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°C	-45°C
External Pressure	103 kPa	260°C	-45°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. 1	Manufactured and certified by Bromley Mechanical Services Inc., A Division of Argo Sales Ltd., 925 23 St. SW, Medicine Hat Alberta T1A 8R1																
)	Manufactured for	Hus	ky Oil Ope	ations	Ltd., Box	4490, S	tation '	'D", Calgar	y, Alberta	T2P 3G7				(Ã	XX	991	900,
3. l	ocation of installa	ation	LSD: 10-04	-050-24	W3M	V-908 (j-108	ll ab	र्भा	address of F							
4.	Гуре	Verti		- 	1304		. —		61.23	ame and add	34000-REG			n/a			2011
	(Honzon) The chemical and CODE. The design	physic		s of all p		the requir	ements		pecification		Drawing num) SME BOILER A		SSURE V	lational Board 'ESSEL) Edition	d numbe	r)	(Year built)
1	0		n/a			_			n/a				Y	ear [n/a		
6. \$	Shell	_	iddenda (date)] SA516-70N				0.750		Case number	s) 0.125"		2	[S _i 24" OD	pecial servic	e per UG		" s/s
7. \$			spec. number, Type 1)	grade)	Full	(Non	ninal thick 100	•	/a	Corr. allow.) n/a	Butt (T		er diameter)	Full	1	(Length	(overali)] 1
	[Long. (w	elded, c	lbl., sngl., lap, b	utt)] [R. T. (spot o	r full)]	(Eff., %)	(H. T.	temp.) (ime, hr)	[Girth (welded, dbl	., sngl., lap	o, butt)] [F	R. T. (spot or full)]	(Eff	., %)	(No. of courses)
8. I	Heads: (a) Materi	s: (a) Material SA516-70N (b) Material SA516-70N (Spec. no., grade) (Spec. no., grade)															
	Location (Top,	T	Minimum	Cor	rosion	Cro\		Knuckle	Ell	ptical	Conical	Hemi	spherical	Flat		Side	To Pressure
	Bottom, Ends)		Thickness	Allo	wance	Radi	ius	Radius	F	atio	Apex Angle	R	adius	Diame	eter	(Conve	ex or Concave)
(a	TOP	┸	0.6875"	+	125"					2:1						(Concave
(b			0.6875"		125"	2:1 Concave									Concave		
	f removable, bolts	movable, bolts used (describe other fastenings) n/a															
9.	MAWP		900 psi		14		15	psi	at	(Ivialeria max. tem	,	550°F	•			550°f	: ,
			(Internal)				(External)	•				(Internal)			(E	xtemal)	
	Min. design meta). —————		-49°F			at	900 psi	Hydro.,	parack, by real	bx test p	ressure -		11	70 psi	
40	Proof testn/a																
10.	Purpose	ion, ai	Diameter	ve open	ings:	Material Nozzle Thickness Reinforcement Attachment Details Loca								Location			
•	let, Outlet, Drain)	No.	or Size	Туре	No			lange	Nom.	Corr.		- 1	Nozz		Flan		(Insp. Open.)
	et, Outlet/Insp	2	4"	CL600	SA33	3GR6		50LF2CL1	0.674"	0.125	_		UW-16.		Тур		Top Head, S
	Drain, Dump	2	2"	CL600	SA33	3GR6	SA35	0LF2CL1	0.343"	0.125	n			UW-16.1(c) Typ			Datum Head,
	LC(2), PSV	3	2"	CL600	SA33	3GR6		0LF2CL1	0.343"	0.125	0		UW-16.1(c) Type			e 1	Shell
\vdash	LG(2), TI, PI	4	1"	CL600	SA33		_	0LF2CL1	0.358"	0.125			UW-16.	``	Тур	e 1	Shell
<u> </u>	Inspection	1	4"	CL600	SA33	3GR6	SA3	0LF2CL1	0.674"	0.125	"		UW-16.	.1(c)	Тур	e 1	Shell
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11.	Supports: Skirt		Yes	Luç	şs	0	Leg	js ())	Other	n/a		Atta	ched	Datu	ım Hea	d Weld
40	Damada Mass		(Yes or no)	— 		(Number)			lumber)		(Descr	,				(Where a	nd how)
	Remarks: Manuf items of the repo			ата керс	iπs prope	ny identiti	eo ano s	signed by Co			6		1 \	_	لد ما است	D. Oth	D UC13E
	items of the repo	n. <u>n/</u>	<u> </u>			(Name o	f part item	number, Manu		0.125", e and identif		perc	itor 1	PSV Su	ippiiea	By Oth	er Per UG125
Vo	lume: 17.0 cu ft	or 0.	48 cu m,				•	esting Exer					Construct	ion Draw	ing Ca	d. No.	34000 Rev.0
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						t are corr	ect and	that all deta	ils of desigr	, materia	l, construction, a			of this ves			
	conform to ti	ne AS	ME BOILER	AND PE	RESSURE	VESSEL	CODE,	Section VIII	, Division 1.	"U" Cerl	tificate of Author	iza r on i	Mimber —		306	34	
	expires	// 10	/26/2013		Promlo	Machan	ioal Co	edoos Tos	A Division	of.	A	K					
	Date	pt	66, // Co	. name	Argo'sa	ies Etd.,		vices Inc.,	A DIVISION		Signed	low	wirk	resentative)			
						С	ERTIFI	CATE OF S	SHOP / FIE								
	Vessel cons	tructe	d by Right	ley Mec	hanical S	Services	Inc., A	Division of	at 925	23 St. S	W, Medicine F	lat, Alb	erta 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																
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L		W. K	411-			Author	ized Inspe	ctor)						nts), State, P	_	and numb	 ver]

Travel Sheet

DO N	IOT START CONSTR	UCTION WITHOU	T AI REVIE	W	TRA'	VEL SHEET	REVISIO	N NO.:	
ALRE	EVIEW:	Heisky Oil	OPERMON:	\$		REVIEW I	DATE:	Aug 10	,2011
SERI	AL NO.: 130 495			VES	SSEL TYP	PE: 24"15"-	2 900 PS	Aug 10 Vent 3	e D
DRA	WING/CAD NO.: 34		3/CAD REVI	SION NO:	0.	TRAVEL	SHEET II	NITIATION B	Y. N. O.
Seq.	Item	Comments	Q.C.I.	Date	A.I. Hold Points	A.I.	Date	Owner	Date
1.	Calculations in File	apply moder	11	alli	*	(C)	P 0 6	2011	
2.	Release of App'd Dwg.	Jypung 111322	80	8/9/11		W 2. U	L1 U U	4011	
3.	Heat Numbers Recorded		W JL. (2 2011	¥	Q c	P 0 6	2044	
4.	Material Examination) SEP (2 2011		<u></u>		(2011 	 -
5.	MTRs Checked		1,SEP (2 2011	¥	(Q) CI	P 0 6	2011	7, 74,
6.	WPS(s) Checked	4 2	16/	8/4/11	*		EP 0 6		
7.	Welder(s) Qualified	,	SEP (2 2011	*		EP n s		rector.
8.	Thicknesses Verified & Recorded		SEP (2 2011					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
9	Shell(s) & Head(s) Fit- up Inspection	.3	A) SEP	2 2011			,	,	11.
10.	Nozzles & Fittings Fit-up Inspection	١	SEP	72 2011			7. 1 22		e for pass
11.	Nozzle Orientation	aj -	SEP (2 2011				1/1	
12.	Nozzle & Flange Rating Checked		SEP 0	2 2011	:			1	4
13.	Impact Tests	Log	Edm	rot		······································			الله والمراجع والمراجع
14.	Internals Checked	v.	30 A	y Lon		Ó	1 50/1		firsts 's
15.	Final Internal Inspection	Shell Side Tube Side	12015	of 2000	**	ري ،	Dolt 1/11		¥3.00
16.	Weld Size Checked		KSEP (2 2011			0,	4.4	
17.	Welder I.D. Checked	(*)) SEP	0 2 2011	*	Ø⇒ S	EP 06	2011	
18.	Final External Inspection		WSEP	0 2 2011	*	0	SEP 0 8	2011	3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
19.	Radiography Ciacs	RT-1	SEP (2 2011	*	(S) S	EP 0 6		()
20.	Other N.D.E.		SEP 0	2 2011			,		
21.	Final Ext. Prior to P.W.H.T.	NĽL	1		**	· · · · · · · · · · · · · · · · · · ·			
22.	PWHT Chart Checked		188. –	_	*				
	Hydrostatic Test	Shell Gauge # Side		2161	3		ED o c	0044	
23.	1170 1516	Tube Gauge# Side	le	appli	**	W.	SEP 06	2011	
24.	CRN Drawing Capply	CRN#/5361.2	111	9/18/11	*	0	EP 0 6	2011	
25.	N.C.R. #	V	1	- 11.0					
26.	Nameplate Stamping		ld.	9/6/11	*	60_	SEP OF	2011	
27.	Manuf. Data Report Completed & Verified	:	Un.	96/11	**	100 S	EP 0 6	2011	
28.	Nameplate Installation	<u> </u>		9/5/4	L		<u> </u>	<u> </u>	

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

Z:\BMSDOCS\travel sheet.doc

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

MATERIAL	L THICKNESS	VERIFICATION ANI	D 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"	54516-70N	0909L78306	Bms	L·I	Mumb	1)	25 mg	A11 80/11							
Shell #2				FIOM	L		-	""	Aug 30/11							
Shell #3				Baso	L.	 										
Head #1	0.6875"	SASIL-TON	94224 27524068	Bmo	C - 1	1	1	or sept								
Head #2	0.6875"		328250 62306	Flom	C-2	<u> </u>		2011								
				Biso	C-											
					C -			1								

ATTACH	MENT AND /	OR NOZZLE MATER	IAL THICKNESS VE	DENTIFICATION	WEI	DER ID	WPS & ABS	A INSPECTIONS	
Mark	Mat. I.D.	Neck	Fitting	Flange	Repad or Attachment	Cat. B	Cat. D	WPS	ABSA COMMENT/ INSPECTION
N145 74.	SpecGrd.	SABBBARLL		SASSOUFZCL1			V2/	Bno710m(E)	NI: WI3
INVET OWNET	Thk./Rating	PIPE 4"XXH		4"600 XXH		ku	'	Bm11(Lost)	N2: XIL
PR-N	Heat# or ID	イントアック	. 1	241VI-LT1311-	511		PK	Busson	•
N3N4 2"	SpecGrd.	SA333GR6	SA420 WPLL	Sassolf2CL1			V2/		11X,01X, PX',EN
Dump	Thk./Rating	PIPE 2"50160	ELL 2" Scuito	2"600 scy 160		ky			N4: X6
erun	Heat# or ID	V526724	4BL337 V	H8615-10	·		BK		
NSAHBN7 2" efwn	SpecGrd.	SA333GR6		Sazeoufzcl1			V2/		N7:X5
LC PSV	Thk./Rating	PIPE 2" San 160		2" 600 Sen 160	¥.	kи	PK		NSA:X7
	Heat# or ID	VS26924	`*3	H8615-10"	્રેલ - હે		144		8X:32N
NIO 4"	SpecGrd.	SA333GR6		SA3SOLFICLS			V2/		X12_
INSPECTION !	Thk./Rating	PILE 14 XXH		4"600 XXH	-	M	1 ′ 1		
lan	Heat# or iD	4179284	V	241VI-LT7311-	\$11		RK		
N6A+B	SpecGrd.	SA333426		SA350LF2CL1			V2/		6A:×1
1" LG LFWN	Thk./Rating	PIPE I" XXH		1"6∞ XXH	** \(\sigma\)	Kн	′ ′		68:X4
	Heat# or ID	VS29232	V152N8-	T2528-1008			BK.	٠	
11 FN8N	SpecGrd.	593334Rb	÷	SA3SOLF2CL1			V2/	<i>A</i> .	N8:x2_
TI/PI LFWN	Thk./Rating	NE I" XXH		1"600 XXH	4	Ku	EX		NALXS
K17-17	Heat# or ID	V29232	V100561/		1008			•	*
	SpecGrd.								
	Thk./Rating			·					
	Heat# or ID								
	SpecGrd:	4							
	Thk./Rating								
	Heat# or ID		:						
					L.				

Designation	Material	Heat Number	WPS	Remarks
ift lug	SASI 6 - FON	VS298SS (B_11) SL		1/2" PLATE
BASE	59 53 B	VS29302 (RK)		PIPE 24" STD.

L <u> </u>	Shells & Heads			Final		F
Task	Name/Welder symbol	Date	Task	Name/Welder symbol	Date	
Layout / Checked by	V2-Fmc A	UG 2 5 2011	Weld ID/ Material code/ Vessel Serial number stamped	V2-K4-EK	SEP 0 2 2	201
Shell cut by	V2 /	AUG 2524 2011	Vessel completed by	lic	SEP 0 2 Z	U
Internals by	1/2	AUG18 13 200	Final Quality Control check	Fre		311

Medicine Hat, Alberta (500) 215 - 9505 (403) 528 - 3142 CERTIFIED BY: °F M.A.W.P. PSI AT M.D.M.T. °F PSI AT MAEWP YR. BUILT MER'S SER NO. 3 040 A SEAFAIRE VESSEL TYPE TAG MAWP KPA MATERIAL SHELL NOM. MATERIAL . HEAD NOM. CRN C.A. 609919

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CERTIF	IED BY:	ME	RANIEA HANIEA		ICES IN) (8 	cine Hat, 100) 215 - 103) 526 -	9806
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HEAD	NOM.	0.7	75()"	M	TERIA	LESA	<u> 516 - 70</u>	
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	TAG	HUSI	4	311		V-108.	
M.A.\	N.P. 62	206	KPA		AT	288]°C
SHELL N	OM. 0.	150"	MA	ATER	IAL	SAS16-70	
HEAD N	OM. 0.7	50"			-	SASIGTON	
	C.A. 0.1	12C			RN	V5361-2	
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PHONE 1-800-442-8721

RADIOGRAPHIC REPORT

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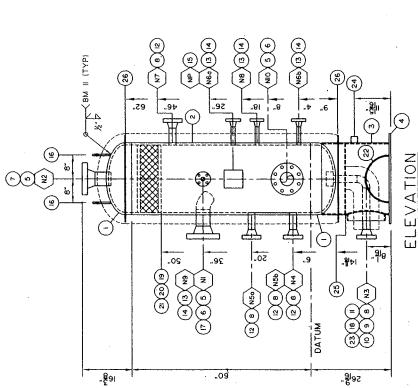
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PHONE 1-800-442-8721

RADIOGRAPHIC REPORT

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MATERIAL REPORT

CUST: Husky Oil Operations Ltd

DATE:

SERIAL NO: 130495

CHECKED:

PRESSURE: 900 psi

SIZE: 24" x 5' s/s

	CAD NO: 34000 Bey 0	
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DI ATE INENITIELED	MANTEDIAL	AIN THK

DRAWING NO: 34000-REG Rev.0

CRN V 5361.2

W.O.: 34000

	ITEM DESCRIPTION	HEAT NUMBER	PLATE IDENTIFIER	MATERIAL	MIN.THK.
လ	S.E. HEAD, 24"OD X 0.750" NOM (0.6875" MIN) c/w 2" SF	Guasu	275040008 SA516-70N	SA516-70N	1,611.0
တ	S.E. HEAD, 24"OD X 0.750" NOM (0.6875" MIN) c/w 2" SF	328250	6230c	SA516-70N	1111-0
0,	SHELL, 24"OD X 0.750" X 5'-0" LONG	0900	7830	SA516-70N	0.750"
	PIPE, 24" SCH.STD (0.375") X 22 7/16" LONG	VS29302.		SA53B	0.375"
	BASE RING, 30"OD X 20"ID X 1/2"			A36/44W	0.500"
	RFWN, 4" 600 ANSI SCH.XXH	17170		SA350LF2CL1	0.674"
	SMLS PIPE, 4" SCH.XXH (0.674") X 5 1/2" LONG	してなると		SA333GR6	0.674"
	SMLS PIPE, 4" SCH.XXH (0.674") X 5 3/8" LONG	TOCO?		SA333GR6	0.674"
	RFWN, 2" 600 ANSI SCH.160	H8615		SA350LF2CL1	0.343"
["	SMLS PIPE, 2" SCH.160 (0.343") X 7 15/16" LONG	~200m		SA333GR6	0.343"
_	WELD 90, 2" SCH.160 LR	62337		SA420WPL6	0.343"
	SMLS PIPE, 2" SCH.160 (0.343") X 13 7/8" LONG	1826724.		SA333GR6	0.343"
٠,	SMLS PIPE, 2" SCH.160 (0.343") X 5 11/16" LONG VS2&コタレ	VS26724		SA333GR6	0.343

ITEM	DESCRIPTION	HEAT NO.	SLAB NO.	MATERIAL	MIN.THK.
13	RFWN, 1" 600 ANSI SCH.XXH	361/1521	S.	SA350LF2CL1	0.358"
14	SMLS PIPE, 1" SCH.XXH (0.358") X 6 1/6" LONG	1829832		SA333GR6	0.358"
15	T-BRACKET NAME PLATE HOLDER, 1/2" (SEE DETAIL) & VESSEL ID PLATE			SA36/ALUM	
16	LIFT LUG – PLATE, 1/2"THK, (SEE DETAIL)	V 820 855.		SA516-70N	0.500"
17	WELD 45, 4" SCH.40 LR			SA420WPL6	0.237"
18	VORTEX BREAKER – PLATE, 1/3" THK (SEE DETAIL)			SA36/44W	0.250"
19	DEM, 24"OD X 6" TK, 1 PC NO GRD, 9LB			316LSS	
20	FLAT, 1/2" X 1"	-		A36/44W	
21	FLAT EXP. METAL, 3/7 X 9LB			CS	
22	SLEEVE – PIPE, 16" SCH.STD (0.375") X 7 9/16" LONG, CUT IN HALF (SEE DETAIL)			SA106B/SA53B	0.375"
23	SLEEVE – PIPE, 12" SCH.STD (0.375") X 6 5/16" LONG (SEE DETAIL)			SA106B/SA53B	0.375"
24	SLEEVE - PIPE, 2" SCH.STD (0.154") X 4 7/16" LONG (SEE DETAIL)			SA106B/SA53B	0.154"
25	INSULATION RING - PLATE, 1/2" THK X 2 1/2"W X 23 1/2" OD			SA36/44W	0.250"
26	INSULATIION RING – PLATE, 1/2" THK X 2 1/2 W X 24"ID			SA36/44W	0.250"
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		BROM	LEY ME	BROMLEY MECHANICAL SERVICES	ERVICE	S					
		W	TERIAL	MATERIAL INSPECTION REPORT	EPORT						
INSPECTED BY:	MICHAEL QUINN	GRADE:		SA 516-70 MT EE			DIA SIZE OK WITH:	.: 	SdN □	24	QI 🗆
DATE: /	AUGUST 29/2011		HEADS	2 :1				LENGTH			
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P.O.#	PO-75688	ı		☐ WELD CAP				PIPE PUBLIS	PIPE PUBLISHED NOM	S	
SUPPLIER: E	EDMONTON EXCHANGERS	GERS	SHELL								
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REQ. MIN TK:	0.68750"				Ż;	ON !	9 <u>;</u>				
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MATERIAL TRACKING CONUMBER	QTY HEAT N	HEAT NUMBERS	MIN. THK.		THICKNESS & LOG	S & LOG		VISUAL	INSP. SURF.	REQ. MARKINGS	PREPAREI BY
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-	2 G4224	275240608	0.7120"					OK	のイ	SK	MQ

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CUSTOMER:		DATE:	-								
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CERTIFICATE OF COMPLIANCE

& manufacturing ltd.

5545-89 Street Edmonton, Alberta Canada T6E 5W9

www.edmontonexchanger.com

tel 780.468.6722 • QC fax 780.466.4668 • sales fax 780.466.5155

Customer BROMLEY MECHANICAL SERVICES PO 75688

Work Order C90707 Date 2011/08/26 CofC# 26964

Page 1 of 1

item#	Description	Otty	Heat#	Required Min Thk	Recorded Min Thik	Form. Proc.
н90707-2	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 Édmonton 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 SEC. VIII, DIV.1 SEC. IV SEC. VIII, DIV.2 B31.1 B31.3 BEVELLED EDGE BACKGOUGE COMPLETED WELDS Repaired Area EE PROCEDURE # MPI-001 REV.11 MATERIAL: 6 A 3 \ 6 - 70 J THICKNESS: 0.754 PARKER B300 YOKE MAGNAFLUX 8A-RED (DRY) AC CONTINUOUS LIGHT: NATURAL TECH: TRACY ENMAN (#11226) CGSB / SNT: LEV. II TIME: DIS DATE: Aug 25/11

AY4044707082	

0. 75' X120. 5' X480'

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11158

G4224FROW 11498 275240614TC

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TLF264

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0. 75" X120. 5" X480"

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DECATION ORIENTATION ORIENTA

TEST No.

Vapon Steel Corporation 新日本製鐵株式會計

注 文 者 SHIPPER 注文者照合番号

CONTRACT No. 商 品 名 COMMODITY 規

数的维引 REFERENCE No.

> 228-38501090 HANWA CO..

1-831-H1-5-4-AT01

文 章 年 号DOCUMENT No. 規 格 SPECIFICATION

> ASME SA-516 GRADE 70-E10 HOT ROLLED STEEL PLATES

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部 樂 CUSTOMER 製鋼番号

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INSPECTION CERTIFICATE

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)

EDNONTON EXCHANGER GROUP OF C-OMPANIES 能數條簡單維号 CUSTOMER'S CONTROL No.

衡學武器 HBW

質明 申申中 CERTIFICATE No. P-13163

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 線 所 、〒299-1141 千 葉 県 君 津 市 君 津 1 番 地 KIMITSU WORKS 1, KIMITSU, KIMITSU-CITY, CHIRA-PRPR 900-1141 170-11

雅行年月日 DATE OF ISSUE

2011-04-06 *****CE#** 2 * * D # * * * * *

CHEMICAL COMPOSITION %

E3001P07Q1 E07

104 187 304 187 300 A V G 157 1 5 7 7 5 7 154 P : 5 P 1 5 P 1 5 16 16 5 C Si 3 3 9 ა ა 4 ა ა 7 9 ယ ယ နှာ ဟ ယ ယ ဇာ ဇာ X 100 ა ა 7 7 TE3 -4 5 1.47 147 1 4 2 144 × **F** 145 TE1 ×196 ש 001× 0001× S Q CA ×ie Z. ₿ - <u>ဝ</u> သ . Ω 2 N Penn Sol. Ceq. Al 2 ×100 ×100 ×100 03441 03441 9 03140 40 40 *

君津製鐵所厚板管理グループリー Head of Department
PLATE QUALITY CONTROL DEPT.
KIMITSU WORKS

「漢子」N:接導 Normalized、Q:接入れ Quenched、T:接戻し 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、SH:液体表面者 Shear Fracture、CF:液体表面者 Crystallinity Fracture、LE:後輩出 Lateral Expansion、AGS:オーステナイト虹膜 Austenite Grain Size、FGS:フェライト虹膜 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、その要求專項を満足していることを証明します。

第三日 模点距離 Gage Length、A: 50mm 平移試費片 Roctangular, B: 50mm 北形試費片 Round、C: 70mm 平形試費片 Round、B: 50mm 北形試費片 Round、G: 200mm, H: 2*, I: 8*, J: 5.65√50。K: 4√50
 第3 RA: 数り Reduction of Area、Y R: 呼代比 Yield Ratio、【※4】 A: 合格 Acceptable、【※5】 F: 簡準寸法下ULL SIZE、2: 2.5mm、3: 3.3mm、4: 3.33mm、5: 5.0mm、6: 6.67mm、7: 7.5mm、8: 6.7mm、9: 数品板厚 PlateThickness。 【※6】 P: 製品分序 Product Analysis。

駅 NOTES ※1 Location Orientation 位置・方向。 T:頭部 Top. B:底部 Boltom, 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

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

AY40448			
			_

| ※7 | N:熊塔 Normalzed, Q:焼入れ Quenched, T:焼戻し Tempered, C.R.: Controlled Rolled, N.I.C.: NIC Process/TMC Process, C.L.C.: CLC Process/TMC Process, A.R.: As Rolled, T.M.R.: TMR Process/TMC Process, N.R.: Normalizing Rolled S.H.: 逐性装面率 Shear Fracture, C.F.: 議性装面率 Crystallinty, Fracture, L.E.: 複勝出 Lateral Expansion, A.G.S.: オーステナイト製度 Austerite Grain Size, F.G.S.: フェライト製度 Ferrite Grain Size, S.R.: Stress Relieved/Post Vield 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、その要求專項を満足していることを証明します。

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

君津製鐵所厚板管理グループリー Head of Department
PLATE QUALITY CONTROL DEPT.
KIMITSU WORKS

* Temperature

新日本製雞族式會社 **Vappon Steel Corporation**

INSPECTION CERTIFICATE 赼 筷

商品 COMMODITY 規 CONTRACT No. REFERENCE No.

¥ SHIPPER X

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注文者照合番号

228-38501090 HANWA CO. . LID.

-831-H1-5-4-AT01

В

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 澤 製 鎌 所 〒299-1141 千 葉 県 君 津 市 君 津 1 番 地 KIMITSU WORKS 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF, 299-1141 JAPAN

問題 特幣 中 CERTIFICATE No.:

P-13163

*3 R	*2 C	法教				0.75				0.75				0.75				DOCU≱	SPEQ	## COMMODITY
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R:降伏比 Yie	50mm 平形質	entation 位置:													#		יזוע		ASME SA-516 GRADE 70-E10	HOT ROLLED STEEL PLATES
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「漢ブ」N: 挽尊 Normalized、Q:焼入れ Quenched、T:焼尿し Tempered、C.R.: Controlled Rolled、N.I.C.: NIC Process/TMC Process, C.L.C.: CLC Process/TMC Process, A.R.: As Rolled、T.M.R.: TMR Process/TMC Process, N.R.: Normalizing Rolled S.H.: 液体液面素 Shear Fracture、C.F.: 洗性液面素 Crystallinity Fracture、L.E.: 領際出 Lateral Expansion、A.G.S.:オーステナイト対策 Austerite Grein Stze、F.G.S.:フェライト対策 Ferrite Grein Stze、S.R.: Stress Relieved/Post Weld Heat Treatment COMMODITY 規格 SPECIFICATION 文音番号 DOCUMENT No. CONTRACT No. 0.75" X120.5" X480" 0. 75' X120. 5' X480' 0. 75" X120. 5" X480" 数物毒品 注文者照合番号 REFERENCE No. 駅 NOTIES | ※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 4 mm, ":inch, ':feet DIMENSION HOT ROLLED STEEL PLATES ASME SA-516 GRADE 70-E10 1-831-H1-5-4-ATO 228-38501090 拼 SA 2-0 Sect. IIA LO 10 Edd. BROMLE POSECHARINANISERVICES INCLES OF THE CONTRACT. 06 90 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。 TIE 買数 魟 MASS 1115 Checked to ASME Div. 1 5579 脚 試験番号 CAST No. 製鋼番号 TEST No. G4224FROM 11506_275240608TC G4224FROM 11502 275240602TC G4224TESTED-PL 11506 275240607TC SEP 0 2 2011 275240609 27524060 製品番号 EDWONTON EXCHANGER GROUP OF OMPANIES PLATE No. Add. INSPECTION CERTIFICATE (AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1) COCATION OR EXPRESSION OR EXPRESSION OR EXPRESSION OR EXPRESSION OF EX Nippon Steel Corporation 56 56 56 引張試験 77 % E C ** BEND TEST 並び越来 ** LOCATION ORIENTATION TLF300 293 LF291 F291 器要象管理番号CUSTOMERS CONTROL No. 288 299 287 2 8 8 2 9 9 2 8 7 305 HBW 1 5 G A V G 158 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 曽 津 製 鎌 所 〒299-1141 干 葉 県 君 津 市 君 津 1 番 地 KIMHTSU WORKS 1, KINITSU, KINITSU-CITY, CHIBA-PREF, 299-1141 JAPAN P1 5 P 1 5 P 5 -6 ×100 ×100 9 1 Φ 3 3 7 9 ယ ယ 4 မ 39 145 3 7 9 ယ ယ **4** 9 ა ა <u>დ</u> ჯ 1 **4** 5 競行年月日: 147 問題 聯聯 号 CERTIFICATE No. -1 -4 -0 57 TE3 TE1 147 147 君津製鐵所厚板管理グループリー **Mn** P PLATE QUALITY CONTROL DEPT. ×100 ×190 ×1000 ×100 S S CHEMICAL COMPOSITION % **D** N CA ×10000 × 190 Z: 1001 2011-04-06 P-13163 B Ç ş E3001P07Q1 ×100 Nb V TAI Coo # 1000 * 1 ×100 ×100 012 9 <u>0</u> *****CEW** 2**D#**** 0 Pcm Sol. 0|34|41 03441 03441

注文 SHIPPER

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HANWA CO.,

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新日本製職族式會社

SPECIFICATION 文 書 番 号 DOCUMENT No. CONTRACT No. 商品名 注文者 SHIPPER 注文者照合番号 0.75" X120.5" X480" 数 COMMODITY 数数等品 REFERENCE No. 75" X120. 5" X480" 75" X120. 5" X480" 紘 4 mm, ":inch, ':feet DIMENSION ASME SA-516 GRADE 70-E10 HOT ROLLED STEEL PLATES 1-831-H1-5-4-AT01 228-38501090 HANWA CO. 採 90 9 90 TOWN 員数 衈 MASS 1158 5579 5579矃 職 類 架 CUSTOMER CAST No. 製鋼番号

新日本製鋼模式會社 ippon Steel Corporation

INSPECTION CERTIFICATE

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1) 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 君 章 數 織 所 ,〒299-1141 千 葉 県 君 津 市 君 津 1 番 地 KIMITSU WORKS 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF, 299-1141 JAPAN

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部類樂等理番号CUSTOMERS CONTROLNS. C Š ₩ ¥ Ψ S Q CHEMICAL COMPOSITION % Q E3001P07Q1 *****CEW** 2**0#*****

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TENSILE TEST 引張武勝 EDMONTON EXCHANGER GROUP OF C-OMPANIES

| ※3 GL 標点語彙 Gage Length、A: 50mm 平形試験片 Rotangular, B: 50mm 乳形試験片 Rotangular, B: 50mm 乳形試験片 Rotangular, C: 70mm 平形試験片 Rotangular, D: 70mm 乳形試験片 Rotangular, F: 80mm 乳形は影片 Rotangular, F: 80mm 乳形試験片 Rotangular, F: 80mm 乳形式験片 tangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳形式 Rotangular, F: 80mm 乳 注 駅 NOTES [※1] Location Orientation 位度・方向、① 策略 Top。 B:底部 Bottom,L:圧態方向 Longitudinal、C:直角方向 Transverse,Z:板厚方向 Through Thickness,R:45° 方向 45Deg. to the Longitudinal Axis 試驗番号 TEST No. G4224TESTED-PL 11510 275240616TG G4224FROM 11507 275240605TC G4224TESTED-PL 11507 275240604TG 275240606 PLATE No. LOCATION ORIENTATION
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上紀注文品は御指定の規格または仕様に従って製造され、その要求専項を満足していることを証明します。

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

君津製鐵所厚板管理グループリータ Headof Department
PLATE QUALITY CONTROL DEPT.
KIMITSU WORKS

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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。

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君津製鐵所厚板管理グループリー Headof Department
PLATE QUALITY CONTROL DEPT.
KMITSU WORKS

T	SH:液体機画家 Chember Cystallintly Fracture, L E 接近 Leteral Expansion, AGS ボーステナイト放皮 Austentia Grain Size, FGS:フェライト放皮 Forting Grain Size, SR: As Rolled, TMR: TMR Process/TMC Process, NR: Normalizing Rolled 無限 Tempy Fracture, LE:接近 有限 Leteral Expansion, AGS:オーステナイト放皮 Austentia Grain Size, FGS:フェライト放皮 Femtia Grain Size, SR: Stress Relieved/Post Weld Heat Treatment 上記注文品は鉤指定の規格または仕様に従って製造され、その要求事項を指用していることを影響は、キャ	※2 GL 標点距離 Gage Length, A: 50mm 平形成影片Rectanguler, B: 50mm 北京は影片 Rectanguler, B: 50mm 北京は北京は Rectanguler, B: 50mm 北京は北京は Rectanguler, B: 50mm 北京は北京は Rectanguler, B: 50mm 北京は Rectanguler, B: 50	登 地 NOTES ※1 Location Orientation 存着・方面、「: 照版 Too. R. 東縣 Referent 1 - 日本本では 1	P16 38 144 8 2 2 2 2 2 2 2 2 3 8 4 4 6 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	75240633	0.75'X120.5'X480' 2 11:158 11512 275240632TCI 56 77 29 TLF285 285 155 35 2 6 0 11	D C C C C C C C C C C C C C C C C C C C	P16 38 144 8 2 2 2	282	0. 75'X120. 5'X480' 06 1 5579 11512 275240631TC 56 77 29 TLF285 285 155 35 7 6 1 1	ω ₁	P15 39 147 9 1 1	200 c	71 F292 303 156 39 145 8 1 2	1111 KG TEST No. 2% CL % 通三OSI 异结糖 超水镀 N TE 3 TE 1 SN x1 2 KS % 3 X X TE AVG BACH X X NORTH X	PLATE No. 在間に 魔力等な状 型魔器を 存び 国語が 2 V - 50 F × 100 × 100 × 100 × 1000 ×	TENSILE TEST # NEW NEW NEW NEW NEW NEW NEW NEW NEW NEW	OMPANIES	ASME SA-516 GRADE 70-E10 TESTS 3.1) TESTS 3.1) TESTS 3.1)	格 101 NULLEU 315EL FLAIE3 (AS PER EN 10204 CERTIFICATE ON MATERIAI DATE OFICEIE :	明のT DO!! ED STEE! DIATES CERTIFICATE No.	NTACT NO. 1-831-H1-5-4-AT01 INSPECTION CERTIFICATE	228-38501090	HEAD OFFICE
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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, MARIJNOUCH, CHIYODA-KU, TOKYO 100-8071, JAPAN 君 淳 毅 雄 所 、〒299-1141 千 葉 県 君 津 市 君 津 1 器 地 KIMITSU WOFKS 1, KINITSU, KINITSU-CITY, CHIBA-PREF, 299-1141 JAPAN

注文者 SHIPPER 注文者照合番号

HANWA CO..

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斯日本製製技式會計 **Appon Steel Corporation**

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君津製鐵所厚板管理グループリー PLATE QUALITY CONTROL DEPT. KIMITSU WORKS

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> 新日本製鑑技式會社 **ppon** Steel Corporation

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、MARINOUCHI、CHIYODA-KU, TOKYO 100-8071、JAPAN 著 筆 製 鍵 所 、〒299-1141 千 葉 県 君 津 市 君 津 1 番 埴 KIMITSU-WORKS 1、KINITSU、KINITSU-CITY、CHIBA-PREF、299-1141 JAPAN

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)

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REFERENCE No. 契約番号 CONTRACT No.

228-38501090

1-831-H1-5-4-ATO

注文 SHIPPER 注文者概合番号

HANWA CO..

LID.

SPECIFICATION : 文章番号 DOCUMENT No. :

ASME SA-516 GRADE 70-E10 HOT ROLLED STEEL PLATES

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職 姻 樂 CUSTOMER

質明會聯号 CERTIFICATE No. P-13163 PAGE .

雅行年月日 DATE OF ISSUE 2011-04-06

1001 *****CE#** 2**DW****

注:駅 NOTES [※1] Location Orientation 位置・方向,了:照据 Top,B:底部 Bolton,L:压逐方向 Longitudinal,C:直角方向 Transverse,Z:扳厚方向 Through Thickness,R:45°方向 45Deg. to the Longitudinal Axis 試驗番号 製鋼番号 TEST No. CAST No. G4225FROM 11520 275240626TC G4225TESTED-PL 11520 275240625TC G4225FROW 11518 275240623TC 27524062 275240624 製品番号 EDMONTON EXCHANGER GROUP OF C-PLATE No. LOCATION ORIENTATION ORIENTATION TENS 0.2% 56 56 56 S TENSILE TEST 3 避難 引張強さ 77 77 29 獿 EL % TLF266 F266 LF281 289 海聲斑聚 HBW 能數後數學事。 CUSTOMER'S CONTROLNO. 253 266 253 266 28 Q 280 1 5 G A V G 156 6 P 1 6 P 1 6 P 6 -6 a ×100 ×100 o 38 144 35 2 ယ ယ တ တ ယ ယ ဟ ထ ယ ယ ထ ထ ယ ယ ဟ ထ 38 144 Si N TE3 TE1 -4 2 4 144 144 144 1 ×100 ×1000 š × 100 ٦ ₩ ×1000 ×100 × Ø δ SN CA 0 2 CHEMICAL COMPOSITION % <u>~</u> ×10000 901× Z B ×100 Q 0 N E3001P07Q1 9 <u>0</u> 23 013 2 <u>0</u>1 3 <u>၀</u> ၁ <u>၀</u> သ Pcan Sol. Ceq. Al 2 ×109 ×100 ×100 03441 0 03441 03441 4 **※7**

| 図 | GL 最点距離 Gage Length、A: 50mm 平形試動片 Rectangular、B: 50mm 丸形試動片 Rectangular、B: 50mm 丸形式動片 ctangular、B: 50mm 丸形式 Rectangular Rectangular、B: 50mm 丸形式 Rectangular、B: 50mm 丸形式 Rectangular、B: 50mm 丸形式 Rectangular、B: 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。

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

君津製鐵所厚板管理グループリー Head of Department PLATE QUALITY CONTROL DEPT. KM/TISU WORKS 0. 75" X120. 5" X480"

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規 SPECIFICATION 文章 番号 DOCUMENT No. CONTRACT No. 商 品 名 注 文 SHIPPER COMMODITY 数卷集品 注文者照合番号 REFERENCE No. . Bo¹ 皉 .. ٠. HOT ROLLED STEEL PLATES HANWA CO., LTD. 228-38501090 -831-H1-5-4-ATO

新日本製鋼技式會對 칻 ippon Steel Corporation 換資

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 智 津 製 鎌 所 〒299-1141 千 葉 県 君 津 市 君 津 1 番 地 KUMITSU WORKS 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF, 299-1141 JAPAN

INSPECTION CERTIFICATE

要行年月日 DATE OF ISSUE 質易毒毒号 CERTIFICATE No. P-13163 PAGE .

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1001 2011-04-06 E3001P07Q1 *****CEW** 2**D#****

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ASME SA-516 GRADE 70-E10

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注 和 NOTES | ※1 | Location Orientation 位置・方向, T:照解 Top, B:底部 Bottom,L:压笼方向 Longitudinal,C:直角方向 Transverse,Z:板厚方向 Through Thickness,R:45° 方向 45Deg. to the Longitudinal Auto

| ※2 GL 模点矩幕 Gage Length、A:50mm 平形試験片 Rectangular, B:50mm 北形試験片 Round、G:200mm, H:2', I:8', J:5.65/50, K:4/50 | ※3 RA:数り Rectangular, P:80mm 平形試験片 Round、G:200mm, H:2', I:8', J:5.65/50, K:4/50 | ※3 RA:数り Reduction of Area, YR:摩伏比 Yield Ratio。 | ※4 Acceptable。 | ※5 F:乗寺士法FULL SIZE、2:2.5mm, 3:3.3mm, 4:3.33mm, 5:5.0mm, 6:6.7mm, 7:7.5mm, 8:6.7mm, 9:製品被買 PlateThickmess。 | ※6 P:製品分析 Product Analysis。 | ※7 N:姚蓉 Normalized、Q:姚八九 Quenched、T:姚灰 Tempered、CR: Controlled Rolled, N.I.C:NIC Process/TMC Process, A.R: As Rolled, T.M.R:TMR Process/TMC Process, N.R:Normalizing Rolled | ※6 P:製品分析 Product Analysis, | ※6 P:製品分析 Product Analysis, | ※7 N:姚蓉 Normalized、Q:姚八九 Quenched、T:姚灰 Tempered、CR: Controlled Rolled Rolled, N.I.C:NIC Process/TMC Process, A.R: As Rolled, T.M.R:TMR Process/TMC Process, N.R:Normalized, Q:姚八九 Quenched、CR: 透彩性、Lateral Expension。 A.G.S:オーステナイト教授 Austentia Grain Size、F.G.S:フェライト教授 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.

君津製鐵所厚板管理グループリー Head of Department
PLATE QUALITY CONTROL DEPT.
KIMITSU WORKS REFERENCE No. | 张2 GL 模点距離 Gage Langth、A:50mm 平形試像片 Redangulat、B:50mm 北形試像片 Round、C:70mm 平形試像片 Redangulat、D:70mm 北形試像片 Round、E:80mm 北形試像片 Round、G:200mm、H:2*、I:8*、J:5.55√So. | ※3 R A:統り Reduction of Area、Y R:時次比 Yield Ratio、 | ※4 | A:合格 Acceptable、 | ※5 | P:報本寸法 FULL SIZE、2:2.5mm、3:3.3mm、4:3.33mm、5:5.0mm、5:5.0mm、8:6.7mm、8:6.7mm、8:6.7mm、8:9.3mm、8:6.7mm 8:6.7mm 8 :6.7mm SPECIFICATION 文 書 番 号 DOCUMENT No. CONTRACT No. (A) COMMODITY 注文者照合番号 0. 75" X120. 5" X480" 注 帮 NOTES | ※1 | Location Orientation 位置・方向, T:照常 Top, B:康惠 Bottom, L:压逐方向 Longitudinal, C:直角方向 Transverse, Z:板厚方向 Through Thickness, R:45°方向 45Deg, to the Longitudinal Auts 875" X120. 5" X480" 875" X120. 5" X480" 紘 帥 4 mm, ":inch, ':feet DIMENSION ASME 228-38501090 HANWA CO. HOT ROLLED STEEL PLATES 1-831-H1-5-4-AT01 뀪 SA-516 GRADE 70-E10 LID 0.7 06 双型 ALE MAIS 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。 避 WE HEREBY CERTIFY THAT THE WATERIAL DESCRIBED HEREIN HAS BEEN WADE IN ACCORDANCE WITH THE RULES OF THE CONTRACT. MASS 3:018 跡 製鋼番号 STOMER W 試験番号 TEST No. CAST No. G4225FROM 11526 275240629TC G4224TESTED-PL 11495 275240713TC G4224FROW 11495 275240714TC { AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1 }
EDWONION EXCHANGER GROUP OF C- 需要家會理學OMPANIES 煡 275240715 27524063 PLATE No. 日番号 INSPECTION CERTIFICATE LOCATION ORIENTATION GL 新日本財政株式會社 **Upper Steel Corporation** 0.2% 耐力學化点 YS YP-55 検 TENSILE TES <u>না</u> 引張強さ S 77 77 77 3 % 13 神な 盟 % TLF291 TLF290 288 295 F291 IMPACT TEST 平均衡 個々値 AVG EACH **海 類 類 数** 雅 要 家 管 理 番 号 CUSTOMER'S CONTROL No. 288 294 290 2 9 4 2 9 4 2 9 6 1 5 G 1 5 G A V G P 1 6 7 5 C 6 ယ ယ <u>ဟ တ</u> X [88 Si

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 鎮 所 〒299-1141 千 葉 県 君 濟 市 君 漳 1 番 地 KUMITSU-WORKS 1, KINITSU-KINITSU-CITY, CHIBA-PREF, 299-1141 JAPAN

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先行年月日 DATE OF ISSUE

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君津製鑑所厚板管理グループリー Head of Department
PLATE QUALITY CONTROL DEPT.
KIMITSU WORKS 1. Adacki | 製型 GL 複点語彙 Gage 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 Round、G: 200mm、H: 2*、I: 5.55√5。, K: 4√50 | 製造 RA: 数り Reduction of Area、YR: 時代比 Yield Ratio。 | 2*4 | A: 合格 Acceptable。 | 2*5 | F: 複様寸法FULL SIZE、2: 2.5mm、3: 3.3mm、4: 3.33mm、5: 5.5mm、6: 6.67mm、7: 7: 7.5mm、8: 6.7mm、9: 製品物 Plate Thickness、 | 2*6 | P: 製品分析 Product Analysis。 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 | 2*1 2. 25" X121" X480" 2. 25" X121" X480" 注 教 NOTES | ※1 | Location Orientation 位置,方向,T:剪部 Top,B:底部 Bottom,L:压度方向 Longitudinal,C:直角方向 Transverse,2:板厚方向 Through Thickness,R:45°方向 45Deg. to the Longitudinal Axis mm, ":inch, ':feet DIMENSION TOTAL 20 20 ALIE OF THE PERSON NAMED IN COLUMN TO A CO 46223491 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 WATERIAL DESCRIBED HEREIN HAS BEEN WADE IN ACCORDANCE WITH THE RULES OF THE CONTRACT. MASS 16809 6809 試驗番号 TEST No. G3952TESTED-PL 09877 275242002TCH G3953TESTED-PL 09894 275242010TCH PLATE No. 4 9 75 75 後に 登り 15+(CR+#0+V) IMPACT TEST 2V - 50F 2V - 50F FT. LB FT. LB ave to the control of the contr 295 503 910CX 307 311 311 1 4 G 1 4 G 10 M /5 P 1 6 3 6 က လ ယ ယ ယ <u>မ</u> တ N TE3 146 - **4** 5 1 4 5 146 Œ ž ×is 2 **-**× 1000

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ASME SA-516 GRADE 70-E10 HOT ROLLED STEEL PLATES

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(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)

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注文者照合番号

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HANWA CO..

228-38501090

1-831-H1-5-4-AT01

本 24. 〒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 章 製 鐵 所 〒299-1141 千 葉 県 君 漳 市 君 漳 1 番 地 KUMITSU-WORKS 1. KIMITSU, KIMITSU-CITY, CHIBA-PREF, 299-1141 JAPAN

配明 排 路号 CERTIFICATE No. P-13163 PAGE:

要有年月日 DATE OF ISSUE 2011-04-06

君津製鐵所厚板管理グループリー PLATE QUALITY CONTROL DEPT. KIMITSU WORKS 1. Adacki

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注 駅 NOTES ※1 Location Ordentation 位在・方向、 7:頭部での。 3:底部 Batton」、 2:最分向 Longitudinal、C: 直分方向 Longitudinal、C: 直分方向 Longitudinal、C: 直角方向 Longitudinal、C: 直角方向 Longitudinal、C: 直角方向 Longitudinal、C: 直角方向 Longitudinal、C: 直角方向 Longitudinal、C: 25 (-				mm, ":inch, ':feet	DIMENSION	洪	文章 带号. DOCUMENT No.	SPECIFICATION ASME SA-516 GRADE 70-E10	COMMODITY HOT ROLLED STEEL	NTRACT I	在文章报音曲号 REFERENCE No. 228-38501090	SHIPPER HANWA CO., LTD.
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op, B:族語 , B:Somm A:合卷 / LE:報题 法文品(::CR: Co LE:和题 #E	 											MASS	資量		0-E1	PLATES			
B:旅源 Bohom, L:正底方向 Longitudine 50mm 対。形成即片 Flourid。C: 70mm ジ 会格 Acceptable。 ※5] F: 教育寺会 8: Controlled Rolled、NIC: NIC FO 18: WE Lateral Expansion。 ACS: 才 に品は御指定の規格または仕ま WE HEREBY CERTIFY ADE IN ACCORDANCE											<u>-</u>	常		CUSTOMER					
照像Top, B:紫湖 Badenn L:正底方向 Longhudinal, C:直角方向 Transversa, Z:坂戸方向 Though Thickness, R:45 方向 45Dog, to the Longhudinal Axis 照像 Top, B:紫湖 Badenn L:正底方向 Longhudinal, C: 直角方向 Transversa, Z:坂戸方向 Though Thickness, R:45 方向 45Dog, to the Longhudinal Axis 無限 Badenn L:正底方向 Longhudinal, C: 20mm 乳形成影片 Round, C: 20mm 乳形成影片 Round, C: 20mm 乳形成影片 Round, C: 20mm 乳形成影片 Round, C: 20mm 乳形成影片 Round, C: 20mm 乳形成影片 Round, C: 20mm 乳形成影片 Round, C: 20mm 乳 6: 567mm, 8: 567mm, 8: 567mm, 8: 587mm, 8: 587mm, 8: 587mm, 8: 587mm, 8: 587mm, 8: 587mm, 8: 577mm, 8: 587mm, 8: 587mm, 8: 577mm, 8: 577mm, 8: 587mm, 8: 577mm,								SULPHIDE	CHEWICAL C	CHENICAL	,	PLATE No.			NOME 3		N.		\ :
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isverise, Z:飯房方向 Through Thiodoness, R:45°方向 ular, D: 70mm 北路越町 Round, E: 80mm 平野町 mm., 3:33mm, 4:333mm, 6:55mm, 6:65mm GLC: CLC ProcessTMC Process、AR: 46 Relied, usinethe Grain Sze, FGS:71=54ト粒度 Femile G 達され、その腰来事項を満足しているこ MATERIAL DESCRIBED HERE RULES OF THE CONTRACT.								CONTROL	A CUUM		l	TS.	_ C 2		GRO	10204 CERTIFICATE	Ž		
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thickness, und, E:: 5:50mm coss, AR エライト位 と満足し RIBEI CONTI									A SISED	, 23 =	% % % :		STEIFE	1	F C-	TIFIC	7	温	
R:45° プ admm 平形 n, 6:667 :: As Rolle 歴 Feritia 歴 FACT.	+						_	-	2	000	* • ** • A	ORIEN SIZE	STAUTAN ION IANION		鷾	ATE	Ä	順	þ
が 45Deg 経験下 A 経験下 A Man A T N T : 7 : 7 in M T N R in M in M	 								-		/G EACH	FI. LB	IMPACT TEST	CUSTOMER'S CONTROL No.	懶後	ON M/	П		
45Deg. to the Longitudic 操作 Rectangular, F: 8 Mr. 7: 7.5mm, 8: 6.7mm TMR: TMR Processort an Stre, SR: Stress! とを証明します。 IN HAS BEEN											- H	<u> </u>		SCONT	柳山	MATERIAL			I=
Longitudinal pular, F: 80n pular, F: 80n s. 6.7mm, 8 8: 6.7mm, 8 8: 6.7mm, 8 8: 6.7mm, 8 8: 5.7mm, 8 8: E N										-	6 % × 1000	¥ 98	č č	- P	串	Ł		KIMITSU WORKS	HEAD OFFICE 始 編 数 織 別
Axts 加州北形試 : 健品被 Process, jeved/Pos	-		-		<u> </u>	-	-	+	-	-	i or	-1		录		DA X	の間	WOH	AD OFFICE 新数数数况
級片 Rou 與 PlateT NR: Non Weid He		ļ			-	<u> </u>	 	-	-	-	11	بر جا ا	X P	积		DATE OF ISSUE	質男會樂場。 CERTIFICATE No.		
#JASDeg, to the Longitudinal Axis #BJF Rectangular, F: 80mm 先形散界 Round, G: 200mm れて:7.5mm, 8: 8元mm, 9: 製造海豚 PlateThickness, [T.M.R: THAP Process NR: Normatzing Rolled rain Stre. S.R: Stress RelievedPost Weld Heat Treatment ことを簡明します。 .! N HAS BEEN 音演製鋼所算板管 FLATECULAUTIN FLATECULAUTIN FLATECULAUTIN FLATECULAUTIN FLATECULAUTIN FLATECULAUTIN											×		S ×	4		SSUE	で で の	OCT THE	299-114
Omm, H: ※6 mit mit mit mit mit mit mit mit mit mit		-			-	 		+	+			SNCA	× 20 × 21 × 21	HEMICA	-	20	ها 	TIMIL	1 + 3
## Round, G: 200mm, H: 2*, I: 8*, J: 5.4 Flound, G: 200mm, H: 2*, I: 8*, J: 5.4 Flound, G: Piedachindress, [※6] P: 製品分析 Proving Head Treatment Weld Heat Treatment Weld Heat Treatment Weld Heat Treatment Head of Docartment PLATE CLAUTY CONTROL DEPT. ROMTSU WOPKS	S. S. S. S. S. S. S. S. S. S. S. S. S. S	公		B	-	+-	-	+-	+	+		₩	× Q	CHEMICAL COMPOSITION %		2011-04-06	P-13163	0 6111,	T299-1141 千葉県君津市君津1番地
7, 3:5.88 3/#F Prod.	Ton stempe	义		N LUZZ		<u> </u>					- 	1	× 186	OSTTION	!		ł	OHI DA	TANTA THE
# 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	To	1	62		-		-		1		× 900 × 300	^1800 × 1086 Pcm S	Mo No V TAI Con.	E3001P0/Q1	- + C	* * 7	PAGE :	NEI , 60	ある 神 ち
Substantian Managers And Control of the Control of		-	-	-		-	-	+	+		20 X 100	38	× × × × × × × × × × × × × × × × × × ×			2 * * 7 * * * * *	9 9 E	I, AIRLIOU, AIRLIOU VIII, UHIDA IAMI, 600 XIII on	141 年

新日本製職株式會社 **Lippon Steel Corporation**

本 社 〒100-8071 東京都千代田区丸の内二丁目6番1号 HEAD OFFICE 2-6-1, MARUNOUCHI, CHIYODA-KU TOKYO 100-8071, JAPAN 君 薄 製 鑑 所 〒999-1141 千 葉 県 君 準 市 君 海 1 番 地 KUMNITSU-WORKS 1, KINITSU, KINITSU-CITY, CHIBA-PREF, 299-1141 JAPAN

		BROM	ALEY M	LEY MECHANICAL SERVICES	ES			
		Σ.	ATERIAL	MATERIAL INSPECTION REPORT				
					DIA SIZE OR WITH:	WITH:	24"	
INSPECTED BY:	MICHAEL QUINN	GRADE:		SA 516-70 MT EE		SUN	do □	aı 🗆
DATE:	AUGUST 29/2011		HEADS	0 2:1		LENGTH		
		ı		□ HEMI		THICKNESS		
P.O.#	PO-75802			□ WELD CAP		PIPE PUBLISHED NOM	OM	
				□ OTHER		PLATE NOM		
SUPPLIER:	EDMONTON EXCHANGERS	GERS	SHELL					
			PIPE	NDE BY MAN				
PAKI ID#:	VES 50379	ı	PLATE	HYDRO	NDE	Weight per foot for pipe over 4"	ot for pipe o	ver 4"
REQ. MIN TK:	0.68750"		REPAD		NO YES			
		ı	OTHER	ISHED BAFFLE				
MATERIAL TRACKING NUMBER	QTY HEAT N	HEAT NUMBERS	MIN. THK.	THICKNE	THICKNESS & LOG	VISUAL INSP.	REQ.	PREPARED
	HEAT NUMBER	PLATE NUMBER		B	0 0		VERIFIED	i
	328250	62306	0.7110"		-	3 オ 3 オ 5	7	200
	1 SB64460	PB30310001	0.7090"					2 4
						20 20	5	7
						·		
W/O#		RECEIVED & ACCEPTED	9	REQUIRED CODE MARKINGS:				
CUSTOMER:	BMS STOCK	DATE:	8886					
			2					
					P. Tradition			



CERTIFICATE OF COMPLIANCE

& manufacturing ltd.

5545-89 Street Edmonton, Alberta Canada T6E 5W9

www.edmontonexchanger.com

tel 780.468.6722 • QC fax 780.466.4668 • sales fax 780.466.5155

Customer BROMLEY MECHANICAL SERVICES PO 75802

Work Order C90913 Date 2011/08/26 CofC# 26974

ltem#	Description	Otty	Hoatif	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	1	328250-62306	0.6875"	0.7110"	1
	(Material Spec: SA 516-70 Normalized)	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./증명시번호:070213-PPSA-002-021 Date of Issue/坒행일자:Feb., 22, 2007



Order No:/계약번호:0002675602

Supplier/李是功:DAE WOO INTERNATIONAL CORP.

Commodity/書명:HR STEEL PLATE (ISO10474/3.1B) PO No./주문번호:E10577

Customer/고객 시:EDMONTON EXCHANGER	EDMONTON	EXCH	ANGER				Spec	Spec & Type/규격:ASME SA516-70	ME	SA516	5-70								-		10201		
	oN tarboad	Qua-	Weight	Heat No.	100	Tensile/인장시험 VP TS 티	260 <u>π</u>	Impact/충격시험 v Notel -50년	0->	Chemir	zal Con	Chemical Composition/화학성문(%)	(전 (전 (전	제 (%									
Size/치수	は、日本日	ntity	10 (a)	五六五四		(KSI)	3 3	. 3	- vı -	ပ	:S	M	۵.	ဟ	ပ်	Ξ̈	æ	3	Mo	N Q P	F	V Sol-Al	_
		30 { -	(LBS)	N 0 ₹	- 0 z	;		(FT-LBS) (%)	-02	4	6.	ņ	4	4	?	?	4	ņ	-2	e .	· ·	.3 .3	_
0,625"x120.5"x480"	PB30301401-1402	. 2	9,300	SB64460	- F	51.5 76.7	29	1:139		1800	343	1147	26	19	8	22	Ļ	06	, H	4	-	19 29	o
			20,502	•				2:127															
								3:145															
								A:137															
0.625"x120.5"x480"	PB30301301-1302	2	9,300	SB64460	2	51.6 77.0	27	1:92		1800	343	1147	92	19	7	22	Ļ	8	i=	; =	-	19 29	o
			20,502					2:117															
								3:125															
								A:111															
Sub Total (050)	050) ***		34			158,100 (kg)		348,546 (LBS)															
*** HEAT TREATMENT ===> Normalized : 890 🖒 30min.	NT ===> Normalize	. 830.	C 30min.																				
0.75"x96.5"x480"	PA24489301		4,467	SA55523	2	50.8 78.5	တ္တ	1:111		1844	367	1170	99	56	8	52	<u>~</u>	98	<u>ب</u>	-	7	21 40	0
			9,848					2:128															
								3:115															
								A:118															
0.75"x96.5"x480"	PA23976401	_	4,467	SA55523	<u>⊢</u>	49.5 76.3	29	1:115	_	1844	367	1170	99	92	7	52	۲	98	<u>ب</u>	_	7	21 40	0
			9,848					2:128															
								3:138															
								A:127											·	•			
* Botton T . Tom Middle B . Bottom	· Middle B · Botto	۱			-			(A	His m	aterial	was pro	ducted	ınder a	quality	ystem r	nanual	Rev.5 d	A) This material was producted under a quality system manual Rev.5 dated JUL.01,2006 and PQG01 Rev.0	.01.20	6 and F	0001	Rev.0	
* Tensile Test. Direction: Transversal, Gauge Length: 200mm(Rectangular),	on : Transversal, G	 auge Le	ngth : 200	ım(Rectangul	ar),			dat	ed JUI	.01.200	6 audit	ed and	pprove	d by cus	tomer a	s confo	rming to	dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III	uiremer	its of AS	SME Se	≡	

YP Method: 0.2% off-set

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

B) No repair welding was performed to the products.C) The product numbers listed on this test report identifies the materialWe hereby certify that the material herein has been made and tested in accordance with the above

NCA-3800 and(or) KEPIC MNA/ SNA4300.

specification and also with the requirements called for by the above order.

This Mill Test Certificate cannot be copied for any purpose.

* 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.



Surveyor To:

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







Na, Che; Bra Chief of material testing section

posco Mill Test Certificate/검사증명서

Order No./계약번호:0002675602

PO No./주문번호: F10577 Supplier/卒是及:DAE WOO INTERNATIONAL CORP.

Commodity/ 号명: HR STEEL PLATE (ISO10474/3.18) ASME2004EDITION)

Spec & Type/규격:ASME SA516-70

Customer/卫 객 小:EDMONTON EXCHANGER

38 38 Sol-Al 39 39 38 ņ > ន ឧ ę 2 2 20 N 2 N 2 F ę £ <u>,</u>: ۲ ~ 2 ŋ 울 ۲ ۲ ۲ ۲ ņ 107 ವ 106 106 107 107 e ۲ Ë ۳ ۳ ω ۳ ຊ 23 23 ž ņ 24 24 ო ပ ņ N Chemical Composition/화학성문(%) Ø 5 9 6 5 5 86 86 89 86 ۵. 68 1159 1159 1171 1159 돌 1171 ņ 375 349 375 375 349 ო õ 1830 1748 1748 1748 1830 ပ __ نــ 0 -- > - v - 0 z Impact/ 충격시험 R ⊗ ⊗ V Notch -50°F Energy (FT-LBS) 1:132 2:123 A:128 2:117 3:118 A:114 1:113 2:132 1:120 A:131 3:128 1:107 2:141 1:101 A:85 3:131 교 🛞 9 8 88 53 29 Tensile/연장시험 76.0 76.9 76.0 75.9 77.3 73 (KSI) 50.9 50.3 51.1 50.9 50.5 <u>\$</u> -۲ 1-**₽**0α-⊢-0Ζ **-**SA57299 SA57299 SA55525 SA55525 SA57299 제강번호 Heat No. 4,467 4,467 9,848 4,467 4,467 9,848 9,848 4,467 9,848 9,848 Weight (kg) (LBS) KЮ 約0 nity 小院 Qua Product No. 제품번화 PA24870701 PA23973801 PA24489401 PA24870401 PA24870501 Size/丸수 0.75"x96.5"x480" 0.75"x96.5"x480" 0.75"x96.5"x480" 0.75"x96.5"x480" 0.75"x96.5"x480"

* Position - T : Top, M : Middle, B : Bottom

Tensile Test. Direction: Transversal, Gauge Length: 200mm(Rectangular).

A) This material was producted under a quality system manual Rev.5 dated JUL.01.2006 and PGG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III

. We hereby certify that the material herein has been made and tested in accordance with the above

B) No repair welding was performed to the products.C) The product numbers listed on this test report identifies the material

NCA-3800 and(or) KEPIC MNA/ SNA4300.

specification and also with the requirements called for by the above order.

This Mill Test Certificate cannot be copied for any purpose.

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.

Surveyor To: G TO

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







Chief of material testing section

Na. C.B

Na, Che; Rong

Certificate No./증명시번호:070213-PPSA-002-023 Date of Issue/발행일及:Feb., 22, 2007

Order No./계약번호:0002675602

Supplier/ 字是刀: DAE WOO INTERNATIONAL CORP.

Commodity/署명:HR STEEL PLATE (ISO10474/3.1B) PO No./주문번호:E10577 (ASME2004EDITION)

Customer/卫马小:EDMONTON EXCHANGER

Spec & Type/규격:ASME SA516-70

							-																	
			Weight		000	Tensile/인장시험	多人的			۵->		al Con	Chemical Composition/화학성문(%)	<u>/</u> 화학	(%) 图									
	Product No.	e d	K₩ 130	Heat No.		ΥΡ	TS E		V Notch -50°F	-														
Size/지수	제품법호	 		제강번호		(KSI)	%)		Finerray	σ –	ပ	i.	ğ	۵	S	ပ်	Z	<u>-</u>	ට	Mo	No T		V Sol-Al	
		0	(LBS)		0 z			i <u>⊩</u>	(FT-LBS) (%)	0 z	4	က္	ဗု	4	4	-5	-5	4	٠ ب	.2	-3	ů	. ట	
								- ◀	A:128															
0.75"x96.5"x480"	PC23953401-3402	2	8,934	SB64080	 -	53.2 78	78.6 28		1:114		1692	356	1167	117	16	7	21	<u>-</u>	93	Tr T	Tr 1	17	32	
		•	19,696						2:95															
									3:96															
								_	A:102															
0.75"x96.5"x480"	PC23953501-3502	2	8,934	SB64080	۲	52.8 77	77.9 31		1:137		1692	356	1167	117	16	7	21	ř.	93	Tr 1	Tr 1	17	32	
			19,696					- 2	2:148															
								m	3:134															
								⋖	A:140															
0.75"x96.5"x480"	PC23953601-3602	- 24	8,934	SB64080	}-	51.9 77	77.0 2	28 1	1:147		1692	356	1167	117	16	7	21	ř	93	T T	T 1	17	32	
			19,696					- 2	2:148															
								<u>ო</u>	3:136															
								⋖	A:144															
0.75"x96.5"x480"	PB30263501-3503	6	13,401	SB64460	-	50.2 75	75.3 27		1:63		1800	343	1147	26	19	7	22	ř	. 8	11.	Tr 1	19	53	
			29,544						2:49	_														
									3:80															
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0.75"x96.5"x480"	PB30267101-7103	6	13,401	SB64460	-	51.2 76	76.3 28		1:117	_	1800	343	1147	26	19	7	22	i i	06	r F	Tr 1	19	53	
			29,544						2:119															1
* Position - T : Top M : Middle, B : Bottom	: Middle, B : Bottom								¥	This m	ateriat v	vas pro	ducted (ınder a	quality s	ystem n	A) This material was producted under a quality system manual Rev.5 dated JUL.01,2006 and PQG01 Rev.0	ev.5 da	ted JUL	.01,2006	and PC	3G01 R	0.7	

Position - T : Top, M : Middle, B : Bottom
 Tensile Test. Direction : Transversal, Gauge Length : 200mm(Rectangular),

dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III

- We hereby certify that the material herein has been made and tested in accordance with the above

B) No repair welding was performed to the products.

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

NCA-3800 and(or) KEPIC MNA/ SNA4300.

specification and also with the requirements called for by the above order

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

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.



Surveyor To:

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







Chief of material testing section

Na, Che; Byg

posco Mill Test Certificate/검사증명서

Order No./계약번호:0002675602

Supplier/ 字是 及: DAE WOO INTERNATIONAL CORP.

Customer/卫冯人:EDMONTON EXCHANGER

PO No./주문번호:E10577 (ASME2004EDITION)

Spec & Type/규격:ASME SA516-70

	ON Proposed	-eno	Weight	T ON CN	200	Tensile/인장시점·	10장시점·	Impact/ 충격시험 v Neth -50"F		ට් >	emical	Сотро	sition/ই	Chemical Composition/화학성분(%)	(%)	•							
Size/치수	100000 HO.	ntity	to 7	がまた。		(KSI)		ı		- 0 -	O	ï	Mn	⊡	s	ა	ž	В	Cu	Mo Nb	F	>	V Sol-Al
	전 () ()	前0 イト	(kg)	호 50 51 51 51	- 0 z	•		Energy (FT-LBS)	- (%)	- 0 z	4	ņ	ņ	4	4	-2 -2	4	<u>د</u> .		ώ.	ო	ო	ကု
								!		<u> </u>													
					_			3:117															
								A:118															
0.75"x96.5"x480"	PB30309601-9602	2	8,934	SB64460	F	51.8 7	76.3 27	1:103		-	1800	343 1	1147	97	19	2	22 T	7. 9	90 Tr	Ë		13	59
			19,696					2:131															
								3:133							٠								
								A:122															
0.75"x96.5"x480"	PB30309701-9702	7	8,934	SB64460	F	51.5 7	76.6 28	1:136			1800	343 1	1147	26	19	2	22 T	<u>ا</u> ت	90 Tr	j≒ L	-	6	53
			19,696					2:139															
								3:132															
								A:136															
0.75"x96.5"x480"	PB30309801-9802	2	8,934	SB64460	F	51.5	76.6 29	1:150		7	1800	343 1	1147	97	19	2	7 7	7.	90 Tr	Ĕ	-	19	59
			19,696					2:136							٠								
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0.75"x96.5"x480"	PB30309901-9902	2	8,934	SB64460	F	52.1	76.6 30	1:140			1800	343	1147	97	19	2	22 T	Tr 9	90 Tr	ŗ.	-	19	53
			19,696					2:139															
								3:149															
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0.75"x96.5"x480"	PB30310001	_	4,467	SB64460	۲	51.9	76.6 29			-	1800	343 1147	147	97	19	2	22	E L	90 Tr	1	- 3	19	53
* Position - T : Too M : Middle, B : Bottom	: Middle, B : Bottor	۴							A) This	s mate	rial was	produ	cted unc	dera qu	ality sys	item ma	nual Ke	ליאי מפוני	ag JOL.	A) This material was producted under a quality system manual Kev.5 dated JUL.01,2006 and PUCOU 186V.0	and Pro	י אר היי	? :
 Tensile Test. Direction: Transversal, Gauge Length: 200mm(Rectangular). 	on : Transversal, Ga	auge Ler	13th : 200	mm(Rectang	ular).				dated.	JUL.91	.2006 8	sudited	and ap	proved	y custo	mer as	contorm	ing to t	ne redu	dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III	Of ASM	r vec	Ξ
YP Method : 0.2% off-set	-set)	,						NCA-3	800 ar	ران) اعران:	EPIC	NNA SI	NCA-3800 and(or) KEPIC MNA/ SNA4300		9							

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.



Surveyor To:

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







Na, Cha; Bra Chief of material testing section

- 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.

B) No repair welding was performed to the products.C) The product numbers listed on this test report identifies the material

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

Order No./계약변호:0002675602

Supplier/平是功:DAE WOO INTERNATIONAL CORP.

Commodity/苦명:HR STEEL PLATE (ISO10474/3.1B) (ASME2004EDITION) PO No./주문번호:E10577

Spec & Type/규격:ASME SA516-70

Customer/고객사:EDMONTON EXCHANGER

33 33 ņ 33 33 V Sol-At ឧ 8 ಜ 8 į= £ ۲ ۲ ۲ F ŝ ۳ ۲ ۲ ۲ ಕ g 66 66 66 ۳ ۳ F ۲ 5 24 24 24 ž Ņ ~ N N ပ ņ Chemical Composition/화학성문(%) 5 Ø 15 5 5 ۵. 97 93 97 97 1183 1183 1183 1183 돌 378 378 378 378 Ö 1793 1793 1793 1793 ပ __ - v - 0 z Impact/ 충격시험 SF (%) 275,741 (LBS) V Notch -50°F (FT-LBS) Energy 3:136 A:145 A:118 2:126 3:123 1:143 3:122 A:128 A:125 1:105 2:117 1:120 2:125 3:131 딥 8 23 8 88 21 Fensile/인장시험 125,076 (kg) 80.8 78.8 78.5 80.4 2 (KSI) 54.0 54.2 53.4 53.7 9 ۲ -F ۳ 400 --- 0 Z SB64078 SB64078 교강번호 SB64078 SB64078 Heat No. 16,737 28 16,737 16,737 *** HEAT TREATMENT ===> Normalized : 890 C 30min. 16,737 36,897 9,848 36,897 36,897 Weight (kg) (LBS) ನ0 KЮ 사 양학 PB30062901-2903 PB30063401-3403 PB30062601-2603 PB30062801-2803 Product No. 재품번호 ... (oob) ... Sub Total 0.75"x120.5"x480" 0.75"x120.5"x480" 0.75"x120.5"x480" 0.75"x120.5"x480" Size/刘수

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

 A) This material was producted 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

- We hereby certify that the material herein has been made and tested in accordance with the above

B) No repair welding was performed to the products.

NCA-3800 and(or) KEPIC MNA/ SNA4300.

specification and also with the requirements called for by the above order C) The product numbers listed on this test report identifies the material

This Mill Test Certificate cannot be copied for any purpose

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.

KT-101. to MAR.01.2009

Surveyor To:

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







Chief of material testing section

posco Mill Test Certificate/검사증명서

Supplier/ 字是功: DAE WOO INTERNATIONAL CORP. Order No./계약번호:0002675602

Commodity/苦명:HR STEEL PLATE (ISO10474/3.1B) ASME2004EDITION) PO No./주문번호:E10577

1

	B Cu Mo Nb Ti V SOLAI 4 -3 -2 -3 -3 -3 -3 -3	OCIER ASSEMBLY OF THE PROPERTY	ev.5 dated JUL 01,2005 and POG01 Rev.0 ing to the requirements of ASME Sec. III
E SA516-70	Chemical Composition/회학성문(%) Chemical Composition/회학성문(%) Chemical Composition/회학성문(%) Chemical Composition/회학성문(%)	· LOT NO ==> VACUUM DEGASSED	A) This material was producted 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
Spec & Type/규격:ASME SA516-70	Impact/ 총격시점 V Notch -50°F Energy SF (FT-LBS) (%)	2,394,103 (LBS) 2,394,103 (LBS) 2,394,103 (LBS) === Last item ===	A) Thi
Spec 8	Tensile/인공시왕 YP TS EL (KSI) (%)	1,085,963 (kg) 1,085,963 (kg) 1,085,963 (kg)	
	Heat No. S A 记述。	·	ectangular)
NGER	Weight Hez Rg Mg Mg Mg Mg Mg Mg Mg Mg Mg Mg Mg Mg Mg	257 257 257 257	th : 200mm(R
XCHA	Qua- ntity 수량	0 6 8 8	uge Leng
EDMONTON E	Product No. 제품번호	T ===> Nomalized	: Middle, B : Botton n : Transversal, Ga
Customer/ ⊇ 각 Al:EDMONTON EXCHANGER	Size/치수	HEAT TREATMENT ===> Normalized : 890 © 43min Lot Total Grade Total Grand Total 257	* Position - T : Top, M : Middle, B : Bottom * Tensile Test: Direction : Transversal, Gauge Length : 200mm(Rectangular).

Tensile Test: Direction: Transversal, Gauge Length: 200mm(Rectangular),

Impact Test. Direction: Longitudinal, T.L.R(Trans Longitude Ratio) YP Method: 0.2% off-set

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.

(1)

Surveyor To:

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







Na, Che, Borg

- We hereby certify that the material herein has been made and tested in accordance with the above

B) No repair welding was performed to the products.

NCA-3800 and(or) KEPIC MNA/ SNA4300.

specification and also with the requirements called for by the above order. C) The product numbers listed on this test report identifies the material

This Mill Test Certificate cannot be copied for any purpose.

Chief of material testing section Na. C.B.



	LNOFECTION	INSPECTION CERTIFICATE 3.1	FICATE	3.1 AS		PER EN 10204:	:2004					Date of dispatch		A03 Certificate No.	
	INSPECTION		CERTIFICATE	3.1.B AS	S PER	R EN 10204:	1991+A1:1995	1:1995	S + AS PER	R ISO 10474:1991					1
	MATERIAL TEST REPORT (MTR)	TEST RE	PORT (MTR)							32,	324601-20.12.08		343880-002	1/
55.	A05 Established inspecting body	Γ	A06 Purchaser		EDMONTON	ON STEEL, EDMON		A07.1 No.		ED10512-J1010-LG			m i	801 Product	6
_	西		Final r	Final receiver BD	EDMONTON	STEEL, E		A07.2 No.	;				<u> </u>	ALCH KOLLEN USAL	Ω.
802/	Steel design.	SA516-70	0					S	SA20-S5			٠	,		
88	Any suppl.	ASME-2A:07	1:07	,				÷							
	requirements	DIL-HUE	Z-2:R24	DIL-HUE-2:R24-2007-11-20	-20					٠.				1507	
1 .	A01.49	No Eurtho		orcial infor	matic	A01.409 Eurther commercial information - Concession requests	ion regul	ests							
814	89	B07.1		Bife miles			-	} .							
S E	Heat No.	Rolplate Test No.	Rol plate /	Concession request no.	aquest	no. Date	e.			٠.		÷			
01	328250	623	62313-01	TO/A1195/2008	5/200	08 19.	.11.08								٠
- 1	B01-B9	39 Descri	ption of	B01-B99 Description of the product	। ध										
B14	908 1	B09	B±0	B10		B11	B12 Theoretical		duct delivery	B07.2 Heat No.	B07.1 Rolled plate No./		A09 Purchaser article number	iber	• .
2	of pieces	111CK11698					mass		condition		Test No.				
01	el	0.7500	≖ ×	172,00000	×	344,00000	5708	N 8		328250	62306-01				
01	H	0,7500	×	172,00000		344,00000	5708	8 N		328250	62306-02				
0.1	H	0,7500	×	172,00000	×	344,00000	5708	8 N		328250	62306-03	m			
0.1	н 	0,7500	×	172,00000	×	344,00000	5708	N 8		328250	62313-01	1			
0.1	# 1	0,7500	×	172,00000	×	344,00000	5708	N 8		328250	62313-02				
01	1	0,7500	×	172,00000	×	344,00000	5708	8		328250	62313-03	M			
*	9						34248				1	,			
02	.; ;	0,8750	×	178,00000		356,00000				329612	76058-01	(
02	3	0,8750	×	178,00000	×	356,00000				329612	76058-02	~ .			
2	02 1	0,8750	×	178,00000	×	356,00000	7133			329614	76032-01	⊣ ∵(
02	٦. خ	0,8750	×	178,00000	×	356,00000	7133	Z Č		329614	76032-02	Ň			
*	4						28532	7							
*	***	:			1		62780	0	:		:				
- 1	B04 Pr	roduct de	elivery c	B04 Product delivery condition			***************************************								
H	ITEM NO.: 01	01-02													
z	N: HT: 1670 GR.F +36 -27 GR.E	GR.F +:	36 -27	GR.E						, .	10 C / 2004/	EPOINT / THE AN			
ಕ ಕ	SOAKING TIME TO ATTAIN THE TARGET TEMPERATURE OVER THE WHOLLE COOLING IN STILL AIR	E TO AT	tain t ir	HE TARGET	TE	PERATURE O	VER THE	MHOL	E SECTION:	: L-1, /5 MIN/MIN (23-45 MIN/ LNCE)	(4) (4) Min/	CONT /NTM			
A A	-	201/202/20	3 We heret	We hereby certify, that the	above	201/202/203 We hereby certify, that the above mentioned materials with the terms of order.	s have been (delivered it	have been delivered in accordance	7. 0		4	AG der D	AG der Dillinger Hüttenwerke	e Secondana
	*	QM-Sys	stem: Co	QM-System: Certification as per ISO 9001	ed se	r.ISO 9001					4	<u></u>	FOSTIACH 130U, L	1350, D-30140 Dam	lgerroaa.
	Monthodurode								•	B. MUELLER					



A02																
ANSPECTION		CERTIFICATE 3.1	AS PER EN 10	10204:20	:2004						A10 Advice	Advice of dispatch No.	No.	A08/ Manufacturer's order/	cturer's order/	Sheet
INSPECTION		CATE 3 1 B	AS PER EN	204:15	391+A	:1991+A1:1995	+ AS	PER ISO	10474:1991	1991		napagen a				
(CTM) RECARD ROOM INTODAMEN	Oden Tob	(cm)			1		<u> </u> -				32460	324601-20 12 08	80 6	343880-002	2002	2.7
A05 Established inspecting body	3 body A08	A06 Purchaser	EDMONTON STE	STEEL, EDMON	1	A07.1 No.	ED105	ED10512-J1010-LG	0-LG					801 Product		
НО		Final receiver		STEEL, EDMON		A07.2 No.								HOT ROI	HOT ROLLED PLATES	ES
802/ Steel design.	SA516-70					SP	SA20-SE							·		
B03 Any suppl. A	ASME-2A:07	7.											_			
St.	IL-HUE-2	DIL-HUE-2:R24-2007-11-20	-11-20										-			
RAG Mar	BOS Marking of the product	product			-											
ITEM NO.: 01-02	02.	i ionno id a														
STEEL DESIGNATION HEAT NO. / TRADEMAN	TION SA	.516 70 MT	STEEL DESIGNATION SA516 70 MILTY SA516 60 MILTY HEAT NO / TREADEMARK / ROLLIED PLATE NO -TRST NO	`~ `	INS	INSPECTOR'S STAMP	S STA	Δį								
C40-C20	C40.C20 Tancilo tect	Port.		•						-						
	י פווסוופ וי	163		1				1					200700			
them Heat No. Rol.pla	ite/	Bos Reference (heat) treatment	tment C01	Temp.	2			3 :	:	∢ ;	•	∢ ?	; ;			:
No. Test No.	No.		٠.	GRE	KSI RP02	. 2		R		C=8 N C=8 N		L0≠2IN	~			
01 328250 62306	90		K1 Q	RT	4	48,1		72,	5,5	28,9	_					
01 328250 62313	13		K1 O	RT	4	48,4	*	73	73,4			40,7				
02 329612 76058	58		K1 Q	RT	4	48,9		74	74,7	28,4						
02 329614 76032	32		K1 0	RT	4,	44,7		72	72,8	27,0	<u>-</u>					
C30-C38	C30-C39 Hardness test	s test														
B14 B07.2	B07.1	B05		Ç9	C02/C04			es.		C35 C31	1	-			G32	!
Item. Heat No. No.	Rol.plate/ Test No.		Reference (heat) treatment			≟ Ø	Iemp 168 GR.F	lesting method	Ė		. Indrivedal values				value	
01 328250	62306			KI	0		RT HBW	W 10/3000	000	HB 140	140		11		140	0
01 328250	62313			KI	Ó		RT HBW	W 10/3000	000		136		137		137	7
02 329612	76058			K1	0		RT HBW		000		150		147		148	80
02 329614	76032	~-		K1	0		RT HBW	W 10/3000	000	HB 142	143		142		142	2
C40-C48	C40-C49 Impact test	sst														
B14 B07.2 Item Heat No.	B07.1 Roi.plate/		805 Reference (heat) treatment	C0 1	CG 26		C41 Width of	C40 Type of	C44 Testing method	ethod	C48 Energy	C45	C42 Individual values	sines.		C43 Mean
No. 01 328250	Test No.			Ø	ΓΛ	GR.F te	test piece (test piece CHP-V				AV 1	AV# 1.18F 100	128	102	110
	62313	· ~		M	ΓΛ	-51		CHP-V				AV	94	96	112	101
	76058			김	N	-51	_	CHP-V				AV	96	158	148	134
A04 Z	201/Z02/Z03 We	We hereby certify, that with the terms of order:	201/202/203 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order:	aterials hav	ve been c	elivered in	accordance	\	\\\ .		1		AG der I	Olllinger t	AG der Dillinger Hüttenwerke	9.
××	2M-Systen	n: Certificati	QM-System: Certification as per ISO 9001	Ξ) }-		A	മ	Inspection department	1 1300, D. Jepartment		igei ii Oadi
Manufacturer's								B. MU	MUELLER							



						2									I
A02 INSPECTIO	A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004	IB 3.1 AS	PER EN	10204:2004	04		-		A10 /	Advice of dispatch No. Date of dispatch	ch No./	A08/ Manufacturer's order/ A03 Certificate No.	urer's order/ s No.	Sheet	<u>.</u>
INSPECTION	ON CERTIFICATE	IE 3.1.B AS	PER EN	10204:19	04:1991+A1:1995	+	PER ISO	AS PER ISO 10474:1991							
MATERIAL	MATERIAL TEST REPORT (MTR)	(MTR)							32	324601-20.12.08	12.08	343880-002	-002	3/.	\exists
A05 Established Inspecting body DH:	A06		EDMONTON ST	STEEL, EDMON	A07.1		ED10512-J1010-LG	-LG				801 Product	801 Product HOT ROLLED PLATES	ģģ	
 -	Fina	Final receiver BD	EDMONTON ST	STEEL, EDMON	A07.2	No.								ı.	
B02/ Steel design.	SA516-70					SA20-S5									
BO3 Any suppl: requirements	ASME-2A:07 DIL-HTE-2:R24-2007-11-20	24-2007-1.1	.20		, .										
										-					
C40-C	C40-C49 Impact test			-											
B14 B07.2 Item Heat No. No.	807.1 Rol.plate/ Test No	B05 Reference (heat) treatment	t) treatment	8	C02 C03 C01 Temp. GR.F	C41 Width of test piece	C40 Type of 1	C44 Testing method	•	C46 C45 Energy	C42 individual values AV=FT.LBf	afues		C43 Mean value	
02 329614	76032			Ŋ	LV -51	-	CHP-V			AV	91	75	86	84	
C70-C	C70-C99 Chemical composition % - Heat analysis	mposition %	- Heat ana	ilysis											
807.2 C	C70	<u> </u>	Z		v	2	3	Ş	Ž	2	>	WB.	Z,	F	
328250	Y 0,185	0	1,10	0,012	0,0011	0,0048	0,026	0,009	0,029	0,049	0,002	000'0	0,001	0,003	
329612			1,17	800'0	0,0008	0,0075	0,054	0,030	0,043	0,047	0,000	000'0	0,004	0,003	
329614	Y 0,177	7 0,367	1,16	600'0	0,0007	0,0071	0,031	0,013	0,039	0,040	0,001	0,000	0,001	0,002	
B07.2 C	C70									٠			. !	•	
328250	0,0000 Y	00 0,0012	0									bronley mechanical services inc.		c.°	
329612										Cae	cked to A	Checked to ASME Div. 1	Gato .		
329614	Y 0,0002	02 0,0022	0,040						-	ć		,			
——— C94 H	C94 Heat analysis C	Carbon equivalent / Alloying	ilent / Allo		restrictions —				Sec	Sact IIA ADO	FOR K	W. Commonweal	Add		
B07.2 Heat		٠							(0	,	4	Q.	()	2011	
328250	FO-02=	2= 0,38	FO-55=	0,11	FO-78=	90'0	FO-91=	ດ.	5				٤	1	
329612	FO-02=		FO-55=	0,17	FO-78=	0,08	FO-91=	9'9		•			3		
329614	FO-02=	2= 0,39	FO-55=	0,12	FO-78=	0,05	FO-91=	9,9			-				
T 560	C95 Ladle treatment										-				
ITEM NO.: 01-02	IIEM NO.: 01-02 HEAT OF THE INDICATED THEM. VACUUM DEGASSED /	TEM . VACTED	1 DEGASSE		SULPHIDE SHAPE CONTROL	PE CONTR	JOI								
			1												
A04	Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.	We hereby certify, that the with the terms of order.	above mentions	d materials hav	e been delivere	id in accordance	'	\ \	-	6	AG der I	AG der Dillinger Hüttenwerke	üttenwerke	, C. O.	AO1
☆	QM-System: Certification as per ISO 900'	Sertification a	s per ISO	9001) }-		AF/B	POSTIACE	rostiacii ioou, D-o inspection department	HIII 0 0 1 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	igen/odd/	
Manufacturer's	<u>,</u>						B. MUELLEK Test House Manager	MUELLEK Horse Manager	Jusur	inspector's stamp	Date 22, 12, 08	.12.08		KW	



Maintenance Maintenance	Erläuterunger	n siehe Rückseite/Ex	wijcations v	oir au verso/	See reverse for	r explanations (v	ww.diffinger.de	(certificate)						4			
PREPORT (MTR)	A02 INS	PECTION CER	TIFICE	ATE 3.1	AS PE	'R EN 102	04:2004						e of dispatch No of dispatch		Manufacturer's o Certificate No.	order/	Sheet
Part Correct	INS	PECTION CER	TIFIC	ATE 3.1	AS	EN	04:1991+		AS	ISO 104	74:1991						
Pinal receiver EDMONTON STEEL, EDMON A072 No.	MAT	ERIAL TEST	REPORT	r (MTR)			•					32460	1-20.12.	_	13880-002	2	4/
Sheaf design SAST CT Sheaf design SAST CT Sheaf design SAST CT CT CT CT CT CT CT	A05 Establisi DH	ed Inspecting body	A06 Pu	irchaser tal receiver	EDMON			ું ફું	ED10512-	J1010-LG	a in			HOT	Product ROLLED 1	PLATES	
Asymptoments DIL-HUE-2:R24-2007-11-20 SA20-S5			- 1		NOWOG!									T			
CT0-C99 Chemical composition % - Product analysis National Managements DIL-HUB-2.R.24-2007-11-20		Ę,	6-70					SAS	30-85					<u>.</u>			
TOTO-C99 Chemical composition % - Product analysis 2		윭	-2A:07 TUE-2:1	R24-200	7-11-20								•			•	
2 morth 2 m		270 000 010			9 70	40.00									-		
1			FILICA! C	nsodmo	10n % - Pr	oduct ana	lysis —										
8250 62313 K1 0,181 0,218 1,08 0,012 0,0010 0,0037 0,026 0,045 0,045 0512 76502 K1 0,188 0,350 1,13 0,007 0,0008 0,0082 0,053 0,031 0,041 0,047 0,0008 0,0008 0,0008 0,0008 0,0037 0,038 0,038 0,038 0,039 0,0308 0,0008 0,0000 0,001 0,00	B07.2 Heat	B07.1 Test No.	2		55	Z	D.	Ø	z	ક	ġ ¥	Ž	8	>	8	S.	=
9512 76050 K1 0,168 0,350 1,13 0,007 0,0008 0,0082 0,053 0,031 0,041 0,047 14	328250	62313), 181	0,218	1,08	0,012	0,0010	0,0037	0,028	0,007	0,026	0,045	0,001	000'0	000'0	0,003
1,	329612	76050),168	0,350	1,13	0,007	0,0008	0,0082	0,053	0,031	0,041	0,047	000'0	000'0	0,002	0,003
10	329614	76032		0,170	0,365	1,14	600,0	9000'0	0,0070	0,027	0,011	0,038	0,039	0,000	0,000	0,000	0,002
Second S	B07.2	B07.1	5		:			:	:		:	:					
8556 62313 K1 0,0002 0,0016 0,033	Heat			m	ď	AL-Ĭ											
96.12 76.05.0 K1 0,000.2 0,0018 0,033 96.14 76.03.2 K1 0,000.2 0,0026 0,040 Cod Product analysis Carbon equivalent / Alloying restrictions 1.2 Bot No.	328250			2000′0	0,0016	0,032	-										
2014 76032 X1 0,0002 0,0040 0.	329612	76050		0,0002	0,0018	0,033	-		:		:.		:				
C94 Product analysis Carbon equivalent / Alloying restrictions 2	329614	76032		2,0007	0,0026	0,040											
BD74		C94 Product	analysi	is Carbo	on equiva	lent / Alloy	ing restric	tions —			-						
## S250 623.3	B07.2	BO7.1 Toot No.	C01														
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B. MUELLER Test House Manager Inspector's stamp Date 22,12,08	√ ∠		ystem:	Certifica	tion as pe	ır ISO 9001	_		•	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Į	AH	a	stfach 158 pection depart	30, D-6674 8 ment	3 Dillinger	/Saar
Test House Manager Inspector's stamp Date 22,12,08	Manufa	turer's	,						ρΩ		æ	ì					
	Ē	¥							Ŧ	sst House Mans	iger	Inspector's	-		90	KW	-



Erlac	iterungen siehe Rückseite/Exp	dications voir au verso/Su	Erfäuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.diflinger.de/certificate)			
A02	INSPECTION CER	FIFICATE 3.1	INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004	A10 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
	INSPECTION CER	LIFICATE 3.1.	INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991			•
	MATERIAL TEST REPORT (MTR)	REPORT (MTR)		324601-20,12.08	343880-002	5
A05	A05 Established Inspecting body A06 Purchaser	A06 Purchaser	EDMONTON STEEL, EDMON A07.1 No. ED10512-J1010-LG		801 Product	•
	e C	Final receiver	EDMONTON STEEL, EDMON A072 No.		HOT KOLLED FLATES	
B02/	802/ Steel design. SAS16-70	-70	SA20-S5		٠	
B03	B03. Any suppl. ASME-2A:07	2A:07			·.	-
	requirements DIL-HI	DIL-HUE-2:R24-2007-11-20	7-11-20	-		

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

ITEM NO.: 01-02

SURFACE, SHAPE AND DIMENSIONS: NO REMARKS RESULT OF MARKING, SURFACE

AS PER ASME-SA20 AS PER ASME-SA20 AS PER ASME-SA20 AS PER 1/2-ASME-SA20 THICKNESS LENGTH AND WIDTH

FLATNESS

AH)B

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

A01

Date 22.12.08

B. MUELLER Test House Manager

QM-System: Certification as per ISO 9001

201/202/203 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

INSPECTED BY: DATE: P.O.# REQ. MIN TK: NUMBER NUMBER	MICHAEL AUGUST 2 PO-75688 CDMONTC VES 27757 O.7500"	MICHAEL QUINN AUGUST 29/2011 PO-75688 CDMONTON EXCHANGERS QTY HEAT NUMBER HEAT NUMBER 7 0909L 7	BRON MEER 78306	LEY MI TERIAL SHELL PIPE PLATE REPAD STRUCT. OTHER MIN. THK.	SA 516-70 MT EE SA 516-70 MT EE OTHER A A B O.765" O.765" O.765"	BROMLEY MECHANICAL SERVICES MATERIAL INSPECTION REPORT SRADE: SA 516-70 MT EE HEADS 2:1 WELD CAP OTHER MIN. HYDRO YES NO OTHER OTHER A B C C OMBER A B C C OF 65" O.769" O.764"	ERVICES EPORT EPORT BY MANUFACTURER NO NO NO NO YES THICKNESS & LOG 769" 0.764"	DIA SIZE OR WITH: NO NO YES O O.761" D O.761		NPS SURF.	FEG. MARKINGS VERIFIED OF OT	Over 4" PREPARED BY MG
W/O#	WO-34000	4000	RECEIVED & AGOR	РТЕО ВҮ: Т	REQUIRED	EPTED BY: REQUIRED CODE MARKINGS:	KINGS:		-			
CUSTOMER: HUSP	HUSKY ENERGY	RGY	DATE:									

Page 1 of 1



CERTIFICATE OF COMPLIANCE

& manufacturing ltd.

5545-89 Street Edmonton, Alberta Canada T6E 5W9

www.edmontonexchanger.com

tel 780.468.6722 • QC fax 780.466.4668 • sales fax 780.466.5155

Customer BROMLEY MECHANICAL SERVICES PO 75688

Work Order C90707 Date 2011/08/17 CofC# 26741

ltem#	Description	City	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 PGA 784 CUSTOMER PLICHARS TO CUSTOMER NAME AND ADDRESS CLAIM 2010-4541 2010/12/07 2011/01/11 209755 CN	-622606
EDMONTON STEEL PLATE 5545 - 89TH STREET EDMONTON, ALBERTA TGE 5W9	ESSAR STEEL ALGOMA INC. HEREBY CENTRES THAT THE MATERIAL HEREIN DESCRIBED WAS NADE AND TESTED IN ACCORDANCE WITH THE BUILES OF THE
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 & ALG-STE7 R12 2010-01-15, PER SA20 - ESP-03R2 - HEAT ANALYSIS INCLUDING %B, SULPHIDE SHAPE CONTROL - FINE GRAIN - PVO - %B SAZINGE - FLATINESS 1/2 A-20 - (TOP AND BOTTOM CRITICAL) - NORMALIZED 25 MINUTES MIN. @ 1670F	SPECIFICATION SHOWN, ALL RESULTS ARE RELAINED IN ACCORDANCE WITH THE COMPANY'S STANDARD RECORD KEEPING PRACTICES, M. MCLEAN
SUPPLACENTARY INSTRUCTIONS TEST CERT 1: WHIEMSTRAGEDMONTONEXCHANGER.COM TEST CERT 2: PLA TE TEST COUPON:	THIS MILL TEST REPORT MAY NOT BE REPODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALGOSTAN IN THE STEEL ALGOSTAN IN
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ENVIRONMENTAL CERTIFICATES AVAILABLE AT WWW.ESSARSTEELALGOMA.COM KILLED WITH (*) FINE GRAINED WITH (+) MADE IN CANADA WITH DOMESTIC AND NORTH AMERICAN MATERIALS ************************************	15842
OUR ITEM 001 DIMENSIONS .750 X 120.5 X 48	
PIECES 24605 NUMBER HEAT-MS PIECES 24605	WEIGHT
: :	LA
SRCE IN COND METH DIR SIZE TEMP * FULLSIZE ENERGY 166" .7500 N CVN L FULL -50F 54 55 60 57	SPEC LAB ASTM ALG

PAGE 15 OF 16

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

ESSAR Steel Algorna Inc. 105 West Street, Sault Ste. Marie, Ontario Canada P6A 7B4 CUSTOME PURPERS NO. CARRIER 2010/12/07/2011/01/11/209755 CARRIER -622606	WILL ORDER	
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BROMLEY MECHANICAL SERVICES INC.

Checked to ASME Div. 1

Sect. IIA 2019 Edd.

SA 20

PAGE 16 OF 16

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 REQUIRIMENTS 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.

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INSPEC	ájo Klo	<u></u> 둘	(1b/ft) STF	1	19.64				94.71		니			(psi) (g/m²)	70195	7228	7630	71210	72081	20630	72228	71210	BLACK THIREAUEU & UNIT CHECK AN	CST COPPER SULPHATE : RESIDUAL MAGNTISM	혐 및 검사에 할	'S HEREIN HAVE	AND ALSO WITH THE REQUIREMENTS.	
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SPONLEY NECHANISM SERVICES INC.

Sect. III 2010 C. FEB 15 2011

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CLIENTE / Customer / Cifen

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

CERTIFICADO DE INSPECCION

Inspection Certificate - Certificat de Réception

DIN EN 10204 / 3.1 ISO 10474 / 3.1



清明 法外司 人名英格兰人姓氏克克特 经通过存货 有不不及 通過 法人物的人 有者 医多子 有一人 人名英格兰人姓氏克克





B° Zubillaga, 3 - Apdo, 14 20560 OÑATI (Gipuzkoa) SPAIN Tel.: 34 - 943 780562 Fax: 34 - 943 781806

83918

E-mail: ukna@ulmapiping.con

FLANGES

PRODUCTO Article - Produii.

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

ASME B16.5-09

A/SA350LF2CL1-07 ASTM/ASME

MATERIAL CORRESPONDIENTE

NORMAS APLICABLES Requirements - Normes Applicable:

4889097-00

HOJA: Page: 2 138506

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20/05/2011

FECHA: Date:

Certified acc. PED 97/23/EC+AD2000-M. by TÜV Rheinlanc N.º 01 202 E/Q 02 744:

DE of. - de 22/12/2010

MARCA DEL FABRICANTE Mark of factory



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>	QUALITY ASSURAN
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NACEMR0175/ISO15156-2 Region 3-2003 NACE MR0103 : 2007 CSA-7245,12-19 GR248 CAT II - SS			r's LADI	_
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241V1 296V1

 Los materiales citados cumplen las normas aplicable
 Manufacturing requirements are satisfiec - Les normes applicables sont respectées

EL INSPECTOR Works inspector - L'inspecteur



N_NORMALIZED AT 900 C AND ALLOWED TO COOL IN STILL AIR

(*) OBSERVACIONES: Remarks Observations

		4	OI OO O SAN	LENGTH 20'	THICKNESS XXH	PIPE PUBLISHED NO 0.674"	PLATE NOM		Weight per foot for pipe over 4"	せらせん	- /)	VISUAL INSP. REG. PREPARED MARKINGS BY EDGE SURF. VERIEID BY		ok of oh ma						NTINA	ALL MARKINGS STENICILED ON PIPE		
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BROMLEY MECHANICAL SERVICES	MATERIAL INSPECTION REPORT		SA 333GR6	0 2:1	O HEMI	□ WELD CAP	□ OTHER	0	· · · · · · · · · · · · · · · · · · ·				4	0.650"		-			REQUIRED CODE MARKINGS:				
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			MICHAEL QUINN	JUNE 16/2011	-	PO-75256		MIDFIELD SUPPLY LTD	SPI 46603			HEAT N	HEAT NUMBER	44380							BMS STOCK		
			MIC	SS		PO-		MID	'IdS			ΩTY		21'							BMS		
			INSPECTED BY:	DATE:		P.O.#		SUPPLIER:	PART ID#:	REQ. MIN TK:		MATERIAL TRACKING		VS 29717					#O/M		CUSTOMER:	-	



INSPECTION CERTIFICATE

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

SIDERCA S.A.I.C.
D. lorge A. Simini 250
(82804MHA, Campana
Buenos Aries, Argentina
(54) 3489 433100 fet.
(54) 3489 433405 fax

Cliente / Customer MCJUNKIN CORPORATION		:	·	Expediente/ Manufacturing Order 5/6268.28	Número / Number 585613		Fecha / Date 14/03/2011	Pág./Page 117
Producto / Product CARBON STEEL FOR LOW TEMPERATURE SERVICE	TURE SERVICE			Orden de Compra/ Purchase Order C012 726237 4D0	ltem R 00048 C	Item Referencia del Clie 00048 C012 726237 4D0	Item Referencia del Cliente / Customer Reference 00048 C012 726237 4D0	er Reference
Norma / Standard ASTWASME A/SA333+CSA Z245.1-07	Norma / Standard ASTNVASME A/SA333+CSA Z245.1-07 CATII SSPSP00374/1+NACE MR0175/0103+IPRO LP-006	3+IPRO LP-006		Grado / Grade 1/6/2901ISS	<u>E</u>	Extremos / Ends BEVELLED AT 3	Extremos / Ends BEVELLED AT 30 DEG. ASTM	
Dimensiones / Dimensions Sche 114.30 x 17.12 mm 4 1/2 x 0.674 inches	Schedule Peso Nominal / Nominal Weight 41.03 KGMT 27.54 LBIFT	Longitud / Length S.R. (SP)	Superficie / Surface INT BARE /EXT VA!	Superficie / Surface INT BARE JEXT VARNISHED	O	Cantidades / Quantities 13 Pz 84.8 13 Pcs 278.9	Quantities 84.89 m 278.51 Ft	3454 Kg 7615 Lb

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INSPECTION CERTIFICATE

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

SIDERCA S.A.I.C. Dr Jorge A. Simini 250 (B2804MHA) Campana Buenos Aires, Argentina

Referencia del Cliente / Customer Reference C012 726237 4D0 3454 Kg 7615 Lb Pág./Page 217 (54) 3489 433100 tel. (54) 3489 433405 fax BEVELLED AT 30 DEG. ASTM 84.89 m 278.51 Ft 14/03/2011 Fecha / Date Cantidades / Quantities Extremos / Ends 13Pz 13Pcs Número / Number 585613 Item 00048 Orden de Compra/ Purchase Order C012 726237 4D0 Expediente/ Manufacturing Order ENCAVOR OF HIMITOR / CHEMICAL ANALVERS 5/6268.28 Grado / Grade INT BARE /EXT VARNISHED 1/6/290IISS Superficie / Surface Longitud / Length S.R. (SP) ASTWASME A/SA333+CSA Z245.1-07 CATII SSPSP00374/1+NACE MR0175/0103+IPRO LP-006 Schedule | Peso Nominal / Nominal Weight 41.03 KG/MT 27.54 LB/FT CARBON STEEL FOR LOW TEMPERATURE SERVICE 114.30 x 17.12 mm 4 1/2 x 0.674 inches MCJUNKIN CORPORATION Dimensiones / Dimensions Cliente / Customer Producto / Product Norma / Standard

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CALJ 175/05



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

SIDERCA S.A.I.C. Dr Jorge A. Simini 250 (82804MHA) Campana Buenos Aires, Argentina (54) 3489 433100 tel. (54) 3489 433405 fax

Cliente / Customer			Ē	acturing Order	Número / N	Jumper	Número / Number Fecha / Date	Pág./Page
MCJUNKIN CORPORATION				5/6268.28	585613	613	14/03/2011	3 / 7
Producto / Product			0	Orden de Compra/ Purchase Order	ltem /	Referencia o	Item Referencia del Cliente / Customer Reference	er Reference
CARBON STEEL FOR LOW TEMPERATURE SERVICE	TURE SERVICE		<u>o</u>	C012 726237 4D0	00048	00048 C012 726237 4D0	7 4D0	
Norma / Standard			9	Grado / Grade	1	Extremos / Ends	spu	
ASTM/ASME A/SA333+CSA Z245.1-07	ASTM/ASME A/SA333+CSA Z245.1-07 CATII SSPSP00374/1+NACE MR0175/0103+IPRO LP-006	03+IPRO LP-006	<u>+</u>	1/6/290IISS	-	BEVELLED	BEVELLED AT 30 DEG. ASTM	
Dimensiones / Dimensions Sche	Schedule Peso Nominal / Nominal Weight	Longitud / Length	Superficie / Surface	100	Ť	Cantidades / Quantities	' Quantities	
114.30 × 17.12 mm	41.03 KG/MT	S.R. (SP)	INT BARE /EXT VARNISHED	VARNISHED		13 Pz	84.89 m	3454 Kg
4 1/2 x 0.674 inches	27 S.4 I PAFT					13 Pcs	278.51 Ft	7615 Lb

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INSPECTION CERTIFICATE

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

SIDERCA S.A.I.C. Dr Jorge A. Simini 250 (82804MHA) Campana Buenos Aires, Argentina

(54) 3489 433100 tel. (54) 3489 433405 fax

3454 Kg 7615 Lb Referencia del Cliente / Customer Reference Pág./Page BEVELLED AT 30 DEG. ASTM 84.89 m 278.51 Ft 14/03/2011 Fecha / Date Cantidades / Quantities C012 726237 4D0 Extremos / Ends 13 Pcs 13 Pz Número / Number Item 00048 Orden de Compra/ Purchase Order C012 726237 4D0 Expediente/ Manufacturing Order Superficie External Surface 5/6268.28 INT BARE /EXT VARNISHED Grado / Grade 1/6/290IISS Longitud / Length ASTW/ASME A/SA333+CSA Z245.1-07 CATII SSPSP00374/1+NACE MR0175/0103+IPRO LP-006 S.R. (SP) Schedule | Peso Nominal / Nominal Weight 41.03 KG/MT 27.54 LB/FT CARBON STEEL FOR LOW TEMPERATURE SERVICE 0.674 inches MCJUNKIN CORPORATION 17.12 mm Dimensiones / Dimensions Producto / Product Cliente / Customer Norma / Standard 114.30 x 4 1/2

	_	Individuales	88	L	Promedios	45	Tipo de dureza
Valores Requeridos /	_	Individuals	ls		Average	,	Hardness type
Required Values	Max	Max Min Var Max Min Var	Var	Max	Min	Var	VICKERS HV10
				248			

Valor Individual/Individual Value Obtenidos/ Obtained ENSAYO DE DUREZA/ HARDNESS TEST 784592 44380 **Ensayo/ Test** Colada/ Heat Cuadrante

Cuadrante	Colada/ Heat	44380			Obter	/sopi	Obtenidos/ Obtained	ed		
	Ensayo/ Test	784591		Valc	r indiv	idual/ I	Valor individual Individual Value	al Valu		
Quadrant	Tubo/ Pipe	9	-	7	3	4	Max	Min	P/A	Var
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4-	Diametro Ext./ External Diam.	ternat Diam.	172	170	174	174	174.0		170.0 172.5	
]	Centro/ Mid-wall		159	162	164	161	164.0	159.0	159.0 161.5 18.0	18.0
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Cuadrante	Colada/ Heat				Obter	/sopiu	Obtenidos/ Obtained	Jed P		
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Quadrant	Tubo/ Pipe	1	2	3	4	4 Max Min P/A Var	Min	b/A	Var
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P/A Var

4 Max Min

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Extremo / End

Tubo/ Pipe

Quadrant

Diametro Ext/ External Diam.

Diametro Int/ Internal Diam.

Centro/ Mid-wall

Max = Máximo/ Maximum P/A = Promedio/ Average Var. = Variación/ Variation E / B = Stencif starting - Comienzo marcación / Cuerpo - Body E / U = Stencif starting - Comienzo marcación / Recalque-Upset E/ VU = Vanishing upset - Desvanecimiento de recalque / Cuerpo - Body Ind = Individual Val. = Valor/ Value Min = Minimo/ Minimum

M = Medio/ Middle O / B = Opposite extreme to E-Extremo opuesto al E/ Cuerpo - Body O / U = Opposite extreme to E-Extremo opuesto al E/ Recalque-Upset O/ VU = Vanishing upset - Desvanecimiento de recalque / Recalque - Upset



INSPECTION CERTIFICATE (BS EN 10204 3.1: 2004 - ISO 10474 3.18: 1991)

SIDERCA S.A.I.C. Dr Jorge A. Simini 250 (82804MHA) Campana Buenos Aires, Argentina

(54) 3489 433100 tel. (54) 3489 433405 fax

Cliente / Customer MCJUNKIN CORPORATION	NOL			Expediente/ Manufacturing Order 5/6268.28	Númer	o / Number 585613	Fecha / Date 14/03/2011	Pág/Page 5 / 7
Producto / Product CARBON STEEL FOR LOW TEMPERATURE SERVICE	LOW TEMPERATURI	ESERVICE		Orden de Compra/ Purchase Order C012 726237 4D0		Item Referencia del Cli 00048 C012 726237 4D0	Referencia del Cliente / Customer Reference C012 726237 4D0	mer Reference
Norma / Standard ASTWASME A/SA333+	CSA Z245.1-07 CATI	Vorma / Standard ASA333+CSA Z245.1-07 CATII SSPSP00374/1+NACE MR0175/0103+IPRO LP-006	3+IPRO LP-006	Grado / Grade 116/290IISS		Extremo / Ends BEVELLED AT	Extremo / Ends BEVELLED AT 30 DEG. ASTM	_
Dimensiones / Dimensions 114.30 x 17.12 mm 4 1/2 x 0.674 inch	imensions Schedule 17.12 mm 0.674 inches	Schedule Peso Nominal / Nominal Weight 41.03 KGMT 27.54 LB/FT	Longitud / Length S.R. (SP)	Superficie / Surface INT BARE /EXT VARNISHED		Cantidades / 13 Pz 13 Pcs	Cantidades / Quantities 13 Pz 84.89 m 13 Pcs 278.51 Ft	3454 Kg 7615 Lb
& = Monograma / Monogram SIDERCA MM.YY = Mes / Año Month / Year	ogram SIDERCA onth / Year	NNNNN = Número de tubo / Nbr Y/T = Año / Trimestre Year / Quarter	of pipe	Marcas / Marking LLL = Longitud / length PPP = Peso / Weight HNXXXXX = Colada / Heat	ight	@= Monog	@= Monograma / Monogram API	۸PI
		Prueba Hidráulica / Hydrostatic Test	tatic Test					
Pres	Presión / Pressure	Tiempo / Time		Resultado / Results				
Unidad / Unit	Valor / Value	Segundos / Second	JS	Satisfactorio / Satisfactory				
PSI	3000	5,00		***************************************				

Estarcido (Tubo) / Stencilling (Pipe)
TENARIS SD MM.YY ASTM/ASME A/SA333 114,3 17,12 41,02 4XXS1/6/290CATIISS HQ QTM45C LT-45C SEAMLESS207KPAX100NDE CSA Z245.1-07PO C012 726237 4D0 MADE IN ARGENTINA HNXXXXX NNNNNN LLLL PPPPP

NNNN LLL FFFF	
FABRICADO POR TENARIS SIDERCA*	*MANUFACTURED BY TENARIS SIDERCA*
PROCESO DE ACERACIÓN	*ACIERAGE PROCESS*
FABRICACIÓN DE ACERO: FUNDICIÓN POR ARCO ELECTRICO Y COLADO CONTINUO - ACERO CALMADO AL ALUMINIO.	STEEL MAKING PROCESS: E.A.F./L.F. AND CONTINUOUS CASTING - FULL ALUMINIUM KILLED AND FINE GRAIN PRACTICE.
LA PRÁCTICA DE AFINO EN EL HORNO - CUCHARA INCLUYE AGITACION POR ARGON Y UNA INYECCIÓN FINAL DE UNA VARILLA DE SILICIURO DE CALCIO PARA OBTENER UNA FORMA GLOBULAR DE EVENTUALES MICROINCLUSIONES.	-THE LF PRACTICE INCLUDES ARGON RINSE AND A FINAL INJECTION OF CALCIUM SILICIDE WIRE FOR MICROINCLUSION SHAPE CONTROL.
-MATERIAL LIBRE DE CONTAMINACIÓN DE MERCURIO.	-MATERIAL FREE FROM MERCURY CONTAMINATION.
PROCESO DE LAMINACIÓN	*ROLLING PROCESS*
-FABRICACIÓN DE TUBO: LAMINADO EN CALIENTE Y SIN COSTURA.	-MANUFACTURING PROCESS : SEAMLESS HOT ROLLED.
CONTROLES	*CONTROLS*
-CONTROL VISUAL Y DIMENSIONAL: SATISFACTORIO.	-VISUAL AND DIMENSIONAL INSPECTION : SATISFACTORY.
CONDICIONES DEL MATERIAL	*MATERIAL CONDITIONS*
-NO REPARADO POR SOLDADURA.	-NOT REPAIRED BY WELDING.
- EL MATERIAL CUMPLE CON LOS REQUERIMIENTOS NACE MR 0103.	-MATERIAL COMPLIES WITH NACE MR 0103.





INSPECTION CERTIFICATE

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

SiDERCA S.A.I.C.
Dr. Jorge A. Simini 250
(B2804MHN) Campana
Buanos Aires, Argentina
(54) 3489 433100 tel.
(54) 3489 433405 fax

3454 Kg 7615 Lb Referencia del Cliente / Customer Reference Pág./Page BEVELLED AT 30 DEG. ASTM 84.89 m 278.51 Ft 14/03/2011 Fecha / Date Cantidades / Quantities C012 726237 4D0 Extremo / Ends 13 Pcs 13 Pz Número / Number -HARDNESS ACCORDING TO NACE MR-01-75/ ISO-15156-2. 00048 ltem Orden de Compra/ Purchase Order Expediente/ Manufacturing Order -EDITION OF REGULATION: ASTM A 333-10 5/6268.28 C012 726237 4D0 Grado / Grade INT BARE /EXT VARNISHED 1/6/290iiss Superficie / Surface "STANDARDS" Longitud / Length ASTWASME A/SA3334CSA Z245.1-07 CATII SSPSP00374/1+NACE MR0175/0103+IPRO LP-006 S.R. (SP) Schedule | Peso Nominal / Nominal Weight 41.03 KG/MT 27.54 LB/FT -LA DUREZA CUMPLE CON LA NACE MR-01-75/ISO-15156-2 CARBON STEEL FOR LOW TEMPERATURE SERVICE EDICIÓN DE LA NORMA: ASTM A 333-10 0.674 inches 17.12 mm **MCJUNKIN CORPORATION** Dimensiones / Dimensions Producto / Product Cliente / Customer Norma / Standard 114.30 × *NORMAS* 4 1/2

Observaciones / Remarks

-EDICIÓN DE LA NORMA: NACE MR 01-75 - ISO 15156-2 : 2003

-EDICIÓN DE LA NORMA: ASME SA 333/ 2007

- EDICIÓN DE LA NORMA: NACE MR-01-03 EDICION 2007

EDICIÓN DE LA NORMA: CSAZ245: 2007

NON DESTRUCTIVE TEST: SATISFACTORY.

INSPECTION METHODS: U.T. LONG./TRANSY. (INT.) NOTCH 10 % + U.T. TRANS. (EXT.) NOTCH 10 % + U.T. LONG. (EXT.) NOTCH 5 % + M.P.I. LONG./TRANSY. (EXT./INT.) ON ENDS + W.M.P.I. ON BEVELS.

-EDITION OF REGULATION: NACE MR 01-75 - ISO 15156-2 : 2003

-EDITION REGULATION: ASME SA 333/ 2007

-EDITION OF REGULATION: NACE MR-01.03 EDITION 2007

-EDITION OF REGULATION : CSA Z245 : 2007

LAMINATIONS CONTROL 100% U.T. SATISFACTORY.

ONE YELLOW (RAL 1	ONE YELLOW (RAL 1023) BAND ON EACH END.			
Tratamiento termico (7	ratamiento termico (Tubo) Heat treatment (Pipe):	QUENCHED AND TEMPERED		
Tipo / Type	Temperatura / Temp	Rango / Range (°C)	Duracion / Duration	
QUENCHED	J.006	-10 +10	84 min.	
TEMPERED	625°C	-5-	70 min.	
Método de enfriamient	to del tratamiento térmico (Tubos) /	détodo de enfriamiento del tratamiento térmico (Tubos) / Quench media of heat treatment process (Pipes):	es):	WATER

Magnetismo remanente/Residual magnetism (max).: 30 GAUSS

Protectores / End Protectors: NON LIFTABLE CLOSED PLASTIC PROTECTOR FOR FLAT / BEVELED PIPE, SUPPLIER METALCENTRO.



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

SIDERCA S.A.I.C. Dr Jorge A. Simini 250 (82804MHA) Campana Buenos Aires, Argentina

(54) 3489 433100 tel. (54) 3489 433405 fax

Cliente / Customer MCJUNKIN CORPORATION				Expediente/ Manufacturing Order 5/6268.28	Número / Number 585613	lumber 113	Fecha / Date 14/03/2011	Pág./Page 7 l 7
Producto / Product CARBON STEEL FOR LOW TEMPERATURE SERVICE	E SERVICE			Orden de Compra/ Purchase Order C012 726237 4D0	ltem 00048 C	Item Referencia del Clii 00048 C012 726237 4D0	Referencia del Cliente / Customer Reference C012 726237 4D0	mer Reference
Norma / Standard ASTWASME A/SA333+CSA Z245.1-07 CATII SSPSP00374/1+NACE MR0175/01	I SSPSP00374/1+NACE MR0175/010	1034IPRO LP-006		Grado / Grade 1/6/290IISS	F	Extremo / Ends BEVELLED AT	Extremo / Ends BEVELLED AT 30 DEG. ASTM	
Dimensiones / Dimensions Schedule 114.30 x 17.12 mm 4 1/2 x 0.674 inches	Schedule Peso Nominal / Nominal Weight 41.03 KGMT 27.54 LB/FT	Longitud / Length S.R. (SP)	Superficie / Surface INT BARE /EXT VARNISHED	face T VARNISHED	<u> </u>	Cantidades / Quantities 13 Pz 84.89 13 Pcs 278.5	Ouantities 84.89 m 278.51 Ft	3454 Kg 7615 Lb

Por la presente certificamos que el material aqui descripto ha sido fabricado	We hereby certify that material herein described has been manufactured in accordance	
de acuerdo con las normas y especificaciones solicitadas en vuestra orden	with the standards and specifications required in your order and satisfies the	
y satisfacen los correspondientes requerimientos.	corresponding requirements.	
Este certificado se emite mediante un sistema computarizado y es valido con This certificate	This certificate is issued by a computerized system and it is valid with electronic signature.	
firma electrónica. El certificado original presenta el logo Tenaris (verde claro),	ifirms electronica. El certificado original presenta el logo Tenaris (verde claro). On the original certificate the trade-mark Tenaris light-green coloured at the bottom of the	
impreso en la parte inferior de la hoja. En caso que el poseedor del certificado	impreso en la parte inferior de la hoja. En caso que el poseedor del certificado page is stamped. In case the owner of the certificate would release a copy of it, he must	
entregue una copia del mismo, deberà garantizar la conformidad con el	attest its conformity to the original one taking upon himself the responsibility for any	
original, haciéndose responsable por cualquier uso ilegal o indebido.	unlawful or not allowed use.	
Cualquier alteración y / o falsificación estará sujeta a fa ley.	Any atteration and / or falsification will be subject to the law.	QUALITY CERTIFICATION DEPT.
Si necesita asegurar la autenticidad de este certificado, contactarse con	If you need to assure the authenticity of this certificate, please do not	DTO CERTIFICACION DE CALIDAD
Siderca SAIC, e-mail: aye@siderca.com	hesitate to contact Siderca SAIC through this e-address:aye@siderca.com	EDUARDO A. AYERBE
		CAU 17505



CERTIFICATO DI COLLAUDO

TEST CERTIFICATE

OFFICINE INCOLA SALPENTI E FIGURE S.B.A. Capitale Sociale 2 802 500.00 interments versate Secte (spele e Amenitationis: 23824 DERVIO (LC) - Vale Entico Ferri, 48 C.C.I. AA Lecco n 02026990138 - R.E. A. 78815 - CF. » P.IVA IT00205890128 Subdaments - Ulfici Amenitation / Workshop - Warnshops - Ulfici Amenitation / Ulfici Amenitation / Vertilage - Warnshops - Ulfici Amenitation / Localitis S. Agata - Tel. 0244-97200 - Fax 0344-97210 E-mal.: gelpstil@alperti.com - www.qafperti.com NS.ORDINE / INTERNAL JOB

EN 10204

EN 10204

GALPERTI CANADA ULC

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

CERTIFICATE N.

DATA / DATE

VS.ORDINE / YOUR

DATA / DATE

013076/1

27/04/2011

27373

100980

23/07/2010

0.427 0.155 0.364 0.414

0.145

C - ANALISI DI PRODOTTO / CHECK ANALISYS

0.400

0.359 0.406

POS	i / IT(EM		DES	CRIZIONE	/ DESCRIP	TION		an an	ANTITA'	S/A	MAT	TERIALE / I	MATERIAL		COLATA / HEAT Nº/TE			CIAIERIA TEEL MILL	
111	/11	- 1	2" 600 CE MR·0) WN RF 1-75	160	NALF2	B1 FSF	4		175	S	ASTH/A	SME A35	D LF2 CI	L.1 8	515-10/2	20	OLIFER	/ACP SP	A A
 	- 1-			······································																
	-									·			ANALYSIS		· · · · · · · · · · · · · · · · · · ·					
Ш	4	C %	MN %	SI %	P %	5 %	CR %	NI %	MO %	CU %	1	V %	SN %	AL %	NB %	TI %	N %	COX	B *	H *
A		0,164	1.200	0,200	0,013	0,007	0,110	0,120	0,045	0,14	0 0	0.012	0.008	0.020	0.002	0.001	0.010	0.013	0.0005	0.0002
A	C	0,160	1,195	0.195	0,010	0,003	0,105	0,110	0.040	0.13	5 0	0.010	0.005	0.025	0.001	0.001	0,010	0,013	0.0001	0.0002
		0 %	CAX							1	+					l	04*	03%	FC*	FLX

NOTE / NOTES

C

0.001

0,001

04=Copper+Nickel+Chromium+Holybd.+Vanadium CU+NI+CR+MO+V

03=Chromium + Holybdenum

CR+MO

FC=Carbon Equivalent Short Formula FL=Carbon Equivalent Long Formula

0.003

0.003

C+(MN/6)

C+(MN/6)+((CR+KO+V)/5)+((NI+CU)/15)

Г	Τ					CAF	PATTERISTICHE	MECCANICHE / N	MECHANIC	AL PROPERT	ES			
l						TRAZIONE / TE	NSILE					RESILIE	NZA / CHARPY TEST	
•		TIPO TYPE	DIAMETRO PROVETTA REMMETER	SEZIONE AREA MMQ.	LUNGHEZZA LENGHT DJR.	TEMP. TEMPERATURE C	ROTTURA TENSILE Mpa	SNERVAMENTO YIELD Mpa	ALL. ELONG %	CONTR. REDUCT: S	TIPO TYPE KV	TEMP. TEMPERATURE C	VALORI / VALUES Joule	DUREZZA HB HARDNESS IAVERAGEI
A	0		12.50 12.50	122,70 122,70		20 20	485 501	250 397	22.0 29.2	30.0 71.6		-50 -50	Min. 27 Med. 27 100 - 105 · 106	197 174
		NOTES												

Lateral Exp/Shear Area (Average)

A = mm.1,45/85

O - OTTENUTE / OBTAINED

S - STANDARD

	TRATTAMENTI T	ERMICI / HEAT
-	· }	

Normalized at 900 dgr.C for

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

MARCHIO DI FABBRICA

INT INSPECT DATE

COLLAUDATORE INT.

SBATTELLA



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

TRACE MARK

DATA COLLAUDO INT 27/04/2011

ENTE UFFICIALE DI COLLAUDO



OFFICINE NICOLA GALPERTI E FIGLIO S.p.A.

EN 10204

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

SPETT LE / MESSAS

GALPERTI CANADA ULC

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

CETTECATO IN T. CERTIFICATE N.

DATA / DATE

VS.ORDINE / YOUR

DATA / DATE

013040/1

27/04/2011

27373

23/07/2010

POS / ITEM	DESCRIZIONE / DESCRIP	TION	QUANTITA'	SVA	MATERIALE / MATERIAL	N° COLATA / PROVA HEAT N°/TEST N°	ACCIAIERIA STEEL MILL	*
111/111	2" 600 WN RF 160 NALF NACE MR-01-75	B1 FSF4	175	S	CSA Z245.12-09 GR290 SS	8615-10/20	OLIFER/ACP SPA	A
					·		:	

	П								NALISI CH	IMICA / C	HEMICAL	ANALYSIS							
"		C %	MN %	SI %	P%	S %	CR %	NI %	MO %	CU %	V %	SN %	AL %	NB %	TI %	N %	CO*	B %	H X
A	П	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	c	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
1	11																		
1		0 %	CAX													04%	03%	FC*	FLY
A	1 [0.001	0,003													0,427	0.155	0,364	0,414
A	C	0.001	0.003													0,400	0,145	0.359	0.406
ĺ																			
NO	TE /	NOTES						L						-	C - ANA	LISI DI PRO	DOTTO /	CHECK A	ALISYS

NOTE / NOTES

04=Copper+Nickel+Chromium+Holybd.+Vanadium CU+NI+CR+MO+V

03=Chromium + Molybdenum

FC=Carbon Equivalent Short Formula FL=Carbon Equivalent Long Formula CR+MO C+(MN/6)

C+(MN/6)+((CR+MO+V)/5)+((NI+CU)/15)

	П					CAF	TATTERISTICHE	MECCANICHE / N	MECHANIC	AL PROPERT	ES			
						TRAZIONE / TE	NSILE					RESILIE	NZA / CHARPY TEST	
		TIPO TYPE	DIAMETRO PROVETTA PMMETER	SEZIONE AREA MMQ.	LUNGHEZZA LEXGHT MM.	TEMP TEMPERATURE C	ROTTURA TENSILE Mpa	SNERVAMENTO VIELO Mpa	ALL ELONG S	CONTR. REDUCT S	TIPO TYPE KV	TEMP. TEMPERATURE C	VALORI/VALUES Joule	DUREZZA HB HARDNES: IAVERAGE
A	S 0		12,50 12,50	122,70 122,70		20 20	414 501	290 397	20.0 29.2	71,6		-50 -50	Min. 27 Med. 27 100 · 105 · 106	197 174
											!			

NOTE / NOTES

Lateral Exp/Shear Area (Average)

A = mm.1.45/ 85%

O = OTTENUTE / OBTAINED S = STANDARD

TRATTAMENTI TERMI	CI / HEAT	TREATMENT

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

DATA COLLAUDO INT 27/04/2011

COLLAUDATORE INT

SBATTELLA



ed acc. PED 97/23/EC By LLOYO'S Registe No LRC 150212

ENTE UFFICIALE DI COLLAUDO

BROMLEY MECHANICAL SERVICES (1985) LTD.

i,

				MATE	MATERIAL INSPECTION REPORT	CTION REP	ORT				30m.	
INSPECTED BY: MOVIR	3	Z	GRADE:	V 3	SH333 6.6	Q.	· .	DIA SIZE OR WITH:			. 2	
٤	76	12006		HEADS	0 2:1 0 HEMI				LENGTH	SdN A	100 cb	Q
P.O.# 0.4	2				□ WELD CAP				THICKNESS		<u>\$</u>	
30,4	<u> </u>				O OTHER			-	PIPE PUBLISHED NOM	SHED NON	1 Co344	
SUPPLIER: TICK TIELS	बुं ,	A Supply		SHELL	o &				PLATE NOM			
PART 10#: 5P1 53228	\sim	228		PLATE	í o				,			
REQ. MIN TK:				REPAD STRUCT.		. •						
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MATERIAL TRACKING NUMBER	αTY	HEAT N	HEAT NUMBERS	MIN.		THICKNE	THICKNESS & LOG		VISUAL	INSP.	REQ.	PREPARED BY
		HEAT NUMBER	PLATE NUMBER		4	m	ပ	Q	}		VERIFIED)
VS26724.		530463			.327	344	340	337	8	N. C.	111	li li
)			
	,			,								
			7									
#O/M			RECEIVED ACCEPTED BY:	BY:	REQUIRED CODE MARKINGS	MARKINGS:	MARKINGS: Stahl/Rehn-Markin	1 1	7 47 47			
CUSTOMER:	٠,		DAJE:					1 1				
Stock	4		MAR 2 1 2006	4								
											•	

Benteler Stahl/Rohr GmbH Postfach 13 40

33043 Paderborn Deutschland

Tel.: +49.5254.81-0 Fax: +49.5254.13666

PC# 8100179

65-297454/001/P

BENTELER 🛡

Stahl/Rohr

4

Blatt: Page: Page:

Dokument-Nr.: Document No.: ABNAHMEPRÜFZEUGNIS EN 10204-3.1 saspection certificate en 10204-3.1 certificat de reception en 10204-3.1

EN 10204:2005-01

No. du document:

Bentaler Stahl/Rohr GmbH - Postfach 1340 - 33043 Paderborn - Deutschland Van Leeuwen Pipe and Tube

2875-64th Avenue EDMONTON, AB T6P 1R1 (Canada) Inc. KANADA

05-5494 / 45000279 1133714 No. de commande du client No. de commande Benteler: Benteler Auftrags-Nr.: Purchase Order No.: Kunden-Bestell-Nr.: Benteler Order No.:

6574049 No. d'avis d'expédition: Versandanzeigen-Nr.: Dispatch Note No.:

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

ISO/TS 16949 (ISO 9001) DNV CERT-13765-2003 PED 97/23/EC TÚV Cen 07 202 4111/Z/5001/11/H Warmrohrwerk Dinslaken No. du certificat: Inspection No.: Manufacturer: Producteur: Hersteller: Prüf-Nr.:

Stempel des Abnahmebeauftragten: Stamp of the inspection representative: Marque du producteur:

Timbre du contrôleur:

Manufacturer's brand:

Herstellerzeichen:

≸

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

ASTM-A 333-HF-2004a, ASME SA-333-HF, ASME Section II Part A Edition 2004, CSA Standard Z245.1-02 Category II, NACE Standard MR0175-03 _ieferbedingungen: Ferrns of delivery:

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

Dimensions-tolerances: Dimensions-tolérances:

GRADE 290, GRADE 6 Nuance d'acier: Stahlsorte: Steel grade:

Normalized Delivery condition: Lieferzustand:

État de livraison:

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

Product marking:

Marquage du produit:

FK = Farbkennzeichnung, colour marking, marquage par couleur FS = Farbschabloniarung, paint stencilling, marquage par peinture FSD = Farbstrahldrucker, Colour jet printer, Imprimante à jet d'encre de couleur LS = Langsschabloniarung, Indigenten PS = Pragastempel, die stamp, marquage par poinçonnage TS = Tintenstrahlkennzeichnung, Ink jet spray marking, imprimante à jet d'encre

Pos.	Pos. Stück Maße	Маßе		Länge	Gewicht	Schmelzen-Nr. Prüfdruck	Prüfdruck	Rohr-NrGruppe	Vielfachlängen
ttem	Number	Dimensions		Length	Weight	Heat No.	Test pressure	Tube number group	Multiple lengths
Poste	Nombre	Dimensions		Longueur	Poids	No. de coulée	Pression d'épreuve	Pression d'épreuve Série de no. des tubes	Longueurs multiples
			feet	feet	sq		bar s		
0004 13	13	2" NPS * Sched. 160		542,09	4041	530403	207 5	ָרָ ק	
		38 FT - 42 FT						21 15 V	



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Postfach 13 40 33043 Paderbom Deutschland Tel.: +49.5254.81-0 Fax: +49.5254.13666

Benteler Stahl/Rohr GmbH

3/ PASSED PASSED Blatt: Page: Page: Essai d'aplatissement: Ringfaltversuch: Hydrostatic test: acc. to CSA Z245.1, holding time min 5 seconds, Test Flattening test: Prüf-Nr.: Inspection No.: No. du certificat: PASSED 65-297454/001/P Vérification des dimensions: pressure/Time-record Dimensions examination: Dokument-Nr.:
Document No.:
No. du document: Maßkontrolle: **PASSED** ABNAHMEPRÜFZEUGNIS EN 10204-3.1 anspection certificate en 102043.1 The tubes have been submitted to a leak tightness test by: Prüfergebnisse / Test results / Résultats des essais Die Rohre sind auf Dichtheit geprüft durch: Les tubes ont passé un contrôle d'étanchéité par: CERTIFICAT DE RECEPTION EN 10204-3.1 Augensichtkontrolle: Visual inspection: Examen visuel:

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'echantillonage etait realise aux longueurs multiples.

ZuqVersuch Streifenprobe / Tensile test Strip test specimen / Essei de traction Bande decoupee sur tub

Zugversuc	th Streitenprobe,	ZugVerSuch Streifenprobe / Tensile test Strip test specimen / Essai de traction Bande decoupee sur tube	pecimen / Essai (de traction B	ande decoupee sur t	npe				
Pos.	Proben-Nr.	Schmelzen-Nr.	Probenabmessung	essung	Streckgrenze	Zugfestigkeit	Dehnung		Einschnürung	Re/Rm
ltem	Specimen No.	Heat No.	Specimen dimensions	ensions	Yield strength	Tensile strength	Elongation		Area reduction	Re/Rm
Poste	No. de l'éprouvette No. de coulée	tte No. de coulée	Dimensions de l'éprouv.	! l'éprouv.	Limite élastique	Résistance à la traction Allongement	Allongement		Coefficient de striction	Re/Rm
Anforderungen	ngen				ReH	Rm	A2"	1. Formel		
Requirements	ţ.		æ		MPa	MPa	%	1. Formula		
Exigences					290-495	415-625	MIN 30	1. Formule		
0004	000001	530403	19,00 X	8,60	333	478	42,00			
0004	000002	530403	19,00 X	8,60	334	475	42,00			!
									Bromley mechanical services (1985) etd.	ദ്
Härteprüfu	Härteprüfung / Hardness test / Essai de dureté	Essai de dureté						Checkedto	Checked to ASME Div. 1	
Pos.	Proben-Nr.	Schmelzen-Nr.	Härte				Sect.	TIA ONG	Sect. 11A My Edition of Add. 2003	ぞんど
kem	Specimen No.	Heat No.	Hardness				i i i			
Poste	No. de l'éprouv.	No. de coulée	Dureté					A Lule	NAP 2 + 2MR	æ
Anforderungen	ngen		HRC	里	¥	HRB		Signature	Date	
Requirements	ts.									
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Page: Page:	VerfBruchanteil Shear fracture Rupture ductile		%				
	Kerbschlagzähigkeit Impact strength	Résistance au chou- einzel mittel single average individuelle moyenne	J/cm² J/cm²				
Prüf-Nr.: hspection No.:	Kerbschlagarbeit		L CC NWA	85 61 89 89			
-Nr.: 65-297454/001/P	nent: (résilience) [CHARPY-V] Prüftemperatur	Specimen position Specimen position Test température d'esse Position de l'éprouvette Température d'esse Bangs (L) Innaftudinal (L)	longitudinal (L) quer (Q) oc	transversal (Q) -45			Kundenbestell-Nr. Purchase Order No. No. de commande du client 05-5494 / 45000279
	V 10204-3.1 Document No. du document impact test / Essai de flexion par choc	Specimen dimensions Specimen dimensions Dimensions de l'éprouvette Länge Breite Höhe	=	mm 7,50 7,50	7,50	emagnetiser max 3,5 millitesla	Kundenmaterial Customer's Material No. No. de matière du client
oosfach 13 40 13043 Paderborn Seutschland 	ABNAHMEPRÜFZEUGNIS EI ABNAHMEPRÜFZEUGNIS EI ANSPECTION CERTIFICATE EN 10204-3.1 CERTIFICAT DE RECEPTION EN 10204-3.1	Kerbschlagbiegeversuch from Pos. Proben-Nr. Schmelzen-Nr. Pos. trem Specimen No. Heat No. trem Specimen No. de coulée Poste No. de l'éprouv. No. de coulée	Anforderungen Requirements Exigences			Restmagnetismus / Demagnetize / Dresidual magnetic field intensity	Pos. Ihr Zeichen Your reference Votre référence
	Průf-Nr: 65-297454/001/P průf-Nr: nspecion No.:	EPRÜFZEUGNIS EN 10204-3.1 EPRÜFZEUGNIS en 10204-3.1 EPRÜFZEUGNIS en 10204-3.1 ERECEPTION EN 10204-3.1 ERECPTION EN 10204-3.1 ERECEPTION EN 10204-3.1 ERECPTION EN 10204-3.1	run Bernath No. du document No	EPRÜFZEUGNIS EN 10204-3.1 EPRÜFZEUGNIS EN 10204-3.1 EPRÜFZEUGNIS EN 10204-3.1 ERECEPTION EN 10204-3.1 ERECEPTION EN 10204-3.1 ERECEPTION EN 10204-3.1 ERECEPTION EN 10204-3.1 ERECEPTION EN 10204-3.1 ERECEPTION EN 10204-3.1 ERECEPTION EN 10204-3.1 ERECEPTION EN 10204-3.1 ERECEPTION EN 10204-3.1 ERECEPTION EN 10204-3.1 ERECEPTION EN 10204-3.1 Absorbed energy Prüffemperatur Absorbed energy Prüffemperatur Absorbed energy Besitance au choc Specimen dimensions Specimen dimensions Benite Höhe längs (L) Länge Breite Höhe längs (L) Langueur Largeur Hauteur Auguer (Q) C Ann 000 Ann	The control of the course of the control of the course of	Pright No. Pright No. Pright No. Pright No. Pright No. Pright No. Pright No. Pright No. Pright No. Probendant No. No. du document No. No. du document No. No. du document No. No. du document No. No. du document No. No. du document No. No. du document No. No. du document No. No. du document No. No. du document No. No. du document No. No. du document No. Probenda bar impact test / Essai de flexion par choc (résilience) [CHARPY-V] Kerbschlagarbeit Kerbschlagarbeit Impact strength Probenda bar impact test / Essai de flexion par choc (résilience) CHARPY-V] Kerbschlagarbeit Kerbschlagarbeit Impact strength Impact	BECEPTION EN 10204-3.1 Dokument No.: EPRÜFZEUGNIS EN 10204-3.1 Dokument No.: ERCEPTION EN 10204-3.1 Dokument No.: ERCEPTION EN 10204-3.1 Dokument No.: ERCEPTION EN 10204-3.1 Dokument No.: ERCEPTION EN 10204-3.1 Prüftemperatur Kerbschlagarbeit in met strangen der 10204-3.1 Prüftemperatur Absorbed energy hologeversung specimen position of irental position of ir

Vermerk / Romark / Remarque

9004 Poste

P.O. 45000279

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

Dinslaken, 31.10.2005, TEL.: 02064.623-537 FAX: 02064.623-539 Verkäufer(in) / Salesman/woman in charge / Personne chargée:

Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen.Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgülftig. We certify that the supplied products comply with the order specification. This document was prepared by means of electronic data processing and is valid withouth sone servalide sans signature. We certify that the supplied products comply with the order specification. This document a été établi par traitement électronique de l'information et est valide sans 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.

Abnahmebeauftragter Inspection representative Contrôleur

JAN FREERKS / WAG

EDTK corporation

INSPECTION

1498-1.SCNG JUNG-DCNG, GANGSED-GU BUSAN,KOREA Tel: 82-51-831-8550 Fox: 82-51-831-8688

Customor	MRC	C Midfield				Certificat	e No.	20110504279	Date	2011/05/25
P.O No.	S 75	59 095456				Project N	emai	STOCK		·
ob No.						POR/Req	'n No.			
pecification or Material	AST	M/ASME A/SA420 WP	7.6(07 Ed.&09 Add.) 56–2 AND NACE MR0103–2	007		Starting M	Aaterial	SEAMLESS PIPE		
pecification or Inspection		4E 816.9-2007				Dimensio	n and Vis	ual Inspection	(GOOD
Heat Code No	No.		Descriptions				Q'ty (Pcs)	Heat Trealment	N.D.E (GOO0)	
8S176 8L337 8L337	0082 0087 0088	REDUCING TEE	SCH80 SCH160 SCH160	B.W B.W B.W	10° x 2° 2°	6"	5 5 165	N: 910.C N: 810.C N: 310.C	MT -	

Heat Code No	Spec.	С	Si	Mn	Р	5	NI	Cr	Мо	Cu	٧	СР	Raw Heat No
(HCN)	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	-	-	-	-	-	-	-	-	
89176	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	88,0	0,012	0,006	0.03	0.03	0.01	0.07	0.003	0.012	606347
8L337	L	0.15	0.26	88,0	0,012	0.006	0.03	0.03	0.01	0.07	0.003	0.012	606347
										_			
							UCE	D 15	खा	F۱			
	}					REV	112F	<u>U 19</u>	200				

MECHANICAL PROPERTIES

	Spec	Y.S	T.S	E.L (%)	Hardne	ss Test		• Impac	t Test(J)		14.1
Heat Code No [HCN]		K	Si	(%)	Н	8	Temp	(3).	Size(20n-v)	1	
(HON)	Мах.		85	-	2	37	-4	16				
	Min.	35	60	30	l·	-		Act.		Ave.	 	
8\$176 BL337 BL337	ዕ ው ው	40.3 45.2 45.2	66.9 69.3 69.3	30.4 33.2 33.2	146 139 139	148 141 141	65,3 120,3 120,3	80,2 201,5 201,5	79,6 169,3 168.3	75.0 163.4 163.4		

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. • Impact Specimen Size & Spec. Value

85176 10X10X55 BL337 BL337 10X7.5X5500 10X7.5X6500

Size

Min. Ave. 13.8 10.8 10.8 17.6 13.6 13.6

Legend: H8:Brinell ST:Sobyton Treatment SR:Stress Relloving N:Normalized

AC:AF Cool
OC:O1 Cool
WQ:Water Quenched
WC:Water Cool

T:Tempered A:Annealed

L:Ladie ıo

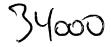
Q:Cuenched	L-Line
(G): Hot-Dip Go	sivanized Coatin
Y.S: 0.2% Offso	t Method

☐Reviewed by

 \square Witnessed by :

Approved by:

Director of Quality Assurance Dep't



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INSPECTION CE J'IFICATE . EN 10204/DIN 50049-3.1B





Certificate No.

G0509001-4

Page 1 / 1

Article:

Hot Forged Flange Carbon steel lorged flanges Material:

Specification: ASME B16.5

A350 LF2

according to: ASTM A350 LF2-1999

ASTM/ASME

Section II Part A and Addenda

State of delivery Quenching 900°C/1hrs/Tempering 590°C/1 hrs

Melting Process:

Marking:

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

Stamp of manufacturer

纫

Oreginal

Content of the	Delivery				
Invoice-No	Item-No	pcs	description	Heat No	Test No
DL/2006-10	286	30	600# WN RF \$160 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 ½"	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 1/3"	100561	1
DL/2006-10	292	100	600# WN,RF STD 2"	100561	1
DL/2006-10	293 .	100	600# WN RF X\$ 2"	100561	1
DL/2006-10	294	100	600# WN RF S160 2"	100561	1
DL/2006-10	321	50	1500# HUB BL/WN solid RF 1/2"	100561	1
DL/2006-10	322	50	1500# HUB BL/WN solid RF 3/4"	100561	1
DL/2006-10	324	40	1500# HUB BL/WN solid RF 1 1/2"	100561	1
DL/2006-10	327	50	1500# HUB BL/WN solid RTJ 2 1/3"	100561	1
DL/2006-10	328	50	1500# HUB BL/WN solid RTJ 3/4"	100561	1
DL/2006-10	329	100	1500# HUB BL/WN solid RTJ 1"	100561	1

Mechanica	i tests	· · · · · · · · · · · · · · · · · · ·	•••••		ition of cimen;	Tange	ential		
Test No	R _m N/mm²	Tensile tes R _{eH} N/mm ²	t A ₆ %	Z %	Char	specii Specii -45,6	nen	iO-V	Hardness HB
				1		J		ΣIN	
1	545	340	31	60	32	36	38	35	162

			Chemica	l analysis	%	,		
Heat No	(C	Si	Mn	P	S	Сr	Mo	NI
	0.16	0,25	1,15	0,017	0,016	0,03	0,01	0,01
100561	TI	Ťa	N	V	Cu	Al	Nb	CE
				0,01	0,06		0,01	0,38

Visual and dimensional inspection: Dimension according to ASME B16.5 Hardness to NACE MR01-76 Smooth finish according to MSS-SP6 without complaint

Place

Gelsenkirchen

Date 06.01.2006

Wilhelm Geldbach Industrie GmbH Ziegelstraße 17, D-45886 Gelsenkirchigs ,

DIN EN 10204 / 3.1 ISO 10474 / 3.1 Inspection Certificate - Certificat de Réception **CERTIFICADO DE INSPECCION**

126374

χ̈́

FECHA: Date:

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

CLIENTE / Customer / Clien

HOJA: Page:

DE of. - de 18/02/2009

PO# CI-09 - 156 (18.02.09)

SU PEDIDO N.º
Your Order No. F

FLANGES

ASME B16.5-03

NORMAS APLICABLES Requirements - Normes Applicables

Certified acc. PED 97/23/EC by TÜV Rheinland N • 01 202 E/Q 02 7443 MARCA DEL FABRICANTE Mark of factory Marque du fabricant

Tel.: 34 - 943 780552 Fax: 34 - 943 781808 E-mail: ulma@ulmapiping.com

B° Zubillaga, 3 - Apdo. 14 20560 ONATI (Gipuzkoa) SPAIN ULMA FORJA, S.COOP

DEPARTAMENTO QUALITY ASSURANCE

Département

OBSERVACIONES COLADA Nº PESISTENCIA
Remarks Heat No T. Strength
Observations N.º Coulde Resist Rupt
(7)

LOTE

DESCRIPCION Description Description

CANTIDAD Quantity Quantite

PARTIDA

Item Poste

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

MATERIAL CORRESPONDIENTE AISA350LF2CL1-04a
Material Correspondent - Qualité
ASTMIASME
NA
MODO DE FUSION'
Steel Makiny - Eileboration de facier
E = Elec. Y = Oxigeno básico

CHARPY V MEDIA Average Moyenne 88482254432 RESILIENCIA impact test Résilience 2828822438 Red. Area Striction 54,70 54,70 73,10 57,50 51,60 61,80 65,70 ALARGAM. E
Elongation
Allongement
Lo: 4 d 36,30 27,70 38,00 27,50 26,40 27,00 35,00 35,00 Y.Strength Limite Elext. 306 327 328 329 329 323 310 310 UMTE ELAST.

145 143 145 145 145 148 148

&&&&&&&&&&&

508 501 501 527 527 527 504 505

324V8 324V8 129V8 489V8 494V8 152V8 465V8 465V8

띨빓띨빓띯띯띯띯

2788 89 2908 3348 3378 2378 228 3258 3258

WN 16 150LB STD RF A350LF2
WN 8 300LB S40 RF A350LF2
WN 14 300LB STD/30 RF A350LF2
WN 4 600LB S80 RF A350LF2
WN 1 600LB S80 RF A350LF2
WN 1 600LB S/XXS RF A350LF2
WN 2 1500LB S/XXS RF A350LF2
BLIND 12 150LB RF A350LF2
BLIND 2 1500LB RF A350LF2

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

% !

W.W

%

%

Nb %

Mo %

%

% 5

% S

ъ М

Mn %

% !S

%

COLADA N.º Heat No N.ºCoulée

3 JA

BX:

1093

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

Terrangue and a serious complen las normas aplicables de la manaculing requirements are sabsified.

Les normes applicables sont respectées.

0,381 0,401 0,383 0,392 0,405 0,401 0,419

0,027 0,033 0,023 0,035 0,035 0,026 0,026

0,220 0,160 0,160 0,320 0,260 0,260 0,200 0,210

0,002 0,002 0,001 0,001 0,003 0,002 0,002

0,007 0,007 0,007 0,007 0,007 0,007 0,007 0,007

0,020 0,020 0,020 0,020 0,020 0,010 0,010 0,010

0,030 0,030 0,030 0,030 0,030 0,120 0,120 0,120

0,120 0,050 0,070 0,090 0,090 0,090 0,090

0,006 0,010 0,007 0,007 0,004 0,006 0,006 0,006

0.000 41000 41000 41000 41000 61000

0,860 0,870 0,870 0,880 0,980 0,960 0,960 0,960

0,300 0,250 0,240 0,240 0,240 0,250 0,240 0,240

0,190 0,200 0,190 0,200 0,200 0,200 0,190 0,190

EL INSPECTOR Works Inspector - L'Inspecteu UMA FORMS, COOF.
Optio de Garanta de calidad
Ouality Accurate de calidad

N_NORMALIZED AT 900 C AND ALLOWED TO COOL IN STILL AIR

(*) OBSERVACIONES: Remarks Observations TRANS AM PIPING #:

HEAT NUMBER

BOKE A350-LF2 τ $G\Gamma$ M/N FLANGE RF XXH 009 $G\Gamma$

PRODUCTO Article - Produit

22129

PO# C716133171581 1tem# MRC Midfield

2 6 S- S

T25A8

	DIA SIZE OR WITH:	LENGTH 25 (/ THICKNESS XX (-/ PIPE PUBLISHED NOM 0.35)	NO Weight per foot for pipe over 4" YES 3.66	VISUAL INSP. REQ. PREPARED MARKINGS BY VERIFIED BY	348 of of of MS.			Benteler Stahl/Rohr-Madein Cormany All Markings Stencilol on Pipo
		DME METER #1 \square	NDE BY MANUFACTURER HYDRO YES NDE NO NO YES NO NO NO YES	IICKNESS & L	. 945. FYE.		CINGS:	Stahl/Rohr-Madein (Kings Stenciled on P
	BROMLEY MECHANICAL SERVICES MATERIAL INSPECTION REPORT SRADE: \$\frac{1}{2}\frac{3}{3}\frac{6}{6}\frac{1}{6}\	(DS = 2:1 = HEMI = WELD CAP = OTHER			0.348 3		REQUIRED CODE MARKINGS:	Benteler All Mar
	BROMLEY MATER GRADE:	H H	SHELL PIPE PLATE REPAD STRUCT	HEAT NUMBERS M			RECEIVER & ACCEPTED BY:	DATE (
	ned Quina	December 9/2010 74239	SP124481	QTY HEAT N				
· · · · · · · · · · · · · · · · · · ·	INSPECTED BY: Michael Work	DATE: December P.O.# 74239	1 1 21 1	MATERIAL TRACKING NUMBER	VSTRUNK		WiO#	CUSTOMER: Stock



Tel.: +49.5254.81-0 Fax: +49.5254.13666

Bernteler Stahl/Rohr GmbH

33043 Paderborn

Deutschland

Postfach 13 40

S

Blatt: Page: Page: PED 97/23/EC TUV CERT 07-202-5635 WZ-0606/07 ISO/TS 16949 (ISO 9001) DNV CERT-11674A-2003 **ELECTRIC FURNACE** ELEKTROSTAHL ≸ Warmrohwerk/Zieherei Stamp of the inspection representative: Stampel das Abnahmebeauftragten: Stahlerschmelzungsverfahren: Marque du producteur: Manufacturer's brand: Poinçon du contrôleur: Herstellerzeichen: No. du certificat: Hersteller: Manufacturer: Inspection No.: Producteur: BST 08-5967 / Midfield 591241 41-527818/001/P 4158400 1536201 NAHTLOSE STAHLROHRE SEAMLESS STEEL TUBES No. de commande du client: No. de commande Benteler: No. d'avis d'expédition: Benteler Auftrags-Nr.: Versandanzeigen-Nr.: Purchase Order No.: Kunden-Bestell-Nr.: **Benteler Order No.:** Dispatch Note No.: Dokument-Nr.: No. du document: Document No.: **Produkt:** Janueler StahinRohr GmbH - Postfach 1340 - 32043 Padorborn - Doutschland ABNAHMEPRÜFZEUGNIS EN 10204-3.1 CERTIFICAT DE RECEPTION EN 10204-3.1 INSPECTION CERTIFICATE EN 10204-3.1 502 25 th Avenue NISKU AB P9E 0K6 KANADA Midfield Supply EN 10204:2005-01

ASME B36.10M-2004, ASME SA-999, ASME Section II Part A Edition 2007 Addenda 2008, ASTM-A 999-2004a ASME SA-333-CD, ASME Section II Part A Edition 2007 Addenda 2008, ASTM-A 333-2005-CD, CSA Standard Z245.1-07 Category II, with agreed deviation: Pt. 9: Eddy current testing instead of hydrostatic est, NACE MR0175/ISO 15156-1:2001, NACE MR0175/ISO 15156-2:2003 GRADE 1, GRADE 290, GRADE 6 Maße - Toleranzen: Conditions de livraison: Lieferbedingungen: Dimensions-tolérances: Dimensions-tolerances: ferms of delivery: Stahlsorte: Steel grade:

Procédé d'élaboration de l'acier: FOUR ELECTRIQUE

Steelmaking process:

TUBES D' ACIER SANS SOUDURE

Product: Produit:

Delivery condition:

Normalized

État de livraison:

Lieferzustand:

Nuance d'acier:

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

Product marking:

Marquage du produit:

NDE M45C S HN DIMENSIONS WEIGHT CLASS WEEK/YEAR WA GERMANY P.O. 591241 SS

AEZ = Azzintenboschritung, Etching ink making, Grevure & l'encre FK = Farbkennzeichnung, colour marking, marquege per coulour FS = Ferbschebbenierung, paint stenciling, marquege per pelnturo FSD = Forbschebbenierung, instruction marking, marquege per point per peinturo FKE = Etiketsenkennzeichnung, instruction FSD = Progestempel, die stemp, marquege per point per peinturo FKE = Etiketsenkennzeichnung, instruction FKE = Etiketsenkennzeichnung, instruction FSD = Progestempel, die stemp, marquege per point angeling in Forber Forber Forber Forber FSD = Forber FSD = Forber FORBER = Etiketsenkennzeichnung, instruction FSD = Progestempel, die stemp, marquege per point angeling in FSD = Tratonestabilisation FSD = Forber FSD = FORBER = F



Benteler Stahl/Rohr GmbH Postfach 13 40 33043 Paderborn Deutschland Tel.; +49,5254.81-0 Fax: +49,5254.13686

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ABN INSPEC	AHMEPF CTION CERTI	ABNAHMEPRÜFZEUGNIS EN 10204-3.1 INSPECTION CERTIFICATE EN 10204-3.1 CERTIFICAT DE RECEPTION EN 10204-3.1	EN 10204	-3.1	Dokument-Nr.: Document No.: No. du document:	Nr.: sant:	41-5278	41-527818/001/P	Prūf-Nr.: Inspectio No. du c	Prūf-Nc: Inspection No.: No. du certificat:			CO 64. G.	Blatt: 2/ 5 Page: Page:
Pos.	Stück	Maße				Lange	Gewicht	E	Schmelzen-Nr.	Prüfdruck Test pressure		Rohr-NrGruppe Tube number group		Vielfachlängen Multiple lengths
Poste		Dimensions	·	faat		Longueur	Poids		No. de coulée	Pression d'épreuve		Série de no. des tubes		Longueurs multiple
0024	150	1" NPS * XXS 20 FT - 22 FT	Į.			3051,18	11144		189120					
Schm	elzenanaly	Schmelzenanalyse [%] / Heat analysis [%] / Analyse sur coulée [%]	sis [%] / Analyse	e sur coulée [%!				:					
Pos.	Schmelzen-Nr. Heat No. No. de coulée	en-Nr. C	<u>~</u>	N	a .	ဟ	85	MO	Z	3	>	NB NB	ш	B
0024	189120	0,135	0,213	08'0	0,010	0,002	0,12	0,04	0,07	0,12	0,003	0,011	0,002	0,0001
1. Formel: 2. Formel:		CE IIW=C+(Mn/6)+((Cr+Mo+V)/5)+((Cu+Ni)/15)<=0,42 % CEV=C+F*((Mn/6)+(Si/24)+(Cu/15)+(Ni/20)+((Cr+Mo+V+Nb)/5) +(5*B)) <=0,40 Mn/C>=3/1	(Cr+Mo+V)/5 Si/24)+(Cu/1)+((Cu+Ni !5)+(Ni/20))/15)<=0,42 % +((Cr+Mo+V	% +Nb)/5) +(5	*B)) <=0,40				Checked	BROMLEY MECHANISM CLANSING. Checked to ASME DIV. 1		Con Con Con Con Con Con Con Con Con Con
4. For		Cr+Cu+Mo+Ni+V<=1,00 %	% 00'1							Sect. HA Z	202 Eg	i. Frog	Add. Ou	Sect. HA For 7. Edit. From District
Forme	elergebniss	Formelergebnisse / Formula results / Résultats des formules	Résultats des fe	ormules						CR 430	1/4	Lett.	ी/3/10	Q
P.S.	Schmelzen-Nr	Izen-Nr	- -	1. Formel	2. Formel	3. Forme		4. Formel					Oato	
Tem	Heat No.	;	7	I. Formula	2. Formula	3. Formula		4. Formula						
Poste		onlee	-	1. Formule	Z. Formule	3. Formule		4. rormule						
0024	189120	0	0,	0,314	0,296	5,926		0,353						
Produ	ktanalyse [Produktanalyse [%] / Product analysis [%] / Analyse sur produit [%)	is [%] / Analyse	sur produit [9	.									
Pos.	Schmelzen-Nr.										:		i	•
1	Heat No	ن	Ū	25	۵	G.	č	2	Z	2	>	82	F	m)

Pos.	Pos. Schmelzen-Nr.												i	
ftem	tem Heat No.	ပ	S	Z	۵.	ဟ	క్ర	2	Z	3	>	NB NB	F	 ™
Poste	Poste No. de coulée						į							3
0024 189	0024 189120	0,140 0,210	0,210	0,79	900'0	0,003	0,11	0,04	0,07	0,11	0,001	0,011	0,002	0,0004

1. Formet: 2. Formet: 3. Formet: 4. Formet:

CE IIW=C+(Mn/6)+((Cr+Mo+V)/5)+((Cu+Ni)/15)<=0,42 %
CEV=C+F*((Mn/6)+(Si/24)+(Cu/15)+(Ni/20)+((Cr+Mo+V+Nb)/5) +(5*B)) <=0,40
Mn/C>=3/1
Cr+Cu+Mo+Ni+V<=1,00 %

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Benteler Stahl/Ro Postfach 13 40 33043 Pederborn Deutschlend Tel.: +49.5254.8	Benteler Stahl/Rohr GmbH Postfach 13 40 33043 Paderborn Deutschland Tel:: +49.5254,81-0 Fax: +49.5254,13666						BENTELER Stahl/Rohr
ABNA INSPECT CERTIFIC	ABNAHMEPRÜFZEUGNIS EN 10204-3.1 INSPECTION CERTIFICATE EN 10204-3.1 CERTIFICAT DE RECEPTION EN 10204-3.1	10204-3.1	Dokument-Nr.: Document No.: No. du document:	41-52	41-527818/001/P	Prūf-Nr.: Inspection No.: No. du certificat:	Blatt: 3/ Page: Page:
Formet	Formelergebnisse / Formula results / Résultats des formulas	Iltats 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		
Die Ro	Die Rohre sind auf Dichtheit geprüff durch: The tubes have been submitted to a leak tightness test by:	durch: mess test by:	Hydrostatic test:	eddy current te	Hydrostatic test: eddy current testing instead of hydrostatic test	ostatic test	PASSED
Les tube	Les tubes ont passé un contrôle d'étanchéité par:	par:					
Die Ro The tube	Die Rohre wurden zerstörungsfrei geprüft: The tubes are non destructive tested:	prüft:	ET-test: acc. to	ASME SA-333,	ASTM-A 333; acc. t	ET-test: acc. to ASME SA-333, ASTM-A 333; acc. to ASTM-E 309; imperfections	s PASSED
Airon	Augensichtkontrolle.	PASSED	Maßkontrolle:		PASSED	Rinofaltversuch:	PASSED
Visual in	Visual inspection:		Dimensions examination:	idon:		Flattening test:	
Examen visuel:	visuel:		Vérification des dimensions:	ensions:		Essai d'aplatissement:	
Ergebni	Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques	g / Results of mechan	ical testing / Résultats	des essais mécani	senb		
Die Pro	Die Probennahme erfolgte an Vielfachlängen.	hlängen.					

Die Probennahme erfolgte an Vielfachlängen. The sampling was carried out on multiple lengths. L'echantillonage eteit realise eux longueurs multiples.

Pos.	Proben-Nr.	Schmelzen-Nr.	Probenabmessung	Bunsse	Streckgrenze	Zugfestigkeit	Dehnung		Einschnürung	Re/Rm
Rem	Specimen No.	Heat No.	Specimen dimensions	ansions	Yield strength	Tensile strength	Elongation		Area reduction	Re/Am
Poste	No. de l'éprouve	No. de l'éprouvette No. de coulée	Dimensions de l'éprouv.	l'éprouv.	Limite élastique	Résistance à la traction Allongement	Allongement		Coefficient de striction	Re/Rm
Anforderungen	ngen				ReH	Rm	A2"	1. Formel		
Requirements	nts		88		N/mm²	N/mm²	*	1. Formula		
Exigences					290-495	415-625	MIN 35	1. Formule		
0024	100000	189120	33,40 X	9,10 303	303	447	56			
0024	000002	189120	33,40 X	9,10	303	447	56			
0024	00000	189120	33,40 X	9,10	303	446	56			
0024	000004	189120	33,40 X	9,10	302	446	56			
0024	00000	189120	33,40 X	9,10	302	445	99			

BENTELER ▼ Stahl/Rohr

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

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Prüf-Nr.:	Inspection No.:	No. du certificat:
41-527818/001/P		
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

Pos.	Proben-Nr. Specimen No.	Proben-Nr. Schmelzen-Nr. Specimen No. Heat No. No deliferoname No. Heat No.	Probenabmessung Specimen dimensions	essung	Ssung Streckgrenze nsions Yield strength	Zugfestigkeit Dehnung Tensile strength Elongation Besistance & la traction Allonoment	Dehnung Elongation		Einschnürung Area reduction Coefficient de striction	Re/Rm Re/Rm
Anforderungen	ngen				ReH	Rm	A2"	1. Formel		
Requirements) sp		ee		N/mm³	N/mm²	*	1. Formula		
Exigences					290-495	415-625	MIN 35	1. Formule		
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Pos.	Proben-Nr.	Schmelzen-Nr.	Нäпе						
tem	Specimen No.	Heat No.	Hardness						
Poste	No. de l'éprouv.	No. de coulée	Dureté						
Anforderungen	ngen		HRC	HB	¥	HRB	HBW		
Requirements	22								
Exigences				MAX 200					
0024	100000	189120		132					
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0024	600003	189120		131					
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Fel.: +49.5254,81-0 Fax: +49.5254,13666

Benteler Stahl/Rohr GmbH

33043 Paderborn Postfach 13 40

ABN/ INSPEC CERTIFI	AHMEPRÜI TION CERTIFICA CAT DE RECEPT	ABNAHMEPRÜFZEUGNIS EN 10204-3.1 INSPECTION CERTIFICATE EN 10204-3.1 CERTIFICAT DE RECEPTION EN 10204-3.1	10204-:	3.1	Dokument-Nr.: Document No.: No. du document:		41-527818/001/P	Prūf-Nr.: Inspection No.: No. du certificat:		Blatt: 5 / Page: Page:
Kerbsc	:hlagbiegever	Such Notched bar in	npact test /	Essai de fic	axion par cho	Kerbschlagbiegeversuch Notched bar Impact test / Essai de flexion par choc (résilience) [CHARPY_V]	5			
Pos.	Proben-Nr.	Pos. Proben-Nr. Schmelzen-Nr. Probenabmessung	Probena	pmessur	D)	Probenlage	Prüftemperatur	Kerbschlagarbeit	Kerbschlagzähigkeit	VerfBruchan
ttem Tem	tem Specimen No. Heat No.	Heat No.	Specimen dimensions	dimension	ø	Specimen position	Test temperature	Absorbed energy	Impact strength	Shear fracture
Poste	Poste No. de l'éprouv. No. de coulée	v. No. de coulée	Dimension	Dimensions de l'éprouvette	uvette	Position de l'éprouvette Température d'essai Energie absorbée	Température d'essai	Energie absorbée	Résistance au choc	Rupture ductile
Anfor	Anforderungen		Länge Breite	Breite	Hőhe	längs (L)		einzel mittel	einzel mittel	
Requirements	ments		Length	Width	Height	longitudinal (L)		single average	single average	
Exigences	3 6 5		Longueur Largeur	Largeur	Hauteur	fongitudinal (L)		individuelle moyenne	individuelle moyenne	
						quer (Q)	GRAD			

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. / fram / 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 deoxydized and inclusion shape controlled with Calcium-Silicon treatment, CSA Z Z245.1-07 meets the requirement for micro hardness of max. 248 HV 500 gf.; Certificate-Remark: Tubes are suitable for sour 245.1 except section 9, This is to confirm that the seamless linepipe supplied by Benteler and verified to CSA Standard 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

THOMAS GOLLAN / GUT Contrôleur

Abnahmebi Inspection (P Es wird bestätigt, daß die geliefenen Erzeugnisse den techn. Lieferbedingungen des Aufrages entsprechen. Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgültig. 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. We carlify that the supplied products comply with the order specification. This document was prepared by means of electronic data processing and is valid without signature.

<u></u>	2011	i i		MATERIAL INSPECTION REPORT	REPORT						
IER:	2011	GRADE:		SA 516-70N			DIA SIZE OR WITH:	·	SAN 🗆	36" X 48"	9
IER:	2011		1					LENGTU			
LIER: ID#:			HEADS	U Z:1				THICKNESS			
,				U WELD CAP				PIPE PUBLISHED NOM	HED NO		,
				□ OTHER				PLATE NOM		1,000 0.500	% 8
	EDMONTON EXCHANGERS		SHELL		GEGIT TARILLA VA EGIN						
			ш		HYDRO	YES NDE	Q	Weigh	Weight per foot for pipe over 4"	for pipe o	over 4"
REQ. MIN TK: 0.5000"			REPAD STRUCT. OTHER			NO YES	YES				
MATERIAL TRACKING QTY	HEAT NUMBER	MBER	MIN.		THICKNE	THICKNESS & LOG		VISUAL	INSP.	REQ. MARKINGS VERIFIED	PREPARE BY
<u> </u>	UEAT MINESES	DI ATE MIMBED		•	80	O	۵				
VS 29855 12'	G4028	275240351	080	0.503"	0.500"	0.504"	0.502"	9	今	も	MQ
WIO# WO-34004/05/06/07		RECEIVED & ACCEPTED	20 BY:	REQUIRED CODE MARKINGS:	MARKINGS:						
	-	(Jakir			NIPPON ST	NIPPON STEEL CORPORATION-MADE IN JAPAN	ATION-MAI	JE IN JAP	AN		
CUSTOMER: COMPASS COMPRESSION		DATE: 7 AUG 1 8 2011			ALL MARKI	ALL MARKINGS STAMPED INTO PLATE	D INTO PL	\TE			

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CERTIFICATE OF COMPLIANCE

& manufacturing ltd.

5545-89 Street Edmonton, Alberta Canada T6E 5W9

www.edmontonexchanger.com

tel 780.468.6722 • QC fax 780.466.4668 • sales fax 780.466.5166

Customer BROMLEY MECHANICAL SERVICES PO 75472

Work Order C90293 Date 2011/07/20 CofC# 26161

Page 1 of 1

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

P90293-8	PLATE(S) ~ 0.5000" NOM X 36" X 48" (Material Spec: SA 516-70 Normalized).	1	G4028-275240351
	Conforms to NACE MR0175 / ISO 15156-2 2009 Annex A		
Brineli Equipme	ent: Newage Calibrated Pin		

Section IX. **EDMONTON EXCHANGER UT: SA-578 LEV.C**

Brinell Hardness Tester

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. dB 100% 38dB SCANNING SENS -4 RANGE CAL IN SEARCH UNIT SERVA X BNC 8 FTLG ABLEA: MICRODOT COAXIAL CABLER: MATERIAL: SA **EXAMINATION** SURFACE / SIDE: TIGHT SCALE COUPLANT: WATER TECH.: TRACY ENMAN #11226 CGSB / SNT: LEVEL II TIME: D 15

Supplementary Examination - Items

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

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, MARUNOVCHI, CHIYODA-EU, TOKYO 100-8071, JAPAN き 津 製 館 所 〒299-1141 千 薬 県 岩 本 市 岩 海 1 番 地 KUMITSU WOPKS 1, KINITSU, KINITSU-CIIT, CHIBA-PREF, 299-1141 JAPAN * **##CEM** E3001P07Q1 E0 Pens Sol. Ceq. A1 2 ×196 ×189 ×100 Mo No VIA 03040 40 40 40 ×100 ×100 ×100 E 粉 春 寿 百 三 CERTIFICATE No. P-13163 PAGE CHEMICAL COMPOSITION 4 2011-04-06 X 108 Ö 8 1001 ¥ د پنو Z ×× P S Cu X # 発作年月日 DATE OF ISSUE 5 × 9 TE3 TE1 ¥ × <u>*</u> 142 143 142 4 ojr . . 3 38 5 50 C Si 16 37 38 z در در 需要类管理番号 CUSTOMERS CONTROL No. 9 <u>6</u> Œ 9 (AS PER EN 10204 CERTIFICATE ON MATERIAL FESTS 3.1 }
EDWONTON EXCHANGER GROUP OF G- 精製水質環境 A V G 156 156 A V G 新華試験 HBW IMPACT TEST 304 316 295 313 307 303 INSPECTION CERTIFICATE F305 TLF305 TLF308 figure Steel Carporation 新四人新聞林八書社 温 **事な %** 73, A Manual Manua 引張試験 TENSILE TEST 查 77 11 17 検 5 57 5 **₹** 275240305TC G4027TESTED-PL 10487 275240304TC G4027TESTED-PL 10488 275240308TC OWPANIE 275240307 數品番号 PLATE No. G4027FR0W 10487 2752 書 数 条 CUSTOMER 製鋼箱柜 試験番号 CAST No. TEST No. 2979 8937 2979 ASME SA-516 GRADE 70-E10 峬 MASS HOT ROLLED STEEL PLATES 氯 1-831-H1-5-4-AT0 HANWA CO. LTD 03 03 03 228-38501090 炪 mm, 'inch, ':feet DIMENSION 0. 5' X96. 5' X480' 0. 5" X96. 5" X480" 0. 5" X96. 5" X480" ₩ .. SPECIFICATION X 中 本 中 ₽ CONTRACT No. REFERENCE NO 注文者假合番号 DOCUMENT No. COMMODITY # × PPGH S

ジュージーが 2018年 1019年 HeadofDepathrant PLATE CLIVALITY CONTROL DEPT. KWITSUWORKS 君津製業所庫板管理グループリータ J. adacki WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE RULES OF THE CONTRACT.

G. 製成部層 Gogs Length. A: 50mm 平影試影片 Rectangular, B: 50mm 北影試影片 Flociangular, B: 50mm 北影試影片 Rectangular, B: 50mm 北影試影片 Rectangular, B: 50mm 不多試影片 Rectangular, B: 50mm 4: 50mm 4: 50mm 4: 50mm 7: 75mm 8: 67mm 9: 製品部房 Pate Fluid Rectangular, B: 20mm 4: 55mm 8: 67mm 7: 75mm 8: 67mm 9: 製品部房 Pate Fluid Rectangular, Ext. Pate Acceptable, | 送ら] P: 報報寸法 Fluid Signary 4: 3.38mm, 4: 3.58mm, 6: 667mm, 7: 75mm, 8: 67mm, 9: 製品部房 Pate Fluid Rectangular, Ext. Pat

聚 NOTES [※1] Location Orientation 位置,方均,T:類節 Top,B:底部 Botlom, L:至斯方向 Longbluchnel, C:直角方向 Transverse。Z:每月方向 Through Thickness,R:45 方向 450-64 to the Longbluchnel, Avis

| X | N:接来 Normalized、Q:接入は、Cuendred、T:接張し Tempered、C R: Controlled Roded、N I C: NIC Process/ N I C: NiC Process, C L C: CLC Process/NiC Process, A R: As Roded、TMR: TWR Process TMC Process. N R: Normalized, Richard Roder Roder Controlled Fracture、L B: 後間出 Labers Expension、A G S: X — X 子 Y イド Nic Authority G Size (FS) T エッイト的版 Ferthe Grain Size, S R: Stress Releved/Foot Weld Heat Treatment

上配注文品は存指定の規格または仕様に従って製造され、その要求専項を満足していることを証明します。

本 100-8071 東京都千代田区九の内二丁目6番1号 HEAD OFFICE 2-6-1,MARUNOUCHI,CHIYODA-KU,TOKYO 100-8071,JAPAN 音楽観簾所 〒299-1141 千楽県音楽市音楽1番地 KAMITSU WOPKS 1,KIMITSU,KIMITSU-CITY,CHIBA-PRF,299-1141,JAPAN MA NA V T.M. ON X 100 M X 100 24 2 * * D || * * * * * E3001P07Q1 E07 Pen Sol. Con Xia xii xii 03040 40 40 03040 03040 PAGE: 5 ᇹ 2011-04-06 在明書書号: P-13163 GERTIFICATE No.: P-13163 後行年月日: 2011-04გ გ ~ ~ œ **岩**菜 <u>ჯ</u> Z : P S Ou , 9 0 143 Z × 43 142 TE3 16 37 × in × in 32 æ ٥ļr 課款 教育 独立 事品 COSTOMETS CONTROL No. 6 AVG 157 157 T1 F308 307 298 287 289 INSPECTION CERTIFICATE T1 F 2 9 1 TUF291 路四大聚聚茶以鱼科 Kippon Stael Carporation % % 温 9 EL % 28 8 **以 景 筑 寒** A STATE TEST STREET S TENSILE TEST 色 1 11 11 XS. 女 VS -----56 56 56 G4027FROW 10488 275240309TC G4027TESTED-PL 10492 275240301TCI G4027FROM 10492 275240302TC 鑑 27524031 27524030 OUPANIE 數品鄉戶 PLATE No. 試験器序 調整数数 CUSTOMER 製鋼番号 CAST No. TEST No. 5958 2979 8937 ASME SA-516 GRADE 70-E10 ij, MASS HOT ROLLED STEEL PLATES 瓤 K 1-831-H1-5-4-AT01 HANWA CO. LTD 03 9 228-38501090 郱 mm, ':inch, ':feet DIMENSION 0. 5' X96. 5' X480" 0. 5" X96. 5" X480" 0. 5' X96. 5' X480 SPECIFICATION 文 备 春 号 DOCUMENT No. REFERENCE No. 数数据号 CONTRACT No. 粫 注文者觀合番号 COMMODITY #

注 限 NOTES [※1] Location Overstation 位置・方向,T:環部 Top,B:底部 Bottom, L:压笔方向 Longbuildinal, C:直角方向 Transverse, Z:板界方向 Through Thickness, R: (5) 方向 45Deg, to the Longbuildinal Axis

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

| ※7] N:海等 Normaticed, Q:施入れ Quenched, T:海灰し Tempered, C.R.: Controlled Rolled, N.I.C.: M.C.Process, T.N.: Controlled Rolled, N.I.C.: M.C.Process, T.N.: Controlled Rolled, N.I.C.: M.C. C. C.L.C. C.L.C. Frocess T.M.C. Trucks Strategies Controlled Training Fractures, L.E.: 通報店 Lateral Expansion, A.G.S:オーステナイト就成 Australia Grain Stra, P.G.S:フェライト就成 Fertile Grain Stra, S.R.: Strees Referendifford Weld Heat Treatment

ジューン・シー | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 2000年 | 20 君津製業所厚板管理グルーブリータ Head of Department
PLATE QUALITY CONTROL DEPT.
KAMTSU WORKS J. adachi-

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,MARONOUCHI,CRIYODA-KU,TOKYO 100-8071,JAPAN 電 著 製 織 所 〒299-1141 千 薬 県 智 孝 市 智 海 1 寿 培 KMMTSJ WOPKS 1,KIMISU,KIMISU-CITY,CHIBA-PREF,299-1141 JAPAN *****CEW** E3601P07Q1 E07 25 Pern Sol. Ceq. x160 x180 x100 40 03140 2 03040 39 PAGE: 6 5 -= = 5 2011-04-06 ž. 証明書書号 CERTIFICATE No.: P-13163 981 X ¢ œ z z S.R. C.A S 901× 0001× 0001× 0001× 0001× 0001× 発行年月日 DATE OF ISSUE ×16 Mn <u>=</u> 4 142 143 144 -4 N TE3 16 37 60 K 8 8 8 4 3 S. 注 教 NOTES [※1] Location Chemistron 位置・方郎、T:蝦螂 Top, B:底部 Boltom, L:压能方向 Longhadinel, C:重角方向 Transverse, Z:板單方向 Through Thickness, R:45 方向 45Deg, to the Longhadinal Add фr P1 6 -CLISTOMER'S CONTROL No. 9 草 (AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
EDMONTON EXCHANGER GROUP OF G- 離職級補理機 A V G A V G A V G 维泰拉泰 1184 307: 304: 297: 312 TLF303 304 INSPECTION CERTIFICATE T L F 3 0 3 T1F306 20日子教皇林八仙四 figure Steel Corporation 盃 96 温 巴건 Ж 30 30 30 引 張 試 歌 TENSILE TEST が観測な 俰 77 11 77 CONSTRUCTION OF THE PARTY OF TH 歓 22 57 56 275240313TC G4027TESTED-PL 10494 275240312TC G4028TESTED-PL 10496 275240316TC 雛 275240315 數吗梅庇 OMPANIE PLATE No. G4027FROM 10494 2752 •• 製鋼番号 試験番号 糖数类 CUSTOMER CAST No. TEST No. 979 8937 2979 ASME SA-516 GRADE 70-E10 MASS HOT ROLLED STEEL PLATES 瓤 影 1-831-H1-5-4-AT01 HANWA CO. LID. 228-38501090 妝 mm, ':inch, ':feet DIMENSION 0. 5' X96. 5' X480' 0. 5' X96. 5' X480 0. 5' X96. 5' X480 公司PPUS 株 公司PPUS 株 江文地類の構造 MEHENBINCE No. 数数数据 SPECIFICATION CONTRACT No. 专用电 DOCUMENT No. COMMODITY 規 格

| ※7] N:物等 Normadzad, Q:物入れ Quenchod, T:物尿し Tempered, C.R.: Controlled Rolled, N.I.C.: NIC Process/TNC Process, C.L.C.: CLC Process/TNC Process, A.R.: As Rotted, T.:物尿 Process/TNC Process, N.R.: Normalizary Rolled Ship Stress Falser Process, N.B.: Stress Falser Process, N.B.: Stress Falser Process, N.B.: Stress Falser Process, N.B.: Stress Falser Process, N.B.: Stress Falser Process (N.B.: Stress Falser Process (N.B.: Stress Falser Process) (N.B.: Stress Falser Process (N.B.: Stress (N.B.: Stress (N.B.: Stress (N.B.: Stress (N.B.: Stress (N.B.: Stress (N.B.: Stress (N.B.: Stress (N.B.: S WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE RULES OF THE CONTRACT. 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、その要求専項を満足していることを証明します。

Head Decement PLATE CLAUTY CONTROL DEPT. KANTSUWOPKS 君津製業所属板管理グループリーダ J. adack.

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※2 G.C. 集点距離 Gage Length, A.: Somm 平形は影片 Recting Less (Sourn 大部は影片 Rectangular, D.: Yourn 大部は影片 Round, E.: Somm 不形は影片 Rectangular, D.: Yourn 子形は影片 Round, E.: Somm 子形は影片 Rectangular, D.: Yourn 子形は影片 Rectangular, D.: Yourn 子形は影片 Rectangular, D.: Yourn 子形は影片 Round, E.: Sourn, S.: Sourn, S.: Sourn, S.: Sourn, S.: Sourn, S.: Sourn, S.: Sourn, D.: Sourn, D.: Washingtoness, Lost Department (本) A.: Of Acceptable, 本 A.: Of Acceptable, 本 B.: F.: Strangular, D.: Sourn, D.: Sour WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE RULES OF THE CONTRACT. 上記法文品は磐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。



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表 NOTES | ※1 Location Otenhadron 位置・方向, T:編第 Top. B:底等 Bottom, L:压底方向 Longthudmal, C: 資点方向 Transverse, Z:板場方向 Through Thickness。R:45 方向 45Deg, to the Longthudmal Axis

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本 100-8071 東京都千代田区北の内二丁目6番1号 HEAD OFFICE 2-6-1, MARINOUCRI, CHITODA-KU, TOKTO 100-8071, JADAN 電 算 観 鏡 所 〒799-1141 千 葉 県 吉 路 市 岩 海 地 KIMITSU WOPKS 1, KIMITSU, KIMITSU-CITY, CRIBA-PREF, 299-1141 JADAN MO ND V TAI OCC SUBSTITUTE A STREET OF STREET Num Sol. Coq. x 100 x 2 1 4 0 ***** E3061P0701 E0 27 33 30 03140 39 03140 6 PAGE: ব - CHEMICAL COMPOSITION % 5 퓽 5 1001 版明書等 CERTHPICATE No. P-13163 股行年月日 DATE OF ISSUE 2011-04-Ģ ×× Ne 60 - 2 Z× Ş P S Ch 2 E 80 X H × 144 144 144 44 ₹ × 144 TE3 15 37 30 900 337 37 S X 咻 5 ... <u>---</u> CLSTOMER'S CONTROL No. ich P11 5 糖酚癸烯基糖 (AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
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| X 7 | N:鏡等 Normalized, Q:地入れ Quendred, T:筋膜し Tempered, C.R:Commised Roked, N.I.C:NIC Process/TMC Process, C.L.C:CLC Process/TMC Process, A.R:As Roifed, T.M.R:TMR Process/TMC Process, N.R:Normalizing Points Process, N.R:Normalizing Profile Process (N.R.) Normalizing Profile 注 駅 NOTES [※1] Location Oversation 位置・方向。下:頭部 Top, B:鹿螂 Botkom, L:压蛋方料 Longbudinal, C:直角方向 Transverse, Z:毛界方向 Through Thickness。R:45 方向 45Deg, to the Longbudinal Auts

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〒100-8071 東京都千代田区丸の内二丁目6番1号 2-6-1, MARDNOUCELL, CHIYODA-KU, TOKTO 100-8071, JAPAN 〒299-1141 千 業 県 岩 津 市 岩 津 1 番 地 1, KINITSU, KINITSU-CITY, CHIBA-PREF, 299-1141 JAPAN Pem Sot, Coq. Al 2 XIM XIM XIM #7 2******* 28 E3001P07Q1 E0 03140 39 03140 8 03140 39 5 PACH. 012 ~ = 012 CHEMICAL COMPOSITION 5 2011-04-06 S 医明音音号 CERTIFICATE No. : P-13163 N C 8 8 X S Z S 1 S ×1960 × 1900 × 190 発行年月日 DATE OF ISSUE 851 X 少 田 安 144 Z × # 社 HEAD OFFICE 的 等 觀 第 河 KIMITSU WORKS 144 144 144 TE3 **#** 39 200 3 ---(2) 調 東 東 東 車 車 車 ECUSTOMERS CONTROL No. S C) ب. س - (AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1) EDMONTON EXCHANGER GROUP OF C- 需要軟管理審 OMPANIES. A V G 156 A √ G 1 5 6 2 0 0 0 0 0 0 0 0 0 0 305 309 292 INSPECTION CERTIFICATE TLF302 F302 新日本聚聚株式會社 Eppen Steel Corporation ж 朏 ж 28 8 CONTROL BANKS OF TENDER OF THE STATE OF THE FI WE BY TENSILE TEST 栖 11 17 11 被 26 56 56 女 G4028FROM . 10506 275240344TCI 10505 275240336TC G4028TESTED-PL 10506 275240343TG 275240346 数咕榔耶 27524033 PLATE No. ٠. 試験番号 數解都形 新期 条 CUSTOMER CAST No. TEST No. 2979 8937 8937 ASME SA-516 GRADE 70-E10 MASS ¥ HOT ROLLED STEEL PLATES 蕉 NE L 盤 1-831-H1-5-4-AT01 HANNA CO. LTD. 03 228-38501090 妝 mm, ':inch, ':feet DIMENSION 0. 5" X96. 5" X480" 0. 5' X96. 5' X480' 0. 5" X96. 5" X480" SPECIFICATION 文書書中 METERBACENO. 数数数器中 CONTRACT No. 柳 **\$** 注文者服合番号 DOCUMENT NO. COMMODITY 注 Selpotry XE

※2 C. 総式部層 Gago Length、A.: Somm 平形は影片 Rochanglate, B.: Somm 平形は影片 Rochanglate, B.: Somm 平形は影片 Rochanglate, B.: Somm 平形は影片 Rochanglate, B.: Somm (3.: Somm (3.: Somm, 4.: Somm, 5.: Somm, 6.: Somm, 6.: Somm, 7.: Somm, 8.: Somm, 注 駅 NOTES [※1] Location Crientation 位置・方的。 T:頻節 Top, B:底部 Bellem, L:圧底方向 Longbudinal, C:直角方向 Transverse, Z:板界方向 Through Thickness。 R:15 方向 45Deg, to the Longbudinal Adds

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、その要求等項を満足していることを配明します。

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



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 言 * 編 編 所 〒299-1141 千 東 県 吉 幹 市 音 降 1 春 地 KMMITSU WOPKS 1,KIMITSU,KIMITSU-CJIT,CHIBA-PREP,299-1141 JAPAN Pen Sol. Opp. X180 X180 X7 X180 X180 X7 2 * * D # * * * * *****CE#** 29 E3001P07Q1 E07 3 9 Mo Nb V TA Oct 6 03140 831 PAGF. ∷ ~ CHEMICAL COMPOSITION % 5 5-- ž 2011-04-06 歴 明 書 書 号 CERTIFICATE No. : P-13163 発 行 年 月 B DATE OF ISSUE 2011-04-Ω × S 20 Mn P S Ch Ni ×100 ×1000 ×1000 ×100 <u>ک</u> پر Z i S X 9 E 分留者 144 144 144 144 N TE3 % % 1- 1-O: X 100 15 37 8 8 8 4 ₩ 7 ~ ~ 無無来有理事句 CUSTOMERSOONTROLING. <u>ب</u> 3 S (AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1) EN EXCHANGER GROUP OF C- 糖 軟 株 衛 祖 軸 衛業就數 HBW DAPACT TEST 2V - 50F B FT. LB 71F306 304 306 AVG EACH 308 304 306 314 INSPECTION CERTIFICATE T1 F 306 第四人数据某人的对 Eppen Steel Corporation 29. ж TENSILE TEST 引着部分 引服就 H 11 OCATION OLE THE CALL OF THE CALL OLE THE CALL OLE THE CALL OLE THE CALL OLD THE CAL 26 56 275240324TCI G4028TESTED-PL 10507 275240323TC G4028TESTED-PL 10510 275240331TC 製品番号 27524032 PLATE No. G4028FROW 10507 2752 .. 試験維料 需要条 Customer 數無海中 CAST No. TEST No. 2979 8937 ASHE SA-516 GRADE 70-E10 輔 MASS HOT ROLLED STEEL PLATES 影 整 1-831-H1-5-4-AT01 03 8 228-38501090 HANWA CO. . 妝 mm, ':inch, ':fect DIMENSION 0. 5' X96. 5' X480' 0. 5' X96. 5' X480' ٠. SPECIFICATION X 申申中 REFERENCE No. Walk to Walk to Walk the Walk to Walk the Walk to Walk ተ 촦 注文者服合番号 DOCUMENT No. CONTRACT NO. COMMODITY 注 SHIPPER

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本 社 〒100-8071 東京都子代田区九の内二丁目6番1号 HEAD OFFICE 2-6-1, MARUNOUCHI, CHIYUDA-KU, TOKYO 100-8071, JAZAN 電 常 数 鑑 所 〒7299-1141 千 薬 県 君 降 市 君 淳 1 番 地 KMMISQLWOPKS 1, KIMIYSU, KIMIYSU-CITY, CHIBA-PREF, 299-1141 JAZAN Mo No V TAI Con to the control of th 2***## ****** 30 E3001P0701 E07 Pera Sol. Out. XI 2 XI 3 XI 0 0 3 1 4 0 | 第2 GL 編点節載 Gago Langth, A: Some 平存証値 Fracengates, B: Some 北部語 Fracengates, B: Some 北部語 Fracengates, B: Some 北部語 Fracengates, B: Some 北部語 Fracengates, B: Some 子形は Fracengates, B: Some 子形は Fracengates, B: Some 子形は Fracengates, B: Some 子形は Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some Particle Fracengates, B: Some 39 39 03140 03140 3 EF 明 書 書 号 □ P-13163 PAGE 012 ~ CHEMICAL COMPOSITION % 5 - -.. 2011-04-06 8 X ð 1001 S.N. C.A. z s N S Or ×1000 ×1000 ×100 発行年月日 DATE OF ISSUE 8 X 4 6 4 144 144 TE3 .. 37 00 × S 50 ი ი ი 4 C Si ×100 ×100 法 教 NOTES [※1] Location Orientation 位置,方向,T:順應 Top,B:底部 Bollon, L:压胀方向 Longitudinal, C:直角方向 Transverse, Z:岩亭方向 Through Thickness。R:45 方向 45Deg, to the Longitudinal Axis 卟 5 CUSTOMER'S CONTROL No. 915 <u>...</u> L. ñ 新 宗 宗 机 斯 非 (AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1) EDMONTON EXCHANGER GROUP OF C- 精酸液值理審 OMPANIES. 듄 上記注文品は鬱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。 A V G A V G 1 5 9 A V G | 新華 試験 | IMPACT TEST | 2V - 50 F | ET L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | F T L B | 314 291 287 309 308 304 309 298 INSPECTION CERTIFICATE F297 TLF304 TLF304 新四水酸糖株式會社 Napon Steel Corporation ж . 63 Ж 200 引 養 試 軟 TENSILE TEST 引機機は 11 5 77 11 NOTION NO vs *** 27 57 57 275240332ICII G4028TESTED-PL 10511 275240339TC 275240340TC 275240342 數品番号 27524033 PLATE No. G4028FROW 10510 2752 G4028FROW 10511 2752 試験番号 製鋼番号 無一類 集 CUSTOMER CAST No. TEST No. 8937 2979 8937 ASME SA-516 GRADE 70-E10 郼 MASS HOT ROLLED STEEL PLATES 飌 1-831-H1-5-4-AT01 93 63 HANWA CO. . LTD 03 228-38501090 妝 mm, ':inch, ':feet DIMENSION 0.5 X 96. 5 X 480' 0. 5' X96. 5' X480 0, 5' X96, 5' X480 SPECIFICATION 文 書 集 和 CONTRACT No. † 文書等号 DOCUMENT No. COMMODITY # ĸ

が野歌の 音楽製作所を表表がレーフリー・一、記憶を配す 音楽製作所を表表がレーフリー・一、記憶を配す PATE CAMPITION (電話を表現) PLATE CUMITY CONTROL DEPT.
KMTSUWOPKS J. Adacki WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE RULES OF THE CONTRACT.

本 社 〒100-8071 東京春千代田区丸の内二丁目6番1号 HEAD OFFICE 2-6-1, MARUNOUCEI, CHIYODA-KU, TOKYO 100-8071, JADAN 音 筆 観 龍 所 〒7299-1141 千 葉 県 岩 幹 市 岩 浄 1 番 地 KMMITSLYWOPKS 1, KIMITSU, KIMITSU-CITI, CHIBA-PREF, 299-1141 JADAN MOTTION VARGUE ****CEW** E3001P07Q1 E07 | 第2 G. 製品配置 Geop Langth, A: Somen 学遊覧的 Fractorogales, B: Somen 対応認動中 Pound, C: 200mm 平波記動片 Rectangular, D: 80mm 平波記動片 Rectangular, D: 80mm 平波記動片 Rectangular, D: 80mm 平波記動片 Rectangular, D: 80mm 平波記動片 Rectangular, D: 80mm 平波記動片 Rectangular, D: 80mm 平波記動 Rectangular, D: 80mm 8: 31 Pen Sol. Con. ×188 ×188 0 3 1 4 0 Mo No V TA CO 03140 m 3 9 PAGE: ~ CHEMICAL COMPOSITION & 5 5 5 5 = 2011-04-06 PLATE QUALITY CONTROL DEPT.
KINNTSU WOPRS J. Adacki 在 朝 十二年 号 CERTIFICATE No. P-13163 **α** 100 Z × S.K. C.A. Ma P S Qu ×100 ×1000 ×1000 ×100 発行年月日 DATE OF ISSUE 91× ळ च <u></u> N TE3 TE1 44 144 144 144 144 37 C Si x 100 00 W 33 ი ო ი 4 法 形 NOTES [※1] Location Orientation 位置、方法、T:類話 Top. B:重新 Bottom, L: 还能方向 Location Aria (2) 是角方向 Transverse。2:能序方向 Transverse。R: 45 方向 450-64 to the Locationarial Aria oļr 裁数 表面 相等 CRISTOMETIS CONTINO. ₩ ••• 50 S <u>2</u> 2 Ų, WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE IN ACCORDANCE WIBROMLEGIEMENTHECHANICAM DERVICES INC. (AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1) EDMONTON EXCHANGER GROUP OF C- 据 教 教 党 理 相 OKPANIES. 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。 157 157 A Y G 156 | We will be 303 2 0 8 3 2 3 2 3 危暴ጚ験 10/0 INSPECTION CERTIFICATE Date LE301 TLF301 TLF312 Ada. Checked to ASME Diget **斯田林悉閣禁火衛**群 Napon Steel Berporation ж % 鱼 #2 EL Ж 58 27 Sect. IIA 2610 Edds TENSULE TIENSULE Tie 明明明明 11 11 × 55 56 20 SAZ G4028TESTED-PL 10512 275240347TC G4028FRON 10512 275240348TC G4028TESTED-PL 15890 275240351TC 製品番号 27524035 PLATE No. 需要系 CUSTOMER 製鋼番号 CAST No. 拉勒維中 TEST No. 2979 2979 8937 ASHE SA-516 GRADE 70-E10 MASS HOT ROLLED STEEL PLATES 瓤 31 最 1-831-H1-5-4-AI01 HANWA CO. LTD. 03 03 03 228-38501090 从 mm, ":inch, ':feet DIMENSION 0. 5" X96. 5" X480" 0. 5' X96. 5' X480' 0. 5' X96. 5' X480' .. HEFENCE No. 数数数。 SPECIFICATION 文 申 申 本 注文者服合書号 CONTRACT No. DOCUMENT NO. COMMODITY # 発売を出る。

V5 29855

EBOTOTERO PXA

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, MARIWOUCHI, CBIYODA-KU, TOKYO 100-8071, JAPAN 吉 草 製 健 所 〒299-1141 千 業 県 君 津 市 君 津 1 春 地 KAMITSU-WORKS 1, KINITSU, KINITSU-CITY, CBIBA-PERF, 299-1141 JAPAN 2 * * D M * * * * * | 第2 GL 個点語集 Gage Langth, A: Somm 平原経動片 Rocangles, B: Somm 北部経動片 Rocangles, D: 70mm 北形成動片 Round, B: 80mm 北形成動片 Rocangless, P: 80mm 北形は動片 Rocangless, P: 80mm 北形は野 Rocangless, P: 80mm 北形は Rocangless, P: 80mm 北形は Rocangless, P: 80mm 北形は Rocangless, P: 80mm 北形は Rocangless, P: 80mm 北北 Rocangless, P: 80mm 北北 Rocangless, P: 80mm 北北 Rocangless, P: 80mm 北北 Rocangless, P: 80mm R: 9.8 7 E3001P07Q1 ₽ 106 ... 2011-04-06 81 X HeadoDoormert RATEQUALITY CONTROL DEPT. KAMTSUWOPKS 君津製鑑所厚板管理グループリー 医明書等。 CERTIFICATE No. P-13163 発行年月B DATE OF ISSUE: 2011-04-Ω × § 逻辑 X S.R. C.A. ₫ 🕏 Man P S C #10K 146 145 ... 4 10 10 10 146 TE3 .. 16 38 C Si ×18 ×100 × 裁数误管监督的 注 界 NCTES | ※ I Location Overtation 改要・方向、7:確認 Top,8:確認 Bodism 12:圧変力的 Location dated。C:重角方向 Transverse。S:緩邪方向 Through Thisdenses。R:65 方向 45Deg to the Location date CUSTOMER'S CONTROL No. (AS PER EN 10204 CERTIFICATE ON WATERIAL TESTS 3.1) EDWONTON EXCHANGER GROUP OF C- 路段等階程 10K 上記法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. + (CR+M0+V) /5 71F303 310 91.0CX INSPECTION CERTIFICATE F308 MAN NAME | HEAT TREATMENT | PLATE & ITEST | SPECIMEN | NORMALITZI |
CHARPY	MPACT	TEST	TEMPERATURE (SI)	
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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.MARDNOUGHI.CHIYODA-KUI.TOKYO 100-8071, JAPAN 電 業 数 維 所 〒299-1141 千 薬 県 岩 浄 市 岩 峰 1 春 地 KMMITSJ-WOCPKS 1.KIMITSU,KIMITSU-CITY,CHIBA-PREF, 399-1141 JAPAN MAS NO V TAI ON X 100 X 9 9 E 第2 CL 報点語集 Gage Lorgit, A.: Sorm 平原経動件 Round, B.: Sonm 外球組動件 Round, C.: Tomm 子部組動件 Round, B.: Sorm, B.: E3001P07Q1 E07 New Sol. 2 X 186 X 2 X 2 X 2 PAGE ∵ CHEMICAL COMPOSITION % 1001 - [×] Headolboathat
RATEQUALITY CONTROL DEFT. 智津製織所厚板管理グループリータ · P-13163 Q × 60 X 逻案 X ۲ پ Mn P S Ca ×100 ×1000 ×1000 ×100 * i 医明 幸 幸 安 CERTIFICATE No. 発行年月日 DATE OF ISSUE 8 X TE3 X Si X 100 X 100 = \$ 注 教 NOTES | ※1 Location Glestation 位置・方向,T:超第 Top,B:底部 Boltom,L:压弦方向 Longfludinal, C:截角方向 Transvente, 2:能影方向 Through Thirduness,R:红 方向 450 Bg, to the Longfludinal Ada 咻 静 税 税 税 協 職 地 CASTOMETS CONTROL No. 金 素 質 禁 | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB # | FB 上記法文品は物格定の根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. (AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
EDMONTON EXCHANGER GROUP OF G- 精 教 教 做 理 祖 OMPANIES 衛 舉 試 験 IMPACT TEST INSPECTION CERTIFICATE XXX X10000 XXX X1000 YTE3 X100 DEGASSED Napon Stort Corporation 的日本新華林大學社 3 × 尴 CHEMICAL GOMPOSITION X: CHEMICAL COMPOSITION X: CHEMICAL GOMPOSITION X: IADLE TREATMENT: VACUUM DISULPHIDE SHAPE CONTROL TENNAL TE 引强政策 數品番号 PLATE No. .. 編 版 版 CUSTOMER 實驗維配 數無指序 CAST No. TEST No. MASS ASME SA-516 GRADE 70-E10 # HOT ROLLED STEEL PLATES 瓤 影 1-831-H1-5-4-AT01 HANWA CO., LID 228-38501090 敚 mm, ":inch, ':feet DIMENSION ** REFERENCE No. 独 SPECIFICATION X 集 市 小 CONTRACT No. DOCUMENT No. 注文者照合署号 COMMODITY # 文法 ED della

3400x 3400K

SAN ENG STEEL FORGING CO LTD
311, Jen Hsin Road, Jen Wu Hsiang
Kaohsiung Hsien, Taiwan, R.O.G.
EN TELL.07-374249; FAV.77-3712923
URL: www.saneng.com.tw

(MILL TEST CERTIFICATE)
EN10204-3.1.8(OIN50049/3.1.8)
Customer: SEYBOLD INTERNATIONAL CORP.
Order No. 7002784/3.17A

Certificate No.: SE<u>-2784C</u> Date: <u>08/25/20</u>10 Page: 1<u>OF</u>.7

) }	e-mail: saneng@ksts.seed.net.tw	seed.net.tw			Order	Order No.: 7002784(3)-T/A	784(3)-T/A	٠,		٠					•			
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F 54 F	T.S. = Tensile Strength, Y.S.=Yield Strength, E.L.=Elongation, R.A.=Reduction of Area N=Normalized, A=Annealed, Q=Quenched, T=Tempered, S.T=Solution Treated, S.R=&A.C=Air Cooled, F.C=Furance Cooled, W.C=Water Cooled, O.C=Oil Cooled. C.E. Value = C + (Mn /6) + (Cr + Mo +V) / 5 + (Ni + Cu) / 15	igth, Y.S.=Yield Str nnealed, Q=Quenc >=Furance Cooled, In /6) + (Cr + Mo +\	rength, E.L.= ched, T=Tem , W.C=Water v) / 5 + (Ni +	Elongation, Fipered, S.T=(Cooled, O.C	ion, R.A.=Reduct S.T=Solution Tres O.C=Oil Cooled	tion, R.A.=Reduction of Area. S.T=Solution Treated, S.R=Stress Relieved, I, O.C=Oil Cooled. 5	tress Relie	sved,						W. A.S. BIRANDE WEEK		* il. do		-	
Ne he	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.	material has been called for by the at	tested in acc bove order.	ordance with	the above	specification	and						Mana	Manager of Quality Assurance Dep't	ality Assu	urance D	ep't		l [

EXPIRY DATE EXTENSION 2311 PQ EXPIRY DATE INITIAL PQ EXPIRY DATE A.O.Q.P. No. 7119 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. WELDER PERFORMANCE QUALIFICATION CARD

MICHAEL KATZ

WASSA File No. Signature of Welder or Operator Card No.: 231 No. 231 844 ABSA File No. Date of Test Process Examiner

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No. 2344 GMAN (SE ABSA File No. W 21120 Name MICHER Date of Test Examiner Process

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WELDER PERFORMANCE QUALIFICATION CARD MICHER LUTZ (Name)

Card No.: 2344

Signature of Welder or Operator

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BATE THITIAL 8	PQ EXPIRY DATE	1/4/11	الإلمار	1/4/12			
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PERFORMANCE QUALIFICATION 2544

Position(s) FLT 30 Seem Min. Outside / " 01) M/N Backing Gas OPTIONAL GMAK Waterial (P.No.) PI-PII Process(es) $\widehat{Gm}\mathcal{W}$ Max. Deposited 0, 1315". Group (F No.) 176 Backing WING Progression EXPIRY DATE EXTENSION 2635 PO EXPIRY DATE INITIAL PO EXPIRY DATE A.O.O.P. No. 7119 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. WELDER PERFORMANCE QUALIFICATION CARD

CHRIS MOOKE
(Name)

(Name)

ABSA File No. Bromley Mechanical Services Signature of Welder or Operator Card No.: 2635 M Kareulschere. Examiner (Print/Type) CHRIS MOORE 5EPT 10, 20/0 Date of Test (Accredited Organization) No. 2635 Name CHAIS MOORE SEPT 10/10 5AW ABSA File No._ Date of Test_ Process Examiner

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Process(es) 51400

EXPIRY DATE EXTENSION 2631 PQ EXPIRY DATE INITIAL PO EXPIRY DATE Bromley Mechanical Services A.O.Q.P. No. 7119 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. WELDER PERFORMANCE QUALIFICATION CARD

CHRIS MORE

L) 24:293

(Name)

ABSA File No. Signature of Welder or Operator Card No.: 2631 CHRIS MORE (Name) (Accredited Organization) Process Conney (SC) Comme 2631 Name CHRIS MOOKE ABSA FILE NO. W 24293 ġ Date of Test Examiner

INITIAL

N 2631	Process(es) Granks (M.C.) Material (P.No.) 71-PU	Min. Outside / OD	Position(s) FCA Qualified	Backing Gas PARGON/CO2		ignature Certificate No.
Card No	Grow JAC	16	MAXWM	(with	Dal Just	More Examiner S
Card No.: 2631	Process(es) Gmmc (2)	Group (F No.)	Wax. Deposited O./Io" MAXLUPS	Backing WCHar+ with with	Progression Devolpe Dal Mile	Que 31,200 Montaine Mariner Signature

Name of WILL Hodgson Gmm ABSA File No. Date of Test Examiner Process

A.O.Q.P. No. 7119 Bromley Mechanical Services

(Accredited Organization)

WELDER PERFORMANCE QUALIFICATION CARD Keulin Hodgson

No. 2628

Card No.: 2628

Signature of Welder or Operator

EXPIRY DATE EXTENSION

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PQ EXPIRY DATE			
INITIAL			
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Card No.: 2628 PERFORMANCE QUALIFICATION

Min. Outside / Wod mix Process(es) Gmina (*) Gmina(me.) Material (P.No.) PI-PII

Max. Deposited 0.110 " ONTS CAPS Qualified Qualified Filler Metal Group (F No.)

Backing Gas Moov/Co2 WIEL Backing wildbut/wild

Progression Dounthu

CAG DOD 37 Certificate No.

A.O.Q.R No. 7119 Bromley Mechanical Services WELDER PERFORMANCE QUALIFICATION CARD This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is in accordance with Secti IX of the ASME Code and subject to the limitations on the reverse side. Signature of Welder or Operator 2629 Card No.: No. 2629 26983 Smm ABSA File No. Date of Test Process Examiner_

INITIAL EXPIRY DATE EXTENSION 2629 PQ EXPIRY DATE INITIAL PQ EXPIRY DATE

N/A	Backing Gas	WITH	Backing WHOUT LAND	Backing CH
ALL	Position(s) ALC Qualified	MANPS	Max. Deposited 0.259 Weld Metal	Max. Deposite Weld Metal
100	Min. Outside / "O.L.	£4	Filler Metal Group (F No.)	Filler Metal Group (F No.)
Material (P-No.) PI-211	Material (P-No.)	Process(es) SMACU SMACU	Smacu	Process(es)
, (Y) V <u>Z</u>	PERFORMANCE QUALIFICATION Z V C /	MANCE OL	PERFOR

Name CHAS UPANER MELLEN 2701 201AU (SC) (mc 960 p8698 ABSA File No. Date of Test Process _

Bromley Mechanical Services

(Accredited Organization)

A.O.Q.P. No. 7119 WELDER PERFORMANCE QUALIFICATION CARD CHAY UNNDERMEULEN

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.

	· 7.	2701		
Dec 30,20#0	Date of Test	Whom were	1111 HANSWINGE	Examiner (Print/Type)

Card No.:

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Min. Outside 1 trop min. Process(es) Granifine) Material (PNO) 21-211 Card No.: 2701

DIAN WIS Qualified FUK +30%. Backing Gas AKO2 Backing to utility Leville Filler Metal F6

Progression | Durth

EXPIRY DATE EXTENSION 2648 INITIAL PO EXPIRY DATE Bromley Mechanical Services A.O.Q.P. No. 7119 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. WELDER PERFORMANCE QUALIFICATION CARD
WELDER PERFORMANCE QUALIFICATION CARD
WELDER PERFORMANCE QUALIFICATION CARD
Mamel Signature of Welder or Operator Card No.: 2648 CHAD UPADER MELLIAN MH/WEW/SEWER Examiner (Print/Type) (Accredited Organization) Name CHIRD UPANDECMELLEN No. 2648 ABSA FILE NO. W 26984 Dec 21 Smar Date of Test Examiner _ Process __

INITIAL

PO EXPIRY DATE

Card No.: 2648

Material (P-No.) 7/-PJ/	Min. Outside I ob min	70 BE LICLARY Qualified 126	Backing Gas N/A-	<	Signature Certificate No.
SMAC	44	TO BELIEVE	MAM	The	Welding Examiner Signature
Process(es) Smith Smith	Filler Metal F3	Max. Deposited 0, 256".	Backing will at full W WITH	Progression CIPNICL	7x 2/20/2 P. Q. Ewity Date

Snow Inc ABSA File No. Date of Test Examiner-Process

Bromley Mechanical Services

(Accredited Organization)

A.O O.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD Koger Kochie

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders Regulations. The performance qualification is necondation with Jection K of the ASME Code and subject to the limitations on the reverse side.

No. 2374

Signature of Welder or Operator

EXPIRY DATE EXTENSION 237

INITIAL					
PO EXPIRY DATE					
INITIAL	11	12	7		
PQ EXPIRY DATE	1//-/1	1/1-1/1	1/1/1/1	•	

Filler Metal Group (F No.)

Without

Progression David Backing

Min. Outside Diameter Position(s) Qualified

Backing Gas OPTION AL

<u> Sかけい</u> Material (P.No.) *A-P*() Card No. 2370 Backing Gas N/A Max. Deposited . 0.250 b. Weld Metal Filler Metal Group (F No.)

Bromley Mechanical Services

A.O Q.P. No. 7119

WELDER PERFORMANCE QUALIFICATION CARD
TOGET ACTIVE
ABSA File No. (Accredited Organization)

Hoger Kochie

W 21333

ABSA File No.

Srade

Name Loger Kochie

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

3006

Date of Test Examiner No. 2370

Signature of Welder or Operator

EXPIRY DATE EXTENSION 2370

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1787	Material (PNo.) $\overrightarrow{P-PH}$ Min. Outside (Lt. g.D.)	Postnorfs Fuar-	Backing Gas の PF7 0 かみた	
1000	Processics) GM/ks/ GM/ks/ Material (PNo.) P=P/II Filler/Metal Group (FNo. E. FC. Mir: Outside 1 t. 6 P		Down	Welding Examiner Signature
Cardino PERFORMANCE QUALIFICATION	Process(es) (5m/kg/ Filler Metal Group (E.No)	Max.Deposited	Backing Control of the Control of th	28/0 3
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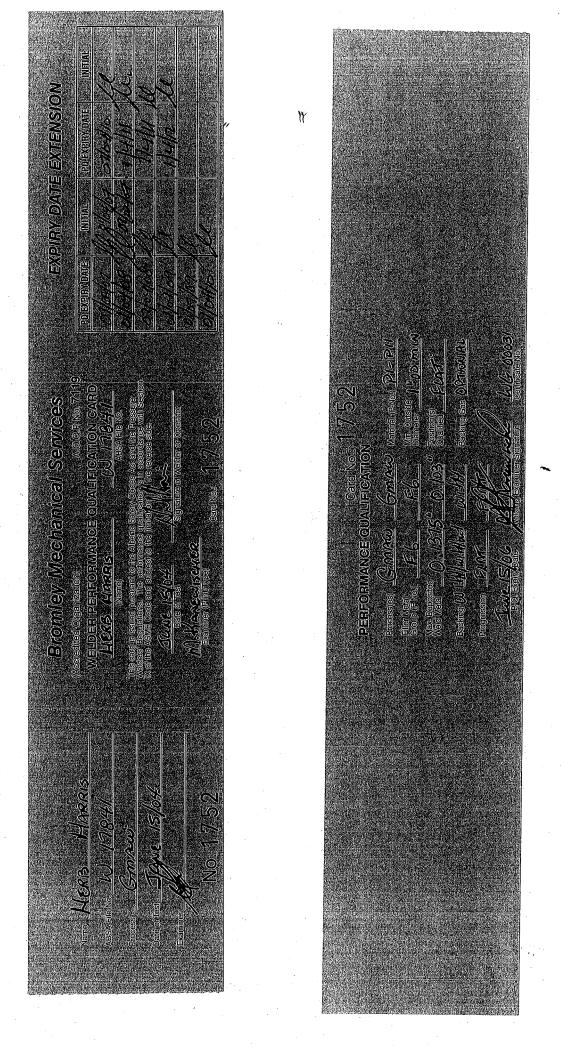
EXPIRY DATE EXTENSION 2303 Bromley Mechanical Services No. 2303 MARCH 29 Sinder Date of Test_ Process

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Card No. PERFORMANCE QUALIFICATION	Process(es) SmRW	Fille Metal F.S.	Max. Deposited 0.250".	Backing With With with	Progression UPHILC	MAR 29,2008
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EXPIRY DATE EXTENSION 2338 JNITIAL PO EXPIRY DATE PQ EXPIRY DATE This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulations. The performance qualification is in accordance with Jection IX of the ASME Code and subject to the limitations on the reverse side. Bromley Mechanical Services WELDER PERFORMANCE QUALIFICATION CARD HERB HIMPALS WITEH Signature of Welder or Operator Card No.: Oct 03,2004 No. 2338 Let 03 300 ABSA File No. Date of Test__ Examiner Process

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Husky Energy

WELDING PROCEDURE REVIEW SHEET

ASME Section IX

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

Pipeline

1.6mm to 38.1mm (Non-impact), 3.2mm to 38.1mm (Impact specified)

VENDOR: BROMLEY MECHANICAL SERVICES INC.

WPS #: BM-11

Application

Electrode

Material

Process

Position Thickness

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

P1 Gr.1 &2 to P1 Gr.1 &2 GMAW/ SMAW

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

☐ Stuctural

DOWN/ FLAT

F6/F4

Diameter	All					
Hardness	☐ Brinnel	▽ Vicker	Rockwell B	☐ Not Done		
PWHT	☐ Yes	☑ No				
Impacts	Low Temprera	ture Impact tested to -46°C	☐ Normal Temper	rature		
Registered	Alberta					
		REVIEW ST	ATTIC			
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	⊠ı	ransitional Sour Service				
COMMENTS						
 Uphand progression only is allowed. Backing rings are not allowed. Max. Weave is restricted to 4 x electrode dia. or 12.7mm for wire feed. Min. Joint thickness for unbevelled joint is 3mm for welding from one side and 6mm for welding from both sides. Accepted for Transitional sour and sour service for piping up to 12.7mm thickness. Production Hardness values not to exceed 210 Hv. 						
<u>Ram</u>	Sridharan Signature		· · · · · · ·	Feb. 03, 2011		
	Jignature		,	X410		

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

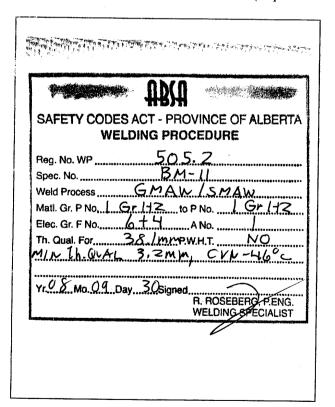
Diameter: All Diameters

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)



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		J.52 00 74 Michaelite
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	N/A
	No Supplementry Filler Metals	No Supplementry Filler Metals
POSITIONS (OW 405)	DOCUMENT DATE	

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	GAS (QW-408) Shielding Gas(es): Argon/CO2
Interpass Temp. Max.: 450°F Preheat Maintenance: Welding & Reheating:	Percent composition (mixtures): 75%/25%
	Flow Rate: 20-40 cfph

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	1/4	DCRP	300-400	23-28	10-25	11
		*\1:-:						

^{*}Minimum Travel Speed At Maximum Volts and Amps

GROOVE DESIGN

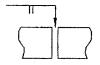


FIGURE 1 SINGLE SQUARE BUTT



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

秦元元,但是自己的自己,因为他就是感觉的感光,但是不是要有更多的的思想的,但是不是是一种的思想,也是这个人的思考的,这是一种的自己,不是是这么



FIGURE 15 DOUBLE BEVEL BUTT

TYPICAL JOINT DESIGN

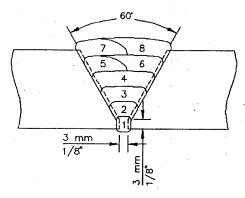


FIGURE 16

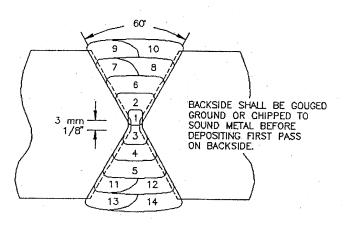


FIGURE 17

and the control of the control of the control of the control of the control of the control of the control of the

Husky Energy

WELDING PROCEDURE REVIEW SHEET

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

VENDOR: BROMLEY MECHANICAL SERVI	CES INC

WPS #: BMS-20N

PQR #: BMS-20N-1, BMS-20N-2 DATE & REV. #: Nov.14, 2007, Rev. 0

Application	☐ Stuctural	Pipeline	ASME Section D	ζ
Electrode	F3/F4			
Material	P1 Gr.1 &2 to P1 Gr.1	&2		
Process	SMAW			
Position	All - Without impact,			
Thickness		on-impact), 3.2mm to 38.	Imm (Impact specified)	
Diameter	All			
Hardness	☐ Brinnel	☑ Vicker	Rockwell B	Not Done
PWHT	☐ Yes	☑ No		
Impacts	Low Temprerature	Impact tested to -46°C	Normal Tempera	ture
Registered	Alberta			
		REVIEW ST	ATUS	
	□ Acce	pted		
	☑ Acce	pted as noted		
	□ Acce	pted as noted: Resub	mit	
		Accepted		
	□ Sour	Sevice		
	☑ Swee	et Service		
	☑ Tran	sitional Sour Service		
		COMMEN	NTS	
2. Bac 3. Ma 4. Min from 5. Ac	m both sides.	owed. to 4 x electrode dia. unbevelled joint is 3mm al sour and sour service f		side and 6mm for welding m thickness. Production
Ram	Sridharan			Feb. 03, 2011
	Signature			Date
1				

9410 - 20 Ave N.W. Edmonton, Alberta, Canada T6N 0A4

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

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

R. Miselmy

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 grove and fillets

AWS Classification:

E-6010, E-7018-1

Thickness:

As Welded: 0.125" to 1.5"

	OVINCE	OF A	BERT	
	AFETY (WELDING			
Reg. No. WF		5.05	.2	
Spec No				**********
Weld Process	***************************************	SMA	W	******
Mati. Gr. P N	lo. I. Grit	Z. to P N	io l Gi	1+3
Elec. Gr. F N	3+4	A N	lo	1
Th. Qual. For				νo
min th. Qua	1 3.24	nm, c	VN-4	^{ن د}
************	*************	**********		
Yr.C.Z.Mo. 1.2	Day Y Sig	ned)
		R. R	OSEBER	. P.ENG.

WELDING PROCEDURE SPECIFICATIONS

Company Name:

Bromley Mechanical Services Inc.

Welding Procedure Specification No.:

BMS-20N

Supporting POR No.(s): Welding Process(es):

BMS-20N-1, BMS-20N-2

SMAW

By: Paul Frederick

Date: November 14, 2007

Rev.#: 0

Type(s): Manual

JOINTS (OW-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

POSIT	IONS ((QW-405)	۱

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

GAS (QW-408)

Shielding Gas(es):

n/a

Interpass Temp. Max.: 450°F

Preheat Maintenance:

Continuous Welding & Reheating:

Percent composition (mixtures):

n/a

Flow Rate:

n/a

Gas Backing:

n/a

Trailing Shielding Gas Composition:

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:

Note:

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

TYPICAL JOINT DESIGN

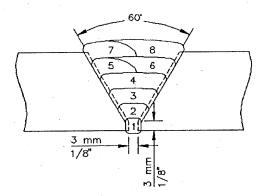


FIGURE 16

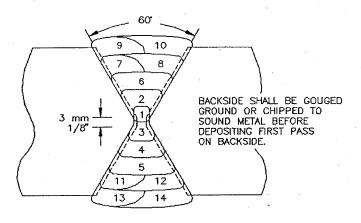


FIGURE 17

en en angles and an engleste de destante de commentante de la commentante de la commentante de la commentante d

GROOVE DESIGN

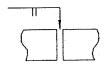


FIGURE 1 SINGLE SQUARE BUTT

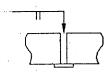


FIGURE 2 SINGLE SQUARE BUTT WITH BACKING STRIP

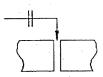


FIGURE 3
DOUBLE SQUARE BUTT

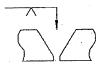


FIGURE 4 SINGLE VEE BUTT

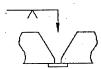


FIGURE 5
SINGLE VEE BUTT.
WITH BACKING STRIP

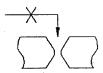


FIGURE 8
DOUBLE VEE BUTT

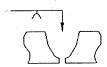


FIGURE 7 SINGLE U BUTT

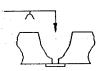


FIGURE 8
SINGLE U BUTT
WITH BACKING STRIP

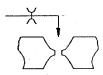


FIGURE 9



FIGURE 10 SINGLE J BUTT

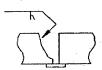


FIGURE 11
SINGLE J BUTT
WITH BACKING STRIP

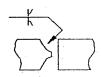


FIGURE 12 DOUBLE J BUTT

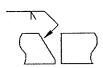


FIGURE 13 SINGLE BEVEL BUTT

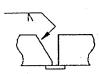


FIGURE 14 SINGLE BEVEL BUTT WITH BACKING STRIP

น้อง การการสะดา ของการการสาขา<mark>งสมาร์สเมราสมาร์สเมราสมาร์สเมราสการสร้า</mark>ยการสมาร์สเมราสมาร์สเมราสมาร์สเมราสมาร์สเมราส

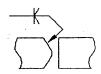


FIGURE 15
DOUBLE BEVEL BUTT

→ Husky Energy

WELDING PROCEDURE REVIEW SHEET

HIS COVE	R SHEET IS USE	D TO IDENTIFY VENDOR	DOCUMENT REL	VIEW STATUS.		
TENDOD.	Duamlay Mach	anical Services Inc.				
	S 710M (Rev.2					
OR #: BM	S 710M-5, BM	S 710M-6				
ATE & R	EV. #: June 28,	2007, Rev.2				
Application	Stuctural	Pipeline	ASME Section	IX		
Electrode	ER 70-S2, E70C-			<u> </u>		
Material	P1 Gr.1 &2 to P1					
Process	GMAW / GMAW All Positions / Fla	(Metalcore)				
Position Thickness	3.2 mm to 203 mm	n				
Diameter	All					
Hardness	☐ Brinnel	✓ Vicker	☑ Rockwell B	Not Done		
PWHT	☐ Yes	☑ No				
Impacts	Low Temprera	ture Impact tested at -46°C	Normal Temper	rature		
Registered	Alberta					
		REVIEW ST	ATUS			
****		Accepted				
		Accepted as noted				
		Accepted as noted: Resub	mit			
		Not Accepted				
		Sour Sevice				
		Sweet Service				
	☐ Transitional Sour Service					
		COMME	NTS			
2. Ba 3. Ma 4. Ma	hand progression cking rings are no ax. Weave is restr ax. thickness of un elding from both s	ot allowed. icted to 4 x electrode dia. or abevelled joint thickness = 31	12.7mm for wire fee nm for welding fron	d. n one side and 6mm for	·	
Ram	Sridharan			Jan. 27, 2011		
	Signature			Date		



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,

ROSEBERG, BOB, P. Eng.

R. Miselmy

Design Survey Engineer

WELDING PROCEDURE SPECIFICATION	ON NO.:	BMS 710M (Rev.2)
WELDING PROCEDURE QUALIFICATION	ON RECORD NO.	(S): BMS 710M-4, BMS 710M-5, BMS 710M-6
QUA	ALIFIED FOR	
Base Metal (Typical): P1 Groups 1 & (SA 333 Gr.6, S) Process(es): GMAW / GMAV Position: GMAW: ALL POSITIONS Diameter: ALL DIAMETEL Filler Metal: ER70S-2, E700	SA 350 Gr.LF2, SA 4 W (Metalcore) Wel GMAW (Metal RS C-6M	420 WPL6, SA 516 Gr.70, etc.) Id Types: GROOVE & FILLET alcore): FLAT & HORIZONTAL
NOTCH TOUGHNESS APPLICATIONS TO BASE METAL THICKNESS RANGE		
COMBINED DEPOSITED WELD METAL TH ASME B31.1 ASME B31.3 ASME SECT. VIII, DIV.1	11CKNESS 19.1 mm (0.7 19.1 mm (0.7 38.1 mm (1.5	750 in.) maximum 750 in.) maximum 500 in.) maximum
ALBERTA BOILERS SAFETY ASSOCIATION PROVINCE OF ALBERTA SAFETY CODES ACT WELDING PROCEDURE Reg. No. WP. 505. 2 Spec No. BMS 710M (REV2) Weld Process GMAW/GMAW(Mc) Matl. Gr. P No. 1 Gr. 17.2 to P No. 1 Gr. 1+7 Elec. Gr. F No. 6 + 6* A No. 1 + * Th. Qual. For 3.2 to 203 m PWHT. NO. CVN-46°c * E70C-6M ELECTRODE Yr. 97 Mo. 97 Day. 3 Signed R. ROSEBERG, PENG. WELDING SPECIALIST		

QW-482 WELDING PROCEDURE SPECIFICATION (WPS)

	Bro	mley Mechanic	al Services In	C.
Welding Procedure S				Date <u>June 28, 2007</u>
				-1, BMS 710M-2, BMS 710M-3
Supporting POR No.	(c)	RMS	710M-4 BMS	710M-5 RMS 710M-6
Molding Process(os)	(s)	VV/ CMVV/ (N/	r 10101-4, DIVIO	710M-5, BMS 710M-6 Type(s) Semi-automatic
vveiding Frocess(es)	GIVIA	AVV / GIVIAVV (IV	ictalcole)	Type(3) <u>Octrii-automatic</u>
JOINTS (QW-402)				
Joint Design	All ASME are	nove & fillet ref	erence constr	uction drawing for joint details.
John Beorgin	Where joint			r to figures 1 to 15 attached
				ee figures 1 to 15 attached
Backing				Not required
Dacking	VVIIII OI WILIIC	out	retainers	Not required
BASE METALS (Q	W-403\			
		8. 2	To P-Num	ber P1 Groups 1 & 2
mickiess Kange.				ess qualified by governing code
Dina Diameter Bange		All base meta		
Pipe Diameter Range	es. Gloo	ve All dia	ameters	
Deposited Wold Mate		All dia		n) movimum
Deposited Weld Meta	ai (Pei Pass)			
		GIVIAVV (IVIELE	alcore): 12.7	mm (0.500 in.) maximum
CILLED METALS /	OW 404)	GMAW		CMANN (Motologra)
FILLER METALS (GMAW (Metalcore)
Specification No. (SF		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 F				Metal cored wire
Supplemental Filler N				Without
Deposited Weld Meta		•		
Groove				* 38.1 mm (1.50 in.) max.**
Fillet		All fillet sizes		
		hall meet the re	<u>equirements o</u>	of ASME Sec.II, Part C SFA 5.18
<u>for E70C-</u>				
				exceed 19.1 mm (0.750 in.)
for ASME	B31.1, B31.3	<u>and 38.1 mm (</u>	<u>1.50 in.) for A</u>	SME Section VIII, Div.1
POSITION (QW-40	•			
Position of Groove _	GMAW: All J	positions	GMAW (Me	talcore): Flat, Horizontal
Position of Fillet	GMAW: All J	positions	GMAW (Me	talcore): Flat, Horizontal
Weld Progression _	GMAW: Ver	tical down	GMAW (Me	talcore): N/A
PREHEAT (QW-40	6)			
Preheat Temperature	e (Minimum) _	See a	ttached prehe	eat sheet
Interpass Temperatu	`		C (450°F)	
				ding. Preheat maintenance is
				after the completion of welding
		ired by the cod		
	·	·	·	

		WPS	NO. BMS 710M (Rev.2)
POST WELD HEAT TREATM			
Temperature Range <u>N/</u>	Α	_ Time Range	eN/A
GAS (QW-408)			
Specification No. (SEA) SE	A 5.32		
AWS No. (Class)GI	MAW: SG-AC-25	GMA'	W (Metalcore): SG-AC-8
Shielding GMAW: 75% Argo			
Shielding GMAW (Metalcore):	92% Argon, 8% C	<u>02, 10 - 25 II</u>	ters per minute (20 - 30 cipir)
Shielding <u>GMAW (Metalcore):</u> Backing <u>No</u>	92% Argon, 8% C ot Required	02, 10 - 25 ll _ Trailing	Not Required
Backing No ELECTRICAL CHARACTER Current Direct	ot Required	_ Trailing Polarity	Not Required Reverse, electrode positive
Backing No ELECTRICAL CHARACTER Current Direct Amps See Table	ot Required ISTICS (QW-409) #1	_ Trailing _ Polarity _ Volts	Not Required Reverse, electrode positive
Backing No ELECTRICAL CHARACTER Current Direct Amps See Table Mode of Metal Transfer G	ot Required ISTICS (QW-409) #1 MAW: Short circuiti	_ Trailing _ Polarity _ Volts ing	Not Required Reverse, electrode positive See Table #1
Shielding GMAW (Metalcore): Backing No ELECTRICAL CHARACTER Current Direct Amps See Table Mode of Metal Transfer Gi Mode of Metal Transfer Gi	ot Required ISTICS (QW-409) #1 MAW: Short circuiti	_ Trailing _ Polarity _ Volts ing	Not Required Reverse, electrode positive See Table #1
Backing No ELECTRICAL CHARACTER Current Direct Amps See Table Mode of Metal Transfer Gl Mode of Metal Transfer Gl Maximum Heat Input	ot Required ISTICS (QW-409) #1 MAW: Short circuiti MAW (Metalcore):	_ Trailing _ Polarity _ Volts ing Spray or Glob	Not Required Reverse, electrode positive See Table #1 pular
Backing No ELECTRICAL CHARACTER Current Direct Amps See Table Mode of Metal Transfer Gl Mode of Metal Transfer Gl	ot Required ISTICS (QW-409) #1 MAW: Short circuiti	_ Trailing _ Polarity _ Volts ing Spray or Glob	Not Required Reverse, electrode positive See Table #1 pular E70C-6M
Backing No ELECTRICAL CHARACTER Current Direct Amps See Table Mode of Metal Transfer Gl Mode of Metal Transfer Gl Maximum Heat Input	ot Required ISTICS (QW-409) #1 MAW: Short circuiti MAW (Metalcore): S	_ Trailing _ Polarity _ Volts ing Spray or Glob	Not Required Reverse, electrode positive See Table #1 pular
Backing No ELECTRICAL CHARACTER Current Direct Amps See Table Mode of Metal Transfer Gl Mode of Metal Transfer Gl Maximum Heat Input Base Metal Thickness Range	ot Required ISTICS (QW-409) # 1 MAW: Short circuiti MAW (Metalcore): S ER70 26,320	_ Trailing _ Polarity _ Volts ing Spray or Glob 0S-2	Not Required Reverse, electrode positive See Table #1 pular E70C-6M

TECHNIQUE (QW-410)

1 = 211111 = (= 112)					
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 carboi	n arc, back-grind as req	uired		
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 (Meta	lcore): 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 (N	Metalcore): Multiple			
Multiple or Single Electrodes	Single				
Electrode Spacing	N/A				
Peening	Not perm	itted			

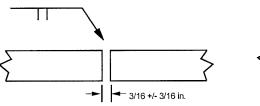
TABLE 1 - WELDING PARAMETERS

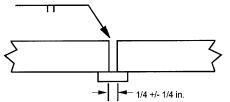
Process	Filler Metal	Diameter mm (in.)	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed mm/min. (i.p.m.)
GMAW	ER70S-2	0.8 (0.030)	DCRP	70 - 130	12 - 21	43 - 250 (1.7 - 10)
GMAW	ER70S-2	0.9 (0.035)	DCRP	80 - 200	13 - 22	53 - 600 (2.1 - 25)
GMAW	ER70S-2	1.1 (0.045)	DCRP	100 - 250	14 - 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.) = Volts X Amps X 60

Travel Speed (ipm)

TYPICAL JOINT DESIGNS





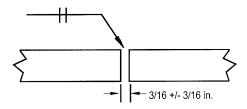
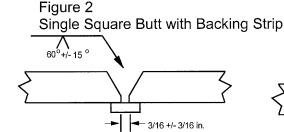
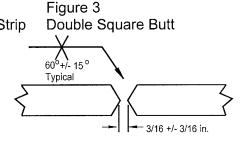
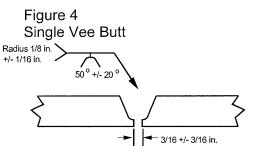


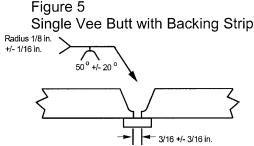
Figure 1
Single Square Butt

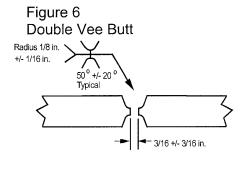


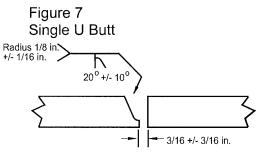




3/16 +/- 3/16 in.







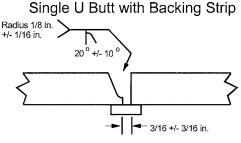
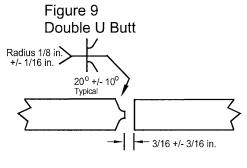
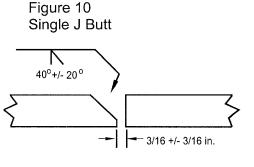
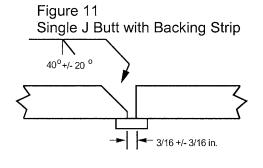


Figure 8







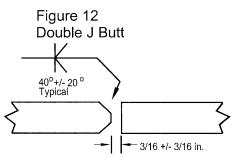


Figure 13 Single Bevel Butt

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	79°C (175°F)
carbon content in excess of 0.30%.	

⁻ The conditions of UW-30 shall apply for base metal temperatures below 0°C (32°F).

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.

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.

⁻ The preheat zone shall extend at least 50 mm (2.0 in.) beyond each edge of the weld.

⁻ The interruption of welding shall be subject to the requirements of paragraph 330.2.4.

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 Numer <u>521650 to 97267</u> 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.) GMAW GMAW (Metalcore) FILLER METALS (QW-404) Specification No. (SFA) SFA 5.18 SFA 5.18 E70C-6M AWS No. (Class) ______ ER70S-2 F6 ____ Filler Metal F-No. F6 A1 Filler Metal A-No. Filler Metal Product Form Solid wire
Filler Metal Trade Name Not recorded Metal cored wire Not recorded Megafil 710M Supplemental Filler Metal Without Without
Size of Electrode See attached sketch
Deposited Weld Metal Thickness 2.54 mm (0.100 in.) 3.78 mm (0.149 in.) Other * Chemical composition meets the requirements of ASME Sec. II, Part C, for E70C-6M 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

ு Husky Energy

WELDING PROCEDURE REVIEW SHEET

ASME Section IX

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

Pipeline

VENDOR: BROMLEY MECHANICAL SERVICES INC.

WPS #: B880 POR #: B880-1

Electrode

Application Stuctural

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

Material	P1 Gr.1 &2 to P1 Gr.1	&2			
Process	SAW				
Position	Flat				
Thickness	4.8mm to 38.1mm (No	n-impact), 15.8mm to 38.	1mm (Impact specified	i)	
Diameter	All				
Hardness	☐ Brinnel	☐ Vicker	☑ Rockwell B	Not Done	
PWHT	☐ Yes	☑ No			
Impacts	Low Temprerature	Impact tested to -46°C	Normal Tempera	ature	
Registered	Alberta				
		REVIEW STA	ATUS		
	□ Accep	ote d			
	☑ Accep	oted as noted			
	□ Accep	oted as noted: Resubr	nit		
	□ Not A	cce pte d			
	□ Sour !	Sevice			
٠	☑ Sweet	t Service			
	✓ Trans	itional Sour Service			
		COMMEN	TS		
2. Min from 3. Acc	n both sides.	wed. abevelled joint is 3mm f sour and sour service fo	or welding from one		•
Ram	Sridharan Signature			Feb. 03, 2011	
	~	·····			



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 \$ 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 testina.

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

A	LBERTA BOILERS SAFETY ASSOCIATION
	PROVINCE OF ALBERTA
	SAFETY CODES ACT WELDING PROCEDURE
R	eg. No. WP
	Dec No
	eld ProcessSAW
M	atl. Gr. P No. 1 Gr 1+2 to P No. 1 Gr 1+2
E	ec. Gr. F No A No J
Th	n. Qual. For
M/	17h. QUAL 15.8 mm, CVN-46°5
•••	***************************************
Yr	07. Mo 2 Day 10. Signed
	R. ROSEBERG, P.ENG WELDING SPECIALIS

WELDING PROCEDURE SPECIFICATIONS

Company Name: Bromley Mechanical Services Inc.

Welding Procedure Specification No.: B880

By: Paul Frederick 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

N/A

No supplementary filler metals

Fillet Welds: All

Pipe Diameter Range: 6 NPS and larger

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

FIL	\mathbf{L}	ER	MET.	ALS	(OW-	404)
-----	--------------	----	------	-----	------	------

	(L	
	Spec. No (SFA)	SFA 5.17
	AWS No. (Class)	EH11K
	^E . No.	F6
Ì	A. No.	Al
	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

Other

POSTWELD HEAT TREATMENT (QW-407)

Temperature Range: None

Time Range: N/A

Welding Progression: Flat Position of Fillet: 1F, 2F

Position(s) of Groove: Flat

POSITIONS (QW-405)

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 to 160 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

Dscillation: 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	Diamet er	Type Polar	Amp. Range	Volt Range	Travel Speed	Other *
							Range(ipm)	
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

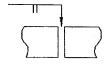


FIGURE 1 SINGLE SQUARE BUTT

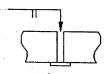


FIGURE 2
SINGLE SQUARE BUTT
WITH BACKING STRIP

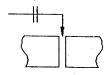


FIGURE 3
DOUBLE SQUARE BUTT

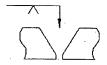


FIGURE 4 SINGLE VEE BUTT

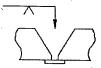


FIGURE 5
SINGLE VEE BUTT.
WITH BACKING STRIP

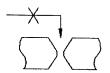


FIGURE 6
DOUBLE VEE BUTT

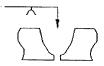


FIGURE 7

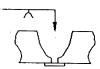


FIGURE 8
SINGLE U BUTT
WITH BACKING STRIP

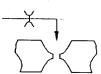


FIGURE 9
DOUBLE U BUTT

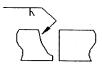


FIGURE 10 SINGLE J BUTT



FIGURE 11
SINGLE J BUTT
WITH BACKING STRIP

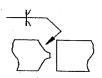


FIGURE 12 DOUBLE J BUTT



FIGURE 13 SINGLE BEVEL BUTT

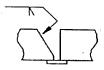


FIGURE 14
SINGLE BEVEL BUTT
WITH BACKING STRIP

e i etras altre meter par sametificamentalisment at destato emperatorio de vertente e encluye e é é sur encord

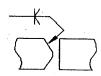


FIGURE 15 DOUBLE BEVEL BUTT

TYPICAL JOINT DESIGN

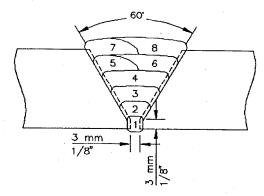


FIGURE 16

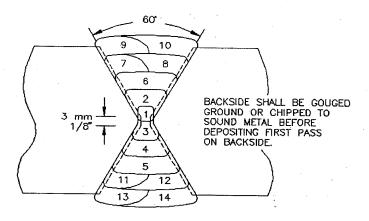


FIGURE 17

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