

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	May 7, 2024	Revision	_____	B05
Proposal No.	02612N	Contract No.	_____	
Inquiry No.	_____	Order No.	_____	
		No. of Item	_____	1

Manufacturer	Damafin Thermal Technology Co.	Heat exchanged	(kW)	257.
Model no.	_____	Surface/Item-Finned tube	(m2)	1579.2
Customer	ENER Teknologi	Bare tube	(m2)	68.101
Plant location	_____	MTD, Eff.	(Deg. C)	6.8
Service	_____	Transfer rate-Finned	(W/m2-K)	25.56
Type draft	FORCED	Bare tube, service	(W/m2-K)	592.72
Bay size (WxL)	(m) 2.65 x 6.4	Bare tube, clean	(W/m2-K)	679.11
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	Yes.
Heating coil code stamped	No. _____	Lethal/toxic service	No.

Performance Data - Tube Side

Fluid name	Propane		In	Out
Total fluid entering	(kg/hr) 3015.5	Total flow rate (Liq/Vap)	(kg/hr) 0.0000 / 3015.5	3015.5 / 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) 19.800	Density (Liq/Vap)	(kg/m3) 435.84 / 40.275	435.92 / 46.077
Pressure drop (All/Calc)	(bar) 0.100 / 0.016	Specific heat (Liq/Vap)	(kJ/kg-C) 3.6067 / 2.2738	3.6051 / 2.3921
Velocity (Allow/Calc)	(m/s) _____ / 0.85	Thermal cond. (Liq/Vap)	(W/m-C) 0.0764 / 0.0253	0.0764 / 0.0238
Inside fouling resistance (m2-K/W)	0.000170	Viscosity (Liq/Vap)	(cP) 0.0730 / 0.0106	0.0730 / 0.0103
Temperature	(Deg. C) In 73.50 Out 56.32			

Performance Data - Air Side

Air inlet temperature	(Deg. C) 48.00	Face velocity	(m/s) 3.15
Air flow rate/item	(m3/s) 45.529	Minimum design ambient temp.(Deg. C)	5.00
Mass velocity	(kg/s-m2) _____	Altitude	(m) 20.000
Air outlet temperature	(Deg. C) 52.28	Static pressure	(Pa) 102.95
Air flow rate/fan	(m3/s) 26.879		

Design, Material, and Construction

Design pressure	(barG) 22 + F.V	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) 2.5 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 Gr70(N)
Action type	_____	Corrosion Allowance	(mm) 3
		No. of passes	4
		Tube / Tubesheet	Strength weld

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Design, Material, and Construction (continued)

Header (continued)				No./Bundle	140
Slope / Split	1% on last pass /	No		Length	(m) 6.096
Plug material	SA 350 LF2 CL.1			Pitch	(mm) 69.850
Gasket material	Soft Iron			Layout	Triangular
Nozzle	No.	Size, (in)	Rating/Facing	Fin	
Inlet	1	4	#300	Type	Extruded
Outlet	1	2	#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)		1.651		

Mechanical Equipment

Fan				RPM	1500
Manufacturer	Axial Fans Int Srl (or equivalent)			Service factor	
No./Bay			2	Enclosure	Exec / IP55
RPM	(Revs/min.)			Voltage	400
Diameter	(ft)		7	Phase	3
No. of blades				Cycle	50
Angle	(degrees)			Fan noise level	(dB) max 85
Pitch adjustment			100% Manual	Speed Reducer	
Blade material			Aluminium	Type	V- belt
Hub material			Manufacturer Standard	Manufacturer	
@design temp	(kW)			No./Bay	2
@min. ambient temp				Service factor	
Tip speed				Speed ratio	
Driver				Support	
Type			Electrical	Vib. switch	YES
Manufacturer			OME ELECTRIC OR AVL	Enclosure	
No./Bay					
Driver	(kW)		7.5		

Controls - Air Side

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

Shipping

Plot area (WxL)	(m) 2.65 x 6.4	Total weight, Dry / Wet (Kg)	(Based On HTRI) 11,800 / 12,300
Bundle weight	(kg)	Shipping	(kg)
Bay	(kg)		

1) STD. nominated power.