CONFIDENTIAL

TEST REPORT ON DETERMINATION OF RANDOM INCIDENCE SOUND ABSORPTION OF ECHO PUNCH ACOUSTIC DIVIDER

ULR-TC508522050000150F
NVH/3100013318/2022-23/0150

15th June 2022

1.0 CUSTOMER NAME : Senses Akustik Private Limited
Plot No. 102, New GIDC, Gundlav,
Valsad- 396 035, Gujarat

2.0 LETTER REF. : E-mail dated 10th MAY 2022

3.0 TEST COMPONENT DETAILS : Test sample details given by customer is as follows:

3.1	Product Name	:	Echo Punch Acoustic Divider
3.2	Acoustic material specification	:	Consist of Felt & Polyester foam
3.3	Dimension	:	1210 mm x 410 mm size, 25 mm thickness
3.4	Density	:	126 kg/m^3
3.5	Samples used for testing	:	8 samples used for testing

4.0 TEST REQUIREMENTS :

Measurement of equivalent sound absorption and per sample equivalent sound absorption on above mentioned test sample as per ASTM C-423 / ISO 354 in reverberation chamber.

5.0 TEST PROCEDURE :

Equivalent sound absorption and per sample equivalent sound absorption was computed by hanging 6 nos. of above mentioned test sample at a height of 1 m from ceiling as per ASTM C-423 / ISO 354 in reverberation chamber. Please refer figure 1 for test set up and test component details. Total three sets of measurement were taken and average value is reported. The measurement was carried out at temperature 25^{0}C ±1^{0}C, humidity 57% and barometric pressure 938 mbar.

6.0 DATE OF EVALUATION :

The Random incidence sound absorption measurement was carried out on above mentioned test sample on 10th June 2022.

An ISO 9001, ISO 14001, ISO 45001 and ISO/IEC 27001 Certified Organization

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7.0 INSTRUMENTATION :

Sr. No	Instrument Name	Type / Model No	Make	Calibrated on	Calibration due on
1	Multi-channel Data Acquisition System	3560 D	Bruel & Kjaer, Denmark	03-Aug-21	03-Aug-22
2	½" Random Incidence Microphone	378B20	PCB, USA	03-Aug-21	03-Aug-22
3	Power Amplifier	2716	Bruel & Kjaer, Denmark	Does not require separate calibration as it is driven by data acquisition system	
4	Omni directionnel Sound source	Omni power 4296	Bruel & Kjaer, Denmark		
5	Reverberation room	80 m^3 and 110 m^3	-	-	-

8.0 TEST RESULTS :

8.1 Table 1 and figure 2 show the values and plot for Equivalent Sound Absorption Area in Sabine m^2 of Echo Punch Acoustic Divider consist of Felt & Polyester foam of measured 1210 mm x 410 mm size, 25 mm thickness, 126 kg/m^3 density and 8 samples tested in hanging condition in the frequency range of 100 Hz to 5000 Hz

8.2 Table 2 and figure 3 show the values and plot for Per Sample Equivalent Sound Absorption Area in Sabine m^2 of Echo Punch Acoustic Divider consist of Felt & Polyester foam of measured 1210 mm x 410 mm size, 25 mm thickness, 126 kg/m^3 density and 8 samples tested in hanging condition in the frequency range of 100 Hz to 5000 Hz.

9.0 CONCLUSIONS :

Average value of per sample sound absorption of Echo Punch Acoustic Divider sample calculated in the frequency range 100 Hz to 5000 Hz.

Echo Punch Acoustic Divider consist of Felt & Polyester foam of measured 1210 mm x 410 mm size, 25 mm thickness, 126 kg/m^3 density	
Average value of per sample sound absorption of Echo Punch Acoustic Divider, Sabine's m^2	0.38

Tested and Report Prepared By:	Reviewed By:	Reviewed By:	Approved By:
P. P. Kamble	M. P. Joshi	S. K. Jain	Dr. N. H. Walke
Engineer	Dy. General Manager	General Manager	Deputy Director

TC-5085

Sachin Kumar Jain
Digitally signed by Sachin Kumar Jain
Date: 2022.07.07 18:20:15 +05'30'

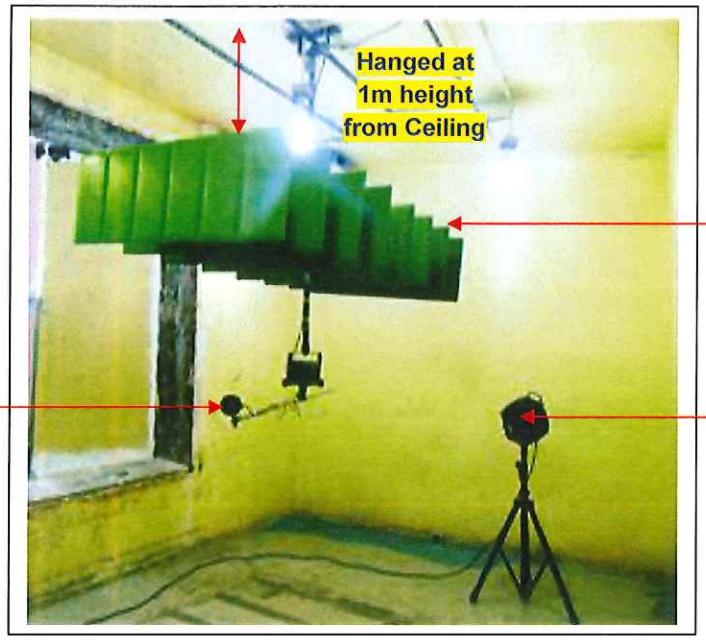

Figure 1: Test set up for mounting and testing of Echo Punch Acoustic Divider sample in reverberation chamber

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Table 1 and Figure 2: Values and Plot for Equivalent Sound Absorption Area in Sabine m^2 of Echo Punch Acoustic Divider consist of Felt & Polyester foam of measured 1210 mm x 410 mm size, 25 mm thickness, 126 kg/m^3 density and 8 samples tested in hanging condition at one third octave frequencies

One third octave frequency, Hz	Equivalent Sound Absorption Area, Sabine m^2	Standard Deviation
100	0.53	0.00
125	0.70	0.03
160	1.10	0.01
200	0.84	0.03
250	1.18	0.14
315	1.68	0.14
400	1.99	0.16
500	2.33	0.14
630	2.70	0.09
800	3.21	0.05
1000	3.85	0.17
1250	4.33	0.01
1600	4.75	0.04
2000	5.04	0.04
2500	5.11	0.05
3150	5.20	0.08
4000	5.22	0.08
5000	5.30	0.04

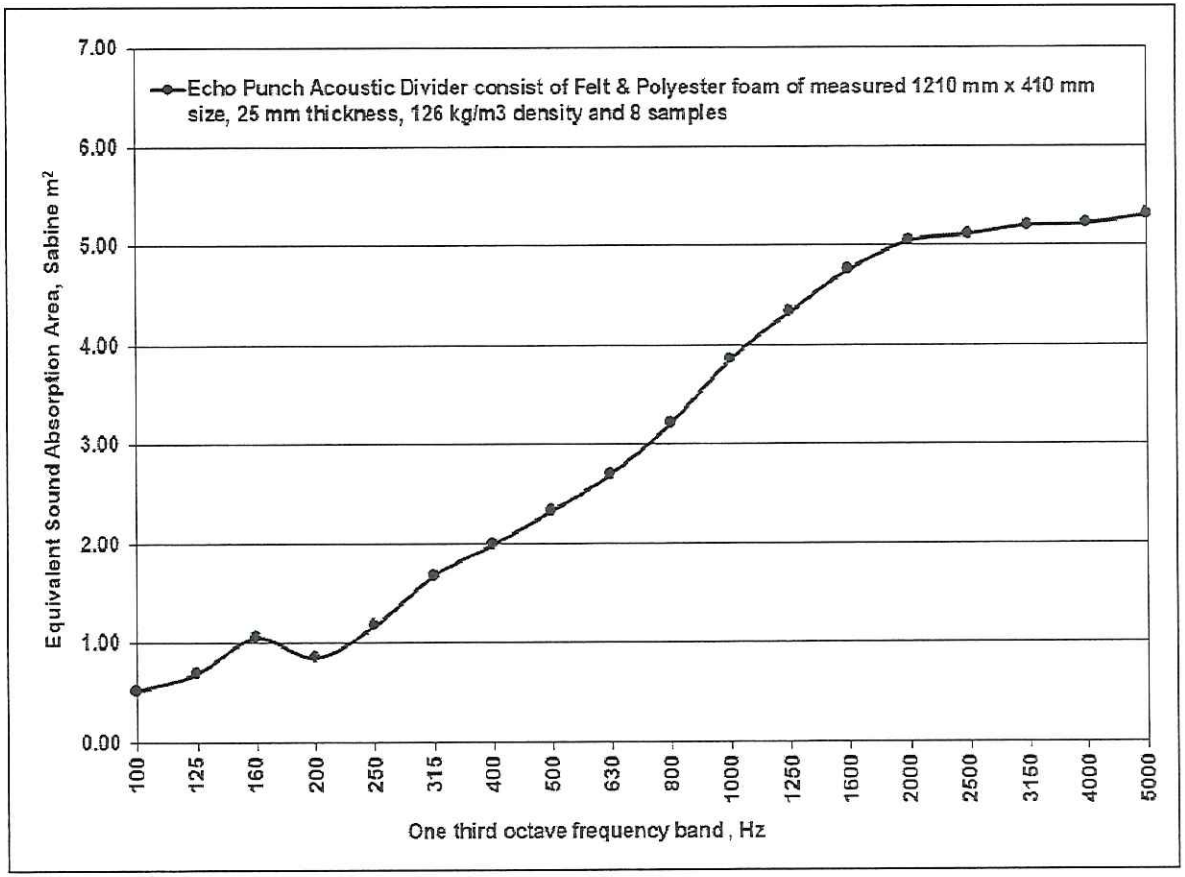

Table 2 and Figure 3: Values and Plot for Per Sample Equivalent Sound Absorption Area in Sabine m^2 of Echo Punch Acoustic Divider consist of Felt & Polyester foam of measured 1210 mm x 410 mm size, 25 mm thickness, 126 kg/m^3 density and 8 samples at one third octave frequencies

One third octave frequency, Hz	Per Sample Equivalent Sound Absorption Area, Sabine m^2	Standard Deviation
100	0.07	0.00
125	0.09	0.00
160	0.14	0.00
200	0.10	0.00
250	0.15	0.02
315	0.21	0.02
400	0.25	0.02
500	0.29	0.02
630	0.34	0.01
800	0.40	0.01
1000	0.48	0.02
1250	0.54	0.00
1600	0.59	0.00
2000	0.63	0.01
2500	0.64	0.01
3150	0.65	0.01
4000	0.65	0.01
5000	0.66	0.00