FABSCO
SHELL & TUBE, LLC

Member HTRI

HEAT EXCHANGER SPECIFICATION SHEET

US Units

		Job No.	S-16030-13-18-X-379REV5
Customer	AIR PRODUCTS (WORLD ENERGY PARAMOUNT)	P.O. No.	4505600058
Address	ALLENTOWN, PA	Fabsco Job	S21-13258-15
Plant Location	PARAMOUNT, CA	Date	10/18/2022 Rev. D
Service of Unit	DEBUTANIZER OVERHEAD CONDENSER	Item No.	18-X-379
Size	40 x 186 inch Type AEU Horizontal	Connected In	1 Parallel 1 Series
Surf/Unit (Gross/Eff)	3237.3 / 3169.1 ft2 Shell/Unit 1	Surf/Shell (Gross/Eff)	3237.3 / 3169.1 ft2

PERFORMANCE OF ONE UNIT

Fluid Allocation		Shell Side		Tube Side	
Fluid Name		BUTANE		COOLING WATER	
Fluid Quantity, Total	lb/hr	68692		575384	
Vapor (In/Out)		68692			
Liquid			68692	575384	575384
Steam					
Water				575384	575384
Noncondensables					
Temperature (In/Out)	F	131.80	105.50	80.00	97.99
Specific Gravity			0.5351	0.9972	0.9941
Viscosity	cP	0.0090	0.1380	0.8572	0.6961
Molecular Weight				18.02	18.02
Molecular Weight, Noncondensables					
Specific Heat	Btu/lb-F	0.4670	0.6320	0.9991	0.9985
Thermal Conductivity	Btu/hr-ft-F	0.0110	0.0480	0.3526	0.3608
Latent Heat	Btu/lb	138.50	138.50		
Inlet Pressure	psia	104.70		64.700	
Velocity	ft/sec	5.44		5.29	
Pressure Drop, Allow/Calc	psi	3.000	1.303	10.000	9.285
Fouling Resistance (min)	ft2-hr-F/Btu	0.00150		0.00200	

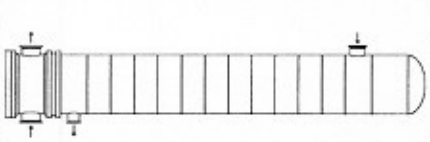
Heat Exchanged 10338086 Btu/hr MTD (Corrected) 35.4 F

Transfer Rate, Service 92.15 Btu/ft2-hr-F Clean 153.66 Btu/ft2-hr-F Actual 93.88 Btu/ft2-hr-F

CONSTRUCTION OF ONE SHELL

Sketch (Bundle/Nozzle Orientation)

			Shell Side	Tube Side
Design/Test Pressure		psig	170/FV / CODE	135 / CODE
Design Temperature		F	330 / 300 / 10	150 / 32
No Passes per Shell			1	4
Corrosion Allowance		inch	0.1250	0.1250
Connections Size & Rating	In	inch	1 @ 8"-300# RF	1 @ 10"-300# RF
	Out	inch	1 @ 6"-300# RF	1 @ 10"-300# RF
	Intermediate			



Tube No. 538 U's OD 0.7500 inch Thk(Min) 0.083 inch Length 15.500 ft Pitch 1.0000 inch

Tube Type Plain Material SA-179 Tube pattern 90

Shell SA-516-70 ID 40.00 inch Shell Cover SA-516-70N (INTEGRAL)

Channel or Bonnet SA-516-70 Channel Cover SA-350-LF2 CL. 1 (REMOVABLE)

Tubesheet-Stationary SA-350-LF2 CL. 1 Tubesheet-Floating

Floating Head Cover Impingement Plate RODS (2 ROWS X 0.75" OD)

Baffles-Cross SA-36 (VERT. CUT) Type SINGLE SEG. %Cut (Diam) 26.25 Spacing(c/c) 13.4375 Inlet 14.4375 inch

Baffles-Long Seal Type

Supports-Tube 13 Cross Passes U-Bend Type FULL SUPPORT

Bypass Seal Arrangement 1 Pair Seal Strips, 4 Dummy Tubes & Tube-Tubesheet Joint SEAL-WELD, ROLL & EXPAND (2 GROOVES)

1 Skid Bar Type

Rho-V2-Inlet Nozzle 2983.2 lb/ft-sec2 Bundle Entrance 823.05 Bundle Exit 36.68 lb/ft-sec2

Gaskets - .175" THK. TP304 S/S SPIRAL WOUND GRAPHTE FILLED w/ TP304 S/S INNER & OUTER COMPRESSION RINGS

Code Requirements ASME SECTION VIII, DIV. 1 NATIONAL BOARD TEMA Class R API 660

Weight/Shell 23,400. lb Filled with Water 32,950. lb Bundle 13,850. lb

1. CORN OIL JET MODE - EOR. UNIT IS THERMALLY & MECHANICALLY GUARANTEED. 2. FLOWS & DUTY INCREASED BY 20%.
3. PROVIDE PARTIAL TUBE SUPPORT IN SHELL INLET, UNDER THE NOZZLE, SUPPORTING (5)FIVE TUBE ROWS.
4. PROVIDE (1)2"-300# RFLWN W/ BLIND IN EACH PROCESS NOZZLE.
5. PROVIDE (2)2"-300# RFLWN W/ BLIND ON CHANNEL FOR VENT & DRAIN. 6. STRESS RELIEVE U-BENDS + 1' S.L.
7. SHELL-SIDE IN TOXIC & FLAMMABLE SERVICE.