



TRAVEL SHEET/INSPECTION TEST PLAN

ALTEX JOB# 15-2253B Rev 0

Page 1 of 3

Travel sheet (ITP) to be presented to an Authorized Inspector and Customer Inspector prior to commencement of construction so that they may denote hold point with the following:

1. (H) - Hold
2. (R) - Review
3. (N/A) - Not Applicable
4. (V) - Verify

Authorized Inspector (signature): *[Signature]*

Date: AUG 31 2015

Customer Inspector (signature):

Date:

Customer Inspector (name):

Phone No.:

Specification: X- ASME Sec. VIII Div. 1

X- Other: TEMA & API 660

☐ - ASME Sec. 1

Customer: Husky Oil Operations Limited

C.R.N. : 40315.23

Location: Morgan, Sask.

(A): 656771

LSD:

NB #:

Project Name/Item #:

TAG: E-102B

AES-LEAN AMINE WATER COOLER

Comments:

Date function is completed and inspectors initials.

Item	Description	Foreman	Altex Q.C.M./ Q.C.E.	A.I.	Customer Inspector	Remarks
1	Repair procedure approved:					
2	Approved Drawings: X - Altex X - Customer		V 15-07-17 WW	AUG 31 2015	H	
3	Material checked against drawing bill of material		V SEP 17 2015		R L	
4	Materials <input type="checkbox"/> - C.E. Required X - MTR's checked		V SEP 17 2015	WSP R OCT 7/15	R L	
5	<input type="checkbox"/> - Production CVN required <input type="checkbox"/> - Shellside <input type="checkbox"/> - tubeside <input type="checkbox"/> - Photomicrograph <input type="checkbox"/> -		N/A			
6	Welder qualifications		V 15-10-01 WW		R L	
7	Welding Procedures approved		V 15-07-17 WW		H	
8	Shell / Head dimension check		V 15-07-17 WW		R L	
9	Shellside layout check		V		R L	
10	Tubeside layout check		SEP 15 2015		R L	
11	Main seam fit ups, shells / flanges, heads		V SEP 23 2015		R L	
12	Nozzle orientation, elevation & rating X - Dimensions X - Welds		V SEP 23 2015		R L	
13	Attachments, layout & installation, supports, lugs & nameplate brackets		V SEP 23 2015		R M	

HT's for Floating Head/Flange, Split Flange JSS Sept 22/15



TRAVEL SHEET / INSPECTION TEST PLAN

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Item	Description	Foreman	Altex Q.C.M./ Q.C.E.	A.I.	Customer Inspector	Remarks
14	Radiography shell side <input type="checkbox"/> - Full per UW-11(a) X - Spot UW-11(b) <input type="checkbox"/> - Partial UW-11(a)(5)(b) <input type="checkbox"/> - Other		H SEPT. 26. 2015 QML	R WLP OCT 6/15	R H	TO INCLUDE ALL JOINT INTERSECTIONS AND ONE ADDITIONAL SPOT ON EACH LONG & CIRC SEAM
15	Radiography tube side <input type="checkbox"/> - Full per UW-11(a) X- Spot UW-11(b) <input type="checkbox"/> - Partial UW-11(a)(5)(b) <input type="checkbox"/> - Other		H SEPT. 26. 2015 QML	R WLP OCT 6/15	R H	TO INCLUDE ALL JOINT INTERSECTIONS AND ONE ADDITIONAL SPOT ON EACH LONG & CIRC SEAM
16	NDE X - MT {MPI} <input type="checkbox"/> - PT {LPI} X - UT X - Hardness <i>WLP</i> <input type="checkbox"/> - PMI <input type="checkbox"/> - Other		H 15.10.06 WLP		R H	SEE ATTACHED MPI & UT SUPPLEMENTARY TRAVEL SHEET / INSPECTION TEST PLANS
17	NDE after PWHT <input type="checkbox"/> - Radiography X - MT {MPI} <input type="checkbox"/> - PT {LPI} X - UT X - Hardness <i>WLP</i> <input type="checkbox"/> - Other		H SEPT. 26. 2015 QML		R H	SEE ATTACHED MPI & UT SUPPLEMENTARY TRAVEL SHEET / INSPECTION TEST PLANS
18	Shell side internal inspection		H SEP 23 2015 WLP	H SEP 24/15 WLP	R H	
19	Shell side external inspection		H SEP 23 2015 WLP	H SEP 24/15 WLP	R H	
20	Channel side internal inspection		H SEP. 25. 2015 QML	H SEP 25/15 WLP	R H	
21	Channel side external inspection		H SEP. 25. 2015 QML	H SEP 25/15 WLP	R H	
22	Floating Head internal inspection		H SEP 22 2015 WLP	H SEP 22/15 WLP	R H	
23	Floating Head external inspection		H SEP 22 2015 WLP	H SEP 22/15 WLP	R H	
24	Final dimensional check shellside		H SEP 23 2015 WLP		H H	
25	Final dimensional check tubeside		H SEP. 25. 2015 QML		H H	
26	Shell pigged		H SEP. 25. 2015 QML		R H	
27	Heat treatment <input type="checkbox"/> - Bundle <input type="checkbox"/> - Shell <input type="checkbox"/> - Shell Cover <input type="checkbox"/> - Channel X- Floating Head		H 15.09.24 WLP	R WLP SEP 25 2015	R H	FLOATING HEAD @ 1150 F for 60 MINUTES
28	Dimension tube sheets		H SEP 16 2015 WLP		R H	
29	Log tube sheets holes		H SEP 18 2015 WLP		R H	
30	Log baffle holes		H SEP 18 2015 WLP		R H	

SHELL COVER INT & EXT

QML SEP. 25. 2015 WLP SEP 25/15



TRAVEL SHEET / INSPECTION TEST PLAN

ALTEX JOB #

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Item	Description	Foreman	Altex Q.C.M./ Q.C.E.	A.I.	Customer Inspector	Remarks
31	Inspect bundle skeleton		SEP 16 2015		R	
32	Log tube expansion		SEP 21 2015		R	
33	Tube Sheet(s) tolerances checked after welding /expansion		SEP 21 2015		R	
34	Tube bundle final		SEP 21 2015		R	
35	Tube Bundle Installed		SEPT. 26 2015		R	
36	Stamping (welders Symbols, material identification)		15.10.06 WW		R	
37	Air test repads / wear pads		SEPT. 26 2015		R	
38	Air test tube to tubesheet welds after first pass		N/A			
39	Air test tube to tubesheet welds after second pass		N/A			
40	Hydro-test shell side 195 psi		H 15.10.07 WW		H	CHART HYDRO 1 HR
41	Hydro-test channel side 98 psi		H 15.10.06 WW		H	CHART HYDRO 1 HR
42	Hydro-test steam jacket psi		N/A			
43	Surface preparation/painting		V 15.10.17 WW		R	
44	NB # Log Updated <input type="checkbox"/> - Yes <input checked="" type="checkbox"/> - No		N/A			
45	Non-Conformances Completed		V N/A		V/H N/A	
46	Name Plate X - Copy	Code Stamp X	R/A Name Plate - <input type="checkbox"/>	H OCT 15 2015	R H	
47	Data reports X - U1 <input type="checkbox"/> - U2 <input type="checkbox"/> - AB-40 <input type="checkbox"/> - AB-25 <input type="checkbox"/> - Other		H OCT 15 2015		R H	TO BE REGISTERED IN ALBERTA & SASKATCHEWAN
48	Prep for shipping X - Unit Drained X - Covers applied <input type="checkbox"/> - Purge required Shell Passification <input type="checkbox"/> - Tubeside <input type="checkbox"/> - Shellside		V 15.10.16 WW		R H	
49	Application of Name plate		V 15.10.16 WW		R H	
50	Heat Tracing <input type="checkbox"/> - Yes <input checked="" type="checkbox"/> - No		N/A			
51	Vessel insulation <input type="checkbox"/> - Yes <input checked="" type="checkbox"/> - No		N/A			
52	Refractory <input type="checkbox"/> - Yes <input checked="" type="checkbox"/> - No		N/A			
53	Release for shipping		H 15.10.19 WW		H	
54	Preliminary Data Package		N/A			
55	Final Data Package		H		R	



MPI SUPPLEMENTARY TRAVEL SHEET / INSPECTION TEST PLAN

ALTEX JOB# 15-2253B Rev A

Page 1 of 1

Travel sheet (ITP) to be presented to an Authorized Inspector and Customer Inspector prior to commencement of construction so that they may denote hold point with the following: 1. (H) - Hold 4. (N/A) – Not Applicable
2. (V) - Verify
3. (R) – Review Documents

Customer Inspector (signature):

Date:

Customer Inspector (name):

Phone No.:

Specification:

☒ - ASME Sec. VIII Div. 1☒ - Other: TEMA & API 660☐ - ASME Sec. I

Customer: Husky Oil Operations Limited

C.R.N. : 40315.23

Location: Morgan, Sask.

(A): 656 771

LSD:

NB #:

Project Name/Item #:

Comments:

TAG: E-102B

AES-LEAN AMINE WATER

COOLER

Function completed and inspectors initials.

Item	Description		Altex Q.C.M./ Q.C.E.	CUSTOMER INSPECTOR		Remarks
1	SHELL CIRC & LONG SEAM WELD PREPS (SHELLSIDE)	N/A				
2	SHELL CIRC & LONG SEAM WELD PREPS (CHANNELSIDE)	N/A				
3	SEMI-ELLIPTICAL HEAD WELD PREPS (SHELLSIDE)	N/A				
4	SEMI-ELLIPTICAL HEAD WELD PREPS (CHANNELSIDE)	N/A				
5	SHELL FLANGE WELD PREPS (SHELLSIDE)	N/A				
6	SHELL FLANGE WELD PREPS (CHANNELSIDE)	N/A				
7	TUBESHEET CORNER JOINT WELD PREPS	N/A				
8	TUBESHEET PERIPHERAL EDGE AFTER WELDING	N/A				
9	NOZZLE CAT "D" WELD PREPS (SHELLSIDE)	N/A				
10	NOZZLE CAT "D" WELD PREPS (CHANNELSIDE)	N/A				
11	NOZZLE CAT "D" BACKGOUGE (SHELLSIDE)	H	21-9-15 RJ			
12	NOZZLE CAT "D" BACKGOUGE (CHANNELSIDE)	H	15-9-15 RJ			
13	FLOATING HEAD FLANGE TO DISHED HEAD BACKGOUGE	H	12-9-15 RJ			
14	LIFT LUGS	H	28-9-15 RJ			
15	ATTACHMENT WELDS	H	28-9-15 RJ			



UT SUPPLEMENTARY TRAVEL SHEET / INSPECTION TEST PLAN

ALTEX JOB# 15-2253B Rev A

Page 1 of 1

Travel sheet (ITP) to be presented to an Authorized Inspector and Customer Inspector prior to commencement of construction so that they may denote hold point with the following: 1. (H) – Hold 4. (N/A) – Not Applicable
2. (V) - Verify
3. (R) – Review Documents

Customer Inspector (signature):

Date:

Customer Inspector (name):

Phone No.:

Specification:

☒ - ASME Sec. VIII Div. 1

☒ - Other: TEMA & API 660

☐ - ASME Sec. I

Customer: Husky Oil Operations Limited

C.R.N. : 40315.23

Location: Morgan, Sask.

(A): 656771

LSD:

NB #:

Project Name/Item #:

TAG: 102B

AES-LEAN AMINE WATER
COOLER

Comments:

Function completed and inspectors initials.

Item	Description		Altex Q.C.M./ Q.C.E.	CUSTOMER INSPECTOR	REMARKS
1	SHELLS (SHELLSIDE)	N/A			
2	SHELLS (CHANNELSIDE)	N/A			
3	SEMI-ELLIPTICAL HEADS (SHELLSIDE)	N/A			
4	SEMI-ELLIPTICAL HEADS (CHANNELSIDE)	N/A			
5	DISHED HEAD	N/A			
6	CHANNEL COVERS	N/A			
7	TUBESHEETS	N/A			
8	SHELL FLANGE FORGINGS	N/A			
9	CHANNEL FLANGE FORGINGS	N/A			
10	SHELL FLANGES (AFTER MACHINING)	N/A			
11	CHANNEL FLANGES (AFTER MACHINING)	N/A			
12	FLOATING HEAD FLANGE FORGINGS	N/A			
13	FLOATING HEAD FLANGE (AFTER MACHINING)	N/A			
14	NOZZLE CAT "D" WELDS (SHELLSIDE)	H	22-9-15 R2		
15	NOZZLE CAT "D" WELDS (CHANNELSIDE)	H	22-9-15 R2		
16	TUBESHEET TO SHELL WELDS	N/A			
17	TUBESHEET TO CHANNEL WELDS	N/A			
18	FLOATING HEAD TO DISHED HEAD WELDS	H	15-9-15 R2		



MPI SUPPLEMENTARY TRAVEL SHEET / INSPECTION TEST PLAN AFTER PWHT

ALTEX JOB# 15-2253B Rev A

Page 1 of 1

Travel sheet (ITP) to be presented to an Authorized Inspector and Customer Inspector prior to commencement of construction so that they may denote hold point with the following: 1. (H) - Hold 4. (N/A) - Not Applicable
2. (V) - Verify
3. (R) - Review Documents

Customer Inspector (signature):

Date:

Customer Inspector (name):

Phone No.:

Specification:

☒ - ASME Sec. VIII Div. 1

☒ - Other: TEMA & API 660

☐ - ASME Sec. I

Customer: Husky Oil Operations Limited

C.R.N. : 40315.23

Location: Morgan, Sask.

(A): 656771

LSD:

NB #:

Project Name/Item #:

Comments:

TAG: E-102B

AES-LEAN AMINE WATER
COOLER

Function completed and inspectors initials.

Item	Description		Altex Q.C.M./ Q.C.E.	CUSTOMER INSPECTOR	Remarks
1	SHELL CIRC & LONG SEAM WELD (SHELLSIDE)	N/A			
2	SHELL CIRC & LONG SEAM WELD (CHANNELSIDE)	N/A			
3	SEMI-ELLIPTICAL HEAD WELD (SHELLSIDE)	N/A			
4	SEMI-ELLIPTICAL HEAD WELD (CHANNELSIDE)	N/A			
5	SHELL FLANGE WELD (SHELLSIDE)	N/A			
6	SHELL FLANGE WELD (CHANNELSIDE)	N/A			
7	TUBESHEET CORNER JOINT WELD	N/A			
8	NOZZLE CAT "D" WELD (SHELLSIDE)	N/A			
9	NOZZLE CAT "D" WELD (CHANNELSIDE)	N/A			
10	NOZZLE CIRC SEAM WELDS (SHELLSIDE)	N/A			
11	NOZZLE CIRC SEAM WELDS (CHANNELSIDE)	N/A			
12	FLOATING HEAD FLANGE TO DISHED HEAD WELD	H	24-9-15		
13	LIFT LUGS	N/A			
14	ATTACHMENT WELDS	N/A			



UT SUPPLEMENTARY TRAVEL SHEET / INSPECTION TEST PLAN
AFTER PWHT

ALTEX JOB# 15-2253B Rev A

Page 1 of 1

Travel sheet (ITP) to be presented to an Authorized Inspector and Customer Inspector prior to commencement of construction so that they may denote hold point with the following: 1. (H) – Hold 4. (N/A) – Not Applicable
2. (V) – Verify
3. (R) – Review Documents

Customer Inspector (signature):

Date:

Customer Inspector (name):

Phone No.:

Specification:

☒ - ASME Sec. VIII Div. 1

☒ - Other: TEMA & API 660

☐ - ASME Sec. I

Customer: Husky Oil Operations Limited

C.R.N. : 40315.23

Location: Morgan, Sask.

(A): 656771

LSD:

NB #:

Project Name/Item #:

Comments:

TAG: E-102B

AES-LEAN AMINE WATER
COOLER

Function completed and inspectors initials.

Item	Description		Altex Q.C.M./ Q.C.E.	Customer Inspector		Remarks
1	SHELL CIRC & LONG SEAM WELD (SHELLSIDE)	N/A				
2	SHELL CIRC & LONG SEAM WELD (CHANNELSIDE)	N/A				
3	SEMI-ELLIPTICAL HEAD WELD (SHELLSIDE)	N/A				
4	SEMI-ELLIPTICAL HEAD WELD (CHANNELSIDE)	N/A				
5	SHELL FLANGE WELD (SHELLSIDE)	N/A				
6	SHELL FLANGE WELD (CHANNELSIDE)	N/A				
7	NOZZLE CAT "D" WELD (SHELLSIDE)	N/A				
8	NOZZLE CAT "D" WELD (CHANNELSIDE)	N/A				
9	FLOATING HEAD FLANGE TO DISHED HEAD WELD	H	24-9-15 20			
10	TUBESHEET TO SHELL WELDS	N/A				
11	TUBESHEET TO CHANNEL WELDS	N/A				



MATERIAL IDENTIFICATION REPORT #1

ALTEX JOB NO.

15-2253B

Page 1 of 1

Line No.	Part	Item No.	Material Specification	Thickness/Rating	Heat No./ Identifying Mark
1	SHELL CYL.	100A	SA-516-70N	0.375"	N35047-FA51969503
2	SHELL CYL.	100B	SA-516-70N	0.375"	N35047-FA51969503
3	SHELL CYL.	100C	SA-516-70N	0.375"	N35047-FA51969503
4	SHELL CVR CYL	101	SA-516-70N	0.500"	N35043-FA51874301
5	SHELL CVR	102	SA-516-70N	0.500"	416702-25246-03
6	CHANNEL CYL.	103	SA-516-70N	0.375"	N35047-FA51899802
7	DISHED HEAD	104	SA-516-70N	0.750"	415933-14511-02
8	PASS PLATE	105A	SA-516-70N	0.500"	E4J215
9	PASS PLATE	105B	SA-516-70N	0.500"	E4J215
10	PASS PLATE	106	SA-516-70N	0.500"	E4J215
11	CHANNEL CVR	200	SA-516-70N	2.187"	389570-80110-01
12	FLANGE	201	SA-350-LF2-CL2	4.125"	BC628
13	FLANGE	202	SA-350-LF2-CL3	4.125"	BC628
14	TUBESHEET	203	SA-516-70N	1.812"	E4K297
15	FLANGE	204	SA-350-LF2-CL1	4.125"	BC628
16	FLANGE	205	SA-350-LF2-CL1	4.187"	BC628
17	FLANGE	206	SA-350-LF2-CL1	3.375"	BC628
18	SPLIT FLANGE	207	SA-350-LF2-CL1	4.125"	BC628
19	TUBESHEET	208	SA-516-70N	1.812"	E4K297
20	FLANGE	209	SA-350-LF3	3.562"	BC628
21	TUBE	210	SA-179	3/4" OD 13 BWG (0.095")	750147
22	BAFFLE	223	SA-36/44W	0.312"	NW5051
23	BAFFLE	224	SA-36/44W	0.312"	NW5051
24	SUPPORT PLATE	225	SA-36/44W	0.312"	NW6044
25	BASE PLATE	400A	SA-36/44W	0.750"	B4K771
26	BASE PLATE	400B	SA-36/44W	0.750"	B4K771
27	WEB PLATE	401A	SA-36/44W	0.500"	5500730-01
28	WEB PLATE	401B	SA-36/44W	0.500"	5500730-01
29	WEAR PLATE	402	SA-516-70N	0.375"	W4E596
30	OUTER RIB	403	SA-36/44W	0.500"	5500730-01
31	INNER RIB	404	SA-36/44W	0.500"	5500730-01
32	INNER RIB	405	SA-36/44W	0.500"	5500730-01
33	LIFT LUG	407	SA-516-70N	0.500"	E4J215
34	LIFT LUG	408	SA-516-70N	0.500"	E4J215
35	LIFT LUG	409	SA-516-70N	0.500"	E4J215

Form 8C3, Rev1

Accudrill 2013 Inc.

Certificate of Calibration

Customer	Altex	Ambient Temp	72 Degrees
S/N#	DNB10627	Test Equipment: Model //	Snap On: QC4ET1600
Tool Hound //	2162931	Test Equipment: Serial //	011280108
Torque Wrench	PROTO	Test Medium	Ft/Lbs of Force
Range	120-600 FT/LBS	Maximum Error	1/-11 FT lbs
Sub Divisions	30 FT/LBS	Date	Aug 26 2015
Connection	3/4" Square drive	Location Tested	Accudrill 2013 Inc.
Accudrill W.O.#	1101	Technician:	CAY
Work Order#		Project/Rig #	
P.O.#	064529		

This gauge is certified to meet and/or exceed the requirements as outlined in API Specification 6A, Twentieth Edition, October 2010 (Effective April 1-2011, Errata 2, November 2011; Addendum 1, November 2011 and Addendum 2, November 2012). In compliance with Section 7, Paragraph 7.1, 7.2 Subparagraph 7.2.1, 7.2.2, 7.2.2.1, 7.2.2.2., and 7.2.2.3, also spec 16A, Third Edition June 2004, Section 8, Paragraph 8.1, 8.2 Subparagraph 8.2.1 and 8.2.2

We hereby certify that on the above date we repaired and recalibrated the above Instrument and that it calibrated to manufacturers specifications. The manufacturers specifications state an accuracy of +/- 2% of full scale calibration. The test gauge is calibrated in compliance with (CSA) CAN3-3-85 and A.N.S.I. B40-1. All test equipment is traceable to N.I.S.T. Standards, Customer Standards Document #CS-003-20th

Test Points (Ft./Lbs)			Calibration Data (Ft./Lbs)	
Nominal	Minimum	Maximum	Clockwise	Counterclockwise
150 Ft./Lbs	144 Ft./Lbs	156 Ft./Lbs	148 Ft./Lbs	146 Ft./Lbs
300 Ft./Lbs	288 Ft./Lbs	312 Ft./Lbs	299 Ft./Lbs	296 Ft./Lbs
450 Ft./Lbs	432 Ft./Lbs	468 Ft./Lbs	445 Ft./Lbs	447 Ft./Lbs
600 Ft./Lbs	576 Ft./Lbs	624 Ft./Lbs	589 Ft./Lbs	593 Ft./Lbs
Ft./Lbs	Ft./Lbs	Ft./Lbs	Ft./Lbs	Ft./Lbs

Technician: CAY

Contact Info: Accudrill 2013 Inc.

Ph: (780) 955-9337 Fax: (780) 955-9363



2.47/48F

BOLT TORQUE / TENSION SIGN OFF FORM Date: Oct 6/2015Customer: HUSKY OIL Serial# _____ Tag# E-102 8Customer Representative (Print and Sign): _____ JOB# 15-2253B

Joint ID: (Specific details ie N2 = 12" class 150 ANSI shellside nozzle, Rear shell flange to Bonnet ect...)
FLOATING HEAD TO SPUT RING / CHANNEL TO STEEL FLANGE / CHANNEL COVER

Materials:Stud Material Specification: SA-9193-B7 Dia: 3/4 Min Length (tensioning): _____Nut Material Specification: 194-2H Dia: _____Gasket Type: SEE DRAWING

Gasket M&Y Values: M = Max _____ Y = Min(psi) _____

Gasket Material: S1 D7 NON-ASBGasket Dimensions: SEE DRAWINGLubricant Type 550 k (nut) Factor _____

Belleville Washers Required Y / N Details _____

Torquing Information (Provided by Altex Engineering Dept / Project Coordinator)Stud Tensile Stress Area (in²): _____Torque Value (ft lbs): Tgt/Min: 200 Max: 250

Residual Stud Load (lbs): Tgt/Min: _____ Max: _____

Torque Value (ft lbs): Pass A: 90 Pass B: 160 Pass C: 220 Pass D: _____

Bolt Pattern: (from SOP 2.47a - Bolt Patterns)

Comments: _____

Altex Engineering Dept or Project Co-ordinator Print name and Sign: _____

Tensioning Information (Provided by Altex Engineering Dept / Project Coordinator)Tensioner Hydraulic Pressure Area (in²): _____Stud Tensile Stress Area (in²): _____

Effective Joint Length (in): _____

Residual Stud Load (lbs): Tgt / Min: _____ Max: _____

Target Elongation (in): Tgt / Min: _____ Max: _____

Pump Pressure (psi): Pass A: _____ Pass B: _____ Pass C: _____ Pass D: _____

Equivalent Torque Value (ft lbs): Tgt / Min: _____ Max: _____

Tensioning Pattern: (from SOP 2.48 / number of tensioners avail)

Comments: _____

Altex Engineering Dept or Project Co-ordinator Print name and Sign: _____

CERTIFIED BY:



EDMONTON, AB., CANADA

W

RT3-S

RT3-T

-

PHT-T

-

M.A.W.P. (INTERNAL) SHELL	1034	KPAG	AT	260	°C
M.A.W.P. (EXTERNAL) SHELL	-	KPAG	AT	-	°C
M.D.M.T. SHELL	-29	°C	AT	1034	KPAG
M.A.W.P. (INTERNAL) TUBES	517	KPAG	AT	149	°C
M.A.W.P. (EXTERNAL) TUBES	-	KPAG	AT	-	°C
M.D.M.T. TUBES	-29	°C	AT	517	KPAG

SERIAL NO.

15-2253B

YEAR BUILT

2015

CUSTOMER

HUSKY OIL OPERATIONS LIMITED

P.O.#

8400973907

TAG#

E-102B

SHOP TEST PRESS: SHELL

1345

KPAG

TUBE

676

KPAG

SHELLSIDE MATERIAL

SA-516-70N

C.A.

3.2

mm

TUBESIDE MATERIAL

SA-516-70N

C.A.

3.2

mm

SERVICE: 737-6198 AES LEAN AMINE WATER COOLER

WEIGHT: 6400 EMPTY, 9045 FULL, 3599 BUNDLE KGS

C.R.N.

Y031573

CERTIFIED BY:



W

EDMONTON, AB., CANADA

RT3-S

500 °F

M.A.W.P. (INTERNAL) SHELL

PSIG

150

AT

RT3-T

°F

M.A.W.P. (EXTERNAL) SHELL

PSIG

-

AT

-

150 PSIG

M.D.M.T. SHELL

°F

-20

AT

PHT-T

300 °F

M.A.W.P. (INTERNAL) TUBES

PSIG

75

AT

-

°F

M.A.W.P. (EXTERNAL) TUBES

PSIG

-

AT

-

75 PSIG

M.D.M.T. TUBES

°F

-20

AT

SERIAL NO.

15-2253B

YEAR BUILT

2015

CUSTOMER

HUSKY OIL OPERATIONS LIMITED

P.O.#

8400973907

TAG#

E-102B

SHOP TEST PRESS: SHELL

195

PSIG

TUBE

98

PSIG

SHELLSIDE MATERIAL

SA-516-70N

C.A.

C.A.

in

TUBESIDE MATERIAL

SA-516-70N

C.A.

C.A.

in

SERVICE: 20-244 AES LEAN AMINE WATER COOLER

WEIGHT: 14240 EMPTY, 20320 FULL, 7939 BUNDLE LBS

0656771

C.R.N.

YC31523

No. 02510

- NON NEGOTIABLE -

SHIPPER			CARRIER		
ALTEX INDUSTRIES INC.			BRY-TAN		
MAIL ADDRESS			CONSIGNEE		ATTENTION
6831-42 STREET			Husky Oil Operations		Marc Case 780-744-3928
POINT OF ORIGIN			STREET ADDRESS		
EDMONTON, ALBERTA T6B 2X1			Bolney amd Morgan Battery		
SHIP DATE	JOB NO.	P.O. NO.	DESTINATION / CITY / TOWN		LSD
10/26/15	15-2253AB	8400973907	Bolney, SK		10-34-051/14 04W4

Received at the point shown on the date specified and from the shipper mentioned herein, the property herein described in apparent good order, except as noted (contents and condition of contents of packages unknown) marked, consigned and destined as indicated below, which said carrier agrees to carry and deliver to the said consignee at the said destination. It is mutually agreed, that every service to be performed hereunder shall be subject to all the conditions not prohibited by law, whether printed or written including conditions on back hereof, which are here agreed to by the shipper accepted for himself and his assigns. **The contract for the carriage of the goods listed in this Bill of Lading is covered by all laws in the jurisdiction at the time and place of shipment and is subject to the conditions set out in all such laws.**

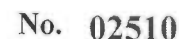
REMARKS:

FREIGHT CHARGES		QUOTATION #		QUOTED PRICE	
<input checked="" type="checkbox"/> COLLECT	<input type="checkbox"/> PREPAID			\$0.00	
COD					
AMOUNT	\$0.00	GST	\$0.00	TOTAL	\$0.00

PIECES	DESCRIPTION OF ARTICLES AND SPECIAL MARKS		WEIGHT: LBS
1	Exchanger Tag# E-102A		14,240
1	Exchanger Tag# E-102B		14,240
1	4' X 4' Skid with Exchanger Gaskets, Nozzle Gaskets and Nozzle Bolting and Jackscrews		50
2	Envelopes		
TOTAL	DIMENSIONS OF SHIPMENT (L x W x H)	DECLARED VALUE	TOTAL WEIGHT
5			28,530

SPECIAL INSTRUCTIONS

CONSIGNEE



- NON NEGOTIABLE -

Received at the point shown on the date specified and from the shipper mentioned herein, the property herein described in apparent good order, except as noted (contents and condition of contents of packages unknown) marked, consigned and destined as indicated below, which said carrier agrees to carry and deliver to the said consignee at the said destination. It is mutually agreed, that every service to be performed hereunder shall be subject to all the conditions not prohibited by law, whether printed or written including conditions on back hereof, which are here agreed to by the shipper accepted for himself and his assigns. **The contract for the carriage of the goods listed in this Bill of Lading is covered by all laws in the jurisdiction at the time and place of shipment and is subject to the conditions set out in all such laws.**

REMARKS:

PIECES	DESCRIPTION OF ARTICLES AND SPECIAL MARKS		WEIGHT: LBS
1	Exchanger Tag# E-102A		14,240
1	Exchanger Tag# E-102B		14,240
1	4' X 4' Skid with Exchanger Gaskets, Nozzle Gaskets and Nozzle Bolting and Jackscrews		50
2	Envelopes		
TOTAL	DIMENSIONS OF SHIPMENT (L x W x H)		DECLARED VALUE
5			28,530

SPECIAL INSTRUCTIONS

CONSIGNEE

14240 LBS

Sent By: Brad Krieger



Altex Industries Inc.
6831-42 St
Edmonton, Alberta T6B 1X1
780-468-6862

Packing Slip 003043

Date: 26/10/15

Ship To:

Husky Oil Operations
Bolney and Morgan Battery
Bolney SK

10-34-051/14 04W4

Attention: Marc Case 780-744-3928
Shipping Co: Bry-Tan
Waybill # 02510
Altex Job # 15-2253B
PO# 8400973907
Tag #: E- 102B

Description	Quantity
29-244 AES Lean Amine Water Cooler 282" LG X 42" WD X 48"	1
Envelope QC Documents	1
5/8" X 4" Long Grade 8 Jackscrews Item 236(For Item 200)	3
5/8" X 5 1/2" Long Grade 8 Jackscrews Item 237(For Item 202 and 204)	6
5/8" X 4" Long Grade 8 Jackscrews Item 238(For Item 206)	3
31 1/4" O.D. X 30 1/4" I.D. X 1/8" THK c/w 3/8" Wide Ribs, SI DJ Style E-B Gasket Item 700	2
31 1/4" O.D. X 30 1/4" I.D. X 1/8" THK c/w 3/8" Wide Ribs, SI DJ Style E-B Gasket Item 701	2
31 1/4" O.D. X 30 1/4" I.D. X 1/8" THK, SI DJ Style R Gasket Item 702	2
34 1/2" O.D. X 33 1/2" I.D. X 1/8" THK, SI DJ Style R Gasket Item 703	2
28 7/8" O.D. X 28 1/8" I.D. X 1/8" THK c/w 3/8" Wide Rib, SI DJ Style C-A Gasket Item 704	2

Notes:

① 656771

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1.

U Certificate of Authorization Number 26,439 Expires September 13, 2016
 Date OCT 15 2015 Name ALTEX INDUSTRIES INC. Signed Ghandi
 (Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by

ABSA

of

Edmonton, Alberta

have inspected the pressure vessel described in this Manufacturer's Data Report on OCT 15 2015, 2015, and state that, to the best

of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1.

By signing this certificate neither the Inspector nor his/her employer make any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report.

Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for personal injury or property damage or the loss of any kind arising from or connected with this inspection.

Date OCT 15 2015 Signed [Signature] Commission NB14446AR, AB422
 (Authorized Inspector) (National Board (incl. endorsements))

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements in this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of

ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. U Certificate of Authorization Number

Expires

Date Name Signed
 (Assembler) (Representative)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by

of , have compared the statements in this Manufacturer's Data Report with the described pressure vessel

and state that parts referred to as data items , not included in the certificate of shop inspection, have been

inspected by me and to the best of my knowledge and belief, the Manufacturer has construction and assembled this pressure vessel in accordance with the ASME BOILER AND

PRESSURE VESSEL CODE, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of

By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in the Manufacturer's Data Report.

Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date Signed Commissions
 (Authorized Inspector) (National Board (incl. endorsements))

OCT 15 2015

OCT 15 2015

656771

JOB: 15-2253B

FORM U-1 (Cont'd)

Items 14-18 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell: (a) No. of course(s) 1 (b) Overall length 11 13/16"

Course(s)				Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment			
No.	Diameter	Length		Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None		Eff.	Type	Full, Spot, None		Eff.	Temp.	Time
1	29 1/4" ID	11 13/16"		SA516-70MT		.375"	.125"	1	SPOT		.85	1	SPOT		.85	-	-
Body Flanges on Shells																	
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting								
									Num & Size	Bolting Matl	Washer(OD,ID,thk)	Washer Matl					
2	HUB	29.250"	34.125"	2.937"	.375"	SA350-LF2 CL 1	TYPE 1	END	88 @ 3/4"	SA193-B7							

Heads: (a) Channel cover SA516-70MT (HT-N/A) (b) Floating dished head SA516-70MT 1150 F for 60 MINUTES
(Material spec., number, grade or type)(H.T. - time and temp.)

Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical	Conical	Hemispherical	Flat	Side to Pressure		Category A		
	Min	Corr.	Crown	Knuckle	Ratio	Apex Angle	Radius	Diameter	Convex	Concave	Type	Full, Spot, None	Eff.
(a) END	2.187"	.125"	N/A	N/A	N/A	N/A	N/A	32.5" BCD	N/A	N/A	-	-	-
(b) END	.6875"	.250"	N/A	N/A	N/A	N/A	22" DR	N/A	X	X	-	-	-

Body Flanges on Heads													
	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting			
										Num & Size	Bolting Matl	Washer(OD,ID,thk)	Washer Matl
1	END	Flange	27.875"	32"	3.375"	N/A	SA350-LF2 CL 1	TYPE 7	END	28 @ 3/4"	SA193-B7	-	-

16. MAWP 75 psi at max. temp. 300 F Min. design metal temp. -20 at 75 psi
(Internal) (External) (Internal) (External)

17. Impact test No exempt shell, heads, flanges, nozzles, tubesheets & channel cover per UG-20(f), ANSI flanges per UCS-66(c) & (g) & tubes per UCS-66(d)
[Indicate yes or no and the component(s) impact tested]

18. Hydro., pneu., or comb. Test pressure 98 psig HYDRO Proof test N/A

19. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain)	No.	NPS or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
INLET / OUTLET	2	6 CL 150	RFWN	SA333-6	SA350-LF2 CL 1	.432"	.125"	N/A	UW16.1c	TYPE 1	SHELL
INLET / OUTLET	2	4 CL 150	RFWN	SA333-6	SA350-LF2 CL 1	.438"	.125"	N/A	UW16.1c	TYPE 1	Channel
VENT	1	1 CL 150	RFWN	SA333-6	SA350-LF2 CL 1	.358"	.125"	N/A	UW16.1c	TYPE 1	SHELL
VENT / DRAIN	2	1 CL 6000	CPLG	SA350-LF2 CL 1	N/A	N/A	.125"	N/A	UW16.1a	N/A	Shell
P.I.	4	.75 CL 6000	CPLG	SA350-LF2 CL 1	N/A	N/A	.125"	N/A	UW16.1a	N/A	Nozzle necks
T.I.	4	1 CL 6000	CPLG	SA350-LF2 CL 1	N/A	N/A	.125"	N/A	UW16.1a	N/A	Nozzle necks
VENT / DRAIN	2	.75 CL 6000	CPLG	SA350-LF2 CL 1	N/A	N/A	.125"	N/A	UW16.1a	N/A	Channel

20. Supports: Skirt NO Legs - Others SADDLES Attached SHELL WELDED
(Yes or no) (Number) (Number) (Describe) (Where and how)

21. Manufacturer's Partial Data Reports properly identified and signed by the Commissioned Inspectors have been furnished for the following items of the report (list the name of part, item number, Manufacturer's name, and identifying number):
N/A

22. Remarks This form represents a cooler designed and fabricated by Altex Industries Inc
Gross surface area 1884 Sq. Ft. / Volume 97.3 Cu. Ft. / PSV's by others per UG-125(g) / Studs & nuts IT exempt per Fig. UCS-66 note (c)
Split ring: SA350-LF2 CL 1 / 32" OD x 27 7/8" ID x 4 1/8" THK / RT Shellside & Tubeside spot per UW-11(b)
Blind, studs & nuts per UG-120(e)- NPS 1 CL 150 RFB SA350-LF2 CL 1- 1/2" Dia.- SA193-B7/194-2H- 13 UNC- UNRC-2A
Construction drawings 15-2253AB-00 Rev 0 & 15-2253B-01A/01B/02A/02B/03/04/05/06/07 Rev 0/0/0/0/0/1/0/0 / Service: Shellside & Tubeside Normal

JOB: 15-2253B

OCT 15 2015

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS

656771

TAG: E-102B

As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

1. Manufactured and certified by ALTEX INDUSTRIES INC., 6831-42 STREET, EDMONTON, Alberta, T6B 2X1 Canada
(Name and address of Manufacturer)

2. Manufactured for Husky Oil Operations Limited Box 4490, Stn D, Calgary, AB T2P 3G7
(Name and address of Purchaser)

3. Location of installation MORGAN, SASKATCHEWAN LSD: 5-07-051-02 W3
(Name and address)

4. Type HORIZONTAL AES-LEAN AMINE WATER COOLER 15-2253B
(Horizontal, vertical, or sphere) (Tank, separator, jkt. vessel, heat exch., etc.) (Manufacturer's serial number)
Y0315.23 15-2253AB-00 Rev 0 N/A 2015
(CRN) (Drawing number) (National Board number) (Year built)

5. ASME Code, Section VIII, Div. 1 2013 ED N/A N/A
(Edition and Addenda, if applicable [date]) (Code Case number) (Special service per UG-120(d))

Items 6-11 incl. to be completed for a single wall vessels, jackets of the jacketed vessels, shell of heat exchangers, or chamber of multichamber vessels.

6. Shell: (a) Number of course(s) 4 (b) Overall length 19' 7 1/2"

No.	Course(s)		Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
	Diameter	Length	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
2	29 1/4" ID	8'	SA516-70MT		.375"	.125"	1	SPOT	.85	1	SPOT	.85	-	-
1	29 1/4" ID	2' 9 1/2"	SA516-70MT		.375"	.125"	1	SPOT	.85	1	SPOT	.85	-	-
1	32 1/4" ID	10"	SA516-70MT		.500"	.125"	1	SPOT	.85	1	SPOT	.85	-	-

Body Flanges on Shells													
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting				Washer Matl
									Num & Size	Bolting Matl	Washer(OD,ID,thk)	Eff.	
1	HUB	29.250"	34.125"	2.937"	.375"	SA350-LF2 CL 1	TYPE 1	END	-	-	-	-	-
1	HUB	29.250"	37.375"	3.187"	.375"	SA350-LF2 CL 1	TYPE 1	END	-	-	-	-	-
1	HUB	32.250"	37.375"	2.187"	.500"	SA350-LF2 CL 1	TYPE 1	END	28 @ 3/4"	SA193-B7	-	-	-

7. Heads (a) Shell cover head SA516-70MT (HT-N/A) (b) -
(Material spec. number, grade or type) (H.T. - time and temp) (Material spec. number, grade or type) (H.T. - time and temp)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical	Conical	Hemispherical	Flat	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	END	.400"	.125"	N/A	N/A	2:1	N/A	N/A	N/A	N/A	X	-	-	-
(b)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Body Flanges on Heads													
	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Bolting				Washer Matl
									Num & Size	Bolting Matl	Washer(OD,ID,thk)	Eff.	
(a)	-	-	-	-	-	-	-	-	-	-	-	-	-
(b)	-	-	-	-	-	-	-	-	-	-	-	-	-

8. Type of jacket N/A Jacket closure N/A
(Describe as ogse weld, bar, etc.)

If bar, give dimensions N/A If bolted, describe or sketch.

9. MAWP 150 psi - at max. temp. 500 F - Min. design metal temp. -20 at 150 psi
(Internal) (External) (Internal) (External)

10. Impact test NO exempt heads, shells, flanges & nozzles per UG-20(f) & ANSI flanges per UCS-66(c) & (g) at temperature of -
(Indicate yes or no and the component(s) impact tested)

11. Hydro., pneu., or comb. Test pressure 195 psig HYDRO Proof test N/A

Items 12 and 13 to be completed for tube sections.

12. Tubesheet SA516-70MT 29 1/8" 1 13/16" .125" SS / .125" TS BOLTED
(Stationary (material spec. no.)) (Diameter (subject to press.)) (Nominal thickness) (Corr. allow.) (Attachment (Welded or Bolted))
SA516-70MT 28 7/8" 1 13/16" .125" SS / .125" TS BOLTED
(Floating (material, spec., no.)) (Diameter) (Nominal thickness) (Corr. allow.) (Attachment)

13. Tubes SA179 3/4" 13 BWG (A/W) 472 STRAIGHT
(Material spec., no., grade or type) (O.D.) (Nominal thickness) (Number) (Type (straight or U))



2202 2nd Avenue
Regina, SK
S4R 1K3
Canada
(306) 787-1443
info@tsask.ca
www.tsask.ca

REGISTRATION OF DESIGN

02-Sep-15

Altex Industries Inc.
6831 - 42 Street
Edmonton, AB
T6B 2X1

ATTENTION : Christopher Niepsuj P. Eng.

File Number: 50480 [0 V]

With reference to your submission respecting the registration of the item below, for legal use in the province, please note we have surveyed and registered this design in accordance with The Boiler and Pressure Vessel Act.

MANUFACTURER :	Altex Industries Inc.	
ITEM :	DRAWING NUMBER :	CRN:
AES Lean Amine Water Cooler	15-2253AB-00 Rev 0 As Noted	Y0315.23

We wish to point out that every vessel must be constructed strictly in accordance with the registered design.

In addition to stamping every vessel with the registration number given above and as required in CSA Code B51, a Manufacturer's Data Report must be forwarded to this office immediately at the time a vessel is shipped. Such forms may be obtained upon request.

Sincerely,

A handwritten signature in black ink, appearing to read "Shamsi Trisha", enclosed within an oval shape.

Shamsi Trisha, Engineer-in-Training
Codes and Standards Compliance

REMARKS: CRN registered under reciprocal agreement and conditional upon compliance with the notes on the original ABSA registration 10th August, 2015.



the pressure equipment safety authority

Celebrating 20 years
1995 – 2015

9410 - 20 Ave N.W.
Edmonton, Alberta, Canada T6N 0A4
Tel: (780) 437-9100 / Fax: (780) 437-7787

August 10, 2015

Attention: Christopher Niepsuj
ALTEX INDUSTRIES INC
6831-42 STREET
EDMONTON, AB T6B 2X1

The design submission, tracking number 2015-05415, originally received on July 22, 2015 was surveyed and accepted for registration as follows:

CRN : Y0315.2

Accepted on: August 10, 2015

Reg Type: New Design

Drawing No. : 15-2253AB-00 Rev 0 As Noted

Description	MAWP	Design Temperature	MDMT
SS Internal Pressure	1034kPa	260 °C	-29 °C
TS Internal Pressure	517kPa	149 °C	-29 °C

The registration is conditional on your compliance with the following notes:

- as per your calculations tube center to center distance (UL1, UL2) is 1.5 in;
- issued with the understanding that nozzles & flanges are exempted per UCS-66(g)
- as per your email confirmation heating surface area;
- * For one shell/exchanger: 1884 sqft
- * For two shells/exchangers: Total gross heating surface area is: 3768 sqft

- other dwgs. include;

15-2253A-01A rev.0, 15-2253A-01B rev.0, 15-2253A-02A rev.0, 15-2253A-02B rev.0, 15-2253A-03 rev.0,
15-2253A-04 rev.0, 15-2253A-05 rev.0, 15-2253A-06 rev.0, 15-2253A-07 rev.0, 15-2253B-01A rev.0,
15-2253B-01B rev.0, 15-2253B-02A rev.0, 15-2253B-02B rev.0, 15-2253B-03 rev.0, 15-2253B-04 rev.0,
15-2253B-05 rev.0, 15-2253B-06 rev.0, 15-2253B-07 rev.0,

An invoice covering survey and registration fees will be forwarded from our Revenue Accounts.

If you have any question don't hesitate to contact me by phone at (403) 291-7070 or fax (403) 291-4545 or e-mail Wasif@absa.ca.

Sincerely,

WASIF, HAMMAD, P. Eng.

thru Fri & Sat



**Shellside Pressure Testing
Inspection Report**

6831-42nd Street Edmonton, AB T6B 2X1
Phone: (780) 468-6 Fax: (780) 465-7443

JOB# 15-2253B
TAG# E-102B

Type of Pressure Testing: ✓ Hydrostatic
Air & Bubble Formation
Vacuum
Other

Item Description for Testing: AES - LEAN AMINE WATER COOLER

Testing Performed: Prior _____ Subsequent ✓ None _____ to PWHT

Medium used for Testing: WATER

Required Pressure for Test: _____ KPA 195 PSIG _____ Other

Temperature of Medium: AMBIENT

Duration of Pressurizing: Pressure 195 PSIG Hold Time 1 HR MIN.
Pressure _____ Hold Time _____

Examination Procedure: VISUAL

Pressure Gauge Identification: No.: AUD 516 Range: 0-10,000 PSI Last Calibrated: APR. 8/15
No.: AUD 517 Range: 0-10,000 PSI Last Calibrated: FEB. 11/15

Chart Recorder Identification: SIN 257502 CALIBRATED MARCH 10/15

Other Equipment used for Recording: (describe) _____

Equipment used for Freon Leak Testing: (describe) _____

Results of Pressure Test: _____ Accept ✓ Reject _____

Describe other: _____

Test Witnessed by: W. W. W. Oct. 7/15 QC Examiner

Test Witnessed by: [Signature] 10/07/15 Customer Inspector

Test Witnessed by: M. Park OCT 7/15 Authorized Inspector

Accudrill 2013 Inc.

Certificate of Calibration

Customer	Altex Industries	Ambient Temp	72 Dcgreess
Serial Number	AUD516	Deadweight	AUD356
Tool Hound#	2147248		
Dial Size/Type	DIGITAL	Test Medium	Oil
Pressure Range	0-10,000 PSI	Maximum Error	+2 PSI
Sub Divisions	1 PSI	Date	April 8, 2015
Connection	½" NPT	Location Tested	Accudrill 2013 Inc.
Accudrill W.O.#	950	Technician:	CAY
Work Order #		Rig/Project #	
P.O.#		M.T.#	

This gauge is certified to meet and/or exceed the requirements as outlined in API specification 6A, Nineteenth edition, July, 2004. In compliance with section 7, paragraph 7.1, 7.2 subparagraph 7.2.1, 7.2.2, 7.2.2.1, 7.2.2.2., and 7.2.2.3, also spec 16A, third Edition June 2004, section 8, paragraph 8.1, 8.2 subparagraph 8.2.1 and 8.2.2

We hereby certify that on the above date we repaired and recalibrated the above Instrument and that it calibrated to manufacturers specifications. The manufacturers specifications state an accuracy of 1/- 2% of full scale calibration. The test gauge is calibrated in compliance with (CSA) CAN3-3-85 and A.N.S.I. B40-1. All test equipment is traceable to N.I.S.T. Standards, Customer Standards Document //CS-003

Tested Before Repair	Deadweight	Error Before Repair
0 PSI	0 PSI	0 PSI

Tested After Repair	Deadweight	Error After Repair
0 PSI	0 PSI	0 PSI
2,500 PSI	2,500 PSI	0 PSI
4,999 PSI	5,000 PSI	-1 PSI
7,501 PSI	7,500 PSI	+1 PSI
10,002 PSI	10,000 PSI	+2 PSI

Technician: CAY

Contact Info: Accudrill 2013 Inc.

Ph: (780) 955-9337 Fax: (780) 955-9363

Accudrill 2013 Inc.

Certificate of Calibration

Customer	Altex Industries	Ambient Temp	72 Degrees
Serial Number	AUD517	Deadweight	AUD356
Tool Hound#	2147246	Test Medium	Oil
Dial Size/Type	DIGITAL	Maximum Error	+/-1 PSI
Pressure Range	0-10,000 PSI	Date	FEBUARY 11, 2015
Sub Divisions	1 PSI	Location Tested	Accudrill 2013 Inc.
Connection	1/2" NPT	Technician:	CAY
Accudrill W.O.#	894	Rig/Project #	
Work Order #	3559	M.T.#	
P.O.#			

This gauge is certified to meet and/or exceed the requirements as outlined in API specification 6A, Nineteenth edition, July, 2004. In compliance with section 7, paragraph 7.1, 7.2 subparagraph 7.2.1, 7.2.2, 7.2.2.1, 7.2.2.2., and 7.2.2.3, also spec 16A, third Edition June 2004, section 8, paragraph 8.1, 8.2 subparagraph 8.2.1 and 8.2.2

We hereby certify that on the above date we repaired and recalibrated the above Instrument and that it calibrated to manufacturers specifications. The manufacturers specifications state an accuracy of +/- 2% of full scale calibration. The test gauge is calibrated in compliance with (CSA) CAN3-3-85 and A.N.S.I. B40-1. All test equipment is traceable to N.I.S.T. Standards, Customer Standards Document //CS-003

Tested Before Repair	Deadweight	Error Before Repair
0 PSI	0 PSI	0 PSI

Tested After Repair	Deadweight	Error After Repair
0 PSI	0 PSI	0 PSI
2,501 PSI	2,500 PSI	+1 PSI
4,999 PSI	5,000 PSI	-1 PSI
7,499 PSI	7,500 PSI	-1 PSI
10,000 PSI	10,000 PSI	0 PSI

Technician: CAY

Contact Info: Accudrill 2013 Inc.

Ph: (780) 955-9337 Fax: (780) 955-9363

Accudrill Inc.

Certificate of Calibration for a Chart Recorder

Customer	ALTEX	Location Tested	Accudrill Inc.
Order #		Date	MARCH 10, 2015
Electronic Chart Recorder	N VISION	Customer Item S/N	T/H-2119345
Pressure Range	0-10,000 PSI	Maximum Error (Pressure)	S/N-257502 -3 PSI
		Maximum Error (Temp)	+2 deg

Accudrill Deadweight (Pressure)	S/N: AUD356	Accudrill Meter (Temperature)	Fluke S/N: 86870014
Ambient Temp Range	0-122 DEG F	Test Medium	Oil
Acceptable Error % (Presssure)	Actual	Acceptable Error % (Temperature)	N/A

Accudrill Inc. certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques.

Pressure PSI	Display PSI	Error (%)	Pressure PSI	Display PSI	Error (%)
2,500 psi	2500 psi	psi	2,500 psi	2500 psi	psi
5,000 psi	5000 psi	psi	5,000 psi	5000 psi	psi
7,500 psi	7500.5 psi	psi	7,500 psi	7500 psi	psi
10,000 psi	10001 psi	psi	10,000 psi	1001 psi	psi
Tested (°F)	Display (°F)	Error (%)	Tested (°F)	Display PSI	Error (%)
+27.5F	F	-0.5	+27.5F	F	0
+59F	F	-0.5	+59F	F	0
+90.5F	F	0	+90.5F	F	+0.5
+120F	F	0	+124F	F	+0.5

Technician: SAL

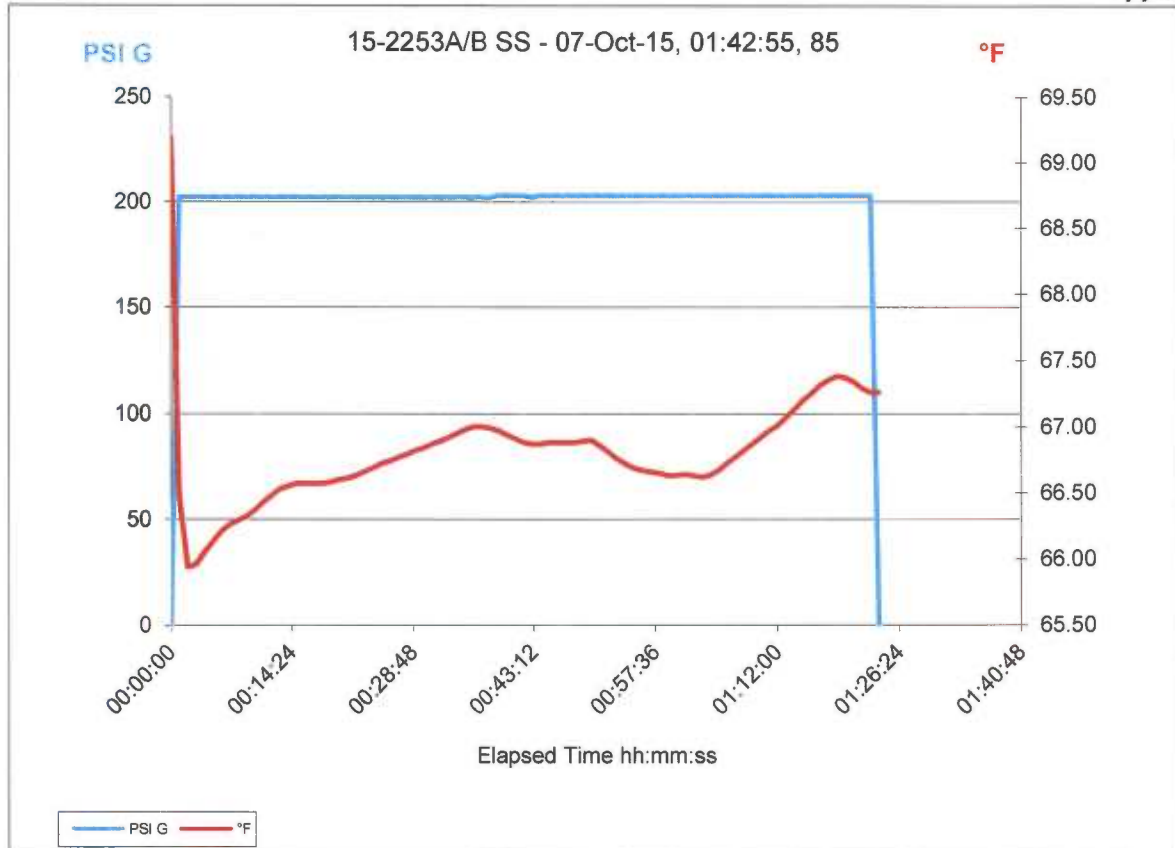
Contact info: Accudrill Inc.
Ph: (780) 955-9337 fax: (780) 955-9363

Data Collection Report

	Chassis	Left Scale	Right Scale
Serial Number	257534	257502	260324
Datatype		Lower	Upper
Units		PSI G	°F

Lower

Upper



Tube-side Pressure Testing Inspection Report

6831-42nd Street Edmonton, AB T6B 2X1
Phone: (780) 468-6862 Fax: (789) 465-7443

JOB#	12-2253B
TAG#	E-102B

Type of Pressure Testing:

<u>X</u>	Hydrostatic
_____	Air & Bubble Formation
_____	Vacuum
_____	Other _____

Item Description for Testing **AES-LEAN AMINE WATER COOLER**

Testing Performed: Prior _____ Subsequent **X** None _____ to PWHT

Medium used for Testing: **WATER**

Required Pressure for Test: KPA **98** PSIG OTHER

Temperature of Medium: **AMBIENT**

Duration of Pressurizing:	Pressure	98 PSIG	Hold Time	1 HR MIN
	Pressure		Hold Time	

Examination Procedure: **VISUAL**

Pressure Gauge Identification:	No.:	AUD420	Range:	0-10000	Last Calibrated:	29-Apr-15
	No.:	AUD687	Range:	0-10000	Last Calibrated:	10-Jul-15

Chart Recorder Identification: **257502, MARCH 10, 2015**

Other Equipment used for Recording: (describe) _____

Equipment used for Freon Leak Testing: (describe) _____

Results of Pressure Test: PASS Accept ☒ Reject ☐

Describe other: _____

Test Witnessed by: adella Oct. 6 2015

QC Examiner

Test Witnessed by: _____

Customer Inspector

Test Witnessed by: 11 Kab Oct 6/15

Authorized Inspector

Accudrill 2013 Inc.

Certificate of Calibration

Customer	ALTEX INDUSTRIES	Ambient Temp	72 Degrees
Serial Number	EV420	Deadweight	AUD355
Tool Hound#	2147086		
Dial Size/Type	DIGITAL	Test Medium	Oil
Pressure Range	0-10,000 PSI	Maximum Error	-1 PSI
Sub Divisions	1 PSI	Date	April 29, 2015
Connection	1/4" NPT	Location Tested	Accudrill 2013 Inc.
Accudrill W.O.#		Technician:	CAY
Work Order #	3908	P.O. #	

This gauge is certified to meet and/or exceed the requirements as outlined in API specification 6A, Nineteenth edition, July, 2004. In compliance with section 7, paragraph 7.1, 7.2 subparagraph 7.2.1, 7.2.2, 7.2.2.1, 7.2.2.2., and 7.2.2.3, also spec 16A, third Edition June 2004, section 8, paragraph 8.1, 8.2 subparagraph 8.2.1 and 8.2.2

We hereby certify that on the above date we repaired and recalibrated the above Instrument and that it calibrated to manufacturers specifications. The manufacturers specifications state an accuracy of +/- 2% of full scale calibration. The test gauge is calibrated in compliance with (CSA) CAN3-3-85 and A.N.S.I. B40-1. All test equipment is traceable to N.I.S.T. Standards, Customer Standards Document #CS-003

Tested Before Repair	Deadweight	Error Before Repair
0	0	0

Tested After Repair	Deadweight	Error After Repair
0 PSI	0 PSI	0 PSI
2,500 PSI	2,500 PSI	0 PSI
4,999 PSI	5,000 PSI	-1 PSI
7,499 PSI	7,500 PSI	-1 PSI
9,999 PSI	10,000 PSI	-1 PSI

Technician: CAY

Contact Info: Accudrill 2013 Inc.

Ph: (780) 955-9337 Fax: (780) 955-9363

Accudrill 2013 Inc.

Certificate of Calibration

Customer	ALTEX INDUSTRIES	Ambient Temp	72 DEGREES
Serial Number	AUD687	Deadweight	AUD356
Tool Hound#	2173492		
Dial Size/Type	DIGITAL	Test Medium	Oil
Pressure Range	0-10,000 PSI	Maximum Error	+3 PSI
Sub Divisions	1 PSI	Date	July 10, 2015
Connection	1/4" NPT	Location Tested	Accudrill 2013 Inc.
Accudrill W.O.#	1066	Technician:	CAY
Work Order #	4217	P.O. #	

This gauge is certified to meet and/or exceed the requirements as outlined in API Specification 6A, Twentieth Edition, October 2010 (Effective April 1-2011, Errata 2, November 2011; Addendum 1, November 2011 and Addendum 2, November 2012). In compliance with Section 7, Paragraph 7.1, 7.2 Subparagraph 7.2.1, 7.2.2, 7.2.2.1, 7.2.2.2., and 7.2.2.3, also spec 16A, Third Edition June 2004, Section 8, Paragraph 8.1, 8.2 Subparagraph 8.2.1 and 8.2.2

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Tested Before Repair	Deadweight	Error Before Repair
0 PSI	0 PSI	0 PSI

Tested After Repair	Deadweight	Error After Repair
0 PSI	0 PSI	0 PSI
2,499 PSI	2,500 PSI	-1 PSI
5,002 PSI	5,000 PSI	+2 PSI
7,503 PSI	7,500 PSI	+3 PSI
10,002 PSI	10,000 PSI	+2 PSI

Technician: CAY

Contact Info: Accudrill 2013 Inc.

Ph: (780) 955-9337 Fax: (780) 955-9363

Accudrill Inc.

Certificate of Calibration for a Chart Recorder

Customer	ALTEX	Location Tested	Accudrill Inc.
Order #		Date	MARCH 10, 2015
Electronic Chart Recorder	N VISION	Customer Item S/N	T/H-2119345 S/N-257502
Pressure Range	0-10,000 PSI	Maximum Error (Pressure)	-3 PSI
		Maximum Error (Temp)	+2 deg

Accudrill Deadweight (Pressure)	S/N: AUD356	Accudrill Meter (Temperature)	Fluke S/N: 86870014
Ambient Temp Range	0-122 DEG F	Test Medium	Oil
Acceptable Error % (Presssure)	Actual	Acceptable Error % (Temperature)	N/A

Accudrill Inc. certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques.

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Tested (°F)	Display (°F)	Error (%)	Tested (°F)	Display PSI	Error (%)
+27.5F	F	-0.5	+27.5F	F	0
+59F	F	-0.5	+59F	F	0
+90.5F	F	0	+90.5F	F	+0.5
+120F	F	0	+124F	F	+0.5

Technician: SAL

Contact info: Accudrill Inc.
Ph: (780) 955-9337 fax: (780) 955-9363

Data Collection Report

	Chassis	Left Scale	Right Scale
Serial Number	257534	257502	260324
Datatype		Lower	Upper
Units		PSI G	°F

Lower

Upper

