

Fire-Protection of I-Joist Assemblies using ROCKWOOL Stone Wool Insulation as per the International Residential Code (IRC)

Since their invention in 1969, I-joists have dramatically changed the construction industry and in turn, driven changes to building code requirements. I-joists are engineered wood joists that offer many benefits compared to conventional wood joists, including the capability to support heavy loads with substantially less lumber while being far less prone to bow, crown, twist, cup or split.

One of the drawbacks of I-joist assemblies is that they are prone to fail sooner in fires than conventional wood joists. In response, the 2012 International Residential Code (IRC) introduced a new requirement in Section R501.3 to address the issues related to fire safety of floor-ceiling assemblies of light-weight construction. IRC 2012 Section R501.3 and IRC 2015, 2018, 2021 Section R302.13 make provisions for required fire protection of light-weight floor assemblies that will provide valuable time for occupants to evacuate as well as fire fighters to perform their duties.

I-joist floor-ceiling assemblies requiring a fire-resistance rating

ROCKWOOL Comfortboard® 80 has been tested and approved for use in I-joist floor-ceiling assemblies that are required to meet a 60-minute and/or 90-minute fire resistance rating. In addition, these assemblies have also been tested for their acoustic performance (STC and IIC), providing a full fire and sound package.

The I-joist fire listing is currently held with Intertek; Design Listing [RI-MBI 60-01](#) and [RI-MBI 90-01](#).



Various Sound Transmission Class (STC) and Impact Isolation Class (IIC) ratings are available, ranging from STC 56 – 61 and IIC 56 – 82.

Assemblies with higher fire-resistance ratings, which can be used to comply with the International Building Code (IBC), are also available. For more information, contact ROCKWOOL Technical Services.

ROCKWOOL's fire and acoustic tested I-joist assemblies provide an alternative solution where a second layer of gypsum is replaced by a continuous layer of mineral wool. This system achieves the same 1-hour fire-resistance rating as current industry standards, which rely on 2 layers of Type C, 5/8 in. gypsum board.

IRC Fireblocking compliance using ROCKWOOL stone wool

For floor assemblies that do not require a fire resistance rating, there are various materials or methods to satisfy the requirements for fireblocking in accordance with Section R302.11.1 of the IRC 2015, 2018 and 2021 when building with I-joists.

For example, basement ceilings can be finished with gypsum, or a sprinkler system can be installed. However, both of these options come with substantial budget implications for homeowners and, in the case of sprinkler systems, home builders are obligated to change their traditional methods of construction.

Alternatively, stone wool insulation batts provide a solution that meets the requirements of the building code, with cost and labour savings, and effective sound absorption, all while following traditional methods of construction.



Fireblocking is defined in the IRC as, "Building materials or materials approved for use as fireblocking, installed to resist the free passage of flame to other areas of the building through concealed spaces."

Fireblocking refers to the use of installed building materials to prevent the movement of undetected flames and hot gasses for an undetermined amount of time, unlike fire resistance rated assemblies which have been tested to a higher level of performance and a defined duration.

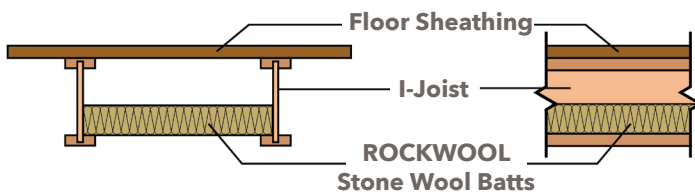
Stone wool (mineral wool) batts, such as ROCKWOOL Safe'n'Sound®, installed in such a manner as to be securely retained in place, comply with Section R302.11.1 of the IRC 2015, 2018 and 2021 for approved fireblocking materials.



Approved fire protection

Prescriptive fire-resistance rated floor-ceiling assemblies that include prefabricated wood I-joists and have demonstrated equivalency to Exception 4 of the 2012 IRC, Section R501.3, and 2015, 2018, 2021 IRC, Section R302.13, in accordance with ICC-ES AC-14 requirements are also available.

The following assembly was tested and evaluated to provide alternate fire resistance per exception 4 of the 2012 IRC, section R501.3, and 2015, 2018, 2021 IRC, Section R302.13. The system complies with ICC Acceptance Criteria AC-14 section 4.4, following testing to ASTM E119.



Installing ROCKWOOL stone wool batts

Optimized for acoustical sound dampening and friction fit between framing members, Safe'n'Sound® is fast and simple to install in I-joist assemblies without disrupting traditional construction methods.

- Follow instructions on personal protection equipment as outlined on the packaging of the product and in ROCKWOOL's Safe Use Instruction Sheet (SUIS).
- Install 3.0" or 6.0" Safe'n'Sound® between joist webs, on top of the bottom flanges. Use batt widths that correspond to joist spacing. Batts sized for steel studs should be used, as these are slightly wider than batts designed for wood studs, providing optimal fit given the OSB web is a thinner profile than dimensional wood joists.
- Install batts snug around any pipes or wires located in the cavity.

Stone wool batts are designed to friction fit to normal I-Joist spacing. The batts cut easily with a serrated knife. No special training is required to install stone wool.

Additional benefits of stone wool

In addition to the benefit of meeting the fire protection code requirements for basement ceilings, stone wool insulation offers many other benefits to homeowners.

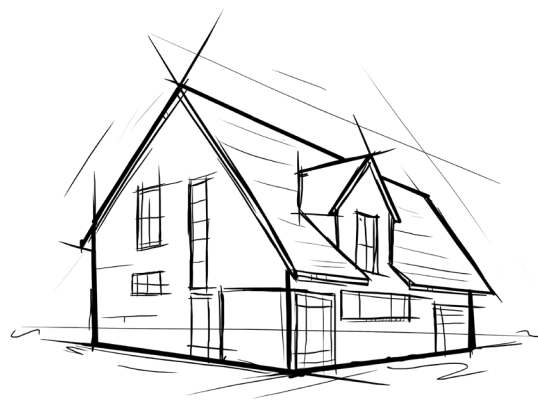
- Cost and labour savings compared to installing protective gypsum board.
- The density and unique non-directional structure of stone wool will provide effective sound absorption, reducing sound transfer between floors.
- Easy to remove and re-install batts in order to gain access to electrical and mechanical system.
- Does not rot, promote mildew, fungi, or bacterial growth

The use of I-joists in residential applications continues to grow. Combining stone wool insulation with I-joists provides the highest level of construction standards for contractors, along with fire safety and improved occupant comfort for homeowners.

Table 1 provides the available widths of ROCKWOOL Safe'n'Sound® batt insulation for the corresponding I-joist spacing. ROCKWOOL recommends the use of batt products sized for steel stud framing, as these are slightly wider than batts designed for wood studs, providing optimal fit given the OSB web is a thinner profile than dimensional wood joists.

Table 1: Widths of Safe'n'Sound® batt insulation for corresponding I-joist spacing

Common I-Joist Spacing	Safe'n'Sound® Thickness	
	3.0"	6.0"
12" o.c.	24.25" (cut in half)	-
16" o.c.	16.25"	16.25"
19.2" o.c.	19.2"	19.2"
24" o.c.	24.25"	2 layers of 3.0"



For more information about the use of ROCKWOOL stone wool insulation as a thermal and ignition barrier, visit rockwool.com



To get in touch with the ROCKWOOL Technical Services team, visit rockwool.com/north-america/contact/ or call at 1-877-823-9790

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