PLATE HEAT EXCHANGER SPECIFICATION

PART 1  GENERAL

1.01  SCOPE

1.01.1  Furnish as shown on the plans, a plate and frame heat exchanger as manufactured by Alfa Laval or approved equal. The plate heat exchanger manufacturer shall not subcontract or purchase for resale the plates. He shall press his own patterns of plates.

1.01.2  The plate heat exchanger manufacturer shall have an established and on-going QA/QC program including manuals available for inspection at plant.

1.01.3  The plate and frame heat exchanger manufacturer shall have extensive background and experience in the design and fabrication of plate and frame heat exchangers. The manufacturer shall have fabricated plate heat exchangers for a minimum of twenty (20) years.

1.02  REFERENCES

- ASME Section II - Material Specification
- ASME Section V - Non-Destructive Testing
- ASME Section IX - Welding and Brazing qualifications
- ASME Section VIII - Pressure Vessel Code
- ARI Standard 400 – Liquid to Liquid Heat Exchangers

1.03  CERTIFICATION

1.03.1  ARI Certification
Plate heat exchangers shall be certified according to ARI Standard 400 and listed on the ARI Prime Net site (www.ariprimenet.org). If heat exchanger is not ARI certified, then the manufacturer shall provide an independent third party field performance test using the mapped ratings, limits and tolerances of ARI Standard 400 to verify performance to specification. Any and all cost associated with correcting a non-performing heat exchanger to meet the performance requirements shall be the responsibility of the supplier. Any cost associated with the field performance test shall be included in the price of the heat exchanger.

As alternate, if heat exchanger is not ARI certified, then the manufacturer shall provide 110% of the heat transfer area of an ARI certified heat exchanger and provide written verification of performance to specification. Any and all cost associated with correcting a non-performing heat exchanger to meet the performance requirements shall be the responsibility of the supplier.

1.03.2  ASME Certification
Plate heat exchangers shall be designed, constructed, and tested in accordance with Section VIII, Division I of the ASME Pressure Vessel Code, and shall be code stamped.

1.4  WARRANTY

1.04.1  The warranty period shall be 3 years from date of shipment for ARI certified plate heat exchangers.
PART 2 PRODUCT

2.01 FRAME COMPONENTS

2.01.1 Preference will be given to single pass designs with all connections on the fixed cover.

2.01.2 The fixed and movable covers shall be of sufficient thickness for the design pressure and code requirements and shall have no welded reinforcements or stiffeners.

2.01.3 The movable cover shall be provided with a steel roller bearing for units greater than 50" in height (from bottom of feet). This allows the movable cover to be moved without additional rigging or handling equipment.

2.01.4 The carrying and guide bars shall be designed to allow for expansion of at least 15%.

2.01.5 The portion of the carrying bar and guide bar system which comes in contact with the plates shall be stainless steel to prohibit corrosion and facilitate movement of the plates. Painted or plated surfaces are not permitted.

2.01.6 Entire frame shall be bolted together to allow unit to be field assembled to permit rigging into place. Welding of the frame components is not permitted.

2.01.7 Plate and carrying bar design shall permit the removal or access to any plate in the plate pack without the need to remove any other plates.

2.01.8 Provide lifting lugs for units with 6 inch ports or larger designed to allow lifting of the entire unit’s flooded weight.

2.01.9 All steel surfaces shall be thoroughly cleaned and prepared for painting per SSPC-SP1063T, painting over mill scale is not acceptable. All carbon steel components shall be Aliphatic Acrylic Polyurethane coated.

2.2 CONNECTIONS

2.02.1 Connections equal to or less than 2" shall be stainless steel NPT type.

2.02.2 To avoid leakage on port area, studded port design should be provided on heat exchangers with connections greater than 2". Flanged nozzle connections are not acceptable.

2.03 COMPRESSION BOLTS

2.03.1 Compression bolts shall not require special tools and shall be equipped with lock washers at the movable cover to facilitate opening and closing of the unit from the fixed cover.

2.03.2 Compression bolts shall be equipped with captive nuts at the fixed cover and threaded nuts at the movable cover. Welding of the nut to the closure bolt is prohibited.

2.03.3 Bolts shall be provided with rolled threads to reduce galling and double width hex nuts to adequately distribute the load, plus ball bearing box washers at all critical closing bolts on all units greater than 50" in height.

2.03.4 Compression bolt material shall be carbon steel. Bolts shall be liberally coated with Gleitmo 500 for lubrication and rust prevention, and covered with a plastic protective sleeving for protection from the environment and to prevent bodily injury. Zinc plating is prohibited.

2.03.5 The bolting system shall be designed so that only four (4) compression bolts are required for the opening and closing of the unit.
2.04 PLATES

2.04.1 The plate and frame heat exchanger shall consist of pressed type AISI 304 to provide the required heat transfer area to meet the operating conditions specified.

2.04.2 Individual plates shall be pressed from a homogeneous single metal sheet in one step. No multi-stage pressing of one sheet is allowed.

2.04.3 Each heat transfer plate to be with herringbone corrugations to optimize heat transfer with nominal pressure loses. Corrugations to be designed to provide support to adjacent plates at evenly distributed support points to allow pressurization of each circuit to a full design pressure with no pressure on the adjacent plate channels without buckling or deformation of the heat transfer plates. (Full pressure differential)

2.04.4 All plates and gaskets shall be permanently marked to identify quality and material.

2.04.5 Each heat transfer plate shall have a built-in self-aligning system to accurately locate the plates in the frame assembly and prevent lateral plate movement and maintain maximum gasket contact under pressure.

2.04.6 Plates shall be reinforced on the upper and lower mounting slots to avoid bending hangers on the plates.

2.04.7 The plate and frame heat exchanger shall be designed to perform the capacities and pressure drops as shown on the schedule. Plates to be have a II B surface finish and tapered gasket grooves.

2.04.8 The plate pack shall be covered with a aluminum shroud in accordance with OSHA.

2.05 GASKETS

2.05.1 Gaskets shall have relieving grooves to prevent intermixing of fluids and cause leak to flow to outside of unit.

2.05.2 One piece molded clip-on NBR gaskets are required and shall fit around both the heat transfer area and the port holes.

2.05.3 Preference shall be given to non-glued gasketing systems.

2.05.4 If an adhesive is necessary, it shall be compatible with the gasket material and the fluids. The adhesive shall be a 2 component epoxy glue and heat cured.

PART 3 INSPECTION AND TESTING

3.01 INSPECTION AND TESTING

3.01.1 The plate heat exchanger shall be tested to full test pressure of 1.3 times the design pressure in one circuit with zero pressure in the alternate circuit.

3.01.2 Hydrostatic test shall be in accordance with ASME Section VIII, Division 1, paragraph UG-99.

3.01.3 The plate heat exchanger shall be ASME U stamped.
PART 4 PREPARATION FOR SHIPMENT

4.01 PREPARATION FOR SHIPMENT

4.01.1 A nameplate shall be securely attached to the exchanger in a location that is easily accessible and visible after installation. The nameplate must include working pressure, design temperature, closing dimension, surface area, media, and plate/gasket material.

4.1.2 The plate heat exchanger shall be flushed clean at factory prior to shipment. All connections shall be factory sealed to prevent the entrance of foreign material during transit.

4.1.3 Port locations shall be clearly marked on the heat exchanger and shall correspond to vendor drawings.