



API 661 Air-Cooled Heat Exchanger - Specification Sheet

| | | | |
|--------------|------------|--------------|---------------|
| Job No. | _____ | Item No. | 2102 (winter) |
| Page | _____ | By | _____ |
| Date | 11/20/2024 | Revision | V04 |
| Proposal No. | _____ | Contract No. | _____ |
| Inquiry No. | _____ | Order No. | _____ |

| | | | |
|--------------------|--------------------------------|-------------------------------|---------------|
| Manufacturer | _____ | Heat exchanged (MegaWatts) | <u>0.4955</u> |
| Model no. | _____ | Surface/Item-Finned tube (m2) | <u>1027</u> |
| Customer | PEDCO/NISOC | Bare tube (m2) | 48.548 |
| Plant location | BINAK oilfeild | MTD, Eff. (Deg. C) | <u>34.1</u> |
| Service | 2st Stage Gas Compression Cool | Transfer rate-Finned (W/m2-K) | <u>16.86</u> |
| Type draft | INDUCED | Bare tube, service (W/m2-K) | <u>356.65</u> |
| Bay size (WxL) (m) | <u>2.172</u> x 3.900 | Bare tube, clean (W/m2-K) | <u>392.2</u> |
| No. of bays/Items | 1 | | |

Basic design data

| | | | |
|---------------------------|-------|----------------------|-------|
| Pressure design code | _____ | Structural code | _____ |
| Tube bundle code stamped | _____ | Flammable service | _____ |
| Heating coil code stamped | _____ | Lethal/toxic service | _____ |

Performance Data - Tube Side

| | | | | | |
|------------------------------------|--------------------|-----------------------------------|-----------------|-----------------|--|
| Fluid name | HYDROCARBON | | | | |
| Total fluid entering (kg/hr) | 7585 X1.1 | Total flow rate (Liq/Vap) (kg/hr) | In / 8343.5 | Out / 8343.5 | |
| Dew/bubble point (Deg. C) | / | Water/Steam (kg/hr) | / | / | |
| Latent heat (kJ/kg) | | Noncondensables (kg/hr) | | | |
| Inlet pressure (barG) | 54.8 | Molecular Wt. (Vap/Non-cond) | / | / | |
| Pressure drop (All/Calc) (bar) | 0.7 / <u>0.081</u> | Density (Liq/Vap) (kg/m3) | / <u>36.175</u> | / <u>50.059</u> | |
| Velocity (Allow/Calc) (m/s) | / <u>3.69</u> | Specific heat (Liq/Vap) (kJ/kg-C) | / <u>2.4633</u> | / <u>2.3853</u> | |
| Inside fouling resistance (m2-K/W) | 0.0002 | Thermal cond. (Liq/Vap) (W/m-K) | / <u>0.05</u> | / <u>0.0387</u> | |
| | In Out | Viscosity (Liq/Vap) (mN-s/m2) | / <u>0.0163</u> | / <u>0.0139</u> | |
| Temperature (Deg. C) | 149 60 | | | | |

Performance Data - Air Side

| | | | |
|---------------------------------|--------------|---------------------------------------|---------------|
| Air inlet temperature (Deg. C) | 50.26 | Face velocity (m/s) | <u>3.27</u> |
| Air flow rate/item (m3/s) | <u>26.98</u> | Minimum design ambient temp. (Deg. C) | 5 |
| Mass velocity (kg/s-m2) | | Altitude (m) | 12.5 |
| Air outlet temperature (Deg. C) | <u>65.43</u> | Static pressure (Pa) | <u>167.92</u> |
| Air flow rate/fan (m3/s) | <u>15.59</u> | | |

Design, Material, and Construction

| | | | |
|----------------------------------|--------------------|---------------------------------|---------------|
| Design pressure (barG) | 62 | Heating Coil | NO |
| Test pressure (barG) | 80.6 | No. of tubes | _____ |
| Design temperature (Deg. C) | 175 | Tube outside diameter (mm) | _____ |
| Min. design metal temp. (Deg. C) | _____ | Tube material | _____ |
| Tube bundle | | Fin material and type | _____ |
| Size (WxL) (m) | <u>2.116</u> X 3.9 | Fin thickness (mm) | _____ |
| No./Bay | 1 | ASME Code, Sec. VIII, Div. 1 | _____ |
| Number of tube rows | 6 | Heating fluid | _____ |
| Bundles in parallel | 1 | Heating fluid flow rate (kg/hr) | _____ |
| Bundles in series | _____ | Temperature (In/Out) (Deg. C) | _____ / _____ |
| Structure mounting | _____ | Inlet pressure (barG) | _____ |
| Pipe rack beams | _____ | Pressure drop (All/Calc) (kPa) | _____ / _____ |
| Ladders, walkways, platforms | _____ | Design temperature (Deg. C) | _____ |
| Structure surface prep. | _____ | Design pressure (barG) | _____ |
| Header surface prep. | _____ | Inlet/Outlet nozzle | _____ / _____ |
| Louver | | Header | |
| Material | YES | Type | PLUG |
| Action control | Manual | Material | SA-240 TP316L |
| Action type | _____ | Corrosion Allowance (mm) | 0 |
| | | No. of passes | 4 |



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Design, Material, and Construction (continued)

| | | | | | |
|----------------------------|-------------------------------|------------|---------------|------------------------------|-------------------------|
| Header (continued) | | | | No./Bundle | 156 |
| Slope | 1% ON LAST PASS | | | Length (m) | 3.9 |
| Plug material | SA-182 F316 L | | | Pitch (mm) | 70.5 |
| Gasket material | Solid METAL | | | Layout | Triangular |
| Nozzle | No. | Size, (in) | Rating/Facing | Fin | |
| Inlet | 1 | 4 | 600 RF | Type | Extruded |
| Outlet | 1 | 4 | 600 RF | Material | Aluminum Alloy 1060 - O |
| Vent | 1 | 2 | 600 RF | Thickness (mm) | 0.48 |
| Drain | 1 | 2 | 600 RF | Selection temp. (C) | _____ |
| Chemical Cleaning | _____ | _____ | _____ | Outside diameter (mm) | 57.15 |
| Min. Wall Thk. | _____ | _____ | _____ | Fin density (fin/meter) | 400 |
| Tube | SA-213 TP316L Tube (S) S31603 | | | ASME Code, Sec. VIII, Div. 1 | _____ |
| Material | SA-213 TP316L Tube (S) S31603 | | | Customer Specifications | _____ |
| Tube outside diameter (mm) | 25.4 | | | _____ | _____ |
| wall thickness (mm) | 1.651 | | | _____ | _____ |

Mechanical Equipment

| | | | | | |
|--------------------|--------------|--|--|----------------------|---------------------------|
| Fan | | | | RPM | 1500 |
| Manufacturer | _____ | | | Service factor | 1 |
| No./Bay | 2 | | | Enclosure | YES,EEExd, IIB T3 (IP 55) |
| RPM (Revs/min.) | 645.4 | | | Voltage | 400 |
| Diameter (mm) | 1450 | | | Phase | 3 |
| No. of blades | 4 | | | Cycle | 50 |
| Angle (degrees) | _____ | | | Fan noise level (dB) | <85 |
| Pitch adjustment | 50% Auto | | | Speed Reducer | |
| Blade material | Al | | | Type | V-Belt |
| Hub material | steel/Alu | | | Manufacturer | _____ |
| @design temp | 4.8 | | | No./Bay | 2 |
| @min. ambient temp | 6.6 | | | Service factor | 1.8 |
| Tip speed | _____ | | | Speed ratio | 2.28 |
| Driver | _____ | | | Support | _____ |
| Type | _____ | | | Vib. switch | YES,EEExd, IIB T3 (IP 65) |
| Manufacturer | _____ | | | Enclosure | _____ |
| No./Bay | 2 | | | _____ | _____ |
| Driver (kW) | 7.5 | | | _____ | _____ |

Controls - Air Side

| | | | |
|--|---------------|----------------------------|----------------|
| Air recirculation | NO | Louvers | _____ |
| Degree control of outlet process temp. (Max. Cooling), +/- | _____ / _____ | Positioner | _____ |
| Action on control signal failure | _____ | Signal air pressure (barG) | _____ |
| Fan pitch | _____ | From | _____ To _____ |
| Louvers | _____ | From | _____ To _____ |
| Actuator air supply | _____ | Supply air pressure (barG) | _____ |
| Fan | _____ | From | _____ To _____ |
| | _____ | From | _____ To _____ |

Shipping

| | | | |
|-----------------------------|----------------------|---------------|--------------|
| Plot area (WxL) (m) | 2.172 x 3.900 | Total (kg) | 10514 |
| Bundle weight (Note 4) (kg) | 3217.6 | Shipping (kg) | _____ |
| Bay (kg) | _____ | _____ | _____ |

Note: 1-Reported duty and flow rates include a user-specified multiplier of 1.10
 2-Maximum allowable nozzle load = 3 x API.
 3-Material will be meet requirements of NACE MR0175/ISO1516 and specification for material requirements in sour service (BK-GNRL-PEDCO-000-PI-SP-0008)
 4- HTRI Weights are reported