Test Report

Korea Marine Equipment Research Institute
24-20, Noksansandan 335-ro, Gangseo-gu, Busan 46754, Rep. of Korea
Tel +82-51-400-5100, Fax +82-51-400-5191

Report No. : KOMERI-0601-18T3596
http://www.komeri.re.kr

1. Applicant

○ Date of Receipt : 2018. 09. 19

2. Equipment under Test

○ Name of Product : Acoustic Fabric

○ Model : 15 Oz Acoustic

○ Serial No. : -

3. Test Standards : ISO 354:2003, ASTM C 423-17 (Refer to the 1.2 TEST STANDARD)

4. Use of Report : Performance check, Submission for R&D project

5. Test Period : 2018. 10. 08

6. Environment : Temperature (Start 22 ℃ / End 22 ℃),
Humidity (Start 44 % R.H. / End 47 % R.H.)

7. Test Result : NRC = 0.55

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

Affirmation
Tested by Name : Soon-Seong MOON (Signature)
Technical Manager Name : Hang KIM (Signature)

This test report is the accredited test results by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

Date of issue : 2018. 11. 19

Accredited by KOLAS, Republic of KOREA

The President of Korea Marine Equipment Research Institute (Signature)

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GENERAL

■ MANUFACTURER

■ TEST SITE

· 24-20, Noksansandan 335-ro, Gangseo-gu, Busan, Korea

■ TEST SUMMARY

No.	Test Item	Test Standard	Result
1	SOUND ABSORPTION TEST	ISO 354:2003, ASTM C 423-17 (Refer to the 1.2 TEST STANDARD)	NRC = 0.55

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1. SOUND ABSORPTION TEST

1.1 TEST ENVIRONMENT

- Temperature (Start 22 ℃ / End 22 ℃)
- Humidity (Start 44 % R.H. / End 47 % R.H.)

1.2 TEST STANDARD

- ISO 354:2003 Acoustics - Measurement of sound absorption in a reverberation room
- ASTM C 423-17 Standard test method for sound absorption and sound absorption coefficients by the reverberation room method

1.3 TEST EQUIPMENT

Description	Manu-facturer	Model Number	Serial No.	Calibration Due
◆ Multi channel signal analyzer	RION	SA-01	00940076	2018. 10. 25
◆ Microphone	G.R.A.S	40AQ	118696	2019. 01. 30
◆ Microphone	G.R.A.S	40AQ	121486	2019. 02. 08
◆ Microphone	G.R.A.S	40AQ	118714	2019. 01. 30
◆ Microphone	G.R.A.S	40AQ	121469	2019. 02. 08
◆ Microphone	G.R.A.S	40AQ	157666	2019. 01. 30
◆ Microphone	G.R.A.S	40AQ	180451	2019. 02. 08
◆ Microphone calibrator	LARSON DAVIS	CAL200	12789	2019. 01. 31
◆ Speaker	CESVA	BP012	T236526	-
◆ Lower frequency speaker	VASCOM	SR 4145SUB	-	-

1.4 TEST INFORMATION

- Source : 1/3 Octave band white noise
- Frequency range of measurement : 100 Hz ~ 5 000 Hz (1/3 Octave band)
- Measurement points : 12 points (Microphone 6 points and source 2 points)
- Volume of test room : 220.0 m^3
- Surface of test room : 214.3 m^2
- Setup area of specimen : 11.5 m^2

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1.5 TEST PROCEDURE

a. The test is performed according to ISO 354:2003.
b. The reverberation time in a empty room shall be measured with interrupted noise method.
c. After installed the test specimen, measure the reverberation time in a reverberation room.
d. The sound absorption coefficient of the test specimen is evaluated from the reverberation time measured and determined using the formula

$$\alpha_s = \left(55.3V \left(\frac{1}{c_2 T_2} - \frac{1}{c_1 T_1} \right) - 4V \left(m_2 - m_1 \right) \right) \frac{1}{S}$$

(1:Empty room, 2:Room installed the test specimen)

where

α_s is the sound absorption coefficient;
V is the volume of the reverberation room, in cubic metres;
c is the propagation speed of sound in air at the temperature t;
T is the reverberation time, in seconds;
m is the power attenuation coefficient, in reciprocal metres;
S is the area covered by the test specimen, in square metres.

e. The noise reduction coefficient(NRC) of the test specimen shall be rounded from the average of the sound absorption coefficients for 250, 500, 1 000 and 2 000 Hz to the nearest multiple of 0.05 according to ASTM C 423-17.

〈 Method of test specimen mounting 〉

- Type G mounting (Type G-100)
- The mounting fixture was constructed of steel, the test specimen was installed to the distance of 100 mm from the face of the test specimen to the room surface.

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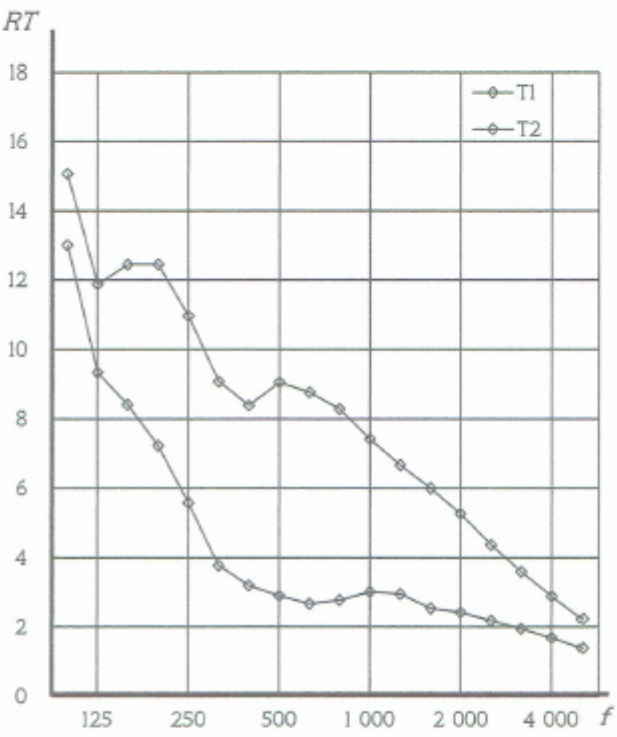
1.6 MEASUREMENT OF THE REVERBERATION TIME

frequency f Hz	T_1 one-third octave s	T_2 one-third octave s
100	15.07	13.01
125	11.88	9.34
160	12.45	8.41
200	12.45	7.22
250	10.96	5.58
315	9.08	3.77
400	8.39	3.20
500	9.06	2.90
630	8.77	2.67
800	8.29	2.78
1 000	7.41	3.02
1 250	6.66	2.95
1 600	6.00	2.54
2 000	5.27	2.42
2 500	4.37	2.18
3 150	3.60	1.95
4 000	2.89	1.69
5 000	2.23	1.40



Key
T_1 the reverberation time of the empty room, in seconds
T_2 the reverberation time of the room installed the test specimen, in seconds
RT reverberation time, in seconds
f frequency, in Hz

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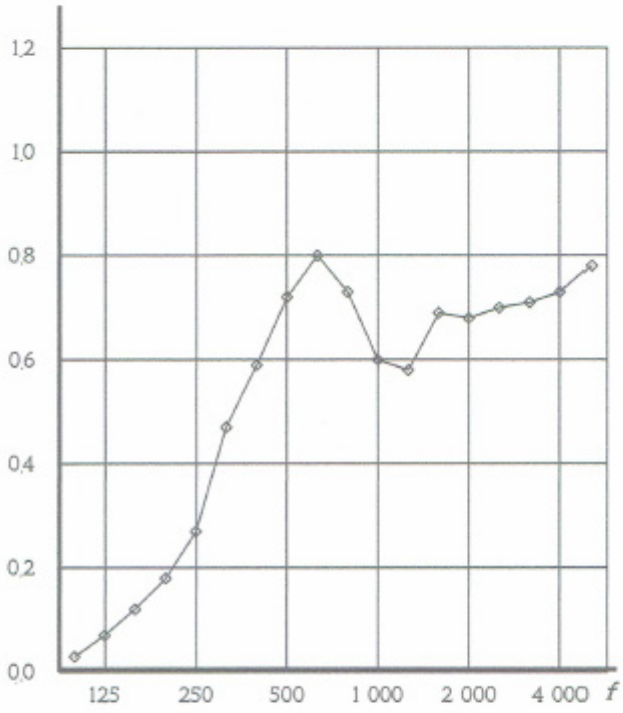
1.7 TEST RESULT

frequency f Hz	α_s one-third octave –
100	0.03
125	0.07
160	0.12
200	0.18
250	0.27
315	0.47
400	0.59
500	0.72
630	0.80
800	0.73
1 000	0.60
1 250	0.58
1 600	0.69
2 000	0.68
2 500	0.70
3 150	0.71
4 000	0.73
5 000	0.78



Key
α_s sound absorption coefficient
f frequency, in Hz

The noise reduction coefficient in accordance with ASTM C 423 :
NRC = 0.55

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1.8 TEST PHOTO

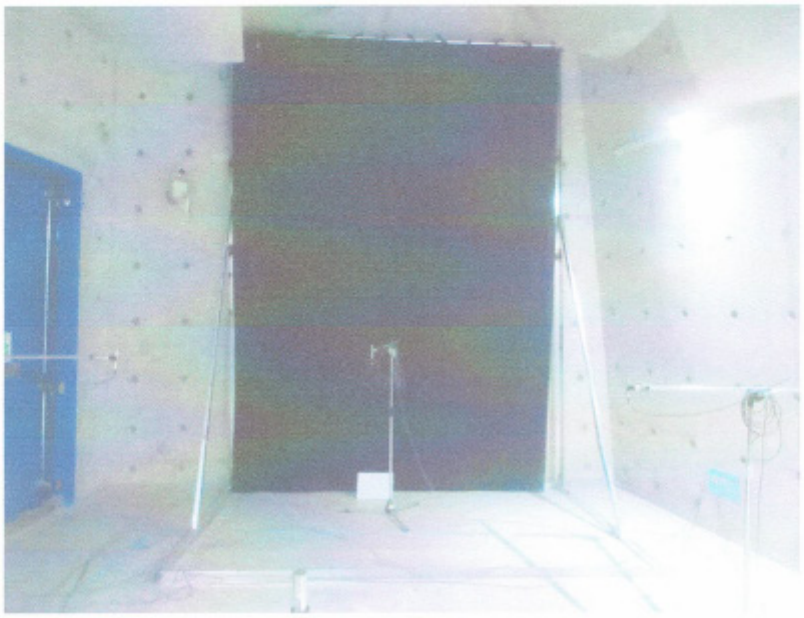

Photo 1-1 Specimen

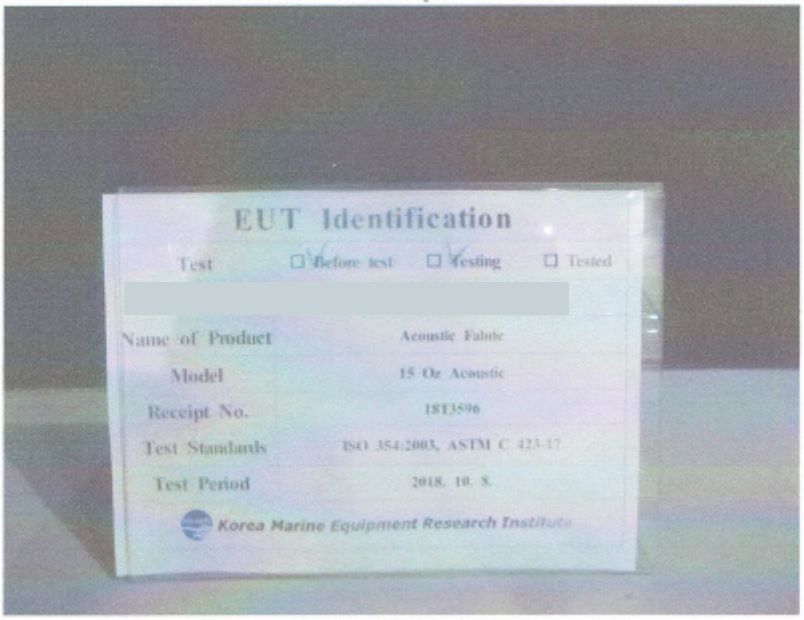

Photo 1-2 Identification of specimen

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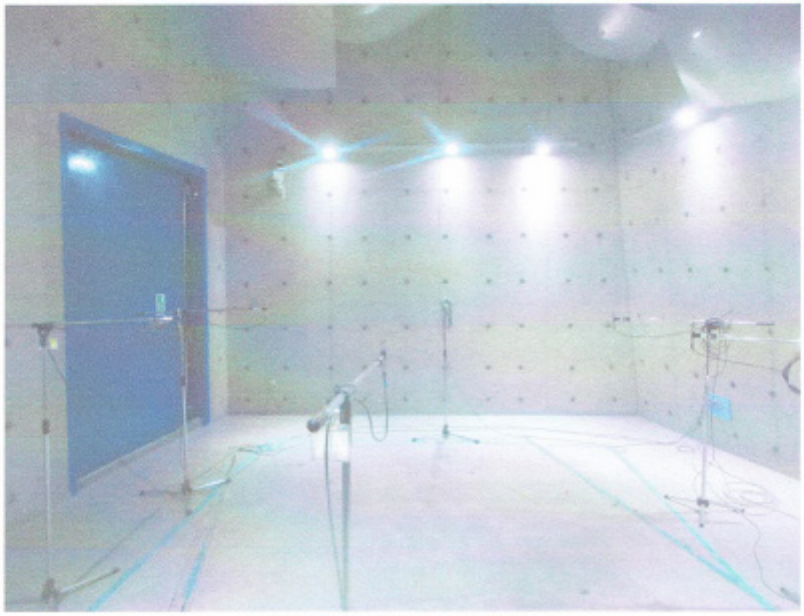

Photo 1-3 Empty room

Photo 1-4 Room installed the test specimen

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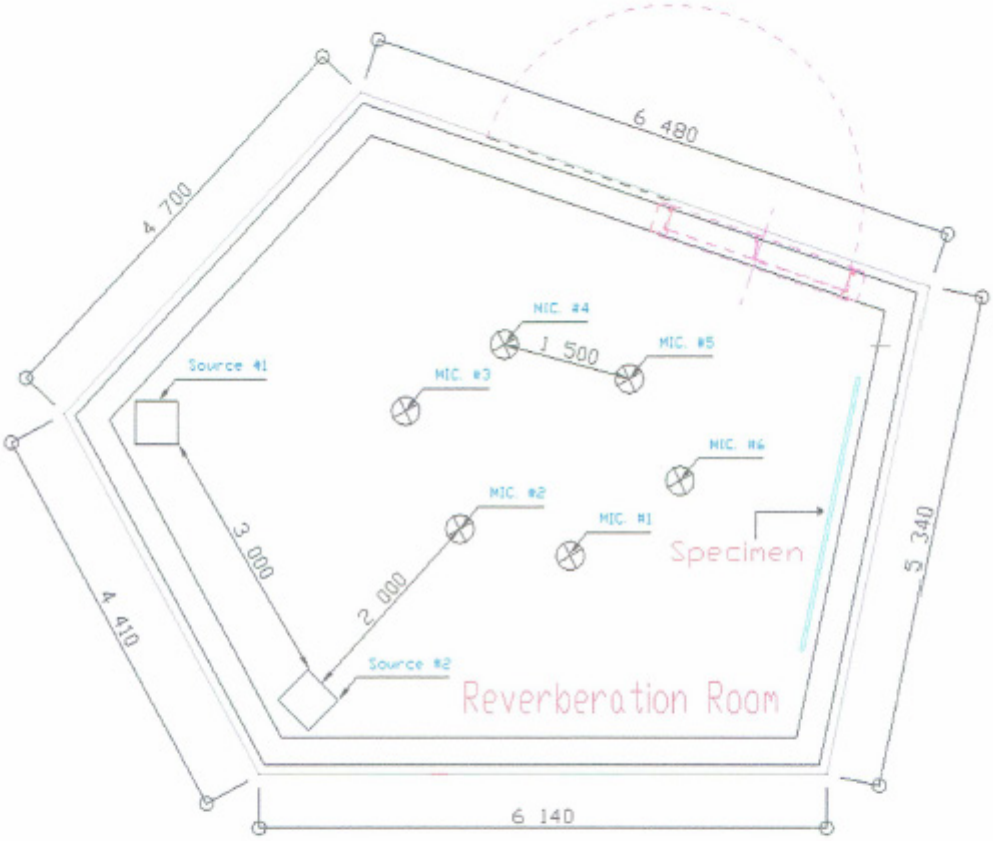
1.9 DRAWING OF THE TEST ROOM AND MEASUREMENT POSITIONS

(Unit : mm)



※ Height of microphones is 1.2 metres above the ground.

- The end -

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Acoustic Test Report

Fabric: Palladium

J&C Joel
Inspiration in every performance

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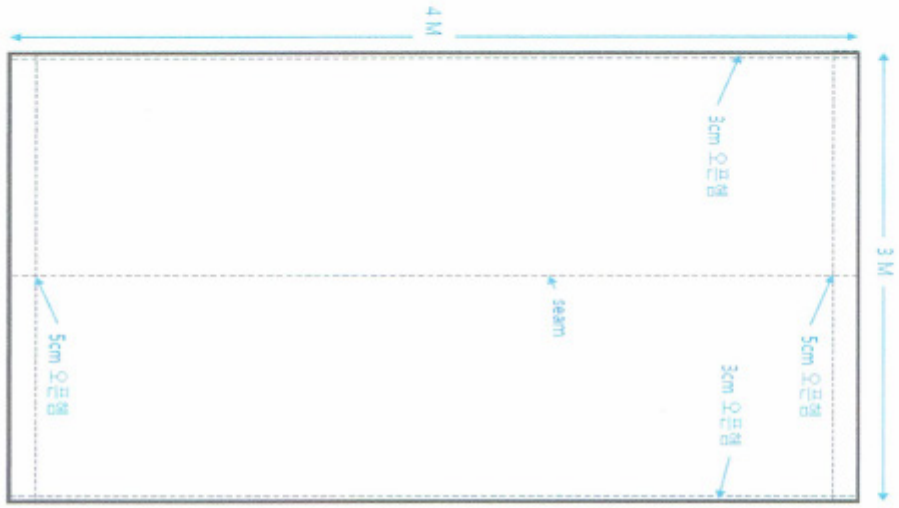
ATTACHMENT

I. DRAWING OF THE TEST SPECIMEN



흡음 시험용 커튼 설계도 (간향실법, G-mount, Flat)

Item	Comp.	Width(gsm)	Width(")
15 Oz (Acoustic)	100% Polyester	330	60"

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