

DATA BOOK

762 (30") OD SEPARATOR SN1670
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 636928

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 1670 W3539.213 2013-070-300 Rev. 2 N/A 2014
(Horiz. 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"
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)

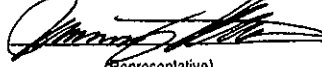
12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:

(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

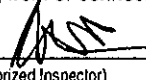
We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. "U"Certificate of Authorization No. 39285 expires Feb.10, 2016.

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  Commissions AB 11 NB 10270 A, B
(Authorized Inspector) (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 1670
 (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 [Signature]
 (Manufacturer) (Representative)

Date JAN 22 2014 Name [Signature] 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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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.: 1670		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		JAN 22 2014		
2.	Release of App'd Dwg.			OCT 03 2013	X		OCT 04 2013		Nov 27
3.	Materials Examined			DEC 11 2013					
4.	Heat Numbers Recorded			DEC 11 2013	X		JAN 22 2014		JAN 23 2014
5.	MTRs Checked			DEC 11 2013					JAN 23 2014
6.	WPS(s) Checked			OCT 03 2013	X		OCT 04 2013		JAN 23 2014
7.	Welder(s) Qualified			DEC 11 2013					JAN 23 2014
8.	Thicknesses Verified & Recorded			DEC 11 2013					
9.	Shell(s) & Head(s) Fit-up Inspection			DEC 11 2013	X		JAN 22 2014		JAN 23 2014
10.	Nozzles & Fittings Fit-up Inspection			DEC 11 2013					Nov 27
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 27
16.	Weld Sizes Checked			DEC 11 2013					Nov 22
17.	Welder I.D. Checked			DEC 11 2013					Jan 22
18.	Final External Inspection			JAN 21 2014	X		JAN 22 2014		"
19.	Radiography			DEC 11 2013	X		JAN 22 2014		JAN 23 2014
20.	Other N.D.E.	Hardness		JAN 21 2014			JAN 22 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 # PG-08A/09 Tube Side Gauge #		JAN 22 2014	X		JAN 22 2014		Jan 22
24.	CRN Drawing	CRN#		JAN 21 2014	X		JAN 22 2014		
25.	N.C.R. #								
26.	Nameplate Stamping			JAN 21 2014	X		JAN 22 2014		JAN 23 2014
27.	Manuf. Data Report Completed & Verified			JAN 21 2014	X		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

S/N 1670

CADO INDUSTRIES INC
Quality Control Manual

Revision Number: 4.0

Revision Date: November 30, 2012

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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	1.327	SA-516-70N	38264821230-0	NA1	D/M	☑	C-1	D/A	☑	☑
Shell #2				L-2			C-2	D/A	☑	☑
Shell #3				L-			C-			
Shell #4				L-			C-			
Shell #5				L-			C-			
Shell #6				L-			C-			
Head #1	1.355	SA-516-70N	61133476540102				C-			
Head #2	1.346	SA-516-70N	61133476540102				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	U/S	
	Heat# or ID	C1561	TL	10004515					
N2	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	4" SCH XXH		4" CL 600 RFWN			S	S	
	Heat# or ID	C1561	TL	10004515					
N3	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	3" SCH XXH		3" CL 600 RFWN			S	U	
	Heat# or ID	C1281		12/35050					
N4	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	3" SCH XXH		3" CL 600 RFWN			R	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	S	
	Heat# or ID	C1692	TL	10005612					
N6	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	2" SCH XXH		2" CL 600 RFWN			C	U/S	
	Heat# or ID	C1700	TL	10005612					
N7	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	4" SCH XXH		4" CL 600 RFWN			S	U/S	
	Heat# or ID	C1561	TL	10004515					
N8	Spec.-Grd.	SA-106-B		SA-105-N					
	Thk./Rating	4" SCH XXH		4" CL 600 RFWN			R	U	
	Heat# or ID	C1561	TL	10004515					

CLIENT CADO	MATERIAL TYPE: CS	THICKNESS RANGE: 1.250"	DATE: 08/14/13
LOCATION CALGARY	SOURCE OF RADIATION: IR192	FOCAL SPOT (F): 3.5mm	PAGE: 1 OF 1
GTL JOB No. 13-01-0068	CONTRACTOR: CADO	TECHNIQUE: SWE <input type="checkbox"/> DWE <input type="checkbox"/> D4 <input type="checkbox"/> D5 <input type="checkbox"/> DWV <input type="checkbox"/> OTHER <input type="checkbox"/>	PROCEDURE: A
CLIENT'S P.O.	FILM TYPE: AGFA <input type="checkbox"/> D4 <input type="checkbox"/> D5 <input type="checkbox"/> DWV <input type="checkbox"/> OTHER <input type="checkbox"/>		CODE: ASME UWS7
CLIENT JOB No. 2013-070			See back for other legends.

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.	SN 1670																	
3.	L1	1 1/4"	1280	8												Full DM B LS = 120"		
4.	0-15																✓	
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): *[Signature]*
TECHNICIAN (PRINT): **W. BAILEY** CGSB LEVEL **2** ASNT LEVEL **2**
ASSISTANT (PRINT): **STEPHEN**

SSOFD: Source Side of Object to Film Distance	Nominal Plus Maximum Reinforcement
SOD: Source to Object Distance	18.750"
Curies	92

CGSB Reg. # **805**

LEAD SCREENS	LEAD SCREENS	FILM DENSITY	MIN 2.0	MAX 4.0
IR192	C060		✓	
.005 FRONT	.010 BACK			
.010 FRONT	.010 BACK			



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

RADIOGRAPHIC REPORT

R - 61220

CLIENT: CADO	MATERIAL TYPE: CS	THICKNESS RANGE: 1.250"	LEGEND: WELDERS SYMBOL ACCEPTABLE BORDERLINE REJECT	DATE: Dec 08/13
LOCATION: CALGARY	SOURCE OF RADIATION: IR192	FOCAL SPOT (F): 3.5mm	WELDERS SYMBOL ACCEPTABLE BORDERLINE REJECT	PAGE: 1 OF 1
GTIL JOB No. 13-01-0068	CONTRACTOR: CADO	TECHNIQUE: SWE <input type="checkbox"/> DWE <input type="checkbox"/> AGFA <input type="checkbox"/> D4 <input type="checkbox"/> D5 <input type="checkbox"/> D7 <input type="checkbox"/> OTHER <input type="checkbox"/>	PROCEDURE: B/A	CODE: ASME UW57
CLIENT'S P.O.	FILM TYPE: AGFA <input type="checkbox"/> D4 <input type="checkbox"/> D5 <input type="checkbox"/> D7 <input type="checkbox"/> OTHER <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
SN 1670	30"	114"	1.250	1														
C1																		
0-14																		
14-28																		
28-42																		
42-56																		
56-70																		
70-84																		
84-0																		
C110	30"	114"	1.250	1														
46-53																		
C2	30"	114"	1.250	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. BALEY** CGSB LEVEL **2** ASNT LEVEL **2**

ASSISTANT (PRINT): **STEPHEN**

FILM USED: **15** PCS. **3 1/2" X 7"** FILM SIZE

CGSB Reg.# **805**

1 Film Per Header

LEAD SCREENS	1B182	.005 FRONT
LEAD SCREENS	C060	.010 FRONT
FILM DENSITY		.010 BACK
		MIN 2.0
		MAX 4.0

SSOFD: Source Side of Object to Film Distance

Nominal Plus Maximum Reinforcement

SOD: Source to Object Distance

Curies

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 1670 PWHT

IRISNDT #: 261900

Date: 15-Jan-14

Material Type: CS

Surface Condition: buffed

Heat Treatment: YES

Equipment: MIC 10

IRISNDT #: 45038

Calibration Date: 12-Jul-13

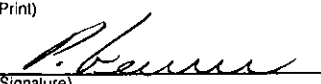

Calibration Block(s): 176, 207

Hardness Scale Readings: Rockwell B Rockwell C Vickers Brinell

Item	Component Identification and Location of Reading	Brinell Impression		Brinell Bar Hardness	Hardness Value	(A)cept (R)eject
		Bar	Material			
WELD	PM	HAZ	WELD	HAZ	PM	
C1	146	153	180	164	149	A
L1	156	152	173	148	138	A
N2 cat D	140	168	173	151	147	A
Name plate Attachment	141	149	163	146	137	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.

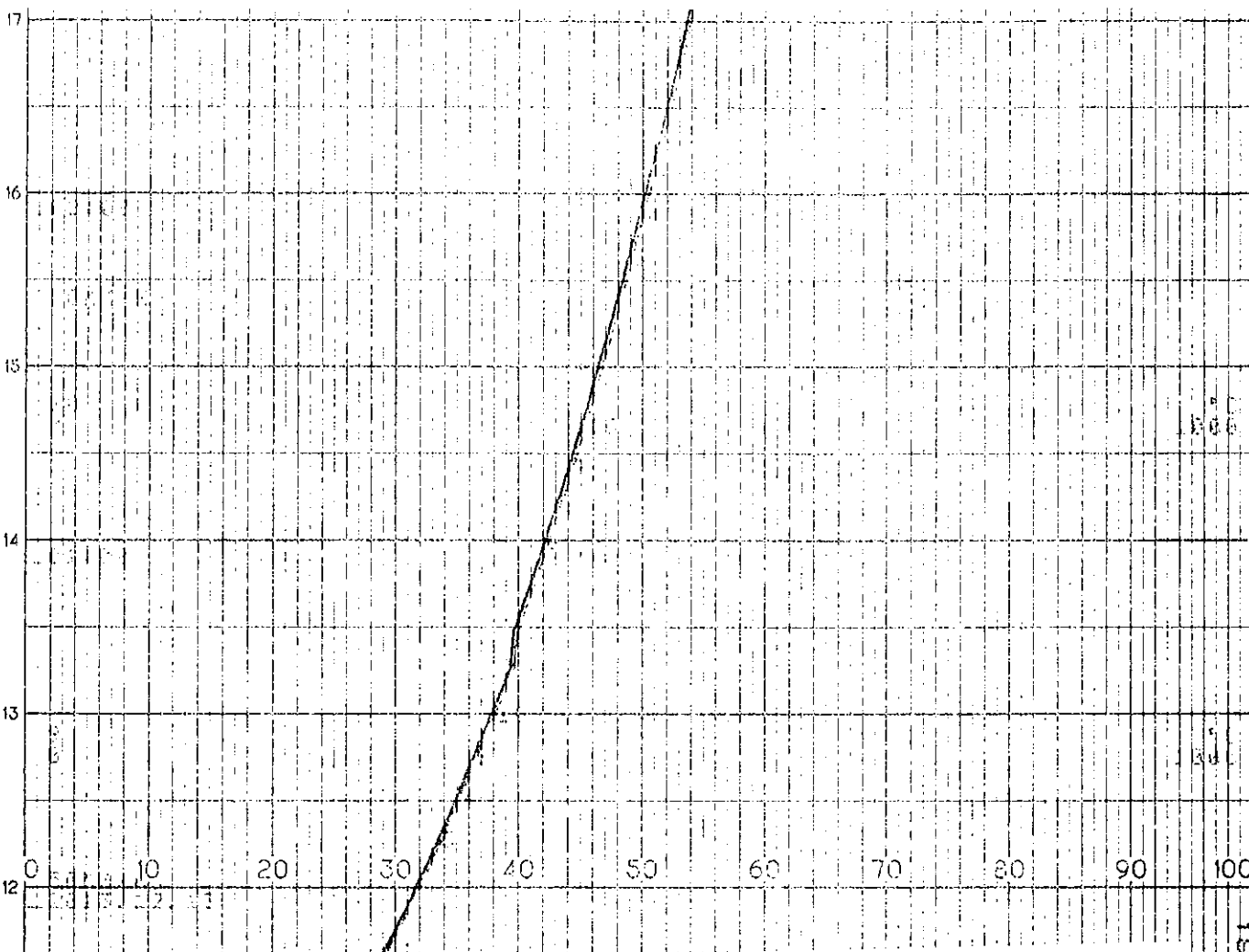
Unit#: <u>389</u> Kilometers: _____	Consumables:	Interpretation by: P. GERVAIS	SNT-TC-1A _____
In: <u>PG</u> Out: _____ Hrs: <u>.5</u>	# of Hits: <u>20</u>	(Print)	C.G.S.B. _____ (Level)
In: _____ Out: _____ Hrs: _____		Client Representative:  (Print)	C.G.S.B. # _____
Personnel: PG		I am in full agreement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

5311 - 86 Street Edmonton, Alberta, T6E 5T8 Phone: (780) 437-2022 Fax: (780) 438-1438

Calgary (403) 279-8121
Lloydminster (780) 875-8455
Barhead (780) 674-3018
Nisku (780) 955-7818

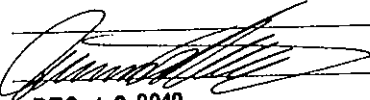
Cold Lake (780) 594-1114
Fort McMurray (780) 743-1536
High Level (780) 958-4094
Red Deer (403) 347-1742
Medicine Hat (403) 427-8284


Corpus Christi, TX (361) 888-4700
Deer Park, TX (281) 478-4444
Matrix, Houston, TX (713) 722-7177
Texas City, TX (409) 945-2282
Tulsa, OK (918) 448-8773



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

178000

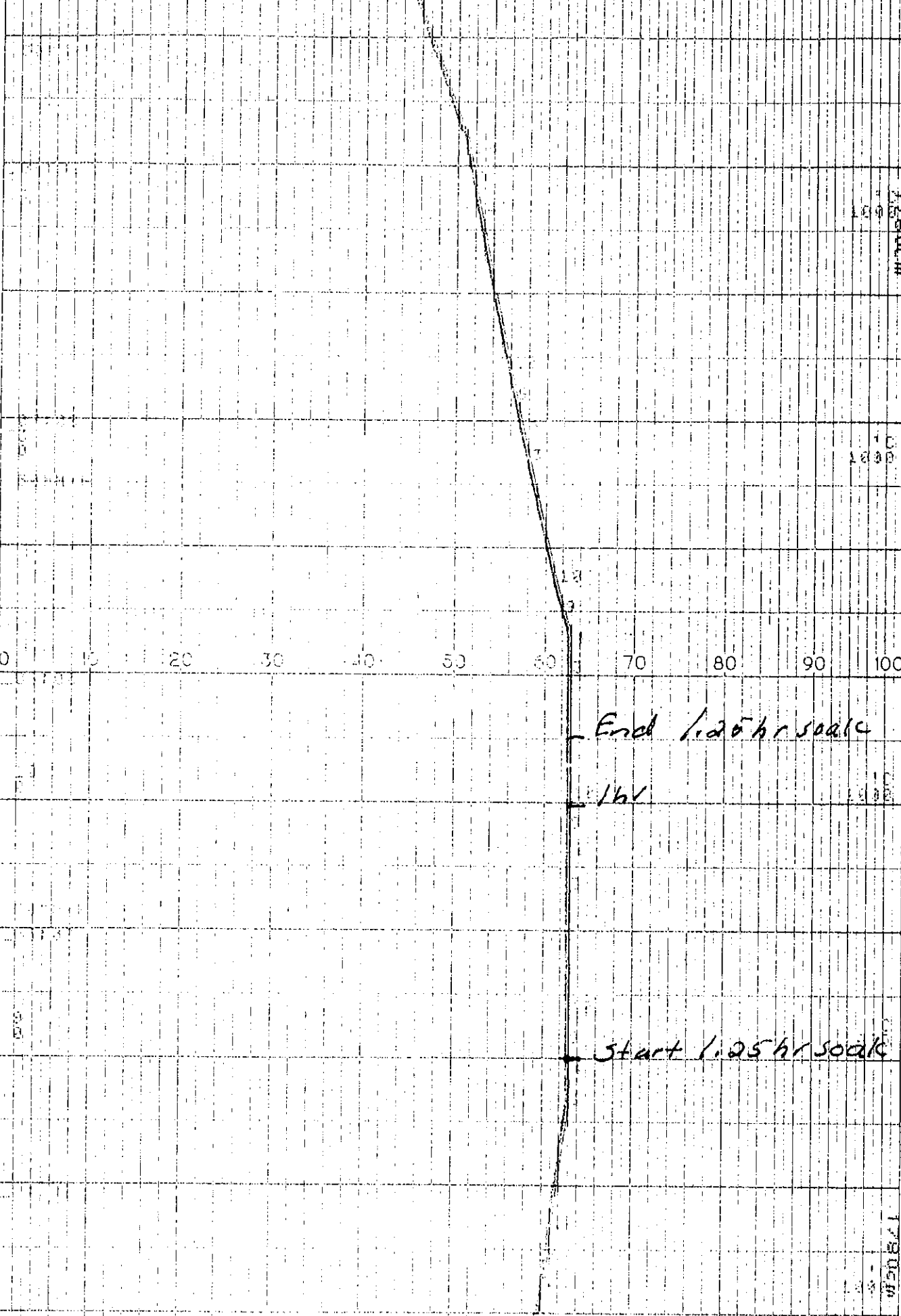
1000

1000

1000

178000

5
4
3
2
1
0
24
23
22
21
20
19



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.: <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>		



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	@ \$0.00	Per Hour = \$0.00
Furnace Number: 2	@	Furnace Charges: \$865.00
		Other Charges(s): \$0.00
		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 222° 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	Recall Date
Fluke	741B	7751004	October 22, 2013


Technician

Oct. 11, 2013
Date

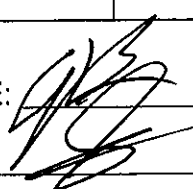
CADO INDUSTRIES INC
Quality Control Manual

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>1670</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-08A</u>	<u>24 JAN 13</u>	<u>0-5000</u>	<u>2040</u>
GAUGE #2 <u>Pg-09</u>	<u>13 Aug 13</u>	<u>0-10000</u>	<u>2040</u>
CHART RECORDER #1			
MANUFACTURERS' REPRESENTATIVE: 		DATE: <u>JAN 22 2014</u>	
OWNERS INSPECTOR: _____		DATE: <u>Jan 22, 2014</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-08A
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	1060	1020
2000	2065	2000
3000	3050	2990
4000	4050	3980
5000	5055	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: WGI
Model: 4"
Serial #: NIL
Temp (°C): 20
Comments: NIL

ID #: PG-09
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:

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

CALIBRATION DATA:

ACCURACY: 1.0 % FS

APPLIED	BEFORE	AFTER
2000	2040	2040
4000	4000	4000
6000	5965	5965
8000	7990	7990
10000	10075	10075

YVON HACHE - TECHNICIAN

① 63 69 28

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Certified by
CANDOR
INDUSTRIES

MAWP:

1360.

PSI

194

MAEWP:

PSI

IDWT:

20

of

1360

1670

YEAR
BUILT

2014

135539.213



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:

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

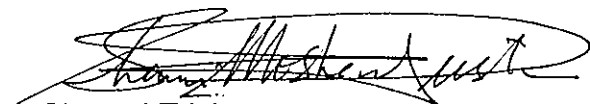
With reference to your submission respecting the registration of the item below, for legal use in the province, please note we have surveyed, approved and registered this design as noted.

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 A. 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



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)

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 [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

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

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)

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

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)

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

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)	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 "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-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	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) **PASS**
 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 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 <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		
artical 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 <input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe	P1 2.375 in. O.D.	P1, 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: 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		
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

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 T2C 3K6 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 P1	With or without With backing P1
Base metal P-No. 1 to P-No. 1	2.375 in. O.D.	1.0 in. O.D. minimum
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe	SFA 5.18 / SFA 5.1	WPS requirements
Filler metal or electrode specification(s)	ER70S-6 / E7018-1	WPS requirements
Filler metal or electrode classification(s)	F6 / F4	F6 / F4
Filler metal F-Number(s)		
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

SGS Ludwig Associates Ltd. 4027 - 14 Street S.E. Calgary AB T2G 3K6 ☎ +1 (403) 262-7072 ☎ +1 (403) 266-3169
7925 Davies Road Edmonton AB T6E 4N1 ☎ +1 (780) 488-3030 ☎ +1 (780) 488-3032 www.ludwigassociatesltd.com www.sgs.com

Member of the SGS Group (SGS SA)



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 2013/09/10	CofC# 43584	Page 1 of 2
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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) <i>Conforms to NACE MR0175 / ISO 15156-2 2009 Annex A</i>	1	382649-21390-02	MTR	WP600	4
	<i>1.320"</i>					
S99866-1-2	SHELL(S) - 1.2500" NOM X 30" OD X 120" (Material Spec: SA 516-70 Normalized) <i>Conforms to NACE MR0175 / ISO 15156-2 2009 Annex A</i>	1	382648-21230-01	MTR	WP600	4
	<i>1.327"</i>					
S99866-1-3	SHELL(S) - 1.2500" NOM X 30" OD X 120" (Material Spec: SA 516-70 Normalized) <i>Conforms to NACE MR0175 / ISO 15156-2 2009 Annex A</i>	1	382649-21390-02	MTR	WP600	4
	<i>1.328"</i>					
S99866-1-4	SHELL(S) - 1.2500" NOM X 30" OD X 120" (Material Spec: SA 516-70 Normalized) <i>Conforms to NACE MR0175 / ISO 15156-2 2009 Annex A</i>	1	382649-21390-02	MTR	WP600	4
	<i>1.328"</i>					
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	→ 1.337" → 1.340"
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-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.
 CA SEP 25 2013



edmonton exchanger
& manufacturing ltd.

CERTIFICATE OF COMPLIANCE

MTR List

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 Co/C# 43584 Page 1 of 1

Email to wilfred.cao@cadoindustries.com

Email to jreimer@edmontonexchanger.com

MTR ID	Pages	Heat#	Thickness	Material Grades
17744	5	382648-21230-01	1.25"	SA 516-70 N
17752	5	382649-21390-02	1.25"	SA 516-70 N

Heat#	Material Grades	MTR ID
382648-21230-01	SA 516-70 N	17744
382649-21390-02	SA 516-70 N	17752

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 447954-01.03.13 A08/ Manufacturer's order/ Certificate No. 381533-001 Sheet 1/...

MATERIAL TEST REPORT (MTR)
 A05 Established inspecting body A06 Purchaser EDMONTON STEEL, EDMON A07.1 No. ED10613-J1010-ER
 DH Final receiver EDMONTON STEEL, EDMON A07.2 No. SA20-S5
 B02/ Sheet design. SA516-70
 B03 Any suppl. ASME-IIA:2010+ADDENDA-2011A
 requirements DIL-HUE-2:R33-2012-10-01



B01-B99 Description of the product

B14 Item No.	B08 Number of places	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	1,1250	121,0000	480,0000	8405	N	382648	-21226-01	
01	1	1,1250	121,0000	480,0000	8405	N	382648	21226-02	
01	1	1,1250	121,0000	480,0000	8405	N	382648	21276-01	
01	1	1,1250	121,0000	480,0000	8405	N	382648	21276-02	
**	4				33620				
02	1	1,2500	97,0000	480,0000	7487	N	382648	-21222-01	
02	1	1,2500	97,0000	480,0000	7487	N	382648	21222-02	
**	2				14974				
03	1	1,2500	121,0000	480,0000	9339	N	382648	21220-01	
03	1	1,2500	121,0000	480,0000	9339	N	382648	21220-02	
03	1	1,2500	121,0000	480,0000	9339	N	382648	21230-01	
03	1	1,2500	121,0000	480,0000	9339	N	382648	21230-02	
03	1	1,2500	121,0000	480,0000	9339	N	382649	-21449-01	
**	6				56034				
***	12				104628				

B04 Product delivery condition

ITEM NO.: 01-03
 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 2017/2023 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.



Baldauf
 8 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



DILLINGER HÜTTE

Erklärungen 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		447954-01.03.13	381533-001	2/...
MATERIAL TEST REPORT (MTR)					

A05	Established inspecting body	A06	Purchaser	EDMONTON STEEL, EDMON	A07.1	No.	ED10613-J1010-ER
DH		Final receiver		EDMONTON STEEL, EDMON	A07.2	No.	

B02/	Steel design.	SAS16-70					SA20-S5
B03	Any suppl. requirements	ASME-III:2010+ADDENDA-2011A					
		DIL-HUE-2:R33-2012-10-01					

B06 Marking of the product

ITEM NO. : 01-03
 STEEL DESIGNATION SAS16 70 MILLIV SAS16 60 MILLIV
 HEAT NO. / TRADEMARK / ROLLED PLATE NO. -TEST NO. / INSPECTOR'S STAMP

B07-B99 Further information about the product
ITEM NO. : 01-03
 THICKNESS REDUCTION RATIO >= 3,0 IS FULFILLED (CF. A/SA20 PAR. 5.3)

C10-C29 Tensile test

B14	B07.2	B07.1	B05	Reference (heat) treatment	C01	C02/ C03	C10	C11	C12	C13	A	A	C14-C15
Item No.	Heat No.	Roll/plate/ Test No.			C01	Temp. GR.F	KSI	RPO2	RM		% L0=2IN	% L0=8IN	
01	382648	21226			K1	Q	RT	50,2	74,5			31	
01	382648	21276			K1	Q	RT	50,5	74,8			30	
02	382648	21222			K1	QV	RT	50,6	75,7		32		
03	382648	21220			K1	QV	RT	49,3	74,8		36		
03	382648	21230			K1	QV	RT	50,8	75,4		36		
03	382648	21449			K1	QV	RT	49,3	74,8		35		

C30-C39 Hardness test

B14	B07.2	B07.1	B05	Reference (heat) treatment	C01	C02/C01	C03	C30	C35	C31	C32
Item No.	Heat No.	Roll/plate/ Test No.			C01	Temp. GR.F	Temp. GR.F	Method of test	Individual values		Mean value
01	382648	21226			K1	O	RT	HBW 10/3000	HB 142	143	144
01	382648	21276			K1	O	RT	HBW 10/3000	HB 139	139	140
02	382648	21222			K1	O	RT	HBW 10/3000	HB 139	139	138
03	382648	21220			K1	O	RT	HBW 10/3000	HB 137	137	138
03	382648	21230			K1	O	RT	HBW 10/3000	HB 143	143	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
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



DILLINGER HÜTTE

Erklärungen 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

A10 Advice of dispatch No./
 Date of dispatch
 447954-01.03.13
 A091 Manufacturer's order/
 A03 Certificate No.
 381533-001
 Sheet
 3/...

A05 Established inspecting body
 A06 Purchaser
 Final receiver
 EDMONTON STEEL, EDMON
 EDMONTON STEEL, EDMON
 A071 No.
 A072 No.
 ED10613-J1010-ER

B02 Steel design: SA516-70
 SA20-SS

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

C30-C39 Hardness test

B14 Item No.	B072 Heat No.	B071 Roll/plate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03 Temp. G.R.F.	C30 Method of test	C35 C31 Individual values	C32 Mean value
03	382649	21449		K1	O	RT	HBW 10/3000	HB 141 138 137	139

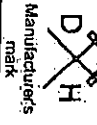
C40-C49 Impact test

B14 Item No.	B072 Heat No.	B071 Roll/plate/ Test No.	B05 Reference (heat) treatment	C01	C02	C03 Temp. G.R.F.	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy	C45 C42 Individual values AV=FTLBF	C43 Mean value
01	382648	21226		K1	LV	-51		CHP-V		AV 114	105	110
02	382648	21276		K1	LV	-51		CHP-V		AV 131	107	116
03	382648	21222		K1	LV	-51		CHP-V		AV 84	113	93
03	382648	21220		K1	LV	-51		CHP-V		AV 87	122	105
03	382648	21230		K1	LV	-51		CHP-V		AV 71	103	98
03	382649	21449		K1	LV	-51		CHP-V		AV 133	83	102

C70-C99 Chemical composition % - Heat analysis

B072 Heat No.	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
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
B072 Heat	C70	B	CA	AL-T											
382648	Y	0,0002	0,0026	0,033											
382649	Y	0,0002	0,0017	0,032											

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

Erklärungen 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 447954-01.03.13	A08/ Manufacturer's order/ A03 Certificate No. 381533-001	Sheet 4/...
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A05 Established inspecting body DH	A06 Purchaser EDMONTON STEEL, EDMON	A07.1 No. ED10613-J1010-ER	A07.2 No. EDMONTON STEEL, EDMON
---------------------------------------	--	-------------------------------	------------------------------------

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

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	FO-02 = 0,40	FO-51 = 0,002	FO-55 = 0,12	FO-78 = 0,06	FO-91 = 6,3
382648	FO-02 = 0,39	FO-51 = 0,002	FO-55 = 0,12	FO-78 = 0,05	FO-91 = 6,6
382649					

C95 Ladle treatment

ITEM NO.: 01-03
HEAT OF THE INDICATED ITEM: VACUUM DEGASSED / SULPHIDE SHAPE CONTROL

C95 Further information about ladle treatment

ITEM NO.: 01-03
CALCIUM TREATED

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
382648	21222	K1	0,177	0,354	1,17	0,010	0,0010	0,0067	0,029	0,009	0,030	0,047	0,001	0,000	0,001	0,002
382648	21226	K1	0,177	0,358	1,17	0,010	0,0020	0,0065	0,028	0,009	0,030	0,047	0,001	0,000	0,001	0,002
382649	21449	K1	0,173	0,372	1,17	0,011	0,0007	0,0060	0,027	0,009	0,036	0,040	0,001	0,000	0,000	0,002

B07.2 Heat	B07.1 Test No.	C01	B	CA	AL-T
382648	21222	K1	0,0000	0,0023	0,031
382648	21226	K1	0,0000	0,0024	0,030
382649	21449	K1	0,0001	0,0016	0,030

A04 Z011Z02/Z03 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
 G. BALDAUF
 Test House Manager
 Inspector's stamp
 Date 04.03.13
 PP 1

QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillingergroup.com/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

A10 Advice of dispatch No./ Date of dispatch

447954-01.03.13

A08/ Manufacturer's order/ A03 Certificate No.

381533-001

Sheet

5

A05 Established inspecting body
DH A06 Purchaser
EDMONTON STEEL, EDMON A07.1 No. ED10613-J1010-ER
Final receiver
EDMONTON STEEL, EDMON A07.2 No.

B01 Product
HEAVY PLATES

B02 Steel design: SA516-70

SA20-SS

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

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

C94 Product analysis Carbon equivalent / Alloying restrictions

Heat	B07.1 Test No.	C01	FO-02=	0,39	FO-51=	0,001	FO-55=	0,12
382648	21222	K1	FO-02=	0,39	FO-51=	0,001	FO-55=	0,11
382648	21226	K1	FO-02=	0,38	FO-51=	0,001	FO-55=	0,11

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

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 201/202/203 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

Date 04.03.13 PP 1

A01



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

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



edmonton exchanger
& manufacturing ltd.

CERTIFICATE OF COMPLIANCE

MTR List

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

文 者 HANWA CO., LTD.
 参考番号 228031-685310100
 約番号 3-811-H1-5-6-A102



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

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
 営業所 〒299-1141 千葉県若葉市豊海岸1番地
 KIMITSU WORKS 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN

鋼材検査証明書
INSPECTION CERTIFICATE

証明書番号: P-23076
 発行年月日: 2013-06-20
 DATE OF ISSUE: 1001
 頁: 1

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
 EDMONTON EXCHANGER GROUP OF C- 需要家管理番号: E10924-J1010ER E3001A0200 E05
 検査号: ASWE SA-516 GRADE 70-E10-A11
 顧客: HOLL ROLLED STEEL PLATES

寸法	DIMENSION	品質	質量	製鋼番号	製品番号	引張試験		衝撃試験		化学成分	CHEMICAL COMPOSITION	物理性能	機械性能						
						TENSILE TEST	IMPACT TEST	U.T.S.	E.L.					2V	50F	C	Si	Mn	P
250 X 121 X 480	mm, inch, feet	01	9338	G1129	TESTED-PL 4765401011CI1	52	75	32	252	148	252	255	252						
				TEST No.															
250 X 121 X 480		01	9338	G1133	TESTED-PL 47654010104TC1	51	75	33	265	147	265	261	264						
				TEST No.															
250 X 121 X 480		01	9338	G1133	TESTED-PL 476540102TC1	54	76	32	271	147	271	251	249						
				TEST No.															

尺 NOTES
 1 Location Orientation 位置・方向
 2 直径 Top, B: 底面 Bottom, L: 長さ Longitudinal, C: 幅 Width Transverse, Z: 厚さ Thickness, R: 45° 折り角 Dog to the Longitudinal Axis
 3 寸法 Dimension
 4 重量 Mass
 5 製鋼番号 Cast No.
 6 製品番号 Plate No.
 7 引張試験 Tensile Test
 8 衝撃試験 Impact Test
 9 化学成分 Chemical Composition
 10 物理性能 Physical Properties
 11 機械性能 Mechanical Properties

上記注文品は御指定の規格または仕様によって製造され、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.

S. Adachi
 検査部長
 HEAD OF DEPARTMENT
 QUALITY ASSURANCE DEPT.
 KIMITSU WORKS

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 東京都千代田区丸の内二丁目6番1号
 2-6-1, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
 営業所 千葉県香取市港1番地
 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN

文書番号: HANWA CO., LTD.
 参考照合番号: 22803J-685310100
 約番号: 3-811-H1-5-6-A102
 品名: HOT ROLLED STEEL PLATES

ASME SA-516 GRADE 70-E10-A11

検査管理番号: E10924-11010ER E3001A0200 E05
 発行年月日: 2013-06-20
 DATE OF ISSUE: 1001
 証明書番号: P-23076
 頁数: 2


EDMONTON EXCHANGER GROUP OF COMPANIES
 検査家管理番号: CUSTOMERS CONTROL No.

寸法 DIMENSION	数量 QUANTITY	質量 MASS	製鋼番号 CAST No.	試験番号 TEST No.	製品番号 PLATE No.	引張試験 TENSILE TESTS		衝撃試験 IMPACT TEST		化学成分 CHEMICAL COMPOSITION %															
						引張強さ T.S.	伸び E.L.	2V FT-LB	50F EACH	C	Si	Mn	P	S	Ca	NI	G	Mo	Nb	V	TAI				
250 X 121 X 480	1	933.8	G1133	22774	476540103TC1	51	75	32	25.7	25.6	1.47	1.6	3.8	14.5	9	3	1	1	17	1	2	0	0.13	0	4.0
500 X 97 X 480	1	898.5	G1134	22786	476540204TC1	50	74	32	20.5	21.0	1.49	1.46	3.8	14.5	6	3	1	1	17	1	2	0	0.12	0	4.0
500 X 97 X 480	1	898.5	G1134	22787	476540201TC1	51	75	37	23.3	26.1	1.46	1.46	3.8	14.5	6	3	1	1	17	1	2	0	0.12	0	4.0

製鋼所: 住友金属工業株式会社
 検査項目: 引張試験, 衝撃試験, 化学成分
 試験方法: JIS S 5008, JIS Z 2241, JIS S 5009, JIS Z 2242
 試験温度: 室温
 試験速度: 標準速度

上記注文品は製造者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.

S. Oshiki
 検査製造所 品質保証室
 HEAD OF DEPARTMENT
 QUALITY ASSURANCE DEPT.
 KIMITSUWORKS



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

鋼材検査証明書
INSPECTION CERTIFICATE

〒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
〒299-1141 千葉県君津市若津1番地
KAMITSUWORKS 1, KAMITSU, KINITSU-CITY, CHIBA-PREF. 299-1141, JAPAN

証明書番号: P-23076
発行年月日: 2013-06-20
DATE OF ISSUE: 1001
PAGE: 3

文書番号: HANWA CO., LTD. 228031-685310100
検査照合番号: 3-811-H1-5-6-A102
品名: HOT ROLLED STEEL PLATES
規格: ASME SA-516 GRADE 70-F10-A11
仕入元: EDINBURGH EXCHANGER GROUP OF COMPANIES
顧客: 需要家管理番号: E10924-11010ER E3001A0200 E05

寸法	DIMENSION	数量	質量	鋼種番号	製品番号	引張試験		衝撃試験	硬度	化学成分	化学組成	物理特性
						引張強さ	伸び					
500 X 97 X 4.80	mm, inch, feet	02	89.85	G1134 TESTED-PL	476540202TC1	50	74	225	148	C: 0.15, Si: 0.037, Mn: 0.143, P: 0.005, S: 0.003, Ni: 0.016, Cu: 0.002, Mo: 0.012, Nb: 0.012, V: 0.040	CA: 0.002, B: 0.001, Ti: 0.002, Al: 0.002	0.012, 0.040
500 X 97 X 4.80	mm, inch, feet	02	89.85	G1134 TESTED-PL	476540203TC1	52	75	225	147	C: 0.15, Si: 0.037, Mn: 0.143, P: 0.005, S: 0.003, Ni: 0.016, Cu: 0.002, Mo: 0.012, Nb: 0.012, V: 0.040	CA: 0.002, B: 0.001, Ti: 0.002, Al: 0.002	0.012, 0.040
500 X 121 X 4.80	mm, inch, feet	03	112.07	G1129 TESTED-PL	476540302TC1	51	75	227	148	C: 0.15, Si: 0.037, Mn: 0.145, P: 0.005, S: 0.003, Ni: 0.016, Cu: 0.002, Mo: 0.013, Nb: 0.013, V: 0.040	CA: 0.002, B: 0.001, Ti: 0.002, Al: 0.002	0.013, 0.040

取付位置: 鋼材検査証明書
検査照合番号: 228031-685310100
品名: HOT ROLLED STEEL PLATES
規格: ASME SA-516 GRADE 70-F10-A11
仕入元: EDINBURGH EXCHANGER GROUP OF COMPANIES
顧客: 需要家管理番号: E10924-11010ER E3001A0200 E05

引張試験: 引張強さ (T.S.), 伸び (E.L.), 断面収縮率 (R.F.), 断面収縮率 (R.F.), 断面収縮率 (R.F.)
衝撃試験: 衝撃試験 (I.M.T.), 衝撃試験 (I.M.T.), 衝撃試験 (I.M.T.)
硬度: 硬度 (H.B.W.), 硬度 (H.B.W.), 硬度 (H.B.W.)

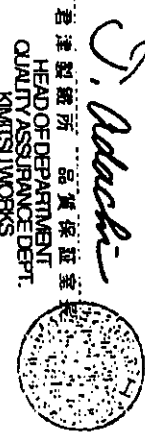
化学成分: C, Si, Mn, P, S, Ni, Cu, Mo, Nb, V
化学組成: CA, B, Ti, Al

物理特性: 0.012, 0.040

取付位置: 鋼材検査証明書
検査照合番号: 228031-685310100
品名: HOT ROLLED STEEL PLATES
規格: ASME SA-516 GRADE 70-F10-A11
仕入元: EDINBURGH EXCHANGER GROUP OF COMPANIES
顧客: 需要家管理番号: E10924-11010ER E3001A0200 E05

取付位置: 鋼材検査証明書
検査照合番号: 228031-685310100
品名: HOT ROLLED STEEL PLATES
規格: ASME SA-516 GRADE 70-F10-A11
仕入元: EDINBURGH EXCHANGER GROUP OF COMPANIES
顧客: 需要家管理番号: E10924-11010ER E3001A0200 E05

上記注文品は鋼材検査証明書に添って製造され、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.



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 課 所 〒299-1141 千葉県君津市若津 1 番地 1 条地
KIAMITSUWORKS 1, KIAMITSU, KIAMITSU-CITY, CHIBA-PREF, 299-1141, JAPAN

証明書番号: P-23076 PAGE: 4
発行年月日: 2013-06-20
DATE OF ISSUE: 1001
*****CEW***

ASME SA-516 GRADE 70-E10-A1
HOT ROLLED STEEL PLATES
EDMONTON EXCHANGER GROUP OF C-
需要家管理番号: E10924-11010ER E3001A0280 E05
CUSTOMER CONTROL NO.

寸法 DIMENSION	数量 QUANTITY	重量 MASS KG	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 2V - 50F	硬度 HBW	化学成分 CHEMICAL COMPOSITION %														
					引張強さ TENSILE STRENGTH MPa	引張強さ TENSILE STRENGTH KSI	伸び ELONGATION %			試験片 SPECIMEN	試験値 TEST VALUE	規格値 SPEC. VALUE	C	SI	Mn	P	S	CU	Ni	CA	B	Mo	(Nb)	V
500 X 121 X 480	03	11207	G1129 22747	TESTED-PL 476540301TC1	52	75	36	ILLF246	248	148	P15	37	146	8	3	1	1	17	1	2	0.13	0	4.0	
500 X 121 X 480	03	11207	G1129 22748	TESTED-PL 476540304TC1	49	74	36	ILLF231	224	144	P15	37	146	8	3	1	1	17	1	2	0.13	0	4.0	

検査項目: A: 50mm 平板試験片 Rectangular, B: 50mm 平板試験片 Round, C: 70mm 平板試験片 Rectangular, D: 70mm 平板試験片 Round, E: 80mm 平板試験片 Rectangular, F: 80mm 平板試験片 Round, G: 200mm 11.2 x 1.8 x 1.565 x So, K: 4 x So
R.A.: 40% Reduction of Area, Y.R.: R.F.I.L.E. Yield Ratio
N: 40% Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, C.R.: Controlled Rolled, N1.C.: N1C Process/TMC Process, C.L.C.: C.L.C Process/TMC Process, A.R.: As Rolled, T.M.R.: T.M.R Process/TMC Process, N.R.: Normalizing Rolled
I: 延性断面率 Elongation, C.F.: 脆性断面率 Crystallinity Fracture, L.E.: 側面引張試験 Austenite Grain Size, F.G.S.: フォスファイト粒度 Ferrite Grain Size, S.R.: Stress Relieved/Post Weld Heat Treatment

位置方位記号: Location Orientation (方位 - 方向) T: 頂面 Top, B: 底面 Bottom, L: 長さ方向 Longitudinal, C: 幅方向 Transverse, Z: 厚み方向 Through Thickness, R: 45° 方向 45Deg to the Longitudinal Axis
試験片形状記号: Rectangular, Round
試験片寸法記号: Full Size, 2: 2.5mm, 3: 3.3mm, 4: 3.3mm, 5: 5.0mm, 6: 5.0mm, 7: 7.5mm, 8: 5.7mm, 9: 5.0mm, 10: 5.0mm
試験片位置記号: 1: 延性断面率 Elongation, 2: 脆性断面率 Crystallinity Fracture, 3: 側面引張試験 Austenite Grain Size, 4: フォスファイト粒度 Ferrite Grain Size, 5: ストレスリリーフ/溶接後熱処理 Stress Relieved/Post Weld Heat Treatment

上記文書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.

品質保証課 品質保証課長
HEAD OF DEPARTMENT
QUALITY ASSURANCE DEPT.
KIAMITSUWORKS



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

鋼材検査証明書 INSPECTION CERTIFICATE

文書番号: HANWA CO., LTD. 228031-685310100
 参考照合番号: 228031-685310100
 約番号: 3-811-H1-5-6-AT02
 INTRACT No.:

本社: 〒100-8071 東京都千代田区丸の内一丁目6番1号
 HEAD OFFICE: 2-6-1, MAKUNOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
 製造場所: 〒299-1141 千葉県君津市君津1番地
 KIMITSU WORKS: 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN

証明番号: P-23076
 CERTIFICATE No.: P-23076
 発行年月日: 2013-06-20
 DATE OF ISSUE: 2013-06-20

頁: 5

品名: H01 ROLLED STEEL PLATES
 規格: ASME SA-516 GRADE 70-E10-A11
 検査家: EDMONTON EXCHANGER GROUP OF C-
 顧客: OMPANIES

検査管理番号: E10924-11010DER E3001A0200 E05
 CUSTOMERS CONTROL No.

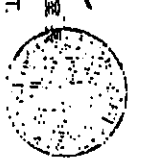
寸法 DIMENSION mm, inch, feet	数量 QTY	質量 MASS KG	製鋼番号 CAST No. 試験番号 TEST No.	製品番号 PLATE No.	引張試験 TENSILE TEST			衝撃試験 IMPACT TEST 2V FT-LB 50F	化学成分 CHEMICAL COMPOSITION %													
					引張強さ T.S.	延伸率 E.L.	断面収縮率 R.S.		C	Si	Mn	P	S	Al	Ni	Cr	Mo	Nb	V	残余元素 RESIDUAL ELEMENTS		
750' X 121' X 480'	1	13073	G1129TESTED-PL 22741	476540401	53	75	3.5	TLF211: 24.5	15	37	146	8	4	3	1	1	1	1	2	0.13	0.29	4.0
750' X 121' X 480'	1	13073	G1129TESTED-PL 22742	476540403	50	74	3.3	ILL225: 20.3 24.7	15	37	145	8	4	3	1	1	1	1	2	0.13	0.29	4.0
750' X 121' X 480'	1	13073	G1129TESTED-PL 22749	476540402	54	75	3.3	TLF246: 25.4	15	37	145	8	4	3	1	1	1	1	2	0.13	0.29	4.0
TOTAL	15	157339																				

【5.1】 Location Orientation (方位): 方向, T: 頂面, B: 底面, L: 長さ/沿 Longitudinal, C: 幅/沿 Transverse, Z: 厚み/沿 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis
 形状: 長方形 Rectangular, 3: 50mm 厚み/沿 Thickness, D: 70mm 厚み/沿 Thickness, E: 80mm 厚み/沿 Thickness, F: 80mm 厚み/沿 Thickness, G: 200mm, H: 2', I: 8', J: 5.65', K: 4'/So
 R.A.: 80% Reduction of Area, Y.R.: 15% Yield Ratio
 N: 標準 Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, C.R.: 連続加工 Continuous Process, N.T.C.: NIC Process/TMC Process, C.L.C.: CQC Process/TMC Process, A.R.: 丸延 Round, T.M.R.: TMR Process/TMC Process, N.R.: Normalizing Rolled
 L: 変形率 Strain, S.F.: 硬化率 Hardening Rate, C.F.: 焼戻し率 Recrystallization Rate, A.G.S.: オーナーメトリック Austenite Grain Size, F.C.S.: フェライト/粒 Ferrite Grain Size, S.R.: Stress Relieved/Post Weld Heat Treatment

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S. Adachi

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



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
お客様センター 〒299-1141 千葉県君津市若津1番地
KAMITSUWORKS 1, KAMITSU, KAMITSU-CITY, CHIBA-PREF. 299-1141, JAPAN

証明書番号: P-23076
発行年月日: 2013-06-20
DATE OF ISSUE: 1001
PAGE: 5E

文書番号: HANWA CO., LTD. 228031-685310100
参照番号: 3-811-H1-5-6-A102
品名: HOT ROLLED STEEL PLATES
規格: ASME SA-516 GRADE 70-E10-A11
需要家管理番号: EDMONTON EXCHANGER GROUP OF COMPANIES
検査番号: E10924-11010ER E3001A0290 E05
需要家管理番号: CUSTOMER CONTROL No.

寸法: DIMENSION mm, inch, feet

数量: QUANTITY

質量: MASS Kg

鋼種番号: CAST No.

試験番号: TEST No.

製品番号: PLATE No.

引張試験: TENSILE TEST (Y.S., T.S., E.L., E.P., A.M., B.T.)

衝撃試験: IMPACT TEST (2V, 50F, FT. LB., BT. LB., EACH)

化学成分: CHEMICAL COMPOSITION % (C, Si, Mn, P, S, Cu, Ni, Cr, Mo, Nb, V, Ti, Al, N, H, O)

HEAT TREATMENT: PLATE & TEST SPECIMEN NORMALIZING
PLATE & TEST SPECIMEN NORMALIZING: 910CX 10MIN.
CHARPY IMPACT TEST TEMPERATURE (SI): 46C
CEQ1 = C+Mn/6+ (Ni+Cu)/15+ (Cr+Mo+V)/5
LADLE TREATMENT: VACUUM DEGASSED
SULPHIDE SHAPE CONTROL



※ 1 Location Orientation 方位: 方向
※ 2 G.L. 鋼板厚さ Plate Thickness: A: 50mm, B: 50mm, C: 70mm, D: 70mm, E: 80mm, F: 80mm, G: 200mm, H: 2', I: 8", J: 5.85"
※ 3 R.A. 板の形状 Fabrication of Area: 形状: A: 50mm, B: 50mm, C: 70mm, D: 70mm, E: 80mm, F: 80mm, G: 200mm, H: 2', I: 8", J: 5.85"
※ 4 N: 正常 Normalized, Q: 焼入 Quenched, T: 焼戻し Tempered, C.R.: Controlled Rolled, N.I.C.: NIC Process/TMC Process, C.I.C.: CIC Process/TMC Process, A.R.: As Rolled, T.M.R.: TMR Process/TMC Process, N.R.: Normalizing Rolled
※ 5 F: 全厚 Full Size, Z: 25mm, 3: 33mm, 4: 33mm, 5: 50mm, 6: 67mm, 7: 75mm, 8: 75mm, 9: 87mm, 10: 87mm, 11: 100mm, 12: 100mm, 13: 100mm, 14: 100mm, 15: 100mm, 16: 100mm, 17: 100mm, 18: 100mm, 19: 100mm, 20: 100mm

上記注文品は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.

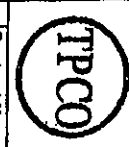
検査製造所 品質保証室
HEAD OF DEPARTMENT
QUALITY ASSURANCE DEPT.
KAMITSUWORKS

S. Adachi

C1561
682

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

10 EDITION 11 ADD
JUL 16 2013



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

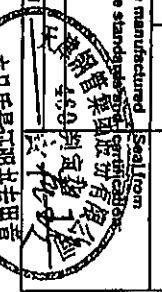
TIANJIN PIPE(GROUP) CORPORATION LTD.
TEST CERTIFICATE
(EN10204 3.1)

LC No.:
No.: C12838265842

Contract No.		2012SSG-CI-12-330		Product		PIPE		O.D. A.V.T.		470X51(14.5x17.12mm)		Packing		IN LOOSE							
Order		Trans Am Piping Products Ltd.		DIMENSION		STANDARD		ASME B36.10		Mann Method		HOT ROLLING SEAMLESS		Total pieces 44							
P.O. No.		CI-12-330		ASTM A 106-B-08, ASME SA 106-B-08, API 5L X42 PSL 1, 07, CSA Z248.1-07 Gr.290 Cat 1,		NACE MR0175-09/ISO 15155		Length range		SRL		Total weight 11.985MT									
Heat No.	Lot No.	Quantity			Sample No.	Tensile test(Mpa)			Impact test(J)			Fla. test(1)	Fla. test(2)								
		Pieces	Meters	Bundles		Tons	Delivery condition	1 st Temp. °C	T.S.	Type	Y.S.			Elong. %	Shrink %	2 nd Temp. °C	Size	AK1 share %	AK2 share %	AK3 share %	AVE share %
127030	130	44			11.985	Hot rolling	130-B-2187	A	583		426	37									
Total		44			11.985			Note:			A: strip, bo=25, A.L.O=50										
Heat No.	Lot No.	Sample No.	Hardness Brinell	Hardness Brinell(1/3)(inside)		Hardness Brinell(1/3)(middle)		Hardness Brinell(1/3)(outside)		NDE	Fla. test(1)	Fla. test(2)									
				1	2	1	2	1	2				1	2	3	4	AVE	EMI L4			
127030	130	130-B-2187	166	167	165	166	166	166	164	165	166	165	164	165	165						
Chemical composition(%): L: steel analysis P: Product analysis													Hydro. Test (Paits)								
Steel specl.	C	SI	Mn	P	S	NI	Cr	Mo	Cu	V	B	TI	Nb	CE	CE(CSA)	275S/5					
127030	L 0.16	0.38	1.26	0.020	0.011	0.01	0.03	0.02	0.01	0.01	0	0	0.001	0.38	0.38						
	P 0.16	0.39	1.27	0.020	0.011	0.02	0.03	0.01	0.01	0.01	0	0	0.001	0.38	0.38						
	P 0.16	0.39	1.27	0.020	0.011	0.02	0.03	0.01	0.01	0.01	0	0	0.001	0.38	0.38						

Remark: desti.=destination; tem.=temperature; steel specl.=steel specification; desti.=destination; Mann.=Manufacture; G=Good

We hereby state that all pipes are manufactured and inspected according to above standards and specifications order.



Rev'd By: SB
2012.5.21

C1281

HENGYANG VALIN STEEL
TUBE CO., LTD

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

Add: 10 Dalisiricun, Hengyang City, Hunan, P. R. China
P.C.: 421001
Tel and Fax: +86 734 8873139
E-mail: hctee@hysteelhub.com

609''
C1281

CUSTOMER	CERAVKUN	CERTIFICATE NO.	C20120142-1
CONTRACT NO.	211000206-1	P.O.NO.	PO289832-OR-2100-B (LOT A)
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE	LC NO.	ZFAND-00037
SPECIFICATION	SEE SPECIFICATION NOTE	DELIVERY CONDITION	N
GRADE	BX42 GRADE 290	HEAT TREATMENT	
TOTAL BUNDLES:	4	TOTAL LENGTH:	520340
		TOTAL WEIGHT:	4390

NO.	LOT No.	HEAT No.	BUNDLES	PIECES	LENGTH		WEIGHT		TENSILE TEST ASTM A370	FLATTENING TEST	
					FT	WT	FT	WT			
1	812100146	1116060	4	26	520340	4390	68295	54230	38.5	0.79	ACCEPTABLE

NO.	IMPACT TEST				NON METALLIC INCLUSION	GRAIN SIZE	HARDNESS TEST
	AKI (J)	A _v (J)	% SHEAR AREA	LE			
1							HRC ≤22

NOTES	NOTCH TYPE/ORIENTATION/TEMPERATURE/SIZE (mm):			
	AK1 (J)	A _v (J)	% SHEAR AREA	LE
W1-THEORETICAL WEIGHT				
W2-ACTUAL WEIGHT				
NR-NORMALIZING ROLLED				
AK1-ABSORB ENERGY FOR THE FIRST SET				
AK2-ABSORB ENERGY FOR THE SECOND SET				

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

N-NORMALIZING
A-ANNEALING
AV-AVERAGE
LE-SIDE EXPANSION
HE-HOT EXPANDED
HR-HOT ROLLED
N&T-NORMALIZING AND TEMPERING



1821

HENGYANG VALIN STEEL
TUBE CO., LTD

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

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

CUSTOMER	CE FRANKLIN	CERTIFICATE NO.	
CONTRACT NO.	2110002906-1	P.O.NO.	PO2995832-OR-2100-8 (LOT A)
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE	L/C NO.:	2FAHDZ-00037
SPECIFICATION	SEE SPECIFICATION/NOTE	DELIVERY CONDITION	
GRADE	B.X42 GRADE 290	HEAT TREATMENT	
TOTAL BUNDLES:	4	TOTAL PIECES:	26
HIC TEST	SEE THE ORIGINAL INSPECTION REPORTS	DIMENSIONS(mm)	3" * 0.890" * 20FT
SSC TEST		TOTAL LENGTH	520.340 FT
		TOTAL WEIGHT:	4.390 MT
REMARK:			

SPECIFICATION NOTE: ASTM A53B/A106B-2010, ASME SA53B/SA106B-2010, API 5L B X42, PSL-2-2008, NACE MR-0175-2009/ISO 15156-2-2006 (REGION 3) (PAR-0103/SS (CSA Z245.1 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 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: hsteelmysteel@tube.com

CUSTOMER THIRD PARTY

Quality Manager: 胡双开

Certificate number: 唐娅娜




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 - CADS 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 No.	Lot Definition
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									
Yield		Tensile		Elongation	Reduction of Area	Hardness	Impact Test Temperature	Impact Values	Shear Fracture
Ksi	53	Ksi	81	33 %	56 %	HBW 159			
Mpa	365	Mpa	559			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 24 2013

Notes
 NACE MRO103 LATEST ED.
 NACE MRO175/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

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. **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 No.	Lot Definition
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	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

Notes

M.T.R. ACCEPTABLE TO A.S.M.E. SECT. II 10 EDITION, 11 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.
 STRADELLO A CUDO DI ACCO (CANTON) - LESANI E MOSSOGUARO

22861 CESANA BRIANZA (LC) - Italy
 Via G. Pirelli, 28
 Tel. +39 031.655441
 Fax +39 031.655149
 quality.znf@metalgar.com

COMPANY WITH
 QUALITY SYSTEM
 CERTIFIED BY DNV
 = ISO 9001 =

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

Carta: N. 2032	Deliberato 09/04/2013	Fattura / Invoice N. 1383	Deliberato 09/04/2013
DDT / Ddt N. 1600	Deliberato 09/04/2013	Nr. Ord. / Our ref. N.	Deliberato
TRANS AM PIPING PRODUCTS LTD		Dist: TRANS AM PROJECT Warehouse	
8335 ENDEAVOR DRIVE S.E.		1711 - 66 Avenue	
T3S 0A1 CALGARY, ALBERTA		T8P 1Y9 Edmonton, ALBERTA	
CA	CA	CA	CA

COD. COL.	COLATA	POS.	VS. ORDINE	Q.TA.	DESCRIZIONE	DIM. IN ACC. A	VSNO E DIMENS.
HEAT CODE	HEAT	ITEM	YOUR REFERENCE	QTY	DESCRIPTION	DIM. ACCORDANCE TO	V/S. & DIMENS.
MATERIALE / MATERIAL						ASME/ANSI B16.5-2009	SATISFACTORY
ASTM A106 (LADLE)							
PROVETTA / TEST SPECIMEN	FORMA	SERVIZIAMENTO	NOTIZIA	ATTUALIZZAMENTO	CONTRAZIONE	DUREZZA	
126,60	50,90	1	347,0	526,0	31,0	189,0 - 183,0	
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 Z245.12 GRADE 248 CAT.1 SOUR SERVICE							
TRATTAMENTO TERMICO / HEAT TREATMENT							
NORMALIZED AT 920 C - COOLED IN STILL AIR							
PROVETTA / TEST SPECIMEN	FORMA	SERVIZIAMENTO	NOTIZIA	ATTUALIZZAMENTO	CONTRAZIONE	DUREZZA	
126,60	50,90	1	347,0	526,0	31,0	189,0 - 183,0	
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 Z245.12 GRADE 248 CAT.1 SOUR SERVICE							
TRATTAMENTO TERMICO / HEAT TREATMENT							
NORMALIZED AT 920 C - COOLED IN STILL AIR							
PROVETTA / TEST SPECIMEN	FORMA	SERVIZIAMENTO	NOTIZIA	ATTUALIZZAMENTO	CONTRAZIONE	DUREZZA	
126,60	50,90	1	347,0	526,0	31,0	189,0 - 183,0	

COD. COL.	COLATA	POS.	VS. ORDINE	Q.TA.	DESCRIZIONE	DIM. IN ACC. A	VSNO E DIMENS.
HEAT CODE	HEAT	ITEM	YOUR REFERENCE	QTY	DESCRIPTION	DIM. ACCORDANCE TO	V/S. & DIMENS.
MATERIALE / MATERIAL						ASME/ANSI B16.5-2009	SATISFACTORY
ASTM A106 (LADLE)							
PROVETTA / TEST SPECIMEN	FORMA	SERVIZIAMENTO	NOTIZIA	ATTUALIZZAMENTO	CONTRAZIONE	DUREZZA	
126,60	50,90	1	341,0	513,0	30,0	189,0 - 189,0	
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 Z245.12 GRADE 248 CAT.1 SOUR SERVICE							
TRATTAMENTO TERMICO / HEAT TREATMENT							
NORMALIZED AT 920 C - COOLED IN STILL AIR							
PROVETTA / TEST SPECIMEN	FORMA	SERVIZIAMENTO	NOTIZIA	ATTUALIZZAMENTO	CONTRAZIONE	DUREZZA	
126,60	50,90	1	341,0	513,0	30,0	189,0 - 189,0	

M.I.R. ACCEPTABLE
 TO A.S.M.E. SECT. II
 10 EDITION
 ADD.
 NOV 17 2013

UFFICIO CONTROLLO QUALITA'	ENTE UFFICIALE DI COLLAUDO	MARCHIO PRODUZIONE
QUALITY CONTROL DEPARTMENT	INSPECTION AUTHORITY	MANUFACTURER'S SYMBOL
<i>Handwritten signature</i>		

NOTE 100% MANUFACTURED IN ITALY
 NOTES MANUFACTURING IN ACCORDANCE WITH ORDER AND SPECIFICATION
 MATERIAL IN ACCORDANCE WITH NACE MR-017532009 ISO 15168-2:009 - SOUR SERVICE
 MATERIAL IN ACCORDANCE WITH NACE MR-01032012 - 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 - 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

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

NACE MRO103 LATEST ED.
 NACE MRO175/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.

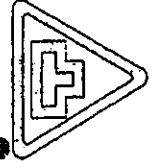
Les Mansfield
 Les Mansfield, CET
 Quality Assurance Manager

2013-12-8 173

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 : BR01310205043 PAGE : 10 ORIGIN : TAIWAN



柏緯鐵工股份有限公司
BOTHWELL STEEL FITTINGS CO., LTD.
 708 蘇州街 仁武區 鹿港鎮 林聖仁心路 303 號
 NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAOHSIUNG 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 CPLG 2" 3000# S/W	100 PC	ASTM A105N -12	ASME B16.11 - 2011	GOOD	GOOD
079	3930	330613	FULL CPLG 2-1/2" 3000# NPT	25 PC	ASME SA105N -A08			
080	3913	330758	FULL CPLG 3/4" 6000# NPT	5 PC				
080	3982	330757	FULL CPLG 3/4" 6000# NPT	245 PC				
081	3860	329902	FULL CPLG 1" 6000# NPT	100 PC				

ITEM	BW HT. CD.	CHEMICAL COMPOSITION (%)											HEAT TREATMENT	ADDITIONAL TEST/REMARKS				
		C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Co(Nb)			N	Al	Ti	Zr
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	0.030	0.040	0.010	0.002	0.002	-	-	-	-	-	0.360

ITEM	BW HT. CD.	MECHANICAL PROPERTIES						HEAT TREATMENT			ADDITIONAL TEST/REMARKS		
		T. S. (EST)	Y. S. (EST)	El. (%)	R of A (%)	Hardness (HBW) (AVG)	Charpy Impact F / (Joule)	MIN. / AVG.	TEMP. / 0 C	AVERAGE			
077	4145	76.9	51.3	34.2	66.4	141	143	187					
079	3930	74.8	48.3	35.6	64.1	142	144						
080	3913	74.4	47.6	37.2	63.5	141	143						900C 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						

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

100% ACCEPTABLE

C.C. Huang
 O.C. MANAGER
 CHEN CHI HUANG
 Y.Y. Chang
 INSPECTOR
 YUAN YAO CHANG

REV: 2

10 EDITION
 NOV 20 2013

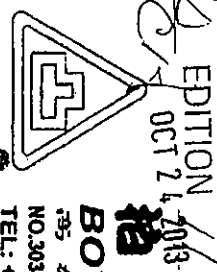
2013-070-8473

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

MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 : 2004 3.1

CUSTOMER : SENGHOD INTERNATIONAL CORP.
CERT. NO : 132175 L/C NO :
ORDER NO : 7006966 DATE : 07/24/2013
INVOICE NO : FMO1310205043 PAGE : 10 ORIGIN : TAIWAN



12 EDITION
OCT 24 2013
ADD

Bothwell Steel Fittings Co., Ltd.
303 號 仁心路 303 號
NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAHSIUNG CITY, TAINAN 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	
					MATERIAL	FITTING	SURFACE	DIM.
077	4145	0093863	ROLL CHG 2" 3000# S/W	100 PC	ASTM A105N -12	ASME B16.11 - 2011	GOOD	GOOD
079	3930	330613	ROLL CHG 2-1/2" 3000# NPT	25 PC	ASME SA105N -A08			
080	3913	330758	ROLL CHG 3/4" 6000# NPT	5 PC				
080	3982	330757	ROLL CHG 3/4" 6000# NPT	245 PC				
081	3860	329902	ROLL CHG 1" 6000# NPT	100 PC				

ITEM	BW HT. CD.	CHEMICAL COMPOSITION (%)											HEAT TREATMENT		ADDITIONAL TEST/REMARKS				
		C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Cb(Nb)	N	Al		Ti	Zr	CE	
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	NORMALIZED 900°C A.C.	CONFORMS TO NACE MR0175-09 /MR0103-10 STEEL MAKING PROCESS : ELECTRIC FURNACE CONFORMS TO NACE ISO15156-3 2009
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			
Min		0.35	0.35	1.05	0.035	0.040	0.40	0.30	0.40	0.12	0.08	-	-	-	-	0.43			
Max																			

ITEM	BW HT. CD.	MECHANICAL PROPERTIES			Charpy Impact			HEAT TREATMENT	
		T. S. (KSI)	Y. S. (KSI)	El. (%)	R of A (%)	Hardness (HRB)(AVG)	F /		0 °C
077	4145	76.9	51.3	34.2	66.4	141	143	187	NORMALIZED 900°C A.C.
079	3930	74.8	48.3	35.6	64.1	142	144	187	
080	3913	74.4	47.6	37.2	63.5	141	143	187	
080	3982	74.2	49.7	36.2	65.3	140	142	187	
081	3860	76.2	53.8	35.4	63.3	141	144	187	
Min		70	36	22	30				
Max									

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

C.C. Huang
O.C. MANAGER
CHEN CHI HUANG

Y.Y. Chang
INSPECTOR
YUAN YAO CHANG