ICE-RACK™ CONCEPT
For the past thirty years, the Cryogenic Industrial Gas Industry has used the eight fin extrusion as its work horse for ambient vaporizers. Originally designed for intermittent service, its use exploded in the late 1970’s when the oil-crisis resulted in a much higher cost of energy for heated vaporizers. Today, operating simplicity, reliability, budget control and long term operation have become important. The thirty year old "star-fin" is no longer the single best choice to meet changing requirements. Thermax has had a continuing engineering and development program reviewing several design configurations to meet the changing needs of the industry. The Ice-Rack" concept resulted.

Options
- 200 SCFH mini-modules to 5,000 SCFH
- long-term hybrid arrays
- Stainless Steel, Monel and other alloy liners
- Design pressures exceeding 15,000 psig
- High wind for 150 MPH wind loads per ASCE 7-05 and IBC-2009
- Low inlet pressure and low pressure drop designs
- Flanged, tongue and groove, butt weld end connections
- Continuous operation with switching system
- Electropolished 316LSS internals for ultra-pure applications

Standard features
- Aluminum corrosion resistant construction
- Reduced welding stress, all butt weld aluminum design
- High strength welded base frame
- Withstands 100 mph winds and Zone 4 seismic forces
- 600 psig standard design pressure on all aluminum units
- Severe thermal cycling design
- Perimeter frame and legs for unrestricted airflow
- ASME B31.3, CRN (all provinces), and PED module D compliant
All tables and information are intended as guides only. Actual performance and dimensions may vary. Thermax Inc. does not make any representations or warranties, express or implied, of fitness for a particular purpose. Request a copy of Thermax Inc.'s limited warranty and remedy for further details. Speak to a Thermax representative for specific design considerations and application criteria. Themafin™ & Supergap™ are Thermax Inc. Trademarks. All the tables shown here are intended as guides reflecting our experience on these models. Actual performance may vary. This product and/or data was designed and/or developed by Thermax Inc. and shall not be used in any way injurious to the interests of Thermax Inc.

Thermax design criteria for ICE RACK™
1. Design for Ice-Clog protection in the 2-5 week winter condition and using switching equipment or artificial defrost for longer term operation.
2. For summer operation, Ice-Clog will be prevented via a shorter switching cycle.
3. Intermittent duty: permits rapid melt-off due to greater open space and no fin clog.
4. As an alternative to switching - design for maximum gas throughput before defrost i.e. total monthly draw.
5. ICE RACK™ to be rated for: 1, Boiling service only: deliver -200°F cold gas to an existing close spaced finned unit in the field as an upgrade, or 2, As part of a hybrid array or module in conjunction with Thermax Super-Gap™ S.G. Design. This is the "Boiler/Pre-heater".

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Boiler SCFH* (Saturated Gas) Continuous For 5 Weeks</th>
<th>Vaporizer, Upper Heater SCFH Approach Temp= 20°F Continuous For A Max Of 5 Weeks</th>
<th>Standard Connection</th>
<th>Weight, Lbs.</th>
<th>Dimensions L x W x H Inches</th>
<th>Approximate Pad Size Required Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>IR-1</td>
<td>1,750</td>
<td>200</td>
<td>1/2&quot; FNPT</td>
<td>65</td>
<td>17 x 15 x 176</td>
<td>see L x W x H</td>
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<tr>
<td>IR-3</td>
<td>4,725</td>
<td>540</td>
<td>3/4&quot; MNPT</td>
<td>180</td>
<td>40 x 28 x 168</td>
<td>see L x W x H</td>
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<tr>
<td>IR-4</td>
<td>7,000</td>
<td>800</td>
<td>1&quot; FNPT</td>
<td>250</td>
<td>40 x 40 x 175</td>
<td>see L x W x H</td>
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<tr>
<td>IR-9</td>
<td>15,750</td>
<td>1,800</td>
<td>1-1/2&quot; MNPT</td>
<td>600</td>
<td>70 x 66 x 175</td>
<td>see L x W x H</td>
</tr>
<tr>
<td>IR-1 &amp; TF3010-HF-SG</td>
<td>N.A.</td>
<td>1,750</td>
<td>1/2&quot; FNPT</td>
<td>1,100</td>
<td>SEE PAD SIZE</td>
<td>6' x 8-1/2'</td>
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<tr>
<td>IR-3 &amp; TF3618-HF-SG</td>
<td>N.A.</td>
<td>4,725</td>
<td>3/4&quot; MNPT</td>
<td>2,650</td>
<td>SEE PAD SIZE</td>
<td>6 x 10-1/2'</td>
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<tr>
<td>IR-4 &amp; TF3612-HF-SG</td>
<td>N.A.</td>
<td>7,000</td>
<td>1&quot; MNPT</td>
<td>3,550</td>
<td>SEE PAD SIZE</td>
<td>6' x 19'</td>
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<tr>
<td>IR-9 &amp; TF6418-HF-SG</td>
<td>N.A.</td>
<td>15,750</td>
<td>1-1/2&quot; MNPT</td>
<td>7,600</td>
<td>SEE PAD SIZE</td>
<td>8-1/2' x 25-1/2'</td>
</tr>
</tbody>
</table>

* Boiler SCFH Rating may be used for pressure build rating. Contact Thermax Inc. and talk to an engineer.