

Obeya acoustical



General acoustical terms*

Term: Sound Absorption (NRC)

Property: The ability of a material to reduce sound reflections, reverberation, and echo within an enclosed space

Example: “The new gathering hall was too reverberant due to the hard-surfaced floor, high concrete deck ceiling, and gypsum walls, making speech unintelligible & music muddy”

Associated Problem: Poor speech intelligibility and sense of cacophony due to the “liveness” and excessive reflectivity within a room

Effective materials properties: Thick porous or fibrous materials, or thinner materials installed with airspace backing. Diaphragms or resonators can be tuned to absorb specific frequencies

Lab Test Method: ASTM C423 which provides Sound Absorption Coefficient, SAA (Sound Absorption Average), and NRC (Noise Reduction Coefficient) Ratings. Small scale option: ASTM E1050 (impedance tube)

Term: Sound Transmission Loss (STC)

Property: The ability of a material, panel, or wall to act as a barrier preventing airborne sound transmission from one space to another

Example: “We could hear people talking and playing music in the apartment next door.” Or “The noise of the train outside my house while I try to sleep is unbearable”

Effective materials properties: Impermeability (to air flow), High mass (weight), structural isolation, mechanical damping, and cavity absorption

Lab Test Method: ASTM E90, which provides sound transmission loss ratings at 1/3 octave bands and ASTM E413 which is the calculation method for the STC (Sound Transmission Class) rating

Acoustics*

The acoustical framed panel provides the most acoustic value for Obeya units

NRC Rating - 0.70

STC Rating - 18

Interior fixtures

The items within an Obeya room can assist in sound quality as well. A set up of upholstered lounge furniture will absorb a greater amount of sound energy than will a table with 4 chairs. Soft-material type wall hangings will absorb a lot more energy than a picture frame with a glass covering. In addition, a plant wall absorbs a lot of sound energy, more so than a veneer or markerboard panel.

*Acoustical information is provided by Riverbanks Acoustical Laboratories

Ceilings

Our ceilings provide an added value when it comes to sound transmission reduction. At the entry level in regards to acoustic properties, the wooden slat ceilings add a lot of surface area to a structure. Any additional surface area within a room will help dissipate sound. The more area within a closed room there is, the more area there is to absorb the sound energy within that room. (Think of walking through an empty house versus walking through a fully furnished house. The surface area of the furniture and fixtures helps dissipate the sound energy.)

At the next level for acoustic properties, our PET slat ceilings with the spanning rods have the same surface area as the wooden slats, but since the PET material has a high absorption rate (1.00 NRC) the PET material itself in addition to the total surface area both provide a better acoustical experience than the wooden slat ceilings.

At our highest level, we can place a PET ceiling 'cloud'. This version has double the amount of PET material of our slat ceilings, plus half of that material is positioned perpendicular to the other half. This multi-planar positioning allows for absorption (and to some degree, blockage) of sound energy coming into the room from perpendicular directions. Our triangle/hex ceilings provide the most sound quality as they have material oriented in three different planes.

Sprinkler and alarm considerations

Depending on the local fire codes, physical ceilings may or may not be allowed to be part of the Obeya room system. This would require someone locally to interpret the fire codes and apply that to the specification as required.

Typically there are parameters that call out the minimum height difference between the sprinkler head and the top of any "nearest structure". These aspects determine how far a sprinkler head can disperse the water in both a horizontal and vertical direction. Certain cities allow for ceiling modules to be present as long as they don't impede (up to a certain percentage of area) the water flow from a sprinkler head. As is the case with required height clearances, this percentage of impedance varies by jurisdiction.

With planning, fire alarms can also be installed inside an Obeya unit. This would also require someone locally to interpret the fire codes and apply that to the specification as required.