NWP Industries Inc™
PO Box 6280
4017-60 Ave.
T4G 1S9



Website: www.nwp.ca Phone: (403) 227-4100

Fax: (403) 227-4102

QC & Instrumentation Documentation Manual

3.0 MM BTU Line Heater

Prepared for:
EnCana Corporation
PO# 41979

Job Order # 08562-002
Unit Serial # NWP-08562-002
Coil Serial # NWP-08562-002-A

PO Box 6280 4017-60 Ave. T4G 1S9



Website: www.nwp.ca

Phone: (403) 227-4100

Fax: (403) 227-4102

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Vendor Documentation

Taylor Relief Valve

CCS Temperature Switch

CCS Pressure Switch

NWP Scrubber

P&ID and BOM (Full Sized)

Instrumentation Manual

For component replacement parts or technical questions, please contact NWP Industries Inc. at (403) 227-4100.

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Equipment/Instrumentation Manual Contents

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- 2. Alberta Y Strainer Model YS 800
- 3. ASCO Solenoid Valves
- 4. CCS Pressure Switch
- 5. CCS temperature Switch 6900
- 6. CM1 Century Needle Valve
- 7. Emico ball valves
- 8. Fisher 67CFR
- 9. Fisher 119 control valve
- 10. Fisher 627 pressure regulator
- 11. Fisher DVC 6030
- 12. Fossils pneumatic actuator
- 13. Headline 360A filters
- 14. Kimray HT-12PG temperature controller
- 15. Kimray separable sockets
- 16. Magnum needle valves
- 17. Nutron T3 floating ball valves
- 18. SOR 1510 Electric
- 19. Speed control valve NAS4000-NO2
- 20. Taylor 8200 Safety Relief Valve
- 21. Trend Thermometers 33
- 22. Wenco flame arrested burner
- 23. Wenco Thief Hatch
- 24. Wheatley swing check valve
- 25. Wika 233.53

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T4G 1S9



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Pre Start Checklist

Following is a Pre Start Checklist of items to be checked prior to package start up:

Ensure temporary-shipping support braces, plugs, blinds and flange protectors have been removed from package piping and vessels.

Ensure level controller dis-placer's have been installed. Ensure level controller connections have been made up correctly and tightened.

Install temperature and pressure indicators as required.

Chemical pumps are shipped dry, check / add oil as required. (Note: CVS Series 51 Chemical Injection Pumps are an oil free operation pump)

Ensure relief valves are installed on piping and vessels. (Shipped loose due to configuration of piping and vessels)

<u>IMPORTANT</u>

Your NWP equipment is shipped from the plant with appropriate "CAUTION" signs attached. These advise of precautions to be taken to avoid potential danger and/or injury. They warn of one or more of the following potential hazards:

- Combustible materials
- Electrical shock
- Moving machinery
- Contents under pressure
- High temperature
- Chemicals present
- Burner start-up

After the equipment is set up and before any process or utility is attached to it, inspect the equipment to be certain that no CAUTION tags are damaged or lost in transit. If this has occurred, or if you feel the equipment requires additional tags, immediately contact NWP Industries Inc. - Innisfail Branch at (403) 227-4100. We will gladly and promptly provide additional tags for equipment and answer any questions and/or problems that you have. SAFETY IS EVERYONE'S BUSINESS!

ssuing Authority: Marvin J. (Ty) DeBelser		Quality Control
Date of Issue:March 13, 2008	INDUSTRIES I	QCFOFinalInspectionReleaseCertificateR00
FINAL I	NSPECTION RELEAS	E CERTIFICATE
CUSTOMER: Encana Corporation		
3.0 MM BTU/HR LINEHEATER	PACKAGE	wo#: 08562-002 DATE: 70009.13
	FINAL INSPECTION DOCU	
REVIEWED BY:	ACCEPTED:	REJECTED:
STANDARD DOCUMENTATION REQUIREMENTS: (SEE	할 수 있다는 그는 이 하는 그 없다는 하다 하다 하다 하다는 것이 하는 모수 있다. 그 하는 하는 하는 하는 하는 사람들은 하는 모든 사람들은 하는 것이 하는 것이 하는 것이다.	
ADDITIONAL DOCUMENT REQUIREMENTS: (TO BE RE	CORDED HERE IF APPLICABLE I.E. DO	OCUMENT PACKAGE
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PREPARATION NEEDED / COMPLETED **********************************	PREPARATION FOR SHIPME NO SHIPPING INSTRUCT N/A	NO DE CONTRACTOR

RELEASED TO INVENTORY:

RELEASED TO CUSTOMER

DATE:

DATE: 100001/3



Box 6280, 4017-60th Avenue, Innistail, AB. T4G 1S9. Phone: 403.227.4100 Fax: 403.227.4102 www.nwp.ca

SHIPPING MANIFEST FOR SHIPPED LOOSE ITEMS

ompleted By:	Colleen Tysoe	N4664	Date:	2	9-Jan-13	
ìΤΥ	14 IANT	LITERA DECODIDITION		-m		
<u> </u>	UNIT	ITEM DESCRIPTION			WWW.77.1	***
	in cabinet					
	ea	R38 ring gaskets				
	ea	30 psi gauge				
	ea	1500 psi gauge				···
	ea	10000 psi gauge	*****	*******	7577	
	ea	stack gasket				
·	ea	filter cartridge				
	ea	1.5" x 1" studs with nuts				
	ea	stack bolts with nuts				
1	ea	length of 1/2" tubing				
1	set	components for chake				
	in firetube					
5	lengths .	tubing of various shapes				
	ın yard					
1	ea	MasterFlo choke				
1	ea	vent stack				
			T TANKE		N-1	

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DRAWING	G#:	08562-1 REV 0; 0856	2 REV 0	; 08562-	·2B REV 0			
			REQ.	HOLD	EMPLOYEE INT.	DATE COMPLETE	QC INIT.	DATE
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	WORK INSTRU	CTIONS ISSUED	V		A		19175	23/12
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502,363

Hydrocarbons

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Shop Construction 🗵:

## PRESSURE PIPING CONSTRUCTION AND TEST DATA REPORT

Field Construction ::

In accordance with the provisions of the PESR Section 31(1)

the pressure e	quipment safety au	ithority	Final D	ata Report	⊠: P:	urtial Data Rep			3SA- authori orized Contr		actor to anothe
				Co	mplete bot	h sides of this I	form				
1. Constru	ucted By: <u>1</u>	(Name	of ABSA a	nc. othorized p nisfail Al	rimary co Iberta, T	ntractor or sub 4G-1S9	contracto	Owi	ner's Job No	o: <u>08562</u> -	002
Certific	ate of Autho	orization	Permit 1	No. AQP	-1253	Address)		Expiry Da	te: Novem	ebr 24 th , 1	2014
2. Constru	icted For: E	EnCana			imary contr	actor if differen	t from abo	ve)		75.00	
		313 10t	lı Ave S	W Calgar	y AB T3	3C 3P9					
Certific (Required t	ate of Autho	orization contractor t	Permit 1 indertakes so	No. AQP-	-NA	address) tions, e.g., NDE,	PWHT, Ti	Expiry Date-in, fabrication	te: <u>NA</u> n, hydro test, fina	al assembly et	c.)
3. Owner:	EnCana Co	rporatio	n Inc.								
	1313 10th /	Ave SW	Calgary		and address 3P9	s)					
Certific	ate of Autho	rization undertakes	Permit N	lo. AQP-	of installati NA metions, e.j		I '. Tie-in, fa	Expiry Dat	e: NA	embly etc.)	11/207-11/20
	Design Alber										
5. Design	Responsibili	tv: Ow	ner □:  C	`ontractor	r 🔯	(Req	uired if ag	gregate piping	volume is over	(0.5m ³ )	
6. WP No.	: WP-1604.2 (Alberta Registr	2 : Co	mpany: <u>1</u>			ıc.	0	wner's W	P No. (If us		NA stration No.)
7. Code: <i>A</i>	o(s). used: <u>N</u> ASME B31.1 B31.5 □; B3	l Non B	oiler Ext	ernal Pip 2 Steam	ing □; Pineline	; Owner's ASME B3			ed): <u>NA</u>		
P.	ASME B31.3 ligh Purity [	3 🗵 - Se	ervice Ca	tegory: N	lormal ⊵	₫, D 🗖, M	□, High	Pressure	□: Severe (	Cyclic Co	ndition 🗀
Drawing No. Rev. No. Line No.	Fluid (Air/Stm. Etc.)	Des. Press. PSI	Des. Temp. F (Max. & Mm.)	Pressure Test PSI	Test Medium	Pipe Mat'l Spec. & Grade	C.A. Inches	Pipe NPS & Schedule	Flange Material & Rating	PWIT7 Preheat Temp. "F	NDF .
08562-2A tev: 0, 08562- 2B Rev 0	***		7						-		
PF+4"-I- XXHBD- 100.101,103 & 104	Hydrocarbons	5171 150	200 -49 200 -49	7757 165	Witter Air	SA-333-6 31688	1/16	4 "XXII 3-8" 0.035"WT	SA-350-LF2 CL 2500 NA	1150-50 NA/NA	106% R
FG-1"-C- 80A/BD-304	Hydrocarbons	150	100 -20- 100 -49	225	Water	SA-106B & SA-333-6	1/16	1" 80 XH	NA	NA	10% K I Random
		150	100 -20	165	Air	31688	0	5" 0 035" WT: 3/8" 0:035"WT	NA	NA/NA	Visual
D-3 4"-C- 80 A BD-250	Hydrocarbons	150	100 -20-	225	Water	SA-333-6	1 16	1 57 80 XII	NA .	NA	Visual

Water

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5-1-333-6

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10% R.T. Emillors

AB-83	201	1-09	

, FG-1"-C- 80A/BD 300/304	Hydrocarbons	150	100/-20-	225	Water	SA-106B & SA-333-6	1/16	1" SCH XH/80	NA	NA NA	10% RT Random
200/204											

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No.	Line No.	Spool No.	Dwg. No.	below and attached to this	AQP No.	Expiry
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				***************************************		· · · · · · · · · · · · · · · · · · ·
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subcon	tractors and sub-	- etc. <i>).</i> not mai uai seatiently complete	a report provide init d by the primary cor	ormation about the code wor ntractor (e.g., hydrostatic test	k that was not com	pleted by
Uardna	es Testina Ma	x 200 BHN 10% o	a by the printing cor	macioi (c.g., hydrosiane tesi	t of entire assembly	, PWHI etc.,
Haranc	.55 Testing - Ma	IX ZOO DEHN 10% O	i weids.			
	A CEDTIESCATI	E OF COMPLIANCE	Endorse certific		33	
		ntractor when supplying	this certificate as a		TE OF COMPLIANC	
		Partial Data Report		Signed by the primary contract		s certificate as a
111		•		Final	Data Report	
We co	ertify that the s	tatements in this	Data Report are	We certify that the st	atements in this [	Data Report
		erials, constructio		are correct and that p		
WOFKI	manship of the	piping fabrication	n conform to the	described in this Data		
		stem and the appl	icable Piping	accordance with the I	rovince of Albei	structeu m eta Safaty
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Date:				ASME Piping Code(		сасис
		Contracto	)r 	Date:Jan 25,2013		Iné
	****			And the state of t	Contractor	1110.
Print Au	thorized Represen	tative's Name	Signature	Colleen Tysoe	VIO	
This cer	rtificate is not	valid unless it fo	orms part of a		ALA-U	**
inal D	ata Report sig	ned by Primary	Contractor	Print Authorized Represent	inge s teame s	Signature
<u> </u>		3540.				
		CE	RTIFICATE (	OF INSPECTION		
I, the u	ndersigned, emp	ployed by Caliper 1	nspection	have ve	erified that all requ	irod
examîn	ation and testing	ghas been complete	ed, and inspected the	e piping described in this con	struction data rene	net to the
extent i	necessary to be s	satisfied that it conf	orms to all applicab	le examination requirements	of the Code and o	Éthe
engined	aring design, and	l state that, to the b	est of my knowledge	and belief the contractor by	as constructed this	minion in
accorda	ince with the Al	berta Safety Codes	Act and Regulations	s. By signing this certificate (	neither the inspect	ar nor bic or
ner emj	pioyer makes an	y warranty, express	sed or implied, conce	erning the piping described in	n this construction.	data report
runer	more, neither th	e inspector nor his	or her employer sha	ll be liable in anv manner for	any personal injur	ry or
propert	y damage or a ic	oss of any kind aris	ing from or connecte	ed with this inspection.		
Date:	Jan 25, 2013			Dut		
istic.				Date:		
Nick Bo						
	Owner's Insp	ector Name (please	print)	ABSA Safety Cod		printi
					(NAL PIPING ÓMLY)	•
	ا السيدرا)	pector Signatu	re:	ABSA Safety Code	s Officer's Signati	t1't'

When they expected that a consequence to a large particle of  $\mathcal{G}_{n+1}$ 

Issuing Authority: Marvin J. (Ty)
DeB@lser/Dale Karg
Date of Issue: March 30 2012
'Rev Status: 2.0

Prepared By: Karim Bouslama

NWIP Industries Inc. ™

ABSA	
FORM_NDE_001	
N.D.E Requirements	

#### N.D.E Requirements

		<u> </u>			
	et: <u>Encana</u> ect: <u>Threaded Piping – 3.5 mm Lir</u>	eheater	JO# 0 <u>8562-002</u> Date: <u>07/01/20</u>	A COLUMN	
Piping: ⊠	l Pressure Vessel: □	Tank: 🗆	Other:		
	□ X-Ray		□ 100%		ASME Section VIII-UW-51
	⊠ Gamma Ray		☐ Full		ASME Section VIII-UW-52
	☐ Ultrasonics		□ 25%		Customer Specification
	☐ Liquid Penetrant		⊠ 10%		ASME B31.3 NFS
	☐ Magnetic Particle		Other(Define)		Other (Specify)
	☐ Accoustic Emission		☐ Spot	⊠	Customer Spec
	□Hardness test Max 200 BHN				CSA W47.1/W59
General I	nstructions:	Vess	el S/N		
P1 Materia	al				
Welder IE Shell-T=					
Pipe-T=	<u>1" XH</u>				
Total Wel	ds 15 x threaded shots as per at	tached drawings (fi	rst # is XT-1)	·	
	ire type iQi ocations of all indications on films on reports e O.F.D-S.O.D S.F.D on reports				
Special Re	equirements:		Shots		
Gap Shots to Threaded Shi Identifyron Er Flashes must Mark all indic NOTE: En	be identified as X-#) be identified as GS-# ots to be identified as XI-# ovelope pairt of package being shot ie. Coil, Pip contain: Customer, JOH, Spool Identification, ated repairs on the project ocana Spec for Welded Piping-acceptance is ze ocana Spec for Socket Welds-acceptance is min cana Spec for Threaded Piping-acceptance is	Xray number, Clock tape, to UC and Zero IP	Welder's ID Symbol, Date		
	is a 5 Point Traverse	CALIFORNIA LIGHTS	•		
				•	· · · · · · · · · · · · · · · · · · ·

Date: <u>07/01/2013</u>



## RADIOGRAPHIC INSPECTION REPORT

CG18 - RT414

Page 8 of 8

IRISNDT #: 256407 Exposure Device #: D6306 Source #: 88662B Job / P.O. #: 08562-002 Date: 08-Jan-13 Cobalt 60 IR 192 X-Ray □ EFSS: .154 Client: ENCANA C/O NWP Film Brand: AGFA #Film/cassette: 1 Location: Innisfall, Alberta Code: Encana Spec. Item Inspected: Threaded Piping - 3.5mm Lineheater Material: CS Welder IRISNDT S.O.D. O.F.D. Type and Location of Discontinuities (A)ccept # of Work Film Location, Film# (rejectable discontinuities in square brackets []) (R)eject ID Proc. Inches Inches Exp. Loc. Type **Thickness** D7 Α XT1 1"XH RT 5 18 1.9 1 1 XT2 1"XH RT 5 18 1.9 1 1 D7 Α Α XT3 1"XH RT 5 18 1.9 1 1 **D7** XT7 1"XH RT 5 18 1.9 1 1 D7 Α 1 1 D7 Α XT8 1"XH RT 5 18 1.9 Α 1 XT11 1"XH RT 5 18 1.9 1 **D7** 6 - 1" XH Thread Shots Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2 [3] Piping/Modular Fab. Area Work Location Legend: [1] Inside Fab. Shop [2] Yard/Lay-down Area [4] N/A (Other) IRIS Procedure: AB - Arc Burns EUC - External Undercut IC - Internal Concavity SOD = Source-to-object distance (D) IUC - Internal Undercut HB - Hollow Bead Single Wall Exposure: BT - Burn Through LF - Lack of Fusion RT 1, 2, 2A, 6, 7 LC - Low Cover CK - Crack O.F.D. = Distance from source side of IP - Incomplete Penetration Double Wall Exposure EP - Excessive Penetration MA - Misalignment object to film (d) S - Slag RT 3, 3A, 4, 5, 8 P - Parosity Interpretation by: Unit#: Kilometers: Film Quantity JEFF BRUCKSHAW (PED LEVEL 2) SNT-TC-1A 6 (3 ½ x 8 ½) D7 C.G.S.B. 2 0400 Out: 0500 Hrs: 1.0 (Level) In: (Print) C.G.S.B. # 12007 Out: Hrs: (Signature) Personnel: Client Representative: J. BRUCKSHAW (Print) Joseph S. Michael V. Lam in full agreement with report contents (Sign)

5311 - 86 Street Edmonton, Alberta, TSE 5T8 Phone: (780) 437-2022 Fax: (780) 438-1436 Calcary (403) 279-8121

Calgary Lloydminster Barrhead Nisku (403) 279-8121 (780) 875-8455 (780) 674-3018 (780) 955-7616 Cold Lake
Fort McMurray
Red Dear

(780) 826-6105 (780) 743-1536 (403) 347-1742 Deer Park, TX Mairix,Houslan , TX Tulsa, OX (281) 476-4444 (713) 722-7177 (918) 446-8773



### **RADIOGRAPHIC INSPECTION REPORT**

CG24 - RT1486

Page 1 of 1

Exposure Device #: D6274

Source #: 79875B

Cobalt 60 ☐ IR 192 ☑ X-Ray ☐

EFSS: .135

#Film/cassette: 1

Code: ENCANA SDEC

Film Brand: AGFA

Job / P.O. #: 08562-002

IRISNDT #: 256376

Date: 7-Jan-13

Client: ENCANA C/O NWP Location: INNISFAIL Alberta

Film #	Size, Location, Thickness	Welder ID	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type	Type and Location of Discontinuities (rejectable discontinuities in square brackets [ ])	(A)ccep (R)ejec
									JO# 08562-002	
:										
XT1	1"XH		RT 8	15	.179	1	1	D7	7/8"ENGAGED	Α
XT2	1"XH		RT 8	15	.179	1	1 •	D7	1"ENGAGED	Α
хтз	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	Α
XT4	1"XH		RT 8	15	.179	1	1	D7	9 THREADS ENGAGED	А
XT5	1"XH		RT8	15	.179	1	1	D7	8 THREADS ENGAGED	Α
XT6	1"XH		RT 8	15	.179	1	1	D7	7/8"ENGAGED	Α
XT7	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	Α
хтв	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	А
хт9	1"XH		RT 8	15	.179	1	1	D7	7/8"ENGAGED	А
XT10	1"XH		RT 8	15	.179	1	1	D7	1 1/8"ENGAGED	Α
XT11	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	Α
XT12	1"XH		RT 8	15	.179	1	1 .	D7	7 THREADS ENGAGED	А
XT13	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	Α
XT14	1"XH		RT 8	15	.179	1	1	D7	9 THREADS ENGAGED	Α
XT15	1"XH		RT 8	15	.179	1	1	D7	1"ENGAGED	· A
-										
									ļ.	
			***************************************						15-1"XH THREAD SHOTS	

(Sign)

Work Location Legend:	[1]	nside Fab.	Shop	[2] Ya	ard/Lay-dow	n Area	[3] Piping/Modular Fab. Area	[4] N/A	(Other)
IRIS Procedure: Single Wall Exposure: RT 1, 2, 2A, 6, 7 Double Wall Exposure RT 3, 3A, 4, 5, 8	S.O.D. = O.F.D. =	Source-to-obje  Distance from object to film (			AB - Arc Bui BT - Burn TI CK - Crack - EP - Excess P - Porosit	rough ive Penetratio	EUC - External Undercut IUC - Internal Undercut HB - Hollow Bead on IP - Incomplete Penetration S - Stag	IC - Interna LF - Lack of LC - Low Co MA - Misalig	f Fusion over
Unit#: 331  In: Out: Personnel;  BS / RS / MV	Kilometers: Hrs: Hrs:		Film Quantity:	½ x 8	3 ½) D7	(S	nterpretation by: IRODY SMITH  Printl  Signature) Lient Representative: (Print) am in full greement with eport contents	SNT-TC-1A - C.G.S.B. C.G.S.B. #	II II (Level) 12569

. 711	_ AR Straat	Edmenton, Alberta	TOE ETO DUO	an /7001 4	17 4844 Envi	TOOL ATO TARG
3-313	- 00 0000	camenon, Awana	. tuc sia rna	NO: (/ DO) 4,	3/*2422 PAX:	17001430-1430

Calgary Lloydminster Banhead Nisku

(403) 279-6121 (780) 875-6455 (780) 674-3016 (780) 955-7616

Cold Lake Fort McMurray Red Deer

(780) 826-6105 (780) 743-1536 (403) 347-1742

Deer Park, TX Mairix,Houston, TX Tulso, OK

(281) 478-4444 (713) 722-7177 (918) 446-8773



## R& R Stress Relieving Service Ltd.

Nisku: 2105 - 6th Street, T9E 7X8 Tel: (780) 955-7559 Fax: (780) 955-2903 Blackfalds: #13 Burbank Industrial Park Tel: (403) 885-2280 Fax: (403) 885-0177 Toll Free: 1-800-499-HEAT(4328)

# CERTIFICATE OF CONFORMANCE OF RECORDING INSTRUMENTS

CERTIFIED BY:	R & R Stress Relieving Service Ltd.
TEST NUMBER:	
	RR1112
DATE:	November 9, 2012
DATE DUE:	February 9, 2013
INSTRUMENT MFG:	Chino
MODEL NUMBER:	AH-3725 N00
SERIAL NUMBER:	AH-057C171
RECORDER NUMBER:	IR-181

This instrument has been calibrated and it is within the manufacturers specifications.

#### REFERENCE STANDARDS

DIGI MITE 311600 S/N48430-5522

CERT DATE Oct 22/12

The calibration of all standards and measuring instruments used in the calibration are traceable to the National Research Council of Canada in Ottawa or to the National Bureau of Standards in Washington, D.C.

Shane Stimson



## HEAT TREATMENT REQUIREMENTS

PO# 711120

JOB NO.: 08562-002-D	CUST	OMER: EnCana C	orporation	DATE: January 1	7 2013
COMPONENT DESCRIPTION:	Welded Piping fo	or 3.0 mm Line He	ater Package	Total S _i	nnois: 1
DWG, NO. AND LINE NO.	DIAMETER	THICKNESS	MATERIAL	LENGTH	WEIGHT
08562-2A REV 0	4" NPS	SCH XXH .	SA-333-6	Various	Unknown
TYPE OF HEAT TREATMENT:	PRES	SURE VESSEL or	Process Piping STRI	ESS RELIEVE P1 ar	nd Materials
HEATING Temperature to be raised from	2000E (4070C) to 4450	F (00410)			
• :		,		,	
			EXCEED 400°F (204°C	**	
[ Calculated rate = 400 degrees F/h plate in inches]	г. (204 degrees C/hr)	Divided by the max	imum metal thickness	of the shell or head	
HOLDING	**		***		
Temperature to be held in range of	1150°F to 1175°F for	60 minutes.	· : : : : : : : : : : : : : : : : : :		
[Holding time to be determined by T		_			· · · · · · · · · · · · · · · · · · ·
Temperature to be lowered from 11	50°F (621°C) to 800°F (	(427°C) at a maximum	rate of 500 °F		
( °C ) per hour.	NOTE: THIS VALUE	MUST NEVER EXCEE	D 500°F (260°C ) PER H	IOUR.	
Calculated rate = 500 degrees F/hr	. (260 degrees C/hr.)	Divided by the maxi	mum metal thickness o	of the shell or head	
plate in inches].					•
From 800°F (427°C) items may be coo	led in still air.				
Additional Requirements:  Job number and descri	ntion roquired on be-				
☐ Job number and descri	puon required on nea	at treatment charts a nod and location, and	long with the operator's	s signature & date.	
calibration is required.					
☐ A sufficient number of temperature on all vess	hermocouples shall I	be located to control	and maintain uniform	distribution of	
pe made for thermocou	ple placement at bot	tom, centre and top	of the furnace charge is	item or provision shall n accordance with the	
ASIVIE Code.				•	
During the heating periodes vessel being heated the	an 250° F (121° C) with	in anv 15 ft. (4:6 m) in	lerval of length. An adea	out the portion of the	
memiocoupies must be t	usea to ensure this C	ode requirement is r	net.	·, ·	
☐ During the holding perio	od, there shall not be	a greater difference	than 150° F (66° C) beto	ween the highest and	
iimited by these instruct	ions.				
☐ If Capacitor Discharge	welding is used to att	ach thermocouples	an ASME Code Section	n IX Welding Procedu	re
Specification is required 125 Watt-Seconds.	tyves qualification	is not required), and	the energy output mus	st be limited to	
No other welding is pen	mitted on vessels or	parts. [ 0.5 x Capaci	tance in farads X Volta	ige ² = W-Sec.)	
I he method of thermoc	ouple removal shall r	not damage the heat	treated item.		
Q.C. Inspector Signature	Conf 2,	und	Date: ;	JEN 18/13	
hermocouple Attachment Metho	d: Capacifor	Discharge	Location (s) $+$	race diagram	mrk
urnace Heat Number 3F32-	13-037	<b>4</b>		<del>- 0</del> -	
urnace Operator Signature (	luis 1	levis2	Date:	Jan 154n(1:	?
orm Prepared by: Kasha Fox			· · · · · · · · · · · · · · · · · · ·	nuary 15 2013	
		,			

NWP Industries Inc™
PO Box 6280
4017-60 Ave.
T4G 1S9



Website: www.nwp.ca				
	Phone:	(403) 227-4100		
j	Fax:	(403) 227-4102		

## HYDROSTATIC TEST AFFIDAVIT

Customer:	Encana	Corporation	

JO# <u>08562-002-D</u>

Project: Piping for 3.0 mm Lineheater

Project#

Test Pressure: 7757 PSI	Hold Time: 60 minutes
Code Requirements: ASME B31.3 NFS 2010 Edition	
All Personnel Advised of Test 🗹 All Signs & Flagging Posted 🗹	
Prior to Filling – Fitting/Hoses & Component Meet Required Test Pres	ssure
Sign-Off Supervisor: Tester:	Date: <u>18/01/2013</u>
Product Description:	•
1)PF-4"-I-XXHBD-101 = 7757 PSI	
PARAMETER STATE OF THE STATE OF	
110	
50% Test Pressure Leak/Systems Check Completed ☑	
1) 50% = 3879 PSI	

Equipment Drained & Flushed to Prevent Freezing:	Yes: □	No: □	
Start Time:		Finish Time:	
12:00			

Test Gauge Identifi	cation #	Pressure Range	Calibration Date
NWPG- 20,000+	30,000	0-20,000 PSI	11-Dec 2013
NWPG- 20,000-	20,500-1	0-20,000 PSI	21/2/02013
NWPG-		PSI	reagen
NWPG-		PSt	
NWPG-		PSI	
NWPG-		PSI	
NWPG-		PSI	
NWPG-	///	PSI	

Test By:	Roul	mayora	Date:	Jan 18/13	
Approved By:	PMT 1			= 1 1	
Approved by.		June	Date:	SAN 18/13	
		12/1			
	7	14	97/	"	

NWP Industries Inc™ 1000			Website	: www.nwp.ca	V.	100
PO Box 6280			Phone: (	403) 227-4100	T.	1.
4017-60 Ave.		HE HE P		,,,		
T4G 1S9		<b>UNID</b> ustries Inc. ™	Fax: (	403) 227-4102		
	mu	ustries inc. ""	<u>'</u>	<u> </u>	<u> </u>	
: · · · · · · · · · · · · · · · · · · ·	DNIFLINGATI			ye to	i i	,
	PNEUMATI	IC TEST AFFID	AVII			
Customer: Encana Corpor	<u>ation</u>	基實實力(	0856 <b>2-</b> 002-0			**
Project: Shell Assembly		P	roject#		The Port	- 4
Test Pressure: 24 oz			old Time: AS RE	QUIRED	7.4	
Code Requirements: CSA	W47.1 and W59. API 1	L2F D	ate: <u>09/01/201</u>	<u>3</u>		to the
Product Description:						7
					50	1
Tank Serial # <u>08562-002</u>	DWG# <u>LH-7</u>	224-BARE 🕖	那EY# 3 *		N W	in the second
		•				£
Test-		-		<b>*</b>	an an	. ,
					The same	
#1.All Welded and Bolted	Connections		N	`	de la company	
	19000		aire		: \	
4-leaks		Leav.	, let			1: %
one on 1"	the 2 1 "	de of shu	ell assent	ola V		
three on	the 2 5 4 a	suplers on	end of e	to. tank	-	
			· · · · · · · · · · · · · · · · · · ·	<u> </u>		
	1				N.	
<u>Repairs</u>		\$ '			17	
		•			Æ	
Ground to sound metal by: James	LWhyce	Repair preparati	on. QC witness by		_	
Reweld using E7018. QC: ムマ		Repaired by:	Jarrett W			
Procedure approved by QC:			ir checked by QC:		···	
				f.		
Additional Comments						
	***************************************					
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The state of the s						
		Э		The second of th		· (C)
			* ************************************	0,577		
	4			<del></del> :	1	
PSV Used:		Range:		Calibration Due:	- //	
7543 - 399		0 – 28 oz	1			
	***************************************	<u> </u>		1		
Test # Test By: Q.	C. O Date T	est Gauge ID.	Pance	Calibration Du		
$\frac{1}{1}$			Range	Campration Du	E.	
Test(s) Approved By:	0	NWPG- 125	1,26 0-5 PSI			



406 – 11979 40 Street SE Calgary, Alberta Canada T2Z 4M3

Tel: 403 543-3232 Fax: 403 543-3233

## SHIPPING RELEASE

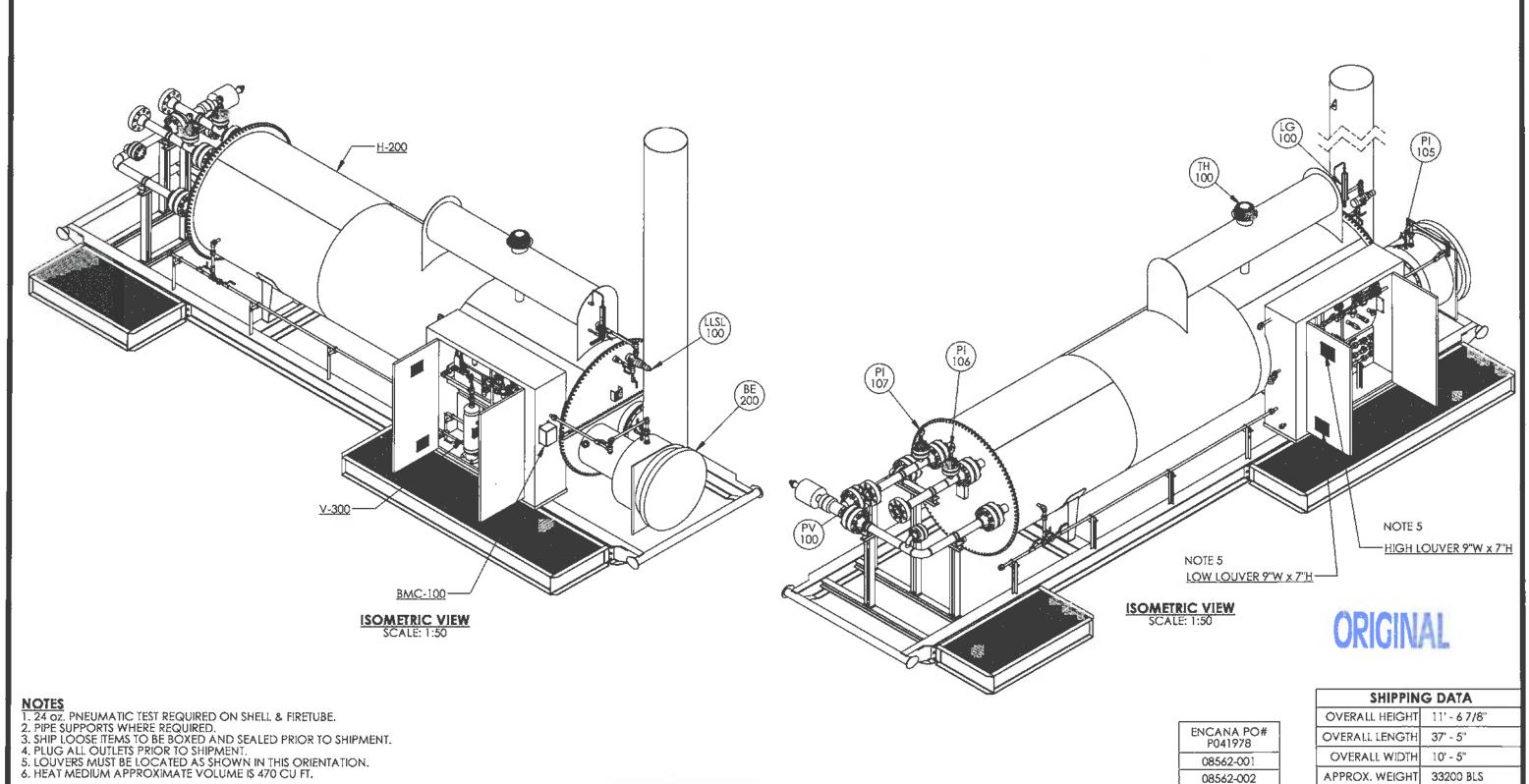
DATE: 25 March 2013 CA	ALIPER JOB #: <u>20355-101-L-01</u>
	RDER #: _41979
LOCATION: <u>Innisfail, Alberta</u> SUB ORDER: _	
PROJECT: 13-05 Wellsite	
DESCRIPTION: 3.0 MMBTU / HR Line heater Package.	NWP Job # 08562-002
DEFICIENCIES REMAINING AT TIME OF SHIPPING:	
- Gilican touchups and flange col	vers to be installed
Shipped Loose Items: Pack of ingide enclo	GUYP-
tems Not Shipped: N/A	
THIS IS A COMPLETE SHIPMENT 🔀 THI	S IS A PARTIAL SHIPMENT
This does not relieve the supplier of any responsibility to e that the material or equipment meets all contractual requin	nsure ements.
	Signed: James Afrild
Supplier	Inspector



Box 6280, 4017-60th Avenue, Innisfail, AB. T4G 1S9. **Phone:** 403,227,4100 Fax: 403,227,4102 www.nwp.ca

## SHIPPING MANIFEST FOR SHIPPED LOOSE ITEMS

Work Order#	08562 and 08563	Serial Number: 08562-001,08562-002,08563-001,08563-002
Description of	Product:	Additional ship loose items for 3.0mm lineheaters
Completed By:	Colleen Tysoe	Date: 08-Aug-13
QTY	UNIT	ITEM DESCRIPTION
	ea	platforms (2 per unit)
	pkg	boltup for platforms-1/2" x 2.5" Grade 8 bolts with nuts, 5/8" x 2" Grade 8 bolts with nuts
	9	Postablion praction 13-172 x 2.3 Grade a boils with holls, 3/8 x 2 Grade 8 boils with holls
	•	
·		
a third name cal	ease certificate req	
a tillio party rei Il parts are boxe	ease cennicate regi d/on pallets	vired Yes No
here is no visible	Damage	Yes No
ll openings are p	lugged	Yes No
	1 4	
gnature by QC <u>I:</u>	1/VI	Date: (1197513
gnature by Asse	em ly Worler ehouse Personylel:_	Date:
anarore na sast	anouse Hersonnel:_	Date:



	ISSUED FOR
	CONSTRUCTION
1	

ALL DIMENSIONS IN INCHES



Total oilfield supply. P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102

08562-002

THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.

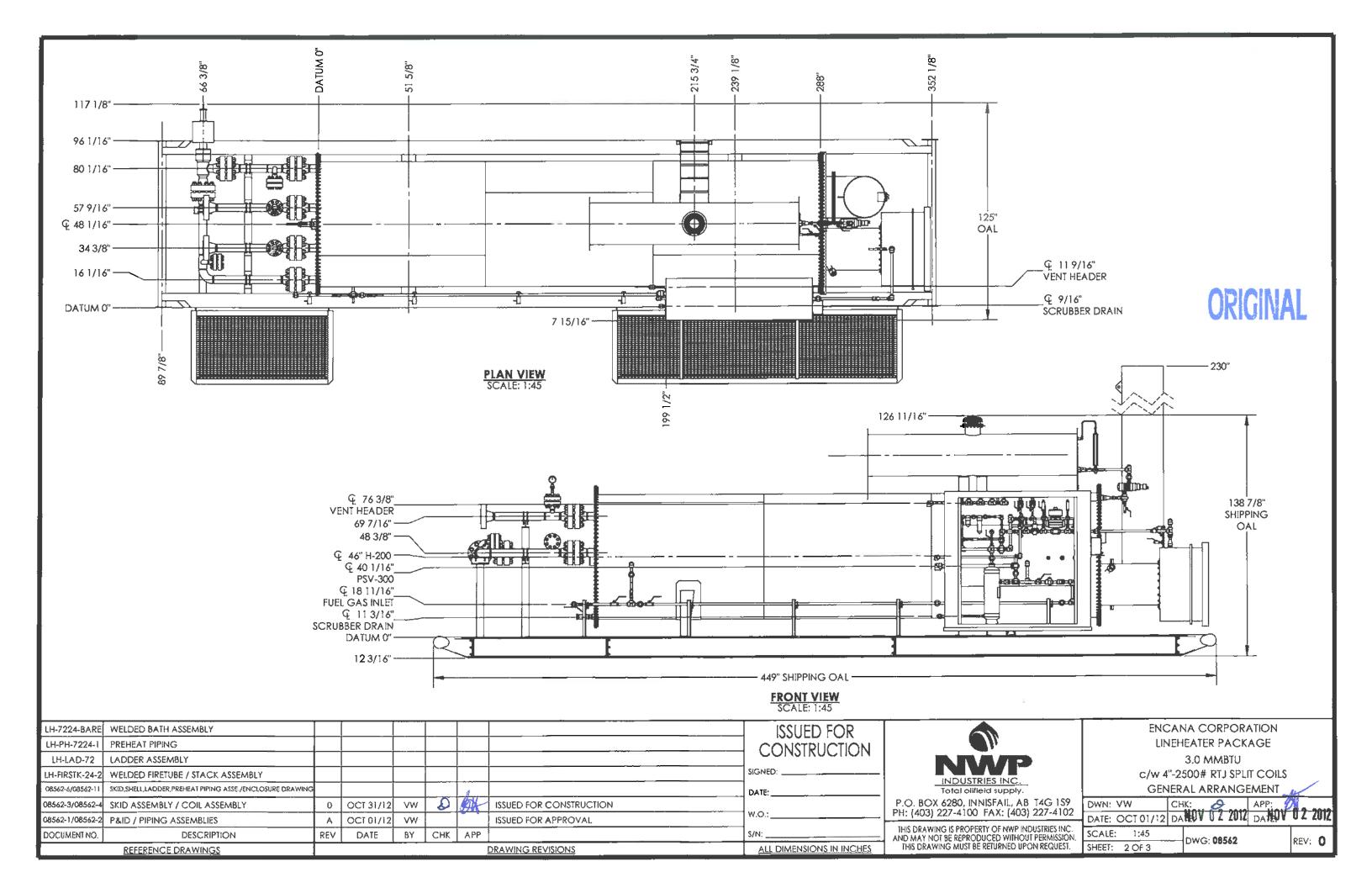
OVERALL WIDTH 10' - 5" 33200 BLS APPROX. WEIGHT

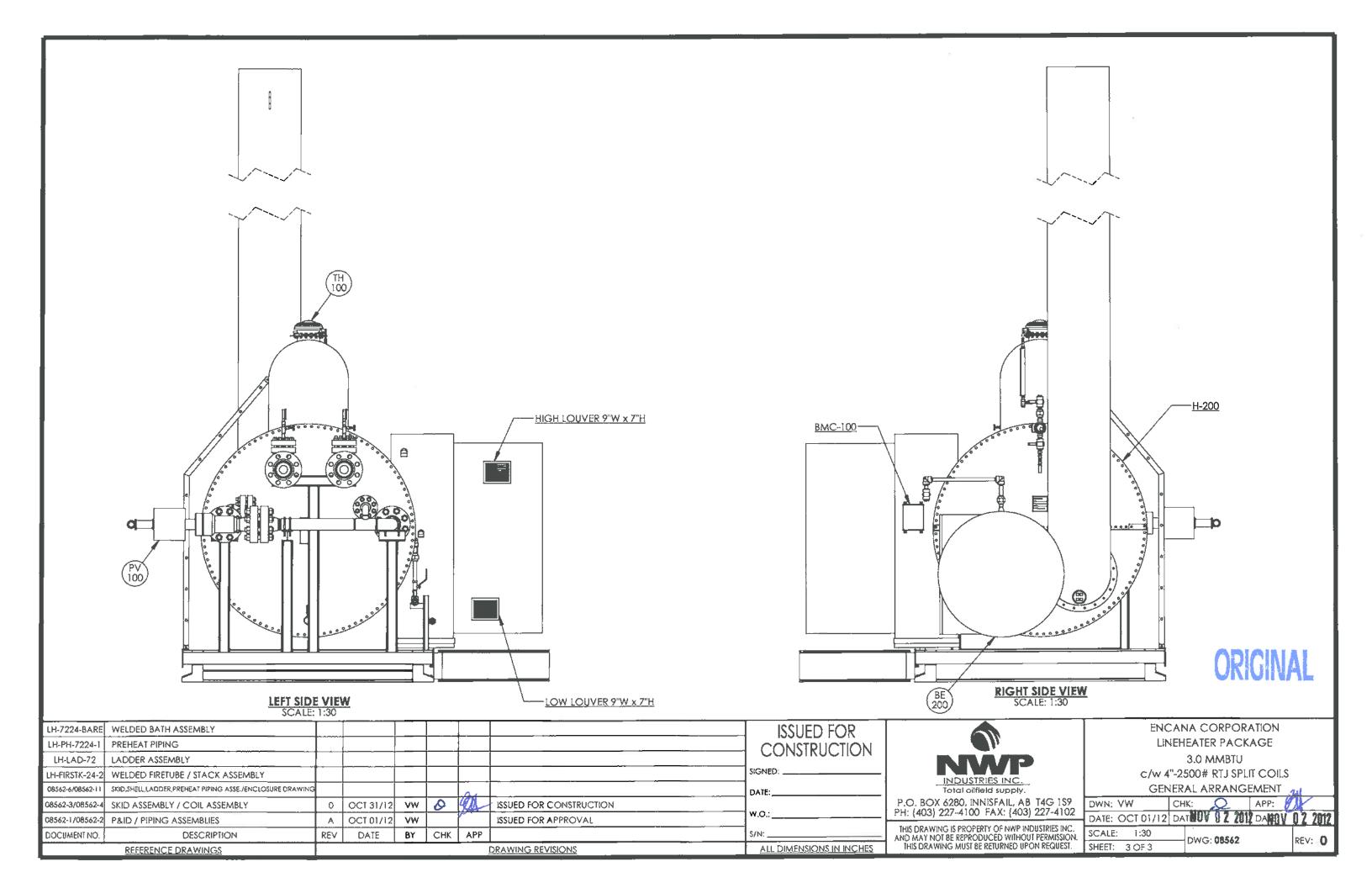
**ENCANA CORPORATION** LINEHEATER PACKAGE 3.0 MMBTU c/w 4"-2500# RTJ SPLIT COILS

GENERAL ARRANGEMENT 40

APP: DWN: VW CHK: DATE: OCT 01/12 DANOV 0 2 2012 DANOV 0 2 2012 SCALE: 1:50 DWG: 08562 REV: 0 SHEET: 1 OF 3

		_						
LH-7224-BARE	WELDED BATH ASSEMBLY							
LH-PH-7224-1	PREHEAT PIPING							
LH-LAD-72	LADDER ASSEMBLY							
LH-FIRSTK-24-2	WELDED FIRETUBE / STACK ASSEMBLY							StG
08562-6/08562-11	SKID, SHELL, LADDER, PREHEAT PIPING ASSE. / ENCLOSURE DRAWING							DA
08562-3/08562-4	SKID ASSEMBLY / COIL ASSEMBLY	0	OCT 31/12	VW	102		ISSUED FOR CONSTRUCTION	<u> </u>
08562-1/08562-2	P&ID / PIPING ASSEMBLIES	Α	OCT 01/12	VW			ISSUED FOR APPROVAL	w.«
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	СНК	APP		S/N
	REFERENCE DRAWINGS					ļ	DRAWING REVISIONS	





## **P&ID Bill of Materials**

ORIGINAL

Job: 08562

Item: Lineheater-08562-2B

Description: 3.0 MM BTU/HR

**Drawing:** 08562-1 Rev 0 **Customer:** ENCANACORP

Description: 3.0 M	IM BTU/HR	Customer: ENCANACORP
Part #	Qty	Description/Notes
BA-1	2.00	BALL VALVE, EMICO, 1" NPT
		VALVE, BALL, EMICO, 1" NPT, 720 SERIES, 3 PIECE BODY, 600 PSI WOG, FULL PORT, STAINLESS STEEL, LOCKING HANDLE, UL APPROVED EAY 730-01-05 REQUIRED FOR B149 COMPLIANCE
BA-2	2.00	BALL VALVE, EMICO, 1/4" NPT
		VALVE, BALL, EMICO, 1/4 IN. NPT, 720 SERIES, TWO PIECE BODY, 600 PSI, WOG, FULL PORT, STAINLESS STEEL, LOCKING HANDLE, UL APPROVED EAY 720-01-01 REQUIRED FOR B149 COMPLIANCE
BA-3	3.00	Ball Valve, Nutron 3000 PSI 1/4" NPT
		CS Body ,STD Trim,FP Lever Operated
		MODEL - T3-R02S30BZ
BA-4	5.00	Ball Valve, Nutron 3000 PSI 1/2" NPT
		CS Body ,STD Trim,FP, Lever Operated
		MODEL:T3-F05S30BZ
BA-5	3.00	Ball Valve, Nutron 3000 PSI 1" NPT
		CS Body ,STD Trim,RP, Lever Operated
		Model: T3-R10S30BZ
BA-6	1.00	Ball Valve, Nutron 3000 PSI 2" NPT
		CS Body ,STD Trim,RP, Lever Operated
		Model: T3-R20S30BZ
BA-7	1.00	Ball Valve, Nutron 3000 PSI 3/4" NPT
		CS Body ,STD Trim,RP, Lever Operated
		MODEL:T3-R07S30BZ
BA-8	3.00	Ball Valve, Nutron 3000 PSI 1" L/T
		CS Body ,STD Trim,RP, Lever Operated, LOW TEMP
		Model: T3-R10S30BLZ
BA-9	1.00	Ball Valve, Nutron 3000 PSI 1/4" L/T
		CS Body ,STD Trim,RP Lever Operated, LOW TEMP
		MODEL - T3-R02S30BLZ
BE-200	1.00	Flame Arrestor
		Wenco Burner Model SB 42/24-24-NG Firebox Flame Arrestor. Two Piece O-type aluminum housing, 42" flame cell element, to fit a 24" fire tube. Burner rated at 3,000,000 BTU/hr (net)

## **P&ID** Bill of Materials



Job: 08562

Item: Lineheater-08562-2B

Description: 3.0 MM BTU/HR

Drawing: 08562-1 Rev 0 Customer: ENCANACORP

<b>Description:</b> 3.0 MM	BTU/HR	Customer: ENCANACORP
Part #	Qty	Description/Notes
		No Internals FBP: blank Hinge: Left 2" Main gas connection at 12:00 1/2" Pilot gas connection at 12:00
		Incendiun Quote Q2910 Oct 20/12
BE-200 INT	1.00	Burner Internals
		(2) ACL-M2000 air/gas mixers (2) ACL-B20016 venturi barrels ACL-2X0N20024 High Efficiency burner nozzle Orifices sized for 3.0 MM BTU/HR natural gas.
		Price Confirmed Oct 20/12
BMC-100	1.00	Burner Control System Zirco
		Burner Control System Zirco Safety-Light ACL 5500 24 VDC (2.4Watt) Must Come with 3/16" Flame Rod
CH-464593	1.00	Swing Check Valve Wheatley 1" 2160
		CH-1
		Swing Check Valve Wheatley 1" 2160 RP Thrd Carbon Steel Body NACE Trim 820-013216-131P
FG-100	1.00	Headline Filter 360A-70
		FILTER HEADLINE MODEL 360A-70 1/2 IN. NPT INLET/OUTLET 25 MICRON CARTRIDGE 500 PSI MAWP
FG-101	1.00	Headline Filter 370A
		Filter Headline, Model 370A 1/2 IN. NPT C/W TWO 25-178-CC Activated Carbon Dessicant filters for adsorption of hydrocarbons and other organic vapors Maximum Pressure 500 PSI Maximum Temperature 120F Flow at 100 PSIG 40 SCFM
FY-100	1.00	Valve Positioner
		Fisher Fieldvue DVC 6030 Pneumatic Valve Positioner C/W Hart Communications Control Signal: 4 -20 mA
		SUPPLIED WITH PV-100
HIC-100	1.00	Conant Selector Valve
		Model AL4TSL CONANT SELECTOR VALVE 1/4" NPT aluminum construction

## P&ID Bill of Materials



Job: 08562

Item: Lineheater-08562-2B

Description: 3.0 MM BTU/HR

**Drawing:** 08562-1 Rev 0 **Customer:** ENCANACORP

escription: 3.0 MM BI	U/HR	Customer: ENCANACORP
Part #	Qty	Description/Notes
		2 stack 4-way valve body Provides for block & vent on actuator supply
.G-100	1.00	Level gauge
		5700-22-CTRH-GS-ATM-AMB-NS 1/2" NPT, 22"
LSL-100	1.00	LEVEL SWITCH ELECTRIC SOR
		LEVEL SWITCH ELECTRIC SOR 2 IN. NPT 316SS BODY 316 SS FLOAT
		MODEL 1510C-G2A-C-L9-ES-CSNCCVMC
		Body Material 316 Stainless Steel
		Process Connections 2" NPT(M)
		Float Material 316SS (Standard) 1500 PSIG -40 to 400°F
		Switch Mechanisms - Low Power SPST 25 Watts Max
		CSA Certified. Class 1, Group A, B, C, D; Divisions 1 & 2. For relay option; Class 1, Group C & D, Divisions 1 & 2. Single seal ambient & process
		temperatures -40°C to +125°C
		Canadian Registration Number (CRN).
		Manual check accessory (uses Viton GLT o-rings)
		NACE construction - MR 01-75 / ISO 15156 2003. Available only with 316SS materials of construction
E-100864	5.00	Needle Valve MAGNUM 1/4" NPT 6000 M
		NE-1
		VALVE NEEDLE MAGNUM 1/4" NPT 6000 M X F STRAIGHT 316 SS BODY ,MODEL 3600B222
E-2	2.00	Needle vaive, Century 316 SST NACE
		Century Gauge Valve,3/4" MNPT x 1/2" FNPT,316 SST,NACE, Model CM11L1M64TCNTSSP100
I-101	1.00	Pressure Gauge, WIKA, 0-200 PSI
		PRESSURE GAUGE WIKA 2-1/2 IN. FACE, 1/4 IN. BOTTOM MOUNT, DUAL SCALE, 0-200 PSI STAINLESS STEEL,
		MODEL 233.53

## **P&ID Bill of Materials**



Job: 08562

Item: Lineheater-08562-2B

Description: 3.0 MM BTU/HR

**Drawing:** 08562-1 Rev 0 **Customer:** ENCANACORP

Description: 3.0 MM BTU/	HK	Customer: ENCANACORP
Part #	Qty	Description/Notes
	29	PRESSURE GAUGE WIKA 2-1/2 IN. F 1/IN.O-30PSI,.DUAL SCALE, STAINLESS STEEL MODEL 233.53, CENTER BACK MOUNT
PI-105	1.00	Pressure Gauge, WIKA, 0 -30 PSI
		PRESSURE GAUGE WIKA 2-1/2 IN. F 1/4 IN. BOTTOM MOUNT,DUAL SCALE, 0 - 30 PSI STAINLESS STEEL,MODEL 233.53
PI-106	1.00	Pressure Gauge, WIKA, 0 - 10000 PS
		PRESSURE GAUGE WIKA 4 IN. F 1/2 IN. BOTTOM MOUNT, 0 - 10000 PSI STAINLESS STEEL, MODEL 233.53
PI-107	1.00	Pressure Gauge, WIKA, 0 - 1500 PSI
		PRESSURE GAUGE WIKA 4 IN. F 1/2 IN. BOTTOM MOUNT,DUAL SCALE, 0 - 1500 PSI STAINLESS STEEL, MODEL 233.53
PI-109/110	2.00	Pressure Gauge, WIKA, 0 - 200 PSI
		PRESSURE GAUGE WIKA 2-1/2 IN. F 1/4 IN. BOTTOM MOUNT,DUAL SCALE, 0 - 200 PSI STAINLESS STEEL,MODEL 233.53
PRV-101	1.00	Fisher 627 Regulator
		REGULATOR PRESSURE FISHER 1 IN. NPT 627-489 5-20 PSI ADJUSTABLE RANGE, 1/2" ORIFICE STD TRIM TAPPED BONNET BODY 500 PSI MAWP
PRV-67CF166338582	2.00	Regulator, Fisher, 0-125psi, 1/4"
		PRV-103/107
		Regulator, Fisher, 0-125psi, 1/4" NPT Tapped-Bonnet, Type: 67 CFR, Adjustable spring range, 5 micron filter, 0-160 psi gauge, adjustable screw with closing cap, temperature range: -20 to 180 Deg F, Tapped Bonnet
PSHH-100	1.00	CCS Pressure switch
		SWITCH, PRESSURE, CCS DUAL SNAP MODEL 6900GZE14, 1/2 IN. NPT, SS CONSTRUCTION, CSA APPROVED, SET @ 14 PSI RISING CALIBRATION CERTIFICATE IS REQUIRED
PSLL-100	1.00	CCS pressure switch
		SWITCH, PRESSURE, CCS DUAL SNAP MODEL 6900GZE12, 1/2 IN. NPT, SS CONSTRUCTION, CSA APPROVED, SET @ 4 PSI FALLING CALIBRATION CERTIFICATE IS REQUIRED
PSV-300	1.00	Relief valve, Taylor 1"
		RELIEF VALVE TAYLOR 1 IN.X 1-1/2" NPT SET AT 150 PSI NACE TRIM "F" ORIFICE. INSP & TEST REPORT REQ'D UV STAMP REQ'D STD SERVICE MODEL 8200 N,FIRE RATED DESIGN BASIS THERMAL RELIEF

## **P&ID Bill of Materials**

ORIGINAL

Job: 08562

Item: Lineheater-08562-2B

Description: 3.0 MM BTU/HR

**Drawing:** 08562-1 Rev 0 **Customer:** ENCANACORP

pescription: 3.0 MM BTG	D/ CIK	Customer: ENCANACORP
Part #	Qty	Description/Notes
SC-100	1.00	SPEED CONTROL VALVE
		SPEED CONTROL VALVE, MODEL NAS4000-NO2, 1/4" NPT, 150 PSI MAWP
SCR-FLOAT-599928	1.00	SCRUBBER FLOAT 2" HLSD
		HLSD-300
		Must be flat disc type, ball type is not approved
SCR823-1	1.00	Fuel Gas Scrubber 8-5/8" OD x 23"
		V-300
		Fuel Gas Scrubber 8-5/8" OD $\times$ 23" S/S 285 PSI, 1/8" C.A, -50 F - 100 F; Radiography None
SOV/UY-100	1.00	1" Fossil POC Valve
		VFossil 1 IN. Gas Safety Shut-off Valve with Proof of Closure Limit Switch 24 volt power source c/w: SS valve, actuator, solenoid and quick dump valve. Approved as a safety shut-off valve assembly to CSA 6.5-2000 C/I (as required by CSA B149.3) Approved to temperatures as low as minus 45 degrees celsius using instrument air.
ST-1	1.00	1" Y Strainer
		Y STRAINER 1 IN. NPT C/W 1/32 IN. PERFORATION MODEL YS800 2000 PSI @ 100F
SY-EF8314H301	1.00	Solenoid ASCO 3-Way, 1/4" NPT SST
		EY-100
	é	Solenoid ASCO 3-Way, 1/4" NPT SST Body 24VDC Coil, CSA Approved Explosion Proof, 130 PSI Maximum Operating Pressure Differential, Low Power 0.55 Watts
TC-100	1.00	Kimray HT-12
		Temperature Controller - KIMRAY. MODEL HT12, SIZE 1/2 IN. NPT 30DEG.F -400 DEG.F TEMP RANGE, 12" PROBE c/w SS THERMOWELL
TCV-100	1.00	Control Valve,Fisher
		VALVE, CONTROL, FISHER MODEL 119, 1" NPT, 9/16 IN PORT, 5-35 PSI RANGE, CAST IRON BODY, 150 PSI MAWP, STD SERVICE
ГН8-16	1.00	Thief Hatch Wenco 16 oz Pressure
		TH-100
		Thief Hatch Wenco 16 oz Pressure Spring 0.4 oz Vaccuum Setting Sweet Service c/w Base Gasket

9:53:51AM

## **P&ID** Bill of Materials



Job: 08562

Item: Lineheater-08562-2B

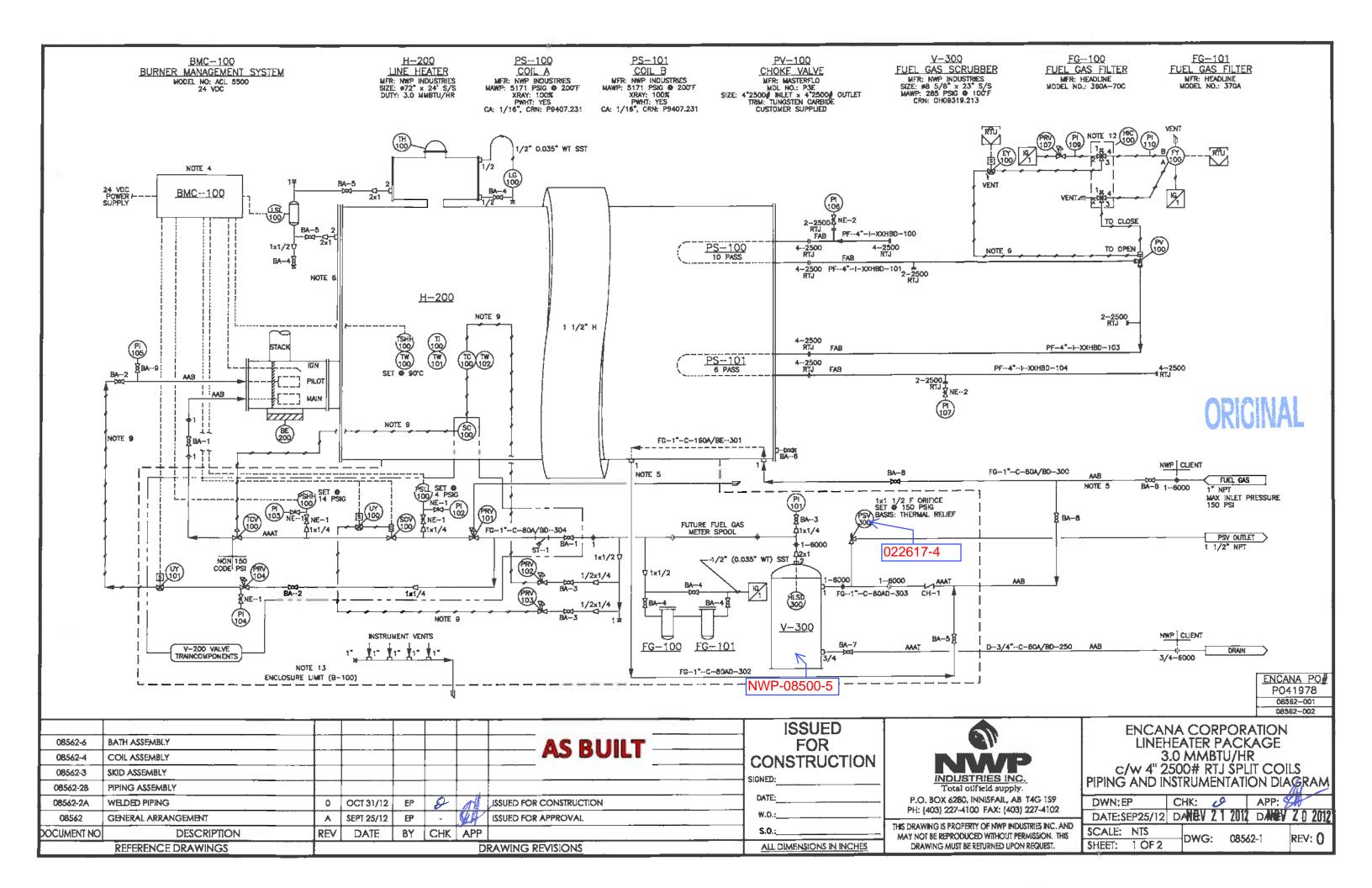
Description: 3.0 MM BTU/HR

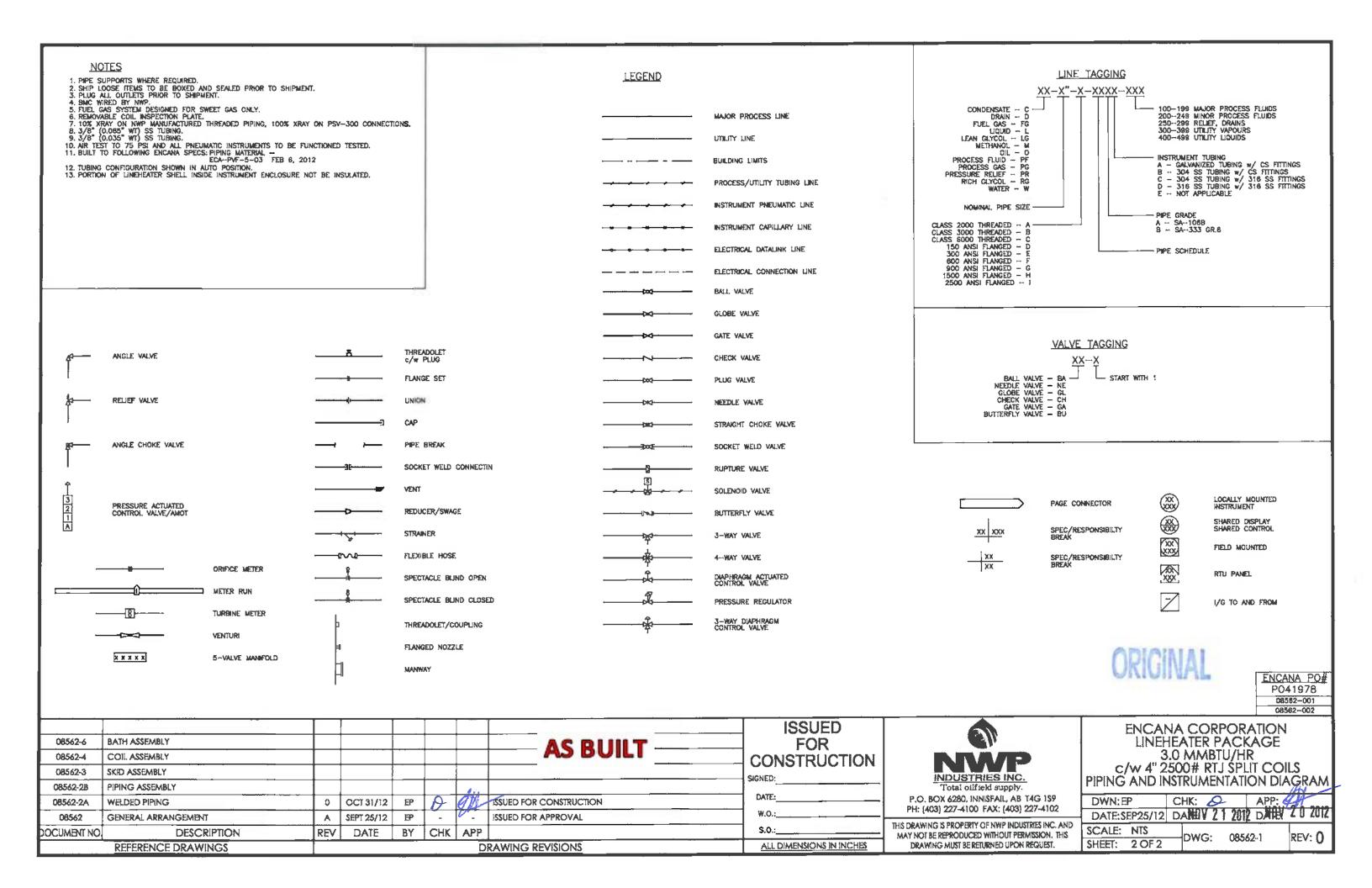
Drawing: 08562-1 Rev 0 Customer: ENCANACORP

ococinption: 5.0 Pin 510/	1111	Customer. ENCANACORP
Part #	Qty	Description/Notes
TI-100	1.00	Thermometer,3" dial
		THERMOMETER 3" DIAL TREND 6" STEM -20 TO 120C / 0 TO 250F 304SS MODEL 33
TSHH-100	1.00	Temperature Switch
		TEMPERATURE SWITCH CCS DUAL SNAP SET @ 90 C RISING C/W FACTORY SET CERTIFICATE MODEL 6900TE 14
TW-100/102	2.00	SEPARABLE SOCKET
		SEPARABLE SOCKET KIMRAY HCE 1 IN. SS-12SS
TW-101	1.00	Thermowell, WIKA 1/2" X 1" X 6"
		THERMOWELL WIKA 1/2" X 1" X 6" 304SS
UY-101	1.00	ASCO Solenoid
		Asco 24VDC Solenoid C/I Rated ANSI Z21.21 & CSA6.5 Certification 1/4" NPT 10.6 Watts P/N HV426716002.
PRV-67CFR362SCSG3	2.00	Regulator, Fisher, 0-35psi, 1/4"
		PRV-102/104
		Regulator, Fisher, 0-35psi, 1/4" NPT Tapped-Bonnet, Type: 67 CFR, Adjustable spring range, 5 micron filter, 0-35 psi gauge, adjustable screw with closing cap, temperature range: -20 to 180 Deg F,Tapped Bonnet
PV/FY100	1.00	CUSTOMER SUPPLIED
		CUSTOMER SUPPLIED
		Master Flo P3E choke,4In 2500RTJ x 4In 250RTJ Nace EE, Trim TC, TC outlet wear sleeve 34J8S-4J8MT72PBY2 Master Flo 100DA actuator, PDA-100PDA100203AAC3E10IV Fisher positioner DVC-6030

Printed on:

21/11/2012 9:53:51AM





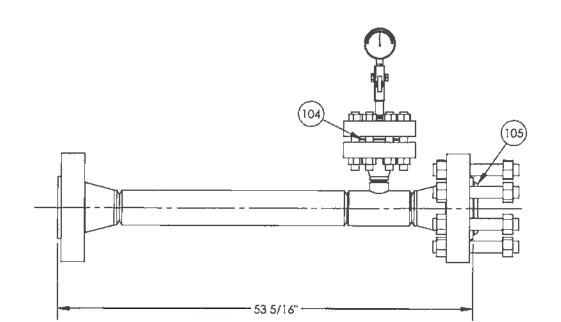
	1 101	233.34*10000	FRESSORE GAOGE WIRA 0-10000 FSHMODEL 200.04 33
	102	BUY	VALVE NEEDLE CENTURY 3/4" M x 1/2" F NPT CM11L1M64TCNISSP100
	103	FLH2.75FYBF	FLANGE HUBBED 2" 2500 ANSI TAPPED 3/4" NPT RTJ SA350LF2-CL1
	104	GASR26YYYD	GASKET 2" 2500 ANSI R26 RTJ MILD STEEL
	105	GASR38YYYD	GASKET 4" 2500 ANSI R38 RTJ MILD STEEL
	106	NUTTYFAY	NUT 1" 2HM HEX
(101)	107	NUT1.5YFAY	NUT 1 1/2" 2HM HEX
	108	PLH.5HYEE	PLUG HEX 1/2" 6M THRD SA 105N
	109	STU1.511HYY	STUD 1 1/2" x 11" LG B7M
108 (102)	110	STU17.5GYY	STUD 1" x 7 1/2" LG B7M
(103)			
(106)			
(107)			
(10	9)		
	/		

PARI#

233.54-10000

-TO PS-100 COIL A INLET

101



## FRONT VIEW SCALE: 1:12

08562-6	BATH ASSEMBLY	-						AS BUILT	 ISSUED FOR CONSTRUCTION
08562-3	SKID ASSEMBLY	†					-		 SIGNED:
08562-2A	WELDED PIPING	1							 DATE:
08562-1	PIPING AND INSTRUMENTATION DIAGRAM	1				Ac.	_		
08562	GENERAL ARRANGEMENT	0	OCI 05/12	VW	9	414	ISSUED FOR	CONSTRUCTION	W.O.:
OCUMENT NO.	DESCRIPTION	REV	DATE	BY	СНК	APP	Ì		 S/N:
	REFERENCE DRAWINGS						DRAWING REV	ISIONS	ALL DIMENSIONS IN IN

ISOMETRIC VIEW
SCALE: 1:12

## )R TION

DESCRIPTION

PRESSURE GAUGE WIKA 0-10000 PSI MODEL 233.54 SS

NOTES

1. ALL DIMENSIONS SHALL HAVE A TOLERANCE OF ±1/8" UNLESS OTHERWISE SPECIFIED.

2. DIMENSIONS INCLUDE 1/8" ROOT GAP.

3. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.

4. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY. SHOP TO

MTR # LENGTH QTY.

16

16

2

8

8

- ADJUST PIPE LENGTHS AS REQUIRED.
  5. HARDNESS TESTING MAX 200 BNH 10%.

	DESIGN D	ATA		
	LINE NUMBER:	PF-4"-I-XXHBD-100		
	CLIENT SPECIFICATION:	ENCAÑA FAB		
DE	SIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION		
	DESIGN PRESSURE:	5171 PSIG		
MUMIXAM	DESIGN TEMPERATURE:	200 °F		
MUMINIM	DESIGN TEMPERATURE:	-49 °F		
	SERVICE:	HYDROCARBONS		
HYDRO	OSTATIC TEST PRESSURE:	7757 PSIG		
	RADIOGRAPHY:	100%		
	OTHER NDE:	SEE NOTE 5		
POST W	ELD HEAT TREATMENT:	1150°F TO 1175°F FOR 1HR MIN.		
COR	ROSION ALLOWANCE:	1/16"		
	Q.C. PROGRAM NO.:	AQP-1253		
WELDING PROCEDU	RE REGISTRATION NO.:	WP-1604.2		
	51.61			

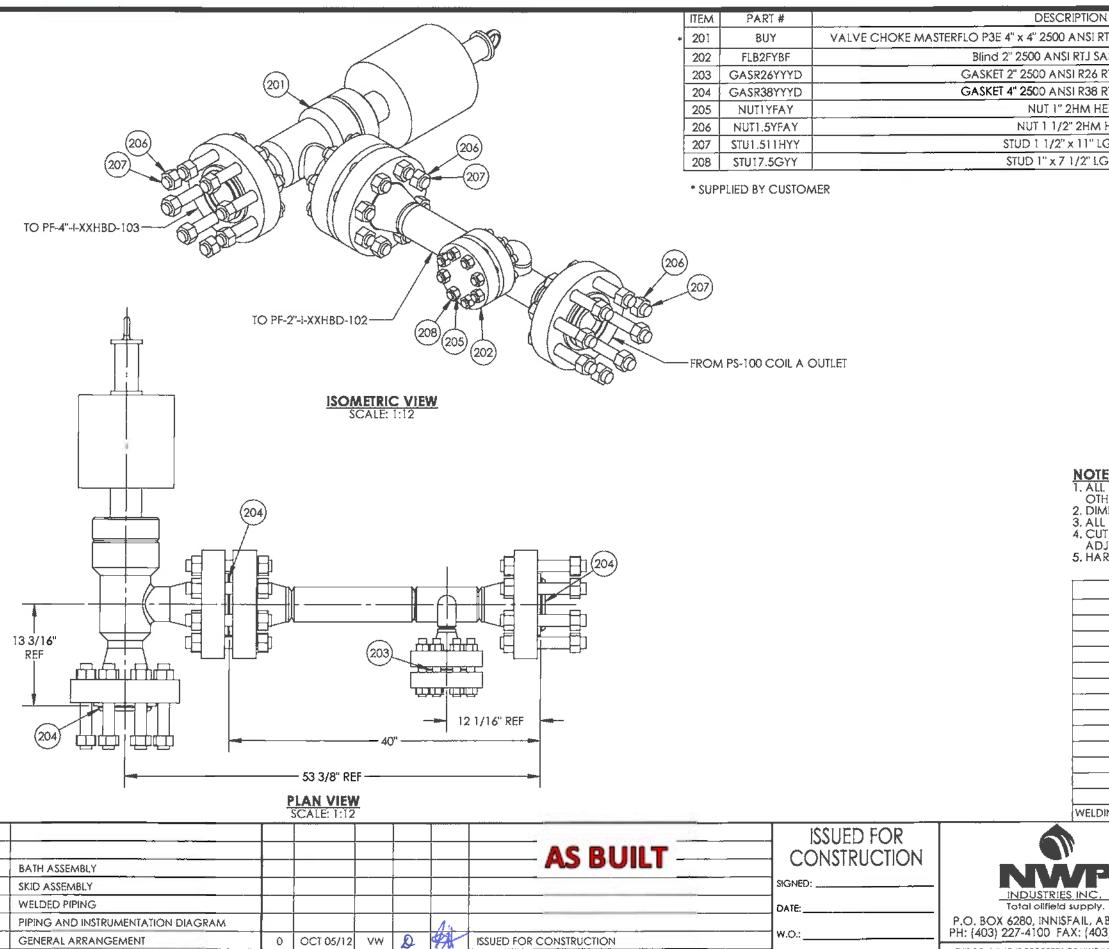
INDUSTRIES INC.
Total olifield supply.

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**ENCANA CORPORATION** LINEHEATER PACKAGE

3.0 MMBTU c/w 4"-2500# RTJ SPLIT COILS PIPING ASSEMBLY

DWN: VW CHK: APP: APP: DATE: OCT 05/12 DATE: OCT 05/12 DATE: OCT 20 20 20 20 AND 19 2012 SCALE: 1:12 DWG: 08562-28 REV: 0 SHEET: 1 OF 8



08562-6

08562-3

08562-2A

08562-1

08562

DOCUMENT NO.

DESCRIPTION

REFERENCE DRAWINGS

REV

DATE

BY

CHK APP

DRAWING REVISIONS

MTR # LENGTH QTY. VALVE CHOKE MASTERFLO P3E 4" x 4" 2500 ANSI RTJ w/ MASTERFLO PDA 100 ACTUATOR Blind 2" 2500 ANSI RTJ SA350LF2-CL1 GASKET 2" 2500 ANSI R26 RTJ MILD STEEL GASKET 4" 2500 ANSI R38 RTJ MILD STEEL 3 NUT 1" 2HM HEX 16 48 NUT 1 1/2" 2HM HEX 24 STUD 1 1/2" x 11" LG B7M 8 STUD 1" x 7 1/2" LG B7M

NOTES

1. ALL DIMENSIONS SHALL HAVE A TOLERANCE OF ±1/8" UNLESS

OTHERWISE SPECIFIED.

2. DIMENSIONS INCLUDE 1/8" ROOT GAP. 3. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.

4, CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY, SHOP TO

ADJUST PIPE LENGTHS AS REQUIRED.
5. HARDNESS TESTING - MAX 200 BNH 10%.

DESIGN D	ATA
LINE NUMBER:	PF-4"-I-XXHBD-101
CLIENT SPECIFICATION:	ENCANA FAB
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
DESIGN PRESSURE:	5171 PSIG
MAXIMUM DESIGN TEMPERATURE:	200°F
MINIMUM DESIGN TEMPERATURE:	49 °F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	7757 PSIG
RADIOGRAPHY:	100%
OTHER NDE:	SEE NOTE 5
POST WELD HEAT TREATMENT:	1150°F TO 1175°F FOR THR MIN.
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	WP-1604.2
· · · · · · · · · · · · · · · · · · ·	



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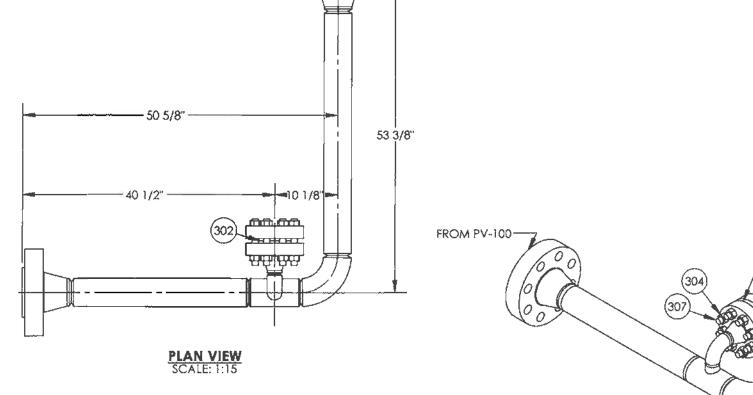
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ALL DIMENSIONS IN INCHES

**ENCANA CORPORATION** LINEHEATER PACKAGE 3.0 MMBTU

c/w 4"-2500# RTJ SPLIT COILS PIPING ASSEMBLY

APP: 944 DWN: VW DATE: OCT 05/12 DANEY Z U 2012 DANEY 19 2012 SCALE: 1:12 DWG: 08562-2B REV: 0 SHEET: 2 OF 8



ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
301	FLB2FYBF	Blind 2" 2500 ANSI RTJ SA350LF2-CL1			1
302	GASR26YYYD	GASKET 2" 2500 ANSI R26 RTJ MILD STEEL			1
303	GA\$R38YYYD	GASKET 4". 2500 ANSI R38 RTJ MILD STEEL			1
304	NUTTYFAY	NUT I" 2HM HEX			16
305	NUT1.5YFAY	NUT 1 1/2" 2HM HEX			16
306	STU1.511HYY	STUD 1 1/2" x 11" LG B7M			8
307	STU17.5GYY	STUD 1" x 7 1/2" LG B7M		<u> </u>	8

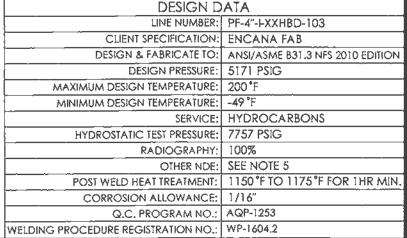
TO P\$-101 COIL B INLET

NOTES

1. ALL DIMENSIONS SHALL HAVE A TOLERANCE OF ±1/8" UNLESS OTHERWISE SPECIFIED.

2. DIMENSIONS INCLUDE 1/8" ROOT GAP.
3. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.
4. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY. SHOP TO ADJUST PIPE LENGTHS AS REQUIRED.

5. HARDNESS TESTING - MAX 200 BNH 10%.



## 6 1/2" REF.

FRONT VIEW
SCALE: 1:15

08562-6

08562-3

**BATH ASSEMBLY** 

SKID ASSEMBLY

ISSUED FOR CONSTRUCTION SIGNED:

FROM PF-2"-EXXHBD-102

ISOMETRIC VIEW

**AS BUILT** 

(306)

INDUSTRIES INC. Total cilfield supply.

P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102

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**ENCANA CORPORATION** LINEHEATER PACKAGE 3.0 MMBTU

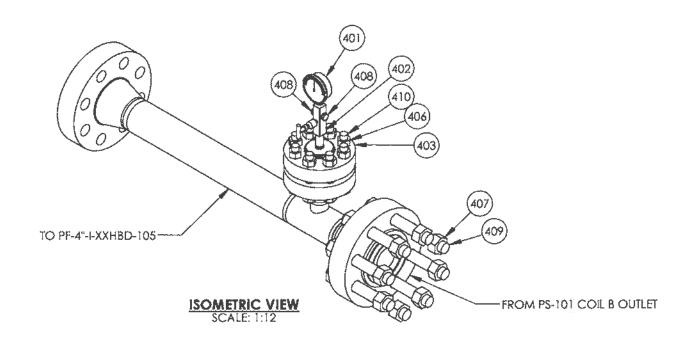
c/w 4"-2500# RTJ SPLIT COILS

PIPING ASSEMBLY APP: 🔀 DWN: VW DATE: OCT 05/12 DATION 2 8 2012 DATION 19 2012

08562-2A WELDED PIPING 08562-1 PIPING AND INSTRUMENTATION DIAGRAM ISSUED FOR CONSTRUCTION GENERAL ARRANGEMENT 08562 0 OCT 05/12 VW DATE CHK APP DOCUMENT NO. DESCRIPTION REV BY ALL DIMENSIONS IN INCHES REFERENCE DRAWINGS DRAWING REVISIONS

SCALE: 1:15 DWG: 08562-2B SHEET: 3 OF 8

REV: 0

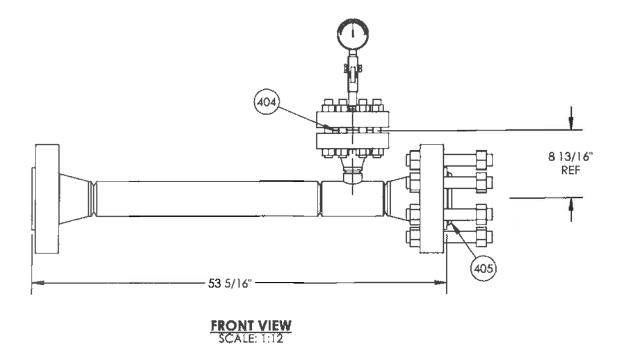


ITEM	PART#	DESCRIPTION	MTR#	LENGTH	QIY.
401	233.54-10000	PRESSURE GAUGE WIKA 0-10000 PSI MODEL 233.54 SS		ĺ	1
402	BUY	VALVE NEEDLE CENTURY 3/4" M x 1/2" F NPT CM11L1M64TCNTSSP100			ı
403	FLH2.75FYBF	FLANGE HUBBED 2" 2500 ANSI TAPPED 3/4" NPT RTJ SA350LF2-CL1			1
404	GA\$R26YYYD	GASKET 2" 2500 ANSI R26 RTJ MILD STEEL			1
405	GA\$R38YYYD	GASKET 4" 2500 ANSI R38 RTJ MILD STEEL			1
406	NUTTYFAY	NUT I" 2HM HEX			16
407	NUT1.5YFAY	NUT 1 1/2" 2HM HEX			16
408	PLH.5HYEE	PLUG HEX 1/2" 6M THRD \$A105N		<u> </u>	2
409	STU1.511HYY	STUD 1 1/2" x 11" LG B7M			8
410	STU17.5GYY	STUD 1" x 7 1/2" LG B7M			8

- NOTES

  1. ALL DIMENSIONS SHALL HAVE A TOLERANCE OF ±1/8" UNLESS OTHERWISE SPECIFIED.
  2. DIMENSIONS INCLUDE 1/8" ROOT GAP.
  3. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.
  4. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY. SHOP TO ADJUST PIPE LENGTHS AS REQUIRED.
  5. HARDNESS TESTING MAX 200 BNH 10%.

DESIGN D	ATA
LINE NUMBER:	PF-4"-I-XXHBD-104
CLIENT SPECIFICATION:	ENCANA FAB
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
DESIGN PRESSURE:	5171 PSIG
MAXIMUM DESIGN TEMPERATURE:	200°F
MINIMUM DESIGN TEMPERATURE:	-49 °F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	7757 PSIG
RADIOGRAPHY:	100%
OTHER NDE:	SEE NOTE 5
POST WELD HEAT TREATMENT:	1150°F TO 1175°F FOR 1HR MIN.
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	WP-1604.2



08562-6	BATH ASSEMBLY						AS BUILT
08562-3	SKID ASSEMBLY	_				_	
08562-2A	WELDED PIPING	$\dashv$					
08562-1	PIPING AND INSTRUMENTATION DIAGRAM	1				Ac	
08562	GENERAL ARRANGEMENT	0	OCT 05/12	VW	8	4	ISSUED FOR CONSTRUCTION
DOCUMENT NO.	DESCRIPTION	REV	DATE	ВҮ	CHK	APP	
	REFERENCE DRAWINGS						DRAWING REVISIONS

# ISSUED FOR CONSTRUCTION

ALL DIMENSIONS IN INCHES

INDUSTRIES INC. Total oilfield supply.

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**ENCANA CORPORATION** LINEHEATER PACKAGE

3.0 MMBTU

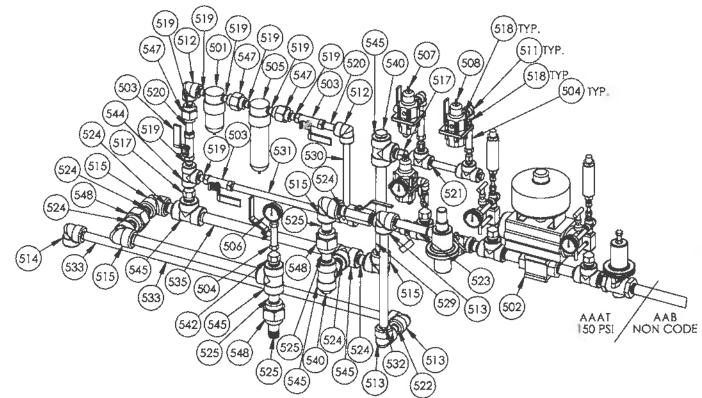
c/w 4"-2500# RTJ SPLIT COILS

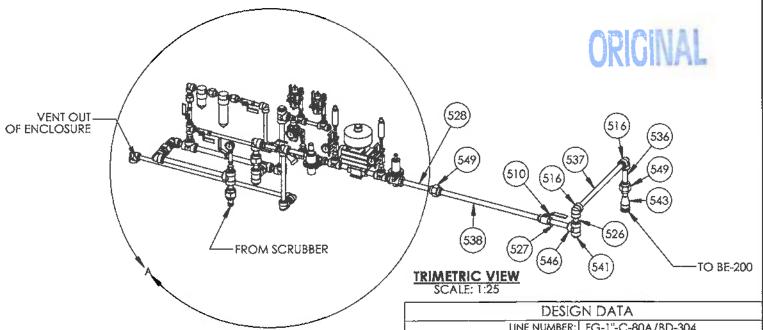
PIPING ASSEMBLY 

SCALE: 1:12 DWG: 08562-2B SHEET: 4 OF 8

IEM	PART#	DESCRIPTION	MIR#	LENGIH	QIY.
501	100218	FILTER, HEADLINE, MDL 360A-70, MAWP 500 PSI, 1/2" NPT			1
502	100963	VALVE TRAIN ENCANA SPEC L-R FLOW			1
503	BUY	BALL VALVE NUTRON 1/2" 3000 PSI NPT FP NACE T3			3
504	BUY	BALL VALVE NUTRON 1/4" 3000 PSI NPT FP STD T3			3
505	BUY	FILTER, HEADLINE, MDL 370A, MAWP 500 PSI, 1/2" NPT		,	1
506	BUY	PRESSURE INDICATOR WIKA 2 1/2" FACE x 1/4" NPT 0-200 PSI SS			1
507	BUY	PRESSURE REGULATOR FISHER 67CFR 0-35 PSI SPRING STD TRIM			1
808	BUY	PRESSURE REGULATOR FISHER 67CFR 0-125 PSI SPRING STD TRIM			1
509	BUY	SWAGE 1/2" x 1/4" SCH XH/80 THRD 316 SST			22
510	BUY	VALVE BALL EMICO 1" NPT 720 SERIES 600 PSI WOG FP		<u> </u>	
511	EL9.25HYEE	Elbow 90 Deg 1/4" 6M THRD SA 105N		<u> </u>	2
512	EL9.5HYEE	Elbow 90 Deg 1/2" 6M THRD SA 105N			2
513	EL9.75HYEE	Elbow 90 Deg 3/4" 6M THRD \$A 105N			3
514	EL9.75HYEF	ELBOW 90 DEG 3/4" 6M THRD SA350-LF2-CL1			ļ
515	EL91HYEE	Elbow 90 Deg 1" 6M THRD SA 105N			4
516	EL91HYEF	ELBOW 90 DEG 1" 6M THRD SA350-LF2-CL1			2
517	SWA1.5Y80EE	SWAGE 1" x 1/2" SCH XH,80 THRD \$A105N			2
518	NIP.252Y80EK	NIPPLE 1/4" x 2" \$CH XH/80 316/316L \$\$T			4
519	NIP,52Y80EA	NIPPLE 1/2" x 2" SCH XH/80 \$A106-8		<del> </del>	8
520	NIP.53Y80EA	NIPPLE 1/2" x 3" SCH XH/80 SA 106-8		<del>                                     </del>	2
521	NIP.55Y80EA	NIPPLE 1/2" x 5" SCH XH/80 SA 106-B		-	
522	NIP.752.5Y80EA	NIPPLE 3/4" x 2 1/2" SCH XH/80 SA 106-B			!
523	NIP.756Y80EA	NIPPLE 3/4" x 6" SCH XH/80 SA 106-B			
524	NIP12.5Y80EA	NIPPLE 1" x 2 1/2" SCH XH/80 SA 106-B	<del></del>	-	- 6
525	NIP13Y80EA	NIPPLE 1" x 3" SCH XH/80 \$A 106-B			
526	NIP13Y80EB	NIPPLE 1" x 3" \$CH XH/80 \$A333-6			!
527	NIP18Y80EB	NIPPLE 1" x 8" SCH XH/80 SA333-6			

HEM	PART#	DESCRIPTION	I MTR#	LENGTH	QIY.
528	NIP110Y80EB	NIPPLE 1" x 10 SCH XH/80 SA333-6			Ì
529	NIP115Y80EA	NIPPLE 1" x 15" \$CH XH/80 \$A 10 <b>6-</b> 8			
530	PIP.580A	PIPE 1/2" \$CH XH/80 \$A 106B TE		11"	1
531	PIP.580A	PIPE 1/2" SCH XH/80 \$A 1068 TE		16 3/16"	1
532	PIP.7580A	PIPE 3/4" SCH XH/80 SA 1068 TE	<u> </u>	15 5/8"	11
533	PIP.7580B	PIPE 3/4" SCH XH/80 SA333-6 TE	<u> </u>	45 11/16"	
534	PIP180A	PIPE 1" SCH XH/80 SA 1068		19 11/16"	
535	PIP180A	PIPE 1" SCH XH/80 SA 1068		20 1/16"	]
536	PIP1808	PIPE 1" SCH XH/80 SA333-6 TE		5 7/8"	1
537	PIP1808	PIPE 1" SCH XH/80 SA333-6 TE		<b>2</b> 5 13/16"	
538	PIP180B	PIPE 1" SCH XH/80 SA333-6 TE		31 5/16"	
539	PLH.5HYEE	PLUG HEX 1/2" 6M THRD \$A 105N	ļ		
540	PLHIHYEE	PLUG HEX 1" 6M THRD SA 105N		<u> </u>	2
541	PLH1HYEF	PLUG HEX 1" 6M THRD SA350-LF2-CL1			
542	SWA1.25Y80EK	SWAGE 1" x 1/4" SCH XH/80 THRD 316 SST		-	
543	SWA21Y80EF	SWAGE 2" x 1" SCH XH/80 THRD \$A350LF2-CL1			1
544	TEE.5HYEE	Tee 1/2" 6M THRD SA 105N			4
545	TEETHYEE	Tee 1" 6M THRD SA 105N			5
546	TEETHYEF	TEE 1" 6M THRD SA350-LF2-CL1	ļ		
547	UNN,5HYEE	UNION 1/2" 6M THRD SA 105N	<u> </u>	<u> </u>	3.
548	UNN 1 HYEE	UNION 1" 6M THRD SA 105N		<u> </u>	3
549	UNNTHYER	UNION 1" 6M THRD \$A350-LF2-CL1	<u> </u>		2





NOTES
1. SHOP TO ADJUST RANDOM PIPE LENGTHS AS REQUIRED.
2. 10% XRAY ON NWP MANUFACTURED THREADED PIPING.

ALL DIMENSIONS IN INCHES

LINE NUMBER:	FG-1"-C-80A/BD-304
CLIENT SPECIFICATION:	ENCANA AAAT/AAB
DESIGN & FABRICATE TO:	ANSI/ASME 831.3 NFS 2010 EDITION
DESIGN PRESSURE:	150 PSIG
MAXIMUM DESIGN TEMPERATURE:	100°F
MINIMUM DESIGN TEMPERATURE:	-20°F/-49°F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	225 PSIG
JOINT SEALANT:	JET LUBE TF-15
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253

			AS BILLET	ISSUED FOR CONSTRUCTION
08562-6	BATH ASSEMBLY		AS BUILT	CONSTRUCTION
39543.3	CNID ACCENTAGE V		 "	SIGNED:

085 08562-3 SKID ASSEMBLY 08562-2A WELDED PIPING 08562-1 PIPING AND INSTRUMENTATION DIAGRAM ISSUED FOR CONSTRUCTION 08562 GENERAL ARRANGEMENT OCT 05/12 VW REV BY CHK APP DOCUMENT NO. DATE DESCRIPTION REFERENCE DRAWINGS DRAWING REVISIONS

DETAIL 'A' SCALE: 1:8

Total oilfield supply.

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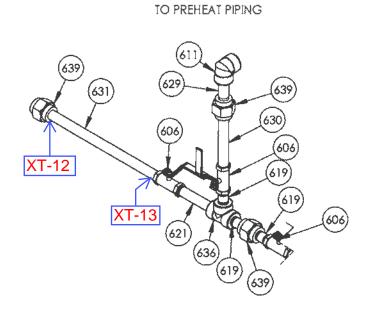
**ENCANA CORPORATION** LINEHEATER PACKAGE

3.0 MMBTU c/w 4"-2500# RTJ SPLIT COILS

PIPING ASSEMBLY

DWN: VW CHK: APP: 944

DATE: OCT 05/12 DATHOV 2 1 2012 DATHOV 2 1 2012 SCALE: 1:25 DWG: 08562-2B REV: 0 SHEET: 5 OF 8



	<del>.</del>
DESIG	N DATA
LINE NUMBER:	FG-1"-C-80A/BD-300/304
CLIENT SPECIFICATION:	ENCANA AAAT/AAB
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2008 EDITION
DESIGN PRESSURE:	150 PSIG
MAXIMUM DESIGN TEMPERATURE:	100°F
MINIMUM DESIGN TEMPERATURE:	-20° F/-49°F
SERVICE:	HYDROCARBONS
HYDROSTATIC TEST PRESSURE:	225 PSIG
JOINT SEALANT:	JET LUBE TF-15
CORROSION ALLOWANCE:	1/16"
Q.C. PROGRAM NO.:	AQP-1253

# ORIGINAL

ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
601	385935	SCRUBBER BASE FORMED 9" W X 11" LG X 2" H x 10 GA, SA-36/44W			Ī
602	599928	SCRUBBER FLOAT - 2" FOR HLSD			Ī
603	926312	8 5/8" OD x 23" S/S SWEET FUEL GAS SCRUBBER			I
604	BOL.52KY	BOLT 1/2" x 2" LG GR. 5 HEX HEAD			4
605	8UY	BALL VALVE NUTRON 1" 3000 PSI T3			1
606	BUY	BALL VALVE NUTRON 1" 3000 PSI NPT RP LOW TEMP T3.			3
607	8UY	BALL VALVE NUTRON 3/4" 3000 PSI T3			1
608	BUY	TAYLOR RELIEF VALVE 1" x 1 1/2", SET @ 150 PSI, NACE TRIM (8200 SERIES)		*	1
609	BUY	VALVE SWING CHECK WHEATLEY 1"'NPT :			1
610	EL91HYEE	2160 PSI P/N 9D::822-013216-166 Elbow 90 Deg 1" 6M THRD \$A105N			6
611	EL91HYEF	ELBOW 90 DEG 1" 6M THRD SA350-LF2-			1
612	EL91.5HYEE	ELBOW 90 DEG 1 1/2" 6M THRD SA 105N			1
613	EL91.5HYEF	ELBOW 90 DEG 1 1/2" 6M THRD \$A350- LF2-CL1			1
614	NIP.753Y80EA	NIPPLE 3/4" x 3" \$CH XH/80 \$A106-B			1
615	NIP1.53Y80EA	Nipple 1-1/2 " X 3 " \$/80 SA 106B			1
616	NIP1.54Y80EA	Nipple 1-1/2 " X 4 " S/80 SA 106B			1
617	NIP12Y80EA	NIPPLE 1 x 2" SCH XH/80 SA 106-B			Į.
618	NIP13Y80EA	NIPPLE 1" x 3" SCH XH/80 \$A 106-B		-	3
619	NIP13Y80EB	NIPPLE I" x 3" \$CH XH/80 \$A333-6		-	3
620	NIP14Y80EA	NIPPLE 1" x 4" SCH XH/80 \$A 106-B		-	7
621	NIP17Y80EB	NIPPLE_I" x 7" \$CH XH/80 \$A333-6		-	1
622	NUT.5YBAA	NUT 1/2" GR. 2 HEX PLATED			4
623	PIP.7580B	PIPE 3/4" SCH XH/80 SA333-6 TE		18 5/16"	1
624	PIP1.580B	PIPE 1 1/2" SCH XH/80 \$A333-6 TE		41 3/16"	1
625	PIP180A	PIPE 1" SCH XH/80 SA 106B		4 1/16"	1
626	PIP180A	PIPE 1" SCH XH/80 SA 106B		8 1/2"	Ī
627	PIP180A	PIPE 1" SCH XH/80 SA 106B		9 5/16"	1
628	PIP180A	PIPE 1" SCH XH/80 SA 106B		10 5/8"	1
629	PIP180B	PIPE 1" SCH XH/80 SA333-6 TE		4 1/16"	1
630	PIP180B	PIPE 1" SCH XH/80 SA333-6 TE		9"	1
631	PIP180B	PIPE 1" \$CH XH/80 \$A333-6 TE		20 7/8"	1
632	PIP180B	PIPE 1" SCH XH/80 SA333-6 TE		69 15/16" 162	1
633	PIP180B	PIPE 1" SCH XH/80 SA333-6 TE		162 13/16"	1
634	PLH.75HYEF	PLUG HEX 3/4" 6M THRD \$A350-LF2-CL1			1
635	TEETHYEE	Tee 1" 6M THRD SA 105N	ļ <u></u>		2
636	TEETHYEF	TEE 1" 6M THRD SA350-LF2-CL1			1
637	UNN.75HYEF	UNION 3/4" 6M THRD SA350-LF2-CL1			1
638	UNNTHYEE	UNION 1" 6M THRD SA 105N			5
639	UNN1HYEF	UNION 1" 6M THRD \$A350-LF2-CL1	ļ		4
640	UNN1.5HYEE	UNION 1 1/2" 6M THRD \$A 105N			1

FLAT WASHER 1/2" GR. 5 PLATED

NOTES
1. SHOP TO ADJUST RANDOM PIPE LENGTHS AS REQUIRED.
2. 10% XRAY ON NWP MANUFACTURED THREADED PIPING.
100%XRAY ON PSV-300 CONNECTIONS.

DESIG	SN DATA						
LINE NUMBER:	D-3/4"-C-80A/BD-250						
CLIENT SPECIFICATION:	ENCANA AAAT/AAB						
DESIGN & FABRICATE TO:	ANSI/ASME 831,3 NFS 2010 EDITION						
DESIGN PRESSURE:	150 P\$IG						
MAXIMUM DESIGN TEMPERATURE:	100°F						
MINIMUM DESIGN TEMPERATURE:	-20°F/-49F						
SERVICE:	HYDROCARBONS						
HYDROSTATIC TEST PRESSURE:	225 PSIG						
JOINT SEALANT:	JET LUBE TF-15						
CORROSION ALLOWANCE:	1/16"						
Q.C. PROGRAM NO.:	AQP-1253						
DESIG	N DATA						
LINE NUMBER:	FG-1"-C-80AD-302/303						
CLIENT SPECIFICATION:	ENCANA AAAT						
DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION						
DESIGN PRESSURE:	150 PSIG						
MAXIMUM DESIGN TEMPERATURE:	100°F						
MINIMUM DESIGN TEMPERATURE:	-20°F						
SERVICE:	HYDROCARBONS						
HYDROSTATIC TEST PRESSURE:	225 PSIG						
JOINT SEALANT:	JET LUBE TF-15						
CORROSION ALLOWANCE:	1/16"						
Q.C. PROGRAM NO.:	AQP-1253						

PIPING AND INSTRUMENTATION DIAGRAM

DESCRIPTION

08562-6

08562-3

08562-2A

08562-1

08562

DOCUMENT NO.

BATH ASSEMBLY

SKID ASSEMBLY

WELDED PIPING

GENERAL ARRANGEMENT

REFERENCE DRAWINGS

613 XT-11 624	
7 XT-8 (640)(616)	
XT-7 XT-9 (612) FRC FG-	DM 1"-C-160A/BE-301
639 XT-6 (618) (610) (605) (626) (620) (605)	
638 XT-3	638
623 607 603 XT-2 XT-2 XT-2	625)
614	610 627
603 ISOMETRIC VIEW XT-15 638 SCALE: 1:8	620

**AS BUILT** 

issued for construction

DRAWING REVISIONS

0 OCT 05/12

DATE

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VW

BY

CHK APP

ISSUED FOR CONSTRUCTION	
SIGNED:	
DATE:	
w.o.:	P.O. PH: (4
S/N:	THIS D AND M SIHT



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P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH; (403) 227-4100 FAX; (403) 227-4102

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LINEHEATER PACKAGE
3.0 MMBTU
c/w 4"-2500# RTJ SPLIT COILS

8

PIPING ASSEMBLY

DWN: VW CHK: APP:

DATE: OCT 05/12 DATE V2 2012 DATE V2 2012

SCALE: 1:8

SHEET: 6 OF 8

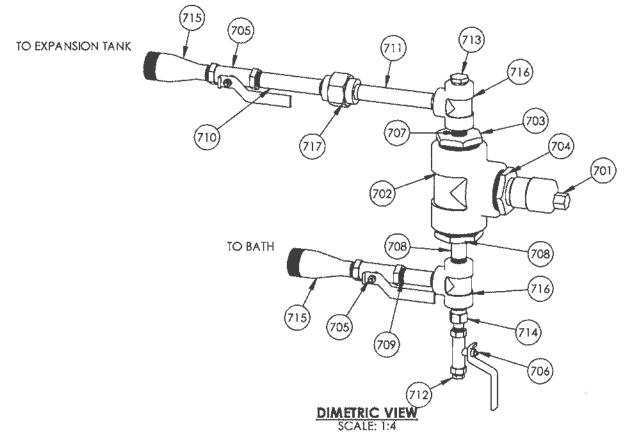
PIPING ASSEMBLY

APP:

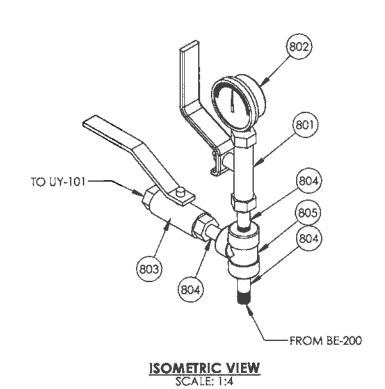
APP:

PREV: 0

ПЕМ	PART#	DESCRIPTION	MTR #	LENGTH	QTY.
701	BUY	LEVEL SWITCH ELECTRIC SOR 2" NPT MODEL 1510C-G2A-C-L9-ES- CSNCCVMC			1
702	140813	TEE 3" FS 3M THREADED			1_1_
703	BUS31YYEE	BUSHING 3" x 1" SA 105N	7	]	2
704	BUS32YYEE	BUSHING 3" x 2" SA 105N			1
705	BUY	BALL VALVE NUTRON 1" 3000 PSI NPT RP NACE T3	1		2
706	BUY	BALL VALVE NUTRON 1/2" 3000 PSI NPT FP STD T3			1
707	NIP12Y80EA	NIPPLE 1 x 2" SCH XH/80 SA 106-B	1	-	1
708	NIP13.5Y80EA	NIPPLE 1" x 3 1/2" SCH XH/80 SA 106-B		-	1
709	NIP14.5Y80EA	NIPPLE 1" x 4 1/2" SCH XH/80 SA 106-B			I
710	NIP17.5Y80EA	NIPPLE 1" x 7 1/2" SCH XH/80 SA 106-B	1	**	1
711	PIP180A	PIPE 1" SCH XH/80 SA 106B		8 3/4"	1
712	PLH.5HYEE	PLUG HEX 1/2" 6M THRD SA 105N		Ĭ	1
713	PLHIHYEE	PLUG HEX 1" 6M THRD \$A 105N	1		1
714	SWA1.5Y80EE	SWAGE 1" x 1/2" SCH XH.80 THRD SA105N	Ĭ		1
715	SWA21Y80EE	SWAGE 2" x 1" SCH XH/80 THRD SA 105N			2
716	TEE1 HYEE	Tee 1" 6M THRD SA 105N			2
717	UNNIHYEE	UNION 1" 6M THRD \$A 105N			1



Тпем	PART#	DESCRIPTION	MTR #	LENGTH	QĩY.
801	BUY	BALL VALVE NUTRON 1/4" 3000 PSI LOW TEMP T3			1
802	BUY	PRESSURE INDICATOR WIKA 2 1/2" FACE x 1/4" NPT 0-30 PSI SS			1
803	BUY	VALVE BALL EMICO 1/4" NPT 720 SERIES 600 PSI SS FP			1
804	NIP.252Y80EB	NIPPLE 1/4" x 2" SCH XH/80 SA333-6		-	3
805	TEE.25HYFF	TEE 1/4" 6M SW \$A350-LF2-CL1			1



NOTES

1. SHOP TO ADJUST RANDOM PIPE LENGTHS AS REQUIRED.

## ORIGINAL

		+-	<u> </u>	,			AS BUILT
08562-6	BATH ASSEMBLY		İ		<u> </u>		AS BUILI
08562-3	SKID ASSEMBLY						
08562-2A	WELDED PIPING						
08562-1	PIPING AND INSTRUMENTATION DIAGRAM					An	
08562	GENERAL ARRANGEMENT	0	OCT 05/12	VW	0	0	ISSUED FOR CONSTRUCTION
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	СНК	APP	
	REFERENCE DRAWINGS		•				DRAWING REVISIONS

# ISSUED FOR CONSTRUCTION

iiGNED: ______

W,O.:____

ALL DIMENSIONS IN INCHES



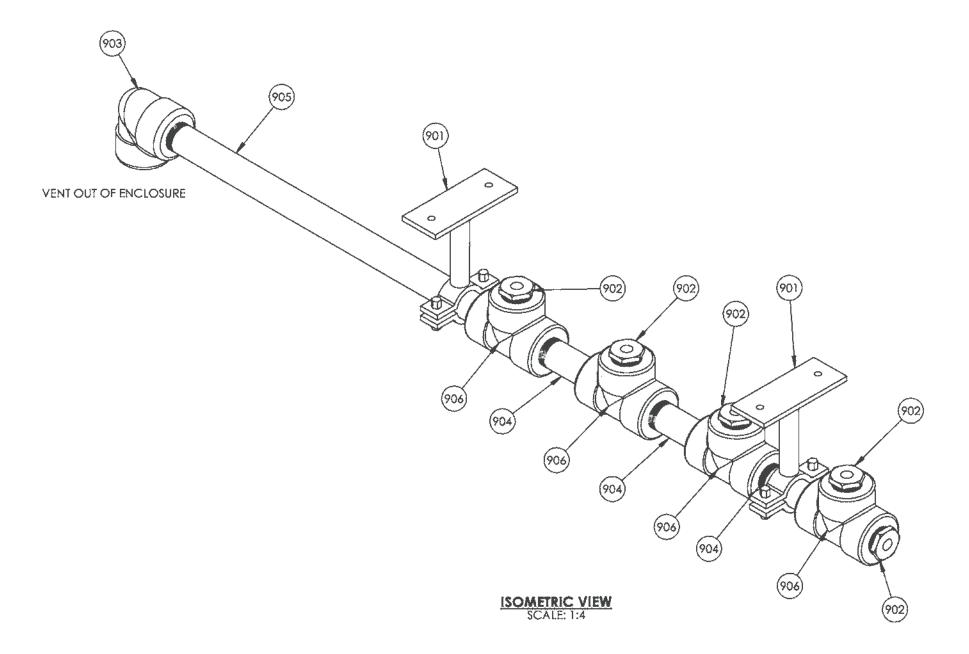
INDUSTRIES INC. Total oilfield supply. P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102

THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST. ENCANA CORPORATION LINEHEATER PACKAGE

3.0 MMBTU
c/w 4"-2500# RTJ SPLIT COILS
PIPING ASSEMBLY

DWN: VW CHK: Q APP: APP. DATE: OCT 05/12 DATE V 2012 DATE V 19 2012

SCALE: 1:4 DWG: **08562-28** REV: **0** 



ITEM	PART#	DESCRIPTION	MTR #	LENGTH	QTY.
901	100812	BRACKET, FUEL GAS VENT HEADER 1"			2
902	706720	1" x 1/4" FS THRD HEX BUSHING			5
903	EL91HYEF	ELBOW 90 DEG 1" 6M THRD \$A350-LF2-CL1			1
904	NIP14Y80EA	NIPPLE 1" x 4" SCH XH/80 SA 106-B		-	3
905	NIP120Y80EB	NIPPLE 1" x 20 SCH XH/80 \$A333-6		+	1
906	TEETHYEE	Tee 1" 6M THRD SA 105N			4

NOTES

1. SHOP TO ADJUST RANDOM PIPE LENGTHS AS REQUIRED.
2. 10% XRAY ON NWP MANUFACTURED THREADED PIPING.

08562-6	BATH ASSEMBLY						AS BUILT	ISSUED FOR CONSTRUCTION
08562-3	SKID ASSEMBLY							SIGNED:
08562-2A	WELDED PIPING							DATE:
08562-1	PIPING AND INSTRUMENTATION DIAGRAM					AT L		
08562	GENERAL ARRANGEMENT	0	OCT 05/12	VW	9	404	ISSUED FOR CONSTRUCTION	w.o.:
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP		S/N:
	REFERENCE DRAWINGS						DRAWING REVISIONS	ALL DIMENSIONS IN INCHES

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ENCANA CORPORATION LINEHEATER PACKAGE 3.0 MMBTU <u>INDUSTRIES INC.</u> Total olifleld supply. P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102

c/w 4"-2500# RTJ SPLIT COILS PIPING ASSEMBLY

DWN: VW DATE: OCT 05/12 DATNOV 2 0 2012 DAWOV 19 2012 SCALE: 1:4 DWG: 08562-28 SHEET: 8 OF 8

Table 2: Summary of Piping Classes

Piping Class	Pipe Sch	Fitting Rating PSI	Flange Rating	Mat.	MDMT Deg F	Service	Corrosion Allowance Inches
AAA	80	3000	150	CS	-20	Sweet hydrocarbons	1/16
AAAT	80	2000	150	CS	-20	Sweet hydrocarbons, threaded	0.0394
AAB	80	3000	150	LT\CS	-49	Low temp, sweet hydrocarbons	1/16
ASA	160	3000	150	CS	-20	Sour hydrocarbons	1/8
ASB	160	3000	150	LT\CS	-49	Low temp, sour hydrocarbons	1/8
AWA	160	3000	150	cs	-20	Produced water, corrosive	1/8
BAA	160	3000	300	CS	-20	Sweet hydrocarbons	1/16
BAAT	80	3000	300	CS	-20	Sweet hydrocarbons, threaded	0.0394
BAB	160	3000	300	LT \CS	-49	Low temp, sweet hydrocarbons	1/16
BSA	XXH	3000	300	CS	-20	Sour hydrocarbons	1/8
BSB	XXH	3000	300	LT\CS	-49	Low temp, sour hydrocarbons	1/8
CAA	160	3000	600	CS	-20	Sweet hydrocarbons	1/16
CAAT	80	3000	600	CS	-29	Sweet hydrocarbons, threaded	0.0394
CAB	160	3000	600	LT\CS	-49	Low temp, sweet hydrocarbons	1/16
CSA	XXH	6000	600	CS	-20	Sour hydrocarbons	1/8
CSB	XXH	6000	600	LT\CS	-49	Low temp, sour hydrocarbons	1/8
CWA	160	3000	600	CS	-20	Produced / Brackish water, sour	1/8
DAA	160	6000	900	CS	-20	Sweet hydrocarbons	1/16
DAB	160	6000	900	LT \CS	-49	Low temp, sweet hydrocarbons	1/16
DSA	XXH	6000	900	CS	-20	Sour hydrocarbons	1/8
DSB	XXH	6000	900	LT\CS	-49	Low temp, sour hydrocarbons	1/8
EAA	XXH	6000	1500	CS	-20	Sweet hydrocarbons	1/16
EAB	XXH	6000	1500	LT\CS	-49	Low temp, sweet hydrocarbons	1/16
ESA	XXH	6000	1500	CS	-20	Sour hydrocarbons	1/8
ESB	XXH	6000	1500	LT\CS	-49	Low temp, sour hydrocarbons	1/8
FAA	ХХН	SW ONLY	2500	CS	-20	Sweet hydrocarbons	1/16
FAB	ХХН	SW ONLY	2500	LT\CS	-49	Low temp, sweet hydrocarbons	1/16
FSA	ХХН	SW ONLY	2500	cs	-20	Sour hydrocarbons	1/8
FSB	XXH	SW ONLY	2500	LT\CS	-49	Low temp, sour hydrocarbons	1/8

Issuing Authority: Marvin J. (Ty) DeBelser		Quality Control
Date of Issue:March 13, 2008	INDUSTRIES INC.	QCFOFinalInspectionReleaseCertificateR00
FINA	L INSPECTION RELEASE C	ERTIFICATE
CUSTOMER: ENCANA		,
PRODUCT: 4" 2500# x 4" 2500# Split C	oil for 2.0 mm I H Pkg	wo#: <b>08562-002-A</b>
4 2300# X 4 2300# Spire		DATE: JA 117, 2013
	FINAL INSPECTION DOCUMENT	
REVIEWED BY:	ACCEPTED:	REJECTED:
STANDARD DOCUMENTATION REQUIREMENTS: (SE		PAGYAGE
ADDITIONAL DOCUMENT REQUIREMENTS: (TO BE R	ECORDED HERE IF APPLICABLE I.E. DOCUMENT	PACKAGE
REQUIRED BY CUSTOMER ETC. )		
Q.C. FILE CLOSURE BY:	) tox	DATE: 5 an 8 2013
	LOOSE COMPONENTS REQUIRED /	PREPARED
ITEMS REQUIRED:	NO. OF BOXES	OR PKGS
ADDITIONAL HARDWARE OR FASTENERS REQUIRE	D YES N	
	PREPARATION FOR SHIPMENT / S	STORAGE
PREPARATION NEEDED / COMPLETED		
SN# NWP-08562-002-A  ITEM# Coil  INVENTORY TAGS ATTACHED YES  CUSTOMER P.O REVIEWED YES  CONTACT PERSON AUTHORIZED TO RELEASE PROPHONE:  FA	NO SHIPPING INSTRUCTIONS N/A D  DUCT:	S
RELEASED TO INVENTORY:		DATE:
		DATE: ((10 7 50) 13
RELEASED TO CUSTOMER!		PAIE 1/3/1 / 2/ V/ 1/ 5

### **NWP** Industries Inc.

### INDIRECT FIRED HEATER COIL EXAMINATION AND INSPECTION REPORT

wheth i

DO NOT START CONSTRUCTION WITHOUT AI REVIEW EXAMINATION AND INSPECTION REPORT REVISION NO.: 0									
AI REVIEW: REVIEW DATE: 5 NOV. 2012									
SERIAL NO. NWP-08562-002-A JOB NO.: 08562-002-A COIL TYPE: 4 2500 # X 4 2500 # SPLIT COIL									
DRA	WING NO.: 08562-4				MINATIC			ECTION	REPORT
Seq.	Item	Comments	Q.C.I.	Date	A.I. Haid Points	A.I.	Date	Owner	Date
1.	Calculations in File		Ruft	NOVOILIS	. Je	JJ.	11.5.12		
2.	Release of App'd Dwg.		RALL	NOVOILIS	* A	17	11.5.12		
3.	Heat Numbers Recorded		RMS	DECOBIA	. 4	99	1.7.13		
4.	MTRs Checked		Rops	DEC 18/12	şi.	B	1.7.13		
5.	Materials Checked Against Drawings and specs	Hold	PAR	NOVIG/13	popolitación Politicación				The Court of the C
6.	W.P.S. Checked		12022	108116/1 L	desilening(f)			many la grova Spirita apperitional Vanco	
7.	Welders Qualified	HOLD	BIOZL	WEY 16/18		ţ			
8.	Thicknesses Recorded		remp	DEC 13/13					
9.	Fit-up Examination(s)	,	PARS	recoulis	j.	H	1.7.13	1	
10.	Impact Tests	NA	<i>V</i> "			11		•	
11.	Welds Examined		RMR	DECOULT	<i>F</i>	J	1.7.13		
12.	Welder I.D. Checked		AME	PECOLIS	1	)	117.13	-	
13	Final External Inspection		RMB	PECOGIA	٠	J.	117.13		
14:	Radiography	Holo	RIPR	DECOURS	- 8	<i>J</i> 9	1.7.13		
15.	Other N.D.E.	Haup	EONR-	DECIGIA		. V			
16.	Final Ext. Prior to P.W.H.T.	Houp	RMS	DECOGIE	- 4				
17.	PWHT Chart Checked	HOLD	RUJE	DECIOLS		89	1.713		
18.	Hydrostatic Test	Coll Gauge # No. 1			<i>C</i> *	M	10.5		
	Hord	Coll Gauge # No. 2		Tam.13		17	1.7.13		
19.	CRN Drawing	CRN# P9417.213	pope	silso vau		37 M	1/15112		
20.	N.C.R. #		7		ų i	•			
21.	Nameplate Stamping		ange	DEC13/12	11	A	1.2.13		
22.	Data Report (AB-28) completed		(P).	J.17.12	٠ بر	1	1.7.13		
23.	Nameplate Installation					· · · · · · · · · · · · · · · · · · ·			
								·	· · · · · · · · · · · · · · · · · · ·

The Authorized Inspector shall be presented with the Examination and Inspection Report prior to construction so that he can designate additional inspection points and/or Hold Points. Any revisions shall be marked with a delta symbol with revision number and described at the bottom of this page.

^{*} Denotes an A.I. Inspection Point ** Denotes an A.I. Hold Point



	(m transcale adoltatem), raju	ety westbesorbby	MANUFAC	TURER'S	DATA	REPOR	T FOR IND	RECT	FIRED	HE,	ATER COILS		4B (	28 2011-és
P/	RTIAL .						5-47-50.00 to \$20-70-10-10-10-10-10-10-10-10-10-10-10-10-10	•••••••••••••••••••••••••••••••••••••••		···	A# <b>6</b>	0576	····	100 to
_M	nufactured By:	NWP Industries	inc. 4017 60th Av	e, Innisfail Alberti	a, T4G-1S	9							<del></del>	
jli	nufactured For:	Encana Corpora	ation, Suite 1800, 8	355-2nd Street St	W. Box 28	50 Calgary	Alberta, T2P-2S	j .			1177.00			
VI	timate Owner: _E		on, Suite 1800, 855	**								7-11.411.411		
Lc	cation of Installati	on: Encana	Corporation, Suite	1800, 855-2nd S	lreet SW.	Box 2850, C	algary Alberta, T	2P-2S5						
M	inufacturer's Seria	il No.	Constru	ction Drawin	a No.				T		ODE: ASME B31	3	V=	ar Built
NV	P-08562-002-A		08562-4 F	·· · · · · · · · · · · · · · · · · · ·					Edition	201			100	2013
					С	ONSTR	UCTION		<u> </u>		-			2075
	Coil ID/Purp	0000	Josian Property	Design	М	Design inimum	Corrosion	1.				1		
а	PS - 100/Coil A		Design Pressure 71 psi	₹ Temp 200 F	-20 F	Temp	Allowance 0.0525*		OOA REV		red Drawing No.	į	P-9417	CRN
b.	PS - 101/Coil B	····	71 psi	200 F	-20 F		0.0625		DOA REV				P-9417	
C										·			1 2777	
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						C	OIL	٠						
						End	Closures			T				
		Tubes			turn Be			Flanges			(	Openings		
а	Mat'l Spec. SA-333-6	Diameter 4" NPS	Thickness SCH XXH	Mat'l Sp	ec.	Thicknes			Ratin	3	Mat'l Spec.		/Туре ]	Rating
	SA-333-6	4" NPS	SCH XXH	SA-420-WPL6 SA-420-WPL6		SCH XXH	SA-350-LF2 SA-350-LF2		CL 2500	_	N/A		ÍΑ	N/A
C				07-120-117-20	<del></del>	JULIANI	Jan-330-LFZ	UII.	CL 2500		N/A	N	IA	· N/A
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					HEA	DERS/I	MANIFOLE	)S						
	-		s	hell				nds .				penings		
	Purpose	Size	Mati	Spec.	Thickn	ess	Mat'l Spec.	Thi	kness	No			/Туре	Rating
1	NA NA	NA NA		NA	- NA	· • •	NA .		NA		NA NA	1	NΑ	NΑ
g	NA NA	NA NA		NA.	. NA	<del></del>	NA	<del>!</del>	NA		NA NA		NA .	NA
a i			TEST PRE	SSURE, N	DE, PO	STWE	D HEAT T	REATIV	ENT A	ND	SIZE	· · · · · ·		
15 23	Hydrostatic Test	Radiograph (100% or %	·	NDE (MT)	Po	stweld He	at Treatment	] .		٠,				
	Pressure	Random)	۰ ا	T) (UT)	Te	emp.	Time	Over	all Lengt	'n	Heating Cor	doon' '	l .,	/al
а	7757 PSI	100%	NA		1150F		MIN	294.875	air ceuili	41	Heating Sur 264 sq.ft.	lace	12.2 cu	olume
b	7757 PSI	100%	NA		1150F	60	MIN	294.875			160 sq.ft.	· · · · · · · · · · · · · · · · · · ·	7.4 cu.f	
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					COTIC	CATE OF	COMPLIANC		2. 4					
We	certify that the state	ements in this	record are corre											
with	the above Provinc	ial Registered	Design.	or and that an	ucialis	oi uesigii,	material, cons	su ucuon, a	ana work	man.	snip of this coil bu	ndie are i	a accor	dance
	7 -			Ad.	~~ ~				÷.					
E	ate boll at	) <u>/3</u> Signed	d RM-Spunce/		X.		For NWP In	dustries Inc.	<u></u>					
			. '	:tXeprekenta	tive)			<del></del>			(Manufacturer)			
	e e e e	•		/ CE	RTIFICA	TE OF SI	IOP INSPEC							
H	e undersigned, a du	ıly authorized i	boiler and pres	sure vessel in	spector (	employed	by <u>:</u>		554		of Alb	erta-have	insner	ated the
abo	ve Heater Coils and	d state that, to	the best of my	knowledge an	d belief.	the constr	ucted is in acc	cordance v	vith the A	۹lber	ta Safety Codec A	ict and Re	anulatio	ins. By
១ប្រើ	ing this certificate,	neimer the ins	pector nor his c	or her employe	r makes	any warra	anty, expresse	d or impli	ed, conce	nime	g the vessel desci	ribed in th	is	

manufacturer's data report. Furthermore, neither the inspector nor his or her employer shall be liable in any manner for any personal injury or property damage or a

Joe Tworek NB 12995 A,B AB 261

loss of any kind arising from or connected with this inspection.

RT-100%. **MADE IN CANADA** SERMENO INVER 08562-0 COLA 4°CL 2500 PS=100 MAWA 5171 **PS/AT** 200 WDW - 20 37 7 1 PSI YEAR 201 BUILT **CRN** 4 PO 4 1 7 2 1 3 COLLB 4°CL 2500 PS=101 MAWP 5171 PSIAT 200 MDMT EZO P AT BEZZ PSI P94176213 CRN. COIL C MAWP PSIAT MP OF AT ME MDMT PSI CRN coil d MAWP ٥F **PSIAT** MDMT °F AT PSI CRN

A#605766

Issuing Authority: Marvin J. (Ty)	
DeBelser/Dale Karg	
Date of Issue: November 13 2012	
Rev Status: 2.1	

NWF	Þ
Industries Inc.	TM

ABSA	
FORM_NDE_001	
N.D.E Requirements	

### N. D. F. Requirements

Clien	t: <u>Encana</u>			JO# <u>0856</u> 2-002	'-Δ	
	ct: <u>4" Coil – 3.0mm Linehe</u>	ater		Date: <u>16/11/20</u>		
Piping: ⊠	Pressure Vessel: 🔲	Tank:		Other:		
	<ul><li>X-Ray</li><li>✓ Gamma Ray</li><li>✓ Ultrasonics</li></ul>			100% Full 25%		ASME Section VIII-UW-51 ASME Section VIII-UW-52 Customer Specification
	Liquid Penetrant Magnetic Particle		Othe	10% er(Define)	<b>\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti}\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\texi{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\texi{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\texi}\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti}}\\ \ti}\\\ \tintte{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\texi}\tittit{\text{\texi}\tittt{\text{\texi}\text{\texi}\text{\texi}\tittit}\\ \tittt{\text{\texitit{\text{\texi}\tittt{\texititt{\tiint{\texi}\tittt{\texi}</b>	ASME B31.3 NFS Other (Specify)
	Accoustic Emission			Spot		
	Hardness test Max 200 BHN					CSA W47.1/W59
P1 Materia Welder ID Shell-T= 'ipe-T= Total Wel Please use wi Please Note id	F  4" XXH  ds start shooting pkg (firs		Ves	ssel S/N <u>NWP-0856</u> .	<u>2-002-A</u>	
Buttweld Xra Gap Shots to I Threaded Sho Identify on En Flashes must	equirements:  y to be identified as X-#  pe identified as GS-#  ts to be identified as XT-#  velope part of package being shot ie  contain: Customer, JO#, Spool Identi  ated repairs on the project		ock tape	<b>Shots</b> e, Welder's ID Symbol, Date		
En En	cana Spec for Welded Piping-ac cana Spec is Zero Elongated Ind cana Spec for Socket Welds-acc cana Spec for Threaded Piping- is a 5 Point Traverse	cations eptance is minimum 1	/16" g	ар		
Prepared B	y: Karim Bouslama			Date: 16/11/2012		



#### **RADIOGRAPHIC** INSPECTION REPORT

CG16-10 - RT4032

Page 1 of 1

Exposure Device #: D9350

Source #: 84352B

Cobait 60 ☐ IR 192 ☑ X-Ray ☐

**EFSS: 0.155** 

Film Brand: AGFA

#Film/cassette: 1

Code: ASME B31.3 NFS + ENCANA SPEC

Job / P.O. #: 08562-002-A

IRISNDT #: 255662

Date: 16-Nov-12

Client: ENCANA C/O NWP.

Location: Innisfail, Alberta

Item Inspected: 4" COIL-3,5mm LINEHEATER

Material: C.S

Film #	Size, Location, Thickness	Welder ID	IRISN DT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Location	Fil m Ty pe	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)ccep (R)ejec
									NWP JOB: 08562-002-A	
									VESSEL S/N: NWP-08562-002-A	
<b>X-1</b>	4" XXH	F	RT 3A	3.83	.674	4	1	D7	FM@9	A
X-2	4" XXH	F	RT 3A	3.83	.674	4	1	D7		A
X-3	4" XXH	F	RT 3A	3.83	.674	4	1	D7	PROFILE@10	
		•	11, 0,1	0.00	.014	<del></del>	<u>'</u>	07	FROFILE@ IU	A
	-A017-	<del>***</del>								
	• • • • • • • • • • • • • • • • • • • •	******		***************************************						144
	7-7-10									
				- wa		v=				
				*******					3- 4" XXH	
		<del></del>								1

Number of Radiation Barrier Warning Signs Erected: 4

Number of Radiation Barrier Warning Signs Returned: 4

Work Location Legend: [1] Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other) IRIS Procedure: IC - Internal Concavity AB - Arc Burns EUC - External Undercut Single Wall Exposure: S.O.D. = Source-to-object distance (D) BT - Burn Through IUC - Internal Undercut LF - Lack of Fusion RT 1, 2, 2A, 6, 7 HB - Hollow Bead CK - Crack LC - Low Cover MA - Misalignment Double Wall Exposure O.F.D. = Source-object-distance (D in T-274.1) - Excessive Penetration IP - Incomplete Penetration RT 3, 3A, 4, 5, 8 - Porosity S - Slag

Unit #: 647 Kilometers: In: 0015

Out: 0100 Hrs: 0.75

în: Out: Hrs:

Personnel: J.G J.S M.V

(3 ½ x 8 ½) 12 D7 Technician: JOSEPH GOMEZ

SNT-TC-1A II C.G.S.B 11 C.G.S.B.# 12296

I am in full agreement with report contents: Client:

Del Some

Edmonton (780) 437-4747 Calgary (403) 279-6121 Nisku (780) 955-7616 Barrhead (780) 674-3018

Fort McMurray Medicine Hat High Level Lloydminster

Film Quantity:

(780) 743-1536 (403) 527-6284 (780) 841-0470 (780) 875-6455

Cold Lake (780) 594-1114 Red Deer (403) 347-1742 Tulsa, OK (918) 446-8773 Houston, TX (713) 722-7177

Mailing Address 5311-86 Street Edmonton, Alberta T6E 5T8

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg
Date of Issue: November 13 2012
Rev Status: 2.1



ABSA	
FORM_NDE_001	
N.D.E Requirements	

### M.D.F. Requirements

Client: Encana Project: 4" Coil – 3:0mm Lineheater	JO# <u>08562-00</u> Date: <u>19/11/2</u> 6	<del></del>
	Tank: Other:	
☐ X-Ray ☑ Gamma Ray ☐ Ultrasonics	⊠ 100% □ Full □ 25%	☐ ASME Section VIII-UW-51 ☐ ASME Section VIII-UW-52 ☐ Customer Specification
Liquid Penetrant  Magnetic Particle	25% 10% Other(Define)	
☐ Accoustic Emission ☐ Hardness test Max 200 BHN	☐ Spot	CSA W47.1/W59
General Instructions:  P1 Material Welder ID F Shell-T= Pipe-T= 4" XXH Total Welds continue shooting pkg (first # is X-4)  Please use wire type iQi Please Note locations of all indications on films on reports Please include O.F.D-S.O.D S.F.D on reports	Vessel S/N <u>NWP-0856</u> 4)	<u>62-002-A</u>
Special Requirements:  Buttweld Xray to be identified as X-# Gap Shots to be identified as GS-# Threaded Shots to be identified as XT-# Identify on Envelope part of package being shot ie. Coil, Piping, ect Flashes must contain: Customer, JOH, Spool Identification, Xray nur Mark all indicated repairs on the project		e
NOTE: Encana Spec for Welded Piping-acceptance is zero Encana Spec is Zero Elongated Indications Encana Spec for Socket Welds-acceptance is min Encana Spec for Threaded Piping-acceptance is 3 HT is a 5 Point Traverse  Prepared By: R.M. Spence	ilmum 1/16" gap	



#### **RADIOGRAPHIC INSPECTION REPORT**

CG24 - RT1277 Page 1 of 1

Evnosure D	evice #: D62	74	Sauras	#: 7987:		,	100 4	00500				
Cobalt 60				#: /96/: <b>SS:</b> .135	313		/ P.O. #:		www			
Film Brand: AGFA #Film/cassette: 1							Client: ENCANA C/O NWP  Location: INNISFAIL Alberta					
Code: ASME B31.3 N & ENCANA SPEC.							item Inspected: 4" COIL - 3.5mm LINEHEATER Material: C.S					
Film#	Size, Location, Thickness	ם ו	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type	Type and Location of Discontinuities (A)ccer (rejectable discontinuities in square brackets [])			
						<b></b>			JO# 08562-002-A			
			ļ						S/N NWP-08562-002-A			
X4	4"XXH	F	RT 3A	4	.674	4	1	D7	A			
				"	····							
X5	4"XXH	F	RT 3A	4	.674	4	1	D7	A			
-			· · · · · · · · · · · · · · · · · · ·									
X6	4"XXH	F	RT 3A	4	.674	4	1	D7	P@10.5 A			
X7	4"XXH	F	RT 3A	4	.674	4	1	D7	A			
			<b></b>									
ХВ	4"XXH	F	RT 3A	4	.674	4	1	D7	A			
							TVF					
7.5.5			,									
						İ						
					***************************************							
									5-4"XXH			
Number of R	adiation Bar	rier Warnii	ng Signs E	rected:		L	Numb	er of Ra	adiation Barrier Warning Signs Returned: 5			
Work Location			nside Fab.			/ard/L	ay-dowr		[3] Piping/Modular Fab. Area [4] N/A (Other)			
IRIS Procedure: Single Wall Expos	ure:	S.O.D. =	Source-to-ob	ject distance	(D)		- Arc Burr - Burn Th		EUC - External Undercut IC - Internal Concavity IUC - Internal Undercut LF - Lack of Fusion			
RT Double Wall Expos	1, 2, 2A, 6, 7	O.F.D. =	Dislance fron object to film		e of	CK EP	- Grack - Excessiv - Porosity	- ve Penetra	HB - Hollow Bead LC - Low Cover			
Unit#: 226		Kilometers:	10	Film Quan	ity:				Interpretation by: BRODY SMITH SNT-TC-1A			
(n: 2000	Out: 211	5 Hrs:	1.25	20	(3 ½ x	8 1/5)	D7		(Print) C.G.S.B. II (Level)			
ln:	Out:	Hrs:				_ , _ ,			C.G.S.B. # 12569			
Personnel;								-	(Signature)			
BS/JS/MV			ŀ					<b></b>	Client Representative: (Print)			
									l am in full agreement with			
									report contents (Sign)			
Edta BE Parent F.	elen Alberta Toria		107 0000									
5311 – 80 Street Edma Calgary Lloydminster	(403) 279-6121 (780) 875-6455		437-2022 Fax: (7	Ç.	old Lake ort McMurray		(780) 826 (780) 74		Deer Park, TX (201) 476-4444 Malitx, Houston, TX (713) 722-7177			
Banhesd Nisku	(780) 674-3018 (780) 955-7616				ed Deer		(403) 341	7-1742	Tulsa, CK (918) 446-8773			

IRISNDT E-2004N

Issuing Authority: Marvin J. (Ty)					
DeBelser/Dale Karg					
Date of Issue: November 13 2012					
Rev Status: 2.1					

Industries Inc. ™

### N D F Panniramants

Client: <u>Encana</u>		JO# <u>08562-002-A</u>	
Project: <u>4" Coil – 3.0mm Lineheater</u>		Date: <u>20/11/2012</u>	
Piping: ⊠ Pressure Vessel: □	Tank: 🗌	Other:	
☐ X-Ray ⊠ Gamma Ray		100% Fuil	☐ ASME Section VIII-UW-51 ☐ ASME Section VIII-UW-52
☐ Ultrasonics ☐ Liquid Penetrant ☐ Magnetic Particle	Other	25% 10% (Define)	<ul><li>✓ Customer Specification</li><li>✓ ASIME B31.3 NFS</li><li>Other (Specify)</li></ul>
☐ Accoustic Emission ☐ Hardness test Max 200 BHN		Spot	CSA W47.1/W59
General Instructions:  P1 Material  Welder ID <u>F</u> Shell-T= Pipe-T= <u>4" XXH</u> Total Welds <u>continue shooting pkg (first # is X-9</u> )  Please use wire type iQi  Please Note locations of all indications on films on reports  Please include O.F.D-S.O.D S.F.D on reports		se <b>l</b> S/N <u>NWP-08562-00</u> 2	<u>?-A</u>
Special Requirements:  Buttweld Xray to be identified as X-# Gap Shots to be identified as GS-# Threaded Shots to be identified as XT-# Identify on Envelope part of package being shot ie. Coil, Piping, ec Flashes must contain: Customer, JOH, Spool Identification, Xray nu Mark all indicated repairs on the project		Shots , Welder's ID Symbol, Date	
NOTE: Encana Spec for Welded Piping-acceptance is ze Encana Spec is Zero Elongated Indications Encana Spec for Socket Welds-acceptance is mir Encana Spec for Threaded Piping- acceptance is HT is a 5 Point Traverse	nimum 1/16" ga	ар	
Prepared By: R.M. Spence RM Symmy		Date: 20/11/2012	

### **RADIOGRAPHIC**

CG24 - RT1284

	MATA			كا	<b>)</b>		INS	SPEC	TION REPORT	Page 1 of 1	
Exposure Device #: D6274 Source #: 79875B  Cobalt 60 IR 192 X-Ray EFSS: .135  Film Brand: AGFA #Film/cassette: 1  Code: ASME B31.3 N & ENCANA SPEC.					Job / P.O. #: 08562-002-A IRISNDT #: 255715 Date: 20-Nov-12 Client: ENCANA C/O NWP Location: INNISFAIL Alberta Item Inspected: 4" COIL - 3.0mm LINEHEATER Material: C.S						
Film #	Size, Location, Thickness	Welder ID	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type	Type and Location of (rejectable discontinuities i	Discontinuities	(A)ccept
						<del>                                     </del>			JO# 08562-		, , , , , ,
,						-			S/N NWP-0856	52-002-A	-
										, , , , , , , , , , , , , , , , , , , ,	
<b>X</b> 9	4"XXH	F	RT 3A	4	.674	4	1	D5	P@8.7	5	Α
X10	4"XXH	F	RT 3A	4	.674	4	1	D5	P@4.5	5	Α
		Ì				-			.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
X11	4"XXH	F	RT 3A	4	.674	4	1	D5	P@13.5-14	4, 10	Α
X12	4"XXH	F	RT 3A	4	.674	4	1	D5		74.74.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4	A
									. 20112-01	THE PLANT OF THE PARTY.	
X13	4"XXH	F	RT 3A	4	.674	4	1	D5			Α
	· arrate										
	· 1000000										
	······································								PARALAL		
										11 117 AVIL 4	
	PAN-1										
	· ····································				-				5-4"XXI		
Number of Ra	diation Barrie	er Warnir	ng Signs E	rected:	5		Numb	er of R	adiation Barrier Warning Sig	ns Returned: 5	
Work Locatio	n Legend:	[1] lı	nside Fab.	Shop	[2] \	/ard/L	ay-dowп	Area	[3] Piping/Modular Fab.	. Area [4] N/A (	Other)
Double Wall Expos	, 2, 2A, 6, 7	O.D. = F.D. =	Source-to-obj Distance from object to film	ı source side	-	BT CK EP	- Arc Burn - Burn Thr - Crack - Excessiv - Porosity	ough	EUC - External Undercut IUC - Internal Undercut HB - Hollow Bead tion IP - Incomplete Penetra S - Slag	IC - Internal C LF - Lack of Fe LC - Low Cove ation MA - Misalignm	ısion r
Unit#: 226	ŀ	Glometers:	10	Film Quan	lity:	, , , , , , , , , , , , , , , , , , , ,	,		Interpretation by: BRODY SMITH	SNT-TC-1A	1
In: 2115	Out: 2315	Hrs;	2	20	(2 ¾ x	8 1/2)	D5	<b> </b>	(Print)	C.G.S,B, 1	Level) 12569
In:	Out:	Hrs:			-				, h		
Personnel: BS / JS / MV									(Signature) Client Representative: (Print)		
									l am in full		<del></del>
					J				report contents (Sign)	1 Bressel	

| S311 - 86 Street Edmonlon, Alberta, T8E ST8 Phone: (750) 437-2022 Fax: (760) 438-1436 | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake | Cold Lake |

(780) 826-8105 (780) 743-1536 (403) 347-1742

Deer Park, TX Matrix,Housion, TX Tulsa, OK

(281) 478-4444 (713) 722-7177 (918) 446-8773

Issuing Authority: Marvin J. (Ty)					
DeBelser/Dale Karg					
Date of Issue: November 13 2012					
Rev Status: 2.1					

MUDIE	
Industries Inc.	ŤΝ

ABSA	
FORM_NDE_001	
N.D.E Requirements	

### N D F Requirements

	lient: <u>Er</u> roject: <u>4</u>	ncana 4" Coil – 3.0mm Lineheater			JO# <u>08562-002</u> - Date: <u>21/11/2</u> 0:			
Piping		Pressure Vessel:	Tank:		Other:		191.4	
		X-Ray Gamma Ray		$\boxtimes$	100% Full	_	AE Section VIII-UW-51 AE Section VIII-UW-52	
		Ultrasonics			25%	⊠ c	ustomer Specification	
		Liquid Penetrant Magnetic Particle		☐ Othe	10% r(Define)	⊠	ASME B31.3 NFS Other (Specify)	
		Accoustic Emission			Spot			
	□Hardi	ness test Max 200 BHN					CSA W47.1/W59	
P1 Mai Welde Shell-T 'ipe-T Total \ Please us Please N	terial er ID F= = Welds se wire typote location	uctions:  F  4" XXH  continue shooting pkg (first  perions of all indications on films on repor  D-S.O.D S.F.D on reports		Ves	ssel S/N <u>NWP-08562</u>	<u>2-002-A</u>		
Buttwell Gap Shot Threaded Identify of Flashes n	d Xray to b ts to be ide d Shots to on Envelop nust conta	rements:  De identified as X-#  Centified as GS-#  De identified as XT-#  De part of package being shot ie. Coil,  Din: Customer, JO#, Spool Identification  Depairs on the project		ock tape	4 Shots  e, Welder's ID Symbol, Date			
NOTE:	Encana Encana Encana HT is a	Spec for Welded Piping-accepta Spec is Zero Elongated Indicatio Spec for Socket Welds-acceptan Spec for Threaded Piping- accep 5 Point Traverse .M. Spence	ns ce is minimum 1	/16" g	ap aged			
··char	ca by. 💢	-ivi openice			Date: <u>21/11/2012</u>			

# TANT

#### **RADIOGRAPHIC INSPECTION REPORT**

CG24 - RT1289

Page 1 of 1

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Exposure Device #: D6274 Source #: 79875B						Job	/ P.O. #:	08562-	-002-A IRISNDT #: 255736 Date: 21-Nov-	12
Cobalt 60☐ IR 192 ☑ X-Ray ☐ EFSS: .135						Clie	nt: EN	CANA (	C/O NWP	
Film Brand:	AGFA	#Fi	lm/casset	te: 1		Loca	ation: II	NNISFA	AIL Alberta	
Code: ASM	E B31.3 N & E	NCANA S	SPEC.						"COIL - 3.0mm LINEHEATER Material: C.S	
Film#	Size, Location, Thickness	Welder ID	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type	1 31	)ccep R)eject
					****				JO# 08562-002-A	
									S/N NWP-08562-002-A	<del></del>
,,,,,,,										
X14	4"XXH	F	RT 3A	4	.674	4	1	D5	D@2.5	
		<del>-                                    </del>	111 0/1		.017	7		D3	P@3.5	Α
V4E	AllVVIII	ļ								
X15	4"XXH	F	RT 3A	4	.674	4	1	D5	P@4.5	Α
	*****									
X16	4"XXH	F	RT 3A	4	.674	4	1	D5		Α
X17	4"XXH	F	RT 3A	4	.674	4	1	D5		Α
	*****									
			70731	-				···		
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	79/-1 ·									
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									A AllVVII	
									4-4"XXH	
***************************************										
***************************************										
Number of Ra	diation Barrie	r Warnin	g Signs E	rected: 8	5		Numbe	er of Ra	adiation Barrier Warning Signs Returned: 5	
Work Location	n Legend:	[1] ln	side Fab.	Shop	[2] Y	ard/La	ıy-down	Area	[3] Piping/Modular Fab. Area [4] N/A (Other	er)
IRIS Procedure: Single Wall Exposur	I E .	O,D, =	Source-to-obj	ect distance	(D)		- Arc Burn: - Burn Thr		EUC - External Undercut IC - Internal Concat IUC - Internal Undercut I.F - Lack of Fusion	
Double Wall Exposu	, 2, 2A, 6, 7 are , 3A, 4, 5, 8		Distance from object to film (		of	CK EP	<ul> <li>Crack</li> <li>Excessive</li> <li>Porosity</li> </ul>	-	HB - Hollow Bead I.C - Low Cover	
Unit#: 226	к	ilometers:	10	Film Quant	ty:				Interpretation by: BRODY SMITH SNT-TC-1A II	
In: <u>2000</u>	Out: 2100	Hrs:	1	16	(2 ¾ x l	3 1/2)	D5		C.G.S.B. II	<del>-</del>
ln:		Hrs: _			<u>,                                     </u>	/		$\exists 1$	(Leve C.G.S.B. # 12556	
Personnel:		- •						-	(Signature)	
BS/JS/MV									Client Representative: (Print)	
									lam in full agreement with	-
									report contents	
	******								(Sign) Will South	_
311 – 86 Street Edmont	an Albada Tar ETB s	N	7.00== -	B) 440 175						

s, Alberta, T&E 5T (403) 279-8121 (700) 875-6455 (780) 674-3018 (780) 955-7616 Calgary Lloydminster Banhead Nisku

18 Cold Lake Forl McMurrey Red Deer

(780) 826-6105 (780) 743-1536 (403) 347-1742

Deer Park, TX Mairix,Houston, TX Tulsa, OK

(281) 476-4444 (713) 722-7177 (818) 445-8773

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg	_
Date of Issue: November 13 2012	-
Rev Status: 7.1	_



ABSA	
FORM_NDE_001	
N.D.E Requirements	

#### NI DE Hoalliramante

Client: <u>E</u> Project:	ncana 4" Coil – 3.0mm Lineheater		JO# <u>08562-00</u> Date: <u>22/11/2</u>	
Piping: ⊠	Pressure Vessel:	Tank:		
	X-Ray Gamma Ray Ultrasonics Liquid Penetrant		] Full	ASME Section VIII-UW-51  ASME Section VIII-UW-52  Customer Specification  ASME B31.3 NFS
□ □ □Hard	Magnetic Particle Accoustic Emission Iness test Max 200 BHN		_	Other (Specify)  CSA W47.1/W59
Please use wire ty Please Note location	F 4" XXH continue shooting pkg (first	# is X-18)	/essel S/N <u>NWP-085</u>	
Gap Shots to be id Threaded Shots to Identify on Envelop Flashes must conta	be identified as X-#		<b>Shots</b> Sape, Welder's ID Symbol, Dat	e
Encana Encana Encana	a Spec for Welded Piping-acceptant a Spec is Zero Elongated Indication a Spec for Socket Welds-acceptance Spec for Threaded Piping- accept 5 Point Traverse	s e is minimum 1/16	" gap ngaged	
Trepared by. E	v.m. spence		Date: <u>22/11/2012</u>	

#### **RADIOGRAPHIC INSPECTION REPORT**

CG24 - RT1295
Page 1 of 1

Exposure Device #: D6274 Source #: 79875B			5B	Job / P.O. #: 08562-002-A IRISNDT #: 255772 Date: 22-Nov-12							
Cobalt 60				1	Job / P.O. #: 08562-002-A IRISNDT #: 255772 Date: 22-Nov-12						
	Film Brand: AGFA #Film/cassette: 1					1					
Code: ASME B31.3 N & ENCANA SPEC.							Location: INNISFAIL Alberta  Item Inspected: 4" COIL - 3.0mm LINEHEATER Material: C,S				
code.	Adviced 1801.5	N & ENCA	VA OFEC.			1feii	mspeci	eu: 4	"COIL - 3.0mm LINEHEATER Material: C.S		
Film	Film # Size, Location, Thickness Welder IRISNDT S.O.D. O.F.D. Inches Inches			# of Exp.				A)ccept R)eject			
									JO# 08562-002-A		
				1					S/N NWP-08562-002-A		
		<del>, , , , , , , , , , , , , , , , , , , </del>				-					
X18	4"XX	H F	RT 3A		674	_					
X10	4 7.0	.П   F	RIJA	4	.674	4	1	D5		Α	
				<u> </u>		<u> </u>					
X19	4"XX	H F	RT 3A	4	.674	4	1	D5		Α	
X20	4"XX	H F	RT 3A	4	.674	4	1	D5		A	
									-		
VOd	410/04	11 6	. DT 64								
X21	4"XX	H F	RT 3A	4	.674	4	1	D5		Α	
~~~											
X22	4"XX	H F	RT 3A	4	.674	4	1	D5		Α	
				 							
					-						
										-	
										-	
									5-4"XXH		
									3-4 (A)11		
Number	of Radiation	Barrier Wa	rning Signs	Erected:	5		Numb	er of R	ladiation Barrier Warning Signs Returned: 5		
Work Lo	cation Legen	d: [1] Inside Fab	. Shop	[2] \	Yard/L	ay-down	ı Area	[3] Piping/Modular Fab. Area [4] N/A (Ot	her)	
IRIS Proced Single Wall		S,O.D. =	Source-to-ol	ject distance	e (D)		- Агс Вил		EUC - External Undercut IC - Internal Cond	avity	
Double Wall	RT 1, 2, 2A, 6, 7 Exposure	U.P.D. =	Distance fro object to film		e of	CK EP	Burn TheCrackExcessive	ve Penetri			
	RT 3, 3A, 4, 5, 8	1	,	, , , ,		P	- Parasity		S - Slag		
Unit#;	226	Kilomete	rs: 20	Film Quan	tity:				Interpretation by: BRODY SMITH SNT-TC-1A II		
In:	2100 Out:	2330 H	rs: <u>2.5</u>	20	(2 ¾ x	8 1/2)	D5	-	(Print) C.G.S.B. II (Let	vel)	
Jn:	Out:		rs:						C.G.S.B.# 125		
Personnel							-		(Signature)		
BS/JS/A									Client Representative: (Print)		
									l am in full agreement with	_	
					L		<u> </u>		report contents (Sign) Ly Lynn		
1	···										
5311 - 88 Stree	et Edmonton, Alberta, 1	GE 5T8 Phone: (780) 437-2022 Fax: (
Calgary Lloydminster Barrhead Nisku	(403) 270 (780) 875 (780) 674 (780) 955	-8455 -3018		F	old Lake ort McMurray ed Deer		(780) 826 (780) 741 (403) 341	3-1536	Deer Park, TX (281) 476-4444 Malrix, Houston, TX (713) 722-7177 Tulsa, OK (918) 446-6773	7 1	

IRISNDT E-2004N

Issuing Authority: Marvin J. (Ty)	
'DeBelser/Dale Karg	
Date of Issue: November 13 2012	
Rev Status: 2.1	



N I) F Romiromonte

Cliant F							
Client: <u>Er</u> Proiect: 4	<u>ncana</u> 1" Coil — 3.0mm Lineheater		JO# <u>08562-0</u> Date: <u>28/11/</u>				
Piping: ⊠	Pressure Vessel:	Tank:	Other:	15 V 16 15			
	X-Ray	×	100%	ASME Section VIII-UW-51			
· X	Gamma Ray		Full	☐ ASME Section VIII-UW-52			
	Ultrasonics		25%	Customer Specification			
	Liquid Penetrant	Othe	10% r(Define)	✓ ASME B31.3 NFS Other (Specify)			
	Magnetic Particle		(Deime)	other (specify)			
	Accoustic Emission		Spot				
Hardı	ness test Max 200 BHN			CSA W47.1/W59			
Shell-T= Pipe-T= Total Welds Please use wire typ Please Note locatio	<u>F</u> <u>4" XXH</u> continue shooting pkg (first # i		ssel S/N <u>NWP-08</u>	<u>562-002-A</u>			
Special Requirements: Buttweld Xray to be identified as X-# Gap Shots to be identified as GS-# Threaded Shots to be identified as XT-# Identify on Envelope part of package being shot ie. Coil, Piping, ect. Flashes must contain: Customer, JO#, Spool Identification, Xray number, Clock tape, Welder's ID Symbol, Date Mark all indicated repairs on the project							
NOTE: Encana Spec for Welded Piping-acceptance is zero root defects Encana Spec is Zero Elongated Indications Encana Spec for Socket Welds-acceptance is minimum 1/16" gap Encana Spec for Threaded Piping- acceptance is 7 threads engaged HT is a 5 Point Traverse							
Prepared By: R	.M. Spence Prof Syum		Date: 28/11/201	2			



RADIOGRAPHIC INSPECTION REPORT

CG18 - RT303

Page 2 of 7

Exposure Device #: DBSDB Source #: 888628 Source #: 888628 Source #: 888628 Source #: 888628 Client: Exposure Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Date: 28-Nov-12 Code: A RIBINOT #: 256874 Code: A RI	P										
Film #	,					2B	Job	/ P.O. #:	08562	2-002-A IRISNDT #: 255874 Date: 28-Nov	-12
Code: ASME B31.3 NFS & Encara Spec.	1	· · · · · · · · · · · · · · · · · · ·			Clie	nt: EN	CANA	C/O NWP			
Film # Sizo,	1	, minodoctic. I			Loc	Location: Innisfail, Alberta					
Film	Code: ASM	Code: ASME B31.3 NFS & Encana Spec.			Item	Inspect	ed: 4	4" Coil - 3mm Lineheater Material: CS			
X23	Film#	Film # Location, Welder IRISNDT S.O.D. O.F.D. #						A)ccep (R)ejec			
X24	X23			RT 3A	3.8	.674	4	1	D5		
X25	X24	4"XXH	F	RT 3A	3.8		4				
X26	X25	4"XXH	F	RT 3A	3.8	.674	 		 		
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2	X26	4"XXH	F	RT 3A	3.8			<u> </u>		Debris	
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2 Number of Radiati	X27	4"XXH	F							Demia	
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2			- 	1	0.0	.074		•			A
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2											
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2	-	***									
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2											
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2											
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2		****						-			
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2		****			***		-				
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2						*****					
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2		****						· · · · · · · · · · · · · · · · · · ·	-		
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2		****							*****	NA CONTRACTOR OF THE CONTRACTO	
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2										·	
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2				*****						5 - 4"XXH	
Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2											
Work Location Legend: 1 Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other)										SN NWP - 08562-002-A	
Work Location Legend: 1 Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other)											
Work Location Legend: 1 Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other)											
Work Location Legend: 1 Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other)											
Work Location Legend: 1 Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other)											
Work Location Legend: 1 Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other)											
Work Location Legend: 1 Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other)				1		i					
RT 1,2 2,4 6,7	Number of Ra	adiation Bar	rier Warnir	ng Signs E	rected:	2		Numb	er of R	Radiation Barrier Warning Signs Returned: 2	
Single Wall Exposure	7.1.1.1	n Legend:	[1] lı	nside Fab.	Shop	[2] \	/ard/L	ay-down	Area	[3] Piping/Modular Fab. Area [4] N/A (Ot	her)
CK - Crack	Single Wall Exposu		S.O.D. =	Source-to-ob	ect distance	(D)					
Unit#: 334	Double Wall Expos	ure	O.F.D. ≈			of of	EP	- Excessiv	e Penetr	HB - Hollow Bead LC - Low Cover ration IP - Incomplete Penetration MA - Misalignment	
Same Company		-, -, -, -, 0, 0			****		1 5	- Purosity			
In: 2100 Out: 2200 Hrs: 1.0	Unit#: 334		Kilometers:	N/A			8 1/2)	D5	_	JEFF BRUCKSHAW (PED LEVEL 2) SNT-TC-1A 2	
Personnel: J. BRUCKSHAW J. SMITH Michael V Salit – 86 Sireet Edmonton, Alberta, TRE 578 Phone: (780) 437-2022 Fax: (780) 436-1436 Calgary (403) 278-8121 Cold Lake (780) 626-6105 Calgary (780) 675-6455 Fort McMurray (780) 743-1536 Maintx-Houston, TX (713) 722-7177 Calgary (780) 675-6455 Fort McMurray (780) 743-1536 Maintx-Houston, TX (713) 722-7177 Tulso DK (918) 448-8773	ln: 2100	Out:220	00 Hrs:	1.0]	,			(Print) (Le	
J. BRUCKSHAW J. SMITH Michael V I am in full agreement with report contents I am in full agreement with repor	In:	Out:	Hrs:							C.G.S.B.# 120	<u>iu (</u>
J. SRUCKSHAW J. SMITH Michael V I am in full agreement with report contents Sign	Personnel:										
Michael V agreement with report contents (Sign) Syund										(Print)	
Sign Sum Sum										agreement with	_
5311 – 86 Street Edmonton, Alberta, TRE 5TB Phone: (780) 437-2022 Fax: (780) 438-1438 Calgary (403) 278-8121 Lloydminster (780) 875-8455 Fort McMurray (780) 743-1536 Maintx,Houston, TX (713) 722-7177 Barnhoad (780) 678-3016 Red Deer (403) 347-1742 Tulso DK (918) 448-8773										(Sign) RM Sunce	
Calgary (403) 278-6121 Cold Lake (780) 626-6105 Deer Park, TX (281) 476-4444 Lloydminster (780) 675-6455 Fort McMurray (780) 743-1536 Maintx,Houston, TX (713) 722-7177 Barrhoad (780) 674-3016 Red Deer (403) 347-1742 Tules OK (918) 48,68,773	\ }			<u>l</u>							
Lioydminster (780) 875-8455 Fort McMurray (780) 743-1536 Maint, Houston, TX (73) 722-7177 Banhoad (780) 674-3018 Red Deer (403) 347-1742 Tulso OK (918) 446,8773	Calgary	nion, Alberta, TGE 5 (403) 276-6121	TB Phone: (760) 4	137-2022 Fax: (7		old Loke		(7RD) RO	L8105	Dear Brit TV (204) 478 444	
	Lioydminster Barrhead	(780) 875-8455 (780) 874-3016	; !		Fi	ort McMurray		(780) 743	3-1536	Mairix, Houston, TX (713) 722-717	7

Issuing Authority: Marvin J. (Ty)
DeBelser/Dale Karg
Date of Issue: November 13 2012
Rev Status: 2.1



ABSA	
FORM_NDE_001	
N.D.E Requirements	

N DF Requirements

Client: <u>E</u> Project:	Encana 4" Coil – 3.0mm Lineheater	JO# <u>08562-002</u> Date: 29/11/2012	10.5					
Piping: ⊠	Pressure Vessel:	Tank: Other:						
E.	Gamma Ray	⊠ 100% □ Full	☐ ASME Section VIII-UW-51 ☐ ASME Section VIII-UW-52					
	Ultrasonics Liquid Penetrant Magnetic Particle	25% 10% Other(Define)	✓ Customer Specification✓ ASME B31.3 NFSOther (Specify)					
□ □Harı	Accoustic Emission dness test Max 200 BHN	☐ Spot	CSA W47.1/W59					
	B,L 4" XXH continue shooting pkg (first #	Vessel S/N NWP=08562- is X-28)	:002-A					
Special Requirements: Buttweld Xray to be identified as X:# Gap Shots to be identified as GS-# Threaded Shots to be identified as XT-# Identify on Envelope part of package being shot ie. Coil, Piping, ect. Flashes must contain. Customer, 10#, Spool Identification, Xray number, Clock tape, Welder's ID-Symbol, Date Mark all indicated repairs on the project								
Encan Encan Encan	IOTE: Encana Specifor Welded Piping-acceptance is zero root defects Encana Spec is Zero Elongated Indications Encana Spec for Socket Welds-acceptance is minimum 1/16" gap Encana Spec for Threaded Piping- acceptance is 7 threads engaged HT is a 5 Point Traverse							
Prepared By:	R.M. Spence	Date: 29/11/2012						



RADIOGRAPHIC INSPECTION REPORT

CG18 - RT309

Page 1 of 7

Exposure Device #: D6306 Source #: 88662B Cobalt 60 IR 192 X-Ray EFSS: .154 Film Brand: AGFA #Film/cassette: 1 Code: ASME B31.3 NFS & Encana Spec.					2B	Clie	Job / P.O. #: 08562-002-A IRISNDT #: 255884 Date: 29-Nov-12 Client: ENCANA C/O NWP Location: Innisfail, Alberta Item Inspected: 4" Coil - 3mm Lineheater Material: CS			
PUM# OCHIOD.				Work Loc.	Film Type	1	(A)ccept (R)eject			
X28	4"XXH	L	RT 3A	3.8	.674	4	1	D5		Α
X29	4"XXH	В	RT 3A	3.8	.674	4	1	D5	P@0	Α
			74 JUL							
		-							The street of th	

		<u> </u>								
									CALABAD ORECO ODO A	
			<u> </u>				***************************************		S/N NWP - 08562-002-A	
		<u> </u>								
*****									2 - 4"XXH	
Number of R	adiation Bar	rler Warni	ng Signs l	Erected:	2		Numb	er of	Radiation Barrier Warning Signs Returned: 2	
Work Location	on Legend:	[1] [nside Fab	. Shop	[2]	Yard/L	.ay-dowr	1 Area	[3] Piping/Modular Fab. Area [4] N/A (O	ther)
IRIS Procedure: Single Wall Expos	ure:	S.O.D. =	Source-lo-oi	ject distanc	e (D)		- Arc Burr - Burn Th		EUC - External Undercut IC - Internal Cor IUC - Internal Undercut LF - Lack of Fus	
Double Wall Expo:		O.F.D. =	Distance fro		le of	CH	- Crack - Excessi	_	HB - Hotlow Bead LC - Low Cover	
RT	3, 3A, 4, 5, 8		object to this	i (u)		F	- Porosity	<u>'</u>	S - Stag	
Unit#: 334		Kilometers:	N/A	Film Quar 8	ntity: (2 ¾ x	8 1/41	D5		Interpretation by: JEFF BRUCKSHAW (PED LEVEL 2) SNT-TC-1A 2	
in: <u>2000</u>	Out: 210	00 Hrs:	1.0		\- \\ \	- /-/		$\exists 1$.evei)
I n:	Out:	Hrs:			-			$-\parallel$	C.G.S.B.# <u>12</u>	2007
Personnel:									(Signature) Client Representative:	
J. BRUCKSHAV J. SMITH	J				-		-		Lient Represenative: (Print) Lam in full	
J. SMITH Michael V						agreement with				
							į		(Sign) PM Same	[
				l ,						
5311 – 86 Street Edmi Calgary Lloydminster Bambead Nisku	anlan, Alberta, T6E 5 (403) 279-612 (780) 875-645 (780) 674-201: (780) 955-781	i i i	437-2022 Fax: (, C	Cold Lake Fort McMurray Red Deer		(780) 82 (780) 74 (403) 34	13-1536	Deer Park, TX (281) 476-44 Maltix, Houston, TX (713) 722-71 Tulso, OK (918) 446-87	177 .

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-	Issuing Authority: Marvin J. (Ty)
	DeBelser/Dale Karg
	Date of Issue: November 13 2012
	Rev Status: 2.1



ABSA	
FORM_NDE_001	
N.D.E Requirements	

M. A + Ppainroments

	:: <u>Encana</u> ct: <u>4" Coil – 3.0mm Lineheater</u>		.:	JO# <u>08562-002-A</u> Date: <u>30/11/2012</u>	
Piping: ⊠	Pressure Vessel:	Tank:		Other:	
	X-Ray Gamma Ray Ultrasonics Liquid Penetrant Magnetic Particle Accoustic Emission		Other	100% Full 25% 10% -(Define)	□ ASME Section VIII-UW-51 □ ASME Section VIII-UW-52 □ Customer Specification □ ASME B31.3 NFS □ Other (Specify)
	ardness test Max 200 BHN			Spot	CSA W47.1/W59
P1 Materia Welder ID Shell-T= Pipe-T= Total Weld Please use win Please Note to	B,L 4" XXH ds continue shooting pkg (first # is X	(<u>-30)</u>	Ves	sel S/N <u>NWP-08562-002-</u>	A
Buttweld Xra Gap Shots to b Threaded Sho Identify on En Flashes must o	equirements: y to be identified as X-# pe identified as GS-# ts to be identified as XT-# velope part of package being shot ie. Coil, Piping, e contain: Customer, 10#, Spool Identification, Xray a sted repairs on the project		ock tape	Shots e, Welder's ID Symbol, Date	
En En En	cana Spec for Welded Piping-acceptance is a cana Spec is Zero Elongated Indications cana Spec for Socket Welds-acceptance is m cana Spec for Threaded Piping- acceptance is a 5 Point Traverse	inimum 1	/16" g	ар	
Prepared B	y: R.M. Spence			Date: 30/11/2012	



RADIOGRAPHIC INSPECTION REPORT

CG18 - RT316

Page 1 of 7

				and the same and the same					100 THE RESERVE TH		
Exposure De	vice #: D630)6	Source	#: 88662	2B	Job / P.O. #: 08562-002-A IRISNDT #: 255923 Date: 30-Nov-12					
Cobalt 60□	IR 192 🛭	X-Ray 🗌	EFS	SS: .154		Client: ENCANA C/O NWP					
Film Brand:	AGFA	#Fi	lm/casset	te: 1		Location: Innisfail, Alberta					
Code: ASM	E B31.3 NFS	& Encana	Spec.			Item	Inspect	ed: 4	" Coil - 3mm Lineheater Material: CS		
	Size,		I	1		<u> </u>	1				
Film #	Location, Thickness	Welder ID	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type	71	(A)ccept (R)eject	
X30	4"XXH	B/L	RT 3A	3.8	.674	4	1	D5		Α	
X31	4"XXH	B/L	RT 3A	3.8	.674	4	1	D5		A	
X32	4"XXH	B/L	RT 3A	3.8	.674	4	1	D5		Α	
Х33	4"XXH	B/L	RT 3A	3.8	.674	4	1	D5	P@5	Α	
						·				,,	

A-111.						******					
								<u> </u>			
									S/N NWP-08562-002-A		
1											
			*****						4 - 4"XXH		
	-										
										İ	
					į						
Number of R	adiation Barr	ier Warnir	ng Signs I	Erected:	2		Numb	er of F	Radiation Barrier Warning Signs Returned: 2		
Work Location	n Legend:	[11 [1	nside Fab	. Shop	r21 \	Yard/L	ay-dowr		[3] Piping/Modular Fab. Area [4] N/A (O)ther)	
IRIS Procedure:		S,O,D, =	Source-to-ob			AB	- Arc Burr	75	EUC - External Undercut IC - Internal Cor	ncavity	
Single Wall Expose	1, 2, 2A, 6, 7	O.F.D. =	Distance from	•		CK	- Burn Th - Crack	-	IUC - Internal Undercut LF - Lack of Fus HB - Hollow Bead LC - Low Cover	- 1	
Double Wall Expos	ure 3, 3A, 4, 5, 8		object to film			EP P	- Excessiv	ve Penel	ration IP - Incomplete Penetration MA - Misalignmen S - Steg	nt	
Unit#: 334		Kilometers:	N/A	Film Quan	tity:	8 ½)	D5		Interpretation by: JEFF BRUCKSHAW (PED LEVEL 2) SNT-TC-1A 2		
ln: <u>2200</u>	Out:230	O Hrs:	1.0		_ ·~ · · · ·	/				.evel)	
ln;	Out:	Hrs:							C.G.S.B.# _12	2007	
Personnal:				-			-		(Signature)		
J. BRUCKSHAW	1								Client Representative: (Print)		
J. SMITH Michael V				-	 				I am in full agreement with		
					<u> </u>		l		report contents (Sign)		
									- June		
5311 – 88 Street Edmi	nlon, Alberta, TGE 57	8 Phone: (780)	437-2022 Fax: F	780) 438-143A							
Calgary Lloydminster	(403) 279-6121 (780) 875-6455		•	·	old Lake ort McMurray		(780) 82 (780) 74	3-1536	Deer Park, TX (281) 476-44 Matrix, Houslan, TX (713) 722-71	177	
Banhead Nisku	(780) 674-3018 (780) 855-7616			F	led Deer		(403) 34	7-1742	Tulsa, OK (918) 446-87	773	

Issuing Authority	/: Marvin J. (Ty)
DeBelser/Dale K	arg
Date of Issue: No	vember 13 2012
Rev Status: 2.1	

NUD Industries Inc. 114

ABSA	
FORM_NDE_001	
N.D.E Requirements	

N D F Requirements

	nt: <u>Enc</u> a			<u>.</u>	JO# <u>08562-002-A</u>			····		
Proje	ect: <u>4</u>	Coil – 3.0mm Lineheate	<u> </u>		Date: <u>03/12/2012</u>					
Piping: ⊠	₹	Pressure Vessel:	Tank:		Other:					
		X-Ray		X	100%		ASME Section VIII-UW-51			
	X	Gamma Ray			Full		ASME Section VIII-UW-52			
		Ultrasonics			25%	\boxtimes	Customer Specification			
	☐ į	iquid Penetrant			10%	X	ASME B31.3 NFS			
	□ ~	1agnetic Particle		Othe	r(Define)		Other (Specify)			
	☐ Ac	coustic Emission			Spot					
	Hardnes	ss test Max 200 BHN					CSA W47.1/W59			
General I	ial			Ves	ssel S/N <u>NWP-08562-00</u> 2	<u>2-A</u>				
	elds <u>co</u> vire type i	XXH ntinue shooting pkg (fir Qi of all indications on films on rep 5.O.D S.F.D on reports								
Special R Buttweld Xr Gap Shots to Threaded Sh Identify on E Flashes must	Require ray to be i pobe identi nots to be invelope p t contain;	ments: dentified as X-# ified as GS-# identified as XT-# part of package being shot ie. Co Customer, JO#, Spool Identifical		ock tap	C Shots e, Welder's ID Symbol, Date					
E: E:	Mark all indicated repairs on the project NOTE: Encana Spec for Welded Piping-acceptance is zero root defects Encana Spec is Zero Elongated Indications Encana Spec for Socket Welds-acceptance is minimum 1/16" gap Encana Spec for Threaded Piping- acceptance is 7 threads engaged HT is a 5 Point Traverse									
Prepared	By : <u>R.I</u> √	I. Spence			Date: <u>03/12/2012</u>					



RADIOGRAPHIC INSPECTION REPORT

CG24 - RT1335

Page 1 of 1

Contract Constant		Service Co										
Exposure De	vice #: D62	74	Source	‡: 79875	iВ	Job / P.O. #: 08562-002-A IRISNDT #: 255935 Date: 3-Dec-12						
Cobalt 60□	IR 192 🛚	X-Ray 🗌	EFS	S: .135		Client: ENCANA C/O NWP						
Film Brand:	AGFA	#Fil	lm/casset	te: 1		Location: INNISFAIL Alberta						
Code: ASM	E B31.3 N &	ENCANA S	PEC.		***	Item	Item Inspected: 4" COIL - 3.0mm LINEHEATER Material: C.S					
Film #	Size, Location, Thickness	ID	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type		A)ccept R)eject		
				******					JO# 08562-002-A			
									S/N NWP-08562-002-A			
		Ross	7500	4/12								
X34	4"XXH	Bril F	RT 3A	4	.674	4	1	D5	L	Α		
X35	4"XXH	B/L	RT 3A	4	.674	4	1	D5	:	Α		
X36	4"XXH	B/L	RT 3A	4	.674	4	1	D5	P@0.25	Α		
X37	4"XXH	B/L	RT 3A	4	.674	4	1	D5	FM@3-4	Α		
X38	4"XXH	B/L	RT 3A	4	.674	4	1	D5	·	A		
X39	4"XXH	B/L	RT 3A	4	.674	4	1	D5	P@11	Α		
			1									
		·····										
								<u> </u>	·			
					<u> </u>	ļ			1			
****						<u> </u>			6-4"XXH			
 			1			<u> </u>			0-4 AATT			
								ļ				
	1		<u> </u>		· ····································							
				<u> </u>			<u></u>					
Number of F									Radiation Barrier Warning Signs Returned: 5			
Work Locati	on Legend:		Inside Fal				Lay-dow		[3] Piping/Modular Fab. Area [4] N/A (O			
Single Wall Expo	sure: 「1, 2, 2A, 6, 7	5.O.D. =	Source-to-o	•		B	T - Burn Ti K - Crack		IUC - Internal Undercut LF - Lack of Fus HB - Hollow Bead LC - Low Cover			
Double Wall Expo		O.F.D. =	Distance fro object to file		ide of	E	P - Excess P - Porosit			nt		
Unit#: 226		Kilometers:	10	Film Qua	ntity:				Interpretation by: BRODY SMITH SNT-TC-1A II			
In:	Out:		1.75	24		x 8 ½)	D5		C.G.S.B. II			
In:	Out:		1,73	24	(2 /4	A U /2)	טט			2569		
Personnel:		1153.			_				(Signature)			
BS / JS / MV									Client Representative: (Print)			
									l am in full agreement with			
				L					report contents (Sign) DW Source			
:				<u></u>								
5311 – 66 Street Edr Calgary	nonton, Alberta, T6E (403) 279-61	578 Phone: (780 21) 437-2022 Fax:	(780) 438-142	6 Cold Lake		{780} !	326-6105	Dear Fatk, TX (281) 475-4	444		
Lloydminster Bantlead Nisku	(780) 875-84 (780) 674-30 (780) 955-76	55 18			Fort McMum Red Deer	ay	(780)	743-1536 147-1742	Malrix,Housten, TX (713) 722-7 Tulsa, OK (916) 446-8	177		

Issuing Authority: Marvin J. (Ty)
DeBelser/Dale Karg
Date of Issue: November 13 2012
Rev Status: 2.1



ABSA
ORM_NDE_001
V.D.E Requirements

N.D.E Requirements

Client France	IOU 005 C2 003 A
Client: <u>Encana</u> Project: <u>4" Coil – 3.0mm Lineheater</u>	JO# <u>08562-002-A</u> Date: <u>04/12/2012</u>
Piping: ☑ Pressure Vessel: ☐ Tank: ☐	J Other:
☐ X-Ray 🔀	100% ASME Section VIII-UW-51
⊠ Gamma Ray	Full ASME Section VIII-UW-52
Ultrasonics	25% Sustomer Specification
Liquid Penetrant] 10% ⊠ ASME B31.3 NFS
Magnetic Particle	her(Define) Other (Specify)
Accoustic Emission] Spot
Hardness test Max 200 BHN	CSA W47.1/W59
P1 Material	essel S/N <u>NWP-08562-002-A</u>
Welder ID <u>B,L</u> Shell-T=	
Total Welds continue shooting pkg (first # is X-40)	
Please use wire type iQi Please Note locations of all indications on films on reports Please include O.F.D-S.O.D S.F.D on reports	
Special Requirements:	ろShots
Buttweld Xray to be identified as X-#	
Gap Shots to be identified as GS-# Threaded Shots to be identified as XT-#	
Identify on Envelope part of package being shot ie. Coil, Piping, ect.	•
Flashes must contain: Customer, JOH, Spool Identification, Xray number, Clock t Mark all indicated repairs on the project	rape, Welder's ID Symbol, Date
NOTE: Encana Spec for Welded Piping-acceptance is zero root defe	ects
Encana Spec is Zero Elongated Indications	
Encana Spec for Socket Welds-acceptance is minimum 1/16 Encana Spec for Threaded Piping- acceptance is 7 threads e	- ·
HT is a 5 Point Traverse	
Prepared By: R.M. Spence	Date: <u>04/12/2012</u>



RADIOGRAPHIC INSPECTION REPORT

CG24 - RT1342

Page 1 of 1

Exposure Device #: D6274 Source #: 79875B Job / P.O. #: 08562-002-A IRISNDT#: 255951 Date: 4-Dec-12 Cobalt 60 IR 192 X-Ray □ EFSS: .135 Client: ENCANA C/O NWP Film Brand: AGFA #Film/cassette: 1 Location: INNISFAIL Alberta Code: ASME B31.3 N & ENCANA SPEC. Item Inspected: 4" COIL - 3.0mm LINEHEATER Material: C.S Size. Welder IRISNDT S.O.D. O.F.D. Work Film Film# Location. Type and Location of Discontinuities (A)ccept Proc. Inches (rejectable discontinuities in square brackets []) Inches Exp. Loc. Type Thickness (R)eject JO# 08562-002-A S/N NWP-08562-002-A X40 4"XXH B/L RT 3A 4 .674 4 1 D₅ P@11 Α X41 4"XXH B/L RT 3A 4 .674 D5 Α X42 4"XXH B/L RT 3A 4 1 D5 P@14.5-0, 10 Α 3-4"XXH Number of Radiation Barrier Warning Signs Erected: 5 Number of Radiation Barrier Warning Signs Returned: 5 Work Location Legend: [1] Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other) IRIS Procedure: AB - Arc Burns EUC - External Undercut IC - Internal Concavity S.O.D. = Single Wall Exposure: Source-to-object distance (D) BT - Burn Through IUC - Internal Undercut LF - Lack of Fusion RT 1, 2, 2A, 6, 7 CK - Crack HB - Hollow Bead OFD = LC - Low Cover Double Wall Exposure RT 3, 3A, 4, 5, 8 Distance from source side of EP - Excessive Penetration Incomplete Penetration MA - Misalignment object to film (d) P - Porosity S - Slag Interpretation by: Unit#: Film Quantity: Kilometers: 10 BRODY SMITH SNT-TC-1A C.G.S.B. Ħ _____ Out: ___ Hrs: 1 (2 1/4 x 8 1/2) D5 C.G.S.B. # Out: ___ 12569 ____ Hrs: Personnel: (Signature) Client Representative: BS/JS/MV (Print) I am in full agreement with report contents (Sign) 5311 - 86 Street Edmonton, Alberta, T6E 518 Phone: (780) 437-2022 Fax: (780) 438-1436 Calgary (403) 279-5121 Loydminster (780) 875-6455 F. Barrhead (780) 675-6455 R. Nisku (780) 955-7618 Cold Lake Fort McMurray (780) 826-6105 (780) 743-1538 Deer Park, TX-) Matrix,Houston, TX Tulsa, OK (281) 476-4444 (713) 722-7177 (918) 446-8773 Red Deer (403) 347-1742

Issuing Authority: Marvin J. (Ty)	
DeBelser/Dale Karg	
Date of Issue: November 13 2012	
Rev Status: 2.1	

Industries Inc. 1M

ABSA	
FORM_NDE_001	
N.D.E Requirements	

N D F Requirements

					- 10 g mm 4 mm	
- Cli	F-2002			JO# <u>0856</u>	52-002- <u>A</u>	
Project Piping: ⊠	Pressure Vessel:	Tank:		Other:		
	X-Ray		X	100%		ASME Section VIII-UW-51
	 ⊠ Gamma Ray			Full		ASME Section VIII-UW-52
[Ultrasonics			25%		✓ Customer Specification✓ ASME B31.3 NFS
	Liquid Penetrant		Othe	10% r(Define)		Other (Specify)
	Magnetic Particle					
[Accoustic Emission			Spot		CSA W47.1/W59
	ardness test Max 200 BHN					
General Ir			Ve	ssel S/N <u>NW</u>	P-08562-00 <u>2</u>	<u>-A</u>
Welder ID Shell-T=						
Pine-T=	4" XXH ds continue shooting pkg (first	# is X-43)				
Please Note !	ocations of all indications on films on repor	ts				
- 110	Pressure Vessel:					
Buttweld Xr Gap Shots to Threaded Sh Identify on E Flashes mus	ay to be identified as X-# be identified as GS-# ots to be identified as XT-# invelope part of package being shot ie. Coil, t contain: Customer, JO#, Spool Identificati	Piping, ect. on, Xray number	, Clock t	ape, Welder's ID S	ymbol, Date	
NOTE: E	Pressure Vessel: X-Ray Gamma Ray Ultrasonics Liquid Penetrant Magnetic Particle Accoustic Emission Hardness test Max 200 BHN Tal Instructions: terial er ID B,L T= T= 4" XXH Welds continue shooting pkg (first # i) use wire type iQi Note locations of all indications on films on reports include O.F.D-S.O.D S.F.D on reports include O.F.D-S.O.D S.F.D on reports ided Shots to be identified as X-# tots to be identified as XT-# y on Envelope part of package being shot ie. Coil, Pip s must contain: Customer, JO#, Spool Identification, Malt indicated repairs on the project Encana Spec for Welded Piping-acceptance Encana Spec for Socket Welds-acceptance	ons ince is minimu	m 1/16	5" gap		
	Low D.M. Coppe			Date: 05	/12/2012	
Prepared	By: K.IVI. Spence					



RADIOGRAPHIC INSPECTION REPORT

CG24 - RT1348

1

Page 1 of 1

Exposure De	wise #LDS	274	Carre	4. 7007			1 D O II					
Cobalt 60				#: 7987; 8 S :.135	DB.	Job / P.O. #: 08562-002-A IRISNDT #: 255979 Date: 5-Dec-12						c-12
Film Brand:		·	ilm/casset			Client: ENCANA C/O NWP Location: INNISFAIL Alberta						
Code: ASM				ie, i		l			AIL Alberta 1" COIL - 3.0mm LINEHEA	TER	Material: C.S	
	-	····	1	1					- GOIL GOILING CHILD			
Film #	Size, Location Thicknes	l, l in	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type	J	on of Disc ties in squ	ontinuities are brackets [])	(A)ccept (R)eject
									JO# 08	562-002-/	1.:	
									S/N NWP	-08562 -0 0	2-A	

X43	4"XXH	B/L	RT 3A	4	.674	4	1	D5	P@	25.5, 6	ļ	Α
X44	4"XXH	B/L	RT 3A	4	.674	4	1	D5				Α
~~								***-				
										White American		
											:	
	-											
								·····				
											,	

	ww.								2-4	"XXH	***************************************	1
			-									

Number of Ra	adiation Ba	rrier Warnii	ng Signs E	rected:	5		Numbe	er of F	Radiation Barrier Warning	g Signs R	eturned: 5	!i
Work Locatio	n Legend:	[1] [nside Fab.	Shop	[2] \	ard/L	ay-down	Area	[3] Piping/Modular	Fab. Area	1- [4] N/A (Other)
RIS Procedure: Single Wall Exposu		S.O.D. =	Source-to-ob	ject distance	e (D)		- Arc Burn - Burn Thr		EUC - External Und		IC - Internal C	
Double Wall Expos	1, 2, 2A, 6, 7 Jure 3, 3A, 4, 5, 8	O.F.D. =	Distance from object to film		e of	EP	 Crack Excessiv Porosity 	e Penet	HB - Hollow Bead		LC - Low Cove MA - Misalignm	г
Unit#: 226		Kilometers:	20	Film Quan	tity:				Interpretation by: BRODY SMITH	maste	SNT-TC-1A	1
ln:	Out:	Hrs:	.75	B	(2 ½ x	8 1/2)	D5	$-\parallel$	(Print)		- C.G.S.B	
In:	Out:	Hrs:			, , , , , ,				<i>I</i>			Level) 12569
Personnel:				Ĭ	<u> </u>			$-\parallel$	(Signature)		_	
BS/JS/MV			-						Client Representative: (Print)		L	
							 		l am in full agreement with			
									repart contents (Sign)	RUT	Samo	
Passa no e				******								
5311 – 86 Street Edmor Calgary Lloydminster	(403) 279-612 (780) 875-645	:t :5	437-2022 Fax: (7	C	old Lake ort McMurray		(780) 826 (780) 743	-6105 -1538		Deer Park, TX	(281) 478	
Barrhead Nisku	(780) 674-301 (780) 955-761	8			ed Deer		(403) 347	-1742		Matrix, Houston Tulsa, OK	i, TX (713) 722-1 (918) 448-6	1773

Issuing Authority:	Marvin J. (Ty)
DeBelser/Dale Kai	rg
Date of Issue: Nov	ember 13 2012
Rev Status: 2.1	

PUVIF	D
Industries Inc.	tM

ABSA	
ORM_NDE_001	
N.D.E Requirements	

M II F Requirements

Client	t: Encana		JO# <u>08562-00</u> 2-A			
	ct: <u>4" Coil – 3.0mm Lineheater</u>	AFTER PWHT	Date: 19/12/2012			
Piping: ⊠	Pressure Vessel: 🗌	Tank:	Other:			
	X-Ray Gamma Ray		100%	ASME Section VIII-UW-51		
	Chillie incy		Full	☐ ASME Section VIII-UW-52		
	Ultrasonics		25%	Customer Specification		
	Liquid Penetrant	\boxtimes	10%			
	Magnetic Particle	Othe	r(Define)	Other (Specify)		
	Accoustic Emission		Spot			
⊠H	ardness test Max 200 BHN			CSA W47.1/W59		
P1 Materia		Ves	ssel S/N <u>NWP-08562-00</u>	<u>02-A</u>		
Welder ID Shell-T=	<u>F,B,L</u>					
.·ipe-T=	<u>4" XXH</u>					
Total Weld	ls HT x 7 welds (first # is HT-1)				
	e type iQi cations of all indications on films on repoi O.F.D-S.O.D S.F.D on reports	rts				
	quirements:		Shots			
	/ to be identified as X-# e identified as GS-#					
Threaded Shot	s to be identified as XT-#					
	relope part of package being shot ie. Coil,					
	ontain: Customer, JO#, Spool Identification ted repairs on the project	n, Xray number, Clock tap	e, Welder's ID Symbol, Date			
NOTE: End	ana Spec for Welded Pining-accents	ince is zoro root defect	_			
	TE: Encana Spec for Welded Piping-acceptance is zero root defects Encana Spec is Zero Elongated Indications					
	Encana Spec for Socket Welds-acceptance is minimum 1/16" gap					
	Encana Spec for Threaded Piping- acceptance is 7 threads engaged					
HT	is a 5 Point Traverse					
Prepared B	y: R.M. Spence		Date: <u>19/12/2012</u>			



HARDNESS TEST REPORT

TIANDINESS TEST REPORT							
DATE:							
CLIENT			NWP ECHO JOB #				: 4953
	ACTOR:	ENCANA	ENCANA				
LOCATI	ON:		RIES (INNISFAIL)		PROJECT:	VESSEL SN# NV	VP-08562-002-A
	EXAMINED:		ım LINEHEATER (,	·· · · · · · · · · · · · · · · · · · ·			
CODE /	SPECIFICATION:	ENCANA SPE	C.ASME B31.3NFS	CLIE	NT PO # / JOB #:	JOB# 08562-002	?-A
				METHOD		and the second second	
HARDN	ESS SCALE:	BHN	MAXIMU	JM TOLERANCE:		200 BHN	
EQUIPN	IENT TYPE:	HL200	SERIAL #:	39702870	LAS	T CALIBRATION	SEPT. 7, 2012
			TE	ST RESULTS	halely value end		PERMENDING STEELS
HT#	XRAY#/STAMP	DIAMETER /		НА	ARDNESS VALUI	ES	
		SCH.	P.M	H.A.Z	WELD	H.A.Z	P.M.
1	X-41 / B,L	4" / XXH	140	141	143	140	139
2	X-40 / B,L	4" / XXH	136	147	138	144	141
3	X-28/ L	4" / XXH	144	140	137	141	133
4	X-29 / B	4" / XXH	148	135	142	140	134
5	X-24 / F	4" / XXH	147	142	145	131	135
6	X-27 / F	4" / XXH	139	144	142	141	136
7	X-5 / F	4" / XXH	141	143	137	140	140
8							
9							
10							
11					-		
12							
13							
14							
15							
16							
17							
18							
19							
20							
ſ	Misc Charges		JON CF	RUICKSHANK		Regular Hours	SEE FIELD
SEE FIEI	_D INVOICE					Overtime Hours	INVOICE
FJC-1212	219-A		CGSB / SNT-T	C-1A LII MT #16:	356	Shift Premium	FJC-121219-1
Kilometers							
Client: BOB Par Rump Technician Signature: Assistant: BRAYDEN C.							
53A Burnt Park Drive I Red Deer, AB I T4P 0J7							
	Ph: (403) 347-7042 Fax: (403) 347-7052 www.echonde.com						



R & R Stress Relieving Service Ltd.

Nisku: 2103 - 6th Street, T9E 7X8 Tel: (780) 955-7559 Fax: (780) 955-2903 Blackfalds: #13 Burbank Industrial Park Tel: (403) 885-2280 Fax: (403) 885-0177 Toll Free: 1-800-499-HEAT(4328)

CERTIFICATE OF CONFORMANCE OF RECORDING INSTRUMENTS

CERTIFIED BY:

R & R Stress Relieving Service Ltd.

TEST NUMBER:

RR1112

DATE:

November 9, 2012

DATE DUE:

February 9, 2013

INSTRUMENT MFG:

Chino

MODEL NUMBER:

AH-3725 N00

SERIAL NUMBER:

AH-059C172

RECORDER NUMBER: IR-182

This instrument has been calibrated and it is within the manufacturers specifications.

REFERENCE STANDARDS

DIGI MITE 311600 S/N48430-5522

CERT DATE Oct 22/12

The calibration of all standards and measuring instruments used in the calibration are traceable to the National Research Council of Canada in Ottawa or to the National Bureau of Standards in Washington, D.C.

CHART NO. EH-51089



HEAT TREATMENT REQUIREMENTS

Serial#: NWP-08562-002-A

PO# 710533

Coil B 4"NPS XXH SA-333-6 294.875 3930 Total: 10286 lbs TYPE OF HEAT TREATMENT: PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL P1 And Materials PRESSURE VESSEL OR P1 And Materials PRESS	JUB NO.: 08562-002-A	CUSTO	OMER: EnCana Co	orporation	DATE: December 11	2012	
DWG, NO, AND LINE NO. DIAMETER THICKNESS MATERIAL LENGTH WEIGHT 44° NPS XXH SA-333-6 294.875 6356 Coll B 4' NPS XXH SA-333-6 294.875 33930 Total: 10286 lbs YPE OF HEAT TREATMENT: PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials [EATING] Temperature to be raised from 800°F (42°C) to 1150°F (62°C) at a maximum rate of 400°F C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 400°F (204°C) PER HOUR. Calculated rate = 400 degrees F/hr. (204 degrees C/hr) Divided by the maximum metal thickness of the shell or head late in inches] [CDING] Emperature to be held in range of 1150°F to 1175°F for 50 minutes. 10ding time to be determined by Table UCS-66 for Nominal Thickness as specified in UW-40(f)] [COLING] (COLING) (COMPONENT DESCRIPTION: 3.0 mm btu/hr Line Heater Coil						
Coil B 4"NPS XXH SA-333-6 294.875 3930 Total: 10286 lbs TYPE OF HEAT TREATMENT: PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL OR PROCESSEL OR P1 And Materials PRESSURE VESSEL P1 And Materials PRESSURE VESSEL OR P1 And Materials PRESS				MATERIAL	LENGTH	WEIGHT	
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YPE OF HEAT TREATMENT: PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials EATING	Coil B	4" NPS	XXH .	SA-333-6	294.875	3930	
Temperature to be raised from 800°F (427°C) to 1150°F (621°C) at a maximum rate of 400°F C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 400°F (204°C) PER HOUR. Calculated rate = 400 degrees F/hr. (204 degrees C/hr) Divided by the maximum metal thickness of the shell or head late in inches] OLDING emperature to be held in range of 1150°F to 1175°F for 60 minutes. 100 LING emperature to be lowered from 1150°F (621°C) to 800°F (427°C) at a maximum rate of 500°F C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 500°F (260°C) PER HOUR. 21 calculated rate = 500 degrees F/hr. (260 degrees C/hr.) Divided by the maximum metal thickness of the shell or head late in inches] 100 LING 100 LIN						Total: 10286 lbs	
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late in Inches] OLDING emperature to be held in range of 1150F to 1175°F for 60 minutes. Holding time to be determined by Table UCS-56 for Nominal Thickness as specified in UW-40(ft)] OOLING emperature to be lowered from 1150°F (621°C) to 800°F (427°C) at a maximum rate of 500°F. "C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 500°F (260°C) PER HOUR. Jacculated rate = 500 degrees F/hr. (260 degrees C/hr.) Divided by the maximum metal thickness of the shell or head late in inches] Tomal Requirements: Job number and description required on heat treatment charts along with the operator's signature & date. Reporting of thermocouple attachment method and location, and verification of furnace thermocouple calibration is required. A sufficient number of thermocouples shall be located to control and maintain uniform distribution of temperature on all vessels and parts. Thermocouples shall be directly attached to the item or provision shall be made for thermocouple palacement at bottom, centre and top of the furnace charge in accordance with the ASME Code. During the heating period, there shall not be a greater variation in temperature throughout the portion of the vessel being heated than 250°F (121°C) within any 15°f. (4.6 m) interval of length. An adequate number of themocouples must be used to ensure this Code requirement is met. During the holding period, there shall not be a greater difference than 150°F (66°C) between the highest and lowest temperature throughout the portion of the vessel being heat treated, except where the range is further limited by these instructions. If Capacitor Discharge welding is used to attach thermocouples an ASME Code Section IX Welding Procedure Specification is required (WPS qualification is not required), and the energy output must be limited to 125 Watt-Seconds. No other welding is permitted on vessels or parts. [0.5 x Capacitance in farads X Voltage ² = W-Sec.] The method of thermocouple removal shall not damage the heat treated item. LC. Inspector Signature he	(° C) per ho	our. NOTE: THIS VA	LUE MUST NEVER	EXCEED 400°F (204°C)	PER HOUR.		
CLDING Properties Color	[Calculated rate = 400 degrees F/h	r. (204 degrees C/hr)	Divided by the max	imum metal thickness o	of the shell or head		
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emperature to be lowered from 1150°F (621°C) to 800°F (427°C) at a maximum rate of 500°F "C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 500°F (280°C) PER HOUR. Calculated rate = 500 degrees F/hr. (260 degrees C/hr.) Divided by the maximum metal thickness of the shell or head late in inches] rom 800°F (427°C) items may be cooled in still air. onal Requirements: Job number and description required on heat treatment charts along with the operator's signature & date. Reporting of thermocouple attachment method and location, and verification of furnace thermocouple calibration is required. A sufficient number of thermocouples shall be located to control and maintain uniform distribution of temperature on all vessels and parts. Thermocouples shall be directly attached to the item or provision shall be made for thermocouple placement at bottom, centre and top of the furnace charge in accordance with the ASME Code. During the heating period, there shall not be a greater variation in temperature throughout the portion of the vessel being heated than 250°F (121°C) within any 15 ft. (4.6 m) interval of length. An adequate number of themocouples must be used to ensure this Code requirement is met. During the holding period, there shall not be a greater difference than 150°F (66°C) between the highest and lowest temperature throughout the portion of the vessel being heat treated, except where the range is further limited by these instructions. If Capacitor Discharge welding is used to attach thermocouples an ASME Code Section IX Welding Procedure Specification is required (WPS qualification is not required), and the energy output must be limited to 125 Watt-Seconds. No other welding is permitted on vessels or parts. [0.5 x Capacitance in farads X Voltage ² = W-Sec.] The method of thermocouple removal shall not damage the heat treated item. LC. Inspector Signature hermocouple Attachment Method: Capacitar Discharge Location (s) CO i) Fin 15 Oppo 5 ite 5 ide 5 Location (s) CO i) Fin 15 Oppo 5 ite 5 ide 5 L	[Holding time to be determined by T			pecified in UW-40(f)]	. ;	<u> </u>	
"C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 500°F (260°C) PER HOUR. Calculated rate = 500 degrees F/hr. (260 degrees C/hr.) Divided by the maximum metal thickness of the shell or head late in inches] rom 800°F (427°C) items may be cooled in still air. onal Requirements: Job number and description required on heat treatment charts along with the operator's signature & date. Reporting of thermocouple attachment method and location, and verification of furnace thermocouple calibration is required. A sufficient number of thermocouples shall be located to control and maintain uniform distribution of temperature on all vessels and parts. Thermocouples shall be directly attached to the item or provision shall be made for thermocouple placement at bottom, centre and top of the furnace charge in accordance with the ASME Code. During the heating period, there shall not be a greater variation in temperature throughout the portion of the vessel being heated than 250° F (121° C) within any 15 ft. (4.6 m) interval of length. An adequate number of thermocouples must be used to ensure this Code requirement is met. During the holding period, there shall not be a greater difference than 150° F (66° C) between the highest and lowest temperature throughout the portion of the vessel being heat treated, except where the range is further limited by these instructions. If Capacitor Discharge welding is used to attach thermocouples an ASME Code Section IX Welding Procedure Specification is required (WPS qualification is not required), and the energy output must be limited to 125 Watti-Seconds. No other welding is permitted on vessels or parts. [0.5 x Capacitance in farads X Voltage ² = W-Sec.] The method of thermocouple removal shall not damage the heat treated item. LC. Inspector Signature Date: **Marchard** Discharge** Location (s) **Coline Tol. Supposite Sides**		50°E (621°C) to 800°E ((427°C) at a maximum	rate of 500°F			
Calculated rate = 500 degrees F/hr. (260 degrees C/hr.) Divided by the maximum metal thickness of the shell or head late in inches] rom 800°F (427°C) items may be cooled in still air. onal Requirements: Job number and description required on heat treatment charts along with the operator's signature & date. Reporting of thermocouple attachment method and location, and verification of furnace thermocouple calibration is required. A sufficient number of thermocouples shall be located to control and maintain uniform distribution of temperature on all vessels and parts. Thermocouples shall be directly attached to the item or provision shall be made for thermocouple placement at bottom, centre and top of the furnace charge in accordance with the ASME Code. During the heating period, there shall not be a greater variation in temperature throughout the portion of the vessel being heated than 250° F (121° C) within any 15 ft. (4.6 m) interval of length. An adequate number of thermocouples must be used to ensure this Code requirement is met. During the holding period, there shall not be a greater difference than 150° F (66° C) between the highest and lowest temperature throughout the portion of the vessel being heat treated, except where the range is further limited by these instructions. If Capacitor Discharge welding is used to attach thermocouples an ASME Code Section IX Welding Procedure Specification is required (WPS qualification is not required), and the energy output must be limited to 125 Watt-Seconds. No other welding is permitted on vessels or parts. [0.5 x Capacitance in farads X Voltage ² = W-Sec.] The method of thermocouple removal shall not damage the heat treated item. Part 24/2 The method of themocouple removal shall not damage the heat treated item.		• •	• • • • • • • • • • • • • • • • • • • •				
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Job number and description required on heat treatment charts along with the operator's signature & date. Reporting of thermocouple attachment method and location, and verification of furnace thermocouple calibration is required. A sufficient number of thermocouples shall be located to control and maintain uniform distribution of temperature on all vessels and parts. Thermocouples shall be directly attached to the item or provision shall be made for thermocouple placement at bottom, centre and top of the furnace charge in accordance with the ASME Code. During the heating period, there shall not be a greater variation in temperature throughout the portion of the vessel being heated than 250° F (121° C) within any 15 ft. (4.6 m) interval of length. An adequate number of themocouples must be used to ensure this Code requirement is met. During the holding period, there shall not be a greater difference than 150° F (66° C) between the highest and lowest temperature throughout the portion of the vessel being heat treated, except where the range is further limited by these instructions. If Capacitor Discharge welding is used to attach thermocouples an ASME Code Section IX Welding Procedure Specification is required (WPS qualification is not required), and the energy output must be limited to 125 Watt-Seconds. No other welding is permitted on vessels or parts. [0.5 x Capacitance in farads X Voltage ² = W-Sec.] The method of thermocouple removal shall not damage the heat treated item. C.C. Inspector Signature Date: Da		oled in still air.					
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	Furnace Heat Number RP32	-12-896			<u></u>		
	Furnace Operator Signature	272		Date: D	ec 11/12		
orm Prepared by: Kasha Fox Date: December 5 2012	, , , , , , , , , , , , , , , , , , , ,	×		Date: De	cember 5 2012	•	

NWP Industries Inc™	
PO Box 6280	
4017-60 Ave.	
T4G 159	



Website: www.nwp.ca
Phone: (403) 227-4100
Fax: (403) 227-4102

HYDROSTATIC TEST AFFIDAVIT

Customer: Encana Corp		JO#	08562-002-A		
Project: Coil for 3.0 mm Linehea	<u>iter</u>	Pro	ject#		
Test Pressure: 7757 PSI		Hol	d Time: <u>60 minutes</u>		
Code Requirements: ASME B31.	3 2010 edition				
All Personnel Advised of Test 位	All Signs & Flagging Poste	ed 🗇			
Prior to Filling – Fitting/Hoses & Sign-Off Supervisor:	Component Meet Required Tester:	Test Pressure			
Product Description:	rester. <u>-</u>		Date: <u>07/01/2013</u>		
-					
PS-100 & 101 / Coils A & B = 77	57 PSI -				

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50% Test Pressure Leak/Syste	oms Charle Completed				
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50% Coils A & B = 3879 PSI					
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Equipment Drained & Flushed to Prevent Freezing:		Yes: □	No: □		F-27
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NWPG- 20,000 # 5	0-20,000	······································	13/449	100 2013	
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 NWPG- 20,000
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 NWPG PSI

 est By:
Approved By:

Date: In 1/2013

Date: 17.13

	NWP Industries Inc™
	PO Box 6280
;	4017-60 Ave.
j	T4G 1S9

NWP	ý
Industries Inc.	FAt

Website: www.nwp.ca Phone: (403) 227-4100

Fax: (403) 227-4102

CHECKLIST FOR CLEANING OF INDIRECT FIRED HEATER COILS	
Initial	
Operator has reviewed safe work practice and signed permit	
Operator has inspected pig receiver to ensure it is in good operating condition and verified that transition spools are correct size and rating for coil to be cleaned	
Operator has verified system is not under pressure	
Operator has ensured	
 block valve is in the proper position valves and seal on blind flange are tight and secure closure on receiver is properly installed and secure working pressure of the system and pig receiver are not exceeded Operator has reported to supervisor any material collected Operator certifies that indirect fired heater coil is free of debris 	
Serial Number: <u>8562 - 008</u>	
Date: Jun 8/2013	
Operator: Andrew Lundgren	
Print Signature	
Witness: 6/16 Ca All	
Print Signature Signature	

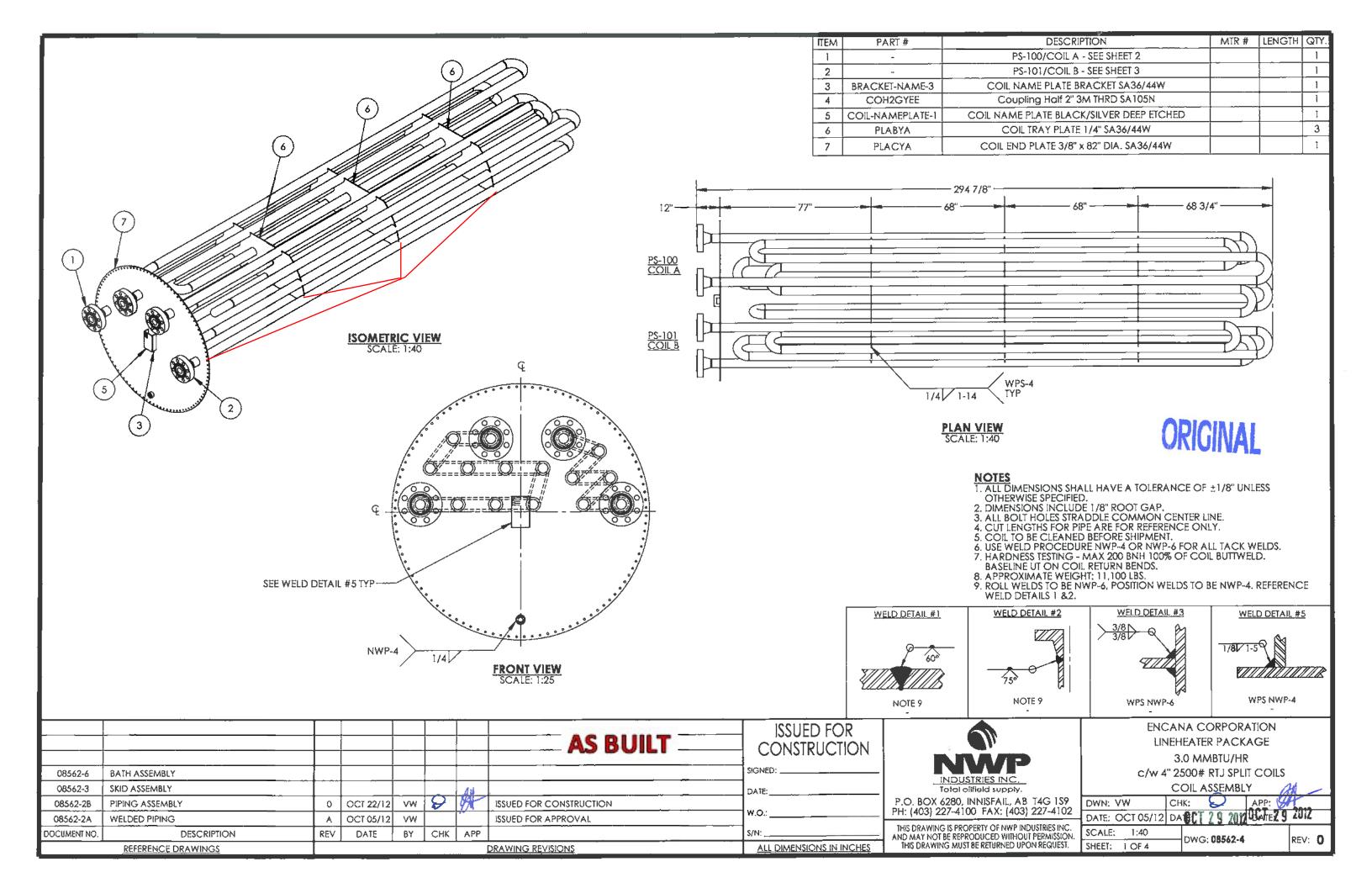


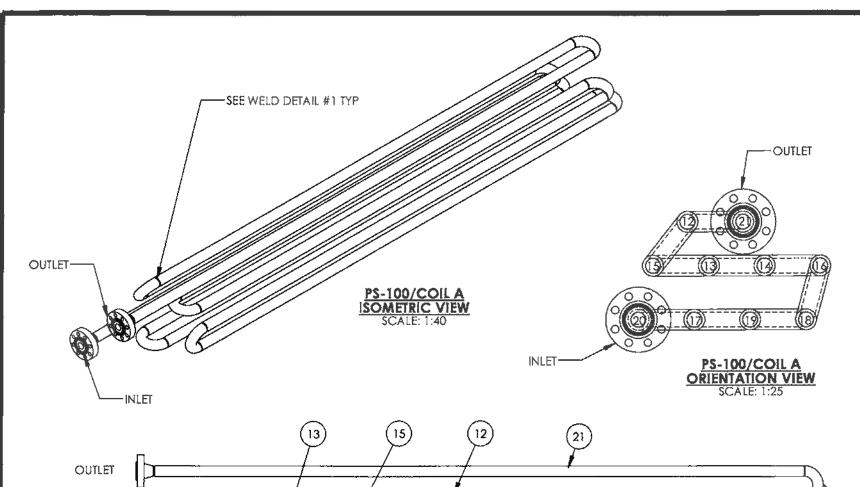
7 JAN 2013

Signed

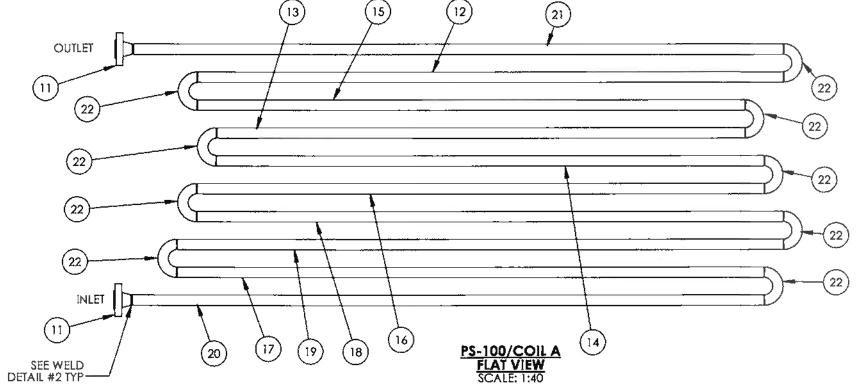
Joe Tworek NB 12995 A,B AB 261

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				Suite 1800, 855-											•		
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WELD SEQUENCE
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PS-100/COIL A 1	DESIGN DATA
DESIGN AND FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
CLIENT SPECIFICATION:	ECA-PVF-S-03 REV 0 SPEC FAA
DESIGN PRESSURE:	5171 PSI
MAX. DESIGN METAL TEMPERATURE:	200°F
MIN. DESIGN METAL TEMPERATURE:	-20°F
IMPACT TEST:	EXEMPT PER TABLE 323.2.2 COLUMN A
RADIOGRAPHY:	100%
OTHER NDE:	SEE NOTE 7
POST WELD HEAT TREATMENT:	1150°F±36°FFOR 1HOUR MIN.
HYDROSTATIC TEST PRESSURE:	7757 PSIG
CORROSION ALLOWANCE:	
PRE-HEAT:	50 °F
WEIGHT EMPTY:	6356 LBS
WEIGHT FULL:	
CAPACITY:	12.2 CU FT
SURFACE AREA:	264 SQ FT
QUALITY CONTROL PROGRAM:	AQP-1253
WELDING PROCEDURE REGISTRATION NO.:	1604.2
WELD PROCEDURES:	NWP-4, NWP-6
SERVICE:	HYDROCARBONS
CRN NO.:	P-9417.213
DESIGN REGISTRATION DRAWINGS:	BDD-400A REV1
REFERENCE CALCULATIONS:	BDD-400A REV4

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08562-6	BATH ASSEMBLY							
08562-3	SKID ASSEMBLY					ac l		
08562-2B	WELDED PIPING	0	OCT 22/12	VW	D	44	issued for construction	
08562-2A	WELDED PIPING	A	OCT 05/12	VW			ISSUED FOR APPROVAL	
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP		
	REFERENCE DRAWINGS		· · · · · · · · · · · · · · · · · · ·			-	DRAWING REVISIONS	

CONSTRUCTION ALL DIMENSIONS IN INCHES

ISSUED FOR

INDUSTRIES INC.
Total oilfield supply.

P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102

THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.

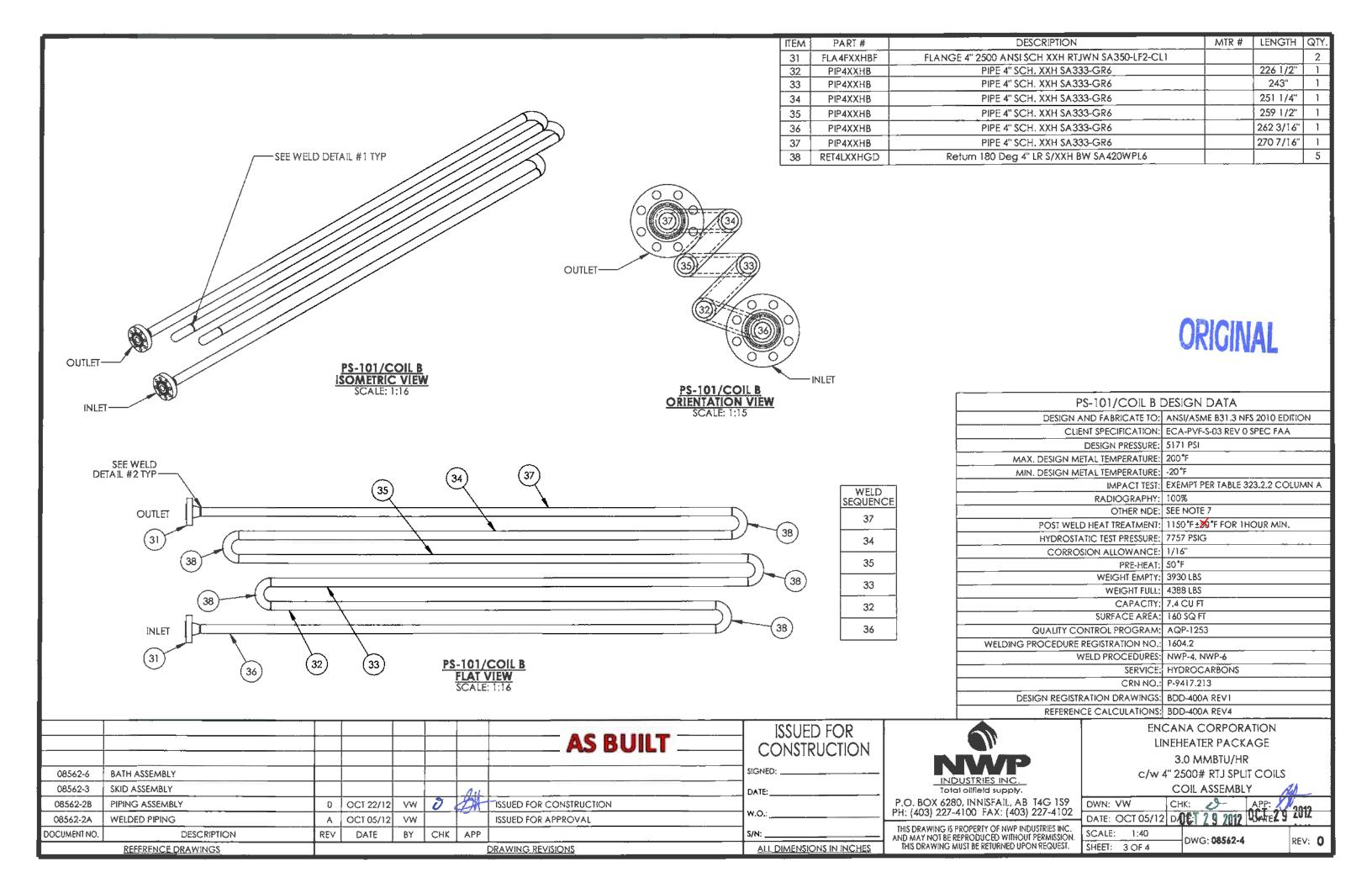
**ENCANA CORPORATION** LINEHEATER PACKAGE 3.0 MMBTU/HR c/w 4" 2500# RTJ SPLIT COILS

COIL ASSEMBLY

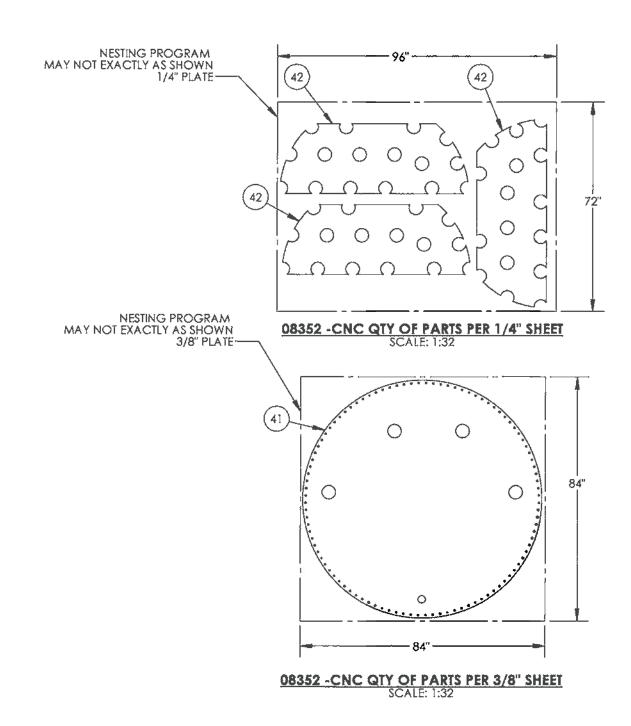
CHK: 🔬 APP: 加 DWN: VW DATE: OCT 05/12 DATECT 2 9 2012 DATE: 29 2012 SCALE: 1:40

DWG: 08562-4 SHEET: 2 OF 4

REV: 0



MEM	PART#	DESCRIPTION	MTR#	LENGTH	QIY.
41	PLAC8484A	PLATE 3/8" x 84" x 84" \$A36/44W		1	1
42	PLAB7296A	PLATE 1/4" x 72" x 96" SA36/44W		.3	3



# ORIGINAL

							AS BUILT	ISSUED FOR CONSTRUCTION
08562-6	BATH ASSEMBLY							SIGNED:
08562-3	SKID ASSEMBLY					nd t		DATE:
08562-28	PIPING ASSEMBLY	0	OCT 22/12	VW	2	VX-	ISSUED FOR CONSTRUCTION	
08562-2A	WELDED PIPING	Α	OCT 05/12	VW		.0.	ISSUED FOR APPROVAL	
DOCUMENT NO.	DESCRIPTION	RE∀	DATE	BY	CHK	APP		5/N:
	REFERENCE DRAWINGS			ALL DIMENSIONS IN INCHES				

TRUCTION

INDUSTRIES INC...
Total oilfield supply.

P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: {403} 227-4100 FAX: (403) 227-4102

THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST. ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU/HR
c/w 4" 2500# RTJ SPLIT COILS

DWN: VW CHK: APP: APP: DATE: OCT 05/12 DATE: 1:14

Y OF NWP INDUSTRIES INC. CED WITHOUT PERMISSION. SCALE: 1:16
SHEET: 4 OF 4

DWG: 08562-4

REV: 0

VT. 643 -.680

Sec II, Part A, 2010 edition,

# 中华 及 等 第 有 即 0 / 1 月 addenda"

114,3 MW NPS 4 朝 SEAMLESS STEEL PIPES 17.12 MM MATERIAL CONFORM ž Name: SPECIFICATIONS TO CUSTOMER BUCANA REQUIREMENTS AS PER P.O. ASTWASME A/SA393-10 GR.8 NACE MR0175-2008 K度 KENGTH 6.1 M 為支数 TOTAL PIECES (PCS) CERTIFICATE NO. 僧用证号 MILL TEST CERTIFICATE 會同号 CONTRACT NO. LIC NO. 中午 (FR 10E05NB) 168 11080252 100810 TOTAL METERS (M) DELIVERY CONDITION 假造方法 MAKING METHOD 热处理工艺 HEAT TREATMENT DATE OF ISSUE Tel: (0510)85580556 Fax: (0510)85580556 文章状态 **无褐市滨湖区胡埭工业园西区西拓振湖路** 出货日期 951,8 Page 10 / 11 TOTAL WEIGHT (TONS) 均候戦(岳) 卷札 HOT-ROLLED AS-ROLLED 2011-11-15 热轧液 39,044

订货单位 CUSTOMER

PURCHASER

收货单位

SPEC/GRADE

茶 建钢级 产品名类PRODUCT

SURVE	李林			NOTES		VISUAL	  *					Ę		T-		 T	-			Ģ	中					
<u></u>		T	1			VISUAL & DIMENSION	外別和尺寸		556	Min	Mex		J.	-			110952			SOXX N	北大学中					
SPECTED		证明本委用	C HEXEB	支援と	¥ 10	NON			556 / 560 -	416		MPa	T.S.	抗拉强度	発用の	Ž.							_			
WE HEREBY CERTIFY THAT THE MATERIALS DESCRIBED HEREIN HAVE BEEN MANUFACTURED, SAMPLED, TESTED INSPECTED IN ACCORDANCE WITH THE CUSTOMER'S SPECIFICATION(S), AND THAT THEY SATISFY THE REQUIREM		到产品, 发	CONFIRM	。 東東方 B OREN ATION : □東国LONGTUDINAL	"1. H: HEAT (LADLE) ANALYSIS, P. PRODUCT ANALYSIS.	9000	全	44	386 / 386	240		4 MPa	Y.S.	母眼頸度	病面 GAUGE LENGTH (50.8mm)	文字准备。FENSILE TEST	000132			HEAT NO.	di di					
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* TEST * * YIELD TENSILE LONG ND METH DIR KSI KSI KSI SELONG R . 2 T 64.2 77.2 26(2")  C H E M I C A L P R O P E R T I E S * * * * * * * * * * * * * * * * * *	MS PIECES D5 1	ROD	TEST REPORTS REQUIRED Sec. 1, Part A, 2010  TEST RESALE  TO 1020. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011.	HOT ROLLED STEEL SHEET - HSLA - TO CHEMISTRIES OF CSA G40.21 44W/ASTM A36 (04)(08) - CHEM OF CSA G40.21 38W - STRL O - TEMPER ROLLED - RESTRICTED GAUGE 3/4 TOL - TOP SEMI-CRITICAL SURFACE - STANDARD SHAPE	STRIAL METALS LTD STREET BRTA	ESSAR Steel Algoria Inc.  105 West Street, Sault Ste. Marie, Ontario Canada P6A 784  15063-BS  15063-BS  2011/10/05 2011/11/20 251758 - NOXL
* * * * * * * * * * * * * * * * * * *	* * * *	* * * * * * * * * * * *	THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALGOMA INC. IF YOU RECIEVE THIS DOCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705)945-2624 COLLECT FOR INSTRUCTIONS ON METHOD OF DISPOSAL OF DOCUMENT.	SPECIFICATION SHOWN, ALL RESULTS ARE RETAINED IN ACCORDANCE WITH THE COMPANY'S STANDARD RECORD KEEPING PRACTICES.  K. UGHADPAGA MMMGER METALLURGICAL SERVICES	MILL TEST REPORTS  ESSAR STEEL ALGOMA INC. HEREBY CERTIFIES THAT THE MATERIAL HEREBY DESCRIBED WAS MADE AND TESTED IN ACCORDANCE WITH THE BRIDES OF THE	784 -380828 MILL DROUGH

^{**}WARNING** THE TEST RESULTS AND VALUES REPORTED HEREIN INDICATE ONLY THAT (1) THE PARTICULAR STEEL FOR WHICH THIS CERTIFICATE IS ISSUED MEETS THE MINIMUM SPECIFIED YIELD STRENGTH AND (2) THE CHEMICAL ANALYSIS AND PHYSICAL PROPERTIES OF SUCH STEEL ARE IN CONFORMANCE WITH THE REQUIRMENTS OF THE SPECIFICATION INDICATED. THE RESULTS OR VALUES REPORTED HEREIN CAN NOT BE USED TO QUALIFY THE STEEL FOR ANY SPECIFICATION OTHER THAN THE ONE INDICATED AND CAN NOT BE RELIED UPON FOR ANY PURPOSE (INCLUDING DESIGN OR CALCULATIONS) AS REPRESENTING THE ACTUAL STRENGTH OF SUCH STEEL.

ArcelorMittal Dolasco Inc. P.O. Box 2460 Hamilton, Ontario

Purchase Order/Bon de Commande M\$1032461-02 JUNE Bill of Lading/Connaissement 750936 FOUNDS SOID TO/VERICH A RUSSEL METALS INC. P.O. BOX 39 WINNIPEG, MB. R3C 2GZ

Spec/Norm et Spec. DOFASCO G40.21 44W/50W STANDARD THICKNESS TOLERANCE STANDARD UNEXPOSED SURFACE MATERIAL CERTIFICATION REQUIRED CODE SPOT 508-14

TEST REPORT RAPPORT D'ESSAI

Customer/Client

Page 1 of 1

Attention: \$/8 Admin Dept. Fax: 9 1 204 774 5732 Date: 05/05/2011

Salos Order/Son de Commande HS2 306201006 243000 HS2 SUbzum Packing Slip/Bordereau de Charge

Vehicle or Carrier/Vehicule ou Transporteur TBA/TBA/C

Ship To/Expedier A RUSSEL METALS INC. 1359 ST. JAMES ST. WINNIPEG, MB. RZH OK9

Material Description/Description du Material : HOT ROLLED STEEL SHEET STRUCTURAL STEEL COILS MILL EDGE PLAIN DRY

.1740 MIN .1820 X 60 X COIL Weight - 56400 LBS Test Methods ASTM A370, E1019, E415

051044379

Vendor/Yendeur

MECHANICAL PROPERTIES

HEAT SERIAL NUMBER COULEE NOMBRE DE SERIE

100512 P21493/00

TEST UNITS KSI GAUGE LENGTH 2 INCH LIFT NUMBER YIELD STRENGTH ULTIMATE STRENGTH %ELONG NOMBRE DE RESISTANCE A LA RESISTANCE A LA ALLONG FARDEAU D'ELASTICITE TRACTION 4622159 71 78 27.4

"Conforms with ASME Sec II, Part A, 2010 edition" Checked to SA36

₩o 013, Als Alt. Cb V Ti Ca N B .049 .051 .042 .003 .020 .002 .0075 .0002 .012

We Certily That The Material Described Herein Conforms To The Specification Shown On This Document
ArcelorMittal Dofasco Inc. as per Diane Skupny-MacBride - CMTL Supervisor
The Results Belate Only To The Items Tested
This Report Shall Not Be Reproduced Except in Full Without The Expressed Written Approval of The CMTL Supervisor.

This Contract is Subject To The Terms And Conditions Of Sale Shown On The Order Acknowledgement. Ce Contral est Sujot aux Terms et Conditions de Vente Indiques Sur l'Accuse de Reception de Commande.

VT.694-.718

1/Cana

HENGYANG VALIN STEEL

TUBE CO., LTD

# MILL CERTIFICATE

P. C.: 421001 Add: 10 Dalixincum, Hengyang City, Hunan, P. R. China

Tel and Fax: +86 734 8873739

		1/3				MT			•••	FLATTENING	TEST	ACCEPTABLE	ACCEPTABLE	ACCEPTABLE
						13		<del></del> -		FLATT	TE	ACCEP	ACCEP	•
		PAGE:				95.113		150	YS/TS			0.71/0.71	0.72/6.72	
COM	C201139822-1	2011-12-31	04045			TOTAL WEIGHT:		TH(mm):S\L\25.4	R.A. (%)					
E-meil: hsiecehysteeltube.com	C2011		L/C NO.: N.ILC.04045			TOTAL	STM A370	GAUGE LENG	EL(%)			44.5/44.0.	44.5/46.0	
-mail: hsie		ä			)FT	FT	TENSILE TEST ASTM A370	N / Size(mm	Rt0.5			48140/47850 🗸	30750	•
		DATE:	z		. 0.674" * 4(	7604.94	TENS	ORIENTATIO	YS(Psl)			48140/	51620/50750	
110204 3.1)	KELLY PIPE CERTIFICATE NO.	NO: 190471	DELIVERY CONDITION N	INT	DIMENSIONS(mm) 4" * 0.674" * 40FT	TOTAL LENGTH:		SAMPLE TYPE/ORIENTATION / SIZE(mm/GAUGE LENGTH(mm):SL\25.450	TS(Psi)			67425/67135	71340/70515	
(ACCORDING TO EN10204 3.1)	CELLY PIPE C	d.		HEAT TREATMENT			WEIGHT	TH.	#1			19.023	15.018	10001
(ACC						S: 190	LENGTH	15				1520.99	1200.78	1440.04
				NOTE		TOTAL PIECES:		PIECES				38	30	36
	- 1		STEEL PIPE	SEE SPECIFICATION NOTE		TO		BUNDLES				8	6	ŧ
1000 000, 1010			SEAMLESS CARBON STEEL PIPE	SEE SPE	B/ A333-GR.6/ X42	39		HEAT No.				1115920	(1115921)	34444
•	MER	CONTRACT NO.		SPECIFICATION		TOTAL BUNDLES:		LOT No.	:			812100049	812100050	1200001
	CUSTOMER	CONT	PRODUCT	SPECI	GRADE	TOTA		Ö N				_ 	22	·

ACCEPTABLE

0,72/0,72

44.0/45.0 7 44.5/44.0

49590/49445 53070/52490

69310/68875

21.025 22.026

1681.09 1761,14

(4 4

1115926 1315924

812200052 **81Z200053** 

71485/70905

0.74/0.74 ACCEPTABLE

HARDNESS TEST

NACE MR0175

GRAIN

NON METALIC INCLUSION

끰

Av. (J) % SHEAR AREA

AK2 (J) CONFORMS

吕

Av. (J) % SHEAR AREA

AK1 (3)

g

V8/T/-45/10

NOTCH TYPE/ORIENTATION TEMPERATURE/SIZE (mm) : (1)

IMPACT TEST

SPECIFICATIONS STOMER

> 88/06/58 85/80/92

134 157

123.0/146.0/132.0 158.0/136.0/178.0 150,0/172.0/130.0 128.0/114.0/156.0

133 158

147.0/159.0/168.0

151

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HRC <22

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N&T-NORMALIZING AND TEMPERING HE-HOT EXPANDED HR-HOT ROLLED | A ş š N-NORMALIZING A-ANNEALING Av.-AVERAGE Date sample one match L-Longitudinal T-TRANSVERSE 1 SAMPLE TYPE: S--STRIP C-CLUBBED F-FULL-SECTION Q&T.-QUENCHING AND TEMPERING REQUIREMENTS Manne ( EUC - 5 90/92/85 88/88/98 85/87/90

LE-SIDE EXPANSION

AK2-ABSORB ENERGY FOR THE SECOND SET

AKI-ABSORB ENERGY FOR THE FIRST SET

NR-NORMALIZING ROLLED

W2-ACTUAL WEIGHT

WI-THEORETICAL WEIGHT

HENCYANG VALIN STEEL TUBE CO., LTD

MILL CERTIFICATE

Add: 10 Dalfxincum, Rengyang Clty, Human, P. R. Chian P. C. :421001

Tel and Faxe +86 734 8873739

NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO. 19641   NO.		TODE ON: TO		(ACCORDING TO EN10204 3.1)	EN10204 3.1)	-3	C201139822-1	C201139822-1	-			
SEAMLESS CARBON STREEL PPR   TACKATABRAT   TOTAL UNION   TOTAL UNION   TOTAL WEIGHT: 95.113 INT	•			אבורו גוגנ	100721	DATR	2011-13	1531		PAGE	213	
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1907AL PIECES   190   TOTAL LINGTH: 7004,3M   7604,5M	B/ A333-GR.6	y X42		DIMENSIONS(mm)	,674" * 40		Cimin	1	2113	5		
13   13   10   15   14   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   14   15   15	DLES:	39	TOTAL					TAL WER	HI.	23.13		
Type   C   Si	SEAT No			***************************************	CHEMICAL COMPO	SI'TION (%)		-		L.	ŀ	
Name   Part	- No. 10	Type	C ISI IMI Cr Mo W	Ni P Al Sn	Sb Nb Ti	Bi S	$\dashv$	CETTE CEPCS	<u> </u>	Sulta	-+	≌
H   H   A  A  A  A  A  A  A  A  A  A  A  A  A			001+		0001*		10000	8			+	$\perp$
H   H   A1   A1   A1   A1   A1   A1		٩							_		-	$\perp$
1		7		7		$\sim$	1	Z	1441	L	_	_
P	1115920	= =	1 10 N 10 VE	2 2	1 3	1	477	35	Ш	lШ		7
H	312100049	2 0	32 102 51	2 2	3	80	47 1	34		ı		7.
H	11,5001	7 5	22 112. 6 2	2 16	1 2	50	43 2	36				ئسة
F   15   15   10   15   11   14   2   15   27   17   19   19   19   19   19   19   1	1113921	E	21 109 4 1	2 2	1 3	80	47	34		·		<u>, , , , , , , , , , , , , , , , , , , </u>
H   15   34   110   5   1   4   2   15   15   27   1   3   10   1   3   10   15   3   10   15   10   10   10   10   10   10	17.100050	<u>.</u>	30 100 41 1	2 55	3	08	47, 1	35(	125		-	۲.,
P   14   31   106   51   14   21   15   27   17   18   18   19   19   19   19   19   19	1114925	<u> </u>	34 1101 5 1	2 16	1 3	H	44 2	351	124	- 1	1	~
F   15   31   107   51   1   4   2   15   277   328   104   51   104   51   32   37   37   37   37   37   37   37	12100051	2	31 106 3 1	2 15	1	-	47 1	33	. !		1	-
H   16   51   105   5   1   4   2   15   27   1   3   5   5   5   4   4   2   15   5   5   8   4   1   15   5   5   10   5   1   4   2   15   27   8   4   1   15   5   10   5   1   1   1   2   10   5   1   1   2   2   10   5   1   1   2   2   2   4   2   1   2   2   2   4   2   2   2   2   4   2   2	150001733	1.	31 107 5 1	2 15	1 3	- 1	47	35	1	_L	1	
P   15   32   107   5   1   4   2   15   27   1   1   3   80   47   1   35   12   57   84   1   1   1   1   1   1   1   1   1	1115926	Ŧ	1 5/160/15	2 V14	1 3	> I	44 2	× ×	_		+	5 1
P   15   32   106   51   1   4   2   15   27   1   3   100   51   1   4   2   15   27   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   100   5   1   1   3   1   1   3   1   1   3   1   1	112200052		32 107 5 1	2 15	1 3	8	47 1	32	2		1	`
H   15 √51 √105  √5   1   5   2 √16   31   1   3   120 √42   3   53 √6   13   52   82   1   1   1   1   1   1   1   1   1	1Z2000\$2		32, 106, 5, 1	2 15	3 3	80		34	20	_i_	<u> </u>	
P   13   106   5   1   4   2   15   28   1   3   106   5   1   3   105   5   1   3   105   5   1   3   105   5   1   3   105   5   1   3   105   5   1   3   105   5   1   3   105   5   1   3   105   5   1   3   105   5   1   3   105   5   1   3   105   5   1   3   1   1   1   1   1   1   1   1	1115924		V31/109 / 5 1	2.A6	3	1201		3			1	
P	312200053		33 106 5 1	2 15	Ε ,	30	- 1	32		Į.	-	27 0
PIPE BODY   PIPE BODY   PIPE END   PIPE END   DIAGEN	81Z200053		32 107 5 1 NON-DEST	4 21 15 UCTIVE TES		100	47	74	1071	i	+	_
MPI   ACCEPTABLE   NOI				CINE SIM		_		חשאשמ	שַכ			
NA   ACCEPTABLE   CUATING	ed evel)	-	ET		MPI				ACCEPTA	BLE		
ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   COATING								VīST	AL & DIA	TENSION		
ACCEPTABLE   ACCEPTABLE   COATING	INAR		N/A						ACCEPTA	BLE		
ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACC	FSITT		ACCEPTABLE		ACCEPTABLE				COATIN	•		
REMENT (50%)	MAGNETI	SM			ACCEPTABLE		-					
ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE   ACCEPTABLE     PPRODUCT ANALYSIS   CEEQUIVALENT CARBON   R-RATIO   RI=Ca /S   R2=Al /N     V5+(Cu+Ni)/15   CEPCM=C+Si/30+(Mn+Cr+Cu)/20+Ni/00+6**   SUM2=Nb+V+1;     SUM2=Nb+V	THIS MPA	NIREMENT (S	50%)		N/A.							
P-PRODUCT ANALYSIS CE-EQUIVALENT CARBON R-RATIO R1=Ca /S R2=Ai /N  A0+V/I5+(Cu+Ni)/15 CEPCM=C+Si/30+(Mn+Cr+Cu)/20+Ni/80+Mn/15+V/10+5*B  SUM2=Nb+V  SUM2=Nb+V  L4,NOTCH DEPTH IS 12.5% THE SPECIFIED WALL THICKNESS. L2-ACCEPT LEVEL 12,NOTCH DEPTH IS 5% THE SPECIFIED WALL, THICK	STATICT	EST	psi/s)		ACCEPTABLE			į	ACCEPTA	BLE		
### CEPCM=C+Si/30+(Mn+Cr+Cu)/20+Ni/ i+V L4,NOTCH DEPTH IS 12.5% THE SPECIFIED WALL THICKNESS.	H-FIEA	T ANAL YSIS	PPRODUCT ANALYSIS	CE-EQUIVALENT CAR		RI=Ca /S		R2=A1 M		R3=Mr	3,1	
SUMZ=Nb+V IS 12.5% THE SPECIFIED WALL THICKNESS.	CEIIWei	C+Mn/6+(Cr+M	10+V)/5+(Cu+Ni)/15	CEPCM=C+Si/30+(Mn+C	+Cu)/20+Ni/80+Mor15+V/10+	5.B						
IOTCH DEPTH IS 12.5% THE SPECIFIED WALL THICKNESS.	SUMI⊨	Cr+Cu+Mo+Ni	<b>∧</b> ±	SUM2=Nb+V		SUM3=]	V4-V4-Ti					
	LI-AC	CEPTLEVELL	CA, NOTCH DEPTH IS 12.5% THE SPEC.	THEID WALL THICKNESS.	L2ACCEPT LB	VEL.1.2, NOTCH DEP	TH IS 5% THI	SPECIFIEE	WALL T	ICKNESS		

MUIC= nowest MN = 109 = 6.81 Highest C = 16

HENGYANG VALIN STEEL

TUBE CO., L'TD

MILL CERTIFICATE

City, Hunan, P. R. China P. C. :421001 8873739 E-mail: helecchysteeltube, com C201139822-1 Add: 10 Dalixincum, Hengyang Tel and Fax: +86 734

(ACCORDING TO ENTOROG 3, 1)

		CACACAMINE OF CALLOROLD	,				
Curonokien	<u> </u>	KELLY PIPE CERT	CERTIFICATE NO.		C201139822-1		
COSTOMER			L	1,66.	2011-12-31	pAGE.	873
CONTRACT NO		NO: 190471	7	DATE:	١		?)
PRODUCT	SEAMLESS CARBON STEEL PIPE	WILIO DELIW	DELIVERY CONDITION N	1,/C NO,: N.II,C.04045	11.C.04045		T
SPECIFICATION	SEE SPECIFICATION NOTE	HEAT TREATMENT					
GDADE	11 A 111.(312 6/ X42)	DIME	DIMENSIONS(mm) 4" " 0.674" * 40FT	* 0.674" * 40FT			
MININI CO.	TOTAL PIECES:	190 TOTAL LE	TOTAL LENGTH: 7604.940	FI	FOTAL WEIGHT: 95.113	95,113	MT
IOLAL BUNDLESS.							
	REMARK						
							<del>~~</del>

SPECIFICATION 5LB/X42, PSL-2-2008, NACE MR-0175-2009 (FOR HARDNESS ONLY) (CSA Z245.1 NOTE GR.241/290 CAT II -2007) ASTM AS3B/A106B/A333-6-2010, KSME SA53B/SA106B/SA333-6-2010, API NOTE

We hereby certify that material herein described has been manufactured in accordance with the standards and specifications required in your order and satisfies the corresponding requirements.

This certificate is issued by a computerized system and it is valid with electroic signature. On the original certificate the trade-mark JOINTIME ight-green coloured at the bottom of the page is stamped. In case the owner of the certificate would release a copy of it, he must attest its conformity to the original one taking upon himself the responsibility for any untawhil or not allowed use.

If you need to assure the authenticity of this certificate, please do not hesitate to contact Mangyang Valin Steel Tube CO., LTB, E-mail: hsiec@hysteoltube.com

Any alteration and/or faisification will be subject to the law.

CUSTOMER THIRD PARTY

(衛用华菱鄉當有順公司)

超双开

Quality Manager:

距婚期 Certificale-maker;

CLIENTE / Customer / Client

**CCTF CORPORATION (EDMONTON)** 5407 - 53 AVENUE NW EDMONTON, AB T6B 3G2 CANADA

#### **CERTIFICADO DE INSPECCION**

Inspection Certificate - Certificat de Réception

DIN EN 10204 / 3.1 ISO 10474 / 3.1





ULMA FORJA, S.COOF

**PRODUCTO** 

**FLANGES** 

N.º 19/10/2012

151901

HOJA: Page: 1

8º Zubillaga, 3 - Apdo. 14 20560 OÑATI (GIpuzkoa) SPAIN

Article - Produit

SU PEDIDO N.º Your Order No.

4891880-00 Votre Çde. N.º

FECHA:

Date:

of. - de 28/09/2012

Certified acc. PED 97/23/EC+AD2000-W0 by TÜV Rheinland N.º 01 202 E/Q 02 7443

MARCA DEL FABRICANTE Mark of factory Marque du l'abricant

E-mail: ulme@ulmepiping.com Packing List: 96870

Tel.: 34 - 943 780552

Fax: 34 - 943 781808

NORMAS APLICABLES Requirements - Normes Applicables

**ASME B16.5-09** 

Material Correspondent - Qualité MODO DE FUSION (*) Steel Making - Elaboration de l'acier E = Elec. Y = Oxígeno básico

MATERIAL CORRESPONDIENTE ASTMIASME A/SA105N-11 A/SA350LF2CL1-11

NACE MR0175/ISO15156-2-09 & MR0103-10 Clause 7.2.1.4. Annex A.2 and SSC Region 3.

CSA-Z245.12-09 GR248 CAT II - SS (WN & BLIND FLANGES ONLY)

DEPARTAMENTO **QUALITY ASSURANCE** Section

Département

E - Clot. 1 - Oxigono	, 24440	CON-1243, (240 CR240 CR1 II - O	S (MIN OF BETUE LEVIL	IGES UNLT				GOLDOLLIOLO C							
PARTIDA item Poste	CANTIDAD Quantity Quantité	DESCRIPCION Description Description	LOTE	OBSERVACIONES Remarks Observations (*)	COLADA N. Heat No N.ºCoulée	RESISTENCIA T.Strength Resist Rupt N/mm2	Y.Strength	ALARGAM, Elongation Allongament Lo: 4 d	ESTRICCION Red. Area Striction %	Impa	ELIENCIA act test Dience es	CHA	RPY V 10x1  MEDIA  Average  Moyenne	TA-SPECARN IOMM	DUREZA Herdness Dureté HBW
18 7586840 18 7586840 29 7581234	17	WN 12 150LB STD RF A350LF2 WN 12 150LB STD RF A350LF2 WN 4 2500LB XXS RTJ A350LF2	1742 2482 1062	NE NE NE	329V2 526V2 192V2	513 515 533	325 318 338	28,40 26,40 25,00	55,30	50 63 61	56 69 35	52 66 38	53 66 45	-50 -50 -50	155 161 150 152 155 156
		08110=4.15													
COLADA NE	COMPOSICA	ON CHIMPA . STEEL MAKED'S I ANI E ANALYSIS . A	MAI VOE GUIROUE	<del></del>											

COLADA N.º Heat No		COM	POSIC	ION QU	IMICA -	STEE	L MAKE	R'S LA	DLE AN	IALYSI:	- ANA	LYSE C	HIMIQL	ĴΕ	
N.ºCoulée	C %	,Si %	Mn %	P%	S%	Cr %	Ni %	Mo %	Nb %	V %	€u %	AI %	Ti %	N %	CEq %
192V2 329V2 526V2	0,200 0,200 0,210	0,240	0,830 0,860 0,840	0,011	0,001 0,001 0,002	0,200	0,090	0,020 0,040 0,025	0,001 0,001 0,006	0,003			0.000	0,000	

(*) OBSERVACIONES: Remarks Observations

N NORMALIZED AT 900 C AND ALLOWED TO COOL IN STILL AIR

2012/11/7 Sinasan "Conforms with ASME Sec II, Part A, 2010 edition, 2011a addenda"

- Las dimensiones y la condición superficial se halfaron satisfactorias.
- Dimension and surface condition were found acceptable.
- Les dimensions et états de surface sont satisfaisants.
- Los materiales citados cumplen las normas aplicables.
- Manufacturing requirements are satisfied.
- Les normes applicables sont respectées.

**EL INSPECTOR** Works Inspector - L'Inspecteur



REQUIREMENTS

SPECIFICATIONS

AS PER P.O.

ENCANA JATERIAL CONFORMS TO CUSTOMER

		$\square$	PARIS	n Bo	say	1800	1.	XXH														
			e fitting					Abna	ahm	ıep	rüfze	ugnis	i		Artikelb	ezeichr	nung /	designa	ion]			
		A-682	24 Schlins	_	107			Insp	ecti	on	Certi	ficate	<del>)</del>		elbows		- 4K 5/					
ernefi	ittings	Haup	tstrasse 46 la/Europe			9	•				04 - 3				LR-180- Anforder	S-WPL	6-4"-X	XS	fraguire	ments n	f the on	derl
		Telefo	on +43/552 ex +43/552	24 501-0	Reg. I 12 100	3054	0324	Nr. [cert. 49/12-SI	D	F	Rev.		um [da /07/201	2	ASME B1	6.9-2007	LR, ma 4.420N	sterial:WPI LEd 07, TI	_6, TR-fil R-addit fi	ting:AST tling:NA(	M A 420 CE 🕶	)/A
Kunde [cus	stomer]					1		[code no	o.j			tuent iv	ii. Įiuci	n 110.j	MADO175/	C01515F	こつ・クロロ	3A2 NAC	E MRU10	)3-20U/ :	2. T 200 4	4. (
TRANS AM	l					13	56547 Insere <i>E</i>	\uftrags.	Nr./A	\rt.N	Vr. (our	order n	o./item	no.]	certificate	:EN 1020 I protecti	14/3.1, 0 on:Mills	end prepar standard, e	xecution	Seamles	55 55	
Piping Prod	lucts Ltd.					11.	41790IF	1-0060 / 1	11444	16					12(-),		·					
Attn: Svava	ì						re Bes	teli Nr. []	your c	orde	er no.j											
9335 Ende	avor Drive	S.E.						quantity]														
CDN-T3S			erta				1															
Vormateria															ļ							_
[base materia	ŋ		seamle					Cabroliza	analys	ee Ih	neat ena	lvsisl	J-Fakto		(Si +	Mn) * (P	+ Sn) *	10000				
Analyse	Schmelz		Erschm	elzungsa	rt [meilin	g proce	$ss_{I} \cap = s$	Schmelza	alreiye	e Iv	,001 0.,00	,, 5,	CEQ (		C +			Mo + V) /	5 + (Cu +	Ni) / 15	<del>,                                    </del>	т—-
[analysis]	[heat n	U.J	<del> </del>	ĪSi 🕌	Mn	P	s /	Cr 🗸	Мо	7	Ni Z	Cu -	V /	Nb -	Al	B 0.0004	Ti 0.004	0,0065	Ceq 🗸	<del> </del>		<del>                                     </del>
1	356547		0.15	0.21	0.92	0,016	0.001	0.07	0.01		0,04	0.05	0.002	0.001	0.026	0.0004	0,004	0.0000				
			<u></u>	<u> </u>				 chnolog			Perificini	n Imecl	techi	nologica	il testi			•				·
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0307_12	LIVE		<del>- 1</del>															quenched	and tempe	red		
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Zertifiziert nac Notified Body	h DGRL 97/23	/EG Anh	ang I - Abs	satz 4.3 du	rch TŬV S	SÜD Indu	strie Servi	ce, Benann	ite Stell	le 003	36 Zerlifik	at Nr. 129	9/2002/M	UC (Certi	fied acc. to i	PED 97/23	VEG ANN	ex I, Paragi 1∆∆\	apπ 4.3 υ) ΞΩΙΔΙ (	CONFC	)RMS	

"Conforms with ASME Sec II, Part A, 2010 edition, 2011a addenda" AS PER P.O.
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		Industries Ind	- [M	N.D.E Requiren	nents
		N.D.E Requ	irements		
Client:	NWP Industries				
Projec	t: <u>UT 4" Return Bends (HT</u> #	387037 256647)	JO#		
	<u></u>	207032, 330347]	Date: <u>08</u>	3/11/2012	
Piping; ⊠	Pressure VesseJ: □	Tank: 🗍	Other:		
	□ X-Ray		Ø	100%	Elector
	□ Gamma Ray			Full	☐ ASME Section VIII-UW-51
	☑ Ultrasonics		_ _	25%	☐ ASME Section VIII-UW-52
	Liquid Penetrant				Customer Specification
	☐ Magnetic Particle			10% Define)	ASME B31.3 NFS
	☐ Accoustic Emission			Spot	Other (Specify)  Customer Specify
	□Hardness test Max 200 BHN				Customer Spec CSA W47.1/W59
					, 44
General Instru	uctions:	Vessel S	5/N		
P1 Material			7		
Welder ID					
Shell-T=					
<b>-</b> -	<u>1" XXH</u>				
- Otal Welds <u>ز</u>	JT x 5 <b>6</b> 4" XXH return bends	for Mill Tolerances re-	1		
lease Note location	iQi s of all indications on films on reports -S.O.D S.F.D on reports		oro min &	<u>avg reading on re</u>	port (First # is UT-264)
pecial Require	ments:				
uliweld Xrau to be	fall covers		hots		
uttweld Xray to be ip Shots to be ident	identilied as x-# ified as GS-#				
readed Shots to be	identified as yr n				
intity on Envelope p thes must contain.	part of package being shortie. Coil, Pipr	ng, ecu.			
rk all indicated repa	CUSTOMER II HE Sphol Ideas ::	ray number, Clock tape, Welde	r's ID Symbol, (	Date	
	c for Welded Piping-acceptance is zero c for Socket Welds-acceptance is minir c for Threaded Piping-acceptance is 7 nt Traverse				

Date: 08/11/2013

ABSA

FORM_NDE_001

DeBeiser/Dale Karg

Rev Status: 2.0

Prepared By: <u>Karim Boustama</u>

Date of Issue: March 30 2012



#### **ULTRASONIC INSPECTION REPORT**

DATE:	NO	/EMBER 9	/2012	REPORT #	:	UGM-1	121109	<del></del>	PAGE	1 OF 3
CLIENT:		<u> </u>	NWP INL	OUSTRIES	<u> </u>			CHO JOB #:		315
CONTRACT	OR:	-								
LOCATION:			NWP SHOP (	INNISFAIL AL	B)	PROJECT:	UT 4" RE	TURN BENDS	/HT # 28702	2 2565471
ITEMS EXAI	WINED:			56	RETURN BE				(111 H 301 D3	2, 3303477
PROCEDUR	E:		JT-1		IT JOB # (PO,		-			<del>_</del>
ACCEPTAN	CE CRITERIA	& SPECIFI	CATION:	l			ME B31.3 N	<u></u>		<u> </u>
				<b>'</b>						
MODE:	Zero Degi	ree 🔲 5	hear Wave	Specialty:		A FOR STATE				
EQUIPMENT	TYPE:	GE DM:	S/USM GO	Serial No	<del></del>	11105174	Lact	Calibrations		4510040
CABLE LEN	GTH:		80"	COUPLANT:		1103174	Last	Calibration:	JONE	15/2012
CAL BLOCK	((S): 1/2	" Step 🔽	<del></del>	/4" ASME	1 1/2" ASME	DSC [	liw [	TEST PIECE:		
REF RELEC		Туре:	Perpendicular	Size:	T	Depth:	_ <del>''''</del> _			000/ 50//
			<u> </u>		<del>\</del>	Depar.	<del></del>		ponse Ht.:	80% FSH
	0 DEG	LONG	5MHZ	0.250"	STRESSTEL	01YB62	4.0000		· · · · · · · · · · · · · · · · · · ·	
				0.230	STRESSTEL	011802	1.000"	58	+6	64
			·		<del> </del>				· <del>-</del>	
				·						
SURFACE C	ONDITION.	Zİ. Clean Bas	se Metal [] A	s Ground	Machined (	Sand Blast				<u> </u>
					i ciacinico (	Sano biast	Painted			
	5 To 10			•						
SCOPE:										
	50055 III 7									
A ZERU U	EGREE ULIF	KASONIC IN	ISPECTION W.	AS PERFORI	MED ON THE .	ABOVE STAT	TED AREAS	AS REQUEST	ED BY CLIE	NT.
THIS INSPEC	- HON INCLU	DED 56 RE	TURN BENDS.	A LOW AND	O AVERAGE R	READING WA	S RECORDE	D FOR EACH	RETURN B	END.
EACH RETU	RN BEND WA	IS 4" XXS (	NOMINAL 0.67	4" AND MILL	. TOLERANCE	E @ 12.5% W	OULD BE 0.5	790").		
RESULTS:										:
REFER TO	PAGES 2 TH	IRU 3 FOR	AREAS OF IN:	SPECTION A	ND RESULTS.	•				
M	lisc Charges		·····	NAME / CERT	TIFICATION/SIG	NATURE		<del></del>		
	NVOICE FGI	1-121109			REG MERCER		F	Regular Hours		SEE
			ce		C-1A UTI/N			Overtime Hours		FIELD
Thent:			0.0			# 11 <b>3</b> 0/	i	Shift Premium		INVOICE
iame:approvat)	011/2	uni C		:	Charles Inch		F	Kilometers		FGM-121109
	<del></del>	7						Assistant		
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often recovering the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of t			177; (100),	347-7042 Fav	7460) 347 <b>-7</b> 052	www.echend	e.com			į



## ULTRASONIC INSPECTION REPORT

DATE:	N(	OVEMBER 9	/2012 REPORT	#	UGM-121109		PAGE 2 O
CLIENT:			NWP IN	IDUSTRIES		ECHO JOB #:	
ONTRAC							1
OCATION	<i>l:</i>		NWP SHOP (INNISFAIL A	1 <i>B</i> )	PROJECT: UT 4" RETU	JRN BENDS (HT #	387032 2645
·······		· · ·					
							<u> </u>
	UT264 1	0 686in	UT276 1	0.666in	UT288 1	0.710in	
	UT264 2	0.702in	UT276 2	0.707in	UT288 2	0.728in	
	UT265 1	0.704in	UT277 1	0.687in	UT289 1	0.708in	
	UT265 2	0.718in	UT277 2	0.710in	UT289 2	0.716in	
	UT266 1	0.674in	UT278 1	0.712in	UT290 1	0.689in	
	UT266 2	0.690in	UT278 2	0.730in	UT290 2	0.698in	
	UT267 1	0.717in	UT279 1	0.673in	UT291 1	0.669in	
	UT267 2	0.735in	UT279 2	0.697in	UT291 2	0.699in	
	UT268 1	0.684in	UT280 1	0.704in	UT292 1	0.685in	
	UT268 2	0.700in	UT280 2	0.723in	UT292 2	0.698in	
	UT269 1	0.695in	UT281 1	0.670in	UT293 1	0.651in	
	UT269 2	0.710in	UT281 2	0.688in	UT293 2	0.669in	
	UT270 1	0.673in	UT282 1	0.692in	UT294 1	0.721in	
	UT270 2	0.694in	UT282 2	0.704in	UT294 2	0.733in	
	UT271 1	0.673in	UT283 1	0.640in	UT295 1	0.688in	
	UT2712	0.689in	UT283 2	0.676in	UT295 2	0.715in	
	UT272 1	0.666in	UT284 1	0.702in	UT296 1	0.707in	
	UT272 2	0.685in	UT284 2	0.723in	UT296 2	0.707in	
	UT273 1	0.702in	UT285 1	0.684in	UT297 1	0.682in	
	UT273 2	0.718m	UT285 2	0.719in	UT297 2	0.697in	
	UT274 1	0.688in	UT286 1	0.684in	UT298 1		
	UT274 2	0.710in	UT286 2	0.699in	UT298 2	0.718in 0.743in	
	UT275 1	0 674in	UT287 1	0.668in	UT299 1	0.743in	
	UT275 2	0 695m	UT287 2	0 689in	UT299 1	0.723in	
			- · · · · <del>-</del>		U12882	0.747in	
	isc Charge		NAME/CERT	IFICATION	Regular H	ours	SEE
E FIELD	INVOICE FO	SM-121109			Overtime H		FIELD
			CGSB/SNT-TC-1A	UTI/MTII # 1	11987 Shift Premis		INVOICE
CON	- Szami	<u>/                                    </u>	·		Kilometers		FGM-121109
nt Repre	sentative: `		echnician Signature:	E"= (1 = 1 + 1 + 1 + 1 + 1	Assistant:		21. 121103
<u></u>	<u> </u>		53A Burnt Park Drive I F		T4P 0J7	<del></del>	<del></del>
		PI:	: (403) 347-7042 Fax: (403) :	347-7052 www.	echonde.com		



### ULTRASONIC INSPECTION REPORT

DATE:	N	OVEMBER	₹ 9/2012	SONIC IN REPORT	#		1-121109	<del></del>	PAGETO
CLIENT:					NDUSTRIES			Eque yes	PAGE 2 0
CONTRACTOR:								ECHO JOB #:	4815
OCATION:			NWP SH	OP (INNISFAIL		PROJECT			
<u> </u>						PROJECT	UT 4" RETU	IRN BENDS (HT # 3	87032, 3565
						<u>Maja ji Mes</u>	· · · · · · · · · · · · · · · · · · ·		· · ·
UT:	300 1	0.71 <b>1</b> in		UT312 1	0.690in				
UT	300 2	0.726in		UT312 2	0.710in				
UTS	301 1	0.706in		UT313 1	0.695in				
	3012	0.720in		UT313 2	0.718in				
UT3	302 1	0.716in		UT314 1	0.694in				
UT3	302 2	0.730in		UT314 2	0.708in				
	803 1	0.672in		UT315 1	0.724in				
UT3	03 2	0.696in		UT315 2	0.742in				
UT3	04 1	0.704in		UT316 1	0.697in				
UT3	04 2	0.723in		UT316 2	0.711in				
UT3	05 1	0.696in		UT317 1	0.701in				
UT3	05 2	0.714in		UT317 2	0.720in				
UT3	06 1	0.662in		UT318 1	0.690in				
UT30	06 2	0.684in		UT318 2	0.703in				
UT30	07 1	0.714in		UT319 1	0.708in				
UT30	07 2	0.744in		UT319 2	0.725in				
UT30	08-1	0.702m			U. / ZUIII				
UT30	08 2	0.715in							
UT30	9 1	0.697in							
UT30	9 2	0.718in							
UT31	0 1	0.681in							
UT31	0.2	0 689in							
UT31		0.688เก							
UT31		0 697m							
Misc Ch	arges	;	····	NAME/CERT	IFICATION	<del></del> -	Denote the		
E FIELD INVOI	CE FG	M-121109					Regular Ho		SEE
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CM Ly	neves	0				<u> </u>	Shift Premiur		IVOICE
nt Representáti	ve:/		Technician	Signature:	Ferri		(ilometers	FG	M-121109
			634 D.	rnt Park Drive I R			ssistant.		

Ph: (403) 347-7042 Fax: (403) 347-7052 www.echonde.com

Head Shira

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ernefi	ittings	Hauptstr Austria/E					· .			10204				• •		0-S-WPL						ftha -	edor!
		Telefon -	+43/5524 5 +43/5524 5		Reg. 1 .12 100	No. 2054		s Nr. <i>[cer</i> 2448/12-5		Rev	··· · · · · · · · · · · · · · · · · ·	24/	ım [da 07/201	12	ASME	derungen B16.9-2007	LR. m	aterial:\	WPL	<ol><li>TR-fit</li></ol>	ting:AST	M A 42	10/A
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Proben			Zugve	ersuch [								·	For	m: ISO- erschnitt	-V	(erbschlagart		475 4 1	(7 LID	[hard	lness tes	:[ <u>]</u>	<del></del>
Nr. [test no.]	PrLage [pos.	Temp.		yield str.]	Zugfe	estigkei Rm (MF	it (tensile Pa) :	Dehnung [ gation] 4D		PR-Lage of sampl		Temp		erschnill ss.sec.]		impact values		135-14	+/ H5				
6388_12	of sampel] LNZ	+20 °C	ReH 381	Rp 0.2	481			35 -	11-3	LNZ		- 50 °C	80		2	268-312-330		Wa	ärmei	behand	lung [he	at treat	ment]
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# 2012/8/21 Si Mason "Conforms with ASME Sec II, Part A, 2010 edition, 2011a addenda"

#### MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 :2004 3.1

CUSTOMER : SEYBOLD INTERNATIONAL CORP. L/C NO :

CERT. NO : 122328

ORDER NO : 7005475 DATE : 07/10/2012

ODICIN .



#### 拍離鐵工股份有限公司

NO.303, JEN-HSIN ROAD JEN-WU DISTRICT **KAOHSIUNG CITY, TAIWAN R.O.C. (81460)** 

FAX: 886-7-371-3864, 371-3882 TEL: 886-7-371-0497, 371-1536, 372-0260

An ISO 9001:2008 Registered Manufacturer **BUREAU VERITAS** 

Nº TW11062Q

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NT. 667-1683

"Conforms with ASME

Sec II, Part A, 2010 edition,

TO CUSTOMER ELLEWAYE 无锡市华友特朝2041a户doenden"
TERMLOGNFORMWuxi Huayou Special Steel Co., Ltd. 品质量

MILE TEST CERTIFICATE 证明书

Tel :( 0510)83073096 Fax :( 0510)83073096 无锡市硕放空港产业园南开路90号

4		HUAYOU SPECIAL STEEL AN TEXT TO	(5N40204 3.4)				
切货单位	ST.	KEQUIKENIEN TO	母件班				制造方法
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INSPECTED IN ACCORDANCE WITH THE CUSTOMER'S SPECIFICATION(S), AND THAT THEY SATISFY THE REQUIREMENTS	SRY OFFI	兹证明本程所列产品,均依标准规定制造、取样、试验和检验,并符合标准及合同要求。	WE HEREBY CONFIRM THAT OUR PRODUCTS ARE MADE WITH MATERIALS WHICH ARE FREE FROM RADIATION	*3、试验方向 ORIENTATION,L=纵向LONGITUDINAL	"1, H; HEAT (LADLE) ANALYSIS; P, PRODUCT ANALYSIS.	6000	合格		355 / 365	240		*4 MPa	Y.S.	風服強度	病題 GAUGE LENGTH (60.8mm)	物种技器 TENSILE TEST	6098-5	$\setminus$	ł	HEAT NO.	帝		:
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# Test Certificate

Form TC1: Revision 1: Date 31 Oct 2000

1770 Bill Sharp Boulevard, Muscatine, IA 52761-9412

Cust Part #:	Sec II. Part A with a 2011 a addwin	CURY IS NOT A METALLURGICAL ING THE MANUFACTURE OF THIS EN 10204:2004 INSPECTION CEDUCTS SHIPPED: F50	Heat C Mm P S N2D776 1 15 85 1 011 1 007	Heat Piece Tested Id Id Thickness W2D776 F50 0.373 DISCRT	Tested Diares	Customer: SAMUEL & SON LIMITED (A DIVISION OF SAMUEL SALES) 2369 DIXIE ROAD MISSISSAUGA ON LAYIZ7
WE HERRERY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH, AND MEDIS THE REQUIREMENTS OF, THE APPROPRIATE SPECIFICATION		OF :	Si 'Lot Al Co Ni Chemical Analysis  O3   O3   O3   O5   O5   O5   O5   O5	13:1 YS   UTS   %RA   Elong %   13:1   Average   Abs. Energy(FT)	Size: 0.375 % 96.00 % 480.0 (IN)	Customer P.O. No.: U01112 & 41-330026 Mill Order No.: Product Description: CSA G40.21(2004)44W/300W / ASTM A36(08) A709(01A)36/ASME SA36(01ED)
B. H. Wales SENIOR METALLURGIST: PRODUCT	44044 S 13 19 19 19 19 19 19 19 19 19 19 19 19 19		N ORGN	Charpy Impact Tests  LB) % Shear Tst Tst Tst BDWTT vg l 2 3 Avg Tmp Dir Siz Tmp %Shr		41-330027-04 Shipping Manifest: MR169567  Ship Date: 20 May 12 Cert No: 061326631  Cert Date: 20 May 12 ( Page 1 of 1 )

ssuing Authority: Marvin J. (Ty) DeBelser	Quality Control
Date of Issue:March 13, 2008	QCFOFinalInspectionReleaseCertificateR00
FINAL INSPECTION R	RELEASE CERTIFICATE
USTOMER: ENCANA	SALES ORDER#: NA
Welded Piping for 3.0 mm btu Lineheater Pkg	wo#: 08562-002-D
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DDITIONAL DOCUMENT REQUIREMENTS: (TO BE RECORDED HERE IF APPLICA	BLE I.E. DOCUMENT PACKAGE
EQUIRED BY CUSTOMER ETC.)	
1.C. FILE CLOSURE BY: KARA	DATE: Jan 172013
LOOSE COMPONENTS	REQUIRED / PREPARED
EMS REQUIRED:	NO. OF BOXES OR PKGS.
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DATE:

RELEASED TO INVENTORY:

RELEASED TO CUSTOMER:

	PRESSURE PIPING EXAMINATION	ON CHECKLIST	
DRUG	# 08562-2A Rev O	JOB NUM	BER:08562-002-D
NO.	FUNCTION		E OR INITIAL DATE
		Q.C. INSPECTOR	OWNERS INSPECTOR
1	DRAWINGS: ABSA registration over 0.5 Cu.M. Approved by Owner. Approved for Construction (signed & dated).		
2	Owner's Inspector notified.	copy not ostion	
3	Registered Welding Procedure Specifications, Q.C. Manual and Forms available at site, Job File started.	EAR NOT 23/12	
4	Welders qualified for WPS's and have valid Performance Qualification cards. Welders Log completed. WPS reviewed with Welders.	part nev 23/12	
5	Material checked against P.O., drawings, and specifications. Identification confirmed. Colour coding applied.	red decostis	An-1
6	Sample of each Welder's work examined, including root spacing, alignment, cleaning, joint preparation, preheat and electrode control.	BUR DEC 10/12	
7	Nondestructive Examination completed. Reports and radiographs $\mathcal{H}_{eLO}$ reviewed, signed by Level II or III, Radiograph I.D. detailed on drawings.	HT HOW DEC 19/12	
8	Visual Examination of all completed welds. Welders I.D. stamped and recorded on drawings.	RYPE DEC 14/12	
9	Heat Treatment verified and recorded on drawings.	Kai DEC/9/12	
10	Each system checked against specifications and drawings before test.	My DEC15/13	
11	All deficiencies recorded and signed off by Q.C.I. and Owner's Inspector before test.	NE DECISIS	
12.	Pressure Test checked. Gauge calibration verified, gauge #'s recorded.	(A) Jan9,13	
13	System checked after test. Deficiencies recorded and corrected.	90 Jan9.13	
14	Construction data reports (AB-83) prepared and signed by Q.C.I. and Owner's Inspector.	SEL RSSEMBLY	
15	Declaration form (AB-81) submitted to ABSA		
16	As built drawings accepted by Owner.		

Issuing Authority: Marvin J. (Ty)
DeBelser/Dale Karg
Date of Issue: November 13 2012
Rev Status: 2.1

NMP
Industries Inc. 1th

ABSA	
FORM_NDE_001	
N.D.E Requirements	

#### N i) F Hormromonic

Client: E				JO# <u>08562-002</u>	
Project:	Welded Pipin	g – 3.0mm Lineheate	<u>r</u>	Date: <u>06/12/20</u>	<u>112</u>
Piping: ⊠	Pressure \	Vessel: □	Tank:	Other:	
×		·		100% Full	☐ ASME Section VIII-UW-51 ☐ ASME Section VIII-UW-52
	Ultrasor Liquid Penetra Magnetic Part	ant	Othe	25% 10% r(Define)	<ul><li>✓ Customer Specification</li><li>✓ ASME B31.3 NFS</li><li>Other (Specify)</li></ul>
□ □ □	Accoustic Emiss	ion		Spot	CSA W47.1/W59
	S,F,M 4" XXH start shootin	g pkg (first # is X-1) ns on films on reports reports	Ve	ssel S/N	
Gap Shots to be id Threaded Shots to Identify on Envelo Flashes must cont Mark all indicated	be identified as X- dentified as GS-# o be identified as X' ope part of package ain: Customer, 10# repairs on the pro	T-# : being shot ie. Coil, Piping, et f, Spool Identification, Xray n	umber, Clock tap		
Encan Encan Encan	a Spec is Zero Ele a Spec for Socke a Spec for Threa a 5 Point Travers	ongated Indications t Welds-acceptance is mi ded Piping- acceptance is	nimum 1/16" _E	ар	



#### **RADIOGRAPHIC INSPECTION REPORT**

CG24 - RT1354

Page 1 of 1

Exposure Device #: D6274 Source #: 79875B Cobalt 60 ☐ IR 192 ☑ X-Ray ☐ EFSS: .135

Job / P.O. #: 08562-002-D

Client: ENCANA C/O NWP

IRISNDT#: 256007

Date: 6-Dec-12

Film Brand: AGFA

#Film/cassette: 1

Location: INNISFAIL Alberta

ì.

	/IE B31.3 N & B					, item	HISHECT	eu, r	IPING - 3.0mm LINEHEATER Material: C	.5
Film #	Size, Location, Thickness	Welder ID	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type	Type and Location of Discontinuities (rejectable discontinuities in square brackets	(A)cce (R)eje
									JO# 08562-002-D	
		ļ								
X1	2"XXH	F	RT 3A	2	.436	4	1	D4	::	А
······································		ļ								
X2	2"XXH	M	RT 3A	2	.436	4	1	D4		A
		ļ	+							
Х3	2"XXH	M	RT 3A	2	.436	4	1	D4		A
					····					
····					***					
									ļ.	
									'	
· · · · · · · · · · · · · · · · · · ·							4		3-2"XXH	
									3-2 ٨٨Π	
umber of R	l ladiation Barri	ler Warnir	na Sians F	rected:	5		Numb	er of R	adiation Barrier Warning Signs Returned: 5	
	on Legend:		rside Fab.			/ard/L	ay-dowr			N/A (Other)
iS Procedure; ngle Wall Expos		5.O.D. =	Source-to-ob			AB	- Arc Burn	ıs	EUC - External Undercut iC - Inte	ernal Concavity
RT oqea Ilaw elduo	1, 2, 2A, 6, 7	D.F.D. =	Distance from object to film		e of	CK EP	- Crack - Excessiv	e Penetra	HB - Hollow Bead LC - Lo	ck of Fusion v Cover salignment
Unit#: 226		Kilometers:	10	Film Quan	tity:				Interpretation by: BRODY SMITH SNT-TC-1	A II
In:	Out:	Hrs:	1						(Print) C.G.S.B.	II (Level)
ln:	Out:	Hrs:		12	(2 ¾ x	5 %)	D4		C.G.S.B.	
Personnel:					(E /4 X	J /2)	174		(Signature) Client Representative:	
BS/JS/MV							_		(Print)	
									agreement with report contents	
			ļ						(Sign) King Syump	· .

5311 - 86 Str	eel Edmonton, Alberta,	TGE ST8	Phone:	(780) 43	37-2022 Fax:	(780)	438-1436
Calgary	(400) 22	0.040					_

Calgary Lloydminster Barrhead Nisku

(403) 279-5121 (780) 875-6455 (780) 674-3018 (780) 955-7616

Cold Lake Fort McMurray Red Deer

(780) 826-6105 (780) 743-1536 (403) 347-1742

Deer Park, TX Matrix,Houston, TX Tulsa, OK

(281) 476-4444 (713) 722-7177 (918) 446-8773

Issuing Authority: Marvin J. (Ty)
DeBelser/Dale Karg
Date of Issue: November 13 2012
Rev Statuc: 2.1



ABSA	
FORM_NDE_001	
N.D.E Requirements	

#### N D.F Pequirements

Client:	<del>-</del>		O# <u>08562-002-D</u>	
Project	: <u>Welded Piping – 3.0mm Lineh</u>	eater L	Date: <u>07/12/2012</u>	
Piping: ⊠	Pressure Vessel:	Tank: ☐ C	Other:	
	X-Raγ	<b>\(\Bar{\Bar{\Bar{\Bar{\Bar{\Bar{\Bar{\B</b>		ASME Section VIII-UW-51
Σ	🖟 Gamma Ray	☐ Fuli		ASME Section VIII-UW-52
	Ultrasonics	☐ 25%		Customer Specification
	Liquid Penetrant	10%		ASME B31.3 NFS
	Magnetic Particle	Other(Define	2)	Other (Specify)
	Accoustic Emission	☐ Spot		
□на	dness test Max 200 BHN			CSA W47.1/W59
	5,M,X  4" XXH, 2" XXH  start shooting pkg (first # is X-	Vessel S/i <u>4)</u>	N	
Gap Shots to be Threaded Shots Identify on Envel Flashes must cor	uirements:  be identified as X-II  dentified as GS-II  be identified as XI-II  be identified as XI-II  ope part of package being shot ie. Coil, Pipi  tain: Customer, IOII, Spool Identification, X  d repairs on the project	ng, ect.	hots r's ID Symbol, Date	
Enca Enca Enca HT is	na Spec for Welded Piping-acceptance na Spec is Zero Elongated Indications na Spec for Socket Welds-acceptance na Spec for Threaded Piping- acceptar a 5 Point Traverse	is minimum 1/16" gap		
Prepared By:	Karim Bouslama	Date	:: <u>07/12/2012</u>	



#### **RADIOGRAPHIC INSPECTION REPORT**

CG24 - RT1361

Page 1 of 1

Exposure Device #: D6274

Source #: 79875B

Cobalt 60☐ IR 192 ⊠ X-Ray ☐

EFSS: .135

Film Brand: AGFA #Film/cassette: 1

Job / P.O. #: 08562-002-D

Client: ENCANA C/O NWP

Location: INNISFAIL Alberta

IRISNDT #: 256007

Date: 7-Dec-12

Code: ASi	ME B31.3 N & E	NCANA S	SPEC.			Item	Inspect	ed: P	IPING -3.0mm LINEHEATER Material: C.S	
Film #	Size, Location, Thickness	Welder ID	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cce (R)ejec
	-								JO# 08562-002-D	
		<u> </u>							ir .	
X4	4"XXH	S	RT 3A	4	.674	4	1	D5	70701	A
X5	4"XXH	S	RT 3A	4	.674	4	1	D5	FM@4.75 HB@12.5-13	A
X6	4"XXH	S	RT 3A	4	.674	4	1	D5	[LF@9.5-10.5]	$\mathbb{R}^{\gamma}$
X7	2"XXH	F	RT 3A	2	.436	4	1	D4	1.	A
X8	2"XXH	X	RT 3A	2	.436	4	1	D4	` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `	A
X9	2"XXH	X	RT 3A	2	.436	4	1	D4		А
X10	4"XXH	M	RT 3A	4	.674	4	1	D5	P@7, 10	A
X11	4"XXH	M	RT 3A	4	.674	4	1	D5	P@11-12	A
X12	4"XXH	М	RT 3A	4	.674	4	1	D5	P@10	А
								**		
									·Ł	
							***************************************		6-4"XXH	
		****							3-2"XXH	
lumber of F	 ladiation Barrie	r Warnir	ng Signs E	rected:	<u> </u> 5	1	Numbe	er of R	adiation Barrier Warning Signs Returned: 5	11.00
Vork Locati			ıside Fab.			/ard/L	ay-down		[3] Piping/Modular Fab. Area [4] N/A (	Other)
ouble Wall Expo	1, 2, 2A, 6, 7	O.D. = F.D. =	Source-to-obj Distance from object to film	1 source sid	(D)	AB BT CK EP	- Arc Burn - Burn Thr - Crack - Excessiv	s ough	EUC - External Undercut IC - Internal C IUC - Internal Undercut LF - Lack of Fi HB - Hollow Bead LC - Low Cove ation IP - Incomplete Penetration MA - Misalignm	oncavity usion
Unit#; 226		ilometers:	10	Film Quan	Lity:	1 1	- Porosity		S - Slag Interpretation by:	
	Out: 0345		2.25	24	(2 ³ / ₄ x	8 ½)	D5		(Print) C.G.S.B.	II (Level) 12569
Personnel: BS / JS / MV	Out:	rtrs;		12	(2 ¾ x	5 ½)	D4		(Signature) Client Representative:	
			1						(Print) I am in full agreement with report contents	
									(Sign) On Sunce	

5311 - 86 Stroot	Edmonton, Albert	- TOU ETA	Diversi (Too)	107 0000	
SOLI - GO OHEEL	Europiton, Albert	8, 10E 310	Prione: (780)	43/-2022 FBX:	(780) 438-1438
Calman	(403)	220 0404			

Calgary Lloydminster Barrhead Nisku

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Deer Park, TX Matrix,Houston, TX Tulsa, OK

(281) 476-4444 (713) 722-7177 (918) 446-8773

Issuing Authority: Marvin J. (Ty)
DeBelser/Dale Karg
Date of Issue: November 13 2012
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ABSA	
FORM_NDE_001	
N.D.E Requirements	

#### N D F Roquiromonte

Client: <u>E</u> Project:	ncana Welded Piping – 3.0mm Line		08562-002-D : 10/12/2012	
Piping: ⊠	Pressure Vessel:	Tank: 🗌 Othe	r:	
$\boxtimes$	. Andy	⊠ 100% □ Full		ASME Section VIII-UW-51 ASME Section VIII-UW-52
	Ultrasonics Liquid Penetrant Magnetic Particle	25% 10% Repair shot Other(Defin	<b>⊠</b> ⊠ e)	Customer Specification ASME B31.3 NFS Other (Specify)
☐ ☐Hard	Accoustic Emission Iness test Max 200 BHN	Spot		CSA W47.1/W59
Please use wire ty Please Note location	S,M,X  4" XXH, 2" XXH  1 x repair (# is X-6R) & contin	Vessel S/N ue shooting pkg (first # is X	13)	
Gap Shots to be ide Threaded Shots to dentify on Envelop Hashes must conta	be identified as X-#	Shots ping, ect. Xray number, Clock tape, Welder's ID		
Encana Encana Encana	a Spec for Welded Piping-acceptani a Spec is Zero Elongated Indication: a Spec for Socket Welds-acceptance a Spec for Threaded Piping- accepta 5 Point Traverse	e is minimum 1/16" gap		
repared By: K	Garim Bouslama	Dato: 10	/13/2013	



# RADIOGRAPHIC INSPECTION REPORT

**CG18 - RT350** 

Page 3 of 5

Exposure De	evice #: D6	306	Source	#: 88662	2B	Job	/ P.O. #:	08562	2-002-D IRISNDT #: 256063 Date: 10-Dec-1	2			
Cobalt 60□	IR 192 🗵	X-Ray	EFS	SS: .154		Clie	nt: ENG	CANA	. C/O NWP				
Film Brand: AGFA #Film/cassette: 1						Loca	Location: Innisfail, Alberta						
Code: ASM	E B31.3 NF	S & Encana	Spec.			1	Item Inspected: Piping 3.0mm Lineheater Material: CS						
Film #	Size, Locatior Thicknes	t, In	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Typ	1	)ccept }eject			
X6R	4"XXH	s	RT 3A	3.8	.467	4	1	D5		Α			
X13	4"XXH	Х	RT 3A	3.8	.467	4	1	D5		Α			
X14	4"XXH	х	RT 3A	3.8	.467	4	1	D5					
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	*******												
	14HL-1												
		-											
							-						
	1												
									1 - 4"XXH Repair				
									2 - 4"XXH				
ļ		ł											
	******												
Number of R	adiation Ba	rrier Warnii	ng Signs I	Erected:	2		Numb	er of	Radiation Barrier Warning Signs Returned: 2				
Work Location			nside Fab			/ard/L	ay-dowr			er)			
IRIS Procedure:		S.O.D. =	Source-to-ob			AB	- Arc Burr	าร	EUC - External Undercut IC - Internal Conca	vity			
Single Wall Exposi	1, 2, 2A, 6, 7	O.F.D. =	Distance from	•	• •	CK	- Burn Th : - Crack	_	IUC - Internal Undercut LF - Lack of Fusion HB - Hollow Bead LC - Low Cover				
Double Wall Expos	3, 3A, 4, 5, 8		object to film			EP P	- Excessiv	re Pene	Iration IP - Incomplete Penetration MA - Misalignment S - Stag				
Unit#: 334		Kilometers:	N/A	Film Quan	titv:				(nterpretation by:				
-	_			12	(2 ¾ x	8 1/2)	D5		JEFF BRUCKSHAW (PED LEVEL 2) SNT-TC-1A 2 C.G.S.B. 2	-			
la: <u>2230</u>	Out:	000 Hrs:	1.5						(Print) (Leve C.G.S.B.# 1200				
in:	Out:	Hrs:		-			+	$\dashv$	1	-			
Personnel:									(Signature) Client Representative:				
J. BRUCKSHAW J. SMITH	1				<u> </u>				(Print)				
M. VANDEWED	3E							-	l em in full egreement with	-			
				***************************************	•				report contents (Sign)				
			!										
5311 – 66 Street Edmo	onton, Alberta, TEE	578 Phone: (780)	437-2022 Fax: (7										
Calgary Lloydminster Banhead	(403) 270-01 (780) 875-04 (780) 874-30	55		F	old Lake orl McMurray		(780) 82 (780) 74	3-1536	Deer Park, TX (281) 478-4444 Matrix, Houston, TX (713) 722-7177				
Nisku	(780) 955-78			H	ed Deer		(403) 34	1-1142	Tulsa, OK (916) 446-8773				

Issuing Authority: Marvin J. (Ty)
DeBelser/Dale Karg
Date of Issue: November 13 2012
Rev Status: 2.1

Industries Inc. ¹¹⁴

ABSA		
FORM_NDE_001	 ······································	
N.D.E Requirements		

#### N DE Heattromants

	Encana t: Welded Piping – 3.0mm Lineh	eater		JO# <u>08562-002-D</u> Date: <u>11/12/2012</u>	
Piping: ⊠	Pressure Vessel:			Other:	
	X-Ray  Gamma Ray			100% Fuil	☐ ASME Section VIII-UW-51 ☐ ASME Section VIII-UW-52
] ] ]	Ultrasonics Liquid Penetrant Magnetic Particle		Oth	25% 10% er(Define)	☑ Customer Specification ☑ ASME B31.3 NFS Other (Specify)
□ _H ;	Accoustic Emission ardness test Max 200 BHN			Spot	CSA W47.1/W59
Please use wire Please Note loc	S,M,X  4" XXH  continue shooting pkg (first #	is X-15)	Ves	ssel S/N	
Gap Shots to be Threaded Shots Identify on Enve Flashes must co	uirements:  to be identified as X-#  identified as GS-#  to be identified as XT-#  elope part of package being shot ie. Coil, Pigntain: Customer, JO#, Spool Identification, ed repairs on the project	***	ck tap	e, Welder's ID Symbol, Date	
Enca Enca Enca	ana Spec for Welded Piping-acceptance ana Spec is Zero Elongated Indications ana Spec for Socket Welds-acceptance ana Spec for Threaded Piping- accepta s a 5 Point Traverse	is minimum 1/	/16" g	ap	
Prepared By	: Karim Bouslama			Date: 11/12/2012	



# RADIOGRAPHIC INSPECTION REPORT

CG18 - RT357

Page 5 of 7

Exposure De	evice #: D6306		Source	#: 8866:		1-6	100 4	00500		
1	iR 192 ⊠			#; 0000, 8 <b>S</b> : .154	213	1	/ P.O. #:			c-12
Film Brand:			د الد Im/casset			1			C/O NWP	
1	E B31.3 NFS 8			.te. i		1	ation:		nisfail, Alberta ning 3mm Lineheater <b>M</b> aterial: CS	
		CHOMINA	opco.			Rem	mspect	eu: Pip	ing 3mm Lineheater Material: CS	
Film#	Size, Location, Thickness	Welder ID	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Lac.	Film Type		(A)ccept (R)eject
X15	4"XXH	М	RT 3A	3.8	.674	4	1	D5	P@4, P@6, P@12	Α
X16	4"XXH	М	RT 3A	3.8	.674	4	1	D5	P@13.5, P@14, P@1.5, P@3, P@8.5,P@11, P@12	Α
X17	4"XXH	М	RT 3A	3.8	.674	4	1	D5		Α
X18	4"XXH	×	RT 3A	3.8	.674	4	1	D5	P@.5	Α
X19	4"XXH	х	RT 3A	3.8	.674	4	1	D5		Α
X20	4"XXH	х	RT 3A	3.8	.674	4	1	D5		A
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	T-10-11	<del></del>								
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	-								6 - 4"XXH	
			.1122							
	- 1/3 ti					*****				T
		-								
Number of Pr	adiation Barrie	- 10(n i -	i							
	*****								adiation Barrier Warning Signs Returned: 2	
Work Locatio			side Fab			,	ay-dowr		[3] Piping/Modular Fab. Area [4] N/A (O	
Single Wall Exposu	1 2 24 5 7	Ó.D. ≂	Saurce-to-ab		• •	BT	- Bum Th		EUC - External Undercut IC - Internal Cor IUC - Internal Undercut LF - Lack of Fus HB - Hollow Bead LC - Law Cover	ncavity ilon
Double Wall Expos	ure 3, 3A, 4, 5, 8	F.D. =	Distance from object to film		e of	EP	- Excessiv - Porosity			nt
Unit#: 334		Giometers:	N/A	Film Quan					Interpretation by: JEFF BRUCKSHAW (PED LEVEL 2) SNT-TC-1A 2	
In: 0000	Out: 0100	Hrs:	1.0	_24	(2 ½ x	8 1/2)	D5		C.G.S.B. 2	
in:	Out;	Hrs:							19	.evel) 2007
Personnel;				-			-		(Signature)	
J. BRUCKSHAW									Client Representative: (Print)	
J. SMITH M. VANDEWEDO	SE							-	l am in full agreement with	
			E						report contents (Sign) Vin Sauce	
	A	*****			•			L	Ly sport	
5311 – 86 Street Edmo Calgary Lloydrainster	(403) 279-6121	Phone: (780) 4	37-2022 Fax: (7		old Lake		(780) 82	6-6105	Deer Park, TX (251) 478-44	
Lloydminster Banhead Nisku	(780) 875-8455 (780) 674-3018 (780) 955-7616			F	ori McMurray ad Deer		(700) 74 (403) 34	3-1538	Deor Park, TX (281) 478-44 Motrix,Houston, TX (713) 722-7 Tulsa, OK (918) 448-87	77

Issuing Authority: Marvin J. (Ty)	
DeBelser/Dale Karg	
Date of Issue: November 13 2012	
Rev Status: 2.1	



BSA
ORM_NDE_001
L.D.E Requirements

#### M. A. F. Romuromonto

	Client: Encana Project: Welded Piping – 3.0mm Lineheater				JO# <u>08562-002-D</u> Date: <u>09/01/2013</u>				
Piping: [		Pressure Vessel:	Tank:		Other:	<u> </u>	<del></del>		
		X-Ray Gamma Ray		$\boxtimes$	100% Full			ASME Section VIII-UW-51 ASME Section VIII-UW-52	
		Ultrasonics			25%		$\boxtimes$	Customer Specification	
		Liquid Penetrant  Magnetic Particle	<u>Cut</u>	Out O	10% ther(Define)		X	ASME B31.3 NFS Other (Specify)	
		Accoustic Emission			Spot				
	Hardr	ness test Max 200 BHN		·				CSA W47.1/W59	
	rial ID elds <u>2</u> wire typ	<u>M</u> 2" XXH 1 x cut out X-9CO	oorts	Ves	sel S/N				
Buttweld X Gap Shots to Threaded St Identify on I Flashes mus Mack all and NOTE: E	cray to book to be ide thous to be Enveloped icontail idea in Encana	rements: e identified as X-II ntified as GS-II ne identified as XT-II e part of package being shot ie. Co n: Customer, JOH, Spool Identifica epairs on the project  Spec for Welded Piping-accep Spec is Zero Elongated Indica	tion, Xray number, Clo tance is zero root c ions	lefects		1-3 hot			
Ε	Encana Spec for Socket Welds-acceptance is minimum 1/16" gap Encana Spec for Threaded Piping- acceptance is 7 threads engaged HT is a 5 Point Traverse								
Prepared By: Karim Bouslama			Date: <u>09/01/2013</u>						



#### RADIOGRAPHIC INSPECTION REPORT

CG18 - RT418 Page 4 of 4

Over Page Tid

Exposure Device #: D6306 Source #: 88662B Job / P.O. #: 08562-002-D IRISNDT #: 256425 Date: 09-Jan-13 Cobalt 60☐ IR 192 ☑ X-Ray ☐ EFSS: 154 Client: ENCANA C/O NWP Film Brand: AGFA #Film/cassette: 1 Location: Innisfail, Alberta Code: ASME B31.3 NFS & Encana Spec. Item Inspected: Piping 3.0mm Lineheater Material: CS Size, Welder RISNDT S.O.D. O.F.D. # of Work Film Type and Location of Discontinuities (A)ccept Film# Location. Proc. inches Inches Exp. (rejectable discontinuities in square brackets []) Loc. Type (R)eject Thickness X-9CO 2"XXH RT 3A 1.9 .436 4 1 D4 Α 1 - 2"160 Number of Radiation Barrier Warning Signs Erected: 2 Number of Radiation Barrier Warning Signs Returned: 2 Work Location Legend: [1] Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other) IRIS Procedure: AB - Arc Burns EUC - External Undercut IC - Internal Concavity SOD =Source-to-object distance (D) Single Wall Exposure: RT 1, 2, 2A, 6, 7 BT - Burn Through IUC - Internal Undercut LF - Lack of Fusion Crack HB - Hollow Bead 0 F D = Distance from source side of LC - Low Cover Double Wall Exposure EP -Excessive Penetration - Incomplete Penetration MA - Misalignment object to film (d) RT 3, 3A, 4, 5, 8 P - Porosity S - Slag Interpretation by: Unit# 334 Kilometers Film Quantity JEFF BRUCKSHAW (PED LEVEL 2) SNT-TC-1A (2 1/4 x 5 1/2) D4 C.G 5 B 0200 Out 0400 Hrs 2.0 (Print) (Levei) CGSB# 12007 ŧŋ ___Out Personnel (Signature) Client Representative J BRUCKSHAW (Print) Joseph S Michael V. agreement with report contents (Sign) (403) 973 6101 (740) 875 6465 (785 614 855) (785 614 855) (780) 826-6405 genalesas 1713 N.D. Thiri 14 Spector

409,347,4742

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg					
Date of Issue: November 13 2012					
Rev Status: 2.1					

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Industries Inc.	IM

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#### N D E Roginromante

	: <u>Encana</u> :t: <u>Welded Piping – 3.0mm Lineh</u>	eater PWHT	JO# <u>08562-002-D</u> Date: <u>18/12/2012</u>	
Piping: ☒	Pressure Vessel: 🔲	Tank:	Other:	
		□ □ ⊠ Other	100%  Full  25%  10%  *{Define}	☐ ASME Section VIII-UW-51 ☐ ASME Section VIII-UW-52 ☑ Customer Specification ☑ ASME B31.3 NFS Other (Specify)
⊠Hardness test Max 200 BHN		_	Spot	CSA W47.1/W59
Please use wire Please Note loc	S,F,M,X 4" XXH, 2" XXH s 4 x HT (first # is HT-1)	Ves	sel S/N	
Buttweld Xray Gap Shots to be Threaded Shots Identify on Enve Flashes must co Mark all indicate NOTE: Enca Enca	to be identified as X-II to be identified as S-II to be identified as GS-II to be identified as XT-II to be identified as XT-II elope part of package being shot ie. Coil, Pipi intain: Customer, 10II, Spool Identification, X ed repairs on the project ana Spec for Welded Piping-acceptance ana Spec is Zero Elongated Indications ana Spec for Socket Welds-acceptance	ray number, Clock tape e is zero root defects is minimum 1/16" ga	, Welder's ID Symbol, Date	
	ina Spec for Threaded Piping- acceptar s a 5 Point Traverse	nce is 7 threads enga	ged	
Prepared By:	: <u>Karim Bouslama</u>		Date: 18/12/2012	



#### **HARDNESS TEST REPORT**

DATE:	19-Dec-12		PAGE 1 of 1						
CLIENT	•	NWP ECHO JOB #: 4							
CONTRA	ACTOR:	ENCANA							
LOCATI	ON:	NWP INDUSTF							
ITEMS E	XAMINED:	VARIOUS SPOOLING FOR 3.6mm LINEHEATER (AFTER PWHT)							
CODE /	SPECIFICATION:	ENCANA SPEC.ASME B31.3NFS							
		METHOD							
HARDNI	ESS SCALE:	вни	MAXIM	UM TOLERANCE:	/ / / PV / No. 20 To 11 No. 20 No. 20 No. 20 No. 20 No. 20 No. 20 No. 20 No. 20 No. 20 No. 20 No. 20 No. 20 No	200 BHN			
EQUIPM	ENT TYPE:	HL200	SERIAL #:	39702870	ST CALIBRATION: SEPT. 7, 2012				
			JE	SI RESULTS =					
HT#	XRAY#/STAMP	DIAMETER /	HARDNESS VALUES						
111		SCH.	P.M	H.A.Z	WELD	H.A.Z	P.M.		
1	X-20 / X	4" / XXS	148	150	152	138	139		
2	X-17 / M	4" / XXS	142	127	160	148	140		
3	X-4/S	4" / XXS	132	140	137	145	144		
4	X-7 / F	2" / XXS	139	140	136	142	141		
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						*****			
ľ	/lisc Charges		NAME/C	Regular Hours	SEE FIELD				
SEE FIEL	D INVOICE			Overtime Hours	INVOICE				
-JC-1212	219-4		CGSB / SNT-1	Shift Premium	FJC-121219-4				
				Kilometers					
Client : B	OB PON Incom	Technician Signature:				Assistant:	BRAYDEN C.		
53A Burnt Park Drive I Red Deer, AB I T4P 0J7									
Ph: (403) 347-7042 Fax: (403) 347-7052 www.echonde.com									



# R & R Stress Relieving Service Ltd.

Nisku: 2103 + 6th Street, T9E 7X8 Tel: (780) 955-7559 Fax: (780) 955-2903 Blackfalds: #13 Burbank Industrial Park Tel: (403) 885-2280 Fax: (403) 885-0177 Toll Free: 1-800-499-HEAT(4328)

# CERTIFICATE OF CONFORMANCE OF RECORDING INSTRUMENTS

CERTIFIED BY:	R & R Stress Relieving Service Ltd.
TEST NUMBER:	RR1112
DATE:	November 9, 2012
DATE DUE:	February 9, 2013
INSTRUMENT MFG:	Chino
MODEL NUMBER:	AH-3725 N00
SERIAL NUMBER:	AH-057C171
RECORDER NUMBER:	

This instrument has been calibrated and it is within the manufacturers specifications.

## REFERENCE STANDARDS

DIGI MITE 311600 S/N48430-5522

CERT DATE Oct 22/12

The calibration of all standards and measuring instruments used in the calibration are traceable to the National Research Council of Canada in Ottawa or to the National Bureau of Standards in Washington, D.C.

Shane Stimson

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CHART NO. EH-51089



# HEAT TREATMENT REQUIREMENTS

PO# 710681

JOB NO.: 08562-002-D	cust	OMER: EnCana C	orporation	DATE: December	18 2012
COMPONENT DESCRIPTION:	Welded Piping fo	or 3.0 mm Line He	eater Package	Total Sp	ools: 4
DWG, NO, AND LINE NO.	DIAMETER	THICKNESS	MATERIAL	LENGTH	WEIGHT
08562-4 Rev 0	4" NPS	SCH XXH	SA-333-6	Various	Unknown .
TYPE OF HEAT TREATMENT:	PRES	SURE VESSEL or	<b>Process Piping STF</b>	RESS RELIEVE P1 an	d Materials
<u>HEATING</u>	-				
Temperature to be raised from	800°F (427°C) to 1150	D'F (621°C) at a maxim	num rate of 400 ° F		
(° C) per he	our. NOTE: THIS V	ALUE MUST NEVER	R EXCEED 400°F (204	C) PER HOUR.	
[ Calculated rate = 400 degrees F/h	ır. (204 degrees C/hı	r) Divided by the max	kimum metal thickness	of the shell or head	
plate in inches]					
<u>HOLDING</u> Temperature to be held in range of	1150°F to 1175°F to	r 60 minutes			
[Holding time to be determined by T			specified in UW-40(f)1		
<u>COOLING</u>					
Temperature to be lowered from 11	50°F (621°C) to 800°F	(427°C) at a maximum	rate of 500 °F		
( °C ) per hour.	NOTE: THIS VALUE	MUST NEVER EXCE	ED 500°F (260°C ) PER	HOUR.	
[Calculated rate = 500 degrees F/hr	. (260 degrees C/hr.	.) Divided by the max	kimum metal thickness	of the shell or head	• .
plate in inches]					
From 800°F (427°C) items may be co	oled in still air.				
Additional Requirements:					
☐ Job number and descr					
☐ Reporting of thermoco calibration is required.		thod and location, ar	id verification of furna	ce thermocouple	
☐ A sufficient number of		l be located to contro	nl and maintain uniforn	n distribution of	
				e item or provision shall	
be made for thermoco				e in accordance with the	
ASME Code.					
☐ During the heating per					
vessel being heated the thermocouples must be				equate number of	
☐ During the holding per				etween the highest and	
				ere the range is further	
limited by these instruc		_			
				ion IX Welding Procedu	re
Specification is require	ed (WPS qualification	n is not required), an	d the energy output m	ust be limited to	
125 Watt-Seconds.  No other welding is pe	rmitted on vessels o	r parte I O 5 v Capa	citonee in forede Y Vo	liogo ² = IA/ Cog I	
The method of thermo				itage - vv-Sec.j	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s
Q.C. Inspector Signature	Druf .	Brund	Date:	DEC 19/15	
Thermocouple Attachment Meth	od: CAPÁCITOR	DISCHARGE	Location (s)	Coil ende	
Furnace Heat Number BF3		•			
Furnace Operator Signature (	lous le	wio	Date:	Noc 18+1/12	
Form Prepared by: Kasha Fox				December 13 2012	

NWP Industries Inc™		Websit	e: www.nwp.ca
PO Box 6280			(403) 227-4100
4017-60 Ave.			(100) 227 1200
T4G 1S9	NOTE Industries Inc. ™	Fax:	(403) 227-4102

# **HYDROSTATIC TEST AFFIDAVIT**

Customer: Encana Corporation
------------------------------

JO# <u>08562-002-D</u>

Project: Piping for 3.0 mm Lineheater

Project#

Test Pressure: 7757 PSI, 225 PSI

Hold Time: 60 minutes

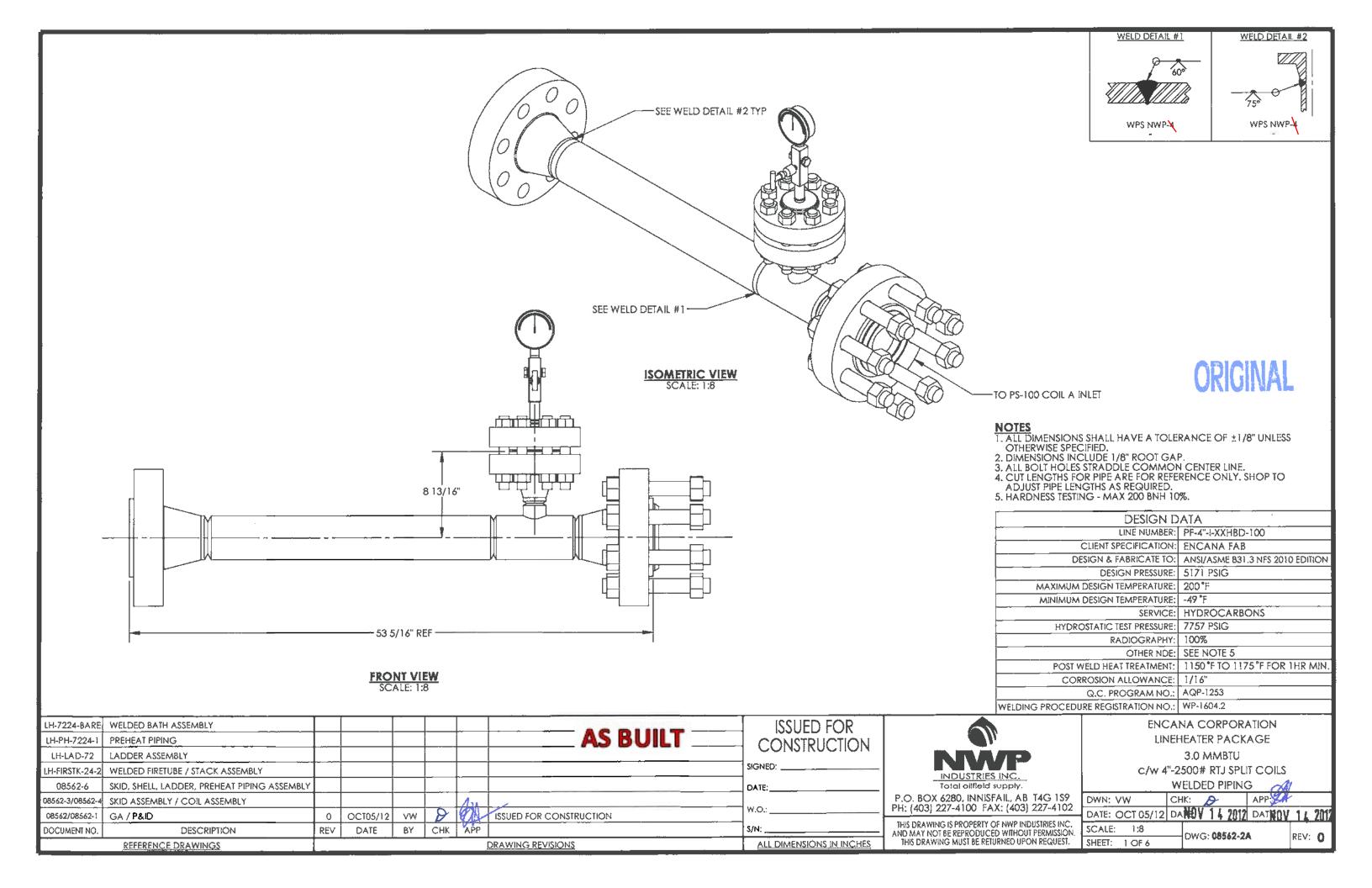
Code Requirements: ASME B31.3 NFS 2010 Edition	
All Personnel Advised of Test ☑ All Signs & Flagging Posted ☑	*
Prior to Filling – Fitting/Hoses & Component Meet Required Test Pressure	
Sign-Off Supervisor: Tester:	Date: <u>09/01/2013</u>
Product Description:	
1)PF-4"-I-XXHBD-100,PF-4"-I-XXHBD-101,PF-4"-I-XXHBD-103,PF-4"-	I-XXHBD-104 = 7757 PSI
2)FG-1"-C-80A/BD-304,FG-1"-C-80AD-302/303,D-3/4"-C-80A/BD-250 = 22	S PSI
50% Test Pressure Leak/Systems Check Completed	
	an interest
1) 50% = 3879 PSI	
2) 50% = 113 PSI	

Equipment Drained & Flushed to Prevent Freezing:	Yes: □	No: □	
Start Time:		Finish Time:	-
141,45 AM	٠.		

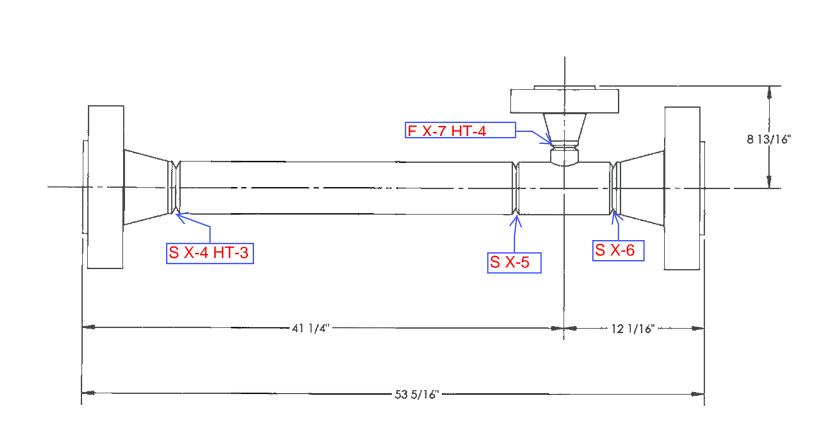
Test Gauge Identification #	Pressure Range	Calibration Date
NWPG- 20,000- /	0-20,000 PSI	31 Qua 2013.
NWPG- 20,000- 兄のひの	0-20,000 PSI	11 DE 0013.
NWPG-∞600⊹ु͡ડ	0-600 PSI	E DOC 2013
NWPG- 600- <b>4</b>	0-600 PŠI	11 Dre 2013:
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Approved By: PAY	Sning P
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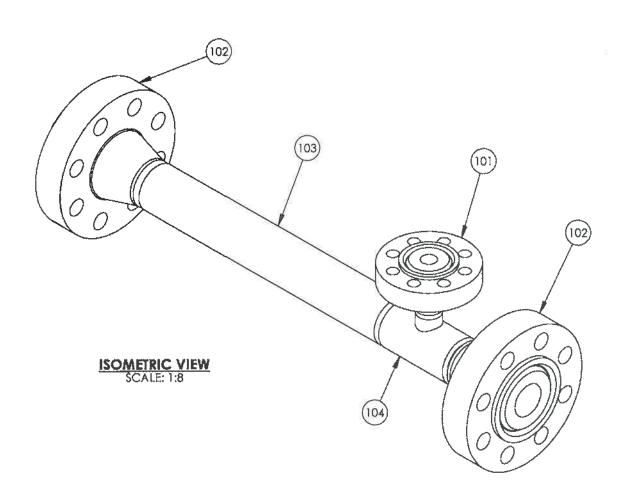
Date: Jan 9/2013 Date: 500 07/13



ITEM	PART#	DESCRIPTION	MTR #	LENGTH	QTY.
101	FLA2FXXHBF	FLANGE 2" 2500 ANSI SCH XXH RTJWN \$A350-LF2-CL1			1
102	FLA4FXXHBF	FLANGE 4" 2500 ANSI SCH XXH RTJWN SA350-LF2-CL1			2
103	PIP4XXH8	PIPE 4" SCH XXH SA333-6		29 3/16"	1
104	TEE42YXXHGD	TEE REDUCING 4" x 2" SCH XXH BW SA 420-WPL6			1



FRONT VIEW
SCALE: 1:8



# ORIGINA

LH-7224-BARE	WELDED BATH ASSEMBLY						AC DILLIT
LH-PH-7224-1	PREHEAT PIPING						AS BUILT
LH-LAD-72	LADDER ASSEMBLY						
LH-FIRSTK-24-2	WELDED FIRETUBE / STACK ASSEMBLY				ĺ	<u> </u>	
08562-6	SKID, SHELL, LADDER, PREHEAT PIPING ASSEMBLY					-	
08562-3/08562-4	SKID ASSEMBLY / COIL ASSEMBLY					FU	
08562/08562-1	GA / P&ID	0	OCT05/12	VW	0	92	ISSUED FOR CONSTRUCTION
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP	
	REFERENCE DRAWINGS						DRAWING REVISIONS

ISSUED FOR CONSTRUCTION

SIGNED: ______

DATE: _____

W.O.: _____

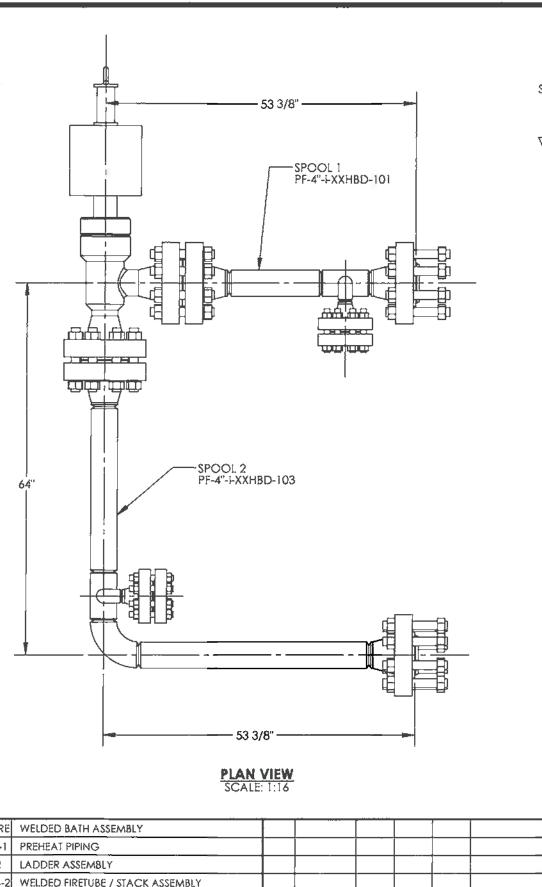
ALL DIMENSIONS IN INCHES

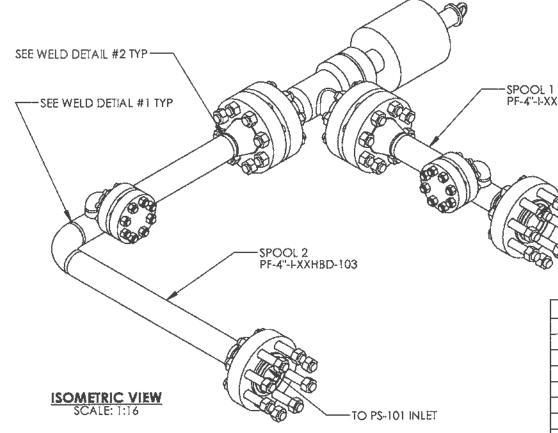
INDUSTRIES INC.
Total olifield supply.

P.O. BOX 6280, INNISFAIL, AB T4G 1\$9 PH: [403] 227-4100 FAX: [403] 227-4102

THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST. ENCANA CORPORATION
LINEHEATER PACKAGE
3.0 MMBTU
c/w 4"-2500# RTJ SPLIT COILS
WELDED PIPING

-	<b>L</b>	TTEEDED FILLING	YI.
	DWN: VW	CHK: APP:	V
4	DATE: OCT 05/12	DANDY 14 2012 DATE	1 4 ZUIZ
	SCALE: 1:8	DWG: 08562-2A	051/2
l	SHEET: 2 OF 6	DWG: 98362*2A	REV: 0





NOTES

1. ALL DIMENSIONS SHALL HAVE A TOLERANCE OF ±1/8" UNLESS OTHERWISE SPECIFIED.

2. DIMENSIONS INCLUDE 1/8" ROOT GAP.

3. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.

4. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY. SHOP TO

ADJUST PIPE LENGTHS AS REQUIRED.

5. HARDNESS TESTING - MAX 200 BNH 10%.

TAIL #2 TYP  SPOOL 1 PF-4"-I-XXHBD-101	WPS NWP-
	DM PS-100 OUTLET
SPOOL 2 PF-4"-I-XXHBD-103	0
	DESIGN DATA

	DESIGN D	ATA
ı	LINE NUMBER:	PF-4"-I-XXHBD-101
	CLIENT SPECIFICATION:	ENCANA FAB
	DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
l	DESIGN PRESSURE:	5171 PSIG
	MAXIMUM DESIGN TEMPERATURE:	200 °F
	MINIMUM DESIGN TEMPERATURE:	-49 °F
	SERVICE:	HYDROCARBONS
	HYDROSTATIC TEST PRESSURE:	7757 PSIG
	RADIOGRAPHY:	100%
	OTHER NDE:	SEE NOTE 5
Ì	POST WELD HEAT TREATMENT:	1150°F TO 1175°F FOR 1HR MIN.
	CORROSION ALLOWANCE:	1/16"
	Q.C. PROGRAM NO.:	AQP-1253
	WELDING PROCEDURE REGISTRATION NO.:	WP-1604.2
	DESIGN D	ATA
İ	LINE NUMBER:	PF-4"-I-XXHBD-103
i	CLIENT SPECIFICATION:	ENCANA FAB
i	DESIGN & FABRICATE TO:	ANSI/ASME B31.3 NFS 2010 EDITION
	DESIGN PRESSURE:	5171 PSIG
	MAXIMUM DESIGN TEMPERATURE:	200 *F
	MINIMUM DESIGN TEMPERATURE:	-49 °F
	SERVICE:	HYDROCARBON\$
	HYDROSTATIC TEST PRESSURE:	7757 PSIG
	RADIOGRAPHY:	100%
	OTHER NDE:	SEE NOTE 5
	POST WELD HEAT TREATMENT:	1150°F TO 1175°F FOR 1HR MIN
1	CORROSION ALLOWANCE:	1/16 ^{°°}
	Q.C. PROGRAM NO.:	AQP-1253
	WELDING PROCEDURE REGISTRATION NO.:	WP-1604.2
_	FNOA	NIA CORROBATIONI

WELD DETAIL #1

WELD DETAIL #2

WPS NWP-4

**ISSUED FOR** LH-7224-BARE WELDED BATH ASSEMBLY **AS BUILT** LH-PH-7224-1 CONSTRUCTION LH-LAD-72 SIGNED: LH-FIRSTK-24-2 WELDED FIRETUBE / STACK ASSEMBLY 08562-6 SKID, SHELL, LADDER, PREHEAT PIPING ASSEMBLY 08562-3/08562-4 SKID ASSEMBLY / COIL ASSEMBLY W.O.: , 08562/08562-1 GA / P&ID OCT05/12 ISSUED FOR CONSTRUCTION VW CHK APP DOCUMENT NO. REV BY DESCRIPTION DATE ALL DIMENSIONS IN INCHES REFERENCE DRAWINGS DRAWING REVISIONS

INDUSTRIES INC. Total olifield supply

P.O. BOX 6280, INNISFAIL, AB 74G 159 PH: (403) 227-4100 FAX: (403) 227-4102

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**ENCANA CORPORATION** LINEHEATER PACKAGE

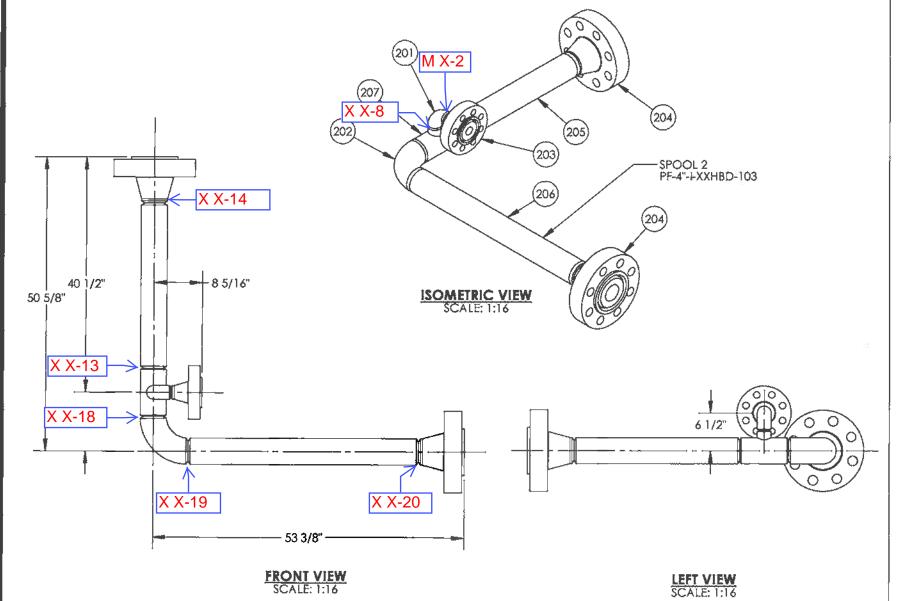
3.0 MMBTU

c/w 4"-2500# RTJ SPLIT COILS

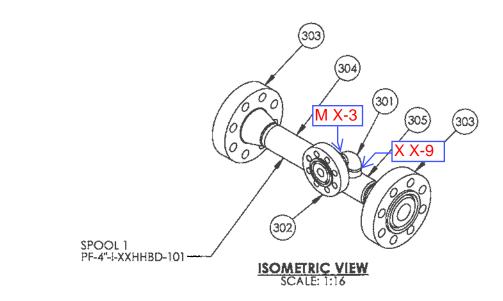
WELDED PIPING

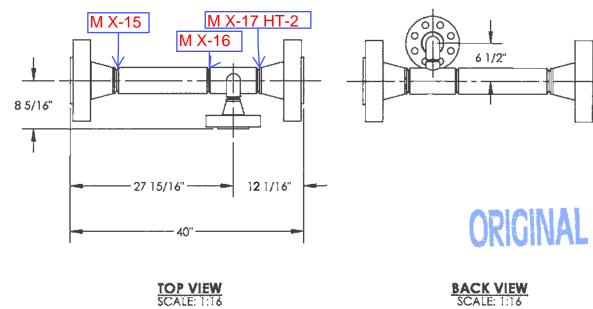
DATE: OCT 05/12 DATOV 14 2012 DATOV 14 2012 SCALE: 1:16 DWG: 08562-2A SHEET: 3 OF 6

ПЕМ	PART#	DESCRIPTION	MTR#	LENGTH	QTY.
201	EL92LXXHGD	ELBOW 90 DEG 2" LR SCH XXH BW \$A420-WPL6			1
202	EL94LXXHGD	ELBOW 90 DEG 4" LR SCH XXH BW \$A420-WPL6			1
203	FLA2FXXH8F	FLANGE 2" 2500 ANSI SCH XXH RTJWN \$A350-LF2-CL1	<u> </u>		I
204	FLA4FXXH8F	FLANGE 4" 2500 ANSI SCH XXH RTJWN SA350-LF2-CL1			2
205	PIP4XXH8	PIPE 4" SCH XXH SA333-6		28 7/16"	1
206	PIP4XXHB	PIPE 4" SCH XXH SA333-6		39 7/16"	1
207	TEE42YXXHGD	TEE REDUCING 4" x 2" SCH XXH BW SA 420-WPL6			1



ITEM	PART #	DESCRIPTION	MTR #	LENGTH	QTY.
301	EL92LXXHGD	ELBOW 90 DEG 2" LR SCH XXH BW SA420-WPL6			1
302	FLA2FXXHBF	FLANGE 2" 2500 ANSI SCH XXH RTJWN SA350-LF2-CL1			1
303	FLA 4FXXHBF	FLANGE 4" 2500 ANSI SCH XXH RTJWN SA350-LF2-CL1			2
304	PIP4XXHB	PIPE 4" SCH XXH SA333-6		15 7/8"	1
305	TEE42YXXHGD	TEE REDUCING 4" x 2" SCH XXH BW SA420-WPL6			1





		_						ļ
LH-7224-BARE	WELDED BATH ASSEMBLY							ISSUED FOR
LH-PH-7224-1	PREHEAT PIPING	I					AS BUILT	CONSTRUCTION
LH-LAD-72	LADDER ASSEMBLY				-			7 CONSTRUCTION
LH-FIRSTK-24-2	WELDED FIRETUBE / STACK ASSEMBLY							SIGNED:
08562-6	SKID, SHELL, LADDER, PREHEAT PIPING ASSEMBLY							DATE:
08562-3/08562-4	SKID ASSEMBLY / COIL ASSEMBLY					M.		
08562/08562-1	GA / P&ID	0	OCT05/12	VW	8	19	ISSUED FOR CONSTRUCTION	
DOCUMENT NO.	DESCRIPTION	REV	DATE	8Y	CHK	APP		S/N:
	REFERENCE DRAWINGS		• • • • • • • • • • • • • • • • • • • •				DRAWING REVISIONS	ALL DIMENSIONS IN INCHES

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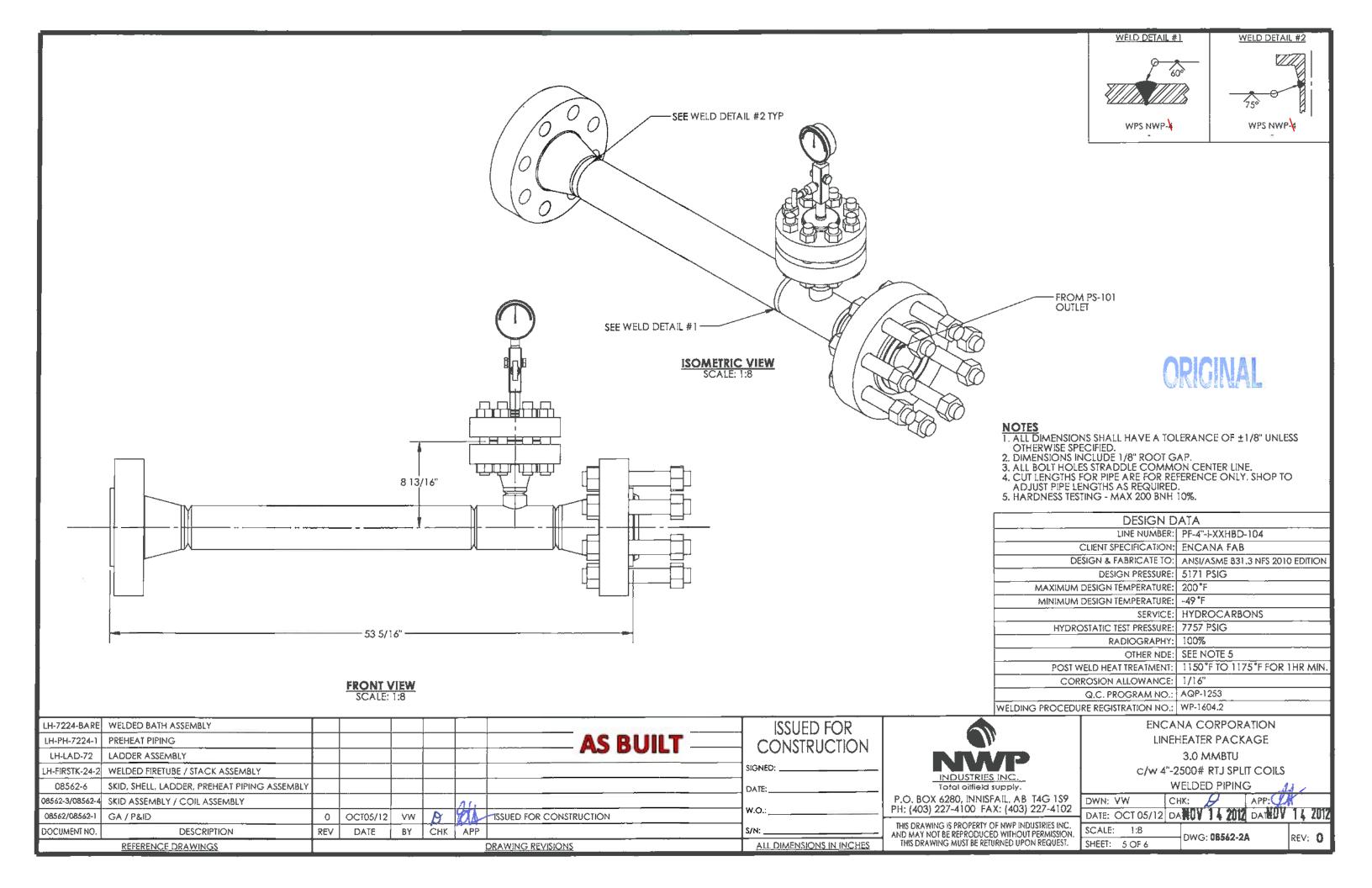
INDUSTRIES INC.

Total oilfield supply.

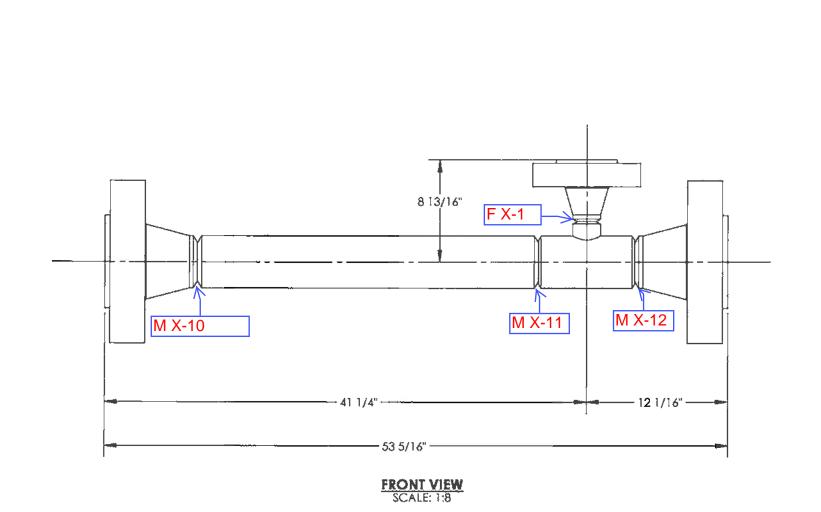
**ENCANA CORPORATION** LINEHEATER PACKAGE 3.0 MMBTU c/w 4"-2500# RTJ SPLIT COILS

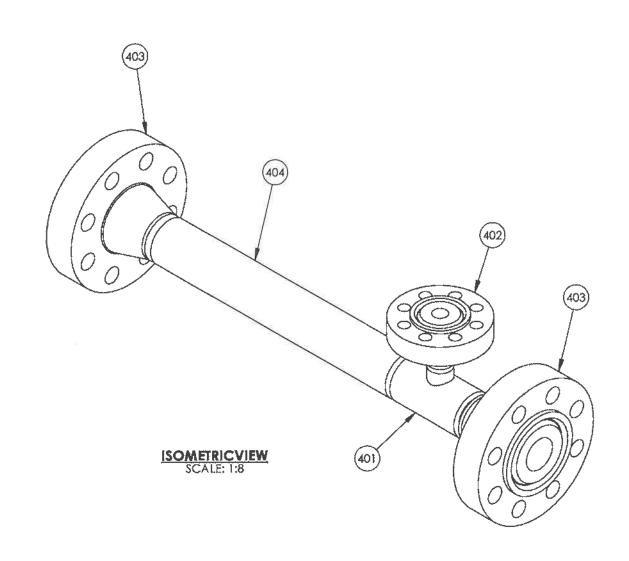
WELDED PIPING

-1			K 21. K
	DWN: VW	CHK: 🔎 APP: 🖔	7/1
4	DATE: OCT 05/12	DATEOV 14 2012 DANEV	T + ZUIZ
	SCALE: 1:16	DWG: 08562-2A	DEV. A
	SHEET: 4 OF 6	DWG: 00362-2A	REV: 0



ПЕМ	PART#	DESCRIPTION	MIR#	LENGTH	QTY.
401	TEE42YXXHGD	TEE REDUCING 4" x 2" SCH XXH BW SA420-WPL6			1
402	FLA2FXXHBF	FLANGE 2" 2500 ANSI SCH XXH RTJWN SA350-LF2-CL1			1
403	FLA4FXXHBF	FLANGE 4" 2500 ANSI SCH XXH RTJWN SA350-LF2-CL1			2
404	PIP4XXHB	PIPE 4" SCH XXH SA333-6		29 3/16"	I





# **ORIGINAL**

LH-7224-BARE	WELDED BATH ASSEMBLY								ISSUED FOR
LH-PH-7224-1	PREHEAT PIPING							AS BUILT	CONSTRUCTION
LH-LAD-72	LADDER ASSEMBLY				·	1	Ï		CONSINUCTION
LH-FIRSTK-24-2	WELDED FIRETUBE / STACK ASSEMBLY								SIGNED:
08562-6	SKID, SHELL, LADDER, PREHEAT PIPING AS	SEMBLY							DATE:
08562-3/08562-4	SKID ASSEMBLY / COIL ASSEMBLY						/26		
08562/08562-1	GA / P&ID		0	OCT05/12	VW	8	924	ISSUED FOR CONSTRUCTION	w.o.:
DOCUMENT NO.	DESCRIPTION		REV	DATE	BY	CHK	APP		\$/N:
	REFERENCE DRAWINGS							DRAWING REVISIONS	ALL DIMENSIONS IN INCHES

NSTRUCTION

INDUSTRIES INC.
Total olifield supply.

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LINEHEATER PACKAGE
3.0 MMBTU
C/w 4"-2500# RTJ SPLIT COILS

WELDED PIPING

DWN: VW CHK: APP: DATE: OCT 05/12 DATE: DATE: DATE: DATE: DATE: 1:8

SHEET: 6 OF 6

DWG: 08562-2A

REV: 0

"Conforms with ASME Sec II Part A 2007 edition 2009 addenda EL9ZLXXH6D IN STOCK 4

HEAT # 01329 Z"-90° Elbow LR/XXH B

	erne fittings gmbh		ソリ	'Ab'nahı	neprüfze	ugnis		Zeug	nisnummer (ce	ertiticate no.)	Rev.	Dat	
ernefittings	A-6824 Schlins Haugistrasse 48	TW.		Inspect	tion Certi	ficate			000014103			(da 26/02	- 1
sementings.	Austria/Europe	122		EN	10204 - 3	.1		Ì	009341/07		A :	20102	/200/
•	Tolefon +43/5524 501-0 Tolefox +43/5524 501-930 1				r [your orde	no.j			ere Auftrags.Nr	, (our order no.			
<u></u>				3-OR-2100					1-PS-0410		<u> </u>	40350	,
Kunde [customer] CE Franklin Ltd.	•		ihre Arti	ikelnumme	r (your item i	ן.מר	•	15cm	nelze Nr [heat i 9	ן.מר	ident i	<b>ir.</b> [lden	t no.j
CE Frankjin Llu.			Menge		Artikalbeze	ichnun	g	Anfo	rderungen <i>(requi</i>	rements)			
'			[quantity	И	[design	ation]		ASME	38169-2001 LR/W	PLB ASTMA 420	A 420M 0	ASME	SATA20
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CDN-T6N 1AB Edmont	on, Alberta		200		LR-BD-S-WPI	.6-2"-XXS		241	· · · · · · · · · · · · · · · · · · ·				
	nisnr. (Lube work's cert.no.)			[menulacitre	1]		·		heitsprüfung //ea/d	age test)			
[base material] 11543Sv0	<del></del>		V&M		<del></del>				1 E309				
Anatyse Schmelze I [analysis] [heat no.	-			zanalyse (héal analyse (prodi		J-Fakto GEQ (0			(in) * (P + Sn) * 100 (in / 6) + (Cr + Mo +		/15		
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[test rio.] Pr. Lage [pos.]	Temp. Dehngr. Grield atr. J	Zuglostigke atr.) Rm (N/		Dehnung (eion- galion) 2" (56)/	PR-Lage (pos of sample)	Temp.	Querschnitt		Kartschlagarbeit (Impact.value) (J)	139-144 HB			
- Jerosapog	1,2,4,5			33,50 gray 555		150;C	80 55 47		152135-160	. Wärmebehar	Aluma D	pot Irontu	and)
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	1 2500	5,0			h.CX	AS PE		XL		Cooling in all air			
	6.2580	_	•		DI		MENTS	(IV)					
Kennzeichnung [marking]	EJØS)		Mal./0132	IleM'MOV6		<del></del>	<del>:!!!⊏!110</del>	Zusat	temorkierung (odd	. mark.)			
Besichtigung und Ausma	ssung (visual inspection an	d dimensio	mai check	/ p.B./o.K.	Name:	En	DYO		esteilten Anforder rements are satisfie		folk (Mar	wacturin	3
Bemerkungen (remarks)		٠.		• •	-	10/1	42013		rements are sausne Verksachverständ		nector!		
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dimensional test are check	g av., to NACE WA-01-75. 3 ed on 10%.	area than w	ART IOUIN	united (Marie 1.)	minited in straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the straight in the str		····		s Dokument worde	elektronisch erste			
				•					, [The certificate is: without signature.]	issued by the com	puterized	system a	nd is

# ernefittings Kunde l'customerl

### erne fittings gmbh

Telefax +43/5524 501-930

A-6824 Schlins Hauptstrasse 48 Austria/Europe Telefon +43/5524 501-0



Reg. No. 12 100 3054

## Abnahmeprüfzeugnis Inspection Certificate EN 10204 - 3.1

Unsere Auftrags.Nr./Art.Nr. four order no./item no.]

Rev.

Datum [date]

28/10/2011

Ident Nr. [ident no.]

7565300

Artikelbezeichnung [designation]

R-S-WPL6-4"/2"-XXS/XXS

Anforderungen der Bestellung [requirements of the order] ASME B16.9-2007, material:WPL6, TR-basematerial:ASME Sect. II

part D table Y-1, TR-fitting:ASTM A 420/A 420M-10, ASME SA-420M-Ed.07, TR-addit fitting:NACE

MR0175/ISO15156-2:2003A.2, NACE MR0103-2007 2.1 and 4, M0803-05, certificate:EN 10204/3.1, rust protection:Millstandard, execution Seamless

**CCTF** Comporation

5407-53 Avenue

Vormaterial

these meterial

CDN-T6B 3G2 Edmonton, Alberta

seamless pipe

4"x2" Tee

35

Zeugnis Nr. [cert. no.]

046233/11-HG

Schmelze Nr [heat no.]

135033TD-0110 / 059549

ihre Bestell Nr. fyour order no.I

1011318301

4890518-00

Menge [quantity]

1	lnaza marana	9 1		• •																
	Analyse	Schmelze Nr.   Erschmelzungsart [melting process]   1 = Schmetzanalyse [heat analysis]   J										J-Faktor		(Si + i	Mn) * (P	+ Sn) * 1	0000			
	[analysis]	[heat no.]	Y		·		2 = 2	rodukt	nalyse	roduct	natysis]	CEQ (C	QJ:	C+(	Mn / 6) +	(Cr + M	o + V)/5	5 + (Cu +	Ni) / 15	
	index		C	Si	Mn	P	S	Cr	Mo	Ni	Cu	V	Nb	Al	B	Ti	N	Sn	<u> </u>	
ı	1	1011318301	0.1652	0.2429	0.9397	0.0089	0.0029	0.0355	0.0066	0.0134	0.0129	0.0022	0.0001	0.0315	0.0003	0.0018	0.0068	0.0021	l	<u> </u>
1	2	1011318301	0.159	0.235	0.918	0.0076	0.00246	0.035	0.013	0.014	0.011	0.001	0.001	0.031	0.00059	0.002	0.004	0.001	l	1

## Mech.-technologische Prüfung Imech. technological test?

- 1										Ψ.			4				
1	Proben			Zuny	ersuch //	tensile te	esti			Kerbschl	agbiege	versuch [notched	l bar impact test]	Härteprüfung			
1	Zag versuon (tonoso tost)											Form: ISO-V		[hardness test]			
-	Nr. [test no.]	PrLage (pos.	Temp.		[yield str.]	Zugfesti	gkeit [tensile	Dehnung		PR-Lage [pos. of sample]	Temp.	Querschnitt fcross sec.1	Kerbschtagarbeit fimpact values! (J)	158-161 HB			
	<u> </u>	of sampel]		ReH	Rp 0,2	/	(MIL-1)	_	7 7	or sample)		1	<del> ` ' '` '</del>				
1	6387_11	L	+20 °C		326	475	<b>V</b>	[33,5	V	<u> </u>	-50 °C	80	157-154-265	Wärmebehandlung [heat treatment]			
							V		•					reatmenerialidating [noot trousing]			

"Conforms With ASME Sec II, Part A. 2010 edition. 2011a addenda"

Encana

normalized temperature 920 °C Holding Time 20 min. Cooling in still air

APPROVED By Kasha at 2:53 pm. Nov 15, 2012 5.6 Ratio

o.B./o.K.

Kennzeichnung [marking]



AUSTRIA / WPL6 / 1011318301 / 4" / 2" / XXS / XXS / MT

Zusatzmarkierung [add. mark.] Die gelieferten Produkte entsprechen den Anforderungen der Bestellung (einschließlich Herstellung, Probennahme, Testen und Prüfen). [The supplied

is issued by the computerized system and is valid without signature.]

Besichtigung und Ausmessung [visual inspection and dimensional check] Bemerkungen (remarks)

cold formed

magnetic particle examination acc. ASTM E709: o.k.

products comply with the requirements of the order (including manufacturing. sampling, testing and inspections).]

Der Werksachverständige [the Works Inspector]

28/10/11 Grabherr Harald 魯 - 321 Dieses Dokument wurde elektronisch erstetlt und ist ohne Unterschrift gültig. [The certificate]

Zertifiziert nach DGRL 97/23/EG Anhang I - Absatz 4,3 durch TÜV SÜD Industrie Service, Benannte Stelle 0036, Zertifikat Nr. 129/2002/MUC [Certified acc. to PED 97/23/EG Annax I, Paragraph 4.3 by TÜV SÜD Industrie Service,

Notified Body 0036, Certificate No. 129/2002/MUC1

Vendor:	Encana	
Heat No:		1011318301
Date:	15-Nov-12	

	С	Mn	Cr	Мо	Ni	Cu	V
	Carbon	Manganese	Chromium	Molybdenum	Nickel	Copper	Vanadium
Fill in Product Analysis from MTR's	0.1652	0.9397	0.0355	0.0066	0.0134	0.0129	0.0022

			Mn	С	Standard	Ratio	
Do Not Fill in these Numbers	Ratio	Mn/C	0.9397	0.1652	>3.00	5.6883	
						•	
	С	Mn	Cr	Мо	V	Ni	Cu
Do Not Fill in these Numbers	0.1652	0.9397	0.0355	0.0066	0.0022	0.0134	0.0129

CE=C+(Mn/6)+((Cr+Mo+V)/5)+((Ni+Cu)/15)	CE=	0.33243
Do Not Fill in these Numbers	Standard	<.45

### Abnahmeprüfzeugnis Artikelbezeichnung [designation] erne fittings gmbh Inspection Certificate A-6824 Schlins tees **Cernefittings** Hauptstrasse 48 EN 10204 - 3.1 R-S-WPL6-4"/2"-XXS/XXS Austria/Europe Telefon +43/5524 501-0 Zeugnis Nr. [cert. no.] Rev. Datum [date] Anforderungen der Bestellung frequirements of the order Telefax +43/5524 501-930 12 100 3054 047148/11-HG 03/11/2011 ASME B16.9-2007, material:WPL6, TR-basematerial:ASME Sect. it part D table Y-1, TR-fitting:ASTM A 420/A 420M-10, ASME Ident Nr. lident no.) Schmelze Nr [heat no.] Kunde [customer] SA-420M-Ed,07, TR-addit fitting:NACE 1011322931 **CCTF** Corporation MR0175/ISQ15156-2;2003A.2, NACE MR0103-2007 2,1 and 4, Unsere Auftrags.Nr./Art.Nr. four order no./item no.) M0803-05, certificate: EN 10204/3.1, rust protection: Millstandard, 135033TD-0110 / 059549 execution:Seamless Ihre Bestell Nr. [your order no.] 7565300 4890518-00 5407-53 Avenue Menge (quantity) CDN-T6B 3G2 Edmonton, Alberta Vormaterial 4"x2" Tee seamless pipe (base material) J-Faktor (Si + Mn) * (P + Sn) * 10000 Erschmelzungsart [melting process] | 1 = Schmelzanalyse [heat analysis] Schmeize Nr. Analyse 2 = Produktanalyse [product_nalysis] CEQ [CEQ]: C + (Mn / 6) + (Cr + Mo + V) / 5 + (Cu + Ni) / 15 fheat no.1 [analysis] Мо Ni Nb ΑL В Τi N Sn Index Mn 0.0007 0.0001 0.0014 0.8969 0.0034 0.0230 0.0033 0.0129 0.0137 0.0023 0.0322 0.0017 0.0059 1 1011322931 0.1678 0.2412 0.0125 1011322931 0.254 0.892 0.0118 0.00324 0.019 0.011 0.013 0.015 0.001 0.001 0.03 0.00050 | 0.002 0.005 100.00 2 0.151 Mech.-technologische Prüfung [mech. technological test] Kerbschlagbiegeversuch [notched bar impact test] Härteprüfung Proben Zugversuch [tensile test] Form: ISO-V [hardness test] Nr. Kerbschlagarbeit Pr.-Lage Ipos. Dehngr. (yield str.) Zugfestigkeit flensile Dehnung felon-PR-Lage (pos. Querschnitt 159-161 HB Temp. Temp. Itest no.1 str.] Rm (MPa) fcross sec.1 of sampell gation] 4D (%). of sample) fimpact values] (J) Rp 0.2 +20 °C 380 34.5 50 °C 98 129-159-93 6386 11 Wärmebehandlung [heat treatment] 5.5 Ratio "Conforms With ASME normalized Encana temperature 920 °C Sec II, Part A, 2010 edition, Holding Time 20 min. Cooling in still air 2011a addenda" APPROVED By Kasha at 2:45 pm, Nov 15, 2012 $(\overline{QS})$ AUSTRIA / WPL6 / 1011322931 / 4" / 2" / XXS / XXS / MT Zusatzmarkierung [add. mark.] Kennzeichnung [marking] Die gelieferten Produkte entsprechen den Anforderungen der Bestellung Besightigung und Ausmessung (visual inspection and dimensional check) o.B./o.K. (einschließlich Herstellung, Probennahme, Testen und Prüfen). [The supplied Bemerkungen [remarks] products comply with the requirements of the order (including manufacturing. cold formed sampling, testing and inspections).]

Zertifiziert nach DGRL 97/23/EG Anhang I - Absatz 4.3 durch TÜV SÜD Industrie Service, Benannte Stelle 0036, Zertifikat Nr. 129/2002/MUC [Certified acc. to PED 97/23/EG Annex I, Paragraph 4.3 by TÜV SÜD Industrie Service, Notified Body 0036, Certificate No. 129/2002/MUC]

Der Werksachverständige [the Works Inspector]

Grabbert Harald

is issued by the computerized system and is valid without signature.]

Dieses Dokument wurde elektronisch erstellt und ist ohne Unterschrift gültig. [The certificate

03/11/11

雪 - 321

Vendor:	Encana	
Heat No:		1011322931
Date:	15-Nov-12	

	С	Mn	Cr	Мо	Ni	Cu	V
	Carbon	Manganese	Chromium	Molybdenum	Nickel	Copper	Vanadium
Fill in Product Analysis from MTR's	0.1678	0.8969	0.0230	0.0033	0.0129	0.0137	0.0007

			Mn	С	Standard	Ratio	
Do Not Fill in these Numbers	Ratio	Mn/C	0.8969	0.1678	>3.00	5.3451	
	_		_		l v 7		_
	С	Mn	Cr	Мо	V	Ni	Cu

CE=C+(Mn/6)+((Cr+Mo+V)/5)+((Ni+Cu)/15)	CE=	0.32446
Do Not Fill in these Numbers	Standard	<.45

CLIENTE / Customer / Client CCTF CORPORATION (EDMONTON) 5407 - 53 AVENUE NW EDMONTON, AB T6B 3G2

1111

PRODUCTO
Article - Produit

FLANGES

ASME 816.5-09

Votne Cde, N.º SU PEDIDO N.º Your Order No.

4691318-00

DE of - de 24/04/2012

N.* 01 202 E/O 02 7443 by TÜV Rheinland

Certified acc. PED 97/23/EC+AD2000-W0

MODO DE FUSION (*) Material Correspondent - Qualità MATERIAL CORRESPONDIENTE Requirements - Normes Applicables NORMAS APLICABLES

A/SA105N-11 // A/SA350LF2CL1-11

# CERTIFICADO DE INSPECCION

Inspection Certificate - Certificat de Réception

FECHA:

20/06/2012

149135

HQJA: Page: 2

ISO 10474 / 3.1

DIN EN 10204 / 3.1











SG16009987 ULMA FORJA, S.COOP.

Tel.: 34 - 943 780552 Fax: 34 - 943 781808 B° Zubillaga, 3 - Apdo. 14 20560 ONATI (Gipuzkoa) SPAIN

MARCA DEL FABRICANTE

Marque du fabrican!

Mark of fectory

Packing List: 94112 E-mail: ulma@ulmapiping.com

N.°Coulée C %	COLADA N.º	### PARTIDA   CA	MODO DE FUSION (*) Steel Making - Elaboration de l'acter
N % iS	COMPOSICION QUÍMICA - STEEL MAKER'S LADLE ANALYSIS - ANALYSE CHIMIQUE	CANTIDAD Quantity Quantité 16 14 14 16 24 24 24 24 24 24 24 24 24 24 24 24 24	i (°) ion do l'acier
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		COLADA N.ºR Heat No N.ºCoulée 233V2 45V2 173V2 189V2 230M2	
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<ul> <li>Dimension and surface condition were found acceptable.</li> <li>Les dimensions et états de surface cont satisfaits.</li> </ul>	- Las dimensiones y la condición superficial se helleron salisfactorias.	ALARGAM ESTRUCCION Blooppilan Red. Area Lo: 4 d Streicon 95	
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(*) OBSERVACIONES:

Observations

173V2 189V2 230M2 233V2 300V2 45V2

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0.250

0,032

Les dimensions et états de surface sont satisfaisants.

Los maleriales citados cumplen las normas aplicables.

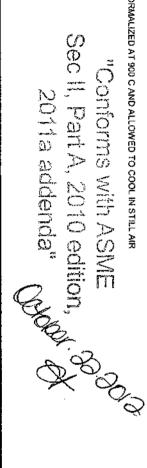
Les normes applicables sont respectées.

Works inspector - L'Inspecteur EL INSPECTOR

Dpto. de(Garantia de calidad Quality\Assurance Dept. ULMANDENAS COOP Manufacturing requirements are satisfied

0,190, % O

N_NORMALIZED AT 900 C AND ALLOWED TO COOL IN STILL AIR



NUL OHEN STEEL CORPORATION
SIMPROVED
JOIGHN SIMPSON, TIL

Conforms with ASME

"Conforms

元叉強電

HUAYOU SPECIAL STEEL

MILL TEST CERTIFICATE

em# 308 Pro 2100 12 9 9 8 Ву はなる。 形 点 会路機 SURVEYOR 安货并位 PURCHASER 订货价位 CUSTOMER VISUAL & DIMENSION SPEC 3 PRODUCT 党 C. 党 书昭的等 2010120734 外院世尺中 电产指电 WORK NO. Ħ 抗拉姆度 T.S. MPa 114.3 mm NPS 4 550/5go 格爾 GAUGE LENGTH 45 英证明本政府列产品、均依所连规定制造、取符、改造制数数,并符合标准及合同要求。 WE HEREBY CERTIFY THAT THE MATERIALS DESCRIBED HEREIN HAVE BEEN MANUFACTURED, SAMPLED, TESTED AND INSPECTED IN ACCORDANCE WITH THE CUSTOMER'S SPECIFICATION(S), AND THAT THEY SATISFY THE REQUIREMENTS. *1、H:HEAT(LADLE) ANALYSIS;P:PRODUCTANALYSIS。 2、试样尺寸 SIZE :圆形试样の12.5mm。 拉奇道路 TENSILE TEST 知验方向 ORIENTATION : L=织南 LONGITUDINAL 4、SY=02%OFFSET 21308 HEAT NO. ASTMIASME AISA333-09 NACE MR0175-2003 中 4 馬恩姆氏 280/280 MP_B 245 がは BRI-CHEM STEEL CORPORATION BRI-CHEM STEEL CORPORATION GOOD SEAMLESS STEEL PIPES S 쳁 Š **33/34** 名となる。 17.12 mm (50.8mm 8' 5 E FLATTENING TEST д ٦. 0.00 田庙其郷 0.30 の飛 が記録 1 0.30 0.30 经商 以验的是 TEMPERATURE OF TEST 029 1,25/0.012 0.005 0.003 S 1.35 多的 7.81 6000 8 6.1M 0.025 10×10×55 (-45℃) S A WACT TEST 0.025 总支援 TOTAL PIECES (PCS) の部 BENDING TEST 7 台田田中 LC NO CONTRACT NO. CERTIFICATE NO. 59 心但其和 u ); 00 00 CHEMICAL COMPOSITION **≋** 83 領級 GRADE 京北京 දි නී 1 53 ì HB160/150/155 \$ 2 NACE MR0175 SYDROSTATIC HRC<22 TEST HARDNESS TEST 強用以緊 高速 \$ 55 10120734 100353 GR.6 % <協 TOTAL METERS (m) EXPAND TEST 19.3MPa,6s 一口氏器 四氢 DELIVERY CONDITION HEAT TREATMENT 多数 MAKING METHOD DATE OF ISSUE 热处理工艺 选 销货 农门 出始日期 以如次法 色白花花 600D 33 対策

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Non-Metallic Inclusions (Grade)

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多形珠 (明) TOTAL WEIGHT (t)

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2010-12-7

MATERIAL CONFORMS

SPECIFICATIONS TOCUSTOMER

WITH ACKE

Sec II, Part A, 2010 edition" 元,Part A, 2010 edition" 元 物 市 华 友 特 例 有 聚 公 司 Name:

REQUIREMENTS

AS PER P.O.

Wuxi Huayou Special Steel Co.,

피

质量证

明、书

Ltd.

HOT-ROLLED

AS-ROLLED

抵抗税

Tel :( 0510)83073086 Fax :( 0510)83073086

Fage 134/34 作无影市红细西路 888-5 Warrh111

的 NSPECTOR 指字符

O CUSTOMER

SPECIFICATIONS AS PER P.O.

REQUIREMENTS

Sec II Part A, 2010 edition Conforms with ASME 2011a addenda

APPROVED
By Ceri Steen at 11:13 am, Jul 27, 2012

HEAT # 21308	С	Mn	Cr	Mo	N:	Cu	\ 
	Carbon	Manganese Chromium	Chromium	Molybdenum	Nickel	Copper	Vanadium
Fill in Product Analysis from MTR's	0.16	1.25	0	0	0.003	0	0

						:	
0	0.003	<u>)</u>	C	0	1.25	0.16	Do Not Fill in these Numbers
Cu	N.	<	Mo	Cr	Mn	С	
		:					
		0.16 >3.00		1.25	Mn/C	Ratio	Do Not Fill in these Numbers
		Standard	С	Mn			



SAN ENG STEEL FORGING CO LTD 311, Jen Hein Roed, Jen Wu District Kantalung, Talwan, R.O.C. TEL:07-3724249; FAX:07-3712923 URL: www.sanerg.com.tw e-mail: saneng@ksts.seed.nel.tw

## (MILL TEST CERTIFICATE)

EN10204-3.1.B(DIN5004B/3.1.B)

Customer: W.F.F.FITTINGS & FLANGES (CANADA)

Order No.: D000234/S759096172

Certificate No.: SE102032

Date: 06/11/2012 Page: 1 OF 1

		PRO	DUCT				MATERI		ECIFI		ONS				IME	4310	NAL	SPE	CIFICA	TIONS	
	FORGED	CARBO	ON STEEL FL	ANGES .	/	,	STM A350 LF2	41 CL1	ASME S	A350 LF	2-11 CL	1/						B16.5- Z245.1			
	-	_	-	-		Tour	NTITY	_	-	-	č	HEMIC	DAL	OMP	OSIT	ION	(%)	-	-	_	_
No.	CODE NO		DES	CRIPTIC	NO	40,	Min	C 0.300	Si 0,150 0.300	Mn 0.600 1.350	P 0.035	5	Cu 0.400	Cr 9.300	Ni 9'400	Mo 0.120	, 8,080	Nb 0.020	N :	. 3	CE(*3
1 2 3 4	•	1500 V 600 BI	MNRTJ XXS : MNRTJ S160 LRE(Z*NPT T. MNRF XXS 3	3" LF2 AP)3" LF2	,o		100 PCE 50 PCE 30 PCE 10 PCE	0.230 0.210 0.230 0.210	-	1.150 1.150 1.150 1.150	0.015 0.017 0.015 0.017	0.008 0.005 0.008 0.008	0.006 0.006 0.006	0.020- 0.010 0.020 0.010	0.010 0.010 0.010	0.005 0.001 0.005	0.005 0.005 0.005	0.001 0.001 0.001			0.425 0.406 0.425 0.406
tem No.	Heat No.	Min	T.S.(*1) (MPA) 485.0 655.0	Y.S.(*1) (MPA) 250.0	EL(*1) (%) 22.0	Hardness (HB)	RA(*1) (%) 30.0	Min	Impact 1 Temp: 4 imum: 21	16°C	3	Mate	rial Sup	plier	8			ENT("2)			_
1 2 3 4	4510829 4554034 4510829 4554034		541.3 520.0 541.3 520.0	395.2 362.0 395.2 362.0	33.2 × 34.0 33.2 34.0	155/153 / 153/151 155/153 153/151	68.6 69.5 58.6 69.5	85.0 72.0 86.0 72.0	5 3 5	4.0 9.0 4.0 9.0	70.0 45.0 70.0	ACOME ACOME ACOME	VAS VAS		B9 CC MF CC SE BL TE	890°CX3HRS CONFORMS WITH NACE MR0103-16 AND NACE MR0175/ISO15156.2-09 CONFORMS WITH Z245.12 CAT II GR.248 SOUR SERVICE-09(FOR USE AS WELDING NECK AND BLIND FLANGES ONLY) TEST SPECIMEN SIZE: 10X10 TEST SPECIMEN ORIENTATION: TRANSVERSE IMPACT TEST TEMP:: -48°C					
2	T.S. = Tensile Stre N=Normalized, A= A.C=Air Cooled, F C.E. Value = C + (	Annesti C=Fun Mn #6)	ed, Q=Quenc ance Cooled,	hed, T=Tem W.C=Water	pered, S.Tet Cooled, O.C	Solution Trea	led, S.R. Stress	s Relieved							( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	300	B.C	3	*		

"Conforms with ASME Sec II, Part A, 2010 edition, 2011a addenda"

2012/11/19 S. nasan

MATERIAL CONFORMS TO CUSTOMER **SPECIFICATIONS** AS PER P.O. REQUIREMENTS

Order#: 213684 Seq: 1 PO#: 708226 Heat#: bn511 Mill: TK Corporation VA Desc: recertified to a234-wpb Part#: WF 4 XXS 90 PB Part Desc: Weld Fittings 4 (114.3mm O.D.) DOUBLE EXTRA HEAVY LR 90 DEG ELBOW A/SA234-WPB

# **OTK** Corporation

# INSPECTION CERTIFICATE

1489-1 "SONG JUNG-DONG, GANGSIEO-GU BUBAN,KOREA Tel : 82-51-831-6550 Fax : 82-51-831-F986

Customar Comco Pipe & Supply Certificate No. 20110901034 Data 2011/09/06 E1-2321 P O No Prince Name POR/Regin No Specification (ASTM/ASME A/SA420 WPL6(07 Ed.809 Add.)
INACE MR0175/ISO 15158-2 AND NACE MR0103-2007 Specification SEAMLESS PIPE Starting Material Specification ASME B16.9-2007 Dimension and Visual Inspection രവാവ for Inspection Heat Code No Descriptions (Pce) Treatment a 8N511 0183 90" ELBOW LONG XX-S N: 910°C 20 2012/7/18 L. Mason "Conforms with ASME Sec II, Part A, 2010 edition, 20|11a addenda"

CHEMICAL COMPOSITION (%)

Heal Code No [HCN] Max. 0.23 0.40 1.35 0.035 0.010 0.40 0.30 0.12 0.40 0.080 0.020 0.42 Mhr 0.15 0.50	0.080 0.020 0.42 
[HCN] Max. 0.23 0.40 1.35 0.035 0.010 0.40 0.30 0.12 0.40 0.080 0.020 0.42 Mh 0.15 0.50	0.008 0.012 0.000 0.0002 0.295 507983 / TPCO 0.008 0.011 0.001 0.0001 0.250  MATERIAL CONFORM TO CUSTOMER SPECIFICATIONS AS PER P.O.
BN511 L 0.13 0.25 0.87 0.010 0.004 0.03 0.05 0.01 0.07 0.008 0.012 0.000 0.0002 0.295 507983 / TPCC 0.10 0.22 0.85 0.009 0.002 0.01 0.04 0.02 0.06 0.011 0.001 0.001 0.001 0.250 MATERI	MATERIAL CONFORM TO CUSTOMER SPECIFICATIONS AS PER P.O.
F 0.10 0.22 0.85 0.009 0.002 0.01 0.04 0.02 0.06 0.008 0.011 0.001 0.0001 0.250 MATERI	MATERIAL CONFORM TO CUSTOMER SPECIFICATIONS AS PER P.O.
AS	REQUIREMENTS

MECHANICAL PROPERTIES

Hardness Test Impact Test(J) Y.S T.S EL (%) Heat Code No [HCN] ΗВ Temp.(C) Size(2ma-y) Mex 85 237 Min. 35 60 30 Acd Ave. BN511 42.6 65.7 33,9 151 154 194.5 214.3 215.6 RATIO = 8.5

We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.

Remark:

• Impact Specimen Size & Size 10X10X55##

Spec, Value, Min. Ave. 13.8 17.6

Legend: HB:Brinell ST:Solution Treatment CR:Siress Relieving

AC:Air Cool OC:Oil Cool WQ:Water Quenched WC:Water Cool

P:Product

SRISInsas Releving WC;Water
N:Normalized WC;Water
T:Temperad
A:Amanalad L:Ladia
C;Quenched P:Product
(G): Hot-Dip Galvanized Coaling
Y,5: 0.2% Offsel Method

☐Reviewed by :

ENCANA

SPECIFICATIONS AS PER P.O.

MATERIAL CONFORMS

TO CUSTOMER

☐ Witnessed by :

REQUIREMENTS Approved by :

Director of Quality Assurance Dep't

P.O.# 705955 | tem# 2 Heat Number: BU112 Trans Am.Piping Products Ltd. - Rev'd By: SB Shipment/Seq #: S 11 - 1952 82

ELGHLXXHUD. XXH LR 90 BW ELBOW

Neat # BUIIZ

# **EDTK** Corporation

1499-1,SOMG JUNG-DONG, CANGSEO-GU BUSAN,KOREA Tel: 82-51-831-8550 Fox: 82-51-831-8886

Company	Tana As Blata Daniel As All	T		1		1	T	7	
Customer	Trans Am Piping Products Ltd. CI-11-408	Cortificati		2011110371	6	Date	2011/11/16	 <del> </del>	
P.O No.	5-11-408	Project Name					=	_	
Job No. Specification	ERSTM/RS/SE/A/RANDOIADHR/OA/AFEIGHEIGHEIGHEIGHEIGHEIGHEIGHEIGHEIGHEIGH	POR/Reg'n No.							
for Material Specification	RASTM/ASME A/SAR2D WPLB(2010EH)	Starting M		SEAMLESS P			-m-	-	
for Inspection	ASME 816.9-2007	Dimension	sual Inspection	<del>-                                    </del>		SOOD			
Heat Code No [HCN]	No. Descriptions		Q'ty (Pcs)	Hoat Trealm			•		
38U12	0041 90' ELBOWILONG XX-S			N: 910	C				
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We hereby certify for by the above						e tequire	mente callelle: _	MON 17 9019	
Remark :	•CSA Z245.11 Gr. 241 Cat II Sour Service	pecimen Size Size	Min.	Ave. HB:8			C:Air Cool C:Oil Cool	,	
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WITTER ST. 18 3.7 4. U. U. 38 DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT, ELEMENTS REPORTED IN MASS FRACTION (%)
9 AGE 1. OF 2 PRESSURE FIRE CARBON SMLS HF ASTM A333-*10 GRADE 1 ASTM A333-*10 GRADE 6 ASME 6A3335-*2010 EDITION GRADE 1 ASME 5A333-*2010 EDITION GRADE 6 ASTM A106-*08 ASME 5A1010 EDITION GRADE 6 ASTM A106-*08 ASME 5A1010 EDITION GRADE 9 EDITION GRADE 5E DUAL GRENCEL 580000 PSI MAX XIELD BLK REG MILL COAT PE BEV 30 DEG MEETING ALL THE APPLICABLE REQUIREMENTS OF NACE STANDARD MR-01-75/*:2003/COR.1:2005 AND MR0103-2007 2800 16:36:55 MIN HYDRO 2800 10037153 PSI W-WELD TUBULAR PRODUCTS h (m) | WALL 0.674 (17, 119) 2199 EAST ZETH ST. LORAIN, OR 44055 B 84:1 B 80.0 MIN: 66.0 SCALE; HRB SERIAL NO: 005 0 0 0 0 4 4 45.2 / 43.2 TOO 35.0 200 AR-AS ROLLED
TR-THERMOMECHANICAL ROLLED
HIGH AL H V B TI ELONG % 680 I'N 2" MIN: 0002 0002 2000 0000 2000 75000 10.60 75000 0.60 75500 0.62 0 0 (IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049 "type 3.1") KAX Ę Welded Pipe Encana 022 New Spec 60000 (NI+CU) /15 LNC 4.500 (114,300) Encana TENSILE PST 50 80 08 02 TEST REPORT TEXAS PIPE & SUPPLY CO 2330 HOLMES RD MAIL TO ADDRESS HOUSTON TX 77051-1098 BPECIFICATION AND GRADE TUBULAR PRODUCTS 45800 Y 50 . מ DATA THIS SHEED 2 CE=C+(MN/6)+(CR+MO+V)/5+ OT - QUENCH & TEMPERED SR - STRESS RELIEVED 45300 PSI 464007 007/003/20 / 16 007/003/20 / 15 CERTIFIED *BOTH HHES: 35000 58000 P.O. NUMBER 111905-00 99 006 001 19 115 01 006 001 20 15 02 011 007 19 16 20 V 101V01 OV 001 VIE TA ra'o MATERIAL CONFORMS REQUIREMENTS SPECIFICATIONS TO CUSTOMER AS PER P.O. END OF 1.500 1.500 1.500 T - TRANSVERSE IM - KORMALIZED E I 표57 COND, SHIPPERS NO. N.B.T. BODY NORMALIZED PALIDE PEGGA SURLE / L/B TEXAS PIPS & GUPPLY COLING 2310 HOLMES ND HOUSION IX 77051-1098 *C.E. 15 BASED ON THE FOLLOWING EQUATION(9): HA1043 P3474A STRIP/1/B HA1043 P3474A STRIP/1/B TENSILE TEST TYPE! ORIENTATION USS) UNITED STATES STEED Sec II, Part A, 2010 edition, HEAT PROD PROD HEAT PROD "Conforms with ASME TPE 2011a addenda" HILL ORDERITEM NO DRO1134 06 HA1043 P3474A FA1032 P3484A FALO32 P3484A FULL FA1032 LEGEND: HA1043 Ratio: MN C = 5.36

107 O CON

PAGE N ç

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIM WAS MANUFACTURED, SAMPLED, TESTED AHDIOR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS THE RECUIREMENTS IN SUCH RESPECTS. Prepared by the office of: R. HARRIS - MANAGER, Q.A.

08/11/11

DRO1134 06 FULL LENGTH UT END AREA INSPECTION (PLAIN END) TEGENO FULL LENGTH VISUAL FULL LENGTH ORIFT SPECIAL END AREA (SEA) INSP MELITED AND MANUFACTURED IN THE USA. NO REPAIRS BY WELDING. NO MERCURY OR MERCURY COMPOUNDS ARE ADDED TO THE STEEL AND ALL MERCURY BEARING EQUIPMENT IS PROTECTED BY A DOUBLE BOUNDARY OF CONTAINMENT. HA1043 P3474A MILL ORDER/TEM NO PA1032 P3484A UNITED STATES STEEL EALT BODA NORWATIZED L-LONGITUDINAL TEST / (NSPECTION Ē 88 Вено SKIPPERS HO. GRAIN SIZE T. TRAKSVERSE TUBULAR PRODUCTS
CERTIFIED TEST REPORT
(IN ACCORDANCE WITH ISO 10474/EM102D4/DIN58049 "type 3.1")
P.O. HUWBER END Ę GOLLAPSE GOLLAPSE 111906-00 ô DATA TESTING I INSPECTION INFORMATION ADDITIONAL NOTESICOMMENTS 밁 CIRT DRIFT MANDREL SIZE: 5 ļō 8 B-BODY 5 1.500 (114.300) or to iest Ge SHEET ** OB/IO S ş 1 60 DEG F TEMP OD/ID 1/2 SIZE RESULTS / COMMENTS N HARPY V-NOTCH IMPACT TESTING GEST CEST (mm) 7.2 2.4 3.4 WALL: 5 |S |} HAZ - HEAT AFFECTED ZOKE SERIAL NO: 0.674 (17,119) TIME: 2 T 14 H0037153 10 10 11 MARK A [mm] 10

08/11/11 16:36:55

ssuing Authority: Marvin J. (Ty) DeBelser		Quality Control
Date of Issue:March 13, 2008	NAMP INDUSTRIES INC.	QCFOFinalInspectionReleaseCertificateR00
FINAL INS	PECTION RELEASE CE	RTIFICATE
USTOMER: ENCANA		SALES ORDER#: NA
RODUCT: Shell, Pre-heat, Expansion Tank, Fire	etube & Stack for 3.0 mm Lineh	eater Wo# 08562-002-0
	NAL INSPECTION DOCUMENTA	DATE: 120 16/13
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line heater	YES NO	IPKGS Istack for 30nn
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REPARATION NEEDED/COMPLETED  Reliebse to ne	Xt Dracess.	
OT# 08562-002-C EM# Bath  VENTORY TAGS ATTACHED YES NO	SHIPPING INSTRUCTIONS	
USTOMER P.O REVIEWED YES 1	va II	
ONTACT PERSON AUTHORIZED TO RELEASE PRODUCT:		
ELEASED TO INVENTORY: Han - Alanana		DATE: 1/16/13
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# **NWP** Industries Inc.

	PRESSURE PIPING EXAMINATION CHECKLIST								
DRWG	H LH-PH-7224-1 REV 3 + 08562-6 REV	O JOB NUMBER: 08562-002-C							
NO.	FUNCTION	SIGNATUR	E OR INITIAL DATE						
		Q.C. INSPECTOR	OWNERS INSPECTOR						
1	DRAWINGS: ABSA registration over 0.5 Cu.M. Approved by Owner. Approved for Construction (signed & dated).								
2	Owner's Inspector notified.								
3	Registered Welding Procedure Specifications, Q.C. Manual and Forms available at site, Job File started.	P Nou16/12							
4	Welders qualified for WPS's and have valid Performance Qualification cards.  Welders Log completed. WPS reviewed with Welders.	P No.16.12							
5	Material checked against P.O., drawings, and specifications. Identification confirmed. Colour coding applied.	eass nevastis							
6	Sample of each Welder's work examined, including root spacing, alignment, cleaning, joint preparation, preheat and electrode control.	Kai New 25/12							
7	Nondestructive Examination completed. Reports and radiographs はいい reviewed, signed by Level II or III, Radiograph I.D. detailed on drawings.	ens novaglis							
8	Visual Examination of all completed welds. Welders I.D. stamped and recorded on drawings.	Han Now 25/1.	2						
9	Heat Treatment verified and recorded on drawings.								
10	Each system checked against specifications and drawings before test.	ene movaglis							
11	All deficiencies recorded and signed off by Q.C.I. and Owner's Inspector before test.	ease werealis							
12	Pressure Test checked. Gauge calibration verified, gauge #'s recorded.	CO CONGB							
13	System checked after test. Deficiencies recorded and corrected.	Or Tan lot	)						
14	Construction data reports (AB-83) prepared and signed by Q.C.i. and Owner's inspector.	SEE ASSEMBLY							
15	Declaration form (AB-81) submitted to ABSA	(							
16	As built drawings accepted by Owner.	· · · · · · · · · · · · · · · · · · ·	.÷						

NOV 14 2012

Issuing Authority: Marvin J. (Ty) DeBelser / Dale Karg	. 4			Manufacturing	<b>o</b>	0		
Date of Issue: November 30, 2007 Rev Status: 1.0	INDUS	TRIES	NC.	FORM-LHTS-001  Line Heater Travel Sheet  (Shell, Skid & Firetube Assecuty)				
ву:		Date:	NOV	14 2012	0	•		
w.o. # 08562-002-C	Description: Fi $R$ $\in$	TUBE !	STACK fo	ir 3.0 mm	LH PKG			
Drawing# LH-FIRSTK-24-2	REV 1							
	Req.	Hold	Employee	Date • Complete	QC Initial	Date		
Work Instructions/Drawings Issued			ME	De CS/12	Co.º	Na11612		
Work Instructions/Drawings Reviewed	/	/	1114	PECS/12	767	1 hiller/2		
Material & Parts Released	/	/	May	DECSIL		Vanlla		
Welding Personnel Assigned	/	/	my	OEC S/IR		Tank		
Visual Dimension Inspection - Firetube/Stack	V			° F	retube CX STACK - 12/17/12	Dec tolix		
Visual Dimension Inspection - Skid	μA				C			
Visual Dimension Inspection - Expansion Tank	NA			· ·	0			
Visual Dimension Inspection - Preheat Line	NA.					•		
Visual Dimension Inspection - Shell Assy.	na na							
Pneumatic Test - Firetube					· 68	Jan 07.13		
Hydro Test - Preheat Line	nA							
Pneumatic Test - Shell Assy.	NA		•					
Installation of All Welded Components Complete						malle		
Final Inspection Release					(3)	Janle		
• • • • • • • • • • • • • • • • • • • •						<u>.                                    </u>		
			2. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.					
		+ 4.						
Accepted By Customer:	:		Date:			·		

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Karg	(			Manufacturing			
Date of Issue: November 30, 2007 Rev Status: 1.0	NDUS	WVI TRIES II	NC.	FORM-LHTS-001 Line Heater Travel Sheet (Shell, Skid & Firetube Assembly)			
By:		Date:	NC	V 14 2012			
W.O. # 08562 - 002/C Descript	ion: Shel	L& EXPA	NSION TAI	uk for 3	3.0 mm LH	PKG.	
Drawing # LH - 7224-BARE REV 3						· · · · · · · · · · · · · · · · · · ·	
-	Req.	Hold	Employee Initial	Date Complete	QC Initial	Date	
Work Instructions/Drawings Issued	V				M)	Nov16-12	
NoT E o N PAge Work Instructions/Drawings Reviewed Ӌ	/	~		d t	(9)	Mbu16/12	
Material & Parts Released	//	-	en e		9	Tanllo	
Welding Personnel Assigned		-			(D)	Janle	
Visual Dimension Inspection - Firetube/Stack	NA	À					
Visual Dimension Inspection - Skid	NA						
Visual Dimension Inspection - Expansion Tank	V					Janle	
Visual Dimension Inspection - Preheat Line นุพระฉน		/ -	#		Mai	Dec 11/12	
Visual Dimension Inspection - Shell Assy.		Ac.,			(D)	Jan 16	
Pneumatic Test - Firetube	NA	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s					
Hydro Test - Preheat Line		_			<u> (9) -</u>	Jan16	
Pneumatic Test - Shell Assy.	/				<u>(GL)</u>	Jan 16	
Installation of All Welded Components Complete	/					Janle	
Final Inspection Release	<u> </u>			<u>-</u>	(A).	anllo	
				:			
	100						
Accepted By Customer:			Date:				

lssuing Authority: Marvin J. (Ty) DeBelser / Dale

Issuing Authority: Marvin J. (Ty) DeBelser/Dale Karg
Date of Issue: March 30 2012
Rev Status: 2.0



FORM_NDE_001	
N.D.E Requirements	

## **N.D.E** Requirements

	t: <u>Encana</u> ct: <u>Preheat Li</u> i	ne – 3.0 mm Linehea	nter	JO# <u>085</u> Date: <u>28</u> ,					
Piping: ⊠	Pressur	re Vessel: 🗌	Tank:	□ Other:					
		] X-Ray			100%			ASME Section VIII-UW-	-51
	×	l Gamma Ray			Full			ASME Section VIII-UW-	-52
		Ultrasonics			25%			Customer Specificati	ion
		Liquid Penetrant		⊠	10%		×	ASME B31.3 N	
	×	Magnetic Particle		Other(	Define)			Other (Speci	ífy)
		Accoustic Emission			Spot		×	Customer Sp	эес
	□Hardness	test Max 200 BHN						CSA W47.1/W	
1 Materia Velder ID		<del>.</del>		Vessel S/N					
ihell-T= ipe-T=	<u>1" Sch 160</u>	า							
•		<u> </u>	(MT-1)						
lease use wir lease Note lo	e type iQi	ations on films on reports	(····						٠
pecial Re	quirements:			Shots					
ap Shots to b hreaded Shot lentify on Env ashes must c lark all indica	ontain: Customer, ited repairs on the	# as XT-# kage being shot ie. Coil, Pipi JO#, Spool Identification, X project	ray number, Clo		ol, Date				
OTE: Enc	ana Spec for Weld	led Piping-acceptance is zer-	o UC and Zero II	р		•			

Encana Spec for Socket Welds-acceptance is minimum 1/16" gap Encana Spec for Threaded Piping- acceptance is 7 threads engaged HT is a 5 Point Traverse

Prepared By: R.M. Spence

Date: 28/11/2012



## **RADIOGRAPHIC INSPECTION REPORT**

CG18 - RT305 Page 4 of 7

Date: 28-Nov-12

Exposure Device #: D6306 Source #: 88662B

Cobait 60☐ IR 192 ☑ X-Ray ☐ EFSS: .154 Film Brand: AGFA #Film/cassette: 1

Job / P.O. #: 08562-002-C IRISNDT #: 255874

Client: ENCANA C/O NWP Location: Innisfail, Alberta

Code: ASME B31.3 NFS & Encana Spec.					Location: Innisfail, Alberta  Item Inspected: Preheat Line - 3mm Lineheater Material: CS						
Film #	Size, Location, Thickness	Welder ID	IRISNDT Proc.		O.F.D. Inches	# of Exp.	Work Loc.	Film Type		(A)cce (R)eje	
GS-1	1"S160	s	RT 5	18	1.3	1	1	D7			
	1 2.00	-	1(13	10	1.3	<u> </u>		D7		A	
						-					
*****		-									
		<u> </u>									
n.i											
71.84		-		Mar.							
					~	10			A A A A A A A A A A A A A A A A A A A		
									1 - Gap Shot on 1"s160		
					=						
					•						
umber of R	adiation Barrie	er Warnin	g Signs E	rected:	2		Numbe	er of R	adiation Barrier Warning Signs Returned: 2		
ork Locatio	n Legend:	[1] ir	side Fab.	Shop	[2] Y	ard/L:	ay-down			N/A (Other)	
IS Procedure: ngle Wall Exposi	ure.		Source-to-obj		•	BT	- Arc Burn: - Burn Thn			mal Concavity k of Fusion	
ouble Wali Expos	1, 2, 2A, 6, 7 sure 3, 3A, 4, 5, 8	,F,D, =	Distance from object to film	(d)	of .	EP	<ul> <li>Crack</li> <li>Excessive</li> <li>Porosity</li> </ul>	a Penetra	HB - Hollow Bead IC - Low	Cover	
Unit#: 334		Glometers:	N/A	Film Quant					Interpretation by:		
In: _ 2300	Out:	•		1	(3 ½ x	8 1/2)	D7		C.G.S.B.	2	
	Out:								(Print) C.G.S.B.#	(Level) 12007	
Personnel:		<del>-</del>					-	$\dashv$	(Signature)		
I. BRUCKSHAW J. SMITH	1								Client Representative: (Print)		
J. SMITH Michael V									l am in full agreement with		
									report contents (Sign) Diff Snowing		

5311 – 96 Siraet Edmonton, Alberta, TBE 5T8 Phono: (780) 437-2022 Fax: (780) 438-1430 Calgary (403) 279-8121 C Lloydminsler (780) 675-8455 F Barrhead (780) 675-8455 R Nisku (780) 955-7816

Cold Lake Fod McMurray Red Deer

(780) 826-8105 (780) 743-1536 (403) 347-1742

Deer Park, TX Matrix,Houston, TX Tuisa, OK

(281) 476-4444 (713) 722-7177 (918) 446-8773



# MAGNETIC PARTICLE INSPECTION REPORT

CG18 - MT3

Page 1 of 1

Dynamics MT DV	h / D O # 00560 000 C	IDIONOT P. OFFICE	
	b / P.O. #: 08562-002-C	IRISNDT #: 255874	Date: 28-Nov-12
	ient: ENCANA		
	cation: Alberta	Latinata	
Ite	m Inspected: Piping 1'160 soc	ket weid	
Surface Condition: Painted Sandblasted .	Machined 🗌 As Cast 🛛 A	s Forged 🔲 Weldment 🗵 Other 🗌	
Material: cs	Т	hickness: 1'160 Heat Treatr	ment: na
Magnetizing Equipment: Yoke ⊠ Coil ☐ Pro	od 🗌 Bench: Headsh	not 🔲 Central Conductor 🔲 Coil 🗌	
IRISNDT #: 40155	Mfg: contour pro	be Calibration Date: 1	24-Oct-12
Blacklight:   IRISNDT#:   Verification per ASME V Art	Mfg: 7 T.777.2	Calibration Date:	-Jan-11
Whitelight: Battery Powered Min. 3V 110V Power Min. 60W Bulb		d within 30 cm (12in) of the inspection sur rides minimum 1000 Lx (100fc)	face
Method of Magnetization: AC ⊠ DC ☐ Conti	nuous 🗵 Residual 🗌	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s	
Magnetic Particles: Dry ☐ Wet ⊠	Red ☐ Grey	☐ Black ☑ Fluorescent ☐	
Batch #: 1206	Mfg: ardrox	Type: 8031	
Background: ⊠ Batch #: 1243	Mfg: ardrox		
Scope: Black on white MPI was performed on a 1" 16	50 socket weld.		
Item inspected:			
·			
MT-1 1"160 socket weld Welder ID: "S"			·
RESULTS: A 1" long crack was found on the fitting,	ending on the HAZ area of th	e weld. Not accentable to code	
the first state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of	ending on the FIAL area of th	e weid. Not acceptable to code.	
			and the second
Inspection Limitation(s):			
Unit#: 334 Kilometers: Consume Min co	1 1	Interpretation by: Joseph Smith	6NT-TC-1A II
in: 0330 Out: 0400 Hrs: .5	iiaui)	(Print)	C.G.S.B. II (Level)
In: Out: Hrs:			C.G.S.B.# 13231
Personnel:		(Signature)	
Joseph Smith, Jeff bruckshaw, Michael V		Client Representative: (Print)	
		t em in full egreement with	
		report contents	net p
			mer
5311 – 86 Street Edmonton, Alberta, TGE 518 Phone: (780) 437-2022 Fax: (780) 438-143 Calgary (403) 270-6121	6 Cold Lake (780) 826-8105		
Lloydminster (780) 875-6455		Deer Park, TX	(281) 478-4444

Issuing Authority: Marvin J. (Ty)	-
DeBelser/Dale Karg	
Date of Issue: March 30 2012	
Rev Status: 2.0	_

Industries Inc. ™

ABSA	
FORM_NDE_001	
N.D.E Requirements	

			N.D	.E Requ	<u>irements</u>				
Client: <u>Encana</u> Project: <u>Prehe</u> :	ne – 3.0 mm Linel	neater		JO# <u>0856</u> Date: <u>30/</u>					
Piping: ⊠ Pre	ssur	e Vessel: □	Tank	: 🗆	Other:				
		X-Ray			X	100%		□ AS	ME Section VIII-UW-51
	×	Gamma Ray				Fuli		□ AS	ME Section VIII-UW-52
		Ultrasonics				25%			Customer Specification
		Liquid Penetrant			$\boxtimes$	10%		$\boxtimes$	ASME B31.3 NFS
	×	Magnetic Particle		<u>C</u>	<u> Other(I</u>	Define)			Other (Specify)
		Accoustic Emission				Spot		X	Customer Spec
□Haro	ness	test Max 200 BHN							CSA W47.1/W59
General Instruction P1 Material	5:			Vesse	I S/N				
Welder ID <u>S</u> Shell-T=									
Pipe-T= <u>1" Sch</u>	160								
Total Welds <u>1 x cu</u>	out	gap shot (GS-1C	0), 1 X MPI cu	ıt out (M	T-1CO) & 3	x MPI (1 ⁵¹	# is MT-2)		
Please use wire type iQi Please Note locations of all Please include O.F.D-S.O.D			ts						
Special Requiremen	ts:				Shots				
Buttweld Xray to be identified a Fhreaded Shots to be identified a Fhreaded Shots to be ident Identify on Envelope part o Flashes must contain: Custo Mark all indicated repairs o	s GS-# fied as f packa mer, J	s XT-# nge being shot ie. Coil, i O#, Spool Identification		ock tape, W	'elder's ID Symbo	ol, Date			

NOTE: Encana Spec for Welded Piping-acceptance is zero UC and Zero IP

Encana Spec for Socket Welds-acceptance is minimum 1/16" gap

Encana Spec for Threaded Piping- acceptance is 7 threads engaged

HT is a 5 Point Traverse

Prepared By: R.M. Spence

Date: 30/11/2012



# RADIOGRAPHIC INSPECTION REPORT

CG18 - RT318

Page 3 of 7

										_
1	Device #: D6			#: 8866	2B	1	/ P.O. #:		2000 00 1101 12	
Cobalt 60☐ IR 192 ☑ X-Ray ☐ EFSS: .154						Clie	nt: EN	CANA	A C/O NWP	
Film Brand: AGFA #Film/cassette: 1						Loc	ation:	In	nnisfall, Alberta	
Code: ASI	VIE B31.3 NF	S & Encana	Spec.			Item	Inspect	ed: i	Preheat Line-3mm Lineheater Material: CS	
	Size,		T	1		<u> </u>	1	ī		
Film#	Location Thicknes	, in	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type		ept ect
GS-1 CO	1"160	s	RT 5	18	1.3	1	1	D7	, A	
			1	· · · · · · · · · · · · · · · · · · ·		-				
	<u> </u>									
			1					<u> </u>		
				<u> </u>						
			<del> </del>							-
									1 - Gap Shot	
		,								
					-					
	···		<u> </u>							
										_
	-									
				i						
Number of I	Radiation Ba	rrier Warni	ng Signs I	Erected:	2		Numb	er of	Radiation Barrier Warning Signs Returned: 2	
	ion Legend:		nside Fab			Vard/I	.ay-dowr			
IRIS Procedure:		S.O.D. =	Source-to-ol	<del></del> :		AE	- Arc Buri	ns	EUC - External Undercut IC - Internal Concavity	
	T 1, 2, 2A, 6, 7	0.6.D. =	Distance from	-	` '		T - Burn Th C - Crack	rough	IUC - Internal Undercut LF - Lack of Fusion HB - Hollow Bead LC - Low Cover	
Double Wall Exp R	osure T 3, 3A, 4, 5, 8	O.1 .D	object to film		ie ui		- Excessi - Porosity		etration IP - Incomplete Penetration MA - Misalignment S - Stag	
11-141. 204		151		Film Quar				<u> </u>	Interpretation by:	=
Unit#: 334		Kilometers:	N/A	1	(3 ½ x	8 1/2)	D7		JEFF BRUCKSHAW (PED LEVEL 2)   SNT-TC-1A   2	.
In: <u>0000</u>	Out: 0	100 Hrs:	1.0						(Print) (Level)	.
ln;	Out:	Hrs:							C.G.S.B. # 12007	.
Personnel:								<b>-</b>	(Signature)	Ì
J. BRUCKSHA	w								Client Representative: (Print)	
J. SMITH Michael V									l am in full ——————————————————————————————————	
				· • · · · · · · ·			I		report contents (Sign)	
									(Sign) Synny	
5311 - 58 Street Edr	nonton, Alberta. TëE	518 Phone: (780)	437-2022 Fax: /	760) 438-143A						—
Calgary Lloydminster	(403) 279-61 (780) 875-64	21 55		, C	Cold Lake Fort McMurray	ı	(780) 82 (780) 74	3-1538	Deer Park, TX (281) 478-4444 Matrix,Houston, TX (713) 722-7177	
Barrhead Nisku	(780) 674-30 (780) 955-78	1B 16			Red Deer		(403) 34	17-1742	Matrix,Houslon, TX (713) 722-7177 Tulsa, OK (918) 448-8773	



# MAGNETIC PARTICLE INSPECTION REPORT

CG18 - MT5 Page 1 of 1

Job / P.O. #: 08562-002-C Procedures: MT 2V IRISNDT #: 255923 Date: 30-Nov-12 Code: CSA W47.1/W59 Client: ENCANA Location: Alberta Item Inspected: Piping 1'160 socket weld (Preheat line- 3.0mm Lineheater) Surface Condition: Painted Sandblasted | Machined □ As Cast 🗵 As Forged Weldment ⊠ Other 🗌 Material: cs Thickness: 1'160 Heat Treatment: na Magnetizing Equipment: Yoke X Coil 🗌 Prod Bench: Headshot [ Central Conductor Coil [ IRISNDT #: 40155 Mfg: contour probe Calibration Date: 24-Oct-12 Blacklight: IRISNDT#: Mfg: Calibration Date: -Jan-11 Verification per ASME V Art 7 T.777.2 Whitelight: Battery Powered Min. 3V 図 Held within 30 cm (12in) of the inspection surface provides minimum 1000 Lx (100fc) 110V Power Min. 60W Bulb П Method of Magnetization: AC 🔯 DC 🖂 Continuous 🖂 Residual [ Magnetic Particles: Dry 🗌 Wet 🗵 Red 🗔 Grey 🗌 Black 🗵 Fluorescent [ Batch #: 1206 Mfg: ardrox Type: 8031 Background: 🛛 Batch #: 1243 Mfg: ardrox Type: 8901w Scope: Black on white MPI was performed on four 1" 160 socket weld. Items inspected: MT-1CO 1"160 socket weld Welder ID: "S" MT-2 1"160 socket weld Welder ID: "S" MT-3 1"160 socket weld Welder ID: "S" MT-4 1"160 socket weld Welder ID: "S" RESULTS: acceptable to code. Inspection Limitation(s): Interpretation by: Consumables: Unit#: 334 Kitometers: SNT-TC-1A Joseph Smith Min consum C.G.S.B. Out: <u>0600</u> Hrs: <u>1</u> (Level) (Print) C.G.S.B. # 13231 ln: Out: Hrs: (Signature) Client Representative: Joseph Smith, Jeff bruckshaw, Michael V (Print) Lam in fell agreement with report contents (Sign) 5311 - 66 Street Edmonton, Alberta, TBE 5T8 Phone: (780) 437-2022 Fax: (780) 438-1436 Calgary Lloydminster Banhead Nisku (403) 279-8121 (780) 875-8455 (780) 874-3018 (780) 955-7618 Deer Park, TX Matrix, Houston, TX Tulsa, OK Cold Lake (780) 826-8105 (281) 476-4444 Fort McMurray Red Ocer (780) 743-1538 (403) 347-1742 (713) 722-7177 (918) 446-8773

NWP Industries	inc™
PO Box 6280	
4017-60 Ave.	
T4G 1S9	



Website: www.nwp.ca						
	Phone:	(403) 227-4100				
	Fax:	(403) 227-4102				

# **HYDROSTATIC TEST AFFIDAVIT**

Lustomer:	<u>Encana</u>	Cor	poration	

JO# <u>08562-002-C</u>

Project: Preheat Lines for 3.0 mm Lineheater

Project#

Test Pressure: 2160 PSI

Hold Time: 60 minutes

Code Requirements: ASME B31.3 NFS 2010 Edition	
All Personnel Advised of Test	
Prior to Filling – Fitting/Hoses & Component Meet Required Test Pressure Sign-Off Supervisor: Tester:	
Sign-Off Supervisor: Tester:	Date: <u>07/01/2013</u>
Product Description:	

FG-1"-C-160A/BE-301 = 2160 PSI	
	3
	- <u> </u>

50% Test Pressure Leak/Systems Check Completed

50% = 1080 PSI	
and Y	

Equipment Drained & Flushed to Prevent Freezing: Yes: \( \Bar\) No: \( \Bar\)

Start Time: 12:00 pm	Finish Time: 2.55 A11
,	

Test Gauge Identification #	Pressure Range	Calibration Date
NWPG- 5000 # 10	0-5000 PSI	
NWPG- 5000 # 24	0-5000 PSI	
NWPG-	. PSI	-
NWPG-	PSI	
NWPG- 14	PSI	
N. C. C. C. C. C. C. C. C. C. C. C. C. C.		

	//		
Test By:	Dock	Date: Jun 7/13	
Approved By:	1,140	Date: 10 0 11-13	
	10,00	JULIGIE	
•	<i>[</i>	· · · · · · · · · · · · · · · · · · ·	•

NWP Industries Inc™
PO Box 6280
4017-60 Ave.
T4G 159

NOTE: Industries Inc. ™

Website: www.nwp.ca
Phone: (403) 227-4100

Fax: (403) 227-4102

# **PNEUMATIC TEST AFFIDAVIT**

Customer: Encana Corporation

Project: Fire Tube

Test Pressure: 24 oz

Code Requirements: CSA W47.1 and W59

**Product Description:** 

Tank Serial # 08562-002

JO# <u>08562-002-C</u>

Project#

Hold Time: AS REQUIRED

Date: <u>07/01/2013</u>

DWG# <u>LH-FIRSTK-24-2</u> REV# <u>1</u>

Test-

#1.All Welded Connections

110	LEAT	16
100	CEM	62

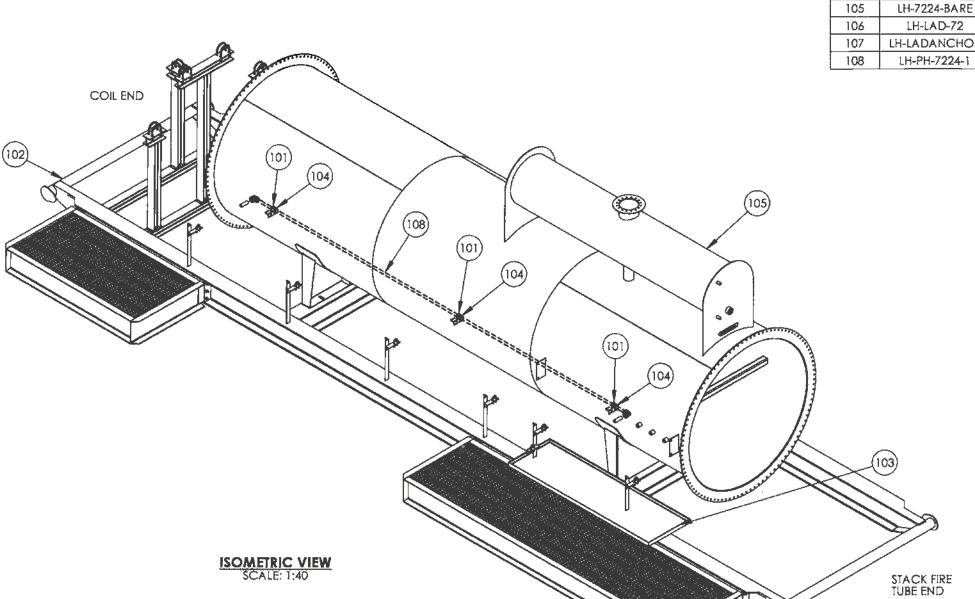
## **Repairs**

Ground to sound metal by:	Repair preparation. QC witness by:
Reweld using E7018. QC:	Repaired by:
Procedure approved by QC:	Completed repair checked by QC:
Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Contro	

	Additional Comments
1	
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1	
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PSV Used:	Range:	Calibration Due:
39 168-10	0 – 28 oz.	March 13 2013

`	Test#	Test By:	Q,Q.	Date	Test Gaug	e ID.	Range	Calibration Due:		
	1	(IV)	64	LAN 07.13	NWPG-	117 119	0-5 PSI	U/W. 1113 \$	Jun	£.19.2013.
į	Test(s) Appro	ved By:			Date	: Januá	RU-07-13	,	0	



	ITEM	PART#	DESCRIPTION	MTR #	LENGTH	QTY.
	101	034878	U-8OLT, 1" c/w 4 NUTS			3
	102	-	SEE DRAWING 08352-3			1
	103	-	SEE ENCLOSURE SUPPORT DETAIL			1
	104	ANGC22A	ANGLE IRON 2"x2"x1/4" \$A-36/44W		6"	3
İ	105	LH-7224-BARE	LH BATH 72" OD x 24' LG BARE			1
İ	106	LH-LAD-72	LINEHEATER LADDER FOR 72" OD BATH			1
İ	107	LH-LADANCHOR	LINEHEATER LADDER ANCHOR			2
	108	LH-PH-7224-1	PRE-HEAT WELDED PIPE			1

NOTES

1. FABRICATION TO W47.1 AND W59.
2. RADIUS ALL SHARP EDGES.
3. ALL WELDS TO BE 1/4" CONTINUOUS FILLET WELDS UNLESS OTHERWISE NOTED.

4. WELD PROCESS TO BE MCAW UNLESS OTHERWISE NOTED.
WPDS FC1-15, FC1-10

5. ALL BOLT HOLES STRADDLE COMMON CENTER LINE.
6. APPROX. WEIGHT: 13370 LBS

-							AS BUILT	ISSUED FOR CONSTRUCTION
08562-3	LINEHEATER SKID ASSEMBLY	_						SIGNED:
LH-FIRSTK-24-2	LINEHEATER FIRETUBE/STACK ASSEMBLY					A:1		DATE:
LH-LAD-72	LINEHEATER SKID LADDER ASSEMBLY	0	OCT 31/12	VW	9	WX.	ISSUED FOR CONSTRUCTION	
LH-PH-7224-1	LINEHEATER PREHEAT PIPING	А	OCT 23/12	VW	<u> </u>	<u> </u>	ISSUED FOR APPROVAL	w.o.:
DOCUMENT NO.	DESCRIPTION	REV	DATE	ΒY	СНК	APP		S/N:
REFERENCE DRAWINGS						•	DRAWING REVISIONS	ALL DIMENSIONS IN INCHES

# INDUSTRIES INC.

Total oilfield supply.

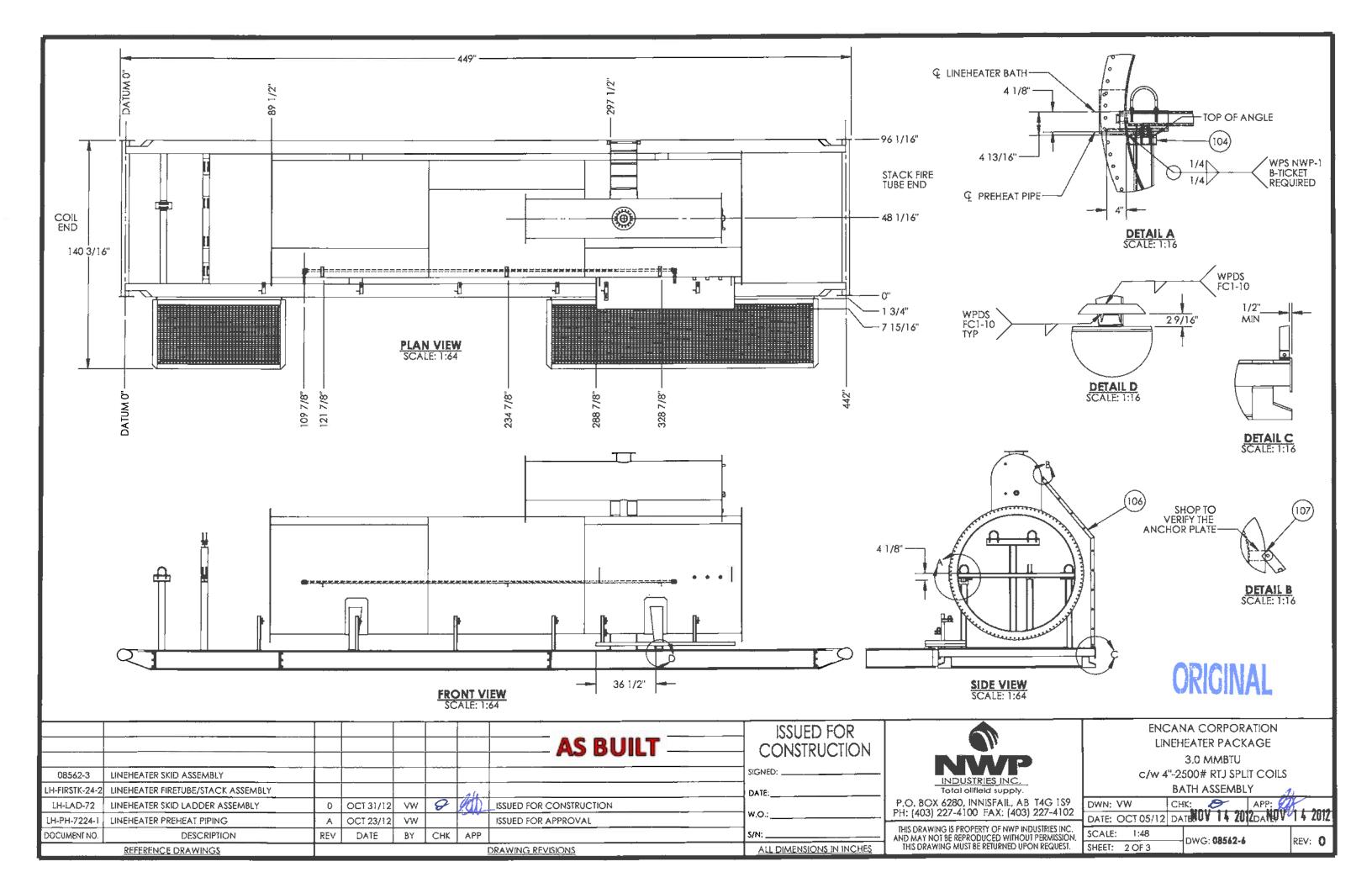
P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102

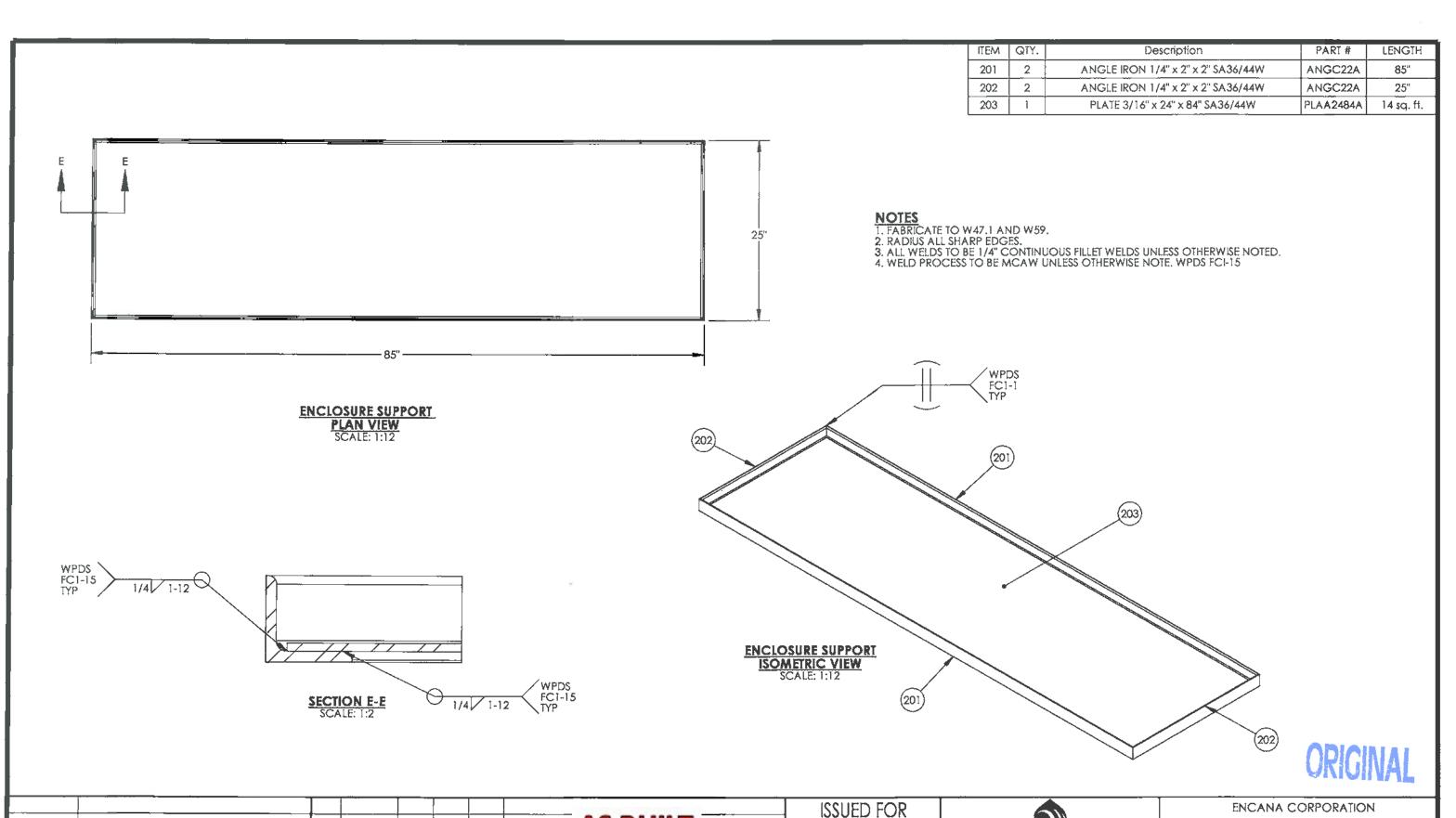
THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.

**ENCANA CORPORATION** LINEHEATER PACKAGE 3.0 MMBTU

c/w 4"-2500# RTJ SPLIT COILS BATH ASSEMBLY

- 1		DA	ATLI MODEIMIRE	1 1	10	
	DWN: VW	Сн		APP:	4.	2012
-	DATE: OCT 05/12	DΑ	WOV 14 2012	DATEUV	1 4	ZUIZ
1.	SCALE: 1:40		DWG: 08562-6		nr.	
i	SHEET: 1 OF 3		DWG: 00302-0		REV:	U





							AS BUILT	ISSUED FOR CONSTRUCTION
08562-3	LINEHEATER SKID ASSEMBLY				ļ			SIGNED:
LH-FIRSTK-24-2	LINEHEATER FIRETUBE/STACK ASSEMBLY					40		DATE:
LH-LAD-72	LINEHEATER SKID LADDER ASSEMBLY	0	OCT 31/12	VW	B	4	ISSUED FOR CONSTRUCTION	
LH-PH-7224-1	LINEHEATER PREHEAT PIPING	Α	OCT 23/12	VW		7-1	ISSUED FOR APPROVAL	W.O.:
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	СНК	APP	<u> </u>	S/N:
	REFERENCE DRAWINGS				•		DRAWING REVISIONS	ALL DIMENSIONS IN INCHES

# NWP INDUSTRIES INC.

INDUSTRIES INC.
Total oilfield supply.

P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102

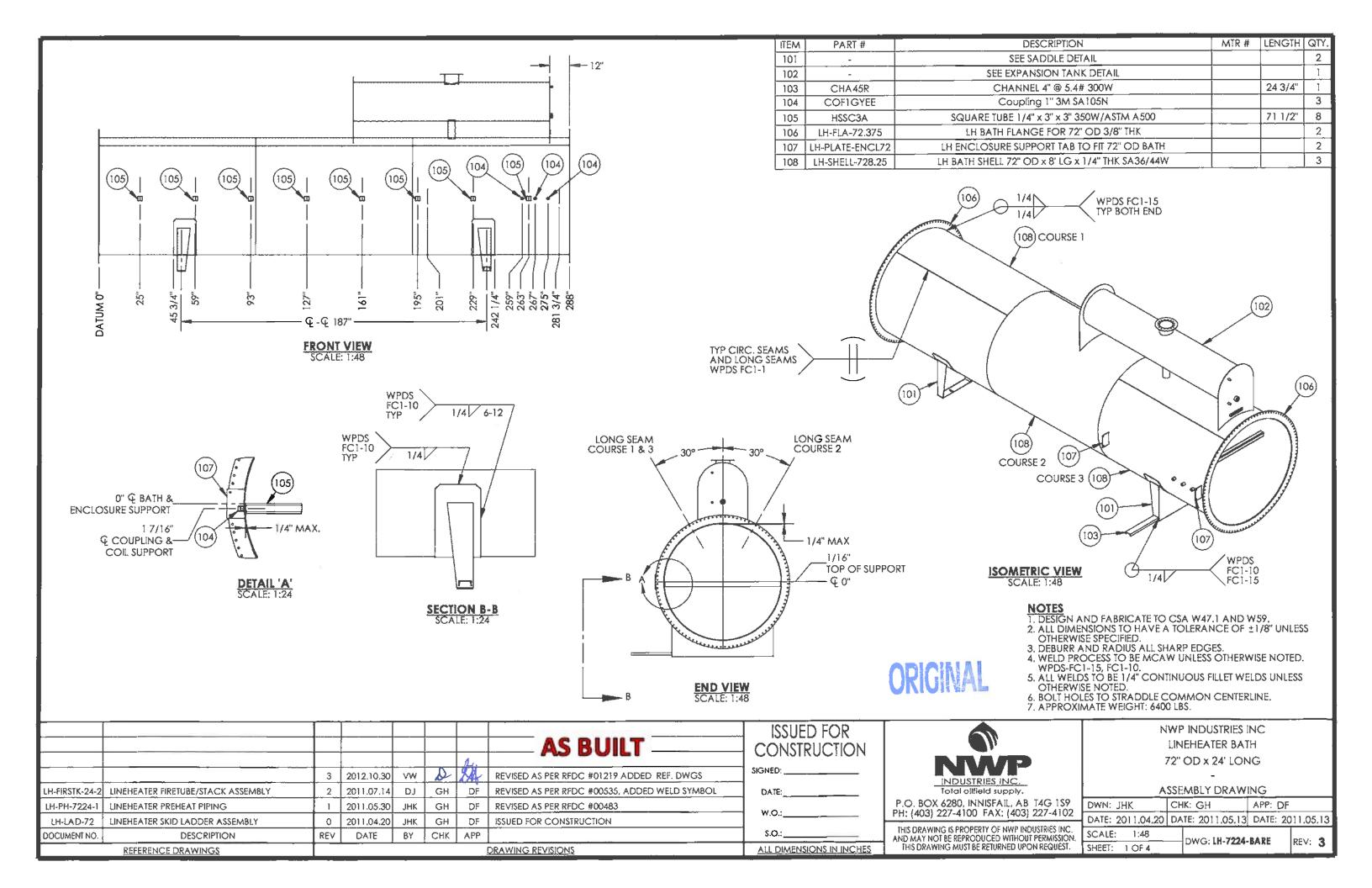
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THIS DRAWING MUST BE RETURNED UPON REQUEST.

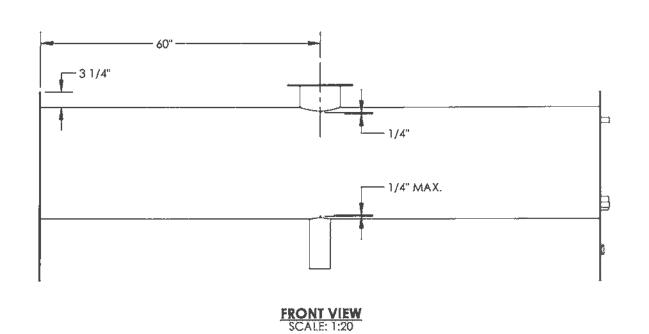
SHEET: 3 OF 3

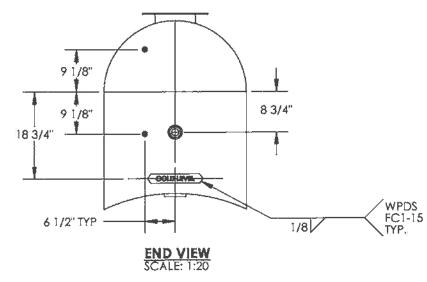
ENCANA CORPORATION
LINEHEATER PACKAGE

3.0 MMBTU
C/W 4"-2500# RTJ SPLIT COILS
RATH ASSEMBLY

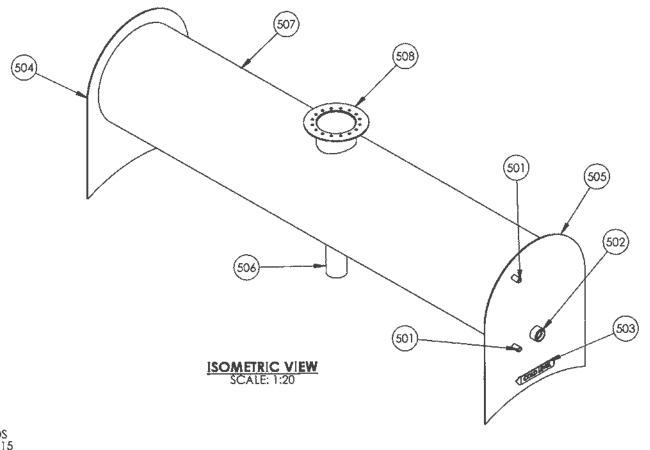
	BAILLA	199EWRT	ĭ .	1/11	_
	CHK:	0	APP:	W.	
DATE: OCT 05/12	DATIUV	14 2012	DA	147	ZVIZ.
SCALE: 1:12	DWG	· 08562-6	·	REV.	0







DESCRIPTION MTR # LENGTH QTY. ITEM PART# Coupling 1/2" 3M THRD SA105N 2 501 COF.5GYEE Coupling Half 2" 3M THRD \$A 105N 502 COH2GYEE LH COLD LEVEL INDICATOR 503 COLDLEVEL-1 EXP. TANK END PLATE TO FIT 24" OD TANK x 72" OD BATH 504 EXP-END2472 EXP-END2472-EXP. TANK LG END PLATE TO FIT 24" OD TANK x 72" OD BATH 505 LGD 506 PIPE 4" SCH STD/40 SA 106B 11.1/2" PIP440A 120" 507 PIPE 24" SCH 10 SA53 ERW PIP2410E THIEF HATCH BASE ASSEMBLY 8 5/8" OD 508 THIEFBASE-1



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2	ΔI	i in

- 1. DESIGN AND FABRICATE TO CSA W47.1 AND W59.
  2. ALL DIMENSIONS TO HAVE A TOLERANCE OF ±1/8" UNLESS OTHERWISE SPECIFIED.
  3. DEBURR AND RADIUS ALL SHARP EDGES.

- 4. WELD PROCESS TO BE MCAW UNLESS OTHERWISE NOTED. WPDS-FC1-15, FC1-10.
- 5. ALL WELDS TO BE 1/4" CONTINUOUS FILLET WELDS UNLESS OTHERWISE NOTED.
- 6. BOLT HOLES TO STRADDLE COMMON CENTERLINE.

3		+				da	AS BUILT
		3	2012.10.30	vw	19	H	REVISED AS PER RFDC #01219 ADDED REF. DWGS
LH-FIRSTK-24-2	LINEHEATER FIRETUBE/STACK ASSEMBLY	2	2011.07.14	DJ	GH	DF	REVISED AS PER RFDC #00535, ADDED WELD SYMBOL
LH-PH-7224-1	LINEHEATER PREHEAT PIPING	1	2011.05.30	JHK	GH	DF	REVISED AS PER RFDC #00483
LH-LAD-72	LINEHEATER SKID LADDER ASSEMBLY	0	2011.04.20	JHK	GH	DF	ISSUED FOR CONSTRUCTION
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP	
	REFERENCE DRAWINGS						DRAWING REVISIONS

### ISSUED FOR CONSTRUCTION

SIGNED:

\$.Q.:_ ALL DIMENSIONS IN INCHES

NWP	
INDUSTRIES INC.	
20 A A 1001 LA	

Total oilfield supply. P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102

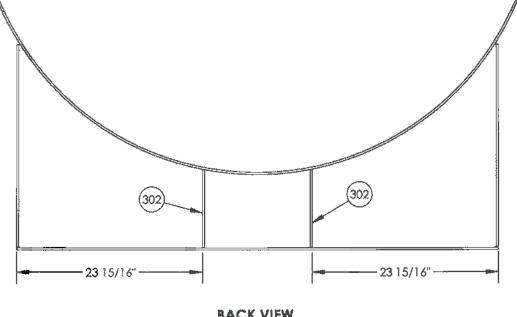
THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION THIS DRAWING MUST BE RETURNED UPON REQUEST.

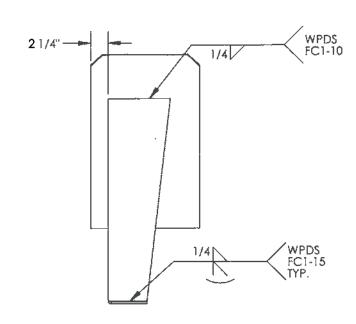
NWP INDUSTRIES INC LINEHEATER BATH 72" OD x 24" LONG

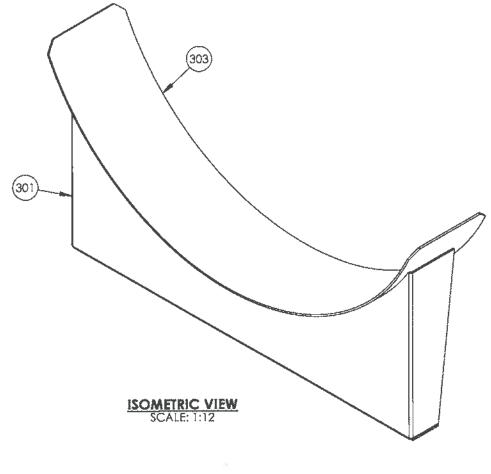
ASSEMBLY DRAWING

DWN: JHK	CHK: GH	APP: DF			
DATE: 2011.04.20	DATE: 2011.05.13	DATE: 2011.05.13			
SCALE: 1:20	DWG: LH-7224	BARE REV: 3			
SHEET: 2 OF 4	- JUNG. LITTALE	MAN KEV. 3			

ITEM	PART#	DESCRIPTION	MIR#	LENGTH	QIY.
301	LH\$AD72-PLATE	LH SADDLE PLATE FOR 72" OD			1 .
 302	LHSAD72-SUPPORT	LH SADDLE SUPPORT FOR 72" OD			2
303	LHSAD72-WEAR	LH SADDLE WEAR PLATE FOR 72" OD			1
					- 1







- NOTES

  1. DESIGN AND FABRICATE TO CSA W47.1 AND W59.
  2. ALL DIMENSIONS TO HAVE A TOLERANCE OF ±1/8" UNLESS OTHERWISE SPECIFIED.
  3. DEBURR AND RADIUS ALL SHARP EDGES.
  4. WELD PROCESS TO BE MCAW UNLESS OTHERWISE NOTED. WPDS-FC1-15, FC1-10.
  5. ALL WELDS TO BE 1/4" CONTINUOUS FILLET WELDS UNLESS OTHERWISE NOTED.

# END VIEW SCALE: 1:12

							AS BUILT
		3	2012,10.30	VW	8	3	REVISED AS PER RFDC #01219 ADDED REF. DWGS
LH-FIRSTK-24-2	LINEHEATER FIRETUBE/STACK ASSEMBLY	2	2011.07.14	DJ	GH	DF	REVISED AS PER RFDC #00535, ADDED WELD SYMBOL
LH-PH-7224-1	LINEHEATER PREHEAT PIPING	1	2011.05.30	JHK	GH	DF	REVISED AS PER RFDC #00483
LH-LAD-72	LINEHEATER SKID LADDER ASSEMBLY	0	2011.04.20	JHK	GH	DF	ISSUED FOR CONSTRUCTION
DOCUMENT NO.	DESCRIPTION	REV	DATE	8Y	CHK	APP	
	REFERENCE DRAWINGS						DRAWING REVISIONS

## ISSUED FOR CONSTRUCTION

SIGNED:

\$.O.:_ ALL DIMENSIONS IN INCHES

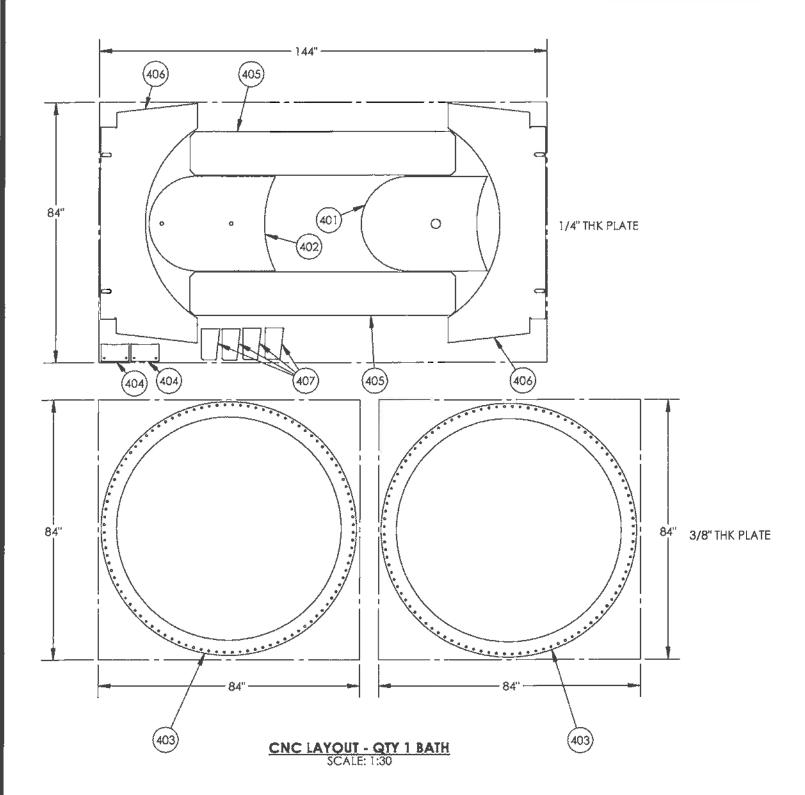
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INDUSTRIES INC. Total oilfield supply. P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102 NWP INDUSTRIES INC LINEHEATER BATH 72" OD x 24' LONG

<b>ASSEMBLY</b>	DRAWING

OWN: JHK	CHK: GH	APP: DF
DATE: 2011.04.20	DATE: 2011.05.13	DATE: 2011.05.13
CALE: 1:12	2000 111 7004	2425 ani 6

DWG: LH-7224-BARE SHEET: 3 OF 4



ITEM	PART#	DESCRIPTION	MTR #	LENGTH	QTY.
401	EXP-END2472-D	EXP. TANK LC END PLATE TO FIT 24" OD TANK x 72" OD BATH			1_
402	EXP-END2472-LG	EXP. TANK LG END PLATE TO FIT 24" OD TANK x 72" OD BATH			1
403	LH-FLA-72.375	LH BATH FLANGE FOR 72" OD 3/8" THK			2
404	LH-PLATE-ENCL72	LH ENCLOSURE SUPPORT TAB TO FIT 72" OD BATH			2
405	LHSAD72-WEAR	LH SADDLE WEAR PLATE FOR 72" OD		-	2
406	LHSAD72-PLATE	LH SADDLE PLATE FOR 72" OD		-	2
407	LHSAD72-SUPPORT	LH SADDLE SUPPORT FOR 72" OD			4

NOTES

1. HEAT NUMBER TO BE CLEARLY MARKED ON EACH PIECE WITH PAINT PEN AS A MINIMUM.

- 2. ALL DOCUMENTATION MUST ACCOMPANY SHIPMENT OF PARTS IF PART IS OUTSOURCED.
- 3. ALL DIMENSIONS TO HAVE A TOLERANCE OF ±1/8" UNLESS OTHERWISE
- 4. DEBURR AND RADIUS ALL SHARP EDGES.

							AS BUILT
		3	2012.10.30	VW	Ø	DA	REVISED AS PER RFDC #01219 ADDED REF. DWGS
LH-FIRSTK-24-2	LINEHEATER FIRETUBE/STACK ASSEMBLY	2	2011.07.14	DJ	GH	ĎF	REVISED AS PER RFDC #00535, ADDED WELD SYMBOL
LH-PH-7224-1	LINEHEATER PREHEAT PIPING	1	2011.05.30	JHK	GH	DF	REVISED AS PER RFDC #00483
LH-LAD-72	LINEHEATER SKID LADDER ASSEMBLY	0	2011.04.20	JHK	GH	DF	ISSUED FOR CONSTRUCTION
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP	
	REFERENCE DRAWINGS						DRAWING REVISIONS

# ISSUED FOR CONSTRUCTION

SIGNED: W.O.: S.O.:_

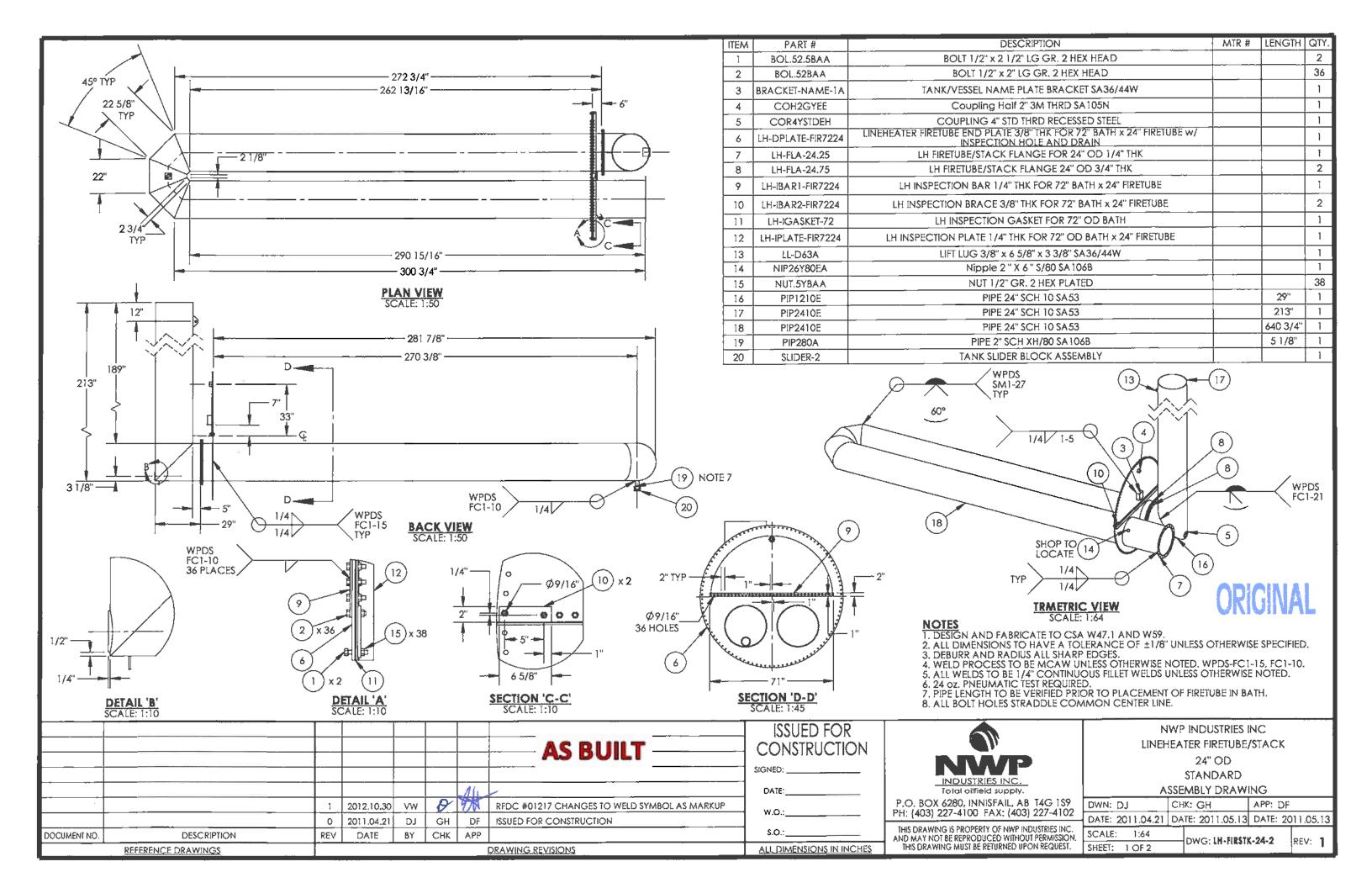
ALL DIMENSIONS IN INCHES

INDUSTRIES INC. Total oilfield supply. P.O. BOX 6280, INNISFAIL, AB T4G 1\$9 PH: (403) 227-4100 FAX: (403) 227-4102

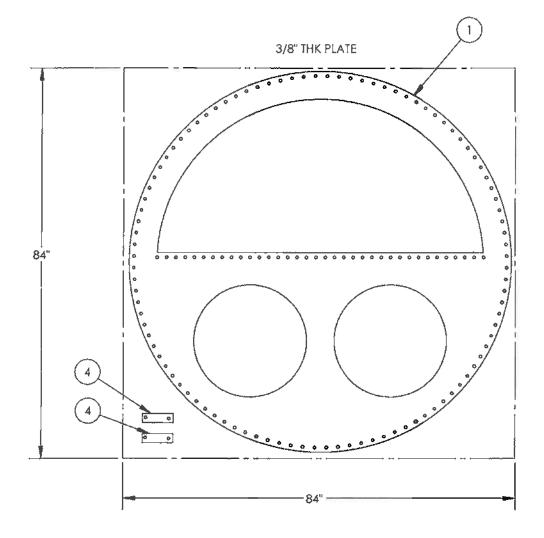
LINEHEATER BATH 72" OD x 24' LONG ASSEMBLY DRAWING CHK: GH APP: DF DWN: JHK

NWP INDUSTRIES INC

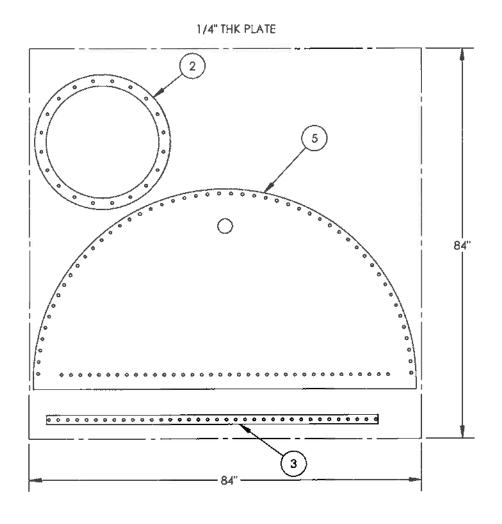
DATE: 2011.04.20 DATE: 2011.05.13 DATE: 2011.05.13 THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST. SCALE: 1:30 DWG: 1H-7224-BARE REV: 3 SHEET: 4 OF 4



LENGTH QTY.	PART # DESCRIPTION MTR #	PART#	MEM PAR				
1	I-DPLATE-FIR7224 LINEHEATER FIRETUBE END PLATE 3/8" THK FOR 72" BATH x 24" FIRETUBE W/ INSPECTION HOLE AND DRAIN	LH-DPLATE-FIR7224	1				
1	LH-FLA-24.25 LH FIRETUBE/STACK FLANGE FOR 24" OD 1/4" THK	LH-FLA-24.25	2				
1	H-IBAR1-FIR7224 LH INSPECTION BAR 1/4" THK FOR 72" BATH x 24" FIRETUBE	LH-IBAR1-FIR7224	3				
2	H-IBAR2-FIR7224 LH INSPECTION BRACE 3/8" THK FOR 72" BATH x 24" FIRETUBE	LH-IBAR2-FIR7224	4				
1	H-IPLATE-FIR7224 LH INSPECTION PLATE FOR 72" BATH x 24" FIRETUBE	LH-IPLATE-FIR7224	5				
	H-IBAR2-FIR7224 LH INSPECTION BRACE 3/8" THK FOR 72" BATH x 24" FIRETUBE	LH-IBAR2-FIR7224	3 4 5				







CNC LAYOUT - QTY OF PARTS SCALE: 1:20

- NOTES

  T. HEAT NUMBER TO BE CLEARLY MARKED ON EACH PIECE WITH PAINT PEN AS A MINIMUM.
- 2. ALL DOCUMENTATION MUST ACCOMPANY SHIPMENT OF PARTS IF PART
- IS OUTSOURCED.

  3. ALL DIMENSIONS TO HAVE A TOLERANCE OF  $\pm 1/8$ " UNLESS OTHERWISE SPECIFIED.
  4. DEBURR AND RADIUS ALL SHARP EDGES.

	· · · · · · · · · · · · · · · · · · ·						AS BUILT	ISSUED FOR CONSTRUCTION
					_	.fl~i		DATE:
		1	2012.10.30	VW	0	W	RFDC #01217 CHANGES TO WELD SYMBOL AS MARKUP	
		0	2011.04.21	DJ	GH	DF	ISSUED FOR CONSTRUCTION	
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	СНК	APP		\$.O.:
REFERENCE DRAWINGS			-				DRAWING REVISIONS	ALL DIMENSIONS IN INCHES

### OR MOIT INDUSTRIES INC. Total oilfield supply.

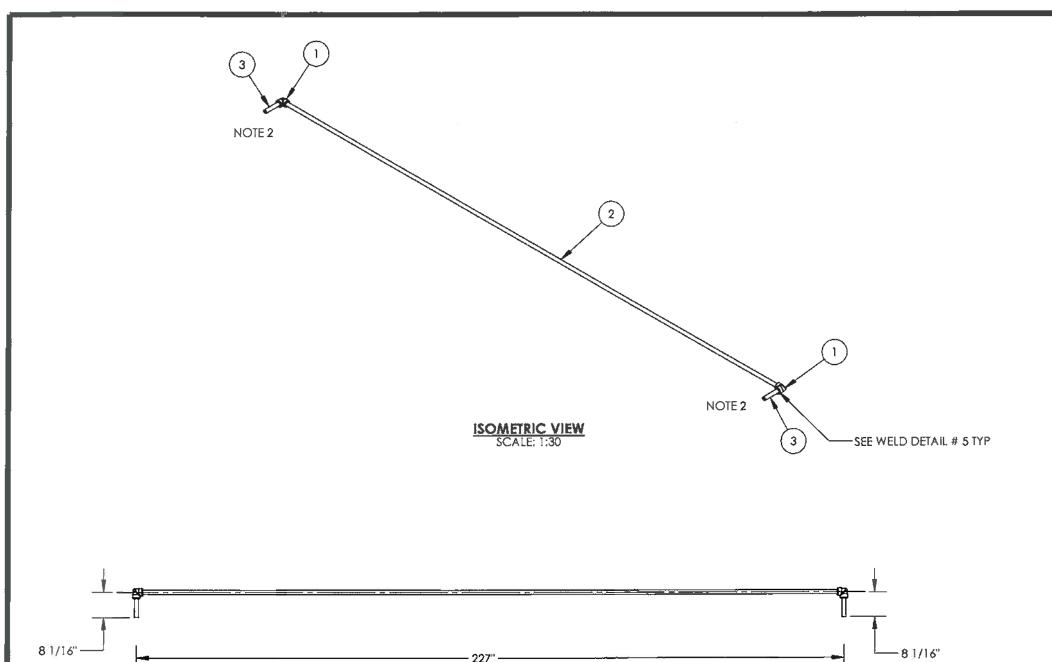
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SHEET: 2 OF 2

NWP INDUSTRIES INC LINEHEATER FIRETUBE/STACK 24" OD STANDARD ASSEMBLY DRAWING

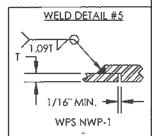
1	^	SSEIVIDET DIXXIII	1140
	DWN: DJ	CHK: GH	APP: DF
4	DATE: 2011.04.21	DATE: 2011.05.13	DATE: 2011.05.13
	SCALE: 1:20	DWG: LH-FIRST	K-24-2 REV: 1
-	CLIECT. A OC A	TOTO, MISTINGIA	7-24-2 KCA. I



	ITEM	PART #	DESCRIPTION	MTR#	LENGTH	QTY.
Ì	1	EL91HYFE	Elbow 90 Deg 1" 6M SW \$A105N			2
	2	PIP1160A	PIPE 1" SCH 160 SA 106B		225 1/4"	1
	3	PIP1160B	PIPE 1" SCH 160 \$A333-6		7"	2

NOTES

1. ALL DIMENSIONS SHALL HAVE A TOLERANCE OF ±1/8" UNLESS OTHERWISE SPECIFIED.
2. SHOP TO THEAD END OF PIPE PRIOR TO WELDING.
3. CUT LENGTHS FOR PIPE ARE FOR REFERENCE ONLY.
4. REVIEW CLIENT SPECIFICATIONS PRIOR TO ISSUE FOR CONSTRUCTION



	DESIGN D	ATA	
3	LINE NUMBER:	FG-1"-	C-160A/BE-301
3	CLIENT SPECIFICATION:	SEE NO	DTE 4
بت	DESIGN & FABRICATE TO:	ANSI/A	SME B31.3 NFS 2010 EDITION
	DESIGN PRESSURE:	1440 F	SIG
	MAXIMUM DESIGN TEMPERATURE:	200°F	**
	MINIMUM DESIGN TEMPERATURE:	-20°F	
	SERVICE:	HYDRO	DCARBONS
	HYDROSTATIC TEST PRESSURE:	2160 F	'SIG
	RADIOGRAPHY:	10% C	F SW FOR GAP
	OTHER NDE:	10% M	IPI ON SW
	POST WELD HEAT TREATMENT:	NONE	
	CORROSION ALLOWANCE:	1/16"	
	Q.C. PROGRAM NO.:	AQP-12	253
	WELDING PROCEDURE REGISTRATION NO.:	WP-160	4.2

						#	AS BUILT		
		3	2012.10.22	VW	0	224	RFDC #01215 REVISED DESIGN DATA AS PER REQUEST		
		2	2012.03.01	JHK	GH	DF	RFDC #00821 REVISED ELBOWS		
		1	2011.06.06	DJ	GH	DF	REVISED AS PER RFDC #00492		
		0	2011.05.06	ום	GH	DF	ISSUED FOR CONSTRUCTION		
DOCUMENT NO.	DESCRIPTION	REV	DATE	8Y	CHK	APP	-		
REFERENCE DRAWINGS			DRAWING REVISIONS						

PLAN VIEW SCALE: 1:30

## ISSUED FOR CONSTRUCTION

ALL DIMENSIONS IN INCHES



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**ENCANA CORPORATION** LINEHEATER PACKAGE

3.0 MMBTU

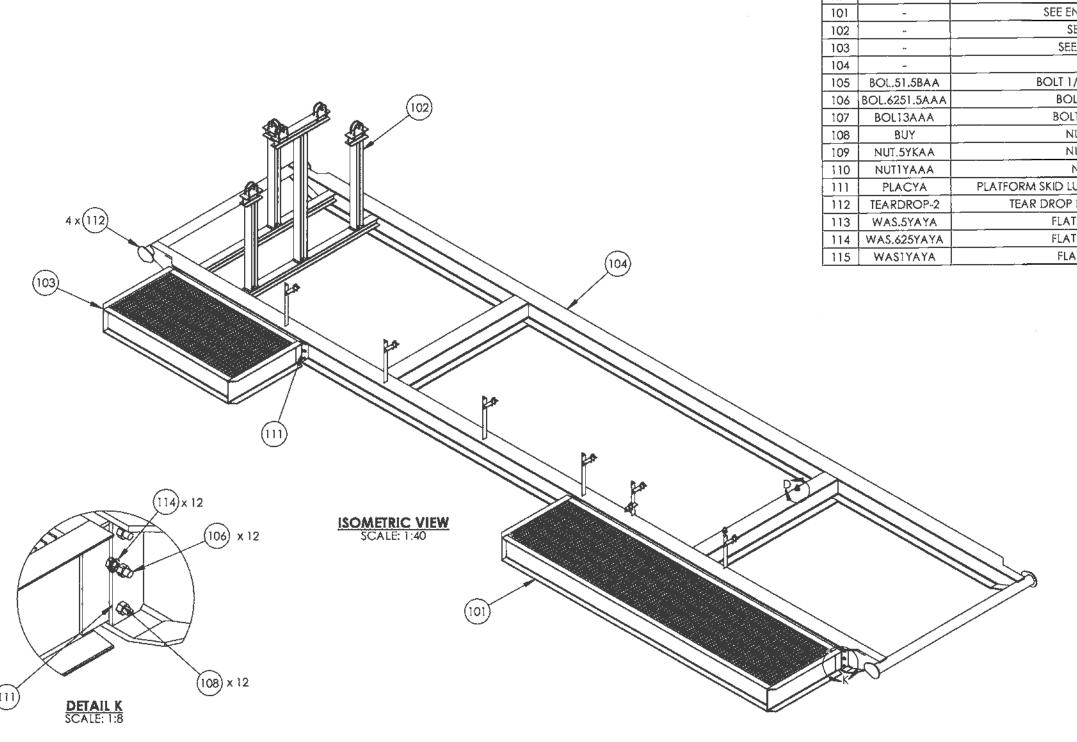
c/w 4"-2500# RTJ SPLIT COILS PREHEAT PIPING

CHK: 29_ DWN: DJ DATE: 2011.05.06 DATE: 2011.05.27 DATE: 2011.05.30

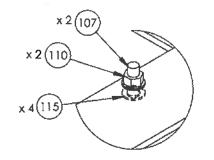
\$CALE: 1:30 DWG: LH-PH-7224-1 SHEET: 1 OF 1

Issuing Authority: Marvin J. (Ty) DeBelser		DeBelser		Quality Con	Quality Control			
Date of Iss	ue:March 13, 2008		INDUSTRIES INC.	QCFOFinal	QCFOFinalInspectionReleaseCertificateR00			
		FINAL INSPE	CTION RELEASE CE	RTIFICATE				
CUSTOMER:	ENCANA			olementarian di territoria di territoria di territoria di territoria di territoria di territoria di territoria				
PRODUCT:	Skid for 3.0 mm Line	heater Pkg			wo#: 08562-002-B			
		FINAL	INSPECTION DOCUMENTA	TION	DATE: JAN 16/2013			
REVIEWED BY	Yı.	ACCE	PTED:	REJECTED:				
医艾克氏性 化氯苯甲烷 化聚甲酚甲基甲酚 经工作证据	DOCUMENTATION REQUIRES  DOCUMENT REQUIREMENT	阿德克特克萨特 机压缩 电自动自动 化二氯甲基甲酚 医多种心质性 电电流电流 医二氯甲酚二甲甲基甲酚二苯甲酚二	REQUIREMENT LIST)	PACKAGE				
REQUIRED B'	Y CUSTOMER ETC. )							
Q.C. FILE CLC	DSURE BY: KA	2/162) 10	<u> </u>		on 172013			
TEMS REQUI			MPONENTS REQUIRED / PF	REPARED	egineres in independent for the least of the con-			
	HARDWARE OR FASTENER  DN NEEDED / COMPLETED  2010	PREPAR	YES NO  ATION FOR SHIPMENT / ST	ORAGE				
LOT#	08562-002-B							
ITEM#	Skid			arente di basa di kuta Milayan kanal di basa				
INVENTORY	TAGS ATTACHED YE							
			SHIPPING INSTRUCTIONS					
CUSTOMERI	P.O REVIEWED	YES N/A	V					
	ERSON AUTHORIZED TO RE							
PHONE:		FAX:						
	O INVENTORY:	DI		DATE:				
RELEASED T	TO CUSTOMER: 42	flomos		DATE: \ /	16/13			

			Tagrika Anti-	APPROVED	si sa <u>.</u>	·	
ÖVID TDA	VEL SHEET	g farmafin A same a		BY:	61	1	
SKID IKA	VEL SHEET	tak Tak		DATE:	NOV 19 2012		
11 1 24 A A A A A A A A A A A A A A A A A A	rammana (Ammana melalah 1964) atau sampan _{melalah dipers} an persaman amamban ana 1 ₉₇₂						pr .
WO #:	08562-002-B	DESCRIP	TION:	Skid for 3.0	mm Linehea	ter Pkg	
DRAWING #:	08562-3 REV 0	-		<b>A</b>	·		, mar 8 s 1 , 7
		REQ.	HOLD	EMPLOYEE INT.	DATE COMPLETE	QC INIT.	DATE
WORK INSTR	RUCTIONS/DRAWINGS ISSUED	٧	·			engh	14112
WORK INSTRU	CTIONS/DRAWINGS REVIEWED	٧	<b>V</b> 20		A SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SANCE OF THE SAN	ent?	14/12
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WELDING	G PERSONNEL ASSIGNED	٧	/			(Q)-	Janl
VISUA	AL CHECKS ON WELDS		V	₩		R	DecVI
NE	DE REQUIREMENTS	N/A					
DIMEN	SIONAL CHECK (FINAL)	V	V	1		Ll	Deci
SURFACE PREP./S	SANDBLAST ETC. & P.O. RECEIVED	N/A			The second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of th		
	PRIMER PAINT	N/A					
FINAL	PAINT & P.O. RECEIVED	N/A		Section Section 1		16 X	d
QC INSPE	ECTION & FINAL RELEASE	20-20-00-00-00 20-00-00-00-00-00-00-00-00-00-00-00-00-0	<b>1</b>		erige To arrang the feature That the second second	(D).	Janl
		The Spine					
প্ৰ-	ACCEPTED BY CUSTOMER	,		DATE		98. <u> </u>	



IT	EM	PART#	DESCRIPTION	MTR#	LENGTH	QTY.
1	01	-	SEE ENCLOSURE PLATFORM DETAIL			1
ī	02		SEE PIPE SUPPORT OUT LIST			ì
1	03		SEE PIPING PLATFORM DETAIL			1_
Ti	04	-	SEE SKID BASE CUT LIST			1
Ti	05	BOL.51.5BAA	BOLT 1/2" x 1 1/2" LG GR. 2 HEX HEAD			8_
1	06	BOL.6251.5AAA	BOLT 5/8" x 2" GR. 8 HEX HEAD			12
1	07	BOL13AAA	BOLT 1" x 3" LG GR. 8 HEX HEAD			2
1	08	BUY	NUT 5/8" GR. 8 HEX PLATED	Ţ <u></u>		12
Ī	09	NUT.5YKAA	NUT 1/2" GR. 5 HEX PLATED			8
1	10	NUTIYAAA	NUT 3" GR. 8 HEX PLATED			2
1	11	PLACYA	PLATFORM SKID LUG PLATE 3/8" x 10 7/8" x 3 3/4" \$A36/44W			4
1	12	TEARDROP-2	TEAR DROP FOR ROLL ENDS 3/8" THK SA36/44W	T		4
ī	13	WAS.5YAYA	FLAT WASHER 1/2" GR. 8 PLATED	T		16
1	14	WAS.625YAYA	FLAT WASHER 5/8" GR. 8 PLATED			12
1	15	WASIYAYA	FLAT WASHER I" GR. 8 PLATED			4



DETAIL Y SCALE: 1:8

NOTES

1. FABRICATE TO CSA W47.1 AND W59.
2. ALL DIMENSIONS TO HAVE A TOLERANCE OF ±1/8" UNLESS OTHERWISE SPECIFIED.
3. DEBURR AND RADIUS ALL SHARP EDGES.
4. WELD PROCESS TO BE MCAW UNLESS OTHERWISE NOTED. WPDS-FC1-15, FC1-10.
5. ALL WELDS TO BE 1/4" CONTINUOUS FILLET WELDS UNLESS OTHERWISE NOTED.

APPROX. WEIGHT: 7500 LBS

							AS BUILT
LH-FIRSTK-24-2	LINEHEATER FIRETUBE/STACK ASSEMBLY						
LH-LAD-72	LINEHEATER SKID LADDER ASSEMBLY						
LH-PH-7224-1	LINEHEATER PREHEAT PIPING	0	OCT 31/12	VW	9	194	ISSUED FOR CONSTRUCTION
08562-6	LINEHEATER PACKAGE BATH ASSEMBLY	A	OCT 01/12	VW			ISSUED FOR APPROVAL
DOCUMENT NO.	DESCRIPTION	REV	DATE	8Y	CHK	APP	
	REFERENCE DRAWINGS						DRAWING REVISIONS

## ISSUED FOR CONSTRUCTION

ALL DIMENSIONS IN INCHES



P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102

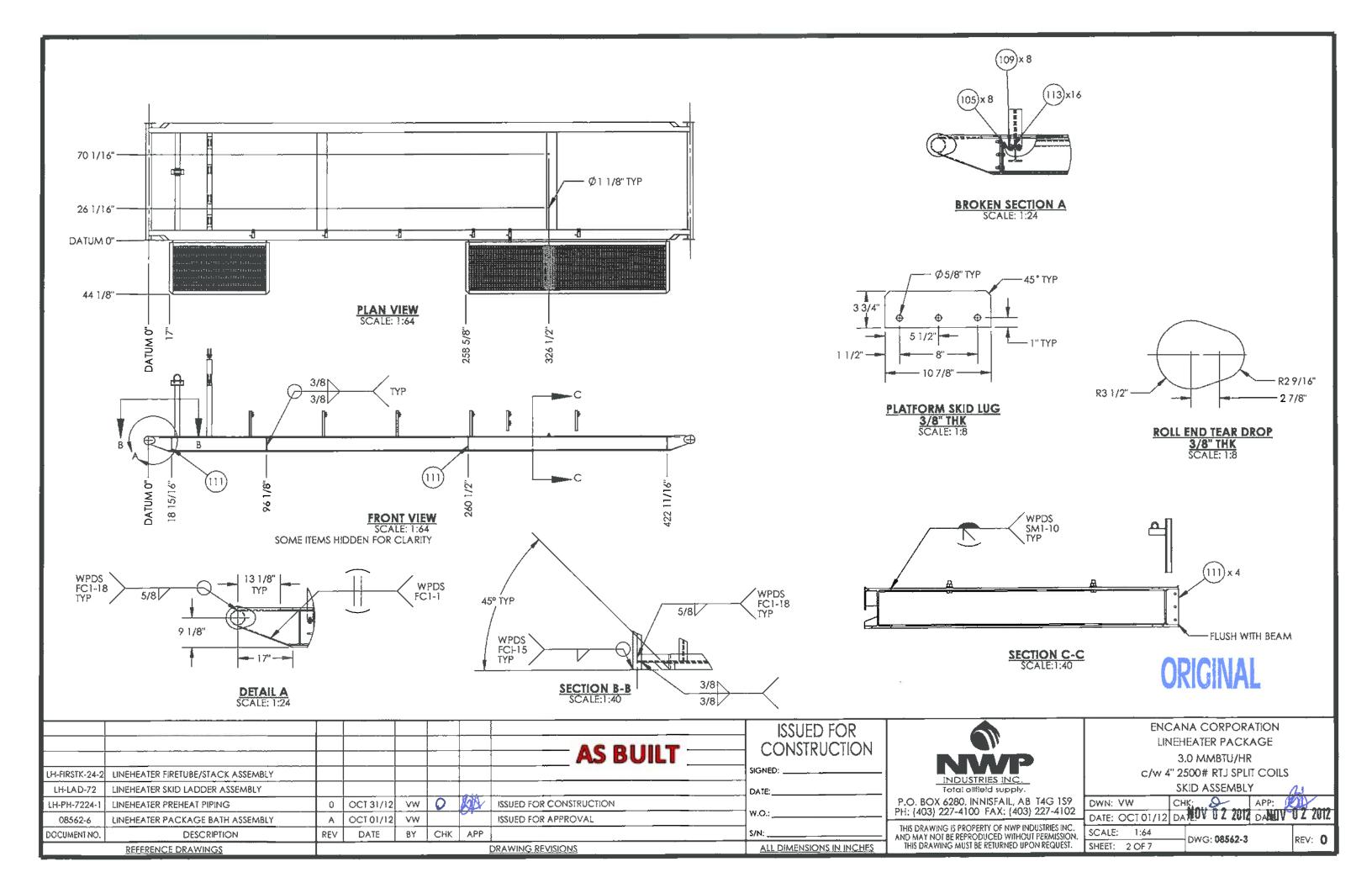
THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.

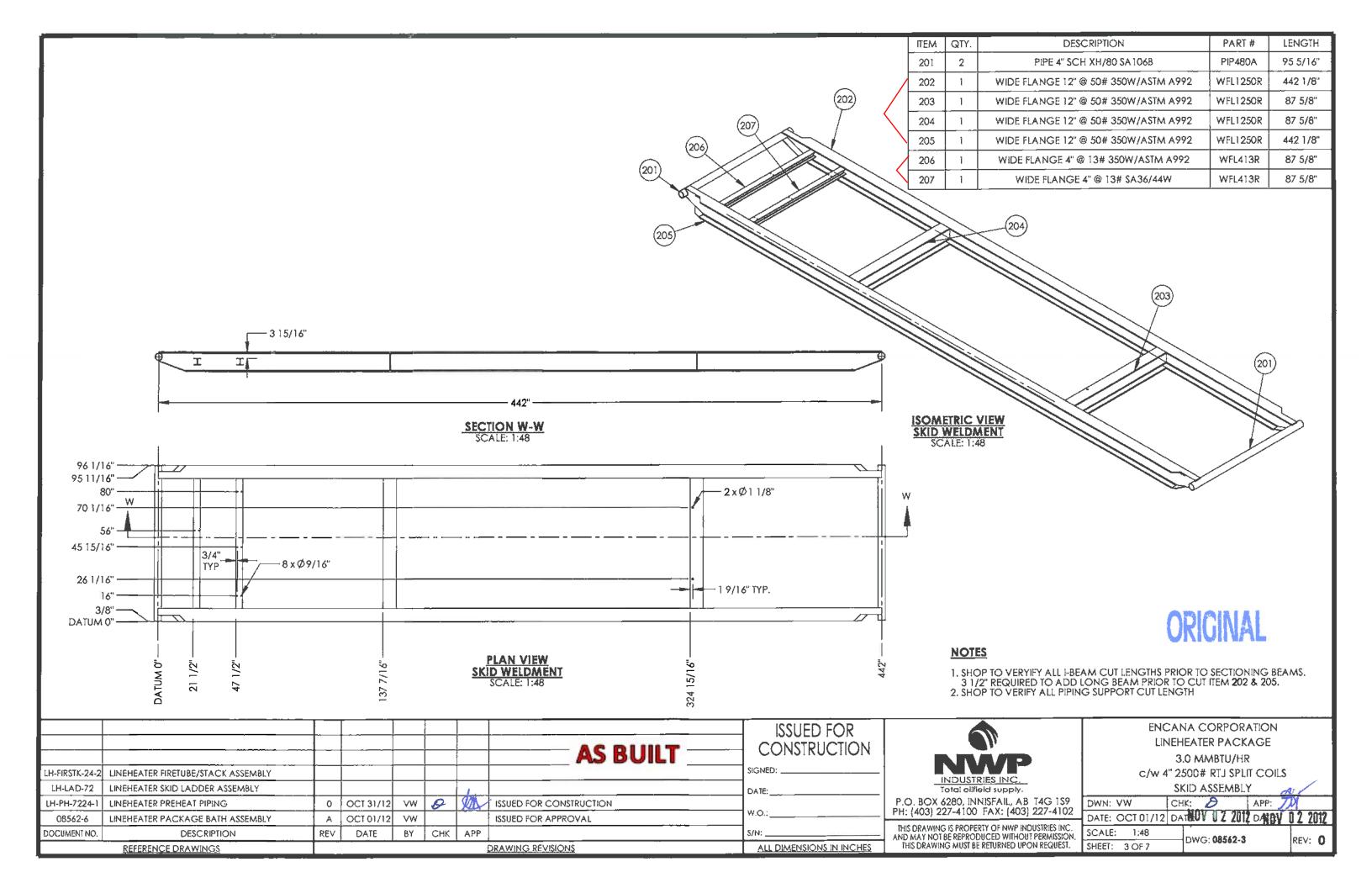
**ENCANA CORPORATION** LINEHEATER PACKAGE 3.0 MMBTU/HR

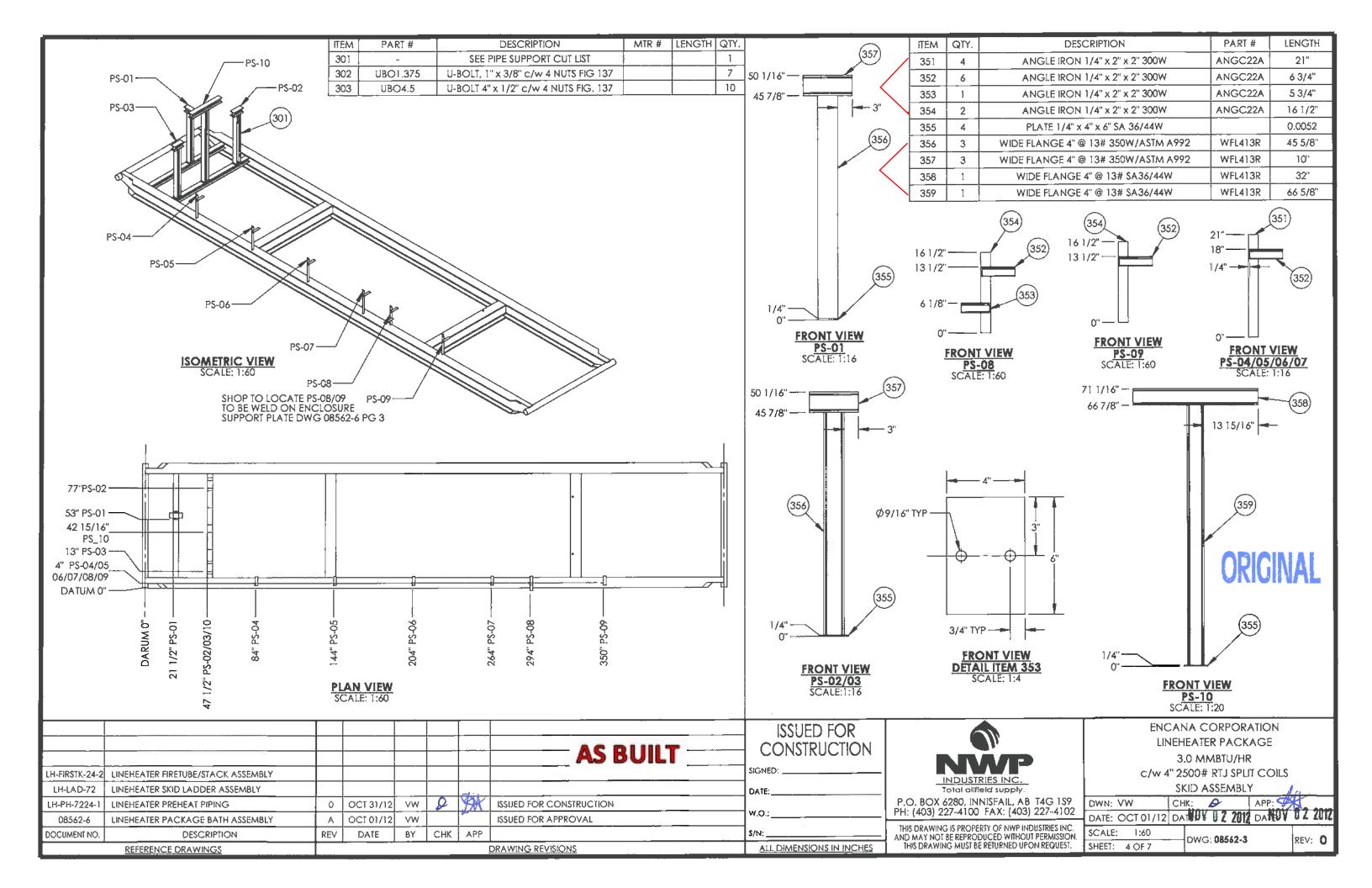
c/w 4" 2500# RTJ SPLIT COILS SKID ASSEMBLY

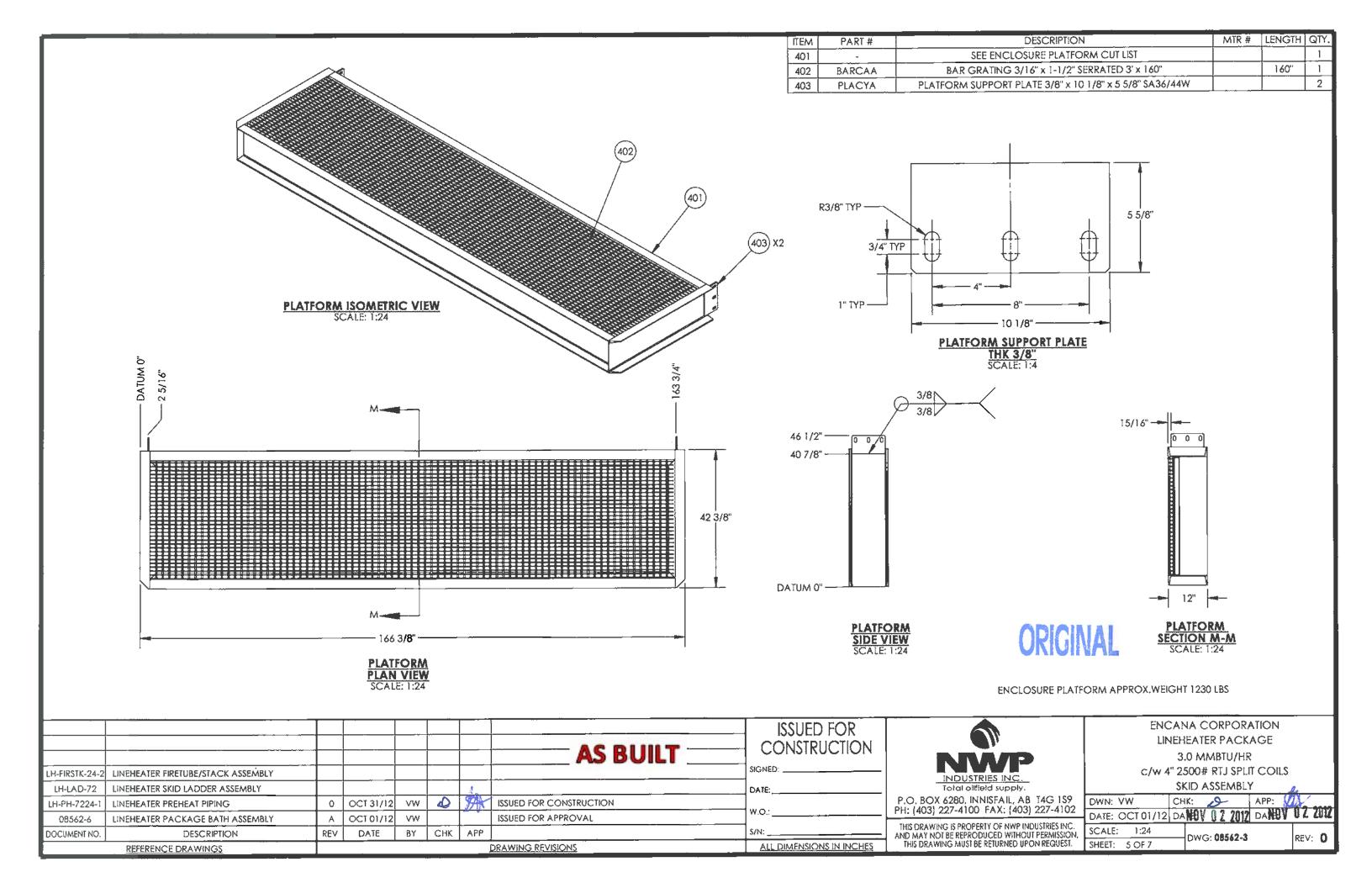
			*****	+ + -		- 49	44.	
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4	DATE: OCT 01/12	DA	MILV	O Z	2012	DATE	UΖ	ZUIZ
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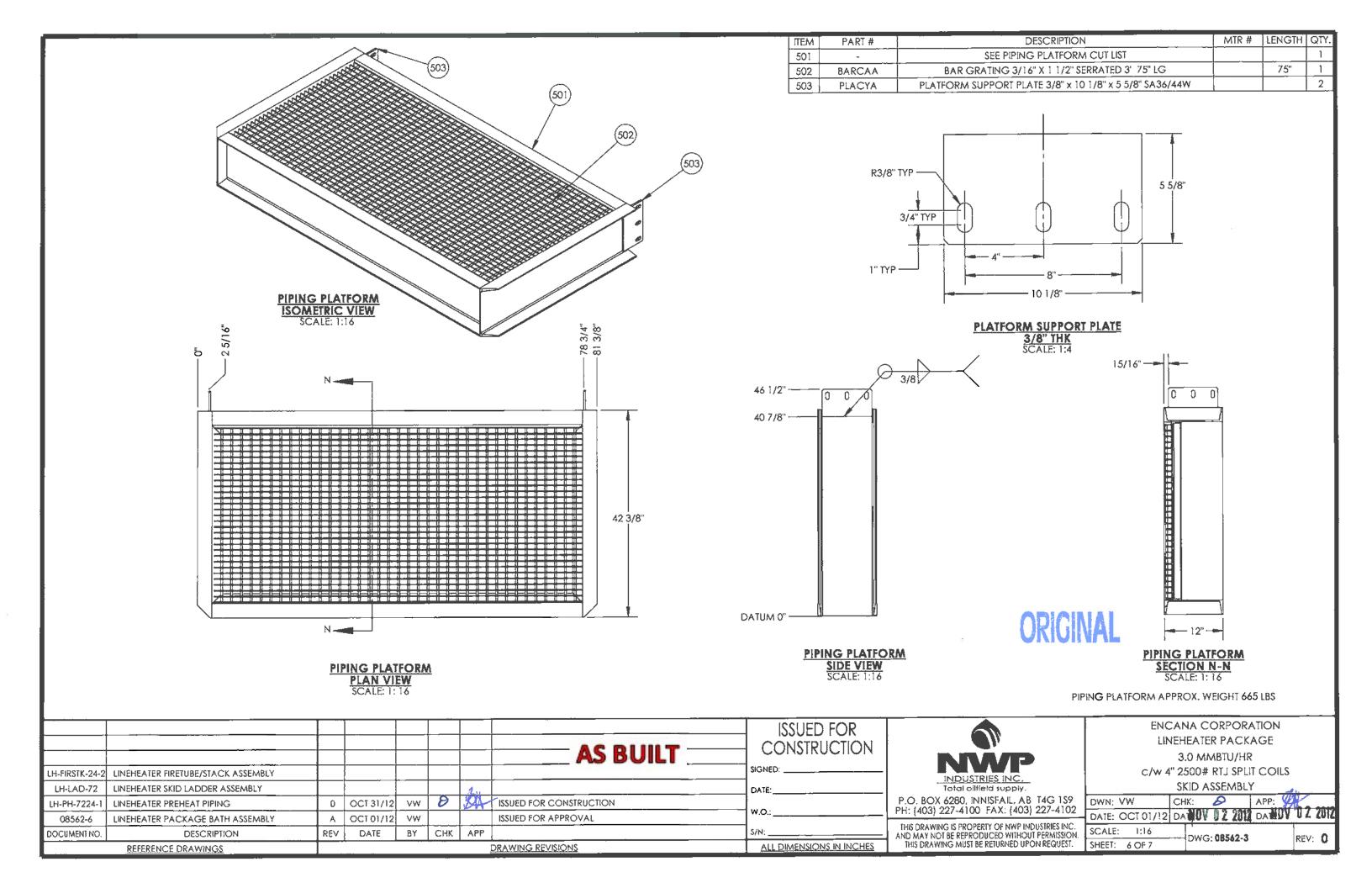
DWG: 08562-3 SHEET: 1 OF 7

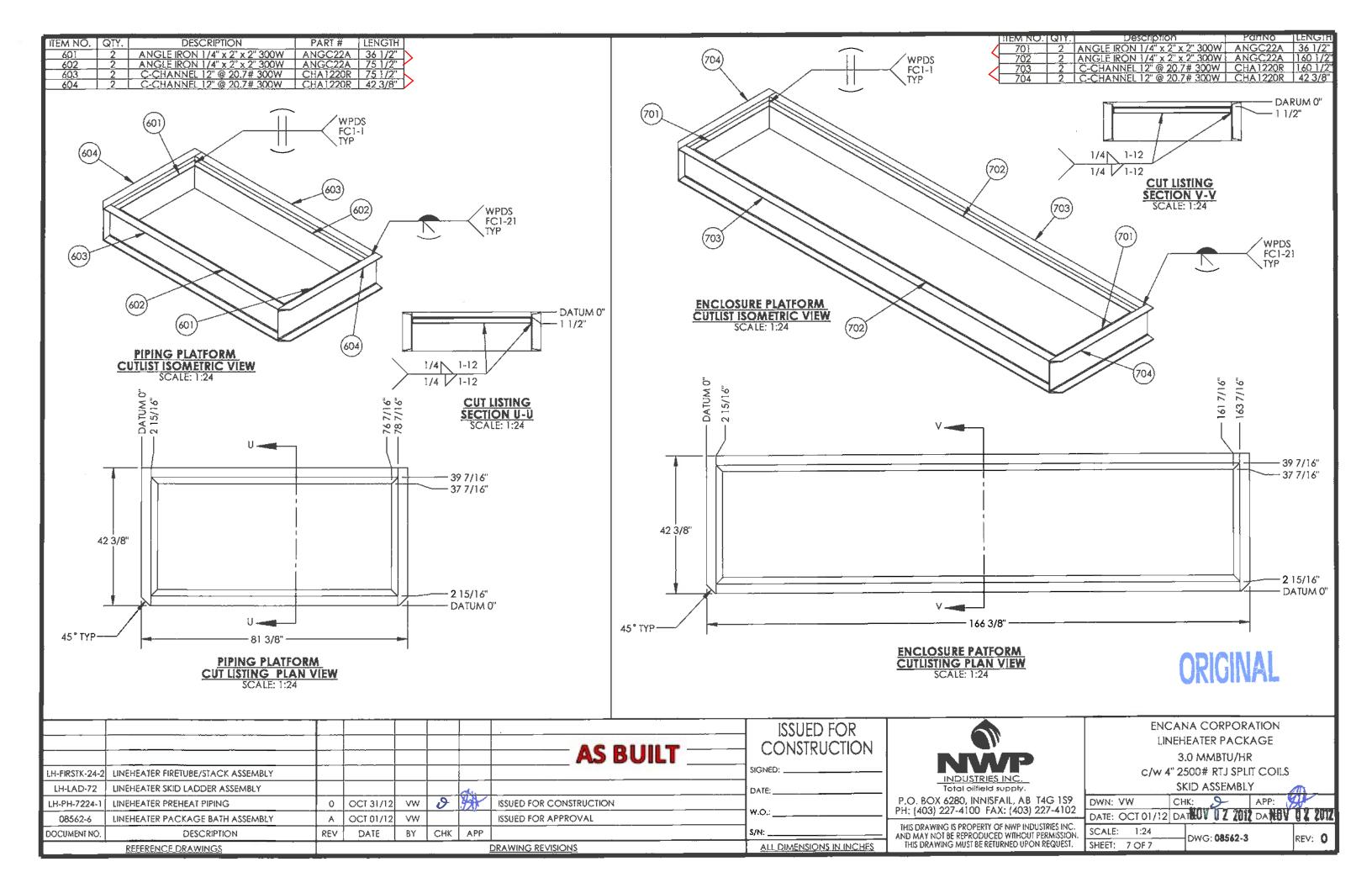


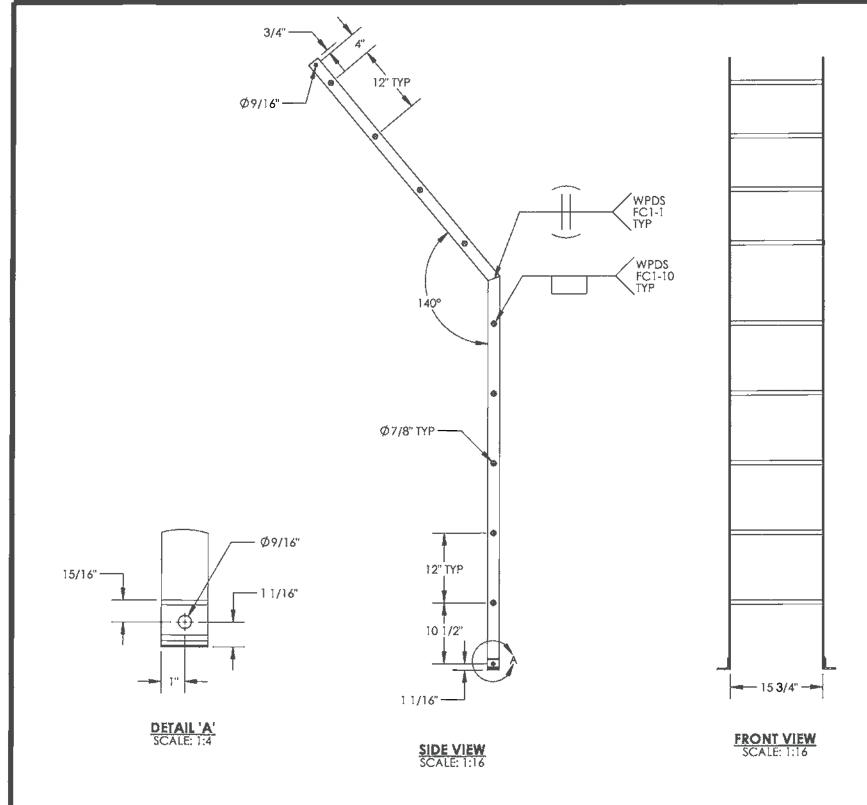




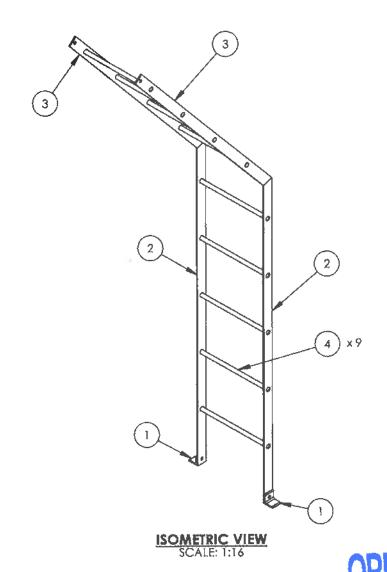








	ITEM	QTY.	DESCRIPTION	PART#	Material	LENGTH
	1	2	ANGLE IRON 1/4" x 2" x 2" \$A36/44W	ANGC22A		2"
	2	2	FLAT BAR 1/4" x 2" SA36/44W	FLBC2A		67 11/16"
	3	2	FLAT BAR 1/4" x 2" \$A36/44W	FLBC2A		49"
ĺ	4	9	ROUND BAR 3/4" SA36/44W	RBRGYA		16"



NOTES

1. FABRICATE TO CSA W47.1 AND W59.
2. ALL DIMENSIONS TO HAVE A TOLERANCE OF ±1/8" UNLESS OTHERWISE SPECIFIED.
3. DEBURR AND RADIUS ALL SHARP EDGES.
4. WELD PROCESS TO BE MCAW UNLESS OTHERWISE NOTED. WPDS-FC1-15.
5. ALL WELDS TO BE 1/4" CONTINUOUS FILLET WELDS UNLESS OTHERWISE NOTED.

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		1						SIGNED:	
					Ĺ	16		DATE:	
		1	2012.07.06	JHK	8	OH-	RFDC #01111 REVISED NOTE	_}	
		0	2011.04.21	DJ	GH	DF	ISSUED FOR CONSTRUCTION	w.o.:	
DOCUMENT NO.	DESCRIPTION	REV	DATE	BY	CHK	APP		S/N NWP-	
	REFERENCE DRAWINGS						DRAWING REVISIONS	ALL DIM	

**ISSUED FOR** CONSTRUCTION SIGNED:

ALL DIMENSIONS IN INCHES

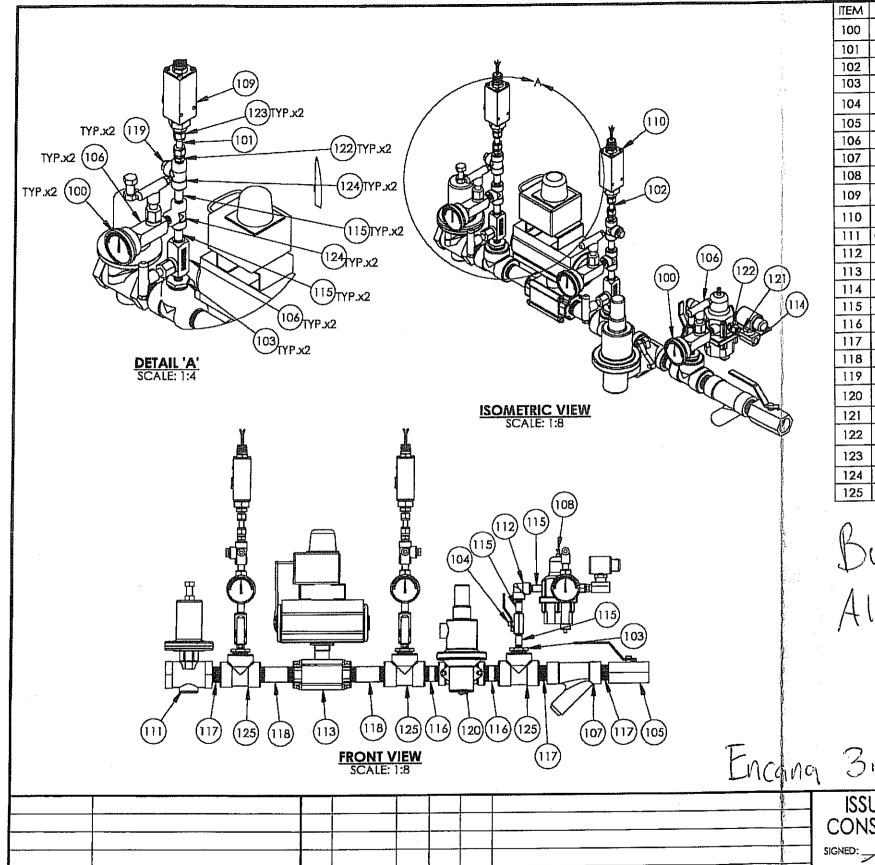
INDUSTRIES INC.
Total alifleid supply. P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: (403) 227-4100 FAX: (403) 227-4102

THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC.
AND MAY NOT BE REPRODUCED WITHOUT PERMISSION.
THIS DRAWING MUST BE RETURNED UPON REQUEST.

NWP INDUSTRIES INC LINEHEATER SKID TO FIT 72"OD BATH

LADDER ASSEMBLY APP: DF DWN: DJ CHK: GH DATE: 2011.04.21 | DATE: 2011.05.13 | DATE: 2011.05.13 SCALE: 1:16 DWG: LH-LAD-72 REV: 1 SHEET: 1 OF 1

Issuing Aut	thority: Marvin J. (Ty) De	Belser		Quality Cont	rol si di di di di di di di di di di di di di	i i i i i i i i i i i i i i i i i i i
Date of Iss	ue:March 13, 2008		JWP DUSTRIES INC.	QCFOFinall	nspectionReleaseCe	ertificateR00
		FINAL INSPECTIO	N RELEASE CE	RTIFICATE		
CUSTOMER:	ENCANA					
PRODUCT:	Valve Train, Encana S Compliant	pec, NWP MFD, Pneuma	tic proof of Closure	Valve, B149.3	wo#: 08	8562-002-E
		FINAL INSPE	CTION DOCUMENTA	ATION		
REVIEWED B		ACCEPTED:		REJECTED;		
STANDARD D	OCUMENTATION REQUIREM	ENTS: (SEE DOCUMENT REQUIR	REMENT LIST)			
	DOCUMENT REQUIREMENTS Y CUSTOMER ETC. )	(TO BE RECORDED HERE IF AP	PLICABLE I.E. DOCUMENT	PACKAGE		
Q.C. FILE CLC	DSURE BY: KO	COOSE COMPON	ENTS REQUIRED / P	DATE: FE	6 5 2013	
ITEMS REQUI	RED;		NO. OF BOXES O			
Rel		ext proces				
SERIAL#	08562-002-E LH-VALVETRAIN-1					
INVENTORY T	TAGS ATTACHED YES	✓ No — □				
			ING INSTRUCTIONS			
CUSTOMER P	O REVIEWED Y	ES N/A				
CONTACT PE	RSON AUTHORIZED TO RELI	ASE PRODUCT:		Periodickie die beide 1994 Periodickie	eine habileine gengebard De athropische beer	en inicipalistik : Pari en erakeristik :
PHONE:		FAX:				
RELEASED TO	D INVENTORY:			DATE:		
RELEASED TO	CUSTOMER:	14)0		DATE: 10	n29,13	



	I DADT 4	DESCRIPTION	MTR #	LENGTH	QTY.
ITEM	PART#	PRESSURE GAUGE WIKA 2 1/2" FACE 1/4" NPT, 0-30 PSI, MODEL NO. 233.53 CENTER BACK MOUNT			3
100	233.53	233.53 CENTER BACK MOUNT		2 3/4"	1
101	SS-T6-S-035-20	TUBING, 0.035" WT SMLS 3/8"			
102	SS-T6-S-035-20	TUBING, 0.035" WT SMLS 3/8"	(1007	2 3/4"	3
103	BUS1.25YYEE		500Z		
104	BUY	BALL VALVE EMICO 1/4" 600 PSI			1
105	BUY	BALL VALVE EMICO 1" 600 PSI			1
106	BUY	VALVE NEEDLE MAGNUM 1/4" 6000 PSI MF-25-SS			5
107	BUY	STRAINER ALTASTRAINER 1" NPT CL 3000 MDL YS3000			1
108	BUY	PRESSURE REGULATOR FISHER 67CFR 0-35 PSI SPRING STD TRIM			1
109	BUY	PRESSURE SWITCH CCS MODEL 6900GZE12 SET @ 14 PSI RISING			1
110	BUY	PRESSURE SWITCH CCS MODEL 6900GZE12 SET @ 4 PSI FALLING	-		1
111	CV-1198869383	Fisher 119 1" NPT 9/16" Orifice Spring Range: 5 to 35 psig	*211a =		1
112	EL9.25GYEE	Elbow 90 Deg 1/4" 3(4 THRD SA 105N (- 1/1)	3260		1
113	FOSSIL-24	PROOF OF CLOSURE VALVE FOSSIL 1" NPT			1
114	HV426716002	SOLENOID VALVE ASCO 1/4" NPT	77.00		1 1
115	NIP.252Y80EK	NIPPLE 1/4" x 2" SCH XH/80 316/316L SST	<u>01/2183</u>	ļ <u> </u>	7
116	NIP12.5Y80EA	NIPPLE 1" x 2 1/2" SCH XH/80 SA 106-B	100		2
117	NIP12Y80EA	NIPPLE 1 x 2" SCH XH/80 SA106-B	N6M_	-	3
118	NIP14Y80EA	NIPPLE 1"xX SCH XH/80 SA 106-B X 5/2	1151		2
119	PLH.25HYEE	PLUG HEX 1/4" 6M THRD SA105N	4973		2
120	PRV- 627121729855	PRESSURE REGULATOR FISHER 627-489 1" NPT 5-20 PSI 1/2" ORIFICE STD TRIM 250 MAWP			1
121	SS-6-TA-1-4	TUBE ADAPTOR 3/8" TUBE x 1/4" MNPT MDL SS-6-TA-1-4	ļ		1
122	SS-600-1-4	TUBING, STRAIGHT CONNECTOR, 3/8" TUBING x 1/4" MNPT, SS-600-1-4			3
123	SS-600-1-8	TUBING, STRAIGHT CONNECTOR, 3/8" TUBING x 1/2" MNPT, SS-600-1-8			2
124	TEE.25GYEE	Tee 1/4" CL 3M THRD SA105N (7 [7])	153		4
125	TEE1 GYEE	Tee 1"3K1 THRD SA105N 611	<u> 1750 </u>		3
		D 12 6-1	سو ن	_	7

Build in Reverse Order

All Fittings to be 6000#

Encana 3:0 mm BTU/HR 09362/09563

RESULTED FOR

**ISSUED FOR** RE-ISSUED FOR CONSTRUCTION (UPDATED PART NUMBERS 2012.09.27 ΕP ISSUED FOR CONSTRUCTION 2012.06.22 CHK APP DESCRIPTION DESCRIPTION REV. DATE BY DOCUMENT NO. ALL DIMENSIONS IN INCHES REFERENCE DRAWINGS



P.O. BOX 6280, INNISFAIL, AB T4G 1S9 PH: [403] 227-4100 FAX: (403) 227-4102

NWP INDUSTRIES INC VALVE TRAIN ASSEMBLY 1" NPT RIGHT TO LEFT FLOW ASSEMBLY DRAWING

CHK: S DWN: JHK DATE: 2012.06.22 DATE: 2012.06.22 DATE: 2012.06.22

SCALE: DWG: LH-VALVETRN-1 SHEET: 1 OF 1

THIS DRAWING IS PROPERTY OF NWP INDUSTRIES INC. AND MAY NOT BE REPRODUCED WITHOUT PERMISSION. THIS DRAWING MUST BE RETURNED UPON REQUEST.

( 7



#### 8300 Southwest 8th Street Oklahoma City, Oklahoma

Customer: NWP INDUSTRIES Customer PO #: 710161

4017, 60 AVE

INNISFAL, ALBERTA

T0G 1S9

#### **Safety Relief Valve Certification**

Taylor Valve Technology, Inc. Safety Relief Valves are designed, manufactured and tested in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.
as allowed for within the provisions of ASME. The published relieving capacities have been certified by the National Board of Boiler and Pressure Vessel Inspectors.

#### **Valve Specifications**

Model Number: Taylor Model 8200 Soft Seat Orifice: F

Body Size: 1 Inch Diameter: 0.674 Inches In² Part Number: 82F4661341 Area: 0.357 ٥F Body Configuration: 1" MNPT X 1-1/2" FNPT Temperature: **PSIG** Inlet Connection: Spring Range: 141-290

Outlet Connection :

0G01316.2C

Materials

Body: WCC Carbon Steel Spring: MP35N or Equal Seat Frame: Carbon Steel Guide: 304 Stainless Steel

Seat Housing: 316 Stainless Steel Adj Screw: Carbon Steel with EN Plating

Set Pressure: 150.0

**PSIG** 

Trim: Nace Options: None

Seat: FKM 90d

CRN:

#### **Set Pressure Specifications**

ASME Units

Set Pressure: 150.0 psig
ASME High Set Limit: 154.5 psig
ASME Low Set Limit: 145.5 psig

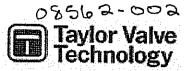
ASME (90%) rated capacity at set pressure for indicated fluid, specific gravity and temperature.

Certifying Fluid: Air 982 SCFM Spec Gravity: 1.00 Temp: 60 °F

Tested by:

Department: Manufacturing Signed Wason Warger

Approved by:



8300 Southwest 8th Street Oklahoma City, Oklahoma

Serial #:

022617-4

telephone: 405.787.0145 facsimile: 405.789.8198

Part#:

82F4661341

email: info@taylorvalve.com

Date: 06-Dec-12

Sales Order #: 022617

Customer:

**NWP INDUSTRIES INC.** 

4017 - 60th AVE INNISFAIL, AB T4G - 1S9

Customer PO#: 710161

### **Safety Relief Valve Certification**

Taylor Valve Technology, Inc. Safety Relief Valves are designed, manufactured and tested in accordance with the provisions of the ASME Boiler and Pressure Vessel Code. as allowed for within the provisions of ASME. The published relieving capacities have been certified by the National Board of Boiler and Pressure Vessel Inspectors.

#### Valve Specifications

Model Number:

Taylor Model 8200 Soft Seat

Orifice:

Body Size:

1 Inch

Diameter: Area:

0.674 0.357

Part Number: Body Configuration:

82F4661341 1" MNPT X 1-1/2" FNPT

Temperature :

Inches in²

Inlet Connection:

70

ᅊ

Spring Range: 141-290

**PSIG** 

Outlet Connection:

Set Pressure: 150.0

**PSIG** 

CRN:

0G01316.2C

**Materials** 

Body:

Seat Frame:

WCC Carbon Steel

Spring:

MP35N or Equal

Carbon Steel

304 Stainless Steel

Seat Housing:

316 Stainless Steel

Adj Screw:

Carbon Steel with EN Plating

Trim:

Nace

Options:

Seat:

FKM 90d

#### **Set Pressure Specifications**

**ASME Units** 

Set Pressure:

150.0

psig

ASME High Set Limit: ASME Low Set Limit:

154.5 145.5 psig psig

ASME (90%) rated capacity at set pressure for indicated fluid, specific gravity and temperature.

Certifying Fluid:

982 SCFM

Spec Gravity: 1.00

Tested by:

Department: Manufacturing

Approved by:

Department: Engineering



3364 - 114 Avenue SE . Calgary, Alberta, Canada . T2Z 3V6

Phone: +1 403.253.7939 • Fax: +1 403.255.0042

Email: info@telematic.ca • telematic.ca

#### **FACTORY SET SWITCH POINT CERTIFICATION**

Customer:	NWP Indu	stries Inc		Date:	Oct-30-2012 (Mmm-dd-yyyy)
Address:	РО ВОХ 6	280	Purchase Order: 70992	8	
	4017 – 60	Ave			
	Innisfail, A	B T4G 1S9	Telematic Work Order: 32507	2	
		ed instructions and spec set as follows:	ifications, we certify the Pressur	e Switch	furnished on this
Model Numb	er: _6900	GZE12	Deadband: 1.2	PSI	
Serial Numb	er: 3250	72 1012 004	Tag No.: N/A		
Set Point:	14 P	SI INCR.			
		Test Equipmen	t No.: TCI055	-	
General Fea	tures:				
Dual Snap, I	laz. Area, 1	½" NPT SST Port &			
Diaphragm,					
		PSIG	BAR		
Max. System	Pressure:	500	34.5		
Proof (Test)	Pressure:	750	51.7		
Adj. Setpoint	t Range				
– On	Increase:	3-20	0.21-1.	1	
– On	Decrease:	1-18	0.07-1.	2	
Approximate	Deadband	: 2	0.14		
Wetted Parts	<b>S</b> :	SST Port &	Viton O-R	ing	
		Diaphragm			
For Telemati	c Controls	Inc.			
Technician:	Mar	124	Mark Rietvel	d	
		(Digital) Signature	Dei	nt Name	

Nov-08-2011 Printed: Oct-30-2012



3364 - 114 Avenue SE . Calgary, Alberta, Canada . T2Z 3V6

Phone: +1 403.253.7939 • Fax: +1 403.255.0042

Email: info@telematic.ca • telematic.ca

#### **FACTORY SET SWITCH POINT CERTIFICATION**

Customer:	NWP	Industries	s Inc				Date:	Oct-30-2012 (Mmm-dd-yyyy)
Address:	РО В	OX 6280		Purchas	e Order:	709928		(William-uu-yyyy)
•	4017	- 60 Ave						. 14., 11. 4.0 100 000 000 100 000 000 000 000 000 0
	Innisf	ail, AB T4	G 1S9	Telematic Wor	k Order:	325072		
In accordance order has be		•	•	ecifications, we ce	ertify the f	Pressure	Switch	furnished on this
Model Numb	ber:	6900GZE	12	Γ	Deadband	l: 1.7 PS	SI	
Serial Numb	рег:	325072 10	012 008		Tag No	: N/A		
Set Point:		4 PSI DE	CR.					
			Test Equipme	ent No.: TCI055				
General Féa	atures:							
Dual Span k	Haz Ai	raa 14° NII	PT SST Port &					
Duai Shap, i	, IUZ, / \	ICO, 72 IVI						
Diaphragm,					A SECTION OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF T			
					AND AND AND AND AND AND AND AND AND AND	BAR		
			PSIG			BAR		
	Viton (	O-Ring				<b>BAR</b> 34.5		
Diaphragm,  Max. System	Viton (	D-Ring sure:	PSIG					
Diaphragm,  Max. System  Proof (Test)	Viton ( n Press Press	O-Ring sure: ure:	<b>PSIG</b> 500			34.5		
Diaphragm,  Max. System  Proof (Test)  Adj. Setpoint	Viton ( n Press Press	D-Ring sure: ure: e	<b>PSIG</b> 500			34.5		
Diaphragm,  Max. System  Proof (Test)  Adj. Setpoint  - On	Viton ( n Press Pressi t Rang	D-Ring sure: ure: e ase:	<b>PSIG</b> 500 750			34.5 51.7		
Max. System Proof (Test) Adj. Setpoint - On - On Approximate	n Press Pressi t Rang I Increa Decre	D-Ring sure: ure: e ase:	<b>PSIG</b> 500 750 3-20			34.5 51.7 0.21-1.4 0.07-1.2 0.14		
Diaphragm,  Max. System  Proof (Test)  Adj. Setpoint  - On	n Press Pressi t Rang I Increa Decre	D-Ring sure: ure: e ase:	PSIG  500 750  3-20 1-18 2 SST Port &			34.5 51.7 0.21-1.4 0.07-1.2	9	
Max. System Proof (Test) Adj. Setpoint - On - On Approximate	n Press Pressi t Rang I Increa Decre	D-Ring sure: ure: e ase:	PSIG 500 750 3-20 1-18 2			34.5 51.7 0.21-1.4 0.07-1.2 0.14	g	
Max. System Proof (Test) Adj. Setpoint - On - On Approximate	n Press Pressi t Rang n Increa n Decre e Deadi s:	Sure: ure: e ase: ease: band:	PSIG  500 750  3-20 1-18 2 SST Port &			34.5 51.7 0.21-1.4 0.07-1.2 0.14	9	
Max. System Proof (Test) Adj. Setpoint - On - On Approximate Wetted Parts	n Press Pressi t Rang n Increa n Decre e Deadi s:	Sure: ure: e ase: ease: band:	PSIG  500 750  3-20 1-18 2 SST Port &		Vit	34.5 51.7 0.21-1.4 0.07-1.2 0.14	9	

Revision: 1

Page 1 of 1 Printed: Oct-30-2012



3364 - 114 Avenue SE • Calgary, Alberta, Canada • T2Z 3V6

Phone: +1 403.253.7939 • Fax: +1 403.255.0042

Email: info@telematic.ca • telematic.ca

### **FACTORY SET SWITCH POINT CERTIFICATION**

Customer: NW	P Industries Inc		Date:	Nov-13-2012 (Mmm-dd-yyyy)
***************************************	6280	Purchase Order:	710162	
	7 – 60 th Ave.			
Innis	sfail AB, T4G 1S9	Telematic Work Order:	325360	
	required instructions and been factory set as follow	d specifications, we certify the Terws:	nperature	Switch furnished
Model Number:	6900TE14	Deadband:	2.77°C	
Serial Number:	325360-1112-002	Tag No.;	N/A	8->
Set Point:	90°C Incr.			
General Features Dual Snap, Haz. A		ment No.: TCI014, TCI028, TCI0	031	
Direct Mount Prob	)e	- VIII VIII VIII VIII VIII VIII VIII VI		
Max. Probe Temp		<u>°C</u> 149 Approx. Deadband:	<u>°</u> F	<u>°C</u>
Adj. Setpoint Ran	-	– At Bottom:	20	11
<ul><li>On Increase:</li><li>On Decrease</li></ul>		27-96 – At Top:	5	4
- On Decrease	e: 60-198 	16-92 Wetted Parts:	30088	
For Telematic Cor	ntrols Inc.			
Technician:	Thomas Hong			

Revision: 0

May-09-2011

Page 1 of 1 Printed: Nov-13-2012

08562-002-4



Thursday, 13-Sep-2012

From:

To:

Cameron Canada 3707 97 Street Edmonton, Alberta, Canada T6E 6J2

Phone: 780-468-2732

#### Subject:

Serial 2547846 Quantity/Series 250

#### Comments:

Part #: 5A-T3R10S30LZ

Description: BV R10 FNPT NUTRON T3 3000 WOG SOUR LT

Sales Order: N/A

Customer PO: N/A



Thursday, 13-Sep-2012

From:

To:

Cameron Canada 3707 97 Street Edmonton, Alberta, Canada T6E 6J2

Phone: 780-468-2732

## **Document Summary Page**

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	L	LOC			Nutron T3, B3, B2, TT Sour Low Temp.
2	Hydro Test	598			API 598
3	U2101				BALL,7/8",ASTM A351 GR CF8M
4	U2071				BALL,7/8",ASTM A351 GR CF8M
5	R4921				STEM,7/8",ASTM A564 17-4 H1150 NACE
6	HN54				CAP,1" RP 4000 WOG FNPT, ASTM A105/LF2
7	322607				BODY,7/8" 4000 WOG,ASTM A105/LF2



VALVES & MEASUREMENT

Cameron Canada Corporation 37D7 – 97 Street Edmonton Alberta Canada T6E 612 Phone 780,463.6868 Fax 780,465.1244 www.c-a-n.com

#### GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3, B3 & B2 & TT

Style 'L': Sour Low Temperature Service

Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Sour Low Temperature Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), API 6D (TT only), ASME B16.34, CSA Z245.15 Sour Service (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25. The valve has also been marked "SOUR" as required by CSA Z245.15 marking requirements for Sour Service.

The materials of construction for this valve conform to the metallurgical requirements of NACE MR0175/ISO 15156:2003 (Parts 1 & 2 for Carbon & Alloy Steels in SSC Region 3 Sour Service and Parts 1 & 3 for CRA's as specified in CSA Z245.15 Chapter 13). According to NACE MR0175-2003/ISO 15156, it is the customer's/user's responsibility to ensure that the valve materials will be satisfactory in the intended service.

The minimum service temperature of these valves is -46°C/-50°F. Impact testing has been performed in accordance with applicable ASTM requirements and those of CSA Z245.15 for Category II M45C Service.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

The B2 and TT valve models are constructed to be anti-static as standard.

Approved by:

g Ogaranko, M.Eng., P.Eng

Ængin¢€r/ng Manager

09/13/10 EWR 7463-01 Rev.06.doc



#### **VALVES & MEASUREMENT**

Cameron Canada Corporation 3707-97th St. Edmonton Alberta Canada TGE 5/3 Phone 780.468.2732 www.c-a-m.com

#### CERTIFICATE OF CONFORMANCE

# API 598 Pressure Testing – Carbon and Low Alloy Steel (2" RP and Smaller)

**COMPLIANCE:** These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

# Carbon & Low Alloy Steel Shell and Seat Test Pressures (Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

M. Ceido

Murray Aide, Quality Manager



# 璋實業有限公

ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 320 桃園縣中壢市中華路2段185號3樓 統一編號:16879927 Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS CERTIFICATE NO. 120725-3 AND MECHANICAL PROPERTIES DATE: 25-Jul-12 To, CAMERON CANADA CORPORATION 3707-97th Street, EDMONTON, AB T6E 6J2, CANADA INVOICE NO. WZ-120725A Your Order No. 4503442572/406503/408736/415485 Material Specification: ASTM A351 CF8M Heat Treatment: Solution Annealed Mechanical Properties O'TY Heat Code PART NAME DRAWING No. T.S.(KSI) V.S.(KSI) ELO.(%) HBW <u>70 min</u> 30 min 30 min 140-237 5.040 5A-11501041617 Ball 7/8" #06002-010 76.4 41.9 U2101 46 145 5.040 5A-11501041617 Ball 7/8" #06002-010 S6611 79.6 46.9 44.5 162 2.016 5A-11501541617 Ball 1½" #06003-010 S6482 76.7 41.2 46.7 150 300 5A-11503041617 Ball 3" #06005-010 U2091 79.8 46.3 36.9 167 5A-21506041220002 Ball 6" 50 #06024 U2081 78.9 46.0 36.5 161 100 I5A-21504041220002 Ball 4" #06040-041 S6483 77.3 45.0 35.9 168 Heat Chemical Composition (%) Code C Μп Si S Cr Ni Mo 0.08max 1.5max 1.5max .040max .040max 18-21 9-12 2.0 - 3.0U2101 0.0470 0.97000.4530.00850.03418.56 9.30 2.10 S6611 0.0548 0.7913 0.47710.00800.0344 18.5197 9.4061 2.1775 S6482 0.0507 1.0200 0.4040 0.0088 0.0211 18.9400 9.4767 2.1567 U2091 0.04850.86001.20500.0063 0.0275 18.3500 9.0600 2.0650 U2081 0.07500.9200 1.1700 0.0150 0.038018.3900 9.2100 2.0700 S6483 0.0695 0.85001.1550 0.0115 0.0310 18.3300 9.0600 2.0100 NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B QUALITY CONTROL INSPECTOR MANAGER Sandy Yeli Grand Hou

Cameron Approved

Bv: Jala Date:08/15/12 8:58



## 原璋實業有限公司 WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 320 桃園縣中堰市中華路 2 段 1 8 5 號 3 樓 統一編號: 1 6 8 7 9 9 2 7 Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFI	CATE OF	CHEMICA	AL ANAL	YSIS	:	CERTIFIC	CATE NO.	120704-	4
AND ME	CHANICA	L PROPEI	RTIES				DATE:	4-Ju	ıl-12
		Т	o. CAME	RON CANA	ADA CORI	PORATIO	N		
ı		3707-9	7th Street,	EDMONT	ON, AB T	6E 6J2, CA	NADA		
INVOICE	NO. WZ-	120704A			Your Ord	er No. 4503	3374619		
Material S	Specificatio	n: ASTM	A351 CF8	M	Heat Trea	tment: So	lution Ann	ealed	
OUTV	Q'TY PART NAME DRAWING No.						Mechanica	l Properties	·
QTI	PART NAME DIKAWING NO.				Heat Code	T.S.(KSI)	Y.S.(KSI)	ELO.(%)	HBW
						<u>70 min</u>	<u>30 min</u>	<u>30 min</u>	140-237
5,000	5A-115005	541617 Bal	1 1/2" #	¥06001-010	S6412	79.0	50.2	47	172
10,080	5A-115010	041617 Bal	1 7/8'' #	406002-010	U2071	76.3	42.1	47	146
1,536	5A-115015	541617 Bal	11½" #	#06003-010	S6413	82.5	52.6	<b>4</b> 7	167
1,008	5A-115020	)41617 Bal	12" #	#06004-010	S6414	81.1	52.6	<b>4</b> 7	166
200	5A-115040	041074 Bal	14" #	¥06011-010	U2072	77.3	39.7	48	155
Heat				Chemic	al Composi	tion (%)			
Code	C	Mn	, Si	S	P	Cr	Ni	Mo	
	0.08max	1.5max	1.5 _{max}	<u>,040max</u>	<u>,040max</u>	<u>18-21</u>	<u>9-12</u>	2.0-3.0	
S6412	0.0614	0.8551	0.9618	0.0087	0.0309	18.3219	9.0845	2.0623	
S6413	0.0474	1.0291	0.5057	0.0075	0.0365	18.5048	9.2315	2.1905	
S6414	0.0551	0.7778	0.4675	0.0070	0.0312	18.5001	9.2520	2.2071	
U2071	0.0510	0.9200	0.438	0.0088	0.034	18.55	9.31	2.13	
U2072	0.0554	0.972	0.6293	0.0128	0.0303	18.515	9.41	2.133	
NOTE: <u>Ce</u>	ERTIFICAT	E ACCORI	DING TO E	EN 10204/3.1	<u>B</u>				
	QUAI	LITY CON	TROL IN	SPECTOR				M	ANAGER
			0.4.4						
Ī		Sandy	Yeh		Grant Hsu				

Cameron Approved

By: Iala Date:07/16/12 9:25



# 璋實業有限公

ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 320 桃園縣中壢市中華路2段185號3樓 統一編號:16879927 Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS

CERTIFICATE NO. 120725-1

AND MECHANICAL PROPERTIES

DATE:

25-Jul-12

To. CAMERON CANADA CORPORATION

3707-97th Street, EDMONTON, AB T6E 6J2, CANADA

INVOICE NO. WZ-120725A

Your Order No. 4503406503/408736/442572

MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D

O'TY	Y PART NAME DRAWING No.		Heat Code	Mechanical Properties					
Ų i i	TAKT SAME DICTOR	10 110.		Y.S.(KSI)	T.S.(KSI)	ELO.(%)	HRC	RA (%)	ft-lbf (-75°f)
	ı			<u>105 min</u>	<u>125 min</u>	<u>16 min</u>	<u> 29~33</u>	<u>50 min</u>	<u>15 min</u>
5,000	5A-11300513617 Stem 1/2"	#02001	R4851	138	145	22	31	72	103/106/99
6,400	5A-11301013617 Stem 7/8"	#02002	R4921	142	146	20	32	72	106/94/89
3,891	5A-11301513617005 Stem 1½"	#02122	DW	123	136	22.5	30	72	107/104/108
2,109	5A-11301513617005 Stem 11/2"	#02122	EB	121	136	22	30	70	91/87/108
660	5A-11302013617005 Stem 2"	#02123	DY	128	140	23	32	73	83/84/82
240	5A-11303013074 Stem 3"	#02005	DΧ	106	135	25	29	73	121/130/115
100	5A-11304013074005 Stem 4"	#02125	DU	117	135	23	29	70	103/100/105
1,400	5A-11500513617 Ball 1/2"	#06001	S6481	115	136	23	30	72	98/92/93
108	5A-11502013617 Ball 2"	#06004	S6612	131	141	20	31	70	38/36/36

Heat	Heat Chemical Composition (%)										
Code	С	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta	
	0.07max	1.0max	1.0max	.030max	<u>,040max</u>	<u>15-17.5</u>	3.0-5.0	<u>0,5 max</u>	3.0-5.0	0.15-0.45	
R4851	0.02	0.62	0.44	0.020	0.023	15.19	4.31	0.13	3.43	0.22	
R4921	0.02	0.64	0.48	0.024	0.028	15.12	4.34	0.19	3.43	0.22	
EB	0.01	0.63	0.44	0.027	0.032	15.28	4.33	0.13	3.47	0.23	
Df.	0.01	0.63	0.50	0.028	0.028	15.21	4.22	0.13	3.45	0.23	
DW	0.01	0.66	0.46	0.021	0.029	15.19	4.18	0.17	3.26	0.22	
DX	0.02	0.65	0.46	0.024	0.029	15.45	4.27	0.17	3.50	0.22	
DY	10.0	0.65	0.49	0.018	0.028	15.18	4.29	0.23	3.46	0.22	
S6612	0.02	0.66	0.49	0.024	0.029	15.05	4.34	0.19	3.34	0.20	
S6481	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22	

Solution Treatment: 1900°F for 30 Min/Inch (Minimum of I Hour), Fast Air Cooling to below 90°F

Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air

Charpy Impact Test Specimens: 10*10*55mm(Longitudinal) NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B

Cameron Approved

By: laia Date: 08/15/12 8:55

QUALITY CONTROL INSPECTOR

MANAGER

Sandy Yeh

Grant Hsu



## **Material Test Report**

Specification Notes:

١	Name	Revision	Grade	Description	Revision Year	
ł	ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2011	
1						

Product Information:

Item #	Product Code	Description	Heat Number	HeatCode	PO#
1	5A-1010101032400	CAP,1" RP 4000 WOG FNPT, ASTM A105/LF2	HN54		

Chemical Information:

Thomas di	10	Mn	P	16	~	B.C	ĪA.	1.4	Α.	137	Tor	CL/ALL	C	CURE
Item#	C	IAM		5	Si	Ni	l _G	Mo	Cri	<b>v</b>	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.15									
Max	0.23	1,35	0,035	0.035	0,3	0.4	0,3	0.12	0.4	0.08	0.43	0,02	1.00	0.32
1	.2	.86	.023	.006	.19	.06	.09	.02	.15	.002	0.380	0.0		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft-lb (average of a set)	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		187
1	86305	65269	31.	38, 40, 48	-50	72.3	179

Additional Notes:

AUSTENITIZED @ 920'C 80 MIN OIL QUENCHED TEMPERED @ 590-704'C 30MIN/IN

Chemical Information Notes:

1. RES 0.322

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and El110204 3.1

Ouality Manager Cameron Canada



## **Material Test Report**

Specification Notes:

Revision Year Name Revision Grade Description Carbon & Low-Alloy Steel Forgings 2011. ASTM A105/ASTM A350 GR LF2 Cameron

Product Information:

	Item#	Product Code	Description	Heat Number	Heat Code	PO#
[	1	5A-10001032400	BODY,7/8" 4000 WOG,ASTM A105/LF2	322607		

Chemical Information:

Item#	C	Mn	P	S	Si	Ni	Q.	Mo	Cu	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6	1		0.15									
Маж	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0,08	0,43	0.02	1.00	0,32
1.	.2	.83	.027	.01	.21	.06	.12	.02	.16	.002	0.380	0.0		

Physical Information:

Item #	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brineli)
Man	70000	36000	22	15	-80	30	137
Max	95000				-50		187
1	85281	64857	28.2	48, 57, 57	-50	68.6	173

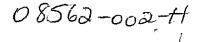
Additional Notes:

AUSTENITIZED @920'C 80 MIN OIL QUENCHED TEMPERED @590-704'C 30MIN/IN

Chemical Information Notes: 1. RES 0.362

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and Ell10204 3.1

M. aida Quality Manager Cameron Canada





Thursday, 02-Aug-2012

From:

To:

3707 97 St.

Edmonton, Alberta, Canada

T6E 6J2

Phone: 780-463-6868 Fax: 780-463-6259 Web Site: www.c-a-m.com

Subject:

Serial 2510867 Series 20

#### Comments:

Part #: 5A-T3F02S30LZ

Description: BV F02 FNPT NUTRON T3 3000 WOG SOUR LT

Sales Order: N/A

Customer PO: N/A



Thursday, 02-Aug-2012

From:

To:

3707 97 St. Edmonton, Alberta, Canada T6E 6J2

Phone: 780-463-6868 Fax: 780-463-6259 Web Site: www.c-a-m.com

### **Document Summary Page**

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	L	LOC	2510867	5A-T3F02S30LZ	Nutron T3, B3, B2, TT Sour Low Temp.
2	Hydro Test	598	2510867	5A-T3F02S30LZ	API 598
3	G28D448		2510867	5A-T3F02S30LZ	BODY,1/2" 6000 WOG,ASTM A105/LF2
4	G28D424		2510867	5A-T3F02S30LZ	BODY,1/2" 6000 WOG,ASTM A105/LF2
5	HN47		2510867	5A-T3F02S30LZ	CAP,1/4" FP 6000 WOG FNPT, ASTM A350 GR
6	R4611		2510867	5A-T3F02S30LZ	STEM,1/2",ASTM A564 17-4 H1150 NACE
7	S6123		2510867	5A-T3F02S30LZ	BALL,1/2", ASTM A351 GR CF8M



Cameron Canada Corporation 3707 – 97 Street Edmonton Alberta Canada T6E 6J2 Phone 780,463,6868 Fax 780,465,1244 www.c-a-n.com

#### GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3, B3 & B2 & TT

Style 'L': Sour Low Temperature Service

Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Sour Low Temperature Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), API 6D (TT only), ASME B16.34, CSA Z245.15 Sour Service (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25. The valve has also been marked "SOUR" as required by CSA Z245.15 marking requirements for Sour Service.

The materials of construction for this valve conform to the metallurgical requirements of NACE MR0175/ISO 15156:2003 (Parts 1 & 2 for Carbon & Alloy Steels in SSC Region 3 Sour Service and Parts 1 & 3 for CRA's as specified in CSA Z245.15 Chapter 13). According to NACE MR0175-2003/ISO 15156, it is the customer's/user's responsibility to ensure that the valve materials will be satisfactory in the intended service.

The minimum service temperature of these valves is -46°C/-50°F. Impact testing has been performed in accordance with applicable ASTM requirements and those of CSA Z245.15 for Category II M45C Service.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

The B2 and TT valve models are constructed to be anti-static as standard.

Approved by:

eg Ogarsinko, M.Eng., P.Eng.

Engingering Manager

09/13/10 EWR 7463-01 Rev.06.doc



Cameron Canada Corporation 3707-97th St. Edmonton Alberta Canada TGE 612 Phone 780.468.2732 www.c-a-m.com

#### CERTIFICATE OF CONFORMANCE

## API 598 Pressure Testing – Carbon and Low Alloy Steel (2" RP and Smaller)

**COMPLIANCE:** These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

# Carbon & Low Alloy Steel Shell and Seat Test Pressures (Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

M. Cido

Murray Aide, Quality Manager



Specification Notes:

	Name	Revision	Grade	Description	Revision Year
	ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2011.
1					

Product Information:

Item#	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-10000532600	BODY,1/2" 6000 WOG,ASTM A105/LF2	G28D448		

Chemical Information:

Item#	С	Mn	P	S	Si	Ni	۵	Мо	Qu	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.15									
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0,4	0.08	0.43	0.02	1.00	0,32
1	.19	.88.	.017	.012	.26	.01	.02	.01	.01	.06	0.356	.01		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft-lb (average of a set)	Charpy Temp (°F)	% Red of Area	Hardness (Brineli)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		187
1	74694	53664	31.5	97, 46, 82	-50	72	159

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2HRS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and ER10204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings 2011

Product Information:

Item#	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-10000532600	BODY,1/2" 6000 WOG,ASTM A105/LF2	G28D424		

Chemical Information:

Item#	С	Mn	P	S	Si	Ni	Cr Cr	Mo	Q.	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.15									
Max	0,23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.19	.88	.017	.012	.26	.01	.02	.01	.01	.06	0.356	.01		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft-lb (average of a set)	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		187
1	80496	62366	33	105, 118, 118	-50	75	164

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2HRS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and El110204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings 2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-1020100231600	CAP,1/4" FP 6000 WOG FNPT, ASTM A350 GR	HN47		
1	I	!	l		ı

Chemical Information:

Item#	c	Mn	P	S	Si	Ni	O-	Mo	Q.	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0,030	0,030	0.3	0.4	0,3	0.12	0,4	0.08	0,43	0.02	1.00	0.32
1	0.21	0.84	0.014	0.009	0.21	0.01	0.02	0	0.02	0.002	0.36			

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	(Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	72708	56156	37.4	83, 82, 83	-50	76.2	149

Additional Notes:

Austenitize at 1550-1700'F(843-930'C). Cycle time shall be one hour minimum.(Actual: 920'C, 80 minutes) O/Q, Temper @ 1100-1300'F (590-704'C), holding at temp. a minimum of 30 min/in.

Chemical Information Notes:

1. RES. 0.052

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EH10204 3.1



#### 璋 實 業 有 CORPORATION WON ZONE

3F No. 185 Chang Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C.

370 桃園縣中興中中華路2段185號3樓 統一編號:16879927 Tel: (03)4341-325 Fax: +886-3-4341-525 E-mail: wonzone.taiwan/a msa.hinet.net

CERTIFICATE NO. 120418- 2 CERTIFICATE OF CHEMICAL ANALYSIS DATE: 18-Apr-12 AND MECHANICAL PROPERTIES To COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA INVOICE NO. WZ-120418A Your Order No. 4503207352/215246/221590/233955/238892/244917/245030/260239/279724 MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D Mechanical Properties DRAWING No. Heat Code OTY PART NAME Y.S.(KSI) T.S.(KSI) ELO.(%) HRC RA (%) ft-Ibf (-75°F) 105 min 125 min 16 min 29~33 50 min 15 min 72 8,000 [5A-11300513617 Stem 1/2" #02001 R4611 138 145 22 31 103/106/99 #02122 DS 140 23 32 69 96/89/87 2,700 5A-11301513617005 Stem 11/2" 126 DN 129 22 71 78/78/79 38 5A-11303013370005 Stem 3" #02124 116 30 DP 20.0 71 118/108/109 72 5A-11304013074005 Stem 4" 141 146 32 #02125 30 72 98/92/93 1.400 5A-11500513617 Ball 1/2" #06001 S6121 115 136 23 #06002 S6122 117 135 23 29 70 103/100/105 1.260 5A-11501013617 Ball 7/8" 70 #060031 68/79/65 96 [5A-11501513617 Ball 1%"] S6182 130 142 21.0 31 18 5A-11502013617 Ball 2" #06004 S6141 131 141 20 31 70 38/36/36 Chemical Composition (%) Heat Cu Nb+Ta C Si S p Cr Ni Mo Code Мn 15-17.5 3.0-5.0 0.5 max 3.0-5.0 0.15 - 0.450.07mas L0max 1.0max .030max .040max 0.02015.19 0.22 R4611 0.02 0.620.440.0234.31 0.13 3.43 DS 0.030.630.480.026 0.029 15.43 4.24 0.15 3.39 0.21 DN 0.021 0.028 15.13 0.10 3.41 0.20 0.02 0.620.454.24 DP 0.21 0.02 0.0200.027 15.09 0.213.39 0.610.444.34 S6121 0.020.640.500.024 0.02815.16 4.22 0.13 3.38 0.22 S6122 0.01 0.028 0.028 15.21 0.23 0.630.504.22 0.133.45 S6182 0.03 0.63 0.47 0.022 0.03115.36 4.36 0.16 3.41 0.23 S6141 0.020.660.490.0240.029 15.05 4.34 0.19 3.34 0.20 Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air Charpy Impact Test Specimens: 10*10*55mm(Longitudinal) NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B QUALITY CONTROL INSPECTOR MANAGER Grant Hou Sandy Yeh

> Cameron Approved By: laia Date:05/09/12 4:08

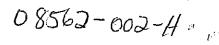


### 原璋實業有限公司 WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 320 桃園縣中壢市中華路 2 段 1 8 5 號 3 樓 統一編號: 1 6 8 7 9 9 2 7 Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@rmsa.hinet.net

CERTIFIC	CATE OF	CHEMICA	L ANALY	'SIS		CERTIFIC	CATE NO.	120328-	4
AND MEG	CHANICA	L PROPE	RTIES				DATE:	28-M	lar-12
		To. <b>C</b> (	OOPER C	AMERON	CANADA	LTDNU	ΓRON		
		2125-6	AVENUE	E. EDMON	TON AB T	6P 1Z4, CA	NADA		
INVOICE	NO. WZ-	120328A			Your Ord	er No. 4503	3207262		
Material S	Specificatio	n: ASTM	A351 CF8	M	Heat Trea	tment: So	lution Ann	ealed	
OPV	D. DT N. V.	r-	DRAW	ING No.	Hent Code		Mechanica	l Properties	
Q'TY	PART NAM	E	DRAW	ING No.	rient Code	T,S.(KSI)	V.S.(KSI)	ELO.(%)	нвพ
						<u>70 min</u>	<u>30 min</u>	<u> 30 min</u>	140-237
5,600	5A-115005	341617 Ball	1/2" #	06001-010	S6123	80.4	50.5	46	170
7,560	5A-115010	)41617 Ball	17/8" #	406002-010	S6125	79.6	48.3	45	161
1,116	5A-115020	)41617 Ball	12" #	06004-010	S6128	81.1	51.2	46	164
80	5A-215040	141220002	Ball 4" #	06040-041	S6129	79.6	46.0	36.2	157
Heat				Chemie	al Composi	ition (%)			
Code	С	Mn	Si	S	P	Cr	Ni	Mo	
	0.08 _{mils}	1.5 _{max}	1.5 _{max}	.040max	<u>,040max</u>	<u>18-21</u>	9-12	2.0-3.0	
S6123	0.0590	0.6969	1.1067	0.0080	0.0297	18.4841	9.1535	2.12-48	
S6129	0.0720	0.7300	1.1500	0.0078	0.0260	18.1200	9.1900	2.0800	
S6125	0.0374	1.0027	0.4578	0.0099	0.0386	18.5585	9.3082	2.2589	
S6128	0.0463	1.0344	0.4178	0.0078	0.0381	18.5509	9.2424	2.2479	
NOTE: <u>CE</u>	RTIFICAT	<u>E ACCORI</u>	DING TO E	N 10204/3.1	В				
	QUAL	ITY CON	TROL IN	SPECTOR				N	IANAGER
		Sandy	Yeh				Grant S	Hsu	

Cameron Approved By: LAIA Date:05/03/12 8:23





Monday, 07-Nov-2011

From:

To:

Cameron Canada 3707 97 Street Edmonton, Alberta, Canada T6E 6J2

Phone: 780-468-2732

#### Subject:

Serial 2247455 Quantity/Series 50

#### Comments:

Part#: 5A-T3R20S30BZ

Description: BV R20 FNPT NUTRON T3 3000 WOG STD

Sales Order#: N/A

Customer PO#: N/A



Monday, 07-Nov-2011

From:

To:

Cameron Canada 3707 97 Street Edmonton, Alberta, Canada T6E 6J2

Phone: 780-468-2732

### **Document Summary Page**

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	В	LOC			Nutron T3, B3 Standard
2	Hydro Test	598			API 598
3	S518A	77			BALL,1-1/2",ASTM A675 GR 70,HARD CHROME
4	KP				STEM,1-1/2",w/O-RING SEAL,ASTM A108 GR
5	110051	DC			CAP,2" RP 4000 WOG FNPT,ASTM A105/LF2
6	A82D314				BODY,1-1/2" 6000 WOG, A105/LF2
7	A84D344				BODY,1-1/2" 6000 WOG, A105/LF2



Cameron Canada Corporation 3707 – 97 Street Edmonton Alberta Canada T6E 6/2 Phone 780.465.686B Fax 780.465.1244 WYVY.C-3-m.com

#### GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3 & B3

Style 'B': Standard Service

Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Standard Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), ASME B16.34, CSA Z245.15 (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25.

The minimum service temperature of these valves is -29°C/-20°F.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

Approved by:

reg Ogaranko, M.Eng., P.Eng

Fngineering Manager



Cameron Canada Corporation 3707-97th St. Edmonton Alberta Canada TEE 612 Phone 780.468.2732 www.c-a-m.com

#### CERTIFICATE OF CONFORMANCE

## API 598 Pressure Testing – Carbon and Low Alloy Steel (2" RP and Smaller)

**COMPLIANCE:** These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

# Carbon & Low Alloy Steel Shell and Seat Test Pressures (Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

M. Ceido

Murray Aide, Quality Manager



### 原璋實業有限公司 WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 3 2 0 桃園縣中壢內中華路 2 段 1 8 5 號 3 樓 統一編號: 1 6 8 7 9 9 2 7 Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS CERTIFICATE NO. 100908-5 DATE: AND MECHANICAL PROPERTIES 8-Sep-10 To. COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA Your Order No. 4502531251/531252/531254 INVOICE NO. WZ-10908A Heat Treatment: NORMALIZING Material Specification: ASTM A105N Mechanical Properties O'TY Heat Cade PART NAME DRAWING No. Y.S.(Mpa) T.S.(Mpa) ELO.(%) RA (%) HB137-187 250 min 485 min 30 min 30 min 1,296 Ball 1-1/2" #06003-301 S518A 289 490 38 62.3 144 #06004-301 S518A 490 62.3 144 252 Ball 2" 289 38 490 38 62.3 144 126 Ball 3" #06005-301 S518A 289 Chemical Composition (%) Heat Cu S P CrMo  $\mathbf{v}$ Nb Code C Mn Si Ni  $.040_{\rm max}$ .035max 0.35max 0.60-1.05 0.10-0.35 .30max .12max .05max .40 max .02max .40 may 0.210 0.8800.240 0.006 0.027 0.030 0.010 0.01 0.002 0.010S518A PLATING: NICKEL UNDER CHROME AS PER NATIONAL STANDARD 4157 CNS H3060 MANAGER QUALITY CONTROL INSPECTOR Grant Hry Lower How





原璋實業有限公司 WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 320 桃園縣中壢市中華路 2 段 1 8 5 號 3 樓 統一編號: 1 6 B 7 9 9 2 7 Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hlnet.net

CERTIFICATE OF CHEMICAL ANALYSIS CERTIFICATE NO. 110720-2 AND MECHANICAL PROPERTIES DATE: 20-Jul-11 To. COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA INVOICE NO. WZ-110720A Your Order No. 4502961290/956946 MATERIAL SPECIFICATION: ASTM A108 GR 12L14 Mechanical Properties Heat Code Q'TY PART NAME DRAWING No. ELO.(%) V.S.(KSI) T.S.(KSI) RA (%) HRB 381 |Stem 1-1/2" #02122 KР 72.9 78.6 18.1 48.8 165 219 Stem 1-1/2" #02122 KS 74.8 80.1 16.8 37.2 178 396 Stem 2" #02123 KR 72.2 78.5 19.0 49.0 165 Heat Chemical Composition (%) Code C S Р Рb Мn 0.04-0.09 0.26-0.35 0.15max 0.85 - 1.150.15-0.35 KP 0.061.04 0.061 0.327 0.28 KS 0.061.04 0.061 0.28 0.327KR 0.070.97 0.057 0.308 0.26 NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B QUALITY CONTROL INSPECTOR MANAGER Sandy Yeh Grant Hru

APPROVED
By Iaia at 11:21 am, 8/6/11



Specification Notes:

Name	Revision	Grade	Description	Revision Year	
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	2010	

Product Information:

Item#	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-1010102032400	CAP,2" RP 4000 WOG FNPT,ASTM A105/LF2	110051	DC	

Chemical Information:

Item#	C	Mn	P	S	Si	N	Or .	Mo	Сī	ν	Œ	Cb/Nb	Cu+Ni	Qr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0,030	0,3	0,4	0.3	0.12	0.4	0.08	0,43	0.02	1.00	0.32
1	.21	.93	,013	.024	.24	.07	.095	.017	.19	.036	0,412	.004	1	

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	78000	61600	30	25, 52, 19	-50	71	163

Additional Notes:

QUENCHED AND TEMPERED

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and Ell10204 3.4



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings 2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-10001532600	BODY,1-1/2" 6000 WOG, A105/LF2	A82D314		

Chemical Information:

Item#	С	Mn	Р	S	Si	Ni	Gr	Mo	Qi .	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0,3	0.12	0.4	0,08	0.43	0.02	1.00	0.32
1	.18	.9	.009	.007	.22	.048	.11	.009	.083	.046	0.3717	.012		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Mán	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	74694	52214	32.5	107, 107, 107	-50	73	161

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2HRS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EH10204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings 2010

Product Information:

ſ	Item#	Product Code	Description		HeatCode	PO#
F	1	5A-10001532600	BODY,1-1/2" 6000 WOG, A105/LF2	A84D344		

Chemical Information:

Item#	С	Mn	P	S	si	Ni	Q.	Mo	Cu	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0,6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1.	.2	.91	.01	.006	.24	.043	.12	.009	.082	.045	0.3948	.017		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	74694	49313	29.5	107, 107, 107	-50	70.5	171

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2HRS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EH10204 3.1



Tuesday, 26-Jul-2011

From:

To:

Cameron Canada 3707 97 Street Edmonton, Alberta, Canada T6E 6J2

Phone: 780-468-2732

#### Subject:

Serial # 2142539 Quantity/Series 50

#### Comments:

Part#

5A-T3F02S30BZ

Description: BV F02 FNPT NUTRON T3 3000 WOG STD

Sales Order#: N/A

Customer PO#: N/A



Tuesday, 26-Jul-2011

From:

To:

Cameron Canada 3707 97 Street Edmonton, Alberta, Canada T6E 6J2

Phone: 780-468-2732

### **Document Summary Page**

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	В	LOC			Nutron T3, B3 Standard
2	Hydro Test	598			API 598
3	S5644				BALL,1/2", ASTM A351 GR CF8M
4	R4101				STEM,1/2",ASTM A564 17-4 H1150 NACE
5	HN38				CAP,1/4" FP 6000 WOG FNPT, ASTM A350 GR
6	G57D110				BODY,1/2" 6000 WOG,from BRSTK,ASTM A479
7	G57D228				BODY,1/2" 6000 WOG,ASTM A105/LF2
8	G57D116				BODY,1/2" 6000 WOG,ASTM A105/LF2



Cameron Canada Corporation 3707 - 97 Street Edmonton Alberta Canada T6E 612 Phone 780.463.6868 Fax 780.465.1244 .wvw.c-a-m.com

#### GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3 & B3

Style 'B': Standard Service

Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Standard Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), ASME B16.34, CSA Z245.15 (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25.

The minimum service temperature of these valves is -29°C/-20°F.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

Approved by:

Greg Oggranko, M.Eng., P.En



Cameron Canada Corporation 3707-97th St. Edmonton Alberta Canada T6E 6J2 Phone 780.468.2732 www.c-a-m.com

#### CERTIFICATE OF CONFORMANCE

## API 598 Pressure Testing – Carbon and Low Alloy Steel (2" RP and Smaller)

**COMPLIANCE:** These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

# Carbon & Low Alloy Steel Shell and Seat Test Pressures (Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

M. aido

Murray Aide, Quality Manager



### 原璋實業有限公司 WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 320 桃園縣中壢市中華路 2 段 1 8 5 號 3 樓 統一編號: 1 6 8 7 9 9 2 7 Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFI	CATE OF	CHEMICA	L ANALY	/SIS	(	CERTIFIC	ATE NO.	110608-	4
AND ME	CHANICA	L PROPEI	RTIES				DATE:	8-Ju	n-11
		To, C	OOPER C	AMERON	CANADA	LTDNU	rron		
		2125-6	4 AVENUE	E, EDMON	TON AB T	5P 1Z4, CA	NADA		
INVOICE	NO. WZ-	110608A			Your Ord	er No. 4502	877267/87	8558	
Material S	Specificatio	n: ASTM	A351 CF8	M	Heat Trea	tment: Sol	ution Ann	enled	
Q'TY	PART NAM	TE	DR AW	ING No.	Heat Code		Mechanica	l Properties	
QII	PARI NAM	E	DIAW	110 110.	meat Code	T.S.(KSI)	Y.S.(KSI)	ELO.(%)	НВ
						70 min	<u>30 min</u>	30 min	183 max
2,100	Ball 1/2"		#	06001-010	S5644	79.2	49.6	52	172
1,080	Ball 7/8''		#	06002-010	S5645	78.9	44.8	44	163
2,976	Ball 1-1/2'	1	#	06003-010	S5646	76.5	42,1	46	149
594	Ball 2''		#	06004-010	S5647	76.8	51.9	45	. 166
3	Ball 4"		#	06040-041	S5648	75.1	46.5	39.4	160
Heat				Chemic	al Composi	tion (%)			
Code	С	Mn	Si	S	P	Cr	Ni	Mo	
	<u>хят80.0</u>	1.5max	1.5 _{max}	.040mex	.040max	<u>18-21</u>	<u>9-12</u>	2.0-3.0	
S5644	0.0450	1.0588	0.5062	0.0059	0.0315	18.6619	9.0723	2.0811	
S5645	0.0561	0.8643	0.4459	0.0095	0.0344	18.4965	9.3286	2.1623	
S5646	0.0430	1.0133	0.0443	0.0113	0.0300	18.4567	9.3167	2.1300	
S5647	0.0557	0.9085	0.4434	0.0083	0.0334	18.4506	9.2969	2.2314	
S5648	0.0567	0.8533	1.1700	0.0106	0.0290	18.1767	9.2067	2.0533	
NOTE: <u>CE</u>	ERTIFICAT	<u>E ACCORI</u>	DING TO E	N 10204/3.1	<u>B</u>				
	QUAI	LITY CON	TROL IN	SPECTOR				M	IANAGER
		Sandy	Yeh			·	Grant S	Hsu	





No 0 100

### 原璋實業有限公司 WON ZONE CORPORATION

31 No. 185 Chung Hwa Road Sec. 2. Chung Li City 320. Taiwan R.O.C. 320 核寬縣中壢門中華路 2 段 1 8 5 號 3 樓 一編號: 1 6 8 7 9 9 2 7 Tel: (03)4341 325 Fax: -886-3-4341 525 F-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS
AND MECHANICAL PROPERTIES

CERTIFICATE NO. 110511-1

DATE:

11-May-11

To. COOPER CAMERON CANADA LTD.-NUTRON

2125-64 AVENUE, EDMONTON AB T6P 174, CANADA

INVOICE NO. WZ-110511A

Your Order No. 4502836671

MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D

Q'TY	PART NA	140	DRAWI	NO No	Hent Code	M	echanica.	Propertie	35		
Q 1 1	EART NA	"AIT?	DICA WI	, , , , , , , , , , , , , , , , , , , ,		Y.S.(KSI)	T.S.(KSI)	Fl.O.(%)	HRC	RA (%)	ft-lbf (-75°F)
						<u>105 min</u>	125 min	<u>16 min</u>	24-33	<u>50 min</u>	<u>15 min</u>
3,000	Stem 1/2	11		#02001	R4101	123	137	21	32	70	108/108/105
7,680	Stem 7/8	3"		#02002	R4102	113	136	21.5	30	<b>7</b> 6	137/140/136
1,500	Stem 1-1/2"			#02122	DG	124	139	22	31	71	83/78/77
660	Stem 2"			#02123	DD	119	137	22	30.0	70	111/106/104
120	Stem 3"			#02005	DE	129	138	25	32	75	122/127/120
700	Ball 1/2'	•		#06001	S5602	115	136	23	30.0	72	98/92/93
1,200	Ball 7/8'	11		#06002	S5603	113	131	22	30	71	108/114/111
.336	Ball 1-1	<b>/2"</b>		#06003	S5604	.126	. 138	.21	32	. 68	82/77/79
Heat				Cho	emical Co	ompositio	n (%)				
Code	С	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta	
	0.07max	<u>1.0max</u>	1,0max	<u>.030max</u>	.040max	<u>15-17.5</u>	3.0-5.0	0.5 max	3.0-5.0	0.15-0.45	
R4101	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22	
R4102	0.02	0.63	0.46	100.0	0.027	15.14	4.40	0.15	3.31	0.21	
ממ	0.03 0.65 0.44		0.021	0.030	15.39	4.29	0.16	3,31	0.22		
DE	0.03	0.66	0.47	0.027	0.029	15.26	4.15	0.19	3.35	0.21	
DG	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22	
S5602	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22	

Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F

0.030

0.029

15,42

15.26

4.31

4.15

0.14

0.19

3.31

3.35

0.026

0.027

Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air

0.41

0.47

NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B

0.63

0.66

S5603

\$5604

0.02

0.03

QUALITY CONTROL INSPECTOR

MANAGER

0.23

0.21

Sandy Yeh

Grant Hou

APPROVED
By LAIA at 10:36 am, 5/20/11



Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	

Product Information:

Item#	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-1020100231600	CAP,1/4" FP 6000 WOG FNPT, ASTM A350 GR	HN38		

Chemical Information:

Item#	C	Mn	Р	S	Si	N	G.	Mo	Q1	V	Œ	Cb/Nb	Cu+Ni	C+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0,030	0,3	0.4	0.3	0.12	0.4	80.0	0.43	0,02	1.00	0.32
1	.21	.86	.016	.006	.21	.02	.02	0.0	.02	.001	0.360	0.0		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lib	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Man	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	72552	51231	37.5	82, 102, 97	-50	76	143

Additional Notes:

AUSTENITIZED @920'C 80 MIN OIL QUENCHED TEMPERED @590-704'C 30MIN/IN

Chemical Information Notes: 1. RES 0.061

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EH10204 3.1



Specification Notes:

Name	Revision	Grade	Description	Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron			Carbon & Low-Alloy Steel Forgings	

Product Information:

Item#	Product Code	Description	HeatNumber	Heat Code	PO#
1	5A-10000523600	BODY,1/2" 6000 WOG,from BRSTK,ASTM A479	G57D110		

Chemical Information:

Item#	С	Mn	P	S	Si	N	G.	Мо	Cu	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0,21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1,00	0.32
1	.18	.88	.013	,004	.23	.01	.01	.007	.01	.001	0.3316	,003		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22.	15	-80	30	137
Max	95000				-50		197
1	83397	65267	27	18, 134, 142	-50	77	155

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2HRS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EP10204 3.1



ASTM A105/ASTM A350 GR LF2 Cameron

### **Material Test Report**

**Revision Year** 

Specification Notes:

Revision Grade Description

Carbon & Low-Alloy Steel Forgings

Product Information:

Name

Item#	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-10000532600	BODY,1/2" 6000 WOG,ASTM A105/LF2	G57D228		

Chemical Information:

Item#	C	Mn	P	S	S	Ni	<u> </u>	Mo	Cu	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0,32
1	.18	.88	.01.3	.004	.23	.01	.01	.007	.01	.001	0,3316	.003		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brineli)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	79046	58740	29.5	107, 107, 107	-50	77	162

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2HRS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and Elf10204 3.1



Contraction of the second

Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings

Product Information:

	Item#	Product Code	Description	Heat Number	Heat Code	- "
Ī	1	5A-10000532600	BODY, 1/2" 6000 WOG T3	G57D116		

Chemical Information:

Item#	C	Mn	P	S	Si	Ni	<b> </b> ℃	Mo	Cu	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10			··						
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1,00	0.32
1	0.18	0.88	0.013	0.004	0.23	0.01	0.01	0.007	0.01	0.001	0.3316	0,003		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Mén	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	71793	50763	32.3	179, 202, 168	-51.	75.5	152

Additional Notes:

QUENCHED @920°C, 2HRS @800°C, 2HRS. TEMPERED @700°C, 2HRS.

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and Ellf0204 3.1





Wednesday, 23-Nov-2011

From:

3707 97 St.

Edmonton, Alberta, Canada

T6E 6J2

Phone: 780-463-6868 Fax: 780-463-6259 Web Site: www.c-a-m.com To:

CAMERON -- STOCK 3707-97 St. Edmonton, Alberta, Canada T6E6J2

Subject:

Serial 2253361

Quantity/Series 350

#### Comments:

Part#:

5A-T3F05S30BZ

Description: BV F05 FNPT NUTRON T3 3000 WOG STD

Sales Order#: N/A

Customer PO#: N/A



Wednesday, 23-Nov-2011

From:

3707 97 St. Edmonton, Alberta, Canada

T6E 6J2

Phone: 780-463-6868 Fax: 780-463-6259 Web Site: www.c-a-m.com To:

CAMERON -- STOCK 3707-97 St. Edmonton, Alberta, Canada T6E6J2

### **Document Summary Page**

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	В	LOC	·		Nutron T3, B3 Standard
2	Hydro Test	598	100000		API 598
3	S5792				BALL,1/2", ASTM A351 GR CF8M
4	R4183				STEM,1/2",ASTM A564 17-4 H1150 NACE
5	R4131				STEM,1/2",ASTM A564 17-4 H1150 NACE
6	318064			- Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Constitution - Cons	BODY,1/2" 6000 WOG,ASTM A105/LF2
7	Z74D345				CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
8	Z74D342				CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR



Cameron Canada Corporation 3707 – 97 Street Edmonton Alberta Canada T6E 6/2 Phone 780,463,6868 Fax 780,465,1244 WWW,Ca-m.com

#### GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3 & B3

Style 'B': Standard Service

Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Standard Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), ASME B16.34, CSA Z245.15 (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25.

The minimum service temperature of these valves is -29°C/-20°F.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

Approved by:

Greg Ogaranko, M.Eng., P.Eng

Engineering Manager

Cameron Canada Corporation 3707-97th St. Edmonton Alberta Canada 16E 6J2 Phone 780.468.2732 www.c-a-m.com

#### **CERTIFICATE OF CONFORMANCE**

## API 598 Pressure Testing – Carbon and Low Alloy Steel (2" RP and Smaller)

**COMPLIANCE:** These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

# Carbon & Low Alloy Steel Shell and Seat Test Pressures (Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

M. Ceido

Murray Aide, Quality Manager



### 原璋實業有限公司 WON ZONE CORPORATION

n,

3F No. 185 Chung Hwa Road Sec. 2. Chung Li City 320, Taiwan R.O.C. 320 私園縣中堰市中華路 2 段 1 8 6 號 3 樓 統一編號: 1 6 8 7 9 9 2 7 fel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@-msa.hinet.net

CERTIFI	CATE OF	CHEMICA	L ANALY	/SIS		CERTIFIC	ATE NO.	110914-	3		
AND ME	CHANICA.	L PROPE	RTIES				DATE:	14-S	ер-11		
		To, <b>C</b> (	OOPER C	AMERON	CANADA	LTDNU	TRON .		i		
		2125-6-	4 AVENUE	E, EDMON	TON AB T6P 1Z4, CANADA						
INVOICE	NO. WZ-	110914A			Your Ord	er No. 4502	990586/30	47672			
Material S	pecificatio	n: ASTM	A351 CF8	M	Heat Trea	tment: Sol	ution Ann	ealed			
Q'TY	PART NAM	F	DR A W	ING No.	Heat Code		Mechanical	l Properties			
<b>V</b> 1 1	I ANI .YAN	ъ	BRATA			T.S.(KSI)	V.S.(KSI)	ELO.(%)	нв		
				·		<u>70 min</u>	<u>30 min</u>	<u>30 min</u>	183 max		
6,300	Ball 1/2"		#	06001-010	S5792	80.0	48.9	55	171		
8,100	Ball 7/8''		#	06002-010	S5793	76.8	47.6	45.5	163		
666	Ball 2"		Ħ	06004-010	S5873	76.8	48.3	44.0	165		
400	Ball 3"		#	06005-010	U1941	73.3	46.5	37.8	157		
28	Ball 3"		#	06005-010	U1942	75.1	43.7	35.2	159		
18	Ball 6"			#06024	U1953	74.5	44.2	34.8	162		
Heat				Chemic	al Composi	tion (%)					
Code	C	Mn	Si	S	P	· ····Cr	Ni	Mo			
	Q.Q8 _{maz}	1.5mas	1.5max	.040max	<u>.040m≖x</u>	<u>18-21</u>	<u>9-12</u>	2.0-3.0			
S5792	0.0640	0.7759	0.8518	0.0055	0.0272	18.4510	9.1608	2,0772			
S5793	0.0614	0.8029	0.5221	0.0071	0.0379	18.5300	9.3242	2.1904			
S5873	0.0545	0.8490	0.5217	0.0063	0.0385	18.7006	9.2707	2.1354			
U1941	0.0580	0.6050	1.1250	0.0110	0.0295	18.1050	9.1850	2.0050			
U1942	0.0740	0.6600	1.1300	0.0120	0.0270	18.1400	9.1000	2.0500			
U1953	0.0690	0.7600	1.1900	0.0110	0.0260	18.3400	9.0100	2.0700			
NOTE: <u>CE</u>	RTIFICAT	E ACCORI	DING TO E	N 10204/3.1	В						
	QUAL	ITY CON	TROL INS	SPECTOR				M	IANAGER		
		Sandy	Yeh			Grant S	Hsu				





璋實業有限

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 320 桃園縣中壢市中華路2段185號3樓 統一編號:16879927 Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@rnsa.hinet.net

Mechanical Properties

CERTIFICATE OF CHEMICAL ANALYSIS

CERTIFICATE NO. 110803-1

AND MECHANICAL PROPERTIES

DATE:

3-Aug-11

To. COOPER CAMERON CANADA LTD.-NUTRON

2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA

INVOICE NO. WZ-110803A

Your Order No. 4502918444/956946/990586

MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D

Q'TY	PART NA	ME	DD A W/I	ING No.	Heat Code	IV.	echanica	Properti	es		
Ų I I	FAKI NA	TIATE	DIGATE	1110 110.	Treat Code	Y.S.(KSI)	T.S.(KSI)	ELO.(%)	HRC	RA (%)	ft-lbf (-75°F)
		<u>,                                      </u>		,		<u>105 min</u>	<u>125 min</u>	<u>16 min</u>	<u>24~33</u>	50 min	<u> 15 min</u>
5,000	Stem 1/2	2"		#02001	R4183	125	138	23	30	70	92/92/89
7,040	Stem 7/8	3"		#02002	R4184	126	140	20	30	70	97/98/96
2,700	Stem 1-1	1/2"		#02122	DJ	122	137	22.5	31	72	112/115/113
240	Stem 3"				DE	129	138	25	32	75	122/127/120
700	Ball 1/2	11		#06001	S5751	115	136	23	30	72	98/92/93
1,620	Ball 7/8	11		#06002	S5752	130	140	20.5	30	70	103/98/102
108	Ball 1-1	all 1-1/2"			S5753	126	138	21	32	68	82/77/79
306	Ball 2"			#06004	S5791	131	141	20	31	70	38/36/36
Heat				Che	mical Co	ompositio	n (%)				
Code	С	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta	
	0.07max	1.0max	1.0max	.030max	.040max	<u>15-17.5</u>	3.0-5.0	0.5 max	3.0-5.0	0.15-0.45	
R4183	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20	
R4184	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20	
$\mathbf{DJ}$	0.02	0.64	0.49	0.002	0.028	15.24	4.35	0.11	3.32	0.23	
DE											
	0.03	0.66	0.47	0.027	0.029	15.26	4.15	0.19	3.35	0.21	
S5751	0.03 0.02	0.66 0.64	0.47 0.50	0.027 0.024	0.029 0.028	15.26 15.16	4.15 4.22	0.19 0.13	3.35 3.38	0.21 0.22	
S5751 S5752						i	Ĺ			1	

Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F

0.029

15.05

4.34

0.024

Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air

0.49

NOTE: <u>CERTIFICATE ACCORDING TO EN 10204/3.1B</u>

0.66

0.02

S5791

QUALITY CONTROL INSPECTOR

MANAGER

0.20

Sandy Yeh

Grant Hou

0.19

3.34

By lala at 11:41 am, 8/22/11



### 原璋實業有限公 WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 320 桃園縣中壢市中華路2段185號3樓 統一編號:16879927 Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS

AND MECHANICAL PROPERTIES

CERTIFICATE NO. 110608-1

DATE:

8-Jun-11

To. COOPER CAMERON CANADA LTD.-NUTRON

2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA

INVOICE NO. WZ-110608A

Your Order No. 4502877267/878558/836671

MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D

Q'TY	DADTNA	ME	DP AW	ING No.	Heat Code	Mechanical Properties						
ŲTT	PART NA	IME	DICAWI	INO INO.	Heart Code	Y.S.(KSI)	T.S.(KSI)	ELO.(%)	HRC	RA (%)	ft-lbf (-75°F)	
						<u>105 min</u>	<u>125 min</u>	<u>16 min</u>	24~33	<u>50 min</u>	<u>15 min</u>	
5,000	Stem 1/2	2"		#02001	R4131	122	136	21	32	68	84/83/83	
2,560	Stem 7/8	311		#02002	R4132	113	136	21.5	30	76	137/140/136	
2,850	Stem 1-1	1/2"		#02122	DG	124	139	22	31	71	83/78/77	
526	Stem 2"				DH	113	131	22	30	71	108/114/111	
134	Stem 2"			#02123	DD	119	137	22	30	70	111/106/104	
180	Stem 3"			#02005	DE	129	138	25	32	75	122/127/120	
1,400	Ball 1/2'	11		#06001	S5641	115	136	23	30	72	98/92/93	
2,220	Ball 7/8'	Ball 7/8" #06				106	. 132	22.5	- 30	71	-130/131/130 -	
144	Ball 1-1/	/2"		#06003	S5643	126	138	21	32	68	82/77/79	
Heat				Che	mical Co	ompositio	п (%)					
Code	С	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta		
	0.07max	1.0max	1.0max	.030max	.040max	<u>15-17.5</u>	3.0-5.0	<u>0.5 max</u>	3.0-5.0	0.15-0.45		
R4131	0.03	0.62	0.43	0.019	0.026	15.23	4.36	0.13	3.30	0.20		
R4132	0.02	0.63	0.46	0.001	0.027	15.14	4.40	0.15	3.31	0.21		
DD	0.03	0.65	0.44	0.021	0.030	15.39	4.29	0,16	3.31	0.22		
DE	0.03	0.66	0.47	0.027	0.029	15.26	4.15	0.19	3,35	0.21		
DG	0.02	0.64	0.50	0.024	0.028	15.16	4.22	0.13	3.38	0.22		
DH	0.02	0.63	0.41	0.023	0.030	15.42	4.31	0.14	3.31	0.23		
S5641	0.02	0.64	0.50	0.024	0.028	15.16	4,22	0.13	3,38	0.22		
S5642	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20		
S5643	0.03	0.66	0.47	0.027	0.029	15.26	4.15	0.19	3.35	0.21		

Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F

Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air ...

NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B

**QUALITY CONTROL INSPECTOR** 

**MANAGER** 

Sandy Yeh

Grant Hsu [APP]



Specification Notes:

Revision Grade Description Revision Year ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings

Product Information:

Item#	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-10000532600	BODY,1/2" 6000 WOG,ASTM A105/LF2	318064		

Chemical Information:

Item#	С	Mn	P	s	Si	Ni	œ	Mo	Cri	V	Œ	Cb/Nb	Cu+Ni	Ω+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0,030	0,3	0.4	0.3	0,12	0.4	0.08	0.43	0.02	1.00	0.32
1	.19	.83	.016	.014	.2	.07	.07	.01	.25	.002	0.370	0.0		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	79891	58826	31.7	87, 84, 95	-50	75.3	171

Additional Notes:

AUSTENITIZED @920'C 80 MIN OIL QUENCHED TEMPERED @590-704'C 30MIN/IN

Chemical Information Notes: 1. RES 0.402

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EH10204 3.1

M. aida **Ouality Manager** Cameron Canada



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A350 GR LF2 Cameron LF2 Class 1 Carbon & Low-Alloy Steel Forgings 2010

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-1020100531400	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR	Z74D345		

Chemical Information:

Item#	С	Mn	P	s	Si	Ni	Cr	Mo	Cu	V	Œ	Cb/Nb
Min		0.6			0.15							
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02
1	,19	.88	.016	.009	.22	,03	.021	.015	.071	.061	0.3628	

Physical Information:

Ibem#	Tensile (psi)	Yield (psi)	% Eongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Man	70000	36000	22	15	-80	30	137
Мак	95000				-50		197
1	73244	52214	31	104, 107, 107	-50	77.5	164

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2RHS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and Ell10204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A350 GR LF2 Cameron LF2 Class 1 Carbon & Low-Alloy Steel Forgings 2010

Product Information:

I	tem#	Product Code	Description	Heat Number	Heat Code	PO #
1		5A-1020100531400	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR	Z74D342		

Chemical Information:

Item#	C	Mn	P	S	Si	NE	<u>Cr</u>	Mo	αı	ν	Œ	Cb/Nb
Min		0.6			0,15							
Max	0.23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02
1.	.19	.88.	.016	.009	.22	.03	.021	.015	.071	.061	0.3628	.013

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	70343	45687	32	104, 107, 107	-50	69.5	163

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2HRS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and El110204 3.1

08563-002-H.



Thursday, 08-Dec-2011

From:

To:

3707 97 St.

Edmonton, Alberta, Canada

T6E 6J2

Phone: 780-463-6868 Fax: 780-463-6259 Web Site: www.c-a-m.com

Subject:

Serial 2275413 Series 360

#### Comments:

Part#: 5A-T3F05S30BZ

Description: BV F05 FNPT NUTRON T3 3000 WOG STD

Sales Order#: N/A

Customer PO#: N/A



Thursday, 08-Dec-2011

From:

To:

3707 97 St. Edmonton, Alberta, Canada T6E 6J2

Phone: 780-463-6868

Fax : 780-463-6259 Web Site : www.c-a-m.com

## **Document Summary Page**

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	В	LOC	2275413	5A-T3F05S30BZ	Nutron T3, B3 Standard
2	Hydro Test	598	2275413	5A-T3F05S30BZ	API 598
3	1TS70		2275413	5A-T3F05S30BZ	BODY,1/2" 6000 WOG,ASTM A105/LF2
4	G55D112		2275413	5A-T3F05S30BZ	BODY,1/2" 6000 WOG,ASTM A105/LF2
5	G68D311		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
6	G68D319		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
7	G56D223		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
8	G55C272		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
9	G55C276		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
10	G55C277		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
11	G55C275		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
12	G55C281		2275413	5A-T3F05S30BZ	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR
13	R4221		2275413	5A-T3F05S30BZ	STEM,1/2",ASTM A564 17-4 H1150 NACE
14	S5792		2275413	5A-T3F05S30BZ	BALL,1/2", ASTM A351 GR CF8M



#### **VALVES & MEASUREMENT**

Cameron Canada Corporation 3707 – 97 Street Edmonton Alberta Canada 76E 6JZ Phone 780.465.6868 Fax 780.465.1244 www.c-a-m.com

#### GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3 & B3

Style 'B': Standard Service

Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Standard Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), ASME B16.34, CSA Z245.15 (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25.

The minimum service temperature of these valves is -29°C/-20°F.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

Approved by:

reg Ogaranko, M.Eng., P.Eng



#### **VALVES & MEASUREMENT**

Cameron Canada Corporation 3707-97th St. Edmonton Alberta Canada T6E 6J2 Phone 780.468.2732 www.c-a-m.com

#### CERTIFICATE OF CONFORMANCE

## API 598 Pressure Testing – Carbon and Low Alloy Steel (2" RP and Smaller)

**COMPLIANCE:** These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

## Carbon & Low Alloy Steel Shell and Seat Test Pressures (Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80_
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

M. aido

Murray Aide, Quality Manager



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings

Product Information:

Item#	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-10000532600	BODY,1/2" 6000 WOG,ASTM A105/LF2	11570		

Chemical Information:

Item#	C	Mn	Р	S	Si	N	C.	Mio	Q.	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0,6	1		0.10						<b> </b>			
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0,4	0.08	0.43	0.02	1.00	0,32
1	0.19	0.84	0.025	0.01	0.2	0.06	0.13	0.01	0.24	0.002	0.38			

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elengation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000	<del>-  </del>			-50		197
1	71087	49894	36.9	151,144, 159	-50	76.1	144

Additional Notes:

Chemical Information Notes: 1. Residue 0.442

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EH10204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings

Product Information:

Iten	# Product Code	Description	Heat Number	HeatCode	PO#
1	5A-10000532600	BODY,1/2" 6000 WOG,ASTM A105/LF2	G55D112		

Chemical Information:

Item#	C	Min	P	s	Si	Ni	<b>℃</b>	Mo	O1	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0,21	1.35	0.030	0.030	0.3	0.4	0.3	0,12	0.4	0.08	0.43	0.02	1.00	0.32
1	,21	.94	.015	.011	.26	.01	.01	,006	.01	.001	0.3714	.001		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Man	70000	36000	22	15	-80	30	137
Max	95000	A			-50		197
1	73969	54389	28.5	158, 153, 198	-50	77.5	152

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2HRS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and Ell10204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A350 GR LF2 Cameron LF2 Class 1 Carbon & Low-Alloy Steel Forgings 2010

Product Information:

Item#	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-1020100531400	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR	G68D311		

Chemical Information:

Item#	С	Mn	Р	s	Si	Ni	۵	Mo	Ci Ci	V	Œ	Cb/Nb
Min		0.6			0,15		·····					
Max	0,23	1.35	0.035	0.035	0.3	0.4	0.3	0.12	0.4	0,08	0,43	0.02
1.	.16	.96	.011	.006	.26	.03	.03	.01	.08	.05	0.3453	.01

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Мах	95000				-50		197
1	73969	51488	28	107, 107, 107	-50	70	151

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2HRS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and El110204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A350 GR LF2 Cameron LF2 Class 1 Carbon & Low-Alloy Steel Forgings 2010

Product Information:

Item#	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-1020100531400	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR	G68D319		

Chemical Information:

Item#	C	Mn	P	S	Si	Ni	G.	Mb	Сu	V	Œ	Cb/Nb
Min		0.6			0.15							
Max	0.23	1.35	0.035	0.035	0,3	0.4	0,3	0.12	0,4	0,08	0,43	0,02
1	0.16	0.96	0.01.1	0,006	0,26	0,03	0.03	0.01	0.08	0.05	0.3453	0,01

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Man	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	76870	52938.77	31.7	106	-50	68.5	157

Additional Notes:

Quenching @ 920' C / 2 HRS, 800' C / 2 HRS, TEMPERING 700' C / 2 HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and El110204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A350 GR LF2 Cameron LF2 Class 1 Carbon & Low-Alloy Steel Forgings 2010

Product Information:

Item#	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-1020100531400	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR	G56D223		

Chemical Information:

Item#	С	Mb	P	S	Si	Ni	Q.	Mb	a	V	Œ	Cb/Nb
Min		0.6			0,15							
Max	0.23	1.35	0,035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02
1	.18	.88	.012	.016	.19	.01	.01	.005	.01.	.002	0.3314	.002

Physical information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Mian	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	79046	55840	28	107, 107, 107	-50	71.5	162

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2HRS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EH10204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings 2010

Product Information:

ſ	Item #	Product Code	Description	Heat Number	Heat Code	PO#
ſ	1	5A-1020100531400	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR	G55C272		

Chemical Information:

Item#	С	Mn	P	S	Si	N	Or .	Mo	Qu	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	80.0	0.43	0.02	1.00	0.32
1	0.21	0.94	0.015	0,011	0.26	0.01	0.01	0,006	0.01	0.001	0.3714	0,001	0.01	0.01

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000			.1	-50		197
1	77595.19	52213.59	36	106	-50	74	162

Additional Notes:

QUENCHING 920'C @ 2 HRS, 800'C @ 2 HRS TEMPERING 700'C @ 2 HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and El110204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100531400	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR	G55C276		

Chemical Information:

Item#	С	Mn	Р	s	Si	Ni	G.	Mo	Cu	V	Œ	Cb/Nb	Cu+Nî	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.21.	.94	.015	.011	.26	.01	.01	.006	.01	.001	0.3714	.001		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Man	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	77595	53664	31	107, 107, 107	-50	74	165

Additional Notes:

QUENCHING @920'C @800'C 2HRS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and El110204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings

Product Information:

Item#	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-1020100531400	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR	G55C277		

Chemical Information:

Item#	С	Mn	P	S	Si	Ni	0	Mo	Сı	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10									
Max	0.21	1.35	0,030	0,030	0.3	0.4	0.3	0.12	0.4	0.08	0,43	0.02	1.00	0.32
1	.21	.94	.015	,011	.26	.01	.01	,006	.01	,001	0,3714	.001		<del> </del>

Physical Information:

Ibem#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	76870	53664	31.5	107, 107, 107	-50	75.5	163

Additional Notes:

QUENCHING @920'C 2HRS @800'C 2HRS TEMPERING @700'C 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EH10204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A350 GR LF2 Cameron LF2 Class 1 Carbon & Low-Alloy Steel Forgings 2010

Product Information:

Item#	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-1020100531400	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR	G55C275		

Chemical Information:

Item#	С	Mn	Р	S	Si	N	O.	Mo	Сu	V	Œ	Cb/Nb
Min	<del></del>	0.6			0.15							
Max	0.23	1.35	0,035	0.035	0.3	0.4	0.3	0.12	0.4	0.08	0.43	0.02
1	0.21	0,94	0.015	0,011	0.26	0.01	0.01	0.006	0.01	0,001	0.3714	0.001

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	76145	52939	32	107	-50	66	163

Additional Notes:

QUENCHING 920'C @ 2 HRS, 800'C @ 2 HRS TEMERPING 700'C @ 2 HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and El110204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO #
1	5A-1020100531400	CAP,1/2" FP 4000 WOG FNPT,ASTM A350 GR	G55C281		

Chemical Information:

Item#	C	Mn	P	S	Si	Ni	a.	Mo	Ci	V	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0.6			0.10		<u> </u>							
Max	0.21	1.35	0.030	0.030	0.3	0.4	0.3	0.12	0,4	0.08	0.43	0.02	1.00	0.32
1	0.21	0.94	0.015	0.011	0.26	0.01	0.01	0,006	0.01	0.001	0.3714	0.001	<u> </u>	

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/lb	Charpy Temp (°F)	% Red of Area	(Brinell)
Mén	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	76145	52214	33.5	140, 137, 173	-51	75.5	164

Additional Notes:

QUENCHED@ 920'C, 2HRS QUENCHED@ 800'C, 2HRS TEMPERED@ 700'C, 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EH10204 3.1



## 原璋實業有限公司 WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 370 桃園縣中堰市中華路2段185號3樓 統一編號:16879927 Tel: (03)4341-325 Fax: +886-3-4341-525 H-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES

CERTIFICATE NO. 110914-1

14-Sep-11

To. COOPER CAMERON CANADA LTD.-NUTRON 2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA

INVOICE NO. WZ-110914A

Your Order No. 4502956946/3001543/3044466/3047672

DATE:

MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D

CUTA	PART NAME	DRAWING No.	Hent Cude	M	echanical	Properti	es		
Q'TY	PART NAME	DICA WING NO. 1	rience nuc	Y.S.(KSI)	T.S.(KSI)	E1.O.(%)	HRC	RA (%)	ft-lbf (-75°F)
				105 min	<u>125 min</u>	<u>16 min</u>	<u>24~33</u>	<u>50 min</u>	<u>15 min</u>
6,000	Stem 1/2"	#02001	R4221	125	138	23	30	70	92/92/89
10,240	Stem 7/8"	#02002	R4311	126	140	20	30	70	97/98/96
594	Stem 2"	#02123	DH	113	131	22	30	71	108/114/111
100	Stem 3"	#02124	DE	129	138	25	32	75	122/127/120
180	Stem 3"	#02005	DE	129	138	25	32	75	122/127/120
720	Ball 1-1/2"	#06003	S5811	127	142	21	32	68	61/58/58
Heat		Che	mical Co	ompositio	n (%)				

Heat				Che	mical Co	mpositio	n (%)				
Code	С	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta	
	<u>0.07max</u>	1.0max	1.0max	<u>,030max</u>	. <u>040max</u>	<u>15-17.5</u>	<u>3.0-5.0</u>	0.5 max	3.0-5.0	0.15-0.45	
R4221	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20	
R4311	0.02	0.62	0.45	0.021	0.028	15.13	4.24	0.10	3.41	0.20	
DH	0.02	0.63	0.41	0.023	0.030	15.42	4.31	0.14	3.31	0.23	
DE	0.03	0.66	0.47	0.027	0.029	15.26	4.15	0.19	3.35	0.21	
S5811	0.03	0.65	0.48	0.025	0.029	15.39	4.29	0.14	3.47	0.22	

Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F

Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air

NOTE: <u>CERTIFICATE ACCORDING TO EN 10204/3.1B</u>

QUALITY CONTROL INSPECTOR

MANAGER

Sandy Yeh

Grant Hsu



## 原璋實業有限公司 WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 320 杭獨縣中壢市中華路 2 段 1 8 5 號 3 樓 統一編號: 1 6 8 7 9 9 2 7 Fel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

	CATE OF			/SIS	(	CERTIFIC	CATE NO.				
AND MEC	HANICA				DATE: 14-Sep-11						
				AMERON							
			AVENUE	E, EDMON	TON AB T6P 1Z4, CANADA						
INVOICE	NO. WZ-	110914A			Your Order No. 4502990586/3047672						
Material S	pecificatio	n: ASTM	A351 CF8:	M	Heat Trea	tment: Sol	lution Ann	ealed			
Q'TY	PART NAM	E	DRAWI	ING No.	Heat Code		Mechanica	l Properties			
, i i	I MINT I MAN	L	Dittivit			T.S.(KSI)	Y.S.(KSI)	ELO.(%)	нв		
						<u>70 min</u>	<u>30 min</u>	<u>30 min</u>	<u>183 max</u>		
6,300	Ball 1/2"		#	06001-010	S5792	80.0	48.9	55	171		
8,100	Ball 7/8"		#	06002-010	S5793	76.8	47.6	45.5	163		
666	Ball 2"		#	06004-010	S5873	76.8	48.3	44.0	165		
400	Ball 3"		#	06005-010	U1941	73.3	46.5	37.8	157		
28	Ball 3"		#	06005-010	U1942	75.1	43,7	35.2	159		
18	Ball 6"			#06024	U1953	74.5	44.2	34.8	162		
Heat				Chemic	al Composi	tion (%)					
Code	С	Mn	Si	S	P	Cr	Ni	$\mathbf{M}_0$			
	Q.08maz	1.5max	1.5 _{max}	<u>.040max</u>	,040max	<u>18-21</u>	<u>9-12</u>	<u>2.0-3.0</u>			
S5792	0.0640	0.7759	0.8518	0.0055	0.0272	18.4510	9.1608	2.0772			
S5793	0.0614	0.8029	0.5221	0.0071	0.0379	18.5300	9.3242	2.1904			
S5873	0.0545	0.8490	0.5217	0.0063	0.0385	18.7006	9.2707	2.1354			
L'1941	0.0580	0.6050	1.1250	0.0110	0.0295	18.1050	9.1850	2.0050	1		
U1942	0.0740	0.6600	1.1300	0.0120	0.0270	18.1400	9.1000	2.0500			
U1953	0.0690	0.7600	1.1900	0.0110	0.0260	18.3400	9.0100	2.0700			
NOTE: <u>CE</u>	RTIFICAT	E ACCORI	OING TO E	N 10204/3.1	B		· · · ·				
	QUAL	ITY CON	TROL INS	SPECTOR				N	IANAGER		
		Sandy	Yeh				Grant S	Hsu			





Monday, 04-Jun-2012

From:

To:

Cameron Canada 3707 97 Street Edmonton, Alberta, Canada T6E 6J2

Phone: 780-468-2732

#### Subject:

Serial

2448662 Quantity/Series

#### Comments:

Part #:

5A-T3F02S30LZ

Description: BV F02 FNPT NUTRON T3 3000 WOG SOUR LT

Sales Order#: N/A

Customer PO#: N/A



Monday, 04-Jun-2012

From:

To:

Cameron Canada 3707 97 Street Edmonton, Alberta, Canada T6E 6J2

Phone: 780-468-2732

## **Document Summary Page**

The documents are printed in the following order:

#	Heat #	Heat Code	Job/Serial #	Material #	Description
1	L	LOC			Nutron T3, B3, B2, TT Sour Low Temp.
2	Hydro Test	598			API 598
3	S6114				BALL,1/2", ASTM A351 GR CF8M
4	R4421				STEM,1/2",ASTM A564 17-4 H1150 NACE
5	A83D443				CAP,1/4" FP 6000 WOG FNPT, ASTM A350 GR
6	D70456	HE			BODY,1/2" 6000 WOG,ASTM A105/LF2



#### **VALVES & MEASUREMENT**

Cameron Canada Corporation 3707 - 97 Street Edmonton Alberta Canada T6E 612 Phone 780,463.6868 Fax 780,465.1244 www.c-a-m.com

#### GENERAL LETTER OF COMPLIANCE

for Valve Models:

T3, B3 & B2 & TT

Style 'L': Sour Low Temperature Service

Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Sour Low Temperature Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), API 6D (TT only), ASME B16.34, CSA Z245.15 Sour Service (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25. The valve has also been marked "SOUR" as required by CSA Z245.15 marking requirements for Sour Service.

The materials of construction for this valve conform to the metallurgical requirements of NACE MR0175/ISO 15156:2003 (Parts 1 & 2 for Carbon & Alloy Steels in SSC Region 3 Sour Service and Parts 1 & 3 for CRA's as specified in CSA Z245.15 Chapter 13). According to NACE MR0175-2003/ISO 15156, it is the customer's/user's responsibility to ensure that the valve materials will be satisfactory in the intended service.

The minimum service temperature of these valves is -46°C/-50°F. Impact testing has been performed in accordance with applicable ASTM requirements and those of CSA Z245.15 for Category II M45C Service.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

The B2 and TT valve models are constructed to be anti-static as standard.

Approved by:

g Ogaranko, M.Eng., P.Eng.

Znginoering Manager



#### **VALVES & MEASUREMENT**

Cameron Canada Corporation 3707-97th St. Edmonton Alberta Canada T6E 6J2 Phone 780.468.2732 www.c-a-m.com

#### CERTIFICATE OF CONFORMANCE

## API 598 Pressure Testing – Carbon and Low Alloy Steel (2" RP and Smaller)

**COMPLIANCE:** These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

# Carbon & Low Alloy Steel Shell and Seat Test Pressures (Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80

M. Cido

Murray Aide, Quality Manager



No 0 100 % --

## 原璋實業有限公司 WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 320 桃園縣中壢市中華路 2 段 1 8 5 號 3 樓 統一編號: 1 6 8 7 9 9 2 7 Tel: (03)4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@ msa.hinet.net

	CATE OF			YSIS	(	CERTIFIC	TATE NO.	120229-			
AND MEG	CHANICA	L PROPEI	RTIES		DATE: 29-Feb-12						
		To. <b>C</b> 0	OOPER C	AMERON	CANADA	LTDNU	ron				
		2125-6-	4 AVENUE	E. EDMON	TON AB T	6P 1Z4. CA	NADA				
INVOICE	NO. WZ-	120229A			Your Ord	er No. 4503	3194451/20	5888			
Material S	Specificatio	n: ASTM	A351 CF8	M	Heat Trea	tment: So	lution Ann	caled			
				F3 - 214 - 3 - 1		Mechanical Properties					
QTY	PART NAM	E	DRAW	ING No.	Heat Code	T.S.(KSI)	V.S.(KSI)	ELO.(%)	HBW		
						<u>70 min</u>	<u>30 min</u>	<u>30 min</u>	140-237		
4,200	5A-115005	541617 Ball	11/2" #	406001-010	S6114	79.2	50.0	48	170		
30	5A-215030	)41220 Ball	13"	#5A-06029	S6115	72.6	31.0	47.5	171		
30	5A-215040	141220002	Ball 4" = #	£06040-041	S6117	76.6	44.7	37.0	159		
Heat				Chemic	al Composi	tion (%)					
Code	С	Mn	Si	S	P Cr Ni <b>Mo</b>						
<u> </u>	0,08 _{max}	1.5 _{max}	1.5 тах	.040max	.040max	<u>18-21</u>	<u>9-12</u>	2.0-3.0			
S6114	0.0652	0.8437	0.9549	0.0098	0.0318	18.3670	9.0911	2.0788			
S6115	0.061	0.87	0.97	0.012	0.032	18.21	9.21	2.08			
S6117	0.0605	0.7100	1.1550	0.0066	0.0255	18.1950	9.1850	2.0400			
NOTE: <u>CE</u>	RTIFICAT	E ACCORI	DING TO E	N 10204/3.1	В	<u> </u>			<u>                                     </u>		
	QUAI	JTY CON	TROL IN	SPECTOR	····			M	IANAGER		
		Sandy	Yeh				Grant S	Hsu			



WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 320, Taiwan R.O.C. 320 桃園縣中壢市中華路2段185號3樓 統一編號:16879927 Tel: (03)4341.325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.binet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES

CERTIFICATE NO. 111214-1

DATE:

14-Dec-11

To. COOPER CAMERON CANADA LTD.-NUTRON

2125-64 AVENUE, EDMONTON AB T6P 1Z4, CANADA

INVOICE NO. WZ-111214A

Your Order No. 4503130699/130702/131676

MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D 🖊

O'TY	PART NAME	DRAWING No.	Hësit Code	: M	lechanica	l Properti	es		
<b>X</b>		5.61.4.1.6.1.6.		Y.S.(K.SI)	T.S.(KSI)	ELO.(%)	HRC	RA (%)	ft-Jbf (-75°F)
			'	<u>105 min</u>	125 min	<u>16 min</u>	<u>24~33</u>	<u>50 min</u>	<u>15 min</u>
3,000	Stem 1/2"	#02001	R4421	130	138	20,5	32	74	120/114/107
3,840	Stem 7/8" 🖊	#02002	R4422	105	138	.22	29	73	109/110/114
1,500	Stem 1-1/2"	#02122	DL	120	133	23	30	74	89/103/94
180	Stem 3"	#02005	DK	136	144	19	33	70	35/38/36
900	Ball 7/8."	/ #06002	S5972	128	139	21	32	71	99/111/111
288	Ball 1-1/2"	#06003	85973	118	138	24	30	69	75/71/76
Heat		Ch	emical Co	ompositio	n (%)				
Code	C Mn	Si S	p	Cr	Ni	Mo	Cu	Nb+Ta	

Heat				Cho	mical Co	ompositio	n (%)	***			
Code	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta	
	0.07max	1.0max	1.0max	.030max	.040max	<u>15-17.5</u>	<u>3.0-5.0</u>	0:5 max	3.0-5.0	0.15-0.45	
R4421	0.02	0.65	0.46	0.024	0.029	15.45	4.27	0.17	3.50	0,22	
R4422	0.02	0.65	0.46	0.024	0,029	15,45	4:27	0.17	3.50	0.22	
DL	0.02	0.62	0.45	0.021	0,028	15.13	4.24	0.10	3,41	0.20	
/ DK	0.02	0.66	0.49	0.024	0.029	15.05	4.34	0.19	3,34	0,20	· •
S5972	0.02	0.61	0.44	0.020	0.027	15,09	4,34	0,21	3,39	0.21	· 
\$5973	0.02	0.66	0.49	0,022	0.024	15.06	4.39	0.13	3.41	0,22,	

Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F

Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air

NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B

QUALITY CONTROL INSPECTOR

MANAGER

Sandy Yeh

Grant Hou

CAMERON

DEC 2 7 2011

Q.C. APPROVED





Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings 2011

Product Information:

Item #	Product Code	Description	Heat Number	Heat Code	PO#
1	5A-1020100231600	CAP,1/4" FP 6000 WOG FNPT, ASTM A350 GR	A83D443		

Chemical Information:

Item#	c	Mn	P	S	Si	Ni	O.	Mo	Ci:	ν	Œ	Cb/Nb	Cu+Ni	Cr+Mo
Min		0,6			0.15									
Max	0.23	1.35	0.035	0,035	0,3	0.4	0.3	0.12	0,4	0.08	0.43	0.02	1.00	0.32
1	0.19	0.89	0.01	0.006	0,23	0,046	0.13	0.006	0.081	0.041	0.3822	0.009		

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft-lb (average of a set)	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Min	70000	36000	22	15	-80	30	137
Мак	95000				-50		187
1	73244	52939	30.5	69	-50	68.5	170.33

Additional Notes:

QUENCHING 920'C @ 2HRS, 800'C @ 2HRS TEMPERING 700'C @ 2HRS

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EH10204 3.1



Specification Notes:

Name Revision Grade Description Revision Year
ASTM A105/ASTM A350 GR LF2 Cameron Carbon & Low-Alloy Steel Forgings 2010

Product Information:

			Heat Number	Heat Code	PO#
1	5A-10000532600	BODY,1/2" 6000 WOG,ASTM A105/LF2	D70456	HE	

Chemical Information:

Item#	C	Mn	P	S	Si	Ni	Q.	Mo	Cu	V	Œ	Cb/Nb	Cu+Ni	Q+Mo
Min		0.6			0.10					<b></b>			-	<del>                                     </del>
Max	0.21	1.35	0.030	0.030	0,3	0.4	0.3	0.12	0.4	0.08	0.43	0.02	1.00	0.32
1	.2	1.21	.009	.018	.21	.04	.05	.01	.110	0.0	_	.014		<u> </u>

Physical Information:

Item#	Tensile (psi)	Yield (psi)	% Elongation	Charpy ft/ib	Charpy Temp (°F)	% Red of Area	Hardness (Brinell)
Mén	70000	36000	22	15	-80	30	137
Max	95000				-50		197
1	76300	49700	34	83, 57, 87	-50	71.	148

Additional Notes:

NORMALIZED AS PER ASTM A105

We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EH10204 3.1

Issuing Authority: Marvin J. (Ty) DeBelser

Date of Issue:March 13, 2008



Quality Control

QCFOFinalInspectionReleaseCertificateR00

		INDUSTRIES INC.			
<del></del>	FINAL IN	SPECTION RELEASE CERT	IFICATE		
CUSTOMER:	NWP STOCK			SALES ORDER#:	NA
PRODUCT:	Scrubber, Vertical Vessel, 8-5/8" x 23 None		graphy	WO#: DATE: OCT &S	08500 -// ১-
REVIEWED B		AL INSPECTION DOCUMENTATION ACCEPTED:	REJECTED:	- Allen	
	OCUMENTATION REQUIREMENTS: (SEE DOCUM				
	DOCUMENT REQUIREMENTS: (TO BE RECORDED		GE		
REQUIRED BY	CUSTOMER ETC. )				
Q.C. FILE CLC	OSURE BY: LOOSE	COMPONENTS REQUIRED / PREPA	DATE: OC	1520	12
ITEMS REQUI		NO. OF BOXES OR PKG			
8/1/0 ADDITIONAL	クメ 43 ¹¹ 5/5 FUEL GAS HARDWARE OR FASTENERS REQUIRED				·
		ARATION FOR SHIPMENT / STORAG	3E		
	ERSE TO NEXT ARD	PC E S S			
S/N #	NWP-08500-1 TO NWP-08500-5				
INVENTORY	rags attached yes No	SHIPPING INSTRUCTIONS			
CUSTOMER F	P.0 REVIEWED YES	N/A			
	RSON AUTHORIZED TO RELEASE PRODUCT:				
PHONE:	FAX:				
RELEASED T	OINVENTORY: RM Brown	<u>/</u>	DATE: #C	705/10	
RELEASED T	O CUSTOMER:		DATE:		

NWP Industries	NWP Industries Inc™ PO Box 6280 4017-60 Ave.					
PO Box 6280	***					
4017-60 Ave.	<b></b>					
T4G 159						

NWPG-

NWPG-

Approved By:

Test By: Math Alexander



Websit	e: www.nwp.ca
Phone:	(403) 227-4100
	/400) 000 4400
Fax.	(403) 227-4102

## **HYDROSTATIC TEST AFFIDAVIT**

			•
Customer: NWP Industries Inc			JO# <u>08500</u>
Project: 8" OD x 23" S/S Fuel Gas	Scrubbers		Project#
Test Pressure: 371 PSI		•	Hold Time: <u>15 Min</u>
Code Requirements: ASME Sec V	III Div 1 2010 Edition 201	l 1a Arldoni	eh.
<u></u>	B. 1 2010 2010011, 201	<u>can Audern</u>	<u> </u>
All Personnel Advised of Test	All Signs & Flagging Pos	ted 🗹	
Prior to Filling – Fitting/Hoses & C	Component Meet Require	d Test Pre	ssure
Sign-Off Supervisor:	Tester:		Date:
<b>Product Description:</b>			•
		· · · · · · · · · · · · · · · · · · ·	104
5 vertical fuel gas scrubbers			. 11-5
•	44		
50% Test Pressure Leak/Syster	ms Check Completed	DÍ.	
	no check completeu	<u>. 60</u>	
186 PSI			
180 F31			
		·	
	1,		711
Equipment Drained & Flushed to I	Prevent Freezing:	Yes: 🗆	] No: □
		7007	, , , , , , , , , , , , , , , , , , , ,
Start Time	··		Finish Time:
			Thisir time,
	1	<u> </u>	Address of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the s
Test Gauge Identification #	Pressure Range		Calibration Date
NWPG- 1000- ゴナ	0-1000	PSI	07 MAD 3013
NWPG- 1000- # 1004	0-1000		17 5EP 2013
NWPG-	P	SI	
NWPG-	Р	SI	
NWPG-		SI	
NWPG-	P	SI	

PSI

PSI

Date: 04 5/12

Date: 607 5/13

#### **ALBERTA MUNICIPAL AFFAIRS**

ABSA, the pressure equipment safety authority 9410 – 20th Avenue Edmonton, AB T6N 0A4

#### MANUFACTURER'S DATA REPORT FOR MINIATURE PRESSURE VESSEL DÉCLARATION DE CONFORMITÉ DU CONSTRUCTEUR D'APPAREILS SOUS PRESSION

Upon shipment of a pressure vessel, this form fully and correctly filled in must be mailed to the office of the Chief Inspector in the province of installation in accordance with the regulations under the Act, governing the construction and installation of pressure vessels.

Au moment de l'exp province d'installation	edition on tel qu	d'un appare ue prévu dai	il sous pres ns les règle	ssion, ce ments d	e formu le la loi	laire sur l	comp les ap	olété co pareils	orrecte s sous	ement, pressi	doit êtré en on.	voye au b	ureau c	le l'inspecte	ır en chef	de la
Manufactured by Construit par	-	Name an	d address of M Industrie:	lanufacture s Inc 40	er/ Nom e <b>017 6</b> 0	et adre O th A	sse du ve Ir	construc	teur il AE	T4G	189					
Manufactured for Construit pour		Name an	d address of P Industrie:	urchaser o s 4017	or Consign 60 th A	nee/ A <b>\ve  </b>	lom et a	adresse fail A	du clien B T4	t ou de so G <b>1S</b> 9	on représentant					
Ultimate owner Utilisateur			d address/ No. Industrie:			D th A	ve Ir	nisfa	il AB	T4G	189	1.00				
Location of installation	ation	Name an Stock	d address/ No.	n et adres:	se								***************************************			.,
Pressure vessel	l Appa	areil												-		
Type/ Genre Overall Le Vertical Fuel Gas Scrubber 23"							ongeu	ır totale		Serial N	o.i N° de séri	e		Year bu	ill/Année de	e fabrication
Provincial Registration No. – C.R.N./N° d'enregistrement provincial - N.E. OH09319.213						).				NWP-0	8500-1 to N	IWP-085	00-5		_	de dessin , 2959.01B
The chemical and phy Les propriétés chimiqu	/sical pro es et phy	operties of a vsiques de tou	ll parts meel ites les comp	the requ	uiremen respecte	nts of ent les	mate: s exige	rial spe ences d	cificat es spé	ions of cification	the A.S.M.E. ns de matéria	Code. ux de code	ASME.			
The design, construction La conception, la const	on and wo Iruction e	orkmanship c et la façon son	onform to C5 t conformes	A B51. A ACNOF	₹ 851.		Sec	ASME	VIII		Division 1	ì	Adden	da/Supplèmer 2011A	t Code N° de	case No. cas NA
Manufacturer's partia report: Les rapports partiels du	ı constru	cleur adqėuai	tement identi	fiés et sig	nės par	les ir	nspect	leurs au	thorisé	s ont été	ė produits pol	ır les ilems ı				tached to this
Names of parts/ Nom o	le la com	posante	Item No./ A	l⊆ d'item		Ma N		clurer's	Name/	Nom du	ı constructeui	-	Identify NA	ing Stamp/ E	stampe d'ide	entification
NA			NA			N,	A				.,		NA		***************************************	
Shell/ Virole												•				
Description		Material	Thickness	Corr. Allow. Surépais		Join Join		Joints	Joints longitudinaux Traitei		P.W.H.T. Traitemen	raitement therm		nts circonféren	Number of courses Nombre de	
	I N	/alériau	Epaisseur	de corr.	Dii	iamėtr	e	Туре	R. Ra	r. Idiog.	Efficiency Efficacité	Temp.	Tim- Duré		R.T. Radiog.	sections
Shell	SA-16	06B	0.322"	1/8"	8	5 / 8'		NA	N/	4	1.0	NA	NA	1 .	NA	1
Heads/ Tetes											!					
Description		Material Matériau	Min. Tr Épals r	iickn. ninim.	Corr. Allow Surép. Corr.	- 1	Crown Radiu Rayon couro	is n	Knuc Radi Petit		Ellipse Rati Rapp. ellips		Angle	Hemisph. Radius Ray. Hėmisph	Flat Diameler Diam.plat	Side to pressure Côle sous pression
Weld Cap	SA	\-234-WPB	.282"		1/8"		NA		NA		NA	NA		NA	NA	Concave
Weld Cap		1-234-WPB	.282"		1/8"		NA		NA		NA	NA		NA	NA	Concave
Removable bolts used (d Boulons amovible utilisés				NA						Spec./ S JA	Spèc. du mal.			Grade NA		Size/ Dimension NA
Pressure - Temp	eratur	el Pressio	n - tempe	rature	!			·							1	
Pressure Vessel Parl Partie de l'appareil		Constructed to pressure Construit pour de marche per	or max, allowa une pression	ble workir	ng A		temp.			Minim Temp	um design me . <i>min</i> .	tal temp.	Pres	pressure (hydi sion d'èpreuvri binaison)		or combination umatique ou
Full Vessel		285 PSI			1	100	F			-50	F		37	I PSI		

Tube Section/ Fais	sceau tuhi	ulairo									AB-24 (Side
Tubesheet/ Plaque tubula		Material/ Material	au	Diameter	/ Diametre	Nominal Ti		Corr. A			Attachment
NA		NA		NA		Epaisseur : NA	nominate	Surépa NA	ais. con	rosion	Mode d'attachement
Tube material/ Materiau d	be material! Materiau des tubes Diameter! Diamètre Nominal Thickness (gauge					Number/ Nbre Typ			Type (Straight or U) Heat		Heating Surface
NA		NA	i	Epaisseu NA	r nominale (calibre)				ype (Droit ou U) Surface NA NA		Surface de chauffe NA
Jacket/ Chemise										_	
Type of jacket/ Genre de d		Jacket closure Fermeture de chen	nise	Proof T	est In d'épreuve		Surface			Sketch	l Schéma
NA	<b>1</b>	NA	noc	NA NA	iii u epieuve	NA	e de chauffe			NA.	
Safety Valve Outle	ts/ Soupa	pes de sûreté		1						l	
Number/ Nombre	Dimension			ocation/ En	droit						***
NA	NA	-		IA							
Nozzles and Open	ings/ Tubu Num		1		Matarial	T NI	T B-1-1-1				
Purpose/ But	Nom		Тур	, e	Material <i>Matériau</i>	Nominal Thickness	Reinforce material	ement	How attach		Location/ Endroit
						Epaisseur nominale	Materiau de renfor	t	Genra d'atta		
C1 Outlet / Inspection	1	2" NPT	Half Cou	pilng	SA-105N	CL 3000	Weld		UW 1	6.1 C	Тор Сар
C2 Inlet	1	1" NPT	TOL		SA-105N	CL 3000	Weld		UW 1	6.1 A	Shell
C3 HOR. Drain/Inspecti	on 1	3/4" NPT	TOL		SA-105N	CL 6000	Weld		UW 1	6.1 A	Bottom Cap
, ,					.,						
· ·											
				-						-	
Supports/ Support	s						,				0.130.00.00
	ugs/ Oreilles		gs/ Pieds		Other/ Autres (De	escription)			Attach	ed/ Attaci	hes
	Vo./ Nbre NA	No.	./ Nbre \		NA				•	e and Hor elding	w/ Méthode et endroit)
Remarks/ Observa	tions (Cu	ibical capacity	// Volum	e)				i_	<del></del>		
Construction Dra	iwing SC	R823-1 Rev	2		1)	,					
Impact Test Exer Radiography Nor	ne ber U	VS-00B (F)	igure O	us-66. in Verti	1) ical Position						
Weight Empty 14	45 lbs JO	# 08500	Jiested 1	111 4 61 61	icai i osition						
Certificate of Complian	ncel Certific	at de conformit	é								
We certify that the state	ments made	in this data repo	ort are corr	ect and th	nat the						
said vessel has been co design below and the re	instructed in	accordance with	the Provii	ncial Regi	stered						
Nous certifions que les e et que l'appareil a été co dessous et les exigence	onstruit en a	ccord avec l'enre	conformit gistremen	e sont cor t provincia	recles al ci-						
_		ic Acron 651.									
Provincial Registered De Enregistrement provincial		19.213									
Manufacturer Constructeur NWP Inc	dustries Inc										
Signature [///	Lyung	Date	e <u>007</u>	05/1	<u>'3</u>						
/ (Re	presentative)										
Signature		Date	e								

(Certified Individual)

#### NWP Industries Inc.

## TRAVEL SHEET (FRONT)

	DO NOT START CONS	TRUCTION V	VITHOUT AI I	REVIEW		TRAVE	SHEET R	EVISION N	0.:
	EVIEW:				EVIEW D				
	RIAL NO. NWP-08500-5		08500	VE	SSEL T	YPE:85/8"C	0×23"s	s 285PS	, SCRU
DRA	WING NO. SCRB23-1	DWG. REV	SION NO.:			HEET INITI		ALK	0
Seq.	llem	Comments	Q.C.I.	Date	A.I. Hold Points	A.I.	Dale (	Byner	Date
1.	Calculations in File		ROPE	200007/13	-				<del> </del>
2.	Release of App'd Dwg.		ense	RUGO7/12					
3.	Materials Examined		ta Hore	7/B/12					<del>                                     </del>
4.	Heat Numbers Recorded		Karkhoo	8/13/12					
5.	MTRs Checked		doll	SEP.27/12			†		
6.	W.P.S. Checked		Kothono	8/13/12		-			
7.	Welder (s) Qualified		ts:floor	8/13/12					
8.	Thicknesses Verified & Recorded		ROPE	SEP 37/13	· · ·				<u> </u>
9.	Shell(s) & Head(s) Fit-up Inspection		KB	Aug21/12	· · ·				
10.	Nozzles & Fittings Fit-up Inspection		VB.	AUTZI/A					-
11.	Nozzle Orientation HOLD	-	16 flor	8/13/12					
12.	Nozzle & Flange Rating Checked		Kaflan	7/13/12					
13.	Impact Tests אין אין								
14.	Internals Checked		Ka. Place	8/18/12					_
15.	Final Internal Inspection	Shell Side	1/2 1/2						
16	Weld Size Checked	Tube Side	11/1/100	727/12					
16.	*		Batter	8/21/12					
17. 18.	Welder I.D. Checked		12 Hon	9/21/12					
19.	Final External Inspection Radiography		Mai Hoon	8/21/12	+ 11				
20.	Other N.D.E.		<u> </u>						
	7071								
21. 22.	Final Ext. Prior to P.W.H.T					<u></u>			
23.	Hydrostatic Test	Shell							
	.,,	Side							
	HOD.	Tube Side	Roll	acrosps	į				
24.	CRN Drawing	OHE#319,313T	RAPS	AUGOZIIS					
25.	N.C.R. #	1.0 1.4 (1017)							
26.	Nameplate Stamping		09/21/12	J7/z1/12					
27.	Manuf. Data Report		marc	57/21/12 ectos/18					
28.	Nameplate Installation		1						
								·	

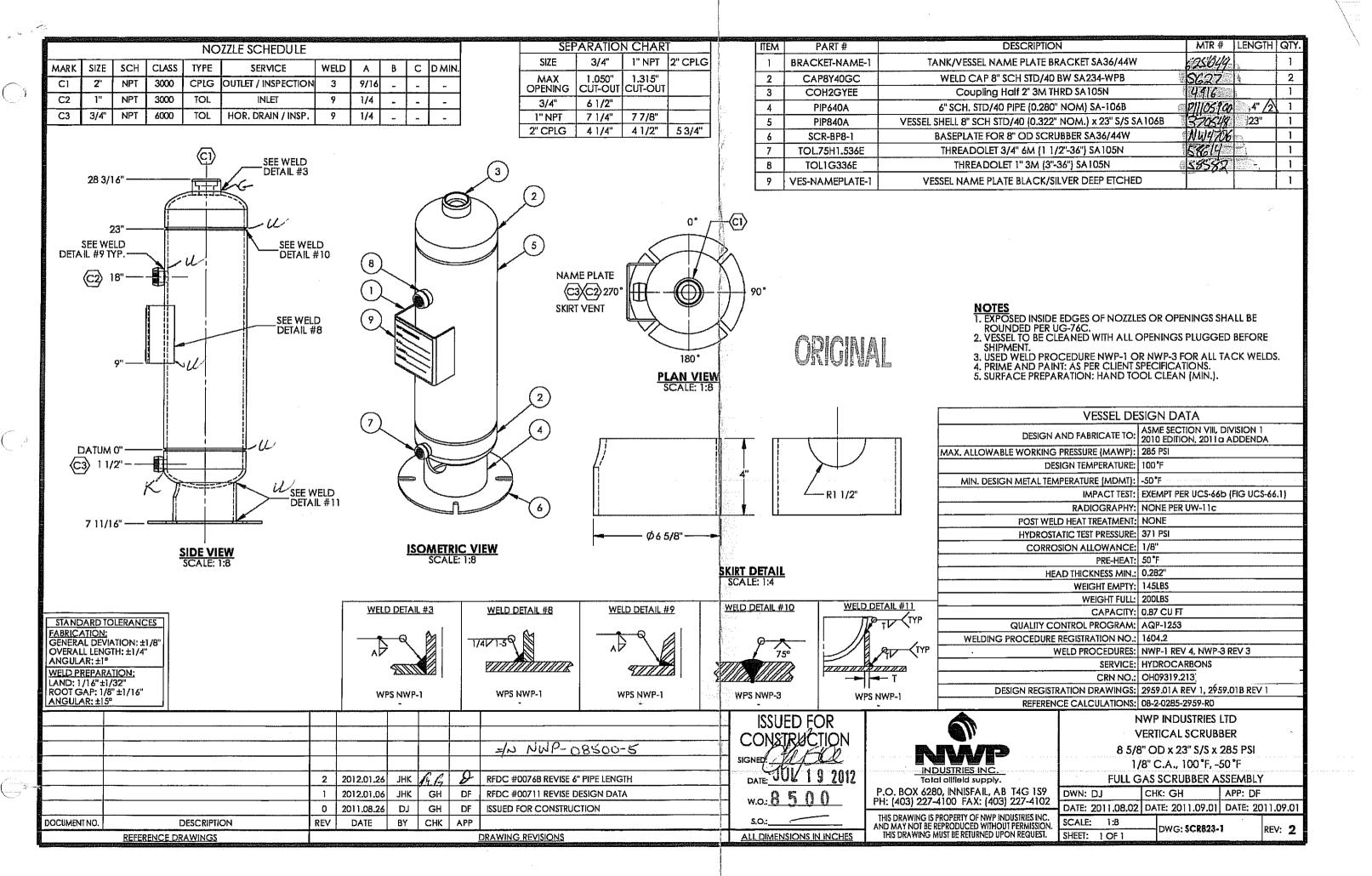
The Authorized Inspector shall be presented with the Travel Sheet prior to construction so that he can designate additional inspection points and/or Hold Points. Any revisions shall be marked with a delta symbol with revision number and described at the bottom of this page.

^{*} Denotes an A.I. Inspection Point ** Denotes an A.I. Hold Point

TRAVEL SHEET (BACK)

MATERIAL '	THICKNESS	VERIFICATION A	AND IDENTIFICATION		V	ÆLD I.D.	/WELDER	SYMBOLS	/ FIT-UP	
Description	Thickness	Material Spec, & Grade	Heat & Slab Number or I.D. Number	Weld I.D.	Welder Symbol	Fit-Up Exam	Weld I.D.	Welder Symbol	Fit-Up Exam	Verify Type 1 Joint
Shell #1		5A(06B	37054K	L-			C-			
Shell #2				L-			C-			
Shell #3			"	L-			C-			
Shell #4				L-			C-			, , , , , , , , , , , , , , , , , , , ,
Shell #5				L-			C-			
Shell #6			, .	L-			C-			
Head #1	•	50234 WPB	5627	,	,		C- (	)	the	
Head #2		SCIZHUPB					c- (	)	Frai	
Head #3							C-			
Head #4							C-			
Boot #1 Shell				L-			C-			
Boot#1 Head SVIA		SAICLAB	PL11105900				c- ပ	)	陷亡	
Boot #2 Shell				L-	,		C-			
Boot #2 Head							C-			
Сопе				L-			C-			

AT	TACHMENT A	AND / OR NOZZLE M	WE	LDER SY	MBOLS / F	IT-UP				
Mark	Mat. I.D.	Neck	Fitting	Flange	Repad or Attachment	Cat. B	Cat. C	Cat. D	Pad OD	]
	SpecGrd.		SOLOSN					Š		]
a 101	Thk./Rating		3600					1)		1
\	Heat# or ID		4916					粉		Į
-	SpecGrd.		50105N				$\mathcal{C}$			1
07	Thk./Rating		3000				,			1
	Heat# or ID		58582			]	Hai		ļ	
	SpecGrd.		SALOSN				_K_			1
(3	Thk./Raling		(2000)				Kin			٦
	Heat# or ID		58614							
	SpecGrd.									1
	Thk./Rating									1
	Heat# or ID					]				ı
	Spec,-Grd.									٦
	Thk./Reting				+ <u>4</u>					1
	Heat# or ID									
	SpecGrd.				:					7
	Thk./Rating									1
	Heat# or ID									
	SpecGrd.									1
	Thk./Rating									1
	Heat# or ID									l
	SpecGrd.									1
1	Thk./Rating									1
	Heat# or ID					]				1



	CERTIFIED BY C
	MADE IN CANADA
78.19 ON Y 275 SP S ST	FUELGAS SCRUFBLE
MAWP 255	PSIAT 100 °F
MAEWP	PSIAT PRINT °F
MDMT ** ** ** ** ** ** ** ** ** ** ** ** **	AT 2002 PSI
S/N. NWP-0250	YEAR BUILT
CRN PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY O	

08500-4

## NWP Industries Job Order Paperwork

#### Order: 08089-D

Item: BRACKET-NAME-1

_ription Tank/Vessel Name Plate Bracket

Ordered: Qty To Mfg:

85.00

/ To Mfg: 85,00 Entered: 04/16/12

**Delv Req:** 04/23/12

Customer: STOCK

Name: STOCK

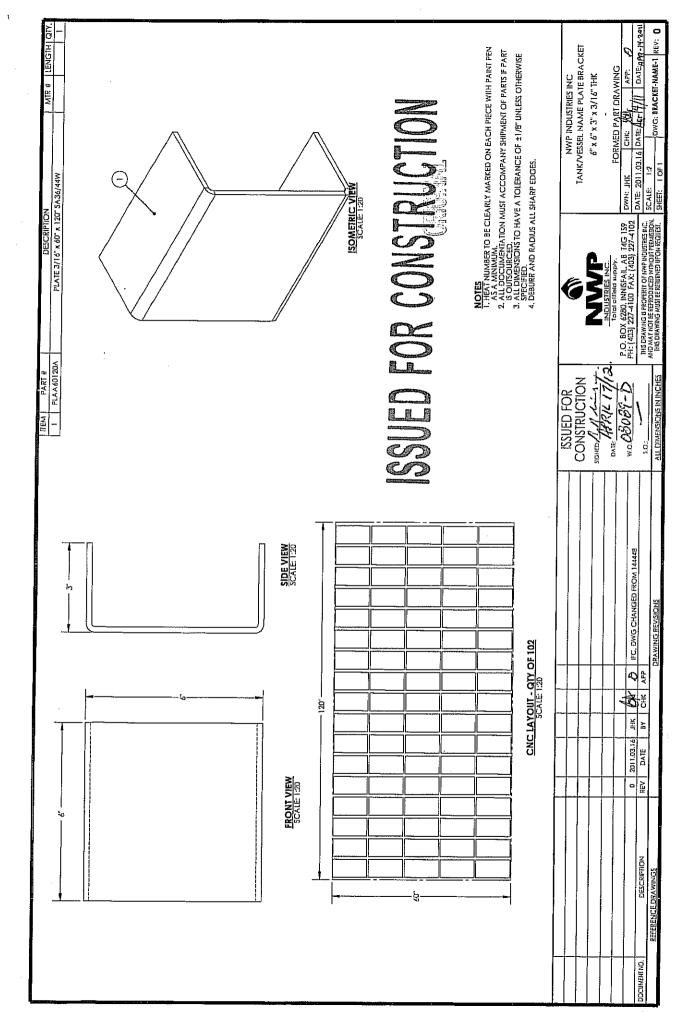
Customer PO: Contact:

Parent Order: 08089

Plate 3/16" x 60" x 120" SA36/44W

**Drawing: BRACKET-NAME-1** 

R S	WORK CENTER	QIY	SETUP	RUN START/END	DESCRIPTION	U/M	QTY
	CNC	85.00	0.00	8.50			
	Plsma/Shear/Brk			•			
	OPER:	•			wc:		
	Structural Welding	As Per	CSA W47.	1 and W59			
	Employee Identifica	ation:_	(AVU	1 and W59	(de. 0)		
	MTR Stock	<u>Ht</u>	7 6	5251049	( Q )		1
				·	1		)
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	Date: abi	٠- ا	20	12012			
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# **Test Certificate**

Form TC1: Revision 1: Date 31 Oct 2000

VRAZ INC. NA 8250 130th Street, Surrey, BC, V3W 819

6251.049 6251049 6251049 Ita Heat Customer: VARSTEEL LTD. 330-220 4TH STREET MATERIAL MARKED WITH AN ASTERISK IS PRODUCED FROM COIL * 6251049 LH4F1955 PCES: 20, WGT: 7678 LETHBRIDGE 1H4F1965 3H4F1961 Piece Id Sec III, Part A, 2010 edition" **Fested Pieces** "Conforms with ASME 0.188 X 60.00 (CUT) 0.188 X 60.00 (CUT) Dimensions Size: 0.188 X 60.00 X 120.0 (IN) Product Description: CSA G40.21(2004)44W300W __ASTM A36(05)
A709(01A)36(ASME SA36(01ED) Customer P.O. No.: RD-943813 Tot Al Cu 1.030 .03 Tst YS Loc (PSI) (PSI) Tensiles : S %RA Elong % |Tst | Average | 2in 8in |Dir | Hardness 20. Chemical Analysis .00 ----.001 .003 Sec II Part A, 2010 edition By Ceri Steen at 9:10 am, Apr 19, 2012 **APPROVED** "Conforms with ASME Mill Order No.: 41-242722-01 8 Abs. Energy(FTLB)
1 2 3 Avg 2011a addenda" .0000|.0038Charpy Impact Tests Ship Dute: 24 Oct 11 Cert Date: 24 Oct 11 % Shear 2 3 Shipping Manifest: ST048151 Αvg T'st 18T Cert No: 011131457 (Page 1 of 1) Tst Dir Tst Siz Tup %Shr BDWIT ΑU ORGN

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Cust Part #:

WE HERLBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH THE APPROPRIATE SPECIFICATION

Greg Balsdon

### **NWP Industries** Job Order Paperwork

Order: 08491-A

Item: SCR-BP8-1

tription Baseplate for 8" OD Scrubber

45.00 Ordered: Qty To Mfg: 45.00 Entered: 07/13/12

Delv Req: 07/20/12

Customer: STOCK

Name: STOCK **Customer PO:** 

Contact: Parent Order: 08491 **Drawing:** 438529

OPER S WORK CENTER

QTY SETUP

RUN START/END DESCRIPTION

U/M

QTY

CNC 10 Plsma/Shear/Brk

OPER:

45.00

0.00

3.75

Quality:

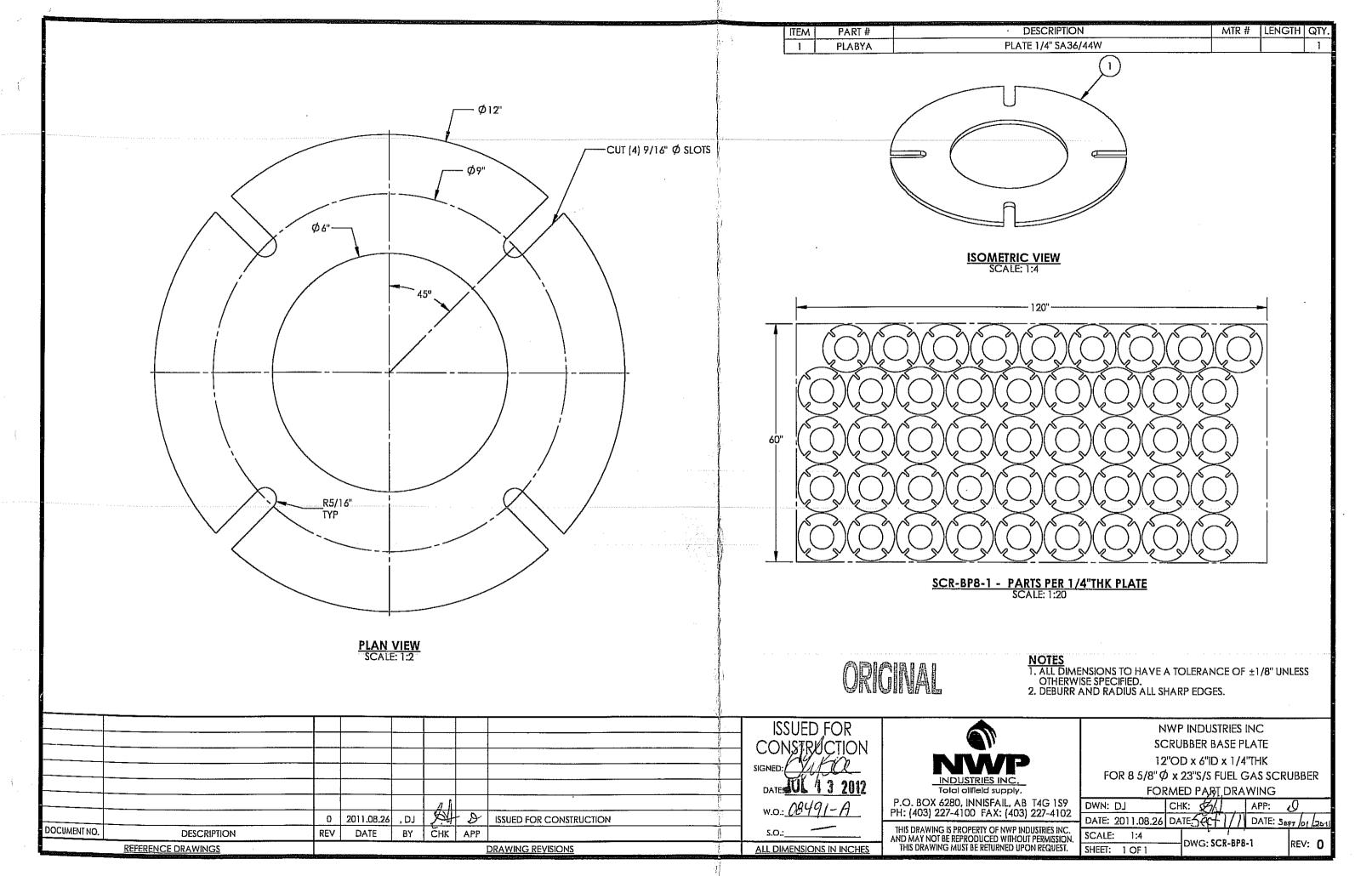
PLAB60120A

Plate 1/4" x 60" x 120" SA36/44W

Each

0.999







### Test Certificate

Form TC1: Revision 1: Date 31 Oct 2000

(U) Cust Part #:	CURY IS NOT A RING THE MANUER PERIAL MARKED 9 188386	Heat C Mn .	488386 B0011 488386 B0014	Heat Piece		Customer: WILKINSON A DIVISION OF PREMETALCO INC. 6L25 SIST ST. S.E. CALGARY	
	FICAL COMPONENT OF THE STRIIS PRODUCT STERISK IS PRODUCED FROM PCES: 43, WGT:	P & S 20 Al Cu	0.245 X 72.00 (CUT)   L 6700047600   C 6200047300   0.308 X 72.00 (CUT)   L 66000 7500   C 60000 7200	Piece Tst YS t Dimensions Loc (PSI) (I	SE 0 250 X 72		
WE HEREBY CERTIFY THAT THIS M. WAS TESTED IN ACCORDANCE WITH APPROPRIATE SPECIFICATION	AND NO MERCURY WAS IN	Chemical Analysis  NI CF MO CB V 71  12   19   .05   .024   .002   .011	00 1 35 V17 T 00 1 45 V22 T 10 1 43 V22 T 10 1 46 V25 T	TS %RA Elong % Tst Average Abs Si) 2in 8in Dir Hardness 1	O. X. 150.0 (IN)	Product Description: CSA G40.21(2004)44W/300W / ASTM A36(05) A709(01A)36/ASME SA36(01ED)	
TH THE Jason Wall		18 .0001.0078		Energy(FTLB) % Shear 2 3 Avg 1 2 3 Avg	Charny Impact Tests	Ship Date:	
		ORGN CAN		Tst Tst BDWT! Tmp Dir Siz Tmp %Shr		22 Feb 12 Cert No: 051061366 22 Feb 12 ( Page 1 of 1)	Marifect · Cayassan

2804M + .18 89 008 008 02 .02 .02 .05 .01 .030 .016 <.008	************************************	TENSILE TESTS: * SAMPLE * * * TEST * * YIELD TENSILE  BEAT SECE GAUGE COND METH DIR KSI % ELONG 2804M DSPC .2400 AR 2 T 590 7300 S1(2")	COIL NO. WEIGHT COIL NO. 1 NUMBER HEAT-MS PIECES 1 NUMBER 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	************** PRODUCT SHIPPED**** ITEM 00007 OUR ITEM 003 DIMENSIONS 240 MIN X 60 X COIL	EETS EN 102 SO QUALITY EATS INDICA	ZTTED RESALE 2012/01/31	USPIN TEST REPORTS REQUIRED 2000212222 DS	TEST CERT 1: BRADGABIM. CA TEST CERT 2: PLATE TEST COUPON:		CUSTOMARS SPECIFICATION OF ASIM A36/CSA G40 21 44W (05) - TO THE CHEM OF CSA G40.21 44W (05) - TO THE CHEM OF CSA G40.21 38W - TOP SEMI-CRITICAL SURFACE - STANDARD SHAPE - HSLAS - CUT EDGE ACCEPTABLE - RESTRICTED GAUGE 1/2 TOL T/R INFO ONLY-COIL END 1/HEAT	ALBERTA INDUSTRIAL METALS LTD 4821 - 78TH STREET 7660 49TH AVENUE RED DEER ALBERTA T4P 1N5 T4P 4G6	ESSAR Steel Algonia Inc. 105 West Street, Sault Ste. Marie, Ontario Canada P6A CUSTOMER PURCHASE ORDER HUMBER ENTRYDATE ORGATE DATE TALLYNMARER SHAPPER'S NO. CARRIER CEP CHARGE TO CUSTOMER NAME AND ADDRESS SHAPP TO CUSTOMER NAME AND ADDRESS
CB V B .016 < .008 CONFORMS WITH ASME	****	LAB ALG	WEIGHT 38084 * * * * * * * * * * *	*****		OF DISPOSAL OF DOCUMENT.	POCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705)945-2624 COLLECT FOR INSTRUCTIONS ON METHOD	THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALGOMALING. IF YOU RECIEVE THIS	K. UGHADPAGA MANASER MERALINGIAL SERVICES	ACCOMUNICATION SHOWN ALL RESULTS SPECIFICATION SHOWN ALL RESULTS ARE REFIANED IN ACCORDANCE WITH THE COMPANY'S STANDARD RECORD KEEPING PRACTICES.	ESSAR STEEL ALGOMA INC. HEREBY CERTIFIES THAT THE MATERIAL HEREIN DESCRIBED WAS MADE AND TESTED IN	784 -346829 15433

**WARNING*** THE TEST RESULTS AND VALUES REPORTED HEREN INDICATE ONLY THAT (1) THE PARTICULAR STREEL FOR WHICH THIS CERTIFICATE IS ISSUED MEETS THE MINIMUM SPECIFIED YIELD STRENGTH AND (2) THE CHEMICAL ANALYSIS AND PHYSICAL PROPERTIES OF SUCH STEEL ARE IN CONFORMANCE WITH THE REQUIRMENTS OF THE SPECIFICATION INDICATED AND CAN NOT BE RELIED UPON FOR ANY PURPOSE (INCLUDING DESIGN OF CALCULATIONS) AS REPRESENTING THE ACTUAL STRENGTH OF SUCH STEEL.

* TEST * * YIELD TENSILE LONG ND METH DIR KSI KSI KSI SELONG R . 2 T 64.2 77.2 26(2")  C H E M I C A L P R O P E R T I E S * * * * * * * * * * * * * * * * * *	HEAT-MS PIECES 0054M-05 1	R O D	TEST REPORTS REQUIRED Sec. 1, Part A, 2010  TEST RESALE  TO 1020. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011. TO 2011.	HOT ROILED STEEL SHEET - HSLA - TO CHEMISTRIES OF CSA G40.21 44W/ASTM A36 (04)(08) - CHEM OF CSA G40.21 38W - STRL Q - TEMPER ROLLED - RESTRICTED GAUGE 3/4 TOL - TOP SEMI-CRITICAL SURFACE - STANDARD SHAPE	STRIAL METALS LTD STREET ERTA	ESSAR Steel Algoria Inc.  105 West Street, Sault Ste. Marie, Ontario Canada P6A 784  15063-BS  2011/10/05 2011/11/20 251758 - NOXL
* ×	+ + + + +	* * * * * * * * * * * *	THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALGOMA INC. IF YOU RECIEVE THIS DOCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705)945-2624 COLLECT FOR INSTRUCTIONS ON METHOD OF DISPOSAL OF DOCUMENT.	SPECIFICATION SHOWN, ALL RESULTS ARE RETAINED IN ACCORDANCE WITH THE COMPANY'S STANDARD RECORD KEEPING PRACTICES.  K. UGHADPAGA MMMGER METALLURGICAL SERVICES	MILL TEST REPORTS  ESSAR STEEL ALGOMA INC. HEREBY CERTIFIES THAT THE MATERIAL HERE IN DESCRIBED WAS MADE AND TESTED IN	784 -380828 MILL 0804 12116

^{**}WARNING** THE TEST RESULTS AND VALUES REPORTED HEREIN INDICATE ONLY THAT (1) THE PARTICULAR STEEL FOR WHICH THIS CERTIFICATE IS ISSUED MEETS THE MINIMUM SPECIFIED YIELD STRENGTH AND (2) THE CHEMICAL ANALYSIS AND PHYSICAL PROPERTIES OF SUCH STEEL ARE IN CONFORMANCE WITH THE REQUIRMENTS OF THE SPECIFICATION INDICATED. THE RESULTS OR VALUES REPORTED HEREIN CAN NOT BE USED TO QUALIFY THE STEEL FOR ANY SPECIFICATION OTHER THAN THE ONE INDICATED AND CAN NOT BE RELIED UPON FOR ANY PURPOSE (INCLUDING DESIGN OR CALCULATIONS) AS REPRESENTING THE ACTUAL STRENGTH OF SUCH STEEL.

JUN 1 1 2012

64A029371

**EVRAZ** EVRAZ II

### **Test Certificate**

form TC1; Revision 1: Date 31 Oct 2000

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### "Conforms with ASME Sec II, Part A, 2010 edition, 2011a adder/06"3 70548 IRAUS. 9/12

期价值宝钢管有限责任公司

YANTAT LIPBAO STEEL PIPE CO., LTD.

V.T. . 318

产品质量证明书

MILL TEST CERTIFICATE

(EN10204 3. I)

PN244347

期台市至福中路185号

NO. 185 XINGFO MIDDLE ROAD, YANTAL , CHINA TEL: 0086 535 6843946/6854750 FAX: HTTP://WWW. LUBAOSTEEL TUBE, COM-

PAGET OF 1 订货单位 无缝砌切骨 产品名称 FRANS AN PIPING PRODUCTS LID., PURCHASER DESCRIPTION OF GOODS PIPE "Conforms with ASME 尺寸原准 ASME BOA. 10 客户代号 DE [33] DINENSION STANDARD COSTOMER'S NO. BOTYG0902200001600 Sec II Part A 2007 edition CERTIFICATE NO. 定货目期 订货合同号 ASTN A106-B, ASME SA106-B, API BL IS DATE OF BELIVERY G9C6902644 2008 addenda" BUB_CONTRACT AN 客户订单编号 海港日间 @ 9/10/09 NATERIAL SPECIFICATION 20090220 CSA 7245, 1 Gr. 241 Cat 1 P. O. NO. . EDATE OF ISSUE 们下均值的世 NACE MR0175/150 15156 STAMP OF MILL INSPECTOR 外位 0.0. 219, Inc PP W T. 於度 Length 5.8-6.7M 島民度 Total Length 总把的Total Dondles Wath, Order 260.00吨 意限数 Total Finces 248. 238 交货状态Delivery Condition 总甲根Total Weight 礼念 As-Rolled 制造方法 Making Method 热红无缝 Hot Finished Spanless 棉 拉伸设备 Tensile Test Chemical Composition 位置 6. L. 元章 地方 民批号 計量基準 Impact Test 271 重量 g ( ) Mn Eu Si Er V Mo CE Bardoes: Lat No. 加雅 抗拉 仲长 斯维 Pieces Weight Heat No 3 4 5 Y. S. T. S. E. L. EXT. M нqМ 医小组3 0 0 0 0 0 0 0. 10 0. 10 0. 10 0. 00 0. 15 210 415 22, 0 9.9 2.00 0.035 0. 035 999 פטע 370548 H 0. 19 0, 21 Vo. 51 Vo. 008 Vo. 005 Vo. 07 Vo. 0-1/0. 03 V 9201773 P 1 2 705 500 25.0 Ind BSG 248, 238 100 495 24.5 1415 1416 蒲谌 压定 遊粉 外心尺寸 辩团 頭種位脸 静水压压力 静水压砂缸 E. T. E. M. I. U. T. M.P. I. Visuel A Digensions Coating Drlft Test Hydrostatic Pressure Duration of Time GOOD Good Good 11. COUPs #143 环状扩口 环状粒钟 16 (4) 当事 花边 抗酰 低倍 热处理工艺 Expansion Rick Expansion Ring Tensile Flattening Bending SSCC Flanging Macrostructure Heat Treatment Good 2# 化学成分Chemical Composition Hillon (Ludie) Analysis 3* P=管体 Pipe Body;4* 1-纵向Longtudinal 5* 2=延邦統行ScripT×20pm;G. L. -Gauge Langth 11:45 SOTES L1=5. 6550RT(F0) ** 1./C NO. : DFCHCV920603 Man Remark 虽证明本老所到产品,均依标准规定制造,取择,试验和模准, 非符合标准型求及合同程序。 WE HERE CERTIFY THAT THE MATERIAL HEREIM DESCRIPED HAS BEEN MANUFACTURED, SAMPLED, TESTED AND INSPECTED IN ACCORDANCE WITH THE REQUIREMENTS OF ABOVE SPECIFICATIONS AND PURCHASE ORDER, AND MET THE REQUIREMENTS. DUST OF DULLAY COMPOUNDED.

# TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 :2004 3.1

ORDER NO CERT. NO CUSTOMER : 7005116 : 121507 : SEYBOLD INTERNATIONAL CORP.

DATE : 05/16/2012 5 ORIGIN : TAIWAN

L/C NO :

## 着数数点数合体级公司 高線年代表現無単年本路 303 號 BOIH-WHI STEH FITTINGS CO., LTD. NO.303, JEN-HSIN ROAD JEN-WU DISTRICT

An ISO 9001:2008 Registered Manufacturer

KAOHSIUNG CITY, TAIWAN R.O.C. (81460) TEL: 886-7-871-0497, 371-1536, 372-0260

FAX: 886-7-371-3864, 371-3882

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® BW-D	BW-D0839	REV:1								<u>u</u>	AS DED DO	CATIO	ર્જ		<u>}</u>	,	) } }-	' '			

Encana

REQUIREMENTS AS PER P.O.

Date!\

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Name (DILC)

The Best Value -Price, Quality, Service All The Time.

**LOG NO.** F00000000017351

**BONNEY FORGE CORPORATION** 

P.O. BOX 330 • 14496 CROGHAN PIKE • MOUNT UNION, PA 17066-0330 (814) 542-2545 • (800) 345-7546 • FAX (814) 542-4906

www.bonneyforge.com

**CUSTOMER: MRC MIDFIELD** 

DATE 07/29/2011

CUSTOMER

ITEM

1

ORDER NO.: \$759118576 SHIP TO: MRC MIDFIELD

**502-25 AVENUE** NISKU AB T9E 0K6

LOT NO.

"Conforms with ASME

Sec II, Part A, 2010 edition"

GRADE OR SPECIFICATION NO.

CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS:

BONNEY ORDER NO. B000101590

QUANTITY

Canada

20 950 4916 2 3000 A105N HCP T SA/A105N Al 0.022 C 0.200 Co 0.004 Cr 0.040 Cu 0.130 Mn 1.020 Mo 0.010 M 0.005 18C10966 Nb 0.014 Ni 0.040 P 0.006 S 0.015 Si 0.200 V 0.003 V CE(Long Formula) = (0.39) T/S(PSI) 74,375 / Y/S(PSI) 51,500 / EL(%) 32.80 / RA(%) 63.25 Brinell 132 BHN 132 BHN SA/A105N

22 25 58288 3/4X3/4X 1/2 3000 A105N TEE T 18C11116

Al 0.022 C 0.190 Co 0.005 Cr 0.040 Cu 0.210 Mn 1.050 Mo 0.010 N 0.005

Nb 0.015 Ni 0.060 P 0.007 S 0.019 Si 0.200 V 0.004

CE(Long Formula) = 0.39

T/S(PSI) 73,750 Y/S(PSI) 51,250 EL(%) 31.90 RA(%) 67.00

Brinell

135 BHN

137 BHN

23 120 58414 18C11128

75

1X1X1/2 3M A105N TEE T

SA/A105N

C 0.200 Cb 0.000 Co 0.003 Cr 0.060 Cu 0.100 Mn 0.990 Mo 0.010 Ni 0.030 P 0.009 S 0.018 Si 0.190 V 0.004

CE(Long Formula) = 0.39

T/S(PSI) 75,000 Y/S(PSI) 52,500 EL(%) 32.25 RA(%) 65.60

Brinell

135 BHN

132 BHN

26 18C11263

58259

13M A105N STEL T

SA/A105N

Al 0.022 C 0.190 Cb 0.000 Co 0.004 Cr 0.040 Cu 0.100 Mn 1.020 Mo 0.010 N 0.005 Nb 0.012 Ni 0.040 P 0.007 S 0.016 Si 0.180 V 0.004

CE(Long Formula) = 0,38

T/S(PSI) 76,875 Y/S(PSI) 52,500

Brinell

137 BHN

EL(%) 33.55 RA(%) 66.10

137 BHN

**ENCANA** 

MATERIAL CONFORMS TO CUSTOMER SPECS

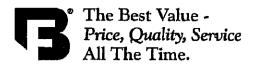
By ceris at 11:46:09 AM, 4/4/2012

We certify that the data on this sheet is a true copy taken from our records of material furnished us by the production mill, or as obtained by additional laboratory checks.

bv

Meloney Specht **QUALITY PROCESS MANAGER** 

CMTR: REV2



LOG NO. F00000000017351

**BONNEY FORGE CORPORATION** 

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www.bonneyforge.com

CUSTOMER: MRC MIDFIELD

ORDER NO.: S759118576

SHIP TO: MRC MIDFIELD

502-25 AVENUE NISKU AB T9E 0K6

Canada

DATE 07/29/2011

BONNEY ORDER NO. B000101590

ITEM QUANTITY

CUSTOMER

GRADE OR SPECIFICATION NO.

CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS:

- THE FITTINGS SUPPLIED ARE IN ACCORDANCE WITH PURCHASE ORDER SPECIFICATIONS.
- 2. CERTIFYING TO ASTM A350 LF2 07 REVISION.

LOT NO.

3. THE MATERIAL SUPPLIED IDENTIFIED AS A 105N WAS NORMALIZED IN ACCORDANCE WITH ASTM A 105 HEAT TREATING REQUIREMENTS.

THE MATERIAL SUPPLIED AS A105N MEETS THE REQUIREMENTS OF BOTH NACE MRO103-2007 AND NACE MRO175/ISO 15156-2.

- 5. CERTIFYING ASTM A105-10 / ASME SA105-10 EDITION.
- 6. THE MATERIAL OF THE FITTINGS SUPPLIED IS ASTM A350-LF2 BUT MEETS THE REQUIREMENTS OF ASME SA350-LF2.
- 7. THE CHARPY V-NOTCH IMPACT TEST WAS PERFORMED AT -50 DEGREES FAHRENHEIT IN ACCORDANCE WITH A350-LF2.
- 8. THE MATERIAL SUPPLIED AS A350 LF2 CL1 MEETS THE REQUIREMENTS OF BOTH NACE MRO103-2007 AND NACE MRO175/ISO 15156-2.
- 9. THE MATERIAL SUPPLIED WAS NORMALIZED IN ACCORDANCE WITH ASTM A350 HEAT TREATING REQUIREMENTS.
- 10. THE PRODUCT SUPPLIED WAS INSPECTED IN ACCORDANCE WITH EN 10204:2004 EDITION TYPE 3.1 INSPECTION DOCUMENT. (EUROPEAN STANDARD)
- 11. THE UNIT OF MEASURE FOR TENSILE AND YIELD (0.2%) STRENGTH ARE IN REPORTED IN PSI.
- 12. ELONGATION TEST RESULTS ARE OBTAINED USING STANDARD ROUND SPECIMEN, 2 INCH OR 50 MM GAGE LENGTH.

We certify that the data on this sheet is a true copy taken from our records of material furnished us by the production mill, or as obtained by additional laboratory checks.

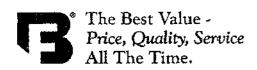
by

Meloney Specht

**QUALITY PROCESS MANAGER** 

ę.

CMTR: REV2



LOG NO. F00000000013522

BONNEY ORDER NO. B000095208

BONNEY FORGE CORPORATION

P.O. BOX 330 • 14496 CROGHAN PIKE • MOUNT UNION, PA 17066-0330 (814) 542-2545 • (800) 345-7546 • FAX (814) 542-4906

www.bonneyforge.com

CUSTOMER: MRC MIDFIELD

DATE 04/20/2011

CUSTOMER

ORDER NO.: S759104356

SHIP TO: MRC MIDFIELD **502-25 AVENUE** 

NISKU AB T9E 0K6

Canada

"Conforms with ASME

Sec II, Part A, 2010 edition, 2011a addenda"

ITEM	QUANTITY	LOT NO.	GRADE OR SPECIFICATION NO. CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS:
175	25	58012	21/2-11/4X3/4 6M A105N THRD T SA/A105N
18C13549	25	33012	Al 0.026 C 0.200 Cb 0.000 Co 0.003 Cr 0.030 Cu 0.090 Mn 1.070 Mo 0.010 Nb 0.015 Ni 0.030 P 0.008 S 0.024 Si 0.210 Sn 0.010 V 0.003 CE(Long Formula) = 0.39
			T/S(PSI) 72,500 Y/S(PSI) 51,250 EL(%) 34.45 RA(%) 65.40 Brinell 132 BHN 135 BHN
176	47	58332	10 -3 X 3/4 6000 A 105N THRD T SA/A 105N
18C13552		135	Al 0.018 C 0.200 Co 0.003 Cr 0.030 Cu 0.140 Mn 1.030 Mo 0.010 N 0.006 Nb 0.016 Ni 0.040 P 0.008 S 0.017 Si 0.200 N 0.004
	1001C	=5.15	CE(Long-Formula) = 0.39
	Mrc	· At	Brinell 130 BHN 130 BHN
		58268	10 -3 X 3/4 6000 A105N THRD T SA/A105N
J8C13552		36206	A1 0.023 C 0.200 Cb 0.000 Co 0.003 Cr 0.040 Cu 0.170 Mn 1.040 Mo 0.010 N 0.005 Nb 0.013 Ni 0.040 P 0.008 S 0.019 Si 0.200 V 0.004 CE(Long Formula) = 0.40
			T/S(PSI) 71,125 Y/S(PSI) 48,775 EL(%) 34.90 RA(%) 67.25 Brinell 132 BHN 132 BHN
			Dinon (32 Bitt)
177	50	58181	21/2-2 X1 6000 A105N THRD T SA/A105N
18C13561			Al 0.021 C 0.200 Co 0.004 Cr 0.030 Cu 0.080 Mn 1.040 Mo 0.010 N 0.004 Nb 0.014 Ni 0.020 P 0.008 S 0.019 Si 0.220 V 0.004
	MATERIAL	CONFORMS	CE(Long Formula) = 0.39
		TOMER	T/S(PSI) 78,375 Y/S(PSI) 50,000 EL(%) 34.95 RA(%) 65.85
	SPECIFIC	CATIONS	Brinell 135 BHN 135 BHN
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	REQUIRI	EMENTS >	> duar na
	Name:(	1000	(1) (1) (1)

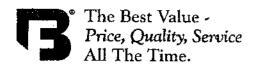
We certify that the data on this sheet is a true copy taken from our records of material furnished us by the production mill, or as obtained by additional laboratory checks.

Meloney Specht

QUALITY PROCESS MANAGER

**CMTR: REV2** 

Date!



LOG NO. F00000000013522

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**CUSTOMER: MRC MIDFIELD** 

DATE 04/20/2011

CUSTOMER

ITEM

CMTR: REV2

ORDER NO.: \$759104356

SHIP TO: MRC MIDFIELD

502-25 AVENUE

NISKU AB T9E 0K6

Canada

QUANTITY

BONNEY ORDER NO. B000095208

GRADE OR SPECIFICATION NO. CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS:

1. THE FITTINGS SUPPLIED ARE IN ACCORDANCE WITH PURCHASE ORDER SPECIFICATIONS.

2. THE MATERIAL SUPPLIED IDENTIFIED AS A 105N WAS NORMALIZED IN ACCORDANCE WITH ASTM A 105 HEAT TREATING REQUIREMENTS.

THE MATERIAL SUPPLIED AS A 105N MEETS THE REQUIREMENTS OF BOTH NACE MRO 103-2007 AND NACE MRO175/ISO 15156-2. /

4. CERTIFYING ASTM A105-09 / ASME SA105-07 EDITION.

LOT NO.

- 5. THE PRODUCT SUPPLIED WAS INSPECTED IN ACCORDANCE WITH EN 10204:2004 EDITION TYPE 3.1 INSPECTION DOCUMENT, (EUROPEAN STANDARD)
- 6. THE MATERIAL SUPPLIED IDENTIFIED AS A 105QT WAS QUENCHED AND TEMPERED IN ACCORDANCE WITH ASTM A105 HEAT TREATING REQUIREMENTS.
- 7. THE UNIT OF MEASURE FOR TENSILE AND YIELD (0.2%) STRENGTH ARE IN REPORTED IN PSI.
- 8. ELONGATION TEST RESULTS ARE OBTAINED USING STANDARD ROUND SPECIMEN, 2 INCH OR 50 MM GAGE LENGTH.

We certify that the data on this sheet is a true copy taken from our records of material

bv

Meloney Specht

Meloney

QUALITY PROCESS MANAGER

furnished us by the production mill, or as obtained by additional laboratory checks.



Manufactures of Piping and Pressure Vessel Components

4407 Haygood St - Houston, TX 77022 Phone: 713-695-3633 Fax: 713-695-3528 A Bonney Farge Company

This product has not come in direct contact with mercury or any of its compounds, nor with any mercury-containing device employing a single boundary of containment. No welding performed.

We certify that the contents of this report are correct and accurate, and that all test results and operations performed by WFI or its subcontractors are in compliance with the material specification and requirements of the referenced code or standard, and that the material conforms to the dimensional requirements of the order. This document is in accordance with EN10204 3.1.

Material: A/SA105N 09

Item
H
36 - 3 X I 3M THP
SHIP AND BACKORDER

A/SA105N

Chemical Composition

0.03

SI

0.23

Ladie

0.050

0.003

Page S of 8

Sold To: TRANS AM PIPING PRODUCTS

CTD

9335 ENDEAVOR DRIVE S.E. CALGARY AB T3S 0AT

MTR#: 220,759

PO#: CI-11-645

Sales Order #: C001115274

Date: 12/16/2011

Certified Material Test Report

Heat Code: 58582

"Conforms with ASME Sec II Part A, 2010 edition 2011a addenda"

**APPROVED** 

By Ceri Steen at 11:32 am, Apr 17, 2012

mn:c= 5.2

0.02

Product c CR ĊП MN МО NT S 0.000 0.00 0.000 0.00 0.000 0.00 0.000 0.000 SI 0.00 0.000

1.04

0.39

0.000

0.014

Product 72,758 Yield PS1 Elong % RA % Unritness 137 BHN

Normalized

JAW NACE MR0175/ ISO 15156- 2009

MATERIAL CONFORMS
TO CUSTOMER
SPECIFICATIONS
AS PER P.O.
REQUIREMENTS

Encana

Marie Dehmer

Ladle.

C 0.200

s

Carbon Equivalency:

0.023

Quality Assurance Representative



Manufacturer of Piping and Pressure Vessel Components

4407 Haygood St - Houston, TX 77022 Phone: 713-695-3633 Fax: 713-695-3528 A Bonney Forge Company

This product has not come in direct contact with mercury or any of its compounds, nor with any mercury-containing device employing a single boundary of containment. No welding performed.

We certify that the contents of this report are correct and accurate, and that all test results and operations performed by WFI or its subcontractors are in compliance with the material specification and requirements of the referenced code or standard, and that the material conforms to the dimensional requirements of the order. This document is in accordance with EN10204 3.1.

Page 1 of 1

Sold To: TRANS AM PIPING PRODUCTS

LTD

9335 ENDEAVOR DRIVE S.E. CALGARY AB T3S 0A1

MTR#: 222,961

PO#: CI-11-645

Sales Order #: C001115274

Date: 01/26/2012

### Certified Material Test Report

Heat Code: 58614

MATERIAL CONFORMS
TO CUSTOMER
SPECIFICATIONS
AS PER P.O.
REQUIREMENTS

Material:

A/SA105N 09

Item 15 Description

36 - 1 1/2 X 3/4 6M THP

A/SA105N 5

MN:C= 4.63

Paramount Encana

Chemical Composition

Ladle C CR CU MN ND NB NI P

0.220 0.03 0.040 1.02 0.000 0.014 0.02 0.007

B SI V

0.021 0.19 0.004

Carbon Equivalency: Ladle 0.40

Product

Tensile PSI 74,320 Yield PSI 45.333 Elong %

RA %

Hardness 130 BHN

130 BHN

Normalized

IAW NACE MR0175/ ISO 15156- 2009

"Conforms with ASME Sec II, Part A, 2010 edition, 2011a addenda" May 10.12

Marie Dehmer

Quality Assurance Representative

VT.277-280



### 嫌輝企業股份有限公司 YEH PHUI ENTERPRISE CO. LT

・ 品質證明書 INSPECTION CERTIFICATE 台灣省高雄市檢閱医学來歷字宏寫369號 No. 359, Yuliao Road, Qiaotou District Kaohsiung City 82544, Taiwan (R.O.C.) TEL:+886(0)7 6117181 FAX:+886(0)7 6126385

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SEQ III NO.			TENSIL		Title St	点 机	E 333 34 54 7 ET	75		MIC CLATES		BASI	C DXYGEN FOR	RACE & COR	TINUODS C	rsting • A1-	KILLED STE	<u> </u>
NO. 111 NO.	管理+序度+長度 OD+THICK+LENGTH	社型(主) 生産 C TY//pcs TEIGHT(kg)	YIELD TENS	ILE IL(%)	DEAD FL.	ii	TET	ATL	EEPP C	W. OF D	5学位 NJ/0R-	C Ma :	Si P S				Nb Ti	CEY
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Chief uf Quality-Assurance Section

C. E. C.+ W.N/6#(CR+MO+V)/5+(NI+CU)/15

We herely repuly that the material herein described has been manufactured, sampled, tested and inspected in accordance with the requirements of above.

MN:C= 4.95





# MATERIAL CONFORMS TO CUSTOMER SPECIFICATIONS AS PER P.O. CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP HSIN ENTERPRISE CO., LTD.: CHUP

	Chemical   Composition   C   SI   Min   P   S   Cu   NH   Che   Mo   NH   Chemical   Composition   C   SI   Min   P   S   Cu   NH   Che   Min   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   NH   Che   Che   NH   Che   NH   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che   Che	OAP SID SEAVILESS 111/2 100 GAP SID SEAVILESS 8 111/2 100 100 100 100 100 100 100 100 100 10	ASME B169-2003	Customer TRANSAM FIRING PRODUCTS LTD. 17. TUN Preduct SEAMLESS CARBON STERL BUTT WELD FITTINGS KAOHS Spec ASME SAASTM A234 WPB-05a TEL(0) CSAA245.11-96 Gr 241 CATA NACE MR0175-03 FAX(0) Specification for Raw Material
32 47448 80342 23 134 41 55428 80385 23 144 1	Tension Test HARD NESS  YS TIS E TEST  PS.1 F.S.1 G. HB  55000 55000 17 191	"Conforms With ASME Sec II, Part A, 2010 edition, 2011a addenda"	GOOD Heat ID Heat No.	IG. I.I. ROAD HSIAO KANG IUNG. TAIWAN R.O.C 7831-3157 7831-2942, 821-7500 Visual Examination
X03HR EN102043.1 EN102043.1	Magnetic Particle ent.: Exam	970111H0056	Raw Material Mfg Raw Gentificate NO.	Gertiffcerte No.: 09900116-01163 Order No.