

## • • • • Sound transmission Coefficient (STC) rating

During general full scale wall testing, cellulose effectively reduces the airborne sound from room to room. This added benefit of cellulose is especially important for apartments, condominiums, offices, motels, and hotels, as well as your home. Buildings insulated with cellulose have a noticeable "quietness". The sharp sounds that easily transmit through normally insulated structures are subdued by the increased mass of cellulose.

The Sound Transmission Coefficient (STC) rating is based on performance with frequencies from 125 to 4000 Hertz (the speech frequencies)

STC	Privacy Achieved
25	Normal speech easily understood
30	Normal speech audible but not intelligible
35	Loud speech audible and fairly understandable
40	Loud speech audible but not intelligible
45	Loud speech barely audible
50	Shouting barely audible
55	Shouting not audible

General guidelines for controlling noise between spaces:

- Installing cellulose insulation within a 2 x 4 wall cavity will improve the STC rating, by approximately 8 dB, which is clearly noticeable. Cellulose installed in a 2 x 6 wall cavity will add approximately 14 dB to the STC rating.
- Cellulose insulation outperforms all other insulation systems for sound attenuation. In a typical 2 x 4 wall with a single layer of 1/2" drywall on each side (Tested STC):
  - o Cellulose STC 41
  - o Fiberglass or mineral fiber STC 38
  - o Icynene STC 37
  - o The installed performance in batt insulation systems is typically well below that of their tested STC values.
- Metal studs perform better than wood studs by about 5db.
- Staggering the studs or using dual studs can provide a substantial increase in sound isolation.
- A wall must extend to the structural deck in order to achieve optimal isolation. Walls extending only to a dropped ceiling will result in poor sound isolation.
- Sound will travel through the weakest structural elements, which, many times, are doors, windows or electrical outlets.

The STC of wall assemblies complete with the installation of cellulose insulation can be estimated by using the table below.

STC	Wall Component
27	Starting wall: Uninsulated wood studs 2x4 - 16" OC
+3	Studs 24" OC
+5	Metal studs
+3	1/2" Gypsum
+4	1/2" Type X Gypsum
+4	5/8" Gypsum
+5	5/8" Type X Gypsum
+2	3/8" Plywood
+3	1/2" Plywood
+4	5/8" Plywood
+3	3/8" OSB
+4	1/2" OSB
+5	5/8" OSB
+8	3 1/2" Cellulose insulation
+14	5 1/2" Cellulose insulation
+3	Resilient Channel

Wood Stud Assemblies		
Description	Cellulose	STC
2x4 stud 16" OC, faced on both sides with 1/2" gypsum wall board	3 1/2"	41
2x6 stud 16" OC, faced on both sides with 1/2" gypsum wall board	5 1/2"	47
Metal Stud Assemblies		
3 5/8" metal studs 16" OC faced on both sides with 5/8" gypsum wall board	3 1/2"	48
3 5/8" metal studs 24" OC faced on both sides with 5/8" gypsum wall board	3 1/2"	51

ASTM standards for testing	
ASTM E90	Sound transmission loss
ASTM E413	Sound transmission loss
ASTM E1042	Acoustical absorption
ASTM C423	Noise reduction coefficients