



CIMCO REFRIGERATION

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Q U O T A T I O N

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To: Brent Millard
Company: Toromont Energy Sys.
Fax No.: 403-291-0158
Re.: 11983

Date: September 19, 2005
From: Resul Danis
Our Ref.: 05179RD

Prices of the heat exchanger as per attached data sheet is as following:

<u>Tag</u>	<u>Size</u>	<u>Price</u>
E-104	10" x 60" NEN Stabilizer Reboiler:	\$7,960.00

- Price is F.O.B. our plant Toronto, ON excluding applicable taxes.
- Primer painted Cimco green.
- Shipment is in 14 to 16 weeks after receipt of order based upon 1 week of drawing approval period.
- Designed to ASME Sec. VIII, Div.1, TEMA C.
- Terms and conditions as per our form 1203/91E and 1204/91E are applicable.
- In the event that the cost of raw materials necessary to fabricate our product, or the cost of components to be incorporated into the project increase after date of quotation, all expenses incurred by CIMCO as a result of these increased costs shall be the responsibility of the purchaser and will be added to the purchase price payable under this contract of supply.

Best Regards,

A handwritten signature in black ink, appearing to be "R. Danis", written over a horizontal line.

Heat Exchanger Specification Sheet

1	Company: TES			
2	Attention: Brent Millard		From: Resul Danis, Cimco Refrigeration	
3	Service of Unit: Stabilizer Reboiler		Our Reference: 05179RD a	
4	Item No.: E-104		Your Reference: 11983	
5	Date: 2005-09-19	Rev No.:	Job No.:	
6	Size 10-60	in	Type NEN	vert Connected in 1 parallel 1 series
7	Surf/unit(eff.)	72 ft ²	Shells/unit 1	Surf/shell (eff.) 72 ft ²
8	PERFORMANCE OF ONE UNIT			
9	Fluid allocation	Shell Side		Tube Side
10	Fluid name	Ethylene Glycol		HC liquid
11	Fluid quantity, Total	lb/h	21627	
12	Vapor (In/Out)	lb/h		3 974
13	Liquid	lb/h	21627	21627 2222 1251
14	Noncondensable	lb/h		
15				
16	Temperature (In/Out)	°F	275	265 195.1 226.5
17	Dew / Bubble point	°F		195.1
18	Density	lb/ft ³	64.174	64.444 26.941 2.382
19	Viscosity	cp	1.214	1.319 0.067 0.011
20	Molecular wt, Vap			53.92 53.92
21	Molecular wt, NC			
22	Specific heat	BTU/(lb F)	0.6899	0.6838 0.8071 0.5358
23	Thermal conductivity	BTU/(ft h F)	0.117	0.119 0.047 0.016
24	Latent heat	BTU/lb		94.1 101.3
25	Pressure	psi	50	255
26	Velocity	ft/s	0.62 0.93	
27	Pressure drop, allow./calc.	psi	5	0.573 0.935 0.593
28	Fouling resist. (min)	ft ² h F/BTU	0.001 0.001	
29	Heat exchanged	148533 BTU/h	MTD corrected 56.72 °F	
30	Transfer rate, Service	36.46 Dirty 76.41 Clean 92.56	BTU/(h ft ² F)	
31	CONSTRUCTION OF ONE SHELL			Sketch
32		Shell Side		Tube Side
33	Design/Test pressure	psi	275/ /Code	350/ /Code
34	Design temperature	°F	-20/ 300	-20/ 250
35	Number passes per shell		1 1	
36	Corrosion allowance	in	0.0625 0.0625	
37	Connections	In	2/ 300 ANSI	1/ 300 ANSI
38	Size/rating	Out	2/ 300 ANSI	6/ 300 ANSI
39		Intermediate	/ 300 ANSI	/ 300 ANSI
40	Tube No. 76	OD 0.75	Tks-avg 0.083	in Length 5 ft Pitch 0.9375 in
41	Tube type Plain	Material CS		Tube pattern 30
42	Shell CS	ID 10.02	OD 10.75	in Shell cover
43	Channel or bonnet CS			Channel cover CS
44	Tubesheet-stationary CS			Tubesheet-floating
45	Floating head cover			Impingement protection None
46	Baffle-crossing CS	Type single seg	Cut(%d) 25	hor Spacing: c/c 5.125 in
47	Baffle-long	Seal type		Inlet 5.8125 in
48	Supports-tube	U-bend	Type	
49	Bypass seal	Tube-tubesheet joint		groove/expand
50	Expansion joint	Type		
51	RhoV2-Inlet nozzle	1183	Bundle entrance 106	Bundle exit 105 lb/(ft s ²)
52	Gaskets - Shell side	Tube Side		
53	Floating head			
54	Code requirements	ASME Code Sec VIII Div 1		TEMA class C
55	Weight/Shell	906.8	Filled with water 1101.2	Bundle 323.8 lb
56	Remarks			
57				
58				

