



the pressure equipment safety authority

9410 - 20 Ave N.W.

Edmonton, Alberta, Canada T6N 0A4

Tel: (780) 437-9100 / Fax: (780) 437-7787

August 18, 2011

Susan Wall
BROMLEY MECHANICAL SERVICES INC
A DIVISION OF ARGO SALES LTD
925-23 STREET SW
MEDICINE HAT, AB T1A 8R1

Dear Susan Wall,

The design submission, tracking number 2011-05074, originally received on August 11, 2011 was surveyed and accepted for registration as follows:

CRN : V5361.2 **Accepted on:** August 18, 2011
Reg Type : New Design
Drawing No. : 34000-REG Rev 0 As Noted

Description	MAWP	Design Temperature	MDMT
Internal Pressure	6205 kPa	260 ^o C	-45 ^o C
External Pressure	103 kPa	260 ^o C	-45 ^o C

The registration is conditional on your compliance with the following notes:

Piping attached to nozzles N2 and N10 shall be removable for inspection purposes.

A note is required on the drawing indicating that requirements for production impact tests and for impact-tested weld procedures are exempt per UCS-67(a)(2), subject to the use of welding consumables that have been qualified for use at or below the MDMT

Joint efficiency for circumferential seams ("heads") is 0.70 since RT-2 radiographs on circumferential seams cannot be used to qualify those seams as spot-radiographed.

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

Enclosed are stamped prints for your reference.

Sincerely,

BRANDON, GREG
Design Surveyor

330 - 1855 Victoria Avenue
 Regina, SK S4P 3T2
 Canada
 306-787-1443
 info@tsask.ca
 www.tsask.ca

REGISTRATION APPROVAL

22-Sep-11

Bromley Mechanical Services Inc.,
 925-23rd Street SW
 Medicine Hat
 AB T1A 8R1

Our File 44928 [0V]

ATTENTION : George Vandermolen

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 :	Bromley Mechanical Services Inc.	
ITEM :	DRAWING NUMBER :	CRN :
Separator	34000-REG Rev. 0	V5361.23

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,



Matthew Korneychuk

Codes and Standards Compliance

REMARKS: CRN registered under reciprocal agreement and conditional upon compliance with the notes on the original registration.

FORM U-1A MANUFACTURER'S 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 Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

1. Manufactured and certified by Bromley Mechanical Services Inc., A Division of Argo Sales Ltd., 925 23 St. SW, Medicine Hat Alberta T1A 8R1
(Name and address of Manufacturer)

Manufactured for Husky Oil Operations Ltd., Box 4490, Station "D", Calgary, Alberta T2P 3G7
(Name and address of Purchaser)

3. Location of installation LSD: 10-04-050-24 W3M ~~V-908~~ V-108 ll 9/2/11
(Name and address)

4. Type Vertical 130495 V 5361.23 34000-REG Rev.0 n/a 2011
(Horizontal or vertical, tank) (Manufacturer's serial number) (CRN) (Drawing number) (National Board number) (Year built)

5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1
2010 Edition
Year

to n/a n/a n/a
(Addenda (date)) (Code Case numbers) (Special service per UG-120(d))

6. Shell SA516-70N 0.750" 0.125" 24" OD 5'-0" s/s
(Material spec. number, grade) (Nominal thickness) (Corr. allow.) (Inner diameter) (Length (overall))

7. Seams Butt (Type 1) Full 100 n/a n/a Butt (Type 1) Full 100 1
(Long, welded, dbl., singl., lap, butt) [R. T. (spot or full)] (Eff. %) (H. T. temp.) (Time, hr) [Girth (welded, dbl., singl., lap, butt)] [R. T. (spot or full)] (Eff. %) (No. of courses)

8. Heads: (a) Material SA516-70N (b) Material SA516-70N
(Spec. no., grade) (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) TOP	0.6875"	0.125"			2:1				Concave
(b) BOTTOM	0.6875"	0.125"			2:1				Concave

If removable, bolts used (describe other fastenings) n/a
(Material spec. number, grade, size, number)

9. MAWP 900 psi 15 psi at max. temp. 550°F 550°F
(Internal) (External) (Internal) (External)

Min. design metal temp. -49°F at 900 psi Hydro., ~~EXEMPT~~ test pressure 1170 psi
 Proof test n/a

10. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
Inlet, Outlet/Insp	2	4"	CL600	SA333GR6	SA350LF2CL1	0.674"	0.125"		UW-16.1(c)	Type 1	Top Head, S
Drain, Dump	2	2"	CL600	SA333GR6	SA350LF2CL1	0.343"	0.125"		UW-16.1(c)	Type 1	Datum Head,
LC(2), PSV	3	2"	CL600	SA333GR6	SA350LF2CL1	0.343"	0.125"		UW-16.1(c)	Type 1	Shell
LG(2), TI, PI	4	1"	CL600	SA333GR6	SA350LF2CL1	0.358"	0.125"		UW-16.1(c)	Type 1	Shell
Inspection	1	4"	CL600	SA333GR6	SA350LF2CL1	0.674"	0.125"		UW-16.1(c)	Type 1	Shell

11. Supports: Skirt Yes Lugs 0 Legs 0 Other n/a Attached Datum Head Weld
(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: n/a CA: 0.125" (Seperator) PSV Supplied By Other Per UG125
(Name of part, item number, Manufacturer's name and identifying stamp)

Volume: 17.0 cu ft or 0.48 cu m, No-Impact Testing Exempt Per UCS 66(a)(b)(g), Construction Drawing Cad. No. 34000 Rev.0

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 Number 30634
 expires 10/26/2013
 Date Sept 6/11 Co. name Bromley Mechanical Services Inc., A Division of Argo Sales Ltd., Signed [Signature]
(Manufacturer) (Representative)

CERTIFICATE OF SHOP / FIELD INSPECTION

Vessel constructed by Bromley Mechanical Services Inc., A Division of Argo Sales Ltd., at 925 23 St. SW, Medicine Hat, Alberta T1A 8R1
 I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of Alberta and employed by ABSA
 have inspected the component described in this Manufacturer's Data Report on Sept. 6, 2011, 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 Sept 6/11 Signed [Signature] Commissions AB 12 NB 10304 A, B
(Authorized Inspector) (National Board (incl. endorsements), State, Province, and number)

Travel Sheet

DO NOT START CONSTRUCTION WITHOUT AI REVIEW TRAVEL SHEET REVISION NO.:

AI REVIEW: *W* **Husky Oil Operations** REVIEW DATE: **Aug 10, 2011**

SERIAL NO.: **130495** JOB/WO NO.: **34000** VESSEL TYPE: **24" x 5' x 900 PSI Vent Sp**

DRAWING/CAD NO.: **34000** DWG/CAD REVISION NO.: **0** TRAVEL SHEET INITIATION BY: *W*

Seq.	Item	Comments	Q.C.I.	Date	A.I. Hold Points	A.I.	Date	Owner	Date
1.	Calculations in File	<i>Apply MB 8/24</i>	<i>W</i>	<i>9/6/11</i>	*	<i>W</i>	SEP 06 2011		
2.	Release of App'd Dwg.		<i>W</i>	<i>8/17/11</i>					
3.	Heat Numbers Recorded		<i>W</i>	JUL 02 2011	*	<i>W</i>	SEP 06 2011		
4.	Material Examination		<i>W</i>	SEP 02 2011					
5.	MTRs Checked		<i>W</i>	SEP 02 2011	*	<i>W</i>	SEP 06 2011		
6.	WPS(s) Checked		<i>W</i>	<i>8/17/11</i>	*	<i>W</i>	SEP 06 2011		
7.	Welder(s) Qualified		<i>W</i>	SEP 02 2011	*	<i>W</i>	SEP 06 2011		
8.	Thicknesses Verified & Recorded		<i>W</i>	SEP 02 2011					
9.	Shell(s) & Head(s) Fit-up Inspection		<i>W</i>	SEP 02 2011					
10.	Nozzles & Fittings Fit-up Inspection		<i>W</i>	SEP 02 2011					
11.	Nozzle Orientation		<i>W</i>	SEP 02 2011					
12.	Nozzle & Flange Rating Checked		<i>W</i>	SEP 02 2011					
13.	Impact Tests		<i>W</i>	<i>Edmont</i>					
14.	Internals Checked		<i>W</i>	<i>30 Aug 11</i>		<i>W</i>	<i>Aug 30/11</i>		
15.	Final Internal Inspection	Shell Side Tube Side	<i>W</i>	<i>01 Sept 2011</i>	**	<i>W</i>	<i>Sept 1/11</i>		
16.	Weld Size Checked		<i>W</i>	SEP 02 2011					
17.	Welder I.D. Checked		<i>W</i>	SEP 02 2011	*	<i>W</i>	SEP 06 2011		
18.	Final External Inspection		<i>W</i>	SEP 02 2011	*	<i>W</i>	SEP 06 2011		
19.	Radiography <i>Cases made by P&T</i>	RT-1	<i>W</i>	SEP 02 2011	*	<i>W</i>	SEP 06 2011		
20.	Other N.D.E.		<i>W</i>	SEP 02 2011					
21.	Final Ext. Prior to P.W.H.T.	NLL	<i>W</i>	—	**				
22.	PWHT Chart Checked		<i>W</i>	—	*				
23.	Hydrostatic Test 1170 PSIG	Shell Side Gauge # Tube Side Gauge #	<i>W</i>	<i>9/6/11</i>	**	<i>W</i>	SEP 06 2011		
24.	CRN Drawing <i>Apply</i>	CRN# V5361.2	<i>W</i>	<i>9/6/11</i>	*	<i>W</i>	SEP 06 2011		
25.	N.C.R. #		<i>W</i>	<i>9/6/11</i>					
26.	Nameplate Stamping		<i>W</i>	<i>9/6/11</i>	*	<i>W</i>	SEP 06 2011		
27.	Manuf. Data Report Completed & Verified		<i>W</i>	<i>9/6/11</i>	**	<i>W</i>	SEP 06 2011		
28.	Nameplate Installation		<i>W</i>	<i>9/6/11</i>					

The Authorized Inspector shall be presented with the Travel Sheet prior to construction so that he can designate addition 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

MATERIAL THICKNESS VERIFICATION AND IDENTIFICATION				WPS / WELD I.D. / WELDER SYMBOLS / FIT-UP					
Description	Thickness	Material Spec. & Grade	Heat & Slab Number or I.D. Number	WPS	Weld I.D.	Welder Symbol	Fit-Up Exam.	Verify Type 1 Joint	ABSA COMMENT/INSPECTION
Shell #1	0.7500"	SAS16-70N	0909L 78306	Bms 710M B880	L-1	Mumb	J	25 AUG 2011	Aug 30/11
Shell #2					L-				
Shell #3					L-				
Head #1	0.6875"	SAS16-70N	G4224 275240608	Bmo 710M B880	C-1		J	02 SEPT 2011	
Head #2	0.6875"	SAS16-70N	328250 62306		C-2				
					C-				
					C-				

ATTACHMENT AND / OR NOZZLE MATERIAL THICKNESS VERIFICATION AND IDENTIFICATION						WELDER ID / WPS & ABSA INSPECTIONS			
Mark	Mat. I.D.	Neck	Fitting	Flange	Repad or Attachment	Cat. B	Cat. D	WPS	ABSA COMMENT/INSPECTION
NIN2 4" INLET ORGET RFWN	Spec.-Grd. Thk./Rating Heat# or ID	SA333GR6 PIPE 4" XXH VS29717		SA350LF2CL1 4" 600 XXH 241VI-LT7311-511		KU	V2/ RK	Bmo710M(B) Bm11(ROOF) Bms20N	N1: X13 N2: X14
N3N4 2" DRAIN DUMP RFWN	Spec.-Grd. Thk./Rating Heat# or ID	SA333GR6 PIPE 2" SCH 160 VS26724	SA420 WPL6 ELL 2" SCH 160 LR BL337	SA350LF2CL1 2" 600 SCH 160 H8615-10		KU	V2/ RK		N3: X9, X10, X11 N4: X6
NSA+BN7 2" RFWN LC PSV	Spec.-Grd. Thk./Rating Heat# or ID	SA333GR6 PIPE 2" SCH 160 VS26724		SA350LF2CL1 2" 600 SCH 160 H8615-10		KU	V2/ RK		N7: X5 NSA: X7 NSB: X8
N10 4" INSPECTION RFWN	Spec.-Grd. Thk./Rating Heat# or ID	SA333GR6 PIPE 4" XXH VS29717		SA350LF2CL1 4" 600 XXH 241VI-LT7311-511		KU	V2/ RK		X12
N6A+B 1" LG RFWN	Spec.-Grd. Thk./Rating Heat# or ID	SA333GR6 PIPE 1" XXH VS29232		SA350LF2CL1 1" 600 XXH MS28-1008		KH	V2/ RK		6A: X1 6B: X4
N8N9 1" TI/PI RFWN	Spec.-Grd. Thk./Rating Heat# or ID	SA333GR6 PIPE 1" XXH V29232	V100561 /	SA350LF2CL1 1" 600 XXH VS2V8-2528-1008		KU	V2/ RK		N8: X2 N9: X3
	Spec.-Grd. Thk./Rating Heat# or ID								
	Spec.-Grd. Thk./Rating Heat# or ID								

Used for recording miscellaneous information (Skirt/ Lift Lug Heat numbers, Another shell etc...)				
Designation	Material	Heat Number	WPS	Remarks
LIFT LUG	SAS16-70N	VS29855 (Bm11) SL		1/2" PLATE
BASE	SAS3B	VS29302 (RK)		PIPE 24" STD.

Shells & Heads			Final		
Task	Name/Welder symbol	Date	Task	Name/Welder symbol	Date
Layout / Checked by	V2-FMC	AUG 25 2011	Weld ID/ Material code/ Vessel Serial number stamped	V2-KU-RK	SEP 02 2011
Shell cut by	V2	AUG 25 2011	Vessel completed by	RK	SEP 02 2011
Internals by	V2	AUG 26 2011	Final Quality Control check	FMC	SEP 02 2011

CERTIFIED BY:

BROMLEY
MECHANICAL SERVICES INC.
A DIVISION OF HUSKY LTD.

Medicine Hat, Alberta
(509) 215 - 9806
(403) 528 - 3142

M.A.W.P. PSI AT °F

M.D.M.T. °F AT PSI

M.A.E.W.P. PSI AT °F

MFR'S SER. NO. YR. BUILT

VESSEL TYPE

TAG

M.A.W.P. KPA AT °C

SHELL NOM. MATERIAL

HEAD NOM. MATERIAL

C.A. CRN



609919

CERTIFIED BY:

BROMLEY
MECHANICAL SERVICES INC.
A DIVISION OF ARGO SALES LTD.

Medicine Hat, Alberta
(800) 215 - 9806
(403) 526 - 3142

W
RT-1

M.A.W.P. 900 PSI AT 550 °F

M.D.M.T. -49 °F AT 900 PSI

M.A.E.W.P. 15 PSI AT 550 °F

MFR'S SER. NO. 130495 YR. BUILT 2011

VESSEL TYPE VERTICAL SEPARATOR

TAG HUSKY OIL V-908 / 9/22/11

M.A.W.P. 6206 KPA AT 288 °C

SHELL NOM. 0.750" MATERIAL SA516-70N

HEAD NOM. 0.750" MATERIAL SA516-70N

C.A. 0.125" CRN V53612

Ⓐ 609919

CERTIFIED BY:



Medicine Hat, Alberta
(800) 215 - 9806
(403) 526 - 3142

W
RT-1

M.A.W.P. 900 PSI AT 550 °F

M.D.M.T. -49 °F AT 900 PSI

M.A.E.W.P. 15 PSI AT 550 °F

MFR'S SER. NO. 130495 YR. BUILT 2001

VESSEL TYPE VERTICAL SEPARATOR

TAG HUSKY OIL V-108

M.A.W.P. 6200 KPA AT 288 °C

SHELL NOM. 0.750" MATERIAL SA516-70N

HEAD NOM. 0.750" MATERIAL SA516-70N

C.A. 0.125" CRN US361.2

~~WSP~~ 34000
Jane



PHONE
1-800-442-8721

RADIOGRAPHIC REPORT
RADIOGRAPHIC REPORT

105145
105145

CLIENT: Bramley Mechanical P.O. NO. 75690
CLIENT: Bramley Mechanical A.P.E. NO. 75690

JOB NO. Acc 171 PAGE 1 OF 1
SUBSISTENCE BREAKFAST PAGE LUNCH OF DINNER
SUBSISTENCE BREAKFAST LATE BREAKFAST DINNER

LOCATION: Hasky A.F.M. NO. _____
PROJECT: WO 34000 DATE: Aug 26/11
CONSTRUCTION CONTRACTOR: BMJ DATE: Aug 26/11

TIME	IN	OUT	ROOM	IN	LATE MEAL	HOURS	KILOMETERS
TRAVEL	1300	OUT	IN	1430		1.5	
TRAVEL	1300	WELDEFFECT		1430		1.5	

CONSTRUCTION CONTRACTOR: BMJ
TECHNIQUE NO. 24 TYPE OF MATERIAL C/CBMS
ISOPIE II 24 X-RAY OF MATERIAL 1 NO. OF FILM 1
ISOPIE II 24 X-RAY MAX. OF MATERIAL 1 NO. OF FILM 1
LEAD SCREENS FROM 2.5 MAX. 2.5 FILM CASSETTE 1

IUC - INTERNAL UNDERCUT
EUC - EXTERNAL UNDERCUT
EUC - EXTERNAL UNDERCUT
IR - INCOMPLETE PENETRATION
IP - INCOMPLETE PENETRATION

BT - BURN THROUGH
BR - BURROUGHT
BR - BURROUGHT
HL - HIGH LOW BEAD
AR - ARC BLOW

WELDEFFECT

LC - LOW COVER
EP - EXCESSIVE PENETRATION
EP - EXCESSIVE PENETRATION
S - SLAG
CR - CONCAVE ROOT

- 1. Slight
- 2. Medium
- 3. Reject

WELD NO.	SIZE	WT	WS	EX	SO	SSF	FILM	WELD OK	IUC	EUC	IC	IP	LF	BT	POR	HB	HL	AB	LC	EP	C	S	CR	DEFECT LOCATION & COMMENTS	WELD REJ. WEL RE.
6-1	24	315	MIN				WO 34000 SN 130495																		
6-75	24	315	MIN		4	24	LAB DS	V																	
13-35								V																	
35-30								V																	
38-25								V																	
45-60								V																	

AUTHORIZED BY: [Signature] WELDING CODE: WWS1 INTERPRETED BY: [Signature]
CLIENT: Bramley Mechanical WELDING CODE: WWS1 INTERPRETED BY: [Signature]
INSPECTION FIRM: [Signature] COPY DESIGNATION: WHITE & PINK - CUSTOMER * GREEN & CANARY - OFFICE * GOLD - FILM ENVELOPE

CLIENT: Bromley Mechanical P.O. NO. 75690
 LOCATION: Husky FILM BOX _____
 PROJECT: wo# 34000 DATE: Aug 31 2011
 CONSTRUCTION CONTRACTOR: BMS

JOB NO. 6955 PAGE 1 OF 1
 SUBSISTENCE BREAKFAST LUNCH DINNER
 ROOM LATE MEAL 1-DAY

TIME AND TRAVEL	IN	OUT	IN	OUT	HOURS	KILOMETERS
	00:30	2:30			2.0	—

TECHNIQUE No. RT-01 TYPE OF MATERIAL CIS
 ISOTOPE Ir 192 X-RAY No. OF FILM PER CASSETTE 1
 MAX. SIZE 2.7 x 2.5 mm MAX. KV _____
 LEAD SCREENS FRONT 0.010 BACK 0.010 FILM DENSITY 2.15-2.7
 WT - WALL THICK WS - WELDER SYMBOL EX - No. OF EXPOSURES
 SO - MIN. SOURCE TO OBJECT DISTANCE (C=Contact)
 SSF - MAX. DISTANCE FROM SOURCE SIDE OF OBJECT TO FILM

WELD DEFECT:											
IUC - INTERNAL UNDERCUT	BT - BURN THROUGH	LC - LOW COVER	1. Slight								
EUC - EXTERNAL UNDERCUT	POR - POROSITY	EP - EXCESSIVE PENETRATION	2. Medium								
IC - INTERNAL CONCAVITY	HB - HOLLOW BEAD	C - CRACK	3. Reject								
IP - INCOMPLETE PENETRATION	HL - HIGH LOW	S - SLAG									
LF - LACK OF FUSION	AB - ARC BURN	CR - CONCAVE ROOT									

WELD NO.	SIZE	WT	WS	EX	SO	SSF	FILM	WELD OK	IUC	EUC	IC	IP	LF	BT	POR	HB	HL	AB	LC	EP	C	S	CR	DEFECT LOCATION & COMMENTS	WELD REJ.
1																									
2																									
3																									
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31																									
32																									

AUTHORIZED BY: [Signature] WELDING CODE: UWS1 INTERPRETED BY: [Signature]
 CLIENT: 01 SGT 200 ASSISTANT: cedo Jessie Marshall
 INSPECTION FIRM: _____

KEVIN HAYWARD
 CGSB #5335
 LEVEL II RT MT PT

CLIENT: Bromley Mechanical P.O. NO. 75690
 AFE NO. _____
 LOCATION: Husky FILM BOX _____
 PROJECT: WO: 34000 DATE: Aug 25-11
 CONSTRUCTION CONTRACTOR: BMS

JOB NO. Acc 171 PAGE 1 OF 1
 SUBSISTENCE BREAKFAST LUNCH DINNER
 ROOM LATE MEAL 1-DAY

TIME AND TRAVEL	IN	OUT	IN	OUT	HOURS	KILOMETERS
	07:00			1800	4	0

TECHNIQUE No. RT-04 TYPE OF MATERIAL C 14
 ISOTOPE Ir 192 X-RAY No. OF FILM PER CASSETTE 1
 MAX. SIZE 2.7 x 2.5 mm MAX. KV _____
 LEAD SCREENS FRONT 0.010 BACK 0.010 FILM DENSITY 2.5
 WT - WALL THICK WS - WELDER SYMBOL EX - No. OF EXPOSURES
 SO - MIN. SOURCE TO OBJECT DISTANCE (C=Contact)
 SSF - MAX. DISTANCE FROM SOURCE SIDE OF OBJECT TO FILM

WELD DEFECT:
 IUC - INTERNAL UNDERCUT BT - BURN THROUGH LC - LOW COVER
 EUC - EXTERNAL UNDERCUT POR - POROSITY EP - EXCESSIVE PENETRATION
 IC - INTERNAL CONCAVITY HB - HOLLOW BEAD C - CRACK
 IP - INCOMPLETE PENETRATION HL - HIGH LOW S - SLAG
 LF - LACK OF FUSION AB - ARC BURN CR - CONCAVE ROOT

1. Slight
 2. Medium
 3. Reject

WELD NO.	SIZE	WT	WS	EX	SO	SSF	FILM	WELD OK	IUC	EUC	IC	IP	LF	BT	POR	HB	HL	AB	LC	EP	C	S	CR	DEFECT LOCATION & COMMENTS	WELD REJ.
X 1	1		XXS	KN	3	12.0	13.0	D4	✓																
2	2								✓																
3	3								✓																
4	4								✓																
5	5	2	160			C	2.5		✓																
6	6								✓																
7	7								✓																
8	8								✓																
9	9								✓																
10	10								✓																
11	11								✓																
12	12	4	XXS				4.5		✓																
13	13								✓																
14	14								✓																
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32																									

AUTHORIZED BY: [Signature] WELDING CODE UW51 INTERPRETER BY: [Signature]
 CLIENT: 26 Aug 2011 ASSISTANT: [Signature]
 INSPECTION FIRM: _____

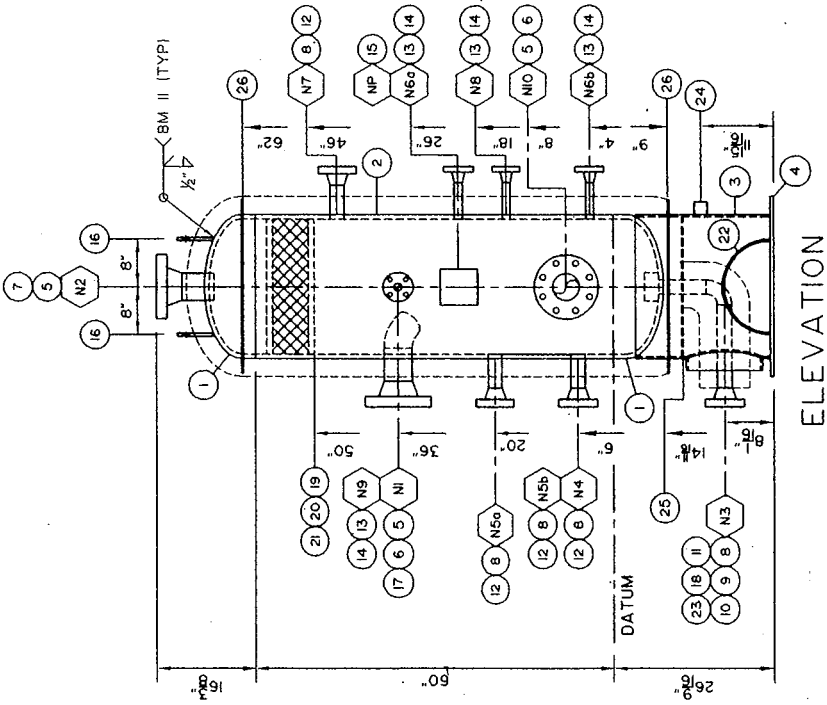
WAYNE KEYKO
 CGSB #8516
 LEVEL II RT

BROMLEY

MECHANICAL SERVICES INC.

MATERIAL REPORT

DATE: Sept 06 2011
 CUST: Husky Oil Operations Ltd.
 CHECKED: [Signature]
 SERIAL NO: 130495
 SIZE: 24" x 5' s/s
 PRESSURE: 900 psi
 W.O.: 34000
 CRN V.5361.2
 DRAWING NO: 34000-REG Rev.0
 CAD NO: 34000 Rev.0



ELEVATION

ITEM	DESCRIPTION	HEAT NUMBER	PLATE IDENTIFIER	MATERIAL	MIN.THK.
1a	S.E. HEAD, 24"OD X 0.750" NOM (0.6875" MIN) c/w 2" SF	64224	875240608	SA516-70N	0.712"
1b	S.E. HEAD, 24"OD X 0.750" NOM (0.6875" MIN) c/w 2" SF	328250	62306	SA516-70N	0.711"
2	SHELL, 24"OD X 0.750" X 5'-0" LONG	0909L	78380	SA516-70N	0.750"
3	PIPE, 24" SCH.STD (0.375") X 22 7/16" LONG	VS29302.		SA53B	0.375"
4	BASE RING, 30"OD X 20"ID X 1 1/2"			A36/44W	0.500"
5	RFWN, 4" 600 ANSI SCH.XXH	241V1		SA350LF2CL1	0.674"
6	SMLS PIPE, 4" SCH.XXH (0.674") X 5 1/2" LONG	VS29717		SA333GR6	0.674"
7	SMLS PIPE, 4" SCH.XXH (0.674") X 5 3/8" LONG	VS29715		SA333GR6	0.674"
8	RFWN, 2" 600 ANSI SCH.160	H8615		SA350LF2CL1	0.343"
9	SMLS PIPE, 2" SCH.160 (0.343") X 7 15/16" LONG	VS26724.		SA333GR6	0.343"
10	WELD 90, 2" SCH.160 LR	6337		SA420WPL6	0.343"
11	SMLS PIPE, 2" SCH.160 (0.343") X 13 7/8" LONG	VS26724.		SA333GR6	0.343"
12	SMLS PIPE, 2" SCH.160 (0.343") X 5 11/16" LONG	VS26724.		SA333GR6	0.343"

BROMLEY MECHANICAL SERVICES
MATERIAL INSPECTION REPORT

DIA SIZE OR WITH: 24"
 NPS OD ID

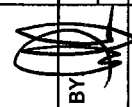
INSPECTED BY: MICHAEL QUINN
 DATE: AUGUST 29/2011
 P.O.#: PO-75688
 SUPPLIER: EDMONTON EXCHANGERS
 PART ID#: VES 50379
 REQ. MIN TK: 0.68750"

GRADE: SA 516-70 MT EE

HEADS 2:1
 HEMI
 WELD CAP
 OTHER
 SHELL
 PIPE → NDE BY MANUFACTURER
 PLATE HYDRO YES NDE NO
 REPAD NO
 STRUCT. NO
 OTHER DISHED BAFFLE YES

LENGTH
 THICKNESS
 PIPE PUBLISHED NOM
 PLATE NOM

Weight per foot for pipe over 4"

MATERIAL TRACKING NUMBER	QTY	HEAT NUMBERS		MIN. THK.	THICKNESS & LOG				VISUAL EDGE	INSP. SURF.	REQ. MARKINGS VERIFIED	PREPARED BY
		HEAT NUMBER	PLATE NUMBER		A	B	C	D				
1	2	G4224	275240608	0.7120"					ok	ok	ok	MD
W/O#				RECEIVED & ACCEPTED BY: 								
CUSTOMER: <u>BMS STOCK</u>				DATE: <u>SEP 02 2011</u>								
REQUIRED CODE MARKINGS:												



edmonton exchanger
& manufacturing ltd.

CERTIFICATE OF COMPLIANCE

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

Customer BROMLEY MECHANICAL SERVICES PO 75688 Work Order C90707 Date 2011/08/26 CotC# 26964 Page 1 of 1
LT

Item#	Description	Qty	Heat#	Required Min Thk	Recorded Min Thk	Form. Proc.
H90707-2	HEAD(S) - Semi-Elliptical 2:1 - 0.7500" NOM (0.6875" MIN) X 24" OD (Material Spec: SA 516-70 Normalized)	2	G4224-275240608	0.6875"	0.7120"	1

Forming Procedure:

1: Hot Formed @ 1650F/899C and Air Cooled

Supplementary Requirements

ITEM 2-1 HAD COSMETIC SURFACE REPAIRS DONE IN ACCORDANCE WITH ASME SEC.VIII, DIV.1 AND ASME SEC.IX. REPAIRS WERE DONE PER APPROVED WELD PROCEDURE WP-2 (AS WELDED) OR WP-63 (PWHT). ALL REPAIRED AREAS WERE MT EXAMINED.

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.

Supplementary Examination - Items

EDMONTON EXCHANGER MPI - DRY MPI ACCEPTABLE TO ASME CODE	
<input checked="" type="checkbox"/> SEC. VIII, DIV.1	<input type="checkbox"/> SEC. IV
<input type="checkbox"/> SEC. VIII, DIV.2	<input type="checkbox"/> B31.1
<input type="checkbox"/> SEC.1	<input type="checkbox"/> B31.3
<input type="checkbox"/> BEVELLED EDGE	<input type="checkbox"/> BACKGOUGE
<input type="checkbox"/> COMPLETED WELDS	
<input checked="" type="checkbox"/> <i>Repaired Area</i>	
EE PROCEDURE # MPI-001 REV.11 MATERIAL: SA 516-70 THICKNESS: 0.75" PARKER B300 YOKE MAGNAFLUX 8A-RED (DRY) AC CONTINUOUS LIGHT: NATURAL TECH: TRACY ENMAN (#11226) CGSB / SNT: LEV. II DATE: Aug 25/11 TIME: D/S	

新日本製鋼株式会社
Nippon Steel Corporation
鋼材検査証明書
INSPECTION CERTIFICATE

注文者: HANWA CO., LTD.
注文者照合番号: 228-38501090
契約番号: 1-831-H1-5-4-AT01
商品名: HOT ROLLED STEEL PLATES

規格: ASME SA-516 GRADE 70-E10
文書番号: EDMONTON EXCHANGER GROUP OF C-
DOCUMENT No. OMPANIES

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, MARINOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
天津製造所: 〒299-1141 千葉県君津市君津一番地
KAMITSUWORKS: 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN

検査番号: P-13163
発行年月日: 2011-04-06
DATE OF ISSUE: 2011-04-06
頁: 51

2**DM*****
****CE***

Main data table with columns for Dimension, Quantity, Mass, Test No., Plate No., Tensile Test, Impact Test, Chemical Composition, etc.

注釈 NOTES: ※1 Location Orientation 位置・方向, T: 頭部 Top, B: 底部 Bottom, L: 任意方向 Longitudinal, C: 長手方向 Transverse, Z: 断面方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis
※2 GL 検査距離 Gauge Length, A: 50mm 半形試験片 Rectangular, B: 50mm 半形試験片 Round, C: 70mm 半形試験片 Rectangular, D: 70mm 半形試験片 Round, E: 80mm 半形試験片 Rectangular, F: 80mm 半形試験片 Round, G: 200mm, H: 2", I: 8", J: 5.65/S, K: 4/S
※3 RA: 絞り Reduction of Area, YR: 降伏比 Yield Ratio, ※4 A: 台巻 Accepible, ※5 F: 試験片注 FULL SIZE, 2: 2.5mm, 3: 3.2mm, 4: 3.33mm, 5: 5.0mm, 6: 6.67mm, 7: 7.5mm, 8: 8.7mm, 9: 鋼板厚 Plate Thickness, ※6 P: 製品分析 Product Analysis



S. Aoki Head of Department
PLATE QUALITY CONTROL DEPT.
KAMITSUWORKS

新日本製鐵株式會社
Nippon Steel Corporation
鋼材検査証明書
INSPECTION CERTIFICATE

注 文 者 : HANWA CO., LTD.
 SHIPPER : HANWA CO., LTD.
 注文者照合番号 : 228-38501090
 REFERENCE No. : 228-38501090
 契約番号 : 1-831-H1-5-4-A101
 商 品 名 : HOT ROLLED STEEL PLATES
 COMMODITY : HOT ROLLED STEEL PLATES
 SPECIFICATION : ASME SA-516 GRADE 70-E10

(AS PER EN 10204 CERTIFICATE ON MATERIAL
 TESTS 3.1)

要 求 家 : EDNOR TON
 CUSTOMER : ONPAILES
 EDNOR TON EXCHANGER GROUP OF C -
 需要家管理番号 : CUSTOMERS CONTROL No.

発行年月日 : 2011-04-06
 DATE OF ISSUE : 2011-04-06

22DM*****
 *****CEW***
 E3001P0701 E07

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 MARUJOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
 若 津 製 鐵 所 : 〒299-1141 千葉県君津市若津1番地
 KAMITSUWORKS : 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF, 299-1141 JAPAN


証明書番号 : P-13163
 CERTIFICATE No. : P-13163
 発行年月日 : 2011-04-06
 DATE OF ISSUE : 2011-04-06
 22DM*****
 *****CEW***
 E3001P0701 E07

寸 法 DIMENSION mm, inch, feet	異数 QUAN- TITY	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 力伸率 Y.S.-T.S. 引張強さ T.S 伸率 E.L. %	衝撃試験 IMPACT TEST 2V-50F FT.LB AVG EACH 個々値	化 学 成 分 CHEMICAL COMPOSITION %								
							C	Si	Mn	P	S	Cu	Ni	Cr	Mo
0.75" X 120.5" X 480"	06	5579	G4224 11499	TESTED-PL 275240610TCI	56 78 28	282 280 277	16 39 145 8 1 2 1 2 0 0	39 147 9 4 1 1 1 1 1 1 1 1 1 1	147 9 4 1 1 1 1 1 1 1 1 1 1	145 8 1 2 1 1 1 1 1 1 1 1	8 1 2 1 1 1 1 1 1 1 1 1	1 2 1 1 1 1 1 1 1 1 1 1	1 2 0 0 0 0 0 0 0 0 0 0	0.12 0.34 4.1	
0.75" X 120.5" X 480"	06	11158	G4224 11499	FROM TESTED-PL 275240611TCI	56 78 28	282 280 277	16 39 145 8 1 2 1 2 0 0	39 147 9 4 1 1 1 1 1 1 1 1	147 9 4 1 1 1 1 1 1 1 1 1	145 8 1 2 1 1 1 1 1 1 1 1	8 1 2 1 1 1 1 1 1 1 1 1	1 2 1 1 1 1 1 1 1 1 1 1	1 2 0 0 0 0 0 0 0 0 0 0	0.12 0.34 4.1	
0.75" X 120.5" X 480"	06	5579	G4224 11502	TESTED-PL 275240601TCI	56 77 29	303 293 305	16 39 145 8 1 2 1 2 0 0	39 147 9 4 1 1 1 1 1 1 1 1	147 9 4 1 1 1 1 1 1 1 1 1	145 8 1 2 1 1 1 1 1 1 1 1	8 1 2 1 1 1 1 1 1 1 1 1	1 2 1 1 1 1 1 1 1 1 1 1	1 2 0 0 0 0 0 0 0 0 0 0	0.12 0.34 4.1	

注 記 (NOTES)
 [1] Location Orientation 位置・方向 T: 頂部 Top, B: 底部 Bottom, L: 延方向 Longitudinal, C: 横方向 Transverse, Z: 板厚方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis
 [2] C1: 端点距離 Gage Length, A: 50mm 平面試験片 Rectangular, B: 50mm 丸形試験片 Round, C: 70mm 平面試験片 Rectangular, D: 70mm 丸形試験片 Round, E: 80mm 平面試験片 Rectangular, F: 80mm 丸形試験片 Round, G: 200mm H: 27, I: 87, J: 5.65/50, K: 4/50
 [3] R.A.: 絞り Reduction of Area, Y.R.: 降伏比 Yield Ratio, [4] A: 合格 Acceptable, [5] S.F.: 絞り率 FULL SIZE, 2: 2.5mm, 3: 3.3mm, 4: 3.3mm, 5: 5.0mm, 6: 6.57mm, 7: 7.5mm, 8: 6.7mm, 9: 製品板厚 Plate Thickness, [6] P: 製品分析 Product Analysis
 [7] N: 標準 Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, CR: Controlled Rolled, N.T.C.: NiC Process/TMC Process, C.L.C.: C/QC Process/TMC Process, A.R.: As Rolled, T.M.R.: TMR Process/TMC Process, N.R.: Normalizing Rolled
 S.H.: 熱延表面 Shear Fracture, C.F.: 脆性断面 Brittle Fracture, L.E.: 側面断面 Lateral Expansion, A.G.S.: オーゴナイト粒度 Austenite Grain Size, F.G.S.: フェライト粒度 Ferrite Grain Size, S.R.: Stress Relief/Post Weld Heat Treatment
 温度 Temperature

上記注記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.

S. Masaki

君津製鐵所 品質管理グループ
 Head of Department
 PLATE QUALITY CONTROL DEPT.
 KAMITSUWORKS


注 文 者 : HANWA CO., LTD.
SHIPPER : HANWA CO., LTD.
注文者照合番号 : 228-38501090
REFERENCE No. : 228-38501090
契約番号 : 1-831-H1-5-4-A101
品名 : HOT ROLLED STEEL PLATES
COMMODITY : HOT ROLLED STEEL PLATES

新日本製鋼株式会社 Nippon Steel Corporation 鋼材検査証明書 INSPECTION CERTIFICATE

規格 : ASME SA-516 GRADE 70-E10
SPECIFICATION : ASME SA-516 GRADE 70-E10
文書番号 : 需要家 : EDMONTON EXCHANGER GROUP OF C-
DOCUMENT No. : CUSTOMER OMPANIES

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
需要家管理番号 : 需要家管理番号 :
CUSTOMERS CONTROL No. : CUSTOMERS CONTROL No.

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
君津製鐵所 : 〒299-1141 千葉県君津市君津一番地
KIMITSUWORKS : 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141, JAPAN
証明書番号 : P-13163
発行年月日 : 2011-04-06
DATE OF ISSUE : 2011-04-06

E3001P07Q1 E07

寸法 DIMENSION mm, inch, feet	数量 QUANTITY	質量 MASS KG	製鋼番号 CAST No.	製品番号 PLATE No.	引張試験 TENSILE TEST		衝撃試験 IMPACT TEST		化学成分 CHEMICAL COMPOSITION %												
					試験番号 TEST No.	位置 LOCATION ORIENTATION	平均値 AVG	個々値 EACH	C	SI	Mn	P	S	CU	NI	Q	CR	MO	Nb	V	Ta
0.75' X 120.5' X 480'	06	2	11158	G4224 FROM 11506 275240602	56	77	29	303	158	16	39	145	8	1	2	1	1	2	0.12	0.34	4.1
0.75' X 120.5' X 480'	06	1	5579	G4224 TESTED-PL 11506 275240607	56	77	28	288	155	16	39	145	8	1	2	1	1	2	0.12	0.34	4.1
0.75' X 120.5' X 480'	06	2	11158	G4224 FROM 11506 275240608	56	77	28	288	155	16	39	145	8	1	2	1	1	2	0.12	0.34	4.1
0.75' X 120.5' X 480'	06	2	11158	G4224 FROM 11506 275240609	56	77	28	288	155	16	39	145	8	1	2	1	1	2	0.12	0.34	4.1

注 記 NOTES

※1 Location Orientation 位置・方向: T: 頂部 Top, B: 底部 Bottom, L: 延延方向 Longitudinal, C: 延延方向 Transverse, Z: 板厚方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis

※2 G1: 板点距離 Gauge Length, A: 50mm 平形試験片 Rectangular, B: 50mm 丸形試験片 Round, C: 70mm 平形試験片 Rectangular, D: 70mm 丸形試験片 Round, E: 80mm 平形試験片 Rectangular, F: 80mm 丸形試験片 Round, G: 200mm, H: 2° I: 8°, J: 5.65° So, K: 4.4° So

※3 RA: 絞り Reduction of Area, YR: 降伏比 Yield Ratio, A: 合格 Acceptable, F: 再検査 FULL SIZE, 2: 2.5mm, 3: 3.2mm, 4: 3.8mm, 5: 5.0mm, 6: 6.8mm, 7: 7.5mm, 8: 6.7mm, 9: 製品板厚 Plate Thickness, P: 製品分析 Product Analysis

※4 N: 焼割 Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, CR: Controlled Rolled, NIC: NiC Process/TMC Process, CLC: CLC Process/TMC Process, AR: As Rolled, TMR: TMR Process/TMC Process, NR: Normalizing Rolled

※5 SH: 延延前面 Shear Fracture, CF: 焼延後面 Crystallinity Feature, LE: 焼延出 Lateral Expansion, AGS: オーステナイト相 Austenite Grain Size, FGS: フェライト相 Ferrite Grain Size, SR: Stress Relief/Post Weld Heat Treatment

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。
 WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN
 BROUGHT TO THE STANDARD SERVICE INC.
 Checked to ASME Div. 1

Sect. IIA 2010 Ed. Add. SA 20 SEP 02 2011
 Date

君津製鐵所 品質管理グループ
 Head of Department
 PLATE QUALITY CONTROL DEPT.
 KIMITSUWORKS
 S. Adachi

新日本製鋼株式会社
Nippon Steel Corporation
鋼材検査証明書
INSPECTION CERTIFICATE

SHIPPER : HANWA CO., LTD.
 注文者照会番号 : 228-38501090
 契約番号 : 1-831-H1-5-4-A101
 商品名 : HOT ROLLED STEEL PLATES
 規格 : ASME SA-516 GRADE 70-E10
 文書番号 : 需要家 : EDMONTON EXCHANGER GROUP OF C-
 DOCUMENT NO. : CUSTOMER COMPANIES


(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
 需要家管理番号 : 3001P0701 E07

本社 : 〒100-8071 東京都千代田区丸の内二丁目6番号
 HEAD OFFICE : 2-6-1, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
 営業所 : 〒299-1141 千葉県君津市岩瀬一丁目1番地
 KIMITSUWORKS : 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN
 証明書番号 : P-13163 PAGE : 55
 発行年月日 : 2011-04-06
 DATE OF ISSUE : 1001 2**DM****
 *****CEW**

寸法	法	数量	質量	製鋼番号	製品番号	位置	引張試験			衝撃試験			化学成分																										
							TS	YS	EL	2V-50F	FT-LB	HBW	C	SI	Mn	P	S	CU	NI	CA	B	Ti	Mo	Nb	V	FAI	Co	AL											
0.75" X 120.5" X 480"		06	2	11:58	G4224FROM 275240617TCl	55	77	31	291	303	156	16	39	145	8	1	2	1	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.75" X 120.5" X 480"		06	1	5:79	G4225TESTED-PL 275240631TCl	56	77	29	289	285	155	16	38	144	9	2	2	2	2	2	0	11	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

生 界 NOTES : Location Orientation 位置・方向, T: 顶部 Top, B: 底部 Bottom, L: 圧延方向 Longitudinal, C: 延方向 Transverse, Z: 板厚方向 Through Thickness, R: 45° 方向 45deg. to the Longitudinal Axis
 3: RA: 絞り Production of Area, YR: 帯状比 Yield Ratio
 4: A: 合格 Acceptable, B: 50mm 丸形試験片 Round, C: 70mm 平形試験片 Rectangular, D: 70mm 丸形試験片 Round, E: 80mm 平形試験片 Rectangular, F: 80mm 丸形試験片 Round, G: 200mm, H: 21, I: 9, J: 5.65/So, K: 4/So
 7: N: 標準 Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, CR: Controlled Rolled, N1C: N1C Process/TMC Process, C1C: C1C Process/TMC Process, AR: As Rolled, TMR: TMR Process/TMC Process, NR: Normalizing Rolled
 SH: 産後表面 Shear Fracture, CF: 脆性断面 Crystallinity Fracture, LE: 離層 Lateral Expansion, AGS: オーステナイト粒径 Austenite Grain Size, FGS: フェライト粒径 Ferrite Grain Size, SR: Stress Relieved/Post Weld Heat Treatment

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

君津製鋼所 厚板管理センター
 Head of Department
 PLATE QUALITY CONTROL DEPT.
 KIMITSUWORKS




注 文 者 : HANWA CO., LTD.

注文者照合番号 : 228-38501090

契約番号 : 1-831-HI-5-4-AT01

商 品 名 : HOT ROLLED STEEL PLATES

規 格 : ASME SA-516 GRADE 70-E10

文 書 番 号 : DOCUMENT No.

需 要 家 : EDMONTON EXCHANGER GROUP OF C- OMPANIES

需 要 家 管 理 番 号 : CUSTOMERS CONTROL No.

需 要 家 管 理 番 号 : E3001P0701 E07

新日本製鐵株式會社
Nippon Steel 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8番1号
HEAD OFFICE : 〒299-1141 千葉県君津市君津1番地
君津製鐵所 : 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN
KIMITSUWORKS

証明書番号 : P-13163
CERTIFICATE No. : P-13163
発行年月日 : 2011-04-06
DATE OF ISSUE : 2011-04-06
PAGE : 57

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)

寸 法 DIMENSION mm, inch, feet	厚 度 THICKNESS	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 KSI	引張強さ TS	伸長率 EL %	位置 LOCATION	方向 ORIENTATION	平均値 AVG	単位 EACH	化 学 成 分 CHEMICAL COMPOSITION %																
												C	Si	Mn	P	S	Ca	Ni	Cr	B	Ti	Nb	V	TAI	Co			
0.75" X 120.5" X 480"	06	2 11158	G4225FROM 11518	275240623TCI 275240624	56	77	29	TLF281	280	277	280	156	16	38	144	9	2	2	2	2	2	2	2	2	2	0	41	
0.75" X 120.5" X 480"	06	1 5579	G4225TESTED-PL 11520	275240625TCI	56	77	29	TLF266	280	253	266	156	16	38	144	9	2	2	2	2	2	2	2	2	2	2	0	41
0.75" X 120.5" X 480"	06	2 11158	G4225FROM 11520	275240626TCI 275240627	56	77	29	TLF266	280	253	266	156	16	38	144	9	2	2	2	2	2	2	2	2	2	2	0	41

注 釈 NOTES

※1 Location Orientation 位置・方向, T: 頭部 Top, B: 底部 Bottom, L: 圧延方向 Longitudinal, C: 直角方向 Transverse, Z: 板厚方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis

※2 CL 板厚公差 Gauge Length, A: 50mm 平行試験片 Rectangular, B: 50mm 丸形試験片 Round, C: 70mm 平行試験片 Rectangular, D: 70mm 丸形試験片 Round, E: 80mm 平行試験片 Rectangular, F: 80mm 丸形試験片 Round, G: 200mm, H: 2" 1: 8", J: 5.65"/So, K: 4"/So

※3 RA: 絞り Reduction of Area, YR: 降伏比 Yield Ratio, ※4 A: 合格 Acceptable, ※5 F: 標準寸法 FULL SIZE, 2: 2.5mm, 3: 3.0mm, 4: 3.3mm, 5: 5.0mm, 6: 5.67mm, 7: 7.5mm, 8: 6.7mm, 9: 製造公差 Plate Thickness, ※6 P: 製品分析 Product Analysis, 製造温度 Temperature

※7 N: 焼鈍 Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, CR: Controlled Rolled, N1C: N1C Process/TMC Process, CLC: CLC Process/TMC Process, AR: As Rolled, TMR: TMR Process/TMC Process, NR: Normalizing Rolled

※8 圧延後冷却率 Steel Fracture, CF: 焼戻後冷却率 Crystalinity Fracture, LE: 焼戻後冷却率 Crystallinity Fracture, AGS: オーステナイト粒径 Austenite Grain Size, FGS: フェライト粒径 Ferrite Grain Size, SR: Stress Relieved/Post Weld Heat Treatment

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

J. Maacki
 品質管理部長 菅原 隆夫
 Head of Department
 PLATE QUALITY CONTROL DEPT.
 KIMITSUWORKS

注 文 者 : HANWA CO., LTD.

注文者照合番号 : 228-38501090

契約番号 : 1-831-H1-5-4-A101

商 品 名 : HOT ROLLED STEEL PLATES

規格 : ASME SA-516 GRADE 70-E10

文 書 番 号 : DOCUMENT No. : 需要家 : EDWINTON EXCHANGER GROUP OF C-

新日本製鋼株式会社
Nippon Steel Corporation

鋼材検査証明書
INSPECTION CERTIFICATE

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)

需要家管理番号 : 需要家管理番号 : OMPANIES

発行年月日 : 2011-04-06

DATE OF ISSUE : 1001

*****CEW***
E3001P07Q1 E07

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
製 鋼 所 : 〒299-1441 千葉県君津市君津一番地
KAMITSUWORKS : 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1441 JAPAN

証明書番号 : P-13163 PAGE : 58
CERTIFICATE No. : P-13163 PAGE : 58

寸 法 DIMENSION mm, inch, feet	厚 度 THICKNESS mm	質 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 FT. LB	化 学 成 分 CHEMICAL COMPOSITION %													
					引張強さ T.S.	伸び E.L.		C	Si	Mn	P	S	Ca	Ni	Cr	Mo	Nb	V	Ti	TAI	Co
0.75" X 120.5" X 480"	06	5579	G422511522	TESTED-PL 275240619TCl	56	77	289	16	38	144	9	2	2	2	2	2	2	0.13	0.34	41	
0.75" X 120.5" X 480"	06	11158	G422511522	TESTED-PL 275240621TCl	56	77	289	16	38	144	9	2	2	2	2	2	2	0.13	0.34	41	

注 釈 NOTES

※1 Location Orientation 位置・方向, T:頂部 Top, B:底部 Bottom, L:延延方向 Longitudinal, C:直角方向 Transverse, Z:板厚方向 Through Thickness, R:45° 方向 45Deg. to the Longitudinal Axis

※2 G1 検査距離 Gauge Length, A: 50mm 平形試験片 Rectangular, B: 50mm 丸形試験片 Round, C: 70mm 平形試験片 Rectangular, D: 70mm 丸形試験片 Round, E: 80mm 平形試験片 Rectangular, F: 80mm 丸形試験片 Round, G: 200mm, H: 27, 1: 87, J: 5.65/So, K: 4.4/So

※3 RA: 絞り Reduction of Area, Y.R.: 降伏比 Yield Ratio, ※4 A: 合格 Acceptable, ※5 F: 標準寸法 FULL SIZE, 2: 2.5mm, 3: 3.2mm, 4: 3.9mm, 5: 5.0mm, 6: 6.3mm, 7: 7.8mm, 8: 9.5mm, 9: 製品板厚 Plate Thickness, ※6 P: 製造方法 Product Analysis

※7 N: 標準 Normalized, Q: 焼入引 Quenched, T: 焼戻し Tempered, CR: Controlled Rolled, N1C: N1C Process/TMC Process, CLC: CLC Process/TMC Process, AR: As Rolled, TMR: TMR Process/TMC Process, NR: Normalizing Rolled

SH: 延延線量 Shear Fracture, CF: 断面収縮率 Crystallinity Fracture, L.E: 側面膨出 Lateral Expansion, AGS: オートテンサイト強度 Austenite Grain Size, FGS: フェライト強度 Ferrite Grain Size, SR: Stress Relieved/Post Weld Heat Treatment

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE RULES OF THE CONTRACT.

S. Masaki

Head of Department
PLATE QUALITY CONTROL DEPT.
KAMITSUWORKS



B

注 文 者 : HANWA CO., LTD.
 SHIPPER : HANWA CO., LTD.
 注文照合番号 : 228-38501090
 REFERENCE NO. :
 契約番号 : 1-831-H1-5-4-A101
 CONTRACT No. : 1-831-H1-5-4-A101

新日本製鋼株式会社
 Nippon Steel 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
 常設製鐵所 : 〒299-1141 千葉県君津市君津1番地
 KINTSUJUWORKS : 1, KINTSUKI, KINTSUKI-CITY, CHIBA-PREF. 299-1141, JAPAN

証明書番号 : P-13163 PAGE : 59
 発行年月日 : 2011-04-06
 DATE OF ISSUE : 1001
 23DU****
 ****CE***

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)

規格 : ASME SA-516 GRADE 70-E10 需要家 : EDMONTON EXCHANGER GROUP OF C- 需要家管理番号 :
 SPECIFICATION : 需要家管理番号 :
 DOCUMENT No. : CUSTOMER : DMPLIES CUSTOMERS CONTROL NO. : E3001P0791 E07

寸法 DIMENSION mm, inch, feet	数量 QUANTITY	質量 MASS Kg	試験番号 TEST No.	製品番号 PLATE No.	引張試験		衝撃試験 IMPACT TEST	化学成分 CHEMICAL COMPOSITION							
					引張強さ TS % KSI	伸び EL %			ZV - 50F FT-LB	C %	Si %	Mn %	P %	S %	Al %
0.75" X 120.5" X 480"	2	11158	64225 FROM 11526 TO	275240629T01	55	77	295	Avg 16.35 C 0.16 Si 0.38 Mn 1.44 P 0.02 S 0.00 Al 2.00 Ni 0.11 Cr 0.12 Mo 0.03 Nb 0.04 V 0.04 Ti 0.41							
0.875" X 120.5" X 480"	1	6509	64224 TESTED-PL 11495 275240713T01	TLF291	55	77	290	Avg 16.34 C 0.16 Si 0.39 Mn 1.45 P 0.02 S 0.00 Al 2.00 Ni 0.11 Cr 0.12 Mo 0.03 Nb 0.04 V 0.04 Ti 0.41							
0.875" X 120.5" X 480"	2	13018	64224 FROM 11495 275240714T01	TLF291	55	77	290	Avg 16.34 C 0.16 Si 0.39 Mn 1.45 P 0.02 S 0.00 Al 2.00 Ni 0.11 Cr 0.12 Mo 0.03 Nb 0.04 V 0.04 Ti 0.41							

注釈 NOTES

※1 Location Orientation 位置・方向, T: 縦筋 Top, B: 底面 Bottom, L: 逆方向 Longitudinal, C: 直外方向 Transverse, Z: 破断方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis

※2 GL 巻点距離 Gage Length, A: 50mm 形状試験片 Rectangular, B: 80mm 形状試験片 Rectangular, C: 70mm 形状試験片 Rectangular, D: 70mm 形状試験片 Round, E: 80mm 形状試験片 Rectangular, F: 80mm 形状試験片 Plate Thickness, ※E1 P: 成分分析 Product Analysis, ※A: 合格 Acceptance

※3 RA: 絞り Reduction of Area, YR: 降伏比 Yield Ratio, ※S F: 鋼材仕様 FULL SIZE, 2: 2.5mm, 3: 3.3mm, 4: 3.3mm, 5: 5.0mm, 6: 6.7mm, 7: 7.5mm, 8: 6.7mm, 9: 製品仕様 Plate Thickness, ※E1 P: 成分分析 Product Analysis

※7 N: 焼鈍 Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, CR: Controlled Rolled, N1: C: NiC Process/TMC Process, CL: C: CLC Process/TMC Process, AR: As Rolled, TMR: TMAR Process/TMC Process, NR: Normalizing Rolled
 SH: 連続変形 Shear Fracture, CF: 連続変形面 Crystallicity Fracture, LE: 焼裂出 Lateral Expansion, AGS: オーステナイト粒径 Austenite Grain Size, FGS: フェライト粒径 Ferrite Grain Size, SR: Stress Relieved/Post Weld Heat Treatment

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

検査部長 菅野 正一
 品質管理課長 菅野 正一
 検査員 菅野 正一

検査部長 菅野 正一
 品質管理課長 菅野 正一
 検査員 菅野 正一

検査部長 菅野 正一
 品質管理課長 菅野 正一
 検査員 菅野 正一



注 文 者 : HANWA CO., LTD.
 SHIPPER : 注文者照会番号 : 228-38501090
 REFERENCE No. : 契約番号 : 1-831-HI-5-4-A101
 CONTRACT No. : 商品名 : HOT ROLLED STEEL PLATES

規 格 : ASME SA-516 GRADE 70-E10
 SPECIFICATION : DOCUMENT No. :
 文 書 番 号 : CUSTOMER : EDMONTON EXCHANGER GROUP OF C-
 DOCUMENT No. : OMPANIES

需要家管理番号 :
 需要家管理番号 :
 需要家管理番号 :

新日本製鋼所株式会社
 Nippon Steel Corporation
 鋼材検査証明書
 INSPECTION CERTIFICATE

AS PER EN 10204 CERTIFICATE ON MATERIAL
 TESTS 3.1)
 EDMONTON EXCHANGER GROUP OF C-
 CUSTOMERS CONTROL No. :

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 MARINOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
 若手製鐵所 : 〒299-1141 千葉県君津市君津1番地
 KAMITSUWORKS : 1, KIMITSE, KIMITSU-CITY, CHIBA-PREF 299-1141 JAPAN
 証明書番号 : P-13163 PAGE : 98
 発行年月日 : 2011-04-06
 DATE OF ISSUE : 1001 *****CEW***
 E3001P07Q1 E07

寸法 DIMENSION mm, inch, feet	数量 QUANTITY	質量 MASS KG	製鋼番号 CAST No.	製品番号 PLATE No.	引張試験 TENSILE TEST		衝撃試験 IMPACT TEST		化学成分 CHEMICAL COMPOSITION %																			
					0.2% KSI	伸び EL %	2V - 50F FT. L.B	Avg	C	Si	Mn	P	S	Cu	Ni	Cr	B	Ti	Nb	V	Al	Ca	Co					
2.25' X 121' X 480'	20	16809	63952	TESTED-PL	49	75	35	303	16	38	146	6	2	2	2	1	2	0	12	0.2841								
2.25' X 121' X 480'	1	16809	09894	275242010	53	75	36	307	16	37	145	6	2	2	1	1	2	0	12	0.3241								
TOTAL	46223	49128																										

注 意 事 項
 [※1] Location Orientation 位置・方向, T: 頭部 Top, B: 底部 Bottom, L: 圧延方向 Longitudinal, C: 直交方向 Transverse, Z: 縦厚方向 Through Thickness, R: 45° 方向 45Deg, to the Longitudinal Axis
 [※2] G.L. 検査位置 Gage Length, A: 50mm 半形試験片 Rectangular, B: 50mm 半形試験片 Round, C: 70mm 半形試験片 Round, D: 70mm 半形試験片 Rectangular, E: 80mm 半形試験片 Rectangular, F: 80mm 半形試験片 Round, G: 200mm H: 2', I: 8', J: 5.05' / So, K: 4.4' / So
 [※3] R.A.: 絞り Reduction of Area, Y.R.: 降伏比 Yield Ratio
 [※4] N: 焼煉 Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, C.R.: Controlled Rolled, N.T.C.: N/C Process/TMC Process, C.L.C.: C/LC Process/TMC Process, A.R.: As Rolled, T.M.R.: TMR Process/TMC Process, N.R.: Normalizing Rolled
 S.H.: 消化後直摩 Street Fracture, C.F.: 消化後直摩 Crystallinity Fracture, L.B.: 消化後直摩 Lateral Expansion, A.G.S.: オートステージ処理 Austemite Grain Size, F.G.S.: フェライト粒径 Ferrite Grain Size, S.T.: Stress Induced Post Weld Heat Treatment
 上記注文品は鋼指定の規格または仕様に基づいて製造され、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
 若手製鐵所検査管理グループ
 Head of Department
 PLATE QUALITY CONTROL DEPT.
 KAMITSUWORKS



SHIPPER : HANWA CO., LTD.
 注文者照会番号 : 228-38501090
 契約番号 : 1-831-H1-5-4-A101

商 品 名 : HOT ROLLED STEEL PLATES
 規 格 : ASME SA-516 GRADE 70-E10
 文 書 番 号 : 228-38501090
 DOCUMENT No. :

鋼材検査証明書 INSPECTION CERTIFICATE

注 文 者 : HANWA CO., LTD.
 注文者照会番号 : 228-38501090
 契約番号 : 1-831-H1-5-4-A101
 商 品 名 : HOT ROLLED STEEL PLATES
 規 格 : ASME SA-516 GRADE 70-E10
 文 書 番 号 : 228-38501090
 DOCUMENT No. :

製 造 家 : EDMONTON EXCHANGER GROUP OF C-
 需要家管理番号 : 228-38501090
 CUSTOMERS CONTROL NO. : E3001P0701 E07

発行年月日 : 2011-04-06
 DATE OF ISSUE : 2011-04-06
 証明書番号 : P-13163
 頁数 : 99E
 発行所 : 1. KIMITSU KIMITSU-CITY, CHIBA-PREF 299-1141 JAPAN

寸 法 DIMENSION mm, "inch, 'feet	具 数 QUAN- TITY	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		弾 性 試 験 ELONGATION		R ₁₀ %	R _{0.2} %	R _m %	R _{0.2} %	R ₁₀ %	R _m %	R _{0.2} %	R ₁₀ %	R _m %	R _{0.2} %	化 学 成 分 CHEMICAL COMPOSITION %																										
					引張強さ TS KSI	伸率 EL %	引張強さ TS KSI	伸率 EL %											C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Nb	V	Ti	N	O	S	As	Pb	Sn	Bi								
						0.2%	24%	22%	56%										0.02	0.03	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005



注 記 (NOTES) 1. 位置 (Location) 2. 方向 (Orientation) 3. 長さ (Length) 4. 厚さ (Thickness) 5. 形状 (Shape)
 2. 丸 (Round) 3. 半 (Half) 4. 全 (Full) 5. 板厚 (Plate Thickness)
 6. 製法 (Manufacture) 7. 加工 (Treatment) 8. 検査 (Inspection) 9. 製品 (Product)
 10. 試験 (Testing) 11. 引張 (Tensile) 12. 弾性 (Elastic) 13. 化学 (Chemical) 14. 成分 (Composition) 15. 分析 (Analysis)

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN
 MADE IN ACCORDANCE WITH THE RULES OF THE CONTRACT.



品質管理課
 検査部長
 KIMITSUWORKS
 Head of Department
 PLATE QUALITY CONTROL DEPT.
 KIMITSUWORKS

BROMLEY MECHANICAL SERVICES

MATERIAL INSPECTION REPORT

DIA SIZE OR WITH: 24" NPS OD ID

INSPECTED BY: MICHAEL QUINN

DATE: AUGUST 29/2011

GRADE: SA 516-70 MT EE

LENGTH
THICKNESS
PIPE PUBLISHED NOM
PLATE NOM

HEADS 2:1
 HEMI
 WELD CAP
 OTHER

SHELL
 PIPE → NDE BY MANUFACTURER
 PLATE HYDRO YES NDE NO
 REPAD NO
 STRUCT. NO
 OTHER DISHED BAFFLE YES

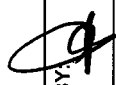
P.O.# PO-75802

SUPPLIER: EDMONTON EXCHANGERS

PART ID#: VES 50379

REQ. MIN TK: 0.68750"

Weight per foot for pipe over 4"

MATERIAL TRACKING NUMBER	QTY	HEAT NUMBERS		MIN. THK.	THICKNESS & LOG				VISUAL EDGE	INSP. SURF.	REQ. MARKINGS VERIFIED	PREPARED BY
		HEAT NUMBER	PLATE NUMBER		A	B	C	D				
	1	328250	62306	0.7110"					OK	OK	OK	ML
	1	SB64460	PB30310001	0.7090"					OK	OK	OK	ML
RECEIVED & ACCEPTED BY: 												
REQUIRED CODE MARKINGS:												
DATE: SEP 02 2011												
W/O#												
CUSTOMER:		BMS STOCK										



edmonton exchanger
& manufacturing ltd.

CERTIFICATE OF COMPLIANCE

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

Customer **BROMLEY MECHANICAL SERVICES** PO 75802 Work Order C90913 Date 2011/08/26 CotC# 26974 Page 1 of 1
LT

Item#	Description	Qty	Heat#	Required Min Thk	Recorded Min Thk	Form. Proc.
H90913-1	HEAD(S) - Semi-Elliptical 2:1 - 0.7500" NOM (0.6875" MIN) X 24" OD (Material Spec: SA 516-70 Normalized)	1	328250-62306	0.6875"	0.7110"	1
		1	SB64460-PB30310001	0.6875"	0.7090"	1

Forming Procedure:

1. Hot Formed @ 1650F/899C and Air Cooled

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.

Supplementary Examination - Items

POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 070213-PPSA-002-021
Date of Issue/발행일자: Feb., 22, 2007



Order No./계약번호: 0002675602
Supplier/주문자: DAE WOO INTERNATIONAL CORP.
Customer/고객사: EDMONTON EXCHANGER
PO No./주문번호: E10577 (ASME2004 EDITION)
Commodity/품명: HR STEEL PLATE (ISO10474/3.1B)
Spec & Type/규격: ASME SA516-70

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 재강번호	POSITION	Tensile/인장시험		Impact/충격시험		Chemical Composition/화합성분(%)													
						YP (KSI)	TS (%)	EL (%)	V Notch -50°F	Energy SF (FT-LBS)	C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V
0.625"x120.5"x480"	PB30301401-1402	2	9,300 20,502	SB64460	T	51.5	76.7	29	1:139 2:127 3:145 A:137	1800	343	1147	97	19	2	22	Tr	90	Tr	1	19	29	
0.625"x120.5"x480"	PB30301301-1302	2	9,300 20,502	SB64460	T	51.6	77.0	27	1:92 2:117 3:125 A:111 348,546 (LBS)	1800	343	1147	97	19	2	22	Tr	90	Tr	1	19	29	
0.75"x96.5"x480"	PA24489301	1	4,467 9,848	SA55523	T	50.8	78.5	30	1:111 2:128 3:115 A:118	1844	367	1170	66	26	2	25	Tr	98	Tr	1	2	21	40
0.75"x96.5"x480"	PA23976401	1	4,467 9,848	SA55523	T	49.5	76.3	29	1:115 2:128 3:138 A:127	1844	367	1170	66	26	2	25	Tr	98	Tr	1	2	21	40

Position - T : Top, M : Middle, B : Bottom
Tensile Test. Direction : Transversal, Gauge Length : 200mm(Reictangular),
YP Method : 0.2% off-set
Impact Test Direction : Longitudinal,
T.L.R.(Trans Longitude Ratio)
Division - L:Ladle Analysis
Chemical Composition Unit: -2:x1/100, -3:x1/1000, -4:x1/10000, -5:x1/100000
Tr : It is within the standard range(<0.008%) and include trace element.
Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.5 dated JUL.01.2006 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and(or) KEPIC MINA/ SNA4300.
B) No repair welding was performed to the products.
C) The product numbers listed on this test report identifies the material
- We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.
* This Mill Test Certificate cannot be copied for any purpose.



Surveyor To:

Na, Chai Bong
Chief of material testing section Na, C.B

POSCO Pohang Works, 5 Dongchon-dong, Nam-gu, Pohang-si, Gyeongsangbuk-do, 790-785, Korea



POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 070213-PPSA-002-022
Date of Issue/발행일자 : Feb., 22, 2007

Order No./계약번호 : 0002675602

PO No./주문번호 : E10577
(ASME2004EDITION)

Supplier/주문자 : DAE WOO INTERNATIONAL CORP.

Commodity/품명 : HR STEEL PLATE (ISO10474/3.1B)

Customer/고객사 : EDMONTON EXCHANGER

Spec & Type/규격 : ASME SA516-70

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 재간번호	POSITION	Tensile/인장시험		Impact/ 충격시험 V Notch -50°F	Chemical Composition/화학성분 (%)														
						YP (KSI)	TS (KSI)		EL (%)	Energy SF (FT-LBS)	C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V
0.75"x96.5"x480"	PA23973801	1	4,467 9,848	SA55525	T	50.9	77.3	29	1:101 2:83 3:72 A:85	1830	349	1171	68	19	2	24	Tr	106	Tr	Tr	2	20	39
0.75"x96.5"x480"	PA24489401	1	4,467 9,848	SA55525	T	50.5	76.9	30	1:120 2:141 3:131 A:131	1830	349	1171	68	19	2	24	Tr	106	Tr	Tr	2	20	39
0.75"x96.5"x480"	PA24870401	1	4,467 9,848	SA57299	T	51.1	76.0	28	1:132 2:123 3:128 A:128	1748	375	1159	98	19	3	23	Tr	107	Tr	Tr	2	20	38
0.75"x96.5"x480"	PA24870501	1	4,467 9,848	SA57299	T	50.9	75.9	28	1:107 2:117 3:118 A:114	1748	375	1159	98	19	3	23	Tr	107	Tr	Tr	2	20	38
0.75"x96.5"x480"	PA24870701	1	4,467 9,848	SA57299	T	50.3	76.0	29	1:113 2:132 3:139	1748	375	1159	98	19	3	23	Tr	107	Tr	Tr	2	20	38

* Position - T : Top, M : Middle, B : Bottom
* Tensile Test. Direction : Transversal, Gauge Length : 200mm(Rectangular),
YP Method : 0.2% off-set
* Impact Test. Direction : Longitudinal,
T.L.R.(Trans Longitude Ratio)
* Division - L:Ladle Analysis
* Chemical Composition Unit: -2:x1/100, -3:x1/1000, -4:x1/10000, -5:x1/100000
* Tr : It is within the standard range(<0.008%) and include trace element.
* Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.5 dated JUL.01.2006 and POG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and(or) KEPIC MNA/ SNA4300.

B) No repair welding was performed to the products.

C) The product numbers listed on this report identifies the material

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

* This Mill Test Certificate cannot be copied for any purpose.



Surveyor To:

Na, Chai Bong

KT-101, 10 MAR 01 2005

POSCO Pohang Works, 5 Dongchon-dong, Nam-gu, Pohang-si, Gyeongsangbuk-do, 790-785, Korea

Chief of material testing section Na, C.B



POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호: 070213-PPSA-002-023
Date of Issue/발행일자: Feb., 22, 2007

Order No./계약번호: 0002675602

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

PO No./주문번호: E10577
(ASME2004 EDITION)

Commodity/품명: HR STEEL PLATE (ISO10474/3.1B)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70

Size/지수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 재간번호	POSITION	Tensile/인장시험		Impact/충격시험		Chemical Composition/화합성분(%)														
						YP (KSI)	TS (%)	EL (%)	V Notch -50°F	Energy (FT-LBS)	SF (%)	C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V
0.75"x96.5"x480"	PC23953401-3402	2	8,934 19,696	SB64080	T	53.2	78.6	28	A:128 1:114 2:95 3:96	A:102	1692	356	1167	117	16	2	21	Tr	93	Tr	Tr	1	17	32
0.75"x96.5"x480"	PC23953501-3502	2	8,934 19,696	SB64080	T	52.8	77.9	31	A:102 1:137 2:148 3:134	A:140	1692	356	1167	117	16	2	21	Tr	93	Tr	Tr	1	17	32
0.75"x96.5"x480"	PC23953601-3602	2	8,934 19,696	SB64080	T	51.9	77.0	28	A:140 1:147 2:148 3:136	A:144	1692	356	1167	117	16	2	21	Tr	93	Tr	Tr	1	17	32
0.75"x96.5"x480"	PB30263501-3503	3	13,401 29,544	SB64460	T	50.2	75.3	27	A:144 1:63 2:49 3:80	A:64	1800	343	1147	97	19	2	22	Tr	90	Tr	Tr	1	19	29
0.75"x96.5"x480"	PB30267101-7103	3	13,401 29,544	SB64460	T	51.2	76.3	28	1:117 2:119		1800	343	1147	97	19	2	22	Tr	90	Tr	Tr	1	19	29

* Position - T : Top, M : Middle, B : Bottom
* Tensile Test. Direction : Transversal, Gauge Length : 200mm(Rectangular),
YP Method : 0.2% off-set

* Impact Test. Direction : Longitudinal,
T.L.R.(Trans Longitude Ratio)

* Division - L:Ladle Analysis

* Chemical Composition Unit: -2x1/1000, -3x1/1000, -4x1/10000, -5x1/100000

* Tr : It is within the standard range(<0.008%) and include trace element.

* Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.5 dated JUL.01.2006 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and (or) KEPIC MINA/ SNA4300.

B) No repair welding was performed to the products.

C) The product numbers listed on this test report identifies the material

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

* This Mill Test Certificate cannot be copied for any purpose.



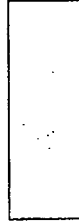
KT-101, ID: 10081012005

Surveyor To:

Na, Chai Bong

POSCO Pohang Works, 5 Dongchon-dong, Nam-gu, Pohang-si, Gyeongsangbuk-do, 790-785, Korea

Chief of material testing section Na, C.B



posco Mill Test Certificate/검사증명서

Certificate No./증명서번호: 070213-PPSA-002-024
Date of Issue/발행일자: Feb., 22, 2007

Order No./계약번호: 0002675602

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

Customer/고객사: EDMONTON EXCHANGER

PO No./주문번호: E10577
(ASME2004 EDITION)

Commodity/품명: HR STEEL PLATE (ISO10474/3.1B)

Spec & Type/규격: ASME SA516-70

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 재간번호	P O S I T I O N	Tensile/인장시험		Impact/충격시험		Chemical Composition/화합성분(%)													
						YP (KSI)	TS (%)	EL (%)	V Netch -50°F	Energy SF (FT-LBS)	C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V
0.75"x96.5"x480"	PB30309601-9602	2	8,934 19,696	SB64460	T	51.8	76.3	27	3:117 A:118	L	1800	343	1147	97	19	2	22	Tr	90	Tr	1	19	29
0.75"x96.5"x480"	PB30309701-9702	2	8,934 19,696	SB64460	T	51.5	76.6	28	2:131 3:133 A:122	L	1800	343	1147	97	19	2	22	Tr	90	Tr	1	19	29
0.75"x96.5"x480"	PB30309801-9802	2	8,934 19,696	SB64460	T	51.5	76.6	29	1:136 2:139 3:132 A:136	L	1800	343	1147	97	19	2	22	Tr	90	Tr	1	19	29
0.75"x96.5"x480"	PB30309901-9902	2	8,934 19,696	SB64460	T	52.1	76.6	30	1:150 2:136 3:146 A:144	L	1800	343	1147	97	19	2	22	Tr	90	Tr	1	19	29
0.75"x96.5"x480"	PB30310001	1	4,467	SB64460	T	51.9	76.6	29	1:140 2:139 3:149 A:143 1:153	L	1800	343	1147	97	19	2	22	Tr	90	Tr	1	19	29

* Position - T : Top, M : Middle, B : Bottom
* Tensile Test. Direction : Transversal, Gauge Length : 200mm(Rectangular).
* YP Method : 0.2% off-set

* Impact Test. Direction : Longitudinal,
T.L.R(Trans Longitude Ratio)

* Division - L:Ladle Analysis

* Chemical Composition Unit: -2:x1/100, -3:x1/1000, -4:x1/10000, -5:x1/100000
* Tr : It is within the standard range(<0.008%) and include trace element.

* Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.5 dated JUL.01.2006 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and(or) KEPIC MNAI SNA4300.

B) No repair welding was performed to the products.

C) The product numbers listed on this test report identifies the material

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

* This Mill Test Certificate cannot be copied for any purpose.



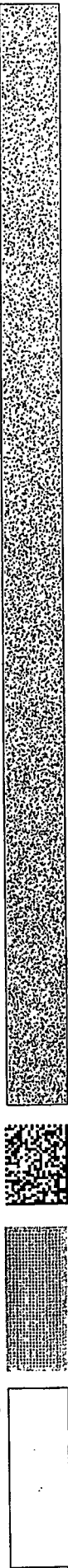
Surveyor To:

Na, Cha, Bong

KT-01, to MAR.01.2005

POSCO Pohang Works, 5 Dongchon-dong, Nam-gu, Pohang-si, Gyeongsangbuk-do, 790-785, Korea

Chief of material testing section Na, C.B



posco Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 070213-PPSA-002-025
Date of Issue/발행일자 : Feb., 22, 2007

Order No./계약번호 : 0002675602

Supplier/주문자 : DAE WOO INTERNATIONAL CORP.

PO No./주문번호 : E10577
(ASME2004 EDITION)

Commodity/품명 : HR STEEL PLATE (ISO10474/3.1B)

Customer/고객사 : EDMONTON EXCHANGER

Spec & Type/규격 : ASME SA516-70

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 재광번호	P O S I T I O N	Tensile/인장시험 YP TS EL (KSI) (%)	Impact/충격시험 V Notch 50°F Energy SF (FT-LBS) (%)	Chemical Composition/화학성분 (%)																
								C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Sol-Al			
0.75"x120.5"x480"	PB30062801-2803	3	16,737 36,897	SB64078	T	53.4 78.5 28	1:105 2:126 3:123 A:118 1:143 2:117	2:144 3:136 A:145 275.741 (LBS)	4	-3	-3	-4	-4	-2	-2	-4	-3	-2	-3	-3	-3	-3		
0.75"x120.5"x480"	PB30062801-2803	3	16,737 36,897	SB64078	T	54.0 80.4 29	1:143 2:117 3:122 A:128	1:120 2:125 3:131 A:125 1:139	L	1793	378	1183	97	15	2	24	Tr	99	99	Tr	Tr	1	20	33
0.75"x120.5"x480"	PB30062901-2903	3	16,737 36,897	SB64078	T	54.2 80.8 29	1:120 2:125 3:131 A:125 1:139	1:120 2:125 3:131 A:125 1:139	L	1793	378	1183	97	15	2	24	Tr	99	99	Tr	Tr	1	20	33
0.75"x120.5"x480"	PB30063401-3403	3	16,737 36,897	SB64078	T	53.7 78.8 27	1:120 2:125 3:131 A:125 1:139	1:120 2:125 3:131 A:125 1:139	L	1793	378	1183	97	15	2	24	Tr	99	99	Tr	Tr	1	20	33

Position - T : Top, M : Middle, B : Bottom
Tensile Test Direction : Transversal, Gauge Length : 200mm (Rectangular),
YP Method : 0.2% off-set
Impact Test Direction : Longitudinal,
T.L.R (Trans Longitude Ratio)
Division - L: Ladle Analysis
Chemical Composition Unit : 2: x1/100, -3: x1/1000, -4: x1/10000, -5: x1/100000
Tr : It is within the standard range (<0.008%) and include trace element.
Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.5 dated JUL.01.2006 and POG07 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and (or) KEPIC MNA/ SNA4300.
B) No repair welding was performed to the products.
C) The product numbers listed on this test report identifies the material
- We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.
* This Mill Test Certificate cannot be copied for any purpose.



Surveyor To:

Na, Chai, Bong

KT-001, 10 MAR 01, 2005

POSCO Pohang Works, 5 Dongchon-dong, Nam-gu, Pohang-si, Gyeongsangbuk-do, 790-785, Korea

Chief of material testing section Na, C.B



POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호: 070213-PPSA-002-031
 Date of Issue/발행일자: Feb., 22, 2007

Order No./계약번호: 0002675602

PO No./주문번호: E10577
(ASME2004 EDITION)

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

Commodity/품명: HR STEEL PLATE (ISO10474/3.1B)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	POSITION		TENSILE/인장시험		IMPACT/충격시험		CHEMICAL COMPOSITION/화학성분 (%)											
					Yield YS (KSI)	Tensile TS (KSI)	EL (%)	V Notch V	Energy (FT-LBS)	SF (%)	C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti
*** HEAT TREATMENT *** Normalized : 890 C 43min. **												* LOT NO ==> VACUUM DEGASSED										
*** Lot Total ***			257				1,085,963 (kg)	1,085,963 (kg)	2,394,103 (LBS)													
*** Grade Total ***			257				1,085,963 (kg)	1,085,963 (kg)	2,394,103 (LBS)													
*** Grand Total ***			257				1,085,963 (kg)	1,085,963 (kg)	2,394,103 (LBS)													



* Position - T : Top, M : Middle, B : Bottom
 * Tensile Test: Direction : Transversal, Gauge Length : 200mm (Rectangular),
 YP Method : 0.2% off-set
 * Impact Test: Direction : Longitudinal,
 T.L.R.(Trans Longitude Ratio)
 * Division - L:Ladle Analysis
 * Chemical Composition Unit: -2:x1/100, -3:x1/1000, -4:x1/10000, -5:x1/100000
 * Tr : It is within the standard range (<0.008%) and include trace element.
 * Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.5 dated JUL 01,2006 and POG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and(or) KEPIC MNAJ SNA4300.
 B) No repair welding was performed to the products.
 C) The product numbers listed on this test report identifies the material
 - We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.
 * This Mill Test Certificate cannot be copied for any purpose.



KT-01, 10 MAR 01 2005

Surveyor To:

Na, Chai Bong

Chief of material testing section Na, C.B

POSCO Pohang Works, 5 Dongchon-dong, Nam-gu, Pohang-si, Gyeongsangbuk-do, 790-785, Korea



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
 324601-20.12.08

A08/ Manufacturer's order/ A03 Certificate No.
 343880-002

B01 Product
 HOT ROLLED PLATES

A06 Purchaser
 EDMONTON STEEL, EDMON

A07.1 No. ED10512-J1010-IG


Final receiver
 EDMONTON STEEL, EDMON

A07.2 No. SA20-S5

B02 Steel design. SA516-70

B03 Any suppl. requirements ASME-2A:07
 DIL-HUE-2:R24-2007-11-20

Sheet
 1/...



A01-A99 Further commercial information - Concession requests

B14 Item No.	B07.1 Hot.plate/ Test No.	B16 Concession request no.	Date
01	62313-01	TO/A1195/2008	19.11.08

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
01	1	0,7500 X	172,00000 X	344,00000 X	5708 N	N	328250	62306-01	62306-01
01	1	0,7500 X	172,00000 X	344,00000 X	5708 N	N	328250	62306-02	62306-02
01	1	0,7500 X	172,00000 X	344,00000 X	5708 N	N	328250	62306-03	62306-03
01	1	0,7500 X	172,00000 X	344,00000 X	5708 N	N	328250	62313-01	62313-01
01	1	0,7500 X	172,00000 X	344,00000 X	5708 N	N	328250	62313-02	62313-02
01	1	0,7500 X	172,00000 X	344,00000 X	5708 N	N	328250	62313-03	62313-03
**	6				34248				
02	1	0,8750 X	178,00000 X	356,00000 X	7133 N	N	329612	76058-01	76058-01
02	1	0,8750 X	178,00000 X	356,00000 X	7133 N	N	329612	76058-02	76058-02
02	1	0,8750 X	178,00000 X	356,00000 X	7133 N	N	329614	76032-01	76032-01
02	1	0,8750 X	178,00000 X	356,00000 X	7133 N	N	329614	76032-02	76032-02
**	4				28532				
***	10				62780				

B04 Product delivery condition

ITEM NO.: 01-02
 N: HT: 1670 GR.F +36 -27 GR.E
 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

ZM1Z02Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

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

AHB

B. MUELLER
 Test House Manager

Inspector's stamp
 Date 22.12.08

KW 1



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
 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
 MATERIAL TEST REPORT (MTR)

A05 Established inspecting body A06 Purchaser EDMONTON STEEL, EDMON A07.1 No. ED10512-J1010-LG
 DH Final receiver EDMONTON STEEL, EDMON A07.2 No. SA20-S5

B02 Steel design SA516-70
 B03 Any suppl. requirements ASME-2A:07
 DIL-HUE-2:R24-2007-11-20

B06 Marking of the product
 ITEM NO.: 01-02
 STEEL DESIGNATION SA516 70 MTLTV SA516 60 MELTV
 HEAT NO. / TRADEMARK / ROLLED PLATE NO. - TEST NO. / INSPECTOR'S STAMP

C10-C29 Tensile test

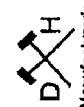
Item No.	B07.2 Heat No.	B07.1 Rol./plate/ Test No.	B05 Reference (heat) treatment	C01 C02/ C03 C01		C12 C13	C14-C15
				Temp. GRF	KSI RP02		
01	328250	62306	K1 Q	RT	48,1	RM 72,5	A 28,9
01	328250	62313	K1 Q	RT	48,4	73,4	A 28,4
02	329612	76058	K1 Q	RT	48,9	74,7	A 27,0
02	329614	76032	K1 Q	RT	44,7	72,8	

C30-C39 Hardness test

Item No.	B07.2 Heat No.	B07.1 Rol./plate/ Test No.	B05 Reference (heat) treatment	C01 C02/ C03 C01	C03 Temp. GRF	C33 Testing method	C35 Individual values	C32 Mean value
01	328250	62306	K1	O	RT	HBW 10/3000	140	140
01	328250	62313	K1	O	RT	HBW 10/3000	139	137
02	329612	76058	K1	O	RT	HBW 10/3000	148	148
02	329614	76032	K1	O	RT	HBW 10/3000	142	142

C40-C49 Impact test

Item No.	B07.2 Heat No.	B07.1 Rol./plate/ Test No.	B05 Reference (heat) treatment	C01 C02/ C03 C01	C40 Width of test piece	C41 Type of test piece	C44 Testing method	C48 Energy	C45 Individual values	C43 Mean value
01	328250	62306	K1	LV	-51	CHP-V		100	128	110
01	328250	62313	K1	LV	-51	CHP-V		94	96	101
02	329612	76058	K1	LV	-51	CHP-V		96	158	134

A04 201202203 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.
QM-System: Certification as per ISO 9001

 Manufacturer's mark
 B. MUELLER
 Test House Manager
 AG der Dillinger Hüttenwerke
 Postfach 1580, D-66748 Dillingen/Saar
 Inspection department
 Inspector's stamp Date 22.12.08 KW 1



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
 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
 MATERIAL TEST REPORT (MTR)

A05 Established inspecting body A06 Purchaser EDMONTON STEEL, EDMON A07.1 No. ED10512-J1010-LG
 DH Final receiver EDMONTON STEEL, EDMON A07.2 No. SA20-S5

B02 Steel design. SA516-70
 B03 Any suppl. ASME-2A:07 requirements DIL-HUE-2:R24-2007-11-20

A10 Advice of dispatch No./ Date of dispatch
 324601-20.12.08

A08/ Manufacturer's order/ A03 Certificate No.
 343880-002

B01 Product
 HOT ROLLED PLATES

Sheet
 3/...

C40-C49 Impact test

B07.2 Heat No.	B07.1 Roll-plate/ Test No.	B05 Reference (heat) treatment	C01 KI	C02/ C01 IV	C03 Temp. GR.F -51	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy	C45 AV	C42 Individual values AV=FT.LBF	C43 Mean value
02	329614	76032					CHP-V			91	75	86

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
328250	Y	0,185	0,228	1,10	0,012	0,0011	0,0048	0,026	0,009	0,029	0,049	0,002	0,000	0,001	0,003
329612	Y	0,176	0,363	1,17	0,008	0,0008	0,0075	0,054	0,030	0,043	0,047	0,000	0,000	0,004	0,003
329614	Y	0,177	0,367	1,16	0,009	0,0007	0,0071	0,031	0,013	0,039	0,040	0,001	0,000	0,001	0,002

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	FO-02=	FO-55=	FO-78=	FO-91=
328250	0,38	0,11	0,06	5,9
329612	0,39	0,17	0,08	6,6
329614	0,39	0,12	0,05	6,6

C95 Ladle treatment

ITEM NO.: 01-02
 HEAT OF THE INDICATED ITEM: VACUUM DEGASSED / SULPHIDE SHAPE CONTROL

BROMLEY MECHANICAL SERVICES INC.
 Checked to ASME Div. 1

Spec IIA 2a0 Edn Add
 SA20 SEP 02 2011
 Date

A04 201202Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001



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

B. MUELLER
 Test House Manager



Inspector's stamp Date 22.12.08

KW 1



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
 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991
 MATERIAL TEST REPORT (MTR)

A05 Established inspecting body DH A06 Purchaser EDMONTON STEEL, EDMON A07.1 No. ED10512-J1010-LG A07.2 No. SA20-S5
 Final receiver EDMONTON STEEL, EDMON

A10 Advise of dispatch No./Date of dispatch 324601-20.12.08
 A08/ Manufacturer's order/ A03 Certificate No. 343880-002
 B01 Product HOT ROLLED PLATES

Sheet 4/....

C70-C99 Chemical composition % - Product analysis

Heat	Test No.	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
B07.1	328250	0,181	0,218	1,08	0,012	0,0010	0,0037	0,028	0,007	0,026	0,045	0,001	0,000	0,000	0,003
B07.1	329612	0,168	0,350	1,13	0,007	0,0008	0,0082	0,053	0,031	0,041	0,047	0,000	0,000	0,002	0,003
B07.1	329614	0,170	0,365	1,14	0,009	0,0006	0,0070	0,027	0,011	0,038	0,039	0,000	0,000	0,000	0,002

C94 Product analysis Carbon equivalent / Alloying restrictions

Heat	Test No.	CA	AL-T
B07.2	328250	0,0002	0,032
B07.2	329612	0,0002	0,033
B07.2	329614	0,0002	0,040

C94 Carbon equivalent formula / Alloying restrictions

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

Z01702/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001

B. MUELLER

B. MUELLER
Test House Manager



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

Inspector's stamp Date 22.12.08 KW 1



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 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 324601-20.12.08	A08 Manufacturer's order/ A03 Certificate No. 343880-002	Sheet 5
A05 Established inspecting body DH	A06 Purchaser Final receiver EDMONTON STEEL, EDMON EDMONTON STEEL, EDMON	A07.1 No. ED10512-J1010-LG A07.2 No. SA20-S5	B01 Product HOT ROLLED PLATES
B02 Steel design. SA516-70	B03 Any suppl. requirements ASME-2A:07 DIL-HUE-2:R24-2007-11-20		

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

ITEM NO.: 01-02
 RESULT OF MARKING, SURFACE, SHAPE AND DIMENSIONS: NO REMARKS
 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  Manufacturer's mark	ZD-1/202/203 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order. QM-System: Certification as per ISO 9001	A01 AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar Inspection department
 B. MUELLER Test House Manager	ADB Inspector's stamp Date 22.12.08	KW 1

BROMLEY MECHANICAL SERVICES

MATERIAL INSPECTION REPORT

DIA SIZE OR WITH: NPS OD ID **24"**

LENGTH **60"**
THICKNESS

PIPE PUBLISHED NOM
PLATE NOM

Weight per foot for pipe over 4"

INSPECTED BY: **MICHAEL QUINN** GRADE: **SA 516-70 MT EE**

DATE: **AUGUST 29/2011** HEADS 2:1 HEMI

P.O.# **PO-75688** WELD CAP OTHER

SUPPLIER: **EDMONTON EXCHANGERS** SHELL

PART ID#: **VES 27757** PIPE → NDE BY MANUFACTURER
 PLATE HYDRO YES NDE NO
 REPAD NO
 STRUCT. NO
 OTHER YES

REQ. MIN TK: **0.7500"**

MATERIAL TRACKING NUMBER	QTY	HEAT NUMBERS		MIN. THK.	THICKNESS & LOG				VISUAL EDGE	INSP. SURF.	REQ. MARKINGS VERIFIED	PREPARED BY
		HEAT NUMBER	PLATE NUMBER		A	B	C	D				
	1	0909L	78306		0.765"	0.769"	0.764"	0.761"	ok	ok	ok	MLQ
W/O#	WO-34000				RECEIVED & ACCEPTED BY: SA REQUIRED CODE MARKINGS:							
CUSTOMER:	HUSKY ENERGY				DATE: SEP 02 2011							



edmonton exchanger
& manufacturing ltd.

CERTIFICATE OF COMPLIANCE

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

Customer BROMLEY MECHANICAL SERVICES PO 75688 Work Order C90707 Date 2011/08/17 CotC# 26741 Page 1 of 1
LT

Item#	Description	Qty	Heat#	Weld Proc.	Form. Proc.
S90707-1-1	SHELL(S) - 0.7500" NOM X 24" OD X 60" (Material Spec: SA 516-70 Normalized)	1	0909L-78306	WP600	4

Forming Procedure:

4. Cold Formed

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.

Supplementary Examination - Items

ESSAR Steel Algoma Inc.

105 West Street, Sault Ste. Marie, Ontario Canada P6A 7B4

CUSTOMER PURCHASE ORDER NUMBER CLAIM 2010-4541	ENTRY DATE 2010/12/07	SHIP DATE 2011/01/11	TALLY NUMBER 209755	SHIPPER'S NO. CN	CARRIER CN	MILL ORDER 71004
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CHARGE TO CUSTOMER NAME AND ADDRESS
EDMONTON STEEL PLATE
5545 - 89TH STREET
EDMONTON, ALBERTA
T6E 5W9

SHIP TO CUSTOMER NAME AND ADDRESS
EDMONTON STEEL PLATE
SWITCH 2057 / EAST EDMONTON
CLOVER BAR, AB

CUSTOMER SPECIFICATION
HR PLATE - CARBON - ASME SA516 GR 70 (10) - CVNL 15/12 FT LBS AT -50 F -
ALG-STE7 R12 2010-01-15 PER SA20 - ESP-03R2 - HEAT ANALYSIS INCLUDING CE &
&B. PRODUCT ANALYSIS INCLUDING %B SULPHIDE SHAPE CONTROL - FINE GRAIN - PVO -
NORMALIZED - FLATNESS 1/2 A-20 - (TOP AND BOTTOM CRITICAL) - NORMALIZED 25
MINUTES MIN. @ 1670F

SUPPLEMENTARY INSTRUCTIONS
TEST CERT 1: WHIEMSTRA@EDMONTONEXCHANGER.COM TEST CERT 2: PLA
TE TEST COUPON:

INSP TR TEST REPORTS REQ'D - INCL C.E. & BORON PRODUCT ANALYSIS 2000171117 PF
CUST USE PRESSURE VESSELS HEADS P/N REPLACEMENT 2011/01/16 08:22

MEETS EN 10204 3 1
ISO QUALITY AND ENVIRONMENTAL CERTIFICATES AVAILABLE AT WWW.ESSARSTEELALGOMA.COM
ALL HEATS FULLY KILLED
HEATS INDICATED WITH (*) FINE GRAINED
HEATS INDICATED WITH (+) MADE IN CANADA WITH DOMESTIC AND NORTH AMERICAN MATERIALS

CUSTOMER ITEM 00001 OUR ITEM 001 DIMENSIONS .750 X 120.5 X 480 "

PLATE NUMBER	HEAT-MS PIECES	NO.	WEIGHT	PLATE NUMBER	HEAT-MS PIECES	NO.	WEIGHT
78306	0909L-56	2	24605				

TENSILE TESTS:
PLATE NUMBER 78306 * SAMPLE * * * TEST * * * YIELD TENSILE * * * ELONG * * *
HEAT NUMBER 0909L 166" SRCE GAUGE .7500 N .2 COND METH DIR T 51.2 KSI 75.1 KSI % ELONG 29(8")

IMPACT TESTS:
PLATE NUMBER 78306 * * * TEST * * * * * FULLSIZE ENERGY * * *
HEAT NUMBER 0909L 166" SRCE IN GAUGE .7500 N COND METH DIR L SIZE TEMP * * * FT/LB * * * AVG* 54 55 60 57

MILL TEST REPORTS
ESSAR STEEL ALGOMA INC. HEREBY CERTIFIES THAT THE MATERIAL HEREIN DESCRIBED WAS MADE AND TESTED IN ACCORDANCE WITH THE RULES OF THE SPECIFICATION SHOWN. ALL RESULTS ARE RETAINED IN ACCORDANCE WITH THE COMPANY'S STANDARD RECORD-KEEPING PRACTICES.

M. MCLEAN
MANAGING METALLURGIST

THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALGOMA INC. IF YOU RECEIVE THIS DOCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705)945-2624 COLLECT FOR INSTRUCTIONS ON METHOD OF DISPOSAL OF DOCUMENT.



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

LAB ALG

SPEC LAB
ASTM ALG

ESSAR Steel Algoma Inc.

105 West Street, Sault Ste. Marie, Ontario Canada P6A 7B4

CUSTOMER PURCHASE ORDER NUMBER CLAIM 2010-4541	ENTRY DATE 2010/12/07	SHIP DATE 2011/01/11	TALLY NUMBER 209755	SHIPPER'S NO. CN	CARRIER CN	MILL ORDER 71004
---	--------------------------	-------------------------	------------------------	---------------------	---------------	---------------------

CHARGE TO CUSTOMER NAME AND ADDRESS

EDMONTON STEEL PLATE
5545 - 89TH STREET
EDMONTON, ALBERTA
T6E 5W9

EDMONTON STEEL PLATE
SWITCH 2057 / EAST EDMONTON
CLOVER BAR, AB

CUSTOMER SPECIFICATION

HR PLATE - CARBON - ASME SA516 GR 70 (10) - CVNL 15/12 FT LBS AT -50 F -
ALG-STE7 R12 2010-01-15 PER SA20 - ESP-03R2 - HEAT ANALYSIS INCLUDING CE &
%B, PRODUCT ANALYSIS INCLUDING %B, SULPHIDE SHAPE CONTROL - FINE GRAIN - PVO -
NORMALIZED - FLATNESS 1/2 A-20 - (TOP AND BOTTOM CRITICAL) - NORMALIZED 25
MINUTES MIN. @ 1670F

SUPPLEMENTARY INSTRUCTIONS

TEST CERT 1: WHIEMSTRA@EDMONTONEXCHANGER.COM TEST CERT 2: PLA
TE TEST COUPON:

INSP TR TEST REPORTS REQ'D - INCL C.E. & BORON PRODUCT ANALYSIS 2000171117 PF
CUST USE PRESSURE VESSELS HEADS P/N REPLACEMENT 2011/01/16 08:22

* * * * * M E C H A N I C A L P R O P E R T I E S * * * * *

PRODUCT ANALYSIS TESTS:	P	S	SI	CR	NI	CU	MO	AL	CB	V	B	DO
PLATE	MN	AS	ZR	PB	SB	.04	.01	.026	.003	.017	.0002	.39
HEAT NUMBER COND	012	.005	.32	.03	.15							
0909L 78306	.004	.0050										
* * * * * C H E M I C A L P R O P E R T I E S * * * * *												
HEAT (WT %)	C	AS	SI	CR	NI	CU	MO	AL	CB <td>V <td>B <td>DO</td> </td></td>	V <td>B <td>DO</td> </td>	B <td>DO</td>	DO
0909L**	.20	.004	.32	.03	.15	.05	.01	.026	.000	.017	.0002	.40
	.004	.0044										

BROMLEY MECHANICAL SERVICES INC.
Checked to ASME Div. 1

Sect. IIA 2019 Edd. Add. SEP 02 2011 Date
SA 20



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

BROMLEY MECHANICAL SERVICES

MATERIAL INSPECTION REPORT

INSPECTED BY: Michael Quinn GRADE: SAS3B DIA SIZE OR WITH: 24"

DATE: January 14/2011 HEADS 2:1 DME METER #1 LENGTH 40'
 P.O.#: 74413 HEMI DME METER #2 THICKNESS 5TO
 WELD CAP OTHER PIPE PUBLISHED NOM 0.3750
 SHELL OTHER NDE BY MANUFACTURER HYDRO YES NO YES NO YES NO YES NO

SUPPLIER: Van Leeuwen Pipe + Tube PIPE PLATE REPAD STRUCT. OTHER WEIGHT PER FOOT FOR PIPE OVER 4" 94.71

MATERIAL TRACKING NUMBER	QTY	HEAT NUMBERS		MIN. THK.	THICKNESS & LOG				VISUAL EDGE	INSP. SURF.	REQ. MARKINGS VERIFIED	PREPARE BY
		HEAT NUMBER	PLATE NUMBER		A	B	C	D				
VS 29302	42'	0012028		0.365	.365	.368	.370	.371	OK	OK	OK	MD
VS 29303	42'	0032190		0.368	.372	.375	.370	.368	OK	OK	OK	MD
W/O#		RECEIVED & ACCEPTED BY:			REQUIRED CODE MARKINGS:							
CUSTOMER:		DATE: <u>2/15/11</u>			<u>Hussteel Co Ltd - Made in Korea</u>							
	<u>Stock</u>				<u>All Marking Stenciled on Pipe</u>							

34000

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

CERTIFICADO DE INSPECCION
 Inspection Certificate - Certificat de Réception

DIN EN 10204 / 3.1
 ISO 10474 / 3.1



SGI 6000296
 SGI 6000297
 SGI 1922164

HOJA: 2
 Page: 2

FECHA: 20/05/2011
 Date: 20/05/2011

138506

Bº Zubillaga, 3 - Apdo. 1º
 20560 OÑATI (Gipuzkoa) SPAIN
 Tel.: 34 - 943 780552
 Fax: 34 - 943 781806
 E-mail: ulma@ulmapiping.com

Certified acc. PED 97/23/EC-AD2000-WI
 by TÜV Rheinland
 N.º 01 202 EQ 02 7443

DE of - de 22/12/2010

SU PEDIDO N.º
 Your Order No. 4889097-00
 Votre Cde. N.º

FLANGES

NORMAS APLICABLES
 Requirements - Normes Applicables:
 ASME B16.5-09

MATERIAL CORRESPONDIENTE
 Material Correspondent - Qualif
 ASTM/ASME

NACE MR0175/ISO15156-2 Region 3-2003
 NACE MR0103 : 2007
 CSA-Z245.12-09 GR248 CAT II - SS

PRODUCTO
 Article - Produit

NORMAS APLICABLES
 Requirements - Normes Applicables:
 ASME B16.5-09

MATERIAL CORRESPONDIENTE
 Material Correspondent - Qualif
 ASTM/ASME

MODO DE FUSION (¹)
 Steel Making - Elaboration de l'acier
 E = Elec. Y = Oxígeno básico



MARCA DEL FABRICANTE
 Mark of factory
 Marque du fabricant: 83918

DEPARTAMENTO QUALITY ASSURANCE
 Section

PARTIDA Item Poste	CANTIDAD Quantity Quantité	DESCRIPCION Description Description	LOTE	OBSERVACIONES Remarks Observations (¹)	COLADA N.º Heat No N.º Coulée	RESISTENCIA T. Strength Resist Rupt N/mm²	LONGITUD L. Length Longueur mm	ALARGAM. Elongation Allongement Lr: 4 d %	ESTRICCION Red. Area Striction %	RESILIENCIA Impact Test Résilience Joules	PROBETA - SPECIMEN		DUREZA Hardness Dureté HB		
											MEZCLA Average Moyenne	°C			
240 7587751	24	WN 4 600LB XXS RF A350LF2	1311	NE	241V1	511		34,90	62,80	55	53	49	53	-50	148 157
244 7580031	24	WN 4 600LB S160 RF A350LF2	1311	NE	241V1	511		34,90	62,80	55	53	49	53	-50	148 157
286 7582169	105	WN 2 1500LB S160 RTJ A350LF2	1321	NE	296V1	510		33,70	61,90	49	60	49	52	-50	147 156

COMPOSICION QUIMICA - STEEL MAKER'S LADLE ANALYSIS - ANALYSE CHIMIQUE

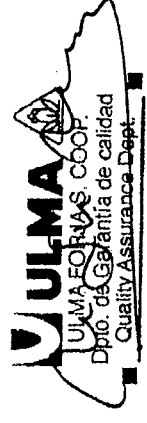
COLADA N.º Heat No N.º Coulée	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Nb %	V %	Cu %	Al %	Ti %	N %	CEq %
241V1	0,200	0,280	0,880	0,010	0,003	0,090	0,100	0,050	0,001	0,002	0,280	0,024	0,000	0,000	0,400
296V1	0,210	0,240	0,830	0,010	0,001	0,120	0,080	0,060	0,001	0,003	0,250	0,024	0,000	0,000	0,407

(¹) OBSERVACIONES: N NORMALIZED AT 900 C AND ALLOWED TO COOL IN STILL AIR

Remarks
 Observations

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

EL INSPECTOR
 Works Inspector - L'Inspecteur



BROMLEY MECHANICAL SERVICES MATERIAL INSPECTION REPORT

INSPECTED BY: MICHAEL QUINN DIA SIZE OR WITH: 4" NPS OD ID

DATE: JUNE 16/2011 GRADE: SA 333GR6

LENGTH: 20'

THICKNESS: XXH

PIPE PUBLISHED NO: 0.674"

PLATE NOM: _____

HEADS: 2:1 HEMI

WELD CAP OTHER

SHELL: PIPE → NDE BY MANUFACTURER

PIPE: HYDRO YES: NO:

PLATE: NDE YES: NO:

REPAD: NO:

STRUCT.: NO:

OTHER: YES:

SUPPLIER: MIDFIELD SUPPLY LTD

PART ID#: SPI 46603

REQ. MIN TK: _____

Weight per foot for pipe over 4" 27.57

MATERIAL TRACKING NUMBER	QTY	HEAT NUMBERS		MIN. THK.	THICKNESS & LOG				VISUAL EDGE	INSP. SURF.	REQ. MARKINGS VERIFIED	PREPARED BY
		HEAT NUMBER	PLATE NUMBER		A	B	C	D				
VS 29717	21'	44380		0.650"	0.652"	0.655"	0.654"		OK	OK	OK	MQ

W/O# _____

RECEIVED & ACCEPTED BY: *[Signature]*

DATE: 6/16/11

CUSTOMER: BMS STOCK

REQUIRED CODE MARKINGS: TENARIS-MADE IN ARGENTINA

ALL MARKINGS STENCILED ON PIPE



INSPECTION CERTIFICATE

(BS EN 10204 3.1: 2004 - ISO 10474 3.1B: 1991)

SIDERCA S.A.I.C.
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(82804)MHA Campana
Buenos Aires, Argentina
(54) 3489 433100 tel.
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Cliente / Customer MC-JUNKIN CORPORATION		Expediente/ Manufacturing Order 5/6268.28		Número / Number 585613		Fecha / Date 14/03/2011		Pág./Page 1 / 7	
Producto / Product CARBON STEEL FOR LOW TEMPERATURE SERVICE		Orden de Compra/ Purchase Order C012 726237 4D0		Item 00048		Referencia del Cliente / Customer Reference C012 726237 4D0			
Norma / Standard ASTM/A533+CSA Z245.1-07 CATII SSPSP00374/1+NACE MR0175/103+IPRO LP-006		Grado / Grade 1/6/290IIS		Extremos / Ends BEVELLED AT 30 DEG. ASTM					
Dimensiones / Dimensions 114.30 x 17.12 mm 4 1/2 x 0.674 inches		Peso Nominal / Nominal Weight 41.03 KG/M 27.54 LB/FT		Superficie / Surface INT BARE / EXT VARNISHED		Caridades / Quantities 13 Pz 84.89 m 13 Pcs 278.51 Ft		3454 Kg 7615 Lb	

ENSAYOS DE TRACCION / TENSILE TEST

Colada / Eneayo	Nº de	Condición de la probeta	Temp de Ens	Dimensiones	Sección	Fluencia / Yield Strength				Rotura/ U.T.S				Relación F/R	Alargamiento Elongation				Dureza / Hardness Tipo / type: BHN	
						Offset Method		EUL Method		Req. V. obt.		Req. V. obt.			YS/UTS Ratio		Lo 2"			Req. de area
Heat Test Nº	Zona Zone	Estado Ext.	Nº P/T	Tipo Ori	Area	Req. Min	V. obt.	Req. Min	V. obt.	Req. Max	V. obt.	Req. Max	Obt	Req. Min	V. obt.	Req. Min	V. obt.	Req. Min	V. obt.	Req. Max
44380	C/B	PRO	E	ST	L	TA/RT	24,98 X 16,67	421,25	415	517,6	625	0,93	0,78	50,8	35,0	41,2	180	237		
44390	C/B	PRO	O	ST	L	TA/RT	25,00 X 16,42	415,24	415	513,7	625	0,93	0,80	50,8	35,0	41,4	193	237		

TEST TECHNOLOGICO / TECHNOLOGICAL TEST

Abastamiento Curvado Bend test		Abocinado Flaring Test		Pestillado Flange Test		Ens. De anillo expandido Ring expanding Test		Ens. De Tracción de anillo Ring tensile Test	
Satisfact.	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pro = Proceso/ Process N = Normalizada/ Normalized DIST = Distensionada / Stress Relief Q & T = Templado y Revenido/ Quenched & Tempered TA/RT = Temp. Ambiente/ Room Temperature		RE = Rectangular CI = Cilindrica/ Cylindrical ST = Segmento Tubular / Tubular segment		RE = Rectangular / Body RU = Recaque / Upset P/A = Promedio / Average Min = Mínimo / minimum Max = Máximo / Maximum		L = Longitudinal T = Transversal P/T = Tubo/ Pipe EXT = Extremo/ End M = Medio/ Middle		V.Obt. = Valor Obtenido / Obtained value E = Comienzo de marcado/ Stenciling starting O = Extremo opuesto al E/ Opposite extreme to E CH = Ensayos en Caliente / Hot Testing	



INSPECTION CERTIFICATE

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Cliente / Customer MCJUNKIN CORPORATION		Expediente / Manufacturing Order 516268.28	Número / Number 585613	Fecha / Date 14/03/2011	Pág./Page 2 / 7
Producto / Product CARBON STEEL FOR LOW TEMPERATURE SERVICE		Orden de Compra / Purchase Order C012 726237 4D0	Item 00048	Referencia del Cliente / Customer Reference C012 726237 4D0	
Norma / Standard ASTM/A533+CSA Z245.1-07 CATH SSPSP00374/1+NACE MR0175/0103+IPRO LP-006		Grado / Grade 1/8/290ISS	Extremos / Ends BEVELLED AT 30 DEG. ASTM		
Dimensiones / Dimensions 114.30 x 17.12 mm 4 1/2 x 0.674 inches		Superficie / Surface INT BARE /EXT VARNISHED	Cantidades / Quantities 13 Pz 84.89 m 3454 Kg 13 Pcs 278.51 Ft 7615 Lb		
Dimensiones / Dimensions Schedule 41.03 KGMGT 27.54 LB/FT		Longitud / Length S.R. (SP)			

ENSAYOS QUIMICOS / CHEMICAL ANALYSES

Colada Heat	Heat	Max	Min	x 1000										x 100								x 1000																																						
				C	Si	Mn	Cr	Mo	W	Cd	P	S	Ni	V	Al	Sn	Cu	As	Nb	Ti	Pb	Sb	Co	Zr	Bi	Ca	B	N	O	Mg	H	C.e.1	C.e.2	Pcm	Sum 1	Sum 2	Sum 3	R 1	R 2	R 3																				
				%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%																	
Heat	Heat	25	50	135																																																								
Prod	Prod	25	50	135																																																								
Heat	Heat	9	26	104	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Prod	Prod	9	26	105	5	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Prod	Prod	9	26	105	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

BROMLEY MECHANICAL SERVICES INC.
 Checked to ASME Div. 2
 Sect. IIIA Part 10 Edd. Add. *M.A.S.* 0.650"
 SA *SP* US 2977 Date *6/17/11*

NOTAS / NOTES: H = Analisis de colada / Heat Analysis. P = Analisis de producto / Product Analysis. C.e = Carbono Equivalente/Equivalent Carbon. R = Ratio. * = PPM / Part per million
 CEQ 1 = C+F((Mn/0.8)+(Si/24)+(Cu/15)+(Ni/20)+(Cr+Mo+V+Nb)/5+(S*8))
 SUM 1 =
 R 1 =

SUM 2 =
 R 2 =

SUM 3 =
 R 3 =



INSPECTION CERTIFICATE

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Cliete / Customer MCJUNKIN CORPORATION		Expediente / Manufacturing Order 585613	Número / Number 1403/2011	Fecha / Date 14/03/2011	Pág./Page 3 / 7
Producto / Product CARBON STEEL FOR LOW TEMPERATURE SERVICE		Orden de Compra / Purchase Order C012 726237 4D0	Item 00048	Referencia del Cliente / Customer Reference C012 726237 4D0	
Norma / Standard ASTM/AISME A5A333+CSA Z245.1-07 CATII SSPSP00374/1+NACE MR0175/0103+IPRO LP-006		Grado / Grade 16/290ISS		Extremos / Ends BEVELLED AT 30 DEG. ASTM	
Dimensiones / Dimensions 114.30 x 17.12 mm 4 1/2 x 0.674 inches		Schedule 41.03 KG/MT 27.54 LB/FT	Peso Nominal / Nominal Weight 41.03 KG/MT 27.54 LB/FT	Longitud / Length S.R. (SP)	Cantidades / Quantities 13 Pz 13 Pcs
Superficie / Surface INT BARE /EXT VARNISHED					

ENSAYOS DE IMPACTO / IMPACT TEST

Colada Heat	Ensayo Test	Condición de la probeta / Specimen condition				Energía Absorbida / Absorbed Energy			Area ductil / Shear Area (%)			Expansión Lateral/Lateral Exp. (MM)																	
		Zona Zone	Metodo Method	Entalla Notch	Dimensiones Size	Orient	Temper. °C	Unidad Unit	Req.		V.Obt/Obtained Values		Req.		V.Obt/Obtained Values														
									Min	P/A	Min	P/A	Min	P/A	Min	P/A													
44380	784591	C/B	CHARPY	V	10,00 x 10,00	T	-45	Joules	18	27	400.9	402.6	410.3	400.9	404.6	50.0	60.0	100.0	100.0	100.0	100.0	1	2	3					
44380	784591	C/B	CHARPY	V	10,00 x 10,00	L	-45	Joules	14	18	417.7	434.9	427.8	417.7	426.8														

NOTE: Req = Requisitos / Requirements C/B = Cuerpo / Body R/U = Recalque / Upsat Orient = Orientación / Orientation V = Valor / Value P/A = Promedio / Average Min = Mínimo / Minimum T/E = Temp. Ens. / Test Temp.



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Cuadrante Colada/ Heat Ensayo/ Test Tubo/ Pipe Extremo / End Diámetro Ext./ External Diam. Centro/ Mid-wall Diámetro Int./ Internal Diam.		44380 784592 3 O / B 191 194 194 191 164 162 164 153 155 155 159		Obtenidos/ Obtained Valor Individual/ Individual Value 1 2 3 4 Max Min P/A Var 191 194 194 191 194.0 191.0 192.5 164 164 162 164 164.0 162.0 163.5 37.0 153 155 155 159 159.0 153.0 155.5	
Cuadrante Colada/ Heat Ensayo/ Test Tubo/ Pipe Extremo / End Diámetro Ext./ External Diam. Centro/ Mid-wall Diámetro Int./ Internal Diam.		44380 784592 3 O / B 191 194 194 191 164 162 164 153 155 155 159		Obtenidos/ Obtained Valor Individual/ Individual Value 1 2 3 4 Max Min P/A Var 191 194 194 191 194.0 191.0 192.5 164 164 162 164 164.0 162.0 163.5 37.0 153 155 155 159 159.0 153.0 155.5	

Valores Requeridos / Required Values	Individuales			Promedios			Tipo de dureza	
	Max	Min	Var	Average	Max	Min	Var	Hardness type
				41.03 KG/MT 27.54 LB/FT	248			VICKERS HV10

ENSAYO DE DUREZA/ HARDNESS TEST

Cuadrante Colada/ Heat Ensayo/ Test Tubo/ Pipe Extremo / End Diámetro Ext./ External Diam. Centro/ Mid-wall Diámetro Int./ Internal Diam.		44380 784591 5 E / B 172 170 174 174 159 162 164 161 152 153 154 159		Obtenidos/ Obtained Valor Individual/ Individual Value 1 2 3 4 Max Min P/A Var 172 170 174 174 174.0 170.0 172.5 159 162 164 161 164.0 159.0 161.5 18.0 152 153 154 159 159.0 152.0 154.5	
Cuadrante Colada/ Heat Ensayo/ Test Tubo/ Pipe Extremo / End Diámetro Ext./ External Diam. Centro/ Mid-wall Diámetro Int./ Internal Diam.		44380 784591 5 E / B 172 170 174 174 159 162 164 161 152 153 154 159		Obtenidos/ Obtained Valor Individual/ Individual Value 1 2 3 4 Max Min P/A Var 172 170 174 174 174.0 170.0 172.5 159 162 164 161 164.0 159.0 161.5 18.0 152 153 154 159 159.0 152.0 154.5	

Cuadrante Colada/ Heat Ensayo/ Test Tubo/ Pipe Extremo / End Diámetro Ext./ External Diam. Centro/ Mid-wall Diámetro Int./ Internal Diam.		44380 784592 3 O / B 191 194 194 191 164 162 164 153 155 155 159		Obtenidos/ Obtained Valor Individual/ Individual Value 1 2 3 4 Max Min P/A Var 191 194 194 191 194.0 191.0 192.5 164 164 162 164 164.0 162.0 163.5 37.0 153 155 155 159 159.0 153.0 155.5	
Cuadrante Colada/ Heat Ensayo/ Test Tubo/ Pipe Extremo / End Diámetro Ext./ External Diam. Centro/ Mid-wall Diámetro Int./ Internal Diam.		44380 784592 3 O / B 191 194 194 191 164 162 164 153 155 155 159		Obtenidos/ Obtained Valor Individual/ Individual Value 1 2 3 4 Max Min P/A Var 191 194 194 191 194.0 191.0 192.5 164 164 162 164 164.0 162.0 163.5 37.0 153 155 155 159 159.0 153.0 155.5	

Ind = Individual Val. = Valor/ Value **Min** = Mínimo/ Minimum **Max** = Máximo/ Maximum **P/A** = Promedio/ Average **Var.** = Variación/ Variation **M** = Medio/ Middle
E/B = Stencil starting - Comienzo marcación / Cuerpo - Body **O/B** = Opposite extreme to E-Extremo opuesto al E/ Recalque-Upset
E/U = Stencil starting - Comienzo marcación / Recalque-Upset **O/U** = Opposite extreme to E-Extremo opuesto al E/ Recalque-Upset
E/VU = Vanishing upset - Desvanecimiento de recalque / Cuerpo - Body **O/VU** = Vanishing upset - Desvanecimiento de recalque / Recalque - Upset



INSPECTION CERTIFICATE

(BS EN 10204 3.1: 2004 - ISO 10474 3.1B: 1991)

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Cliente / Customer MC-JUNKIN CORPORATION		Expediente/ Manufacturing Order 56268.28		Número / Number 585613		Fecha / Date 14/03/2011		Pág./Page 5 / 7	
Producto / Product CARBON STEEL FOR LOW TEMPERATURE SERVICE		Orden de Compra/ Purchase Order C012 726237 4D0		Item 00048		Referencia del Cliente / Customer Reference C012 726237 4D0			
Norma / Standard ASTM/ASME A5A333+CSA Z245.1-07 CATH SSPSP00374/1+NACE MR01750103+HPRO LP-006		Grado / Grade 116/290I1SS		Extremo / Ends BEVELLED AT 30 DEG. ASTM					
Dimensiones / Dimensions 114.30 x 17.12 mm 4 1/2 x 0.674 inches		Peso Nominal / Nominal Weight 41.03 KG/MT 27.54 LB/FT		Superficie / Surface INT BARE /EXT VARNISHED		Cantidades / Quantities 13 Pz 84.89 m 13 Pcs 278.51 Ft		3454 Kg 7615 Lb	
MM.YY = Mes / Año Month / Year YY = Año / Trimestre Year / Quarter		NNNNN = Número de tubo / Nbr of pipe Y/T = Año / Trimestre Year / Quarter		LLL = Longitud / length HNXXXXX = Colada / Heat		PP = Peso / Weight @ = Monograma / Monogram API			
Presión / Pressure Valor / Value 3000		Prueba Hidráulica / Hydrostatic Test Tiempo / Time Segundos / Seconds 5,00		Resultado / Results Satisfactorio / Satisfactory					
Unidad / Unit PSI		Estarcido (Tubo) / Stencilling (Pipe) TENARIS SD MM.YY ASTM/ASME A5A333 114.3 17.12 41.02 4XXS1/6/290CATI1SS HQ QTM45C LT-45C SEAMLESS207KPAX100NDE CSA Z245.1-07PO C012 726237 4D0 MADE IN ARGENTINA HNXXXXX NNNNN LLLL PPHPP							
FABRICADO POR TENARIS SIDERCA		*PROCESO DE ACERACIÓN* FABRICACIÓN DE ACERO: FUNDICIÓN POR ARCO ELECTRICO Y COLADO CONTINUO - ACERO CALMADO AL ALUMINIO. -LA PRÁCTICA DE AFINO EN EL HORNO - CUCHARA INCLUYE AGITACION POR ARGON Y UNA INYECCIÓN FINAL DE UNA VARILLA DE SILICIO DE CALCIO PARA OBTENER UNA FORMA GLOBULAR DE EVENTUALES MICROINCLUSIONES. -MATERIAL LIBRE DE CONTAMINACIÓN DE MERCURIO.		*MANUFACTURED BY TENARIS SIDERCA*		*ACIERAGE PROCESS* STEEL MAKING PROCESS: E.A.F./L.F. AND CONTINUOUS CASTING - FULL ALUMINIUM KILLED AND FINE GRAIN PRACTICE. -THE LF PRACTICE INCLUDES ARGON RINSE AND A FINAL INJECTION OF CALCIUM SILICIDE WIRE FOR MICROINCLUSION SHAPE CONTROL. -MATERIAL FREE FROM MERCURY CONTAMINATION.			
PROCESO DE LAMINACIÓN -FABRICACIÓN DE TUBO: LAMINADO EN CALIENTE Y SIN COSTURA.		*CONTROL VISUAL Y DIMENSIONAL: SATISFACTORIO.		*CONTROLES*		*ROLLING PROCESS* -MANUFACTURING PROCESS : SEAMLESS HOT ROLLED.			
CONDICIONES DEL MATERIAL -NO REPARADO POR SOLDADURA.		*CONTROL VISUAL Y DIMENSIONAL: SATISFACTORIO.		*MATERIAL CONDITIONS* -NOT REPAIRED BY WELDING.		-VISUAL AND DIMENSIONAL INSPECTION : SATISFACTORY.			
- EL MATERIAL CUMPLE CON LOS REQUERIMIENTOS NACE MR 0103.				-MATERIAL COMPLIES WITH NACE MR 0103.					



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Cliente / Customer MCJUNKIN CORPORATION		Expediente/ Manufacturing Order 5/6268.28		Número / Number 585613		Fecha / Date 14/03/2011		Pág./Page 6 / 7	
Producto / Product CARBON STEEL FOR LOW TEMPERATURE SERVICE		Orden de Compra/ Purchase Order C012 726237 4D0		Item 00048		Referencia del Cliente / Customer Reference C012 726237 4D0			
Norma / Standard ASTM/ASME A5A333+CSA Z245.1-07 CATH SSPSP00374/1+NACE MR0175/103+IPRO LP-006		Grado / Grade 1/6/290IIS		Extremo / Ends BEVELLED AT 30 DEG. ASTM					
Dimensiones / Dimensions 114.30 x 17.12 mm		Peso Nominal / Nominal Weight 41.03 KG/MT		Superficie / Surface INT BARE /EXT VARNISHED		Cantidades / Quantities 13 Pz		3454 Kg	
4 1/2 x 0.674 inches		Schedule 27.54 LB/FT		Longitud / Length S.R. (SP)		13 Pcs		278.51 Ft	
-LA DUREZA CUMPLE CON LA NACE MR-01-75/ISO-15156-2									
NORMAS									
-EDICIÓN DE LA NORMA: ASTM A 333-10									
-EDICIÓN DE LA NORMA: ASME SA 333/ 2007									
-EDICIÓN DE LA NORMA: NACE MR 01-75 - ISO 15156-2 : 2003									
-EDICIÓN DE LA NORMA: NACE MR-01-03 EDICION 2007									
EDICIÓN DE LA NORMA : CSAZ245: 2007									
Observaciones / Remarks									
NON DESTRUCTIVE TEST: SATISFACTORY.									
INSPECTION METHODS: U.T. LONG./TRANSV. (INT.) NOTCH 10 % + U.T. TRANS. (EXT.) NOTCH 10 % + U.T. LONG. (EXT.) NOTCH 5 % + M.P.I. LONG./TRANSV. (EXT./INT.) ON ENDS + W.M.P.I. ON BEVELS.									
LAMINATIONS CONTROL 100% U.T: SATISFACTORY.									
ONE YELLOW (RAL 1023) BAND ON EACH END.									
Tratamiento termico (Tubo) Heat treatment (Pipe):									
Tipo / Type									
QUENCHED									
TEMPERED									
Método de enfriamiento del tratamiento térmico (Tubos) / Quench media of heat treatment process (Pipes):									
Magnésimo remanente/Residual magnésium (max): : 30 GAUSS									
Protectores / End Protectors:									
NON LIFTABLE CLOSED PLASTIC PROTECTOR FOR FLAT / BEVELED PIPE. SUPPLIER METALCENTRO.									




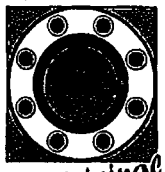
INSPECTION CERTIFICATE

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Cliente / Customer MC-JUNKIN CORPORATION		Expediente/ Manufacturing Order 516268.28		Número / Number 585613		Fecha / Date 14/03/2011		Pág./Page 7 / 7	
Producto / Product CARBON STEEL FOR LOW TEMPERATURE SERVICE		Orden de Compra/ Purchase Order C012 726237 4D0		Item 00048		Referencia del Cliente / Customer Reference C012 726237 4D0			
Norma / Standard ASTM/ASME ASA333+CSA Z245.1-07 CATII SSPSP003741+NACE MR017510103+IPRO LP-006		Grado / Grade 116/290IISS		Extremo / Ends BEVELLED AT 30 DEG. ASTM					
Dimensiones / Dimensions 114.30 x 17.12 mm		Peso Nominal / Nominal Weight 41.03 KG/MT 27.54 LB/FT		Superficie / Surface INT BARE TEXT VARNISHED		Cantidades / Quantities 13 Pz 84.89 m 13 Pcs 278.51 Ft		3454 Kg 7615 Lb	
4 1/2 x 0.674 inches		Schedule S.R. (SP)		Longitud / Length S.R. (SP)		13 Pz		84.89 m	
4 1/2 x 0.674 inches		27.54 LB/FT		INT BARE TEXT VARNISHED		13 Pcs		278.51 Ft	

<p>Por la presente certificamos que el material aquí descrito ha sido fabricado de acuerdo con las normas y especificaciones solicitadas en vuestra orden y satisfacen los correspondientes requerimientos.</p> <p>Este certificado se emite mediante un sistema computarizado y es válido con firma electrónica. El certificado original presenta el logo Tenaris (verde claro), impreso en la parte inferior de la hoja. En caso que el poseedor del certificado entregue una copia del mismo, deberá garantizar la conformidad con el original, haciéndose responsable por cualquier uso ilegal o indebido.</p> <p>Cualquier alteración y/o falsificación estará sujeta a la ley. Si necesita asegurar la autenticidad de este certificado, contactarse con Siderca SAIC, e-mail: aye@siderca.com</p>	<p>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.</p> <p>This certificate is issued by a computerized system and it is valid with electronic signature. On the original certificate the trade-mark Tenaris 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.</p> <p>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 Siderca SAIC through this e-address: aye@siderca.com</p>	<div style="text-align: center;">  <p>QUALITY CERTIFICATION DEPT. DTO CERTIFICACION DE CALIDAD EDUARDO A. AYERBE</p> </div>
--	---	---



OFFICINE NICOLA GALPERTI E FIGLIO S.p.A.
 Capitale Sociale € 2.892.500,00 interamente versato
 Sede Legale e Amministrativa: 23824 GERVIO (LC) - Via Enrico Fermi, 48
 C.C.I.A.A. Lecco n. 00205990138 - R.E.A. 70815 - C.F. e P.IVA IT00205990138
 Stabilimento - Uffici Amministrativi / Workshop - Warehouse - Offices - Mailing address
 22010 QERA LARIO (CO) - Località S. Agata - Tel. 0344-97200 - Fax 0344-97210
 E-mail: galperti@galperti.com - www.galperti.com

34000
 SPETT LE / MESSRS:

GALPERTI CANADA ULC

**3931 - 76 AVENUE
 EDMONTON, ALBERTA, T6B 2S8 (CDN)**

CERTIFICATO DI COLLAUDO EN 10204
TEST CERTIFICATE EN 10204
NS. ORDINE / INTERNAL JOB
100980

3.1

CERTIFICATE N.

DATA / DATE

VS. ORDINE / YOUR

DATA / DATE

013076/1

27/04/2011

27373

23/07/2010

POS / ITEM	DESCRIZIONE / DESCRIPTION	QUANTITA' / QUANTITY	S/A	MATERIALE / MATERIAL	N° COLATA / PROVA / HEAT N° / TEST N°	ACCIAIERIA / STEEL M&L	#
111/111	2" 600 WN RF 160 NALF2 B1 FSF4 NACE MR-01-75	175	S	ASTM/ASHE A350 LF2 CL.1	8615-10/20	OLIFER/ACP SPA	A

ANALISI CHIMICA / CHEMICAL ANALYSIS

#	C %	MN %	SI %	P %	S %	CR %	NI %	MO %	CU %	V %	SN %	AL %	NB %	TI %	N %	CO%	B %	H %
A	0.164	1.200	0.200	0.013	0.007	0.110	0.120	0.045	0.140	0.012	0.008	0.020	0.002	0.001	0.010	0.013	0.0005	0.0002
A	0.160	1.195	0.195	0.010	0.003	0.105	0.110	0.040	0.135	0.010	0.005	0.025	0.001	0.001	0.010	0.013	0.0001	0.0002
A	0.001	0.003													0.427	0.155	0.364	0.414
A	0.001	0.003													0.400	0.145	0.359	0.406

NOTE / NOTES

C - ANALISI DI PRODOTTO / CHECK ANALYSIS

04=Copper+Nickel+Chromium+Molybd.+Vanadium CU+NI+CR+MO+V
 03=Chromium + Molybdenum CR+MO
 FC=Carbon Equivalent Short Formula C+(MN/6)
 FL=Carbon Equivalent Long Formula C+(MN/6)+((CR+MO+V)/5)+((NI+CU)/15)

CARATTERISTICHE MECCANICHE / MECHANICAL PROPERTIES

#	TRAZIONE / TENSILE										RESILIENZA / CHARPY TEST			
	TIPO TYPE	DIAMETRO PROVETTA / DIAMETER	SEZIONE AREA / mmq.	LUNGHEZZA LENGTH / mm.	TEMP. TEMPERATURE / C	ROTTURA TENSILE / Mpa	SNERVAMENTO YIELD / Mpa	ALL. ELONG %	CONTR. REDUCT. %	TIPO TYPE / KV	TEMP. TEMPERATURE / C	VALORI / VALUES / Joule		DUREZZA HB / HARDNESS (AVERAGE)
A	S	12.50	122.70	50.00	20	485	250	22.0	30.0		-50	Min. 27	Med. 27	197
A	O	12.50	122.70	50.00	20	501	397	29.2	71.6		-50	100 - 105	106	174

NOTE / NOTES

Lateral Exp/Shear Area (Average)
 A = mm.1.45/ 85%

O - OTTENUTE / OBTAINED
 S - STANDARD

TRATTAMENTI TERMICI / HEAT TREATMENTS

NOTE GENERALI / GENERAL NOTES

Normalized at 900 dgr.C for 1 h.-Cooling from 900 dgr.C in still air

FINITURE / ROUGHNESS
 FSF4=Ra 3,2 - Ra 6,3

STANDARD
 B1 = ASME B16.5 Ed.2003

NOTE / NOTES

Flanges comply with NACE MR-01-75 / ISO 15156-2 and NACE MR-01-03 Ed.2007 and Sour Service Requirements.

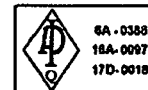
MARCHIO DI FABBRICA / TRADE MARK



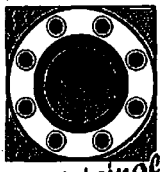
DATA COLLAUDO INT. / INT. INSPECT DATE
 27/04/2011

COLLAUDATORE INT. / INT. INSPECTOR
 E. SBATTELLA

ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY



Certified acc. PED 97/23/EC
 By LLOYD'S Register
 No LRC 160212



OFFICINE NICOLA GALPERTI E FIGLIO S.p.A.
 Capitale Sociale € 2.592.500,00 interamente versato
 Sede Legale e Amministrativa: Z3824 DERVIO (LC) - Via Enrico Fermi, 48
 C.C.I.A.A. Lecce n. 00206980138 - R.E.A. 78816 - C.F. e P.IVA IT00205880138
 Stabilimento - Ufficio Amministrativo / Workshop - Warehouse - Office - Mailing address
 22010 OGERA LARIO (CO) - Località S. Agata - Tel. 0344-97200 - Fax 0344-97210
 E-mail: galperti@galperti.com - www.galperti.com

SPETT.LE / MESSRS:

GALPERTI CANADA ULC

**3931 - 76 AVENUE
 EDMONTON, ALBERTA, T6B 2S8 (CDN)**

CERTIFICATO DI COLLAUDO EN 10204
 TEST CERTIFICATE EN 10204
 NS.ORDINE / INTERNAL JOB
100980

CERTIFICATE NO. **013040/1** DATA / DATE **27/04/2011** VS. ORDINE / YOUR **27373** DATA / DATE **23/07/2010**

POS / ITEM	DESCRIZIONE / DESCRIPTION	QUANTITA' / QUANTITY	S/A	MATERIALE / MATERIAL	N° COLATA / PROVA HEAT N° / TEST N°	ACCIAIERIA / STEEL MILL	#
111/111	2" 600 MN RF 160 NALF2 B1 FSF4 NACE MR-01-75	175	S	CSA Z245.12-09 GR290 SS	8615-10/20	OLIFER/ACP SPA	A

ANALISI CHIMICA / CHEMICAL ANALYSIS

#	C %	MN %	SI %	P %	S %	CR %	NI %	MO %	CU %	V %	SN %	AL %	NB %	TI %	N %	CO%	B %	H %
A	0.164	1.200	0.200	0.013	0.007	0.110	0.120	0.045	0.140	0.012	0.008	0.020	0.002	0.001	0.010	0.013	0.0005	0.0002
A	0.160	1.195	0.195	0.010	0.003	0.105	0.110	0.040	0.135	0.010	0.005	0.025	0.001	0.001	0.010	0.013	0.0001	0.0002
A	O %	CA%													0.4%	0.3%	FC%	FL%
A	0.001	0.003													0.427	0.155	0.364	0.414
A	0.001	0.003													0.400	0.145	0.359	0.406

NOTE / NOTES

04=Copper+Nickel+Chromium+Molybd.+Vanadium CU+NI+CR+MO+V
 03=Chromium + Molybdenum CR+MO
 FC=Carbon Equivalent Short Formula C+(MN/6)
 FL=Carbon Equivalent Long Formula C+(MN/6)+((CR+MO+V)/5)+((NI+CU)/15)

C = ANALISI DI PRODOTTO / CHECK ANALYSIS

CARATTERISTICHE MECCANICHE / MECHANICAL PROPERTIES

#	TRAZIONE / TENSILE									RESILLENZA / CHARPY TEST				DUREZZA HB HARDNESS (AVERAGE)
	TIPO TYPE	DIAMETRO PROVETTA R/METER	SEZIONE AREA mmq.	LUNGHEZZA LENGTH mm.	TEMP TEMPERATURE C	ROTTURA TENSILE Mpa	SNERVAMENTO YIELD Mpa	ALL ELONG %	CONTR. REDUCT %	TIPO TYPE KV	TEMP TEMPERATURE C	VALORI / VALUES Joule		
A	S	12,50	122,70	50,00	20	414	290	20,0			-50	Min. 27	Med. 27	197
A	O	12,50	122,70	50,00	20	501	397	29,2	71,6		-50	100 - 105 - 106		174

NOTE / NOTES

Lateral Exp/Shear Area (Average)
 A = mm.1.45/ 85%

O = OTTENUTE / OBTAINED
 S = STANDARD

TRATTAMENTI TERMICI / HEAT TREATMENTS

Normalized at 900 dgr.C for 1 h.-Cooling from 900 dgr.C in still air

NOTE GENERALI / GENERAL NOTES

FINITURE / ROUGHNESS
 FSF4=Ra 3,2 - Ra 6,3

STANDARD
 B1 = ASME B16.5 Ed.2003

NOTE / NOTES

Flanges comply with the requirements specified for SSC Region 3 sour service in NACE MR-01-75 / ISO 15156-2 and CSA. Material according to NACE MR-01-03 Ed.2007.

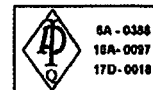
MARCHIO DI FABBRICA TRADE MARK



DATA COLLAUDO INT. INSPECT DATE
27/04/2011

COLLAUDATORE INT. INSPECTOR
E. SBATTELLA

ENTE UFFICIALE DI COLLAUDO INSPECTION AUTHORITY



Certified acc. PED 97/23/EC
 By LLOYD'S Register
 No LRC 180212

BROMLEY MECHANICAL SERVICES (1985) LTD.

MATERIAL INSPECTION REPORT

INSPECTED BY: Merle GRADE: SIA 333 6rb DIA SIZE OR WITH: 2"

DATE: Mar 9 6/2006

P.O.#: 64804

SUPPLIER: Midfield Supply

PART ID#: SPI S3228

REQ. MIN TK: _____

HEADS 2:1 HEMI WELD CAP OTHER

SHELL PIPE PLATE REPAD STRUCT. OTHER

LENGTH: 40'

THICKNESS: 160

PIPE PUBLISHED NOM: 0344

PLATE NOM: _____

NPS OD ID

MATERIAL TRACKING NUMBER	QTY	HEAT NUMBERS		MIN. THK.	THICKNESS & LOG				VISUAL EDGE	INSP. SURF.	REQ. MARKINGS VERIFIED	PREPARED BY
		HEAT NUMBER	PLATE NUMBER		A	B	C	D				
VS26724.		S30403			.327	.344	.340	.337	OK	OK	OK	lc.
W/O#												
CUSTOMER:	Stock											

RECEIVED & ACCEPTED BY: [Signature]

DATE: MAR 21 2006

REQUIRED CODE MARKINGS:
Benteler Stahl/Rehr-Maschinen Germany

Benteler Stahl/Rohr GmbH
 Postfach 13 40
 33043 Paderborn
 Deutschland
 Tel.: +49.5254.81-0 Fax: +49.5254.13666

Post 4 1000 279


ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1
 EN 10204:2005-01

Dokument-Nr.: 65-297454/001/P
 Document No.:

Prüf-Nr.:
 Inspection No.:

Kunden-Bestell-Nr.: 05-5494 / 45000279
 Purchase Order No.:
 No. de commande du client:
 Benteler Auftrags-Nr.: 1133714
 Benteler Order No.:
 No. de commande Benteler:
 Versandanzeigen-Nr.: 6574049
 Dispatch Note No.:
 No. d'avis d'expédition:

Hersteller:
 Manufacturer:
 Producteur:
 Herstellerzeichen:
 Manufacturer's brand:
 Marque du producteur:

Warmrohrwerk Dinslaken
 ISO/TS 16949 (ISO 9001) DNV CERT-13765-2003
 PED 97/23/EC TÜV Cert. 07 202 4111/Z/5001/1/H

 Stempel des Abnahmebeauftragten: WA
 Stamp of the inspection representative:
 Timbre du contrôleur:

Produkt: NAHTLOSE STAHLROHRE
 Product: SEAMLESS STEEL TUBES
 Produit: TUBES D'ACIER SANS SOUDURE

Stahlschmelzungsverfahren: ELEKTROSTAHL
 Steelmaking process: ELECTRIC FURNACE
 Procédé d'élaboration de l'acier: FOUR ELECTRIQUE

Lieferbedingungen: ASTM-A 333-HF-2004a, ASME SA-333-HF, ASME Section II Part A Edition 2004, CSA Standard Z245.1-02 Category II,
 Terms of delivery: NACE Standard MR0175-03
 Conditions de livraison:

Maße - Toleranzen: ASME B36.10M-2004, ASME SA-530, ASME Section II Part A Edition 2004, ASTM-A 999-2004a
 Dimensions-tolerances:

Stahlsorte: GRADE 290, GRADE 6
 Steel grade:

Nuance d'acier: Normalized
 Lieferzustand:

Delivery condition: Normalized
 État de livraison:

Produktkennzeichnung: FS: BENTELER Z.245.1-A/SA-333 6/290 CAT II HEAT-NO. M45C S HN DIMENSIONS SCHE DULE WA
 Product marking: GERMANY P.O. 45000279

Marquage du produit:

FK = Farbkennzeichnung, colour marking, marquage par couleur FS = Farbschablonierung, paint stencilling, marquage par peinture FSD = Farbstrahlrucker, Colour jet printer, imprimante à jet d'encre de couleur LS = Längsschablonierung, longitudinal stencilling, marquage longitudinal par peinture PKE = Etikettenszeichnung, tag marking, marquage sur étiquette PS = Prägestempel, die stamp, marquage par poinçonnage TS = Tintenstrahlkennzeichnung, ink jet spray marking, imprimante à jet d'encre

Pos. Item Poste	Stück Number Nombre	Maße Dimensions Dimensions	Länge Length Longueur	Gewicht Weight Poids	Schmelzen-Nr. Heat No. No. de coulée	Prüfdruck Test pressure Pression d'épreuve	Rohr-Nr.-Gruppe Tube number group Série de no. des tubes	Vielfachlängen Multiple lengths Longueurs multiples
			feet	lbs		bar	s	
0004 13		2" NPS * Sched. 160 38 FT - 42 FT	542,09	4041	530403	207	5	21710

Benteler Stahl/Rohr GmbH
 Postfach 13 40
 33043 Paderborn
 Deutschland
 Tel.: +49.5254.81-0 Fax: +49.5254.13666

Prüf-Nr.: 65-297454/001/P
 Inspection No.:
 No. du certificat:
 Blatt: 3 / 4
 Page:
 Page:

Dokument-Nr.: 65-297454/001/P
 Document No.:
 No. du document:

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
 INSPECTION CERTIFICATE EN 10204-3.1
 CERTIFICAT DE RECEPTION EN 10204-3.1

Prüfergebnisse / Test results / Résultats des essais
 Die Rohre sind auf Dichtheit geprüft durch: Hydrostatic test: acc. to CSA Z245.1, holding time min 5 seconds, Test
 The tubes have been submitted to a leak tightness test by: pressure/Time-record
 Les tubes ont passé un contrôle d'étanchéité par:

Augsensichtkontrolle: PASSED Maßkontrolle: PASSED Ringfaltversuch: PASSED
 Visual inspection: Dimensions examination: Flattening test:
 Examen visuel: Vérification des dimensions: Essai d'aplatissement:

Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques

Die Probenahme erfolgte an Vielfachlängen.
 The sampling was carried out on multiple lengths.
 L'échantillonnage était réalisé aux longueurs multiples.

Zugversuch Streifenprobe / Tensile test Strip test specimen / Essai de traction Bande decoupee sur tube

Pos.	Proben-Nr.	Schmelzen-Nr.	Probenabmessung	Streckgrenze	Zugfestigkeit	Dehnung	Einschnürung	Re/Rm
Item	Specimen No.	Heat No.	Specimen dimensions	Yield strength	Tensile strength	Elongation	Area reduction	Re/Rm
Poste	No. de l'éprouvette	No. de coulée	Dimensions de l'éprouv.	Limite élastique	Résistance à la traction	Allongement	Coefficient de striction	Re/Rm
0004	000001	530403	19,00 X 8,60	333	478	A2"	1. Formel	Re/Rm
			mm	MPa	MPa	%	1. Formula	Re/Rm
				290-495	415-625	MIN 30	1. Formule	Re/Rm
0004	000002	530403	19,00 X 8,60	334	475	42,00		Re/Rm
			19,00 X 8,60	334	475	42,00		Re/Rm

Härteprüfung / Hardness test / Essai de dureté

Pos.	Proben-Nr.	Schmelzen-Nr.	Härte	HRC	HB	HV	HRB	Date
Item	Specimen No.	Heat No.	Hardness	Dureté	Dureté			Signature
Poste	No. de l'éprouv.	No. de coulée	Dureté	HRC	HB	HV	HRB	Date
0004	000001	530403	MAX 200					
			143					
0004	000002	530403	142					
			142					

BRONLEY MECHANICAL SERVICES (1985) LTD.
 Checked to ASME Div. 1

Sect. 11A Edition 05 Add. 30530
 MAR 21 2006

[Signature]
 Signature

Prüf-Nr.: 65-297454/001/P
Inspection No.:
No. du certificat:

Dokument-Nr.:
Document No.:
No. du document:

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Kerbschlagbiegeversuch / Notched bar impact test / Essai de flexion par choc (résilience) [CHARPY-V]
Verf.-Bruchanteil
Shear fracture
Rupture ductile

Pos. Proben-Nr. Schmelzen-Nr.
Item Specimen No. Heat No.
Poste No. de l'éprouv. No. de coulée

Anforderungen
Requirements
Exigences

Probennabmessung
Specimen dimensions
Dimensions de l'éprouvette

Probenlage
Specimen position
Position de l'éprouvette

Prüftemperatur
Test temperature
Température d'essai

Kerbschlagarbeit
Absorbed energy
Energie absorbée

Kerbschlagzähigkeit
Impact strength
Résistance au choc

0004	000001	530403	Länge		Breite		Höhe		GRAD	J	J	J/cm ²	J/cm ²	%
			mm	mm	mm	mm	mm	mm						
			55	7,50	7,50	10,00	10,00	-45	MIN 020	85	61	99	82	
			55	7,50	10,00	10,00	L	-45						
			7,50	7,50	10,00	10,00								
			7,50	7,50	10,00	10,00								

Restmagnetismus / Demagnetize / Démagnétiser
residual magnetic field intensity max 3,5 millitesla

Pos. Ihr Zeichen
Item Your reference
Poste Votre référence

Kundenmaterial
Customer's Material No.
No. de matière du client

Kundenbestell-Nr.
Purchase Order No.
No. de commande du client

0004
P.O. 45000279
05-5494 / 45000279

Vermerk / Remark / Remarque
NACE Standard: hardness acc. to NACE Standard MR0175 HRC max 22, The material meets the requirements of NACE MRO103; Certificate remarks: This is to confirm that the seamless linepipe supplied by Benteler and verified to CSA Standard Z245.1-02 meets the requirement for micro hardness of max. 248 HV 500.

Wärmebehandlung / Heat treatment / Traitement thermique
Normalized: 890 °C ; Holding time: 5 min.
Mr. Seelbach, Tel.: 05254/81-4281, Fax: 4289

Abnahmebeauftragter
Inspection representative
Contrôleur
JAN FREEERKS / WAG

Dinslaken, 31.10.2005, TEL.: 02064.623-537 FAX: 02064.623-539
Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen. Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgültig.
We certify that the supplied products comply with the order specification. This document was prepared by means of electronic data processing and is valid without signature.
Nous attestons que les produits livrés sont conformes aux stipulations de la commande. Ce document a été établi par traitement électronique de l'information et est valide sans signature.

Customer	MRC Midfield		Certificate No.	20110504279	Date	2011/05/25
P.O No.	S 759 095458		Project Name	STOCK		
Job No.			POR/Req'n No.			
Specification for Material	ASTM/ASME A/SA420 WPL6(07 Ed.809 Add.) NACE MR0175 / ISO 15156-2 AND NACE MR0103-2007		Starting Material	SEAMLESS PIPE		
Specification for Inspection	ASME B16.9-2007		Dimension and Visual Inspection	GOOD		
Heat Code No [HCN]	No.	Descriptions	Q'ty (Pcs)	Heat Treatment	N.D.E (GOOD)	
BS176	0062	REDUCING TEE SCH80 B.W 10" x 8"	5	N: 910°C	MT	
BL337	0067	45° ELBOW LONG SCH160 B.W 2"	5	N: 910°C	-	
BL337	0068	90° ELBOW LONG SCH160 B.W 2"	165	N: 910°C	-	

CHEMICAL COMPOSITION (%)

Heat Code No [HCN]	Spec	C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Cb	Raw Heat No
	Max.	0.30	0.40	1.35	0.035	0.040	0.40	0.30	0.12	0.40	0.080	0.020	
	Min.	-	0.15	0.50	-	-	-	-	-	-	-	-	
BS176	L	0.15	0.28	0.72	0.008	0.006	0.02	0.03	0.01	0.05	0.006	0.011	100414
BL337	L	0.15	0.26	0.88	0.012	0.006	0.03	0.03	0.01	0.07	0.003	0.012	606347
BL337	L	0.15	0.26	0.88	0.012	0.006	0.03	0.03	0.01	0.07	0.003	0.012	606347

REVISED ISSUE

MECHANICAL PROPERTIES

Heat Code No [HCN]	Spec	Y.S		T.S	E.L (%)	Hardness Test		* Impact Test(J)				
		Ksi				HB		Temp.(°C)	Size(2mm-v)			
		Max.	Min.					Act.	Ave.			
BS176	P	40.3	66.9	85	30.4	237	146	148	65.3	80.2	79.6	75.0
BL337	P	45.2	69.3	60	33.2	-	139	141	120.3	201.5	168.3	163.4
BL337	P	45.2	69.3		33.2		139	141	120.3	201.5	168.3	163.4

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

Remark : * CSA Z245.11-05 Gr241 CAT II Sour Service
* CRN No.: OA09067.2, OA09067.24, OA9067.27, OA9067.20, OA9067.28, OA9067.25, OA9067.29, OA9067.26, OA9067.2T, OA9067.2Y, OA9067.2N

* Impact Specimen Size & Spec. Value Legend:
 HB: Brinell
 ST: Solution Treatment
 SR: Stress Relieving
 N: Normalized
 T: Tempered
 A: Annealed
 Q: Quenched
 (G): Hot-Dip Galvanized Coating
 Y.S: 0.2% Offset Method
 AC: Air Cool
 OC: Oil Cool
 WC: Water Quenched
 L: Ladle
 P: Product

Reviewed by :
 Witnessed by :

Approved by :

S. O. Lee
 Director of Quality Assurance Dept

34000

INSPECTION CERTIFICATE
 EN 10204/DIN 50049-3.1B



Certificate No. G0509001-4

Page 1 / 1

Article: Hot Forged Flange
 Carbon steel forged flanges
Specification: ASME B16.5
Material: A350 LF2

according to:
 ASTM A350 LF2-1999
 ASTM/ASME
 Section II Part A and Addenda

State of delivery:
 Quenching 900°C/1hrs/Tempering 690°C/1 hrs

Melting Process:

Y

Marking: Material, Size, PN, DN, Heat-No.

Stamp of manufacturer



Content of the Delivery

Invoice-No	Item-No	pcs	description	Heat No	Test No
DL/2006-10	286	30	600# WN RF S160 1"	100561	1
DL/2006-10	287	50	600# WN RF XXS 1"	100561	1
DL/2006-10	288	50	600# WN RF STD 1 1/2"	100561	1
DL/2006-10	289	75	600# WN RF XS 1 1/2"	100561	1
DL/2006-10	290	50	600# WN RF S160 1 1/2"	100561	1
DL/2006-10	291	50	600# WN RF XXS 1 1/2"	100561	1
DL/2006-10	292	100	600# WN,RF STD 2"	100561	1
DL/2006-10	293	100	600# WN RF XS 2"	100561	1
DL/2006-10	294	100	600# WN RF S160 2"	100561	1
DL/2006-10	321	50	1500# HUB BLAWN solid RF 1/2"	100561	1
DL/2006-10	322	50	1500# HUB BLAWN solid RF 3/4"	100561	1
DL/2006-10	324	40	1500# HUB BLAWN solid RF 1 1/2"	100561	1
DL/2006-10	327	50	1500# HUB BLAWN solid RTJ 2 1/2"	100561	1
DL/2006-10	328	50	1500# HUB BLAWN solid RTJ 3/4"	100561	1
DL/2006-10	329	100	1500# HUB BLAWN solid RTJ 1"	100561	1

Test No	Tensile test				Charpy-Impact test, ISO-V Specimen -45,6°C				Hardness HB
	R _m N/mm ²	R _{0,2} N/mm ²	A ₅ %	Z %	J		E/N		
1	545	340	31	60	32	36	38	35	162

Heat No	Chemical analysis %								
	C	Si	Mn	P	S	Cr	Mo	Ni	
100561	0,16	0,26	1,15	0,017	0,016	0,03	0,01	0,01	
	TI	Ta	N	V	Cu	Al	Nb	CE	
				0,01	0,06		0,01	0,38	

Visual and dimensional inspection: without complaint
 Dimension according to ASME B16.5
 Hardness to NACE MR01-75
 Smooth finish according to MSS-SP6

Place
 Gelsenkirchen

Date
 06.01.2006

Works Inspector

Wilhelm Geldbach Industrie GmbH
 Ziegelstraße 17, D-45886 Gelsenkirchen

34000

MRC Midfield PO# C716133171581 Item# 1
 HEAT NUMBER : 152V8
 TRANS AM PIPING PRODUCTS - REV'D BY: [Signature]
 Shipment/Seq #: S 9 - 1093 17

CLIENTE / Customer / Client
 TRANS AM PIPING PRODUCTS LTD.
 9335 ENDEAVOR DRIVE S.E.
 CALGARY, ALBERTA T3S 0A1
 CANADA

CERTIFICADO DE INSPECCION
 Inspection Certificate - Certificat de Réception

DIN EN 10204 / 3.1
 ISO 10474 / 3.1

FECHA: 26/02/2009 No. 126374
 Date: Page: 1



ULMA
 ULMA FORJA, S.COOP.

By Zubillaga, 3 - Apdo. 14
 20560 ONATI (Gipuzkoa) SPAIN
 Tel.: 34 - 943 780552
 Fax: 34 - 943 781808
 E-mail: ulma@ulmapijping.com

Certified acc. PED 97/23/EC
 by TÜV Rheinland
 N° 01 202/EQ 02 7443

MARCA DEL FABRICANTE
 Mark of factory
 Marque du fabricant

72030

DE of. - de 18/02/2009

SU PEDIDO N°
 Your Order No.
 Votre Cde. N°

FLANGES ASME B16.5-03

NORMAS APLICABLES
 Requirements - Normes Applicables

MATERIAL CORRESPONDIENTE
 Material Correspondent - Qualité

NACE MR-01-75/05 & MR-01-03/03

ASTM A350-LF2CL1-048
 ASTM A350-LF2CL1-048

PARTIDA Item Poste	CANTIDAD Quantity Quantité	DESCRIPCION Description Description	LOTE	OBSERVACIONES Remarks Observations	COLADA N° Heat No. N° Coudée	RESISTENCIA T. Strength Resist Rupt N/mm2	Y. Strength Limite Rupt N/mm2	MARQUE Logo Lo. A d	ESTRICCION Red. Area Striction %	RESILIENCIA Impact test Résilience		CHARPY V		DUREZA Hardness Dureté HB
										Joules	°C	MEDIA Average Moyenne	PROBETA, UNIDADES	
3		WN 16 150LB STD RF A350LF2	2788	NE	399V8	508	306	36,30	71,30	48	44	48	-50	144 155
5		WN 8 300LB S40 RF A350LF2	89	NE	324V8	526	327	27,70	54,70	66	66	64	-50	152 154
6		WN 14 300LB STD/30 RF A350LF2	2908	NE	129V8	501	309	38,00	73,10	38	40	40	-50	143 155
10		WN 4 600LB S80 RF A350LF2	3348	NE	489V8	525	324	27,50	57,50	57	66	64	-50	151 155
10		WN 4 600LB S80 RF A350LF2	3378	NE	494V8	527	329	28,40	51,60	59	69	42	-50	153 155
15		WN 1 600LB S4XS RF A350LF2	3528	NE	152V8	531	323	27,00	56,20	64	74	80	-50	153 156
16		WN 2 1500LB S4XS RF A350LF2	3278	NE	480V8	504	301	35,00	61,80	43	40	44	-50	145 154
21		BLIND 12 1500LB RF A350LF2	3258	NE	485V8	505	310	35,60	65,70	48	44	42	-50	147 155
24		BLIND 2 1500LB RF A350LF2	3228	NE	474V8	514	310	32,40	61,10	46	56	52	-50	148 155

COMPOSICION QUIMICA - STEEL MARKER'S LADLE ANALYSIS - ANALYSE CHIMIQUE														
COLADA N° Heat No. N° Coudée	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Nb %	V %	AJ %	Ti %	N %	Ceq %
129V8	0,190	0,300	0,860	0,021	0,006	0,120	0,070	0,020	0,007	0,002	0,027	0,000	0,000	0,381
152V8	0,200	0,250	1,010	0,004	0,010	0,050	0,120	0,020	0,000	0,002	0,033	0,000	0,000	0,401
324V8	0,190	0,240	0,870	0,014	0,001	0,070	0,090	0,030	0,007	0,001	0,023	0,000	0,000	0,383
399V8	0,200	0,240	0,850	0,011	0,007	0,090	0,110	0,020	0,007	0,001	0,032	0,000	0,000	0,391
489V8	0,200	0,250	0,880	0,014	0,004	0,080	0,090	0,030	0,007	0,001	0,035	0,000	0,000	0,392
474V8	0,200	0,240	0,980	0,014	0,004	0,090	0,120	0,010	0,001	0,003	0,037	0,000	0,000	0,405
480V8	0,200	0,230	0,950	0,018	0,007	0,090	0,110	0,010	0,001	0,002	0,026	0,000	0,000	0,401
488V8	0,210	0,240	1,010	0,012	0,006	0,080	0,120	0,010	0,001	0,002	0,026	0,000	0,000	0,419
494V8	0,190	0,260	0,800	0,010	0,002	0,070	0,080	0,030	0,006	0,001	0,024	0,000	0,000	0,366

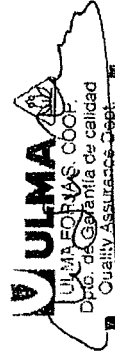
(*) OBSERVACIONES:
 Remarks
 Observations

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

- Las dimensiones y la condición superficial se hallaron satisfactorias.
 - Dimension and surface condition were found acceptable.
 - Les dimensions et états de surface sont satisfaisants.

- Los requisitos aplicables cumplen las normas aplicables.
 - All applicable requirements are satisfied.
 - Les normes applicables sont respectées.

EL INSPECTOR
 Works Inspector - L'inspecteur



BROMLEY MECHANICAL SERVICES

MATERIAL INSPECTION REPORT

DIA SIZE OR WITH: 1"

INSPECTED BY: Michael Quinn
 DATE: December 9/2010
 P.O.#: 74239
 SUPPLIER: Midfield Supply
 PART ID#: SPI 24481
 REQ. MIN TK: _____

GRADE: SA 333 6rb

NPS OD ID

LENGTH: 20"
 THICKNESS: XXH
 PIPE PUBLISHED NOM: 0358
 PLATE NOM: _____

HEADS 2:1
 HEMI
 WELD CAP
 OTHER

SHELL
 PIPE
 PLATE
 REPAD
 STRUCT.
 OTHER

NDE BY MANUFACTURER
 HYDRO YES NO
 NDE YES NO
 STRUC. YES NO
 OTHER YES

Weight per foot for pipe over 4"
3.66

MATERIAL TRACKING NUMBER	QTY	HEAT NUMBERS		MIN. THK.	THICKNESS & LOG				VISUAL EDGE	INSP. SURF.	REQ. MARKINGS VERIFIED	PREPARED BY
		HEAT NUMBER	PLATE NUMBER		A	B	C	D				
VS29232201	20	189120		0.349"	0.348	0.347	0.349	0.348	OK	OK	OK	MD

W/O# _____
 RECEIVED & ACCEPTED BY: [Signature]
 DATE: 12/3/10
 REQUIRED CODE MARKINGS:
Benteler Stahl/Rohr - Made in Germany
All Markings Stenciled on Pipe
 CUSTOMER: Stock

Benteler Stahl/Rohr GmbH
 Postfach 13 40
 33043 Paderborn
 Deutschland
 Tel.: +49.5254.81-0 Fax: +49.5254.13668

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1
 EN 10204:2005-01

Benteler Stahl/Rohr GmbH - Postfach 1340 - 33043 Paderborn - Deutschland
 Midfield Supply
 502 25 th Avenue
 NISKU AB P9E 0K6
 KANADA

Dokument-Nr.: 41-527818/001/P

Prüf-Nr.: 1 / 5
 Inspection No.: Page:
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Kunden-Bestell-Nr.: BST 08-6987 / Midfield 591241

Hersteller: Warmrohrwerk/Zieherrei
 ISO/TS 16949 (ISO 9001) DIN CERT-116744-2003
 Producteur: PED 97/23/EC TUV CERT 07-202-6635 WZ-0606/07

Benteler Auftrags-Nr.: 1536201

Herstellerzeichen:
 Manufacturer's brand:
 No. de commande Benteler: Marque du producteur:

Versandanzeigen-Nr.: 4158400

Stampel des Abnahmebeauftragten: WA
 Dispatch Note No.: Poinçon du contrôleur:

Produkt: NAHTLOSE STAHLROHRE
 Product: SEAMLESS STEEL TUBES
 Produkt: TUBES D' ACIER SANS SOUDURE

Stahlschmelzungsverfahren: ELEKTROSTAHL
 Steelmaking process: ELECTRIC FURNACE
 Procédé d' élaboration de l' acier: FOUR ELECTRIQUE

Lieferbedingungen: ASME SA-333-CD, ASME Section II Part A Edition 2007 Addenda 2008, ASTM-A 333-2005-CD, CSA Standard
 Terms of delivery: Z245.1-07 Category II, with agreed deviation: Pl. 9: Eddy current testing instead of hydrostatic
 Conditions de livraison: test, NACE MR0175/ISO 15156-1:2001, NACE MR0175/ISO 15156-2:2003

Maße - Toleranzen: ASME B36.10M-2004, ASME SA-999, ASME Section II Part A Edition 2007 Addenda 2008, ASTM-A 999-2004a

Dimensions-tolerances:

Stahlsorte: GRADE 1, GRADE 290, GRADE 6

Steel grade: Nuance d' acier:

Lieferzustand: Normalized

Delivery condition: État de livraison:

Produktkennzeichnung: FSD: BENTELER Z.245.1 -07- except section 9 - A/SA333 1/6/290 CAT II CATEGORIE 2HEAT-NO.

Product marking: NDE M45C S HN DIMENSIONS WEIGHT CLASS WEEKYEAR WA GERMANY P.O. 591241 SS

Marquage du produit:

AEZ = Azimienbeschriftung, Etching ink marking, Graveure à l' encre FK = Farbmarkenzeichnung, colour marking, marquage par couleur FS = Farbschablonierung, point stenciling, marquage par peinture FSD = Farbschablonen, Colour jet printer, Imprimante à jet d' encre dp c
 LS = Längsachsbildnerung, longitudinal stenciling, marquage longitudinal par peinture PKE = Etikettenszeichnung, tag marking, marquage sur étiquette PS = Prägestempel, die stamp, marquage par poinçonnage TS = Titonenstahlkennzeichnung, ink jet spray marking
 imprimante à jet d' encre

Benteler Stahl/Rohr GmbH
 Postfach 13 40
 33043 Paderborn
 Deutschland
 Tel.: +49.5254.81-0 Fax: +49.5254.13666

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Pos.	Stück	Maße	Länge	Gewicht	Schmelzen-Nr.	Prüfdruck	Rohr-Nr.-Gruppe	Vielfachlängen
Item	Number	Dimensions	Length	Weight	Heat No.	Test pressure	Tube number group	Multiple lengths
Poste	Nombre	Dimensions	Longueur	Poids	No. de coulée	Pression d'épreuve	Série de no. des tubes	Longueurs multiples
			feet	lbs				
0024	150	1" NPS * XXS 20 FT - 22 FT	3051,18	11144	189120			

Schmelzenanalyse [%] / Heat analysis [%] / Analyse sur coulée [%]

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI	CU	V	NB	TI	B
Item	Heat No.													
Poste	No. de coulée													
0024	189120	0,135	0,213	0,80	0,010	0,002	0,12	0,04	0,07	0,12	0,003	0,011	0,002	0,0001

1. Formel: $CE\ IIW=C+(Mn/6)+((Cr+Mo+V)/5)+((Cu+Ni)/15)\leq 0,42\%$
2. Formel: $CEV=C+F*((Mn/6)+(Si/24)+(Cu/15)+(Ni/20)+((Cr+Mo+V+Nb)/5)+(5*B))\leq 0,40$
3. Formel: $Mn/C\geq 3/1$
4. Formel: $Cr+Cu+Mo+Ni+V\leq 1,00\%$

BROMLEY METEOROLOGICAL SERVICES INC.
 Checked to ASME Div. 1

Secl. NA 201 Ed. 2002 Add. Min. 0.347"
 SA-530
 Date

Formelergebnisse / Formula results / Résultats des formules

Pos.	Schmelzen-Nr.	1. Formel	2. Formel	3. Formel	4. Formel
Item	Heat No.	1. Formule	2. Formule	3. Formule	4. Formule
Poste	No. de coulée	1. Formule	2. Formule	3. Formule	4. Formule
0024	189120	0,314	0,296	5,926	0,353

Produktanalyse [%] / Product analysis [%] / Analyse sur produit [%]

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI	CU	V	NB	TI	B
Item	Heat No.													
Poste	No. de coulée													
0024	189120	0,140	0,210	0,79	0,006	0,003	0,11	0,04	0,07	0,11	0,001	0,011	0,002	0,0004

1. Formel: $CE\ IIW=C+(Mn/6)+((Cr+Mo+V)/5)+((Cu+Ni)/15)\leq 0,42\%$
2. Formel: $CEV=C+F*((Mn/6)+(Si/24)+(Cu/15)+(Ni/20)+((Cr+Mo+V+Nb)/5)+(5*B))\leq 0,40$
3. Formel: $Mn/C\geq 3/1$
4. Formel: $Cr+Cu+Mo+Ni+V\leq 1,00\%$

Benteler Stahl/Rohr GmbH
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ABNAHMEPRÜFZEUGNIS EN 10204-3.1
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Formelergebnisse / Formula results / Résultats des formules

Pos.	Schmelzen-Nr	1. Formel	2. Formel	3. Formel	4. Formel
Item	Heat No.	1. Formula	2. Formula	3. Formula	4. Formula
Poste	No. de coulée	1. Formule	2. Formule	3. Formule	4. Formule
0024	189120	0,314	0,298	5,643	0,331

Prüfergebnisse / Test results / Résultats des essais

PASSED

Hydrostatic test: eddy current testing instead of hydrostatic test

Die Rohre sind auf Dichtheit geprüft durch:
 The tubes have been submitted to a leak tightness test by:

Les tubes ont passé un contrôle d'étanchéité par:

PASSED

ET-test: acc. to ASME SA-333, ASTM-A 333; acc. to ASTM-E 309, imperfections

Die Rohre wurden zerstörungsfrei geprüft:
 The tubes are non destructive tested:

Les tubes ont passé un essai non destructif:

PASSED

Ringfaltversuch:
 Flattening test:
 Essai d'aplatissement:

PASSED

PASSED

Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques

Die Probennahme erfolgte an Vielfachlängen.
 The sampling was carried out on multiple lengths.
 L'échantillonnage était réalisé aux longueurs multiples.

Zugversuch Vollprobe / Tensile test Full section test specimen / Essai de traction Eprouvette a section complete

Pos.	Proben-Nr.	Schmelzen-Nr.	Probennahme-Nr.	Streckgrenze	Zugfestigkeit	Dehnung	Einschnürung	Re/Rm
Item	Specimen No.	Heat No.	Specimen dimensions	Yield strength	Tensile strength	Elongation	Area reduction	Re/Rm
Poste	No. de l'éprouvette	No. de coulée	Dimensions de l'éprouv.	Limite élastique	Résistance à la traction	Allongement	Coefficient de striction	Re/Rm
Anforderungen	ReH	Rm	A2"	1. Formel	1. Formel	1. Formel	1. Formel	1. Formel
Requirements	N/mm ²	N/mm ²	%	1. Formula	1. Formula	1. Formula	1. Formula	1. Formula
Exigences	290-495	415-625	MIN 35	1. Formule	1. Formule	1. Formule	1. Formule	1. Formule
0024	000001	189120	33,40 X 9,10	303	447	56		
0024	000002	189120	33,40 X 9,10	303	447	56		
0024	000003	189120	33,40 X 9,10	303	446	56		
0024	000004	189120	33,40 X 9,10	302	446	56		
0024	000005	189120	33,40 X 9,10	302	445	56		

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
 INSPECTION CERTIFICATE EN 10204-3.1
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Zugversuch Vollprobe / Tensile test Full section test specimen / Essai de traction Eprouvette a section complete

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Pos.	Proben-Nr.	Schmelzen-Nr.	Probenabmessung	Streckgrenze	Zugfestigkeit	Dehnung	Einschnürung	Re/Rm
Item	Specimen No.	Heat No.	Specimen dimensions	Yield strength	Tensile strength	Elongation	Area reduction	Re/Rm
Poste	No. de l'éprouvette	No. de coulée	Dimensions de l'éprouv.	Limite élastique	Résistance à la traction	Allongement	Coefficient de striction	Re/Rm
Anforderungen	ReH	Rm	A2"	1. Formel				
Requirements	N/mm ²	N/mm ²	%	1. Formule				
Exigences	290-495	415-625	MIN 35	1. Formule				
0024	000006	189120	33,40 X 9,10	301	445	54		
0024	000007	189120	33,40 X 9,10	301	445	54		
0024	000008	189120	33,40 X 9,10	302	445	56		

Härteprüfung / Hardness test / Essai de dureté

Pos.	Proben-Nr.	Schmelzen-Nr.	Härte	HV	HRB	HB	HRC	HBW
Item	Specimen No.	Heat No.	Hardness					
Poste	No. de l'éprouv.	No. de coulée	Dureté					
Anforderungen	HRC	HB	HV	HRB	HB	MAX 200		
Requirements								
Exigences								
0024	000001	189120		132				
0024	000002	189120		133				
0024	000003	189120		131				
0024	000004	189120		134				
0024	000005	189120		132				
0024	000006	189120		131				
0024	000007	189120		130				
0024	000008	189120		132				

Benteler Stahl/Rohr GmbH
Postfach 13 40
33043 Paderborn
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BENTELER
Stahl/Rohr

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
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Kerbschlagbiegeversuch Notched bar impact test / Essai de flexion par choc (résilience) [CHARPY_V]

Pos. Proben-Nr. Schmelzen-Nr.	Probenabmessung	Probenlage	Prüftemperatur	Kerbschlagarbeit	Kerbschlagzähigkeit	Verf.-Bruchanteil
Item Specimen No. Heat No.	Specimen dimensions	Specimen position	Test temperature	Absorbed energy	Impact strength	Shear fracture
Poste No. de l'éprouv. No. de coulée	Dimensions de l'éprouvette	Position de l'éprouvette	Température d'essai	Energie absorbée	Résistance au choc	Rupture ductile
Anforderungen	Länge Breite Höhe	längs (L)	GRAD	einzel mittel	einzel mittel	einzel mittel
Requirements	Length Width Height	longitudinal (L)	°C	single average	single average	single average
Exigences	Longueur Largeur Hauteur	longitudinal (L)	-45	individuelle moyenne	individuelle moyenne	individuelle moyenne
0024 000001 189120	mm mm mm 55 9,00 10,00	quer (Q) transversal (Q) transversal (Q)	°C -45	J J J MIN 024 140 136 142	J/cm ² J/cm ² J/cm ²	
	55 9,00 10,00 9,00 10,00 9,00 10,00	L	-45			

Restmagnetismus / Demagnetize / Démagnétiser

Pos. / Item / Poste: 0024

demagnetized tubes; 1 measurement per 4 hours on both tube ends Two readings 180° apart around the circumference. Average value max 3.0 Millitesla (24 A/cm), individual value max 3.5 Millitesla (28 A/cm)

Vermerk / Remark / Remarque

Pos. / Item / Poste: 0024

NACE Standard: Hardness acc. to NACE MR0175/ISO 15156: HRC max 22., The material meets the requirements of NACE MR0103; Certificate remarks: The Material is Aluminium deoxidized and inclusion shape controlled with Calcium-Silicon treatment, CSA Z 245.1 except section 9, This is to confirm that the seamless linepipe supplied by Benteler and verified to CSA Standard Z245.1-07 meets the requirement for micro hardness of max. 248 HV 500 gf.; Certificate-Remark: Tubes are suitable for sour service

Verkäufer(in) / Salesman/ woman in charge / Personne chargée : Herr Buerger, Tel.: 05254/81-4266, Fax: 4299

Paderborn Schloß Neuhaus, 19.02.2009, TEL.: 05254.81-1765 FAX: 05254.81-1752


Abnahmebeauftragter
Inspection representative
Contrôleur

THOMAS GOLLAN / GUT

Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen. Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgültig.
We certify that the supplied products comply with the order specification. This document was prepared by means of electronic data processing and is valid without signature.
Nous attestons que les produits livrés sont conformes aux stipulations de la commande. Ce document a été établi par traitement électronique de l'information et est valide sans signature.

**BROMLEY MECHANICAL SERVICES
MATERIAL INSPECTION REPORT**

INSPECTED BY: MICHAEL QUINN GRADE: SA 516-70N DIA SIZE OR WITH: 36" X 48"
 NPS OD ID

DATE: AUGUST 3/2011 HEADS 2:1 HEMI
 P.O.# PO-75472 WELD CAP OTHER
 SUPPLIER: EDMONTON EXCHANGERS SHELL PIPE → NDE BY MANUFACTURER
 PART ID#: STL 33229 PLATE HYDRO YES NO NDE YES NO YES NO YES NO YES NO YES NO

REQ. MIN TK: 0.5000" REPAD STRUCT. OTHER
 LENGTH _____ THICKNESS _____
 PIPE PUBLISHED NOM _____ PLATE NOM 1.000" 0.500"
 Weight per foot for pipe over 4" _____

MATERIAL TRACKING NUMBER	QTY	HEAT NUMBER		MIN. THK.	THICKNESS & LOG				VISUAL EDGE	INSP. SURF.	REQ. MARKINGS VERIFIED	PREPARE BY
		HEAT NUMBER	PLATE NUMBER		A	B	C	D				
VS 29855	12'	G4028	275240351	0.500	0.503"	0.500"	0.504"	0.502"	ok	ok	ok	MQ

W/O# WO-34004/05/06/07 RECEIVED & ACCEPTED BY: [Signature] REQUIRED CODE MARKINGS: NIPPON STEEL CORPORATION-MADE IN JAPAN
 CUSTOMER: COMPASS COMPRESSION DATE: AUG 18 2011
ALL MARKINGS STAMPED INTO PLATE



edmonton exchanger
& manufacturing ltd.

CERTIFICATE OF COMPLIANCE

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

Customer **BROMLEY MECHANICAL SERVICES** PO 75472 Work Order **C90293** Date 2011/07/20 CofC# 26161 Page 1 of 1
LT

Item#	Description	Qty	Heat#
P90293-8	PLATE(S) - 0.5000" NOM X 36" X 48" (Material Spec: SA 516-70 Normalized). Conforms to NACE MR0175 / ISO 15156-2 2009 Annex A	1	G4028-275240351

Brinell Equipment: Newage Calibrated Pin
Brinell Hardness Tester

Material being supplied conforms to the latest ASME Code Section II, Part A, 2010 Edition. All welders and procedures are qualified to ASME Code Section IX.

	EDMONTON EXCHANGER
	UT: SA-578 LEV.C
	ACCEPTABLE TO ASME CODE
EE PROCEDURE:	UIP-001 REV.9
EQUIPMENT:	KRAUTKRAMER USN-58L
SERIAL NO.:	010X9H
TRANSDUCER:	BENCHMARK
CALIBRATION:	PLATE
TRANS. TYPE:	0", 1", 2 1/4 MHz
PRIMARY REF. RES.:	38dB
SCANNING SENS.:	Soda
RANGE CAL.:	3" Screen
SEARCH UNIT SERIAL:	00V5J3
	X BNC & FT LG
COAXIAL CABLE:	MICRODOT
GRID:	L4
MATERIAL:	SA 516-70 N
EXAMINATION SURFACE / SIDE:	TIGHT SCALE
COUPLANT:	WATER
TECH.:	TRACY ENMAN #11228
CSQB / SNT:	LEVEL II
TIME:	DIS
DATE:	JUL 19/11

Supplementary Examination - Items

B

注文者: HANWA CO., LTD.
注文者照会番号: 228-38501090
契約番号: 1-831-H1-5-4-AI01
商品名: HOT ROLLED STEEL PLATES
規格: ASME SA-516 GRADE 70-E10
文書番号: 需要家: EDMONTON EXCHANGER GROUP OF CUSTOMERS
DOCUMENT No.: OMPANIES

新日本製鋼株式会社
Nippon Steel Corporation

鋼材検査証明書
INSPECTION CERTIFICATE

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
需要家管理番号: 鋼材検査管理番号: E3001P0701E07

本社: 〒100-8071 東京都千代田区丸の内二丁目6番1号
HEAD OFFICE: 2-F-1, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
営業所: 〒299-1141 千葉県君津市君津1番地
KOMATSU WORKS: 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF, 299-1141, JAPAN

証明書番号: P-13163
発行年月日: 2011-04-06
PAGE: 2/3

寸法 DIMENSION mm, inch, feet	数量 QUANTITY	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			化学成分 CHEMICAL COMPOSITION %						
					YS 0.2%	TS	EL	2V	50F	C		SI	Mn	P	S	CH	Ni
0.5' X 96.5' X 480'	03	2979	G4027 10487	TESTED-PL 275240308TCI	57	77	28	304 316 295	AVG TLF305	16 37 143 7 2 1 2 2 0 8 0 0 0	0.011	0.30	0.40				
0.5' X 96.5' X 480'	03	8937	G4027 10487	FROM 275240308TCI TO 275240307	57	77	28	304 316 295	AVG TLF305	16 37 143 7 2 1 2 2 0 8 0 0 0	0.011	0.30	0.40				
0.5' X 96.5' X 480'	03	2979	G4027 10488	TESTED-PL 275240308TCI	56	77	29	313 307 303	AVG TLF306	16 37 143 7 2 1 2 2 0 8 0 0 0	0.011	0.30	0.40				

注記 NOTES: 1. 位置 Orientation: 位置 - 方向, T: 縦部 Top, B: 底部 Bottom, L: 圧縮方向 Longitudinal, C: 垂直方向 Transverse, Z: 縦部方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis
2. GL: 製品仕様 Gauge Length, A: 50mm 平形試験片 Rectangular, B: 50mm 平形試験片 Rectangular, C: 70mm 平形試験片 Rectangular, D: 70mm 平形試験片 Rectangular, E: 80mm 平形試験片 Rectangular, F: 80mm 平形試験片 Rectangular, G: 200mm, H: 2.1, I: 2.1, J: 5.65, K: 4.7 / So
3. RA: 絞り Production of Area, YR: 異状比 Yield Ratio, A: 合格 Acceptable, B: 合格 Acceptable, C: 合格 Acceptable, D: 合格 Acceptable, E: 合格 Acceptable, F: 合格 Acceptable, G: 合格 Acceptable, H: 合格 Acceptable, I: 合格 Acceptable, J: 合格 Acceptable, K: 合格 Acceptable, L: 合格 Acceptable, M: 合格 Acceptable, N: 合格 Acceptable, O: 合格 Acceptable, P: 合格 Acceptable, Q: 合格 Acceptable, R: 合格 Acceptable, S: 合格 Acceptable, T: 合格 Acceptable, U: 合格 Acceptable, V: 合格 Acceptable, W: 合格 Acceptable, X: 合格 Acceptable, Y: 合格 Acceptable, Z: 合格 Acceptable, AA: 合格 Acceptable, AB: 合格 Acceptable, AC: 合格 Acceptable, AD: 合格 Acceptable, AE: 合格 Acceptable, AF: 合格 Acceptable, AG: 合格 Acceptable, AH: 合格 Acceptable, AI: 合格 Acceptable, AJ: 合格 Acceptable, AK: 合格 Acceptable, AL: 合格 Acceptable, AM: 合格 Acceptable, AN: 合格 Acceptable, AO: 合格 Acceptable, AP: 合格 Acceptable, AQ: 合格 Acceptable, AR: 合格 Acceptable, AS: 合格 Acceptable, AT: 合格 Acceptable, AU: 合格 Acceptable, AV: 合格 Acceptable, AW: 合格 Acceptable, AX: 合格 Acceptable, AY: 合格 Acceptable, AZ: 合格 Acceptable, BA: 合格 Acceptable, BB: 合格 Acceptable, BC: 合格 Acceptable, BD: 合格 Acceptable, BE: 合格 Acceptable, BF: 合格 Acceptable, BG: 合格 Acceptable, BH: 合格 Acceptable, BI: 合格 Acceptable, BJ: 合格 Acceptable, BK: 合格 Acceptable, BL: 合格 Acceptable, BM: 合格 Acceptable, BN: 合格 Acceptable, BO: 合格 Acceptable, BP: 合格 Acceptable, BQ: 合格 Acceptable, BR: 合格 Acceptable, BS: 合格 Acceptable, BT: 合格 Acceptable, BU: 合格 Acceptable, BV: 合格 Acceptable, BW: 合格 Acceptable, BX: 合格 Acceptable, BY: 合格 Acceptable, BZ: 合格 Acceptable, CA: 合格 Acceptable, CB: 合格 Acceptable, CC: 合格 Acceptable, CD: 合格 Acceptable, CE: 合格 Acceptable, CF: 合格 Acceptable, CG: 合格 Acceptable, CH: 合格 Acceptable, CI: 合格 Acceptable, CJ: 合格 Acceptable, CK: 合格 Acceptable, CL: 合格 Acceptable, CM: 合格 Acceptable, CN: 合格 Acceptable, CO: 合格 Acceptable, CP: 合格 Acceptable, CQ: 合格 Acceptable, CR: 合格 Acceptable, CS: 合格 Acceptable, CT: 合格 Acceptable, CU: 合格 Acceptable, CV: 合格 Acceptable, CW: 合格 Acceptable, CX: 合格 Acceptable, CY: 合格 Acceptable, CZ: 合格 Acceptable, DA: 合格 Acceptable, DB: 合格 Acceptable, DC: 合格 Acceptable, DD: 合格 Acceptable, DE: 合格 Acceptable, DF: 合格 Acceptable, DG: 合格 Acceptable, DH: 合格 Acceptable, DI: 合格 Acceptable, DJ: 合格 Acceptable, DK: 合格 Acceptable, DL: 合格 Acceptable, DM: 合格 Acceptable, DN: 合格 Acceptable, DO: 合格 Acceptable, DP: 合格 Acceptable, DQ: 合格 Acceptable, DR: 合格 Acceptable, DS: 合格 Acceptable, DT: 合格 Acceptable, DU: 合格 Acceptable, DV: 合格 Acceptable, DW: 合格 Acceptable, DX: 合格 Acceptable, DY: 合格 Acceptable, DZ: 合格 Acceptable, EA: 合格 Acceptable, EB: 合格 Acceptable, EC: 合格 Acceptable, ED: 合格 Acceptable, EE: 合格 Acceptable, EF: 合格 Acceptable, EG: 合格 Acceptable, EH: 合格 Acceptable, EI: 合格 Acceptable, EJ: 合格 Acceptable, EK: 合格 Acceptable, EL: 合格 Acceptable, EM: 合格 Acceptable, EN: 合格 Acceptable, EO: 合格 Acceptable, EP: 合格 Acceptable, EQ: 合格 Acceptable, ER: 合格 Acceptable, ES: 合格 Acceptable, ET: 合格 Acceptable, EU: 合格 Acceptable, EV: 合格 Acceptable, EW: 合格 Acceptable, EX: 合格 Acceptable, EY: 合格 Acceptable, EZ: 合格 Acceptable, FA: 合格 Acceptable, FB: 合格 Acceptable, FC: 合格 Acceptable, FD: 合格 Acceptable, FE: 合格 Acceptable, FF: 合格 Acceptable, FG: 合格 Acceptable, FH: 合格 Acceptable, FI: 合格 Acceptable, FJ: 合格 Acceptable, FK: 合格 Acceptable, FL: 合格 Acceptable, FM: 合格 Acceptable, FN: 合格 Acceptable, FO: 合格 Acceptable, FP: 合格 Acceptable, FQ: 合格 Acceptable, FR: 合格 Acceptable, FS: 合格 Acceptable, FT: 合格 Acceptable, FU: 合格 Acceptable, FV: 合格 Acceptable, FW: 合格 Acceptable, FX: 合格 Acceptable, FY: 合格 Acceptable, FZ: 合格 Acceptable, GA: 合格 Acceptable, GB: 合格 Acceptable, GC: 合格 Acceptable, GD: 合格 Acceptable, GE: 合格 Acceptable, GF: 合格 Acceptable, GG: 合格 Acceptable, GH: 合格 Acceptable, GI: 合格 Acceptable, GJ: 合格 Acceptable, GK: 合格 Acceptable, GL: 合格 Acceptable, GM: 合格 Acceptable, GN: 合格 Acceptable, GO: 合格 Acceptable, GP: 合格 Acceptable, GQ: 合格 Acceptable, GR: 合格 Acceptable, GS: 合格 Acceptable, GT: 合格 Acceptable, GU: 合格 Acceptable, GV: 合格 Acceptable, GW: 合格 Acceptable, GX: 合格 Acceptable, GY: 合格 Acceptable, GZ: 合格 Acceptable, HA: 合格 Acceptable, HB: 合格 Acceptable, HC: 合格 Acceptable, HD: 合格 Acceptable, HE: 合格 Acceptable, HF: 合格 Acceptable, HG: 合格 Acceptable, HH: 合格 Acceptable, HI: 合格 Acceptable, HJ: 合格 Acceptable, HK: 合格 Acceptable, HL: 合格 Acceptable, HM: 合格 Acceptable, HN: 合格 Acceptable, HO: 合格 Acceptable, HP: 合格 Acceptable, HQ: 合格 Acceptable, HR: 合格 Acceptable, HS: 合格 Acceptable, HT: 合格 Acceptable, HU: 合格 Acceptable, HV: 合格 Acceptable, HW: 合格 Acceptable, HX: 合格 Acceptable, HY: 合格 Acceptable, HZ: 合格 Acceptable, IA: 合格 Acceptable, IB: 合格 Acceptable, IC: 合格 Acceptable, ID: 合格 Acceptable, IE: 合格 Acceptable, IF: 合格 Acceptable, IG: 合格 Acceptable, IH: 合格 Acceptable, II: 合格 Acceptable, IJ: 合格 Acceptable, IK: 合格 Acceptable, IL: 合格 Acceptable, IM: 合格 Acceptable, IN: 合格 Acceptable, IO: 合格 Acceptable, IP: 合格 Acceptable, IQ: 合格 Acceptable, IR: 合格 Acceptable, IS: 合格 Acceptable, IT: 合格 Acceptable, IU: 合格 Acceptable, IV: 合格 Acceptable, IW: 合格 Acceptable, IX: 合格 Acceptable, IY: 合格 Acceptable, IZ: 合格 Acceptable, JA: 合格 Acceptable, JB: 合格 Acceptable, JC: 合格 Acceptable, JD: 合格 Acceptable, JE: 合格 Acceptable, JF: 合格 Acceptable, JG: 合格 Acceptable, JH: 合格 Acceptable, JI: 合格 Acceptable, JJ: 合格 Acceptable, JK: 合格 Acceptable, JL: 合格 Acceptable, JM: 合格 Acceptable, JN: 合格 Acceptable, JO: 合格 Acceptable, JP: 合格 Acceptable, JQ: 合格 Acceptable, JR: 合格 Acceptable, JS: 合格 Acceptable, JT: 合格 Acceptable, JU: 合格 Acceptable, JV: 合格 Acceptable, JW: 合格 Acceptable, JX: 合格 Acceptable, JY: 合格 Acceptable, JZ: 合格 Acceptable, KA: 合格 Acceptable, KB: 合格 Acceptable, KC: 合格 Acceptable, KD: 合格 Acceptable, KE: 合格 Acceptable, KF: 合格 Acceptable, KG: 合格 Acceptable, KH: 合格 Acceptable, KI: 合格 Acceptable, KJ: 合格 Acceptable, KK: 合格 Acceptable, KL: 合格 Acceptable, KM: 合格 Acceptable, KN: 合格 Acceptable, KO: 合格 Acceptable, KP: 合格 Acceptable, KQ: 合格 Acceptable, KR: 合格 Acceptable, KS: 合格 Acceptable, KT: 合格 Acceptable, KU: 合格 Acceptable, KV: 合格 Acceptable, KW: 合格 Acceptable, KX: 合格 Acceptable, KY: 合格 Acceptable, KZ: 合格 Acceptable, LA: 合格 Acceptable, LB: 合格 Acceptable, LC: 合格 Acceptable, LD: 合格 Acceptable, LE: 合格 Acceptable, LF: 合格 Acceptable, LG: 合格 Acceptable, LH: 合格 Acceptable, LI: 合格 Acceptable, LJ: 合格 Acceptable, LK: 合格 Acceptable, LL: 合格 Acceptable, LM: 合格 Acceptable, LN: 合格 Acceptable, LO: 合格 Acceptable, LP: 合格 Acceptable, LQ: 合格 Acceptable, LR: 合格 Acceptable, LS: 合格 Acceptable, LT: 合格 Acceptable, LU: 合格 Acceptable, LV: 合格 Acceptable, LW: 合格 Acceptable, LX: 合格 Acceptable, LY: 合格 Acceptable, LZ: 合格 Acceptable, MA: 合格 Acceptable, MB: 合格 Acceptable, MC: 合格 Acceptable, MD: 合格 Acceptable, ME: 合格 Acceptable, MF: 合格 Acceptable, MG: 合格 Acceptable, MH: 合格 Acceptable, MI: 合格 Acceptable, MJ: 合格 Acceptable, MK: 合格 Acceptable, ML: 合格 Acceptable, MM: 合格 Acceptable, MN: 合格 Acceptable, MO: 合格 Acceptable, MP: 合格 Acceptable, MQ: 合格 Acceptable, MR: 合格 Acceptable, MS: 合格 Acceptable, MT: 合格 Acceptable, MU: 合格 Acceptable, MV: 合格 Acceptable, MW: 合格 Acceptable, MX: 合格 Acceptable, MY: 合格 Acceptable, MZ: 合格 Acceptable, NA: 合格 Acceptable, NB: 合格 Acceptable, NC: 合格 Acceptable, ND: 合格 Acceptable, NE: 合格 Acceptable, NF: 合格 Acceptable, NG: 合格 Acceptable, NH: 合格 Acceptable, NI: 合格 Acceptable, NJ: 合格 Acceptable, NK: 合格 Acceptable, NL: 合格 Acceptable, NM: 合格 Acceptable, NN: 合格 Acceptable, NO: 合格 Acceptable, NP: 合格 Acceptable, NQ: 合格 Acceptable, NR: 合格 Acceptable, NS: 合格 Acceptable, NT: 合格 Acceptable, NU: 合格 Acceptable, NV: 合格 Acceptable, NW: 合格 Acceptable, NX: 合格 Acceptable, NY: 合格 Acceptable, NZ: 合格 Acceptable, OA: 合格 Acceptable, OB: 合格 Acceptable, OC: 合格 Acceptable, OD: 合格 Acceptable, OE: 合格 Acceptable, OF: 合格 Acceptable, OG: 合格 Acceptable, OH: 合格 Acceptable, OI: 合格 Acceptable, OJ: 合格 Acceptable, OK: 合格 Acceptable, OL: 合格 Acceptable, OM: 合格 Acceptable, ON: 合格 Acceptable, OO: 合格 Acceptable, OP: 合格 Acceptable, OQ: 合格 Acceptable, OR: 合格 Acceptable, OS: 合格 Acceptable, OT: 合格 Acceptable, OU: 合格 Acceptable, OV: 合格 Acceptable, OW: 合格 Acceptable, OX: 合格 Acceptable, OY: 合格 Acceptable, OZ: 合格 Acceptable, PA: 合格 Acceptable, PB: 合格 Acceptable, PC: 合格 Acceptable, PD: 合格 Acceptable, PE: 合格 Acceptable, PF: 合格 Acceptable, PG: 合格 Acceptable, PH: 合格 Acceptable, PI: 合格 Acceptable, PJ: 合格 Acceptable, PK: 合格 Acceptable, PL: 合格 Acceptable, PM: 合格 Acceptable, PN: 合格 Acceptable, PO: 合格 Acceptable, PP: 合格 Acceptable, PQ: 合格 Acceptable, PR: 合格 Acceptable, PS: 合格 Acceptable, PT: 合格 Acceptable, PU: 合格 Acceptable, PV: 合格 Acceptable, PW: 合格 Acceptable, PX: 合格 Acceptable, PY: 合格 Acceptable, PZ: 合格 Acceptable, QA: 合格 Acceptable, QB: 合格 Acceptable, QC: 合格 Acceptable, QD: 合格 Acceptable, QE: 合格 Acceptable, QF: 合格 Acceptable, QG: 合格 Acceptable, QH: 合格 Acceptable, QI: 合格 Acceptable, QJ: 合格 Acceptable, QK: 合格 Acceptable, QL: 合格 Acceptable, QM: 合格 Acceptable, QN: 合格 Acceptable, QO: 合格 Acceptable, QP: 合格 Acceptable, QQ: 合格 Acceptable, QR: 合格 Acceptable, QS: 合格 Acceptable, QT: 合格 Acceptable, QU: 合格 Acceptable, QV: 合格 Acceptable, QW: 合格 Acceptable, QX: 合格 Acceptable, QY: 合格 Acceptable, QZ: 合格 Acceptable, RA: 合格 Acceptable, RB: 合格 Acceptable, RC: 合格 Acceptable, RD: 合格 Acceptable, RE: 合格 Acceptable, RF: 合格 Acceptable, RG: 合格 Acceptable, RH: 合格 Acceptable, RI: 合格 Acceptable, RJ: 合格 Acceptable, RK: 合格 Acceptable, RL: 合格 Acceptable, RM: 合格 Acceptable, RN: 合格 Acceptable, RO: 合格 Acceptable, RP: 合格 Acceptable, RQ: 合格 Acceptable, RR: 合格 Acceptable, RS: 合格 Acceptable, RT: 合格 Acceptable, RU: 合格 Acceptable, RV: 合格 Acceptable, RW: 合格 Acceptable, RX: 合格 Acceptable, RY: 合格 Acceptable, RZ: 合格 Acceptable, SA: 合格 Acceptable, SB: 合格 Acceptable, SC: 合格 Acceptable, SD: 合格 Acceptable, SE: 合格 Acceptable, SF: 合格 Acceptable, SG: 合格 Acceptable, SH: 合格 Acceptable, SI: 合格 Acceptable, SJ: 合格 Acceptable, SK: 合格 Acceptable, SL: 合格 Acceptable, SM: 合格 Acceptable, SN: 合格 Acceptable, SO: 合格 Acceptable, SP: 合格 Acceptable, SQ: 合格 Acceptable, SR: 合格 Acceptable, SS: 合格 Acceptable, ST: 合格 Acceptable, SU: 合格 Acceptable, SV: 合格 Acceptable, SW: 合格 Acceptable, SX: 合格 Acceptable, SY: 合格 Acceptable, SZ: 合格 Acceptable, TA: 合格 Acceptable, TB: 合格 Acceptable, TC: 合格 Acceptable, TD: 合格 Acceptable, TE: 合格 Acceptable, TF: 合格 Acceptable, TG: 合格 Acceptable, TH: 合格 Acceptable, TI: 合格 Acceptable, TJ: 合格 Acceptable, TK: 合格 Acceptable, TL: 合格 Acceptable, TM: 合格 Acceptable, TN: 合格 Acceptable, TO: 合格 Acceptable, TP: 合格 Acceptable, TQ: 合格 Acceptable, TR: 合格 Acceptable, TS: 合格 Acceptable, TU: 合格 Acceptable, TV: 合格 Acceptable, TW: 合格 Acceptable, TX: 合格 Acceptable, TY: 合格 Acceptable, TZ: 合格 Acceptable, UA: 合格 Acceptable, UB: 合格 Acceptable, UC: 合格 Acceptable, UD: 合格 Acceptable, UE: 合格 Acceptable, UF: 合格 Acceptable, UG: 合格 Acceptable, UH: 合格 Acceptable, UI: 合格 Acceptable, UJ: 合格 Acceptable, UK: 合格 Acceptable, UL: 合格 Acceptable, UM: 合格 Acceptable, UN: 合格 Acceptable, UO: 合格 Acceptable, UP: 合格 Acceptable, UQ: 合格 Acceptable, UR: 合格 Acceptable, US: 合格 Acceptable, UT: 合格 Acceptable, UY: 合格 Acceptable, UV: 合格 Acceptable, UW: 合格 Acceptable, UX: 合格 Acceptable, UZ: 合格 Acceptable, VA: 合格 Acceptable, VB: 合格 Acceptable, VC: 合格 Acceptable, VD: 合格 Acceptable, VE: 合格 Acceptable, VF: 合格 Acceptable, VG: 合格 Acceptable, VH: 合格 Acceptable, VI: 合格 Acceptable, VJ: 合格 Acceptable, VK: 合格 Acceptable, VL: 合格 Acceptable, VM: 合格 Acceptable, VN: 合格 Acceptable, VO: 合格 Acceptable, VP: 合格 Acceptable, VQ: 合格 Acceptable, VR: 合格 Acceptable, VS: 合格 Acceptable, VT: 合格 Acceptable, VU: 合格 Acceptable, VV: 合格 Acceptable, VW: 合格 Acceptable, VX: 合格 Acceptable, VY: 合格 Acceptable, VZ: 合格 Acceptable, WA: 合格 Acceptable, WB: 合格 Acceptable, WC: 合格 Acceptable, WD: 合格 Acceptable, WE: 合格 Acceptable, WF: 合格 Acceptable, WG: 合格 Acceptable, WH: 合格 Acceptable, WI: 合格 Acceptable, WJ: 合格 Acceptable, WK: 合格 Acceptable, WL: 合格 Acceptable, WM: 合格 Acceptable, WN: 合格 Acceptable, WO: 合格 Acceptable, WP: 合格 Acceptable, WQ: 合格 Acceptable, WR: 合格 Acceptable, WS: 合格 Acceptable, WT: 合格 Acceptable, WU: 合格 Acceptable, WV: 合格 Acceptable, WW: 合格 Acceptable, WX: 合格 Acceptable, WY: 合格 Acceptable, WZ: 合格 Acceptable, XA: 合格 Acceptable, XB: 合格 Acceptable, XC: 合格 Acceptable, XD: 合格 Acceptable, XE: 合格 Acceptable, XF: 合格 Acceptable, XG: 合格 Acceptable, XH: 合格 Acceptable, XI: 合格 Acceptable, XJ: 合格 Acceptable, XK: 合格 Acceptable, XL: 合格 Acceptable, XM: 合格 Acceptable, XN: 合格 Acceptable, XO: 合格 Acceptable, XP: 合格 Acceptable, XQ: 合格 Acceptable, XR: 合格 Acceptable, XS: 合格 Acceptable, XT: 合格 Acceptable, XU: 合格 Acceptable, XV: 合格 Acceptable, XW: 合格 Acceptable, XX: 合格 Acceptable, XY: 合格 Acceptable, XZ: 合格 Acceptable, YA: 合格 Acceptable, YB: 合格 Acceptable, YC: 合格 Acceptable, YD: 合格 Acceptable, YE: 合格 Acceptable, YF: 合格 Acceptable, YG: 合格 Acceptable, YH: 合格 Acceptable, YI: 合格 Acceptable, YJ: 合格 Acceptable, YK: 合格 Acceptable, YL: 合格 Acceptable, YM: 合格 Acceptable, YN: 合格 Acceptable, YO: 合格 Acceptable, YP: 合格 Acceptable, YQ: 合格 Acceptable, YR: 合格 Acceptable, YS: 合格 Acceptable, YT: 合格 Acceptable, YU: 合格 Acceptable, YV: 合格 Acceptable, YW: 合格 Acceptable, YX: 合格 Acceptable, YZ: 合格 Acceptable, ZA: 合格 Acceptable, ZB: 合格 Acceptable, ZC: 合格 Acceptable, ZD: 合格 Acceptable, ZE: 合格 Acceptable, ZF: 合格 Acceptable, ZG: 合格 Acceptable, ZH: 合格 Acceptable, ZI: 合格 Acceptable, ZJ: 合格 Acceptable, ZK: 合格 Acceptable, ZL: 合格 Acceptable, ZM: 合格 Acceptable, ZN: 合格 Acceptable, ZO: 合格 Acceptable, ZP: 合格 Acceptable, ZQ: 合格 Acceptable, ZR: 合格 Acceptable, ZS: 合格 Acceptable, ZT: 合格 Acceptable, ZU: 合格 Acceptable, ZV: 合格 Acceptable, ZW: 合格 Acceptable, ZX: 合格 Acceptable, ZY: 合格 Acceptable, ZZ: 合格 Acceptable

上記注文品は鋼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.

J. Adachi
君津製鋼所 検査管理グループリーダ
Head of Department
PLATE QUALITY CONTROL DEPT.
KOMATSU WORKS



B

新日本製鋼所株式会社
Nippon Steel Corporation

社 千100-8071 東京都千代田区丸の内二丁目6番1号
HEAD OFFICE : 2-6-1, MARUUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
若 千299-1141 千葉県君津市君津1番地
KIMITSUWORKS : 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141, JAPAN

鋼材検査証明書
INSPECTION CERTIFICATE

注文者 : HANWA CO., LID.
注文者組合番号 : 228-38501090
契約番号 : 1-831-H1-5-4-AI01
商 品 名 : HOI ROLLED STEEL PLATES
規 格 : ASME SA-516 GRADE 70-E10
文 章 番 号 :
DOCUMENT No. :
需要家 : EDMONTON EXCHANGER GROUP OF C-
CUSTOMER : OMPANIES

証明書番号 : P-13163 頁 : 2/4
CERTIFICATE No. : P-13163 PAGE : 2/4
発行年月日 : 2011-04-06
DATE OF ISSUE : 2011-04-06

228DM*****
*****CEW***
E3001P07Q1 E07

寸 法 DIMENSION mm, 'inch, 'feet	数量 QUAN- TITY	質量 MASS KG	鋼種番号 CAST No.	製品番号 PLATE No.	引張試験 TENSILE TEST Y.S. 0.2% T.S. KSI	衝撃試験 IMPACT TEST 2V - 50F FT-LB AVG EACH	化学成分 CHEMICAL COMPOSITION %																
							C	Si	Mn	P	S	Cr	Ni	Cu	Mo	Nb	V	Ti	Other				
0.5' X 96.5' X 480'	03	6937	64027FROM	275240301CI	56	77	29	TLF808	313	307	303	16	37	143	7	2	1	2	0	11	0	30	40
			TO	275240311										16	38	142	6	2	1	1	1	1	0
0.5' X 96.5' X 480'	03	2979	64027TESTED-PL	275240301CI	56	77	28	TLF291	298	287	289	16	37	143	7	2	1	2	0	11	0	30	40
			TO	275240303									16	38	142	6	2	1	1	1	1	1	0
0.5' X 96.5' X 480'	03	5958	64027FROM	275240302ICI	56	77	28	TLF291	298	287	289	16	37	143	7	2	1	2	0	11	0	30	40
			TO	275240303									16	38	142	6	2	1	1	1	1	1	0

注 意 NOTES: [表1] Location Orientation 位置・方向, T: 上部 Top, B: 底部 Bottom, L: 長さ方向 Longitudinal, C: 寬度方向 Transverse, Z: 板厚方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis
 [表2] GL 板成距離 Gauge Length, A: 50mm 丸形試験片 Round, B: 50mm 平形試験片 Rectangular, C: 70mm 平形試験片 Rectangular, D: 70mm 平形試験片 Rectangular, E: 80mm 平形試験片 Rectangular, F: 80mm 平形試験片 Rectangular, G: 200mm, H: 2.1, 8, J: 5.65/So, K: 4.7/So
 [表3] RA: 板厚 Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, CR: Controlled Rolled, NI C: NIC Process/TMC Process, CLC: CLC Process/TMC Process, A.R: As Rolled, T.M.R: T.M.R Process/TMC Process, N.R: Normalizing Rolled
 [表4] A: 合格 Acceptable, [表5] F: 鋼材注法 FULL SIZE, 2: 2.5mm, 3: 3.2mm, 4: 3.9mm, 5: 5.0mm, 6: 6.7mm, 7: 7.5mm, 8: 8.6mm, 9: 鋼板厚 Plate Thickness, L: 表G: 鋼板分析 Product Analysis, S.H: 熱処理 Shear Fracture, L.E: 熱処理 Lateral Expansion, A.G.S: オーステナイト型 Austenite Grain Size, F.G.S: オーステナイト型 Ferrite Grain Size, S.R: Stress Relief/Post Weld Heat Treatment

上記注文品は鋼材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.

J. Adachi
Head of Quality Control Dept.
KIMITSUWORKS



新日本製鋼所株式会社
Nippon Steel Corporation

鋼材検査証明書
INSPECTION CERTIFICATE

社 100-8071 東京都千代田区丸の内二丁目6番号
HEAD OFFICE 2-6-1, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
名 299-1141 千葉県君津市君津1番地
KIMITSUWORKS 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141, JAPAN

証明書番号 P-13163 PAGE 25
CERTIFICATE No. 発行年月日 2011-04-06

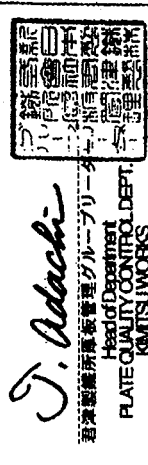
需要家管理番号 E3001P07Q1 E07
CUSTOMER'S CONTROL No. 2***0M***

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
需要家管理番号 E3001P07Q1 E07
CUSTOMER'S CONTROL No.

寸法 DIMENSION min. inch. feet	数量 QUANTITY	質量 MASS KG	製鋼番号 CAST No.	製品番号 PLATE No.	引張試験 TENSILE TEST Y.S. 0.2% KSI 引張強さ T.S. 伸び E.L. %	衝撃試験 IMPACT TEST 2V-50F F.T.L.B. 平均値 AVG EACH	化学成分 CHEMICAL COMPOSITION %										
							C	Si	Mn	P	S	Cr	Ni	Mo	Nb	V	Al
0.5' X 96.5' X 480"	1	2979	G4027TESTED-PL 10494 275240312ICI		57 77 30	307 304 297	N	TE3	TE1	SN	CA	B	TI	From	Spec.	Other	
							AVG	16	37	143	7	2	1	2	0	11	0
							TLF303	32	2	5	0	8	0	0	0	0	0
								P16	38	142	6	2	1	1	1	0	11
									35	3			14	0	0	0	0
0.5' X 96.5' X 480"	3	8937	G4027FROM 10494 275240313ICI		57 77 30	307 304 297	AVG	16	37	143	7	2	1	2	0	11	0
							TLF303	32	2	5	0	8	0	0	0	0	0
								P16	38	142	6	2	1	1	1	0	11
									35	3			14	0	0	0	0
0.5' X 96.5' X 480"	1	2979	G4028TESTED-PL 10496 275240316ICI		56 77 30	312 313 294	AVG	15	37	144	6	1	1	1	2	0	11
							TLF306	37	2	4	0	8	0	0	0	0	0
								P15	39	144	6	1	1	1	1	0	12
									34	3			12	0	0	0	0

注 記 事項 (Notes): 1. 位置 (Location): 縦長方向 (Longitudinal), C: 厚さ方向 (Transverse), Z: 横方向 (Through Thickness), R: 45° 方向 (45deg. to the Longitudinal Axis)
2. 試験方法 (Test Method): 引張試験 (Tensile Test), 衝撃試験 (Impact Test), 化学分析 (Chemical Analysis)
3. 公差 (Tolerance): 公差 (Tolerance) については、本規格 (This Specification) 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。
4. 検査 (Inspection): 検査 (Inspection) については、本規格 (This Specification) 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.



Head of Department
PLATE QUALITY CONTROL DEPT.
KIMITSUWORKS



新日本製鐵株式會社
Nippon Steel Corporation

鋼材検査証明書
INSPECTION CERTIFICATE

本社 千100-8071 東京都千代田区丸の内二丁目6番1号
 HEAD OFFICE : 2-6-1, MARUONICHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
 営業課 千299-1141 千葉県君津市君津一番地
 OPERATING OFFICE : 1-299-1141, KIMITSU-KHIMITSU-CITY, CHIBA-PREF. 299-1141, JAPAN
 KIMITSUWORKS

証明書番号 : P-13163 PAGE: 2/6
 CERTIFICATE No. : P-13163 PAGE: 2/6

COMMODITY: HOT ROLLED STEEL PLATES
 SPECIFICATION: ASME SA-516 GRADE 70-E10
 DOCUMENT No. : E3001P07Q1 E07

EDMONTON EXCHANGER GROUP OF COMPANIES
 CUSTOMERS CONTROL No. : E3001P07Q1 E07

発行年月日 : 2011-04-06
 DATE OF ISSUE : 2011-04-06
 2**ADM***
 *****CEW***

寸法	数量	質量	製鋼番号	製品番号	引張試験				化学成分
					YS	TS	EL	KA	
0.5' X 96.5' X 480"	03	2979	64028 10497	275240317 275240318	56	77	30		C 15.37 Si 3.7 Mn 14.4 P 6.1 S 2.4 N 3.7 TE3 14.4 TE1 4.6 TI 1.1 CA 1.1 SM 0.0 Ni 1.1 Cu 1.1 Mo 0.0 Nb 0.0 V 0.0 Ti 0.0 Al 0.0 As 0.0 Sb 0.0 Pb 0.0
0.5' X 96.5' X 480"	03	2979	G4028 10497	275240319 275240320	56	77	29		P15.39 Si 3.4 Mn 14.4 P 6.1 S 3.4 N 3.7 TE3 14.4 TE1 4.6 TI 1.1 CA 1.1 SM 0.0 Ni 1.1 Cu 1.1 Mo 0.0 Nb 0.0 V 0.0 Ti 0.0 Al 0.0 As 0.0 Sb 0.0 Pb 0.0
0.5' X 96.5' X 480"	03	8937	G4028 10497	275240321 275240322	56	77	29		P15.39 Si 3.4 Mn 14.4 P 6.1 S 3.4 N 3.7 TE3 14.4 TE1 4.6 TI 1.1 CA 1.1 SM 0.0 Ni 1.1 Cu 1.1 Mo 0.0 Nb 0.0 V 0.0 Ti 0.0 Al 0.0 As 0.0 Sb 0.0 Pb 0.0

注 意 [英] Location Orientation 位置・方向. T: 縦部 Top. B: 底面 Bottom. L: 圧延方向 Longitudinal. C: 垂直方向 Transverse. Z: 転向方向 Through Thickness. R: 45° 方向 45Deg to the Longitudinal Axis.
 [日] 検査位置 位置・方向. T: 上部 Top. B: 下部 Bottom. L: 圧延方向 Longitudinal. C: 垂直方向 Transverse. Z: 転向方向 Through Thickness. R: 45° 方向 45Deg to the Longitudinal Axis.
 [英] GA 検査距離 Gauge Length. A: 50mm 平均試験片 Rectangular. B: 50mm 平均試験片 Rectangular. C: 70mm 平均試験片 Rectangular. D: 70mm 平均試験片 Rectangular. E: 80mm 平均試験片 Rectangular. F: 80mm 平均試験片 Rectangular. G: 200mm. H: 211.8. J: 5.65/S₀. K: 4/S₀.
 [日] RA: 絞り Reduction of Area. YR: 降伏比 Yield Ratio. [英] A: 合格 Acceptable. [日] A: 合格 合格. [英] P: 板厚 Plate Thickness. [日] P: 板厚 板厚. [英] F: 鋼材注法 Full Size. [日] F: 鋼材注法 鋼材注法. [英] A: 冷作 Annealed. [日] A: 冷作 冷作. [英] T: 焼き入れ Tempered. [日] T: 焼き入れ 焼き入れ. [英] C: 圧延鋼材 Processed. [日] C: 圧延鋼材 圧延鋼材. [英] A: 圧延鋼材 Processed. [日] A: 圧延鋼材 圧延鋼材. [英] S: 鋼材注法 Full Size. [日] S: 鋼材注法 鋼材注法. [英] F: 鋼材注法 Full Size. [日] F: 鋼材注法 鋼材注法. [英] S: 鋼材注法 Full Size. [日] S: 鋼材注法 鋼材注法. [英] S: 鋼材注法 Full Size. [日] S: 鋼材注法 鋼材注法.

J. Adachi
 Head of Department
 PLATE QUALITY CONTROL DEPT.
 KIMITSUWORKS

上配注文品は弊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.



新日本製鐵株式會社
Nippon Steel Corporation

鋼材検査証明書
INSPECTION CERTIFICATE

社 長 千原 千代田 丸の内二丁目6番1号
HEAD OFFICE : 2-6-1, MARUOUCHI, CHITODA-KU, TOKYO 100-8071, JAPAN
若 津 製 鐵 所 : 千 葉 県 君 津 市 君 津 1 番 地
KOMITSUWORKS : 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141, JAPAN

SHIPPER : HANWA CO., LTD.
注文者照合番号 : 228-38501090
契約番号 : 1-831-H1-3-4-A101
商 品 名 : HOT ROLLED STEEL PLATES
規 格 : ASME SA-516 GRADE 70-E10
文 書 番 号 :
DOCUMENT No. :

証明書番号 : P-13163 PAGE : 27
CERTIFICATE No. :
発行年月日 : 2011-04-06
DATE OF ISSUE :
2***M****
*****CEW***
E3001P07Q1 E07

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
需要家 EDMONTON EXCHANGER GROUP OF C-
CUSTOMERS CONTROL No. :
需要家管理番号 :
CUSTOMERS CONTROL No. :

寸 法 DIMENSION mm, 'inch, 'feet	数量 QUANTITY	重量 MASS KG	製鋼番号 CASTING No.	製品番号 PLATE No.	引張試験 TENSILE TEST		衝撃試験 IMPACT TEST		化 学 成 分 CHEMICAL COMPOSITION %													
					YS 0.2%	TS	EL	CV	C	Si	Mn	P	S	Ca	Ni	Cr	Mo	Nb	V	Ti	Al	Other
0.5' X 96.5' X 480'	03	2979	G4028TESTED-PL	275240327TCI	57	77	28	291	AVG	15	37	144	6	1	1	1	2	0	11	0	3	140
			10504		275240327TCI	57	77	28	291	AVG	15	37	144	6	1	1	1	2	0	11	0	3
0.5' X 96.5' X 480'	03	8937	G4028FROM	275240328TCI	57	77	28	291	AVG	15	37	144	6	1	1	1	2	0	11	0	3	140
			10504		275240328TCI	57	77	28	291	AVG	15	37	144	6	1	1	1	2	0	11	0	3
0.5' X 96.5' X 480'	03	2979	G4028TESTED-PL	275240335TCI	56	77	28	300	AVG	15	37	144	6	1	1	1	2	0	11	0	3	140
			10505		275240335TCI	56	77	28	300	AVG	15	37	144	6	1	1	1	2	0	11	0	3

注 釈 NOTES : 1. 位置 Orientation 位置・方向, T: 頂部 Top, B: 底部 Bottom, L: 圧延方向 Longitudinal, C: 垂直方向 Transverse, Z: 短厚方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis
2. 試験位置 Gauge Length, A: 50mm 平形試験片 Rectangular, B: 50mm 平形試験片 Rectangular, C: 70mm 平形試験片 Rectangular, D: 70mm 平形試験片 Rectangular, E: 80mm 平形試験片 Rectangular, F: 80mm 平形試験片 Rectangular, G: 200mm, H: 2.1, 8, J: 5.65, K: 4, L: 50
3. RA: 絞り Reduction of Area, YR: 降伏比 Yield Ratio, 4. 合格 Acceptable, 5. 50mm 平形試験片 Rectangular, 6. 50mm 平形試験片 Rectangular, 7. 50mm 平形試験片 Rectangular, 8. 50mm 平形試験片 Rectangular, 9. 50mm 平形試験片 Rectangular, 10. 50mm 平形試験片 Rectangular
4. 合格 Acceptable, 5. 50mm 平形試験片 Rectangular, 6. 50mm 平形試験片 Rectangular, 7. 50mm 平形試験片 Rectangular, 8. 50mm 平形試験片 Rectangular, 9. 50mm 平形試験片 Rectangular, 10. 50mm 平形試験片 Rectangular
5. 50mm 平形試験片 Rectangular, 6. 50mm 平形試験片 Rectangular, 7. 50mm 平形試験片 Rectangular, 8. 50mm 平形試験片 Rectangular, 9. 50mm 平形試験片 Rectangular, 10. 50mm 平形試験片 Rectangular
6. 50mm 平形試験片 Rectangular, 7. 50mm 平形試験片 Rectangular, 8. 50mm 平形試験片 Rectangular, 9. 50mm 平形試験片 Rectangular, 10. 50mm 平形試験片 Rectangular
7. 50mm 平形試験片 Rectangular, 8. 50mm 平形試験片 Rectangular, 9. 50mm 平形試験片 Rectangular, 10. 50mm 平形試験片 Rectangular
8. 50mm 平形試験片 Rectangular, 9. 50mm 平形試験片 Rectangular, 10. 50mm 平形試験片 Rectangular
9. 50mm 平形試験片 Rectangular, 10. 50mm 平形試験片 Rectangular
10. 50mm 平形試験片 Rectangular

上記注文品は鋼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.

J. Adachi

若津製鐵所 鋼材管理グループリーダー
Head of Department
PLATE QUALITY CONTROL DEPT.
KOMITSUWORKS



新日本製鐵株式會社
Nippon Steel Corporation

鋼材検査証明書
INSPECTION CERTIFICATE

社 千100-8071 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 千299-1141 千葉県君津市君津1番地
KUMISUWORKS : 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN

証明番号 : P-13163
頁 : 28
CERTIFICATE No. : P-13163 PAGE

発行年月日 : 2011-04-06
DATE OF ISSUE : 2011-04-06

需要家管理番号 : E3001P7Q1 E07
CUSTOMERS CONTROL No.

Table with columns for Material (鋼材), Dimensions (寸法), Quantity (数量), Mass (質量), and Chemical Composition (化学成分). Includes rows for 0.5' X 96.5' X 480" and 0.5' X 96.5' X 480" with various test results.

注 要 事 項 (Notes): 1. Location Orientation (位置・方向), 2. 断面方向 (Transverse), 3. 板厚方向 (Through Thickness), 4. 方向 (Direction), 5. 鋼材 (Steel), 6. 鋼材 (Steel), 7. 鋼材 (Steel), 8. 鋼材 (Steel), 9. 鋼材 (Steel), 10. 鋼材 (Steel), 11. 鋼材 (Steel), 12. 鋼材 (Steel), 13. 鋼材 (Steel), 14. 鋼材 (Steel), 15. 鋼材 (Steel), 16. 鋼材 (Steel), 17. 鋼材 (Steel), 18. 鋼材 (Steel), 19. 鋼材 (Steel), 20. 鋼材 (Steel), 21. 鋼材 (Steel), 22. 鋼材 (Steel), 23. 鋼材 (Steel), 24. 鋼材 (Steel), 25. 鋼材 (Steel), 26. 鋼材 (Steel), 27. 鋼材 (Steel), 28. 鋼材 (Steel), 29. 鋼材 (Steel), 30. 鋼材 (Steel), 31. 鋼材 (Steel), 32. 鋼材 (Steel), 33. 鋼材 (Steel), 34. 鋼材 (Steel), 35. 鋼材 (Steel), 36. 鋼材 (Steel), 37. 鋼材 (Steel), 38. 鋼材 (Steel), 39. 鋼材 (Steel), 40. 鋼材 (Steel), 41. 鋼材 (Steel), 42. 鋼材 (Steel), 43. 鋼材 (Steel), 44. 鋼材 (Steel), 45. 鋼材 (Steel), 46. 鋼材 (Steel), 47. 鋼材 (Steel), 48. 鋼材 (Steel), 49. 鋼材 (Steel), 50. 鋼材 (Steel), 51. 鋼材 (Steel), 52. 鋼材 (Steel), 53. 鋼材 (Steel), 54. 鋼材 (Steel), 55. 鋼材 (Steel), 56. 鋼材 (Steel), 57. 鋼材 (Steel), 58. 鋼材 (Steel), 59. 鋼材 (Steel), 60. 鋼材 (Steel), 61. 鋼材 (Steel), 62. 鋼材 (Steel), 63. 鋼材 (Steel), 64. 鋼材 (Steel), 65. 鋼材 (Steel), 66. 鋼材 (Steel), 67. 鋼材 (Steel), 68. 鋼材 (Steel), 69. 鋼材 (Steel), 70. 鋼材 (Steel), 71. 鋼材 (Steel), 72. 鋼材 (Steel), 73. 鋼材 (Steel), 74. 鋼材 (Steel), 75. 鋼材 (Steel), 76. 鋼材 (Steel), 77. 鋼材 (Steel), 78. 鋼材 (Steel), 79. 鋼材 (Steel), 80. 鋼材 (Steel), 81. 鋼材 (Steel), 82. 鋼材 (Steel), 83. 鋼材 (Steel), 84. 鋼材 (Steel), 85. 鋼材 (Steel), 86. 鋼材 (Steel), 87. 鋼材 (Steel), 88. 鋼材 (Steel), 89. 鋼材 (Steel), 90. 鋼材 (Steel), 91. 鋼材 (Steel), 92. 鋼材 (Steel), 93. 鋼材 (Steel), 94. 鋼材 (Steel), 95. 鋼材 (Steel), 96. 鋼材 (Steel), 97. 鋼材 (Steel), 98. 鋼材 (Steel), 99. 鋼材 (Steel), 100. 鋼材 (Steel).

上記注文品は鋼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.

J. Adachi
Head of Department
PLATE QUALITY CONTROL DEPT.
KUMISUWORKS



B

注文者: HANMA CO., LTD.
 注文者組合番号: 228-38501090
 契約番号: 1-831-H1-5-4-AI01
 商標名: HOT ROLLED STEEL PLATES
 規格: ASME SA-516 GRADE 70-E10
 注文書番号: E3001P07Q1 E07

新日本製鋼所株式会社
 Nippon Steel 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
 京都支店: 〒699-1141 千葉県君津市君津1番地
 KIMITSU WORKS: 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141, JAPAN

証明書番号: P-13163 PAGE: 2/9
 CERTIFICATE No.: P-13163 PAGE: 2/9

発行年月日: 2011-04-06
 DATE OF ISSUE: 2011-04-06

製鋼家管理番号: E3001P07Q1 E07
 CUSTOMERS CONTROL No.: E3001P07Q1 E07

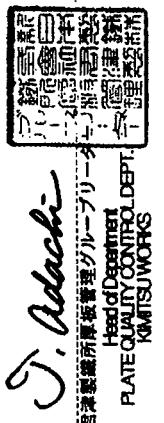
(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
 (EDMONTON EXCHANGER GROUP OF CUSTOMERS CONTROL No.)

製鋼家: EDMONTON EXCHANGER GROUP OF CUSTOMERS CONTROL No. 0MPANLIES

寸法	数量	質量	鋼種番号	製品番号	引張試験	衝撃試験	化学成分												
							C	Si	Mn	P	S	Co	Ni	Cr	Mo	Nb	V	Ti	Al
0.5' X 96.5' X 480'	1	2979	G4028 10507	TESTED-PL 275240324ICI	56 77	29	AVG 308 TLF306	15 37 37	3.7	144	6	1	1	1	2	0	11	0	3140
0.5' X 96.5' X 480'	3	8937	G4028 10507	FROM 275240324ICI TO 275240326	56 77	29	308 TLF306	15 37 37	3.4	144	6	1	1	1	2	0	11	0	3140
0.5' X 96.5' X 480'	1	2979	G4028 10510	TESTED-PL 275240331ICI	57 77	31	314 TLF297	15 37 156	3.4	144	6	1	1	1	2	0	11	0	3140

注意 [表1] Location Orientation 位置・方向, T: 頂部 Top, B: 底部 Bottom, L: 圧延方向 Longitudinal, C: 厚手方向 Transverse, Z: 短手方向 Through Thickness, R: 45° 方向 45deg. to the Longitudinal Axis
 [表2] GL 製品距離 Gage Length, A: 50mm 平巻試験片 Rectangular, B: 70mm 平巻試験片 Rectangular, C: 70mm 平巻試験片 Rectangular, D: 70mm 平巻試験片 Rectangular, E: 80mm 平巻試験片 Rectangular, F: 80mm 平巻試験片 Rectangular, G: 200mm, H: 2, I: 6', J: 565/SO, K: 4'/SO
 [表3] RA: 絞り Reduction of Area, YR: 降伏比 Yield Ratio, [表4] A: 合格 Acceptable, [表5] F: 鋼材中核 FULL SIZE, 2: 2.5mm, 3: 3.2mm, 4: 3.2mm, 5: 5.0mm, 6: 6.67mm, 7: 7.5mm, 8: 6.7mm, 9: 製品厚 Plate Thickness, [表6] P: 製品分析 Product Analysis, [表7] N: 焼戻 Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, CR: 焼戻し Tempered, CLC: CLC Process/TMC Process, A.R: As Rolled, T.M.R: T.M.R Process/TMC Process, S.R: Stress Relieved/Post Weld Heat Treatment, SH: 焼戻し Normalized, CF: 焼戻し Normalized, Crystalinity Fraction, L.E: 焼戻し Normalized, A.G.S: エスチレート処理 Austenite Grain Size, F.G.S: エスチレート処理 Ferrite Grain Size, S.R: Stress Relieved/Post Weld Heat Treatment

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



新日本製鋼所株式会社
Nippon Steel Corporation

鋼材検査証明書
INSPECTION CERTIFICATE

社名: HANWA CO., LTD.
注文者: HANWA CO., LTD.
注文者問合せ番号: 228-38501090
契約番号: 1-881-H1-5-4-A101
商品名: HOT ROLLED STEEL PLATES
規格: ASME SA-516 GRADE 70-E10
文書番号: EDMONTON EXCHANGER GROUP OF C-CUSTOMERS CONTROL NO.

社名: 千代田製鋼株式会社
HEAD OFFICE: 2-6-1, MARUNOUCHI, CHYODAI-KU, TOKYO 100-8071, JAPAN
営業所: 千代田製鋼株式会社 千葉工場
KUMISETSU WORKS: 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN

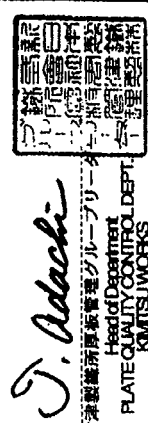
証明書番号: P-13163 PAGE: 30
発行年月日: 2011-04-06

AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1
EDMONTON EXCHANGER GROUP OF C-CUSTOMERS CONTROL NO.

寸法	数量	質量	製品番号	引張試験	衝撃試験	化学成分												
						C	Si	Mn	P	S	Cl	Ni	Cr	Mo	Nb	V	TAI	Co
0.5' X 96.5' X 480'	3	8937	G4028FROM 10510 275240334 TO 275240334	引張強さ Y.S. 0.2% KSI 77.31	平均値 AVG EACH 314	15	37	144	6	1	1	1	2	0	11	0	31	14
0.5' X 96.5' X 480'	1	2979	G4028TESTED-PL 10511 275240339 TO 275240342	引張強さ Y.S. 0.2% KSI 77.29	平均値 AVG EACH 309	15	37	144	6	1	1	1	2	0	11	0	31	14
0.5' X 96.5' X 480'	3	8937	G4028FROM 10511 275240340 TO 275240342	引張強さ Y.S. 0.2% KSI 77.29	平均値 AVG EACH 309	15	37	144	6	1	1	1	2	0	11	0	31	14

注釈 NOTES: 1. 位置 Orientation 位置 - 方向, T: 横面 Top, B: 底面 Bottom, L: 圧延方向 Longitudinal, C: 直交方向 Transverse, Z: 接線方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis
2. GL 組成成分 Composition, A: 50mm 平形試験片 Rectangular, B: 50mm 平形試験片 Round, C: 70mm 平形試験片 Rectangular, D: 70mm 平形試験片 Round, E: 80mm 平形試験片 Rectangular, F: 80mm 平形試験片 Round, G: 200mm, H: 2', I: 8', J: 5.65'/Sq., K: 4./Sq.
3. RA: 絞り Reduction of Area, YR: 降伏比 Yield Ratio, 4. 合格 Acceptable, 5. F: 縦方向 Full Size, 2: 25mm, 3: 32mm, 4: 38mm, 5: 50mm, 6: 62mm, 7: 75mm, 8: 87mm, 9: 鋼板厚 Plate Thickness, 10. P: 製品分析 Product Analysis
6. N: 焼入焼戻し Tempered, CR: Controlled Rolled, NI C: NIC Process/TMC Process, CI C: CLC Process/TMC Process, AR: As Rolled, TMR: TMR Process/TMC Process, NTR: Normalizing Rolled
7. N: 焼入焼戻し Tempered, CR: Controlled Rolled, NI C: NIC Process/TMC Process, CI C: CLC Process/TMC Process, AR: As Rolled, TMR: TMR Process/TMC Process, NTR: Normalizing Rolled
8. S: 焼入焼戻し Tempered, CR: Controlled Rolled, NI C: NIC Process/TMC Process, CI C: CLC Process/TMC Process, AR: As Rolled, TMR: TMR Process/TMC Process, NTR: Normalizing Rolled
9. S: 焼入焼戻し Tempered, CR: Controlled Rolled, NI C: NIC Process/TMC Process, CI C: CLC Process/TMC Process, AR: As Rolled, TMR: TMR Process/TMC Process, NTR: Normalizing Rolled
10. S: 焼入焼戻し Tempered, CR: Controlled Rolled, NI C: NIC Process/TMC Process, CI C: CLC Process/TMC Process, AR: As Rolled, TMR: TMR Process/TMC Process, NTR: Normalizing Rolled

上記注文品は弊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.



注文者: HANWA CO., LTD.
SHIPPER
注文者照合番号: 228-38501090
契約番号
CONTRACT NO.: 1-831-H1-5-4-A101
商品名
COMMODITY: HOT ROLLED STEEL PLATES

新日本製鋼所株式会社
Nippon Steel 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
若葉製鋼所: 〒299-1141 千葉県君津市君津一番地
KIMITSUWORKS: 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141, JAPAN

証明書番号: P-13163 頁: 31
CERTIFICATE No.: P-13163 PAGE: 31

発行年月日: 2011-04-06
DATE OF ISSUE: 2011-04-06
需要家管理番号: E3001P07Q1E07
CUSTOMER'S CONTROL NO.:

Table with columns for DIMENSION, MASS, QUANTITY, CAST No., TEST No., TENSILE TEST, CHEMICAL COMPOSITION, etc. Includes rows for 0.5' X 96.5' X 4.80' and 0.5' X 96.5' X 4.80' with various test results and chemical compositions.

注釈 NOTES: Location Orientation 位置 - 方向, T: 縦筋 Top, B: 縦筋 Bottom, L: 縦筋方向 Longitudinal, C: 横筋方向 Transverse, Z: 縦筋方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis... [5] A: 合格 Acceptable. [6] 許容許差 許容許差 Permissible Tolerance. [7] N: 基準 Normalized, Q: 焼入引 焼入引 Tempered, T: 焼戻し 焼戻し Tempered, CR: 焼戻し 焼戻し Tempered, L.E: 焼戻し 焼戻し Tempered, L.E: 焼戻し 焼戻し Tempered, S.H: 焼戻し 焼戻し Tempered, C.F: 焼戻し 焼戻し Tempered.

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE SPECIFICATIONS OF VIBRON LLOYD MECHANICAL SERVICES INC.
Checked to ASME D112
Sect. IIA 2010 Ed. Add. 9th 0500
SA 20 [Signature] Date: 1/3 2011
J. Adachi
Head of Department
KIMITSUWORKS



本 社 千 100-8071 東京都千代田区丸の内二丁目6番1号
HEAD OFFICE: 2-6-1 WARDENOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
名 義 親 戚 所 千 299-1141 千葉県君津市君津 1 番街
KIMITSUWORKS, 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141, JAPAN

新日本製鋼所株式会社
Nippon Steel Corporation
鋼材検査証明書
INSPECTION CERTIFICATE

注 文 者 : HANWA CO., LTD.
SHIPPER
注文者照会番号 : 228-3850109D
契約番号 : 1-831-HI-5-4-AI01
商 品 名 : HOT ROLLED STEEL PLATES
規 格 : ASME SA-516 GRADE. 70-E10
SPECIFICATION
文 書 番 号 :
CUSTOMER :

証明番号 : P-13153 PAGE : 99E
CERTIFICATE No.
発行年月日 : 2011-04-06
DATE OF ISSUE
必要家管理番号 : 1001
CUSTOMER CONTROL No.
化学成分 化学成分
E3001P07Q1 E07

寸 法 DIMENSION mm, inch, feet	質量 QUAN- TITY KG	製造番号 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		化 学 成 分 CHEMICAL COMPOSITION %									
				YS	TS	KV	U	C	Si	Mn	P	S	Cl	Ni	Cu	Nb	V
				0.2%		2V - 50F		0.10	0.035	0.035	0.010	0.010	0.010	0.010	0.010	0.010	0.010

注 意 NOTES

- 東 1 東 1 位置
東 2 東 2 位置
東 3 東 3 位置
東 4 東 4 位置

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

J. Adachi
Head of Department
PLATE QUALITY CONTROL DEPT.
NIPPON STEEL WORKS



34005, 34006

MRC Heat Number: 079001397380 Item# 3
 # of Products: 1431
 # of Revisions: 1
 # of Trans: 1
 # of Items: 1
 # of W/Born Flange: 1
 # of SCL 150 W/Born Flange: 1
 # of SCL 150 W/Born Flange: 1

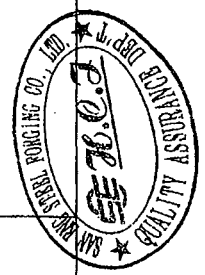


SAN ENG STEEL FORGING CO LTD
 311, Jen Hsin Road, Jen Wu Hsiang
 Kaohsiung Hsien, Taiwan, R.O.C.
 TEL: 07-3724249; FAX: 07-3712923
 URL: www.saneng.com.tw
 e-mail: saneng@ksis.seed.net.tw

MILL TEST CERTIFICATE
 EN10204-3.1 (BIN500493.1.B)
 Customer: SEYBOLD INTERNATIONAL CORP.
 Order No.: Z002784(3)-T/A

Certificate No.: SE-2784C
 Date: 08/25/2010
 Page: 1 OF 1

PRODUCT		MATERIAL SPECIFICATIONS		DIMENSIONAL SPECIFICATIONS															
FORGED CARBON STEEL FLANGES		ASTM A105-09/ASME SA105-09		ASME B16.5-09 CSA Z245.12															
Item No.	Heat No.	T.S.(*) (MPa)	Y.S.(*) (MPa)	E.L.(*) (%)	Hardness (HB)	R.A.(*) (%)	Impact Test Temp: Minimum: Joule	CHEMICAL COMPOSITION (%)											CE(*)
								C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Nb	
1	31079	515.8	333.4	36.4	187	68.6	1	0.350	0.180	1.070	0.007	0.040	0.300	0.400	0.120	0.060	0.020	0.009	0.403
2	915942	509.9	352.1	35.8	149	69.5	2	0.209	0.280	1.030	0.018	0.010	0.017	0.040	0.006	0.003	0.005	0.006	0.391
3	931202	513.9	372.7	33.2	156	68.0	3	0.199	0.290	1.050	0.011	0.013	0.008	0.015	0.049	0.002	0.002	0.001	0.381
4	21532	515.8	331.5	34.2	155	66.8	1	0.200	0.170	1.100	0.007	0.011	0.060	0.090	0.040	0.005	0.003	0.005	0.409
5	935866	508.0	335.4	36.0	148	68.6	2	0.204	0.270	1.010	0.013	0.017	0.014	0.018	0.049	0.005	0.006	0.005	0.381
6	931198	505.0	335.4	34.0	156	66.0	2	0.197	0.250	1.080	0.012	0.015	0.005	0.017	0.049	0.002	0.006	0.001	0.384
7	21379	513.9	354.0	34.2	152	68.6	1	0.212	0.250	1.050	0.011	0.013	0.018	0.045	0.005	0.037	0.005	0.005	0.401
8	10988	529.6	354.0	35.0	152	70.4	2	0.215	0.310	1.080	0.014	0.008	0.006	0.051	0.043	0.005	0.017	0.005	0.409
9	29570	491.3	298.1	35.4	150	65.9	1	0.190	0.200	1.140	0.008	0.011	0.110	0.080	0.070	0.005	0.003	0.005	0.409
10	931198	505.0	335.4	34.0	156	66.0	2	0.197	0.250	1.080	0.012	0.015	0.005	0.017	0.049	0.002	0.006	0.001	0.384



HEAT TREATMENT(*)
 N
 REMARKS
 880°C X 3HRS
 CONFORMS WITH NACE MR0103-07 AND NACE MR0175/ISO 15156.2
 CONFORMS WITH Z245.12 CAT I GR.248 SOUR SERVICE-05
 TEST SPECIMEN ORIENTATION: TRANSVERSE

*1: T.S. = Tensile Strength, Y.S.=Yield Strength, E.L.=Elongation, R.A.=Reduction of Area.
 *2: N=Normalized, A=Annealed, Q=Quenched, T=Tempered, S.T.=Solution Treated, S.R.=Stress Relieved, A.C.=Air Cooled, F.C.=Furnace Cooled, W.C.=Water Cooled, O.C.=Oil Cooled.
 *3: C.E. Value = C + (Mn /6) + (Cr + Mo +V) / 5 + (Ni + Cu) / 15
 We hereby certify that the material has been tested in accordance with the above specification and also with the requirements called for by the above order.
 Manager of Quality Assurance Dept

Bromley Mechanical Services

(Accredited Organization) A.O.Q.P. No. 71-19

WELDER PERFORMANCE QUALIFICATION CARD

Name Michael Kurtz (Name)
 ABSA File No. W 21120

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance limitation is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

Process SAW
 Date of Test Aug 10 2006
 Examiner (Print/Type) M. [Signature]
 Signature of Welder or Operator _____
 Card No.: **2311**

EXPIRY DATE EXTENSION 2311

PQ EXPIRY DATE	INITIAL	PQ EXPIRY DATE	INITIAL
01/04/09	ll.	1/4/12	ll
07/04/09	ll.		
01/04/10	ll.		
07/04/10	ll.		
1/4/11	ll.		
7/4/11	ll		

PERFORMANCE QUALIFICATION Card No. **2311**

Process(es) SAW Material (F.No.) PT-P11
 Filler Metal Group (F No.) FL Min. Outside Diameter 12" NPS
 Max. Deposited Weld Metal MAX WPS Position(s) Qualified FLAT
 Backing WITH Backing Gas N/A
 Progression FLAT
 P.Q. Expiry Date Aug 10 2008 Welding Examiner Signature [Signature]
 Certificate No. 065 00031

Name Michael Kurtz
 ABSA File No. W 21120
 Process SAW
 Date of Test Aug 10 2006
 Examiner [Signature]
 No. **2311**

Bromley Mechanical Services

(Accredited Organization) A.O.Q.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD

MICHAEL LUTZ

(Name)

W 21120

ABSA File No.

GMaw (sc)

Process

Nov 22/05

Date of Test

Examiner

M. Hanel

Signature of Welder or Operator

No. 2344

Card No.:

2344

EXPIRY DATE EXTENSION 2344

PQ EXPIRY DATE	INITIAL	PQ EXPIRY DATE	INITIAL
01/04/08	ML	11/4/11	ML
07/04/08	ML	7/4/11	ML
01/04/09	ML	11/4/12	ML
07/04/09	ML		
01/04/10	ML		
07/04/10	ML		

PERFORMANCE QUALIFICATION

Card No. **2344**

Process(es) GMaw GMaw Material (F.No.) PI-P11
 Filler Metal Group (F No.) IF6 F6 Min. Outside Diameter 1" OD MIN
 Max. Deposited Weld Metal 0.1375" 0.240" Position(s) Qualified FLW 30° SPECN
 Backing WithOut With Backing Gas OPTIONAL
 Progression Down Down
 P. Q. Expiry Date Nov 22, 2007 Welding Examiner Signature M. Hanel Certificate No. W6 00031

Bromley Mechanical Services

(Accredited Organization) A.O.Q.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD

Name CHRIS MOORE ABSA File No. W 24293
 (Name) ABSA File No.

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

Process SAW Date of Test SEPT 10 2010 Signature of Welder or Operator
 Examiner (Print/Type) M. K. Knevischer Card No.: 2635

No. 2635

EXPIRY DATE EXTENSION 2635

PQ EXPIRY DATE	INITIAL	PQ EXPIRY DATE	INITIAL

PERFORMANCE QUALIFICATION Card No.: 2635

Process(es) SAW Material (P-No.) P1-P1
 Filler Metal Group (F No.) F6 Min. Outside Diameter 10" NPS
 Max. Deposited Weld Metal MAX. WPS Position(s) Qualified FLAT
 Backing WITH Backing Gas N/A
 Progression DOWNHILL FLAT

P. Q. Expiry Date SEPT 10 2012 Welding Examiner Signature [Signature] Certificate No. WG 00031

EXPIRY DATE EXTENSION 2631

Bromley Mechanical Services

(Accredited Organization) A.O.Q.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD

Name CHRIS MOORE ABSA File No. W 24293

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

Date of Test Aug 31/2010 Signature of Welder or Operator

Examiner (Print/Type) M. Knowles Card No.: 2631

PQ EXPIRY DATE	INITIAL	PQ EXPIRY DATE	INITIAL

Name CHRIS MOORE
 ABSA File No. W 24293
 Process Gamma (sc) Gamma (mc)
 Date of Test Aug 31/2010
 Examiner [Signature]

No. 2631

PERFORMANCE QUALIFICATION Card No.: **2631**

Process(es) Gamma (sc) Gamma (mc) Material (P-No.) 71-P11
 Filler Metal Group (F No.) F6 F6 Min. Outside Diameter 1" OD
 Max. Deposited Weld Metal 0.10" MAX WPS Position(s) Qualified FCAT
 Backing with/without with Backing Gas ARGON/CO2
 Progression Double Double
 P. Q. Expiry Date Aug 31/2010 Welding Examiner Signature [Signature] Certificate No. WB-00031

EXPIRY DATE EXTENSION 2628

PQ EXPIRY DATE	INITIAL	PQ EXPIRY DATE	INITIAL

Bromley Mechanical Services

(Accredited Organization) A.O.Q.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD

Name Kevin Hodgson (Name) ABSA File No. W 26983

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

Date of Test Aug 23, 2010

Signature of Welder or Operator

M. Kinnersley
Examiner (Print/Type)

Card No.: **2628**

Name Kevin Hodgson
 ABSA File No. W-26983
 Process GMW (sc) (mc)
 Date of Test Aug 23, 2010
 Examiner AK

No. 2628

PERFORMANCE QUALIFICATION Card No.: **2628**

Process(es) GMW (sc) GMW (mc) Material (P-No.) P1-P11
 Filler Metal Group (F-No.) FG FG Min. Outside Diameter 1/40 diam
 Max. Deposited Weld Metal 0.110" Position(s) Qualified FLAT
 Backing withheld with Backing Gas ARGON/CO2
 Progression Downhill
 P. O. (Expiry) Date Aug 23, 2012 Welding Examiner Signature [Signature] Certificate No. WGS 00031

Name KEVIN HODGSON
 ABSA File No. W 26983
 Process SMRW
 Date of Test Aug 23, 2010
 Examiner M. R. Newisser

No. 2629

Bromley Mechanical Services

(Accredited Organization) A.O.Q.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD

KEVIN HODGSON (Name) W 26983 (ABSA File No.)

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

Aug 23, 2010 (Date of Test) _____ (Signature of Welder or Operator)

M. R. Newisser (Examiner (Print/Type)) 2629 (Card No.)

EXPIRY DATE EXTENSION 2629

PQ EXPIRY DATE	INITIAL	PQ EXPIRY DATE	INITIAL

PERFORMANCE QUALIFICATION Card No.: 2629

Process(es) SMRW Material (F.No.) P1-P11
 Filler Metal Group (F No.) F3 F4 Min. Outside Diameter 1" od
 Max. Deposited Weld Metal 0.750" max WPS Position(s) Qualified ALL
 Backing with backfill with Backing Gas N/A

Progression uphill
 P. of Expiry Date Aug 23, 2010
 Welding Examiner Signature [Signature] Certificate No. WG-00031
 [Signature]

EXPIRY DATE EXTENSION 2701

Bromley Mechanical Services

(Accredited Organization)
A.O.Q.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD

CHAD VANDERMEULEN W 26984
(Name) ABSA File No.

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

PQ EXPIRY DATE	INITIAL	PQ EXPIRY DATE	INITIAL

Dec 30 2010 Date of Test
M. Y. ... Examiner (Print/Type)
Signature of Welder or Operator
2701 Card No.

Name CHAD VANDERMEULEN
ABSA File No. W 26984
Process GMAW (sc) (mc)
Date of Test Dec 30 2010
Examiner [Signature]
No. 2701

Card No.: 2701

PERFORMANCE QUALIFICATION

Process(es) (GMAW) (GMAW) Material (P-No.) P1-P11
Filler Metal Group (F No.) F6 Min. Outside Diameter 1/4" DD MIN
Max. Deposited Weld Metal D. 110" MAX WPS FLAW ±30%
Backing without/culth with Backing Gas ArCo2

Progression [Signature]
Dec 30 2012 P. O. Expiry Date
[Signature] Welding Examiner Signature
WG-00031 Certificate No.

Bromley Mechanical Services

(Accredited Organization) A.O.Q.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD

CHAD VANDERMEULEN W 26984
 (Name) ABSA File No.

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

Dec 21 2010 Date of Test
 M. Hines Examiner (Print/Type)
 Signature of Welder or Operator
 Card No.: 2648

PQ EXPIRY DATE	INITIAL	PQ EXPIRY DATE	INITIAL

EXPIRY DATE EXTENSION 2648

Name CHAD VANDERMEULEN
 ABSA File No. W 26984
 Process SMW
 Date of Test Dec 21 2010
 Examiner [Signature]

No. 2648

Card No.: 2648

PERFORMANCE QUALIFICATION

Process(es) SMW SMW Material (P-No.) P1-P11
 Filler Metal Group (F No.) F3 F4 Min. Outside Diameter 1" OD MIN
 Max. Deposited Weld Metal 0.250" MAX TO BE USED Position(s) Qualified PRC
 Backing with/without WITH Backing Gas N/A

Progression LIPWEL [Signature]
 P. Q. Expiry Date Dec 21 2012 Welding Examiner Signature
 Certificate No. WG-00031

EXPIRY DATE EXTENSION 2374

Bromley Mechanical Services

(Accredited Organization) A.O.C.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD

Roger Kochie (Name) ABSA File No. W 2133

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

SEPT 25, 2008 Date of Test

Signature of Welder or Operator

M. Knewstetter Examiner (Print/Type)

Card No.: **2374**

Name Roger Kochie
 ABSA File No. W 2133
 Process GTAW (MC)
 Date of Test SEPT 25, 2008
 Examiner JBK

No. 2374

PQ EXPIRY DATE	INITIAL	PQ EXPIRY DATE	INITIAL
1/4/11	<i>JK</i>		
7/4/11	<i>JK</i>		
1/4/12	<i>JK</i>		

Card No.: **2374**

PERFORMANCE QUALIFICATION

Process(es) GTAW (MC) Material (P.No.) P1-P11

Filler Metal Group (F No.) FC Min. Outside Diameter N/A

Max. Deposited Weld Metal 0.210" Position(s) Qualified FLAT

Backing without Backing Gas OPTIONAL

Progression Down

P.Q. Expiry Date SEPT 25, 2010

Welding Examiner Signature [Signature] Certificate No. WG 00031

Card No. **2370**
PERFORMANCE QUALIFICATION

Process(es) SMaw Material (P.No.) P-211
 Filler Metal Group (F.No.) F4 Min. Outside Diameter 1"
 Max. Deposited Weld Metal max to be welded Position(s) Qualified ALL
 Backing with back with Backing Gas N/A
 Progression UPHILL WINNER
SEP 18 2010 Welding Examiner Signature [Signature] Certificate No. WG00031
 P.Q. Expiry Date

EXPIRY DATE EXTENSION 2370

PQ EXPIRY DATE	INITIAL	PQ EXPIRY DATE	INITIAL
1/4/11	[Signature]		
7/4/11	[Signature]		
1/4/12	[Signature]		

Bromley Mechanical Services

(Accredited Organization) A.O.C.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD

Roger Kochie (Name) ABSA File No. W21333

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

SEP 18 2008 Date of Test Signature of Welder or Operator

[Signature] Examiner (Print/Type) Card No. **2370**

Name Roger Kochie
 ABSA File No. W21333
 Process SMaw
 Date of Test SEP 18 2008
 Examiner [Signature]
 No. **2370**

Bromley Mechanical Services

(Accredited Organization) A.C.C.P. No. 7-1-19

WELDER PERFORMANCE QUALIFICATION CARD

Name: SHAWN LITTLE ABSA File No. W21606

Process: GMAW

Date of Test: July 28, 05

Examiner: M. Krawtewischer

Card No. 1787

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is recorded in Section X of the ASME Code and subject to the provisions of the ASME Code.

EXPIRY DATE EXTENSION

P.Q. EXPIRY DATE	INITIAL	P.Q. EXPIRY DATE	INITIAL
01/04/08	SL	11/11/11	SL
01/04/08	SL	11/11/11	SL
01/04/08	SL	11/11/11	SL
01/04/08	SL	11/11/11	SL
01/04/10	SL		
01/04/10	SL		

Card No. 1787

PERFORMANCE QUALIFICATION

Process(es) GMAW GMAW Material (P.No.) PI-P11
 Filler Metal Group (F.No.) F6 F6 Min. Outside Diameter 1/4" O.D.
 Max. Deposited Weld Metal 0.1375" 0.240" Position(s) Qualified FUTT
 Backing w/ W/Back with Backing Gas OPTIONAL

Progression Down Down

P.Q. Expiry Date July 28, 03 Welding Examiner Signature [Signature]

Certificate No. W21606-31

Name: SHAWN LITTLE

ABSA File No. W 21606

Process: GMAW

Date of Test: July 28, 05

Examiner: [Signature]

No. 1787

EXPIRY DATE EXTENSION 2303

Bromley Mechanical Services

(Accredited Organization) A.O.Q.P. No. 71119

WELDER PERFORMANCE QUALIFICATION CARD

Name: SHAWN LITTLE ABSA File No. W 21606

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualifications are those of the ASME Code and subject to the limitations of the relevant Section IX of the ASME Code.

Date of Test: MAR 29 2006 Signature of Welder or Operator: [Signature]

Examiner (Print/Type): M. Krawewischer Card No.: 2303

P.Q. EXPIRY DATE	INITIAL	P.Q. EXPIRY DATE	INITIAL
07/04/08	ll	7/4/08	ll
01/04/09	ll	1/4/09	ll
07/04/09	ll		
01/04/10	ll		
07/04/10	ll		
01/04/11	ll		

Name: SHAWN LITTLE

ABSA File No.: W 21606

Process: SMRW

Date of Test: MARCH 29 2006

Examiner: [Signature]

No. 2303

Card No. 2303
PERFORMANCE QUALIFICATION

Process(es): SMRW Material (F.No.): P1-P11
 File Metal Group (F No.): F3 Min. Outside Diameter: N/A
 Max. Deposited Weld Metal: 0.250" Position(s) Qualified: FLAT
 Backing: w/heat shield Backing Gas: N/A

Progression: UPHILL Welding Examiner Signature: [Signature] Certificate No.: W600031
 P.Q. Expiry Date: MAR 29 2008

Bromley Mechanical Services

(Accredited Organization) A.O.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD

HERB HARRIS W 17841

(Name) ABSA File No.

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

Oct 03, 2007

Date of Test

M. HARRIS

Examiner (Print/Type)

Signature of Welder or Operator

2338

Card No.:

Name Herb Harris

ABSA File No. W 17841

Process SAW

Date of Test Oct 03 2007

Examiner lc.

No. 2338

EXPIRY DATE EXTENSION 2338

PQ EXPIRY DATE	INITIAL	PQ EXPIRY DATE	INITIAL
01/04/10	ll		
07/04/10	ll		
01/4/11	ll		
7/4/11	ll		
1/4/12	ll		

PERFORMANCE QUALIFICATION Card No. 2338

Process(es) SAW Material (F.No.) R-P11
 Filler Metal Group (F No.) Fl Min. Outside Diameter 10" NPS
 Max. Deposited Weld Metal MARLB Position(s) Qualified FLAT
 Backing Required Backing Gas N/A
 Progression DOWN
 P.Q. Expiry Date Oct 3, 2009 Welding Examiner Signature [Signature] Certificate No. W500031

Bromley Mechanical Services

(Accredited Organization) A.O.C.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD
HARRIS (Name)
W17841 (ABS File No.)

This card is issued pursuant to the ASME Section IX and the Pressure Vessels' Regulations. The performance qualifications in accordance with Section IX of the ASME Code and subject to the limitations in the reverse side.

Steve 15/04 (Date of Test)
M. Stonehouse (Examiner)
Signature of Welder or Operator
1752 (Card No.)

EXPIRY DATE EXTENSION

PO EXPIRY DATE	INITIAL	PO EXPIRY DATE	INITIAL
01/06/04	MS	07/04/06	MS
01/06/04	MS	07/04/06	MS
01/06/04	MS	07/04/06	MS
01/06/04	MS	07/04/06	MS
01/06/04	MS	07/04/06	MS

Name **HARRIS**
 ABS File No. **W17841**
 Process **GMAW**
 Date of Test **Steve 15/04**
 Examiner **M. Stonehouse**
No. 1752

Card No. **1752**

PERFORMANCE QUALIFICATION

Process(es) **GMAW** Material (P-No.) **PA-P11**
 Filler Metal Group (F-No.) **F6** Electrode **1/8 D.M.W.**
 Max. Deposited Weld Metal **0.1315" 0.103"** Position(s) **6BT**
 Backing **Welded** Backing Gas **Optional**
 Progression **6BT**
Steve 15/04 (Examiner Signature)
 P.O. Expiry Date **16/06/03**



WELDING PROCEDURE REVIEW SHEET

THIS COVER SHEET IS USED TO IDENTIFY VENDOR DOCUMENT REVIEW STATUS.

VENDOR: BROMLEY MECHANICAL SERVICES INC.

WPS #: BM-11

PQR #: BM-11-1, BM-11-2, BM-11-3, BMS-20N-2

DATE & REV. #: Sep. 17, 2008, Rev. 2

Application	<input type="checkbox"/> Structural	<input type="checkbox"/> Pipeline	<input checked="" type="checkbox"/> ASME Section IX
Electrode	F6/F4		
Material	P1 Gr.1 &2 to P1 Gr.1 &2		
Process	GMAW/ SMAW		
Position	DOWN/ FLAT		
Thickness	1.6mm to 38.1mm (Non-impact) , 3.2mm to 38.1mm (Impact specified)		
Diameter	All		
Hardness	<input type="checkbox"/> Brinell	<input checked="" type="checkbox"/> Vicker	<input type="checkbox"/> Rockwell B <input type="checkbox"/> Not Done
PWHT	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Impacts	<input checked="" type="checkbox"/> Low Temperature	Impact tested to -46°C	<input type="checkbox"/> Normal Temperature
Registered	Alberta		

REVIEW STATUS	
	<input type="checkbox"/> Accepted <input checked="" type="checkbox"/> Accepted as noted <input type="checkbox"/> Accepted as noted: Resubmit <input type="checkbox"/> Not Accepted
	<input type="checkbox"/> Sour Service <input checked="" type="checkbox"/> Sweet Service <input checked="" type="checkbox"/> Transitional Sour Service
COMMENTS	
1. Uphand progression only is allowed. 2. Backing rings are not allowed. 3. Max. Weave is restricted to 4 x electrode dia. or 12.7mm for wire feed. 4. Min. Joint thickness for unbevelled joint is 3mm for welding from one side and 6mm for welding from both sides. 5. Accepted for Transitional sour and sour service for piping up to 12.7mm thickness. Production Hardness values not to exceed 210 Hv.	
Ram Sridharan <small>Signature</small>	Feb. 03, 2011 <small>Date</small>



the pressure equipment safety authority

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

September 30, 2008

Merle Kanewischer
BROMLEY MECHANICAL SERVICES INC
A DIVISION OF ARGO SALES LTD
925-23 STREET SW
MEDICINE HAT, AB T1A 8R1

Dear Merle Kanewischer,

The welding procedures received on September 26, 2008 are accepted for registration as follows:

Reg. No. : WP-0505.2

Accepted on: September 30, 2008

Tracking No. : 2008-07110

Reg Type : New Design

Spec. No. : BM-11 As Noted

Please note the acceptance of the registration does not allow the use of this welding procedure in the construction, modification, or repair of any boiler, pressure vessel, pressure piping system or fitting in Alberta unless the contractor/manufacturer has registered a Quality Control system for such work with ABSA.

Welding procedures, which specify impact testing, have been accepted in accordance with A.S.M.E. Section IX only. Other A.S.M.E. Code Sections may have additional requirements respecting impact testing.

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

Enclosed is a stamped welding procedure for your reference.

Sincerely,

ROSEBERG, BOB, P. Eng.
Design Survey Engineer

WPS Number: BM-11

PQR Number: BM-11-1
BM-11-2
BM-11-3
BMS - 20N-2

QUALIFIED FOR

Material P Number: P Gr 1 and Gr 2

Material Type (typical): SA-333 Grade 6, SA-350-LF2, SA-420 WPL6
SA-516 Gr 70, etc

Process: GMAW/SMAW

Position: 45°/Flat


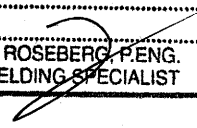
Diameter: All Diameters

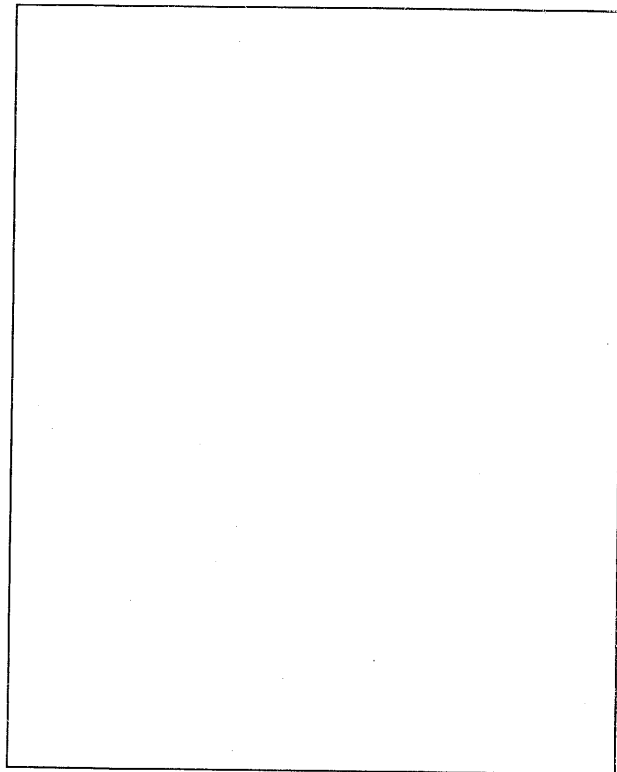
Joint Design: All Groove & Fillet Designs

AWS Classification: ER70S-6, E-7018-1

Thickness: With PWHT: N/A

As Welded: .0625" to 1.5" (Non-Impact)
.0125" to 1.5" (Impact Tested)

	
SAFETY CODES ACT - PROVINCE OF ALBERTA WELDING PROCEDURE	
Reg. No. WP	505.2
Spec. No.	BM-11
Weld Process	GMAW/SMAW
Matl. Gr. P No.	1 Gr 1/2 to P No. 1 Gr 1/2
Elec. Gr. F No.	6+4 A No. 1
Th. Qual. For.	3.81mm PWHT NO
MIN Th. Qual.	3.2mm, CVN -46°C
Yr. 08 Mo. 09 Day. 30	Signed 
R. ROSEBERG, P.ENG. WELDING SPECIALIST	



WELDING PROCEDURE SPECIFICATIONS

Company Name: Bromley Mechanical Services Inc. By: Paul Frederick
 Welding Procedure Specification No.: BM-11 Date: September 17, 2008
 Supporting PQR No.(s): BM-11-1, BM-11-2, BM-11-3, BMS-20N-2 Rev.#: 2
 Welding Process(es): GMAW/SMAW Type(s): Semi Automatic/Manual
 Revision 1 is for editorial updates to the WPS and to change the name of the company. Revision 2 is to add PQR, BMS-20N-2 for thickness increase.

JOINTS (QW-402)

Joint Design: All Groove and Fillet designs. See attached sketches
 Backing: with or without Backing Material (type): Weld Metal NO RETAINERS

BASE METALS (QW-403)

P.No. 1 Group No. 1 or 2 to P.No. 1 Group No. 1 or 2
 Thickness Range
 Base Metal:
 Groove Welds: .0625" to 1.5" (Non-Impact)
 .0125" to 1.5" (Impact Specified)
 Fillet Welds: All fillet welds
 Pipe Diameter Range: All diameters
 Deposited Weld Metal Thickness per pass: 0.500 in. Max

FILLER METALS (QW-404)

Spec. No (SFA)	SFA 5.18	SFA 5.1
AWS No. (Class)	ER70-S6	E-7018-1
F. No.	F6	F4
A. No.	A1	A1
Size of Filler Metals	.035" to .045" inclusive	3/32" to 1/4" inclusive
Deposited Weld Metal Thickness Range		
Groove	.138" max.	1.5" max
Fillet	All	All
Electrode Flux (class)	N/A	N/A
Flux Trade Name	N/A	N/A
Consumable Insert	N/A	N/A
Other	GMAW for root pass only No Supplementary Filler Metals	N/A No Supplementary Filler Metals

POSITIONS (QW-405)

Position(s) of Groove: GMAW 45°/ SMAW1G
 Welding Progression: Down/Flat
 Position of Fillet: All

POSTWELD HEAT TREATMENT (QW-407)

Temperature Range: None
 Time Range: N/A

PREHEAT (QW-406)

Preheat Temp. Min.: 50°F
 Interpass Temp. Max.: 450°F
 Preheat Maintenance: Welding & Reheating:

GAS (QW-408)

Shielding Gas(es): Argon/CO2
 Percent composition (mixtures): 75%/25%
 Flow Rate: 20-40 cfph
 Gas Backing: N/A
 Trailing Shielding Gas Composition: N/A

ELECTRICAL CHARACTERISTICS (QW-409)

Current AC or DC: DC Polarity: Reverse
 Amps (Range): See table Volts (Range): See Table
 Tungsten Electrode Size and Type: N/A

Mode of Metal Transfer for GMAW: Short Circuiting Arc
 Electrode Wire Fed Speed Range: 46-160 ipm

Max. Heat Input:

Base Metal Thickness Range	Heat Input Joules/in.
.125" to .375"	48,000
.500" to .888"	64,000
.375" to .500"	52,364
.500" to 1.5"	75,667

TECHNIQUE (QW-410)

String or Weave Bead: String and Weave

Orifice or Gas Cup Size: N/A

Initial and Interpass Cleaning (Brushing, Grinding, etc.): Brushing, Chipping, Grinding

Method of Back Gouging: Air Carbon Arc

Oscillation: N/A

Contact Tube to Work Distance: N/A

Multiple or Single Pass (per side): Multiple

Multiple or Single Electrodes: Single

Travel Speed (Range): See table

Peening: None

Other: N/A

		Filler Metal	Current					
Weld Layers	Process	Class	Diameter Inches	Type Polar	Amp. Range	Volt Range	Travel Speed Range(ipm)	Other *
1	GMAW	ER-70S-6	.035	DCRP	100-150	15-21	7-12	7
1	GMAW	ER-70S-6	.045	DCRP	135-250	16.21	5-14	5
2 to Rem	SMAW	E-7018-1	3/32	DCRP	60-110	19-24	1.5-12	2.5
2 to Rem	SMAW	E-7018-1	1/8	DCRP	90-140	20-25	1.5-14	3
2 to Rem	SMAW	E-7018-1	5/32	DCRP	110-190	20-26	2-14	5
2 to Rem	SMAW	E-7018-1	3/16	DCRP	180-275	21-26	4-13	7
2 to Rem	SMAW	E-7018-1	7/32	DCRP	260-350	22-27	8-20	9
2 to Rem	SMAW	E-7018-1	¼	DCRP	300-400	23-28	10-25	11

*Minimum Travel Speed At Maximum Volts and Amps

GROOVE DESIGN

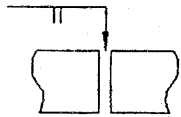


FIGURE 1
SINGLE SQUARE BUTT

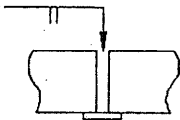


FIGURE 2
SINGLE SQUARE BUTT
WITH BACKING STRIP

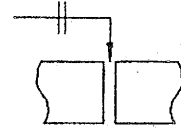


FIGURE 3
DOUBLE SQUARE BUTT

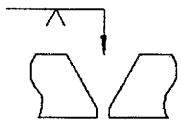


FIGURE 4
SINGLE VEE BUTT

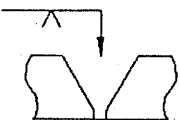


FIGURE 5
SINGLE VEE BUTT
WITH BACKING STRIP

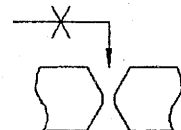


FIGURE 6
DOUBLE VEE BUTT

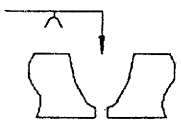


FIGURE 7
SINGLE U BUTT

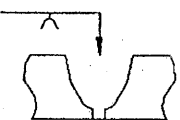


FIGURE 8
SINGLE U BUTT
WITH BACKING STRIP

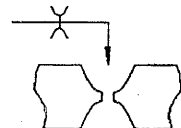


FIGURE 9
DOUBLE U BUTT

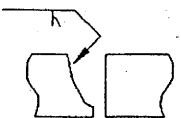


FIGURE 10
SINGLE J BUTT

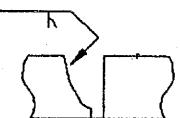


FIGURE 11
SINGLE J BUTT
WITH BACKING STRIP

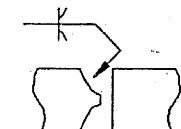


FIGURE 12
DOUBLE J BUTT

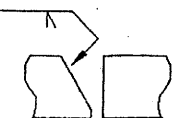


FIGURE 13
SINGLE BEVEL BUTT

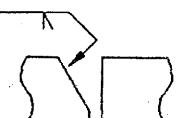


FIGURE 14
SINGLE BEVEL BUTT
WITH BACKING STRIP

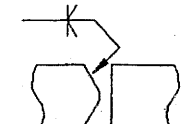


FIGURE 15
DOUBLE BEVEL BUTT

TYPICAL JOINT DESIGN

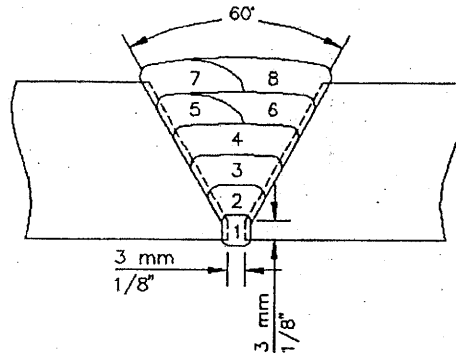


FIGURE 16

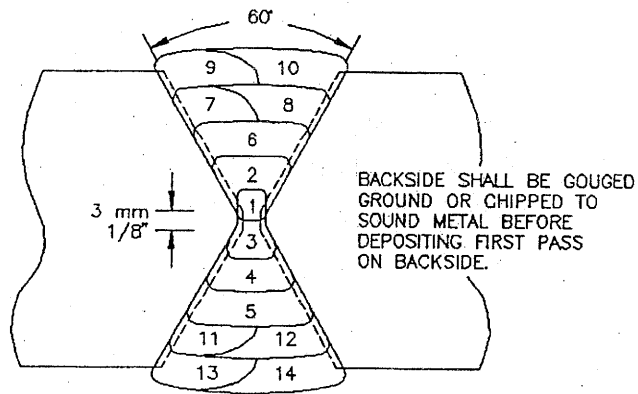


FIGURE 17



WELDING PROCEDURE REVIEW SHEET

THIS COVER SHEET IS USED TO IDENTIFY VENDOR DOCUMENT REVIEW STATUS.

VENDOR: BROMLEY MECHANICAL SERVICES INC.

WPS #: BMS-20N

PQR #: BMS-20N-1, BMS-20N-2

DATE & REV. #: Nov.14, 2007, Rev. 0

Application	<input type="checkbox"/> Structural	<input type="checkbox"/> Pipeline	<input checked="" type="checkbox"/> ASME Section IX
Electrode	F3/F4		
Material	P1 Gr.1 &2 to P1 Gr.1 &2		
Process	SMAW		
Position	All – Without impact, 1G- With impact		
Thickness	1.6mm to 38.1mm (Non-impact) , 3.2mm to 38.1mm (Impact specified)		
Diameter	All		
Hardness	<input type="checkbox"/> Brinell	<input checked="" type="checkbox"/> Vicker	<input type="checkbox"/> Rockwell B <input type="checkbox"/> Not Done
PWHT	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Impacts	<input checked="" type="checkbox"/> Low Temperature	Impact tested to -46°C	<input type="checkbox"/> Normal Temperature
Registered	Alberta		

REVIEW STATUS	
	<input type="checkbox"/> Accepted <input checked="" type="checkbox"/> Accepted as noted <input type="checkbox"/> Accepted as noted: Resubmit <input type="checkbox"/> Not Accepted
	<input type="checkbox"/> Sour Service <input checked="" type="checkbox"/> Sweet Service <input checked="" type="checkbox"/> Transitional Sour Service
COMMENTS	
<ol style="list-style-type: none"> 1. Up hand progression only is allowed. 2. Backing rings are not allowed. 3. Max. Weave is restricted to 4 x electrode dia. 4. Min. Joint thickness for unbevelled joint is 3mm for welding from one side and 6mm for welding from both sides. 5. Accepted for Transitional sour and sour service for piping up to 12.7mm thickness. Production Hardness values not to exceed 210 Hv. 	
Ram Sridharan <small>Signature</small>	Feb. 03, 2011 <small>Date</small>

December 14, 2007

Merle Kanewischer
BROMLEY MECHANICAL SERVICES INC
925-23 STREET SW
MEDICINE HAT, AB T1A 8R1

Dear Merle Kanewischer,

The welding procedures received on December 04, 2007 are accepted for registration as follows:

Reg. No. : WP-0505.2 **Accepted on:** December 14, 2007
Tracking No. : 2007-08619
Reg Type : New Design
Spec. No. : BMS-20N

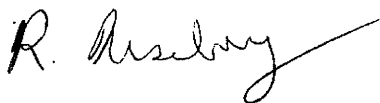
Please note the acceptance of the registration does not allow the use of this welding procedure in the construction, modification, or repair of any boiler, pressure vessel, pressure piping system or fitting in Alberta unless the contractor/manufacturer has registered a Quality Control system for such work with ABSA.

Welding procedures, which specify impact testing, have been accepted in accordance with A.S.M.E. Section IX only. Other A.S.M.E. Code Sections may have additional requirements respecting impact testing.

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

Enclosed is a stamped welding procedure for your reference.

Sincerely,



ROSEBERG, BOB, P. Eng.
Design Survey Engineer

WPS Number: BMS-20N

PQR Number: BMS-20N-1, BMS-20N-2

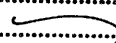
QUALIFIED FOR

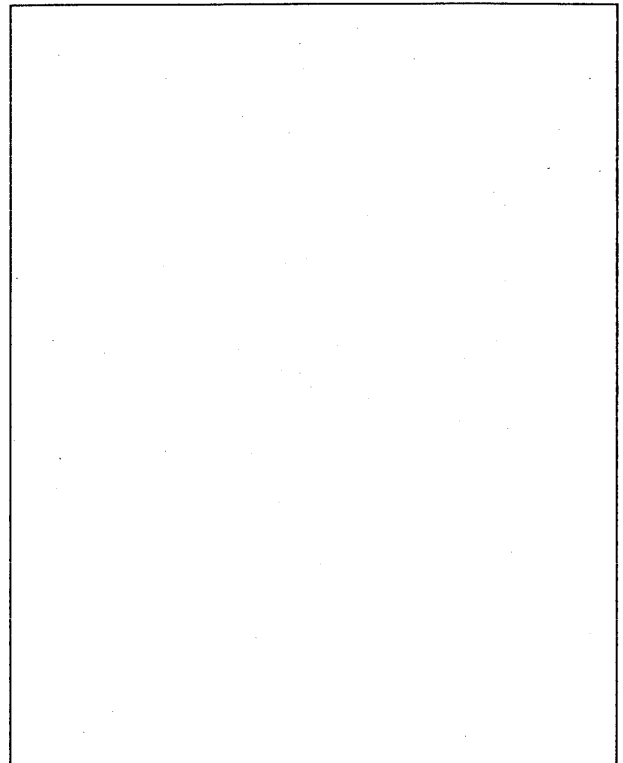
Material P Number: P1 Group 1 and 2 to P1 Group 1 and 2
Material Type (typical): SA-333 Grade 6, SA-350 Grade LF2, SA-420 Grade WPL6

Process: SMAW
Position: All without impacts / Flat with impacts
Diameter: All diameters
Joint Design: All groove and fillets
AWS Classification: E-6010, E-7018-1

Thickness:

As Welded: 0.125" to 1.5"

ALBERTA BOILERS SAFETY ASSOCIATION	
PROVINCE OF ALBERTA	
SAFETY CODES ACT	
WELDING PROCEDURE	
Reg. No. WP	505.2
Spec No.	BMS-20N
Weld Process	SMAW
Matl. Gr. P No.	1 Gr. 1 & 2 to P No. 1 Gr. 1 & 2
Elec. Gr. F No.	3+4 A No. 1
Th. Qual. For	38.1mm PWHT NO
MIN Th. Qual	3.2mm, CVN -46°C
Yr. 07 Mo. 12 Day 14	Signed 
R. ROSEBERG, P.ENG. WELDING SPECIALIST	



WELDING PROCEDURE SPECIFICATIONS

Company Name: Bromley Mechanical Services Inc.
 Welding Procedure Specification No.: BMS-20N
 Supporting PQR No.(s): BMS-20N-1, BMS-20N-2
 Welding Process(es): SMAW

By: Paul Frederick
 Date: November 14, 2007
 Rev.#: 0
 Type(s): Manual

JOINTS (QW-402)

Joint Design: All groove and fillet weld types are qualified (See chart)
 Backing: with or without Backing Material (type): Weld Metal
 Retainers: No Retainers

BASE METALS (QW-403)

P.No. 1 Group No. 1 or 2 to P.No. 1 Group No. 1 or 2

Thickness Range

Base Metal: 0.125" to 1.5"

Groove Welds: 0.0625" to 1.5" without impacts, 0.125" to 1.5" with impacts

Fillet Welds: All fillet welds

Pipe Diameter Range: All pipe diameter ranges

Deposited Weld Metal Thickness per pass: 0.500" **MAXIMUM**

FILLER METALS (QW-404)

Spec. No (SFA)	SFA 5.1	SFA 5.1
AWS No. (Class)	E-6010	E-7018-1
F. No.	F3	F4
A. No.	A1	A1
Size of Filler Metals	3/32" to 1/4"	3/32" to 1/4"
Deposited Weld Metal Thickness Range		
Groove	0.250"	1.25"
Fillet	All	All
Electrode Flux (class)	n/a	n/a
Flux Trade Name	n/a	n/a
Consumable Insert	n/a	n/a
Supplementary Filler Materials	n/a	n/a
Wire: Solid, Cored, Powder	n/a	n/a
Other	n/a	n/a

POSITIONS (QW-405)

Position(s) of Groove: All without impact, 1G with impact
 Welding Progression: Up down without impacts, Flat with impacts
 Position of Fillet: Up down without impacts, Flat with impacts

POSTWELD HEAT TREATMENT (QW-407)

Temperature Range: n/a
 Time Range: n/a

PREHEAT (QW-406)

Preheat Temp. Min.: 50°F

 Interpass Temp. Max.: 450°F
 Preheat Maintenance:
 Continuous Welding & Reheating:

GAS (QW-408)

Shielding Gas(es): n/a

 Percent composition (mixtures): n/a

 Flow Rate: n/a
 Gas Backing: n/a
 Trailing Shielding Gas Composition: n/a

ELECTRICAL CHARACTERISTICS (QW-409)

Current AC or DC: DC Polarity: Electrode Negative
 Amps (Range): See Chart Volts (Range): See chart
 Tungsten Electrode Size and Type: n/a

Mode of Metal Transfer for GMAW: n/a
 Electrode Wire Fed Speed Range: n/a
 Max. Heat Input: J/in

Base Metal Thickness Range	Heat Input Joules/in.
0.125" to 0.500"	42846
0.500" to 1.5"	75667

TECHNIQUE (QW-410)

String or Weave Bead: String and Weave
 Orifice or Gas Cup Size: n/a
 Initial and Interpass Cleaning (Brushing, Grinding, etc.): Brushing, chipping, grinding, etc.

Method of Back Gouging: Air Carbon Arc and grinding
 Oscillation: n/a
 Contact Tube to Work Distance: n/a
 Multiple or Single Pass (per side): Multiple
 Multiple or Single Electrodes: Single
 Travel Speed (Range): See Table
 Peening: n/a
 Other: n/a

		Filler Metal		Current				
Weld Layers	Process	Class	Diameter	Type Polar	Amp. Range	Volt Range	Travel Speed Range(ipm)	Other "*"
1 &/or 2	SMAW	E-6010	3/32"	DCRP	40 - 100	18 - 28	1.5 - 12	3.9
1 &/or 2	SMAW	E-6010	1/8"	DCRP	70 - 120	20 - 30	1.5 - 14	5.0
1 &/or 2	SMAW	E-6010	5/32"	DCRP	90 - 150	21 - 30	2 - 16	6.3
Rem	SMAW	E-7018-1	3/32"	DCRP	60 - 110	18 - 26	1.5 - 12	4.0
Rem	SMAW	E-7018-1	1/8"	DCRP	80 - 150	20 - 27	1.5 - 14	5.7
Rem	SMAW	E-7018-1	5/32"	DCRP	110 - 220	21 - 28	2 - 16	8.6
Rem	SMAW	E-7018-1	3/16"	DCRP	160 - 320	21 - 30	3 - 20	13.4
Rem	SMAW	E-7018-1	7/32"	DCRP	240 - 350	23 - 32	5 - 22	15.7
Rem	SMAW	E-7018-1	1/4"	DCRP	300 - 400	23 - 32	5 - 22	17.9

Note: "*" Minimum Travel Speed at Maximum Amps and Volts for Impact Requirements

TYPICAL JOINT DESIGN

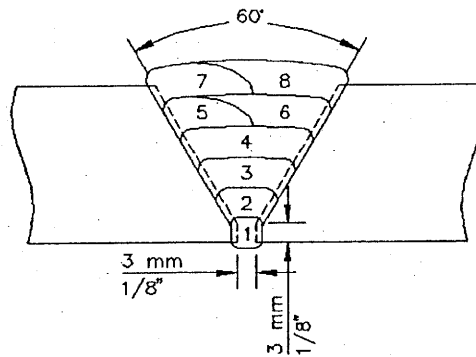


FIGURE 16

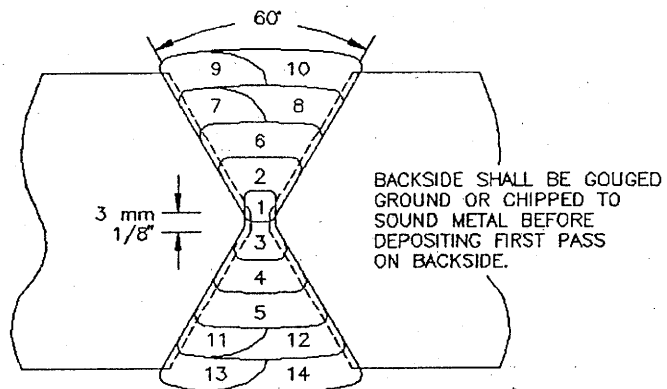


FIGURE 17

GROOVE DESIGN

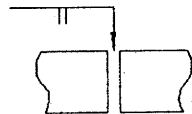


FIGURE 1
SINGLE SQUARE BUTT

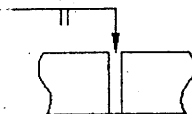


FIGURE 2
SINGLE SQUARE BUTT
WITH BACKING STRIP

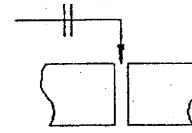


FIGURE 3
DOUBLE SQUARE BUTT



FIGURE 4
SINGLE VEE BUTT

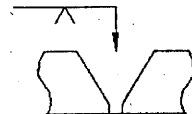


FIGURE 5
SINGLE VEE BUTT
WITH BACKING STRIP

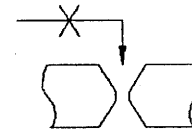


FIGURE 6
DOUBLE VEE BUTT



FIGURE 7
SINGLE U BUTT

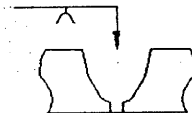


FIGURE 8
SINGLE U BUTT
WITH BACKING STRIP

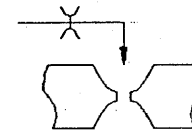


FIGURE 9
DOUBLE U BUTT

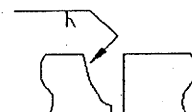


FIGURE 10
SINGLE J BUTT

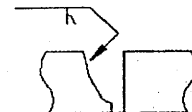


FIGURE 11
SINGLE J BUTT
WITH BACKING STRIP

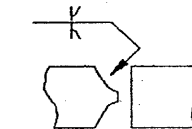


FIGURE 12
DOUBLE J BUTT

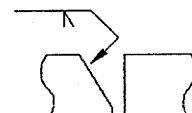


FIGURE 13
SINGLE BEVEL BUTT

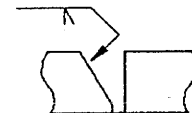


FIGURE 14
SINGLE BEVEL BUTT
WITH BACKING STRIP

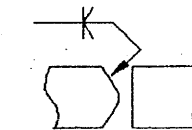


FIGURE 15
DOUBLE BEVEL BUTT



WELDING PROCEDURE REVIEW SHEET

THIS COVER SHEET IS USED TO IDENTIFY VENDOR DOCUMENT REVIEW STATUS.

VENDOR: Bromley Mechanical Services Inc.

WPS #: BMS 710M (Rev.2)

PQR #: BMS 710M-5, BMS 710M-6

DATE & REV. #: June 28, 2007, Rev.2

Application	<input type="checkbox"/> Structural	<input type="checkbox"/> Pipeline	<input checked="" type="checkbox"/> ASME Section IX
Electrode	ER 70-S2, E70C-6M (F6/F6)		
Material	P1 Gr.1 &2 to P1 Gr.1 &2		
Process	GMAW / GMAW (Metalcore)		
Position	All Positions / Flat, Horizontal		
Thickness	3.2 mm to 203 mm		
Diameter	All		
Hardness	<input type="checkbox"/> Brinell	<input checked="" type="checkbox"/> Vicker	<input checked="" type="checkbox"/> Rockwell B <input type="checkbox"/> Not Done
PWHT	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Impacts	<input checked="" type="checkbox"/> Low Temperature Impact tested at -46°C		<input type="checkbox"/> Normal Temperature
Registered	Alberta		

REVIEW STATUS	
	<input type="checkbox"/> Accepted <input checked="" type="checkbox"/> Accepted as noted <input type="checkbox"/> Accepted as noted: Resubmit <input type="checkbox"/> Not Accepted
	<input type="checkbox"/> Sour Service <input checked="" type="checkbox"/> Sweet Service <input type="checkbox"/> Transitional Sour Service
COMMENTS	
1. Uphand progression only is allowed. 2. Backing rings are not allowed. 3. Max. Weave is restricted to 4 x electrode dia. or 12.7mm for wire feed. 4. Max. thickness of unbevelled joint thickness = 3mm for welding from one side and 6mm for welding from both sides.	
Ram Sridharan <small>Signature</small>	Jan. 27, 2011 <small>Date</small>



the pressure equipment safety authority

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

July 13, 2007

Merle Kanewischer
BROMLEY MECHANICAL SERVICES INC
925-23 STREET SW
MEDICINE HAT, AB

Dear Merle Kanewischer,

The welding procedures received on July 04, 2007 are accepted for registration as follows:

Reg. No. : WP-0505.2 **Accepted on:** July 13, 2007
Tracking No. : 2007-04764
Reg Type : Revision To Acc. Design
Spec. No. : BMS 710M REV 2

Registered under owner / manufacturer name BROMLEY MECHANICAL SERVICES INC

Please note the acceptance of the registration does not allow the use of this welding procedure in the construction, modification, or repair of any boiler, pressure vessel, pressure piping system or fitting in Alberta unless the contractor/manufacturer has registered a Quality Control system for such work with ABSA.

Welding procedures, which specify impact testing, have been accepted in accordance with A.S.M.E. Section IX only. Other A.S.M.E. Code Sections may have additional requirements respecting impact testing.

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

Enclosed is a stamped welding procedure for your reference.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Roseberg', with a long, sweeping horizontal line extending to the right.

ROSEBERG, BOB, P. Eng.
Design Survey Engineer

WELDING PROCEDURE SPECIFICATION NO.: _____ BMS 710M (Rev.2)

WELDING PROCEDURE QUALIFICATION RECORD NO. (S): BMS 710M-4,
BMS 710M-5, BMS 710M-6

QUALIFIED FOR

Base Metal (Typical): P1 Groups 1 & 2 to P1 Groups 1 & 2
(SA 333 Gr.6, SA 350 Gr.LF2, SA 420 WPL6, SA 516 Gr.70, etc.)
Process(es): GMAW / GMAW (Metalcore) Weld Types: GROOVE & FILLET
Position: GMAW: ALL POSITIONS GMAW (Metalcore): FLAT & HORIZONTAL
Diameter: ALL DIAMETERS
Filler Metal: ER70S-2, E70C-6M

BASE METAL CONDITIONS & GROOVE THICKNESS RANGE QUALIFIED:

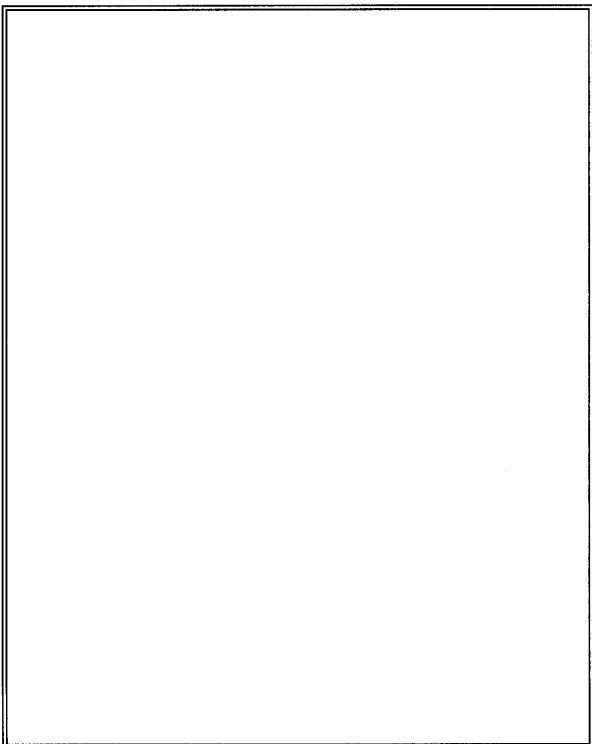
NOTCH TOUGHNESS APPLICATIONS TO -46°C AS WELDED
BASE METAL THICKNESS RANGE 3.2 to 203 mm (0.125 to 8.00 in.) inclusive

COMBINED DEPOSITED WELD METAL THICKNESS

ASME B31.1	<u>19.1 mm (0.750 in.) maximum</u>
ASME B31.3	<u>19.1 mm (0.750 in.) maximum</u>
ASME SECT. VIII, DIV.1	<u>38.1 mm (1.500 in.) maximum</u>

ALBERTA BOILERS SAFETY ASSOCIATION	
PROVINCE OF ALBERTA	
SAFETY CODES ACT	
WELDING PROCEDURE	
Reg. No. WP.....	<u>505.2</u>
Spec No.	<u>BMS 710M (REV2)</u>
Weld Process	<u>GMAW / GMAW (mc)</u>
Matl. Gr. P No.	<u>1 Gr 1+2</u> to P No. <u>1 Gr 1+2</u>
Elec. Gr. F No.	<u>6+6*</u> A No. <u>1+*</u>
Th. Qual. For.....	<u>3.2 to 203 mm PWHT</u> <u>NO</u>
	<u>CVN-46°C</u>
	<u>* E70C-6M ELECTRODE</u>
Yr. <u>07</u> Mo. <u>07</u> Day <u>13</u> Signed	
	R. ROSEBERG, P.ENG.
	WELDING SPECIALIST

PROVINCIAL REGISTRATION



QW-482 WELDING PROCEDURE SPECIFICATION (WPS)

Bromley Mechanical Services Inc.

Welding Procedure Specification No. BMS 710M (Rev.2) Date June 28, 2007
 Revision(s) Rev. 2: (Essential) - Replace PQR's BMS 710M-1, BMS 710M-2, BMS 710M-3
 Supporting PQR No. (s) BMS 710M-4, BMS 710M-5, BMS 710M-6
 Welding Process(es) GMAW / GMAW (Metalcore) Type(s) Semi-automatic

JOINTS (QW-402)

Joint Design All ASME groove & fillet, reference construction drawing for joint details.
Where joint details are not specified, refer to figures 1 to 15 attached
 Root Opening As per attached typical groove designs, see figures 1 to 15 attached
 Backing With or without Retainers Not required

BASE METALS (QW-403)

P-Number P1 Groups 1 & 2 To P-Number P1 Groups 1 & 2
 Thickness Range: Groove See cover page for thickness qualified by governing code
 Fillet All base metal thicknesses
 Pipe Diameter Ranges: Groove All diameters
 Fillet All diameters
 Deposited Weld Metal (Per Pass) GMAW: 2.79 mm (0.110 in.) maximum
GMAW (Metalcore): 12.7 mm (0.500 in.) maximum

FILLER METALS (QW-404)

	GMAW	GMAW (Metalcore)
Specification No. (SFA)	SFA 5.18	SFA 5.18
AWS No. (Class)	ER70S-2	E70C-6M
F-No.	F6	F6
A-No.	A1	*
Size	.030 to .045 in. inclusive	0.035 to 1/16 in. inclusive
Filler Metal Product Form	Solid wire	Metal cored wire
Supplemental Filler Metal	Without	Without
Deposited Weld Metal Thickness Range:		
Groove	2.79 mm (0.110 in.) max.** 38.1 mm (1.50 in.) max.**	
Fillet	All fillet sizes	All fillet sizes
Other	* Chemical composition shall meet the requirements of ASME Sec.II, Part C SFA 5.18 for E70C-6M	
	** Combined deposited weld metal thickness shall not exceed 19.1 mm (0.750 in.) for ASME B31.1, B31.3 and 38.1 mm (1.50 in.) for ASME Section VIII, Div.1	

POSITION (QW-405)

Position of Groove GMAW: All positions GMAW (Metalcore): Flat, Horizontal
 Position of Fillet GMAW: All positions GMAW (Metalcore): Flat, Horizontal
 Weld Progression GMAW: Vertical down GMAW (Metalcore): N/A

PREHEAT (QW-406)

Preheat Temperature (Minimum) See attached preheat sheet
 Interpass Temperature (Maximum) 232°C (450°F)
 Preheat Maintenance See attached preheat sheet prior to welding. Preheat maintenance is not required if welding is interrupted or after the completion of welding unless required by the code of construction.

POST WELD HEAT TREATMENT (QW-407)

Temperature Range N/A Time Range N/A

GAS (QW-408)

Specification No. (SFA) SFA 5.32
 AWS No. (Class) GMAW: SG-AC-25 GMAW (Metalcore): SG-AC-8
 Shielding GMAW: 75% Argon, 25% CO2, 10 - 25 liters per minute (20 - 50 cfph)
 Shielding GMAW (Metalcore): 92% Argon, 8% CO2, 10 - 25 liters per minute (20 - 50 cfph)
 Backing Not Required Trailing Not Required

ELECTRICAL CHARACTERISTICS (QW-409)

Current Direct Polarity Reverse, electrode positive
 Amps See Table #1 Volts See Table #1
 Mode of Metal Transfer GMAW: Short circuiting
 Mode of Metal Transfer GMAW (Metalcore): Spray or Globular
 Maximum Heat Input

Base Metal Thickness Range	ER70S-2	E70C-6M
0.125 - 0.499 in.	26,320 J/in.	21,320 J/in.
0.500 - 0.624 in.	30,080 J/in.	25,200 J/in.
0.625 - 8.00 in.	30,080 J/in.	46,200 J/in.

TECHNIQUE (QW-410)

String or Weave Either Travel Speed See Table #1
 Orifice or Gas Cup Size 9.52 mm (0.375 in.) to 19.1 mm (0.750 in.)
 Initial & Interpass Cleaning Brushing, chipping or grinding as required
 Method of Back Gouging Air carbon arc, back-grind as required
 Oscillation N/A
 Contact Tube to Work Distance GMAW: 6.35 mm (0.250 in.) to 19.1 mm (0.750 in.)
 Contact Tube to Work Distance GMAW (Metalcore): 12.7 mm (0.500 in.) to 25.4 mm (1.00 in.)
 Multiple or Single Pass Per Side GMAW: Single, root pass only
GMAW (Metalcore): Multiple
 Multiple or Single Electrodes Single
 Electrode Spacing N/A
 Peening Not permitted

TABLE 1 - WELDING PARAMETERS

Process	Filler Metal	Diameter mm (in.)	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed mm/min. (i.p.m.)
GMAW	ER70S-2	0.8 (0.030)	DCRP	70 - 130	12 - 21	43 - 250 (1.7 - 10)
GMAW	ER70S-2	0.9 (0.035)	DCRP	80 - 200	13 - 22	53 - 600 (2.1 - 25)
GMAW	ER70S-2	1.1 (0.045)	DCRP	100 - 250	14 - 23	71 - 900 (2.8 - 35)
GMAW (Metalcore)	E70C-6M	0.9 (0.035)	DCRP	130 - 260	24 - 30	103 - 254 (4.1 - 10)
GMAW (Metalcore)	E70C-6M	1.1 (0.045)	DCRP	150 - 400	25 - 35	124 - 508 (4.9 - 20)
GMAW (Metalcore)	E70C-6M	1.3 (0.052)	DCRP	200 - 400	25 - 36	165 - 635 (6.5 - 25)
GMAW (Metalcore)	E70C-6M	1.6 (1/16)	DCRP	250 - 500	26 - 36	215 - 762 (8.5 - 30)

Note: Welding parameters shall be adjusted to insure that the maximum heat input value specified in QW-409 above is not exceeded.
 Heat Input (J/in.) = $\frac{\text{Volts} \times \text{Amps} \times 60}{\text{Travel Speed (ipm)}}$

TYPICAL JOINT DESIGNS

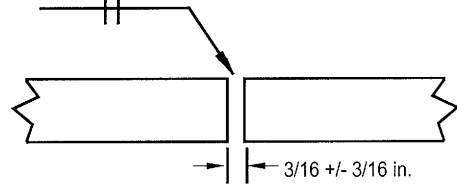
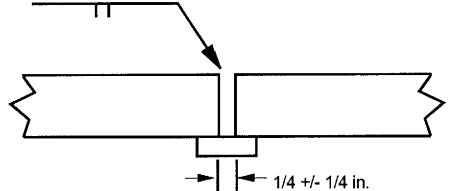
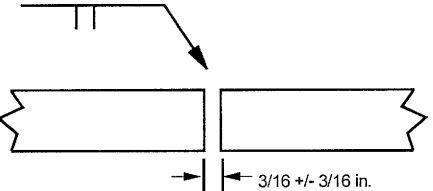


Figure 1
Single Square Butt

Figure 2
Single Square Butt with Backing Strip

Figure 3
Double Square Butt

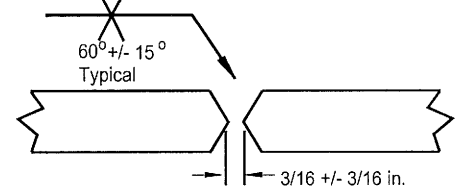
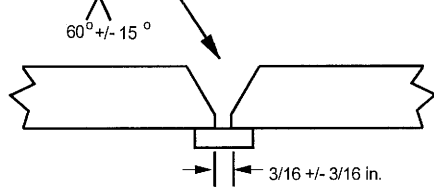
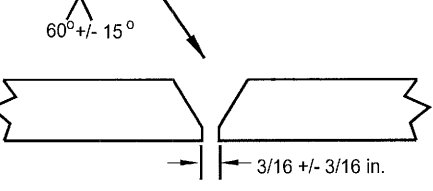


Figure 4
Single Vee Butt

Figure 5
Single Vee Butt with Backing Strip

Figure 6
Double Vee Butt

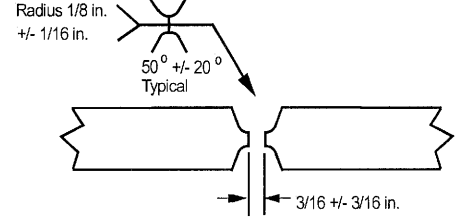
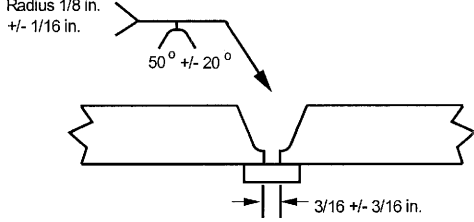
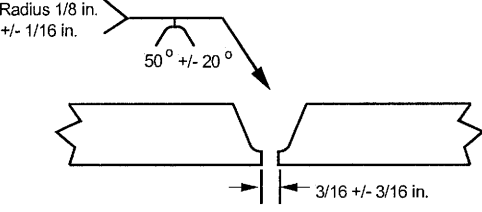


Figure 7
Single U Butt

Figure 8
Single U Butt with Backing Strip

Figure 9
Double U Butt

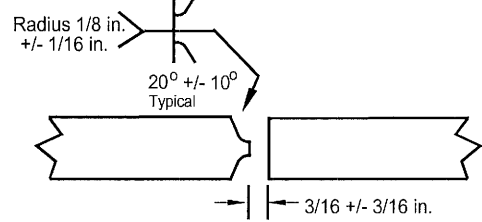
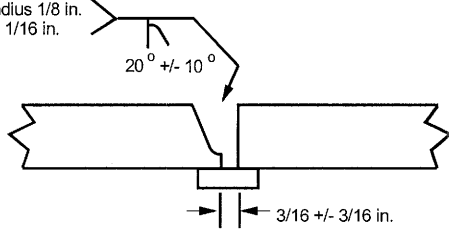
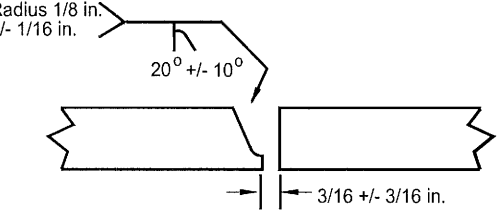


Figure 10
Single J Butt

Figure 11
Single J Butt with Backing Strip

Figure 12
Double J Butt

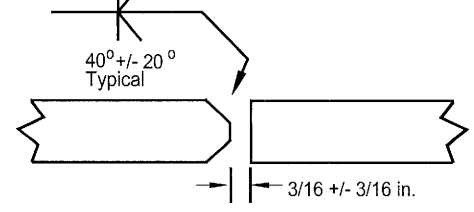
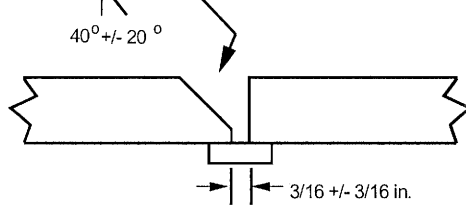
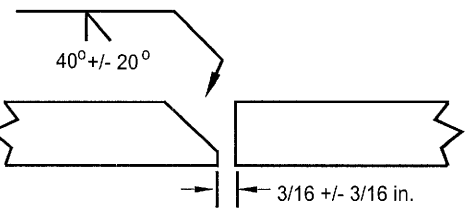


Figure 13
Single Bevel Butt

Figure 14
Single Bevel Butt with Backing Strip

Figure 15
Double Bevel Butt

Or as per the joint design on the approved construction drawing.

PREHEAT

P-No. 1

1. Welds joining pressure parts or attachments shall be preheated to not less than the minimum preheat temperatures stated in paragraph 5.
2. The preheat temperature shall be maintained during welding.
3. If welding is interrupted, the weld joint and adjacent areas shall be reheated to the minimum preheat temperature stated in paragraph 5, prior to the start of welding.
4. Preheat temperatures shall be checked by the welder or inspector, using temperature indicating crayons or other reputable methods.
5. Minimum preheating temperatures shall be as follows:

PRESSURE VESSELS IN ACCORDANCE WITH ASME SECTION VIII, DIV. 1

NOMINAL WALL THICKNESS	MINIMUM PREHEAT TEMPERATURE
0 to 32 mm (0 to 1.25 in)	10°C (50°F)
Over 32 mm (Over 1.25 in.)	95°C (200°F)
Over 25 mm (1.0 in.) & specified maximum carbon content in excess of 0.30%.	79°C (175°F)

- The conditions of UW-30 shall apply for base metal temperatures below 0°C (32°F).
- The preheat zone shall extend at least 50 mm (2.0 in.) beyond each edge of the weld.

PROCESS PIPING IN ACCORDANCE WITH ASME B31.3

NOMINAL WALL THICKNESS	MINIMUM SPECIFIED BASE METAL TENSILE STRENGTH	MINIMUM PREHEAT TEMPERATURE
< 25 mm (1.0 in.)	≤ 490 MPa (71 ksi)	10°C (50°F)
≥ 25 mm (1.0 in.)	All	79°C (175°F)
All	> 490 MPa (71 ksi)	79°C (175°F)

- The preheat zone shall extend at least 25 mm (1.0 in.) beyond each edge of the weld.
- The interruption of welding shall be subject to the requirements of paragraph 330.2.4.

POWER PIPING IN ACCORDANCE WITH ASME B31.1

NOMINAL WALL THICKNESS	MINIMUM PREHEAT TEMPERATURE
Over 25 mm (1.0 in.) & specified maximum carbon content in excess of 0.30%.	80°C (175°F)
All others	10°C (50°F)

- The preheat zone shall extend beyond each edge of the weld for at least 76.2 mm (3.0 in.) or 1.5 times the base metal thickness (as defined in paragraph 131.4.1), whichever is greater.

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Bromley Mechanical Services Inc.

Procedure Qualification Record No. BMS 710M-4 Date June 4, 2007
Welding Procedure Specification No. BMS 710M (Rev.2)
Welding Process(es) GMAW / GMAW (Metalcore) Type(s) Semi-automatic

JOINTS (QW-402)

Type Butt joint, single vee groove, see next page

BASE METALS (QW-403)

Material Spec. SA 333 to SA 350 Type or Grade Gr. 6 to Gr. LF2
Heat Number 521650 to 97267
P-No. P1 Grp.1 To P-No. P1 Grp.2 Thickness 6.32 mm (0.249 in.)
Diameter 114.3 mm (4.50 in.) O.D. Other Schedule 80 m/c to 0.249 in. w.t.
Deposited Weld Metal (Per pass) Did not exceed 12.7 mm (0.500 in.)

FILLER METALS (QW-404)

	<u>GMAW</u>	<u>GMAW (Metalcore)</u>
Specification No. (SFA)	<u>SFA 5.18</u>	<u>SFA 5.18</u>
AWS No. (Class)	<u>ER70S-2</u>	<u>E70C-6M</u>
Filler Metal F-No.	<u>F6</u>	<u>F6</u>
Filler Metal A-No.	<u>A1</u>	<u>*</u>
Filler Metal Product Form	<u>Solid wire</u>	<u>Metal cored wire</u>
Filler Metal Trade Name	<u>Not recorded</u>	<u>Megafil 710M</u>
Supplemental Filler Metal	<u>Without</u>	<u>Without</u>
Size of Electrode	<u>See attached sketch</u>	
Deposited Weld Metal Thickness	<u>2.54 mm (0.100 in.)</u>	<u>3.78 mm (0.149 in.)</u>
Other	<u>* Chemical composition meets the requirements of ASME Sec. II, Part C, for E70C-6M</u>	

POSITION (QW-405)

Position of Groove GMAW: 30° off flat GMAW (Metalcore): 1G
Weld Progression GMAW: Vertical down GMAW (Metalcore): N/A

PREHEAT (QW-406)

Preheat Temperature 66°C (150°F) Interpass Temp. (Max.) 232°C (450°F)

POSTWELD HEAT TREATMENT (QW-407)

Temperature N/A Time N/A

GAS (QW-408)

Specification No. (SFA) SFA 5.32
AWS No. (Class) GMAW: SG-AC-25 GMAW (Metalcore): SG-AC-8
Shielding GMAW: 75% Argon, 25% CO₂, 12.5 liters per minute (25 cfph)
Shielding GMAW (Metalcore): 92% Argon, 8% CO₂, 12.5 liters per minute (25 cfph)
Backing Without Trailing Without

ELECTRICAL CHARACTERISTICS (QW-409)

Current Direct Polarity Reverse, electrode positive
Amps See next page Volts See next page
Heat Input ER70S-2: 26,320 J/in. maximum E70C-6M: 21,320 J/in. maximum
Mode of Metal Transfer GMAW: Short circuiting arc GMAW (Metalcore): Spray arc

TECHNIQUE (QW-410)

String or Weave GMAW: Weave GMAW (Metalcore): Weave
Travel Speed See next page
Multiple or Single Pass Per Side GMAW: Single GMAW (Metalcore): Multiple
Multiple or Single Electrodes Single



WELDING PROCEDURE REVIEW SHEET

THIS COVER SHEET IS USED TO IDENTIFY VENDOR DOCUMENT REIVIEW STATUS.

VENDOR: BROMLEY MECHANICAL SERVICES INC.

WPS #: B880

PQR #: B880-1

DATE & REV. #: Feb.01, 2007, Rev. 1

Application	<input type="checkbox"/> Structural	<input type="checkbox"/> Pipeline	<input checked="" type="checkbox"/> ASME Section IX
Electrode	F6		
Material	P1 Gr.1 &2 to P1 Gr.1 &2		
Process	SAW		
Position	Flat		
Thickness	4.8mm to 38.1mm (Non-impact) , 15.8mm to 38.1mm (Impact specified)		
Diameter	All		
Hardness	<input type="checkbox"/> Brinell	<input type="checkbox"/> Vicker	<input checked="" type="checkbox"/> Rockwell B <input type="checkbox"/> Not Done
PWHT	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Impacts	<input checked="" type="checkbox"/> Low Tempererature	Impact tested to -46°C	<input type="checkbox"/> Normal Temperature
Registered	Alberta		

REVIEW STATUS	
	<input type="checkbox"/> Accepted <input checked="" type="checkbox"/> Accepted as noted <input type="checkbox"/> Accepted as noted: Resubmit <input type="checkbox"/> Not Accepted
	<input type="checkbox"/> Sour Sevice <input checked="" type="checkbox"/> Sweet Service <input checked="" type="checkbox"/> Transitional Sour Service
COMMENTS	
1. Backing rings are not allowed. 2. Min. Joint thickness for unbevelled joint is 3mm for welding from one side and 6mm for welding from both sides. 3. Accepted for Transitional sour and sour service for piping up to 12.7mm thickness. Production Hardness values not to exceed 210 Hv.	
Ram Sridharan <small>Signature</small>	Feb. 03, 2011 <small>Date</small>



the pressure equipment safety authority

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

February 20, 2007

Merle Kanewischer
BROMLEY MECHANICAL SERVICES INC
925-23 STREET SW
MEDICINE HAT, AB

Dear Merle Kanewischer,

The welding procedures received on February 08, 2007 are accepted for registration as follows:

Reg. No. : WP-0505.2

Accepted on: February 16, 2007

Tracking No. : 2007-00989

Reg Type : New Design

Spec. No. : B880 *Rev #1 R 5/12/09*

Please note the acceptance of the registration does not allow the use of this welding procedure in the construction, modification, or repair of any boiler, pressure vessel, pressure piping system or fitting in Alberta unless the contractor/manufacturer has registered a Quality Control system for such work with ABSA.

Welding procedures, which specify impact testing, have been accepted in accordance with A.S.M.E. Section IX only. Other A.S.M.E. Code Sections may have additional requirements respecting impact testing.

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

Enclosed is a stamped welding procedure for your reference.

Sincerely,

ROSEBERG, BOB, P. Eng.
Design Survey Engineer

WPS Number: B880

PQR Number: B880-1

QUALIFIED FOR

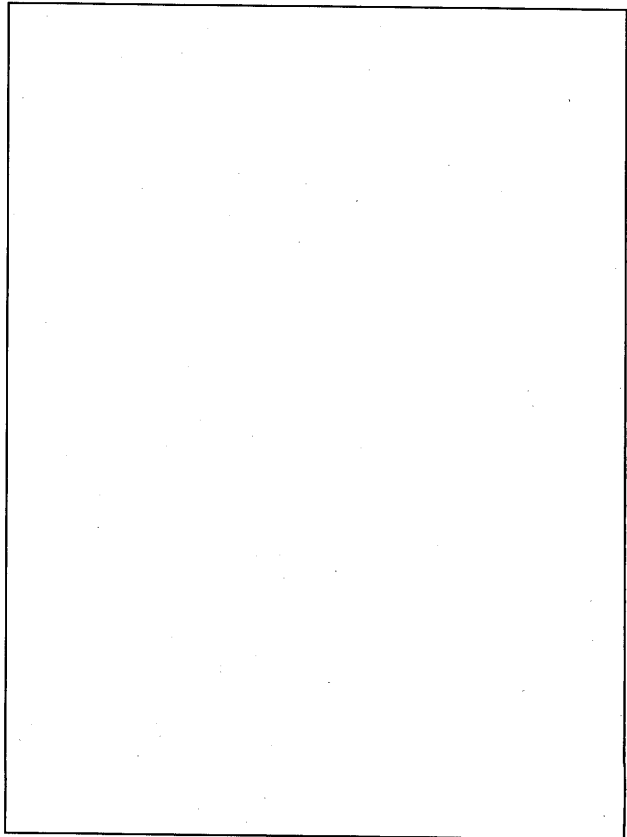
Material P Number: P1 Gr1 & Gr2
Material Type (typical): SA-333-Grade6,SA-516-Grade 70,SA-420-WPL-6
SA-106-Grade B,SA-105 etc.

Process: SAW
Position: Flat
Diameter: 6 NPS and larger
Joint Design: All
AWS Classification: F7P6-EH11K

Thickness: With PWHT: N/A

As Welded: 0.187" to 1.5" without CVN
0.625" to 1.5" with CVN

ALBERTA BOILERS SAFETY ASSOCIATION	
PROVINCE OF ALBERTA	
SAFETY CODES ACT	
WELDING PROCEDURE	
Reg. No. WP.....	505.2
Spec No.	B.880
Weld Process	SAW
Matl. Gr. P No. 1 Gr 1 & 2 to P No. 1 Gr 1 & 2	
Elec. Gr. F No. 6	A No. 1
Th. Qual. For. 38.1mm	PWHT NO
MIN. TH. QUAL 15.8mm, CVN -46°C	
Yr. 07 Mo. 02 Day 10	Signed
R. ROSEBERG, P.ENG. WELDING SPECIALIST	



WELDING PROCEDURE SPECIFICATIONS

Company Name: Bromley Mechanical Services Inc.

By: Paul Frederick

Welding Procedure Specification No.: B880

Date: February 1, 2007

Supporting PQR No.(s): B880-1

Rev.#: 1

Welding Process(es): SAW

Type(s): Automatic

Revision 1 is for editorial updates to the WPS and to change the company name.

JOINTS (QW-402)

Joint Design: All ASME joint designs

Backing: with Backing Material(type): Weld or Backing strip(removable): No retainers

BASE METALS (QW-403)

P.No. 1 Group No. 1 or 2 to P.No. 1 Group No. 1 or 2

Thickness Range

Base Metal: 0.187" to 1.5" without CVN

.675" to 1.5" with CVN -50°F

Groove welds: .375" to 1.5" without CVN, .625" to 1.5" with CVN -50°F

Fillet Welds: All

Pipe Diameter Range: 6 NPS and larger

Deposited Weld Metal thickness per pass: .500"max.

FILLER METALS (QW-404)

Spec. No (SFA)

SFA 5.17

AWS No. (Class)

EH11K

F. No.

F6

A. No.

A1

Size of Filler Metals

5/64" to 5/32"

Deposited Weld Metal

Thickness Range

Groove

.375" to 1.5"

Fillet

All

Electrode Flux (class)

F7P6 Neutral

Flux Trade Name

Consumable Insert

N/A

Other

No supplementary filler metals

POSITIONS (QW-405)

Position(s) of Groove: Flat

Welding Progression: Flat

Position of Fillet: 1F, 2F

POSTWELD HEAT TREATMENT (QW-407)

Temperature Range: None

Time Range: N/A

PREHEAT (QW-406)

Preheat Temp. Min.: 200°F

Interpass Temp. Max.: 450°F

Preheat Maintenance: Welding and Reheating

GAS (QW-408)

Shielding Gas(es): N/A

Percent composition (mixtures): N/A

Flow Rate: N/A

Gas Backing: N/A

Trailing Shielding Gas Composition: N/A

ELECTRICAL CHARACTERISTICS (QW-409)

Current AC or DC: DC Polarity: Reverse(Electrode Positive)

Amps (Range): 200-700 Volts (Range): 24-36

Tungsten Electrode Size and Type: N/A

Mode of Metal Transfer for GMAW: N/A

Electrode Wire Fed Speed Range: 19 to160 ipm

Max. Heat Input: 75,469 J/in.

Max. Heat Input: Minimum travel speed and maximum amps and volts.

Base Metal Thickness Range	Heat Input Joules/in.
.187" to 1.5"	75,469

TECHNIQUE (QW-410)

String or Weave Bead: String

Orifice or Gas Cup Size: N/A

Initial and Interpass Cleaning (Brushing, Grinding, etc.): Brushing,Chipping,Grinding

Method of Back Gouging: Air Carbon Arc, Back grind as required

Oscillation: N/A

Contact Tube to Work Distance: N/A

Multiple or Single Pass (per side): Multiple

Multiple or Single Electrodes: Single

Travel Speed (Range): See Table

Peening: None

Other:N/A

Weld Layers	Process	Filler Metal		Current		Volt Range	Travel Speed Range(ipm)	Other *
		Class	Diameter	Type Polar	Amp. Range			
All	SAW	F7P6-EH11K	5/64"	DCRP	200-450	24-33	4-30	12
All	SAW	F7P6-EH11K	3/32"	DCRP	250-475	24-34	6-35	13
All	SAW	F7P6-EH11K	1/8"	DCRP	250-600	25-35	8-40	17
All	SAW	F7P6-EH11K	5/32"	DCRP	350-700	26-36	8-40	21

* Minimum travel speed and maximum amps and volts.

GROOVE DESIGN

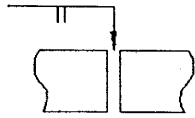


FIGURE 1
SINGLE SQUARE BUTT

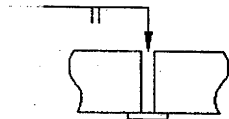


FIGURE 2
SINGLE SQUARE BUTT
WITH BACKING STRIP

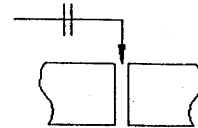


FIGURE 3
DOUBLE SQUARE BUTT

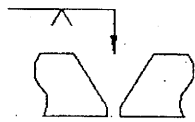


FIGURE 4
SINGLE VEE BUTT

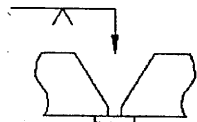


FIGURE 5
SINGLE VEE BUTT
WITH BACKING STRIP

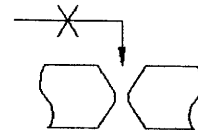


FIGURE 6
DOUBLE VEE BUTT

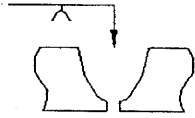


FIGURE 7
SINGLE U BUTT

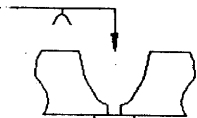


FIGURE 8
SINGLE U BUTT
WITH BACKING STRIP

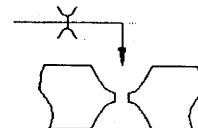


FIGURE 9
DOUBLE U BUTT

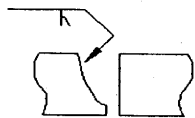


FIGURE 10
SINGLE J BUTT



FIGURE 11
SINGLE J BUTT
WITH BACKING STRIP

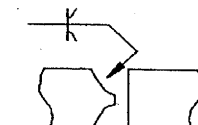


FIGURE 12
DOUBLE J BUTT

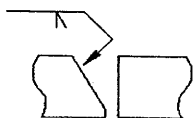


FIGURE 13
SINGLE BEVEL BUTT

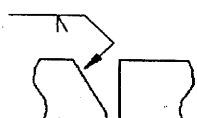


FIGURE 14
SINGLE BEVEL BUTT
WITH BACKING STRIP

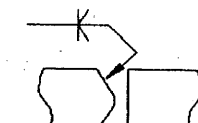


FIGURE 15
DOUBLE BEVEL BUTT

TYPICAL JOINT DESIGN

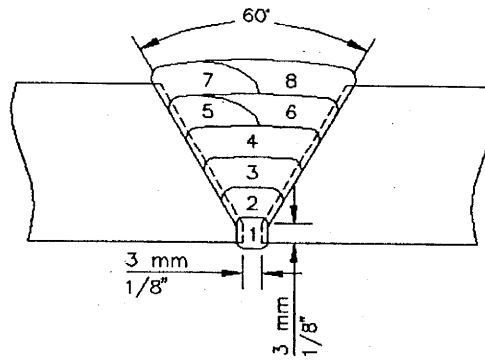


FIGURE 16

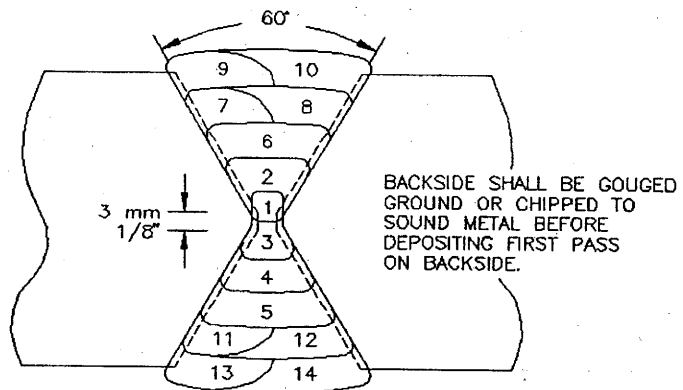


FIGURE 17

BILL OF MATERIAL

ITEM	QTY.	DESCRIPTION
1	1	S.E. HEAD, 24"OD X 0.750" NOM. (0.6875" MIN.) C/W 2" S.F., SA516-70N
2	1	SHELL, 24"OD X 0.7500" SA516-70N X 5'-0" LONG
3	1	PIPE, 24" SCH. STD (0.375") X 22' 7/16" LONG, SA53B
4	1	BASE RING, 30"OD X 20"ID X 1/2", A36/44W
5	3	RFWN, 4" 600 ANSI SCH. XXH, SA350-LF2 CL.1
6	2	SMLS PIPE, 4" SCH. XXH (0.674") X 5 1/2" LONG, SA333GR.6
7	2	SMLS PIPE, 4" SCH. XXH (0.674") X 5 3/8" LONG, SA333GR.6
8	5	RFWN, 2" 600 ANSI SCH. 160, SA350-LF2 CL.1
9	1	SMLS PIPE, 2" SCH. 160 (0.343") X 7 15/16" LONG, SA333GR.6
10	1	WELD 90, 2" SCH. 160 LR, SA420WPL6
11	1	SMLS PIPE, 2" SCH. 160 (0.343") X 13 7/8" LONG, SA333GR.6
12	4	SMLS PIPE, 2" SCH. 160 (0.343") X 5 11/16" LONG, SA333GR.6
13	4	RFWN, 1" 600 ANSI SCH. XXH, SA350-LF2 CL.1
14	4	SMLS PIPE, 1" SCH. XXH (0.358") X 6 1/16" LONG, SA333GR.6
15	1	T-BRACKET NAME PLATE HOLDER, 1/4" SA36/44W (SEE DETAIL) & VESSEL ID PLATE, ALUM
16	2	LIFT LUG - PLATE, 1/2" THK, SA516-70N (SEE DETAIL)
17	1	WELD 45, 4" SCH. 40 LR, SA420WPL6
18	1	VORTEX BREAKER - PLATE, 1/4" THK, SA36/44W (SEE DETAIL)
19	1	DEM. 24"OD X 6"TK, 1 PC NO GRD, 9LB 316LSS
20	20	FLAT, 1/4" X 1", A36/44W
21	4	FLAT EXP. METAL 3/4" X 9/16, CS
22	1	SLEEVE - PIPE, 16" SCH. STD (0.375") X 7 9/16" LONG, CUT IN HALF, SA106B OR SA53B (SEE DETAIL)
23	1	SLEEVE - PIPE, 12" SCH. STD (0.375") X 6 5/16" LONG, SA106B OR SA53B (SEE DETAIL)
24	2	SLEEVE - PIPE, 2" SCH. STD (0.154") X 4 7/16" LONG, SA106B OR SA53B (SEE DETAIL)
25	1	INSULATION RING - PLATE, 1/4" THK X 2 1/2" W X 23 1/4" OD, SA36/44W
26	2	INSULATION RING - PLATE, 1/4" THK X 2 1/2" W X 24" ID, SA36/44W

NOTES: /A
 - 100% X-RAY ON ALL NOZZLE BUTT WELDS
 - LG CONNECTIONS TO BE JIG SET
 - ALL ATTACHMENT WELDS TO BE CONTINUOUSLY FILLET WELDED ALL AROUND
 - COMMERCIAL SANDBLAST TO SPG-SP6 (NOZZLES, SKIRT & BASE ONLY)
 - PRIME: CLOVERDALE INORGANIC ZINC PRIMER, 2 MILS DFT (NOZZLES, SKIRT & BASE ONLY)
 - FINISH: CLOVERDALE SILICON ACRYLIC, 1.5 MILS DFT (NOZZLES, SKIRT & BASE ONLY)
 - COLOR: SILVER GREY
 - 3" THK MINERAL WOOL INSULATION C/W 0.020" STUCCO EMBOSSED ALUM CLADDING & SS BANDING

ASME 2010 ED. CODE SECT. VIII DIV. 1

BMS AOP 1009 (S) REGISTERED WELD PROCEDURE 505.2
 FOR VESSEL TOLERANCES, SEE WELDER HANDBOOK
 VESSEL TYPE: VERTICAL
 M.A.W.P.: 900 PSI (6206 kPa) AT +550F (+288C)
 M.A.E.W.P.: 15 PSI (103 kPa) AT +550F (+288C)
 M.D.M.T.: -49F (-45C) AT 900 PSIG (6206 kPa)
 IMPACT TESTING EXEMPT PER UCS 66(g)(b)(g)
 P.W.H.T.: NIL
 RADIOGRAPHY: RT-1 CIRC.: FULL LONG: FULL
 JOINT EFFICIENCY: HEADS: 1.00 SHELL: 1.00
 CORROSION ALLOWANCE: 1/8"
 HYDROSTATIC TEST: 1170 PSIG (8067 kPa)
 VOLUME: 17.0ft³ (0.48m³)
 WEIGHT (DRY): 2500 lb (1136 kg)

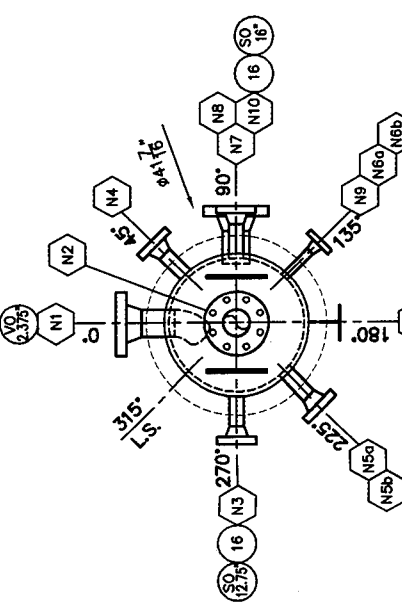
BROMLEY MECHANICAL SERVICES

925 - 23rd Street S.W., Medicine Hat, Alberta, Canada, T1A 8R1 (403) 526-3142

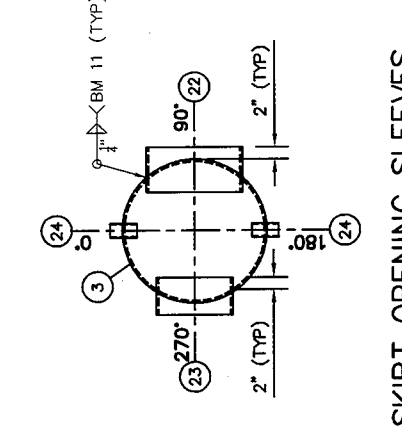
CLIENT: HUSKY OIL OPERATIONS LIMITED
 PROJECT: HOT WATER VAPOR PROCESS PILOT PROJECT
 LSD: 10-04-050-24 W3M
 V-108

TITLE: 24"OD X 5'-0" S/S X 900 PSI LT FV SEPARATOR

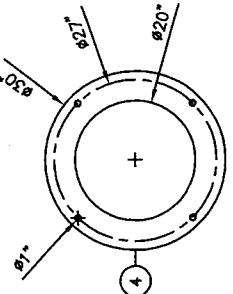
CRN: V5361.23 Wb No.: 34000 SERIAL No.: 130495
 DRAWN BY: S.WALL/M.CASH REV. No.: 1 DATE: MM/DD/YY 09/20/11
 DATE: MM/DD/YY 05/11/11 SCALE: 3/8"=1" CAD No.: 34000



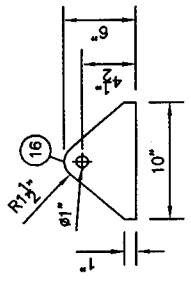
PLAN VIEW



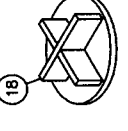
SKIRT OPENING SLEEVES



BASE LAYOUT



LIFT LUGS



VORTEX BREAKER

NOZ NO.	NO. REQ'D	SIZE	RATING	TYPE OF SERVICE	OD OF NOZ NECK		PROJECTION		REIF PAD	FILLET WELD SIZE			BILL OF MAT'L ITEM No.	REMARKS
					INSIDE	OUTSIDE	INSIDE	OUTSIDE		A	B	C		
N1	1	4"	600	INLET	4.5"	8"	3/4"	3/4"	4.5	3/8	5/8	5.6,17		
N2	1	4"	600	OUTLET/INSPECT	4.5"	8"	3/4"	3/4"	4.5	3/8	5/8	5.7	INSPECTION	
N3	1	2"	600	DRAIN	2.375"	8"	0"	0"	4.5	3/8	3/8	8,9,10,11,18		
N4	1	2"	600	DUMP	2.375"	8"	0"	0"	4.5	3/8	3/8	8,12		
N5ab	2	2"	600	LC	2.375"	8"	0"	0"	4.5	3/8	3/8	8,12		
N6ab	2	1"	600	LG	1.315"	8"	0"	0"	4.5	3/8	3/8	13,14		
N7	1	2"	600	PSV	2.375"	8"	0"	0"	4.5	3/8	3/8	8,12		
N8	1	1"	600	TI	1.315"	8"	0"	0"	4.5	3/8	3/8	13,14		
N9	1	1"	600	PI	1.315"	8"	0"	0"	4.5	3/8	3/8	13,14		
N10	1	4"	600	INSPECTION	4.5"	8"	3/4"	3/4"	4.5	3/8	5/8	5.6		

REV.	MM	DD	YY	DATE	DESCRIPTION	SW	SW	SW	SW
1	09	22	11		AS-BUILT				
0	08	05	11		ISSUED FOR CONSTRUCTION	34000	REG-R.0		

NO.	DATE	BY	CHK'D	SIGN'D

INSIDE & OUTSIDE OF NOZZLE BE ROUNDED PER UG-76(C)

ELEVATION

