

DATA BOOK

762 (30") OD SEPARATOR SN1669
QUADRUPLES SEPARATOR PACKAGE
CORDOVA D-55-A/94-P-10 FACILITY
PENN WEST EXPLORATION
P.O. # PEI-A13370663-01
C/O PIONEER ENGINEERING INC
CADO PROJECT # 2013-070 UNIT 1 OF 2

CADO INDUSTRIES INC.

7491 – 110 AVENUE SE CALGARY, AB T2C 3B8 TEL 403-279-6662 FAX 403-279-6687

FORM U-1A MANUFACTURERS DATA REPORT FOR PRESSURE VESSELS
 (Alternative Form for Single Chamber, Completely Shop or Field Fabricated Vessels Only)
 As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

A. 636926

1. Manufactured and certified by Cado Industries Inc. 7491, 110 Avenue S.E. Calgary, Alberta, Canada, T2C 3B8
(Name and Address of Manufacturer)

2. Manufactured for Penn West Exploration #200, 207 - 9th Avenue S.W. Calgary, Alberta T2P 1K3
(Name and address of purchaser)

3. Location of installation Penn West Exploration Cordova d-55-A/94-P-10 Facility
(Name and address)

4. Type Vertical 1669 W3539.213 2013-070-300 Rev. 2 N/A 2014
(Honz. or vert., tank) (Mfg's serial No.) (CRN) (Drawing No.) (Nat'l Bd. No.) (Year built)

5. ASME Code, Section VIII, Division 1 2010 ED, 2011 ADD N/A N/A
(Edition & Addenda, if applicable (Date)) (Code Case No.'s) (Special Service per UG-120(d))

6. Shell SA-516-70N 1.25" 0.125" 2'-4" 10'-0"
Mat'l. (Spec. No., Grade) Nom. Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft. & in.) Length (overall) (ft. & in.)

Body Flanges on Shells

No.	Type	ID	OD	Flange Thickness	Min. Hub Thickness	Material	How Attached	Location	Bolting				
									Num & Size	Bolting Material	Washer (OD.ID. Thk)	Washer Material	

7. Seams Type 1 Full 100% 1100° F 1.25 HR Type 1 Full 100% 1
Long (Welded, Dbl., Singl., Lap, Butt) R. T. (Spot or Full) Eff. (%) H.T. Temp. (° F) Time (hr) Girth (Welded, Dbl., Singl., Lap, Butt) R.T. (Spot or Full) Eff (%) No. of Courses

8. Heads: (a) Mat'l. SA-516-70N (Spec. No., Grade) b) Mat'l. SA-516-70N (Spec. No., Grade)

	Location (Top Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	End	1.14"	0.125"			2:1				Concave
(b)	End	1.14"	0.125"			2:1				Concave

Body Flanges on Heads

	Location	Type	ID	OD	Flange Thickness	Min. Hub Thk	Material	How Attached	Bolting			
									Num & Size	Bolting Material	Washer (OD.ID. Thk)	Washer Material
(a)												
(b)												

9. MAWP 1360 PSI at max. temp. 194° F
Internal External Internal External
 Min. design metal temp -20° F at 1360 PSI Hydro., pneu., or comb. test pressure 1768 PSI
 Proof Test N/A

10. Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain etc.)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
				SEE	ATTACH	ED	FORM	U-4			

11. Supports: Skirt Yes Lugs Two Legs None Other N/A Attached Top & Bottom Head, Welded
(Yes or no) (Number) (Number) (Describe) (Where and how)


12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:

(Name of part, item number, Mfg's name and identifying stamp)

Vessel : 30" Separator; Construction Drawing : 2013-070-300 Rev. 2; Volume : 45.8 Cu. Ft. Impact test: Exempt as per FIG UCS-66, UCS 66(b)(1)(b) and UG-20(f). Three 4" Blind RF CL 600 SA-105-N c/w 36 1" Ø Studs 171 LG c/w 2 Nuts each SA-193-B7M/194-2HM UNC.

CERTIFICATE OF SHOP/ FIELD COMPLIANCE


We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. "U" Certificate of Authorization No. 39285 expires Feb. 10, 2016

Date JAN 21 2014 Co. name Cado Industries Inc. Signed 
(Manufacturer) (Representative)

CERTIFICATE OF SHOP / FIELD INSPECTION

Vessel constructed by Cado Industries Inc at 7491, 110 Avenue S.E. Calgary, Alberta, Canada, T2C 3B8
 I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by ABSA

have inspected the component described in this Manufacturer's Data Report on JAN 22 2014, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date JAN 22 2014 Signed 
(Authorized Inspector) Commissions AB 11 NB 10270 A, B
(National Board (incl. endorsements))

FORM U-4 MANUFACTURER'S DATA REPORT SUPPLEMENTARY SHEET
As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

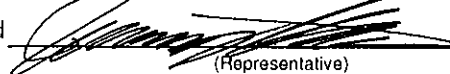
1. Manufactured and certified by Cado Industries Inc. 7491, 110 Avenue S.E. Calgary, Alberta, Canada, T2C 3B8
 (Name and address of Manufacturer)
2. Manufactured for Penn West Exploration #200, 207 – 9th Avenue S.W. Calgary, Alberta T2P 1K3
 (Name and address of Purchaser)
3. Location of installation Penn West Exploration Cordova d-55-A/94-P-10 Facility
 (Name and address)
4. Type: Vertical 30" Separator 1669
 (Horizontal, vertical, or sphere) (Tank, separator, heat exh., etc.) (Mfg's. serial No.)
- W3539.213 2013-070-300 Rev. 2 N/A 2014
 (CRN) (Drawing No.) (Nat'l Bd. No.) (Year Built)

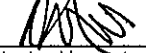
Data Report
 Item Number 10
 Continued from Form U1a

Remarks

Purpose (Inlet, Outlet, Drain etc.)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
Inlet	1	4" CL 600	RFWN	SA-106-B	SA-105-N	0.674"	0.125"	Inherent	UW16.1(c)	Type 1	Shell
Gas Outlet	1	4" CL 600	RFWN	SA-106-B	SA-105-N	0.674"	0.125"	Inherent	UW16.1(c)	Type 1	Head
H2O Outlet	1	3" CL 600	RFWN	SA-106-B	SA-105-N	0.600"	0.125"	Inherent	UW16.1(c)	Type 1	Shell
HC Outlet	1	3" CL 600	RFWN	SA-106-B	SA-105-N	0.600"	0.125"	Inherent	UW16.1(c)	Type 1	Shell
Drain	1	2" CL 600	RFWN	SA-106-B	SA-105-N	0.436"	0.125"	Inherent	UW16.1(c)	Type 1	Head
PSV	1	2" CL 600	RFWN	SA-106-B	SA-105-N	0.436"	0.125"	Inherent	UW16.1(c)	Type 1	Shell
LSHH	1	4" CL 600	RFWN	SA-106-B	SA-105-N	0.674"	0.125"	Inherent	UW16.1(c)	Type 1	Shell
LSSL	1	4" CL 600	RFWN	SA-106-B	SA-105-N	0.674"	0.125"	Inherent	UW16.1(c)	Type 1	Shell
LC (H2O)	1	3" CL 600	RFWN	SA-106-B	SA-105-N	0.600"	0.125"	Inherent	UW16.1(c)	Type 1	Shell
LC (HC)	1	3" CL 600	RFWN	SA-106-B	SA-105-N	0.600"	0.125"	Inherent	UW16.1(c)	Type 1	Shell
Inspection	2	4" CL 600	RFWN	SA-106-B	N/A	0.674"	0.125"	Inherent	UW16.1(c)	Type 1	Shell
LG (H2O)	2	¾" CL 6000	CPLG	SA-105-N	N/A	CL 6000	0.125"	Inherent	UW16.1(c)	Type 1	Shell
LG (HC)	2	¾" CL 6000	CPLG	SA-105-N	N/A	CL 6000	0.125"	Inherent	UW16.1(c)	Type 1	Shell
PG	1	¾" CL 6000	CPLG	SA-105-N	N/A	CL 6000	0.125"	Inherent	UW16.1(c)	Type 1	Shell
TG	1	1" CL 6000	CPLG	SA-105-N	N/A	CL 6000	0.125"	Inherent	UW16.1(c)	Type 1	Shell

Certificate of Authorization: Type "U" No. 39285 Expires Feb. 10, 2016

Date JAN 21 2014 Name Cado Industries Inc. Signed 
 (Manufacturer) (Representative)

Date JAN 22 2014 Name  Commission AB 11 NB 10270 A, B
 (Authorized Inspector) (Nat'l Board incl. Endorsement, State, Province and No.)

CADO INDUSTRIES INC
Quality Control Manual

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Revision Date: November 30, 2012

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EXHIBIT 9.5 TRAVEL SHEET (FRONT)

DO NOT START CONSTRUCTION WITHOUT AI REVIEW						TRAVEL SHEET REVISION NO.:			
AI REVIEW:		REVIEW DATE:		OCT 04 2013					
SERIAL NO.: 1669		JOB NO.: 2013-070		VESSEL TYPE: 762 Separator					
DRAWING NO.: 2013-070-300		DWG. REVISION NO.: Rev. 0		TRAVEL SHEET INITIATION BY: CA					
Seq.	Item	Comments	Q.C.I.	Date	A.I. Hold Points	A.I.	Date	Owner	Date
1.	Calculations in File			JAN 21 2014	X				
2.	Release of App'd Dwg.			OCT 03 2013	Y		OCT 04 2013		Nov 26
3.	Materials Examined			DEC 11 2013					
4.	Heat Numbers Recorded			DEC 11 2013	Y		JAN 22 2014		JAN 23 2014
5.	MTRs Checked			DEC 11 2013	X				JAN 23 2014
6.	WPS(s) Checked			OCT 03 2013	Y		OCT 04 2013		JAN 23 2014
7.	Welder(s) Qualified			DEC 11 2013					
8.	Thicknesses Verified & Recorded			DEC 11 2013					
9.	Shell(s) & Head(s) Fit-up Inspection			DEC 11 2013	Y		JAN 22 2014		JAN 23 2014
10.	Nozzles & Fittings Fit-up Inspection			DEC 11 2013					Nov 26
11.	Nozzle Orientation			DEC 11 2013					"
12.	Nozzle & Flange Rating Checked			DEC 11 2013					"
13.	Impact Tests			N/A					-
14.	Internals Checked			NOV 25 2013					
15.	Final Internal Inspection	Shell Side Tube Side		NOV 25 2013	X		NOV 26 2013		Nov 26
16.	Weld Sizes Checked			DEC 11 2013					Jan 22
17.	Welder I.D. Checked			DEC 11 2013					"
18.	Final External Inspection			JAN 21 2014	X		JAN 22 2014		"
19.	Radiography			DEC 11 2013	Y		JAN 22 2014		JAN 23 2014
20.	Other N.D.E.	Hardness		JAN 21 2014					JAN 23 2014
21.	Final Ext. Prior to P.W.H.T.			DEC 11 2013					
22.	PWHT Chart Checked			JAN 21 2014	X		JAN 22 2014		Jan 22
23.	Hydrostatic Test	Shell Side Gauge # TPG-08B/17 Tube Side Gauge #		JAN 22 2014	XX		JAN 22 2014		"
24.	CRN Drawing	CRN#		JAN 21 2014	XX		JAN 22 2014		
25.	N.C.R. #								
26.	Nameplate Stamping			JAN 21 2014	XX		JAN 22 2014		JAN 23 2014
27.	Manuf. Data Report Completed & Verified			JAN 21 2014	XX		JAN 22 2014		JAN 23 2014
28.	Nameplate Installation			"					

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

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SU 1669

EXHIBIT 9.6 TRAVEL SHEET (BACK)

MATERIAL THICKNESS VERIFICATION AND IDENTIFICATION				WELD I.D. / WELDER SYMBOLS / FIT-UP						
Description	Thickness	Material Spec. & Grade	Heat & Plate Identifier 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	1.320	SA-516-70N	3826492136-01	L-1			C-1	R/M	9/3	9/3
Shell #2				L-2			C-2	R/M	9/3	9/3
Shell #3				L-			C-			
Shell #4				L-			C-			
Shell #5				L-			C-			
Shell #6				L-			C-			
Head #1	1.357	SA-516-70N	61129476540101				C-			
Head #2	1.352	SA-516-70N	61129476540101				C-			
Head #3							C-			
Head #4							C-			
Boot #1 Shell				L-			C-			
Boot #1 Head							C-			
Boot #2 Shell				L-			C-			
Boot #2 Head							C-			
Re-Pad										

ATTACHMENT AND / OR NOZZLE MATERIAL THICKNESS VERIFICATION AND IDENTIFICATION						WPS # WELDER SYMBOLS/FIT-UP			
Mark	Mat. I.D.	Neck	Fitting	Flange	Repad or Attachment	Cat. B	Cat. C	Cat. D	Pad OD
N1	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	4" SCH XXH		4" CL 600 RFWN			S	R/S	
	Heat# or ID	C1561		TL10004515					
N2	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	4" SCH XXH		4" CL 600 RFWN			C	R/S	
	Heat# or ID	C1561		TL10004515					
N3	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	3" SCH XXH		3" CL 600 RFWN			S	U/R	
	Heat# or ID	C1281		12/35050					
N4	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	3" SCH XXH		3" CL 600 RFWN			S	P/S/U	
	Heat# or ID	C1281		12/35050					
N5	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	2" SCH XXH		2" CL 600 RFWN			C	R	
	Heat# or ID	C1692		TL10005612					
N6	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	2" SCH XXH		2" CL 600 RFWN			S	R/S	
	Heat# or ID	C1700		TL10005612					
N7	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	4" SCH XXH		4" CL 600 RFWN			S	S/R	
	Heat# or ID	C1561		TL10004515					
N8	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	4" SCH XXH		4" CL 600 RFWN			S	U/R	
	Heat# or ID	C1561		TL10004515					



Gamma-Tech Inspection Ltd.
3080 - 49th Avenue SE
Calgary, Alberta T2B 2X4
Phone: 403-235-2454
Fax: 403-207-4451

RADIOGRAPHIC REPORT

R - 60806

CLIENT: CADCO	MATERIAL TYPE: CS	THICKNESS RANGE: 1.250"	LEGEND: WELDERS SYMBOL ACCEPTABLE BORDERLINE REJECT	DATE: Oct 14/13
LOCATION: CALGARY	SOURCE OF RADIATION: IR192	FOCAL SPOT (F): 3.5mm	WELDERS SYMBOL ACCEPTABLE BORDERLINE REJECT	PAGE: 1 OF 1
GITL JOB No. 13-01-0068	CONTRACTOR: CADCO	TECHNIQUE: SWE <input type="checkbox"/> DWE <input type="checkbox"/> DWT <input type="checkbox"/> OTHER <input type="checkbox"/>	PROCEDURE: A	CODE: ASME UW51
CLIENT'S P.O.	FILM TYPE: AGFA <input type="checkbox"/> D4 <input type="checkbox"/> D5 <input type="checkbox"/> D67 <input type="checkbox"/>		See back for other legends.	
CLIENT JOB No. 2013-070				

IDENTIFICATION	PIPE SIZE	PIPE SCHEDULE	t	# OF EXP	CRK	LF	IP	P	S	UC	CR	EP	%	*	IQI	DEFECT LOCATION AND REMARKS	ACCEPT	REJECT
1.																		
2.	SN1669																	
3.	L1	R	1 1/4"	1280	8											Full DM B LS=120"		
4.	Q-15																	
5.	15-30																	
6.	30-45																	
7.	45-60																	
8.	60-75																	
9.	75-90																	
10.	90-105																	
11.	105-120	END																
12.																		
13.																		
14.																		
15.																		
16.																		
17.																		
18.																		
19.																		
20.																		

FINAL FILM INTERPRETATION IS THE RESPONSIBILITY OF THE CLIENT. I AM IN FULL AGREEMENT WITH THE ABOVE DETAILS AND ACKNOWLEDGE RECEIPT OF FILM.

CLIENT REPRESENTATIVE: _____

TECHNICIAN (SIGN): _____

TECHNICIAN (PRINT): **W. B. RILEY** CGSB LEVEL **4** ASNT LEVEL **4**

ASSISTANT (PRINT): **STEPHEN**

FILM USED: **8** PCS. **3 1/2" X 17"**

FILM SIZE: _____ PCS. _____

CGSB Reg.#: **805**

Nominal Plus Maximum Reinforcement: **18.750**

SOD: Source to Object Distance: _____

Curies: **92**

LEAD SCREENS: **1R192** .005 FRONT .010 BACK

LEAD SCREENS: **C060** .010 FRONT .010 BACK

FILM DENSITY: MIN 2.0 MAX 4.0

RADIOGRAPHIC REPORT

R - 61214

CLIENT CADD	MATERIAL TYPE: CS	THICKNESS RANGE: 1.250"
LOCATION CALGARY	SOURCE OF RADIATION: IR192	
GTIL JOB No. 13-01-0.068	CONTRACTOR: CADD	FOCAL SPOT (F): 3.5mm
CLIENT'S P.O.	TECHNIQUE: <input checked="" type="checkbox"/> SWE <input type="checkbox"/> DWE <input type="checkbox"/> DWV <input type="checkbox"/>	
CLIENT JOB No. 2013-070	FILM TYPE: <input type="checkbox"/> AGFA <input type="checkbox"/> D4 <input type="checkbox"/> D5 <input checked="" type="checkbox"/> D07 <input type="checkbox"/> OTHER	

IDENTIFICATION	PIPE SIZE	PIPE SCHEDULE	1	# OF EXP	CRK	LF	IP	P	S	UC	CR	EP	%	*	IQI	DEFECT LOCATION AND REMARKS	ACCEPT	REJECT
SN1669	30"	1 1/4"	1250	1														
C1																		
0-14																		
14-28																		
28-42																		
42-56																		
56-70																		
70-84																		
84-0																		
C110	30"	1 1/4"	1250	1														
77-90																		
C2	30"	1 1/4"	1250	1														
0-14																		
14-28																		
28-42																		
42-56																		
56-70																		
70-84																		
84-0																		

FINAL FILM INTERPRETATION IS THE RESPONSIBILITY OF THE CLIENT. I AM IN FULL AGREEMENT WITH THE ABOVE DETAILS AND ACKNOWLEDGE RECEIPT OF FILM.

CLIENT REPRESENTATIVE: _____

TECHNICIAN (SIGN): _____

TECHNICIAN (PRINT): **W. B. BAKER** CGSB LEVEL **SA** ASNT LEVEL **SA**

ASSISTANT (PRINT): **STEPHEN**

FILM USED: **15** PCS. **3 1/2" X 17"**

SSOFT: Source Side of Object to Film Distance

Nominal Plus Maximum Reinforcement

LEAD SCREENS: **IR192**

LEAD SCREENS: **C060**

FILM DENSITY: **53**

CGSB Reg.#: **805**

1 Film Per Holder

MIN 2.0 MAX 4.0

Procedures: HT-2 Code: Client spec Acceptance / Rejection Criteria: Min. Hardness: _____ Max. Hardness: HB 200	Job / P.O. #: 2013-070 Client: Cado Industries Inc Location: CA-Calgary Alberta Item Inspected: Vessel S/N 1669 PWHT	IRISNDT #: 261900	Date: 15-Jan-14
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Material Type: CS **Surface Condition:** buffed **Heat Treatment:** YES

Equipment: MIC 10 **IRISNDT #:** 45038 **Calibration Date:** 12-Jul-13

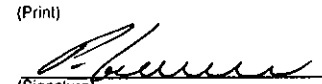
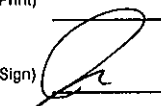
Calibration Block(s): 176, 207

Hardness Scale Readings: Rockwell B Rockwell C Vickers Brinell

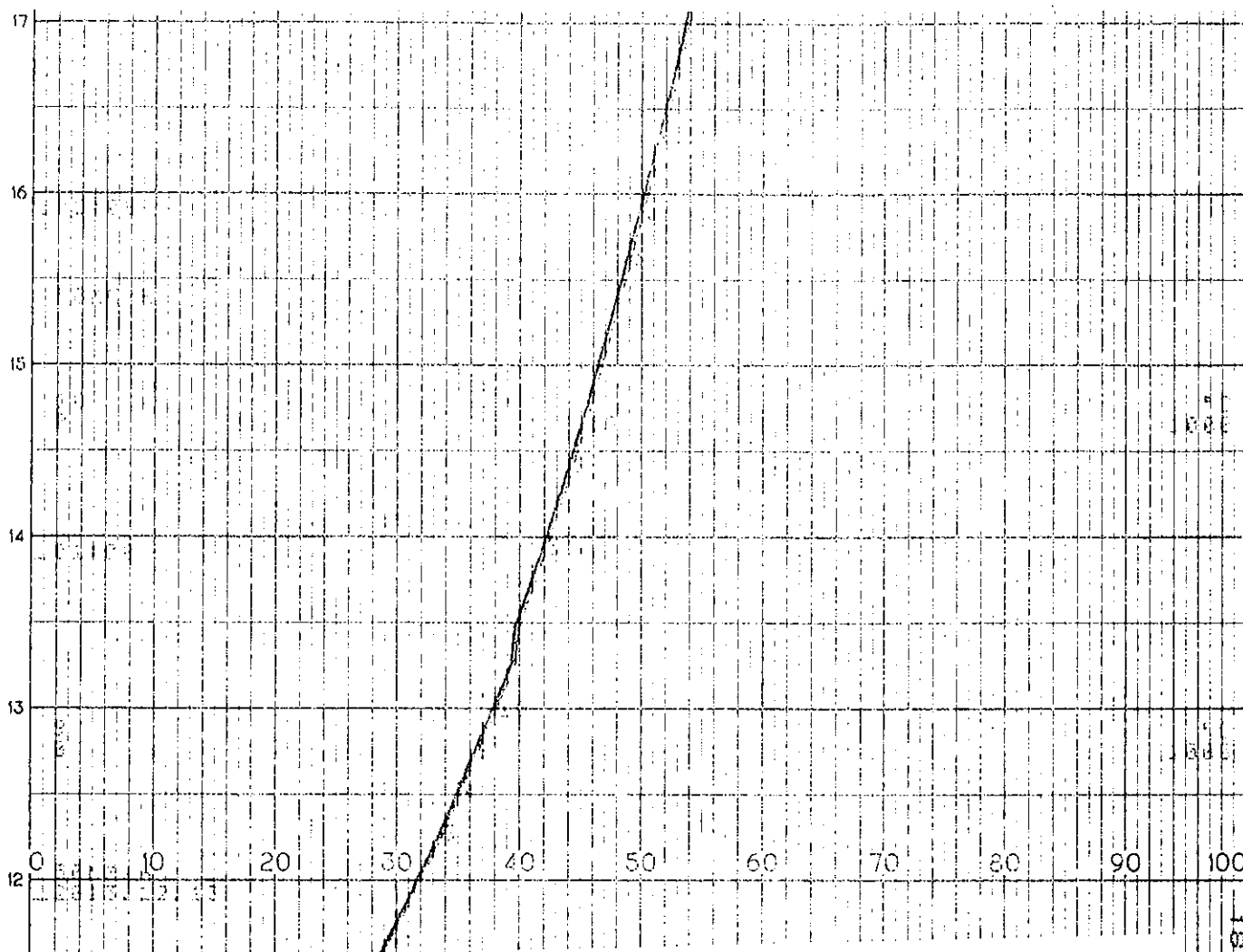
Item	Component Identification and Location of Reading	Brinell Impression		Brinell Bar Hardness	Hardness Value	(A)ccpt (R)eject	
		Bar	Material				
WELD	PM	HAZ	WELD	HAZ	PM		
C1	148	167	176	156	142	A	
L1	147	169	184	167	155	A	
N2 cat D	148	157	174	165	171	A	
Name plate	Attachment	156	166	172	142	134	A

Remarks:

NOTE: When testing weldments the precise location of the test must be clearly identified i.e. Parent Material or Heat Affected Zone or Weld.

Unit#: <u>389</u> Kilometers: _____ In: <u>PG</u> Out: _____ Hrs: <u>.5</u> In: _____ Out: _____ Hrs: _____ Personnel: PG	Consumables: # of Hits: <u>20</u>	Interpretation by: P. GERVAIS SNT-TC-1A _____ _____ C.G.S.B. _____ (Print) (Level) _____ C.G.S.B. # _____ (Signature)  Client Representative: _____ (Print) I am in full agreement with report contents _____ (Sign) 
--	--	---

GRAPHIC CONTROLS BUFFALO, NEW YORK



CONTINENTAL STRESS RELIEVING SERVICES LTD.
 Telephone: 403-273-5105

Date: December 12, 2013

Client: Cado Industries Inc

Owning Co.: N/A

Chart Speed: 50mm/Hours

Material: As Per Customer Specifications

Procedure: PWHT

Furnace Load #: CF13-7952

Client Job #: 2013-070

P.O. #: _____

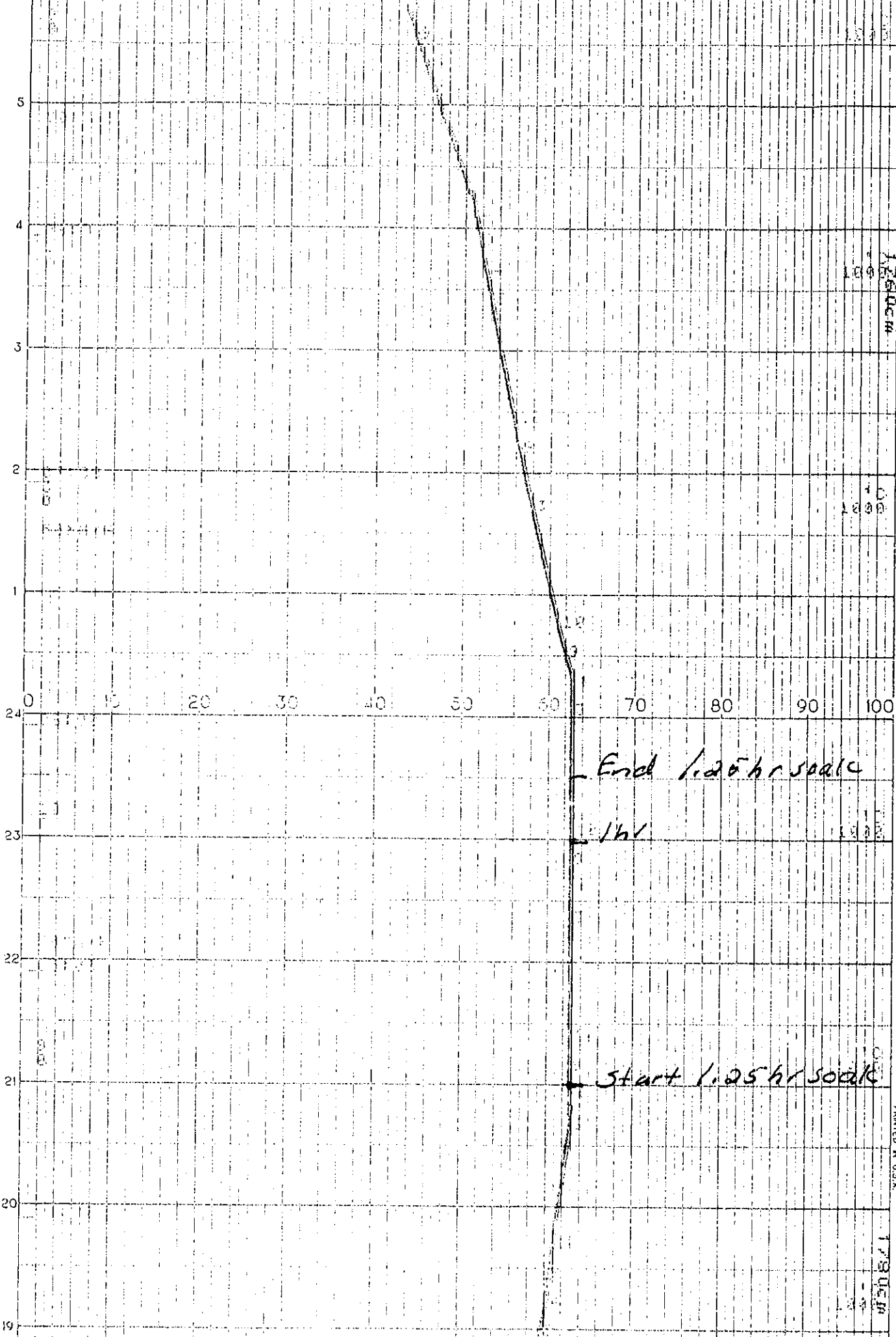
Comments: 4 Vessels (1667/1668/1669/1670)

DEC 16 2013

Operator Name: Marc Lagerquist

Operator Signature:

Temperature in °C: ✓ Recorder #: RE-103



17845M

0021

0021

0021

17845M

CADO INDUSTRIES INC
Quality Control Manual

Revision Number: 4.0

Revision Date: November 30, 2012

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EXHIBIT 14.1 HEAT TREATMENT INSTRUCTIONS

HEAT TREATMENT INSTRUCTIONS

JOB NO.: <u>2013-070</u> CUSTOMER: <u>Penn West</u>		DATE: <u>DEC 12 2013</u>			
COMPONENT DESCRIPTION: <u>30" Separators (4 total)</u>					
DWG. NO. AND LINE NO.	DIAMETER	THICKNESS	MATERIAL	LENGTH	WEIGHT
<u>2013-070-300 Rev. 2</u>	<u>30"</u>	<u>1.25"</u>	<u>SA-516-70N</u>	<u>10' S/S</u>	<u>6240 LBS</u>
<u>1667, 1668, 1669, 1670</u>			<u>SA-105-N</u>		
			<u>SA-106-B</u>		
TYPE OF HEAT TREATMENT: <u>PRESSURE VESSEL STRESS RELIEF P-No. 1</u>					
HEATING					
Temperature to be raised from 800°F (425°C) to <u>1150°F</u> at a maximum rate of <u>320</u> °F (<u>160</u> °C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 400°F (222°C) PER HOUR. [Calculated rate = 400 degrees F/hr. (222 degrees C/hr.) Divided by the maximum metal thickness of the shell or head plate in inches]					
HOLDING					
Temperature to be held at a minimum of <u>1150</u> °F (<u>621</u> °C) for <u>75</u> minutes. [Holding time to be determined by Table UCS-56 for Nominal Thickness as specified in UW-40(f)]					
COOLING					
Temperature to be lowered from <u>1150</u> °F (<u>621</u> °C) to 800°F (425°C) at a maximum rate of <u>400</u> °F (<u>204</u> °C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 500°F (280°C) PER HOUR. [Calculated rate = 500 degrees F/hr. (280 degrees C/hr.) Divided by the maximum metal thickness of the shell or head plate in inches]					
From 800°F (425°C) items may be cooled in still air.					
Additional requirements:					
<ul style="list-style-type: none"> ◆ 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 (140°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. This limitation is also applicable to the temperature variations between the different thicknesses of various vessel components. ◆ During the holding period, there shall not be a greater difference than 150°F (83°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 Voltage² = W-Sec.] ◆ The method of thermocouple removal shall not damage the heat treated item. 					
Quality Control Inspector Signature: <u>[Signature]</u>			Date: <u>DEC 12 2013</u>		
Thermocouple Attachment Method: <u>Capacitor Discharge</u>			Location(s): <u>TMB</u>		
Furnace Heat Number: <u>CF13-7952</u>					
Furnace Operator Signature: <u>[Signature]</u>			Date: <u>Dec 12/13</u>		

Certificate of Conformance Multipoint Recorder

Make:	Chino	Customer:	Continental Stress Relieving Services
Model:	AH3745-N00	Address:	318 Monument Place SE
Serial Number:	AH093Q001		Calgary, Alberta, T2A 1X3
Description:	24 channel Type "K" temperature recorder		
Location:	Calgary, Alberta, Canada	Calibration Date:	October 11, 2013
Tag # :	RE-103	Calibration Due:	April 11, 2014
Report Number:	CSR-111013-03	Technician:	Austin Tarrant

Comments: All 24 channels checked at 0°C, 500°C and 1000°C. See also, recorder chart

Reding Instrument Services Ltd. certifies that the above listed instrument meets or exceeds all published specifications unless otherwise indicated. This instrument has been calibrated using equipment and standards traceable to the National Research Council of Canada (NRC), the National Institute of Standards and Technology (NIST), or derived from accepted values of natural physical constants. This calibration certificate applies only to the item described and shall not be reproduced, other than in full, without approval from Reding Instrument Services Ltd.

Calibration Standards

Make	Model	Serial Number	Recall Date
Fluke	741B	7751004	October 22, 2013


Technician

Oct 11, 2013
Date

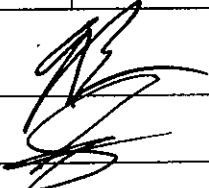
CADO INDUSTRIES INC
Quality Control Manual

Revision Number: 4.0

Revision Date: November 30, 2012

Section: 16 Page: 3 of 3

EXHIBIT 16.2 PRESSURE TEST REPORT

PRESSURE TEST REPORT			
TYPE OF TEST: Hydrostatic <input type="checkbox"/> Pneumatic <input type="checkbox"/> Other <input type="checkbox"/>			
EQUIPMENT DESCRIPTION: <u>30" separator + piping</u>		JOB NUMBER: <u>2013-070</u>	
SERIAL NO: <u>1669</u>	SHELL SIDE TEST PRESSURE <u>2040</u>	(PSI) KPA	
TUBE SIDE TEST PRESSURE _____		PSI / KPA	
LINE NO: _____	CONSTRUCTION DRAWING NUMBER _____	REV NO _____	
GAUGE IDENTIFICATION	CALIBRATION DATE	GAUGE RANGE	GAUGE PRESSURE
GAUGE #1 <u>Pg-083</u>	<u>24 Jan 13</u>	<u>0-5000</u>	<u>2040</u>
GAUGE #2 <u>Pg-017</u>	<u>31 Oct 13</u>	<u>0-5000</u>	<u>2040</u>
CHART RECORDER #1			
MANUFACTURERS' REPRESENTATIVE: 		DATE: <u>JAN 22 2014</u>	
OWNERS INSPECTOR: _____		DATE: <u>Jan 22, 14</u>	
AUTHORIZED INSPECTOR: _____		DATE: _____	



19A, 3515 - 27th St. N.E., Calgary, Alberta T1Y 5E4
Ph: (403) 275-7090 • Fax: (403) 291-7001

CERTIFICATE OF CALIBRATION

Description: PRESSURE GAUGE
Make: WGI
Model: 4"
Serial #: NIL
Temp (°C): 20
Comments: NIL

ID #: PG-08B
Issue Date: 24JAN13
Expiry Date: 24JAN14
Work order #: 4061
RH: 25%

THE CALIBRATION CENTRE CERTIFIES THAT THE ABOVE LISTED INSTRUMENT
HEREIN MEETS OR EXCEEDS ALL PUBLISHED SPECIFICATIONS.

THE CALIBRATION HAS BEEN PERFORMED BY COMPARISON TO STANDARDS
THAT ARE TRACEABLE TO NATIONAL STANDARDS.

(1. NRC X / 2. NIST)

EQUIPMENT USED:

<u>MFG:</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>
SI	PC-6	2743

CALIBRATION DATA:

ACCURACY: 1.0 % FS

<u>APPLIED</u>	<u>BEFORE</u>	<u>AFTER</u>
1000	1000	1000
2000	1990	1990
3000	2980	2980
4000	4000	4000
5000	4990	4990

YVON HACHE - TECHNICIAN



19A, 3515 - 27th St. N.E., Calgary, Alberta T1Y 5E4
Ph: (403) 275-7090 • Fax: (403) 291-7001

CERTIFICATE OF CALIBRATION

Description: PRESSURE GAUGE
Make: WIKA
Model: 4 1/2"
Serial #: NIL
Temp (°C): N/A
Comments: NIL

ID #: PG-017
Issue Date: 31OCT13
Expiry Date: 31OCT14
Work order #: 4486
RH: N/A

THE CALIBRATION CENTRE CERTIFIES THAT THE ABOVE LISTED INSTRUMENT
HEREIN MEETS OR EXCEEDS ALL PUBLISHED SPECIFICATIONS.

THE CALIBRATION HAS BEEN PERFORMED BY COMPARISON TO STANDARDS
THAT ARE TRACEABLE TO NATIONAL STANDARDS.

(1. NRC / 2. NIST)

EQUIPMENT USED:

<u>MFG:</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>
SI	PC-6	2743

CALIBRATION DATA:

ACCURACY: 1.0 % FS

<u>APPLIED</u>	<u>BEFORE</u>	<u>AFTER</u>
1000	1020	1000
2000	2025	2000
3000	3020	2995
4000	4020	3995
5000	5015	5020

YVON HACHE - TECHNICIAN

Ⓟ 636926

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Certified
VANDOR
INDUSTRIES

MAW.P. 1360

PSI Ⓟ 194

EA.EWP.

PSI Ⓟ

MD.M.T. -20

°F Ⓟ 1360

YEAR 1969

YEAR BUILT 2014

13539213



the pressure equipment safety authority

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

December 02, 2013

Attention: Wilfred Cao
CADO INDUSTRIES INC
7491 110 AVENUE SE
CALGARY, AB

The design submission, tracking number 2013-08662, originally received on November 19, 2013 was surveyed and accepted for registration as follows:

CRN : W3539.2

Accepted on: December 02, 2013

Reg Type: New Design

Drawing No. : 2013-070-300 Rev 2

Description	MAWP	Design Temperature	MDMT
Internal Pressure	9377kPa	90 °C	-29 °C

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

Enclosed are stamped prints for your reference.

Sincerely,

DEDOVIC, BLAZO



505 - 6th Street, Suite 200
New Westminster, BC V3L 0E1

Toll Free: 1-866-566-SAFE
Fax: (778) 396 - 2064
www.safetyauthority.ca

CADO INDUSTRIES INC
7491 110 AVENUE SE
CALGARY AB T2C 3B8

Date: December 9, 2013
Account #: 46804
Journal #: 58602
Our File #: 5478899

Attn: WILFRED CAO

Re: Application for Design Registration

The design, as detailed in your, Ref: 2013-070, for a Pressure Vessel is accepted for registration as follows:

Registered To: CADO INDUSTRIES INC **CRN:** W3539.21

MDMT: -29 deg C

MAWT: 90 deg C

MAWP: 9376 kPa

Drawing #: 2013-070-300

Drawing Revision: 2

Conditions Of Registration:

Registration of a 30" Separator.

This design was registered based on a technical review performed by the province of initial registration in accordance with the Association of Chief Inspectors policy on reciprocal recognition of design review.

Contact me if you have any questions. The invoice for registration will be forwarded under separate cover.

SHARON PETERS
(778) 396-2027
Sharon.Peters@safetyauthority.ca
Design Administration

cc:

**Technical
Safety Authority
of Saskatchewan**

2202 2nd Avenue
Regina, SK S4R 1K3
Canada

306-787-1443
info@tsask.ca
www.tsask.ca

REGISTRATION APPROVAL

23-Dec-13

CADO Industries Inc.
7491 - 110 Ave. SE
Calgary, AB
T2C 3B8

Our File 48044 [0V]

ATTENTION : Wilfred Cao

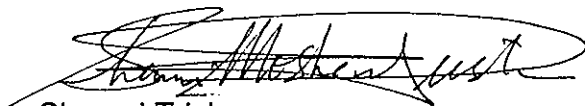
With reference to your submission respecting the registration of the item below, for legal use in the province, please note we have surveyed, approved and registered this design as noted.

MANUFACTURER :	CADO Industries Inc.	
ITEM :	DRAWING NUMBER :	CRN :
30" OD Vertical Separator	2013-070-300 Rev 2	W3539.23

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

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

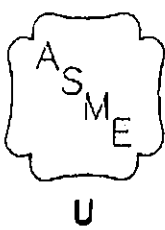
Sincerely,



Shamsi Trisha

Codes and Standards Compliance

REMARKS: CRN registered under reciprocal agreement.



CERTIFICATE OF AUTHORIZATION

The named company is authorized by the American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the certification mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with this certification mark shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY:

**Cado Industries Inc.
7491 110th Avenue SE
Calgary, Alberta, T2C 3B8
Canada**

SCOPE:

Manufacture of pressure vessels at the above location only

AUTHORIZED: **December 12, 2012**

EXPIRES: **February 10, 2016**

CERTIFICATE NUMBER: **39,285**

Vice President, Conformity Assessment

Director, Conformity Assessment



Certificate of Authorization Permit

Quality Management System

Expiry Date: **February 10, 2016**

Reg. No.: **AQP-1426(S)**

This is to certify that:

CADO INDUSTRIES INC.
7491 - 110 AVENUE S.E.
CALGARY, ALBERTA

having complied with the provisions of the SAFETY CODES ACT, is hereby authorized to:

Construct, Repair/Alter ASME Section VIII-1 Pressure Vessels

Construct, Repair/Alter ASME B31.3 Indirect Fired Heater Coils

Construct, Repair/Alter ASME B31.1 Power Piping and ASME B31.3 Process Piping

Manufacture Category 'A', 'E' & 'H' Fittings in accordance with CSA B51

at the above SHOP address.

As a condition of this permit, the holder is required to participate in interim audits by a safety codes officer to verify that the quality management system is being maintained in a manner acceptable to a safety codes officer.

Dated at Edmonton, this 17th day of December, 2012



WELDER "A"

SGS

LUDWIG

WELDING OPERATOR PERFORMANCE QUALIFICATION TEST RECORD

Company Cado Industries Inc. Contact Jeremy Koster
Welder's Name Clifford Magno ABSA File No. MW-71559
WP Registration No. 2621.2 WPS No. CADO-14N
Welding Process(es) SAW Position 1G
Specification of Base Metal(s) SA 36 Thickness 19.1 mm (0.750 in.)
Base metal P-No. 1 to P-No. 1 Test coupon Production weld
 Plate Pipe N/A Filler metal (SFA) specification SFA 5.17
Filler metal or electrode classification F7A8-EM14K

Welding Variables (QW-361.2)

Type of welding (Machine)
Welding process(es) used
Backing
Filler metal F-Number(s)
Consumable Inserts (GTAW or PAW)
Deposit thickness
Welding Position
Vertical progression
Direct or remote visual control
Automatic arc voltage control (GTAW)
Automatic joint tracking
Single or multiple passes per side

Actual Values

Machine
SAW
Weld metal backing
F6
N/A
0.750 in.
1G
N/A
Direct
N/A
Manual
Multiple

Range Qualified

Machine
SAW
With backing
F6
N/A
Max to be welded
Flat
N/A
Direct
N/A
Manual or Automatic
Single or Multiple

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)
Side bend #S1 Pass Side bend #S2 Pass

PASS

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION SGS Ludwig Associates Ltd. A.O.Q.P. Registration No. 7106 (C)
Test Conducted By Rob Cormier, CSA W178.2 Level 1 Insp. Date of Test January 13, 2014
Certified By RC Rob Cormier, C.E.T., I.W.T. Welding Examiner File No. E-00441
Test Certified for Compass Compression Services Ltd. by Representative Jeremy Koster

RECORD INFORMATION

SGS Ludwig Associates Ltd. testing facility Edmonton Calgary Field
Location of test: Cado Industries Inc. 7491 - 110 Avenue SE Calgary, AB T3R 1R8
Date test coupon is to be retained February 13, 2014 Test Coupon Heat No. W302107
Welder Performance Qualification Card No. 13223 Laboratory Test No. CW14-023.1

WELDER "C"



LUDWIG ASSOCIATES LTD.

Materials and Welding Consulting

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company CADO Industries Inc. Contact Jeremy Koster
Welder's Name Robert Gray ABSA File No. W-12068
WP Registration No. 2621.2 WPS No. CADO-6
Welding Process(es) GMAW / SMAW Type Semi-automatic / Manual
Specification of base metal(s) SA 106 Gr.B Thickness 5.54 mm (0.218 in.)

Welding Variables (QW-350)

Backing

Base metal P-No. 1 to P-No. 1

Plate Pipe

Filler metal or electrode specification(s)

Filler metal or electrode classification(s)

Filler metal F-Number(s)

Deposit thickness for each process

GMAW: 3 layers minimum Yes No

SMAW: 3 layers minimum Yes No

Position qualified

Vertical progression

Inert gas backing (GTAW, PAW, GMAW)

Transfer mode (spray/globular or pulse to short circuit-GMAW)

Actual Values

GMAW None

SMAW With

P1

2.375 in. O.D.

SFA 5.18 / SFA 5.1

ER70S-6 / E7018-1

F6 / F4

0.100 in.

0.118 in.

GMAW SP 30°

SMAW 1G Rotated

GMAW Downhill

SMAW N/A

None

Short circuiting

Range Qualified

With or without

With backing

P1

1.0 in. O.D. minimum

WPS requirements

WPS requirements

F6 / F4

0.110 in. maximum

0.236 in. maximum

SP 0 - 45°, Flat

Flat

Downhill

N/A

With or without

Short circuiting

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)

Transverse face bend #F1 Pass Transverse root bend #R1 Pass

PASS

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION Ludwig Associates Ltd. A.O.Q.P. Registration No. 7106 (C)
Test Conducted By Darren McLean, CSA W178.2 level 1 Insp. Date of Test June 19, 2013
Certified By Darren McLean, T.T. Welding Examiner File No. E-00413
Test Certified for Cado Industries Inc. by Representative Jeremy Koster

RECORD INFORMATION

Ludwig Associates Ltd. testing facility Edmonton Calgary Field
Date test coupon is to be retained July 19, 2013 Test Coupon I.D. No. C2-45
Welder Performance Qualification Card No. 04965 Laboratory Test No. CW13-466.2

WELDER "C"



LUDWIG ASSOCIATES LTD.

Materials and Welding Consulting

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company Cado Industries Inc. Contact Jeremy Koster
Welder's Name Robert Gray ABSA File No. W-12068
WP Registration No. 2621.2 WPS No. CADO-1
Welding Process(es) SMAW Type Manual
Specification of base metal(s) A 513 Gr. 1026 Thickness 15.9 mm (0.625 in.)

Welding Variables (QW-350)

Backing

Base metal P-No. 1 to P-No. 1

Plate

Pipe

Filler metal or electrode specification(s)

Filler metal or electrode classification(s)

Filler metal F-Number(s)

Deposit thickness for each process

SMAW: F3 3 layers minimum Yes No

SMAW: F4 3 layers minimum Yes No

Position qualified

Vertical progression

Actual Values

F3 None

F4 With

P1

2.50 in. O.D.

SFA 5.1

E6010 / E7018-1

F3 / F4

0.125 in.

0.500 in.

6G

Uphill

Range Qualified

With or without

With backing

P1

1.0 in. O.D. minimum

WPS requirements

WPS requirements

F3 / F4

0.250 in. maximum

Max. to be welded

All

Uphill

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)

Side bend #S1 Pass

Side bend #S3 Pass

Side bend #S2 Pass

Side bend #S4 Pass

PASS

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION Ludwig Associates Ltd. A.O.Q.P. Registration No. 7106 (C)

Test Conducted By Darren McLean, CSA W178.2 level 1 Insp. Date of Test June 26, 2013

Certified By [Signature] Darren McLean, T.T. Welding Examiner File No. E-00413

Test Certified for Cado Industries Inc. by Representative Jeremy Koster

RECORD INFORMATION

Ludwig Associates Ltd. testing facility Edmonton Calgary Field

Date test coupon is to be retained July 26, 2013 Test Coupon I.D. No. C2-54

Welder Performance Qualification Card No. 04991 Laboratory Test No. CW13-475.2

WELDER "D"



LUDWIG ASSOCIATES LTD.

Materials and Welding Consulting

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company Cado Industries Inc. Contact Jeremy Koster
Welder's Name Robert Sinnott ABSA File No. W-26006
WP Registration No. 2621.2 WPS No. CADO-1
Welding Process(es) SMAW Type Manual
Specification of base metal(s) A 513 Gr. 1026 Thickness 15.9 mm (0.625 in.)

Welding Variables (QW-350)

Backing

Actual Values

Range Qualified

Base metal P-No. 1 to P-No. 1

Plate

Pipe

Filler metal or electrode specification(s)

Filler metal or electrode classification(s)

Filler metal F-Number(s)

Deposit thickness for each process

SMAW: F3 3 layers minimum Yes No

SMAW: F4 3 layers minimum Yes No

Position qualified

Vertical progression

F3 None

F4 With

P1

2.50 in. O.D.

SFA 5.1

E6010 / E7018-1

F3 / F4

0.125 in.

0.500 in.

6G

Uphill

With or without

With backing

P1

1.0 in. O.D. minimum

WPS requirements

WPS requirements

F3 / F4

0.250 in. maximum

Max. to be welded

All

Uphill

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)

Side bend #S1 Pass Side bend #S3 Pass

Side bend #S2 Pass Side bend #S4 Pass

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION Ludwig Associates Ltd. A.O.Q.P. Registration No. 7106 (C)

Test Conducted By Rob Cormier, CSA W178.2 Level 1 Insp. Date of Test September 4, 2013

Certified By Rob Cormier, C.E.T., I.W.T. Welding Examiner File No. E-00441

Test Certified for Cado Industries Inc. by Representative Jeremy Koster

RECORD INFORMATION

Ludwig Associates Ltd. testing facility Edmonton Calgary Field

Date test coupon is to be retained October 4, 2013 Test Coupon I.D. No. C2-57

Welder Performance Qualification Card No. 02445 Laboratory Test No. CW13-675.1

WELDER "D"



LUDWIG ASSOCIATES LTD.

Materials and Welding Consulting

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company CADO Industries Inc. Contact Jeremy Koster
Welder's Name Robert Sinnott ABSA File No. W-26006
WP Registration No. 2621.2 WPS No. CADO-6
Welding Process(es) GMAW / SMAW Type Semi-automatic / Manual
Specification of base metal(s) SA 106 Gr.B Thickness 5.54 mm (0.218 in.)

Welding Variables (QW-350)

	Actual Values	Range Qualified
Backing	GMAW None SMAW With P1	With or without With backing P1
Base metal P-No. 1 to P-No. 1 <input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe	2.375 in. O.D.	1.0 in. O.D. minimum
Filler metal or electrode specification(s)	SFA 5.18 / SFA 5.1	WPS requirements
Filler metal or electrode classification(s)	ER70S-6 / E7018-1	WPS requirements
Filler metal F-Number(s)	F6 / F4	F6 / F4
Deposit thickness for each process		
GMAW: 3 layers minimum <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	0.125 in.	0.138 in. maximum
SMAW: 3 layers minimum <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	0.093 in.	0.186 in. maximum
Position qualified	GMAW SP 30° SMAW 1G Rotated	SP 0 - 45°, Flat Flat
Vertical progression	GMAW Downhill SMAW N/A	Downhill N/A
Inert gas backing (GTAW, PAW, GMAW)	None	With or without
Transfer mode (spray/globular or pulse to short circuit-GMAW)	Short circuiting	Short circuiting

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)
Transverse face bend #F1 Pass Transverse root bend #R1 Pass

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION Ludwig Associates Ltd. A.O.Q.P. Registration No. 7106 (C)
Test Conducted By Rob Cormier, CSA W178.2 Level 1 Insp. Date of Test September 4, 2013
Certified By Rob Cormier, C.E.T., I.W.T. Welding Examiner File No. E-00441
Test Certified for Cado Industries Inc. by Representative Jeremy Koster

RECORD INFORMATION

Ludwig Associates Ltd. testing facility Edmonton Calgary Field
Date test coupon is to be retained October 4, 2013 Test Coupon I.D. No. C2-45
Welder Performance Qualification Card No. 02448 Laboratory Test No. CW13-675.2

WELDER "M"



LUDWIG ASSOCIATES LTD.

Materials and Welding Consulting

WELDING OPERATOR PERFORMANCE QUALIFICATION TEST RECORD

Company Cado Industries Inc. Contact Jeremy Koster
Welder's Name Renante Morales ABSA File No. MW-69053
WP Registration No. 2621.2 WPS No. CADO-13N
Welding Process(es) SAW Position 1G
Specification of base metal(s) SA 36 Thickness 15.9 mm (0.625 in.)
Base metal P-No. 1 to P-No. 1 Test coupon Production weld
 Plate Pipe N/A Filler metal (SFA) specification SFA 5.17
Filler metal or electrode classification F7P8-EM14K

Welding Variables (QW-361.2)

Welding Variables (QW-361.2)	Actual Values	Range Qualified
Type of welding (Machine)	Machine	Machine
Welding process(es) used	SAW	SAW
Backing	Metal backing	With backing
Filler metal F-Number(s)	F6	F6
Consumable Inserts (GTAW or PAW)	N/A	N/A
Deposit thickness	0.625 in.	Max to be welded
Welding Position	1G	Flat
Vertical progression	N/A	N/A
Direct or remote visual control	Direct	Direct
Automatic arc voltage control (GTAW)	N/A	N/A
Automatic joint tracking	Manual	Manual or Automatic
Single or multiple passes per side	Multiple	Single or Multiple

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)
Side bend #S1 Pass Side bend #S2 Pass

PASS

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION Ludwig Associates Ltd. A.O.Q.P. Registration No. 7106 (C)
Test Conducted By Darren McLean, CSA W178.2 level 1 Insp. Date of Test July 2, 2013
Certified By [Signature] Darren McLean, T.T. Welding Examiner File No. E-00413
Test Certified for Cado Industries Inc. by Representative Jeremy Koster

RECORD INFORMATION

Ludwig Associates Ltd. testing facility Edmonton Calgary Field
Location of test: Cado Industries Inc. 7491 110 Ave. SE Calgary, AB T3R 1R8
Date test coupon is to be retained Aug 2, 2013 Test Coupon I.D. No. CPL-93
Welder Performance Qualification Card No. 02126 Laboratory Test No. CW13-487.2



LUDWIG ASSOCIATES LTD.

WELDER "P"

Materials and Welding Consulting

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company	Cado Industries Inc.	Contact	Jeremy Koster
Welder's Name	Kelvin Perez	ABSA File No.	W-6448
WP Registration No.	2621.2	WPS No.	CADO-8
Welding Process(es)	GMAW / SMAW	Type	Semi-automatic / Manual
Specification of base metal(s)	SA 106 Gr.B	Thickness	11.1 mm (0.436 in.)

Welding Variables (QW-350)

Welding Variables (QW-350)	Actual Values	Range Qualified
Backing	GMAW None SMAW With	With or without With backing
Base metal P-No. 1 to P-No. 1 <input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe	P1 2.375 in. O.D.	P1 or P8 to P8 1.0 in. O.D. minimum
Filler metal or electrode specification(s)	SFA 5.9 / SFA 5.4	WPS requirements
Filler metal or electrode classification(s)	ER309L / E309L-16	WPS requirements
Filler metal F-Number(s)	F6 / F5	F6 / F5
Deposit thickness for each process		
GMAW: 3 layers minimum <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	0.100 in.	0.110 in. maximum
SMAW: 3 layers minimum <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	0.336 in.	0.672 in. maximum
Position qualified	GMAW SP 30° SMAW 1G Rotated	SP 0 - 45°, Flat Flat
artical progression	GMAW Downhill SMAW N/A	Downhill N/A
Inert gas backing (GTAW, PAW, GMAW)	None	With or without
Transfer mode (spray/globular or pulse to short circuit-GMAW)	Short circuiting	Short circuiting

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)
Side bend #S1 Pass Side bend #S2 Pass

PASS

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION	Ludwig Associates Ltd.	A.O.Q.P. Registration No.	7106 (C)
Test Conducted By	Darren McLean, CSA W178.2 level 1 Insp.	Date of Test	November 23, 2012
Certified By	Darren McLean, T.T.	Welding Examiner File No.	E-00413
Test Certified for	Cado Industries Inc. by Representative		Jeremy Koster

RECORD INFORMATION

Ludwig Associates Ltd. testing facility	<input type="checkbox"/> Edmonton	<input checked="" type="checkbox"/> Calgary	<input type="checkbox"/> Field
Latest test coupon is to be retained	December 23, 2012	Test Coupon I.D. No.	C2-46
Welder Performance Qualification Card No.	07656	Laboratory Test No.	CW12-783.1

WELDER "P"



LUDWIG ASSOCIATES LTD.

Materials and Welding Consulting

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company Cado Industries Inc. Contact Jeremy Koster
Welder's Name Kelvin Perez ABSA File No. W-6448
WP Registration No. 2621.2 WPS No. CADO-12N
Welding Process(es) GTAW / SMAW Type Manual
Specification of base metal(s) SA 106 Gr.B Thickness 8.74 mm (0.344 in.)

Welding Variables (QW-350)

Backing

Base metal P-No. 1 to P-No. 1

Plate Pipe

Filler metal or electrode specification(s)

Filler metal or electrode classification(s)

Filler metal F-Number(s)

Consumable insert (GTAW or PAW)

Filler type (solid/metal or flux cored/powder) (GTAW or PAW)

Deposit thickness for each process

GTAW: 3 layers minimum Yes No

SMAW: 3 layers minimum Yes No

Position qualified

Vertical progression

Inert gas backing (GTAW, PAW, GMAW)

GTAW current type/polarity (AC, DCEP, DCEN)

Actual Values

GTAW None

SMAW With

P1

2.375 in. O.D.

SFA 5.9 / SFA 5.4

ER2209 / E2209-17

F6 / F5

None

Solid

0.125 in.

0.219 in.

2G

N/A

With

DCEN

Range Qualified

With or without

With backing

P10H

1.0 in. O.D. minimum

WPS requirements

WPS requirements

F6 / F5

Without

Solid

0.250 in. maximum

0.438 in. maximum

Flat, horizontal

N/A

With

DCEN

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)

Transverse face bend #F1 N/A Transverse root bend #R1 N/A

Transverse face bend #F2 N/A Transverse root bend #R2 N/A

PASS

Alternative radiographic examination results (QW-191) Acceptable - See radiography report R-61910

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION Ludwig Associates Ltd. A.O.Q.P. Registration No. 7106 (C)

Test Conducted By Darren McLean, CSA W178.2 level 1 Insp. Date of Test July 2, 2013

Certified By [Signature] Darren McLean, T.T. Welding Examiner File No. E-00413

Test Certified for Cado Industries Inc. by Representative Jeremy Koster

RECORD INFORMATION

Ludwig Associates Ltd. testing facility Edmonton Calgary Field

Location of test: Cado Industries Inc. 7491 110 Ave. SE Calgary, AB T3R 1R8

Date test coupon is to be retained Aug 2, 2013 Test Coupon I.D. No. C2-51

Welder Performance Qualification Card No. 02140 Laboratory Test No. CW13-487.1

WELDER "P"

SGS

LUDWIG

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company Cado Industries Inc. Contact Jeremy Koster
Welder's Name Kelvin Perez ABSA File No. W-6448
WP Registration No. 2621.2 WPS No. CADO-1
Welding Process(es) SMAW Type Manual
Specification of Base Metal(s) A 513 Gr. 1026 Thickness 15.9 mm (0.625 in.)

Welding Variables (QW-350)

Backing

Actual Values

F3 None

F4 With

P1

2.50 in. O.D.

SFA 5.1

E6010 / E7018-1

F3 / F4

Range Qualified

With or without

With backing

P1

1.0 in. O.D. minimum

WPS requirements

WPS requirements

F3 / F4

Base metal P-No. 1 to P-No. 1

Plate

Pipe

Filler metal or electrode specification(s)

Filler metal or electrode classification(s)

Filler metal F-Number(s)

Deposit thickness for each process

SMAW: F3 3 layers minimum

Yes

No

0.125 in.

0.250 in. maximum

SMAW: F4 3 layers minimum

Yes

No

0.500 in.

Max. to be welded

Position qualified

6G

All

Vertical progression

Uphill

Uphill

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)

Side bend #S1 Pass

Side bend #S3 Pass

Side bend #S2 Pass

Side bend #S4 Pass

PASS

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION SGS Ludwig Associates Ltd. A.O.Q.P. Registration No. 7106 (C)

Test Conducted By Rob Cormier, CSA W178.2 Level 1 Insp. Date of Test October 21, 2013

Certified By Rob Cormier, C.E.T., I.W.T. Welding Examiner File No. E00441

Test Certified for Cado Industries Inc. by Representative Jeremy Koster

RECORD INFORMATION

SGS Ludwig Associates Ltd. testing facility Edmonton Calgary Field

Date test coupon is to be retained November 21, 2013 Test Coupon I.D. No. C2-59

Welder Performance Qualification Card No. 12685 Laboratory Test No. CW13-B12.1

WELDER "P"

SGS

LUDWIG

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company Cado Industries Inc. Contact Jeremy Koster
Welder's Name Kelvin Perez ABSA File No. W-6448
WP Registration No. 2621.2 WPS No. CADO-6
Welding Process(es) GMAW / SMAW Type Semi-automatic / Manual
Specification of Base Metal(s) SA 106 Gr.B Thickness 5.54 mm (0.218 in.)

Welding Variables (QW-350)

Backing

Base metal P-No. 1 to P-No. 1

Plate

Pipe

Filler metal or electrode specification(s)

Filler metal or electrode classification(s)

Filler metal F-Number(s)

Deposit thickness for each process

GMAW: 3 layers minimum

Yes

No

SMAW: 3 layers minimum

Yes

No

Position qualified

Vertical progression

Inert gas backing (GTAW, PAW, GMAW)

Transfer mode (spray/globular or pulse to short circuit-GMAW)

Actual Values

GMAW None

SMAW With

P1

2.375 in. O.D.

SFA 5.18 / SFA 5.1

ER70S-6 / E7018-1

F6 / F4

0.125 in.

0.093 in.

GMAW SP 30°

SMAW 1G Rotated

GMAW Downhill

SMAW N/A

None

Short circuiting

Range Qualified

With or without

With backing

P1

1.0 in. O.D. minimum

WPS requirements

WPS requirements

F6 / F4

0.138 in. maximum

0.186 in. maximum

SP 0 - 45°, Flat

Flat

Downhill

N/A

With or without

Short circuiting

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)
Transverse face bend #F1 Pass Transverse root bend #R1 Pass

PASS

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION SGS Ludwig Associates Ltd. A.O.Q.P. Registration No. 7106 (C)
Test Conducted By Rob Cormier, CSA W178.2 Level 1 Insp. Date of Test October 21, 2013
Certified By [Signature] Rob Cormier, C.E.T., I.W.T. Welding Examiner File No. E00441
Test Certified for Cado Industries Inc. by Representative Jeremy Koster

RECORD INFORMATION

SGS Ludwig Associates Ltd. testing facility Edmonton Calgary Field
Date test coupon is to be retained November 21, 2013 Test Coupon I.D. No. C2-45
Welder Performance Qualification Card No. 12684 Laboratory Test No. CW13-812.2



LUDWIG ASSOCIATES LTD.

WELDER "R"

Materials and Welding Consulting

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company Cado Industries Inc. Contact Jeremy Koster
 Welder's Name Carlos Robertson ABSA File No. W-29988
 WP Registration No. 2621.2 WPS No. CADO-5
 Welding Process(es) GMAW / SMAW Type Semi-automatic / Manual
 Specification of base metal(s) SA 106 Gr.B Thickness 8.74 mm (0.344 in.)

Welding Variables (QW-350)

	Actual Values	Range Qualified
Backing	GMAW None SMAW With	With or without With backing
Base metal P-No. 1 to P-No. 1 <input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe	P1 2.375 in. O.D.	P1, P6, 4130 1.0 in. O.D. minimum
Filler metal or electrode specification(s)	SFA 5.18 / SFA 5.1	WPS requirements
Filler metal or electrode classification(s)	ER70S-6 / E7018-1	WPS requirements
Filler metal F-Number(s)	F6 / F4	F6 / F4
Deposit thickness for each process		
GMAW: 3 layers minimum <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	0.100 in.	0.110 in. maximum
SMAW: 3 layers minimum <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	0.244 in.	0.488 in. maximum
Position qualified		
Vertical progression	GMAW SP 30° SMAW 1G Rotated	SP 0 - 45°, Flat Flat
Inert gas backing (GTAW, PAW, GMAW)	GMAW Downhill SMAW N/A	Downhill N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	None Short circuiting	With or without Short circuiting

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)
 Transverse face bend #F1 Pass Transverse root bend #R1 Pass

Alternative radiographic examination results (QW-191) N/A

PASS

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION Ludwig Associates Ltd. A.O.Q.P. Registration No. 7106 (C)
 Test Conducted By Darren McLean, CSA W178.2 level 1 Insp. Date of Test September 21, 2012
 Certified By [Signature] Darren McLean, T.T Welding Examiner File No. E-00413
 Test Certified for Cado Industries Inc. by Representative [Signature] Jeremy Koster

RECORD INFORMATION

Ludwig Associates Ltd. testing facility Edmonton Calgary Field
 Date test coupon is to be retained October 21, 2012 Test Coupon I.D. No. C2-39
 Welder Performance Qualification Card No. 01894 Laboratory Test No. CW12-624.2



LUDWIG ASSOCIATES LTD.

WELDER "S"

Materials and Welding Consulting

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company	<u>Cado Industries Inc.</u>	Contact	<u>Jeremy Koster</u>
Welder's Name	<u>Donghao Shi</u>	ABSA File No.	<u>W-28478</u>
WP Registration No.	<u>2621.2</u>	WPS No.	<u>CADO-13N</u>
Welding Process(es)	<u>GMAW / SMAW</u>	Type	<u>Semi-automatic / Manual</u>
Specification of base metal(s)	<u>SA 106 Gr.B</u>	Thickness	<u>8.74 mm (0.344 in.)</u>

Welding Variables (QW-350)

	Actual Values	Range Qualified
Backing	GMAW: None SMAW: With	With or without With backing
Base metal P-No. 1 to P-No. 1	P1	P1, 4130
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe	2.375 in. O.D.	1.0 in. O.D. minimum
Filler metal or electrode specification(s)	SFA 5.18 / SFA 5.1	WPS requirements
Filler metal or electrode classification(s)	ER70S-6 / E7018-1	WPS requirements
Filler metal F-Number(s)	F6 / F4	F6 / F4
Deposit thickness for each process		
GMAW: F6 3 layers minimum <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	0.100 in.	0.110 in. maximum
SMAW: F4 3 layers minimum <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	0.244 in.	0.488 in. maximum
Position qualified	GMAW: SP 30° SMAW: 1G Rotated	SP 0 - 45°, Flat Flat
Vertical progression	GMAW: Downhill SMAW: N/A	Downhill N/A
Inert gas backing (GTAW, PAW, GMAW)	None	With or without
Transfer mode (spray/globular or pulse to short circuit-GMAW)	Short circuiting	Short circuiting

RESULTS

PASS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)
Transverse face bend #F1 Pass Transverse root bend #R1 Pass

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION	<u>Ludwig Associates Ltd.</u>	A.O.Q.P. Registration No.	<u>7106 (C)</u>
Test Conducted By	<u>Dan Nguyen, CSA W178.2 level II Insp.</u>	Date of Test	<u>June 5, 2012</u>
Certified By	<u>Dan Nguyen, C.E.T.</u>	Welding Examiner File No.	<u>E-00286</u>
Test Certified for Cado Industries Inc. by Representative	<u>Jeremy Koster</u>		

RECORD INFORMATION

Ludwig Associates Ltd. testing facility	<input type="checkbox"/> Edmonton <input checked="" type="checkbox"/> Calgary <input type="checkbox"/> Field
Date test coupon is to be retained	<u>July 5, 2012</u> Test Coupon I.D. No. <u>C2-39</u>
Welder Performance Qualification Card No.	<u>01474</u> Laboratory Test No. <u>CW12-357.2</u>

4027 - 14 Street, S.E., CALGARY, ALBERTA T2G 3X6 PHONE: (403) 262-7072 FAX: (403) 266-3169

7925 Davies Road, EDMONTON, ALBERTA T6E 4N1 PHONE: (780) 468-3030 FAX: (780) 468-3032



LUDWIG ASSOCIATES LTD.

WELDER "S"

Materials and Welding Consulting

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company	<u>Cado Industries Inc.</u>	Contact	<u>Jeremy Koster</u>
Welder's Name	<u>Donghao Shi</u>	ABSA File No.	<u>W-28478</u>
WP Registration No.	<u>2621.2</u>	WPS No.	<u>CADO-1</u>
Welding Process(es)	<u>SMAW</u>	Type	<u>Manual</u>
Specification of base metal(s)	<u>A 513 Gr. 1026</u>	Thickness	<u>15.9 mm (0.625 in.)</u>

Welding Variables (QW-350)

	Actual Values	Range Qualified
Backing	F3 None	With or without
	F4 With	With backing
Base metal P-No. 1 to P-No. 1	P1	P1
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe	2.50 in. O.D.	1.0 in. O.D. minimum
Filler metal or electrode specification(s)	SFA 5.1	WPS requirements
Filler metal or electrode classification(s)	E6010 / E7018-1	WPS requirements
Filler metal F-Number(s)	F3 / F4	F3 / F4
Deposit thickness for each process		
SMAW: F3 3 layers minimum <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	0.125 in.	0.250 in. maximum
SMAW: F4 3 layers minimum <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	0.500 in.	Max. to be welded
Position qualified	6G	All
artical progression	Uphill	Uphill

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)

Side bend #S1 Pass Side bend #S3 Pass

Side bend #S2 Pass Side bend #S4 Pass

PASS

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION	<u>Ludwig Associates Ltd.</u>	A.O.Q.P. Registration No.	<u>7106 (C)</u>
Test Conducted By	<u>Dan Nguyen, CSA W178.2 level II Insp.</u>	Date of Test	<u>June 5, 2012</u>
Certified By	<u>Dan Nguyen, C.E.T.</u>	Welding Examiner File No.	<u>E-00286</u>
Test Certified for Cado Industries Inc. by Representative	<u>[Signature]</u>		<u>Jeremy Koster</u>

RECORD INFORMATION

Ludwig Associates Ltd. testing facility	<input type="checkbox"/> Edmonton	<input checked="" type="checkbox"/> Calgary	<input type="checkbox"/> Field
Date test coupon is to be retained	<u>July 5, 2012</u>	Test Coupon I.D. No.	<u>C2-41</u>
Welder Performance Qualification Card No.	<u>01473</u>	Laboratory Test No.	<u>CW12-357.1</u>

WELDER "U"

SGS

LUDWIG

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company Cado Industries Inc. Contact Jeremy Koster
Welder's Name Mohammed Masri ABSA File No. W-29270
WP Registration No. 2621.2 WPS No. CADO-1
Welding Process(es) SMAW Type Manual
Specification of base metal(s) A 513 Gr. 1026 Thickness 15.9 mm (0.625 in.)

Welding Variables (QW-350)

	Actual Values	Range Qualified
Backing	F3 None F4 With P1	With or without With backing P1
Base metal P-No. 1 to P-No. 1 <input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe	2.50 in. O.D.	1.0 in. O.D. minimum
Filler metal or electrode specification(s)	SFA 5.1	WPS requirements
Filler metal or electrode classification(s)	E6010 / E7018-1	WPS requirements
Filler metal F-Number(s)	F3 / F4	F3 / F4
Deposit thickness for each process		
SMAW: F3 3 layers minimum <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	0.125 in.	0.250 in. maximum
SMAW: F4 3 layers minimum <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	0.500 in.	Max. to be welded
Position qualified	6G	All
Vertical progression	Uphill	Uphill

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)
Side bend #S1 Pass Side bend #S3 Pass
Side bend #S2 Pass Side bend #S4 Pass

PASS

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION Ludwig Associates Ltd. A.O.Q.P. Registration No. 7106 (C)
Test Conducted By Colin Burnette, CSA W178.2 Level 1 Insp. Date of Test December 2, 2013
Certified By Colin Burnette T.T. Welding Examiner File No. E-00391
Test Certified for Cado Industries Inc. by Representative Jeremy Koster

RECORD INFORMATION

Ludwig Associates Ltd. testing facility Edmonton Calgary Field
Date test coupon is to be retained January 2, 2014 Test Coupon I.D. No. C2-61
Welder Performance Qualification Card No. 13080 Laboratory Test No. CW13-931.1

WELDER "U"

SGS

LUDWIG

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company CADO Industries Inc. Contact Jeremy Koster
Welder's Name Mohammed Masri ABSA File No. W-29270
WP Registration No. 2621.2 WPS No. CADO-6
Welding Process(es) GMAW / SMAW Type Semi-automatic / Manual
Specification of base metal(s) SA 106 Gr.B Thickness 5.54 mm (0.218 in.)

Welding Variables (QW-350)

	Actual Values	Range Qualified
Backing	GMAW None SMAW With	With or without With backing
Base metal P-No. 1 to P-No. 1	P1	P1
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe	2.375 in. O.D.	1.0 in. O.D. minimum
Filler metal or electrode specification(s)	SFA 5.18 / SFA 5.1	WPS requirements
Filler metal or electrode classification(s)	ER70S-6 / E7018-1	WPS requirements
Filler metal F-Number(s)	F6 / F4	F6 / F4
Deposit thickness for each process		
GMAW: 3 layers minimum <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	0.100 in.	0.110 in. maximum
SMAW: 3 layers minimum <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	0.118 in.	0.236 in. maximum
Position qualified	GMAW SP 30° SMAW 1G Rotated	SP 0 - 45°, Flat Flat
Vertical progression	GMAW Downhill SMAW N/A	Downhill N/A
Inert gas backing (GTAW, PAW, GMAW)	None	With or without
Transfer mode (spray/globular or pulse to short circuit-GMAW)	Short circuiting	Short circuiting

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

Bend test QW-462.2; QW-462.3(a); QW-462.5(c); QW-462.5(d)
Transverse face bend #F1 Pass Transverse root bend #R1 Pass **PASS**

Alternative radiographic examination results (QW-191) N/A

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

ACCREDITED ORGANIZATION Ludwig Associates Ltd. A.O.Q.P. Registration No. 7106 (C)
Test Conducted By Colin Burnette, CSA W178.2 Level 1 Insp. Date of Test December 2, 2013
Certified By [Signature] Colin Burnette T.T. Welding Examiner File No. E-00391
Test Certified for Cado Industries Inc. by Representative Jeremy Koster

RECORD INFORMATION

Ludwig Associates Ltd. testing facility Edmonton Calgary Field
Date test coupon is to be retained January 2, 2014 Test Coupon I.D. No. C2-58
Welder Performance Qualification Card No. 13081 Laboratory Test No. CW13-931.2



edmonton exchanger
& manufacturing ltd.

CERTIFICATE OF COMPLIANCE

5545-89 Street Edmonton, Alberta Canada T6E 5W9 www.edmontonexchanger.com tel 780.468.6722 • QC fax 780.466.4668 • sales fax 780.466.5155

Customer CADO INDUSTRIES INC. Po 2013-070-7921 Work Order C99866 Date 2013/09/10 ColC# 43584 Page 1 of 2

Item#	Description	Qty	Heat#	Brinell Hardn.	Weld Proc.	Form. Proc.
S99866-1-1	SHELL(S) - 1.2500" NOM X 30" OD X 120" (Material Spec: SA 516-70 Normalized) Conforms to NACE MR0175 / ISO 15156-2 2009 Annex A	1.320"	1 382649-21390-02	MTR WP600		4
S99866-1-2	SHELL(S) - 1.2500" NOM X 30" OD X 120" (Material Spec: SA 516-70 Normalized) Conforms to NACE MR0175 / ISO 15156-2 2009 Annex A	1.327"	1 382648-21230-01	MTR WP600		4
S99866-1-3	SHELL(S) - 1.2500" NOM X 30" OD X 120" (Material Spec: SA 516-70 Normalized) Conforms to NACE MR0175 / ISO 15156-2 2009 Annex A	1.328"	1 382649-21390-02	MTR WP600		4
S99866-1-4	SHELL(S) - 1.2500" NOM X 30" OD X 120" (Material Spec: SA 516-70 Normalized) Conforms to NACE MR0175 / ISO 15156-2 2009 Annex A	1.328"	1 382649-21390-02	MTR WP600		4
S99866-3	COUPON(S) - 1.2500" NOM X 12" X 6" (Material Spec: SA 516-70 Normalized)	2	382649-21390-02	-	-	-

Forming Procedure:
4. Cold Formed

Brinell Equipment: Newage Calibrated Pin
Brinell Hardness Tester

→ 1.337"
→ 1.340"

Supplementary Requirements

Normalized Material Identification Marking:

'MT' indicates normalized by the mill per ASME Code Section II, Part A, SA 20, Paragraph 13.1.1.
'GMT' indicates normalized by Edmonton Exchanger per ASME Code Section II, Part A, SA 20, Paragraph 13.1.2.
'GT' indicates normalized by Edmonton Exchanger per ASME Code Section VIII Division 1, UG-85 or ASME Code Section I, PG-77.4.

The item(s) listed above comply with the requirements of ASME Code Section I, PG-80 and ASME Code Section VIII, Division 1, UCS-79(d), UG-79 & UG-80. All welders and procedures are qualified to ASME Code Section IX. For tacking carbon steel items, roundbar used is 1018 Cold Rolled. Material being supplied conforms to the latest ASME Code Section II, Part A, 2010 Edition, Addenda July 1, 2011.

M.T.R. ACCEPTABLE

TO A.S.M.E. SECT. II

10 EDITION 11 ADD.

SEP 25 2013

QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

Erfahrungen siehe Rockwell/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004	A10 Advice of dispatch No./ Date of dispatch	A08 Manufacturer's order/ Certificate No.	Sheet
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991	447957-01.03.13	381826-001	1/...
MATERIAL TEST REPORT (MTR)			

A05 Established inspecting body	A06 Purchaser	A07.1 No.	A07.2 No.
DH	EDMONTON STEEL, EDMON	ED10614-J1010-ER	
	Final receiver	EDMONTON STEEL, EDMON	

B02 Steel design:	SAS16-70	SAS20-SS
B03 Any suppl. requirements	ASME- IIA:2010+ADDENDA-2011A DIL-HUE-2:R33-2012-10-01	

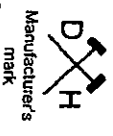
B01-B99 Description of the product

B14 Item No.	B08 Number of Pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A08 Purchaser article number
01	1	0,8750	120,50000	480,00000	6510	N	382647	20724-01	
01	1	0,8750	120,50000	480,00000	6510	N	382647	20724-02	
01	1	0,8750	120,50000	480,00000	6510	N	382647	20812-01	
01	1	0,8750	120,50000	480,00000	6510	N	382647	20812-02	
**	4				26040				
03	1	1,0000	120,50000	480,00000	7440	N	382648	21312-01	
03	1	1,0000	120,50000	480,00000	7440	N	382648	21312-02	
03	1	1,0000	120,50000	480,00000	7440	N	382648	21312-03	
03	1	1,0000	120,50000	480,00000	7440	N	382648	21315-01	
03	1	1,0000	120,50000	480,00000	7440	N	382648	21315-02	
**	5				37200				
04	1	1,2500	121,00000	480,00000	9339	N	382649	21390-01	
04	1	1,2500	121,00000	480,00000	9339	N	382649	21390-02	
**	2				18678				
****	11				81918				

B04 Product delivery condition

ITEM NO.: 01,03-04
 N: HT: 1670 GR.F +36 -27 GR.F
 SOAKING TIME TO ATTAIN THE TARGET TEMPERATURE OVER THE WHOLE SECTION: 1-1,75 MIN/MM (25-45 MIN/INCH)
 COOLING IN STILL AIR

A04 2011/2022/03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.



B. BALDAUF
 Test House Manager



B. BALDAUF
 Test House Manager
 Inspector's stamp
 Date 04.03.13
 PP 1

AG der Dillinger Hüttenwerke
 Postfach 1580, D-66748 Dillingen/Saar
 Inspection department



QM-System: Certification as per ISO 9001

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)



DILLINGER HÜTTE

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004

A10 Advice of dispatch No./ Date of dispatch

A08/ Manufacturer's order/ Certificate No.

Sheet

INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991

MATERIAL TEST REPORT (MTR)

447957-01.03.13

381826-001

2/...

A05 Established inspecting body A06 Purchaser EDMONTON STEEL, EDMON A07.1 No. ED10614-J1010-ER

DH Final receiver EDMONTON STEEL, EDMON A07.2 No.

B01 Product HEAVY PLATES

B02 Steel design SA516-70

SA20-SS

B03 Any suppl. ASME-TIA:2010+ADDENDA-2011A requirements DIL-HUE-2:R33-2012-10-01

B06 Marking of the product

ITEM NO.: 01, 03-04

STEEL DESIGNATION SA516 70 MLTIV SA516 60 MLTIV

HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

B07-B99 Further information about the product

ITEM NO.: 01, 03-04

THICKNESS REDUCTION RATIO >= 3,0 IS FULFILLED (CF. A/SA20 PAR. 5.3)

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rollplate/ Test No.	B05 Reference (heat) treatment	C01	C02	C03	C10	C11	C12	C13	C14-C15
				Temp. GR.F	Temp. GR.F	Temp. GR.F	Temp. GR.F	Temp. GR.F	Temp. GR.F	Temp. GR.F	Temp. GR.F
01	382647	20724		RT	RT	RT	RT	50,6	75,3	27	
01	382647	20812		K1 Q	RT	RT	50,2	75,4	29		
03	382648	21312		K1 Q	RT	RT	51,8	75,1	32		
03	382648	21315		K1 Q	RT	RT	51,0	75,5	29		
04	382649	21390		K1 QV	RT	RT	48,0	75,4	34		

C30-C39 Hardness test

B14 Item No.	B07.2 Heat No.	B07.1 Rollplate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03	C30	C35	C31	C32
				Temp. GR.F	Temp. GR.F	Temp. GR.F	Method of test	Individual values	Individual values	Mean Value
01	382647	20724		RT	RT	RT	HBW 10/3000	143	143	143
01	382647	20812		K1	O	RT	HBW 10/3000	138	138	139
03	382648	21312		K1	O	RT	HBW 10/3000	142	142	142
03	382648	21315		K1	O	RT	HBW 10/3000	144	144	144
04	382649	21390		K1	O	RT	HBW 10/3000	142	142	142

A04 Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.



Manufacturer's mark

B Baldauf

B BALDAUF
Test House Manager



Inspector's stamp

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

Date 04.03.13

PP

1

A01

QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

Erfüllungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dilling.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+AI:1995 + AS PER ISO 10474:1991
 MATERIAL TEST REPORT (MTR)

A10 Advice of dispatch No./
 Date of dispatch
 447957-01.03.13

A08/Manufacturer's order/
 A03 Certificate No.
 381826-001

Sheet
 3/...

A05 Establishment/inspecting body A06 Purchaser A07.1 No. A07.2 No.
 DH: EDMONTON STEEL, EDMON EDMONTON STEEL, EDMON ED10614-J1010-ER

B01 Product
 HEAVY PLATES

B02/ Steel design: SA516-70
 B03 Any suppl: ASME-TIA:2010+ADDENDA-2011A
 requirements DIL-HUE-2:R33-2012-10-01

SA20-SS

C40-C49 Impact test

Item No.	Heat No.	B07.1 Rotiplate/ Test No.	B05 Reference (heat) treatment	C01	C02	C03 Temp. GRF	C41 Width of test piece	C40 Type of test place	C44 Testing method	C46 Energy	C45 Individual values AV=FTLBF	C43 Mean value
01	382647	20724		K1	LV	-51		CHP-V	AV 57		79	158
01	382647	20812		K1	LV	-51		CHP-V	AV 112		119	113
03	382648	21312		K1	LV	-51		CHP-V	AV 78		77	110
03	382648	21315		K1	LV	-51		CHP-V	AV 116		99	119
04	382649	21390		K1	LV	-51		CHP-V	AV 105		106	93

C70-C99 Chemical composition % - Heat analysis

Heat No.	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
382647	Y	0,182	0,360	1,17	0,010	0,0008	0,0084	0,023	0,011	0,037	0,037	0,001	0,001	0,001	0,002
382648	Y	0,188	0,364	1,19	0,011	0,0017	0,0068	0,030	0,009	0,031	0,047	0,001	0,001	0,002	0,002
382649	Y	0,179	0,384	1,19	0,012	0,0009	0,0064	0,029	0,011	0,037	0,042	0,001	0,001	0,001	0,003

C94 Heat analysis Carbon equivalent / Alloying restrictions

Heat No.	B07.2	FO-02=	FO-51=	FO-55=	FO-78=	FO-91=	FO-02=	FO-51=	FO-55=	FO-78=	FO-91=
382647	Heat	0,39	0,002	0,11	0,05	6,4	0,39	0,002	0,12	0,05	6,4
382648	Heat	0,40	0,002	0,12	0,06	6,3	0,40	0,002	0,12	0,06	6,3
382649	Heat	0,39	0,002	0,12	0,05	6,6	0,39	0,002	0,12	0,05	6,6

A04/ Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

A01



Manufacturer's mark

B. BALDAUF
 Test House Manager



AG der Dillinger Hüttenwerke
 Postfach 1580, D-66748 Dillingen/Saar
 Inspection department

Inspector's stamp Date 04.03.13 PIP 1

QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

Erhaltenungen siehe Rockseite/Explications voir au verso/See reverse for explanations (www.dillingerg.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004	A10 Advice of dispatch No./ Date of dispatch	A08 Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991	447957-01.03.13	381826-001	4 / ...
MATERIAL TEST REPORT (MTR)			

A05 Established inspecting body	A06 Purchaser	EDMONTON STEEL, EDMON	A07.1 No. ED10614-J1010-ER
DH	Final receiver	EDMONTON STEEL, EDMON	A07.2 No.

B02 Steel design:	SA516-70	SA20-SS
B03 Any suppl. requirements	ASME-11A:2010+ADDENDA-2011A DIL-HUE-2:R33-2012-10-01	

C95 Ladle treatment

ITEM NO.: 01,03-04

HEAT OF THE INDICATED ITEM: VACUUM DEGASSED / SULPHIDE SHAPE CONTROL

C95 Further information about ladle treatment

ITEM NO.: 01,03-04
CALCIUM TREATED

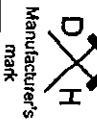
C70-C99 Chemical composition % - Product analysis

Heat	Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI				
B07.2	B07.1	Heat	382647	20724	K1	0,173	0,353	1,15	0,009	0,0005	0,0077	0,021	0,010	0,037	0,036	0,001	0,000	0,000	0,000	0,002
382648	21315	K1	0,177	0,355	1,14	0,009	0,0009	0,0070	0,022	0,009	0,036	0,036	0,001	0,000	0,000	0,000	0,000	0,000	0,002	
382649	21390	K1	0,174	0,379	1,17	0,011	0,0009	0,0060	0,028	0,009	0,033	0,046	0,001	0,000	0,000	0,001	0,000	0,002		

C94 Product analysis Carbon equivalent / Alloying restrictions

Heat	Test No.	C01	B	CA	AL-T			
B07.2	B07.1	Heat	382647	20724	K1	0,0000	0,0023	0,029
382648	21315	K1	0,0001	0,0019	0,032			
382649	21390	K1	0,0000	0,0021	0,030			

A04 Z01/2022/03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.



B. Baldauf



B BALDAUF Test House Manager
Inspector's stamp Date 04.03.13 PP 1

AG der Dillinger Hüttenwerke
Postfach 1580, D-66748 Dillingen/Saar
Inspection department

A01

QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

Erfäulungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204 : 2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991 MATERIAL TEST REPORT (MTR)	A10 Advice of dispatch No./ Date of dispatch 447957-01.03.13	A09/ Manufacturer's order/ A03 Certificate No. 381826-001 5
A05 Established inspecting body DH A08 Purchaser EDMONTON STEEL, EDMON EDMONTON STEEL, EDMON A07.2 No.	A07.1 No. ED10614-J1010-ER A07.2 No.	801 Product HEAVY PLATES
B02 Steel design: SA516-70 B03 Any suppl. ASME-11A:2010+ADDENDA-2011A requirements DIL-HUE-2:R33-2012-10-01	SA20-SS	

C94 Carbon equivalent formula / Alloying restrictions

- FO-02 = C+ (Mn/6) + (CR+MO+V) /5+ (NI+CU) /15
- FO-51 = V +NB
- FO-55 = CU+MO+NI+CR
- FO-78 = CR+MO
- FO-91 = MN/C

D01 Marking and identification, surface appearance, shape and dimensional properties

ITEM NO. : 01,03-04
 EXAMINATION OF MARKING, SURFACE, SHAPE AND DIMENSIONS: THE RESULTS MEET THE REQUIREMENTS.
 SURFACE AS PER ASME-SA20
 THICKNESS AS PER ASME-SA20
 LENGTH AND WIDTH AS PER ASME-SA20
 FLATNESS AS PER 1/2-ASME-SA20



A04 2012/02/203 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

B. Baldauf
 B. BALDAUF
 Test House Manager



AG der Dillinger Hüttenwerke
 Postfach 1580, D-66748 Dillingen/Saar
 Inspection department

Inspector's stamp Date 04.03.13 PP 1



CERTIFICATE OF COMPLIANCE

edmonton exchanger
& manufacturing ltd.

5545-89 Street Edmonton, Alberta Canada T6E 5W9 www.edmontonexchanger.com tel 780.468.6722 • QC fax 780.466.4668 • sales fax 780.466.5155

Customer CADO INDUSTRIES INC.	PO 2013-070-7921	Work Order C99866	Date 2013/09/13	ColC# 43661	Page 1 of 1
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Item#	Description	Qty	Heat#	Brinell Hardn.	Required Min Thk	Recorded Min Thk	Form. Proc.
H99866-2	HEAD(S) - Semi-Elliptical 2:1 - 1.2500" NOM (1.1400" MIN) X 30" OD (Material Spec: SA 516-70 Normalized) Conforms to NACE MR0175 / ISO 15156-2 2009 Annex A	4	G1133-476540102	MTR	1.1400"	1.2100"	1
		4	G1129-476540101	MTR	1.1400"	1.2110"	1

Forming Procedure: 1. Hot Formed @ 1650F/899C and Air Cooled
Brinell Equipment: Newage Calibrated Pin Brinell Hardness Tester
Supplementary Requirements
Normalized Material Identification Marking: 'MT' indicates normalized by the mill per ASME Code Section II, Part A, SA 20, Paragraph 13.1.1. 'GMT' indicates normalized by Edmonton Exchanger per ASME Code Section II, Part A, SA 20, Paragraph 13.1.2. 'GT' indicates normalized by Edmonton Exchanger per ASME Code Section VIII Division 1, UG-85 or ASME Code Section I, PG-77.4.
The item(s) listed above comply with the requirements of ASME Code Section I, PG-29, PG-81 and ASME Code Section VIII, Division 1, UCS-79(d), UG-79 & UG-81. All welders and procedures are qualified to ASME Code Section IX. Material being supplied conforms to the latest ASME Code Section II, Part A, 2010 Edition, Addenda July 1, 2011.

Supplementary Examination - Items
<div style="display: flex; justify-content: space-around;"> <div style="text-align: left;"> <p>10 1.355"</p> <p>10 1.346"</p> <p>10 1.343"</p> <p>10 1.348"</p> </div> <div style="text-align: left;"> <p>10 1.357"</p> <p>10 1.352"</p> <p>10 1.340"</p> <p>10 1.339"</p> </div> </div> <p style="text-align: center; margin-top: 20px;">M.T.R. ACCEPTABLE TO A.S.M.E. SECT. II 10 EDITION 11 ADD. CH SEP 25 2013</p>



CERTIFICATE OF COMPLIANCE

MTR List

edmonton exchanger
& manufacturing ltd.

5545-89 Street Edmonton, Alberta Canada T6E 5W9 www.edmontonexchanger.com tel 780.468.6722 • QC fax 780.466.4668 • sales fax 780.466.5155

Customer CADO INDUSTRIES INC. PO 2013-070-7921 Work Order C99866 Date 2013/09/13 ColC# 43661 Page 1 of 1

Email to wilfred.cao@cadoindustries.com
Email to jreimer@edmontonexchanger.com

MTR ID	Pages	Heat#	Thickness	Material Grades
17934	6	G1129-476540101	1.25"	SA 516-70 N
		G1133-476540102	1.25"	SA 516-70 N

Heat#	Material Grades	MTR ID
G1129-476540101	SA 516-70 N	17934
G1133-476540102	SA 516-70 N	17934

新日鐵住金株式会社
NIPPON STEEL & SUMITOMO METAL CORPORATION

鋼材検査証明書
INSPECTION CERTIFICATE

本 社 〒100-8071 東京都千代田区丸の内二丁目6番1号
HEAD OFFICE 2-6-1, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
営業 製造 所 〒299-1141 千葉県君津市智雅1番地
KAMITSU WORKS 1, KAMITSU, KINETSU-CITY, CHIBA-PREF. 299-1141 JAPAN

証明 番号 : P-23076 PAGE : 2
CERTIFICATE No. : 2013-06-20
発行 年月日 : 1001 *****
DATE OF ISSUE : 2013-06-20 *****

注文者 HANWA CO., LTD.
注文者照合番号 228031-685310100
REFERENCE No. 228031-685310100
契約番号 3-811-H1-5-6-AT02
CONTRACT No. 3-811-H1-5-6-AT02
商品名 HOT ROLLED STEEL PLATES
規格 ASME SA-516 GRADE 70-E10-A11
SPECIFICATION ASME SA-516 GRADE 70-E10-A11
文書番号 DOCUMENT No. ED-10924-11010ER E3001A0200 E05

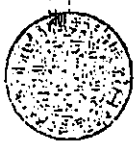
需要家 ED-10924-11010ER
CUSTOMER OMPANIES
需要家管理番号 E10924-11010ER
CUSTOMERS CONTROL No. E3001A0200 E05

寸法	DIMENSION	数量	質量	製造番号	製品番号	引張試験		衝撃試験	硬度	化学成分														
						引張強さ	伸長率			2V	FT	SI	Mn	P	S	Ca	NI	Q	B	Ti	Mo	Nb	V	TAI
1.250' X 121' X 480'	mm, inch, feet	01	93.38	G1133 TESTED-PL CAST No. 22774 TEST No. 476540103TCI	G1134 TESTED-PL PLATE No. 476540204TCI	51	75	32	257	147	15	37	143	5	3	2	2	16	1	2	2	0.12	0.26	4.0
1.500' X 97' X 480'		02	89.85	G1134 TESTED-PL CAST No. 22786 TEST No. 476540204TCI	G1134 TESTED-PL PLATE No. 476540204TCI	50	74	32	205	149	15	37	143	5	3	2	2	16	1	2	2	0.12	0.26	4.0
1.500' X 97' X 480'		02	89.85	G1134 TESTED-PL CAST No. 22787 TEST No. 476540204TCI	G1134 TESTED-PL PLATE No. 476540204TCI	51	75	37	233	146	15	37	143	5	3	2	2	16	1	2	2	0.12	0.26	4.0

注 意 事 項
 1. 位置 方位 例: T: 頂部, B: 底部, L: 縦方向, Longitudinal, C: 横方向, Transverse, Z: 板厚方向, Through Thickness, R: 45° 折り, 45Deg. to the Longitudinal Axis
 2. 寸法 公差 例: Rectangular, A: 50mm 厚さ, 50mm Thick, B: 70mm 厚さ, 70mm Thick, C: 70mm 厚さ, 70mm Thick, D: 70mm 厚さ, 70mm Thick, E: 80mm 厚さ, 80mm Thick, F: 80mm 厚さ, 80mm Thick, G: 200mm 厚さ, 200mm Thick, H: 2° 傾斜, 2° Slope, I: 5.05° 傾斜, 5.05° Slope, K: 4° 傾斜, 4° Slope
 3. RA: 表面粗さ, Surface Roughness, Y: R: 表面粗さ, Yield Point, Z: 表面粗さ, Surface Roughness
 4. A: 合格, Acceptable
 5. F: 全厚, Full Thickness, G: 全厚, Full Thickness, H: 全厚, Full Thickness, I: 全厚, Full Thickness, J: 全厚, Full Thickness, K: 全厚, Full Thickness, L: 全厚, Full Thickness, M: 全厚, Full Thickness, N: 全厚, Full Thickness, O: 全厚, Full Thickness, P: 全厚, Full Thickness, Q: 全厚, Full Thickness, R: 全厚, Full Thickness, S: 全厚, Full Thickness, T: 全厚, Full Thickness, U: 全厚, Full Thickness, V: 全厚, Full Thickness, W: 全厚, Full Thickness, X: 全厚, Full Thickness, Y: 全厚, Full Thickness, Z: 全厚, Full Thickness
 6. 試験方法, Test Method, A: 引張試験, Tensile Test, B: 引張試験, Tensile Test, C: 引張試験, Tensile Test, D: 引張試験, Tensile Test, E: 引張試験, Tensile Test, F: 引張試験, Tensile Test, G: 引張試験, Tensile Test, H: 引張試験, Tensile Test, I: 引張試験, Tensile Test, J: 引張試験, Tensile Test, K: 引張試験, Tensile Test, L: 引張試験, Tensile Test, M: 引張試験, Tensile Test, N: 引張試験, Tensile Test, O: 引張試験, Tensile Test, P: 引張試験, Tensile Test, Q: 引張試験, Tensile Test, R: 引張試験, Tensile Test, S: 引張試験, Tensile Test, T: 引張試験, Tensile Test, U: 引張試験, Tensile Test, V: 引張試験, Tensile Test, W: 引張試験, Tensile Test, X: 引張試験, Tensile Test, Y: 引張試験, Tensile Test, Z: 引張試験, Tensile Test
 7. N: 標準化, Normalized, Q: 入射, Quenched, R: 焼入れ, Tempered, S: 焼入れ, Tempered, T: 焼入れ, Tempered, U: 焼入れ, Tempered, V: 焼入れ, Tempered, W: 焼入れ, Tempered, X: 焼入れ, Tempered, Y: 焼入れ, Tempered, Z: 焼入れ, Tempered
 8. 試験方法, Test Method, A: 引張試験, Tensile Test, B: 引張試験, Tensile Test, C: 引張試験, Tensile Test, D: 引張試験, Tensile Test, E: 引張試験, Tensile Test, F: 引張試験, Tensile Test, G: 引張試験, Tensile Test, H: 引張試験, Tensile Test, I: 引張試験, Tensile Test, J: 引張試験, Tensile Test, K: 引張試験, Tensile Test, L: 引張試験, Tensile Test, M: 引張試験, Tensile Test, N: 引張試験, Tensile Test, O: 引張試験, Tensile Test, P: 引張試験, Tensile Test, Q: 引張試験, Tensile Test, R: 引張試験, Tensile Test, S: 引張試験, Tensile Test, T: 引張試験, Tensile Test, U: 引張試験, Tensile Test, V: 引張試験, Tensile Test, W: 引張試験, Tensile Test, X: 引張試験, Tensile Test, Y: 引張試験, Tensile Test, Z: 引張試験, Tensile Test
 9. 試験方法, Test Method, A: 引張試験, Tensile Test, B: 引張試験, Tensile Test, C: 引張試験, Tensile Test, D: 引張試験, Tensile Test, E: 引張試験, Tensile Test, F: 引張試験, Tensile Test, G: 引張試験, Tensile Test, H: 引張試験, Tensile Test, I: 引張試験, Tensile Test, J: 引張試験, Tensile Test, K: 引張試験, Tensile Test, L: 引張試験, Tensile Test, M: 引張試験, Tensile Test, N: 引張試験, Tensile Test, O: 引張試験, Tensile Test, P: 引張試験, Tensile Test, Q: 引張試験, Tensile Test, R: 引張試験, Tensile Test, S: 引張試験, Tensile Test, T: 引張試験, Tensile Test, U: 引張試験, Tensile Test, V: 引張試験, Tensile Test, W: 引張試験, Tensile Test, X: 引張試験, Tensile Test, Y: 引張試験, Tensile Test, Z: 引張試験, Tensile Test
 10. 試験方法, Test Method, A: 引張試験, Tensile Test, B: 引張試験, Tensile Test, C: 引張試験, Tensile Test, D: 引張試験, Tensile Test, E: 引張試験, Tensile Test, F: 引張試験, Tensile Test, G: 引張試験, Tensile Test, H: 引張試験, Tensile Test, I: 引張試験, Tensile Test, J: 引張試験, Tensile Test, K: 引張試験, Tensile Test, L: 引張試験, Tensile Test, M: 引張試験, Tensile Test, N: 引張試験, Tensile Test, O: 引張試験, Tensile Test, P: 引張試験, Tensile Test, Q: 引張試験, Tensile Test, R: 引張試験, Tensile Test, S: 引張試験, Tensile Test, T: 引張試験, Tensile Test, U: 引張試験, Tensile Test, V: 引張試験, Tensile Test, W: 引張試験, Tensile Test, X: 引張試験, Tensile Test, Y: 引張試験, Tensile Test, Z: 引張試験, Tensile Test

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。
 WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN
 MADE IN ACCORDANCE WITH THE RULES OF THE CONTRACT.

君津製鐵所 品質保証室
HEAD OF DEPARTMENT
QUALITY ASSURANCE DEPT.
KAMITSU WORKS



C1561
682

M.T.R. ACCEPTABLE
TO A.S.M.E. SECT. II

10 EDITION 11 ADD.

JUL 16 2013

L/C No.:
No.: C12838265842



ADD: JINTANG ROAD DONGLI
DISTRICT: TIANJIN, CHINA
TEL: 86-22-24801139
FAX: 86-22-24801291

TIANJIN PIPE(GROUP) CORPORATION LTD.
TEST CERTIFICATE
(EN10204 3.1)

Order P.D.No.	Contract No.	Product DIMENSION STANDARD	PIPE	O.D.xW.T.	Packing
CI-12-330	2012SSG-CI-12-330	ASME B36.10		4700x(114.3x17.12mm)	IN LOOSE
Material Standard	ASTM A 106-B-08, ASME SA 106-B-08, API 5L X42 PSL 1-07, CSA Z245.4-07 Gr.290 Cst.1, NACE MR0175-09/ISO 15156	MANUFACTURE		HOT ROLLING SEAMLESS	Total pieces 44
Lot No.	130	Quantity Pieces	44	Length range	Total metres
127030	130	Bundles	11.985		
		Tons	11.985		
		Delivery condition	Hot rolling		
		Sample No.	130-6-2187		
		Temp. T.C.	A		
		T.S. Type	583		
		Y.S.	426		
		Elong. %	37		
		Shrink %			
		Z			
		Temp. T.C.			
		Size			
		AK1 share %			
		AK2 share %			
		AK3 share %			
		AK4 share %			
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C1281

609 11
C1281

HENGANG VALIN STEEL
TUBE CO., LTD

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

Add: 10 Dalistinaua, Rengcong City, Yunna, P. R. China
P.C.: 621001
Tel and Fax: +86 734 8873739
E-mail: hse@hysteeltube.com

CUSTOMER		CEFRANGLIN		CERTIFICATE NO.		C2012011421							
CONTRACT NO.		2110002306-1		P.O.NO.		P0289532-OR-2100-B (LOT A) / C/NO.: ZF4HDS-00037							
PRODUCT		SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE		DELIVERY CONDITION		DATE:							
SPECIFICATION		SEE SPECIFICATION NOTE:		HEAT TREATMENT		2012-1-12							
GRADE		B.X42.GRADE 200		DIMENSIONS(mm)		3" x 0.500" x 2FT							
TOTAL BUNDLES:		4		TOTAL LENGTH:		520.340 FT							
TOTAL PIECES:		26		TOTAL WEIGHT:		4.390 MT							
NO.	LOT No.	HEAT No.	BUNDLES	PIECES	LENGTH		WEIGHT		SAMPLE TYPE/ ORIENTATION / SIZE (mm)	TENSILE TEST ASTM A370			FLATTENING TEST
					FT	WT	YS (PS)	TS (PS)		EL (%)	RA (%)	YS/TS	
1	812100146	1116060	4	26	520.340	4.390	68295	54230	38.5	0.79	ACCEPTABLE		

NOTES:
 W1-THEORETICAL WEIGHT
 W2-ACTUAL WEIGHT
 NR-NORMALIZING ROLLED
 A1-ABSORB ENERGY FOR THE FIRST SET
 A2-AVERAGE
 A3-AVERAGE
 LE-SIDE EXPANSION
 SAMPLE ORIENTATION: L-LONGITUDINAL T-TRANSVERSE
 SAMPLE TYPE: S-STRIP C-CLIPPED F-FULL SECTION
 Q&T-QUENCHING AND TEMPERING
 A1-ABSORB ENERGY FOR THE FIRST SET
 A2-AVERAGE
 A3-AVERAGE
 LE-SIDE EXPANSION

M.T.R. ACCEPTABLE
 TO A.S.M.E. SECT. II
 11 EDITION
 ADD.
 NOV - 7 2012



1821

HENGYANG VALIN STEEL
TUBE CO., LTD

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

Add: 10 Dalinicom, Hengyang
City, Hunan, P. R. China P. C.: 421001
Tel and Fax: +86 734 8873739
E-mail: hsteel@valinsteel.com

CUSTOMER	CE FRANKLIN	P.O. NO.	PO.2895832-OR-2100-B (LOT A)	L/C NO.	2FAHDS-00037	CERTIFICATE NO.	
CONTRACT NO.	211002306-1	PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.	DATE:	2012-1-12	PAGE:	3/3
SPECIFICATION		GRADE	SEE SPECIFICATION NOTE	DELIVERY CONDITION	N		
TOTAL BUNDLES:	4	EX42 GRADE 290	HEAT TREATMENT				
HIC TEST		SEE THE ORIGINAL INSPECTION REPORTS					
SSC TEST							
REMARK:							
TOTAL PIECES:	26	TOTAL LENGTH:	520.340	3" * 0.800" * 20FT	FT	TOTAL WEIGHT:	4.390 MT

ASTM A53B/A106B-2010, ASME SA53B/A106B-2010, API 5LXX42, PSL-2-2008,
NACE MR-0175-2009/ISO 15156-2-2005 (REGION 3) MAR-0103/SS (CSA Z245.1)
NOTE GRADE 290 CATEGORY 1 (2009)

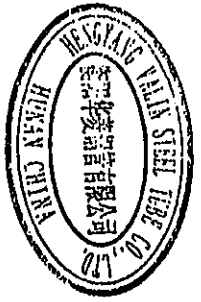
We hereby certify that material herein described has been manufactured in accordance with the standards and specifications required in your order and satisfies the corresponding requirements.

This certificate is issued by a computerized system and it is valid with electronic signature. On the original certificate the trademark JOINTIME light-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 unlawful or not allowed use.

Any alteration and/or falsification will be subject to the law.
If you need to assure the authenticity of this certificate, please do not hesitate to contact Hengyang Valin Steel Tube CO., LTD, E-mail: hsteel@valinsteel.com

CUSTOMER THIRD PARTY

Quality Manager: 胡双开



Certificate number: 唐双敏



2013-070-8473



ISO 9001:2008

TRILAD Flanges and Fittings, Inc.

30 WOODSLEE AVE.
PARIS, ON, CANADA N3L 3V1
(PHONE) 519-442-6520
(FAX) 519-442-7658
www.tri-lad.com

CERTIFIED MATERIAL TEST REPORT

Certificate No. **13170743**

EN 10204 3.1

Date of Report **7/11/2013**

Customer
ALLIED EDMONTON - CAD\$
172 TURBO DRIVE
SHERWOOD PARK AB T8H 2J6

Customer Order No.
405991

Quantity **6**

Tri-Lad Order No. **581920** Line No. **1**

Specification SA105N SECT II 2010 EDITION 2011A ADDENDA	Heat Treatment NORMALISED
Item Description 4 600 WN XXS RF A105N (802152)	Temperature Init 1634 F 890 C
Shop Order/Trace No.	Time N=1. 30HRS Lot Definition
Lot No.	
Heat Code TL10004515	
C.E. .42	Melt Practice

	Chemical Composition									
	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V
Heat Product	.22	.96	.029	.014	.24	.05	.05	.15	.02	.004
Heat Product										
Heat Product										

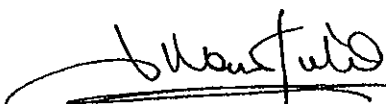
Mechanical Properties						Impact Values		Shear Fracture	
Yield	Tensile		Elongation	Reduction of Area	Hardness	Impact Test Temperature			
Ksi 53 Mpa 365	Ksi 81 Mpa 559		33 %	56 %	HBW 159 HBW 159				
Tensile Specimen STD RD									
Lateral Expansion		Impact Type		Impact Orientation		Starting Material		Impact Specimen	

M.T.R. ACCEPTABLE
TO A.S.M.E. SECT. II
10 EDITION 11 ADD.
CA OCT 21 2013

Notes

NACE MR0103 LATEST ED.
NACE MR0175/ISO15156-09

Material is in accordance with the applicable Standard to which it is ordered including: ASME Sect II, ASME B16.5, B16.9, B16.36, B16.47, CSA, MSS, AWWA C-207. NO WELD REPAIR
Material conforms to both ASTM (A) and ASME (SA) applicable specifications. We hereby certify that all information presented on this CMTR conforms to the above specification.
We hereby certify the results to be a true copy of the records of the company.


Les Mansfield, CET
Quality Assurance Manager

2013-070-8473



ISO 9001:2008

TRILAD Flanges and Fittings, Inc.

30 WOODSLEE AVE.
 PARIS, ON, CANADA N3L 3V1
 (PHONE) 519-442-6520
 (FAX) 519-442-7658
 www.tri-lad.com

CERTIFIED MATERIAL TEST REPORT

Certificate No. **13174335**

EN 10204 3.1

Date of Report **9/13/2013**

Customer
ALLIED EDMONTON - CAD\$
172 TURBO DRIVE
SHERWOOD PARK AB T8H 2J6

Customer Order No.
414181

Quantity **1**

Tri-Lad Order No. **591330**
 Line No. **1**

Specification SA105N SECT II 2010 EDITION 2011A ADDENDA	Heat Treatment NORMALISED
Item Description 3 600 WN XXS RF A105N (802127)	Temperature Init 1634 F 890 C
Shop Order/Trace No.	Time N=1.20HRS
Lot No.	Lot Definition
Heat Code TL10004630	
C.E. .45	Melt Practice

	Chemical Composition									
	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V
Heat Product	.23	1.02	.027	.014	.29	.12	.11	.15	.02	.001
Heat Product										
Heat Product										

Mechanical Properties						Impact Values		Shear Fracture
Yield	Tensile		Elongation	Reduction of Area	Hardness	Impact Test Temperature		
Ksi 53 Mpa 367	Ksi 78 Mpa 538		29 %	58 %	HBW 149 HBW 149			
Tensile Specimen STD RD								
Lateral Expansion			Impact Type	Impact Orientation		Starting Material		Impact Specimen

M.T.R. ACCEPTABLE
TO A.S.M.E. SECT. II
10 EDITION, 11 ADD.
CA **OCT 26 2013**

Notes

NACE MR0103 LATEST ED.
 NACE MR0175/ISO15156-09

Material is in accordance with the applicable Standard to which it is ordered including:
 ASME Sect II, ASME B16.5, B16.9, B16.36, B16.47, CSA, MSS, AWWA C-207.
NO WELD REPAIR
 Material conforms to both ASTM (A) and ASME (SA) applicable specifications.
 We hereby certify that all information presented on this CMTR conforms to the above specification.
 We hereby certify the results to be a true copy of the records of the company.

Les Mansfield
Les Mansfield, CET
 Quality Assurance Manager

2013-070-8473



ISO 9001:2008

TRILAD Flanges and Fittings, Inc.

30 WOODSLEE AVE.
 PARIS, ON, CANADA N3L 3V1
 (PHONE) 519-442-6520
 (FAX) 519-442-7658
 www.tri-lad.com

CERTIFIED MATERIAL TEST REPORT

Certificate No. **13167320**

EN 10204 3.1

Date of Report **5/13/2013**

Customer
ALLIED EDMONTON - CAD\$
172 TURBO DRIVE
SHERWOOD PARK AB T8H 2J6

Customer Order No.
399436

Quantity **2**

Tri-Lad Order No. **573464**
 Line No. **1**

Specification SA105N SECT II 2010 EDITION 2011A ADDENDA	Heat Treatment NORMALISED
Item Description 2 600 WN XXS RF A105N (802093)	Temperature Init 1634 F 890 C
Shop Order/Trace No.	Time N= 1.15HRS
Lot No.	Lot Definition
Heat Code TL10005612	
C.E. .42	Melt Practice

Chemical Composition

Heat Product	C .22	Mn .92	P .029	S .010	Si .21	Cu .07	Ni .06	Cr .13	Mo .06	V .008
Heat Product										
Heat Product										

Mechanical Properties

Yield Ksi 55 Mpa 382	Tensile Ksi 84 Mpa 576	Elongation 30 %	Reduction of Area 58 %	Hardness BHN 163 BHN 167	Impact Test Temperature	Impact Values	Shear Fracture
Tensile Specimen STD RD							
Lateral Expansion		Impact Type	Impact Orientation		Starting Material	Impact Specimen	

Notes **MACHINED TO .436 WT**

M.T.R. ACCEPTABLE
TO A.S.M.E. SECT. II

10 EDITION **11** ADD.
OK **OCT 24 2013**

NACE MR0103 LATEST ED.
 NACE MR0175/ISO15156-09

Material is in accordance with the applicable Standard to which it is ordered including:
 ASME Sect II, ASME B16.5, B16.9, B16.36, B16.47, CSA, MSS, AWWA C-207.
NO WELD REPAIR
 Material conforms to both ASTM (A) and ASME (SA) applicable specifications.
 We hereby certify that all information presented on this CMTR conforms to the above specification.
 We hereby certify the results to be a true copy of the records of the company.

Les Mansfield
Les Mansfield, CET
Quality Assurance Manager

2013-11-28 8:17:33

MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 : 2004 3.1

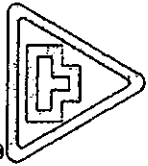
CUSTOMER : SEYBOLD INTERNATIONAL CORP.

CERT. NO : 132175

ORDER NO : 7006966

INVOICE NO : BM01310205043

L/C NO :
DATE : 07/24/2013
PAGE : 10 ORIGIN : TAIWAN



柏緯鐵工股份有限公司
BOTHWELL STEEL FITTINGS CO., LTD.
 台灣 台北市 仁武區 烏木里 仁心路 303 號
 NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAOSHIUNG CITY, TAIWAN R.O.C.(81460)
 TEL: +886-7-3711536, 3710497, 3720260 FAX: +886-7-3713864, 3713882
 Web site: <http://www.bothwell.com.tw> e-mail: box@bothwell.com.tw

ITEM	BW HT. CD.	RAW MATERIAL HEAT NO.	DESCRIPTION	QUANTITY	SPECIFICATION FOR			INSPECTION SURFACE	DIM.
					MATERIAL	FITTING			
077	4145	0093863	ROLL CGLG 2" 3000# S/W	100 PC	ASTM A105N -12		ASME B16.11 - 2011	GOOD	GOOD
079	3930	330613	ROLL CGLG 2-1/2" 3000# NPT	25 PC					
080	3913	330758	ROLL CGLG 3/4" 6000# NPT	5 PC	ASME SA105N -A08				
080	3982	330757	ROLL CGLG 3/4" 6000# NPT	245 PC					
081	3860	329902	ROLL CGLG 1" 6000# NPT	100 PC					

ITEM	BW HT. CD.	CHEMICAL COMPOSITION (%)										Cu(Nb)	N	Al	Ti	Zr	CE	MATERIAL SUPPLIER	
		C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V								
077	4145	0.18	0.19	0.94	0.011	0.012	0.21	0.08	0.06	0.01	0.001	0.000	-	-	-	-	-	0.373	
079	3930	0.20	0.21	0.84	0.017	0.013	0.15	0.07	0.06	0.02	0.002	0.001	-	-	-	-	-	0.372	
080	3913	0.19	0.21	0.85	0.013	0.009	0.13	0.05	0.05	0.01	0.002	0.002	-	-	-	-	-	0.356	
080	3982	0.19	0.20	0.82	0.013	0.011	0.12	0.05	0.04	0.01	0.002	0.002	-	-	-	-	-	0.350	
081	3860	0.200	0.200	0.830	0.014	0.008	0.100	0.050	0.040	0.010	0.002	0.002	-	-	-	-	-	0.360	

ITEM	BW HT. CD.	MECHANICAL PROPERTIES						HEAT TREATMENT			ADDITIONAL TEST/REMARKS													
		T. S. (KSI)	Y. S. (KSI)	EL. (%)	R of A (%)	Hardness (HBM)(AVG)	Charpy Impact F / (Joule)	MIN. AVG.	1	2		3	AVG.											
077	4145	76.9	51.3	34.2	66.4	141	143																	
079	3930	74.8	48.3	35.6	64.1	142	144																	
080	3913	74.4	47.6	37.2	63.5	141	143																	
080	3982	74.2	49.7	36.2	65.3	140	142																	
081	3860	76.2	53.8	35.4	63.3	141	144																	

WE HEREBY CERTIFY, THAT THE MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLIES WITH THE TERMS OF THE ORDER CONTRACT.

MTR ACCEPTABLE
 U.S.M.E. SECT. II
 C.C. Huang
 Q.C. MANAGER
 CHEN CHI HUANG
 INSPECTOR
 YUAN YAO CHANG

BW-D0839 REV: 2

16 EDITION
 ADD.
 NOV 20 2013

2013-07-0-8473

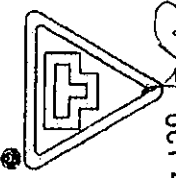
M.T.R. ACCEPTABLE
TO A.S.M.E. SECT II

12 EDITION
OCT 24 2013
ADD

MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 : 2004 3.1

CUSTOMER : SEYBOLD INTERNATIONAL CORP.
CERT. NO : 132175
ORDER NO : 7006966
INVOICE NO : BMO1310205043
L/C NO :
DATE : 07/24/2013
PAGE : 10 ORIGIN : TAIWAN



招 鐵 鋼 工 股 份 有 限 公 司
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						MATERIAL	FITTING	SURFACE	DIM.
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079	3930	330613		PELL CRG 2-1/2" 3000# NPT	25 PC				
080	3913	330758		PELL CRG 3/4" 6000# NPT	5 PC	ASME SA105N -A08			
080	3982	330757		PELL CRG 3/4" 6000# NPT	245 PC				
081	3860	329902		PELL CRG 1" 6000# NPT	100 PC				

ITEM	BW HT. CD.	CHEMICAL COMPOSITION (%)															
		C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	CH(NB)	N	Al	Ti	Zr	CE
077	4145	0.35	0.10	0.60	0.035	0.040	0.40	0.30	0.40	0.12	0.08	-	-	-	-	-	0.43
079	3930	0.18	0.19	0.94	0.011	0.012	0.21	0.08	0.06	0.01	0.001	0.000	-	-	-	-	0.373
080	3913	0.20	0.21	0.84	0.017	0.013	0.15	0.07	0.06	0.02	0.002	0.001	-	-	-	-	0.372
080	3982	0.19	0.21	0.85	0.013	0.009	0.13	0.05	0.05	0.01	0.002	0.002	-	-	-	-	0.356
081	3860	0.19	0.20	0.82	0.013	0.011	0.12	0.05	0.04	0.01	0.002	0.002	-	-	-	-	0.350
		0.200	0.200	0.830	0.014	0.008	0.100	0.050	0.040	0.010	0.002	0.002	-	-	-	-	0.360

ITEM	BW HT. CD.	MECHANICAL PROPERTIES										HEAT TREATMENT			ADDITIONAL TEST/REMARKS
		T. S. (KSI)	Y. S. (KSI)	El. (%)	R of A (%)	Hardness (HBW)(AVG)	Charpy Impact T / (Joule)	MIN./AVG.	1	2	3	AVG.	TREATMENT		
077	4145	76.9	51.3	34.2	66.4	141	143	187	1	2	3	AVG.	NORMALIZED	CONFORMS TO NACE MR0175-09 /MR0103-10 STEEL MAKING PROCESS : ELECTRIC FURNACE CONFORMS TO NACE ISO15156-3 2009	
079	3930	74.8	48.3	35.6	64.1	142	144								
080	3913	74.4	47.6	37.2	63.5	141	143							900°C A.C.	
080	3982	74.2	49.7	36.2	65.3	140	142								
081	3860	76.2	53.8	35.4	63.3	141	144								

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BW-D0839 REV: 2

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