

Laboratory for Acoustics

Determination of the soundinsulation of a standard metal stud build-up with 2 layersgypsum board and a metal stud profile with Gyrex GRG material

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Determination of the sound insulation of a standard metal stud build-up with 2 layers gypsum board and a metal stud profile with Gyrex GRG material

Principal: Gyrex
Vaarkant rechts 8G
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Belgium

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1 Introduction

At the request of Gyrex based in Brecht (Belgium) sound insulation measurements have been carried out on:

**a standard metal stud build up with 2 layers
gypsum board and
a metal stud profile with Gyrex GRG material**

The measurements were performed in the Laboratory for Acoustics of Peutz bv, situated at Lindenlaan 41, 6584 AC in Molenhoek (the Netherlands). See Appendix 2 for a plan of the laboratory.

2 Standards and guidelines

The measurements have been carried out according to the Quality Manual of the Laboratory for Acoustics as well as:

EN-ISO 10140-1:2021	Acoustics – Laboratory measurements of sound insulation of building elements – Part 1: Application rules for specific products
EN-ISO 10140-2:2021 ¹	Acoustics – Laboratory measurements of sound insulation of building elements – Part 2: Measurement of airborne sound insulation
EN-ISO 10140-4:2021	Acoustics – Laboratory measurements of sound insulation of building elements – Part 4: Measurement procedures and requirements
EN-ISO 10140-5:2021	Acoustics – Laboratory measurements of sound insulation of building elements – Part 5: Requirements for test facilities and equipment
EN-ISO 12999-1:2020	Acoustics – Determination and application of measurement uncertainties in building acoustics – Part 1: Sound insulation
EN-ISO 717-1:2020 ¹	Acoustics – Rating of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation

1



For these type of measurements the Laboratory for Acoustics has been accredited by the Dutch Accreditation Council (RvA).

The RvA is member of the EA MLA (**EA MLA: European Accreditation Organization Multi Lateral Agreement**: <http://www.european-accreditation.org>).

EA: "Certificates and reports issued by bodies accredited by MLA and MRA members are considered to have the same degree of credibility, and are accepted in MLA and MRA countries."

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3 Tested construction

The values mentioned are the nominal values as given by the client, unless otherwise stated (MV, measured value).

For the measurements, two elements were tested, which had been manufactured by the client beforehand.

Variant 1: Element build-up as a standard metal stud wall construction.

Build-up	50 mm metal stud profile with 45 mm Isover mineral wool. On both sides 2 layers of 12,5 mm gypsum board, type: Knauf A
Dimensions (w x h):	1485 mm x 1235 mm (MV)
Thickness:	Total construction: 100 mm (MV)
Mass:	70,2 kg (MV) = 38,3 kg/m ²



Variant 2: Element build-up with Gyrex GRG material.

Build-up	50 mm metal stud profile with 45 mm Isover mineral wool. On both sides a strip with the same width as the metal stud profile (i.e. not applied to the entire panel) of 1 layer 12,5 mm gypsum board, type: Knauf A. On both sides Gyrex material, with a maximum thickness of approx. 12.5 mm
Dimensions (w x h):	1490 mm x 1240 mm (MV)
Thickness:	Total construction: ca. 100 mm (MV)
Mass:	82,5 kg (MV) = 44,7 kg/m ²



Gyrex GRG material can be used to create curved shapes for interior metal stud walls. Both variants provide a comparison between a standard metal stud wall section and a wall section of Gyrex GRG material.

4 Measurements

4.1 Results

The results of the measurements are summarised in table t 4.1. The frequency dependent results are given in the figures of appendix 3. The measurements were performed in 1/3 octave bands. The results presented in octave bands are the arithmetic average of the three 1/3-octave bands belonging to that octave band. From those values the following single- number quantities have been calculated and stated:

- the "weighted sound reduction index R_w " and the spectrum adaptation terms C and C_{tr} according to EN-ISO 717-1:2020.

t 4.1 Measurement results sound insulation ((indicated measurement uncertainty is under reproducibility conditions)

Variant nr.	Setup	$R_w (C; C_{tr})$ [dB]	$R_w \pm U (k=2)$ [dB]	Record nr.	Appendix nr.
1	Element build-up as a standard metal stud wall construction.	49 (-2;-6)	$49,8 \pm 2,4$	#33	3.1
2	Element build-up with Gyrex GRG material	49 (-2;-7)	$49,2 \pm 2,4$	#64	3.2

The results as presented here are based on a testing area of 1,88 m². In situations where different dimensions and/or method of mounting differ from the ones tested, different results may be found.

4.2 Measurements set-up and method

The measurements were conducted in accordance with the provisions of the test method EN-ISO 10140-2:2021 in the Laboratory for Acoustics of Peutz bv in Molenhoek. A detailed description of the test set up has been given in appendix 2 of this report.

The construction to be tested is placed into a test opening between two measuring rooms. In one of the rooms (the so-called sending room) loudspeakers generate broadband noise. In this sending room as well as in the adjacent room (the "receiving room") the resulting sound pressure level is measured by means of a continuous rotating boom, so the (time- and space-) averaged sound pressure level is determined.

The reverberation time of the receiving room is also measured.

The instruments and the method used meet the requirements of EN-ISO 10140-5:2021.

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LABORATORY FOR ACOUSTICS

MEASUREMENT OF THE SOUND INSULATION ACCORDING TO EN-ISO 10140-2:2021



principal: Gyrex

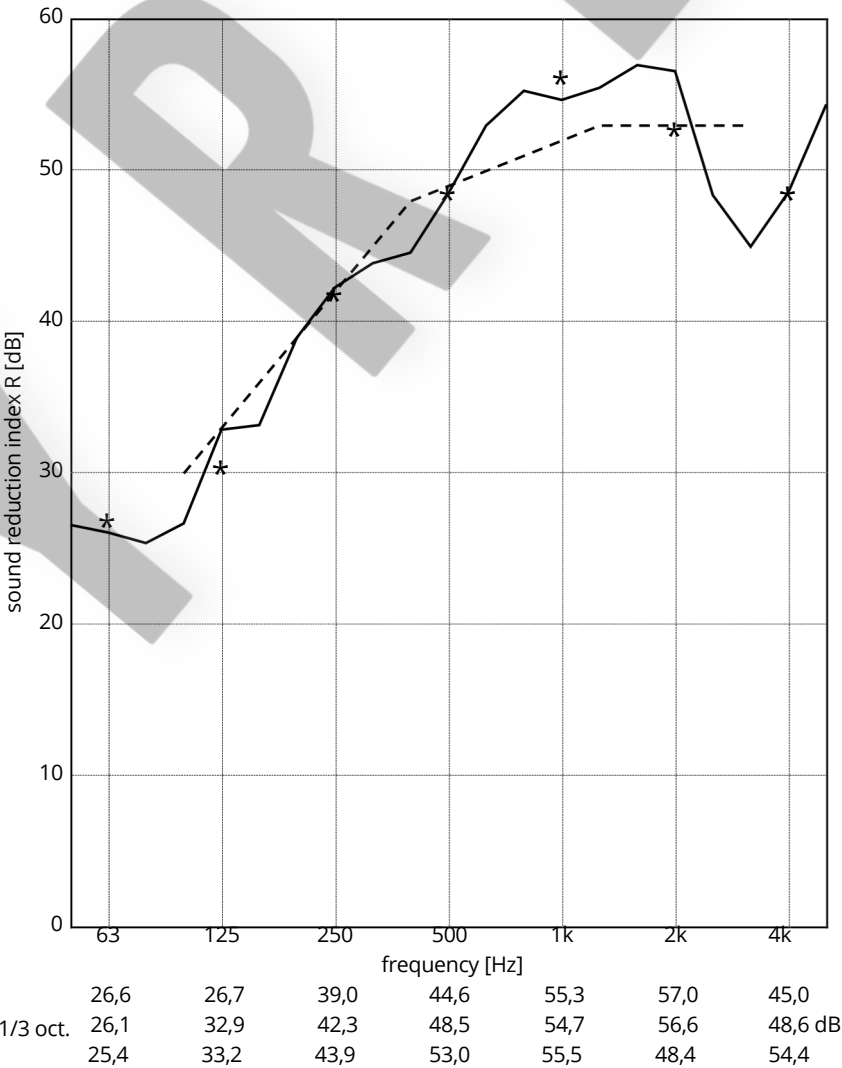


Variant 1: Element build-up as a standard metal stud wall construction.



volume measuring room
213 m³
volume measuring room
115 m³
surface area tested partition
1,88 m²
measured at
Peutz Laboratory for Acoustics
signal
broad-band noise
bandwidth
1/3 octave

ISO 717-1:2020
R_w(C;C_{tr}) = 49(-2;-6) dB
C₁₀₀₋₅₀₀₀;C_{tr,100-5000} = (-1;-6) dB
C₅₀₋₃₁₅₀;C_{tr,50-3150} = (-2;-9) dB
C₅₀₋₅₀₀₀;C_{tr,50-5000} = (-2;-9) dB



----- 1/3 oct.
* 1/1 oct.
----- ref. curve (ISO 717)

1/1 oct. 26,0 29,8 41,2 47,5 55,2 52,1 47,9 dB

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RA

Molenhoek, measured at 28-05-2026

LABORATORY FOR ACOUSTICS

MEASUREMENT OF THE SOUND INSULATION ACCORDING TO EN-ISO 10140-2:2021

PEUTZ

principal: Gyrex



Variante 2: Element build-up with Gyrex GRG material.



volume measuring room
213 m³

volume measuring room
115 m³

surface area tested partition
1,88 m²

measured at
Peutz Laboratory for Acoustics

signal
broad-band noise

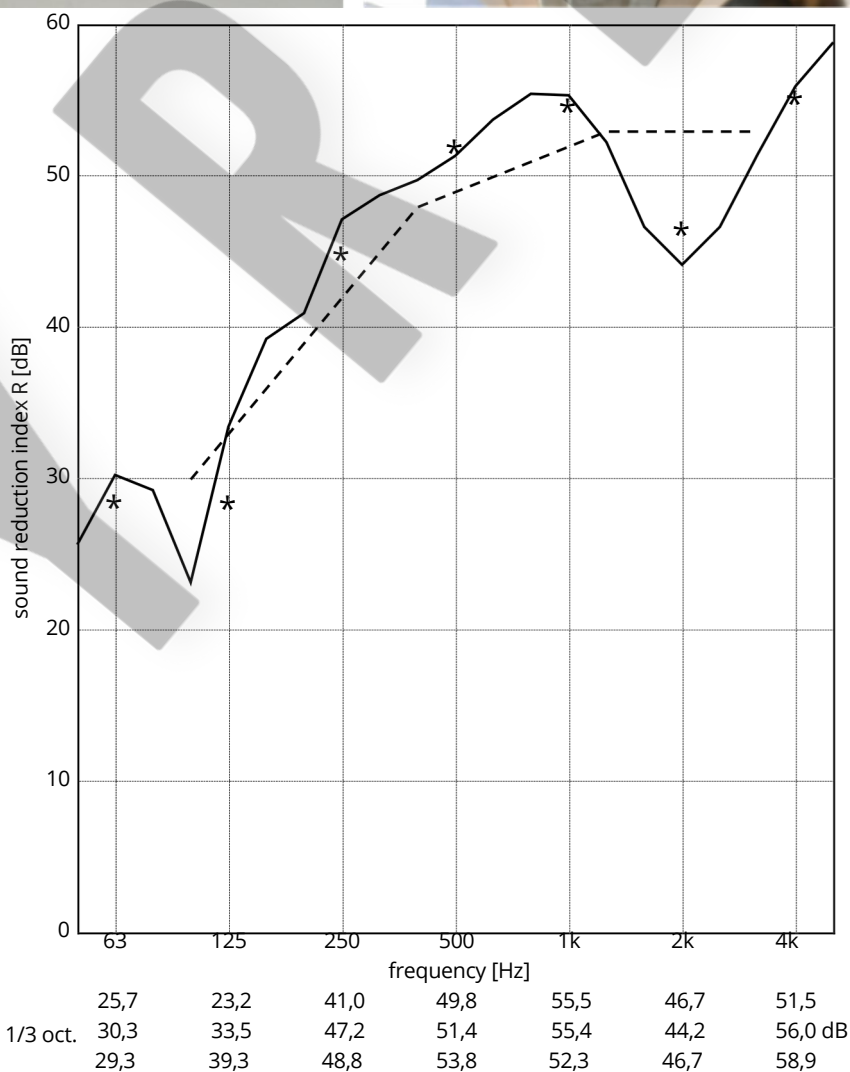
bandwidth
1/3 octave

ISO 717-1:2020
R_w(C;C_{tr}) = 49(-2;-7) dB

C₁₀₀₋₅₀₀₀;C_{tr,100-5000} = (-2;-7) dB

C₅₀₋₃₁₅₀;C_{tr,50-3150} = (-3;-9) dB

C₅₀₋₅₀₀₀;C_{tr,50-5000} = (-2;-9) dB



----- 1/3 oct.
* 1/1 oct.
----- ref. curve (ISO 717)

1/1 oct. **28,0 27,5 44,3 51,4 54,1 45,7 54,4 dB**

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RA

Molenhoek, measured at 28-05-2026

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Appendix 3.2

As stated in the EN-ISO 12999-1:2020 standard, the reproducibility with regard to the single number value R_w is $\pm 2,4$ dB. See appendix 1 of this report for a further explanation.

4.4 Environmental conditions during the measurements

t 4.2 Environmental conditions during the measurements at 28-05-2026

temperature	relative humidity
[°C]	[%]
19	64



R.T. Allan
Laboratory Supervisor



S.M.C.M. Dirkx
Management

Molenhoek,

This report contains 10 pages and 4 appendices.

appendix 1	Standard uncertainty	(1 page)
appendix 2	Plans and Sections	(2 pages)
appendix 3	Measurement results	(2 pages)
appendix 4	Drawing tested variants	(1 page)

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