# STC Ratings & Steel Stud Framed Walls

Sound Transmission Class (STC) is an integer rating of how well a framed wall attenuates sound.

- Doubling the mass of a wall assembly does not double the STC rating.
- An empty framed wall (steel studs and a layer of gypsum wallboard on each side) has an STC of approximately 35
- Adding an additional layer of gypsum wallboard to each side (from two sheets to four sheets) increases the STC by about 5-6 points.
- Adding cavity insulation increases the STC approximately 4-6 points
- Fiberglass batts increase the STC about 4 points; Cellulose insulation increases the STC about 9 points
- Batt insulation must fit tight without gaps
- Batt thickness provides better sound control than batt density.
- Stud assembly must span from deck to ceiling
- Structurally decoupling the gypsum wallboard panels from each other (using resilient channel, a staggered stud assembly or a double stud wall) can yield an STC as high as 63 or more
- Other materials such as mass-loaded vinyl (MLV), "soundproof" gypsum wallboard, or liquid applied dampening compound may also improve STC ratings. (Refer to manufacturer specifications)

| STC | What is heard |
|---|---|
| 25 | Normal speech can be understood easily and heard distinctly through wall |
| 30 | Loud speech can be understood well, normal speech heard but not understood |
| 35 | Loud speech audible but not understood |
| 40 | Beginning of "privacy" |
| 42 | Loud speech heard as a murmur |
| 45 | Loud speech not audible |
| 50 | Very loud sounds such as musical instruments or stereo can be faintly heard |
| 60+ | Superior soundproofing. Most sounds inaudible |

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2 ½" metal studs (25 ga.) @ 24" o.c.

| Gypsum Wallboard (each side) | Finish | Insulation | STC | Fire Rating |
|---|---|---|---|---|
| ½", one layer | one side | none | 36 | NR |
| 5/8" type X, one layer | one side | none | 39 | 1 hr. |
| 5/8" type X, one layer | one side | 2 ½" – 2 ¾" fiberglass batt | 47 | 1 hr. |
| ½", one layer, ½" type X, two layers | one - two | none | 39 | NR |
| 5/8", one layer, 5/8" type X, two layers | one - two | none | 44 | 1 hr. |
| 5/8",one layer, two layers 5/8" type X | one - two | 2 ½" – 2 ¾" fiberglass batt | 52 | 1 hr. |
| ½" type X, two layers each side | two each side | none | 45 | 2 hr. |
| 5/8" type X, two layers each side | two each side | none | 48 | 2 hr. |
| 5/8" type X, two layers each side | two each side | 2 ½" – 2 ¾" fiberglass batt | 57 | 2 hr. |

3 5/8" metal studs (25 ga.) @ 24" o.c.

| Gypsum Wallboard (each side) | Finish | Insulation | STC | Fire Rating |
|---|---|---|---|---|
| ½", one layer | one side | none | 39 | NR |
| 5/8" type X, one layer | one side | none | 39 | 1 hr. |
| 5/8" type X, one layer | one side | 3 ½" – 4" fiberglass batt | 50 | 1 hr. |
| ½", one layer, ½" type X, two layers | one - two | none | 42 | NR |
| 5/8", one layer, 5/8" type X, two layers | one - two | none | 47 | 1 hr. |
| 5/8",one layer, two layers 5/8" type X | one - two | 3 ½" – 4" fiberglass batt | 55 | 1 hr. |
| ½" type X, two layers each side | two each side | none | 50 | 2 hr. |
| 5/8" type X, two layers each side | two each side | none | 52 | 2 hr. |
| 5/8" type X, two layers each side | two each side | 3 ½" – 4" fiberglass batt | 58 | 2 hr. |