

**API 661 Air-Cooled Heat Exchanger - Specification Sheet**



Based on  
**GEA**  
Btt-Batignolles  
Technologies  
Thermiques  
FRANCE

Job No.	_____	Item No.	_____	Air Cooler
Page	Page 1 of 2	By	_____	
Date	May 7, 2024	Revision	_____	02
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	(m <sup>2</sup> )	1579.2
Customer	ENER Teknologi	Bare tube	(m <sup>2</sup> )	68.101
Plant location	_____	MTD, Eff.	(Deg. C)	6.8
Service	_____	Transfer rate-Finned	(W/m <sup>2</sup> -K)	25.56
Type draft	FORCED	Bare tube, service	(W/m <sup>2</sup> -K)	592.72
Bay size (WxL)	(m) 2.65 x 6.4	Bare tube, clean	(W/m <sup>2</sup> -K)	679.11
No. of bays/Items	1			

**Basic design data**

Pressure design code	ASME VIII div 1	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/m <sup>3</sup> )	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 (m <sup>2</sup> -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	(m <sup>3</sup> /s)	45.529	Minimum design ambient temp.(Deg. C)		5.00
Mass velocity	(kg/s-m <sup>2</sup> )	_____	Altitude	(m)	20.000
Air outlet temperature	(Deg. C)	52.28	Static pressure	(Pa)	102.95
Air flow rate/fan	(m <sup>3</sup> /s)	26.879			

**Design, Material, and Construction**

Design pressure	(barG)	22 + F.V	<b>Heating Coil</b>	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	_____
<b>Tube bundle</b>			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	_____ / _____
<b>Louver</b>		NO.	<b>Header</b>	
Material		_____	Type	Plug
Action control		_____	Material	SA-516 Gr70(N)
Action type		_____	Corrosion Allowance	(mm) align="right">3
			No. of passes	4
			Tube / Tubesheet	Strength weld

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 Date **May 7, 2024**  
 Proposal No. 02612N  
 Inquiry No. \_\_\_\_\_

Item No. \_\_\_\_\_ Air Cooler  
 By \_\_\_\_\_  
 Revision **B05**  
 Contract No. \_\_\_\_\_  
 Order No. \_\_\_\_\_

**Design, Material, and Construction (continued)**

<b>Header (continued)</b>				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
<b>Nozzle</b>	No.	Size, (in)	Rating/Facing	<b>Fin</b>	
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
<b>Tube</b>				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**

<b>Fan</b>				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	<b>Speed Reducer</b>	
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	
<b>Driver</b>				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.**