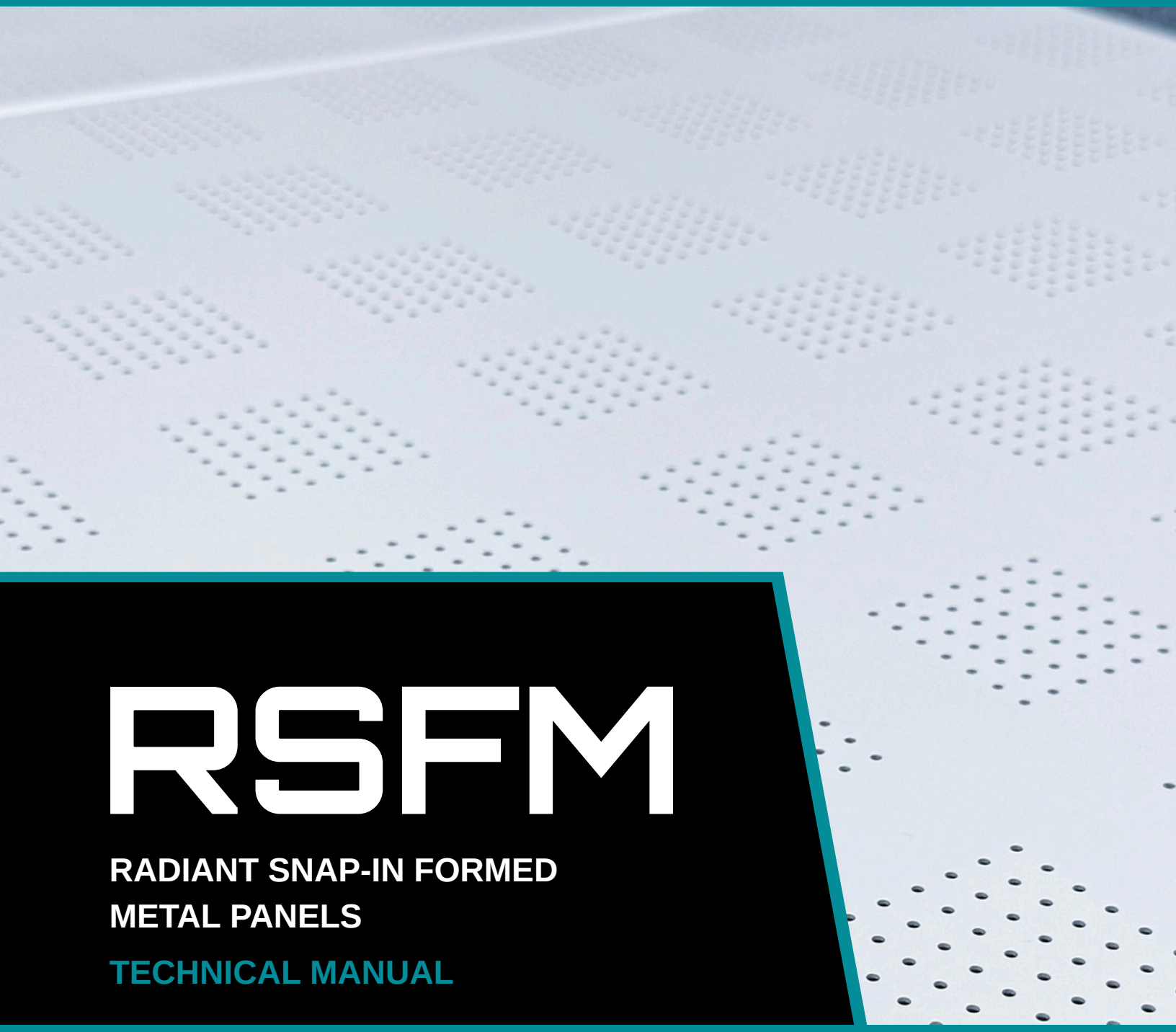
AERO TECH

CLEAN
QUIET
EFFICIENT



RSFM

RADIANT SNAP-IN FORMED METAL PANELS

TECHNICAL MANUAL

INSTALLATION | OPERATION | MAINTENANCE | PERFORMANCE

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WATER PRESSURE DROP

Water Flow Rate (GPM)	Head Loss in Feet of Water Per 2' x 2' Pnl (.505 ID Tube)	Head Loss in Feet of Water Per 2' x 4' Pnl (.505 ID Tube)
2.1	2.78	
2.0	2.48	4.00
1.9	2.21	3.69
1.8	2.00	3.35
1.7	1.79	3.03
1.6	1.59	2.73
1.5	1.39	2.41
1.4	1.19	2.15
1.3	1.00	1.89
1.2	0.84	1.61
1.1	0.78	1.41
1.0	0.65	1.20
0.9	0.55	1.00
0.8	0.45	0.81
0.7	0.35	0.62
0.6	0.28	0.48
0.5	0.20	0.37

To ensure proper system performance, design flow rates below 0.5 US gallons per minute are not recommended

HEATING PERFORMANCE

MWT (Deg. F)	Interior Panels BTU/Hr Sq FT	Perimeter Panels BTU/Hr Sq FT
120	70	82
125	78	92
130	86	101
135	96	113
140	104	124
145	114	135
150	123	145
155	133	156
160	142	167
165	152	179
170	162	190
175	172	203
180	183	215
185	194	228
190	204	240
195	213	251
200	223	262
205	234	275
210	245	288
215	256	301
220	266	313
225	276	325
230	287	337

Use these performance values directly in standard ASHRAE heat loss calculations. Performance values are from certified data based on 70 degree AUST (Average Unheated Surface Temperature), natural convection, and 1 inch, 3/4 Pounds/Cubic Foot insulation on top of panel

Concept of Radiant Heating

Radiant heat transfer works much like sunlight: heat moves from the warm panel to the cooler objects in the room being heated until a temperature equilibrium is reached. Aero Tech Radiant Ceiling Systems function on the basis of providing a comfortable environment by controlling surface temperature and minimizing excess air motion and temperature within the conditioned space.

Like the light energy from a lighting fixture illuminates the room, a radiant ceiling panel emits thermal energy which is absorbed and re-radiated by all elements in the room.

Radiant heat transfer results in an energy-efficient, cost-effective way to heat almost any kind of building.

RSFM PANEL CONSTRUCTION

Radiant Snap-In Formed Metal (RSFM) ceiling panels are constructed of .040" thick aluminum sheets with six (6) passes of .505" ID copper tube metallurgically bonded to each sheet. Tube ends will accept a 3/8" Type “L” soft copper tube without additional fittings.

Standard panel nominal sizes are 2' x 2' and 2' x 4' (2' x 4' panels are center scored to appear as a 2' x 2' panel).

Matching, non-radiant (inactive) panels can be provided on request.

Panels are factory finished in standard white or optional finishes in a large variety of custom colors or textures.

Specification for Aero Tech Radiant Panels

MANUFACTURER QUALIFICATIONS

This specification is based on the Radiant Ceiling employing Radiant Panels and matching Non-Radiant Panels (as required) manufactured by AERO TECH MANUFACTURING INC. 395 West 1100 North, North Salt Lake, Utah, 84054.

Published performance data and dimensional specifications are included in this booklet, provided by the manufacturer. Performance and capacity data is to be based on testing performed by the manufacturer or confirmed by a testing laboratory recognized in the industry.

The manufacturer shall demonstrate his capability in engineering, manufacturing and financial resources to the satisfaction of the Architect and Engineer, and shall have continuously been in the business of manufacturing radiant panels for a minimum of five (5) years

RADIANT PANEL PERFORMANCE REQUIREMENTS

The Radiant Panel will have a minimum heating output of ____ BTU/HR SQFT panel at _____ °F mean water temperature when the room temperature is 70°F, the roof is of medium insulation value and natural convection prevails in the room.

CONTRACTOR QUALIFICATIONS

Installation of the Radiant and Non-Radiant Panels will be performed by a qualified contractor and installed as recommended by the manufacturer. The contractor must be experienced in the installation of radiant ceilings and is to provide all labor, materials, tools, service and supervision for a complete functional

system as shown on the mechanical and architectural plans. Materials furnished by the contractor shall include all components required for the ceiling as specified on the room finish schedule.

CONTRACTOR RESPONSIBILITIES

Install the Radiant and Non-Radiant Panels complete in accordance with the manufacturer's recommendations and to the satisfaction of the Architect and Engineer.

Contractor shall abide by the architectural and mechanical drawings, room finish schedule and architectural details for correct placement of all panels. Shop drawings at 1/8" scale may be submitted by the contractor showing layouts and details of all areas where Radiant and Non-Radiant Panels are indicated. Aero Tech will create shop drawings that include the Mechanical plan and Architectural Reflected Ceiling plan.

Please contact our local Sales Rep for cost involved. In order to create the most accurate shop drawings, Aero Tech needs high-quality PDFs (no scans), or CAD files showing the mechanical piping and reflected ceiling plans.

Radiant Panel shop drawings should show a complete pre-engineered, designed and tested system, including Aero Tech Radiant and Non-Radiant Panels, suspension components, interconnecting piping, trim and all other details and materials (as required) to provide a fully operational system.

RADIANT PANELS

Radiant Panels shall be Aero Tech formed aluminum sheet with a continuous copper tube soldered to the back of the panel, providing continuous contact and eliminating the need for separate U-bends, retaining clips, or heat paste. Finish to be as specified.

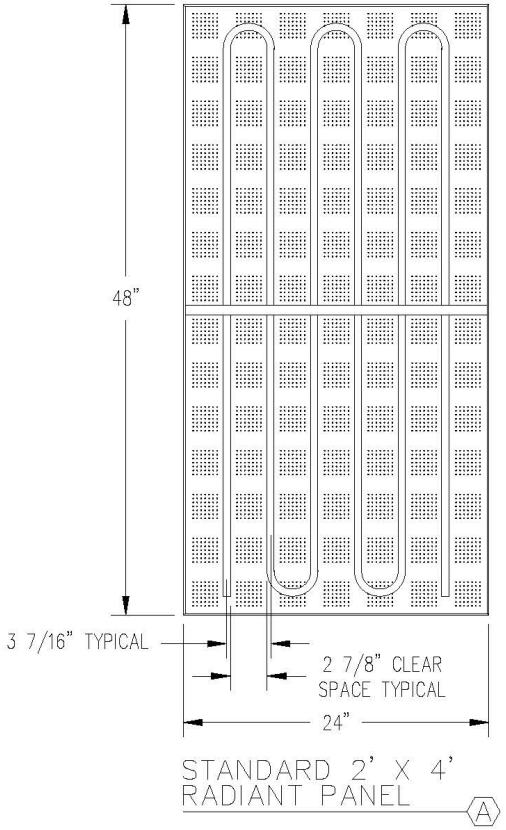
NON-RADIANT PANELS (AS REQUIRED)

Non-Radiant Panels shall be Aero Tech formed aluminum sheet, finished to match active radiant panels.

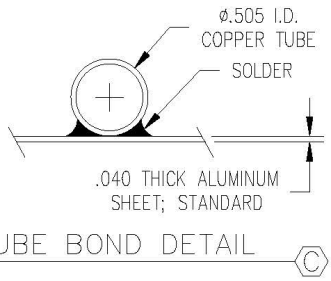
INSULATION

Insulation on top of panels should be minimum of 1" thick 3/4 pound/cubic foot, glass fiber pad. All Aero Tech extruded panels ship with 1.5" insulation unless otherwise specified.

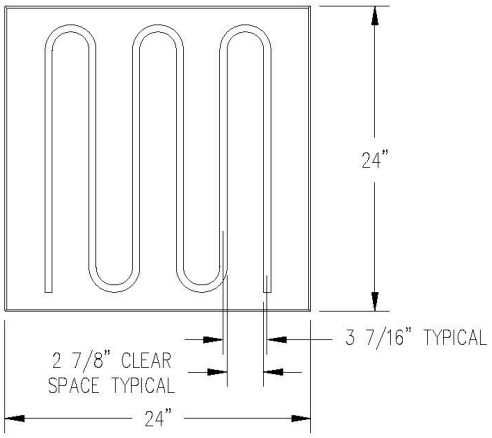
Radiant Snap-In Formed Metal Panel (RSFM) Options



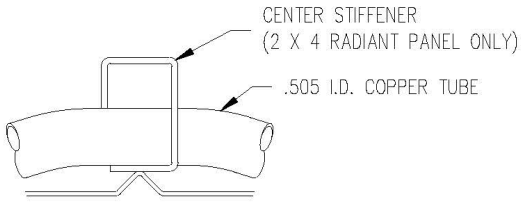
STANDARD 2' X 4'
RADIANT PANEL (A)



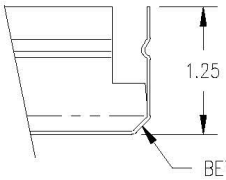
TUBE BOND DETAIL (C)



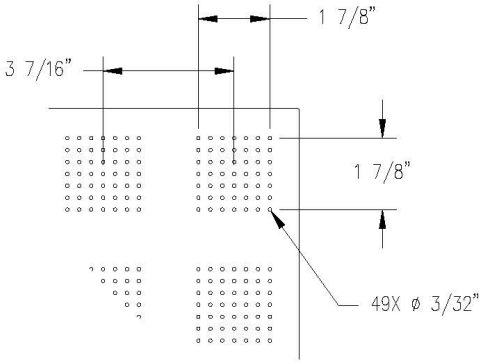
STANDARD 2' X 2'
RADIANT PANEL (B)



CENTER DETAIL 2' X 4'
RADIANT PANEL (D)

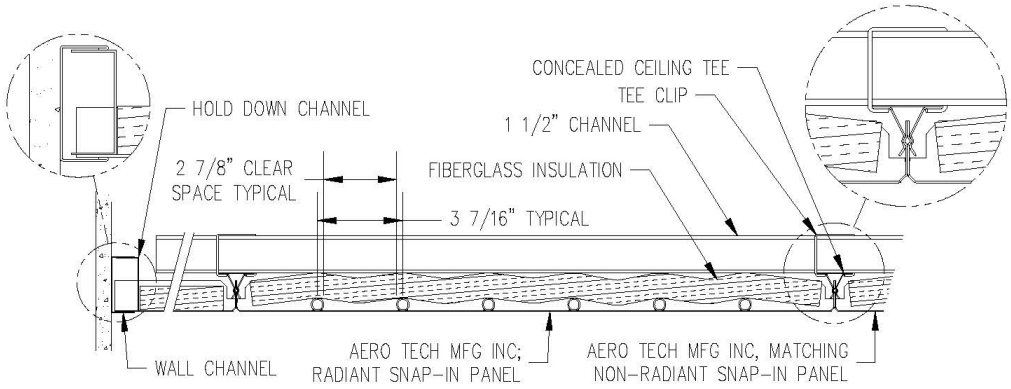


CORNER DETAIL (E)

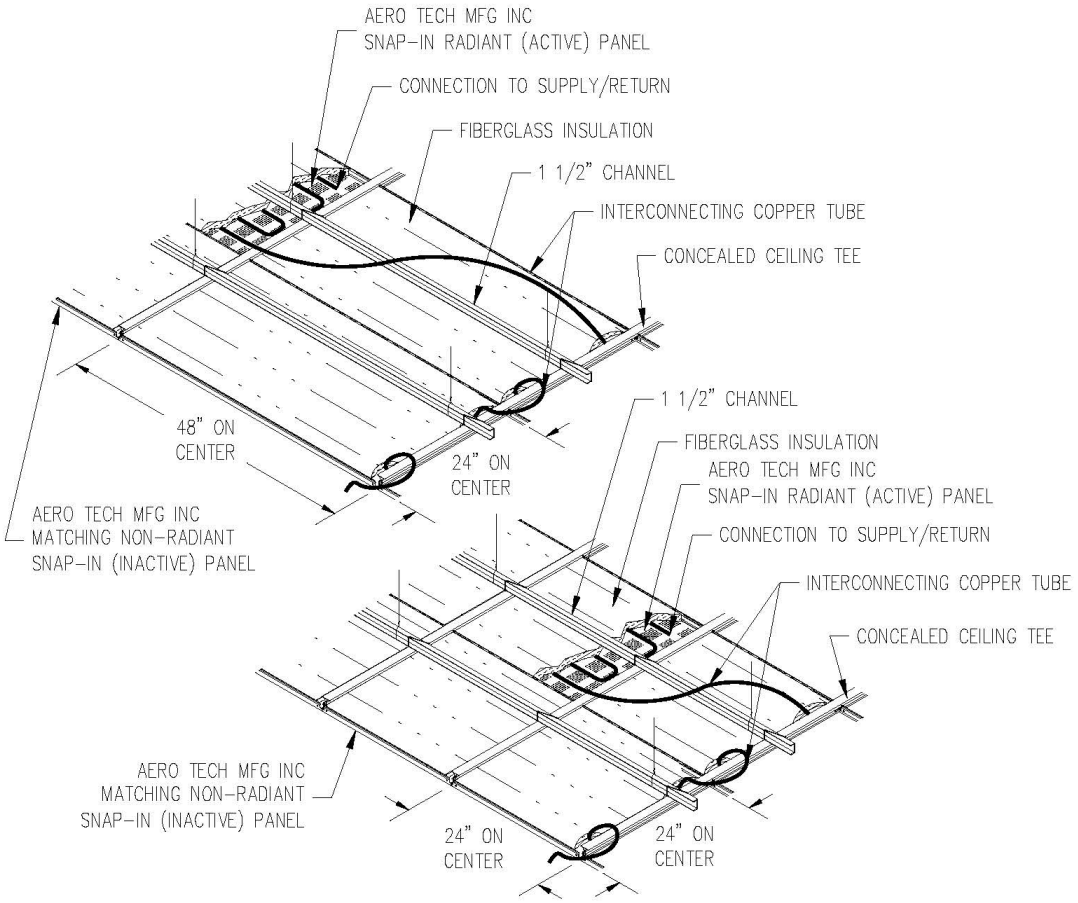


OPTIONAL BLOCK
PERFORATION DETAIL (F)

Installation and Piping Connection Details

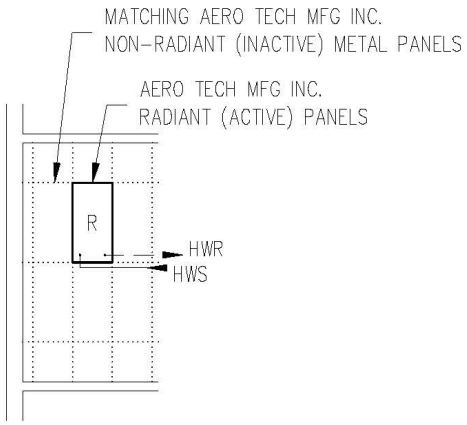


CONCEALED CEILING APPLICATION (A)

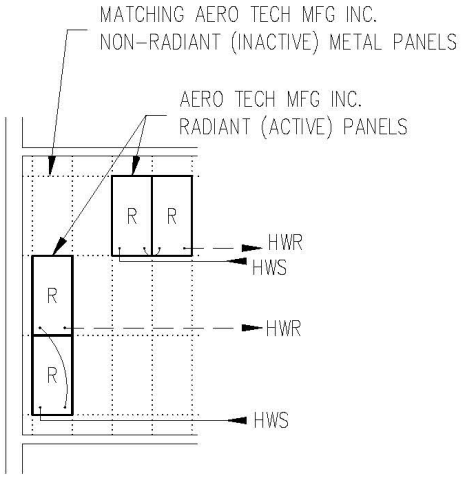


RADIANT PANEL CONNECTIONS (B)

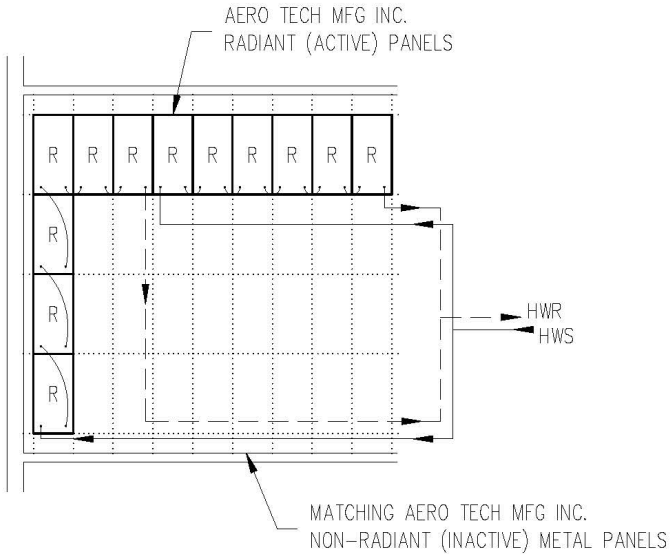
RSFM Circuit Examples



TYPICAL SINGLE PANEL CONNECTION (A)



TYPICAL DOUBLE PANEL CONNECTION (B)



TYPICAL MULTIPLE PANEL CONNECTION (C)

INSTALLATION

In a typical installation the suspension system should consist of 3/4" wide wall channels and hold-downs and concealed snap-in tee bars attached at 90 degrees to carrying channels.

Snap-in tee bars should be laid out on 2'x4' or 2'x2', as required, according to specifications and reflected ceiling plan.

Measure and cut inactive perimeter panels first, using a band saw or reciprocating saw (a blade designed for thin metals with 24 to 32 teeth per inch is recommended). Cut 1/8" undersize.

Place panel in position at wall molding, do not place all the way to wall molding. Leave 1/8" space to allow for expansion. Insert edges of panel into snap-in tee bar and seat bead of panel onto tee bar using the palm of the hand at the edges.

Prior to placing panel in ceiling, lift tube ends away from back side of active panel, being careful not to kink tube.

Install edges of full inactive and active panels into snap-in tee bar and seat bead of panel onto tee bar using the palm of the hand at the edges. After installing slide panel along tee bar into final position.

Aero Tech recommends using soft cotton gloves when handling panels.

Connect panel to supply and return run outs using 3/8" type "L" soft copper tubing. Because Aero Tech panels utilize .505 ID panel tubing, 3/8" type "L" tubing can be soldered directly inside without fittings or flaring.

Panels connected in series are joined with 3/8" type "L" tubing. Make connection with interconnecting loop laying horizontally approximately 3" above the panel face.

With panel installed place insulation on back of panel as specified.

OPERATION

START-UP

Once boilers are operating and circulators are functioning, set control valves to the full flow position and gradually allow the system to come up to design temperature. Design temperature drop will only be achieved at the design load.

BALANCING

Balancing for heating is most effectively done on a cloudy winter day.

Start at the farthest panel from the zone supply and establish the mean water temperature with a surface pyrometer. Adjust all other radiant panels to the same mean water temperature by adjusting the balancing valves.

Place automatic control valves in operation, calibrate room thermostat and set at design point. Check function of all valves.

Note: If any panel must be removed or repositioned during balancing, this should be done only by a qualified individual to prevent damage to panels and connections.

MAINTENANCE

Since there are no moving parts to the Aero Tech Radiant Ceiling System, there is normally no maintenance other than periodic cleaning. Aero Tech Panels have a wear-resistant, long-lasting baked enamel finish, which can be easily cleaned. They may be washed with a mild detergent cleaner applied with a sponge or other soft

object. Avoid excessive moisture that can be trapped in joints. If dusty, a soft brush or vacuum should first be used. Rinse with a damp sponge using clean water. DO NOT use abrasives of any kind on the baked enamel finish.

Place a small sticker or other identification on the corner of any panel, which may provide regular access to the ceiling. This identification will minimize the time spent in removing the proper panel. If a panel is damaged, replace it only with the correct Aero Tech panel.

Note: All Aero Tech products are packaged for interior storage only. Aero Tech ceiling products have an interior finish. Exercise care to protect panels from moisture and extremes in environmental conditions.

Benefits of Radiant Snap-In Formed Metal (RSFM) Panels

Since 1982 Aero Tech has developed and manufactured more than a million square feet of ceiling panels, which have been successfully installed in schools, universities, hospitals, laboratories, aircraft hangars, athletic facilities, office buildings and many other sites throughout the country.

Whether in original construction or modernization/remodeling, there are good reasons to choose Aero Tech radiant ceiling panels:

COMPATIBILITY

Aero Tech panels are available in a variety of combinations, allowing them to blend beautifully into virtually any architectural style.

COST-EFFECTIVE

Centrally located equipment simplifies and reduces maintenance and operating costs.

Minimized air requirements for ventilation and dehumidification reduce costs for ductwork, fans and filters.

EASE OF CONSTRUCTION

Mechanical equipment is not required at the outside walls. Mechanical equipment need not be located within the occupied space.

PERMANENCE

Metal ceiling panels will last for the life of the building in which they are installed. There is no need to replace panels over the years.

EASY MAINTENANCE

Aero Tech ceiling panels retain their original beauty with just an occasional cleaning.

APPEARANCE

Aero Tech's top quality, baked-on finishes resist fading and discoloration.

INCOMBUSTIBILITY

Aero Tech's aluminum panels are non-combustible.

- All Aero Tech Radiant Ceiling Panels are manufactured in a certified ISO9001:2015 facility.
- All Aero Tech Radiant Ceiling Panels are made and assembled in North Salt Lake, Utah, USA.
- All raw components are of US or NAFTA origin.
- All panel components are 100% recyclable.

Hydronic Radiant Panel Performance Certification

Aero Tech certifies that its Radiant Panels will perform equivalent to or exceed that of other hydronic radiant panels, under identical conditions.

Aero Tech has performed extensive testing of competitive panels in a test room with temperature control of walls and floors to provide a constant average unheated surface temperature (AUST). All panels were tested under identical conditions with regards to room, insulation, temperature control and instrumentation.

Performance values are intended for use directly in standard heat loss calculations and are from certified data based on 70°F. AUST, natural convection and 1", 3/4 PCF insulation on top of panel. Due to actual conditions, stated performance values can vary plus or minus 3%.

AERO TECH MANUFACTURING

RADIANT CEILING PANEL SYSTEMS

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