Test report

No. 167 19336/1e*

Fenster
Türen
Fassaden
Werkstoffe
Zubehör

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Report date	9th October 1997
Translation	**18th June 2001**
Client	Comaglio S.R.L. Via Industriale 4/B I-25080 Muscoline
Order	Determination of the joint sound insulation of a floor seal on the basis of DIN 52 210 (Type testing)
Specimen	Floor seal with product description "1700 No Sound"

Contents

*) This test report is a translation of the test report no. 167 19336/1 dated 09th October 1997.

Institut für Fenstertechnik e.V.
Leiter: Dr. Helmut Hohenstein
Theodor-Gietl-Str. 7-9
83026 Rosenheim

Telefon +49 (0) 8031 261-0
Telefax +49 (0) 8031 261 290
E-Mail info@ift-rosenheim.de
http://www.ift-rosenheim.de

Sparkasse Rosenheim:
Kto. 38 22 (BLZ 711 500 00)
Postscheckamt München:
Kto. 2849 26-801 (BLZ 700 100 80)

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1 Definition of task

The **ift** Rosenheim was charged by Comaglio S.R.L., I-25080 Muscoline, to determine the joint sound reduction of the floor seal with the product description "1700 No Sound" on the basis of DIN 52 210.

The measurement of the joint seal sound reduction index R_{ST}, referred to as sound reduction index of seals, was carried out using a mobile joint-measuring arrangement, as shown in figs. 1 and 2.

The test method is described in the following. The test conditions and test variations applicable are shown in table 1 and in the annex, sheets 2 to 7.

1.1 Measuring arrangement

This mobile measuring apparatus comprises a highly sound-insulating element made of metal profiles and a Bondal-sheet with a cassette to be inserted (Fig. 1).

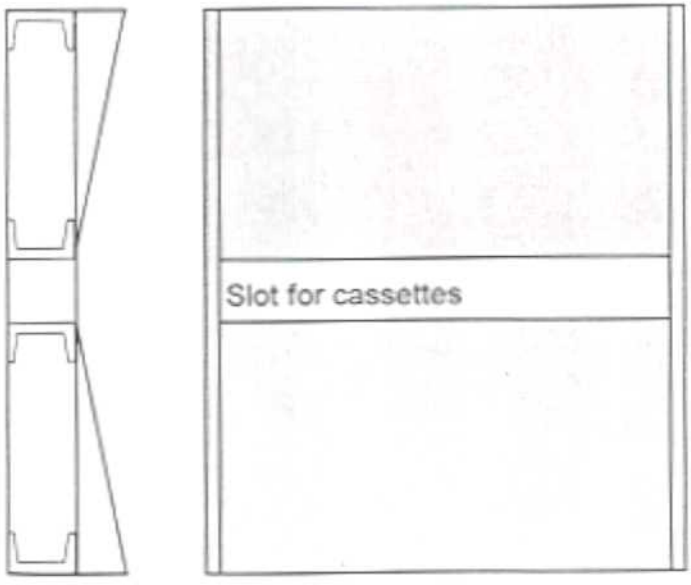

Fig. 1 Highly sound-insulating element

The cassette consists of a door section faced with a lead and of the groove for receiving the floor seal. This door section is fixed to a receiving device which is covered with lead. The construction is mounted on a 10 mm thick aluminium plate. This simulates the joint geometry of the floor seals in a door. In the cassette the air gap beneath the door, in the following known as air gap b, can be varied (fig. 2).

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2 Test procedure

The measurements were carried out on the basis of DIN 52 210 using measurement equations for the sound insulation of joints [1], which are not defined in a standard but are acknowledged in testing institutes.

The sound reduction index of seals is determined from the sound level difference between the both test rooms. Two measuring equations can be used for that:

1. Reference area S_O

$$R_{S_o} = L_1 - L_2 + 10\log\frac{So}{A}\,dB \qquad (1)$$

where:

R_{So} = Sound reduction index of seal
L_1 = Sound level in the source room
L_2 = Sound level in the receiving room
A = Equivalent sound absorption area of the receiving room, determined by means of measurement of the reverberation time and of the volume of the receiving room
S_O = Reference area = $h_o \cdot l$
where h_o = standard height
l = length of joints

2. Sound receiving area S_N, sound radiating length of joints l_N

$$R_{ST} = L_1 - L_2 + 10\log\frac{S_N \cdot l}{A \cdot l_N}\,dB \qquad (2)$$

Both measuring equations correspond, if it is fixed:

ho = 1 m
l_N = 1 m
S_N = 1 m²

Then the measuring equation for the sound reduction index of joints is:

$$R_{S_o} = R_{ST} = L_1 - L_2 + 10\log\frac{1 \cdot l}{A \cdot 1}\,dB \qquad (3)$$

This sound reduction index of seals is comparable to the sound reduction index of an element which has a defined area where an area of 1 m² relates to a joint of 1 m length. The sound is exclusively transmitted via the joint with seal.

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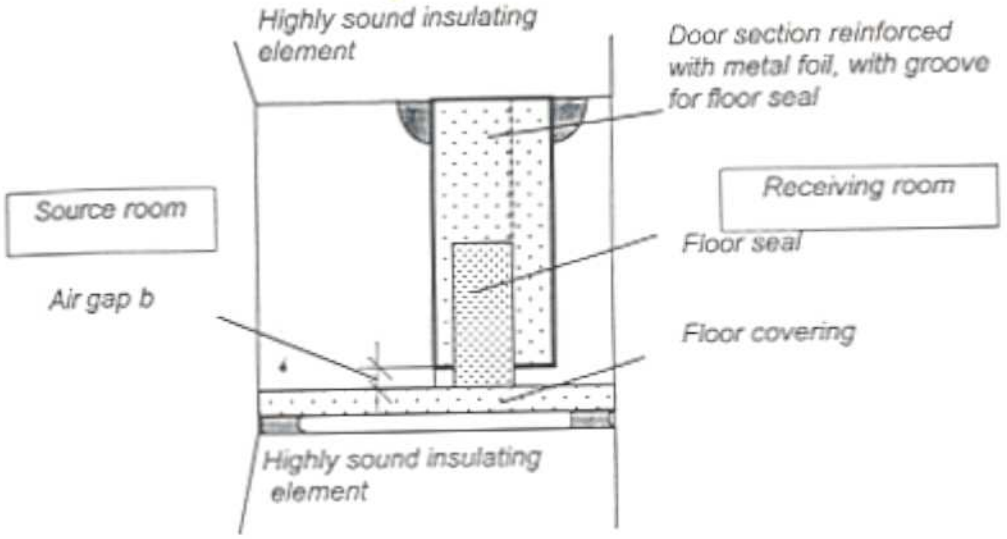

Vertical section

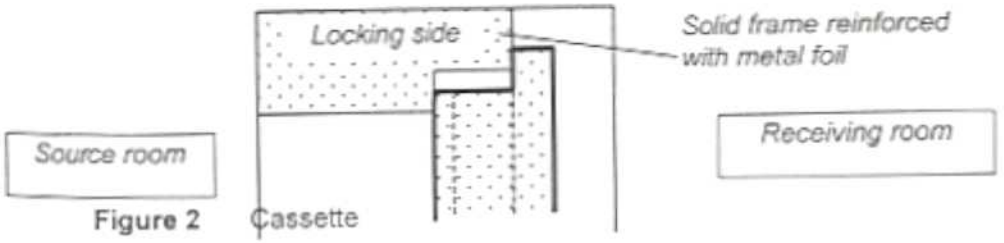

Figure 2 Cassette

Horizontal section

nm

Air gap: b = variable
Joint depth: t = 40 mm
Task: Sound reduction index of seals R_{ST}

The cassette is mounted into the highly sound insulating frame (fig. 1), which in turn is installed in the standard window testing facility which corresponds to DIN 52 210-P-F.

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If the seal is combined with a building component 1 (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 (= b · l, b = width of joint), then the resulting figure for the sound reduction index is:

$$R_{res} = -10\log\left(10^{-R_1/10} + \frac{S_N \cdot l}{S_1 \cdot l_N} 10^{-R_{ST}/10}\right) dB \qquad (4)$$

or, with the standard area or length

S_N = 1 m²

l_N = 1 m

$$R_{res} = -10\log\left(10^{-R_1/10} + \frac{1 \cdot l}{S_1 \cdot 1} 10^{-R_{ST}/10}\right) dB \qquad (5)$$

Literature:

[1] H. Ertel and F. P. Mechel, Research report Nr. BS 35/79, IBP Stuttgart (1979)

3 Test results

The values of the sound reduction index R_{ST} of the examined floor seal are shown as a function of the frequency drawn-up in a diagram (annexes). On the basis of this the weighted sound reduction index of seals $R_{ST,w}$ can be calculated in relation to the length of joints l = 1.0 m according to DIN 52210 part 4 (issue 1984).

The limiting sound insulation of the measuring arrangement (related to l = 1.00 m) was also drawn-up in the curve diagram using a weighted maximum sound reduction index

$$R_{ST,w\,max} = 53\ dB$$

The weighted sound reduction indices of seals as a function of the air gap are given in table 1 and drawn-up in diagram 1.

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Table 1 **Test results, test arrangement for floor seal** 1700 No Sound

Annex no.	Weighted sound reduction index of seals		Measures taken, notes
	$R_{ST,w}$ in dB	$R^*_{ST,w}$ in dB	
2	53	53.9	Maximum insulation
3	48	48.5	Air gap 2 mm
4	47	47.0	Air gap 4 mm
5	45	45.9	Air gap 6 mm
6	44	44.2	Air gap 8 mm
7	43	43.8	Air gap 10 mm

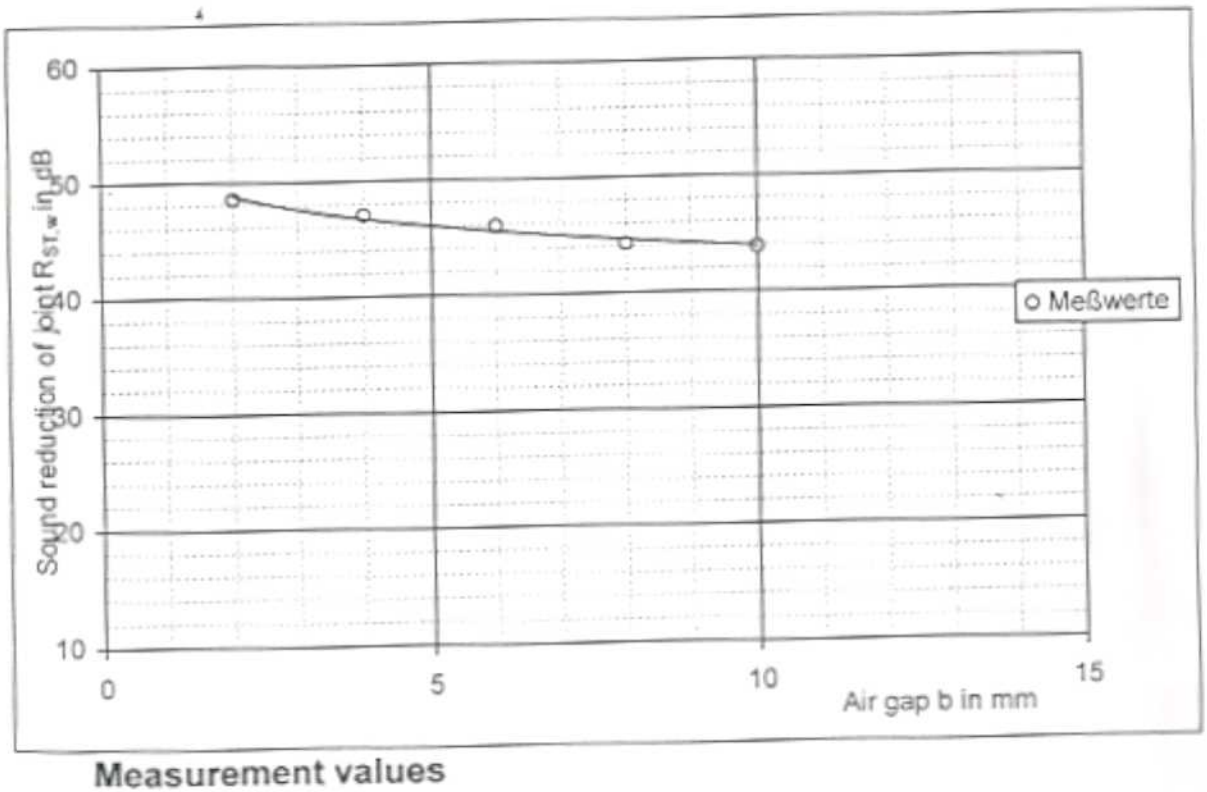

Diagram 1 Measurement values, test arrangement for floor seal 1700 No Sound on a smooth base as a function of the air gap b.

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For the nominal measure of b_0 = 7 mm for the lower air gap according to DIN 18101 (1.1985) the result is a

nominal weighted sound reduction index for floor seals $R_{ST,w,0}$ = 45 dB

4 Conclusions

For use in practice, i.e. the combination of the sound reduction of a door with the sound reduction of a defined floor joint, annex 1 is to be observed. The measured sound reduction indices of joints are applicable for solid, flat surfaces. The values cannot be extended to uneven surfaces or to carpets.

5 Information for use of ift test reports

Regulations for the use of test reports are given in the enclosed information sheet „Conditions and information for use of ift test reports for publication and commercial purposes". This test report is a translation from the test report no. 167 19336/1 of 09th October 1997.

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9th October 1997

Dr. Helmut Hohenstein
Director

Dr. Rolf Schumacher
Head of the Acoustic Department

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Determination of the resulting sound reduction index of a door in combination with the tested floor seal.

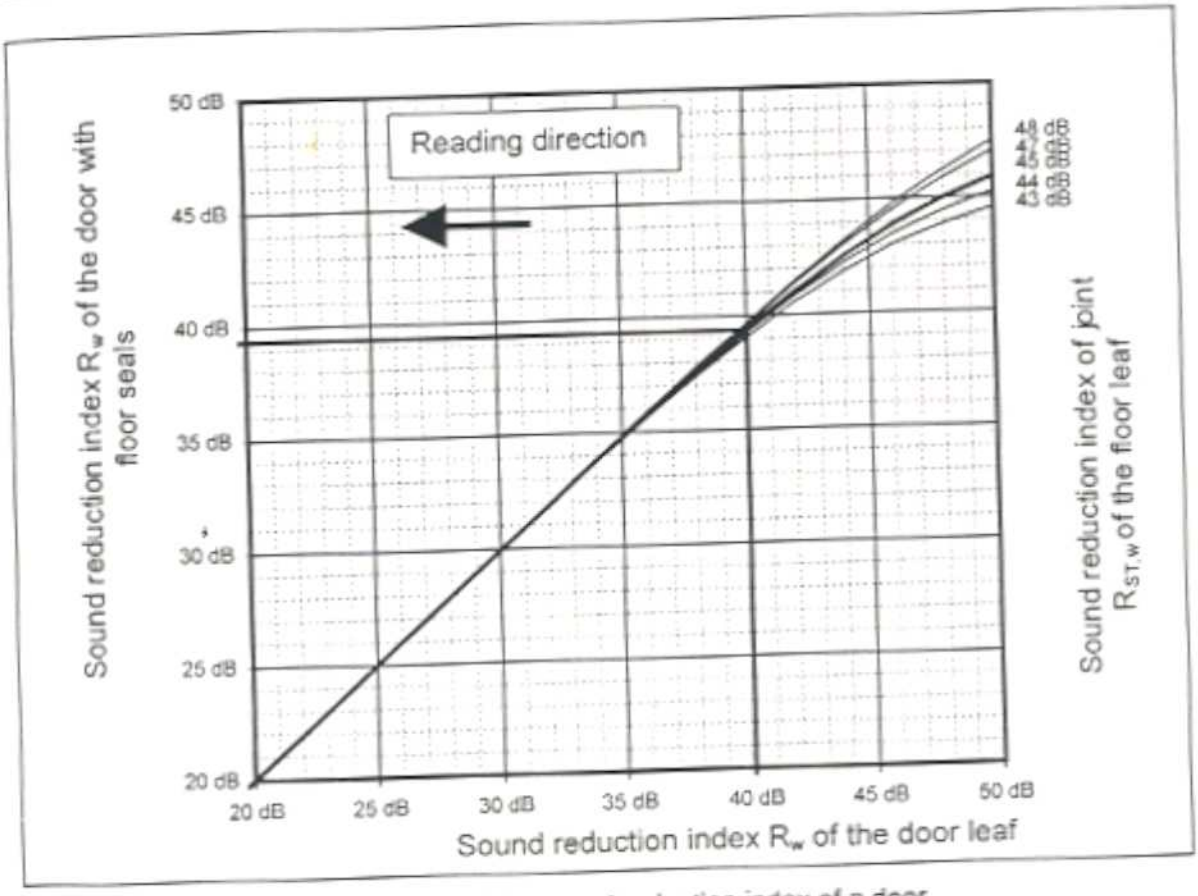


Diagram 2 Graphic representation of the sound reduction index of a door

Diagram 2 shows a graphic method to determine the sound reduction index of a door using the sound reduction index of a door leaf and the sound reduction index of the floor seal. The calculation of resulting sound reduction indices (5) with S_1 = 2 m² and l = 1 m forms the basis of the diagram.

Procedure:
Corresponding to the lower air gap b of the construction shown in table 1 or diagram 1 the weighted sound reduction index of the floor seal can be seen. Using the weighted sound reduction index of the door leaf the then resulting weighted sound reduction index can be seen from diagram 2.

Example:

Sound reduction index of the door leaf	R_w	= 40 dB
Sound reduction index of the floor seal	$R_{ST,w}$	= 45 dB
Resulting sound reduction index of the door	R_w	= 39 dB

Sound reduction index on the basis of DIN 52 210

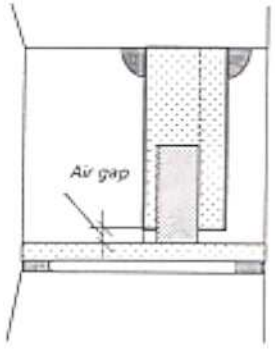
Type testing
Annex sheet 2 of 7

Customer: Comaglio S.R.L., I-25080 Muscoline

Test specimen: Floor seal "1700 No Sound"

Geometry of the joint:

Length: 1000 mm
Air gap: - mm
Depth: ≈ 40 mm



Sketch of the test arrangement
(not in scale)

Measure:

Elastic seal on both sides (maximum insulation)

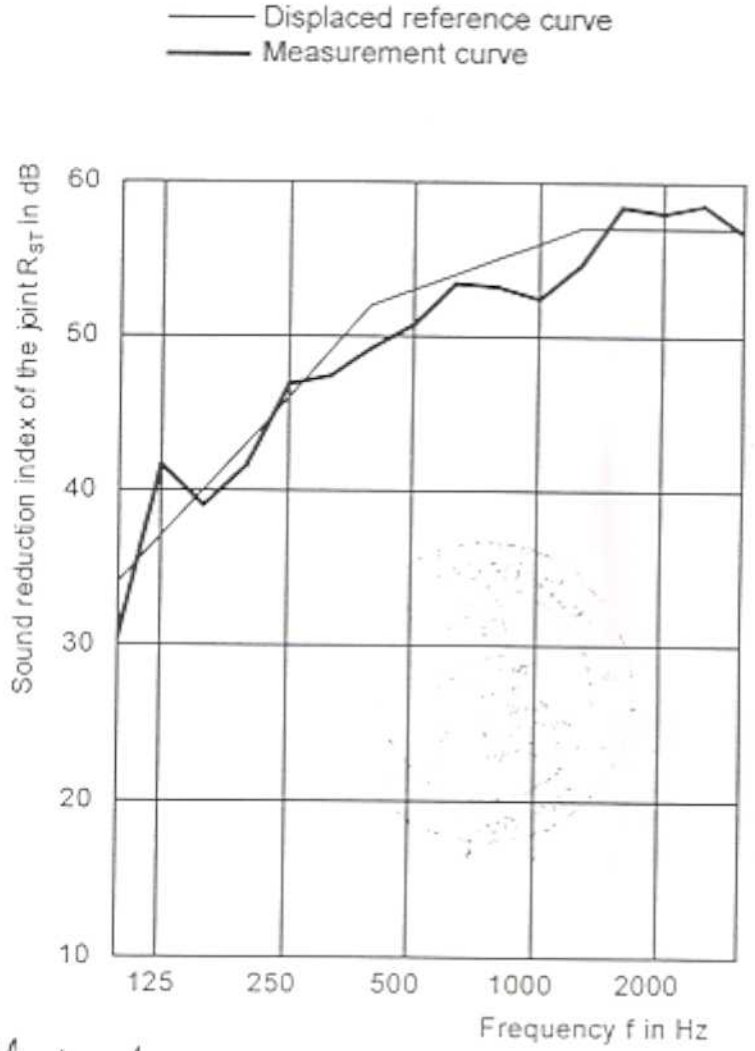
Test date 24th February 1997
Test length 1,0 m

Laboratory partition wall
Two-leaf concrete wall, DIN 52 210 Part 2 (1984)

Volumes of test rooms
V_S = 109.9 m³
V_E = 101.3 m³

Maximum sound reduction index
$R_{w,max}$ = 53 dB (based on the test length)

Mounting conditions
Insertion of cassette into highly sound insulating element.



$R_{ST,w}$ from figure R(f)

Weighted sound reduction index of the joint

$R_{ST,w}$ = 53 dB = maximum insulation

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Head of the Acoustic Department

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Sound reduction index on the basis of DIN 52 210

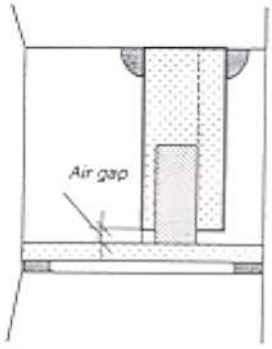
Customer: Comaglio S.R.L., I-25080 Muscoline

Type testing
Annex sheet 3 of 7

Test specimen: Floor seal "1700 No Sound"

Geometry of the joint:

Length:	1000 mm
Air gap:	2 mm
Depth:	≈ 40 mm



Sketch of the test arrangement
(not in scale)

Test date 9th October 1997

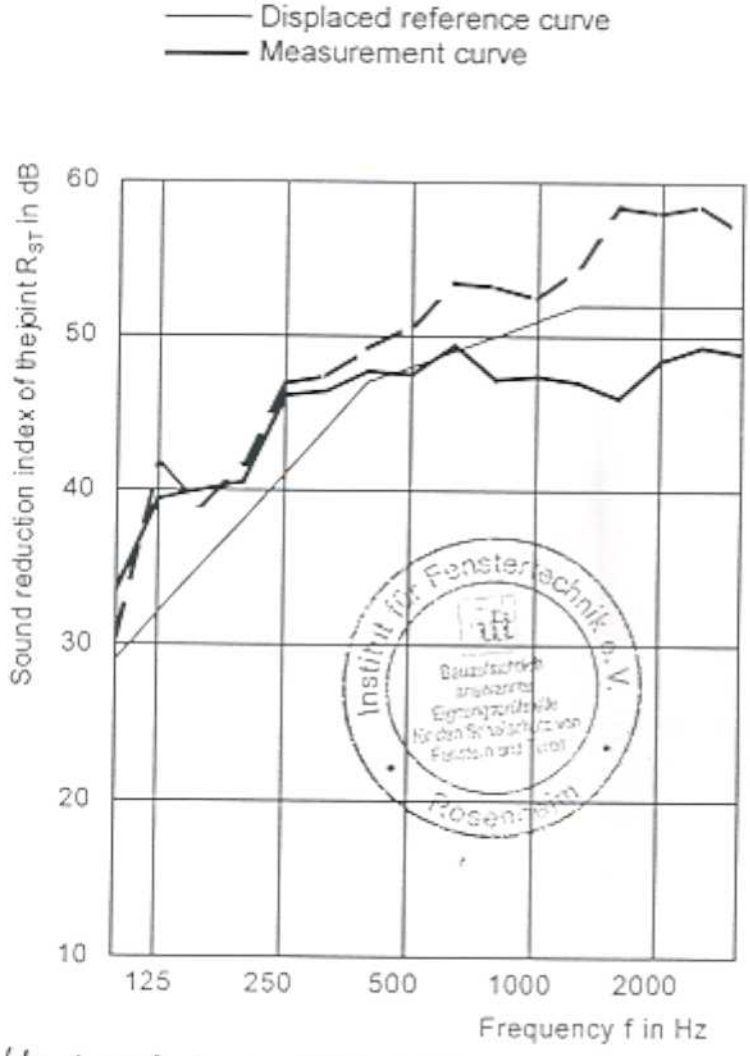
Test length 1.0 m *

Laboratory partition wall
Two-leaf concrete wall, DIN 52 210 Part 2 (1984)

Volumes of test rooms
V_S = 109.9 m³
V_E = 101.3 m³

Maximum sound reduction index
$R_{w,max}$ = 53 dB (based on the test length)

Mounting conditions
Insertion of cassette into highly sound insulating element.



$R_{ST,w}$ from figure R(f)

Weighted sound reduction index of the joint

$R_{ST,w}$ = 48 dB

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Head of the Acoustic Department

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Sound reduction index
on the basis of DIN 52 210

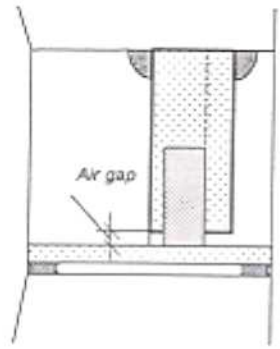
Customer: Comaglio S.R.L., I-25080 Muscoline

Type testing
Annex sheet 4 of 7

Test specimen: Floor seal
1700 No Sound

Geometry of the joint:

Length:	1000 mm
Air gap:	4 mm
Depth:	≈ 40 mm



Sketch of the test arrangement
(not in scale)

Test date 9th October 1997

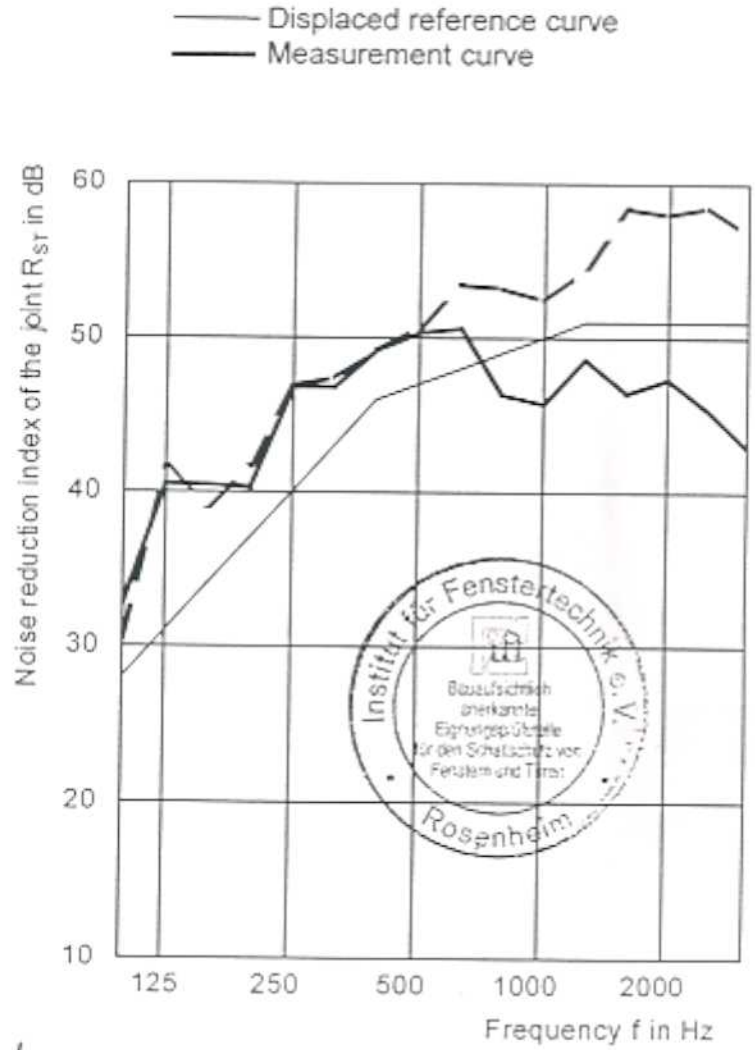
Test length 1.0 m

Laboratory partition wall
Two-leaf concrete wall, DIN 52 210 Part 2 (1984)

Volumes of test rooms
V_S = 109.9 m³
V_E = 101.3 m³

Maximum sound reduction index
$R_{w,max}$ = 53 dB (based on the test length)

Mounting conditions
Insertion of cassette into highly sound insulating element.



$R_{ST,w}$ from figure R(f)

Weighted sound reduction index of the joint

$R_{ST,w}$ = 47 dB

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Sound reduction index
on the basis of DIN 52 210

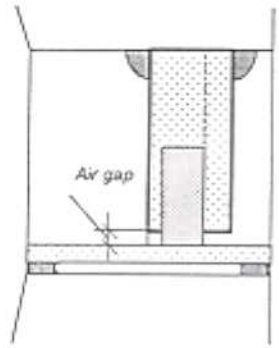
Customer: Comaglio S.R.L., I-25080 Muscoline

Type testing
Annex sheet 5 of 7.

Test specimen: Floor seal
1700 No Sound

Geometry of the joint:

Length:	1000 mm
Air gap:	6 mm
Depth:	≈ 40 mm



Sketch of the test arrangement
(not in scale)

Test date 9th October 1997

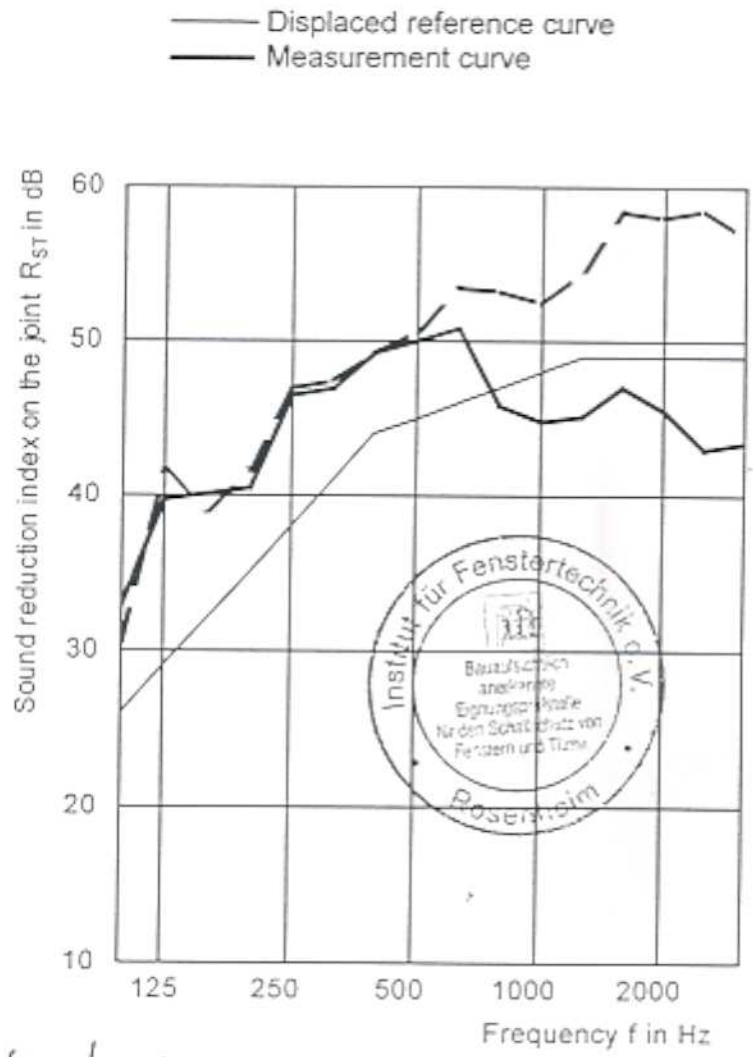
Test length 1.0 m

Laboratory partition wall
Two-leaf concrete wall, DIN 52 210 Part 2 (1984)

Volumes of test rooms
V_S = 109.9 m³
V_E = 101.3 m³

Maximum sound reduction index
$R_{w,max}$ = 53 dB (based on the test length)

Mounting conditions
Insertion of cassette into highly sound insulating element.



$R_{ST,w}$ from figure R(f)

Weighted sound reduction index of the joint

$R_{ST,w}$ = 45 dB

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Sound reduction index
on the basis of DIN 52 210

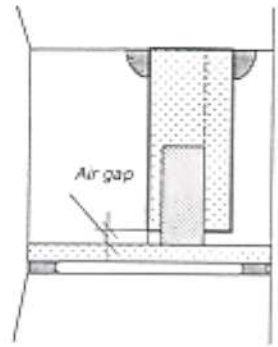
Customer: Comaglio S.R.L., I-25080 Muscoline

Type testing
Annex sheet 6 of 7

Test specimen: Floor seal
1700 No Sound

Geometry of the joint:

Length:	1000 mm
Air gap:	8 mm
Depth:	≈ 40 mm



Sketch of the test arrangement
(not in scale)

Test date 9th October 1997

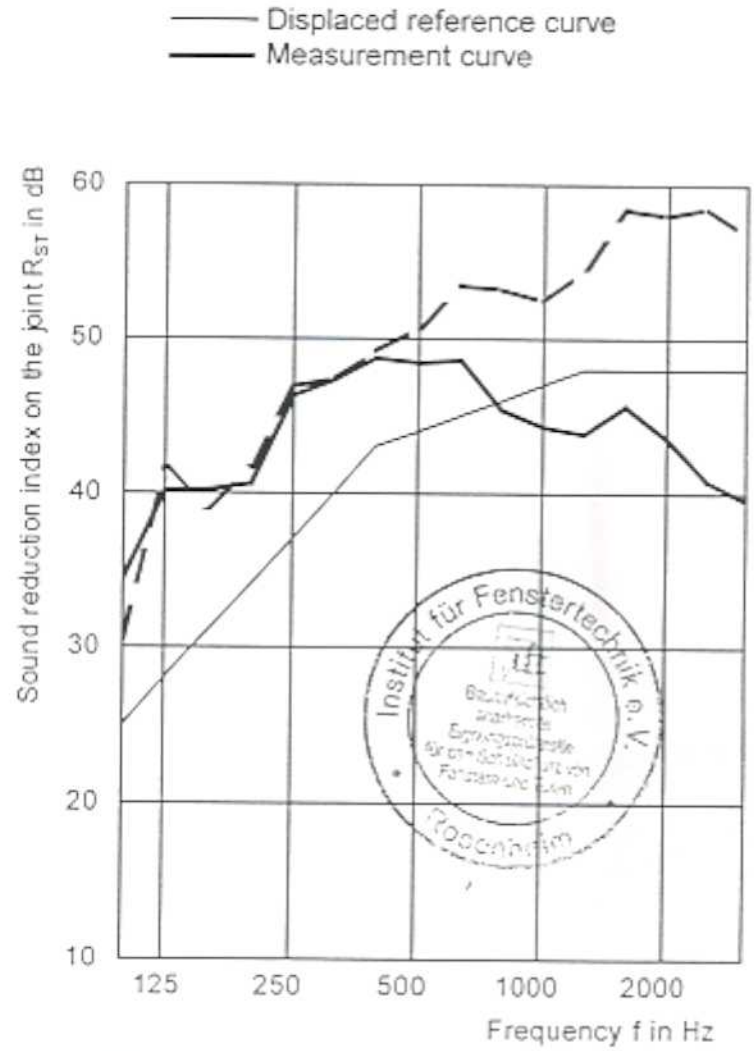
Test length 1.0 m

Laboratory partition wall
Two-leaf concrete wall, DIN 52 210 Part 2 (1984)

Volumes of test rooms
V_S = 109.9 m³
V_E = 101.3 m³

Maximum sound reduction index
$R_{w,max}$ = 53 dB (based on the test length)

Mounting conditions
Insertion of cassette into highly sound insulating element.



$R_{ST,w}$ from figure R(f)

Weighted sound reduction index of the joint

$R_{ST,w}$ = 44 dB

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Head of the Acoustic Department

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Sound reduction index on the Basis of DIN 52 210

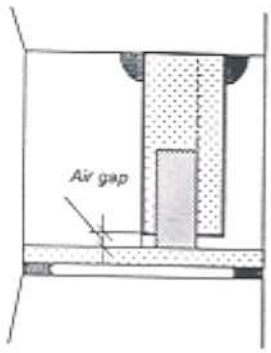
Type testing
Annex sheet 7 of 7

Customer: Comaglio S.R.L., I-25080 Muscoline

Test specimen: Floor seal
1700 No Sound

Geometry of the joint:

Length:	1000 mm
Air gap:	10 mm
Depth:	≈ 40 mm



Sketch of the test arrangement
(not in scale)

Test date 9th October 1997

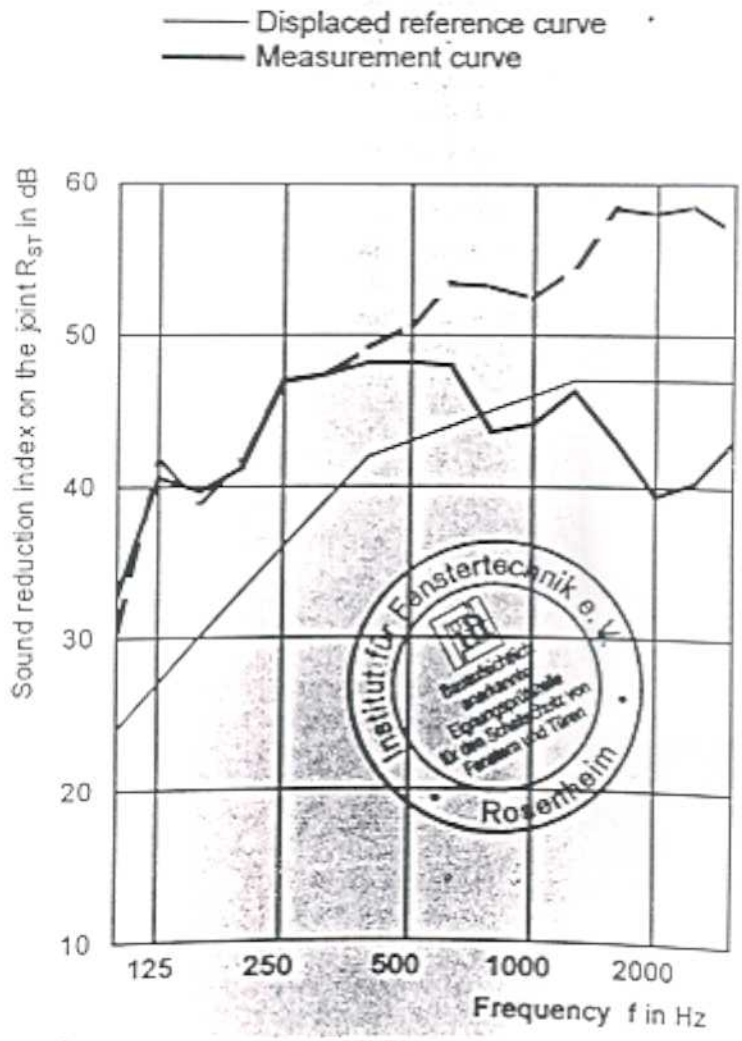
Test length 1.0 m

Laboratory partition wall
Two-leaf concrete wall, DIN 52 210 Part 2 (1984)

Volumes of test rooms
V_S = 109.9 m³
V_E = 101.3 m³

Maximum sound reduction index
$R_{w,max}$ = 53 dB (based on the test length)

Mounting conditions
Insertion of cassette into highly sound insulating element.



$R_{ST,w}$ from figure R(f)

Weighted sound reduction index of the joint

$R_{ST,w}$ = 43 dB

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