

SECTION 235719 - HEAT EXCHANGERS, PLATE TYPE

PART 1 - GENERAL

1.1 SCOPE

- A. Provide complete plate type heat exchanger assemblies of the size, capacity and requirements indicated.

1.2 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions, for related requirements. Refer to other sections of the Division 23 and to all other applicable portions of the drawings and specification.

1.3 CODES AND STANDARDS

- A. Equipment shall be designed, manufactured and tested in accordance with the latest edition and addenda of ASME Boiler and Pressure Vessel Code Section VIII, Division I, or Section III, Class 3.

1.4 SHOP DRAWINGS

- A. Refer to the section entitled, "General Mechanical Provisions".

1.5 BASIS OF DESIGN

- A. Basis of design is similar to Baltimore Aircoil "Ener-Changer".

1.6 MANUFACTURERS

- A. Acceptable manufacturers are: Baltimore Aircoil, Alfa-Laval, Dean Products, Bell & Gossett, or equal.

PART 2 - GENERAL

2.1 GENERAL

- A. Heat exchanger shall consist of a removable assembly of gasketed plates supported in a frame, fitted with inlet and outlet nozzles or studded ports for each fluid stream.

2.2 FRAME

- A. Shall provide the structural support and pressure containment for the plate pack; consists of fixed cover, movable cover, upper and lower carrying bars, closing bolts and nuts and carrying bar support column.

2.3 COVERS

- A. Fixed Cover: Located at primary stationary end of the plate heat exchanger. Shall contain all four service nozzles or studded ports and shall extend to the foundation on which the heat exchanger stands. The fixed cover end shall be supported by either two legs or one leg extending along the entire width of the exchanger. The other end may have one support leg only.
- B. Movable Cover: Shall be supported in a roller bearing hanger from the upper carrying bar along which it can move guided by the lower carrying bar. The movable cover shall provide the other bearing surface and mounting for the opposite end of the closing bolts.

2.4 CARRYING BARS

- A. Upper Carrying Bar: Shall be supported horizontally by the fixed cover and the carrying bar support column, to both of which it shall be welded or bolted. A stainless steel Tee section shall be welded to the upper carrying bar to provide the mounting member for the plates of the plate pack.
- B. Lower Carrying Bar: Bar shall be welded or bolted to the stationary cover and the carrying bar support column. It shall be sheathed in stainless steel on those three surfaces in contact with the plates and shall be a guide bar only for the plates.

2.5 CARRYING BAR SUPPORT COLUMN

- A. Shall extend to the foundation on which the plate heat exchanger is mounted. With the fixed cover it shall support the carrying bars, the upper of which carries the plate pack. The carrying bar support column with the fixed cover shall transmit the static load of the plate heat exchanger to the foundation.

2.6 COMPRESSION BOLTS AND NUTS

- A. Compression bolts and nuts shall bear against the fixed and movable cover to close the plate pack to the dimension established by the number of plates in the plate pack.
- B. Compression bolts lengths shall accommodate provision for future expansion. Washers shall be provided at both ends of compression bolts.

2.7 PLATE PACK

- A. Plate pack shall consist of an assembly of gasketed plates which when compressed between the fixed and movable covers forms the vessel. The plates shall separate the hot liquid from the cold liquid and act as the heat transfer surface.
- B. The minimum thickness and design of plates shall be adequate so that each plate can withstand full pressure differential on either side.
- C. Design of plates shall have metal to metal contact between adjacent plates.
- D. Gasket grooves shall be designed to contain gaskets within the grooves, to provide full gasket support, and to prevent over-compression of the gaskets.

- E. Port holes not feeding passes between plates shall be fully gasketed and vented to the atmosphere.
- F. Plates shall be fully supported from the top carrying bar and only guided by the bottom bar with reinforced slots integral with the plate.
- G. Plate and gasket arrangements shall prevent heating and cooling mediums from coming in contact with either the fixed or movable covers.
- H. Each plate shall be pressed from a homogenous piece of sheet metal.
- I. End plates shall be furnished at the fixed and movable cover to provide sealing of the first and last flow channel.

2.8 GASKETS

- A. Each heat transfer plate shall be fitted with a gasket which contains and separate the liquids between the plates.
- B. Gaskets shall be compressed to achieve a metal to metal contact between plates during operation.
- C. Relieving grooves shall be provided in the gaskets at those locations where internal seals are used so that, should an internal seal failure take place, it will become immediately evident by visual inspection of the external surface of the exchanger. The relieving grooves shall be located so that no cross contamination of liquids can occur due to internal seal failure without external evidence, as described above.
- D. Each plate with a gasket in place shall undergo a curing operation at a temperature no less than the exchanger normal operating temperature, for a duration of one hour. After curing, all gaskets shall be checked. Deformed gaskets shall be replaced and the curing operation shall be repeated on new gaskets.

2.9 NOZZLES

- A. Provide 150-lb ASA rated loose flange type.

2.10 OTHER REQUIREMENTS

- A. Plate Design: Unit shall be supplied with a mixed Herringbone Plate Design so that the unit can be optimized with respect to minimum pressure drops and heat transfer surface required for the duty. Mixed plate design shall consist of plates of varying corrugation configurations, but of the same size, mixed in the plate pack to optimize heat transfer, flow rates, and pressure drop.
- B. Lifting lugs to facilitate handling of exchanger and component shall be provided and designed to withstand the flooded weight of the unit.
- C. Identification: All plates shall be marked with type reference symbol and individually numbered in sequence.
- D. Arrangement: Unit shall be arranged for single pass flow on each side so that all piping connections are located at the fixed end, permitting the heat exchanger to be opened for

inspection or cleaning without disturbing the piping. In addition, the inlet and outlet connections for each stream will be located on the same side of the exchanger to facilitate piping. Units shall be designed to be self-draining whenever possible.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install in accord with manufacturer's recommendations.
- B. Arrange to allow all necessary access for servicing and maintenance.
- C. Provide all necessary support for the assembly.
- D. Coordinate piping connections with flow diagrams and layout shown on Drawing.

END OF SECTION 235719