API 661 Air-Cooled Heat Exchanger - Specification Sheet

Job No.		Item No.	2101 (winter)
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Date		Revision	V04
Proposal No.		Contract No.	
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Manufacturer			Heat exchanged	(MegaWatts)	0.276
Model no.			Surface/Item-Finned tube	(m2)	668.71
Customer		PEDCO/NISOC	Bare tube	(m2)	31.536
Plant location		Binak oilfield	MTD, Eff.	(Deg. C)	26.3
Service		1st stage Gas Compression Cooler	Transfer rate-Finned	(W/m2-K)	19.37
Type draft		INDUCED	Bare tube, service	(W/m2-K)	410.75
Bay size (WxL)	(m)	1.966 x 3.8	Bare tube, clean	(W/m2-K)	458.48
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

					In	Out
Fluid name		HYDROCARBON				
Total fluid entering	(kg/hr)	7585 x 1.1	Total flow rate (Liq/Vap)	(kg/hr)	8343.5	8343.5
Dew/bubble point	(Deg. C)	/	Water/Steam	(kg/hr)	/	/
	(Deg. C)		Noncondensables	(kg/hr)		
Latent heat	(kJ/kg)		Molecular Wt. (Vap/Non-cond)		/	/
Inlet pressure	(barG)	17.9	Density (Liq/Vap)	(kg/m3)	12.847	14.916
Pressure drop (All/Calc)	(bar)	0.7 / 0.416	Specific heat (Liq/Vap)	(kJ/kg-C)	2.2197	2.0293
Velocity (Allow/Calc)	(m/s)	/ 16.06	Thermal cond. (Liq/Vap)	(W/m-K)	0.0441	0.0356
Inside fouling resistance	(m2-K/W)	0.0002	Viscosity (Liq/Vap)	(mN-s/m2)	0.0137	0.0121
		In / Out				
Temperature	(Deg. C)	116 / 60				

Performance Data - Air Side

Air inlet temperature	(Deg. C)	50.26	Face velocity	(m/s)	2.9
Air flow rate/item	(m3/s)	24.148	Minimum design ambient temp.	(Deg. C)	5
Mass velocity	(kg/s-m2)		Altitude	(m)	12.5
Air outlet temperature	(Deg. C)	61.02	Static pressure	(Pa)	137.4
Air flow rate/fan	(m3/s)	12.074			

Design, Material, and Construction

Design pressure	(barG)	22	**Heating Coil**		NO
Test pressure	(barG)	28.6	No. of tubes		
Design temperature	(Deg. C)	155	Tube outside diameter	(mm)	
Min. design metal temp.	(Deg. C)		Tube material		
Tube bundle			Fin material and type		
Size (WxL)	(m)	1.922X 3.80	Fin thickness	(mm)	
No./Bay		1	ASME Code, Sec. VIII, Div. 1		
Number of tube rows		4	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		YES	**Header**		
Material			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)

Slope	1% ON LAST PASS
Plug material	SA 182 F316L
Gasket material	Solid Metal

Nozzle	No.	Size, (In)	Rating/Facing
Inlet	1	6	300 RF
Outlet	1	6	300RF
Vent	1	2	300RF
Drain	1	2	300RF
Chemical Cleaning			
Min. Wall Thk.			

Tube

Material		SA-213 TP316L Tube (S) S31603
Tube outside diameter	(mm)	25.4
wall thickness	(mm)	1.651

No./Bundle		104
Length	(m)	3.8
Pitch	(mm)	63.5
Layout		Triangular

Fin

Type		EXTRUDED
Material		Aluminum Alloy 1060 - O
Thickness	(mm)	0.48
Selection temp.	(C)	
Outside diameter	(mm)	57.15
Fin density	(fin/meter)	400
ASME Code, Sec. VIII, Div. 1		
Customer Specifications		

Mechanical Equipment

Fan

Manufacturer		
No./Bay		2
RPM	(Revs/min.)	626.4
Diameter	(mm)	1372
No. of blades		4
Angle	(degrees)	
Pitch adjustment		50% Auto
Blade material		AL
Hub material		Alu/Steel
@design temp		2.6
@min. ambient temp		3.5
Tip speed		

Driver

Type		
Manufacturer		
No./Bay		2
Driver	(kW)	5.5

RPM		1500
Service factor		1
Enclosure		EExd, IIB T3 (IP 55)
Voltage		400
Phase		3
Cycle		50
Fan noise level	(dB)	<85

Speed Reducer

Type		V-Belt
Manufacturer		
No./Bay		2
Service factor		1.8
Speed ratio		
Support		
Vib. switch		YES EExd, IIB T3 (IP 65)
Enclosure		

Controls - Air Side

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

Shipping

Plot area (WxL)	(m)	1.966 x 3.8	Total (Note 4)	(kg)	9140.4
Bundle weight (Note 4)	(kg)	2252.7	Shipping	(kg)	
Bay	(kg)				

Note:1- Reported duty and flow rates include a user-specifiedmultiplier 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 requirments in sour service (BK-GNRAL-PEDCO-000-PI-SP-0008)
4-HTRI Weight is reported