ISSUED: 05/07/21

ROCKWOOL 1 HOUR & 1.5 HOUR FIRE RATED I-JOIST ASSEMBLY LISTINGS

ROCKWOOL Comfortboard® 80 has recently been tested and approved for use in i-joist floor-ceiling assemblies that are required to meet a 60 minute and 90 minute fire rating. In addition to the fire rating, these assemblies have also been tested for acoustics, providing a full fire and sound package. The i-joist listing is currently held with Intertek; Design Listing RI-MBI 60-01 and RI-MBI 90-01 [See Appendix]

FIRE TESTING

Fire testing was conducted in accordance with the applicable requirements of, and following the standard methods:

- ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials
- CAN/ULC-S101-14, Standard Method of Fire Endurance Tests of Building Construction and Materials

The ASTM E119 and CAN/ULC S101 test subjects a loaded assembly to a full scale furnace fire until failure occurs or until the test specimen has withstood the conditions of acceptance as per the standard.

The fire resistance testing yielded a fire resistance rating of 93 minutes for an unrestrained i-joist floor assembly with a 60 minute fire resistance rating subsequently obtained through an engineering judgement.

ACOUSTICAL TESTING

The acoustical tests were conducted in accordance with the following standards:

- ASTM E 90-09 (2016), Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions [STC]
- ASTM E 492-09(2016)e1, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine [IIC]

The ASTM E90 test uses the test specimen to separate two adjacent reverberation rooms [source room & receiving room]. A sound field is produced in the source room and the subsequent sound field created in the receiving room is measured. The sound pressure levels in both rooms, sound absorption in the receiving room and the area of the specimen are then used to calculate the sound transmission loss.

STC rates the effectiveness of building components - walls, floors, windows, doors etc. - as barriers to airborne sound. The greater the value of STC, the less sound is transmitted through the building component. This rating system applies only to airborne sound, i.e. the sound from sources like voices, TV sets, stereos etc. It does not apply when the source is some object that strikes a surface in the building or when a vibrating object is in contact with the building.

The ASTM E492 test places a standard tapping machine on a floor specimen intended to represent a horizontal separation between two rooms. The sound pressure levels produced by the tapping machine are measured in the receiving room below.

IIC rates the effectiveness of floors at reducing the transmission of impact sound. The greater the value of IIC, the less sound is transmitted through the specimen. The IIC rating never applies to a floor topping or a resilient underlayment on its own. It always applies to a complete floor system.

Two identical sets of i-joist assemblies were tested, one set with a gypcrete floor topping and a resilient interlayer and the other set without a gypcrete floor topping. The acoustics testing on various i-joist assemblies achieved the results summarised in Table 1 and Table 2 below.

Gypcrete Topping + Resilient Interlayer		
I-Joist Assembly	**STC Rating**	**IIC Rating**
Ceramic Tile Floor Underlayment Sound Attenuation Mat OSB Sheathing 9.5” I-Joist spaced 24” o.c. 6” ROCKWOOL AFB® 1.5” ROCKWOOL Comfortboard® 80 Resilient channel spaced 16” o.c. 5/8” Gypsum Board	61	57
Carpet Carpet Pad Floor Underlayment Sound Attenuation Mat OSB Sheathing 9.5” I-Joist spaced 24” o.c. 6” ROCKWOOL AFB® 1.5” ROCKWOOL Comfortboard® 80 Resilient channel spaced 16” o.c. 5/8” Gypsum Board	61	82
Engineering Hardwood Floor Underlayment Sound Attenuation Mat OSB Sheathing 9.5” I-Joist spaced 24” o.c. 6” ROCKWOOL AFB® 1.5” ROCKWOOL Comfortboard® 80 Resilient channel spaced 16” o.c. 5/8” Gypsum Board	60	58
Engineered Hardwood Floor Underlayment Sound Attenuation Mat OSB Sheathing **9.5” I-Joist spaced 16” o.c.** 6” ROCKWOOL AFB® 1.5” ROCKWOOL Comfortboard® 80 Resilient channel spaced 16” o.c. 5/8” Gypsum Board	60	60

Table 1: STC & IIC Ratings for I-Joist Assemblies with Gypcrete Topping & Resilient Interlayer

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No Gypcrete Topping or Resilient Interlayer		
I-Joist Assembly	**STC Rating**	**IIC Rating**
Ceramic Tile OSB Sheathing 9.5” I-Joist spaced 24” o.c. 6” ROCKWOOL AFB® 1.5” ROCKWOOL Comfortboard® 80 Resilient channel spaced 16” o.c. 5/8” Gypsum Board	58	48
Carpet Carpet Pad OSB Sheathing 9.5” I-Joist spaced 24” o.c. 6” ROCKWOOL AFB® 1.5” ROCKWOOL Comfortboard® 80 Resilient channel spaced 16” o.c. 5/8” Gypsum Board	54	73
Engineering Hardwood OSB Sheathing 9.5” I-Joist spaced 24” o.c. 6” ROCKWOOL AFB® 1.5” ROCKWOOL Comfortboard® 80 Resilient channel spaced 16” o.c. 5/8” Gypsum Board	56	54
Engineered Hardwood OSB Sheathing **9.5” I-Joist spaced 16” o.c.** 6” ROCKWOOL AFB® 1.5” ROCKWOOL Comfortboard® 80 Resilient channel spaced 16” o.c. 5/8” Gypsum Board	54	50

Table 2: STC & IIC Ratings For I-Joist Assemblies Without A Gypcrete Topping or Resilient Interlayer

Acoustics testing showed that the addition of ROCKWOOL AFB in the i-joist cavity added between 2 – 3 STC points and between 2 – 3 IIC points depending on the assembly.

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CONCLUSION

ROCKWOOL's fire and acoustic tested i-joist assemblies provide a revolutionary system where a second layer of gypsum is replaced with a continuous layer of mineral wool. The continuous layer of ROCKWOOL Comfortboard 80, mineral wool insulation provides both excellent fire performance and enhanced acoustical performance.

This system achieves the same 1 hour fire rating as current industry standards which rely on 2 layers of gypsum board but is also able to provide a 90 minute fire rating with the single layer of mineral wool and a single layer of Type C Gypsum with the added acoustical performance.

In order to provide the best possible solution, ROCKWOOL further investigated constructability of these assemblies to ensure that while not only performing as expected, these assemblies are easy to build. Field tests were conducted to examine real world experience with installing this system. Through these tests ROCKWOOL determined that as a result of the increased rigidity of ROCKWOOL Comfortboard 80, the assemblies were much easier to build and installation of the resilient channels was much easier.

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Appendix

RI-MBI 60-01

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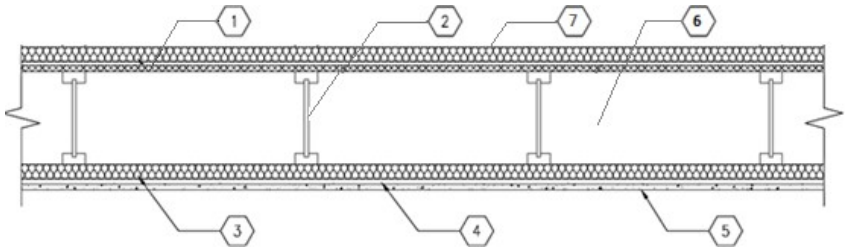
Division 07 – Thermal and Moisture Protection
07 21 00 Thermal Insulation
07 21 13.19 Mineral Board Insulation

ROCKWOOL
Design No. RI/MBI 60-01
ROCKWOOL Mineral Wool Insulation Board and Semi-Rigid Batt
ASTM E119, CAN/ULC S101-07
Rating: 1 Hour



1. **SHEATHING:** Min. 23/32 in. thick, PS1 or PS2 wood structural panel installed perpendicular to the wood I-joists and nailed using min. 8d common nails at max. 12 in. on center (oc) in the field, and 6 in. oc at panel ends and around perimeter of assembly. Min. 19/32 in. thick PS1 or PS2 wood structural panel when I-joists are spaced max. 16 in. oc.

2. **STRUCTURAL MEMBERS:** Wood I-joists conforming to ASTM D5055, spaced max. 24 in. oc. I-joists manufactured with solid wood or LVL flanges.

   ALTERNATIVE – Solid sawn dimensional lumber 2 in. × 10 in., or wood trusses oriented in the horizontal direction.

3. **CERTIFIED MANUFACTURER:** ROCKWOOL

   CERTIFIED PRODUCTS: ROCKWOOL mineral wool insulation board and semi-rigid batt products

   CERTIFIED MODELS: ROCKWOOL ROXUL SAFE®, ROXUL SAFE® 45, COMFORTBOARD™ 80, COMFORTBOARD™ 110

   ROCKWOOL mineral wool insulation board 2 ft. × 4 ft. with a min. density of 4.5 pcf and min. thickness of 1-1/2 in. ROCKWOOL products can be cut to the required thicknesses.

   Install between min. 1/2 in. resilient channels (Item 4) under bottom flange of wood I-joists. Insulation boards attach to the wood I-joist flanges using 15-1/2 GA × 1/2 in. × 2 in. staples at the corners and every third of the insulation board.

4. **RESILIENT CHANNEL:** Install 22 mil galvanized steel RC-1 resilient channel that is 2-5/8 in. wide × 1/2 in. deep, with 1-1/4 in. screw flange and 1/2 in. return lip. Install resilient channel perpendicular to the wood I-joists, spaced 16 oc, using 2-1/2 in. Type W coarse-thread screws. Overlap resilient channels by a min. 4 in. at the joints and install double resilient channels at gypsum board end joints.

5. **GYPSUM BOARD:** Attach USG or CGC Sheetrock® Type C, min. 5/8 in. gypsum board, to 1/2 in. resilient channel (Item 4) using no. 6 × 1-5/8 in. bugle-head self-drilling screws spaced 1 in. from ends/joints, and spaced 12 in. oc in the field and 6 in. oc around the perimeter of each board. Cover all exposed joints and fasteners with joint compound.

RI-MBI 60-01 (2 OF 2)

6. **BATT INSULATION (Optional):** Friction fit ROCKWOOL batt insulation into the cavities for use in the assembly.

7. **INSULATION (Optional):** Attach max. 2 in. ROCKWOOL MonoBoard, ROCKWOOL TopRock, or ROCKWOOL TopRock DD above the gypsum board (Item 1) using an insulation screw with a min. length equaling the thickness of the mineral wool plus 0.5 in.

RI-MBI 90-01

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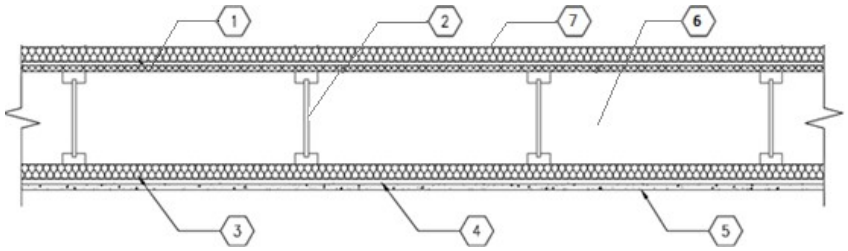
Division 07 – Thermal and Moisture Protection
07 21 00 Thermal Insulation
07 21 13.19 Mineral Board Insulation

ROCKWOOL
Design No. RI/MBI 90-01
ROCKWOOL Mineral Wool Insulation Board and Semi-Rigid Batt
ASTM E119, CAN/ULC S101-07
Rating: 1-1/2 Hour



1. **SHEATHING:** Min. 23/32 in. thick, PS1 or PS2 wood structural panel installed perpendicular to the wood I-joists and nailed using min. 8d common nails at max. 12 in. on center (oc) in the field, and 6 in. oc at panel ends and around perimeter of assembly. Min. 19/32 in. thick PS1 or PS2 wood structural panel when I-joists are spaced max. of 16 in. oc.

2. **STRUCTURAL MEMBERS:** Wood I-joists conforming to ASTM D5055, spaced max. 24 in. oc, I-joists manufactured with solid wood or LVL flanges with the following min. dimensions: 1-1/8 in. high × 2-5/16 in. wide flange dimensions, 3/8 in. thick web, and min. 9-1/2 in. joist depth.

   ALTERNATIVE – Solid sawn dimensional lumber 2 in. × 10 in., or wood trusses oriented in the horizontal direction and above min. dimensions.

3. **CERTIFIED MANUFACTURER:** ROCKWOOL

   CERTIFIED PRODUCTS: ROCKWOOL mineral wool insulation board and semi-rigid batt products

   CERTIFIED MODELS: ROXUL SAFE®, ROXUL SAFE® 45, COMFORTBOARD™ 80, or COMFORTBOARD 110

   ROCKWOOL stone wool insulation board 2 ft. × 4 ft. with a min. density of 4.5 pcf and min. thickness of 1-1/2 in. ROCKWOOL products can be cut to the required thicknesses.

   Install between min. 1/2 in. resilient channels (Item 4) under bottom flange of wood I-joists. Insulation boards attach to the wood I-joist flanges using 15-1/2 GA × 1/2 in. × 2 in. staples at the corners and every third of the insulation board.

4. **RESILIENT CHANNEL:** Install 22 mil galvanized steel RC-1 resilient channel that is 2-5/8 in. wide × 1/2 in. deep, with 1-1/4 in. screw flange and 1/2 in. return lip. Install resilient channel perpendicular to the wood I-joists, spaced 16 oc, using 2-1/2 in. Type W coarse-thread screws. Overlap resilient channels by a min. 4 in. at the joints and install double resilient channels at gypsum board end joints.

5. **GYPSUM BOARD:** Attach USG or CGC Sheetrock® Type C, 5/8 in. gypsum board, to 1/2 in. resilient channel (Item 4) using no. 6 × 1-5/8 in. bugle-head self-drilling screws spaced 1 in. from ends/joints, and spaced 12 in. oc in the field and 6 in. oc around the perimeter of each board. Cover all exposed joints and fasteners with joint compound.

RI-MBI 90-01 (2 OF 2)

6. **BATT INSULATION (Optional):** Friction fit ROCKWOOL batt insulation into the cavities for use in the assembly.

7. **INSULATION (Optional):** Attach max. 2 in. ROCKWOOL MonoBoard, ROCKWOOL TopRock, or ROCKWOOL TopRock DD above the gypsum board (Item 1) using an insulation screw with a min. length equaling the thickness of the mineral wool plus 0.5 in.