

# Ice-Pak™ Unit Specifications

Furnish and install internal melt, hot-dip galvanized ice coils with factory-assembled, insulated, steel tank. System design and performance is based on EVAPCO model \_\_\_\_\_ modular ice tank with a net latent storage capacity of \_\_\_\_\_ ton-hours.

## COIL CONSTRUCTION

Coils shall be designed and manufactured to meet the requirements of ASME Code B31.5 and rated for 300 psig working pressure.

Coils shall be configured to provide countercurrent glycol flow in adjacent circuits. Coil circuits shall be constructed of continuous 1.05" O.D. all prime surface high frequency induction welded ASTM A-1008 Carbon Steel Type B tubing. The steel tubing shall be nominal 16 gauge thickness, formed into an ellipse, and eddy current tested for continuous in-process testing. Full-length circuits with no intermediate butt welds shall be formed into serpentes and individually leak tested with air under water prior to being welded into Schedule 40 ASTM SA-53 Carbon Steel Type E, Grade B pipe headers. Headers and connecting piping shall be sized for maximum fluid velocity of 10 ft/sec.

Coil circuits, intermediate tube sheets, headers and connecting piping shall be assembled into a heavy-duty steel frame. The completed coil assembly shall be leak tested with 400 psig air pressure under water for a minimum of fifteen (15) minutes. The coils shall be then hot-dip galvanized in a zinc bath deep enough for full, uniform coverage per ASTM A123/A123M with minimum Coating Grade 24. After galvanizing, the coil assembly shall again be leak tested with 400 psig air pressure under water for fifteen (15) minutes. Coils shall then be mounted on hot-dip galvanized structural supports. Finished coil connections shall be grooved for mechanical coupling.

## TANK CONSTRUCTION AND INSULATION

Tank shall be constructed of heavy-gauge (minimum 12 gauge) stainless steels (Types 304 and 439) with all seams welded watertight. All floor, wall and cover support structural members shall be constructed of G-235 hot-dip galvanized steel and thermally isolated from the tank to avoid condensation on exterior surfaces. Tank walls shall be covered with 3" of high density polyisocyanurate insulation, having a net thermal resistance (R-value) of 19.5 hr-ft<sup>2</sup>-°F/BTU. Tank floor and top covers shall be insulated with 2" of high density polyisocyanurate, having a net thermal resistance (R-value) of 13 hr-ft<sup>2</sup>-°F/BTU.

Tank walls and insulation shall be protected by hot-dip galvanized panels. Top of tank shall be covered with hot-dip galvanized panels, supported by structural members designed to handle external loads of 300 lbs/ ft<sup>2</sup>, and sealed to be rain-tight. A large (4 sq. ft. minimum), removable, insulated access cover shall be provided for visual inspection of the ice coil.

A clear PVC sight tube shall be provided for visual indication of water level and ice inventory. A removable cover shall be provided to avoid shipping damage and prevent algae growth due to direct sunlight.

## ICE INVENTORY CONTROL

The ice tank shall be provided with an electronic ice inventory controller that measures tank water level changes in direct proportion to change in ice volume on the coil. Outputs shall include a 4-20 mA analog signal and mechanical relays for low level alarm and high level ice charge termination.

## HEAT TRANSFER FLUID QUALITY

Coils shall be filled with an industrial grade ethylene or propylene glycol, premixed with distilled or deionized water and corrosion inhibitors suitable for all materials found in the ice storage system (copper, brass and steel). Dow Chemical

Company products DOWTHERM SR-1 (ethylene glycol) and DOWFROST HD (propylene glycol) shall be the minimum acceptable level of quality.

## TANK WATER QUALITY

Ice tank shall be filled with clean, fresh water meeting the following quality guidelines.

pH	7.0 to 8.2
Hardness as CaCO <sub>3</sub>	50 to 500 ppm
Sulfates	250 ppm maximum
Alkalinity as CaCO <sub>3</sub>	75 to 400 ppm
Chlorides as Cl	125 ppm maximum
Total Dissolved Solids	1000 ppm maximum