

**SECTION 235700
HEAT EXCHANGERS FOR HVAC**

PART 1 GENERAL**1.01 SUMMARY**

- A. Section includes [shell-and-tube] [brazed-plate] [and] [gasketed-plate] heat exchangers.

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product.
1. Include rated capacities, operating characteristics, and furnished specialties and accessories.
- B. Shop Drawings: Signed and sealed by a qualified professional engineer. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
1. Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment.
- C. Delegated-Design Submittal: Details and design calculations for seismic restraints for heat exchangers.

1.03 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Equipment room plan or BIM model, drawn to scale, showing the items described in this Section, and coordinated with all building trades.
- B. Source quality-control reports.
- C. Field quality-control reports.
- D. Sample Warranty: For manufacturer's warranty.

PART 2 PRODUCTS**2.01 PERFORMANCE REQUIREMENTS****2.02 GASKETED-PLATE HEAT EXCHANGERS**

- A. Manufacturers: Subject to compliance with requirements herein provide products from one of the following:
1. Taco
 2. Bell & Gossett
 3. Alfa Laval
- B. Basis of Design: As Scheduled on the drawings
- C. Configuration: Freestanding assembly, consisting of frame support, top and bottom carrying and guide bars, fixed and movable end plates, tie rods, individually removable plates, and one-piece gaskets. Floor-mounted heat exchangers must have integral legs with mounting feet.
- D. Construction: Fabricate and label heat exchangers to comply with ASME Boiler and Pressure Vessel Code, Section VIII, "Pressure Vessels," Division 1.
- E. Frame:
1. Capacity to accommodate 25 percent additional plates.
 2. Painted carbon steel with provisions for anchoring to support.
- F. Top and Bottom Carrying and Guide Bars: stainless steel.
1. Fabricate attachment of heat-exchanger support bars and guide bars with reinforcement strong enough to resist heat-exchanger movement during seismic event when heat-exchanger support bars and guide bars are anchored to building structure.
- G. End-Plate Material: Epoxy painted carbon steel.
- H. Tie Rods and Nuts: Stainless steel.
- I. Plate Material: Manufacturer's standard thickness for pressure rating scheduled/specified; 316 stainless steel.

- J. Gasket Materials: Nitrile Rubber or EPDM
- K. Piping Connections: Factory fabricated of materials compatible with heat-exchanger shell. Attachappings to shell before testing and labeling.
 - 1. NPS 2 (DN 50) and Smaller: Threaded ends in accordance with ASME B1.20.1.
 - 2. NPS 2-1/2 (DN 65) and Larger: Flanged ends in accordance with ASME B16.5 for steel and stainless steel flanges and in accordance with ASME B16.24 for copper and copper-alloy flanges.
- L. Enclose plates in solid stainless steel removable shroud.
- M. Capacities and Characteristics: As scheduled on the drawings

2.03 BRAZED-PLATE HEAT EXCHANGERS

- A. Manufacturers: Subject to compliance provide products by one of the following
 - 1. Taco
 - 2. Bell & Gossett
 - 3. Alfa Laval
- B. Configuration: Brazed assembly, consisting of embossed or pressed stainless steel plates brazed together and two end plates, one with threaded nozzles and one with pattern-embossed plates. Floor-mounted heat exchangers must have factory-furnished integral legs with mounting feet.
- C. Construction: Fabricate and label heat exchangers to comply with ASME Boiler and Pressure Vessel Code, Section VIII, "Pressure Vessels," Division 1.
- D. End-Plate Material: Type 316 stainless steel.
- E. Threaded Nozzles: Type 316 stainless steel.
- F. Plate Material: Type 316 stainless steel.
- G. Brazing Material: copper.
- H. Capacities and Characteristics: As scheduled on the drawings

2.04 ACCESSORIES

- A. Hangers and Supports:
 - 1. Custom-built steel supports and saddles for mounting on [floor] [wall] [structural steel].
 - a. Minimum Number of Saddles: .
 - 2. Supports and saddles to ensure both horizontal and vertical support of heat exchanger. Comply with requirements in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Shroud: Stainless-Steel sheet.
- C. Pressure-Relief Valves: Cast Bronze , ASME rated and stamped.
 - 1. Pressure-relief valve setting: as noted on the drawings

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas for compliance with requirements for installation tolerances and for structural rigidity, strength, anchors, and other conditions affecting performance of heat exchangers.
- B. Examine roughing-in for heat-exchanger piping to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF HEAT EXCHANGER, GENERAL

- A. Equipment Mounting:
 - 1. Install floor-mounted heat exchangers on cast-in-place concrete equipment bases. Install all heat exchangers level and plumb in accordance with manufacturer's recommendations. Install floor-mounted and wall-hung steam heat exchangers at sufficient height, using sufficient length supports, to achieve required steam and condensate pipe pitch. Comply

with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete."

3.03 INSTALLATION OF GASKETED-PLATE HEAT EXCHANGER

- A. Install wall-mounted gasketed-plate heat exchanger on custom-designed wall supports anchored to structure as indicated on Drawings.
- B. Install floor-mounted gasketed-plate heat exchangers on cast-in-place concrete equipment base, and fasten legs to base.
- C. Install metal shroud over installed gasketed-plate heat exchanger in accordance with manufacturer's written instructions.

3.04 INSTALLATION OF BRAZED-PLATE HEAT EXCHANGER

- A. Install wall-mounted brazed-plate heat exchanger on custom-designed wall supports anchored to structure as indicated on Drawings.
- B. Install floor-mounted brazed-plate heat exchangers on cast-in-place concrete equipment base and fasten legs to base.

3.05 PIPING CONNECTIONS

- A. Comply with requirements for piping specified in Section 232113 "Hydronic Piping" and Section 232116 "Hydronic Piping Specialties." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Maintain manufacturer's recommended clearances for tube removal, service, and maintenance.
- C. Install piping adjacent to heat exchangers to allow space for service and maintenance of heat exchangers. Arrange piping for easy removal of heat exchangers.
- D. Install shutoff valves at heat-exchanger inlet and outlet connections.
- E. Install pressure-relief valves on heat-exchanger shells where a connection has been provided on shell. When no shell pressure-relief valve connection has been provided, install pressure-relief valve on shell outlet piping before any isolation valves.
- F. Install pressure-relief valves on heat-exchanger tube outlet piping before any isolation valves.
- G. Pipe pressure-relief valves, full size of valve connection, to floor drain.

3.06 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain heat exchangers.

END OF SECTION 235700

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