

HEAT EXCHANGER SPECIFICATION

CLIENT: EnCana Integrated Oil Division

DPH Focus

JOB NO.

DPH-07-9971

LOCATION:

Foster Creek

Rev	Description	Date	By	Chk	App'd
A	ISSUED FOR BID	10-Jan-08	CA	KJK	
0	ISSUED FOR PURCHASE	13-May-08	CA	DB	
1	ISSUED FOR PURCHASE	18-Jul-08	SJ		
2	ISSUED FOR PURCHASE	12-Aug-08	SJ		
3	ISSUED FOR PURCHASE	1-Oct-08	SJ		
	AS BUILT	31-Jul-09	SJ		

TAG NO.	P.O. NO.
E-5868	9971-4002

SERVICE:
Amine Reboiler

NO. UNITS:	ONE (1)	TEMA TYPE:	BKU	SIZE:	40 / 57 - 273 / 1022 / 1448 - 6936
SQ. m PER UNIT (TOT/EFF):	354.2 / 350.4	SHELLS PER UNIT:	1	SQ. m PER SHELL (TOT/EFF):	354.2 / 350.4
MANUFACTURER:	Exchanger Industries	MODEL:			

PERFORMANCE OF ONE UNIT

OPERATING CONDITIONS:	SHELL SIDE		TUBE SIDE	
	AMINE		60 wt% TEG/H ₂ O	
FLUID CIRCULATED:	120,862		219,779	
TOTAL FLOW kg/h:	120,862		219,779	
	INLET	OUTLET	INLET	OUTLET
VAPOUR - kg/h	-	12,345	-	-
LIQUID - kg/h	120,862	108,517	219,779	219,779
GLYCOL/WATER - kg/h				
MOL. WT. HC (VAP/LIQ)	/	18.191 /	38.17	38.17
LATENT HEAT - kJ/kg		2,210	-	-
DENSITY HC (VAP/LIQ) - kg/m ³	/ 985.0	0.994 / 984.2	-	-
DENSITY GLYCOL/WATER - kg/m ³			961.1	991.1
THERM.COND. HC(VAP/LIQ) - W/m C	/ 0.429	0.035 / 0.492	-	-
THERM. COND. GLY./WATER - W/m C			0.308	0.320
VISCOSITY HC (VAP / LIQ) - cP	/ 0.830	0.014 / 0.790	-	-
VISCOSITY GLY./WATER - cP			0.250	0.500
SPEC. HEAT HC (VAP/LIQ) - kJ/kg C	/ 4.019	1.899 / 4.086	-	-
SPEC. HEAT GLY./WATER - kJ/kg C			3.856	3.663
OPERATING TEMP. - deg C	122.4	123.4	177.0	143.0
OPERATING PRESSURE - kPa (ga)	103.4	102.7	978	910
FLUID VELOCITY - m/s	4.85		1.57	
PRESSURE DROP - kPa	ALLOW. 1.379	CALC. 0.985	ALLOW. 68.948	CALC. 68.711
ATMOS. PRESSURE - kPa (abs)	93		93	
FOULING FACTOR (TEMA) - C m ² /W	0.00035		0.00035	
FLOW ARRANGEMENT				
NUMBER PASSES PER SHELL	1		4	
HEAT EXCHANGED - kW	7,755		TRANSFER RATE (W/m ² C)	
LMTD (CORR. / UNCORR.) - deg C	34.2 /		CLEAN - 1595.23 SERVICE - 643.86	
HEAT RELEASE CURVE	ATTACHED		DIRTY -	

CONSTRUCTION

DESIGN PRESSURE - kPa (ga)	345 / FULL VAC	@ 149 deg C / -45 deg C	2300 @	204 deg C / -45 deg C
TEST PRESSURE - kPa (ga)	PER CODE		PER CODE	
CORROSION ALLOWANCE - mm	0		3.175	
PER ASME VIII DIV.	1	PROV. OF ALBERTA	MATERIALS (1)	
CODE SYMBOL REQ'D	NO	TEMA CLASS R	SHELL SA-240-316L	SHELL COVER SA-240-316L
OTHER SPECS	NOTE 6	API 660	TUBES SA-789 UNS 31803	CHANNEL COVER SA-516-70N
SOUR SERVICE	YES	CORR/EROS DUE TO HOT CO ₂ /H ₂ S	CHANNELS SA-516-70N	FIXED TUBESHT SA-240-316L
SHELL DIA., mm		THK., mm	GASKETS 316 SS FLEX	FLOAT TUBESHT
OVERALL LENGTH, mm	EXPANSION JOINT		SS PIPE SA 312 316L	FLOAT HEAD
BAFFLE FACING - NO. OF BAFFLES - % CUT	- 814 - 0		SS FLG/CPLGS SA-182-316L	BAFFLES - CROSS 316L
TUBE OD, mm	19.05	BWG 16	TS PIPE SA-333-6	- LONG
			TS FLG/CPLGS SA-350LF2 CL1	TUBE SUPPORTS
			SURF.PREP SSPC SP10	BOLTS/NUTS B7M/2HM
SS INLET RhoV2, kg/m s ²	1318	IMPINGEMENT PROTECTION Y	PRIMER 400B	EXT. SUPPORTS Saddles
WTS., SHIP - HYDRO - BUNDLE -			FINISH NONE	INT. COATING None

MARK	CONNECTION	NO./SIZE	RATING	FACING	PROJECT
N1	AMINE IN	1 / 8"	150#	RFWN	
N2/A	VAPOUR OUT	2 / 12"	150#	RFWN	
N3	AMINE OUT	1 / 8"	150#	RFWN	
N4	PG IN	1 / 8"	300#	RFWN	
N5	PG OUT	1 / 8"	300#	RFWN	
N6/N7	S/S VENT/DRAIN	2 / 2"	150#	RFWN	
N8/N9	PG (ON N1&N2)	2 / 2"	150#	RFWN	
N10/N11	TG (ON N1&N2)	2 / 2"	150#	RFWN	
N12/A/B	LEVEL BRIDLE	2 / 2"	150#	RFWN	
N13/N14	PG (ON N4&N5)	2 / 2"	300#	RFWN	
N15/N16	TG (ON N4&N5)	2 / 2"	300#	RFWN	

INSUL'N TYP/THK., mm 64 H BY Vendor

FIREPROOFING NONE

NOTES:

- Allow for 10% excess area in design, by increasing tube length not number of tubes.
- Provide 2 lifting lugs and 1 grounding lug
- To avoid fouling and minimize hot spots, 203mm liquid spacing shall be provided above and below the tube bundle. A minimum 229mm disengaging height is required above the liquid level.
- Provide a minimum of two (2) minutes of retention time on outlet side of weir.
- Welded tube to tubesheet joint.
- The following specs shall apply:
TR-43-SPC-00-001-01
TR-43-SPC-00-019-01
TR-43-SPC-00-021-01