

API 661 Air-Cooled Heat Exchanger - Specification Sheet



Based on
GEA
Btt-Batignolles
Technologies
Thermiques
FRANCE

Total quantity is 2

Job No.	_____	Item No.	_____	Air Cooler
Page	Page 1 of 2	By	_____	
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	(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)	26.509
Type draft	FORCED	Bare tube, service	(W/m2-K)	614.72
Bay size (WxL)	(m) 2.65 x 6.4	Bare tube, clean	(W/m2-K)	708.15
No. of bays/Items	1			

Basic design data

Fluid type is propane and is flammable

Pressure design code	ASME VIII div 1 + API 661	Structural code	_____	UBC 97
Tube bundle code stamped	No. _____	Flammable service	No. _____	No.
Heating coil code stamped	No. _____	Lethal/toxic service	No. _____	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/m3)	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 (m2-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				

bara

Performance Data - Air Side

Air inlet temperature	(Deg. C)	48.00	Face velocity	(m/s)	3.25
Air flow rate/item	(m3/s)	46.975	Minimum design ambient temp.(Deg. C)	_____	5.00
Mass velocity	(kg/s-m2)	_____	Altitude	(m)	20.000
Air outlet temperature	(Deg. C)	52.06	Static pressure	(Pa)	109.07
Air flow rate/fan	(m3/s)	27.733			

Vendor to check calculated static pressure.

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

Strength weld

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Design, Material, and Construction (continued)

Header (continued)

Slope / Split	1% on last pass /	No
Plug material	SA 350 LF2 CL.1	
Gasket material	Soft Iron	
Nozzle	No.	Size, (in)
Inlet	1	6
Outlet	2	4
Vent		
Drain		
Chemical Cleaning		
Min. Wall Thk.		
Tube		
Material	SA-334 6	
Tube outside diameter	(mm)	25.400
Min wall thickness	(mm)	1.651

No./Bundle	140
Length	(m) 6.096
Pitch	(mm) 69.850
Layout	Triangular
Fin	
Type	Extruded
Material	Aluminum
Thickness (Base / Tip)	(mm) 1 / 0.24
Selection temp.	(C)
Outside diameter	(mm) 57.150
Fin density	(fin/meter) 433.1
ASME Code, Sec. VIII, Div. 1	
Customer Specifications	

Mechanical Equipment

Fan	
Manufacturer	Axial Fans Int Srl (or equivalent)
No./Bay	2
RPM	(Revs/min.)
Diameter	(ft) 7
No. of blades	
Angle	(degrees)
Pitch adjustment	100% Manual
Blade material	
Hub material	
@design temp	(kW)
@min. ambient temp	
Tip speed	
Driver	
Type	
Manufacturer	
No./Bay	
Driver (1)	(kW) 7.5

RPM	1500
Service factor	
Enclosure	Exec / IP55
Voltage	400
Phase	3
Cycle	50
Fan noise level	(dB) max 85
Speed Reducer	
Type	V- belt
Manufacturer	
No./Bay	2
Service factor	
Speed ratio	
Support	
Vib. switch	YES
Enclosure	

Controls - Air Side

Air recirculation	
Degree control of outlet process temp. (Max. Cooling), +/-	_____ / _____
Action on control signal failure	
Fan pitch	
Louvers	
Actuator air supply	
Fan	

Louvers	
Positioner	
Signal air pressure (bar)	
From _____ To _____	
From _____ To _____	
Supply air pressure (bar)	
From _____ To _____	
From _____ To _____	

Shipping

Plot area (WxL)	(m) 2.65 x 6.4
Bundle weight	(kg)
Bay	(kg)

Total weight, Dry / Wet (Kg)	(Based On HTRI) 11,000 / 11,400
Shipping (kg)	

1) STD. nominated power.