Classification report

Joint sound reduction of filling material

Test report 167 28330e

This is a translation of the test report 167 28330 of 1st June 2004.

Customerr

Soudal N.V.
Everdongenlaan 18-20

2300 Turnhout
Belgien

Product: Soudafoam 1K
Soudafoam Gun
Soudafoam Gun (Click & Fix)
Product labelling: Soudafoam Gun Low Expansion (Click & Fix)

Specials: -/-

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

$$R_{ST,w}\ (C;C_{tr}) = 58\ (-1;-6)\ dB$$

Determined for 10 and 20 mm width

Foundation

ift guideline SC-01/2 „Determination of sound reduction index of joints“ 2002-09
Test report 167 28330 from 1st June 2004 in german language

Representation

Purpose

This procedure is suited for comparison of building products to 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“

This page can be used as short version

ift Rosenheim
22. Juli 2005

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This test report includes 8 pages

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Sachverständige Prüfstelle Gruppe I
für Eignungs- und Güteprüfung nach DIN 4109

1 Test specimen

1.1 Description

Product	Soudafoam 1K
Manufacturer*	Soudal N.V.
Date of manufacturing	26th April 2004 (Creating the specimen)
Product labelling	Soudafoam Gun
	Soudafoam Gun (Click & Fix)
	Soudafoam Gun Low Expansion (Click & Fix)
Article No.	562953
Production code	EXP 31/03/2005
Size	
Length of joint l	1200 mm
Depth of joint d	100 mm
Width of joint w	10 mm und 20 mm
Covering of joint	no cover, foam cutted
Conditioning time	2 days
Moulded density	13,9 g/l

The description 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 consists of a highly sound insulating element made of metal-profiles and a steel sheet with cassettes to be inserted; the profiles are filled with sand. Using these cassettes, joints with variable joint width b may be created (fig. 1).

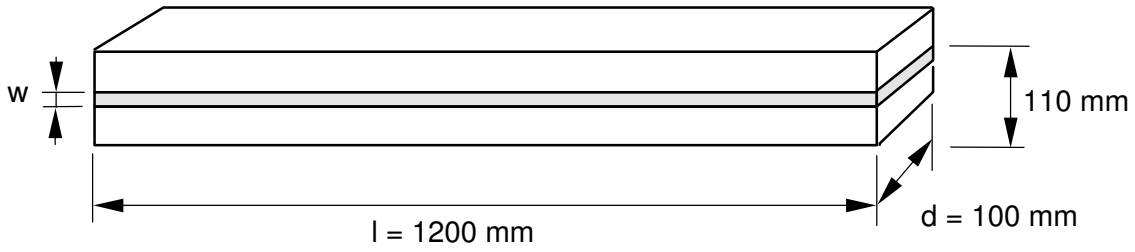


Fig. 1 Inserted cassettes

This cassettes was filled 2 days before the test by **ift** with the filling material acc. to the guideline of the manufacturer. After the hardening the material was cut on the edges and mounted in the highly sound insulating element (fig. 2), which was mounted in the test opening of the window-test rigg acc. to DIN EN ISO 140-1 : 1998-03. The joints to the test opening were filled with cellular material and sealed with putty type Typ Perennator 2001 S on both sides.

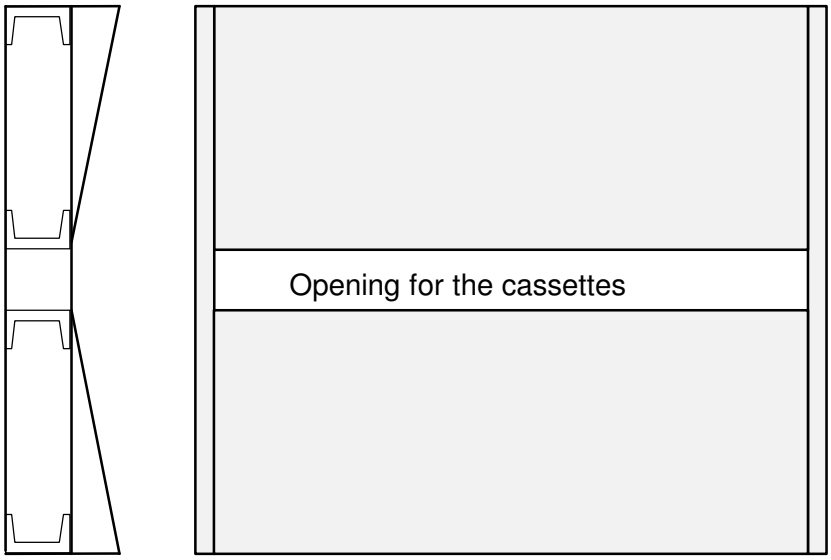


Fig. 2 highly sound insulating element

Fig. 3 Picture of the mounted element (taken by ift)

2 Test procedure

2.1 Specimen collection

Selection of the specimen by customer. The cassettes with the filling material were made by **ift** according to the specification of the manufacturer.

Quantity	2 cassettes
Supply	26th April 2004
Registry No.	16765

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 from 50 Hz up to 500 Hz 1/3rd octave band noise from 630 up to 5000 Hz
Test filter	1/3rd octave band filter
Measurement limits	
Background noise	The background noise in the receiving room was measured during the test and corrected acc. to the procedure described in DIN EN 20140-3:1995 chapter 6.5
Maximum insulation	The maximum insulation of the test arrangement is near to the test results, so the tested values are minimum values. A calculation correction was not performed.
Measurement 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
Measurement of Soundleveldifference	At least 2 speaker positions and on circulate paths moved microphones
Equation R_{ST}	$R_{ST} = L_1 - L_2 + 10\log\left(\frac{S_N \cdot l}{A \cdot l_N}\right)$ dB

Legend

R_{ST}	joint sound reduction index in dB
L_1	Soundpressurelevel source room in dB
L_2	Soundpressurelevel receiving room 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 joints is comparable with a sound reduction index of a building component for which there is a joint of 1 m length with a seal for every m^2 of area, whereby the sound is transmitted only via the joint with a seal.

If the joint is combined with a building component (e.g. doors with a surface S and the sound reduction index R) 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:

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

2.3 Equipment

Apparatus	Type	Manufacturer	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	28th April 2004
Test engineer	Bernd Saß

3 Test results

The values of the joint sound reduction index R_{ST} of the examined filling material are shown as a function of the frequency drawn up in a diagram (Annex). On the basis of this, 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 = 1.20 m following to EN ISO 717-1:1996-12 for the frequency range 100 Hz up to 3150 Hz. The maximum achievable sound insulation of the test arrangement (related to l = 1.20 m) was also drawn-up in the curve diagram yielding a weighted maximum sound reduction index

$$\mathbf{R_{ST,w\,max}\,(C;C_{tr}) = 58\,(-1;-7)\ dB}$$

The weighted joint sound insulation values for the different filling arrangements are shown in table 1.

The test results are in the range of the maximum sound insulation, so the results are minimum values. A correction of the maximum insulation was not carried out.

Table 1 Test results, depth of joint t = 100 mm

weighted joint sound reduction index $R_{ST,w}$ (C;C_{tr}) in dB	Measures taken, annotations
58 (-1;-7)	Maximum insulation
58 (-1;-6)	Width 10 mm, filled with Soudafoam Gun Soudafoam Gun (Click & Fix) Soudafoam Gun Low Expansion (Click & Fix)
58 (-1;-6)	Width 20 mm, filled with Soudafoam Gun Soudafoam Gun (Click & Fix) Soudafoam Gun Low Expansion (Click & Fix)

Remarks

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

For the practical use, i.e. the combination of the sound insulation of a window with the sound insulation of joints built in a defined window niche, the following has to be taken into account:

a) due to physical reasons, the sound reduction index of joints has to be reduced by approx. –3 dB in the area of corners and edges;
b) the real thickness of the window frame profile (joint depth t) has to be adapted with a correction of –1 up to –2 dB
c) experience shows that the filling of window niches in edges and difficult reachable areas are weak points by handling

From this results, that in practice the measured sound reduction index of joint has to be

a) either corrected with –4 dB or
b) increased by additional sealing with backfilling tape with or without covering lathes or elastic sealant.

According to the experience of **ift** the following correction reduction has to be applied for a window with an area of 1,82 m^2 and a surrounding joint length of 5,5 m (conditions in laboratory) with the sound reduction index of a window of $R_w \geq 40$ dB :

$R_{w,res} = R_w - 2$ dB

The corrective factor of –2 dB is inapplicable if a sealing is carried out on both sides additionally to the foaming.
For Elements with $R_w \geq 48$ dB higher reductions may apply.

ift Rosenheim
Schallschutzzentrum
22. Juli 2005

Jount sound reduction index acc. to **ift** Guideline SC 01

Determination of sound reduction index of joints

Customer Soudal N.V., 2300 Turnhout
Product labelling Soudafoam Gun
Soudafoam Gun (Click & Fix)
Soudafoam Gun Low Expansion (Click & Fix)

Data sheet 1

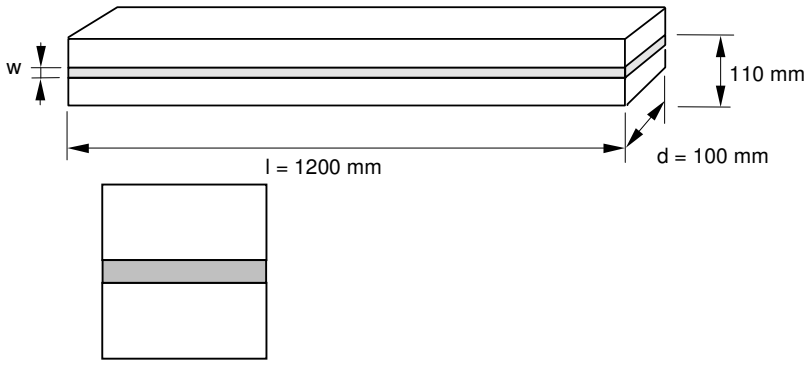
Test specimen

Soudafoam 1K

Size of joint:

Length l 1200 mm
Depth d 100 mm
Width w 10 mm

Drawing and section of the test arrangement



(Drawing not in scale)

Date of test 28th April 2004

Test length 1,20 m

Laboratory partition wall
Two-leaf concrete wall

Test noise Pink noise

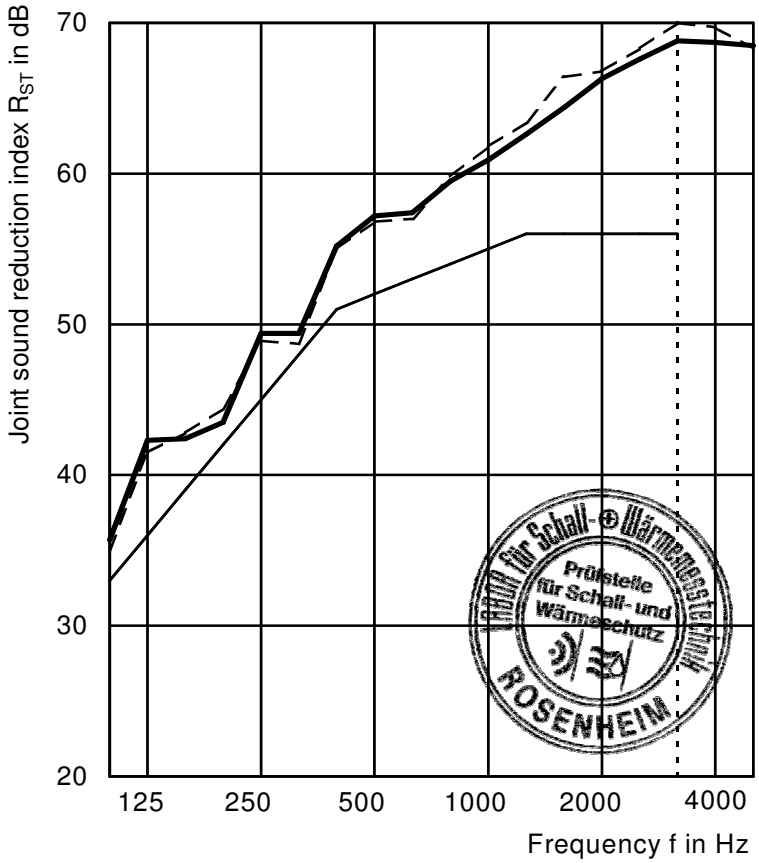
Volumes of test rooms
V_S = 109,9 m^3
V_E = 101,3 m^3

Maximum joint sound reduction index
$R_{ST,w,max}$ = 58 dB (related to test length)

Installation conditions
Mounting of the cassette in a highly sound insulating element.

Climate in the laboratory 21 °C / 41 % RF

Reference curve
Measurement curve
Maximum sound insulation
Frequency range acc. to EN ISO 717-1



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

Weighted joint sound inulation index
Weighted acc. to EN ISO 717-1

$R_{ST,w}$ ($C;C_{tr}$) = 58 (-1;-6) dB

Test report No.: **167 28330e**

ift Rosenheim
Schallschutzzentrum
22. Juli 2005

Dr. Joachim Hessinger
Head of test laboratory

Jount sound reduction index acc. to **ift** Guideline SC 01

Determination of sound reduction index of joints

Customer Soudal N.V., 2300 Turnhout
Product labelling Soudafoam Gun
Soudafoam Gun (Click & Fix)
Soudafoam Gun Low Expansion (Click & Fix)

Data sheet 2

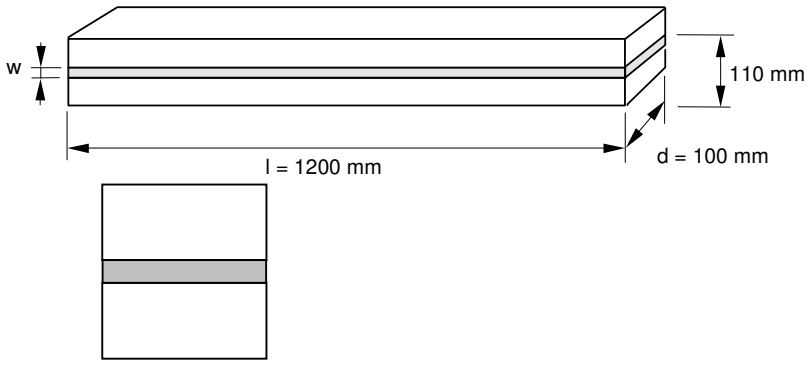
Test specimen

Soudafoam 1K

Size of joint:

Length l 1200 mm
Depth t 100 mm
Width w 20 mm

Drawing and section of the test arrangement



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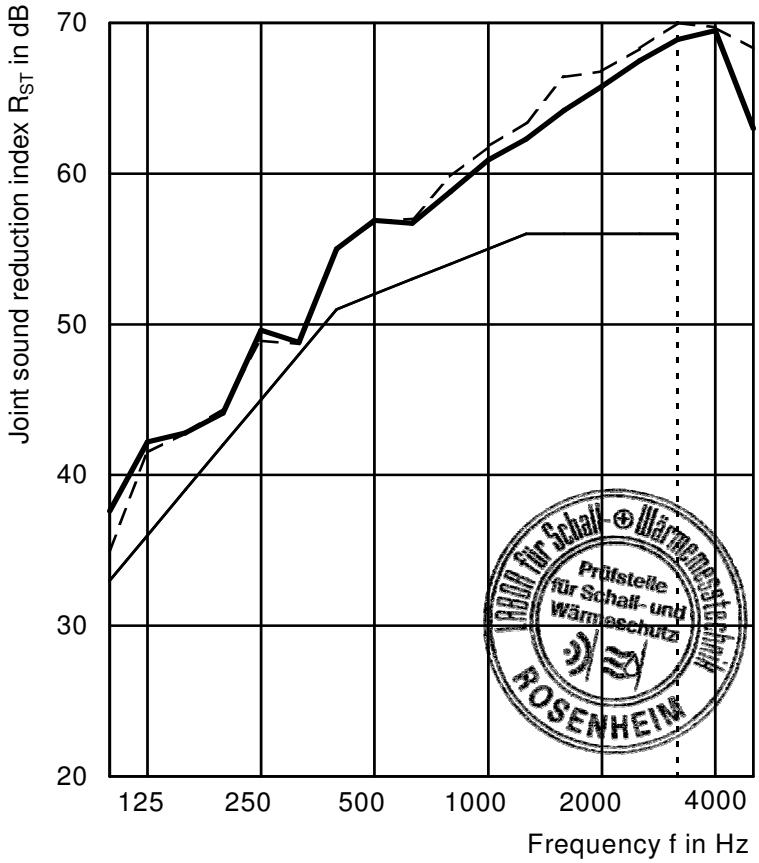

$R_{ST,w}$ from Diagram R(f)

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Weighted acc. to EN ISO 717-1

$R_{ST,w}$ ($C;C_{tr}$) = 58 (-1;-6) dB

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