AFTER COOLER MECHANICAL DATA SHEET FOR NITROGEN GAS

Rev.	Date	Purpose of Issue	Prepared	Checked	Approved	AC Code
02	*07/02/2022*	**For approval**	**KP**	**LdM**	**JR**	
01	14/09/2021	**For approval**	**KP**	**PW**	**JR**	
00	11/12/2020	**For approval**	**KP**	**PW**	**JL**	

Class: 1 **Phase: P**

TABULATION OF REVISED PAGES

Page	D00	D01	D02	D03	D04
1.	X	X	X		
2.	X	X	X		
3.	X	X	X		
4.			X		
5.			X		
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					

Page	D00	D01	D02	D03	D04

		Job No.	17811-CC-0000
Customer	Airpack Nederland B.V.	Reference No.	17811-CC-0000
Address		Proposal No.	202204
Plant Location		Date	04/02/2022
Service of Unit	Intercooler	Item No.	
Size	133,3 x 1256 mm Type AES Horizontal	Connected In	1 Parallel 1 Series
Surf/Unit (Gross/Eff)	23,618 / 23,517 m2 Shell/Unit 1	Surf/Shell (Gross/Eff)	23,618 / 23,517 m2

PERFORMANCE OF ONE UNIT

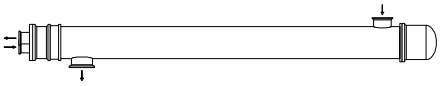
Fluid Allocation		Shell Side		Tube Side	
Fluid Name		Wet Air		Water	
Fluid Quantity, Total	kg/hr	766,20		4477,1	
Vapor (In/Out)		766,20	720,59		
Liquid			45,606	4477,1	4477,1
Steam					
Water				4477,1	4477,1
Noncondensables					
Temperature (In/Out)	C	134,00	40,00	35,00	45,00
Specific Gravity			0,9917	0,9947	0,9909
Viscosity	mPa-s	0,0219	0,0187 V/L 0,6530	0,7193	0,5962
Molecular Weight		19,75	21,76 V/L 2,62e-3	18,02	18,02
Molecular Weight, Noncondensables					
Specific Heat	kJ/kg-C	1,1026	1,0361 V/L 4,2194	4,1778	4,1777
Thermal Conductivity	W/m-C	0,0318	0,0259 V/L 0,6291	0,6223	0,6350
Latent Heat	kJ/kg	2221,5	2344,3		
Inlet Pressure	bar	14,500		5,513	
Velocity	m/s	1,23		0,90	
Pressure Drop, Allow/Calc	bar		0,054		0,073
Fouling Resistance (min)	m2-K/W	0,000340		0,000340	

Heat Exchanged	51985, Watts			MTD (Corrected)	18,5 C
Transfer Rate, Service	119,70 W/m2-K	Clean	287,03 W/m2-K	Actual	124,50 W/m2-K

CONSTRUCTION OF ONE SHELL

Sketch (Bundle/Nozzle Orientation)

			Shell Side	Tube Side
Design/Test Pressure		barG	25,000 /	10,000 /
Design Temperature		C	210,00	95,00
No Passes per Shell			1	2
Corrosion Allowance		mm	0,000	0,000
Connections	In	mm	1 @ Flange 2"	1 @ SAE 1 1/2"
Size &	Out	mm	1 @ Flange 2"	1 @ SAE 1 1/2"
Rating	Intermediate		@	@



Tube No.	72	OD	8,000	mm	Thk(Avg)	0,500	mm	Length	1256,	mm	Pitch 11,500 mm
Tube Type	Continuous Fin					Material	Copper/nickel 90/10				Tube pattern 30
Shell	316 Stainless steel (17 Cr, 12 Ni)			ID	133,30	OD	139,70	mm	Shell Cover	Carbon steel	(Remove.)
Channel or Bonnet	Carbon steel								Channel Cover	Carbon steel	
Tubesheet-Stationary	Red brass (85 Cu, 15 Zn)								Tubesheet-Floating	Red brass (85 Cu, 15 Zn)	
Floating Head Cover	Carbon steel								Impingement Plate	None	
Baffles-Cross	316 Stainless steel (17 Cr,		Type	NTIW-Seg.		%Cut (Diam)	17,33	Spacing(c/c)	0,000	Inlet	600,00 mm
Baffles-Long						Seal Type	None				
Supports-Tube						U-Bend					Type None
Bypass Seal Arrangement		pairs seal strips				Tube-Tubesheet Joint		Expanded (No groove)			
Expansion Joint						Type	None				
Rho-V2-Inlet Nozzle	679,25 kg/m-s2					Bundle Entrance	0,00	Bundle Exit	0,00	kg/m-s2	
Gaskets-Shell Side	O-Ring (Viton)					Tube Side	O-Ring (Viton)				
- Floating Head	O-Ring (Viton)										
Code Requirements	ASME								TEMA Class	TEMA-C	
Weight/Shell	121,42 kg			Filled with Water	143,06 kg				Bundle	31,27 kg	

Continuous Fin Density=1200 fin/meter; Root Diameter=8 mm; Thickness=0,2 mm

Air Humidity: 0.06718 kg Water / kg dry air @50 °C; 1,01325 bar (a); 80%)

HEAT EXCHANGER SPECIFICATION SHEET

		Job No.	17811-CC-0000
Customer	Airpack Nederland B.V.	Reference No.	17811-CC-0000
Address		Proposal No.	202204
Plant Location		Date	04/02/2022
Service of Unit	Aftercooler (8 kW)	Item No.	
Size	133,3 x 856 mm Type AES Horizontal	Connected In	1 Parallel 1 Series
Surf/Unit (Gross/Eff)	15,779 / 15,678 m2 Shell/Unit 1	Surf/Shell (Gross/Eff)	15,779 / 15,678 m2

PERFORMANCE OF ONE UNIT

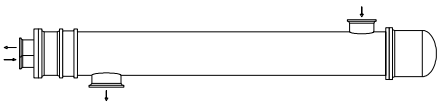
Fluid Allocation		Shell Side		Tube Side	
Fluid Name		Wet Air		Water	
Fluid Quantity, Total	kg/hr	720,30		1347,4	
Vapor (In/Out)		720,30	717,21		
Liquid			3,0926	1347,4	1347,4
Steam					
Water				1347,4	1347,4
Noncondensables					
Temperature (In/Out)	C	64,00	40,00	35,00	39,50
Specific Gravity			0,9918	0,9947	0,9931
Viscosity	mPa-s	0,0197	0,0188 V/L 0,6529	0,7193	0,6592
Molecular Weight		21,64	21,79 V/L 3,96e-3	18,02	18,02
Molecular Weight, Noncondensables					
Specific Heat	kJ/kg-C	1,0501	1,0471 V/L 4,2191	4,1778	4,1774
Thermal Conductivity	W/m-C	0,0275	0,0259 V/L 0,6293	0,6223	0,6282
Latent Heat	kJ/kg	2281,5	2308,0		
Inlet Pressure	bar	21,500		5,513	
Velocity	m/s	1,24		0,27	
Pressure Drop, Allow/Calc	bar		0,015		5,96e-3
Fouling Resistance (min)	m2-K/W	0,000340		0,000340	

Heat Exchanged	7041, Watts			MTD (Corrected)	9,9 C
Transfer Rate, Service	45,22 W/m2-K	Clean	65,89 W/m2-K	Actual	50,69 W/m2-K

CONSTRUCTION OF ONE SHELL

Sketch (Bundle/Nozzle Orientation)

			Shell Side	Tube Side
Design/Test Pressure		barG	25,000 /	10,000 /
Design Temperature		C	210,00	95,00
No Passes per Shell			1	2
Corrosion Allowance		mm	0,000	0,000
Connections Size & Rating	In	mm	1 @ Flange 2"	1 @ SAE 1 1/2"
	Out	mm	1 @ Flange 2"	1 @ SAE 1 1/2"
	Intermediate		@	@



Tube No.	72	OD	8,000	mm	Thk(Avg)	0,500	mm	Length	856,	mm	Pitch 11,500 mm
Tube Type	Continuous Fin					Material	Copper/nickel 90/10				Tube pattern 30
Shell	316 Stainless steel (17 Cr, 12 Ni)			ID	133,30	OD	139,70	mm	Shell Cover	Carbon steel	(Remove.)
Channel or Bonnet	Carbon steel								Channel Cover	Carbon steel	
Tubesheet-Stationary	Red brass (85 Cu, 15 Zn)								Tubesheet-Floating	Red brass (85 Cu, 15 Zn)	
Floating Head Cover	Carbon steel								Impingement Plate	None	
Baffles-Cross	316 Stainless steel (17 Cr,	Type	NTIW-Seg.		%Cut (Diam)	17,33	Spacing(c/c)	0,000	Inlet	400,00 mm	
Baffles-Long					Seal Type	None					
Supports-Tube					U-Bend					Type None	
Bypass Seal Arrangement	pairs seal strips				Tube-Tubesheet Joint	Expanded (No groove)					
Expansion Joint					Type	None					
Rho-V2-Inlet Nozzle	324,13 kg/m-s2				Bundle Entrance	0,00	Bundle Exit	0,00	kg/m-s2		
Gaskets-Shell Side	O-Ring (Viton)				Tube Side	O-Ring (Viton)					
- Floating Head	O-Ring (Viton)										
Code Requirements	ASME								TEMA Class	TEMA-C	
Weight/Shell	114,01 kg		Filled with Water	130,41	kg				Bundle	28,25 kg	

Remarks: Continuous Fin Density=1200 fin/meter; Root Diameter=8 mm; Thickness=0,2 mm

Air Humidity: 0.003182 kg Water / kg dry air @40 °C; 21,5 bar (a); 100%)