

Sound Isolation Materials

Installation and User Guide

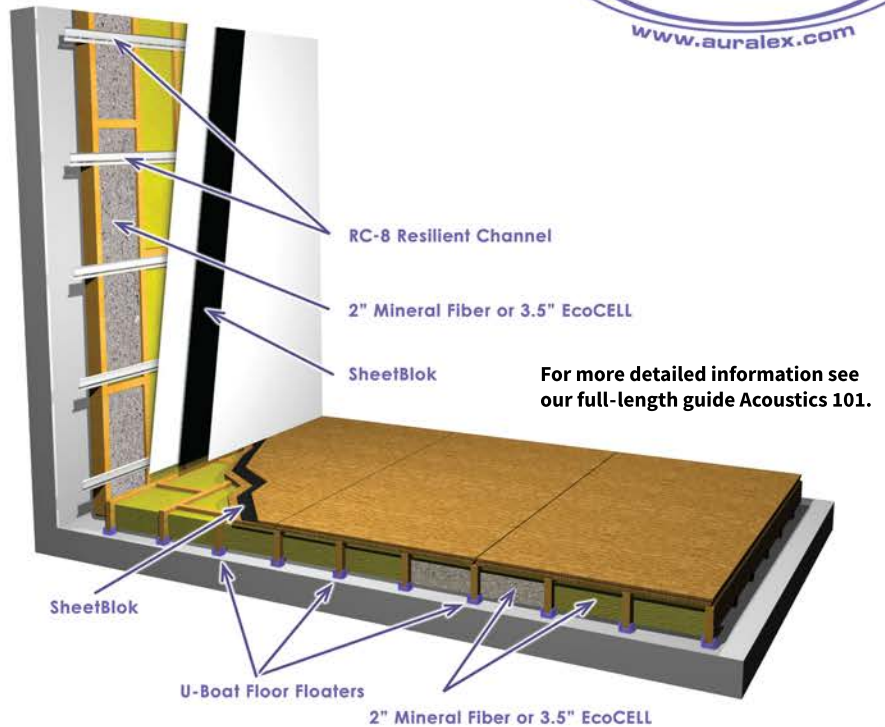


This is a simplified guide that compiles Auralex's recommendations and product information regarding building an isolated space using what is commonly referred to as "room-within-a room" construction.

In order to achieve the best results possible, with this material stack-up, it is absolutely necessary to "float" both the floor and the ceiling, as well as isolate all wall surfaces.

Wherever possible throughout the framing, glue materials together rather than nailing or screwing them. Where you must use screws we recommend drywall screws (such as Hillman Walldog) which have weight ratings of 50 lbs. or higher.

NOTE: Auralex makes no claim to the effectiveness of this method if one or more surface is left un-isolated.



StopGap™ Acoustical Sealant

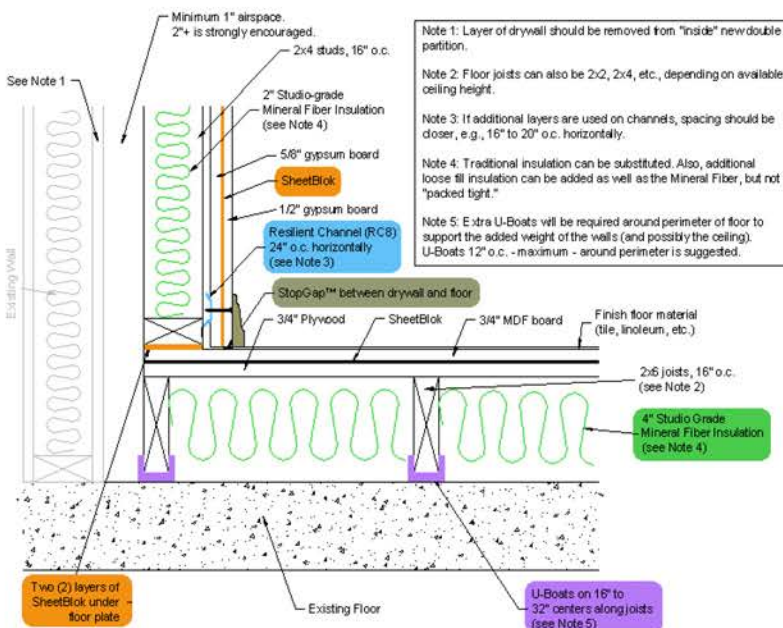
StopGap Acoustical Sealant is a highly elastic, water-based sealant used for reducing sound transmission at the perimeter of wall systems or around electrical box cutouts to achieve specified STC/MTC values. **StopGap** will achieve a Sound Transmission Class (STC) of 53 when applied properly. It is advisable to caulk all edges, seams, corners, and holes (including the tops of screw heads) - especially where different materials meet. Leave about a 1/4" gap in parallel seams and perpendicular corners. We recommend a 3/8" bead, with this size each tube should yield approximately 40 linear feet. **StopGap** will remain flexible, dries white and is paintable.



Subfloor Construction

There are two major ways to consider building this system: The first is to build the wall segments on the existing floor, the second is to build the wall segments on top of the floated floor. View diagrams to the right for further explanation. Vibration and lower frequencies can travel much more easily through a solid shared subfloor, like a concrete slab.

If you are seeking maximum isolation, building a new wall frame on top of your floated sub-floor is the best choice. When anchoring to concrete slab, give consideration to isolated bolt mechanisms which provide rubber grommets for the solid bolt to go through and isolate from the sill plate. Also note the airspace that separates the new wall structure from the existing one. This is important in order to further isolate the space. A 1" minimum airspace to 2"+ is advised for maximum effectiveness. If you must attach the wall, make sure to run **StopGap** at the juncture of the two sections.





U-Boat™ Floor Floaters

The first layer to be added to your existing floor surface are **U-Boat Floor Floaters**, these are u-shaped rubber channels used to support framing members and float (isolate and decouple) them from the surrounding structure. With the help of **U-Boats**, a floated room features greatly improved transmission loss (isolation) and low frequency definition.

- **Size:** 2 1/8" wide x 1 1/2" high x 2" long, Inner Dimension: 1 1/2" wide, Thickness: sides 5/16" and base=1/2"
- **Weight:** 65 grams per **U-Boat**
- **U-Boats** fit any size 2" (nominal) joists; 2"x2", 2"x3", 2"x4", 2"x6", etc. – However, the larger vertical air cavity, the better potential decoupling effect.
- When joist spacing is between 12" - 16", **U-Boat** spacing should be 16" along the joist. Most (>99%) of applications will work fine with 16" spacing of **U-Boats** along the joist
- **Weight Restrictions:** We have discussed the properties of **U-Boats** with rubber experts and we have been assured that: The framing member will fail before the **U-Boat** will fail.



Floor/Wall Joists



Any size flooring joists (must be 2" nominal – i.e. 1 1/2" wide to fit **U-Boats**™) will work for walls or floors, but again, the larger the air cavity created by the joist, the better the potential decoupling effect.

When building the wall framing, we recommend lining two layers of **SheetBlok™ Sound Barrier** underneath it to decouple it from the floor surface. The most common framing for walls is either 2'x4' wood studs or 3/4" metal studs. While wood may be easier and more cost effective, metal does offer superior resiliency benefits for acoustical purposes.

Stringers

Stringers are short (nominally 16" o.c.) pieces of the same material as your joists that run perpendicular to the joists and are nailed and glued between them in a random, staggered fashion. We certainly acknowledge that stringers may not be completely applicable to each and every construction, but our position is they are important to help tie the whole wall, ceiling, and/or floor together. This makes the entire system less likely to move, transmit sound, and less susceptible to vibrations at lower frequencies.



◀ SheetBlok

Sheetblok is a limp mass, dense, vinyl sound barrier material that is used as an inner layer sandwiched between layers of flooring surfaces or drywall in a material stack up.



Mineral Fiber Insulation

Place **Mineral Fiber Insulation** in between the stud work in wall and floor (and ceiling if possible) framework. **Mineral Fiber** is available in 2" and 4" thick 2'x4' panels and it can be easily cut or trimmed to fit in smaller spaces. This the workhorse of the material stack-up so it is best to use 4" whenever possible. transmit sound, and less susceptible to vibrations at lower frequencies.



EcoCell™ Insulation

EcoCell Acoustic and Thermal Insulation is a cellulose fiber that is 80% recycled and renewable fibers. **EcoCell** is an insulation panel that provides acoustic isolation, as well as typical insulation properties. It offers excellent acoustic performance with an NRC of 1.00 (3.5"). The thermal performance has an R-Value of R13, 3.60 per inch of thickness. **Auralex EcoCell** has a nominal density of 8 pounds per cubic foot (PCF). Two widths are available: 24" wide for commercial installations and 16" wide, sized more for residential solutions.



RC-8™ Resilient Channel

RC-8's are specially shaped metal to which gypsum board or other building materials can be mounted to isolate them from the framing members (studs) of a wall or ceiling. **RC-8 Resilient Channel** can add as much as 10 dB of isolation if used properly.

This isolation helps improve the structure's ability to block the transmission of sound. **RC-8** should be installed horizontally at the bottom and top of your wall, then every 2' or less in between. Up to (2) layers of 5/8" drywall and a layer of **SheetBlok** may be hung on **RC-8**, even on a ceiling.

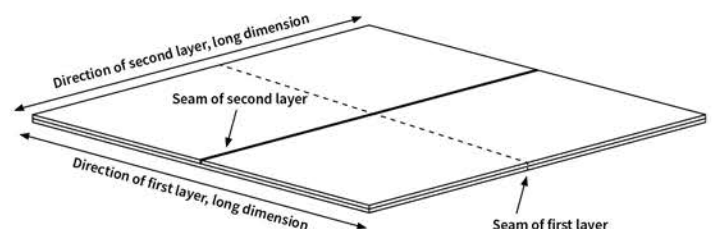
One leg of the **Resilient Channel** attaches to the stud, the other leg to the layer of building material being hung. The short-width leg with pilot holes of the **RC-8** attaches to the stud, the wider leg is for attaching the drywall, **SheetBlok** stack-up to the **RC-8**. The correct orientation of the **RC-8** is with the short channel (section that attaches to the stud) on the top.

This allows the weight of the drywall and **SheetBlok** to hang from the stud rather than the weight pushing into the stud. Be sure to not short circuit the **RC-8**. The fasteners used to mount the drywall/**SheetBlok** stack up should only connect to the **RC-8** and NOT to a stud.

Drywall Layers

When layering, subsequent sheets of material should be rotated 90 degrees so no seams line up (this staggering applies to wall, ceiling and floor materials).

Tongue and groove materials should be glued at each seam as well. As mentioned previously, all seams – regardless of material used – must be sealed up tight with **StopGap**.



Ceilings

The construction methods used for controlling structure-borne sound that is passing through ceilings is similar to walls and floors. When tackling the ceiling, it is very important to make the fewest holes and penetrations possible. Be sure to use **StopGap** on any wire openings and around all light boxes. Track lighting, surface-mounted conduit, or even just using floor lamps are all good options. Here are a few different construction approaches we suggest in order of effectiveness:

First, if you are unable to add anymore gypsum board, consider adding a layer of **SheetBlok** to the existing ceiling. It can be painted to use as a finished surface (may need to be primed). We recommend some type of mechanical fasteners: Plastic cap nails, screws with grommets, furring strips at the edges, etc. Also, for standard **SheetBlok**, multi-purpose flooring adhesive is recommended because it is made for use with vinyl materials.

The most straightforward choice is to simply layer **SheetBlok** and gypsum board directly over the existing ceiling. To increase isolative properties when using this method, hang the board on **RC-8 Resilient Channel** and rest atop to the new walls.

Alternatively, if you have vertical height to spare, drop down 3½” and frame another ceiling resting it only on top of your new walls (which, ideally, are on top of your new floated floor). Insulate it with **Mineral Fiber** in the same manner as walls and floor, then cover it with two (2) ½” sheets of drywall mounted on **RC-8**.

If you have an unfinished existing ceiling, insulate it with **Mineral Fiber**, cover the joists with two (2) layers of ½” gypsum board mounted on **RC-8** and then drop down 3½” and frame your new ceiling as described above. If you have questions about the size, shape, angle, etc. related to ceilings - review pages 22-25 of Acoustics 101 for more information.

StudioDoor™

Auralex has two options for studio-quality sound isolation in doorways, **StudioDoor41** and **StudioDoor48**.

The **StudioDoor** is a pre-hung total sound isolation solution which is vastly superior to standard hollow core doors. If you are constructing a studio environment where you need to achieve recording-level sound isolation, a solid core door is highly advised.

Installing a solid core door is a large undertaking and they can weigh 300lbs or more. Because of this, it highly recommended you have at least one additional person to help you.

View the **StudioDoor User Guide** on **Auralex.com** for more detailed installation instructions.

