



TECHNICAL BULLETIN No. 207

Date: January 1, 2020

Subject: Wall Assemblies and Acoustical Performance

The purpose of this bulletin is to provide answers to common questions relating to wall assembly configurations and associated acoustic performance. The answers to these questions have been the subject of research by the National Research Council of Canada (NRC-CNRC) in their report: “Sound Transmission Through Gypsum Board Walls: Sound Transmission Results” by J.D. Quirt, October 1995. Internal Report IRC-IR-693

Q1. What type of wall cavity insulation should be installed?

No important acoustical differences were found among fiberglass, rock wool and cellulose. It is best to fill the wall cavity to at least 90% of its depth, and not to overfill the cavity. In steel stud assemblies, cavity insulation should be wide enough to fill the cavity from the web of one stud to the web of the adjacent stud.

Q2. Does the density of wall cavity insulation have an impact on acoustical performance?

No, high and low density wall cavity insulations provide equivalent acoustic performance.

Q3. Does choice of studs (metal or wood) have an impact on acoustical performance?

Yes, wood studs, particularly at 16” o.c., make for a rigid construction that allows sound vibrations to transmit. Lighter gauge steel studs are less rigid and provide improved acoustical performance.

Q4. Does stud spacing have an impact on acoustical performance?

Yes, stud spacing at 24” o.c. provides significant acoustical performance over 16” o.c.

Q5. Does stud cavity depth have an impact on acoustical performance?

Yes, doubling the stud cavity depth with insulation increases the STC.

Q6. Does stud configuration (straight studs, staggered studs, double wall studs) have an impact on acoustical performance?

Yes, double walls and staggered stud walls provide significant acoustical performance improvement thru decoupling.



Q7. What is triple leaf effect?

The triple leaf effect is the addition of an internal wall panel layer in the middle of a double stud or double wall. The internal wall panel reduces needed cavity depth and adds rigidity to the assembly. Both conditions will reduce acoustical performance and cause resonance of low frequency sound. An internal layer of gypsum board may increase fire resistance, but only at the expense of sound reduction. Use of resilient channel between two layers of gypsum board in a wall creates the same affect, and is thus not recommended.

Tom Verrill
Technical Manager