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Sound Absorption Testing of 1” DECOSOFT panels for Déco-Acoustique

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Client Déco-Acoustique
125-1097 Armand-Bombardier St.
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Specimen 25 mm (1”) thick DECOSOFT acoustic panels in Type A Mounting

Specimen IDs A1-026759-01A

Specimen description

The 25 mm (1”) thick DECOSOFT acoustic panels in standard size of 610 mm x 1220 mm (24” x 48”), were installed directly on the floor (ASTM E795 – Type A Mounting) of the large reverberation chamber in a 2 by 5 arrangement. The total surface area of the test specimen was 7.43 m² (2.438 m x 3.048 m or 8 ft x 10 ft). The joints between the panels and the edges were sealed with adhesive tape. Along the edges of the full specimen, approximately 13 mm (½”) of the panel edge was left exposed.

Figure 1: 25 mm (1”) thick DECOSOFT acoustic panels installed on the floor for ASTM C423 test

Specimen Properties

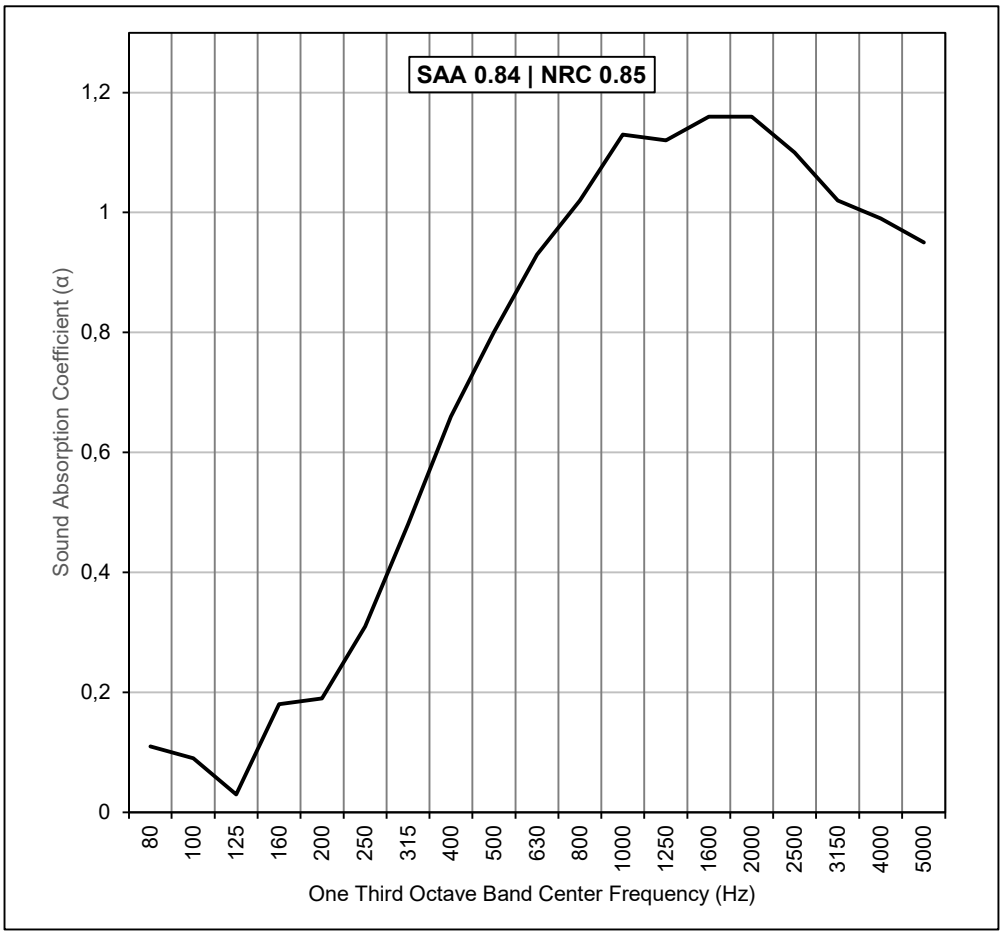
Element	Actual thickness (mm)	Mass/length, area or volume
25 mm (1”) thick DECOSOFT acoustic panels	25	2.9 kg/m^2
Total	**25**	**2.9 kg/m^2**

Sound Absorption Measured in Accordance with ASTM C423-23

Client: Déco-Acoustique
Test ID: ABA-26-002
Date of Test: 2026-02-03
Specimen ID: A1-026759-01A

Room	Volume (m^3)	Air Temperature (°C)	Relative Humidity (%)	Atmospheric Pressure (kPa)	Area of Test Specimen (m^2)
Large Chamber	251.7	22.8 to 23.0	45.8 to 47.0	100.7	7.43

Frequency (Hz)	Sound Absorption Coefficient (α)
80	0.11
100	0.09
125	0.03
160	0.18
200	0.19
250	0.31
315	0.48
400	0.66
500	0.80
630	0.93
800	1.02
1000	1.13
1250	1.12
1600	1.16
2000	1.16
2500	1.10
3150	1.02
4000	0.99
5000	0.95
SAA	0.84
NRC	0.85



In the graph: The solid line is the measured sound absorption coefficient calculated for this specimen according to ASTM C423-23.
In the table: SAA is the Sound Absorption Average, and NRC is the Noise Reduction Coefficient, as defined in ASTM C423-23.

The sound absorption measurements were conducted in accordance with the requirements of ASTM C423-23, “Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.”

The results in this report apply only to the specimen that was tested. No responsibility is assumed for the performance of any specimen other than that described in this report.

APPENDIX – ASTM C423-23 – Sound Absorption Measurement

Facility and Equipment: The NRC Construction large reverberation room used for the sound absorption testing has an approximate volume of 250 m^3 and an approximate surface area of 245 m^2. The walls, floor and ceiling are made of 300 mm thick reinforced concrete. The room is mounted on springs to provide vibration isolation. The room has a 2230 mm x 1300 mm steel door on the east wall and a 3770 mm x 2540 mm steel sliding door on the north wall. The room has four loudspeakers driven by separate amplifiers and signal generators controlled by a computer. The four loudspeaker systems are mounted at four corners facing into the trihedral corners of the room. To increase the diffusivity of the sound field, the reverberation room includes nine fixed diffusers and four rotating diffusers. The diffusers are melamine panels 2.44 m long x 1.22 m wide x 16 mm thick. The rotating diffusers are installed in the middle of the reverberation room. The fixed diffusers are placed against the four walls, with two diffusers for the north, south and west walls and three diffusers for the east wall.

Test Procedure: The sound absorption measurements were conducted in accordance with the requirements of ASTM C423-23, “Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method”. Measurements of the decay rate are made on eight different positions using eight calibrated Brüel & Kjær type 4942 microphones with preamplifier. The mean decay rates of the empty room are obtained by averaging the measurements of ten decays at each of the eight microphone positions. Similarly, the mean decay rates are obtained with the specimen in the chamber, at eight microphone positions. The mean decay rates are then used to calculate the absorption of the test specimens in each one-third octave band.

Specimen Mounting: The mounting conditions for the sound absorption testing conform to the standards ASTM C423-23 and ASTM E795-23 “Standard Practices for Mounting Test Specimens during Sound Absorption Tests.” The mounting conditions used in the measurements are described in the specimen description for each specimen.

Interpretation of Results: The sound absorption for a specimen is measured in square meters. “1 m^2 of absorption” may be thought of as one square meter of perfect absorber. Sound absorption coefficients are derived by dividing the sound absorption of the specimen at each frequency by its total surface area. Diffraction effects usually cause the effective area of a specimen to be greater than its geometrical area, thereby increasing the measured absorption coefficient. When the coefficients are large, the measured values may exceed unity, but no adjustments to the measured coefficients are made.

Sound Absorption Average (SAA) and Noise Reduction Coefficient (NRC): The SAA and the NRC values are single-number ratings that are calculated from measured sound absorption coefficients as specified in ASTM C423-23. SAA is the average of the sound absorption coefficients of a material for the one-third octave bands from 200 Hz through 2500 Hz, inclusive, rounded to the nearest multiple of 0.01. NRC is the average of the sound absorption coefficients of a material for 250 Hz, 500 Hz, 1000 Hz, and 2000 Hz, rounded to the nearest multiple of 0.05. The higher the SAA or the NRC value, the greater is the average sound absorption.