

API 661 Air-Cooled Heat Exchanger - Specification Sheet



Based on
GEA
 Btt-Batignolles
 Technologies
 Thermiques
 F R A N C E

Job No.	_____	Item No.	_____	Air Cooler
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Date	February 27, 2024	Revision	_____	B01
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	(m ²)	1579.2
Customer	ENER Teknologi	Bare tube	(m ²)	68.101
Plant location	_____	MTD, Eff.	(Deg. C)	6.8
Service	_____	Transfer rate-Finned	(W/m ² -K)	26.509
Type draft	FORCED	Bare tube, service	(W/m ² -K)	614.72
Bay size (WxL)	(m) 2.65 x 6.4	Bare tube, clean	(W/m ² -K)	708.15
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

Fluid name	propane		In	Out
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/m ³) 435.50 / 42.251	435.58 / 46.266
Pressure drop (All/Calc)	(bar) 0.200 / 0.015	Specific heat (Liq/Vap)	(kJ/kg-C) 3.6130 / 2.3072	3.6115 / 2.3963
Velocity (Allow/Calc)	(m/s) _____ / 0.83	Thermal cond. (Liq/Vap)	(W/m-C) 0.0763 / 0.0248	0.0763 / 0.0239
Inside fouling resistance (m ² -K/W)	0.000170	Viscosity (Liq/Vap)	(cP) 0.0728 / 0.0105	0.0729 / 0.0103
Temperature	(Deg. C) In 67.94 / Out 56.66			

Performance Data - Air Side

Air inlet temperature	(Deg. C) 48.00	Face velocity	(m/s) 3.25
Air flow rate/item	(m ³ /s) 46.975	Minimum design ambient temp.(Deg. C)	5.00
Mass velocity	(kg/s-m ²) _____	Altitude	(m) 20.000
Air outlet temperature	(Deg. C) 52.06	Static pressure	(Pa) 109.07
Air flow rate/fan	(m ³ /s) 27.733		

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	Seal Weld + Heavy Expanded

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Design, Material, and Construction (continued)

Header (continued)				No./Bundle	
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				Fin	
Inlet	No.	Size, (in)	Rating/Facing	Type	Extruded
Outlet	1	6	#300	Material	Aluminum
Vent	2	4	#300	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	
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				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 (1)	(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)	11,000 / 11,400
Bundle weight	(kg)		Shipping	(kg)	
Bay	(kg)				

1) STD. nominated power.