SECTION 23 57 00

**HEAT EXCHANGERS FOR HVAC**

**BASED ON DFD MASTER SPECIFICATION DATED 09/23/2022**

This section has been written to cover most (but not all) situations that you will encounter. Depending on the requirements of your specific project, you may have to add material, delete items, or modify what is currently written. The Division of Facilities Development expects changes and comments from you.

# P A R T 1 - G E N E R A L

**SCOPE**

This section includes specifications for shell and tube heat exchangers and plate heat exchangers. Included are the following topics:

PART 1 - GENERAL

Scope

Related Work

Reference

Reference Standards

Quality Assurance

Submittals

Operation and Maintenance Data

PART 2 - PRODUCTS

Shell and Tube Heat Exchangers

Plate Heat Exchangers

Brazed Plate Heat Exchangers

PART 3 - EXECUTION

Installation

Shell and Tube Heat Exchangers

Plate Heat Exchangers

Brazed Plate Heat Exchangers

Construction Verification Items

Functional Performance Testing

Agency Training

**RELATED WORK**

Section 01 91 01 or 01 91 02 – Commissioning Process

Section 23 08 00 – Commissioning of HVAC

Section 23 11 00 - Facility Fuel Piping

Section 23 21 13 - Hydronic Piping

Section 23 22 13 - Steam and Condensate Heating Piping

Section 23 24 00 - Internal-Combustion Engine Piping

Section 23 83 16 - Radiant-Heating Hydronic Piping

**REFERENCE**

Applicable provisions of Division 1 govern work under this section.

**REFERENCE STANDARDS**

ASME Boiler and Pressure Vessel Code VIII - Rules for Construction of Pressure Vessels-Latest Edition.

**QUALITY ASSURANCE**

Refer to division 1, General Conditions, Equals and Substitutions

**SUBMITTALS**

Refer to division 1, General Conditions, Submittals.

Include data concerning dimensions, capacities, and material of construction.

**OPERATION AND MAINTENANCE DATA**

All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

Delete the following if there are no additional requirements.

In addition to the general content specified under GENERAL REQUIREMENTS supply the following additional documentation:

1. ***[A/E and commissioning provider to define detailed operation and maintenance data requirements for equipment specifications added to this section.]***

# P A R T 2 - P R O D U C T S

**SHELL AND TUBE HEAT EXCHANGERS**

Manufactures: Bell & Gossett, DHT, ITT Standard, Taco, Thrush, Grundfos, AIC, or approved equal.

Shell and tube type with removable copper U-tube bundle, integral supporting devices and external support. Heat exchangers shall be constructed and stamped in accordance with the latest ASME Pressure Vessel Code Section VIII.

Tubes to be U-type, minimum ¾ inch OD x 20 BWD copper.

Provide steel shell with threaded or flanged piping connections, steel saddle and attaching U-bolts. Provide ¾” threaded tap for vacuum breaker. Fabricated steel or cast iron removable head with steel or bronze tube sheets and threaded piping connections for 2” and smaller and flanged piping connections for 2-1/2” and larger. Factory seal all connections prior to shipment to prevent entrance of foreign material.

Heat exchangers to have a tube side pressure rating of 150 psig with shell pressure rating of 150 psig. Design temperature is 375 degrees F.

Provide heat exchangers with capacities and operating characteristics indicated on drawings.

**PLATE HEAT EXCHANGERS**

This is for the gasketed type plate heat exchanger. If the there is a need to change the heat exchanger capacity in the future by adding or deleting plates then include the future performance information on the schedule.

Manufactures: Alfa Laval, Bell & Gossett, DHT, Graham, ITT Standard, Taco, Grundfos, AIC, or approved equal.

Plate and frame type with gasketed heat transfer channel plates mounted on carrying bars and held between a stationary frame plate and a moveable pressure plate. Design pressure of [150][200] psig at 230 degrees F in each circuit with no pressure in the other circuit. Heat exchangers shall be constructed and stamped in accordance with the latest ASME Pressure Vessel Code Section VIII.

304 or 316 stainless steel corrugated channel plates with one piece Nitrile or EPDM gaskets (whichever material suitable for the fluids used). Gaskets may be glued or non-glued type. Provide relieving grooves on gaskets to prevent cross contamination between fluids. Provide OSHA compliant aluminum splashguard over channel plate rack.

Carbon steel pressure plates with enamel paint or epoxy coating. Plates shall not require additional stiffeners for support. Carbon steel carrying bars with zinc yellow chromate finish or epoxy coated finish.

Studded port type pipe connections to accept ANSI flanges for 3” and larger. Carbon steel NPT tappings or stainless steel NPT nozzles for connections 2” and smaller. Factory seal all connections prior to shipment to prevent entrance of foreign material.

Provide heat exchangers with capacities and operating characteristics indicated on drawings.

**BRAZED PLATE HEAT EXCHANGERS**

Manufactures: Alfa Laval, Bell & Gossett, DHT, ITT, Grundfos, AIC, Standard or approved equal.

This is for a brazed type plate heat exchanger, which cannot be disassembled for cleaning or adding plates. Consult with DFD prior to using this type of heat exchanger.

Brazed plate type with 316 stainless steel corrugated channel plates, 316 stainless steel cover plates and threaded 316 stainless steel pipe connections. Copper or nickel brazing material shall be used. Design pressure of 435 psig at 437 degrees F.

Provide heat exchangers with capacities and operating characteristics indicated on drawings.

# P A R T 3 - E X E C U T I O N

**INSTALLATION**

Install units as shown on plans, as detailed, and according to manufacturer's installation instructions. Provide clearance around units as shown on the drawings and as recommended by the manufacturer for service access. Provide elbows, flanges and unions on piping to allow for servicing heat exchangers.

**SHELL AND TUBE HEAT EXCHANGERS**

Provide structural steel framework to support unit. Provide vacuum breaker on shell.

**PLATE HEAT EXCHANGERS**

Bolt to concrete pad. Apply grease to the threaded surfaces of the compression bolts and cover with plastic sleeving.

**BRAZED PLATE HEAT EXCHANGERS**

Mount as shown on the drawings. Maintain clearance around unit so it can be easily removed and replaced.

**CONSTRUCTION VERIFICATION**

Contractor is responsible for utilizing the construction verification checklists supplied under specification Section 23 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01 or 01 91 02.

**FUNCTIONAL PERFORMANCE TESTING**

Contractor is responsible for utilizing the functional performance test forms supplied under specification Section 23 08 00 in accordance with the procedures defined for functional performance testing in Section 01 91 01 or 01 91 02.

**AGENCY TRAINING**

All training provided for agency shall comply with the format, general content requirements and submission guidelines specified under Section 01 91 01 or 01 91 02.

END OF SECTION