

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



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

Job No. \_\_\_\_\_  
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Date April 8, 2024  
Proposal No. 02612N  
Inquiry No. \_\_\_\_\_

Item No. Air Cooler  
By \_\_\_\_\_  
Revision B03  
Contract No. \_\_\_\_\_  
Order No. \_\_\_\_\_  
No. of Item 1

Manufacturer	Damafin Thermal Technology Co.	Heat exchanged	(kW) <u>252.</u>
Model no.		Surface/Item-Finned tube	(m <sup>2</sup> ) <u>1579.2</u>
Customer	ENER Teknoloji	Bare tube	(m <sup>2</sup> ) <u>68.101</u>
Plant location		MTD, Eff.	(Deg. C) <u>6.8</u>
Service		Transfer rate-Finned	(W/m <sup>2</sup> -K) <u>26.508</u>
Type draft	FORCED	Bare tube, service	(W/m <sup>2</sup> -K) <u>614.71</u>
Bay size (WxL)	(m) <u>2.65 X 6.4</u>	Bare tube, clean	(W/m <sup>2</sup> -K) <u>708.13</u>
No. of bays/items	<u>1</u>		

### 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)	<u>3089.2</u>		Total flow rate (Liq/Vap)	(kg/hr)	<u>0.0000 / 3089.2</u>	<u>3089.2 / 0.0000</u>
Dew/bubble point	(Deg. C)	_____ / _____		Water/Steam	(kg/hr)	<u>0.0000 / 0.0000</u>	<u>0.0000 / 0.0000</u>
	(Deg. C)	_____ / _____		Noncondensables	(kg/hr)	<u>0.0000</u>	<u>0.0000</u>
Latent heat	(kJ/kg)	_____		Molecular Wt. (Vap/Non-cond)	_____ / _____	_____ / _____	_____ / _____
Inlet pressure	(bar)	<u>19.867</u>		Density (Liq/Vap)	(kg/m <sup>3</sup> )	<u>435.50 / 42.251</u>	<u>435.59 / 46.262</u>
Pressure drop (All/Calc)	(bar)	<u>0.200 / 0.016</u>		Specific heat (Liq/Vap)	(kJ/kg-C)	<u>3.6130 / 2.3072</u>	<u>3.6114 / 2.3962</u>
Velocity (Allow/Calc)	(m/s)	_____ / <u>0.83</u>		Thermal cond. (Liq/Vap)	(W/m-C)	<u>0.0763 / 0.0248</u>	<u>0.0763 / 0.0239</u>
Inside fouling resistance (m <sup>2</sup> -K/W)		<u>0.000170</u>		Viscosity (Liq/Vap)	(cP)	<u>0.0728 / 0.0105</u>	<u>0.0729 / 0.0103</u>
Temperature	(Deg. C)	In <u>67.94</u> Out <u>56.66</u>					

### Performance Data - Air Side

Air inlet temperature	(Deg. C) <u>48.00</u>	Face velocity	(m/s) <u>3.25</u>
Air flow rate/item	(m <sup>3</sup> /s) <u>46.975</u>	Minimum design ambient temp	(Deg. C) <u>5.00</u>
Mass velocity	(kg/s-m <sup>2</sup> ) _____	Altitude	(m) <u>20.000</u>
Air outlet temperature	(Deg. C) <u>52.06</u>	Static pressure	(Pa) <u>108.40</u>
Air flow rate/fan	(m <sup>3</sup> /s) <u>27.733</u>		

### Design, Material, and Construction

Design pressure	(barG) <u>22 + F.V</u>	Heating Coil	NO.
Test pressure	(barG) _____	No. of tubes	_____
Design temperature	(Deg. C) <u>120.00</u>	Tube outside diameter	(mm) _____
Min. design metal temp.	(Deg. C) _____	Tube material	_____
<b>Tube bundle</b>		Fin material and type	_____
Size (WxL)	(m) <u>2.5 X 6.4</u>	Fin thickness	(mm) _____
No./Bay	<u>1</u>	ASME Code, Sec. VIII, Div. 1	_____
Number of tube rows	<u>4</u>	Heating fluid	_____
Bundles in parallel	<u>1</u>	Heating fluid flow rate	(kg/hr) _____
Bundles in series	_____	Temperature (In/Out)	(Deg. C) _____ / _____
Structure mounting	<u>Grade</u>	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>	<u>NO.</u>	<b>Header</b>	
Material	_____	Type	<u>Plug</u>
Action control	_____	Material	<u>SA-516 Gr70(N)</u>
Action type	_____	Corrosion Allowance	(mm) <u>3</u>
		No. of passes	<u>4</u>
		Tube / Tubesheet	<u>Strength weld</u>

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

Header (continued)				No./Bundle	
Slope / Split	1% on last pass /	No		140	
Plug material	SA 350 LF2 CL.1			Length	(m) 6.096
Gasket material	Soft Iron			Pitch	(mm) 69.850
				Layout	Triangular
Nozzle				Fin	
	No.	Size, (in)	Rating/Facing	Type	Extruded
Inlet	1	4	#300	Material	Aluminum
Outlet	1	2	#300	Thickness (Base / Tip)	(mm) 1 / 0.24
Vent				Selection temp.	(C) _____
Drain				Outside diameter	(mm) 57.150
Chemical Cleaning				Fin density	(fin/meter) 433.1
Min. Wall Thk.				ASME Code, Sec. VIII, Div. 1	_____
Tube				Customer Specifications	
Material	SA-334 6				
Tube outside diameter	(mm)			_____	
Min wall thickness	(mm)			_____	

### 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.)	404		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.**