

Vescom B.V.  
Postbus 70  
NL-5750 AB Deurne  
Holland

**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 Marmara, **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  $\alpha_s$  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  $\alpha_s$  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

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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



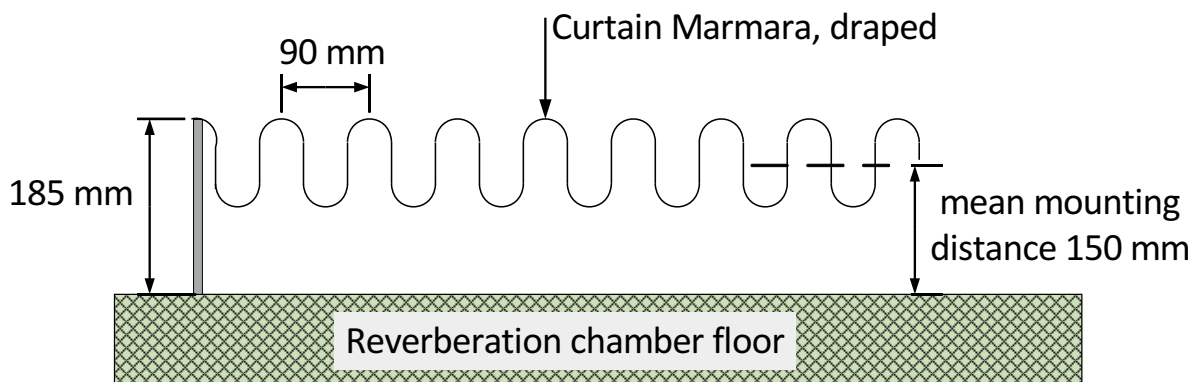
# Sound Absorption Coefficient (Reverberation room) Page 2

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

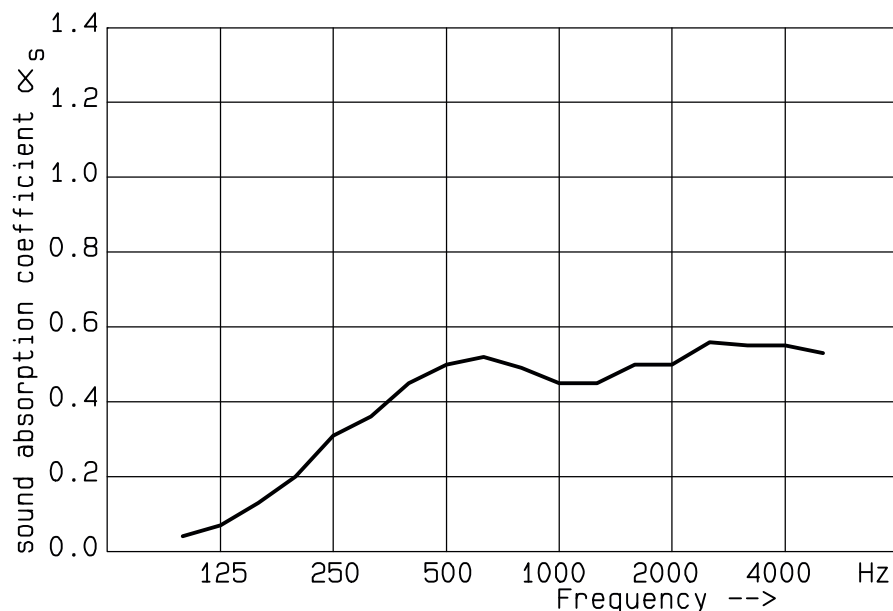
Test: Reverberation room EMPA Dübendorf      Volume V: 215 m<sup>3</sup>  
Temperature: 21 °C    Relative humidity: 59 %    Area S: 12,0 m<sup>2</sup>

Measurement no. 7  
Date: 01.03.2011

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



Frequency	$\alpha_s$
[Hz]	
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  $\alpha_s$ :

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):

$\alpha_p$ : 250Hz: 0.30    500Hz: 0.50    1000Hz: 0.45    2000Hz: 0.50    4000Hz: 0.55     $\alpha_w$ : 0.50

Methode of measurement: ISO 354

MLS-based measurement; 1/3 octave filters; T20

**EMPA**  
CH-8600 Dübendorf

Test Report:  
207872.7

Client:  
Annette Douglas Textiles AG, CH-5430 Wettingen

Internal no.  
575307  
617.5753

Vescom B.V.  
Postbus 70  
NL-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 Marmara, 0% fullness, mounting distance 150 mm**  
(Layout: see sketch, page 2)

Client Reference: Mrs. A. Douglas

Date of assignment: 01.01.2010

Receipt of test object: 25.02.2011      EMPA reference: 575301

Installation of test object: 28.02.2011      Performed by: R. Pieren

Execution of test: 28.02.2011      Performed by: R. Diggelmann

Number of pages: 2

Attachments: 1: Fundamentals, Calculations  
2: Test Facility

The measurement of the sound absorption of absorbing materials as well as the data analysis and determination of the sound absorption coefficient  $\alpha_s$  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  $\alpha_s$  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, 18. May 2012

Vice Head of Laboratory:  
R. Bütikofer



Head of Laboratory:  
K. Eggenschwiler

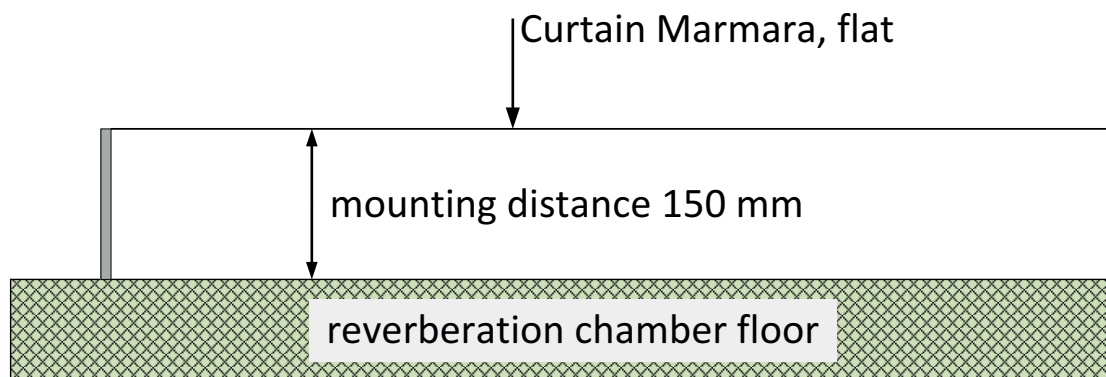


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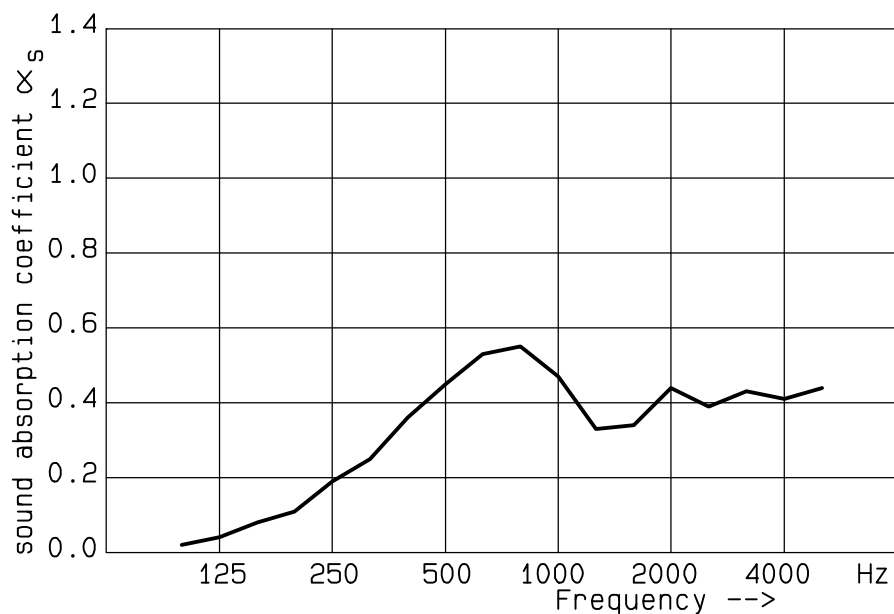
Object: Annette Douglas Textiles ACOUSTICS®, curtain Marmara,  
0% fullness, mounting distance 150 mm

Test: Reverberation room EMPA Dübendorf      Volume V: 215 m<sup>3</sup>      Measurement no. 1  
Temperature: 21 °C    Relative humidity: 58 %    Area S: 12,0 m<sup>2</sup>      Date: 28.02.2011

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



Frequency $\alpha_s$ [Hz]	
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 $\alpha_s$ :			
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):			
$\alpha_p$ : 250Hz: 0.20	500Hz: 0.45	1000Hz: 0.45	2000Hz: 0.40    4000Hz: 0.45 $\alpha_w$ : 0.45

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