

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"

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
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				
									Num & Size	Bolting Matl	Washer(OD,ID,thk)	Washer Matl	
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)

(Material spec. number, grade or type) (H.T. - time and temp)

(b)

-

(Material spec. number, grade or type) (H.T. - time and temp)

	Position (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	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				
									Num & Size	Bolting Matl	Washer(OD,ID,thk)	Washer Matl	
(a)	-	-	-	-	-	-	-	-	-	-	-	-	-
(b)	-	-	-	-	-	-	-	-	-	-	-	-	-

8. Type of jacket

N/A

Jacket closure

N/A

(Describe as ogee 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))

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(A) 656771

JR 2253B

FORM U-1 (Cont'd)

Items 1-18 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	-	-

1 AWP 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 Lugs - 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 RFWN SA350-LF2 CL 1- 1/2" Dia.- SA193-B7/194-2H- 13 UNC- UNRC-2A

Instruction drawings 15-2253AB-00 Rev 0 & 15-2253B-01A/01B/02A/02B/03/04/05/06/07 Rev 0/0/0/0/0/0/0 / Service: Shellside & Tubeside Normal

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 Chandel
 (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 constructed 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))