Mechanical 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 \_\_\_\_\_\_\_\_\_ kWh.

# COIL CONSTRUCTION

Coils shall be designed and manufactured to meet the requirements of the Pressure Equipment Directive (PED 2014/68/EU) and rated for 15bar working pressure.

Coils shall be configured to provide countercurrent glycol flow in adjacent circuits. Coil circuits shall be constructed of continuous all prime surface high frequency induction welded Carbon Steel with an outer diameter of 27 mm. The steel tubing shall be 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 serpentines and individually leak tested with air under water prior to being welded into P355/TC1 (EN10216/3 AD2000 W4-PED 2014/68/EU) pipe headers. Headers and connecting piping shall be sized for maximum fluid velocity of 3 m/s.

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 24 bar 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 EN ISO 1461. After galvanizing, the coil assembly shall again be leak tested with 24 bar air pressure under water for fifteen (15) minutes. Coils shall then be mounted on hot-dip galvanized structural supports. Finished coil connections shall be beveled for welding or grooved for mechanical coupling.

# TANK CONSTRUCTION AND INSULATION

Tank shall be constructed of heavy-gauge (minimum 12 gauge) stainless steels (Types 304L) with all seams welded watertight. All floor, wall and cover support structural members shall be constructed of DX51-Z725 hot-dip galvanized steel and thermally isolated from the tank to avoid condensation on exterior surfaces. Tank walls shall be covered with 75mm of high density polyisocyanurate insulation, having a net thermal resistance (R-value) of 3.434 m².K/W. Tank floor and top covers shall be insulated with 50mm of high density polyisocyanurate, having a net thermal resistance (R-value) of 2.289 m².K/W.

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 14.3 kN/m², and sealed to be rain-tight. A large (0.37m² 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 CaCO3 50 to 500 ppm

Sulfates 250 ppm maximum

Alkalinity as CaCO3 75 to 400 ppm

Chlorides as Cl 125 ppm maximum

Total Dissolved Solids 1000 ppm maximum