Empa
Überlandstrasse 129
CH-8600 Dübendorf
T +41 44 823 55 11
F +41 44 821 62 44
www.empa.ch

Materials Science & Technology

Vescom B.V.
Postbus 70
5750 AB Deurne
Holland

Test Report
No. 207872.1.R
int. Nr. 617.5753

Assignment:	**Measurement of the sound absorption coefficient (reverberation room method)** in accordance with Standard EN ISO 354
Test object:	**Annette Douglas Textiles ACOUSTICS ®, curtain Whisper, 0% fullness, mounting distance 150 mm** (Layout: see sketch, page 2)
Client Reference:	Vescom B.V.
Date of assignment:	01.01.2010
Receipt of test object:	25.02.2011
Installation of test object:	28.02.2011
Execution of test:	28.02.2011
Number of pages:	2
Attachments:	1: Fundamentals, Calculations 2: Test Facility

EMPA reference:	575301
Performed by:	R. Pieren
Performed by:	R. Diggelmann

The measurement of the sound absorption of absorbing materials as well as the data analysis and determination of the sound absorption coefficient α_S is described in Standard EN ISO 354 (2003). Details of the measurement procedure, the test layout, installation and dimensions of the test facility (reverberation room), a list of the measurement equipment and the respective calibration dates are to be found in the internal Quality Assurance Document SOP-177-6 (Nr. 1059).

The description of the object and the results are presented on page 2. The numerical data represent the official values. These values are limited to the objects actually measured in the EMPA facility; they cannot necessarily be applied to a series.

The measurement accuracy for α_S is given as the standard deviation as a function of frequency in accordance with previous experience for the equipment employed:
Low frequency range 100 - 250 Hz: +/- 0.1; Middle frequency range 315 - 800 Hz: +/- 0.05;
High frequency range 1000 - 5000 Hz: +/- 0.02.

In the reverberation chamber a test area of 3m x 4m was fixed on a closed frame of height 150 mm.

Reprint of the test report of 21. March 2011

Swiss Federal Laboratories for Materials Testing and Research, Laboratory of Acoustics
Dübendorf, 22. June 2012

Vice Head of Laboratory:
R. Bütikofer

Head of Laboratory:
K. Eggenschwiler

ilac-MRA

SWISS TESTING
STS 068

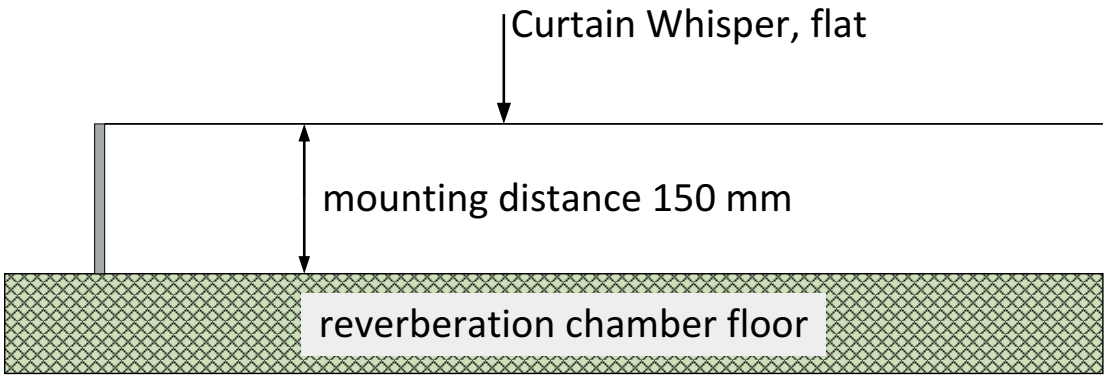
Sound Absorption Coefficient (Reverberation room)

Object: Annette Douglas Textiles ACOUSTICS®, curtain Whisper, 0% fullness, mounting distance 150 mm

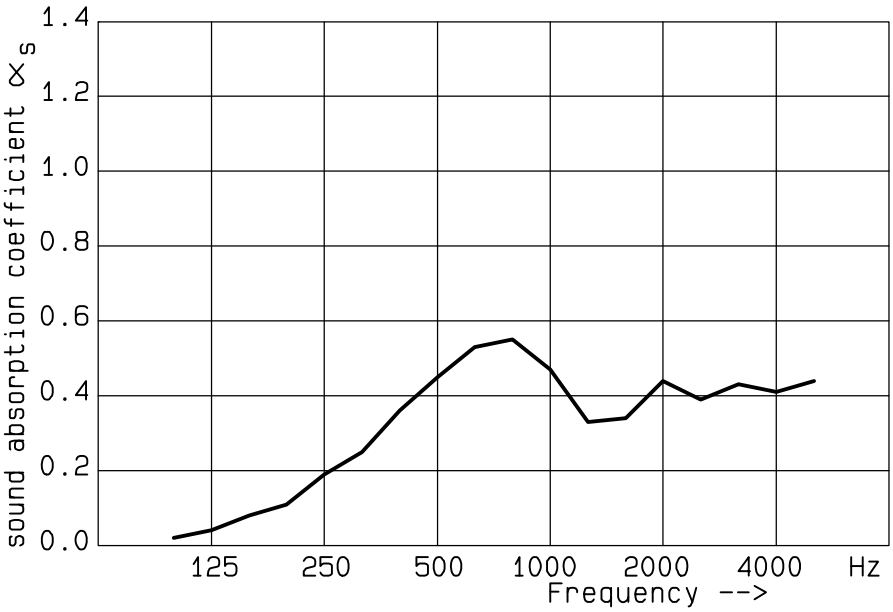
Test: Reverberation room EMPA Dübendorf Volume V: 215 m³
Temperature: 21 °C Relative humidity: 58 % Area S: 12,0 m²

Measurement no. 1
Date: 28.02.2011

Photograph and schematic vertical cut of the setup in the reverberation chamber



Frequency [Hz]	α_s
100	0.02
125	0.04
160	0.08
200	0.11
250	0.19
315	0.25
400	0.36
500	0.45
630	0.53
800	0.55
1000	0.47
1250	0.33
1600	0.34
2000	0.44
2500	0.39
3150	0.43
4000	0.41
5000	0.44



Averages of α_s:

100 - 315 Hz: 0.11 400 - 1250 Hz: 0.45 1600 - 5000 Hz: 0.41
500 - 2000 Hz: 0.44 125 - 4000 Hz: 0.34 100 - 5000 Hz: 0.32

Evaluation acc. EN ISO 11'654 (1997):

α_p: 250Hz: 0.20 500Hz: 0.45 1000Hz: 0.45 2000Hz: 0.40 4000Hz: 0.45 α_w: 0.45

Methode of measurement: ISO 354 MLS-based measurement; 1/3 octave filters; T20

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Postbus 70
5750 AB Deurne
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Test Report
No. 207872.7.R
int. Nr. 617.5753

Assignment:	**Measurement of the sound absorption coefficient (reverberation room method**) in accordance with Standard EN ISO 354
Test object:	**Annette Douglas Textiles ACOUSTICS ®, curtain Whisper, 100% fullness,mean mounting distance 150 mm** (Layout: see sketch, page 2)
Client Reference:	Vescom B.V.
Date of assignment:	01.01.2010
Receipt of test object:	25.02.2011
Installation of test object:	01.03.2011
Execution of test:	01.03.2011
Number of pages:	2
Attachments:	1: Fundamentals, Calculations 2: Test Facility

EMPA reference:	575307
Performed by:	R. Pieren
Performed by:	R. Diggelmann

The measurement of the sound absorption of absorbing materials as well as the data analysis and determination of the sound absorption coefficient α_S is described in Standard EN ISO 354 (2003). Details of the measurement procedure, the test layout, installation and dimensions of the test facility (reverberation room), a list of the measurement equipment and the respective calibration dates are to be found in the internal Quality Assurance Document SOP-177-6 (Nr. 1059).

The description of the object and the results are presented on page 2. The numerical data represent the official values. These values are limited to the objects actually measured in the EMPA facility; they cannot necessarily be applied to a series.

The measurement accuracy for α_S is given as the standard deviation as a function of frequency in accordance with previous experience for the equipment employed:
Low frequency range 100 - 250 Hz: +/- 0.1; Middle frequency range 315 - 800 Hz: +/- 0.05;
High frequency range 1000 - 5000 Hz: +/- 0.02.

In the reverberation chamber a test area of 3m x 4m was draped on tensioned wires on a closed frame of height 185 mm.

Reprint of the test report of 21. March 2011

Swiss Federal Laboratories for Materials Testing and Research, Laboratory of Acoustics
Dübendorf, 22. June 2012

Vice Head of Laboratory:
R. Bütikofer

Head of Laboratory:
K. Eggenschwiler

ilac-MRA

SWISS TESTING
STS 068

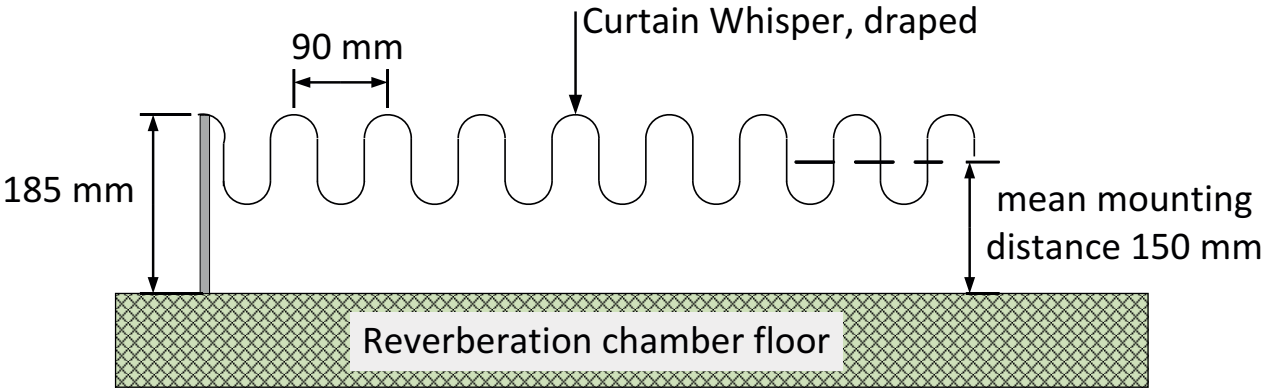
Sound Absorption Coefficient (Reverberation room)

Object: Annette Douglas Textiles ACOUSTICS®, curtain Whisper, 100% fullness, mean mounting distance 150 mm

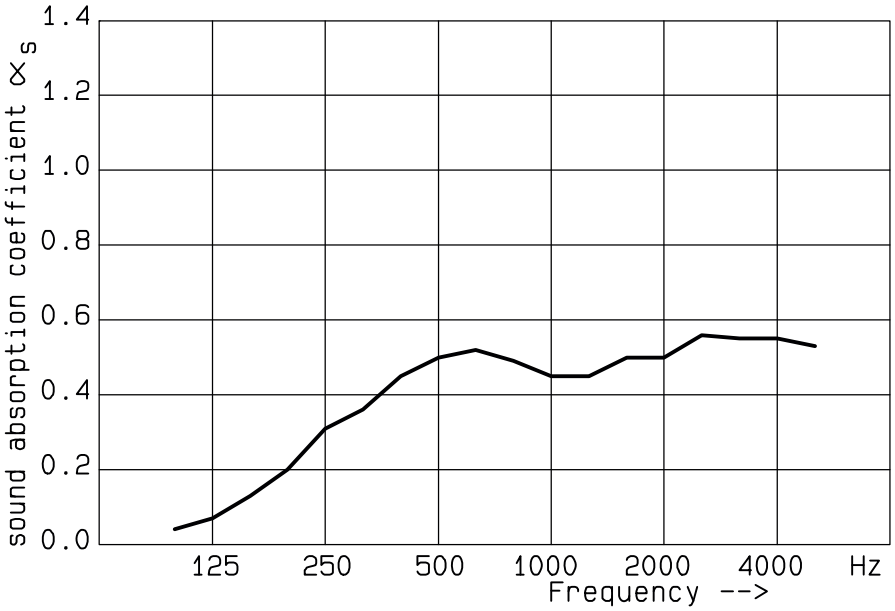
Test: Reverberation room EMPA Dübendorf Volume V: 215 m³
Temperature: 21 °C Relative humidity: 59 % Area S: 12,0 m²

Measurement no. 7
Date: 01.03.2011

Photograph and schematic vertical cut of the setup in the reverberation chamber



Frequency [Hz]	α_s
100	0.04
125	0.07
160	0.13
200	0.20
250	0.31
315	0.36
400	0.45
500	0.50
630	0.52
800	0.49
1000	0.45
1250	0.45
1600	0.50
2000	0.50
2500	0.56
3150	0.55
4000	0.55
5000	0.53



Averages of α_s:

100 - 315 Hz: 0.18 400 - 1250 Hz: 0.48 1600 - 5000 Hz: 0.53
500 - 2000 Hz: 0.49 125 - 4000 Hz: 0.41 100 - 5000 Hz: 0.40

Evaluation acc. EN ISO 11'654 (1997):

α_p: 250Hz: 0.30 500Hz: 0.50 1000Hz: 0.45 2000Hz: 0.50 4000Hz: 0.55 α_w: **0.50**

Methode of measurement: ISO 354 MLS-based measurement; 1/3 octave filters; T20