



FLOW DIAGRAM

Reviewed

TUM Engineering School Management und Betrieb GmbH

11

Executive 97/23/EC

-Testing Laboratory-

FEB 11 2003

T.R.

REVISION RECORD	A	ORDER PRODUCTION INTERMEDIATE SPACE INTERESTING. READER HANDS WERE HITTED. 1-30-04 PARLIN	DR. DOVAL	STD ENGR SPEC	CHART HEAT EXCHANGERS, LP. ALL RIGHTS RESERVED THIS DRAWING AND INFORMATION ARE THE CONFIDENTIAL PROPERTY OF CHART HEAT EXCHANGERS, LP. WITHOUT PRIOR WRITTEN CONSENT IT MAY NOT BE COPIED, USED OR COMMUNICATED TO OTHERS ORALLY OR IN PART. © CHART HEAT EXCHANGERS, LP. ALL RIGHTS RESERVED	BRAZED ALUMINUM HEAT EXCHANGER 2 STREAM PLATE ITEM NO. W21001	SIZE DRAWING D 15772A
			DATE: 11-6-00	NOTE 5: SES 9-8.01 PARA 1, 3, 1, 3, 2 & 4.1			
			CHKD SMITH	NOTE 6: SES 9-14.00			
			DATE: 10-28-04				
			PRD'D ENG MTJ				
			DATE: 11-5-04				
			HFG ENG				
			DATE:				
			WELD ENG				
			DATE:				
				THIRD ANGLE PROJECTION			

NOTES:

- NOTES:
1. HEAT EXCHANGER DESIGNED, CONSTRUCTED, AND STAMPED PER THE LATEST MANDATORY EDITION AND ADDENDA OF THE ASME PRESSURE VESSEL CODE/ SECTION VIII, DIV. 1 AND REGISTERED WITH THE NATIONAL BOARD.
 2. THE HEADERS AND NOZZLES ARE LABELED ON THE DRAWING WITH THEIR NOMINAL PIPE SIZE (NPS). IF A STANDARD SIZE IS NOT USED THE PIPING IS LISTED AT ITS ACTUAL OUTSIDE DIAMETER AND LABELED "OD". UNLESS SHOWN OTHERWISE ALL NOZZLES ARE ON THE HEAT EXCHANGER CENTERLINE.
 3. TOLERANCE ON ALL DIMENSIONS IS +/- .25 IN (6) UNLESS OTHERWISE NOTED. ANGULAR TOLERANCE ON NOZZLES IS CONTROLLED BY THE TOLERANCE ON THE CARTESIAN COORDINATE DIMENSIONS (X, Y, Z). IN NO CASE SHALL THE ANGULAR TOLERANCE EXCEED 3 DEGREES.

- | | | | |
|-------------|-------------------|-------------|----------|
| 4. STREAM | | A | B |
| NAVP (PSIG) | | 109 | SEE NOTE |
| [BARG] | | [7.5] | 10B |
| DESIGN TEMP | DEG. F + 150 MAX. | - 320 MIN. | |
| | [C][+65] MAX. | [-196] MIN. | |

5. TESTING INFORMATION

STREAM	(PSIG)	A	B
FIRST AIR	(BARG)	36 (2.5)	---
HPNEU	(PSIG)	164	---
	(BARG)	[11.3]	---
LEAK	(PSIG)	109	---
	(BARG)	[7.5]	---

A. I. WITNESS REQUIRED.

<u>HELIUM VACUUM LEAK TEST</u> <u>STREAMS</u>	<u>MAX. ALLOW. LEAKAGE</u>
A - EXT	1. E-3 STD CC/SEC (1. E-3 MBAR L/SEC)

6. UNIT TO BE CLEANED FOR OXYGEN SERVICE. (INTERNAL AND EXTERNAL)
7. CONNECTIONS TO BE SUITABLY MARKED FOR FIELD TRIAL.
- B. ESTIMATED WEIGHT = 16,200 LBS. (DRY)
17,347 LBS. (FILLED WITH WATER)
21,400 LBS. (FILLED WITH WATER)
(19,705) KG
(WARNING: DO NOT HYDRO TEST IN FIELD WITH WATER)

9. STREAM VOLUME:	A	B
STREAM	82.8	75.3
CU. FT.	[2.34]	[2.13]
[CU. M.]		

10. CUSTOMER NOTE:

- A. ESTIMATED BRAZE HEIGHT. ACTUAL BRAZE HEIGHT MAY VARY +/- .12 INCH/FOOT (+/- .10 MM/IN) OF BRAZE HEIGHT. MAX DIMENSION INCLUDES TOLERANCE ON BRAZE HEIGHT.
 - B. DURING OPERATION THE "B" STREAM SUBJECTS THE EXCHANGER TO EXTERNAL PRESSURE. EXCHANGER DESIGNED FOR 44 PSIG (3.0 BARG) EXTERNAL PRESSURE (EXTERNAL WAMP = 47 PSIG (3.2 BARG)) BUT NOT TESTED BY CHART. IF THE "B" STREAM IS PRESSURE TESTED AFTER INSTALLATION TO NOT SUBJECT THE EXCHANGER TO A DIFFERENTIAL PRESSURE (GAUGE + LIG HEAD, "B" STREAM TO "A" STREAM) GREATER THAN 1.3 TIMES THE EXTERNAL WAMP.
 - C. EXTERNAL WAMP OF EACH PIPING RUN TO BE DETERMINED BY CUSTOMER. DEPENDING ON PIPING CONFIGURATION, EXTERNAL WAMP MAY BE LOWER THAN EXTERNAL WAMP OF THE EXCHANGER.
 - D. DISCHARGE SPECIFIED IN NOTE 6 COMPLIES WITH AL SC274.01-D AND V-GS-3-1-1.
11. PED NOTE:
- A. HEAT EXCHANGER TO COMPLY WITH EU PED 97/23/EC) ASSESSMENT MODULE "B & F"
 - B. PED NOTIFIED BODY IS TÜV SÜDDEUTSCHLAND BAU UND BETRIEB.
 - C. ASSESSMENT CATEGORY IS "IV", WORKING FLUIDS ARE GROUP 2 (A STREAM).
12. PRODUCTION NOTES:
- A. INSPECT OPEN PASSAGES FOR BLOCKAGE USING LIGHT TEST.
 - B. AFTER BRAZING MEASURE AND RECORD FIN GAPS ON OPEN PASSES.
 - C. AFTER BRAZING MEASURE AND RECORD HEIGHT OF PORT FIN ON OUTER OPEN PASSES.

STREAM	INLET		OUTLET	
	HEADER O.D. X WALL	NOZZLE O.D. X WALL	HEADER O.D. X WALL	NOZZLE O.D. X WALL
A (GAS/LIN)	16.000 X .375 (406 X 9.5)	14.000 X .375 (356 X 9.5)	12.750 X .375 (324 X 9.5)	10.750 X .365 (273 X 9.3)
A-VENT (GAS/LIN)	—	—	—	1.315 X .133 (33 X 3.4)
B (BATH)	—	—	—	—

ALL MATERIAL IN TABLE ABOVE IS 5083 ALUMINU

