API 661 Air-Cooled Heat Exchanger - Specification Sheet

Based on GEA Btt-Batignolles Technologies Thermiques FRANCE

Job No.		Item No.	Air Cooler
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Date	February 24, 2024	Revision	B00
Proposal No.	02612N	Contract No.	
Inquiry No.		Order No.	
		No. of Item	1

Manufacturer		Damafin Thermal Technology Co.	Heat exchanged	(kW)	252.
Model no.			Surface/Item-Finned tube	(m2)	1443.9
Customer		ENER Teknoloji Co.	Bare tube	(m2)	62.264
Plant location			MTD, Eff.	(Deg. C)	6.9
Service			Transfer rate-Finned	(W/m2-K)	25.983
Type draft		FORCED	Bare tube, service	(W/m2-K)	602.53
Bay size (WxL)	(m)	2.35 X 6.4	Bare tube, clean	(W/m2-K)	696.17
No. of bays/Items		1			

Basic design data

Pressure design code	ASME VIII div 1 + API 661	Structural code	UBC 97
Tube bundle code stamped	No.	Flammable service	No.
Heating coil code stamped	No.	Lethal/toxic service	No.

Performance Data - Tube Side

					In		Out	
Fluid name		Propane						
Total fluid entering	(kg/hr)	3089.2	Total flow rate (Liq/Vap)	(kg/hr)	0.0000	3089.2	3089.2	0.0000
Dew/bubble point	(Deg. C)	/	Water/Steam	(kg/hr)	0.0000	0.0000	0.0000	0.0000
	(Deg. C)		Noncondensables	(kg/hr)		0.0000		0.0000
Latent heat	(kJ/kg)		Molecular Wt. (Vap/Non-cond)		/		/	
Inlet pressure	(bar)	19.867	Density (Liq/Vap)	(kg/m3)	435.50	42.251	435.62	46.245
Pressure drop (All/Calc)	(bar)	0.200 / 0.022	Specific heat (Liq/Vap)	(kJ/kg-C)	3.6130	2.3072	3.6108	2.3958
Velocity (Allow/Calc)	(m/s)	/ 0.99	Thermal cond. (Liq/Vap)	(W/m-C)	0.0763	0.0248	0.0763	0.0239
Inside fouling resistance (m2-K/W)		0.000170	Viscosity (Liq/Vap)	(cP)	0.0728	0.0105	0.0729	0.0103
		In / Out						
Temperature	(Deg. C)	67.94 / 56.64						

Performance Data - Air Side

Air inlet temperature	(Deg. C)	48.00	Face velocity	(m/s) 4.00
Air flow rate/item	(m3/s)	53.067	Minimum design ambient temp.	(Deg. C) -17.78
Mass velocity	(kg/s-m2)		Altitude	(m) 0.000
Air outlet temperature	(Deg. C)	51.92	Static pressure	(Pa) 175.45
Air flow rate/fan	(m3/s)	28.998		

Design, Material, and Construction

Design pressure	(barG)	23.000	**Heating Coil**		NO.
Test pressure	(barG)		No. of tubes		
Design temperature	(Deg. C)	120.00	Tube outside diameter	(mm)	
Min. design metal temp.	(Deg. C)		Tube material		
Tube bundle			Fin material and type		
Size (WxL)	(m)	2.2 X 6.4	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		Grade	Inlet pressure	(bar)	
Pipe rack beams			Pressure drop (All/Calc)	(kPa)	/
Ladders, walkways, platforms			Design temperature	(Deg. C)	
Structure surface prep.			Design pressure	(bar)	
Header surface prep.			Inlet/Outlet nozzle		/
Louver		NO.	**Header**		
Material			Type		Plug
Action control			Material		SA-516 Gr60/70
Action type			Corrosion Allowance	(mm)	3
			No. of passes		4
			Tube / Tubesheet		Expanded

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Design, Material, and Construction (continued)

Header (continued)			No./Bundle		128
Slope / Split		No / No	Length	(m)	6.096
Plug material		SA-105	Pitch	(mm)	66.670
Gasket material		Soft Iron	Layout		Triangular
Nozzle	No.	Size, (in) / Rating/Facing	**Fin**		
Inlet	1	6 / #300	Type		Extruded
Outlet	1	4 / #300	Material		Aluminum
Vent			Thickness (Base / Tip)	(mm)	1 / 0.24
Drain			Selection temp.	(C)	
Chemical Cleaning			Outside diameter	(mm)	57.150
Min. Wall Thk.			Fin density	(fin/meter)	433.1
Tube			ASME Code, Sec. VIII, Div. 1		
Material		SA-334 6	Customer Specifications		
Tube outside diameter	(mm)	25.400			
Min wall thickness	(mm)	2.108			

Mechanical Equipment

Fan			RPM		1500
Manufacturer		Axial Fans Int Srl (or equivalent)	Service factor		
No./Bay		2	Enclosure		Safe Area / IP55
RPM	(Revs/min.)		Voltage		400
Diameter	(ft)	6	Phase		3
No. of blades			Cycle		50
Angle	(degrees)		Fan noise level	(dB)	max 85
Pitch adjustment		100% Manual	**Speed Reducer**		
Blade material			Type		V- belt
Hub material			Manufacturer		
@design temp	(kW)		No./Bay		2
@min. ambient temp			Service factor		
Tip speed			Speed ratio		
Driver			Support		
Type			Vib. switch		YES
Manufacturer			Enclosure		
No./Bay					
Driver	(kW)	11			

Controls - Air Side

Air recirculation		Louvers	
Degree control of outlet process temp.		Positioner	
(Max. Cooling),+/-	/	Signal air pressure (bar)	
Action on control signal failure		From	To
Fan pitch		From	To
Louvers		Supply air pressure (bar)	
Actuator air supply		From	To
Fan		From	To

Shipping

Plot area (WxL)	(m)	2.35 X 6.4	Total	(kg)	(Based On HTRI) 10,500
Bundle weight	(kg)		Shipping	(kg)	
Bay	(kg)				

1) Std , Nominated Power.