

DATA BOOK

762 (30") OD SEPARATOR SN1668
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

① A . 636957

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 1668 W3539.213 2013-070-300 Rev. 2 N/A 2014
(Horiz. or vert., tank) (Mfg's serial No.) (CRN) (Drawing No.) (Natl. 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"
Matl. (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) Matl. SA-516-70N (Spec. No., Grade) (b) Matl. 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)

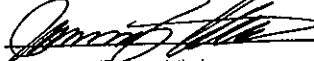
12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:

(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

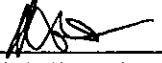
We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. "U" Certificate of Authorization No. 39285 expires Feb. 10, 2016

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

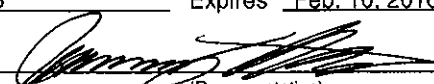
1. Manufactured and certified by Cado Industries Inc. 7491, 110 Avenue S.E. Calgary, Alberta, Canada, T2C 3B8
 (Name and address of Manufacturer)
2. Manufactured for Penn West Exploration #200, 207 - 9th Avenue S.W. Calgary, Alberta T2P 1K3
 (Name and address of Purchaser)
3. Location of installation Penn West Exploration Cordova d-55-A/94-P-10 Facility
 (Name and address)
4. Type: Vertical 30" Separator 1668
 (Horizontal, vertical, or sphere) (Tank, separator, heat exch., 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  (Representative)
 (Manufacturer)

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

Revision Number: 4.0

Revision Date: November 30, 2012

Section: 9 Page: 10 of 11

EXHIBIT 9.5 TRAVEL SHEET (FRONT)

DO NOT START CONSTRUCTION WITHOUT AI REVIEW						TRAVEL SHEET REVISION NO.:			
AI REVIEW: <i>X</i>			REVIEW DATE: OCT 04 2013						
SERIAL NO.: 1668		JOB NO.: 2013-070		VESSEL TYPE: 762 Separator					
DRAWING NO.: 2013-070-300		DWG. REVISION NO.: Rev. 0		TRAVEL SHEET INITIATION BY: <i>CA</i>					
Seq.	Item	Comments	Q.C.I.	Date	A.I. Hold Points	A.I.	Date	Owner	Date
1.	Calculations in File		<i>[Signature]</i>	JAN 21 2014	X	<i>[Signature]</i>	JAN 22 2014		
2.	Release of App'd Dwg.		<i>[Signature]</i>	OCT 03 2013	X	<i>[Signature]</i>	OCT 04 2013	<i>[Signature]</i>	Nov 27
3.	Materials Examined		<i>[Signature]</i>	DEC 11 2013					
4.	Heat Numbers Recorded		<i>[Signature]</i>	DEC 11 2013	X	<i>[Signature]</i>	JAN 22 2014	<i>[Signature]</i>	JAN 23 2014
5.	MTRs Checked		<i>[Signature]</i>	DEC 11 2013	X	<i>[Signature]</i>		<i>[Signature]</i>	JAN 23 2014
6.	WPS(s) Checked		<i>[Signature]</i>	OCT 03 2013	X	<i>[Signature]</i>	OCT 04 2013	<i>[Signature]</i>	JAN 23 2014
7.	Welder(s) Qualified		<i>[Signature]</i>	DEC 11 2013				<i>[Signature]</i>	JAN 23 2014
8.	Thicknesses Verified & Recorded		<i>[Signature]</i>	DEC 11 2013					
9.	Shell(s) & Head(s) Fit-up Inspection		<i>[Signature]</i>	DEC 11 2013	X	<i>[Signature]</i>	JAN 22 2014	<i>[Signature]</i>	JAN 23 2014
10.	Nozzles & Fittings Fit-up Inspection		<i>[Signature]</i>	DEC 11 2013				<i>[Signature]</i>	Nov 27
11.	Nozzle Orientation		<i>[Signature]</i>	DEC 11 2013				<i>[Signature]</i>	"
12.	Nozzle & Flange Rating Checked		<i>[Signature]</i>	DEC 11 2013				<i>[Signature]</i>	"
13.	Impact Tests		<i>[Signature]</i>	DEC 11 2013				<i>[Signature]</i>	-
14.	Internals Checked		<i>[Signature]</i>	NOV 25 2013					
15.	Final Internal Inspection	Shell Side Tube Side	<i>[Signature]</i>	NOV 25 2013	X	<i>[Signature]</i>	NOV 26 2013	<i>[Signature]</i>	Nov 27
16.	Weld Sizes Checked		<i>[Signature]</i>	DEC 11 2013				<i>[Signature]</i>	JAN 23 2014
17.	Welder I.D. Checked		<i>[Signature]</i>	DEC 11 2013				<i>[Signature]</i>	JAN 23 2014
18.	Final External Inspection		<i>[Signature]</i>	DEC 11 2013	X	<i>[Signature]</i>	JAN 22 2014	<i>[Signature]</i>	JAN 23 2014
19.	Radiography		<i>[Signature]</i>	DEC 11 2013	X	<i>[Signature]</i>	JAN 22 2014	<i>[Signature]</i>	JAN 23 2014
20.	Other N.D.E.	Hardness	<i>[Signature]</i>	JAN 21 2014				<i>[Signature]</i>	JAN 23 2014
21.	Final Ext. Prior to P.W.H.T.		<i>[Signature]</i>	DEC 11 2013					
22.	PWHT Chart Checked		<i>[Signature]</i>	JAN 21 2014	X			<i>[Signature]</i>	JAN 23 2014
23.	Hydrostatic Test	Shell Side Gauge # PG-17A/07A Tube Side Gauge #	<i>[Signature]</i>	JAN 22 2014	XX	<i>[Signature]</i>	JAN 22 2014	<i>[Signature]</i>	Jan 22
24.	CRN Drawing	CRN#	<i>[Signature]</i>	JAN 21 2014	XX	<i>[Signature]</i>	JAN 22 2014		
25.	N.C.R. #		<i>[Signature]</i>				JAN 22 2014		
26.	Nameplate Stamping		<i>[Signature]</i>	JAN 21 2014	XX	<i>[Signature]</i>		<i>[Signature]</i>	JAN 23 2014
27.	Manuf. Data Report Completed & Verified		<i>[Signature]</i>	JAN 21 2014	XX	<i>[Signature]</i>		<i>[Signature]</i>	JAN 23 2014
28.	Nameplate Installation		<i>[Signature]</i>	"			JAN 22 2014		

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

CADO INDUSTRIES INC
Quality Control Manual

Revision Number: 4.0

Revision Date: November 30, 2012

Section: 9 Page: 10 of 11

S/N 1668

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	1.328"	SA-516-70N	38264921340-02	L-1	VM	45	C-1	S/M	45	45
Shell #2				L-2			C-2	S/M	45	45
Shell #3				L-			C-			
Shell #4				L-			C-			
Shell #5				L-			C-			
Shell #6				L-			C-			
Head #1	1.340"	SA-516-70N	G1129476540101				C-			
Head #2	1.339"	SA-516-70N	G1129476540101				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					
	Heat# or ID	C1561		710004515					
N2	Spec.-Grd.	SA-106-B		SA-105-N			R	S	
	Thk./Rating	4" SCH XXH		4" CL 600 RFWN					
	Heat# or ID	C1561		710004515					
N3	Spec.-Grd.	SA-106-B		SA-105-N			S	S/R	
	Thk./Rating	3" SCH XXH		2" CL 600 RFWN					
	Heat# or ID	C1281		12/35050					
N4	Spec.-Grd.	SA-106-B		SA-105-N			S	R/S	
	Thk./Rating	3" SCH XXH		2" CL 600 RFWN					
	Heat# or ID	C1281		12/35050					
N5	Spec.-Grd.	SA-106-B		SA-105-N			S	S	
	Thk./Rating	2" SCH XXH		2" CL 600 RFWN					
	Heat# or ID	C1692		710005612					
N6	Spec.-Grd.	SA-106-B		SA-105-N			S	S	
	Thk./Rating	2" SCH XXH		2" CL 600 RFWN					
	Heat# or ID	C1700		710005612					
N7	Spec.-Grd.	SA-106-B		SA-105-N			S	S/R	
	Thk./Rating	4" SCH XXH		4" CL 600 RFWN					
	Heat# or ID	C1561		710004515					
N8	Spec.-Grd.	SA-106-B		SA-105-N			S	S/R	
	Thk./Rating	4" SCH XXH		4" CL 600 RFWN					
	Heat# or ID	C1561		710004515					



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

RADIOGRAPHIC REPORT

R - 60796

CLIENT: CADD	MATERIAL TYPE: CS	THICKNESS RANGE: 1.250"	LEGEND	DATE: Oct 13
LOCATION: CANARY	SOURCE OF RADIATION: IR192	FOCAL SPOT (F): 3.5mm	WELDERS SYMBOL	PAGE: 1 OF 1
GTL JOB No. 13-01-0068	CONTRACTOR: CADD	TECHNIQUE: SWE <input type="checkbox"/> DWE <input type="checkbox"/> D5 <input type="checkbox"/> D6 <input type="checkbox"/> D7 <input type="checkbox"/> OTHER <input type="checkbox"/>	BORDERLINE	PROCEDURE: A
CLIENT'S P.O.	FILM TYPE: AGFA <input type="checkbox"/> D4 <input type="checkbox"/> D5 <input type="checkbox"/> D6 <input type="checkbox"/> D7 <input type="checkbox"/> OTHER <input type="checkbox"/>		REJECT	CODE: ASME UW57
CLIENT JOB No. 2013-070			See back for other legends.	

IDENTIFICATION	PIPE SIZE	PIPE SCHEDULE	t	# OF EXP	CRK	LF	IP	P	S	UC	OR	EP	%	*	IQI	DEFECT LOCATION AND REMARKS	ACCEPT	REJECT	
1. SN1668	RL	1 1/4"	1280	8															
2. L1																Fin P/M B			
3. 0-15																	✓		
4. 15-30																	✓		
5. 30-45																	✓		
6. 45-60																	✓		
7. 60-75																	✓		
8. 75-90																	✓		
9. 90-105																	✓		
10. 105-120END																	✓		
11.																			
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: [Signature] FILM USED: **8** FILM SIZE: **3 1/2" X 17"**

TECHNICIAN (SIGN): [Signature] PCS. _____

TECHNICIAN (PRINT): **W.L. BONEY** CGSB LEVEL **2** PCS. _____

ASSISTANT (PRINT): **STEPHEN** PCS. _____

CGSB Reg. # **805**

SSQFD: Source Side of Object to Film Distance	Nominal Plus Maximum Reinforcement	LEAD SCREENS	LEAD SCREENS	FILM DENSITY
	18.75	18.75	0060	1.8192
SOD: Source to Object Distance				
Curies	48			

MIN 2.0 MAX 4.0



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

Gamma-Tech
Inspection Ltd.

RADIOGRAPHIC REPORT

R - 61189

CLIENT CADO	MATERIAL TYPE: CS	THICKNESS RANGE: 1.250"	LEGEND WELDERS SYMBOL ACCEPTABLE BORDERLINE REJECT See back for other legends.	DATE: Dec 05/13
LOCATION CARGARY	SOURCE OF RADIATION: IR192	FOCAL SPOT (F): 3.5mm	* 1 2 3	PAGE: 1 OF 1
GTIL JOB No. 13-01-0068	CONTRACTOR: CADO	TECHNIQUE: <input checked="" type="checkbox"/> SWE <input type="checkbox"/> DWE <input type="checkbox"/> DWV <input type="checkbox"/>	PROCEDURE: B/A	CODE: ASME UW51
CLIENT'S P.O.	FILM TYPE: <input type="checkbox"/> AGFA <input type="checkbox"/> D4 <input type="checkbox"/> D5 <input type="checkbox"/> D7 <input type="checkbox"/> OTHER			
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	
C1	30"00	114"	1.250	1										Full SM B					
0-14																			
14-28																			
28-42																			
42-56																			
56-70																			
70-84																			
84-0																			
C110	30"00	114"	1.250	1										Full SM B		IO 87-94	REPT OK		
87-94																			
C2	30"00	114"	1.250	1										Full SM B					
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. MURPHY** CGSB LEVEL **SA** ASNT LEVEL **A**
ASSISTANT (PRINT): **STEPHEN**

SSOFD: Source Side of Object to Film Distance	Nominal Plus Maximum Reinforcement
SOD: Source to Object Distance	
Curies	

CGSB Reg. # **805**
1 Film Per Huddle

LEAD SCREENS	1R192	.005 FRONT
LEAD SCREENS	C060	.010 BACK
FILM DENSITY		MIN 2.0
		MAX 4.0

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

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 1668 PWHT	IRISNDT #: 261900	Date: 15-Jan-14
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Material Type: CS	Surface Condition: buffed	Heat Treatment: YES
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Equipment: MIC 10	IRISNDT #: 45038	Calibration Date: 12-Jul-13
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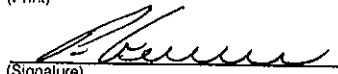

Calibration Block(s): 176, 207

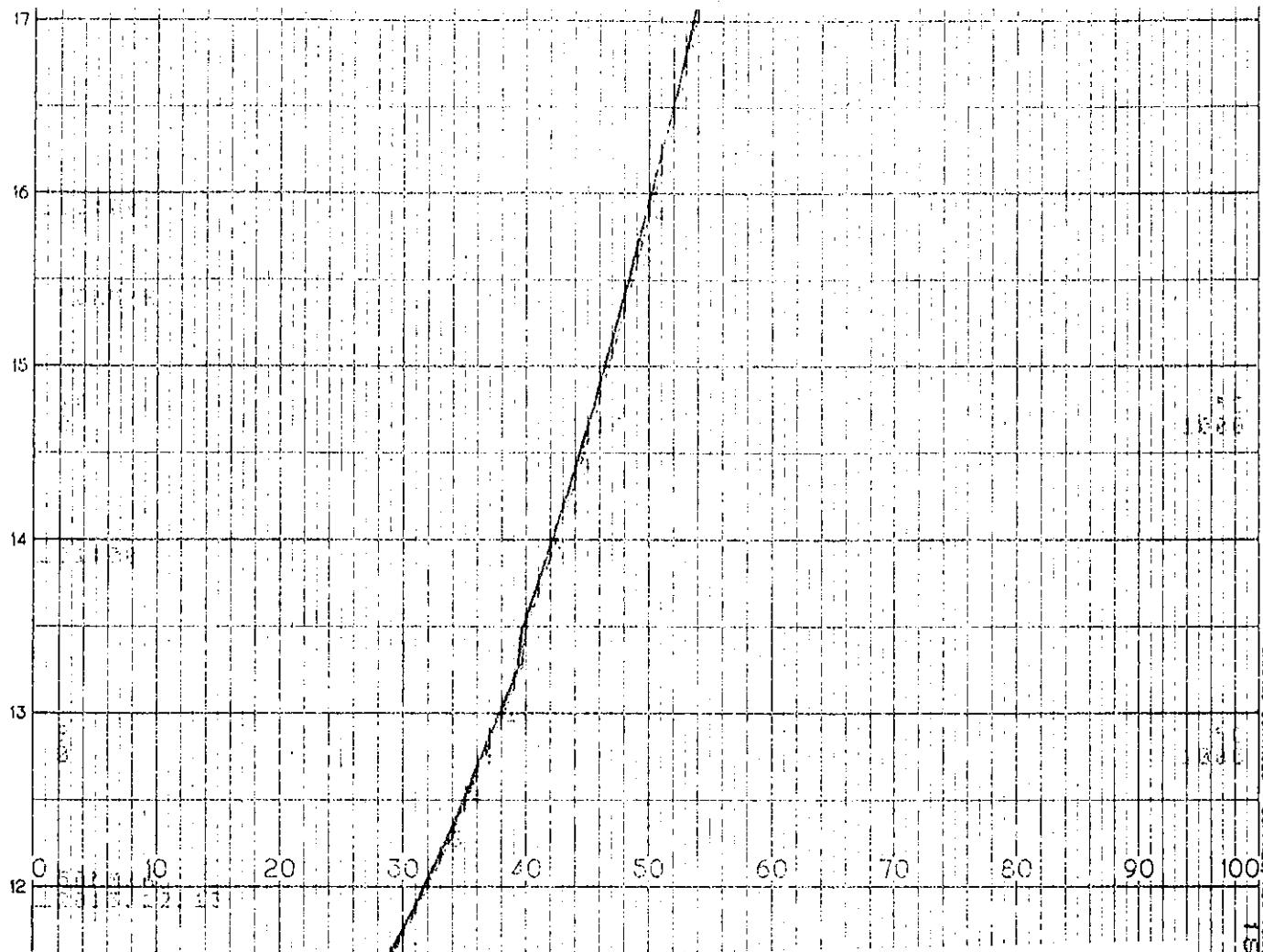
Hardness Scale Readings: Rockwell B Rockwell C Vickers Brinell

Item	Component Identification and Location of Reading	Brinell Impression		Brinell Bar Hardness	Hardness Value	(A)cept (R)ject	
		Bar	Material				
WELD		PM	HAZ	WELD	HAZ	PM	
C1		144	180	183	166	152	A
L1		144	150	175	162	146	A
N2 cat D		150	159	160	158	151	A
Name plate	Attachment	155	152	162	141	135	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.

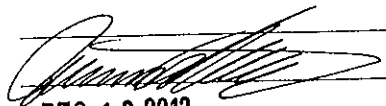
Unit#: 389 Kilometers: _____ In: PG Out: _____ Hrs: .5 In: _____ Out: _____ Hrs: _____ Personnel: PG	Consumables: # of Hits: 20	Interpretation by: P. GERVAIS _____ (Print)  (Signature) Client Representative: _____ (Print) I am in full agreement with report contents (Sign) 
---	--	--

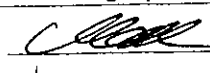


GRAPHIC CONTROLS 3 BUFFALO, NEW YORK

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

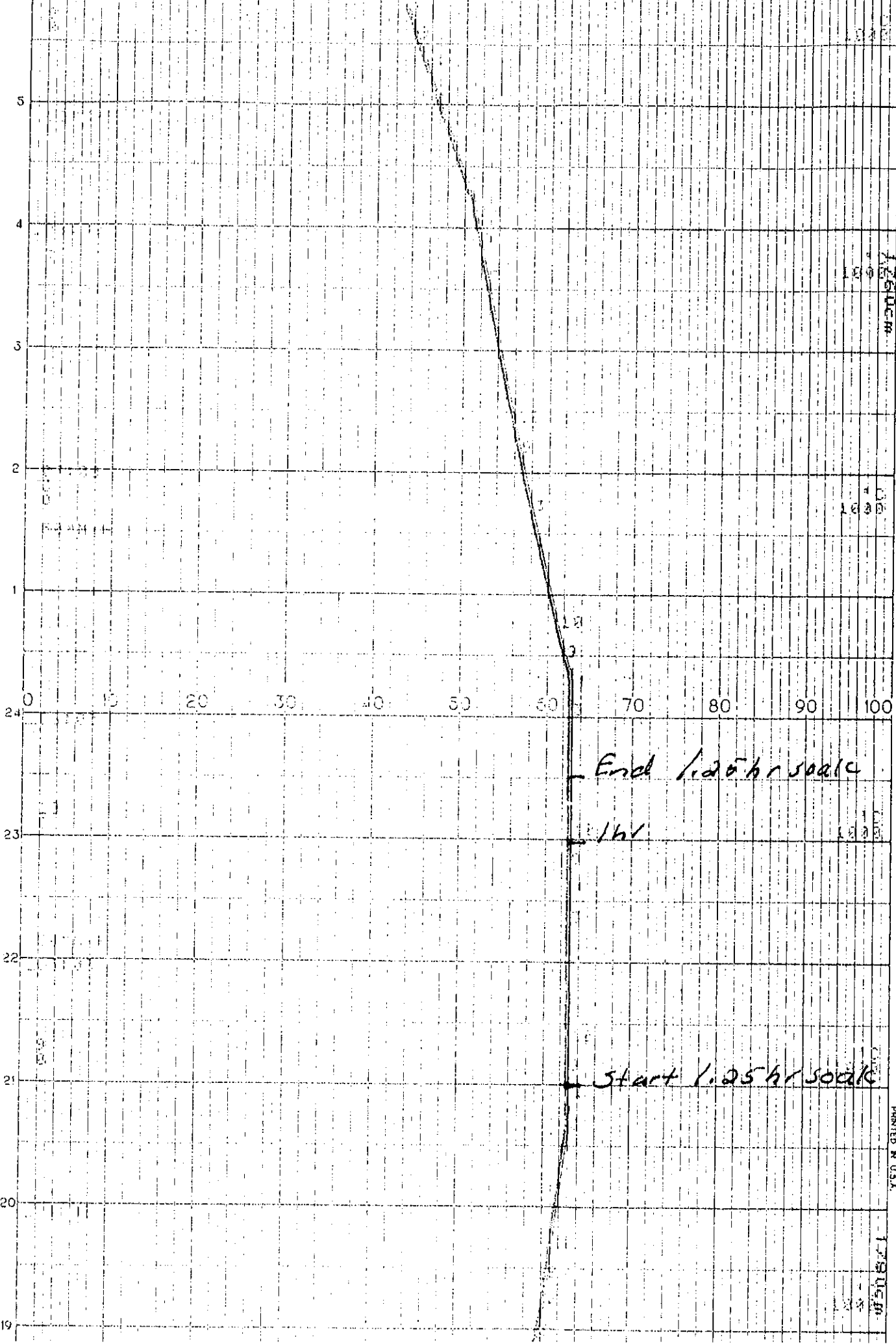
1.25 hr

1.25 hr

1.25 hr

1.25 hr

1.25 hr



CADO INDUSTRIES INC

Quality Control Manual

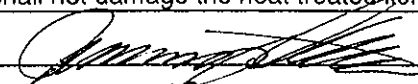
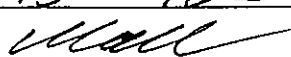
Revision Number: 4.0

Revision Date: November 30, 2012

Section: 14 Page: 2 of 2

EXHIBIT 14.1 HEAT TREATMENT INSTRUCTIONS

HEAT TREATMENT INSTRUCTIONS

JOB NO.: 2013-070 CUSTOMER: Penn West			DATE: DEC 12 2013		
COMPONENT DESCRIPTION: 30" Separators (4 total)					
DWG. NO. AND LINE NO.	DIAMETER	THICKNESS	MATERIAL	LENGTH	WEIGHT
2013-070-300 Rev. 2	30"	1.25"	SA-516-70N	10' 5/8"	6240 LBS
1667, 1668, 1669, 1670			SA-105-N		
			SA-106-B		
TYPE OF HEAT TREATMENT: PRESSURE VESSEL STRESS RELIEF P-No. 1					
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°F</u> (<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: 			Date: DEC 12 2013		
Thermocouple Attachment Method: Capacitor Discharge			Location(s): TMB		
Furnace Heat Number: CF13-7952					
Furnace Operator Signature: 			Date: Dec 12/13		



318 Monument Place SE
 Calgary, AB T2A 1X3
 Telephone: (403) 273-5105
 Fax: (403) 248-6497
 Email: calgary@continentalstress.com

Furnace Work Order

Date: Thursday December 12, 2013

Client: CADO INDUSTRIES INC.
 Address: 7491 110 AVE SE.
 CALGARY, AB
 T3R 1R8

Owning Company:
 Date Required: Friday December 13, 2013

Attention: JEREMY KOSTER
 Phone: (403) 279-6662
 Fax:
 Email:

Client Reference: 2013-070
 Purchase Order :

Furnace Work Order Number: CF13-7952

Description	Quantity
VESSELS (1667/1668/1669/1670)	4

Total Overtime Hours =	0	@	\$.00	Per Hour =	\$.00
Furnace Number:	2	@		Furnace Charges:	\$865.00
				Other Charges(s):	\$.00
				COST:	\$865.00
				GST:	\$43.25
				TOTAL COST:	\$908.25


Heat Cycle (In Degrees Celsius)

Material: Carbon Steel (P1) <= 1.25" W/T Code: Customer Spec.
 Heat from Ambient to 425° at a Moderate Rate.
 Heat from 425° to 621° at 222° per Hour Maximum.
 Soak at 621° +/- 14° for 1 Hours.
 Cool to 425° at 277° per Hour Maximum.
 Cool from to at per Hour Maximum.
 From 425° Air Cool with furnace in place.

Comments:

- NOTE: 1. An extra charge will apply for any additional supporting or blocking if required.
 2. Customer will not hold Continental Stress Relieving Services Ltd. responsible for any damage of distortion caused by heat treatment process.

Thank you for the opportunity of quoting.
 Continental Stress Relieving Services Ltd.

Name: Marc Lagerquist Signed: 

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	Recal Date
Fluke	741B	7751004	October 22, 2013



Technician

Oct. 11, 2013

Date

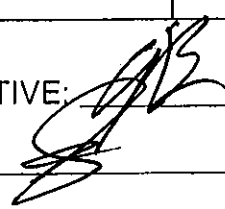
CADO INDUSTRIES INC
Quality Control Manual

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>1668</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-17A</u>	<u>13 Aug 13</u>	<u>0-5000</u>	<u>2040</u>
GAUGE #2 <u>Pg-07A</u>	<u>31 Oct 13</u>	<u>0-3000</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-07A
Issue Date: 31OCT13
Expiry Date: 31OCT14
Work order #: 4486
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 / 2. NIST)

EQUIPMENT USED:

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

CALIBRATION DATA:

ACCURACY: 1.0 % FS

APPLIED	BEFORE	AFTER
500	500	500
1000	1000	1000
1500	1495	1495
2000	1990	1990
2500	2490	2490
3000	2990	2990

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: WGI
Model: 4"
Serial #: NIL
Temp (°C): 20
Comments: NIL

ID #: PG-17A
Issue Date: 13AUG13
Expiry Date: 13AUG14
Work order #: 4367
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 / 2. NIST)

EQUIPMENT USED:

MFG: SI MODEL PC-6 SERIAL NUMBER 2743

CALIBRATION DATA: ACCURACY: 1.0 % FS

APPLIED	BEFORE	AFTER
1000	1050	1000
2000	2050	2000
3000	3060	2995
4000	4065	3995
5000	5075	5020

YVON HACHE - TECHNICIAN

10055927

10055927

Completed by
10055927

NAME:

1360

PSI

194

NAME:

PSI

M.D.M.T.

-20

F @

1360

SERIAL #

1668

YEAR BUILT

2014

GRN #

W3539.213

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

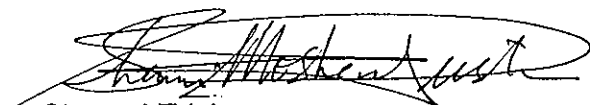
With reference to your submission respecting the registration of the item below, for legal use in the province, please note we have surveyed, approved and registered this design as noted.

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.

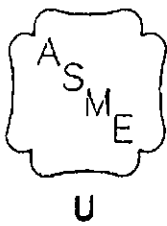
In addition to stamping every vessel with the registration number given above and as required in CSA Code B51, a Manufacturer's Data Report must be forwarded to this office immediately at the time a vessel is shipped. Such forms may be obtained upon request.

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

Handwritten signature of Bryan A. Eiler.

Vice President, Conformity Assessment

Handwritten signature of Paul M. Wyle.

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

Chief Inspector and Administrator

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 [Signature] 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)

	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 Darren McLean, CSA W178.2 level 1 Insp. Date of Test June 19, 2013
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 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)

	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

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)

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

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 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 "R"

Materials and Welding Consulting

WELDER PERFORMANCE QUALIFICATION TEST RECORD

Company	<u>Cado Industries Inc.</u>	Contact	<u>Jeremy Koster</u>
Welder's Name	<u>Carlos Robertson</u>	ABSA File No.	<u>W-29988</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
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 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. C2-48
 Welder Performance Qualification Card No. 01893 Laboratory Test No. CW12-624.1



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	P1	P1, P6, 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: 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	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) **PASS**

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 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

ate 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	Cado Industries Inc.	Contact	Jeremy Koster
Welder's Name	Donghao Shi	ABSA File No.	W-28478
WP Registration No.	2621.2	WPS No.	CADO-13N
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	With or without
	SMAW: With	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°	SP 0 - 45°, Flat
	SMAW: 1G Rotated	Flat
Vertical progression	GMAW: Downhill	Downhill
	SMAW: N/A	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	Ludwig Associates Ltd.	A.O.Q.P. Registration No.	7106 (C)
Test Conducted By	Dan Nguyen, CSA W178.2 level II Insp.	Date of Test	June 5, 2012
Certified By	Dan Nguyen, C.E.T.	Welding Examiner File No.	E-00286
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
Date test coupon is to be retained	July 5, 2012	Test Coupon I.D. No.	C2-39
Welder Performance Qualification Card No.	01474	Laboratory Test No.	CW12-357.2

4027 - 14 Street, S.E., CALGARY, ALBERTA T2G 3K6 PHONE: (403) 262-7072 FAX: (403) 266-3169

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



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

Erläuterungen siehe Rückseite/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/
A03 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

1/...

A05 Established inspecting body
DH A06 Purchaser
Final receiver

EDMONTON STEEL, EDMON

EDMONTON STEEL, EDMON

A07.1 No. ED10614-J1010-ER

B01 Product
HEAVY PLATES

B02/ Steel design: SAS16-70

SA20-SS

B03 Any suppl. requirements
ASME-11A: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 INCH	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 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 2012/02/203 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.



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

B. BALDAUF
Test House Manager



Inspector's stamp Date 04.03.13

PP 1

A01

QM-System: Certification as per ISO 9001

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



DILLINGER HÜTTE

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	A08/ Manufacturer's order/ A03 Certificate No. 381826-001	Sheet 2/...
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A05 Established inspecting body DH	A06 Purchaser EDMONTON STEEL, EDMON	A07.1 No. ED10614-J1010-ER	B01 Product HEAVY PLATES
	Final receiver EDMONTON STEEL, EDMON	A07.2 No.	

B02 Steel design: SAS16-70	SA20-SS
B03 Any suppl. requirements ASME-11A:2010+ADDENDA-2011A DIL-HUE-2:R33-2012-10-01	

B06 Marking of the product

ITEM NO.: 01,03-04
STEEL DESIGNATION SAS16 70 MILLV SAS16 60 MILLV
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

Item No.	Heat No.	Rel.plate/ Test No.	B05 Reference (heat) treatment	C01 C02/ C03 GR.F	C10 C11 KSI RP02	C12 RM	C13 A % LO=8IN	A % LO=2IN	C14-C15
01	382647	20724		K1 Q	RT	50,6	27		
01	382647	20812		K1 Q	RT	50,2	29		
03	382648	21312		K1 Q	RT	51,8	32		
03	382648	21315		K1 Q	RT	51,0	29		
04	382649	21390		K1 QV	RT	48,0	34		

C30-C39 Hardness test

Item No.	Heat No.	Rel.plate/ Test No.	B05 Reference (heat) treatment	C01 C02/C01	C03 Temp. GR.F	C30 Method of test	C35 C31 Individual values	C32 Mean Value
01	382647	20724		K1 O	RT	HBW 10/3000	143	143
01	382647	20812		K1 O	RT	HBW 10/3000	138	140
03	382648	21312		K1 O	RT	HBW 10/3000	142	142
03	382648	21315		K1 O	RT	HBW 10/3000	144	144
04	382649	21390		K1 O	RT	HBW 10/3000	142	142

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



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

QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

Erfahrungen stehen/Experiences vor/auverses/See reversals for explanations: (www.dillinger.de/certifcate)

A02 INSPECTION CERTIFICATE 3..2 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)

A05 Establishing/Specifying 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-S5

B03 Any suppl. ASME- IIA:2010+ADDENDA-2011A

requirements DIL-HUE-2:R33-2012-10-01

A10 Advice of dispatch No./ Date of dispatch

447957-01.03.13

A09/ Manufacturer's order/ Certificate No.

381826-001

Sheet

3/...

B01 Product HEAVY PLATES

C40-C49 Impact test

Item No.	Heat No.	Roll plate/ Test No.	B05 Reference (heat) treatment	C01 C01	C02/ C02	C03 C03	C41 C41	C40 C40	C44 C44	C46 C46	C45 C45	C43 C43
				Temp. G.R.F.	Width of test piece	Type of test piece	Testing method	Energy	Individual values AV=FTLBF	Mean value		
01	382647	20724		-51		CHP-V		AV 57	79	158		98
01	382647	20812		-51		CHP-V		AV 112	119	113		115
03	382648	21312		-51		CHP-V		AV 78	77	110		88
03	382648	21315		-51		CHP-V		AV 116	99	119		111
04	382649	21390		-51		CHP-V		AV 105	106	93		101

C70-C99 Chemical composition % - Heat analysis

Heat No.	C70	C	SI	MN	P	S	N	CU	MO	NI	GR	V	NB	SN	TR
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.	B	CA	AL-T	FO-02=	FO-51=	FO-55=	FO-78=	FO-91=
382647	Y	0,0002	0,0022	0,39	0,002	0,11	0,05	6,4
382648	Y	0,0002	0,0026	0,40	0,002	0,12	0,06	6,3
382649	Y	0,0002	0,0017	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.

R. Baldauf



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

B. BALDAUF
Test House Manager

Inspector's stamp

Date 04.03.13

pp 1



Manufacturer's mark

A01

QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

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

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

MATERIAL TEST REPORT (MTR)

447957-01.03.13

381826-001

4/...

A05 Established inspecting body
A06 Purchaser
Final receiver

EDMONTON STEEL, EDMON
EDMONTON STEEL, EDMON

A07.1 No. ED10614-J1010-ER
A07.2 No.

B02/ Steel design. SA516-70

SA20-S5

B03 Any suppl. ASME-III-A:2010+ADDENDA-2011A
requirements DIL-HDE-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.	C	SI	MIN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
B07.2	B07.1	C01													
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	0,002
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	0,002
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	0,002
B07.2	B07.1	C01													
Heat	Test No.	B	CA	AL.T											
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										

C94 Product analysis Carbon equivalent / Alloying restrictions

Heat	Test No.	FO-02=	FO-51=	FO-55=
B07.2	B07.1	C01		
382647	20724	K1	0,38	0,001
382648	21315	K1	0,38	0,001
382649	21390	K1	0,38	0,001

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



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

A01

QM-System: Certification as per ISO 9001

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



DILLINGER HÜTTE

<p>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)</p>	<p>A10 Advice of dispatch No./ Date of dispatch 447957-01.03.13</p>	<p>A08 Manufacturer's order/ Certificate No. 381826-001 Sheet 5</p>
<p>A05 Established inspecting body DH A08 Purchaser Final receiver EDMONTON STEEL, EDMON EDMONTON STEEL, EDMON</p>	<p>A07.1 No. A07.2 No. ED10614-J1010-ER A072 No.</p>	<p>B01 Product HEAVY PLATES</p>
<p>B02 Steel design SA516-70</p> <p>B03 Any suppl. requirements ASME-IIA:2010+ADDENDA-2011A DIL-HUE-2:R33-2012-10-01</p>	<p>SA20-S5</p>	

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 2012/2023 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

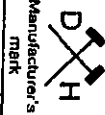


Inspector's stamp Date 04.03.13

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

A01

PP 1





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 2013/09/13 Co/C# 43661 Page 1 of 1

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

10 1.355"

10 1.346"

10 1.343"

10 1.348"

10 1.357"

10 1.352"

10 1.340"

10 1.339"

M.T.R. ACCEPTABLE
TO A.S.M.E. SECT. II
10 EDITION 11 ADD.
CH SEP 25 2013



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 Co/C# 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 千葉県若葉市若津1番地
 KIMITSU WORKS 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN

証明書番号 : P-23076 PAGE : 2
 発行年月日 : 2013-06-20
 DATE OF ISSUE : 1001

文 者 : HANWA CO., LTD.
 文者照合番号 : 22803J-685310100
 契約番号 : 3-811-H1-5-6-A102
 品名 : HOT ROLLED STEEL PLATES
 規格 : ASME SA-516 GRADE 70-E10-A11
 仕様書番号 : EDMONTON EXCHANGER GROUP OF C-
 顧客番号 : OMPANIES

AS PER EN 10204 CERTIFICATE ON MATERIAL
 TESTS 3.1.1
 EDMONTON EXCHANGER GROUP OF C-
 顧客管理番号 : CUSTOMERS CONTROL No. E10924-J1010ER E3001A0200 E05

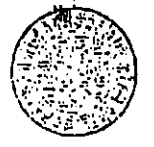
寸法	DIMENSION	単位	数量	質量	製鋼番号	製品番号	引張試験	衝撃試験	硬度試験	化学成分											
										C	Si	Mn	P	S	Al	Ni	Cr	Mo	ND	V	Ti
500' X 97' X 480'	500' X 97' X 480'	mm, inch, feet	02	8985	G1134	TESTED-PL	51	75	32	205	15	37	143	5	3	2	2	2	0.12	0.26	4.0
500' X 97' X 480'	500' X 97' X 480'	mm, inch, feet	01	8985	G1133	TESTED-PL	51	75	32	205	15	37	143	5	3	2	2	2	0.12	0.26	4.0

引張試験 : TENSILE TEST
 衝撃試験 : IMPACT TEST
 硬度試験 : HARDNESS TEST
 化学成分 : CHEMICAL COMPOSITION %

製鋼番号 : CAST No. TEST No.
 製品番号 : PLATE No.
 引張試験 : TENSILE TEST
 衝撃試験 : IMPACT TEST
 硬度試験 : HARDNESS TEST
 化学成分 : CHEMICAL COMPOSITION %

鋼材検査証明書
 新日鐵住金株式会社
 NIPPON STEEL & SUMITOMO METAL CORPORATION

品質保証部
 HEAD OF DEPARTMENT
 QUALITY ASSURANCE DEPT.
 KIMITSU WORKS



1821

HENGYANG VALIN STEEL
TUBE CO., LTD

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

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

CUSTOMER	CE FRANKLIN	CERTIFICATE NO.	
CONTRACT NO.	2110072906-1	P.O.NO.	PO2895832-OR-2100-B (LOT A)
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE	L/C NO.	2PFAHD5-00037
SPECIFICATION	SEE SPECIFICATION; NOTE	DELIVERY CONDITION	
GRADE	B.X42 GRADE 290	HEAT TREATMENT	
TOTAL BUNDLES:	4	TOTAL LENGTH	520.240
		3" * 0.690" * 20FT	
		FT	TOTAL WEIGHT: 4.390
			MT
HIC TEST	SEE THE ORIGINAL INSPECTION REPORTS	REMARK:	
SSC TEST			

SPECIFICATION	ASTM A53B/A106B-2010, ASME SA53B/A106B-2010, API 5L B X42, PSL-2-2008, NACE MR-0175-2009/ISO 15156-2-2005 (REGION 3) MR-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 trade-mark JOINTIME light-green coloured at the bottom of the page is stamped. In case the certificate would release a copy of it, the must attach 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: hesteel@valintube.com

CUSTOMER THIRD PARTY

Quality Manager:

胡双开



Certificate number:

唐双开



2013-070-8473

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



ISO 9001:2008

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

Heat Product	Chemical Composition									
	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V
	.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

Notes

M.T.R. ACCEPTABLE TO A.S.M.E. SECT. II 10 EDITION 11 ADD.

CA 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

2013-070-8473



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 - CADS
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 Definition
Lot No.	
Heat Code TL10004630	
C.E. .45	Melt Practice

Heat Product	Chemical Composition									
	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V
	.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		
Ksi 53 Mpa 367	Ksi 78 Mpa 538		29 %	58 %	HBW 149 HBW 149		
Tensile Specimen STD RD		Impact Type		Impact Orientation	Starting Material	Impact Specimen	
Lateral Expansion							

Notes

M.T.R. ACCEPTABLE TO A.S.M.E. SECT. II 10 EDITION, // ADD.

CA **OCT 26 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



METALFAR
 PRODOTTI INDUSTRIALI S.P.A.
 VIA G. Pardi, 28
 761 538 031053441
 FAX 439 031 6531749
 quality@metalfar.com

23951 CESANA BIRAZZA (CI) - Italy
 SUCCESSIONE AMMINISTRATIVA E STABILIMENTO

COMPANY WITH
 QUALITY SYSTEM
 CERTIFIED BY DNV
 = ISO 9001 =

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE	
Order N. 2032	Delivered 09.04.2013
DOT / Del N. 1600	Delivered 08.04.2013
TRANS AM PIPING PRODUCTS LTD	Order: TRANS AM PROJECT Warehouse
8335 ENDEAVOR DRIVE S.E.	1711 - 68 Avenue
T5S 0A1 CALGARY, ALBERTA	T5P 1Y9 Edmonton, ALBERTA
CA	CA

SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT

COD. COL. HEAT	COLATA ITEM	POS.	VS. ORDINE YOUR REFERENCE	Q.T.A. Q.T.Y	DESCRIZIONE DESCRIPTION	TRATTAMENTO TERMICO / HEAT TREATMENT	DIM. IN ACC. A DIM. ACCORDANCE TO	VS. DIMENS. SATISFACTORY
MATERIALE / MATERIAL	ASTM A106 (LADLE)	036	CI-12-294	176,00	W/N 300 RF 4" STD	A105N	ASME/ANSI B16.5 - 2009	EUROPEAN UNION
PROVETTA / TEST SPECIMEN	FORMA	1						
SEZ. / SECTION	LENGH. / LENGTH	1						
126,80	80,80							
SERVIZI / SERVICES	YIELD POINT	347,0						
126,80	80,80							
MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO	ASTM/ASME A 106/SA 106 M - 11a ASME CODE SECT. II, PART A, ED. 2010							
ADD. 2011a								
CSA Z246.12 GRADE 248 CAT1 SOUR SERVICE								

COD. COL. HEAT	COLATA ITEM	POS.	VS. ORDINE YOUR REFERENCE	Q.T.A. Q.T.Y	DESCRIZIONE DESCRIPTION	TRATTAMENTO TERMICO / HEAT TREATMENT	DIM. IN ACC. A DIM. ACCORDANCE TO	VS. DIMENS. SATISFACTORY
MATERIALE / MATERIAL	ASTM A106 (LADLE)	072	CI-12-294	212,00	W/N 800 RF 3" XXS	A105N	ASME/ANSI B16.5 - 2009	EUROPEAN UNION
PROVETTA / TEST SPECIMEN	FORMA	1						
SEZ. / SECTION	LENGH. / LENGTH	1						
126,80	50,80							
SERVIZI / SERVICES	YIELD POINT	341,0						
126,80	50,80							
MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO	ASTM/ASME A 106/SA 106 M - 11a ASME CODE SECT. II, PART A, ED. 2010							
ADD. 2011a								
CSA Z246.12 GRADE 248 CAT1 SOUR SERVICE								

MTR. ACCEPTABLE
 TO A.S.M.E. SECT. II
 EDITION 11 ADD.
 NOV 17 2013

Uffici Controllo Qualita'
 QUALITY CONTROL DEPARTMENT

ENTE Ufficiale di Collaudo
 INSPECTION AUTHORITY



NOTE 100% MANUFACTURED IN ITALY
 MATERIAL IN ACCORDANCE WITH ORDER AND SPECIFICATION
 MATERIAL IN ACCORDANCE WITH NACE MR-017/2009 ISO 15166-2009 - SOUR SERVICE
 MATERIAL IN ACCORDANCE WITH NACE MR-0103/2012 - SOUR SERVICE

2013-070-8973

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



ISO 9001:2008

CERTIFIED MATERIAL TEST REPORT

Certificate No. **13167320**

EN 10204 3.1

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

Customer
ALLIED EDMONTON - CADS
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

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

Mechanical Properties							Impact Values	Shear Fracture
Yield	Tensile		Elongation	Reduction of Area	Hardness	Impact Test Temperature		
Ksi 55 Mpa 382	Ksi 84 Mpa 576		30 %	58 %	BHN 163 BHN 167			
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 II 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.

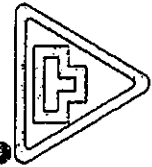
We hereby certify the results to be a true copy of the records of the company.

Les Mansfield
 Les Mansfield, CET
 Quality Assurance Manager

2015-07-28 84173

MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 : 2004 3.1
 CUSTOMER : SEYBOLD INTERNATIONAL CORP.
 CERT. NO : 132175 L/C NO :
 ORDER NO : 7006966 DATE : 07/24/2013
 INVOICE NO : BM01310205043 PAGE : 10 ORIGIN : TAIWAN



拍 德 鐵 工 股 份 有 限 公 司
BOTH-WELL STEEL FITTINGS CO., LTD.
 高 雄 市 仁 武 區 烏 林 聖 仁 心 路 303 號
 NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAHSIUNG 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	FULL C1G 2" 3000# S/W	100 PC	ASTM A105N -12	ASME B16.11 - 2011	GOOD	GOOD
079	3930	330613	FULL C1G 2-1/2" 3000# NPT	25 PC	ASME SA105N -A08			
080	3913	330758	FULL C1G 3/4" 6000# NPT	5 PC				
080	3982	330757	FULL C1G 3/4" 6000# NPT	245 PC				
081	3860	329902	FULL C1G 1" 6000# NPT	100 PC				

ITEM	BW HT. CD.	CHEMICAL COMPOSITION (%)											Cb(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	-	-	-	-	-	-	-	0.373	
079	3930	0.20	0.21	0.84	0.017	0.013	0.15	0.07	0.06	0.02	0.002	-	-	-	-	-	-	-	0.372	
080	3913	0.19	0.21	0.85	0.013	0.009	0.13	0.05	0.05	0.01	0.002	-	-	-	-	-	-	-	0.356	
080	3982	0.19	0.20	0.82	0.013	0.011	0.12	0.05	0.04	0.01	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	-	-	-	-	-	-	-	0.360	

ITEM	BW HT. CD.	MECHANICAL PROPERTIES										HEAT TREATMENT			ADDITIONAL TEST/REMARKS								
		T. S. (ES1)	Y. S. (ES1)	EL. (%)	R of A (%)	Hardness (HRB/AVG)	Charpy Impact J ₂ / 0 °C	MIN./AVG.			AVG.												
077	4145	76.9	51.3	34.2	66.4	141	143	187	1	2	3												
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.

MR. ACCEPTABLE
 P.O.A.S.M.E. SECT. II
 O.C. MANAGER: CHEN CHI HUANG
 INSPECTOR: YUAN YAO CHANG

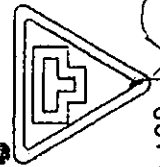
REV: 2

10 EDITION
 ADD. NOV 20 2013

2013-070-8473

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

12 EDITION
OCT 21 2013
ADD



Bothwell Steel Fittings Co., Ltd.
 柏緯鐵工股份有限公司
 NO. 303, REN-SIN ROAD, REN-WU DISTRICT, KAOHSIUNG CITY, TAIWAN R.O.C. (81450)
 TEL: +886-7-3711536, 3710497, 3720260 FAX: +886-7-3713864, 3713882
 Web site: <http://www.bothwell.com.tw> e-mail: box@bothwell.com.tw

MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 : 2004 3.1

CUSTOMER : SETROLD INTERNATIONAL CORP.

CERT. NO : 132175 L/C NO :

ORDER NO : 7006966 DATE : 07/24/2013

INVOICE NO : BMO1310205043 PAGE : 10 ORIGIN : TAIWAN

ITEM	BW HT. CD.	RAW MATERIAL HEAT NO.	DESCRIPTION	QUANTITY	MATERIAL	SPECIFICATION FOR FITTING	INSPECTION SURFACE	DIM.
077	4145	0093863	RAW CTRG 2" 3000# S/W	100 PC	ASTM A1028 -12	ASME B16.11 - 2011	GOOD	GOOD
079	3930	330613	RAW CTRG 2-1/2" 3000# NPT	25 PC				
080	3913	330758	RAW CTRG 3/4" 6000# NPT	5 PC	ASME SA105N -A08			
080	3982	330757	RAW CTRG 3/4" 6000# NPT	245 PC				
081	3860	329902	RAW CTRG 1" 6000# NPT	100 PC				

ITEM	BW HT. CD.	CHEMICAL COMPOSITION (%)											Cb(Nb)	N	Al	Ti	Zr	CE	
		C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Y							
Max		0.35	0.30	1.05	0.035	0.040	0.40	0.30	0.40	0.12	0.08	-	-	-	-	-	-	-	0.43
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 (HRB)(AVG)	Charpy Impact T / 0 °C	MIN.	AVG.	MAX.	TEMP.	TIME	METHOD						
Min		70	36	22	30	187	1	2	3	AVG.									
Max		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.

REV: 2

C.C. Huang
 O.C. MANAGER
 CHEN CHI BIANG

Y.Y. Chang
 INSPECTOR
 YUAN YAO CHANG

ADDITIONAL TEST / REMARKS
 CONFORMS TO NACE MR0175-09 / MR0103-10
 STEEL MARKING PROCESS : ELECTRIC FURNACE
 CONFORMS TO NACE ISO15156-3 2009