Classification report
Joint sound reduction of floor seals

Test report 167 30083/1e

ROSENHEIM

Customer **Häfele GmbH & Co KG**
Adolf-Häfele-Straße 1

72202 Nagold

Product	Lowerable floor seal in wooden door section
Product labelling	Activated both sides: 950.05.093 Activated one side: 950.05.193
Specials	One-side and both side activated lowerable floor seal Additional to the tested seal the seal type is manufactured in different lenght with following product label: 708 mm: 950.05.091 resp. 950.05.191 833 mm: 950.05.092 resp. 950.05.192 1083 mm: 950.05.094 resp. 950.05.194 1208 mm: 950.05.095 resp. 950.05.195

Weighted joint sound reduction index $R_{ST,w}$
Spectrum adaptation terms C and C_{tr}

See table 1

ift Rosenheim
16th June 2005

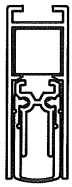
i. V. Dr. Joachim Hessinger, Dipl.-Phys.
Head of test laboratory
ift Schallschutzzentrum

i. A. Bernd Saß, Dipl.-Ing. (FH)
test engineer
ift Schallschutzzentrum

Foundation

ift guideline SC-01/2 „Determination of sound reduction index of joints“ 2002-09
Test reports 167 27718/1 from 26th January 2004 in german language, 167 27718/1e from 16th June 2005
Authority dated 15th June 2005 and declaration of identity dated 13th Mai 2005 from the customer

Representation



Purpose

This procedure is suited for comparison of building products intended for sealing of joints seal (e.g. Sealings, fillers for joints and fugues). The results can be used to evaluate the transmission degree τ_e according to EN 12354-3 Annex B.

The calculation of joint sound reduction to calculate a total construction cannot replace a classification for complete building elements.

Validity

The values given in this test report are only valid for the tested specimen described.

General conclusions for the construction and other functional details may not be drawn from this test report.

Information for use

Regulations for the use of test reports are given in the enclosed information sheet „Conditions and notes for use of **ift** test documents“ and “Determination of the sound insulation of a door with floor seal”

Contents

This test report includes 8 pages

1 Test specimen
2 Test procedure
3 Test results
Data sheet (2 pages)

LSW - Labor für Schall- und Wärmemesstechnik GmbH
- das Schallschutzprüfzentrum des ift Rosenheim
Geschäftsführer:
Prof. Fritz Holtz

Lackermannweg 26
D-83071 Stephanskirchen
Tel.+49 (0) 8036 / 3006-0
Fax+49 (0) 8036 / 3006-33
www.lsw-gmbh.de

Sitz: 83026 Rosenheim
AG Traunstein, HRB 14821
Sparkasse Rosenheim
Kto. 500 434 626
BLZ 711 500 00

Anerkannte Prüf-, Überwachungs- und Zertifizierungsstelle nach Landesbauordnung: BAY24
Sachverständige Prüfstelle Gruppe I
für Eignungs- und Güteprüfung nach DIN 4109

1 Test specimen

1.1 Description

Product	Lowerable floor seal, activated on one and on both sides
Product labelling	Activated both sides: 950.05.093 Activated one side: 950.05.193
Manufacturer*	Customer of the test report 167 27718/1 from 26th January 2004
Date of production*	19th January 2004
Size	
Length of joint l	965 mm
Depth of joint d	45 mm
Width of joint w	variable, 5-10 mm
Cover	none
Cross section of the seal	12 mm × 35 mm
Depth of groove	35 mm
Length of the seal	965 mm, length of body 958 mm
Distance floor seal-rebate seal	15 mm
Material of seal*	Silicone
Mounting of the seal	Fittings sidewise

The desription is based on the documentation of **ift**. Numbers and names of material are given by the customer. (Other data from customer are marked with „*)“).

1.2 Mounting of the test specimen

The measurement of the sound insulation of seals R_{ST} was carried out using a mobile joint measuring arrangement (see Fig. 1 and 2). This mobile measuring apparatus comprises a highly sound-insulating element made of metal profiles and a Bondal sheet with an inserted cassette (Fig. 1).

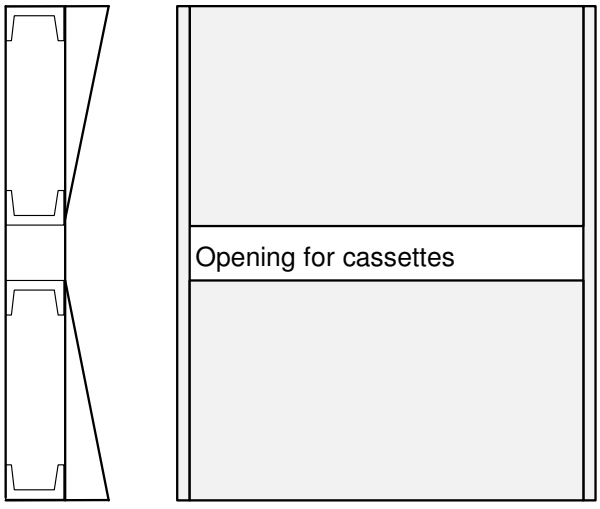
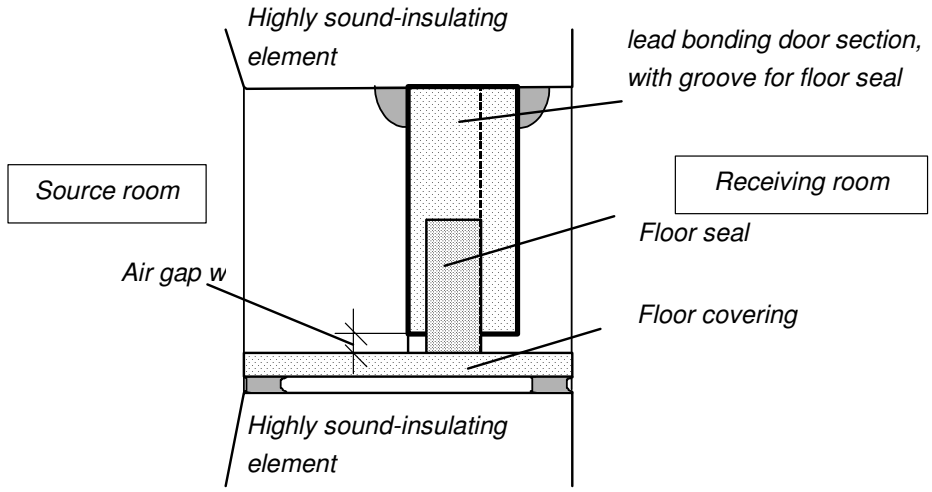


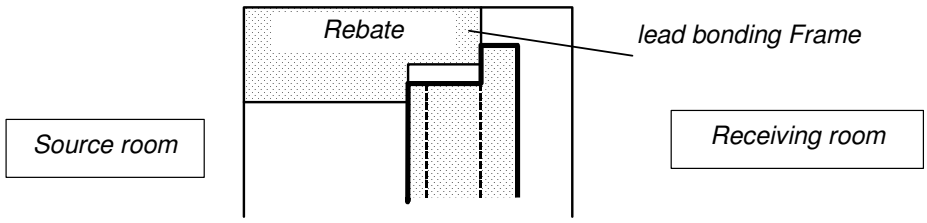
Fig.1 highly sound insulating element (principle drawing of the mounted element)

The cassette consists of a wooden door section with the groove for the floor seal. This door section is faced with a heavy flexible foil and fixed to a receiving device which is adjustable in height. The sealing works on a wooden bar which simulates the floor. This device was manufactured by the customer.

The joint geometry of the floor seal in a doorway is simulated in this apparatus. The air gap beneath the door, referred to below as the air gap w, can be varied in the cassette (Fig. 2).



Vertical section



Horizontal section

Fig. 2 Cassette (sketch of principle)

Geometric data:
Joint length: l = 985 mm
Air gap: w = variable
Joint depth: d = 45 mm

The cassette is mounted into the highly sound-insulating frame (Fig. 1), which in turn is installed in the standard window testing facility that conforms to DIN EN ISO 140-1. The test arrangement is conform to the requirement according to **ift**-guideline SC-01. The element was mounted in the test rig by **ift**.

2 Test procedure

2.1 Specimen collection

The specimen collection is shown in the test report 167 27718/1.

Quantity	1
Supply	22th January 2004

2.2 Procedure

Technical basics	**ift** guideline SC-01/2:2002-09 „Determination of sound reduction index of joints“
Boundary conditions	Up to the guideline.
Deviation	No deviation from the guideline
Test noise	Pink noise
Test of reverberation time	Arithmetic average: 2 tests on 2 speaker and 2 microphone positions (8 in total).
Equation A	$A = 0{,}16 \cdot \frac{V}{T}$ m²
Test of Soundleveldifference	At least 2 speaker positions and on circulat paths moved microphones
Equation	$R_{ST} = L_1 - L_2 + 10\log\left(\frac{S_N \cdot l}{A \cdot l_N}\right)$ dB

Legend

R_{ST}	joint sound reduction index in dB
L_1	Soundpressurelevel sourceroom in dB
L_2	Soundpressurelevel receivingroom in dB
l	Length of joint in m
S_N	Reference area (1 m²)
l_N	Reference length (1 m)
A	equivalent absorption area in m²
V	Volume of receiving room in m³
T	Reverberation time in s

This sound reduction index of seals is comparable with a sound reduction index of a building component for which there is a 1 m long joint with a seal for every m^2 of area, whereby the sound is transmitted only via the joint with a seal.

If the joint seal is combined with a building component (e.g. doors with a surface S_1 and the sound reduction index R_1) and assuming the building component's surface S_1 >> than the surface of the seal S (= w · l, w = width of joint), then with the length l of the joint the resulting sound reduction index R_{res} can be calculated as follows:

$$R_{res} = -10\log\left(10^{-\frac{R}{10}} + \frac{l}{S} \cdot 10^{-\frac{R_{ST}}{10}}\right) \text{ dB}$$

2.3 Equipment

Apparatus	Type	Producer	Nr.
Integrating measurement device	Typ Nortronic 840	Fa. Norsonic-Tippkemper	17848*
Microphone-preamplifier	Typ 1201	Fa. Norsonic-Tippkemper	18326* / 18327*
Microphone	Typ 1220	Fa. Norsonic-Tippkemper	15108* / 15248*
Calibrator	Typ 1251	Fa. Norsonic-Tippkemper	17413*
Loudspeaker dodecahedron	Typ 229, 96 Ohm	Fa. Norsonic-Tippkemper	22837**/ 22294**
Amplifier	Typ 235, 100 W	Fa. Norsonic-Tippkemper	22227**
Rotating microphone	Typ 231-N-360	Fa. Norsonic-Tippkemper	22253** /22254**

*App. No. by cal. sheet
** **ift** App.No.

2.4 Execution of the test

Date	22th January 2004
Test engineer	Bernd Saß

3 Test results

The values of the joint sound reduction index R_{ST} of the examined floor seal are shown as a function of the frequency drawn up in a diagram (Annex). On this basis, the weighted joint sound reduction index $R_{ST,\,w}$ and the spectrum adaptation terms C and C_{tr} can be calculated in relation to the length of joints l = 1.085 m following to EN ISO 717-1:1996-12 for the frequency range 100 Hz up to 3150 Hz. The limiting sound insulation of the test arrangement (related to l = 0.965 m) was also drawn-up in the curve diagram yielding a weighted maximum sound reduction index

$$\mathbf{R_{ST,w\,max}\,(C;C_{tr}) = 56\,(-1;-5)\ dB}$$

A correction of the maximum insulation was not carried out.

The weighted sound reduction indices of seals as a function of the air gap w are given in table 1 and drawn-up in diagram 1. For the nominal measure of w_0 = 7 mm for the lower air gap according to DIN 18101 (1.1985) the result is

nominal weighted sound reduction index for floor seals

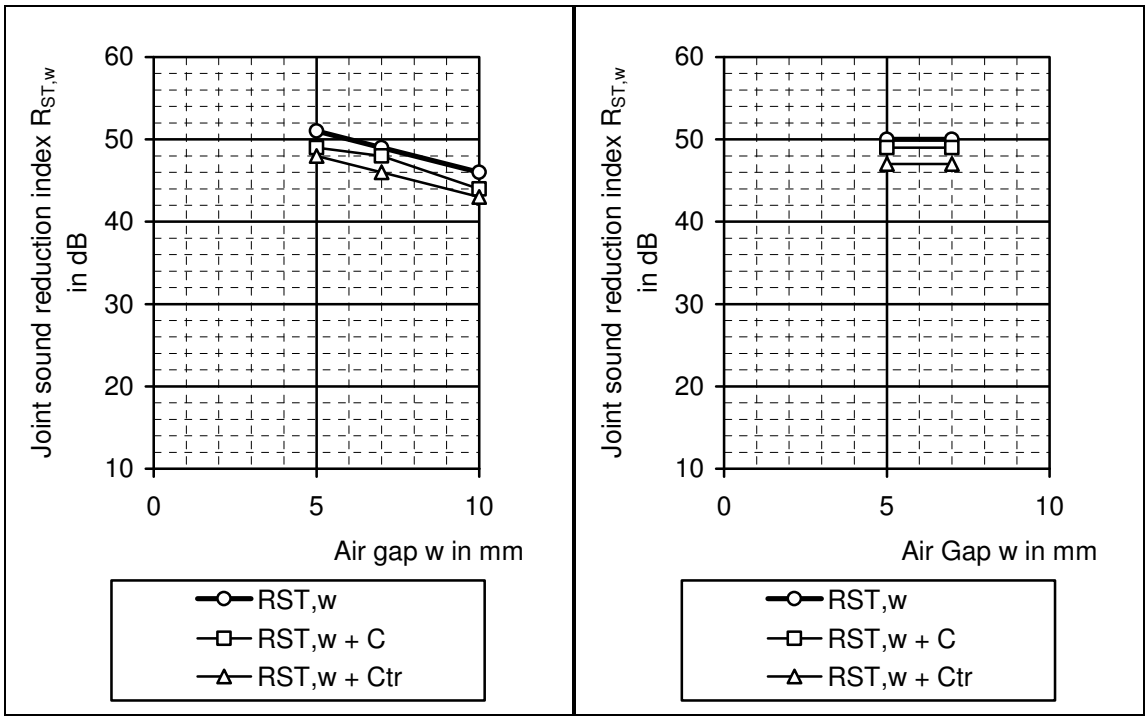
activated on both sides	$\mathbf{R_{ST,w,0}\,(C;C_{tr}) = 49\,(-1;-3)\ dB}$
activated on one side	$\mathbf{R_{ST,w,0}\,(C;C_{tr}) = 50\,(-1;-3)\ dB}$

Comment

This procedure is suited for comparison of building products intended for sealing of joints (e.g. Sealings, fillers for joints and fugues). The results can be used to evaluate the transmission degree τ_e according to EN 12354-3 Annex B.
The calculation of joint sound reduction to calculate a total construction cannot replace a classification for complete building elements.

Table 1 Test results for floor seal Activated both sides: 950.05.093
Activated one side: 950.05.193

weighted joint sound reduction index $R_{ST,w}$ (C;C_{tr}) in dB	Measures taken, notes
56 (-1;-5)	Maximum sound insulation
51 (-2;-3)	Air gap 5 mm, seal activated on both sides
49 (-1;-3)	Air gap 7 mm, seal activated on both sides
46 (-2;-3)	Air gap 10 mm, seal activated on both sides
50 (-1;-3)	Air gap 5 mm, seal activated on one sides
50 (-1;-3)	Air gap 7 mm, seal activated on one sides



activated on both sides activated on one side

Diagram 1 Test results for floor seal as function of the air gap w

The **ift** information sheet SC-02/1 “Determination of the sound insulation of a door with floor seal” must be observed for practical use, i.e. the combination of the sound reduction of a door with the sound reduction of a defined floor joint. The measured sound reduction indices of joints are applicable to solid, flat surfaces. The indices cannot be extended to uneven surfaces or to carpets.

ift Rosenheim
Schallschutzzentrum
16th June 2005

Joint sound reduction index acc. to **ift** guideline SC 01

Determination of sound reduction index of joints

Customer Häfele GmbH & Co KG, 72202 Nagold
Product labelling 950.05.093

ift ROSENHEIM

Test specimen

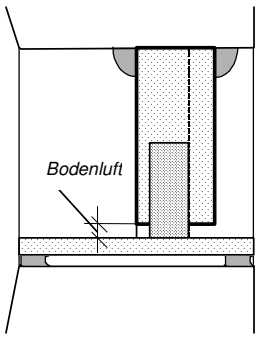
Lowerable floor seal, activated on both sides

Section 12 mm × 35 mm

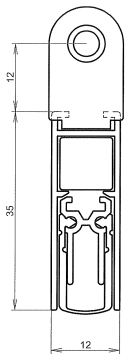
Joint dimensions:

Length l 965 mm
Depth d 45 mm
Rebate single

Test arrangement



Profile



Drawing of the test arrangement
(not true to scale)

Date of Test 22th January 2004

Test length 0,965 m

Laboratory partition wall
Two-leaf concrete wall

Test noise Pink noise

Volumes of test rooms
V_S = 109,9 m³ V_E = 101,3 m³

Maximum joint sound reduction index
$R_{ST,w,max}$ = 54 dB (related to test length)

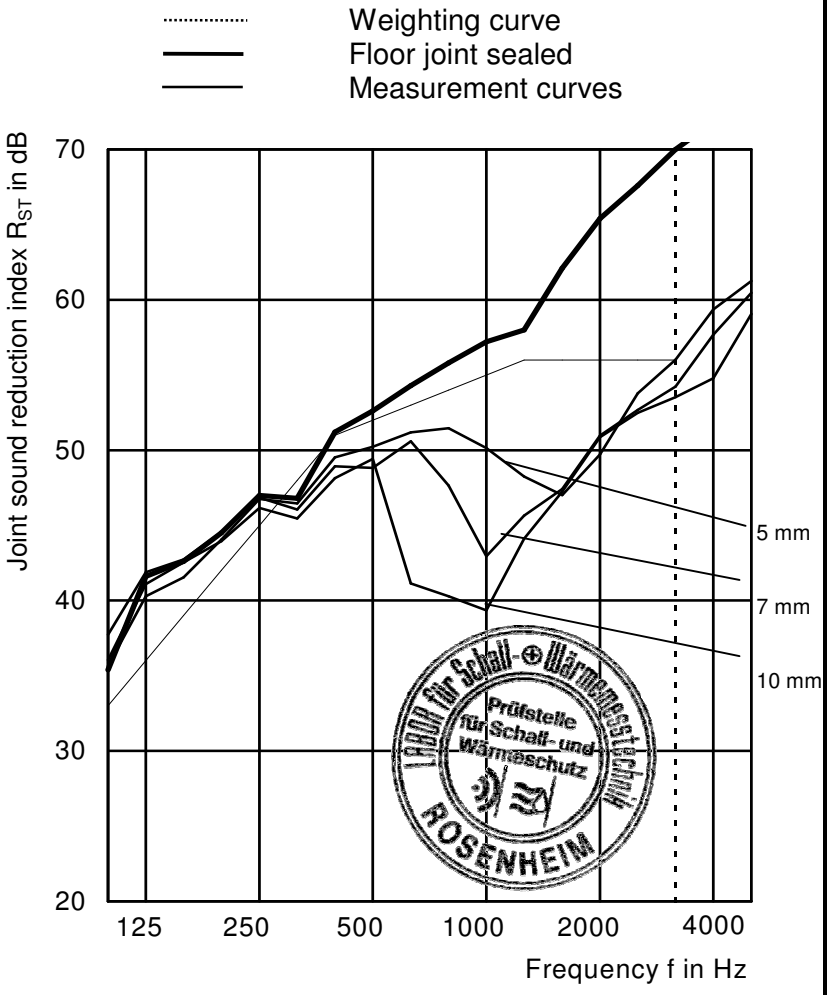
Installation conditions
Insertion of cassette in highly sound-insulating element.

Climate in the lab 20 °C / 50 % RF

$R_{ST,w}$ ($C;C_{tr}$) from Diagram R(f)

Floor joint sealed (Maximum sound insulation) $R_{ST,w}$ ($C;C_{tr}$) = 56 (-1;-5) dB

Air gap
5 mm $R_{ST,w}$ ($C;C_{tr}$) = 51 (-2;-3) dB
7 mm $R_{ST,w}$ ($C;C_{tr}$) = 49 (-1;-3) dB
10 mm $R_{ST,w}$ ($C;C_{tr}$) = 46 (-2;-3) dB



Test report No.: **167 30083/1e**
Data sheet 1

ift Rosenheim
Schallschutzzentrum
16th June 2005

Dr. Joachim Hessinger
Head of test laboratory

Joint sound reduction index acc. to **ift** guideline SC 01

Determination of sound reduction index of joints

Customer Häfele GmbH & Co KG, 72202 Nagold
Product labelling 950.05.193

Test specimen

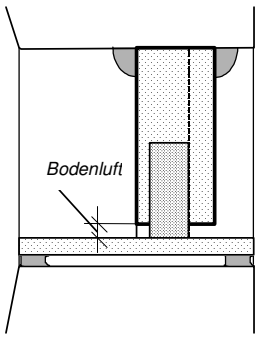
Lowerable floor seal, activated on one side

Section 12 mm × 35 mm

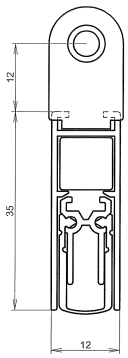
Joint dimensions:

Length l 965 mm
Depth d 45 mm
Rebate single

Test arrangement



Profile



Drawing of the test arrangement
(not true to scale)

Date of Test 22th January 2004

Test length 0,965 m

Laboratory partition wall
Two-leaf concrete wall

Test noise Pink noise

Volumes of test rooms
V_S = 109,9 m³ V_E = 101,3 m³

Maximum joint sound reduction index
$R_{ST,w,max}$ = 54 dB (related to test length)

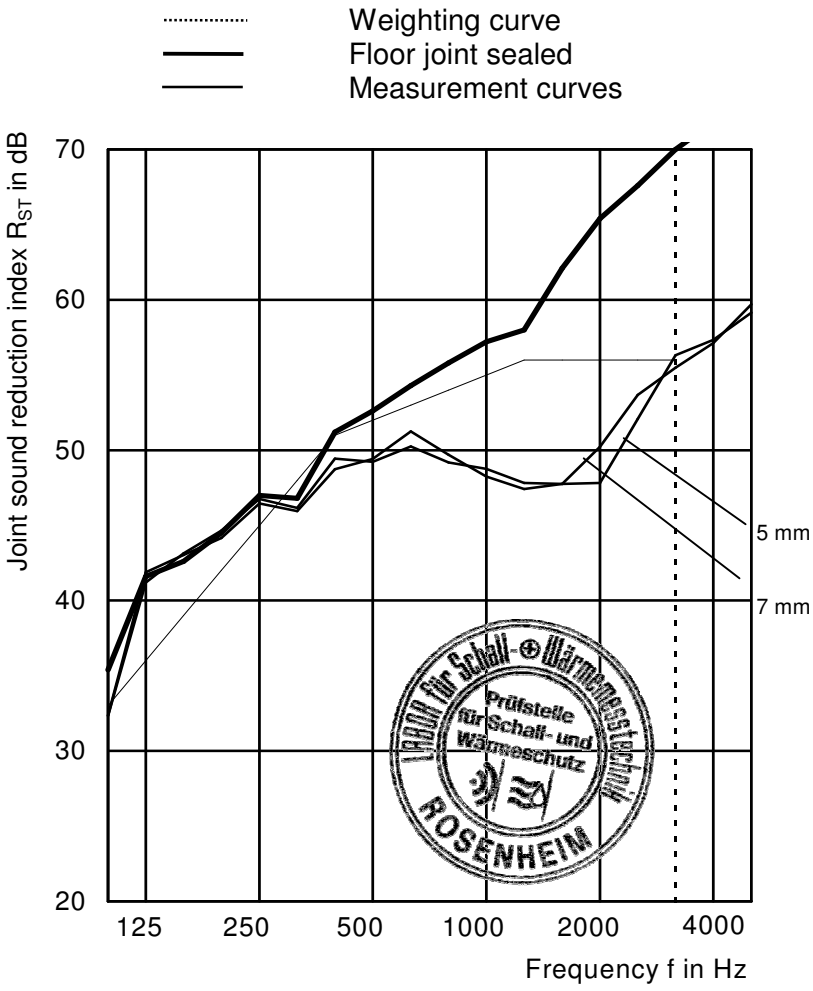
Installation conditions
Insertion of cassette in highly sound-insulating element.

Climate in the lab 20 °C / 50 % RF

$R_{ST,w}$ (C,C_{tr}) from Diagram R(f)

Floor joint sealed (Maximum sound insulation) $R_{ST,w}$ ($C;C_{tr}$) = 56 (-1;-5) dB

Air gap
5 mm $R_{ST,w}$ ($C;C_{tr}$) = 50 (-1;-3) dB
7 mm $R_{ST,w}$ ($C;C_{tr}$) = 50 (-1;-3) dB



Test report No.: **167 30083/1e**
Data sheet 2

ift Rosenheim
Schallschutzzentrum
16th June 2005

Dr. Joachim Hessinger
Head of test laboratory