Johns Manville

Insulating for ACOUSTICS

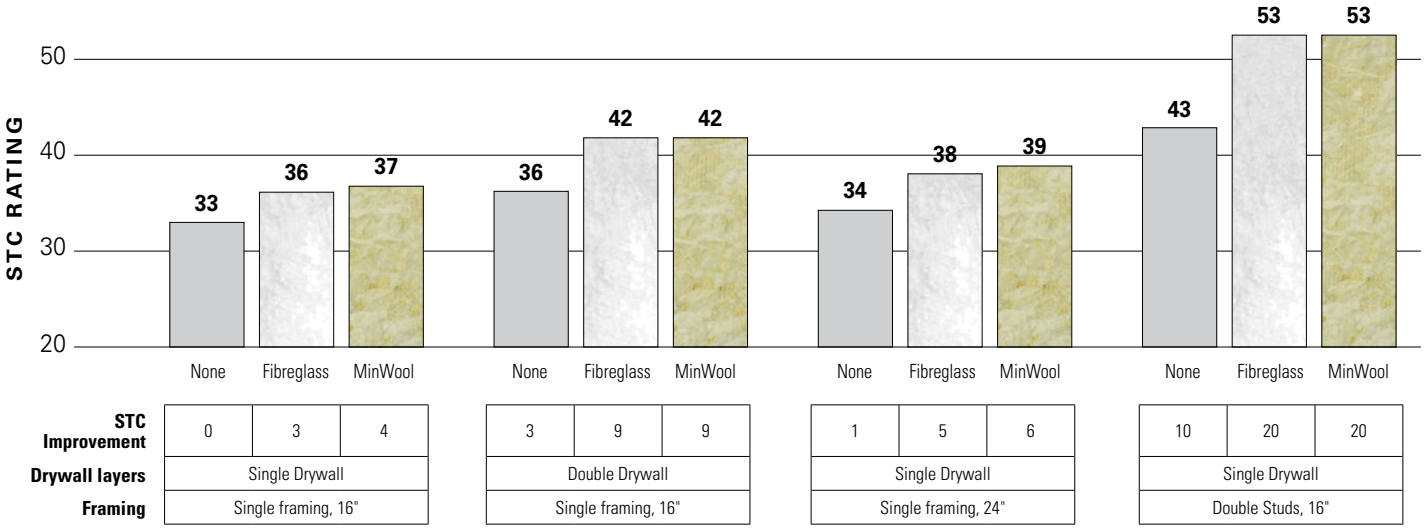
Mineral Wool vs. Fibreglass

If you think mineral wool is better than fibreglass for acoustical value, you might be surprised.

For both sound transmission and sound absorption, mineral wool and fibreglass are nearly identical. They both provide excellent solutions for acoustical performance, and the tiny differences are undetectable to the human ear.

Check out the below chart to discover how combinations of drywall layers, framing and type of insulation compare for STC (Sound Transmission Class) ratings.

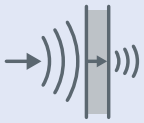
The first row lists the improvement in STC rating with insulation as compared to an uninsulated wall. The other rows detail the type of insulation (none, fibreglass or mineral wool), the type of drywall layers and the type of framing.



STC Improvement	0	3	4	3	9	9	1	5	6	10	20	20
Drywall layers	Single Drywall			Double Drywall			Single Drywall			Single Drywall		
Framing	Single framing, 16"			Single framing, 16"			Single framing, 24"			Double Studs, 16"		

Sound Transmission and Noise Reduction

Acoustical insulation has several important ratings, including Sound Transmission Class (STC) and Noise Reduction Coefficient (NRC). STC is a rating of airborne transmission loss performance through an assembly, while NRC measures absorption of an exposed material or assembly.



Sound Transmission Class (STC):

- Walls, roofs, floors and ceilings prevent sound from traveling between adjacent spaces
- The design of these components is extremely important for sound isolation
- Transmission loss, the ratio of transmitted sound to incident sound, is measured for many constructions and products
- Sound transmission class (STC) is the common single-number rating used

Noise Reduction Coefficient (NRC):

- Intent is to reduce reflections and sound buildup to increase speech and listening intelligibility
- Applicable to schools, offices, lobbies, auditoriums, arenas, etc.

What is the role of insulation in acoustical design?

Insulation is an absorber, but it also helps reduce transmission. Quality absorbers have increased thickness and density, plus smaller fiber diameter/cell size. High performing absorbers need to be porous.

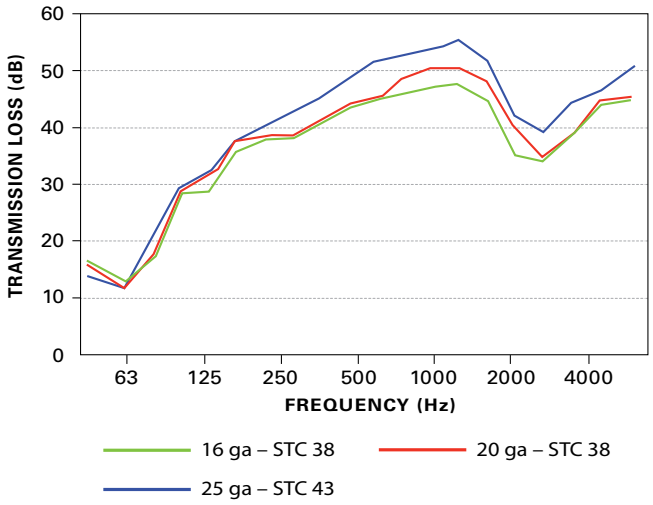
Common misconceptions

1. Do I need to fill the cavity with insulation? Do I get more performance if I overstuff the cavity?

- Generally, the best performance will be achieved with a full cavity, but not overstuffed – it's not worth it.
- Polyiso and closed-cell foam do not perform as well acoustically.

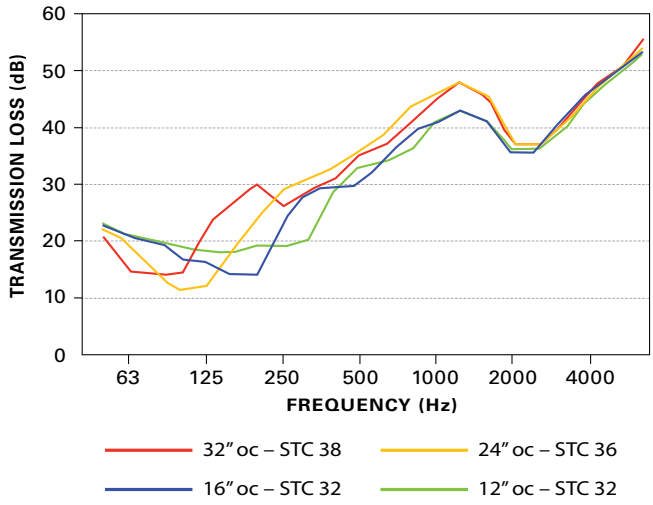
2. Are all studs the same?

No they are not. This graph shows that while 16 and 20 gauge studs perform fairly equally, with a layer on each side of the wall, a 24 gauge stud outperforms by 5 points.



3. Is transmission loss performance affected by stud spacing?

In short, yes! Wider stud spacing and fewer studs perform better, as shown in this data chart by the National Research Council of Canada. In a system using gypsum boards on 2x4s, the STC rating varies depending spacing. Construction with spacing of 32" on center has the best rating (STC 38) while 12" on center construction drops the rating to 32. Many test studies are performed on 24" on center, which will not yield the same results for a 16" on center assembly.



JM ACOUSTICAL INSULATION PRODUCTS

Sound & Fire Block® Mineral Wool: Mineral wool is the clear choice if you need fire protection. Johns Manville Sound & Fire Block® mineral wool batts are noncombustible and moisture-resistant. The high-density fibers in mineral wool help delay the spread of fire and reduce noise transfer in interior walls and between ceilings and floors.

Formaldehyde Free™ – Unfaced Fibreglass: Johns Manville Formaldehyde-free™ Unfaced thermal and acoustical insulation offers R-Values of up to R-49, and is offered in precut batts to fit standard wall cavities or rolls for custom installation in any size cavity. Unfaced insulation reduces sound transmission through walls, ceilings and floors, and can be used in a variety of wood frame, engineered wood and steel frame construction applications, including new construction and retrofit.