Acoustic test report no 23015

<table>
<tr><td>Laboratory</td><td>AcouTechLab (Laboratory of Acoustics)
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<tr><td>Date</td><td>27.09.2023</td></tr>
<tr><td>Customer</td><td>EHL Profiles Group
Ruusi tee 12,
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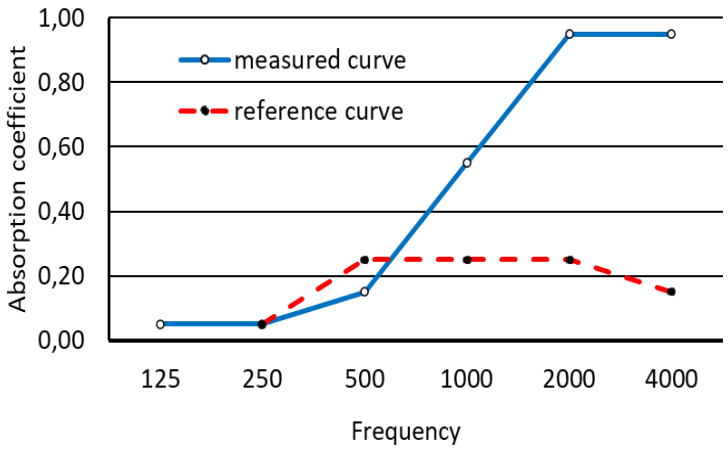
Viljandi county, Estonia</td></tr>
<tr><td>Task</td><td>Determination of sound absorption coefficient, weighted sound absorption coefficient and noise absorption class</td></tr>
<tr><td>Test object</td><td>Frame panels: WHISPER panel 7x300/12x27, see Appendix A1</td></tr>
<tr><td>Method</td><td>Reverberation room method according to EN ISO 354:2003
and EVS-EN ISO 11654:1999, see Appendix A2</td></tr>
<tr><td>Results</td><td>
<table>
<tr><th>Freq. Hz</th><th>Absorber</th><th>Ref. curve</th></tr>
<tr><td>125</td><td>0,05</td><td></td></tr>
<tr><td>250</td><td>0,05</td><td>0,05</td></tr>
<tr><td>500</td><td>0,15</td><td>0,25</td></tr>
<tr><td>1000</td><td>0,55</td><td>0,25</td></tr>
<tr><td>2000</td><td>0,95</td><td>0,25</td></tr>
<tr><td>4000</td><td>0,95</td><td>0,15</td></tr>
</table>


The weighted sound absorption coefficient of the object is 0.25
The noise absorption class of the object is E
</td></tr>
<tr><td>Test conditions</td><td>Temperature: 20.2°C. humidity: 60%. barometric pressure: 99.6kPa</td></tr>
<tr><td>Responsible for the test</td><td>Jüri Lavrentjev (juri.lavrentjev@ttu.ee)
Govt Certified Expert in Tech. Acoustics,
PhD in Tech. Acoustics</td></tr>
</table>

Appendices:

A1: OBJECTS TESTED

Test object:

Frame panels, see Figure A1-1. Overall thickness 19 mm. Slats dimensions 27 x 12 mm, spacing between slats 16 mm, slats material: MDF. Rear face covered with 7 mm felt.
The tested object had dimensions 1.5x1.5 m with the total area 2.25 m^2. The test object installed in the measurement laboratory is shown in Figure A1-1.
The test object installed in the measurement laboratory is shown in Figure A1-1.
The measured absorption over the frequency range 100-5kHz is presented in Figure A1-2.

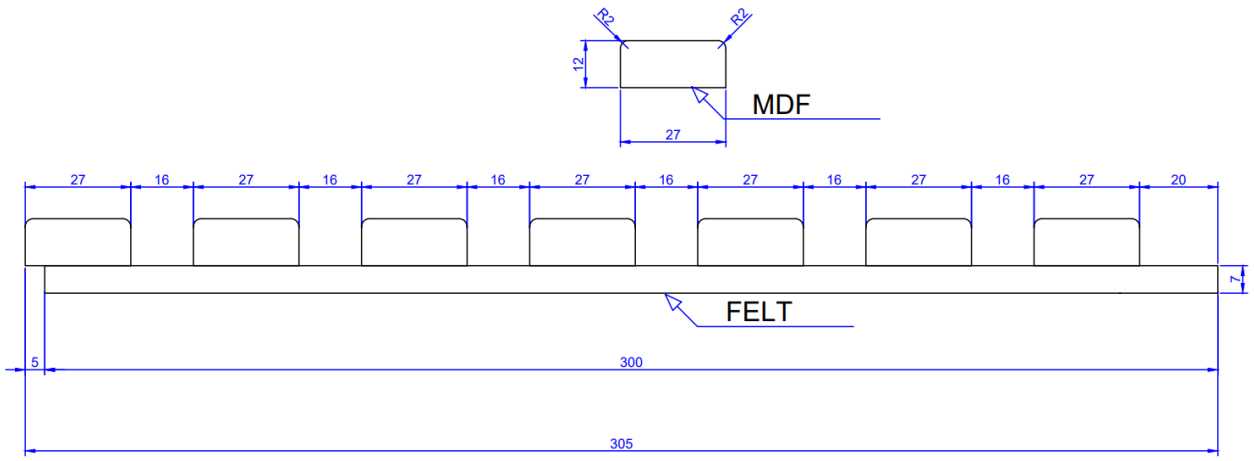


Figure A1-1. Test object installed for the measurements in acoustic laboratory, tech drawing.

Frequency, Hz	Absorption
100	0,07
125	0,07
160	0,03
200	0,06
250	0,03
315	0,06
400	0,10
500	0,10
630	0,24
800	0,35
1 k	0,55
1.25 k	0,73
1.6 k	0,88
2 k	1,00
2.5 k	0,99
3.15 k	0,99
4 k	0,97
5 k	0,82

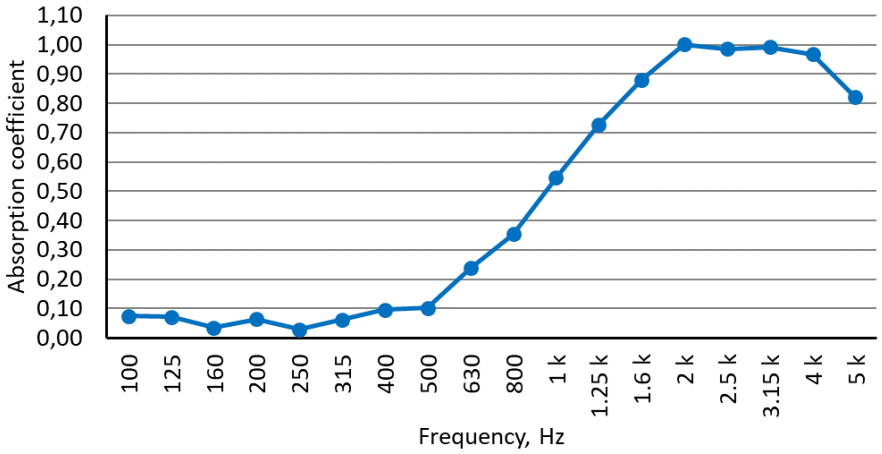


Figure A1-2. The measured absorption

A2. METHOD

Laboratory room:

Rectangular reverberation room with mansonry concrete block walls (see Figure A2-1), with the wall mass greater than 400 kg/m^2 (class: heavy). Dimensions of the room: 2.8 x 4.0 x 5.9 m. Total area of the walls: 55.4 m^2, of the floor: 23.6 m^2 and of the cealing: 23.6 m^2. An appropriate system of sound diffusers has been installed according to EN ISO 354:2003.

Equipment:

- noise level meter Brüel & Kjær 2270,
- measurement microphones Brüel & Kjær 4189,
- omnidirectional loudspeaker Brüel & Kjær 4292-L
- sound amplifier Brüel & Kjær 2734
- acoustic calibrator Brüel & Kjær 4231.

All equipment follow class 1 rating and is calibrated.

Method:

The measurements are carried out according to standard EN ISO 354:2003. The reverberation time is measured with and then without the tested object. The tested object can be installed on the wall, ceiling or floor (see Figure A2-1) or hanging freely. The interrupted noise method with white noise is applied for the reverberation time measurements. The frequency range is between 100 – 5000 Hz according to the recommendation of the standard. For both measurement cases 2 different loudspeaker positions and 6 microphone positions are used. For each measurement case the average value of 3 reverberation times is calculated. From the reverberation time data the absorption coefficient, the weighted sound absorption coefficient and the noise absorption class are then calculated.

Figure A2-1. An example of installation of test object in TalTech acoustics laboratory's reverberation room. Omnidirectional acoustic source (loudspeaker) and tripod mounted condenser microphone are exhibited in the background and foreground accordingly.