

**CONFIDENTIAL**

**TEST REPORT ON DETERMINATION OF
RANDOM INCIDENCE SOUND ABSORPTION COEFFICIENT OF
MICRO PERFORATED PLATE WITH INFILL OF PAPER HONEYCOMB OF TOTAL
105 MM THICKNESS**

ULR-TC508525050000123F

NVH/3100024017/2025-26/0123

26th April 2025

1.0 CUSTOMER NAME : SHREE VENUS ENERGY SYSTEM PVT LTD
135, Burma Colony, Perungudi,
Kancheepuram, Tamil Nadu - 600096

2.0 LETTER REF. : E-mail dated 14th April 2025

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

Micro Perforated Plate consists of Micro Perforated Aluminium sheet of 1 mm thick having hole size of 0.25 x 0.040 mm, 1 mm pitch with 0.33% open area + Infill of Paper Honeycomb having cell size of 21 mm, 200 GSM paper density and honeycomb of 100 mm thickness + Back Plate of 0.6 mm GI, total measured 105 mm thickness with Micro Perforated sheet side source facing.

3.1 Size of one plate : 600 mm X 600 mm

3.2 Total plate used for testing : 16 Nos

3.3 Date of receipt of sample : 24th April 2025

4.0 TEST REQUIREMENTS :

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

5.0 TEST PROCEDURE :

The random incidence sound absorption coefficient measurement was carried out on above mentioned test sample as per ASTM C-423 / ISO 354 in reverberation chamber. The test sample of size 2.4 m x 2.4 m was directly placed on the floor with type A mounting. Please refer figure 1 for test set up and test component details. The random incidence sound absorption coefficient test was carried out three times on same sample in reverberation chamber and average value reported. The measurement was carried out at temperature 25^oC ± 1^oC, humidity 40% and barometric pressure 936 mbar.

6.0 DATE OF EVALUATION :

The random incidence sound absorption coefficient measurement was carried out on above mentioned test samples on 25th April 2025.

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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	19-Jul-24	19-Jul-25
2	½" Random Incidence Microphone	378C20	PCB, USA	19-Jul-24	19-Jul-25
3	Power Amplifier	2716	Bruel & Kjaer, Denmark	Does not require separate calibration as it is driven by data acquisition system	
4	Omnidirectional sound source	Omni power 4296	Bruel & Kjaer, Denmark		
5	Reverberation room	80 m ³	-	-	-

8.0 TEST RESULTS :

Table 1 and figure 2 shows the average values and plot for random incidence sound absorption coefficient of Micro Perforated Plate consists of Micro Perforated Aluminium sheet of 1 mm thick having hole size of 0.25 x 0.040 mm, 1 mm pitch with 0.33% open area + Infill of Paper Honeycomb having cell size of 21 mm, 200 GSM paper density and honeycomb of 100 mm thickness + Back Plate of 0.6 mm GI, total 105 mm thickness with Micro Perforated sheet side source facing in the frequency range of 100 Hz to 5000 Hz.

9.0 CONCLUSIONS :

- 9.1 The Noise Reduction Coefficient (NRC) is given by the average value of sound absorption coefficient at 250 Hz, 500 Hz, 1000 Hz and 2000 Hz is calculated as per ASTM C- 423.
- 9.2 The weighted sound absorption coefficient (α_w) and sound absorption class are calculated as per ISO 11654 are given below :

Micro Perforated Plate consists of Micro Perforated Aluminium sheet of 1 mm thick having hole size of 0.25 x 0.040 mm, 1 mm pitch with 0.33% open area + Infill of Paper Honeycomb having cell size of 21 mm, 200 GSM paper density and honeycomb of 100 mm thickness + Back Plate of 0.6 mm GI, total 105 mm thickness with Micro Perforated sheet side source facing	
Noise Reduction Coefficient (NRC)	0.90
Weighted Sound Absorption Coefficient (α_w)	0.75 (L)
Sound Absorption Class	Class C

Tested and Report Prepared By:



P.P. Kamble
Dy. Manager

Reviewed By:



M. P. Joshi
General Manager

Reviewed By:



S.K. Jain
Dy. Director

Approved By:



Dr. N. H. Walke
Sr. Dy. Director & HOD

This test report pertains only to the samples actually tested at ARAI in the presented condition. The issuing of this test report does not indicate any measure of approval, certification, supervision, control of quality surveillance by ARAI of any product. No extract, abridgement or abstraction from this test report be published or used to advertise the product without the written consent of the Director, ARAI, who reserves the absolute right to agree or reject all or any of the details of any items of publicity for which consent may be sought.



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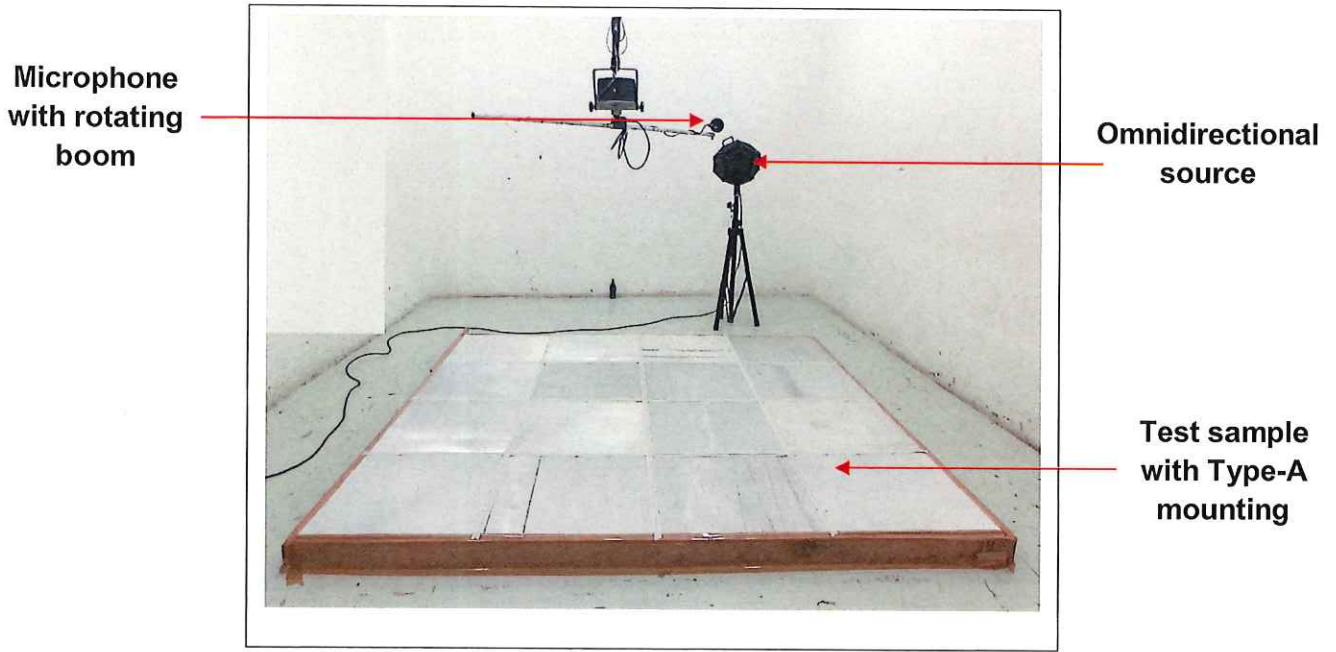
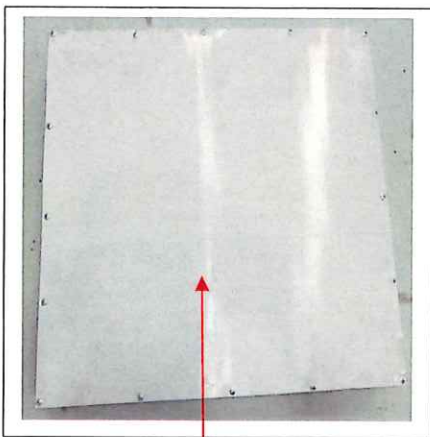
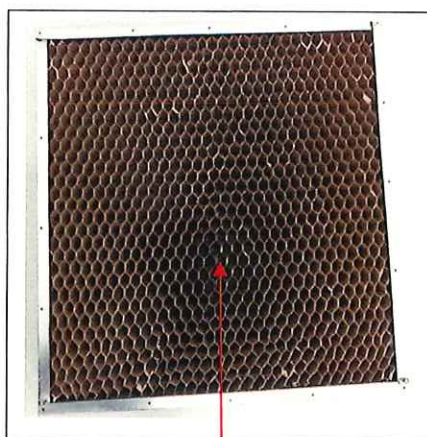


Figure 1: Test set up for mounting and testing of Metal Perforated Plate of total 105 mm thickness in Reverberation Chamber



Micro Perforated Aluminium Sheet
1 mm thick



Infill of Paper Honeycomb 100 mm thick



Back Plate 0.6 mm GI

Table 1 and Figure 2: Values and plot for random incidence sound absorption coefficient of Micro Perforated Plate consists of Micro Perforated Aluminium sheet of 1 mm thick having hole size of 0.25 x 0.040 mm, 1 mm pitch with 0.33% open area + Infill of Paper Honeycomb having cell size of 21 mm, 200 GSM paper density and honeycomb of 100 mm thickness + Back Plate of 0.6 mm GI, total 105 mm thickness with Micro Perforated sheet side source facing tested at one third octave frequencies

One third octave frequency, Hz	Random Incidence Sound Absorption Coefficient (-)	Standard Deviation
100	0.18	0.01
125	0.16	0.01
160	0.52	0.01
200	0.75	0.05
250	1.08	0.02
315	1.05	0.08
400	1.02	0.07
500	1.00	0.05
630	0.89	0.03
800	0.80	0.01
1000	0.75	0.01
1250	0.63	0.02
1600	0.56	0.01
2000	0.78	0.01
2500	0.73	0.02
3150	0.54	0.02
4000	0.70	0.01
5000	0.56	0.01

