



## **Installation of Xalon X5000 RF Shielded Ceiling Panels**

A drop down or suspended RF shielded ceiling system is composed of a commercial metal ceiling grid with 15/16" grid type (non-metallic grid systems will not work) and Xalon RF Shielded ceiling panels, with FRP, that are placed into the grid. Two standard sizes that are available: 2'x2' and 2'x4', other sizes up to 4' x 8' are available. Light fixtures with metallic housings (preferably RF shielded) can also be used in the drop ceilings or LED light strips attached to the bottom of the ceiling grid or LED light fixtures that take the place of the ceiling grid member. Metal or RF shielded air vents are also recommended.

**Xalon RF shielded ceiling tiles are designed to be inserted into a commercial grade, metal, suspended ceiling grid with 15/16" grid tees, that is electrically grounded and all joints RF sealed (foil taped with electrically conductive PSA or Xalon FS electrically conductive caulking).**

**If the walls are RF shielded, install all the wall(s) RF shielding layer(s) first, leaving the inner wall RF shield layer exposed. Before installing the ceiling grid.**

**The ceiling grid perimeter angle molding will be attached directly in contact with the inner RF shielded wall layer (typically sheet metal, foil or metalized fabric).**

### **BEFORE INSTALLING CEILING GRID SYSTEM**

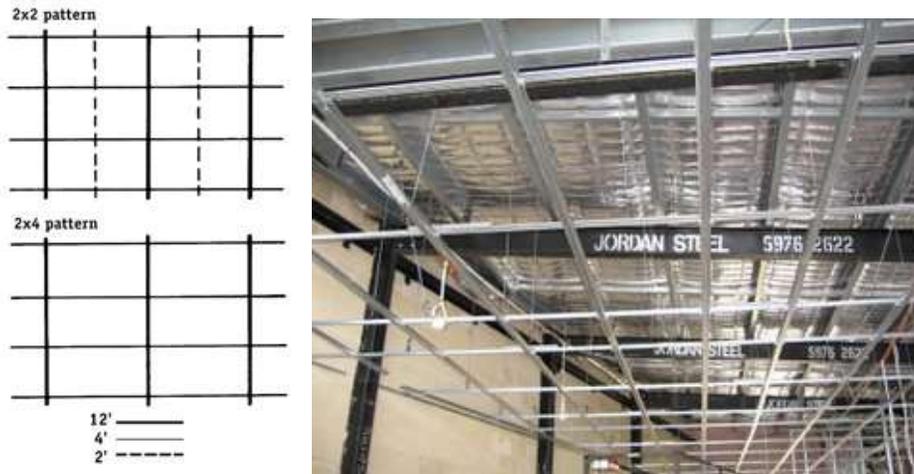
Your need to make sure that every metal wall stud and metal ceiling or floor stud is connected electrically to earth or electric ground. You might have to make more than one connection from the metallic grid to a good ground. Verify that all metal wall studs are grounded by continuity checking them using an ohmmeter or multi-meter. The suspended ceiling grid grounding is typically through the metal wall studs and metal ceiling studs (if available). Even if the walls are not RF shielded, it is a good idea to make sure all the metal wall studs are grounded. The Xalon RF Shielding System relies on multi-point grounding to maximize the RF shielding performance.

### **PLANNING FOR A RF SHIELDED SUSPENDED CEILING**

First, get the exact measurements of the room where the suspended ceiling will be installed. Use special care in measuring any odd-shaped alcoves, bays, etc.



You can choose from either a 2'x2' or a 2'x4' pattern (Fig. 1). The pattern you pick will determine the material requirements for your ceiling.



**FIG. 1** - Select the grid pattern you want to use.

It is important to space the cross tees so the border panels at the ends of the room are equal and as large as possible. If you are using a 2'x4' pattern, space the 4' cross tees 2' apart. For a 2'x2' pattern, add 2' cross tees between the midpoints of the 4' cross tees (Fig. 1).

The grid system, must be metal, most common is aluminum or steel (hot dipped galvanized steel is recommended). Non-metallic grid systems will create gaps in the shielding, effectively making the shield useless. The best type of metal suspended grid system, for RF shielding, only has the portion facing into the room coated or painted (see recommended systems below).



Only the portion facing into the room is coated or painted



## RECOMMENDED SUSPENDED CEILING GRID SYSTEMS

[ACP Classic X Cliq](#)

[Armstrong Prelude ML](#)

[Armstrong Prelude XL](#)

[Armstrong Prelude XM](#)

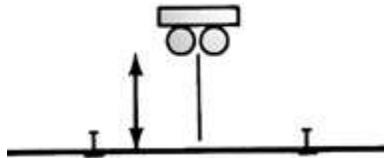
[CertainTeed Classic Aluminum Capped Stab System](#)

[CertainTeed Classic Environmental Stab System](#)

**For retrofit of acoustic panels to RF shielded panels, most existing, commercial grade, ceiling grid systems can be made to work.**

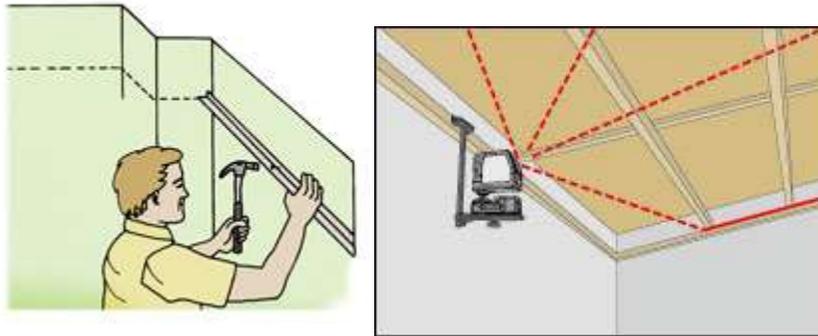
## INSTALLING WALL ANGLES

Determine the exact height at which the suspended ceiling will be installed. Allow a minimum of 8" clearance between the parent room ceiling and the new ceiling for installation of the FRP panels and RF shielded ceiling panels. The Xalon ceiling panels are similar rigidity to standard acoustic tiles. Additional clearance will be required if you are using recessed RF shielded lighting (Fig.2).



**FIG. 2** - Allow a minimum of 8" space between the ceilings if you're using recessed lights.

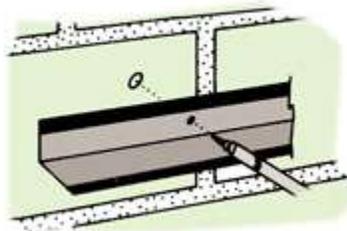
After locating the exact position for the suspended ceiling, use a laser level to draw a line completely around the room indicating where the wall angle will be applied (Fig. 3). Don't assume the original ceiling is level—use a laser level for accuracy. Set the wall angle low enough to conceal as many pipes, ducts, etc., as possible.



**FIG. 3** - Use a level to apply the wall angle at a proper height around the room.

For non-shielded walls, fasten the wall angles securely to the wall at all points. Screw them firmly to metal or wood studs, or use screw anchors or other masonry fasteners on brick or masonry walls (Fig. 4).

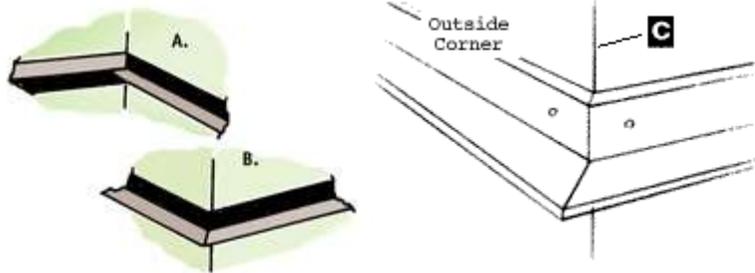
For RF shielded walls, you must maintain the shielding integrity of the wall system you are attaching or anchoring through. Metal screws going through the ceiling grid perimeter angle moulding, through the RF shield layer, through the sheetrock or plywood and anchoring into the metal wall stud is recommended. Due to the many different shielded wall systems, it will be left to the installer. Usually with a combination of flashing and foil tape with electrically conductive adhesive.



**FIG. 4** - Fasten the wall angles securely to the wall at all points.

Position the wall angle so that the bottom flange rests on the level line you have drawn on the wall. Take the time to do this right!

Overlap the wall angle on inside corners and miter cut the wall angle on outside corners (Fig. 5). Make a temporary wooden miter box if you don't have one. Cut any needed angles with metal cutting snips or a saw. Tape the top of the joint seams with RF shielded foil tape with conductive adhesive or fill with Xalon FS conductive caulking.

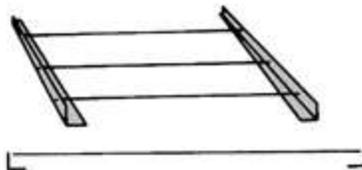


**FIG. 5** - Overlap the inside corners and miter the outside corners.

## LOCATING & HANGING SUSPENSION WIRES FOR MAIN TEES

Main tees should run at right angles to the joists in the room.

Locate the position of each main tee by stretching a tight line from the top edge of the wall angle on all sides of the room at each position where the main tees are to be placed (Fig. 6).



**FIG. 6** - Stretch a tight line from the top edge of the wall angle on all sides of the room at each position where the main tees are to be placed.

Now, cut the suspension wires to the proper length. The wires should be 12" longer than the distance between the parent ceiling and the new guideline string you have stretched to indicate the position of each main tee.

Locate the first suspension wire for each main tee directly above the point where the first cross tee meets the main tee. Check your original sketch of the room to determine this location.



Be sure the suspension wires are securely fastened. Apply them to the ceiling with screw eyes, screw hooks, nails, or drilling (Fig. 7).

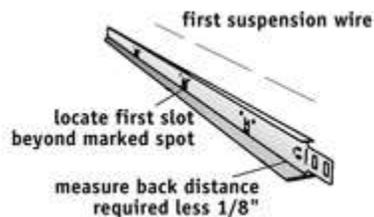


**FIG. 7** - Be sure the suspension wires are securely fastened.

Attach a metal suspension wire every 2' to 4' along the level guideline, as required by the ceiling grid system manufacturer. Stretch each wire to remove any kinks and make a 90° bend where the suspension wire crosses the level line.

## INSTALLING MAIN TEES

Most main tees are 12' long and have cross tee slots punched every 12" beginning 6" from each end (Fig. 8).



**FIG. 8** - Main tees generally have cross tee slots every 12".

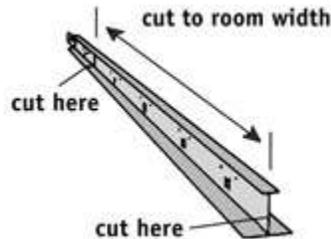
Refer to your layout sheet to determine the distance from the wall to the first cross tee. Now measure this distance along the top flange of the main tee and locate the slot just beyond this point.

From this slot, measure back the same distance, subtract 1/8" and saw the main tee at that point. The 1/8" subtraction is for the thickness of the wall angle.

If the wall angles are not square, position the cross tee slots accordingly.

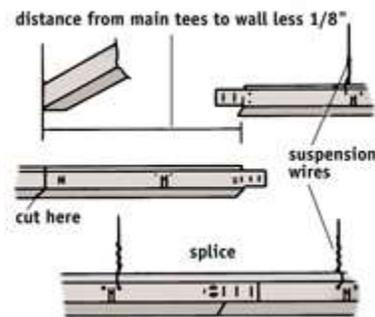


When main tees are installed in rooms less than 12' across, cut the main tee to the exact measurement of the room, allowing 1/8" for the thickness of the wall angle (Fig. 9).



**FIG. 9** - If the room is less than 12' across, cut the main tee to the width of the room less 1/8" for the thickness of the wall angle.

For rooms wider than 12', the main tee can be spliced (Fig. 10). Be sure to align the splice so that the suspension wires are correctly positioned. Splice carefully, or all the main tees will be thrown off. Apply RF shielded foil tape with electrically conductive adhesive to the top side of all the joints.



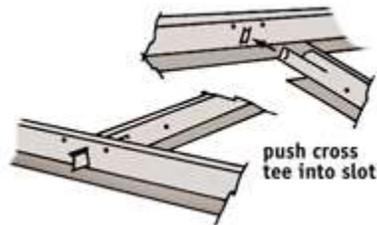
**FIG. 10** - Main tees can be spliced for rooms wider than 12'.

Install the main tees so that they are all level with the wall angle already mounted. Use a long level for this.



## INSTALLING CROSS TEES & BORDER CROSS TEES

Install the cross tees by inserting the ends of the cross tees into the slots in the main tees (Fig. 11). Use the manufacturer's instructions for fitting the cross tees into position.



**FIG. 11** - Insert the cross tees into the slots in the main cross tees.

Determine the location of the cross tees by the pattern you selected either 2'x2' or 2'x4' (Fig. 2).

Be sure the lock tab on the cross tee is on the outside of the slot. This attachment is slightly different in some types of tees.

You can remove most cross tees by depressing the lock tab with a screwdriver.

Border cross tees are installed between the wall angle and the last main tee.

Measure from the last tee to the wall angle, allowing 1/8" for the thickness of the wall angle. Cut the cross tees and install them by inserting the connector in the main tee and resting the cut edge on the wall angle.

Apply RF shielded foil tape with electrically conductive adhesive (EC Foil Tape) to the top side of all the joints or use Xalon FS conductive caulking to the top side of all the gaps, typically where the cross tees fit into the main tees.





## **INSTALL CEILING GRID CROSS TEE SUBSTITUTION LED LIGHTING NOW**

If you are eliminating your existing lighting fixtures or going with new LED lighting, Now is the time to install your cross tee substitution LED lighting fixtures. Magnetic and clip-on LED lighting strips are also available that attached to the bottom of the ceiling grid tees.



## **BEFORE INSTALLING CEILING PANELS**

You need to make sure that every grid component is connected electrically to earth or electric ground. You might have to make more than one connection from the metallic grid to a good ground. Verify that all ceiling grid components are grounded by continuity checking them using an ohmmeter or multi-meter.



Use RF shielded foil tape with electrically conductive adhesive foil tape or Xalon FS electrically conductive caulking to cover up all joints or gaps on the top side of the inverted T channel, Tees, expansion joints, and angle molding.



## **CUTTING THE XALON RF SHIELDED CEILING PANEL AND FRP PANEL**

The FRP panel is separate from the Xalon RF shielded panel, so you can cut as needed for sizing, angles, light fixtures, penetrations etc. with a hole saw or fine tooth metal blade saw or miter saw. For straight cuts a straight edge and utility knife work the best.

Once your FRP panel is cut to fit the ceiling grid, you can use it as a template for cutting the Xalon RF shielded panel.

Place the custom cut FRP panel on top of the Xalon RF panel and mark all your cuts with a sharpie.

Cut, your marked lines, on the Xalon X5000 RF shielded ceiling panel, using the same method as the FRP panel. A utility knife with straight edge is recommended (A miter saw for the Xalon RF panels is not recommended). Using the 3" (PN: ST-3x180-1s recommended) or 4" wide PN: ST-4x180-1s, RF shielded foil tape with electrically conductive adhesive, cover all the exposed panel cuts, overlapping at least 1" on to the uncut Xalon X5000 aluminum panel in all directions, typically top surface to bottom surface and side to side. If you need to overlap multiple foil tape pieces, overlap at least 1", to the adjoining foil tape piece.

For round or oval openings you will need to radial tape up the opening, so it is RF sealed. Examples are round air vents, can light fixtures and sprinkler pipe penetrations. For small holes, like sprinkler pipe penetrations, we recommend the 1" wide (cut the 4" wide PN: ST-4x180-1s into 1" strips) RF shielded foil tape with electrically conductive adhesive. Overlap the best you can.

## **INSTALL LIGHTS, AIR VENTS AND PENETRATIONS FIRST**

For recessed lighting, you can use 2'x2' or 2'x4' drop-in troffer lighting fixtures, which are specially RF shielded and designed for this purpose. You can install RF shielded can light fixtures into the Xalon RF shielded panel. You can also center fluorescent light fixtures over the panels and use a RF shielded luminous lay-in panel.





For air vents and return air vents, we recommend metal 2' x 2' or 2' x 4' air vents with metal perforated grill, metal housing and metal reducer. We recommend RF shielded honeycomb air vents for higher SE requirements (60dB and up).



We also recommend the use of metalized HVAC ducting. EC Foil Tape the seam from the air vent flange to the metal of metalized HVAC duct.



For penetrations, cut the hole in the FRP panel and the Xalon RF panel and RF seal up the hole in the RF panel (as described above). Install the FRP panel, install the Xalon RF panel, on top of the FRP panel, use the panel clips on all four sides to hold the FRP and RF panel tightly down in to the ceiling grid channel. You will also need to get above the panels to radial tape, using EC foil tape, the metal pipe to the top of the RF panel.





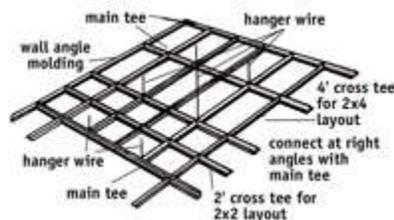
If the pipe is not metal, you will need to spiral wrap EC foil tape around the pipe from the top of the panel, to least 6 times the diameter of the pipe. Then radial tape from your now taped pipe to the top of the RF panel.

Example: The pipe penetration is 2" in diameter, from the top of the RF panel, you will spiral wrap EC foil tape up to a height of 12", then radial tape from the top of Xalon RF panel to the newly tape pipe penetration.



## INSTALLING X5000 CEILING PANELS

Your final main and cross tee arrangement will look similar to Fig. 13. The top part of the illustration shows an arrangement of a 2'x4' layout, while the lower half shows main and cross tees arranged for a 2'x2' layout.



**FIG. 13** - Your final tee arrangement will look similar to this.



Drop in the FRP ceiling panels into position by tilting them slightly, lifting them above the framework and letting them fall into place (Fig. 14).



**FIG. 14** - Tilt the FRP ceiling panels slightly and drop them into position.

You will have to work from above the ceiling grid in an open area to install the Xalon X5000 RF shielded panels into the ceiling grid above the FRP panel. Push the X5000 panels down if they are a tight fit. Be careful not to tear the foil on the X5000 panels.

#### **Options Depending on the shielding effectiveness requirement**

**For All Systems:** Seal the ceiling tee joints and gaps as described above, with electrically conductive tape or Xalon FS caulking.

**For 20dB to 40dB System:** Install the FRP panel, then install the X5000 panel

**For 40dB to 60dB System:** Install the FRP panel, then install the X5000 panel, then from the top seal the perimeter of the X5000 with the FS conductive caulking.

**For 70dB to 80dB System:** Install the FRP panel, then install the X5000 panel, then from the top tape (using 4" wide EC aluminum tape PN: ST-4x180-1s) across all ceiling grid tee tops, from X5000 panel to X5000 panel.

**For the final X5000 panel:** Tape the FRP panel to the X5000 panel using the 3" wide electrically conductive aluminum seaming tape, around the perimeter of the panels extending 1/2" on to the face of the FRP panel. Apply 1/4" bead of Xalon FS conductive caulking around the perimeter of the ceiling grid tees, in the bottom corner. Then using a couple suction cups or very sticky adhesive tape, attached to the bottom of the FRP panel, position the two taped together panels above the ceiling grid and then dull them down into position. Clean off any excess FS caulking from the FRP panel and ceiling grid tee.



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