Radiant Lay-In Formed Metal Panels

Energy Efficient
Comfortable
Clean
Quiet
# Radiant Lay-In Formed Metal Panels

## Water Pressure Drop

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

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

## Heating Performance

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

Use these performance values directly in standard ASHRAE heat loss calculations. Performance values are from certified data based on 70° F AUST (Average Unheated Surface Temperature), natural convection and 1” thick, 3/4 Pound/Cubic Foot insulation on top of panel. Due to actual conditions, stated performance values can vary plus or minus 3%.

*Note: Refer to Radiant Panel Engineering Manual for cooling performance.*
Manufacturerv Qualifications

These specifications are based on ceilings 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 are based on testing performed by the manufacturer or confirmed by a testing laboratory recognized in the industry. The manufacturer shall demonstrate capabilities in engineering, manufacturing and financial resources to the satisfaction of the Architect and Engineer and shall have been continuously in the business of manufacturing radiant panels for a minimum of five (5) years.

Radiant Panel Performance Requirements

Radiant Panels will have a minimum heating output of ________ BTU/Hr Sq Ft at ________ degrees 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’s Qualifications

Installation of 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 completely 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’s Responsibilities

Completely install the Radiant and Non-Radiant Panels 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.

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, edge moldings, soffits, fascia, 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 copper tube soldered to the back of the sheet. Finished as specified.

Non-Radiant Panels (as required)

Non-Radiant Panels shall be Aero Tech formed aluminum sheet. Finished to match Radiant Panels.

Insulation

Insulation on top of panels should be a minimum of 1” thick, 3/4 Pound/Cubic Foot, glass fiber pad.
Radiant Lay-In Formed Metal Panels

TUBE BOND DETAIL

STANDARD 2' x 4' RADIANT PANEL

STANDARD 2' x 2' RADIANT PANEL

TEGULAR 2' x 2' 15/16" GRID RADIANT PANEL

TEGULAR 2' x 2' 9/16" GRID RADIANT PANEL
Radiant Lay-In Formed Metal Panels

STANDARD CORNER DETAIL

TEGULAR SQUARE CORNER STANDARD 15/16” GRID

TEGULAR SQUARE CORNER NARROW 9/16” GRID

TEGULAR BEVELED CORNER STANDARD 15/16” GRID

TEGULAR BEVELED CORNER NARROW 9/16” GRID

STANDARD 15/16” FALSE “T” DETAILS

FOR STANDARD 2 x 4 LAY-IN PANEL TO SIMULATE THE APPEARANCE OF TWO 2 x 2 PANELS
Radiant Lay-In Formed Metal Panels

OPTIONAL BLOCK PERFORATION

RECESS MOUNT FRAME

SURFACE MOUNT FRAME
Radiant Lay-In Formed Metal Panels

ACOUSTIC CEILING TILE OR AERO TECH MFG. INC.
MATCHING LAY-IN NON-RADIANT (INACTIVE) PANEL

AERO TECH MFG. INC.
LAY-IN RADIANT (ACTIVE) PANEL
CONNECTION TO SUPPLY/RETURN
FIBERGLASS INSULATION
BUTT CUT CROSS TEE
INTERCONNECTING COPPER TUBE

12 GA GALVANIZED HANGER WIRE
MAIN TEE

48" ON CENTER
24" ON CENTER

RADIANT PANEL CONNECTION DETAIL
Radiant Lay-In Formed Metal Panels

SUSPENDED CEILING APPLICATION

AERO TECH MFG. INC. RADIANT LAY-IN PANEL

HOLD DOWN CHANNEL

2 7/8" CLEAR SPACE TYPICAL

12 GA GALVANIZED HANGER WIRE

FIBERGLASS INSULATION

3 7/16" TYPICAL

AERO TECH MFG. INC. RADIANT LAY-IN PANEL

AERO TECH MFG. INC. RADIANT LAY-IN PANEL

ACOUSTIC CEILING PANEL

MAIN "T" / BUTT CUT CROSS "T"

SUSPENDED CEILING APPLICATION

A

REGULAR OPTION ShOWN AT RIGHT

2 7/8" CLEAR SPACE TYPICAL

FIBERGLASS INSULATION

3 7/16" TYPICAL

RECESS MOUNT FRAME

GWB CEILING

AERO TECH MFG. INC. RADIANT LAY-IN PANEL

GWB CEILING

GWB CEILING

GWB CEILING

WALL MOLDING

RECESS MOUNT FRAME

AERO TECH MFG. INC. RADIANT LAY-IN PANEL

RECESS MOUNT FRAME

CEILING GRID 24" OC WIDTH, 24" OR 48" OC LENGTH
Radiant Lay-In Formed Metal Panels

SURFACE MOUNT APPLICATION

SUSPENDED MOUNT APPLICATION

SURFACE FRAME DETAIL

CEILING GRID 24" OC WIDTH, 24" OR 48" OC LENGTH
Radiant Lay-In Formed Metal Panels

**INSTALLATION**

In a typical installation, the suspension system should consist of 3/4” wide wall channels and 15/16” wide main tees and butt cut cross tees. Other suspension systems may be used as required provided there is sufficient and uniform support around the periphery of the panel. The panel should lie uniformly on supports. Hold-down channels are required at the perimeter.

Ceiling grid should be laid out on 2’ by 4’ or 2’ by 2’, patterns as required, according to specifications and reflected ceiling plan.

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

Install panel into grid from back. Panel face should contact grid on all four sides and should have space on at least 2 perpendicular sides to allow for expansion.

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, the 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 panel face.

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

**OPERATION**

**Start-up**

When 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 done most effectively 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:** To prevent damage to panels and connections only a qualified individual should remove or reposition panels during balancing.

**MAINTENANCE**

There are no moving parts to the Aero Tech Radiant Ceiling System, so 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 mild detergent applied with a sponge or other soft material. Avoid excessive moisture that can be trapped in joints. If dusty, use a soft brush or vacuum first, then wipe 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 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 interior finishes. Exercise care to protect panels from moisture and extreme environmental conditions.
Radiant Lay-In Formed Metal Panels

Benefits of Radiant Lay-In Formed Metal (RLFM) Panels

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

There are good reasons to choose Aero Tech Radiant Ceiling Panels for original construction or modernization/remodeling.

**Compatibility**
Aero Tech panels are available in a variety of combinations that allow them to blend beautifully into virtually any architectural style.

**Cost-Effective**
Centrally located equipment simplifies maintenance and reduces 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 and 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.

**Easy Maintenance**
Aero Tech ceiling panels retain their original beauty with just occasional cleaning.

**Appearance**
Aero Tech's top quality, baked enamel finishes resist fading and discoloration.

**Incombustibility**
Aero Tech's aluminum panels are non-combustible.

Hydronic Radiant Panel Performance Certification

Aero Tech certifies that under identical conditions its Radiant Panels will perform equal to or better than other hydronic radiant panels.

Aero Tech has performed extensive testing of competitor's panels at its permanent on site test room (one of two in the country and the only one with temperature controlled walls and floors that provide a constant Average Unheated Surface Temperature [AUST]). All panels were tested under identical conditions with regard to room size, 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” thick, 3/4 Pound/Cubic Foot insulation on top of panel. Due to actual conditions, stated performance values can vary plus or minus 3%.