report No: 1367-001-12
SG-Bauakustik
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Mainstraße 15
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Airborne Sound Measurement according to DIN EN ISO 10140-2

Determination of the Airborne Sound Insulation in Laboratory

Annex 8

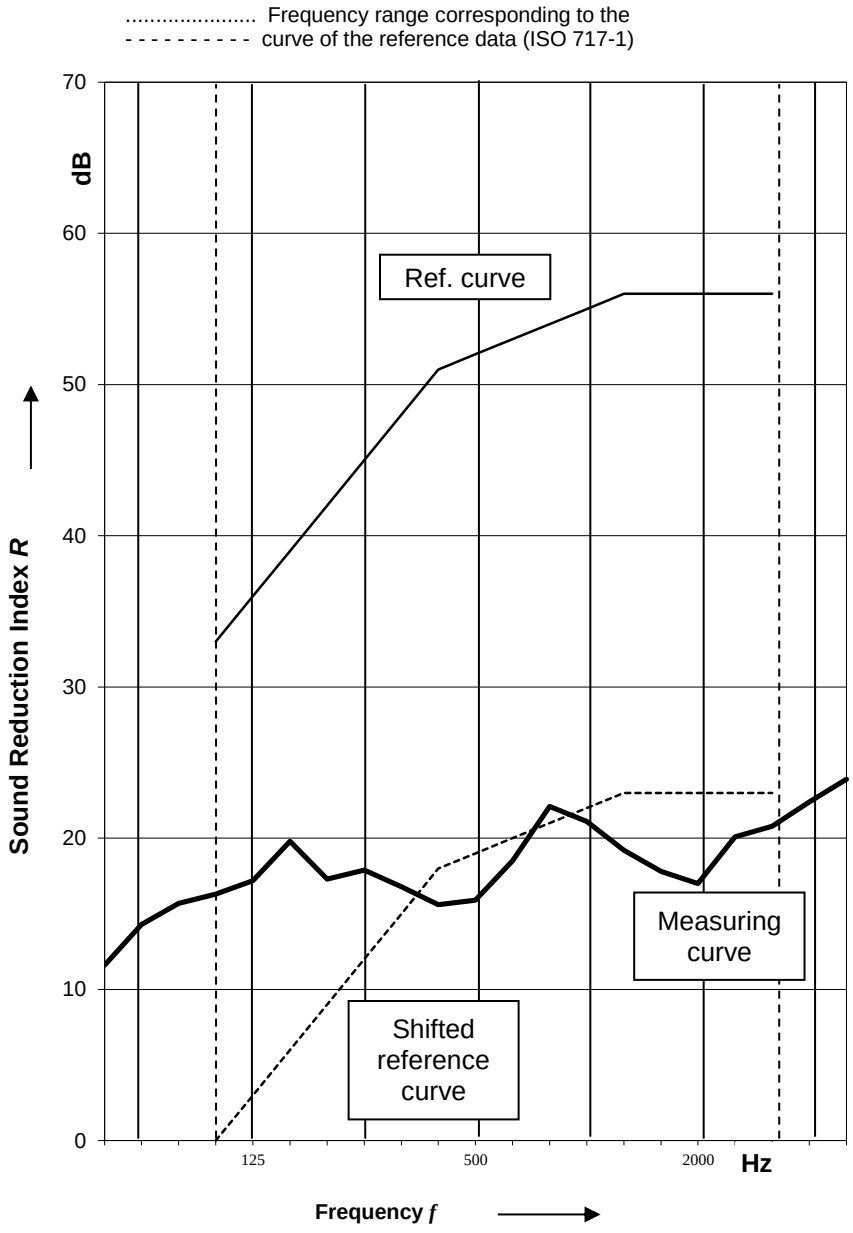
Manufacturer:	Sunflex Aluminium Systeme GmbH	Product designation:	System SF 50 H-S-W
Customer:	Sunflex Aluminium Systeme GmbH	Test rooms:	Laboratory
Test item installed by	Customer	Test date:	23.02.2012

Description of the test item:
Horizontal-Sliding-Wall-System Sunflex, Type SF 50 H-S-W, Construction made of non-thermally insulated aluminium profiles, d = 55 mm, with insulated glass units Float 10 mm, SZR 18 mm, VSG 8 mm, 4 wings with EPDM-seals (vertical) and brush seals (horizontal), dimensions width x height = 3.710 mm x 2.175 mm, S = 8,07 m²

Remarks:
detailled construction see Report:
Section 2.2 and Annexes 1 thru 3

Area S test item:	8,1 m²
Site-specific mass:	
Air temp. in test rooms:	19,5 °C
Humidity in test rooms:	56,1 %
Volume transmission room:	74,5 m³
Volume receiving room:	81,1 m³

Frequency Hz	*R* Terz dB
50	11,6
63	14,3
80	15,7
100	16,3
125	17,2
160	19,8
200	17,3
250	17,9
315	16,8
400	15,6
500	15,9
630	18,5
800	22,1
1000	21,1
1250	19,2
1600	17,8
2000	17,0
2500	20,1
3150	20,8
4000	22,4
5000	23,9



Evaluation acc. to ISO 717-1:

R_w (C; Ctr) = 19 (0; 0) dB

$C_{50\text{-}3150}$ = 0 dB $C_{50\text{-}5000}$ = 0 dB $C_{100\text{-}5000}$ = 0 dB

$C_{tr50\text{-}3150}$ = -1 dB $C_{tr50\text{-}5000}$ = -1 dB $C_{tr100\text{-}5000}$ = 0 dB

The determination is based on measurement results which were measured in third octave bands.

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