Thermax Inc.

PRODUCT DATASHEET 3.8

Ice Rack™ Cryogenic Ambient Vaporizer

Thermax Inc. is pleased to introduce its latest concept in Cryogenic Ambient Vaporizers ice-Racks Modules. Ice-Racks is the first completely new Ambient Vaporizer Design since the finned extrusion was introduced over thirty years ago.

The New Ice-Racks provides:

- Lower Cost vaporization.
- More Rapid recovery during warm days at off-peak operation
- Longer continuous operation between defrost.
- Reduced handling weight
- Compatibility with existing old style finned units for add-on upgrades
- Increased natural frost shedding

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" may no longer the single best choice to meet changing requirements.

Thermax Inc. 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.

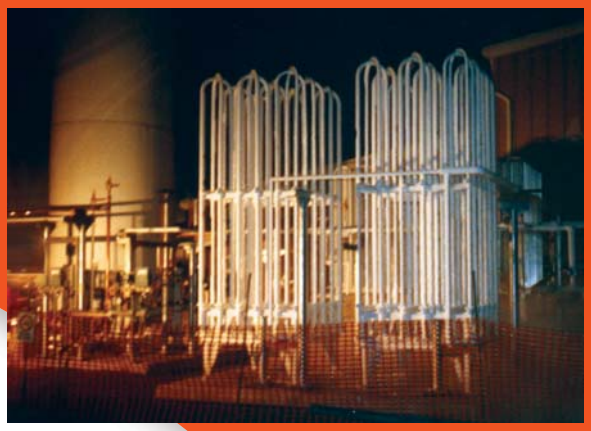
Ice Rack Advantages

- Cost of Ambient Vaporization - Cut 15% to 25%
- Plant Space Requirement - Cut 10%
- Continuous Vaporization Before Ice-Clog: 1-2 weeks summer
- Continuous Operation Before Ice-Clog: 2-5 weeks winter
- In Hybrid Applications - Doubles system operation without defrost

Ice Rack™ Cryogenic Ambient Vaporizer

OPERATION

Nitrogen flows through one Ice-Rack™ and one of the SuperGap™ Ambient Vaporizers and then is automatically switched to the other side which is also one Ice-Rack™ and one SuperGap™ Ambient Vaporizer. (Switching Cycle . 14 hours) Capacity; 9000 SCFH Continuous, 24 hours/day, 7 days/week, 365 days/year.



Two Ice Racks Model IR-9,
Two Super-Gap Ambient
Vaporizers Model TF3618HF•SG

Thermax design criteria for ICE RACK™

Design for Ice-Clog protection in the 2-5 week winter condition and using switching equip-ment or artificial defrost for longer term operation.

For summer operation, Ice-Clog will be prevented via a shorter switching cycle.

Intermittent duly: permits rapid melt-off due to greater open space and no fin clog.

As an alternative to switching - design for maximum gas throughput before defrost i .e. total monthly draw.

Problem,

Ice bridging on standard ambient vaporizers.

Solution

ICE-RACK, install one or more new ICE-RACKs in front of existing ambient vaporizers

Performance

1, As a booster-boiler pre heating to existing array:
Preheats 3,500 SCFH short term
2,500 SCFH long term

2, As a complete vaporizer
500 SCFH 1 day to 1 week
150-200 SCFH long term/continuous

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".

ICE RACK!

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