

ALCO  GAS & OIL PRODUCTION EQUIPMENT LTD.		5203, 75 Street Edmonton, AB Canada T6E 5S5		MECHANICAL DATA SHEET SHELL & TUBE HEAT EXCHANGER		DOC. NO.: 2003-6974-E400-MDS P.O. NO.: OGSP/48000-01106/NKC		REVISION MARK
				SHT. 2 OF 5		REV. 1		
EQUIPMENT DESCRIPT.: GAS / GAS EXCHANGERS				EQUIP. NO.: E-400 / E-401		QTY. 2		
PROJECT: SONGO SONGO GAS DEV. AND POWER GEN. PROJECT LOT 1				S.O.. NO.: 2003-6974-06		SHELL/UNIT 4		

MECHANICAL DATA				
	UNITS	SHELL SIDE	TUBE SIDE	
53 MAX. DESIGN TEMPERATURE	°C (°F)	66 (150)	66 (150)	
54 MIN. DESIGN TEMPERATURE	°C (°F)	-28.8 (-20)	-28.8 (-20)	
55 DESIGN PRESSURE (INTERNAL)	kPa-G (PSIG)	9756 (1415)	12500 (1815)	1
56 DESIGN PRESSURE (EXTERNAL)	kPa-G (PSIG)	Nil	Nil	1
57 MAWP	kPa-G (PSIG)	9756 (1415)	12500 (1815)	1
58 CORROSION ALLOWANCE	mm (in)	1.6 (0.0625)	1.6 (0.0625)	
59 RADIOGRAPHY	%	100	100	
60 JOINT EFFICIENCY	-	1.0	1.0	
61 HEAT TREATMENT	-	AS PER CODE REQUIREMENTS	AS PER CODE REQUIREMENTS	
62 PWHT	-	-	-	
63 DESIGN MEAN METAL TEMP.	°C (°F)	3.9 (39.1)	8.4 (47.1)	
64 HYDROTEST PRESSURE	kPa-G (PSIG)	18750 (2723)	14634 (2123)	
65 HYDROTEST AXIS		HORIZONTAL	HORIZONTAL	
66 HYDROTEST DURATION	Hours	ONE	ONE	
67 PNEUMATIC TEST PRESSURE	kPa-G (PSIG)	-	-	
68 LINING / CLADDING THK.	mm (in)	-	-	
69 INSULATION TYPE		CELLULAR FOAM GLASS	CELLULAR FOAM GLASS	
70 INSULATION THK.	mm (in)	38 (1-1/2)	38 (1-1/2)	
71 FIRE PROOFING THK.	mm (in)	-	-	
72 WIND SPEED	m/s (mph)	66 (150)	66 (150)	
73 SEISMIC SPECIFICATION / ZONE		UBC / ZONE 1	UBC / ZONE 1	
74 IBR REQUIREMENT				
75 CCE REQUIREMENT				
76 PAINTING		SEE NOTE 11	SEE NOTE 11	
77 CODE STAMPING		'U' STAMPED	'U' STAMPED	
78 SOUR SERVICE REQUIREMENTS		-	-	
79 IMPACT TEST REQUIREMENTS		AS PER CODE	AS PER CODE	
80 OTHER REQUIREMENTS		-	-	

INSPECTION REQUIREMENTS		APPURTENANCES (YES / NO)	
82		LIFTING LUGS	SA-516-70
83		PULLING EYE BOLTS	NO
84		EARTHING LUG	316SS
85		NAME PLATE	304SS
86		TEST FLANGE	-
87		TEST RING	-
88		DAVITS	NO
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LOADS AND MOMENTS AT SUPPORTS - FIXED / SLIDING SUPPORT (HORIZONTAL EXCHANGER)							
	CONDITION	'Fx' kgf	'Fy' kgf	'Fz' kgf	'Mx' kgm	'My' kgm	'Mz' kgm
107	EMPTY	TBA	TBA	TBA	TBA	TBA	TBA
108	OPERATING + THERMAL	TBA	TBA	TBA	TBA	TBA	TBA
109	WIND IN 'X' DIRECTION	TBA	TBA	TBA	TBA	TBA	TBA
110	WIND IN 'Y' DIRECTION	TBA	TBA	TBA	TBA	TBA	TBA
111	SEISMIC - 'X' DIRECTION	TBA	TBA	TBA	TBA	TBA	TBA
112	SEISMIC - 'Y' DIRECTION	TBA	TBA	TBA	TBA	TBA	TBA
113	SEISMIC - 'Z' DIRECTION	TBA	TBA	TBA	TBA	TBA	TBA
114	BUNDLE PULLING (EMPTY)	TBA	TBA	TBA	TBA	TBA	TBA
115							



GAS & OIL

5203, 75 Street
Edmonton, AB
Canada T6E 5S5

MECHANICAL DATA SHEET VESSELS

DOC. NO.: 2003-6974-E400-MDS

P.O. NO.: OGSP/48000-01106/NKC

SHT. 4 OF 5	REV. 1
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REV. 1

EQUIPMENT DESCRIP.: GAS / GAS EXCHANGERS

EQUIP. NO.:

F-400 / F-401

REV.	7
QTY.	2

PROJECT: SONGO SONGO GAS DEV. AND POWER GEN. PROJECT LOT 1

S.O. NO.:

2003-6974-06

SHELL/UNIT	4
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NOZZLE SCHEDULE

[illegible]

GENERAL NOTES

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1. ALL PRIMARY DIMENSIONS ARE IN "mm" WITH "in" IN PARENTHESES, UNLESS OTHERWISE NOTED.
 2. 'X' MARK IN BOX INDICATES APPLICABILITY / SELECTION.
 3. ORIENTATION OF FLANGE BOLT HOLES SHALL BE AS FOLLOWS:
 - a) WHEN THE NOZZLE AXIS LIES IN A PLANE PERPENDICULAR TO THE FILTER AXIS, BOLT HOLES SHALL STRADDLE THE CENTER LINE PARALLEL TO THE VESSEL AXIS.
 - b) WHEN THE NOZZLE AXIS IS PARALLEL TO OR COINCIDENT WITH THE FILTER AXIS, THE BOLT HOLE SHALL STRADDLE THE LINE PARALLEL TO THE 0° VESSEL CENTER LINE ON VERTICAL FILTERS AND THE VERTICAL CENTER LINE ON HORIZONTAL FILTERS.
 4. NORTH DIRECTION, WHERE SHOWN, IS WITH RESPECT TO THE PLAN VIEW.
 5. FOR NOZZLES ON SHELL, PROJECTION IS REFERRED FROM OUTSIDE VESSEL WALL TO FLANGE CONTACT FACE. FOR NOZZLES ON HEAD, PROJECTION IS REFERRED FROM VESSEL TANLINE TO FLANGE CONTACT FACE.
 6. FLANGES SHALL BE AS PER ASME B16.5 UP TO AND INCLUDING 24" NPS AND AS PER ASME B16.47, SERIES-B FOR ABOVE 24" NPS.
 7. NOZZLES 2" NPS AND BELOW SHALL BE PROVIDED WITH STIFFENERS AS REQUIRED DUE TO EXCESSIVE NOZZLE LOADING.
 8. REINFORCING PADS SHALL BE PROVIDED WITH 2 Nos. 3/2 (1/8") NPT TELL TALE HOLES AT 180° APART AND FILLED WITH GREASE AFTER AIR TEST AT 150 kPa (22 PSIG) WITH SOAP SUDS.
 9. NOZZLE FLANGE GASKET SHALL BE RAISED FACE AND SHALL HAVE FACING AS BELOW
SERRATED SPIRAL FINISH

X

 AS PER ASME B16.5
SMOOTH FINISH TO 125 AARH

X

 AS PER ASME B16.5
 10. FOR RTJ FLANGES, THE SIDE WALL SURFACE OF THE GASKET GROOVE SHALL NOT EXCEED 63 MICRO INCH ROUGHNESS.
 11. BOLTS AND NUTS SHALL BE HOT DIP GALVANIZED AS PER ASTM A-53.
 12. COMMERCIAL SANDBLAST TO SSPC-SP6. 1-2 mils 83003 CLOVAZINC 3 ORGANIC ZINC PRIMER. 3-5 mils 83150 CLOVAGUARD HI-BUILD EPOXY, 3-4 mils 83400 CLOVATHANE URETHANE. IN ADDITION, THE BOOT SHALL BE INTERNALLY COATED WITH 2 COATS OF EPOXY LINER (DEVCO 253), 5.6 mils / COAT, WHITE METAL BLAST TO SSPC-SP5 AS PER 45-803.
 13. HYDROTEST PRESSURE SHALL BE AT LEAST EQUAL TO 1.5 x M.A.W.P.
 14. FOR THE TUBESIDE, THE GASKET USED SHALL BE OCTAGONAL RING SOFT IRON 100 BHN MAX. AND FOR THE SHELL SIDE THE GASKET SHALL BE SS 304 SPIRAL WOUND NON ASBESTOS 3.2mm (1/8") THK.
 15. SPRAY NOZZLE ARRANGEMENT SHALL BE SUCH THAT IT PROVIDES TOTAL COVERAGE OF THE TUBESHEET AT ALL FLOW CONDITIONS. SPRAY NOZZLE SYSTEM IS ONLY RETRACTABLE WHEN EXCHANGERS ARE OFF-LINE.
 16. TUBE SIDE $\rho \times V^2$ TO BE 450 MAX.

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PROJECT: SONGO SONGO GAS DEV. AND POWER GEN. PROJECT LOT 1		S.O. NO.: 2003-6974-06		SHELL/UNIT 4		QTY. 2		
APPLICABLE STANDARD DRAWINGS				APPLICABLE STANDARD SPECIFICATIONS				REV. MARK
SI NO.	SPEC. DESCRIPTION	DOC. NO.	REV.	SI NO.	SPEC. DESCRIPTION	DOC. NO.	REV.	
244	1	SD-72-6703/1	0	1	JOB SPEC. FOR DEW-POINT	9263-72-704	D1	
245					CONTROL & MEG REGEN SKID			
246				2	GS FOR UNFIRED PRESSURE	42-401	1	
247	1	A-4540	2		VESSELS			
248				3	GS FOR WELDING AND	41-504	1	
249					INSPECTION			
250				4	GS FOR PIPING AND VALVE	41-506	1	
251					CLASSIFICATION			
252				5	CIVIL AND STRUCTURAL	20-001	1	
253					DESIGN CRITERIA			
254				6	JOB SPEC. FOR PAINTING	9263-72-706	D1	
255				7	STRUCTURAL STEEL	20-120	0	
256				8	GS FOR INSULATION	45-802	1	
257				9	PIPING DESIGN BASIS	9263-74-700	0	
258				10	INSTR. DESIGN BASIS	9263-76-700	C2	
259				11	GENERAL SPEC. FOR PIPING	41-502	1	
260					FLEXIBILITY ANALYSIS			
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REFERENCE DRAWINGS / DOCUMENTS								REV. MARK
SI NO.	SPEC. DESCRIPTION	DOC. NO.	REV.					
272	1	P&ID FOR DEWPOINT SKIDS	D-2003-6974-52F	A				
273	2	GA FOR DEWPOINT SKIDS	D-2003-6974-52A	A				
274	3	PFD	HYSYS Case GIK	0				
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