

MetalWorks™ Airtite® Radiant AR-B Ceiling Panels

Assembly and Installation Instructions



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Scan the QR code below with your smartphone camera to view the installation video.

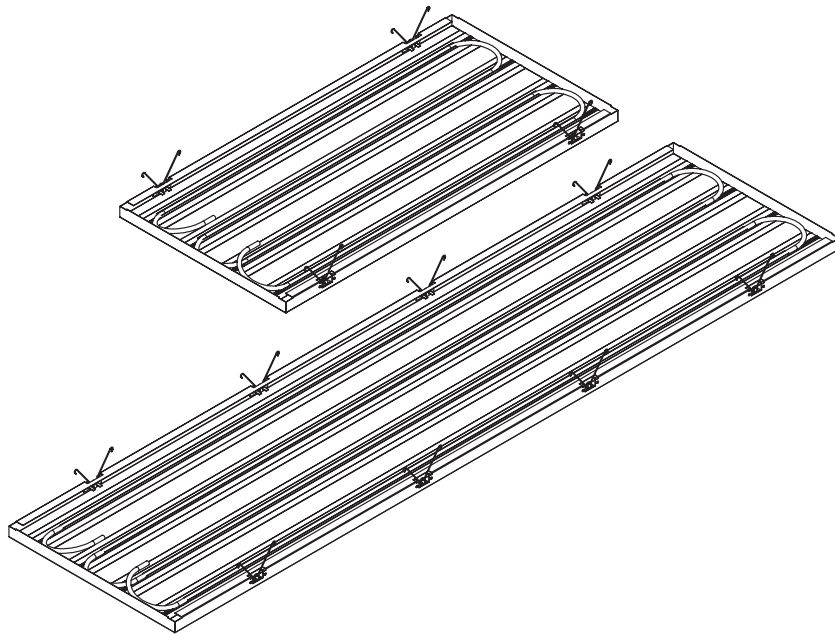


Armstrong®
World Industries

1. GENERAL

1.1 Product Description

MetalWorks™ Airtite® Radiant ceiling panel system is a manufactured aluminum panel that provides sustainable heating and cooling to any interior space by circulating hot and cold water through copper tubing and connecting braided stainless steel hose with an oxygen barrier concealed on the back of the panel. The panel is comprised of downward accessible 24" x 24", 24" x 48", 24" x 72" and 24" x 96" panels, designed to install on a 15/16" Prelude® suspension system that is pre-slotted to accept the panel springs. MetalWorks Airtite Radiant ceiling panels are produced with a Whitelume pre-coat finish and are offered in unperforated and perforated options. A factory-applied fleece is included with perforated panels and a 1" acoustical pad is available to increase acoustical performance. Additional sizes, perforations, and finishes are available as a custom solution. Consult your local Radiant rep for assistance (**Fig 1**).



(Fig 1)

This is an installation guide. All AR-B projects will receive full shop drawings (shop drawings should be used as the master guide). Please refer to these drawings for project-specific designs, layouts, and fixture integration.

1.2 Storage and Handling

MetalWorks Airtite Radiant ceiling panels should be stored in a dry interior and should remain in the original packaging prior to installation to avoid damage and to protect against direct exposure to moisture, light, and frost. The ideal storage temperature is between 50° F and 90° F. Do not store hazardous materials/chemicals next to hoses or in the same area as the hoses. Packaging contains foam sheets to protect bare panels from shifting and scratching one another, so keep back-to-back and face-to-face for transporting. Proper care should be taken to avoid damage and soiling when handling panels.

IMPORTANT NOTE: The ends of the copper tubing have dust caps that should not be removed until the installation of the hose. Each panel also has a clear PVC protective film on the surface of the panel to protect it from dirt and scratching. The film should be removed after installation is complete. For any fingerprints, which may need to be wiped clean, see Cleaning Section 1.8.

1.3 Site Conditions

Areas to receive ceilings must be free of construction dust and debris. Panels should only be installed in closed and acclimatized buildings. Such installations must not be exposed to abnormal conditions, namely: chemical liquids and fumes, or the presence of standing water or contact with moisture, which could result from condensation or building leaks. Panels are intended for interior use only, and may not be used in exterior applications.

1.4 Fire Performance and Sprinklers

MetalWorks™ Airtite® Radiant ceiling panels have been tested in accordance with ASTM E-84 Testing and are considered incombustible. The material has a Flame Spread Index of 25 or less and Smoke Developed Index of 50 or less.

This panel system may obstruct or skew the existing or planned fire sprinkler water distribution pattern, or possibly delay the activation of the fire sprinkler or fire detection system. Designers and installers are advised to consult a fire protection engineer, NFPA 13, and their local codes for guidance on the proper installation techniques where fire detection or suppression systems are present.

1.5 Safety Considerations

Use caution and always wear appropriate safety glasses and gloves to protect hands and eyes when installing metal panels to avoid injury. Special consideration should be taken before field cutting panels; refer to Section 7 for cutting instructions. For those that can be cut, utilize recommended tools and metal-cutting blades in good condition. Improper cutting equipment could damage or dent the panels and cause the aluminum saddle adhesion to the panel to fail. If a project requires special-sized panels, consult Architectural Specialties.

1.6 Warranty

MetalWorks Airtite Radiant ceiling panels have been tested based on the installation method described in this document. The warranty will be voided if you do not follow instructions and guidelines.

1.7 Temperature and Humidity During Installation

MetalWorks Airtite Radiant ceiling panels are interior finish products designed for installation in temperature conditions between 50°F and 86°F, in spaces where the building is enclosed, and HVAC systems are functioning and will be in continuous operation. Relative humidity should not fall below 25% RH or exceed 55% RH. There must be proper ventilation of the plenum in high-moisture areas. All plastering, concrete, terrazzo, or any other wet work should be completely dry. All windows and doors should be in place. The heating, ventilating, and air-conditioning system should be installed and operable where necessary to maintain proper temperature and humidity conditions before, during, and after installation.

1.8 Cleaning Recommendation

An abrasive or strong chemical detergent should not be used. A mild detergent diluted in warm water, applied with a soft cloth, rinsed, and wiped off with a chamois will maintain the panels in good condition. If not removed by washing, oily or stubborn stains can be wiped with products like Fantastik®, but care is necessary to avoid affecting the gloss level of the paint.

2. DESIGN CONSIDERATIONS

2.1 Plenum

Although MetalWorks Airtite Radiant ceiling panels install from below and panels never travel into the plenum space, they will require a minimum 6" clearance above the suspension system. This allows enough room for the panel springs to travel into the plenum space during installation.

NOTE: Sub-header piping, valves, manifolds, light fixtures, and air handling systems require more space and may be the factor that determines the minimum plenum height for the installation.

2.2 Suspension System

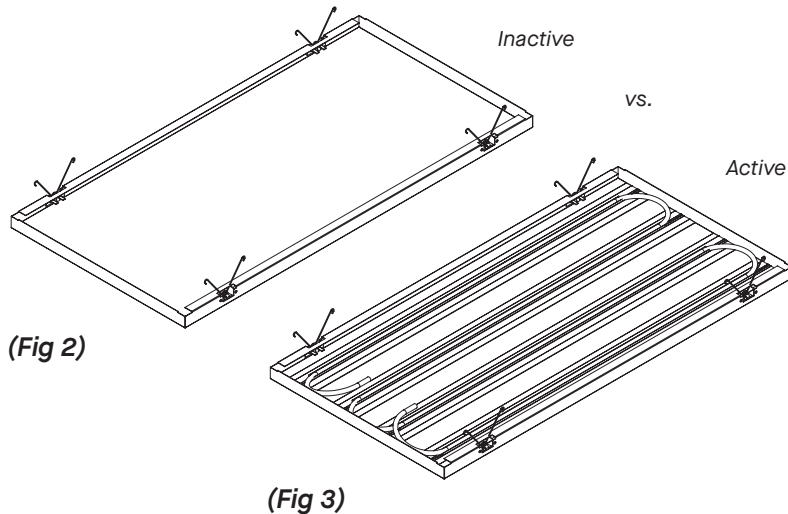
MetalWorks Airtite Radiant ceiling panel system uses a standard 15/16" suspension system. The elements of the system include pre-slotted Prelude® XL® 15/16" main beams and standard Prelude XL cross tees. The installation must in all cases conform to the requirements of the International Building Code and its referenced standards. For a clean visual, box molding and spreader hold-down clips are recommended for perimeter cut conditions.

2.3 Exterior Applications

MetalWorks Airtite Radiant ceiling panels are not intended for exterior use.

2.4 Perimeters and MEP Integration Consideration

Inactive panels are recommended where MEP (i.e. sprinklers, lighting, etc.) are located, and perimeter conditions where cutting of the panels is needed. Custom TechZone® type panels can also be designed and integrated with your radiant layout (**Figs 2 & 3**). Refer to Section 7.0 for cutting instructions.



3. ACCESSORIES

3.1 Hook Removal Tool (Item 7129)

3.2 Arrives with Panel

- 3.2.1 Acoustical Pads
- 3.2.2 Flexible Braided Stainless Steel Hose with Oxygen Barrier
- 3.2.3 House Security Clip
- 3.2.4 Brass Adapter Fitting

4. SUSPENSION SYSTEM

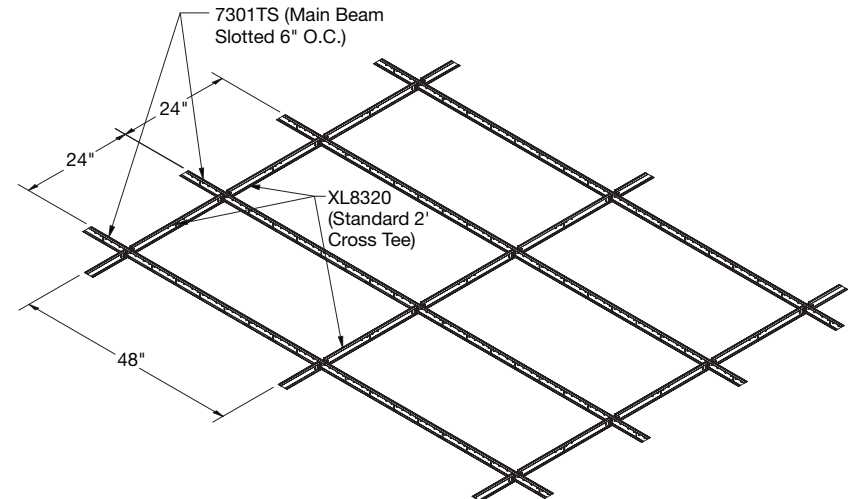
4.1 Non-seismic Suspension System Installation (Wall-to-Wall)

The requirements listed here represent the manufacturer's minimum acceptable installation requirements established by the local authority having jurisdiction. Suspension system installation must conform to ASTM C636 requirements. Hangers and bracing are to comply with all local code requirements. The suspension system must be properly installed and leveled using no less than 12-gauge galvanized steel wire. The suspension system for all panel sizes must be leveled to within 1/4" in 10' and must be square to within 1/16" in 2'. 90 degree Alignment Clips (Item 7134) can be used to assure the grid system meets the squareness requirement.

The following are examples of the most common suspension system layouts:

4.2 24" × 24", 24" × 48", and 24" × 96" Panels

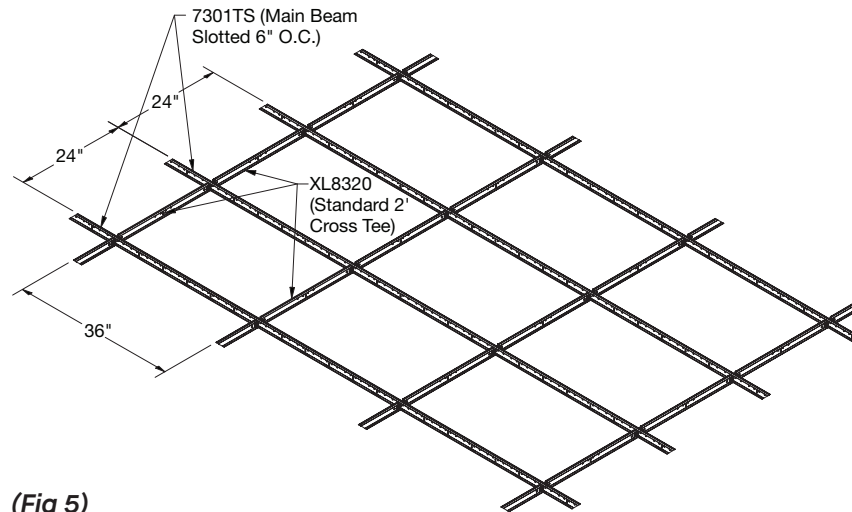
For 24" × 24", 24" × 48", and 24" × 96" panels: Prelude® XL® HD main beams that are pre-slotted 6" O.C. (Item 7301TS) are installed every 24" O.C. with hanger wires every 48". Then 24" Prelude cross tees (Item XL8320) must intersect the main beams at 90 degrees every 48", creating a 24" × 48" grid module. Springs on the panel must be inserted into main beam slots only (**Fig 4**).



(Fig 4)

4.3 24" x 72" Panels

Prelude® XL® HD main beams that are pre-slotted 6" O.C. (Item 7301TS) are installed every 24" O.C. with hanger wires every 48". Then 24" Prelude cross tees (Item XL8320) must intersect the main beams at 90 degrees every 36", creating a 24" x 36" grid module. Springs on the panel must be inserted into the main beam slots only (**Fig 5**).



(Fig 5)

Alternative suspension system layouts will be determined by the panel size.

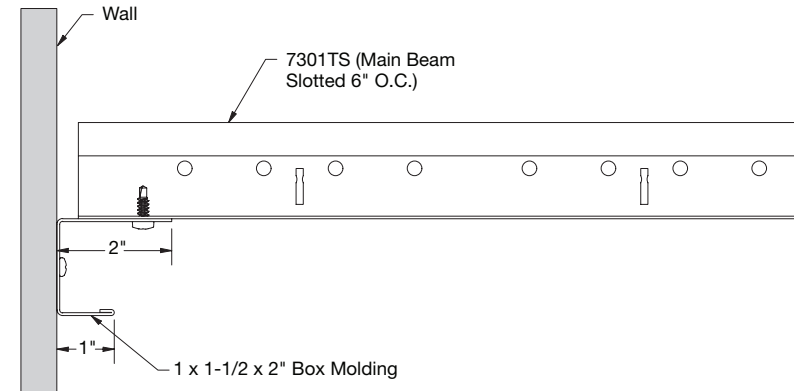
4.4 First Main

The location of the first main beam must be as detailed on the reflected ceiling plan to provide borders that are equal in size and greater than 1/2 of the full panel width. Pay close attention when cutting this first main beam to length; make sure that the slots in the main beam are in the correct position to accept the springs attached to the panel size being installed.

4.5 Wall-to-Wall Perimeter Solutions

4.5.1 Box Molding

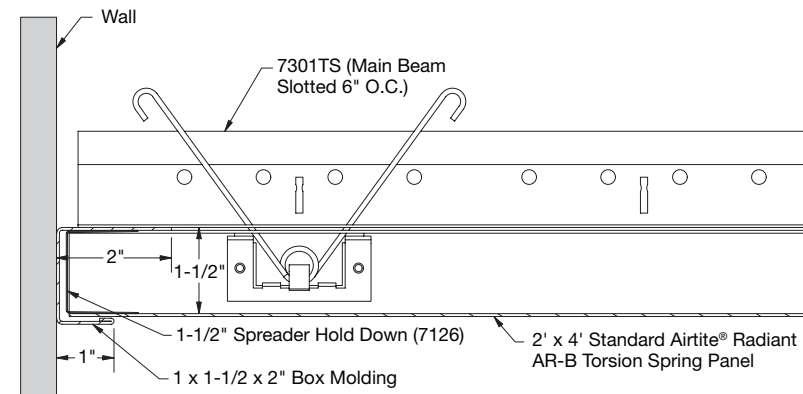
Perimeters are trimmed with 1 x 1-1/2 x 2" box molding attached with appropriate fasteners. The suspension system will rest on the box molding's upper 2" flange, and the panel edges will rest on the bottom 1" flange (**Fig 6**).



(Fig 6)

4.5.2 Cut Edge

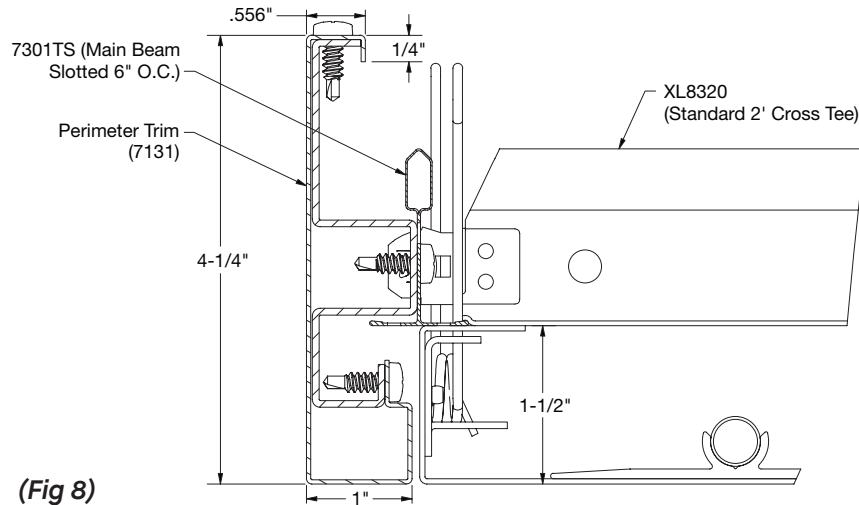
The cut edge of the panels is held down against the molding by inserting a Spreader Hold-down Clip (Item 7126) into the molding, between the upper and lower flanges, over each cut panel. The Spreader Hold-down Clip is 10.625" long, so use the appropriate number of hold-down clips for the panel edge dimension. Armstrong does not recommend cutting active radiant panels in the field. If required, a custom solution is available upon request (**Fig 7**).



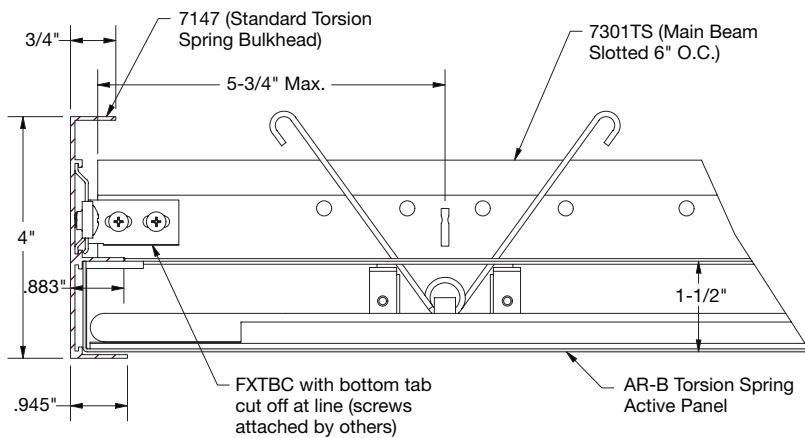
(Fig 7)

5. FLOATING PERIMETER / DISCONTINUOUS SYSTEMS

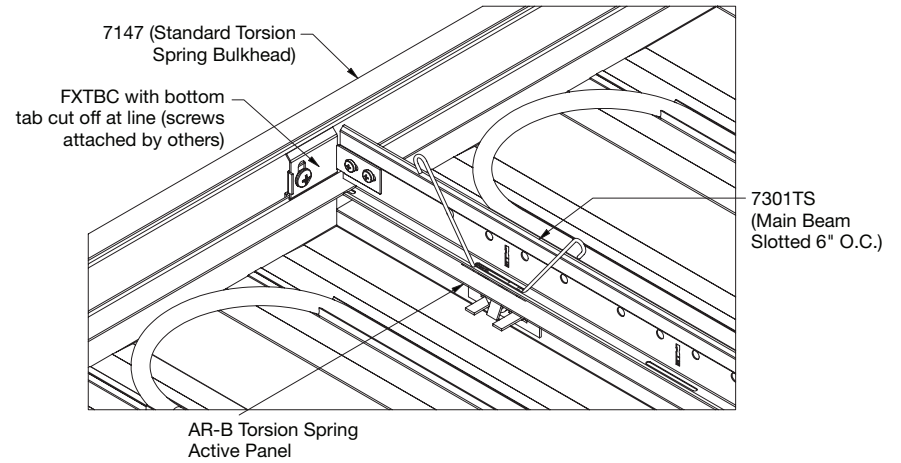
The suspension system layout for floating perimeters or cloud applications should be the same as detailed in Section 4 for the specific panel sizes. Please note that main beams and cross tees need to be installed around the entire perimeter for the perimeter trim to be fastened to the suspension system. Item 7147 is an extruded perimeter trim available in White, Silver, Gun Metal, and Black. Item 7131 is a formed perimeter trim for full-panel installation only and is available in Lacquer Mill, Satin Anodized, and Brushalume finishes. The perimeter trim is designed for straight perimeters and should not be curved. For curved conditions, custom solutions are available (Figs 8-11).



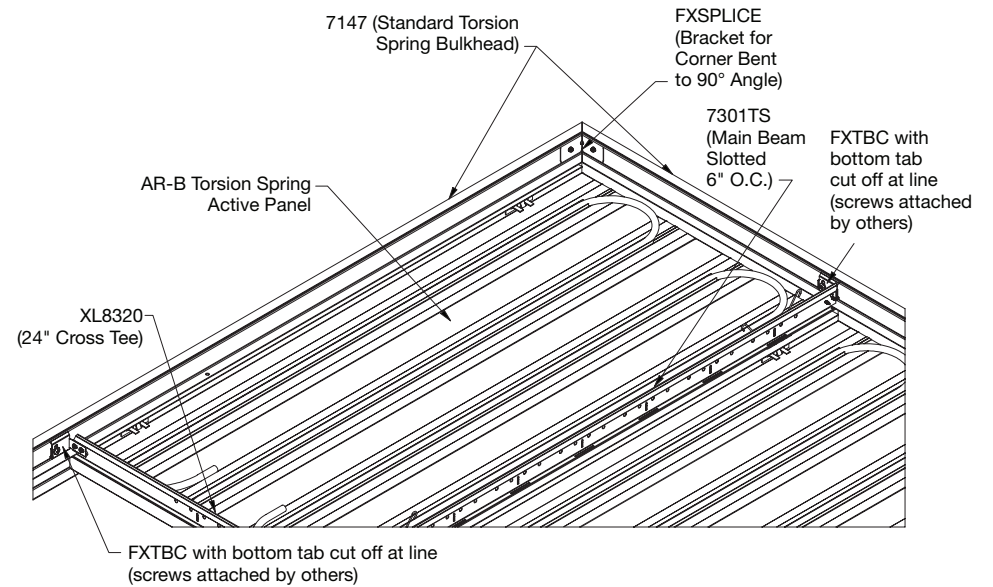
(Fig 8)



(Fig 9)



(Fig 10)



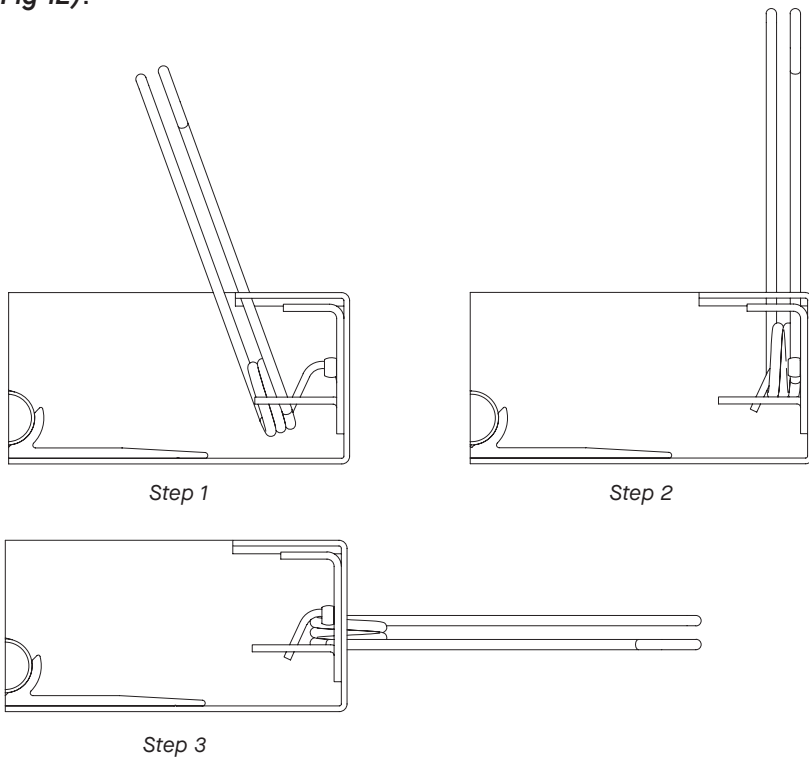
(Fig 11)

6. PANEL INSTALLATION

When installing MetalWorks™ Airtite® Radiant ceiling panels, coordination and collaboration between trades is critical for a successful and efficient installation. The general contractor should work with the mechanical contractor and ceiling contractor to clearly coordinate responsibilities.

6.1 Panel Assembly

Springs will need to be installed in the field on the panel bracket prior to installation. Ensure you have the correct number of springs required for each panel. The springs are included and packaged in a separate box. Insert springs to each bracket following the 3 steps shown (Fig 12).



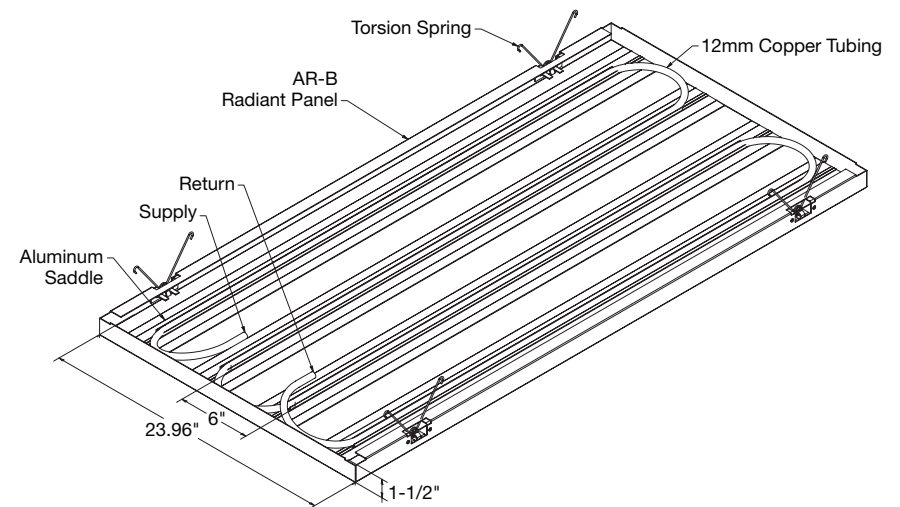
(Fig 12)

6.2 Installing Active Radiant Panels

Active panels will include 12mm nominal copper tubing seated in aluminum saddles adhered to the back of the ceiling panel. The panel will have supply and return points to be bent upward for ease of connection.

6.2.1 Panel Directionality

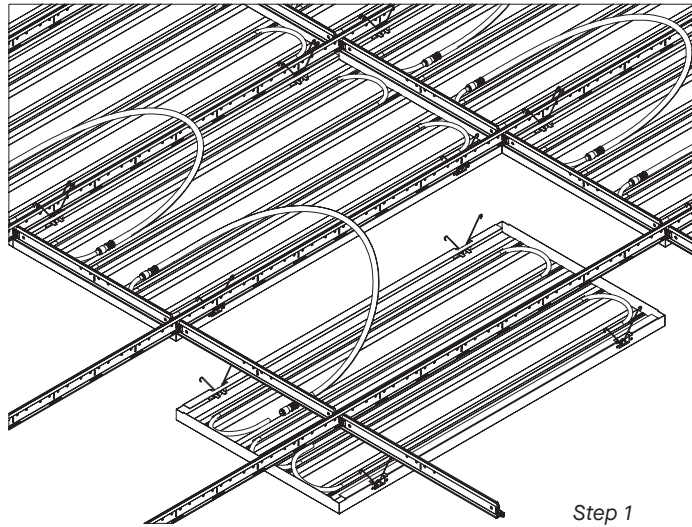
Panels are mechanically directional due to the location of the supply and return point of the copper tubing adhered to the back of the panels (Fig 13). The installer should refer to the shop drawings for correct panel placement and directionality. Panels feature a set of springs on the long side that securely pull the panel up against the main beam holding the panel in place.



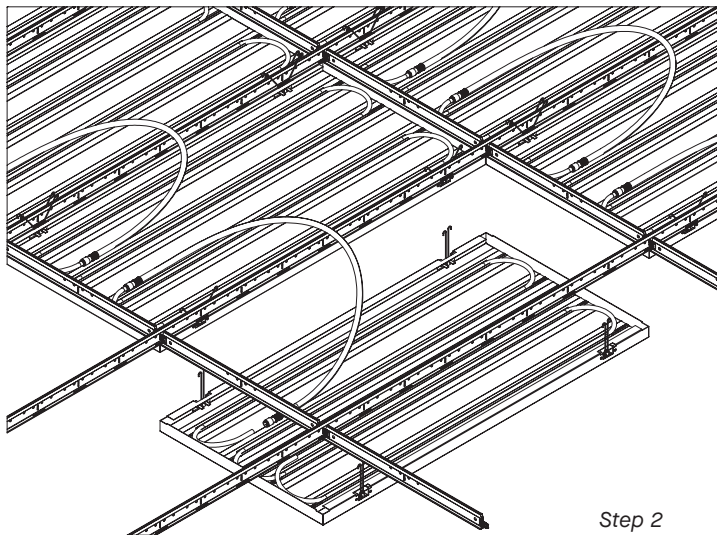
(Fig 13)

6.2.2 Panel to Suspension System Installation

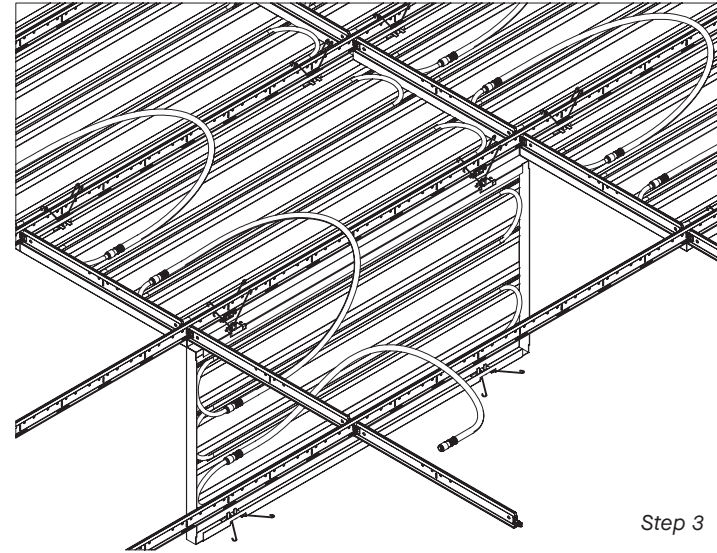
Panels will need to be partially installed to allow panels to hang in the vertical position for completion of the hose connection (**Fig 14**). Align the springs with the slots in the flange of the main beam or cross tee on only one side of the panels. The hose connections will occur while panels hang in the vertical position before fully being installed into the suspension system. **CAUTION:** Do not pull or add any extra weight to avoid bending the hook tabs on the brackets. The hoses are connected and the panels install progressively; refer to Section 6.2.3 for hose connection instruction.



Step 1



Step 2



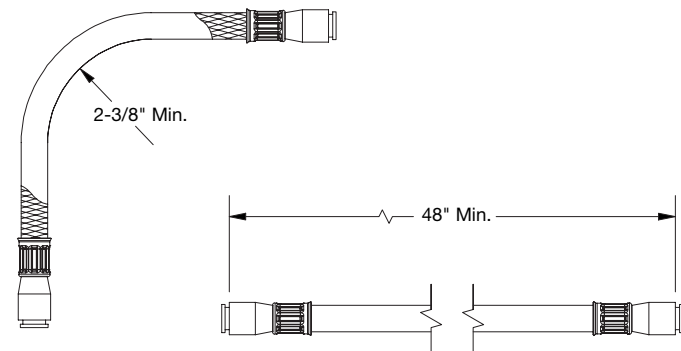
Step 3

(Fig 14)

6.2.3 Panel-to-Panel Connections

6.2.3.1 Hose (Fig 15)

A hose, constructed of EPDM core with a 304 stainless steel braided exterior oxygen barrier designed to connect with the radiant ceiling panels, along with a security clip and brass adapter, provided for system connections. Panels will be circuited together via a 12mm x Length as required (48" minimum) size hose. Armstrong defines panel connection circuitry in the shop drawings. The shop drawing submittals will identify the length and locations of connection hoses. The minimum allowance bend radius of the hose must not be underrun.



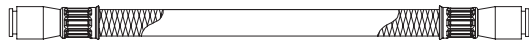
(Fig 15)

The minimum bending radius of a 12mm stainless steel braided hose must be maintained to ensure flow rate is not impeded. If this cannot be achieved, the method of hose installation must be reevaluated **(Fig 16)**.

Correct:

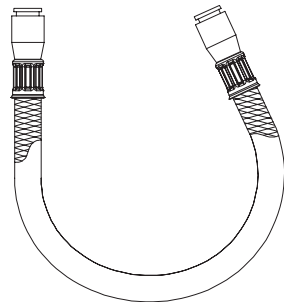


Incorrect:

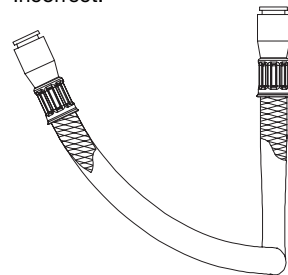


Hose should have some slack in installed position

Correct:

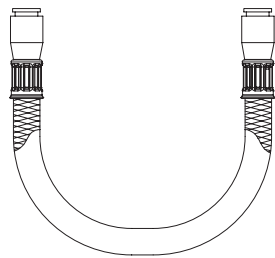


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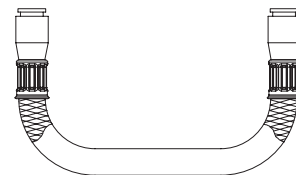


Hose Should Not be Torqued

Correct:



Incorrect:



Minimum Bend Radii of Hose Should Not be Under Run

(Fig 16)

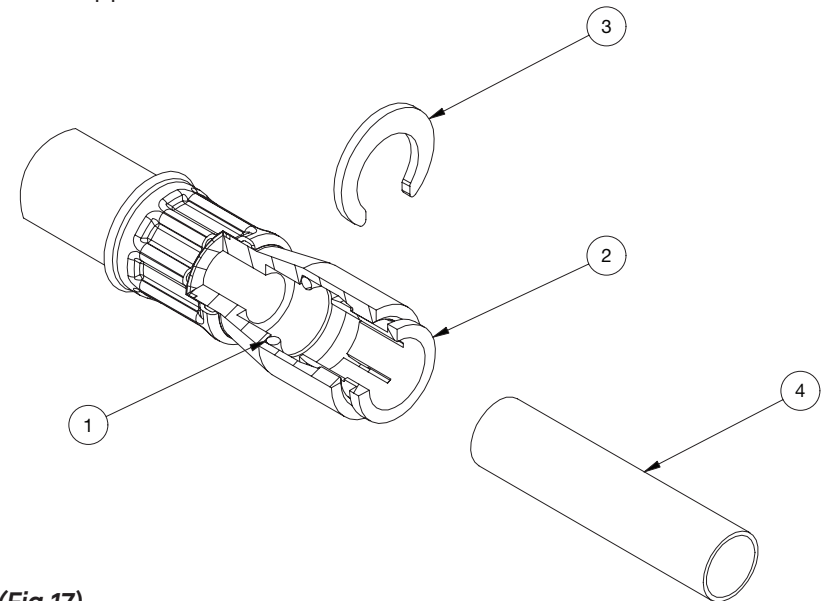
The hose should not be subjected to compressive or tensile loads during installation/operation. The hose can change length after installation once the system becomes pressurized or exposed to heat, therefore hoses should be installed with some slack/sag to account for these length variations.

6.2.3.2 Pressure/Temperature Ratings

The maximum allowable working pressure is 15 bar (217psi) @ 90° C (194° F) for a 12mm stainless steel braided hose with EPDM core and 12mm push-fit fittings on each end. Higher working pressure is not permitted by a lower operating temperature. Hoses should not be used in installations that will exceed the manufacturer's rated working temperature and pressure.

6.2.3.3 Push-Fit Components (Fig 17)

1. O-ring
2. Collet with stainless steel teeth
3. Security clip
4. Copper tube



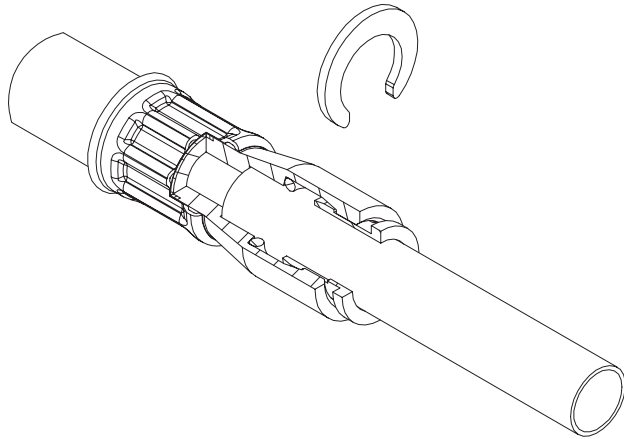
(Fig 17)

6.2.3.4 Possible Fittings

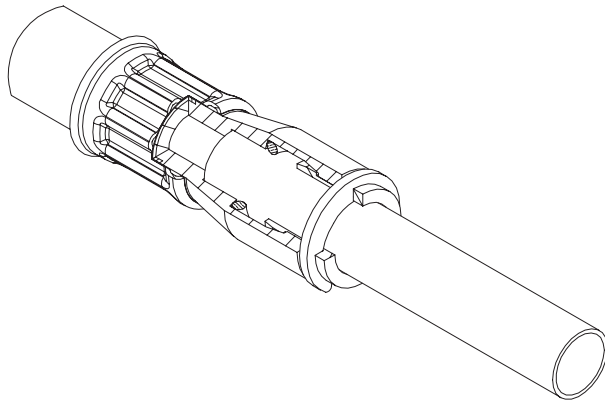
Custom threaded fitting is available, please contact your local Radiant rep.

6.2.3.5 Connecting Fitting to the Tube or Adapter (Figs 18 & 19)

- Holding the fitting square to the copper, begin pushing it into the copper and continue pushing until the copper bottoms out on the O-ring (some resistance will be encountered).
- Once the copper tube is fully seated on the O-ring, pull back on the hose/fitting to confirm the connection is secure and test as follows. Charge with $p = 10 \text{ bar}/10 \text{ min}$, release of pressure $p = 0 \text{ bar}$, and charge with $p = \text{operating pressure}/10 \text{ min}$. There should be no “slippage” of the fitting.
- Required security clip can be installed once all testing has been completed. The security clip will help avoid inadvertent removal.



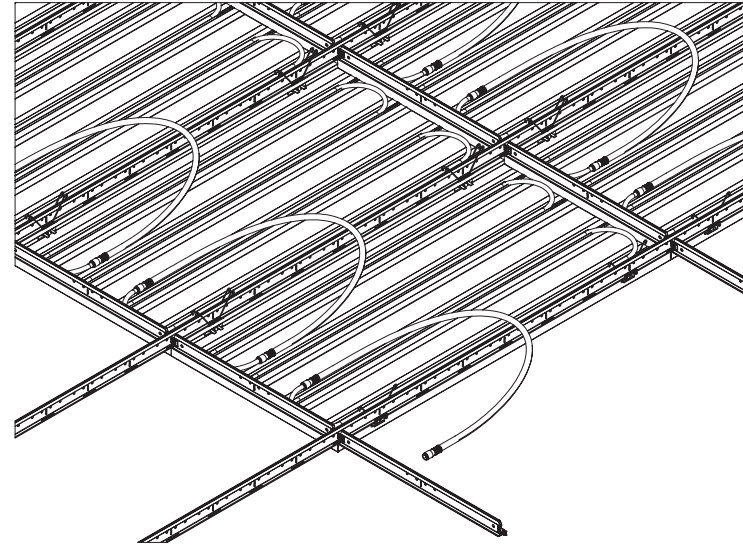
(Fig 18)



(Fig 19)

6.2.4 Completing Panel Installation

Once panel-to-panel connection is completed, align the rest of the panel springs with the slots of the main beam, compress the springs, and insert them into the corresponding slot. Then press up into place with the palm of the hand. The springs should spread apart in the slots of the grid and seat the panel into place (Fig 20).

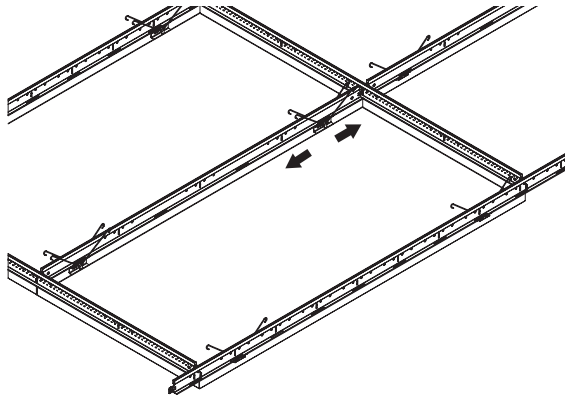


(Fig 20)

IMPORTANT NOTE: Use caution when compressing panel springs as they may accidentally slip from hands and damage the panel, the hose connection or cause an injury.

6.3 Inactive Panel Installation

Inactive panels (without copper tubing) install the same way as a standard torsion spring panel. Panels are 180-degree directional, with two supporting sides. Align all panel springs with the slots of the main beam, compress the springs, and insert them into the corresponding slots. Then press up into place with the palm of the hands to sit the panel in place (*Fig 21*).



(Fig 21)

7. CUTTING

Inactive panels are recommended at perimeter conditions requiring cuts or MEP integrations. For active radiant ceiling panels, mounted devices must either replace a full radiant panel or install in a hole that is cut into the face of the panel. **IMPORTANT NOTE:** For MEP integration that must occur within active panels, refer to shop drawings and seek support from your Radiant ceiling representative due to copper tubing. When cutting inactive panels, the following methods can be used:

7.1 Cutting Tool Recommendations

7.1.1 MetalWorks™ Airtite® Radiant inactive ceiling panels can be cut using standard tools and methods for metal panels.

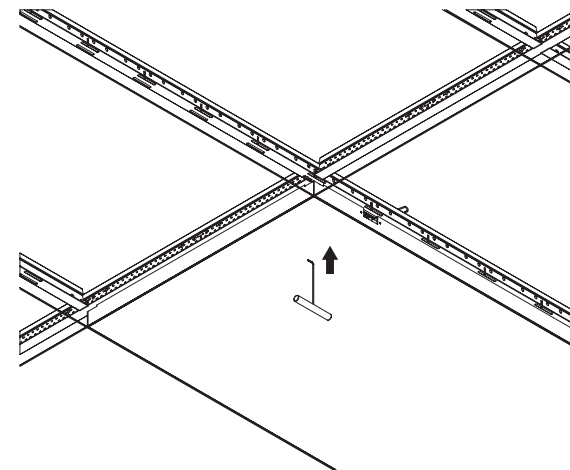
- For straight cuts, it is recommended to use a metal cutting circular saw with a non-ferrous metal cutting blade (consult blade manufacturer for specific recommendation)
- For curved cuts, it is recommended to use a jigsaw with an aluminum cutting blade or electric metal cutting shears

- The quality of the cut at perimeters can impact the flatness of the cut edge, which may require additional Spreader Hold-down Clips (Item 7126). It is recommended to use a metal cutting circular saw with a non-ferrous metal cutting blade (consult blade manufacturer for specific recommendation).

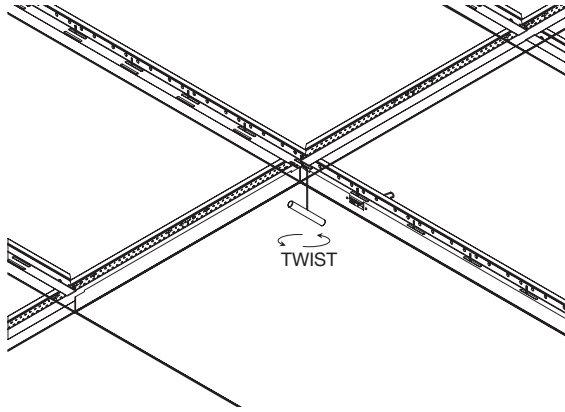
8. PANEL REMOVAL

All panels are removable without moving up into the plenum, however, some caution and additional steps will need to be taken when removing active radiant panels; refer to Section 8.1.

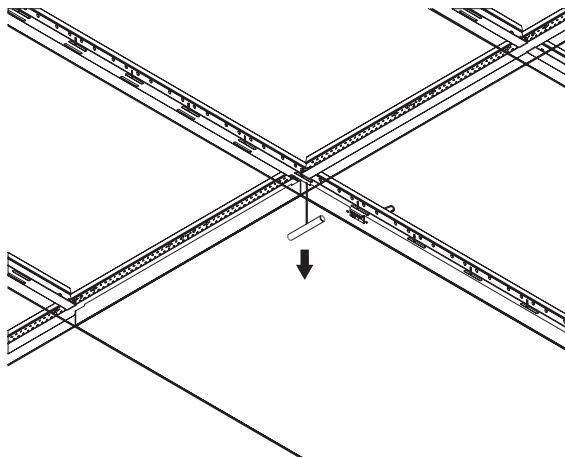
The Hook Panel Removal Tool (Item 7129) for perforated or unperforated panels is inserted into the joint between two panels. Make sure you insert the tool within 1" from a panel intersection to engage the recessed corner of the panel. Twist the tool 90 degrees to hook the top of the panel. Then pull the tool downward, slowly, until the spring catches on the flange of the grid and can be seen. Now that the spring has become accessible, push the spring together, slide it down through the slot, and pull down gently to release the panel from the main beam (*Figs 22-25*).



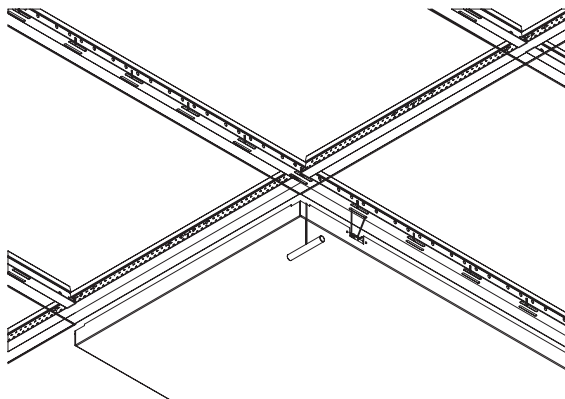
(Fig 22)



(Fig 23)



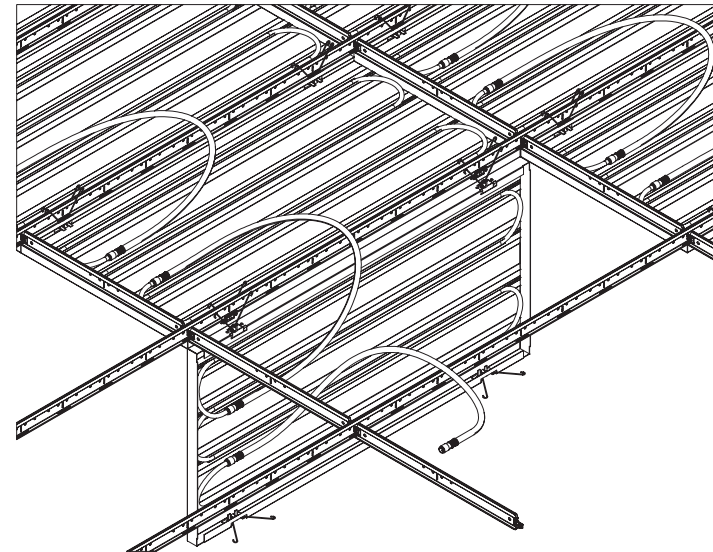
(Fig 24)



(Fig 25)

Adjacent panels may be removed from the same row of main beams without further use of the tool.

The panel is designed to provide swing-down accessibility. Using the above method, pull the panel down until all springs catch on the flange of the grid and can be seen. Disengage all springs from one side of the panel and rotate the panel down slowly and carefully. This will allow the panel to be supported by the springs on the opposing side. Be sure to guide the panel into its resting position to avoid introducing unnecessary forces into the panel or system (**Fig 26**).



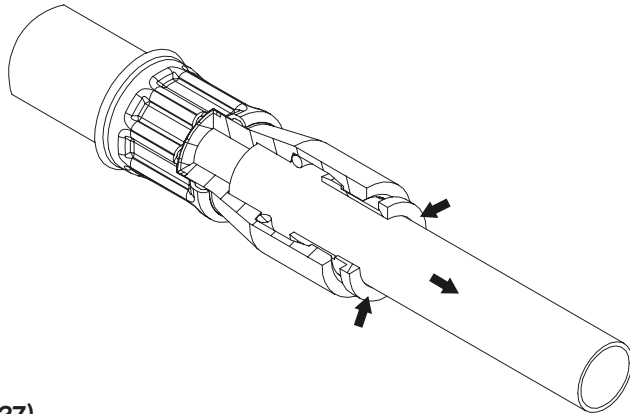
(Fig 26)

8.1 Additional Removal Steps for Active Panels

CAUTION: When accessing active panels, extra caution should be taken to not allow the panel to over-stretch the hose and cause damage. Although panels are individually accessible, accessing multiple panels at the same time may not be possible based on panel size or location. Removing or accessing the panels can be achieved by reversing the installation procedure; refer to Section 6.2.3.5. Panels should always be supported by panel springs, personnel, or other means while the area is being accessed. Do not attempt to remove hoses from the panels when the system is pressurized and there is active water flowing through them.

Hose Removal Steps (Fig 27)

- Ensure the system is depressurized
- Push the fitting slightly forward into the copper and hold
- While holding and using your other hand, push the black collet towards the hose fully
- The fitting should now freely slide off the copper



(Fig 27)

9. SEISMIC INSTALLATION

The installation should, in all cases, conform to the International Building Code Seismic Design Category C, D, E, and F. Refer to Armstrong Seismic Ceiling Installation Guide BPCS-4141, Seismic Design: What You Need to Know brochure, for more details. In addition to the above requirements, also follow ASTM C636 requirements.

9.1 Seismic Rx® Suspension System Cat C

- Ceiling installation should conform to basic minimums established in ASTM C636
- Box Molding (Item #7125)
- Minimum 7/8" wall molding (Item #7800)
- Suspension system may be cut tight on two adjoining walls
- Minimum 3/8" clearance on two unattached walls
- BER2 on all main beams and cross tees
- BER2 maintains the main beam and cross-tee spacing; stabilizer bars are not required

- Safety wires are required on light fixtures
- Maximum ceiling weight of 2.5 LBS/SF

9.2 Seismic Rx Suspension System Cat D, E, and F

- Ceiling installation should conform to basic minimums established in ASTM C636
- Box Molding (Item #7125)
- Minimum 7/8" wall molding
- Suspension system must be attached on two adjacent walls – opposite walls require BER2 with 3/4" clearance
- BER2 maintains the main beam and cross-tee spacing; no other components are required
- Heavy-duty systems as identified in ICC-ESR-1308
- Safety wires are required on light fixtures
- Perimeter support wires within 8"
- Ceiling areas over 1,000 SF must have horizontal restraint wire or rigid bracing
- Ceiling areas over 2,500 SF must have seismic separation joints or full-height partitions
- Ceilings without rigid bracing must have 2" oversized trim rings for sprinklers and other penetrations
- Changes in the ceiling plane must have positive bracing
- Suspension layouts are the same as described in Section 4

9.3 Connection to Wall

See BPCS-4141 Seismic Design: What You Need to Know – Code Requirements Seismic Rx Suspension System Tested Solutions – SEISMIC RX APPROACHES TO CATEGORY C & D, E, AND F INSTALLATIONS.

9.4 Special Bracing Required

See BPCS-4141 Seismic Design: What You Need to Know – Code Requirements Seismic Rx Suspension System Tested Solutions – Bracing and Restraint for Seismic Installations Seismic Separation Joints.

9.5 Restraint/Bracing

Restraint/Bracing systems should be approved by the project design team and reviewed with local building department.

METALWORKS™ AIRTITE® RADIANT CEILING PANELS					
Item No.	Description	Ordered Separately/ Included with	Required for Install	Sold by the	PCS/CTN
Suspension System					
7301TS	Prelude® XL® 12' HD Slotted Main Beam	Included with Order	Yes/Based on Design	CTN	20
XL8320	Prelude XL 2' Cross Tee	Included with Order	Yes/Based on Design	CTN	60
7891	12-gauge Hanger Wire	Ordered Separately	Yes	Bundle	-
Perimeter Trim					
7131	Formed Perimeter Trim	Included with Order	Based on Design	CTN	30
7147	Straight Trim – Recommended in Black 6" and up	Included with Order	Based on Design	PCS	10 LF
Accessories					
7129	Hook Removal Tool	Ordered Separately	Based on Design	PCS	1
FXTBC	T-Bar Connector Clip	Included with Order	Based on Design	Pail	50
7126	Spreader Hold-down Clip	Included with Order	Based on Design	CTN	50
BERC2	2" Beam End Retaining Clip	Ordered Separately	Based on Design	Pail	200

IMPORTANT NOTE: Panels and all suspension components, with the exception of those otherwise indicated above to be ordered separately, are quoted as a complete system.

MORE INFORMATION

For more information, or for an Armstrong Ceilings representative, call 877 276-7876.
 For complete technical information, detail drawings, CAD design assistance, installation information, and many other technical services, call TechLine customer support at 877 276-7876 or FAX 800 572-TECH.

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