

LOT 7595H-1152AR

107594

ASME

National Board Number: 2664

Mr. Representative: S. M. 7 Date: APR. 11/2015

Authorized Inspector: [Signature] Date: APR. 18, 2015

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

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

1. Manufactured and certified by Isung Coporation #74 Daejeong-Ro, Onsan-Eub, Ulju-Gun, Ulsan 689-892, Republic Korea.  
(Name and address of Manufacturer)
2. Manufactured for SHELL CANADA ENERGY 460 4AVE, S.W., BOX 100, STATION M, CALGARY, ALBERTA T2P 0J4  
(Name and address of Purchaser)
3. Location of installation CARMON CREEK EXPANSION IN PEACE RIVER COMPLEX, ALBERTA, CANADA  
(Name and address)
4. Type Horizontal Heat Exchanger 14-HE-080  
(Horizontal, vertical, or sphere) (Tank, separator, pt. vessel, heat exch., etc.) (Manufacturer's serial number)
- W7852.2 VP-SG07-E11570-001 Rev.9 2064 2014  
(CRN) (Drawing number) (National Board number) (Year built)
5. ASME Code, Section VII, Div. 1 2010 ED, 2011 ADD (July.01,2011) 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 single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multichamber vessels.

6. Shell: (a) Number of course(s) 3 (b) Overall length 6536mm

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	I.D 1150mm	2200mm	SA516-70(+1)	17mm	1.5mm	1	Full	1.0	1	Full	1.0	—	—
1	I.D 1150mm	2136mm	SA516-70(+1)	17mm	1.5mm	1	Full	1.0	1	Full	1.0	—	—
(BLANK)													

Body Flanges on Shells												
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting			
									Num & Size	Bolting Material	Washer (OD,ID,thk)	Washer Material
(BLANK)												

7. Heads: (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 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) | (BLANK)                      |           |       |        |         |                  |                    |                      |               |                  |         |            |                  |      |
| (b) |                              |           |       |        |         |                  |                    |                      |               |                  |         |            |                  |      |

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

8. Type of jacket N/A Jacket closure N/A  
(Describe as open and weld, bar, etc.)
- If bar, give dimensions N/A If bolted, describe or sketch.

9. MAWP 3639kPa F.V at max. temp. 110°C 110°C Min. design metal temp. -45°C at 3639kPa.  
(Internal) (External) (Internal) (External)

10. Impact test YES(SHELL-A02) at test temperature of -45°C.  
(Indicate yes or no and the component(s) impact tested)

11. Hydro. proof or control test pressure 5600kPa Proof test -

Items 12 and 13 to be completed for tube sections.

12. Tubesheet SA785-II+S31803 CLAD 1150mm 73+10mm 1.5mm WELODED  
(Stationary (material spec. no.)) (Diameter (subject to press.)) (Nominal thickness) (Corr. allow.) (Attachment (welded or bolted))
- SA789-S31803 19.05mm 1.63mm 1952 Straight  
(Floating (material spec. no.)) (Diameter) (Nominal thickness) (Corr. allow.) (Attachment)
13. Tubes SA789-S31803 19.05mm 1.63mm 1952 Straight  
(Material spec. no., grade or type) (O.D.) (Nominal thickness) (Number) (Type (Straight or U))

## 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) 2 (b) Overall length 1948mm

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	1.D 1150mm	1024mm	SA240-S31803	15mm	0.0mm	1	Full	1.0	1	Full	1.0	-	-
1	1.D 1150mm	924mm	SA240-S31803	15mm	0.0mm	1	Full	1.0	1	Full	1.0	-	-
(BLANK)													

Body Flanges on Shells													
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting				
									Num & Size	Bolting Material	Washer (OD,ID,Thk)	Washer Material	
4	(+2)	1150mm	1358mm	99mm	15mm	(+6)	Single, butt weld	End	60, 1 1/8"-8UNx300L	SA320-L7M	58, 32, 6mm	ASTM-F436	
(BLANK)													

15. Heads: (a) SA765-II+S31803 CLAD(+1) - H.T-N/A (b) SA765-II+S31803 CLAD(+1) - H.T-N/A  
 (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 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	88+10mm(+12)	0.0mm	-	-	-	-	-	1358mm	-	-	-	-	-
(b)	End	88+10mm(+12)	0.0mm	-	-	-	-	-	1358mm	-	-	-	-	-

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

16. MAWP 965 kPa F.V at max. temp. 110°C 110°C Min. design metal temp. -45°C at 965 kPa  
 (Internal) (External) (Internal) (External)

17. Impact test YES(CHANNEL-A01) at test temperature of -45°C  
 (Indicate yes or no and the component(s) impact tested)

18. Hydro. Pressure test pressure 2500 kPa Proof test -

19. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
SHELL SIDE INLET	1	DN 150	Cl. 300 fig.	SA333-6	(+3)	15.09mm	3.0mm	SA516-70(+1)	(+4)	(+1)	-
SHELL SIDE OUTLET	1	DN 150	Cl. 300 fig.	SA333-6	(+3)	15.09mm	3.0mm	SA516-70(+1)	(+4)	(+1)	-
TUBE SIDE INLET	1	DN 600	Cl. 150 fig.	(+6)	(+6)	25.2mm	0.0mm	INHERENT	(+4)	(+5)	-
TUBE SIDE OUTLET	1	DN 500	Cl. 150 fig.	(+6)	(+6)	26.0mm	0.0mm	INHERENT	(+4)	(+5)	-
TUBE SIDE VENT(+7)	1	DN 50	Cl. 150 lwn.	(+6)	(+6)	13.6mm	0.0mm	INHERENT	(+4)	-	-
TUBE SIDE DRAIN(+7)	1	DN 50	Cl. 150 lwn.	(+6)	(+6)	13.6mm	0.0mm	INHERENT	(+4)	-	-
(BLANK)											

20. Supports: Skirt NO Lugs N/A Legs N/A Others SADDLES Attached WELDED TO SHELL  
 (Yes or no) (Number) (Number) (Describe) (Where and how)

21. Manufacturer's Partial Data Reports properly identified and signed by 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 \*1. Single Butt, RT-none, 0.7 \*2. Mandatory App.2 Fig.2-4(6) \*3. SA350-LF2 CL.1 \*4. FIG. UW-16.1 (d) \*5. Single Butt, RT-Full, 1.0  
\*6. SA182-F51(S31803) \*7. Pressure retaining cover : (+6), SA320-L7M/SA194-7M, 5/8"-11UNCx95L, 8 SETS.  
8. Nameplate is located on the shell. 9. See attached form U-5. 10. Inspection opening is omitted by UG-46(a).  
11. Safety valve will be installed in system by others. 12. UCL-23(a) was applied for thickness calculation of the clad part.  
13. Length of tube bundle : 6706mm



**ASME**National Board Number 2064  
Mr. Representative: S. Jang Date: APR. 17/2015  
Authorized Inspector: S. Jang Date: APR. 18, 2015**PAGE 3****FORM U-1 (Cont'd)****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 32,997 Expires DEC. 04, 2016Date APR. 17/2015 Name ILSUNG CORPORATION. Signed S. Jang  
(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 the employed by HSB Global Standards of Hartford CT.

have inspected the pressure vessel described in this Manufacturer's Data Report on APR. 18, 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 makes 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 any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date APR. 18, 2015 Signed S. JANG Commissions NB#14412(A,N)  
(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 \_\_\_\_\_

I, \_\_\_\_\_, 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 this 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))