# TEST REPORT

FILK
a Subsidiary of KFPA

Report No : GK2026-0102E


1030, Gyeongchung-daero, Ganam-eup, Yeoju-si, Gyeonggi-do, 12661, Korea

1. Client
   - Name : Lee, Suckwoo, Saint-Gobain Isover Korea Co., Ltd
   - Address : #1, 70, Bugokgongdan 1-gil, Songak-eup, Dangjin-si, Chungcheongnam-do, Korea
   - Date of Receipt : 2026. 3. 4.
2. Test specimen : Glasswool Insulation Board 48 kg/m$^3$ 50 mm
3. Date of Test : 2026. 3. 5.
4. Use of Report : Capability Verification
5. Location of Test : ■ Permanent Testing Lab ☐ On Site Testing
   (Address : the same as the address of FILK)
6. Test method : KS F 2805 : 2014
7 Test Environment : Temperature : (16 ± 1) ℃, Humidity : (40 ± 2) % R.H.
8 Test Results

| Test | Results | | | | Reference |
|---|---|---|---|---|---|
| | Frequency (Hz) | Sound absorption coefficient($a_s$) | Frequency (Hz) | Sound absorption coefficient($a_s$) | |
| Sound absorption coefficient | 100 | 0.10 | 800 | 1.07 | Details : Refer to the Contents |
| | 125 | 0.15 | 1 000 | 1.15 | |
| | 160 | 0.24 | 1 250 | 1.07 | |
| | 200 | 0.51 | 1 600 | 1.09 | |
| | 250 | 0.60 | 2 000 | 1.07 | |
| | 315 | 0.73 | 2 500 | 1.01 | |
| | 400 | 0.93 | 3 150 | 0.97 | |
| | 500 | 1.07 | 4 000 | 0.88 | |
| | 630 | 1.04 | 5 000 | 0.82 | |

* The results shown in this report refer only to the specimen(s) tested unless otherwise stated.
* The results obtained from using only excerpts of this test report are not guaranteed.
* This report is related to KS Q ISO / IEC 17025 and KOLAS accreditation

| Affirmation | Tested by | Technical Manager |
|---|---|---|
| | Name : Lee Hyojin (Signature) 이 효진 | Name : Jeong Jeongho (Signature) 정정호 |

**Fire Insurers Laboratories of Korea**
a subsidiary of Korean Fire Protection Association
Accredited by KOLAS, Republic of KOREA

The above test report is the accredited test result by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

## 1. SUMMARY

The purpose of the test was to determine the sound absorption coefficient and noise reduction coefficient(NRC) of the specimen through the acoustic test in accordance with KS F 2805 : 2014 (Measurement of sound absorption in a reverberation room).

## 2. CONSTRUCTION OF THE TEST SPECIMEN

The test specimen supplied and constructed by Saint-Gobain Isover Korea Co., Ltd as shown in **Table 1**. (See Appendix 1, 2.)

2.1 Test specimen : Glasswool Insulation Board 48 kg/m$^3$ 50 mm

2.2 Test specimen size : Width 3 000 mm × Length 4 000 mm × Depth 50 mm (Area : 12 m$^2$)

〈Table 1〉 Material components and arrange of the specimens

(Dimension : mm)

| Material components | |
|---|---|
| Specimen unit size | Width 1 000 × Length 2 000 × Depth 50 |
| Installation of specimen | Glasswool Insulation Board 48 kg/m$^3$ 50 |

2.3 The details of the specimen was shown in appendix 1.

## 3. TEST PROCEDURE

3.1 Measuring Position and Repeat

The reverberation time of the room with and without the specimen were measured 20 times at 5 microphone points in reverberation room.

The microphone positions were located in the reverberation room with distance of not less than 2 m from sound source and 1.5 m from other measuring positions, and the distance between the specimen and wall boundary was 1 m at least.

3.2 Equivalent Sound Absorption Area of The Empty Reverberation Room ($A_1$)

The equivalent sound absorption area of the empty reverberation room, $A_1$(㎡) were calculated by equation (1) as follows

$$A_1 = \frac{55.3V}{cT_1} - 4Vm_1 \quad \text{---------- (1)}$$

where $V$ : Volume of the empty reverberation room($m^3$)

$c$ : Propagation speed of sound in air( $c$ = 331+0.6 $t$/℃, m/s)

$T_1$ : Reverberation time of the empty reverberation room(s)

$m_1$ : Power attenuation coefficient in the empty reverberation room($m^{-1}$)

($m$ = α/10log($e$), α : sound absorption coefficient in the atmospheric pressure)

3.3 Equivalent Sound Absorption Area of The Reverberation Room with The Test Specimen ($A_2$)

The equivalent sound absorption area of the reverberation room with the test specimen, $A_2$ (㎡) were calculated by equation (2) as follows

$$A_2 = \frac{55.3V}{cT_2} - 4Vm_2 \quad \text{---------- (2)}$$

where $T_2$ : Reverberation time of the empty reverberation room(s)

$m_2$ : Power attenuation coefficient in the reverberation room with the test specimen($m^{-1}$)

($m$ = α/10log($e$), α : sound absorption coefficient in the atmospheric pressure)

3.4 Equivalent Sound Absorption Area of The Test Specimen ($A_T$)

The equivalent sound absorption area of the test specimen, $A_T$($m^2$) were calculated by equation (3) as follows

$$A_T = A_2 - A_1 = 55.3V\left(\frac{1}{c_2T_2} - \frac{1}{c_1T_1}\right) - 4V(m_2 - m_1) \quad \text{----- (3)}$$

where $c_1$ : Propagation speed of sound in air at the temperature $t_1$(m/s)

$c_2$ : Propagation speed of sound in air at the temperature $t_2$(m/s)

3.5 Sound absorption coefficient ($\alpha_s$)

The sound absorption coefficient, $\alpha_s$, of a plane absorber or a specified array of test objects were calculated by equation (4) as follows

$$\alpha_s = \frac{A_T}{S} \quad \text{---------- (4)}$$

where $A_T$ : Equivalent sound absorption area of the test specimen($m^2$)

$S$ : Area covered by the test specimen($m^2$)

3.6 Frequency Range of Measurements

From 100 Hz to 5 000 Hz (Defined as one-third octave band)

## 4. TEST FACILITY

4.1 Test Room

The structure of the test room is made of reinforced concrete in thickness of 300 mm.

The shape of the reverberation room is irregular polyhedrons and the volume is 200 $m^3$ with seven faces.

4.2 Test Instrument

4.2.1 Sound Source

- Broad band noise with amplifier and loudspeaker
- Instrument model : B&K 4296 made in Denmark

4.2.2 Microphone

- Omni-directional microphone
- Instrument model : B&K 4942 made in Denmark

4.2.3 Sound Level Analyser

- Real-time frequency analyser
- Instrument model : B&K PULSE made in Denmark

## 5. TEST RESULTS

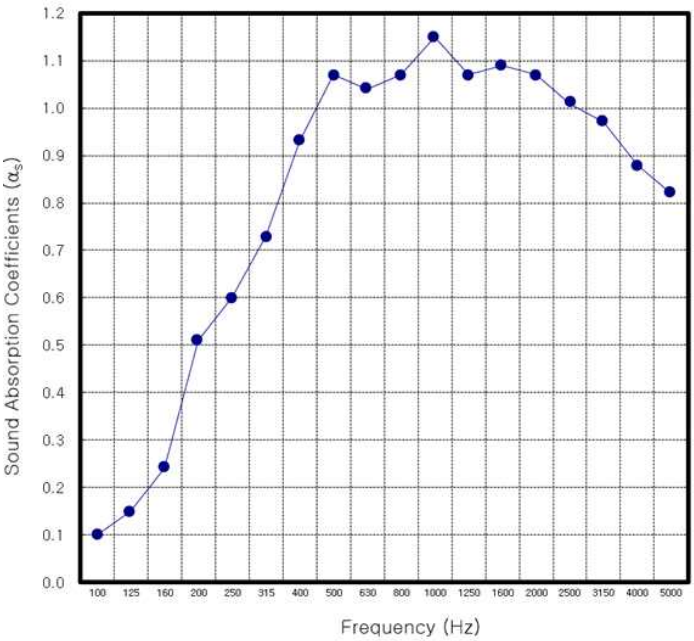
As the results of the tests, the sound absorption coefficient($\alpha_s$) and NRC of each specimen was evaluated as shown in **table 2**.

〈Table 2〉 TEST RESULTS

| Test method | KS F 2805 : 2014 | Date of Test | 2026. 3. 5. |
|---|---|---|---|
| Test specimen | Glasswool Insulation Board 48 kg/m$^3$ 50 mm | Condition | Temperature : (16 ± 1) ℃<br>Humidity : (40 ± 2) % R.H |

| Frequency (Hz) | Reverberation time (s) | | Sound absorption coefficient($\alpha_s$) |
|---|---|---|---|
| | ($T_1$) | ($T_2$) | |
| 100 | 19.38 | 11.16 | 0.10 |
| 125 | 16.04 | 8.61 | 0.15 |
| 160 | 11.60 | 5.72 | 0.24 |
| 200 | 9.34 | 3.37 | 0.51 |
| 250 | 5.79 | 2.53 | 0.60 |
| 315 | 5.09 | 2.15 | 0.73 |
| 400 | 4.64 | 1.78 | 0.93 |
| 500 | 4.07 | 1.56 | 1.07 |
| 630 | 4.86 | 1.69 | 1.04 |
| 800 | 5.34 | 1.72 | 1.07 |
| 1 000 | 5.55 | 1.65 | 1.15 |
| 1 250 | 5.44 | 1.72 | 1.07 |
| 1 600 | 5.20 | 1.67 | 1.09 |
| 2 000 | 4.52 | 1.62 | 1.07 |
| 2 500 | 3.74 | 1.56 | 1.01 |
| 3 150 | 2.92 | 1.43 | 0.97 |
| 4 000 | 2.15 | 1.26 | 0.88 |
| 5 000 | 1.65 | 1.10 | 0.82 |
| **NRC** | **0.97** | | |

※ MEASURED GRAPH



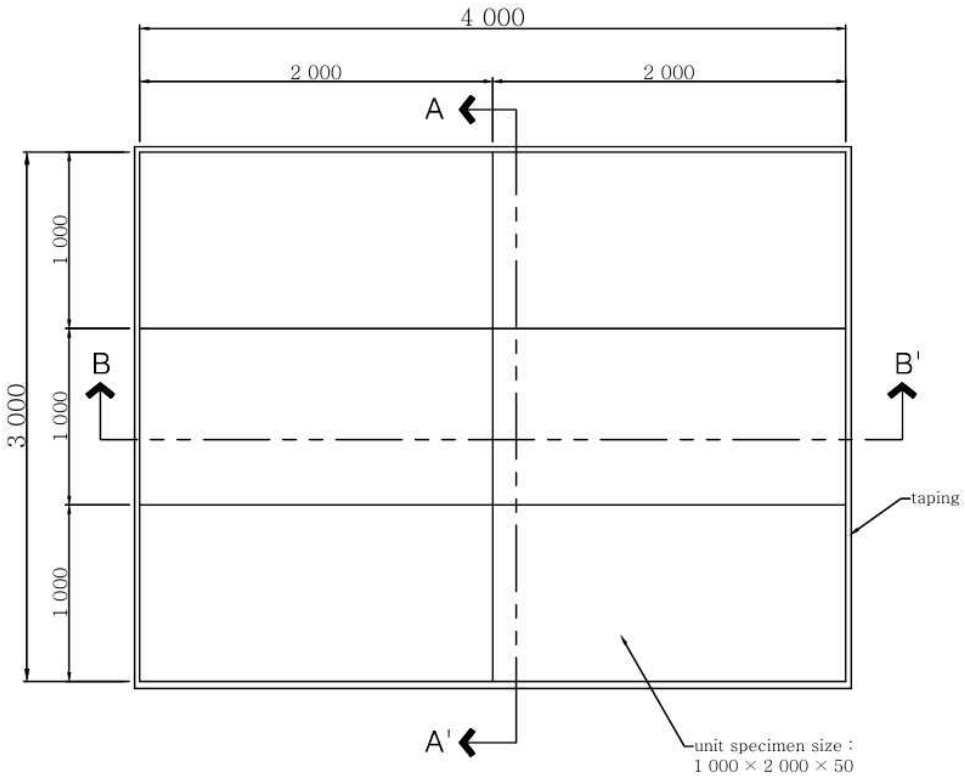

○ Specimen unit size :
Width 1 000 mm × Length 2 000 mm × Depth 50 mm

○ Installation of specimen : Glasswool Insulation Board 48 kg/m$^3$ 50 mm

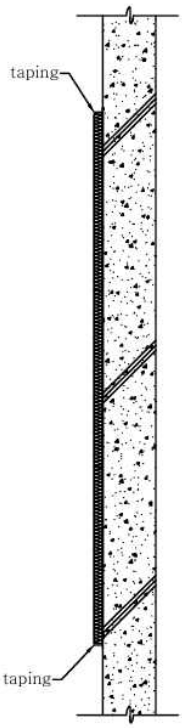
APPENDIX 1.

## DRAWING OF THE TEST SPECIMEN

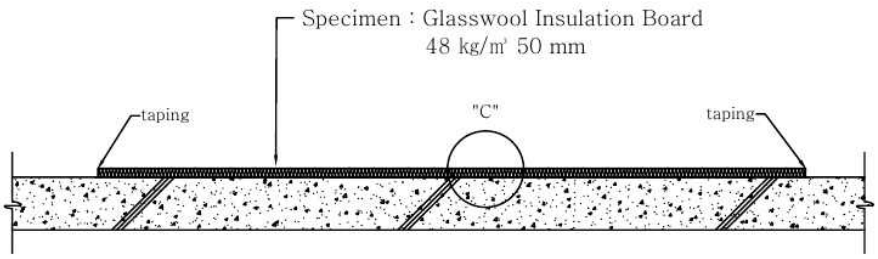
(Dimension : mm)



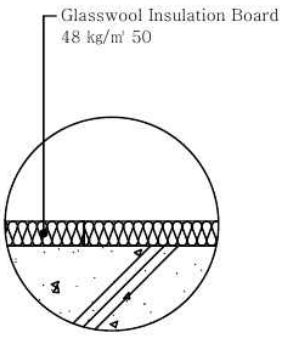

PLAN




A-A' SECTION



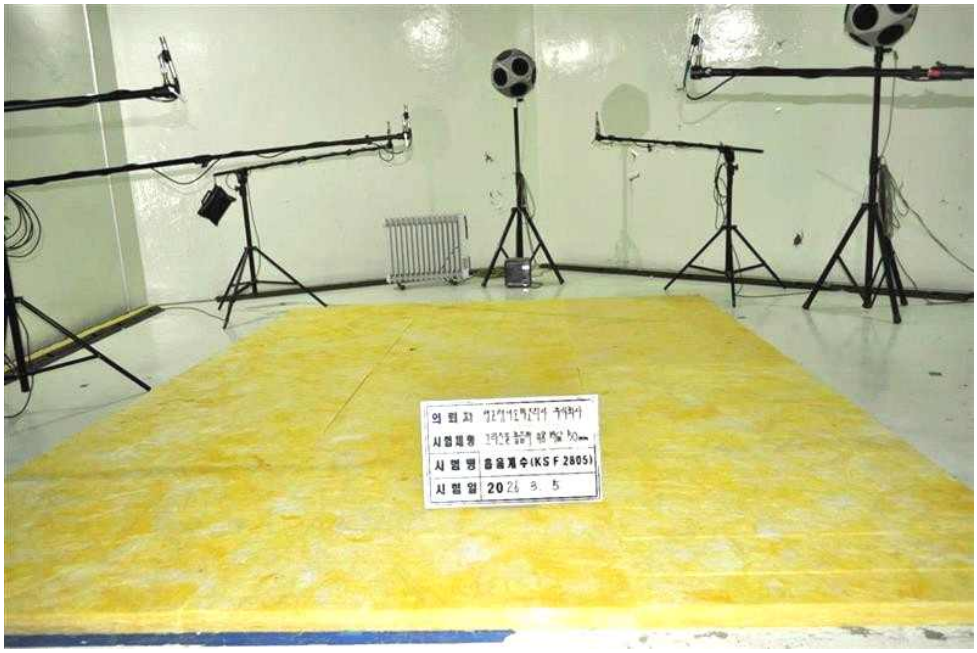

B-B' SECTION




"C" Detail

APPENDIX 2.

## PHOTOGRAPHS

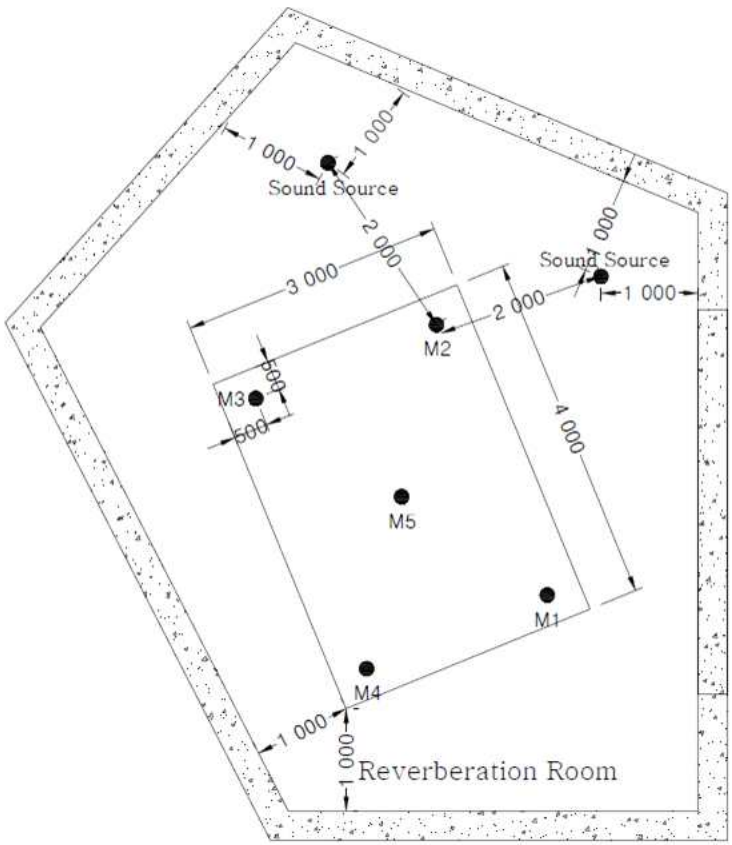



[PHOTO 1] Test specimen arranged in reverberation room


[PHOTO 2] Details of the test specimen arrangement

APPENDIX 3.

## LAYOUT OF THE TEST FACILITY




* M1, M2, M3, M4, M5 : Microphone position (Measuring point)

* Height of each receiving point of microphone position is 1.5 m.