

Sound Testing

Sound reduction is a major benefit of the Arxx ICFs. A wall assembly of two layers of expanded polystyrene (EPS) over a mass concrete core, acts as a great buffer to the transfer of sound through a wall. Accompanied by additional combinations of wall finishes and applications techniques an ARXX ICF wall assembly substantially reduces the amount of acoustical noise that either enters into the structure or passes between interior spaces.

The accepted measure of sound performance is Sound Transmission Class, or STC. Sound transmission is reported on a logarithmic scale. Therefore, an STC rating of 10 corresponds to just over 1/3 of the sound penetrating the wall, while an STC rating of 20 corresponds to sound penetration of 1/10.

The following table relates these numbers to the perceptions of all occupants:

STC	Audibility of Loud Speech From Opposite Side of Wall
25	Easily understood
30	Fairly understood
35	Audible but not intelligible
45	Must strain to hear
48	Barley audible
50	Inaudible

Source: *Insulating Concrete Forms for Residential Design and Construction/Huntsman Chemical.*

The preferred sound rating for exterior walls and interior party walls or demising walls is – good at 40-49, better at 50-59 and excellent at 60 or above. ARXX ICFs easily provide an STC rating of 50 or higher. Project specific requirements can be met by enhancing the overall wall assembly to achieve STC ratings of 60 or better and even over 70 for theatres and sound studios.

Wall Assemblies

Typically, all the wall assemblies, as tested, have a single layer of ½” gypsum board on the ‘receiver’ side of the wall. A typical ARXX wall assembly has the same thickness gypsum board, fastened with screws, on both sides of the wall. To increase the STC rating, the assembly on the ‘sound source’ side (one side) of the wall is enhanced with thicker gypsum board, additional acoustic insulation and/or resilient channels or isolated studs.

In an ARXX wall, the thickness of the two EPS layers, the mass concrete core and the finish assemblies on both sides of the wall provide STC ratings as indicated in the Summary Table.

Sound Testing

ARXX has conducted acoustical testing by a third party acoustical engineering firm following the testing criteria conforming to ASTM E336-90 and ASTM E413-87. A steady sound is generated and measured on one side of the wall, and the sound which passes through is measured in the adjacent room. The measurement of sound levels is made at sixteen frequencies, over a range of 125 to 4000cps, which is then reduced to a single STC number by means of comparing test results against a standard.

Summary of STC Ratings

ARXX 4” Form

STC Rating	Source Side Finish Assembly	ARXX ICF	Receiver Side Finish Assembly
42	½” gypsum wallboard	4”	½” gypsum wallboard
46	5/8” gypsum wallboard ½” deep RC-1 resilient channels	4”	½” gypsum wallboard
50	5/8” gypsum wallboard 7/8” deep hat channels @ 24” o/c, 1” thick acoustical grade fibreglass bat insulation	4”	½” gypsum wallboard

ARXX 6” Form

STC Rating	Source Side Finish Assembly	ARXX ICF	Receiver Side Finish Assembly
51	½” gypsum wallboard	6”	½” gypsum wallboard
55	5/8” gypsum wallboard	6”	½” gypsum wallboard
71	5/8” gypsum wallboard 2 ½” non-load bearing steel studs cavities	6”	½” gypsum wallboard
50	vinyl siding	6”	½” gypsum wallboard

ARXX 8” Form

STC Rating	Source Side Finish Assembly	ARXX ICF	Receiver Side Finish Assembly
54	½” gypsum wallboard	8”	½” gypsum wallboard
75	5/8” gypsum wallboard 2 ½” non-load bearing steel studs @ 24” o/c studs 1/4” from ARXX wall - 2 1/2” fibreglass insulation in stud cavities	8”	½” gypsum wallboard

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