



QUALITY SYSTEM DOCUMENTATION

Drawing	5005-0001 REV B2
CRN#	U7770.213
Manufactured for	PARAMOUNT RESOURCES
Serial Number	1J105033-2
Description	VERTICAL KNOCKOUT

Manufacturer Specifications, Data Report, Travel Sheet

Drawings & Design Calculations

Receivers, Transfers, MTRs

Weld Procedures/Welder Qualifications

X-Ray Reports

Heat Treatment Report

Hydrostatic Test Report

A-575457

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

1. Manufactured and certified by: Dynacorp Fabricators Inc. 8600 92 Street, Grande Prairie, Alberta, Canada, T8V 7S3
(Name and address of Manufacturer)
2. Manufactured for: Paramount Resources
(Name and address of Purchaser)
3. Location of installation Portable
(Name and address)
4. Type: Vertical 1J105033-2 U7770.21 5005-0001 Rev. B2 2010
(Horizontal or vertical, tank) (Manufacturer's serial number) (CRN) (Drawing number) (National Board number) (Year built)
5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1 2007
Year

- to 2009
Addenda (date)
6. Shell SA516 70N 0.500" 0.125" 60" 5'0" s/s
Material spec. number, grade) Nominal thickness (Code Case numbers) (Corr. allow) (Inner diameter) [Special Service per UG-120 (d)]
7. Seams: Type 1 Full 100% 1150 F 30 min Type 1 Full 100% 1
[Long (welded, dbl. singl., lap, butt)] [R.T. (spot or full)] (Eff. %) (H.T. temp.) (Time, hr) [Girth (welded, dbl. singl., lap, butt)] [R.T. (spot or full)] (Eff. %) (No. of courses)
8. Heads: (a) Material SA516 70N (b) Material SA516 70N
(Spec. no., grade) (Spec. no., grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	Top	0.4375"	0.125"			2:1				Concave
(b)	Bottom	0.4375"	0.125"			2:1				Concave

If removable, bolts used (describe other fastenings)

9. MAWP 170 PSI at max. temp. 300 F
(Internal) (External) (Material spec. number, grade, size, number)
- Min. design metal temp. -20 F at 170 PSI Hydro. pneu., or comb. test press. 255 PSI
(Internal) (External)

10. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain)	Number	Diameter or Size	Type	Material	Nominal Thickness	Reinforcement Material	How Attached	Location
Manway	1	20"	Cl. 150 RFSO	SA105 N	0.500"	SA516 70N	UW16.1(d)	Shell
Inspection	1	8"	Cl. 150 RFSO	SA105 N	0.906"	NA	UW16.1(d)	Top Head
Outlet / Drain	2	4"	Cl. 150 RFSO	SA105 N	0.531"	NA	UW16.1(d)	Top & Bottom Head
Inlet / PSV	2	2"	Cl. 150 RFSO	SA105 N	0.344"	NA	UW16.1(d)	Top Head

11. Supports: Skirt No Lugs 2 Legs 4 Other Attached
(Yes or no) (Number) (Number) (Describe) (Where and How)

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

(Name of part, item number, Manufacturer's name and identifying stamp)
Heads, shell, and repad impact test exempt per UCS-66 Curve D. Nozzle pipe impact test exempt per UCS-66 Curve B & Fig. UCS-66.1 (g). Flanges impact test exempt per UCS-66(c). Fabrication drawing: 5005-0001 Rev. A3. Volume: 1028 US Gallons. PSV to be installed by others.

CERTIFICATE OF SHOP/FIELD COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. "U" Certificate of Authorization Number 38,136
expires December 22, 2011

Date Dec 23/10 Co. Name Dynacorp Fabricators Inc Signed AC Booth
(Manufacturer) (Representative)

CERTIFICATE OF SHOP/FIELD INSPECTION

Vessel constructed by Dynacorp Fabricators Inc at 8600 92 St. Grande Prairie, AB, Canada, T8V 7S3
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, Canada and employed by ABSA
have inspected the component described in this Manufacturer's Data Report on Dec 14/10, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel this described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date Dec 23/10 Signed Henry A. Wadley Commissions WB126324 AB-1434
(Authorized Inspector) (National Board (incl endorsements) State, Province and number)



TRAVEL SHEET

Pg.

DO NOT START CONSTRUCTION WITHOUT AI REVIEW						TRAVEL SHEET REVISION NO.:			
AI REVIEW: <i>Henry Waddy</i>				REVIEW DATE:					
SERIAL NO.: 1J105033-2		JOB NO.: 1J105033-2		VESSEL TYPE: Vertical Knockout					
DRAWING NO.: 5005-0001		DWG. REVISION NO.: REV B2		TRAVEL SHEET INITIATION BY: Claude McDonald					
Seq.	Item	Comments	Q.C.I.	Date	A.I. Hold Points	A.I.	Date	Owner	Date
1.	Calculations in File		CMS	09/15/10	x				
2.	Release of App'd Dwg.		CMS	09/15/10					
3.	Materials Examined		CMS	10/27/10					
4.	Heat Numbers Recorded		CMS	11/29/10					
5.	MTRs Checked		CMS	10/27/10	x	HTW	Dec 23/10		
6.	WPS(s) Checked		CMS	09/15/10	x	HTW	Dec 23/10		
7.	Welder(s) Qualified		CMS	09/15/10	x	HTW	Dec 23/10		
8.	Thicknesses Verified & Recorded		CMS	10/27/10					
9.	Shell(s) & Head(s) Fit-up Inspection		CMS	11/29/10					
10.	Nozzles & Fittings Fit-up Inspection		CMS	11/30/10					
11.	Nozzle Orientation		CMS	11/30/10					
12.	Nozzle & Flange Rating Checked		CMS	11/30/10					
13.	Impact Tests								
14.	Internals Checked		CMS	12/07/10					
15.	Final Internal Inspection	Shell Side Tube Side	CMS	12/08/10	x x	HTW	Dec 08/10		
16.	Weld Sizes Checked		CMS	12/08/10	x	HTW	Dec 08/10		
17.	Welder I.D. Checked		CMS	12/08/10	x	HTW	Dec 08/10		
18.	Final External Inspection		CMS	12/23/10					
19.	Radiography		CMS	12/02/10	x	HTW	Dec 23/10		
20.	Other N.D.E.								
21.	Final Ext. Prior to P.W.H.T.		CMS	12/08/10	x x	HTW	Dec 08/10		
22.	PWHT Chart Checked		CMS	12/09/10	x	HTW	Dec 23/10		
23.	Hydrostatic Test	Shell Side Gauge # Tube Side Gauge #	CMS	12/14/10	x x	HTW	Dec 14/10		
24.	CRN Drawing	CRN# 07770.213	CMS		x	HTW	Dec 23/10		
25.	N.C.R. #								
26.	Nameplate Stamping		CMS	12/23/10	x x	HTW	Dec 27/10		
27.	Manuf. Data Report Completed & Verified		CMS	12/23/10	x x	HTW	Dec 23/10		
28.	Nameplate Installation								

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

* Denotes an A.I. Inspection Point ** Denotes an A.I. Hold Point



the pressure equipment safety authority

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

January 24, 2009

Jarret Mann
DYNACORP FABRICATORS INC
244109 PARTRIDGE PL SW
CALGARY, AB

Dear Jarret Mann,

The drawings, specifications and/or information received on January 08, 2009 are accepted for registration as follows:

CRN : U7770.2

Accepted on: January 24, 2009

Tracking No. : 2009-00033

Reg Type : New Design

Drawing No. : 5005-0001 Rev 0

Description

MAWP

Design Temperature

MDMT

Internal Pressure

1172 kPa

149°C

-29°C

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

Enclosed are stamped prints for your reference.

Sincerely,

GRYNCHUK, MILLA
Design Survey Engineer



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

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

DYNACORP FABRICATORS INC
244109 PARTRIDGE PLACE SW
CALGARY AB T3Z 3M2

Date: June 1, 2009
Account #: 48276
Journal #: 47215
Our File #: 4028488

Attn: JERRET MANN

Re: Application for Design Registration

The design, as detailed in your, Job 1J94533 (Dwg: 5005-0001), for a Pressure Vessel is accepted for registration as follows:

Registered To: DYNACORP FABRICATORS INC CRN: U7770.21

MDMT: -20 deg F

MAWT: 300 deg F

MAWP: 170 psig

Drawing #: 5005-0001

Drawing Revision: 0

	<u>Amount</u>	<u>GST</u>	<u>Total</u>
Fee for reviewing your design:	\$144.00	\$7.20	\$151.20
Total:	\$144.00	\$7.20	\$151.20
Less amount received with submission:			\$0.00
			\$151.20

An invoice for \$151.20 will follow.

Contact me if you have any questions.

ALIREZA BONAKDAR
(778) 396-2032
Alireza.Bonakdar@safetyauthority.ca
Design Engineer

cc:

Saskatchewan



Ministry of
Corrections, Public
Safety and Policing

Licensing and Inspections

Boiler & Pressure Vessel Safety
330 - 1855 Victoria Avenue
Regina, SK S4P 3T2

SASK TOLL FREE: 1-866-530-8599
or PHONE: (306) 787-1443

FAX: (306) 787-9273

REGISTRATION APPROVAL

17-Jul-09

Dynacorp Fabricators Inc
244109 Partridge Place SW
Calgary, AB
T3Z 3M2

Our File 41968 [0V]

ATTENTION: Jarret Mann

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 :	Dynacorp Fabricators Inc	
ITEM :	DRAWING NUMBER :	CRN :
60" x 103 " x 170psi Vertical Knockout Vessel	5005-0001 Rev. 0	U7770.23

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,

Shane Kleisinger, E.I.T.
Codes and Standards Compliance

REMARKS: CRN registered under reciprocal agreement.

Ⓐ 575457

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W
HT
RT₁

170

300

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—20

170

1J105033—2

2010

U7770.213

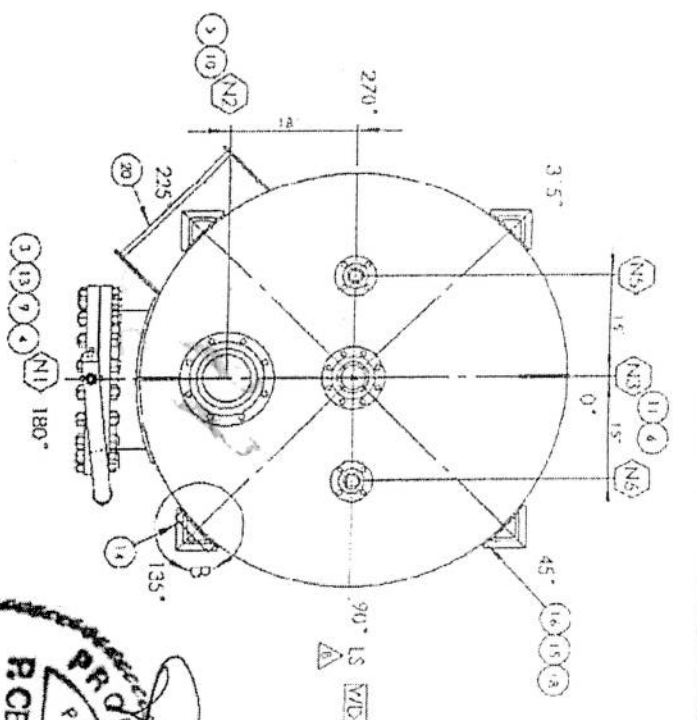
SA 516 70N

0.5

SA 516 70N

0.4375

0.125

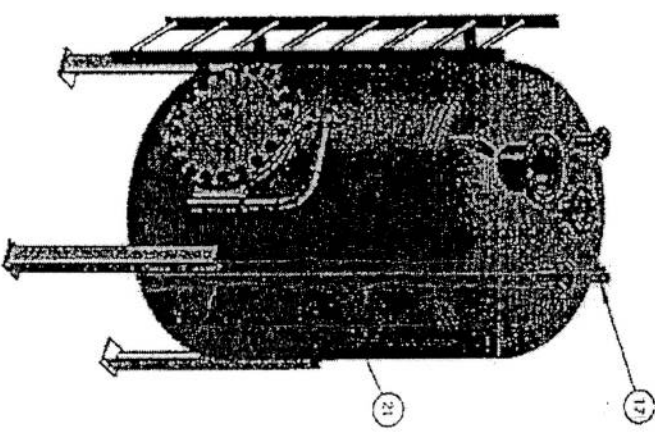
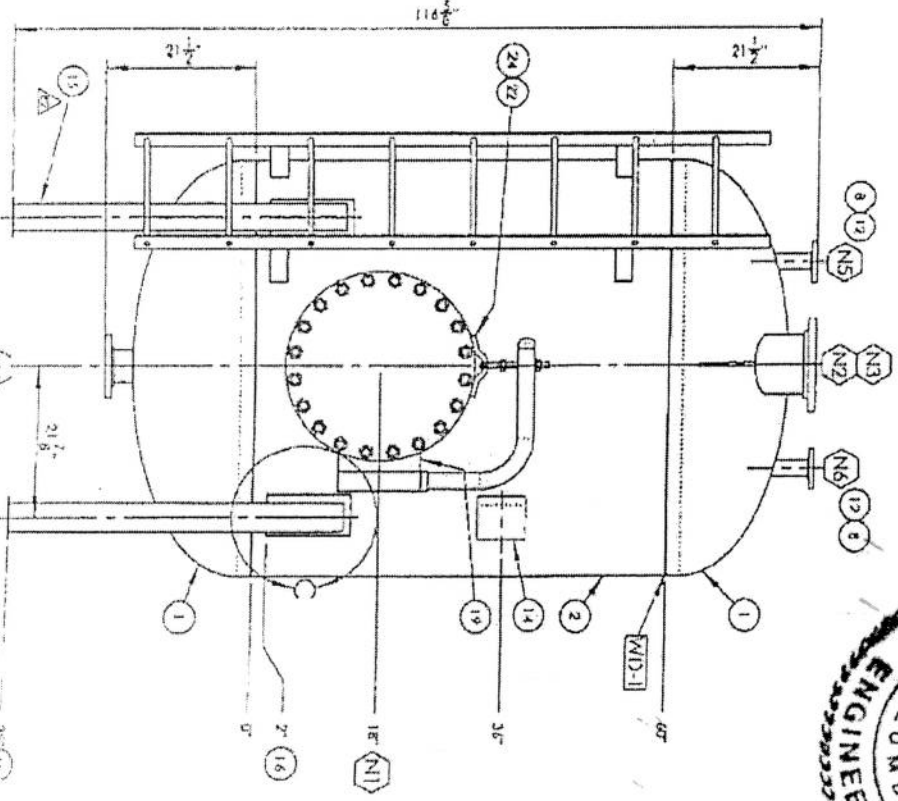


PROFESSIONAL
PAUL OCECHANEK
ENGINEER
ALBERTA
PROFESSIONAL
ENGINEERING
32314
BRITISH
COLUMBIA
ENGINEER

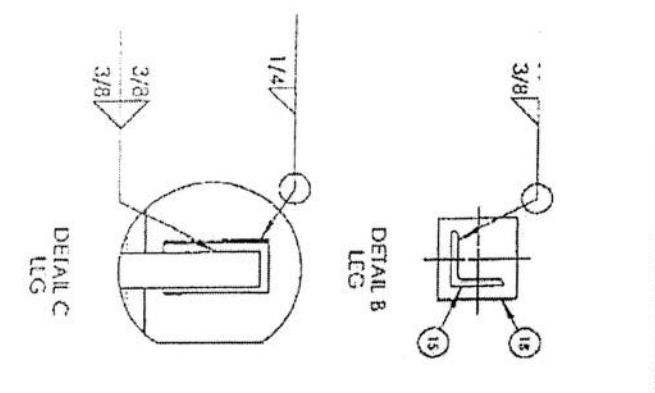
AS BUILT

2, 2010

LUG DETAIL



ITEM NO.	QTY.	PART NUMBER	DESCRIPTION	BRANCH	MATERIAL
1	2	HEAD DADO SHEET	60" ID X 1/2" THK (0.4375" MIN) 2.15E 77E 30DEG C/RX RVTX NO L&D		SA-516-70N
2	1	ROULED SHEET 60" X 72" X 0.5 THK	ROULED SHEET 60" X 72" X 0.5 THK 178" GA 30DEG D/5 BEVEL		SA-516-70N
3	1	5000-0001-106	REPAID 1/2" THK X 24" FINISHED OD X 20" ID ROULED TO FIT SHEET OD		SA-516-70N
4	1	PR20H106	20" NPS XH 0.500" NOM 0.438" MIN 5M 5 PIPE	8 3/4"	SA-106-B
5	1	PR5160106	6" NPS 5160 0.906" NOM 0.793" MIN 5M 5 PIPE	10"	SA-106-B
6	1	PR4160106	4" NPS 5160 0.531" NOM 0.465" MIN 5M 5 PIPE	4 3/4"	SA-106-B
7	1	PR4160106	4" NPS 5160 0.531" NOM 0.465" MIN 5M 5 PIPE	3 7/8"	SA-106-B
8	2	PR2160106	2" NPS 5160 0.344" NOM 0.301" MIN 5M 5 PIPE	7 3/8"	SA-106-B
9	1	FLA201508F50	20" NPS CLASS 150 RAISED FACE SLIP-ON FLANGE		SA-105N
10	1	FLA81508F50	8" NPS CLASS 150 RAISED FACE SLIP-ON FLANGE		SA-105N
11	2	FLA41508F50	4" NPS CLASS 150 RAISED FACE SLIP-ON FLANGE		SA-105N
12	2	FLA21508F50	2" NPS CLASS 150 RAISED FACE SLIP-ON FLANGE		SA-105N
13	1	FLA201508F50	20" NPS CLASS 150 RAISED FACE SLIP-ON FLANGE		SA-105N
14	1	FLA41508F50	4" NPS CLASS 150 RAISED FACE SLIP-ON FLANGE		SA-105N
15	4	5005-0001-201 REV1	NAMEPLATE BRACKET		SA-36
16	4	5005-0001-202	ANG-X4X1/2"	47 3/4"	SA-36/44W
17	2	5005-0001-203	REPAID 3/8" THK X 17" LONG 8" WIDE ROULED TO HI SHELL OD		SA-36/44W
18	4	5005-0001-204	LEADING LUG 1/2" THK CUT AS PER DRAWING		SA-36/44W
19	1	5005-0001-205	BASE PLATE 6" X 6" X 1/4" THK		SA-36/44W
20	1	5005-0001-206	BAR 3/4" X 7" CUT AS PER DRAWING	17"	SA-36/44W
21	1	5005-0001-207	LADDER		SA-36/44W
22	1	5005-0001-208	DAVT ASSY		SA-36/44W
23	1	5005-0001-209	DAVT EYE		SA-36/44W
24	1	5005-0001-210	DAVT LIFTING EYE NUT 3/4"		SA-36/44W
25	20	5005-0001-211	1-1/8" STUD X 6-1/2" LG		SA-193-87M
26	40	5005-0001-212	1-1/8" HEAVY SERIES HEX NUT		SA-193-87M



CODE	CONSTRUCTION IN ACCORDANCE WITH ASME B&PV CODE SEC. VIII DIV. 1 2007ED 09/2010
MAWP:	170 PSI
CORROSION ALLOWANCE:	0.125"
HYDROTEST:	255 PSI
VOLUME:	1028 USGAL
WEIGHT:	3,600 LBS
PWHT:	30 MINUTES @ 1150 ± 50 °F
MONI:	-20 °F

DESIGN DATA

MAWP: 170 PSI

CORROSION ALLOWANCE: 0.125"

HYDROTEST: 255 PSI

VOLUME: 1028 USGAL

WEIGHT: 3,600 LBS

PWHT: 30 MINUTES @ 1150 ± 50 °F

MONI: -20 °F

DESIGN NOTES:

SPRINGS REPAIRS IS NOT PERMITTED FOR WELD DETAIL INFO SEE ECL-WD-03 REV0 FOR TOLERANCE INFO SEE ECL-FT-01 REV1 FOR UNSPECIFIED WELDS USE 3/8" FILLET WELD OR MATCH MATERIAL THICKNESS IF LESS THAN 3/8"

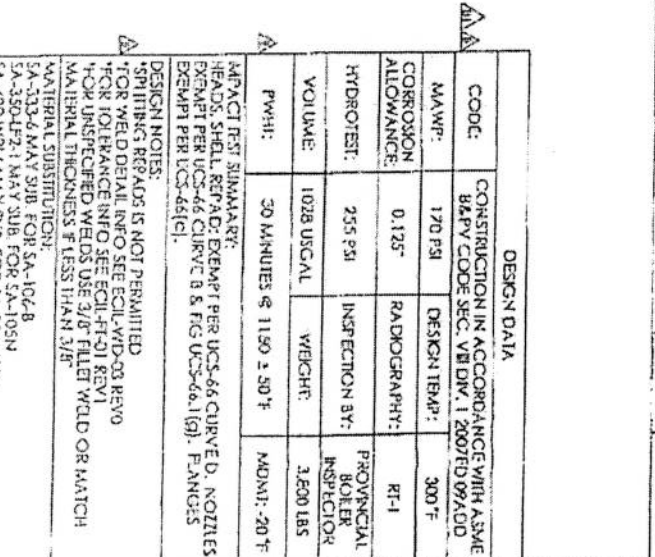
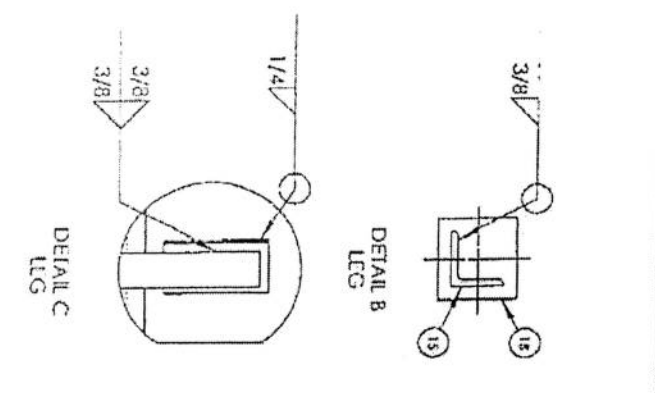
MATERIAL SUBSTITUTION:

SA-333-6 MAY SUB FOR SA-106-B

SA-350-172-1 MAY SUB FOR SA-105N

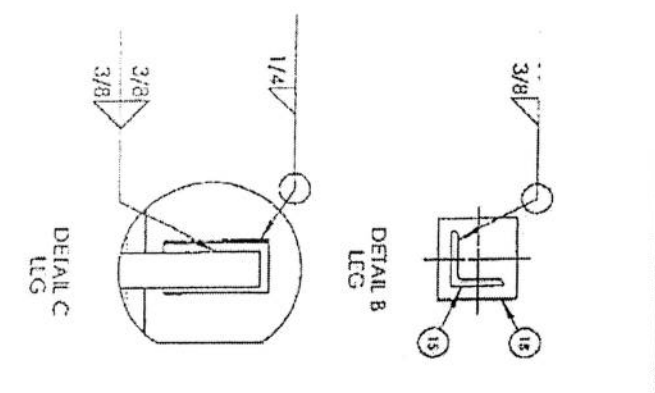
SA-420-WPL-6 MAY SUB FOR SA-232-WPB

SA-516-70N MAY SUB FOR SA-36/44W

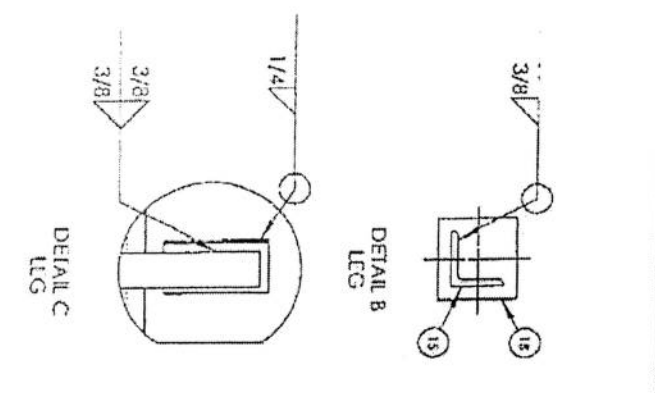


DETAIL B

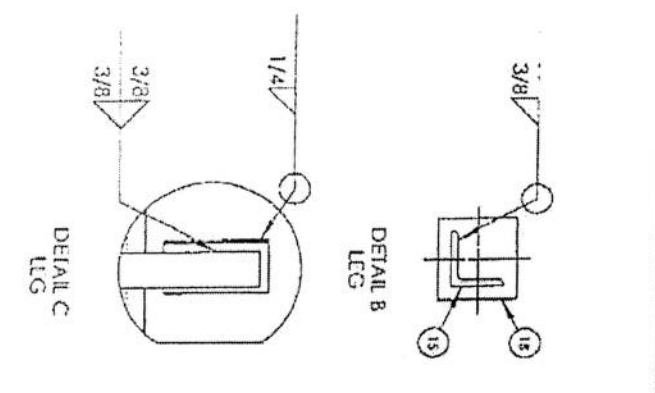
DETAIL C



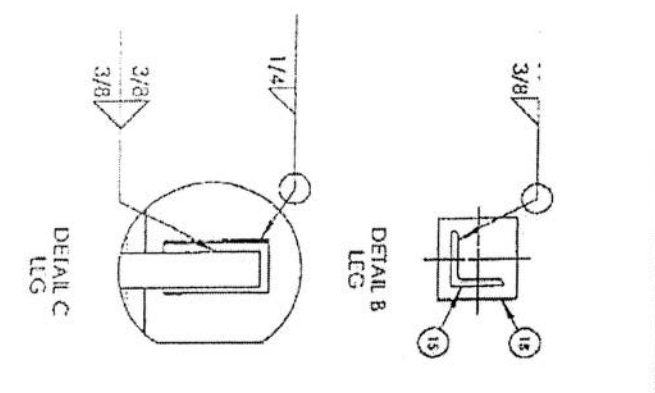
DETAIL A



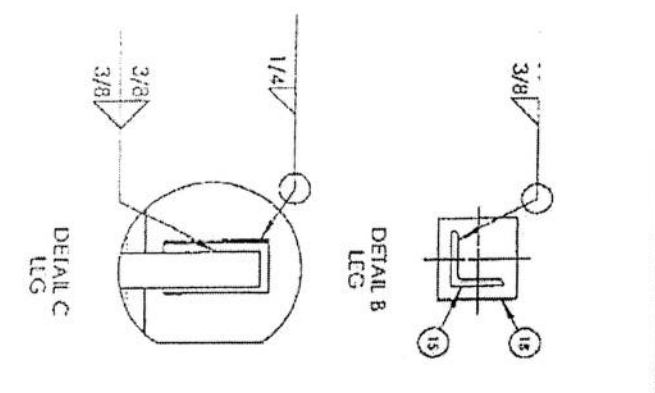
DETAIL B

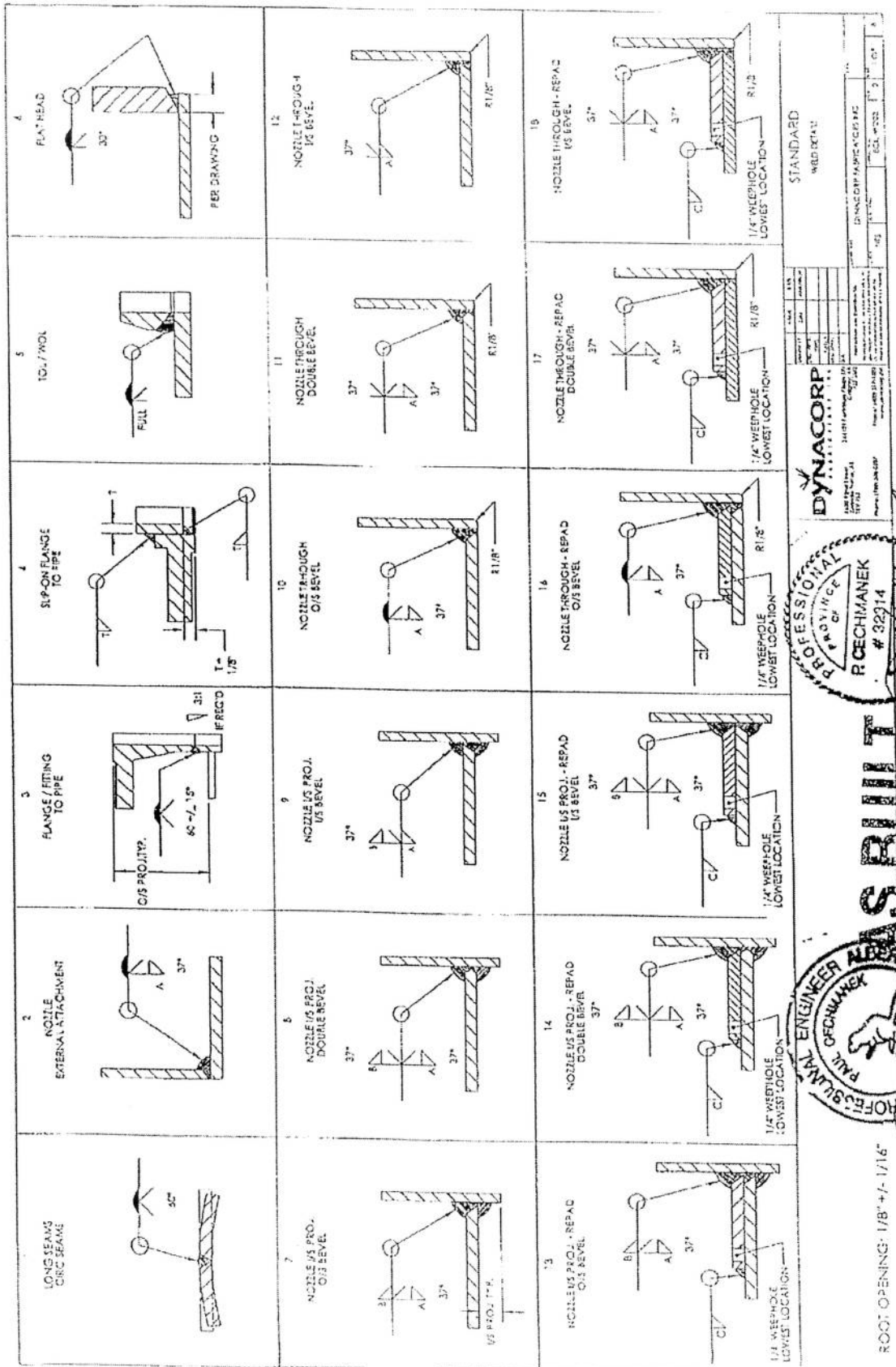


DETAIL C



DETAIL A





ROOF OPENING: 1/8" +1- 1/16"

DEC 2, 2010

STANDARD

WELD DETAIL

DYNACORP

PROFESSIONAL ENGINEER

R. CECHEMANEK

32914

ALBERTA

DEC 2, 2010

Material Receiving Report

Rec. Date:	Sept 30, 2010	Rec'd	J. Schmitt
PO#:	1P5562	By:	
Supplier:	National Oilwell		

[illegible]

V&M FRANCE TUBERIE SAINT SAULVE SAINT SAULVE ZONE INDUSTRIELLE F-59680 SAINT SAULVE 	 VALLOUREC & MANNESMANN TUBES	MATERIAL TEST REPORT - INSPECTION CERTIFICATE 3.1 EN 10204 : 2004 No. / N° : 6869Sv06 Page/Page: 2 / 5 Date/Date: 08.08.2006
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(A13) V&M Item Poste	(A09) Cust. Item Poste	(B07.1) Heat Coulée	(B08) Quantity Nombre	(B11) Total length Long. totale ft	(B13) Weight Poids lb
4		40772	105	4.068,47	15.199

(C71)

HEAT CHEMICAL ANALYSIS / ANALYSE CHIMIQUE COULEE

For each reduction of 0,01 % carbon below 0,30 %, an increase of 0,06 % manganese above 1,06 % will be permitted up to a maximum of 1,20 % manganese

(B07.1) Heat Coulée	(B15) Process Procédé	C %	Si %	Mn %	P %	S %	Cr %	Mo %	Ni %	Cu %	Ti %
min	-	-	0,10	0,29	-	-	-	-	-	-	-
max	-	0,26	0,50	1,06	0,030	0,030	0,40	0,15	0,40	0,40	0,04
40772	Electric (EAF)	0,16	0,20	0,76	0,011	0,003	0,08	0,03	0,07	0,19	0,02

(B07.1) Heat Coulée	Nb/Cb %	V %	B %	0002 %	2528 %	0014 %	1099 %	0001 %				
min	-	-	-	-	3,00	-	-	-				
max	0,11	0,08	0,001	0,15	-	1,00	0,40	0,03				
40772	0,00	0,00	0,000	0,02	4,84	0,37	0,31	0,00				

0002	V+NB+Ti
2528	MN/C
0014	CR+CU+MO+NI+V
1099	C+F(MN/6+SI/24+CU/15+NI/20+((CR+MO+V+NB)/5)+5*B)
0001	NB+V

Heats fully killed
Acier Calmé

(C72)

PRODUCT CHEMICAL ANALYSIS / ANALYSE CHIMIQUE PRODUIT

For each reduction of 0,01 % carbon below 0,30 %, an increase of 0,06 % manganese above 1,06 % will be permitted up to a maximum of 1,20 % manganese

MATERIAL ACCEPTEDCode Edition used
for verification

Addenda

QC

date

07
CWS 10/27/11
09

BENTELER

Stahl/Rohr

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

ABNAHMEPRÜFZEUGNIS EN 10204-3.1

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

Dokument-Nr.: 65-378675/003/P

Prüf-Nr.:
Inspection No.:
No. du certificat:

Blatt: 2/
Page:
Page:

Pos.	Stück Item	Maße Number	Dimensions Poste	feet	Länge Length	Gewicht Weight	Schmelzen-Nr. Heat No.	Prüfdruck Test pressure	Rohr-Nr.-Gruppe Tube number group	Vielfachlänge Multiple lengths
					Longueur	Poids	No. de coulée	Pression d'épreuve	Série de no. des tubes	Longueurs multi
0002	1480	2" NPS * Sched. 40	18 FT - 22 FT		29733,63	113203	539228	207	5	
0004	468	4" NPS * Sched. 40	18 FT - 22 FT		10206,92	111135	748554	207	5	
0007	249	2" NPS * Sched. 160	18 FT - 22 FT		5259,61	39685	748481	207	5	

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

Pos.	Schmelzen-Nr. Item	C	SI	MIN	P	S	CR	MO	NI	CU	V	NB	TI	B
	Heat No. Poste	No. de coulée												
0001	539187	0,140	0,200	0,79	0,006	0,004	0,10	0,03	0,10	0,17	0,001	0,010	0,003	0,0002
0001	748503	0,135	0,190	0,84	0,007	0,005	0,12	0,04	0,11	0,18	0,002	0,010	0,003	0,0001
0002	539228	0,140	0,210	0,81	0,007	0,003	0,11	0,03	0,07	0,13	0,001	0,010	0,003	0,0001
0004	748554	0,130	0,213	0,81	0,008	0,004	0,11	0,03	0,08	0,18	0,002	0,010	0,003	0,0001
0007	748481	0,135	0,180	0,80	0,008	0,004	0,11	0,03	0,08	0,12	0,001	0,010	0,003	0,0001

1. Formel: $CE\ IIW = C + (Mn/6) + ((Cr + Mo + V)/5) + ((Cu + Ni)/15) \leq 0,40\ %$

2. Formel: $CEV = C + F * ((Mn/6) + (Si/24) + (Cu/15) + ((Cr + Mo + V + Nb)/5) + (S * B)) \leq 0,40$

3. Formel: $Mn/C \geq 3/1$

4. Formel: $Cr + Cu + Mo + Ni + V \leq 1,00\ %$

MATERIAL ACCEPTED

Code Edition used
for verification

Addenda

07 09
CMM 10/27/10
QC date

Formelergebnisse / Formula results / Résultats des formules

Pos.	Schmelzen-Nr. Item	1. Formel 1. Formula	2. Formel 2. Formula	3. Formel 3. Formula	4. Formel 4. Formula
	Heat No. Poste	No. de coulée			
0001	539187	0,316	0,298	5,643	0,401
0001	748503	0,327	0,305	6,222	0,452
0002	539228	0,317	0,299	5,786	0,341

98476 A

Contract No: 2110001376
P.O.NO.CNF10067A
Customer: CHINA INDUSTRIAL METAL CO.LTD.

HENGYANG VALIN STEEL TUBE CO., LTD
MILL TEST CERTIFICATE

Add: 10 Dalixincun, Hengyang City, Hunan, China
Tel and Fax: +86 734 8873739 8872942
Cable: 6993
P.C. 421001

DESCRIPTION: SEAMLESS CARBON STEEL PIPES
TOTAL: 909PIECES,24BUNDLES,51.84MT

Date: APR 19,2010
Page: 1/1

SPEC: ASTM/ASME SA53/A53/106/SA106/API 5L/B/X42 CSA Z245.1 GRADE 290,NACE MR0175/ISO15156.2/NACE MR 0103										CERTIFICATE NO: 2010-03-0419									
NO.	BATCH NO.	HEAT NO.	STEEL GRADE	SIZE	BUNDLES	PIECES	FEET	THEORETICAL WEIGHT(MT)	ACTUAL WEIGHT(MT)										
1	903101722	1011032	B/290/X42	2"*.154"*.21FT	5	293	6153	10.202	N/A										
2.1	903101723	0925013	B/290/X42	2"*.154"*.40FT	3	116	4640	7.694	N/A										
2.2	903101724	1011032	B/290/X42	2"*.154"*.40FT	1	37	1480	2.454	N/A										
3	510461205	1011127	B/290/X42	1"*.179"*.21FT	2	235	4935	4.874	N/A										
4	903101715	1011033	B/290/X42	3"*.216"*.21FT	4	146	3066	10.551	N/A										
5.1	903302019	0912544	B/290/X42	4"*.237"*.40FT	6	56	2240	10.971	N/A										
5.2	903302020	0912542	B/290/X42	4"*.237"*.40FT	3	26	1040	5.094	N/A										
Total					24	909	23554	51.84	N/A										
										CHEMICAL COMPOSITION (%)									
NO.	DELIVERY CONDITION	NONDESTRUCTIVE TEST		TYPE:	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Ti	Nb	Mn:C	CE(11W)	
1	HOT-ROLLED	PIPE BODY ET OK	PIPE END MPI OK	P	0.15	0.31	1.08	0.013	0.003	0.04	0.02	0.02	0.01	0.01	0.002	0.001	7.20	0.34	
				P	0.16	0.32	1.09	0.013	0.003	0.04	0.02	0.02	0.01	0.01	0.002	0.001	6.81	0.35	
				L	0.16	0.31	1.07	0.013	0.003	0.04	0.02	0.02	0.01	0.01	0.002	0.001	6.69	0.35	
2.1	HOT-ROLLED	OK	OK	P	0.14	0.29	1.06	0.012	0.002	0.04	0.02	0.02	0.01	0.01	0.002	0.001	7.57	0.33	
				P	0.15	0.31	1.07	0.012	0.002	0.04	0.02	0.02	0.01	0.01	0.002	0.001	7.13	0.34	
				L	0.14	0.32	1.09	0.01	0.004	0.09	0.03	0.04	0.01	0.01	0.003	0.001	7.79	0.34	
2.2	HOT-ROLLED	OK	OK	P	0.15	0.33	1.07	0.012	0.003	0.04	0.02	0.02	0.01	0.01	0.002	0.001	7.13	0.34	
				P	0.15	0.33	1.07	0.012	0.003	0.04	0.02	0.02	0.01	0.01	0.002	0.001	7.13	0.34	
				L	0.16	0.31	1.07	0.013	0.003	0.04	0.02	0.02	0.01	0.01	0.003	0.001	6.69	0.35	
3	NORMALIZED	OK	OK	P	0.14	0.32	1.11	0.017	0.007	0.07	0.03	0.03	0.01	0.01	0.003	0.001	7.93	0.34	
				P	0.14	0.33	1.1	0.017	0.007	0.07	0.03	0.03	0.01	0.01	0.004	0.001	7.93	0.34	
				L	0.14	0.33	1.11	0.016	0.004	0.04	0.02	0.03	0.01	0.01	0.004	0.001	7.71	0.34	
4	HOT-ROLLED	OK	OK	P	0.14	0.31	1.08	0.015	0.004	0.04	0.02	0.03	0.02	0.01	0.004	0.001	7.13	0.34	
				P	0.15	0.31	1.07	0.015	0.004	0.04	0.02	0.03	0.02	0.01	0.003	0.001	6.81	0.35	
				L	0.16	0.34	1.09	0.016	0.004	0.04	0.02	0.02	0.01	0.01	0.003	0.001	7.33	0.35	
5.1	HOT-ROLLED	OK	OK	P	0.15	0.32	1.1	0.013	0.004	0.07	0.02	0.04	0.02	0.01	0.004	0.001	7.33	0.35	
				P	0.15	0.33	1.1	0.013	0.004	0.07	0.02	0.04	0.02	0.01	0.004	0.001	7.33	0.35	
				L	0.15	0.33	1.09	0.016	0.004	0.08	0.03	0.04	0.01	0.01	0.004	0.001	7.27	0.35	
5.2	HOT-ROLLED	OK	OK	P	0.15	0.34	1.09	0.013	0.004	0.07	0.02	0.04	0.02	0.01	0.004	0.001	7.27	0.35	
				P	0.16	0.34	1.09	0.013	0.004	0.07	0.02	0.04	0.02	0.01	0.004	0.001	6.81	0.38	
				L	0.15	0.31	1.11	0.013	0.003	0.08	0.03	0.03	0.01	0.01	0.003	0.001	7.40	0.35	
										MECHANICAL PROPERTIES									
NO.	TENSILE STRENGTH σ _b (PSI)		YIELD STRENGTH σ _s (PSI)		ELONGATION (%)		IMPACT			HARDNESS (HRC ≤22)		HYDROSTATIC TEST (PSI/s)		FLATTEN TEST		BEND TEST			
	strip, L _{bo} =19mm, L _o =50mm										SIZE		AK (J)		Ori/Tem				
1	72500		53650		35		10*3*55		30/38/34		T/0°C		OK		2500		N/A OK		
2.1	72500		54375		32		10*3*55		26/30/28		T/0°C		OK		2500		N/A OK		
2.2	72500		54375		32		10*3*55		26/30/28		T/0°C		OK		2500		N/A OK		
	Full, L _o =50mm																		
3	80475		55100		46		10*3*55		22/22/24		T/0°C		OK		850		N/A OK		
	strip, L _{bo} =19mm, L _o =50mm																		
4	69600		49300		35.5		10*3*55		46/64/96		T/0°C		OK		2500		OK N/A		
	strip, L _{bo} =25mm, L _o =50mm																		
5.1	70325		47125		40.5		10*3*55		33/31/32		T/0°C		OK		2210		OK N/A		
5.2	71050		51475		41.5		10*3*55		32/31/33		T/0°C		OK		2210		OK N/A		

- REMARKS: 1. We hereby certify that this certificate of quality is issued and signed by the manufacturer.
2. We hereby certify that the properties described herein meet the requirement of the above specification
3. We hereby certify that this certificate is issued accordance with EN10204 3.1
4. Type: P-Product analysis, L-Ladle analysis;
5. Hardness to NACE MR0175/ISO15156 AND NACE MR0103

QUALITY MANAGER: *Wang*



110057

MATERIAL ACCEPTED

Code Edition used 07 Addenda 09
for verification QW 10/27/10
QC date

V&M FRANCE TUBERIE SAINT SAULVE SAINT SAULVE ZONE INDUSTRIELLE 59880 SAINT SAULVE	 VALLOUREC & MANNESMANN TUBES Vallourec Group	MATERIAL TEST REPORT - INSPECTION CERTIFICATE 3.1 EN 10204 : 2004 No. : 3767Sv10 Page: 2 / 5 Date: 06.05.2010
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(A13) V&M Item	(A06) Cust. Item	(B07.1) Heat	(B08) Quantity	(B11) Total length ft	(B13) Weight lb
2		316283	28	1.082,41	20.126

(C71)

HEAT CHEMICAL ANALYSIS

For each reduction of 0,01% carbon below 0.30 %, an increase of 0,05% manganese above 1.06 % would be permitted to a maximum of 1,35% manganese.

(B07.1) Heat	(B15) Process	C %	Si %	Mn %	P %	S %	Cr %	Mo %	Ni %	Cu %	Ti %
min	-	-	0,10	0,40	-	-	-	-	-	-	-
max	-	0,26	0,50	1,06	0,025	0,025	-	-	-	-	0,11
316283	Oxygen (BOF)	0,12	0,21	1,28	0,010	0,001	0,050	0,010	0,040	0,030	0,02

(B07.1) Heat	Nb/Cb %	V %	B %	2528 %	1099 %							
min	-	-	-	3,00	-							
max	0,11	0,11	0,001	-	0,40							
316283	0,00	0,01	0,000	10,67	0,30							

2528	MN/C
1099	$C+F(MN/6+SI/24+CU/15+NI/20+((CR+MO+V+NB)/5)+5*B)$

Heats fully killed

(B04)

HEAT TREATMENT

NORMALIZED CONDITION MIN 920°C (1688 F) COOLING AIR

TENSILE TEST RESULTS

Type (C10.1)	Tube strip specimen
Test temperature (C03)	Room temperature
Direction (C02)	longitudinal

SIMPLE LENGTH

MATERIAL ACCEPTEDCode Edition used
for verification

Addenda

07
CWS09
10/27/10
date

QC

Contract No.: 2110000553-2
L/C NO.: N.I.LC.02942

HENGYANG VALIN STEEL TUBE CO., LTD

MILL CERTIFICATE

Name of Customer: NATIONAL OILWELL
ORDER NO.: MSI-5295 (LOT B) P.O. NO.: 1116399
DESCRIPTION: SEAMLESS CARBON STEEL PIPE
TOTAL: 170PIECES, 18BUNDLES, 36,980MT, 3570FT

Add: 10 Dalixincun, Hengyang City, Hunan, China
Tel and Fax: +86 734 8873739 8872942
Cable: 6993
P.C. 421001

Date: MAY 12, 2008
Page: 2/2

SPEC: ASTM A53B-2002/A106B-2002a, ASME SA53B/SA106B-2004, API 5L B/X42, PSL1-2004, NACE MR-0175-2003										CERTIFICATE NO: 08-02-0403												
NO.	BATCH NO.	HEAT NO.	STEEL GRADE	SIZE	BUNDLES	PIECES	FEET	QUANTITY (MT)	ACTUAL WEIGHT(MT)													
4	884300024	0811177	B/X42	4"±0.531"×21FT	6	58	1218	12.453	N/A													
	884300030	0811176	B/X42	4"±0.531"×21FT	1	10	210	2.147	N/A													
	884300031	0814051	B/X42	4"±0.531"×21FT	1	11	231	2.362	N/A													
	884400025	0822452	B/X42	4"±0.531"×21FT	9	81	1701	17.391	N/A													
5	884300044	0811239	B/X42	4"±0.674"×21FT	1	10	210	2.627	N/A													
NO.	DELIVERY		NONDESTRUCTIVE TEST										CHEMICAL COMPOSITION %									
	CONDITION		ET	UT	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Al	V	Ti	B					
4	HOT-ROLLED		OK	N/A	0.16	0.42	0.84	0.014	0.004	0.08	0.03	0.04	0.01	0.004	0.01	0.003	0.0001					
	HOT-ROLLED		OK	N/A	0.16	0.4	0.83	0.011	0.005	0.03	0.04	0.04	0.01	0.007	0.01	0.003	0.0001					
	HOT-ROLLED		OK	N/A	0.16	0.4	0.83	0.011	0.005	0.03	0.04	0.04	0.01	0.007	0.01	0.003	0.0001					
	HOT-ROLLED		OK	N/A	0.19	0.43	0.87	0.014	0.006	0.08	0.04	0.04	0.01	0.004	0.01	0.003	0.0001					
5	HOT-ROLLED		OK	N/A	0.19	0.43	0.87	0.011	0.003	0.08	0.03	0.04	0.01	0.009	0.01	0.004	0.0002					
NO	σ _b (PSI)		σ _s (PSI)		6 (%)		Ak (J)		IMPACT		HARDNESS		HYDROSTATIC TEST (Psi)		FLATTEN TEST		BEND TEST					
	TENSILE STRENGTH		YIELD STRENGTH		ELONGATION		SIZE		AK		OR/TEM											
	strip, L, bo=25, Lo=50mm																					
4	76125		49300		43		N/A		HRC 5.5			3000		OK			N/A					
	74675		54375		38		N/A		HRC 6			3000		OK			N/A					
	75400		50750		37		N/A		HRC 5.5			3000		OK			N/A					
	75400		48575		41		N/A		HRC 5			3000		OK			N/A					
	71775		52700		47		N/A		HRC 4.5			3000		OK			N/A					

Customer: COMMERCIAL METALS COMPANY DBA CMC DALLAS TRADING
6555 N MACARTHUR BLVD, SUITE 800, IRVING, TX 75039, USA

HENGYANG STEEL TUBE GROUP INTERNATIONAL TRADING INC.
MILL TEST CERTIFICATE

Add: 10 Dalixincun, Hengyang City, Hunan, China
Tel and Fax: +86 734 8873739 8872942
Cable: 6993

Description:

PRIME NEWLY PRODUCED CARBON STEEL SEAMLESS LINE PIPE
LC NO:11857290836 P.O.NO:62430 LOT NO:1

TOTAL: 4387 PIECES, 130 BUNDLES, 257.754MT

Date: SEP 07, 2009

P.C. 421001

Page: 3/3

ITEM NO	BATCH NO	HEAT NO	STEEL GRADE	SIZE	BUNDLES	PIECES	FEET	THEORETICAL WEIGHT(MT)	CERTIFICATE NO: 09-02-0905
14	997102704	0911809	X42	3" X 0.300" X DRL	7	71	2840	13.22	
15	997102705	0911807	X42	3" X 0.300" X SRL	6	147	3087	14.369	
16	997102714	0911808	X42	3" X 0.300" X SRL	2	48	1008	4.892	
17	998300305	0911872	X42	3" X 0.300" X SRL	3	69	1449	6.745	
18	997102701	0911799	X42	4" X 0.237" X SRL	9	171	3591	17.586	
19	997302624	0911798	X42	4" X 0.237" X SRL	6	102	2142	10.49	
20	997302625	0911795	X42	4" X 0.237" X SRL	11	192	4032	19.746	
21	997302626	0911796	X42	4" X 0.237" X SRL	6	101	2121	10.387	
22	997302627	0911799	X42	4" X 0.237" X SRL	2	30	630	3.086	
23	997102721	0911808	X42	4" X 0.337" X SRL	8	117	2457	16.716	
24					60	1048	23357	117.037	

CHEMICAL COMPOSITION %									
NO	DELIVERY CONDITION	NONDESTRUCTIVE TEST	ET	TYPE	C	Si	Mn	P	S
14	HOT-ROLLED	OK	N/A	P	0.15	0.30	1.11	0.011	0.003
15	HOT-ROLLED	OK	N/A	L	0.14	0.28	1.11	0.011	0.003
16	HOT-ROLLED	OK	N/A	L	0.15	0.33	1.12	0.009	0.003
17	HOT-ROLLED	OK	N/A	L	0.15	0.32	1.12	0.009	0.003
18	HOT-ROLLED	OK	N/A	L	0.15	0.31	1.11	0.012	0.003
19	HOT-ROLLED	OK	N/A	L	0.15	0.30	1.11	0.012	0.003
20	HOT-ROLLED	OK	N/A	L	0.15	0.31	1.11	0.012	0.003
21	HOT-ROLLED	OK	N/A	L	0.15	0.32	1.12	0.012	0.003
22	HOT-ROLLED	OK	N/A	L	0.15	0.32	1.12	0.012	0.003
23	HOT-ROLLED	OK	N/A	L	0.15	0.30	1.10	0.012	0.004
24	HOT-ROLLED	OK	N/A	L	0.15	0.29	1.10	0.012	0.004
25	HOT-ROLLED	OK	N/A	L	0.15	0.28	1.09	0.010	0.005
26	HOT-ROLLED	OK	N/A	L	0.14	0.28	1.08	0.010	0.004
27	HOT-ROLLED	OK	N/A	L	0.13	0.30	1.10	0.010	0.004
28	HOT-ROLLED	OK	N/A	L	0.13	0.29	1.10	0.010	0.004
29	HOT-ROLLED	OK	N/A	L	0.13	0.31	1.14	0.010	0.004
30	HOT-ROLLED	OK	N/A	L	0.14	0.30	1.10	0.010	0.004
31	HOT-ROLLED	OK	N/A	L	0.15	0.31	1.20	0.012	0.003
32	HOT-ROLLED	OK	N/A	L	0.14	0.31	1.10	0.012	0.004
33	HOT-ROLLED	OK	N/A	L	0.15	0.30	1.10	0.012	0.004
34	HOT-ROLLED	OK	N/A	L	0.15	0.31	1.10	0.012	0.004
35	HOT-ROLLED	OK	N/A	L	0.15	0.32	1.12	0.012	0.003
36	HOT-ROLLED	OK	N/A	L	0.14	0.31	1.12	0.012	0.003
37	HOT-ROLLED	OK	N/A	L	0.15	0.31	1.11	0.012	0.003

MECHANICAL PROPERTIES									
NO	TENSILE STRENGTH	YIELD STRENGTH	ELONGATION	IMPACT	HARDNESS	HYDROSTATIC	FLATTEN TEST	BEND TEST	
14	72500	52925	40	AK	OK	3000	OK	N/A	
15	71775	51475	36.5	N/A	OK	3000	OK	N/A	
16	70325	52200	35	N/A	OK	3000	OK	N/A	
17	68150	48575	37.5	N/A	OK	3000	OK	N/A	
18	71050	52925	39.5	N/A	OK	2850	OK	N/A	
19	70225	52925	42.5	N/A	OK	2850	OK	N/A	
20	73225	55825	36	N/A	OK	2850	OK	N/A	
21	73950	55825	40.5	N/A	OK	2850	OK	N/A	
22	72500	52925	40.5	N/A	OK	2850	OK	N/A	
23	71775	51475	36.5	N/A	OK	3000	OK	N/A	

REMARKS: 1. We hereby certify that the material has been manufactured, sampled, tested and inspected in accordance with the required standards.

2. Properties compliance to EN10204 3.1 B.

3. BRINELL/Rockwell hardness certified to NACE MR 0175-03 and MR 0103-03.

4. TYPE-P-Product analysis L-Ladle analysis.

5. CHEMICAL/MECHANICAL AND PHYSICAL PROPERTIES ARE IN COMPLIANCE WITH CONTRACTED QUALITY AND TOLERANCES AS PER OMARCEAL METALS COMPANY DBA CMC DALLAS TRADING DT PURCHASE ORDER NUMBER 62450

6. MTR AND STENCILING PER CSA 245.1 GRADE 290 LATEST EDITION PSI PER API 5L SPECIFICATION LATEST EDITION ON MTR AND PIPE.

QUALITY MANAGER:

108915

MATERIAL ACCEPTED

Code Edition used for verification

07 10/27/10

Addenda

date

MATERIAL ACCEPTED

Addenda

date

date

date

date

date

date

date

date

DYNACORP

$\frac{1}{2} \leq \frac{r}{R} < 1$

 $20 + 102A$

By:

2



2" S160 A106 PIPE

MATERIAL ACCEPTED

Code Edition used for verification 07 Addenda 09
QC Dec 16/10 date

BENTELER
Stahl/Rohr

Benteler Stahl/Rohr GmbH

Postfach 13 40
33043 Paderborn
Deutschland

Tel.: +49.5254.81-0 Fax: +49.5254.13666

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

Benteler Stahl/Rohr GmbH - Postfach 1340 - 33043 Paderborn - Deutschland
National-Oilwell Canada Ltd.
7127 - 56 Avenue
EDMONTON, AB T6B 3L3
KANADA

Dokument-Nr.: 65-378675/003/P
Document No.:
No. du document:
Kunden-Bestell-Nr.: 06-5704 / 10501778
Purchase Order No.:
No. de commande du client:
Benteler Auftrags-Nr.: 1152866
Benteler Order No.:
No. de commande Benteler:
Versandanzeigen-Nr.: 6538718
Dispatch Note No.:
No. d'avis d'expédition:
Produkt: NAHTLOSE STAHLROHRE
Product: SEAMLESS STEEL TUBES
Produit: TUBES D'ACIER SANS SOUDURE
Prüf-Nr.:
Inspection No.:
No. du certificat:
Hersteller: Warmrohrwerk Dinslaken
Manufacturer: ISO/TS 16949 (ISO 9001) DIN CERT-11674C-2003
Producteur: PED 97/23/EC TÜV Cert 07 202 4834 Z 071916H-1
Herstellerzeichen:
Manufacturer's brand:
Marque du producteur:
Stempel des Abnahmebeauftragten: WA
Stamp of the inspection representative:
Timbre du contrôleur:
Stahlschmelzungsverfahren: ELEKTROSTAHL
Steelmaking process: ELECTRIC FURNACE
Procédé d'élaboration de l'acier: FOUR ELECTRIQUE

Lieferbedingungen: CSA Standard Z245.1-02 Category I, API Specification 5L Forty-Third Edition, March 2004, PSL 1, ASTM-A
Terms of delivery: 106-2004b, S5, ASME SA-106, ASME Section II Part A Edition 2004 Addenda 2005, S5, NACE MR0175/ISO
Conditions de livraison: 15156-1:2001, NACE MR0175/ISO 15156-2:2003

Maße - Toleranzen: ASME B36.10M-2004, ASME SA-530, ASME Section II Part A Edition 2004 Addenda 2006, ASTM-A 530-2004a
Dimensions-tolerances:

Stahlsorte: GRADE 290, GRADE B, GRADE X 42
Steel grade:

Nuance d'acier:

Lieferzustand: Hot rolled
Delivery condition:

État de livraison:

Produktkennzeichnung: see attachment product marking
Product marking:

Marquage du produit:

Pos. Item Poste	Stück Number Nombre	Maße Dimensions Dimensions	Länge Length Longueur	Gewicht Weight Poids	Schmelzen-Nr. Heat No. No. de coulée	Prüfdruck Test pressure Pression d'épreuve	Rohr-Nr.-Gruppe Tube number group Série de no. des tubes	Vielfachlängen Multiple lengths Longueurs multiples
0001	1595	2" NPS * Sched. 80 18 FT - 22 FT	31439,54 feet	157829 lbs	539187	207 bar	5	
0001	236	2" NPS * Sched. 80 18 FT - 22 FT	4685,63 feet	23477 lbs	748503	207 bar	5	98476

BENTELER

Stahl/Rohr

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

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

65-378675/003/P

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

Blatt: 2 /
Page:
Page:

Pos.	Stück	Maße	Länge	Gewicht	Schmelzen-Nr.	Prüfdruck	Rohr-Nr.-Gruppe	Vielfachlänge
Item	Number	Dimensions	Length	Weight	Heat No.	Test pressure	Tube number group	Multiple lengths
Poste	Nombre	Dimensions	Longueur	Poids	No. de coulée	Pression d'épreuve	Série de no. des tubes	Longueurs multi
			feet	lbs		bar		
0002	1480	2" NPS * Sched. 40 18 FT - 22 FT	29733,63	113203	539228	207	5	
0004	468	4" NPS * Sched. 40 18 FT - 22 FT	10206,92	111135	748554	207	5	
0007	249	2" NPS * Sched. 160 18 FT - 22 FT	5259,61	39685	748481	207	5	

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

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI	CU	V	TI	B
Item	Heat No.												
Poste	No. de coulée												
0001	539187	0,140	0,200	0,79	0,006	0,004	0,10	0,03	0,10	0,17	0,001	0,010	0,003
0001	748503	0,135	0,190	0,84	0,007	0,005	0,12	0,04	0,11	0,18	0,002	0,010	0,003
0002	539228	0,140	0,210	0,81	0,007	0,003	0,11	0,03	0,07	0,13	0,001	0,010	0,003
0004	748554	0,130	0,213	0,81	0,008	0,004	0,11	0,03	0,08	0,18	0,002	0,010	0,003
0007	748481	0,135	0,180	0,80	0,008	0,004	0,11	0,03	0,08	0,12	0,001	0,010	0,003

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

Formelergebnisse / Formula results / Résultats des formules

Pos.	Schmelzen-Nr.	1. Formel	2. Formel	3. Formel	4. Formel
Item	Heat No.	1. Formula	2. Formula	3. Formula	4. Formula
Poste	No. de coulée	1. Formule	2. Formule	3. Formule	4. Formule
0001	539187	0,316	0,298	5,643	0,401
0001	748503	0,327	0,305	6,222	0,452
0002	539228	0,317	0,299	5,786	0,341

98476 A

BENTELER

Stahl/Rohr

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

Pos.	Schmelzen-Nr	1. Formel	2. Formel	3. Formel	4. Formel
Item	Heat No.	1. Formula	2. Formula	3. Formula	4. Formula
Poste	No. de coulée	1. Formule	2. Formule	3. Formule	4. Formule
0004	748554	0,311	0,283	6,231	0,402
0007	748481	0,310	0,291	5,926	0,341

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

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI	CU	V	NB	TI	B
Item	Heat No.													
Poste	No. de coulée													
0001	539187	0,150	0,180	0,79	0,008	0,004	0,10	0,03	0,10	0,17	0,002	0,010	0,003	0,0005
0001	539187	0,150	0,180	0,78	0,008	0,004	0,10	0,03	0,10	0,17	0,002	0,010	0,003	0,0004
0001	748503	0,130	0,160	0,84	0,008	0,004	0,12	0,04	0,11	0,17	0,002	0,010	0,003	0,0005
0001	748503	0,140	0,170	0,83	0,008	0,004	0,12	0,04	0,11	0,17	0,002	0,010	0,002	0,0004
0002	539228	0,130	0,190	0,82	0,011	0,006	0,10	0,03	0,09	0,13	0,002	0,010	0,002	0,0005
0002	539228	0,130	0,170	0,84	0,011	0,006	0,10	0,03	0,09	0,14	0,002	0,010	0,003	0,0006
0004	748554	0,130	0,190	0,82	0,009	0,003	0,10	0,02	0,10	0,20	0,001	0,010	0,002	0,0005
0004	748554	0,130	0,210	0,82	0,009	0,004	0,11	0,03	0,08	0,20	0,002	0,010	0,003	0,0003
0007	748481	0,140	0,160	0,77	0,008	0,002	0,12	0,03	0,06	0,10	0,001	0,010	0,002	0,0003
0007	748481	0,140	0,160	0,76	0,008	0,002	0,11	0,03	0,06	0,10	0,001	0,010	0,002	0,0003

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

Formelergebnisse / Formula results / Résultats des formules

Pos.	Schmelzen-Nr	1. Formel	2. Formel	3. Formel	4. Formel
Item	Heat No.	1. Formula	2. Formula	3. Formula	4. Formula
Poste	No. de coulée	1. Formule	2. Formule	3. Formule	4. Formule
0001	539187	0,326	0,314	5,267	0,402
0001	539187	0,324	0,312	5,200	0,402

98476 B

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BENTELER
Stahl/Rohr

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
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65-378675/003/P

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

Formelergebnisse / Formula results / Résultats des formules

Blatt: 4 /
Page:
Page:

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
0001	748503	0,321	0,290	6,462	0,442
0001	748503	0,329	0,309	5,929	0,442
0002	539228	0,308	0,281	6,308	0,352
0002	539228	0,312	0,284	6,462	0,362
0004	748554	0,311	0,283	6,308	0,421
0004	748554	0,314	0,286	6,308	0,422
0007	748481	0,309	0,292	5,500	0,311
0007	748481	0,306	0,288	5,429	0,301

Prüfsergebnisse / Test results / Résultats des essais

Die Rohre sind auf Dichtheit geprüft durch:
The tubes have been submitted to a leak tightness test by:
Les tubes ont passé un contrôle d'étanchéité par:

Hydrostatic test: acc. to CSA Z245.1, Test pressure/Time-record

PASSED

Augensichtkontrolle: PASSED
Visual inspection: PASSED
Examen visuel: PASSED

Biegeversuch:
Bending test:
Essai de cintrage:

PASSED

PASSED

Pos. / Item / Poste: 0001, 0002, 0007

PASSED

Ringfaltversuch:
Flattening test:
Essai d'aplatissement:

Pos. / Item / Poste: 0004

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

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

98476C

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ABNAHMEPRÜFZEUGNIS EN 10204-3.1

INSPECTION CERTIFICATE EN 10204-3.1

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Document No.:

No. du document:

Prüf-Nr.: 65-378675/003/P

Inspection No.:

No. du certificat:

Blatt: 5 /

Page:

Page:

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

Pos. Item Poste	Proben-Nr. Specimen No. No. de l'éprouvette	Schmelzen-Nr. Heat No. No. de coulée	Probenabmessung Specimen dimensions Dimensions de l'éprouv.	Streckgrenze Yield strength Limite élastique	ReH MPa 290-495	Zugfestigkeit Tensile strength Résistance à la traction	Dehnung Elongation Allongement	Einschnürung Area reduction Coefficient de striction	Re/Rm Re/Rm Re/Rm
Anforderungen Requirements Exigences			mm			Rm MPa 415-760	A2" % MIN 30		
0001	000001	539187	19,00 X 5,80	347	347	488	36,00		
0001	000002	539187	19,00 X 6,00	349	349	491	36,00		
0001	000001	748503	19,00 X 5,50	359	359	496	36,00		
0001	000002	748503	19,00 X 5,50	359	359	496	36,00		
0002	000001	539228	19,00 X 4,00	349	349	475	39,00		
0002	000002	539228	19,00 X 4,00	351	351	472	39,00		
0004	000001	748554	25,40 X 6,00	360	360	476	36,00		
0004	000002	748554	25,40 X 6,00	359	359	480	36,00		
0007	000001	748481	19,00 X 8,90	323	323	468	38,00		
0007	000002	748481	19,00 X 8,60	320	320	457	40,00		

Härteprüfung / Hardness test / Essai de dureté

Pos. Item Poste	Proben-Nr. Specimen No. No. de l'éprouv.	Schmelzen-Nr. Heat No. No. de coulée	Härte Hardness Dureté
Anforderungen Requirements Exigences			
			HRC HB HV HRB
0001	000001	539187	MAX 200
0001	000001	748503	142
0002	000001	539228	139
0004	000001	748554	141
0007	000001	748481	147
0007	000002	748481	135

984761

BENTELER

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

Restmagnetismus / Demagnetize / Démagnétiser

Pos. / Item / Poste: 0001, 0004, 0002, 0007
residual magnetic field intensity max 3,5 millitesla

Prüf-Nr.: 65-378675/003/P
Inspection No.:
No. du certificat:

Blatt: 6 /
Page:
Page:

Pos. Item Poste	Ihr Zeichen Your reference Votre référence	Kundenmaterial Customer's Material No. No. de matière du client	Kundenbestell-Nr. Purchase Order No. No. de commande du client
0001		P.O. 10901778	06-5704 / 10901778
0002		P.O. 10901778	06-5704 / 10901778
0004		P.O. 10901778	06-5704 / 10901778
0007		P.O. 10901778	06-5704 / 10901778

Vermerk / Remark / Remarque

Pos. / Item / Poste: 0001, 0007, 0002, 0007, 0007, 0007, 0002, 0007
NACE Standard: Hardness acc. to NACE MR0175/ISO 15156: HRC max 22., The material meets the requirements of NACE MR0103;
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.; Bend test: mandrel diameter 12D, bending angle 90 degree

Pos. / Item / Poste: 0004
NACE Standard: Hardness acc. to NACE MR0175/ISO 15156: HRC max 22., The material meets the requirements of NACE MR0103;
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.

Beiblatt Produktkennzeichnung / Attachment product marking / Supplément marquage du produit

Pos. Item Poste	Produktkennzeichnung Produktkennzeichnung Marquage du produit
0001, 0002, 0004, 0007	

FS: BENTELER Z.245.1, Spec.5L-PSL1, A/SA-106 0107 S5 B/X42/290 HEAT-NO. TEST P RESSURE DIMENSIONS SCHEDULE WA
GERMANY P.O. 10901778

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

Verkäufer(in) / Salesman/ woman in charge / Personne chargée : Mr Seelbach, Tel.: 05254/81-4281, Fax: 4289

984761

Benteler Stahl/Rohr GmbH

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33043 Paderborn

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BENTELER
Stahl/Rohr

ABNAHMEPRÜFZEUGNIS EN 10204-3.1

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Document No.:

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Prüf-Nr.:

Inspection No.:

No. du certificat:

Blatt: 7 /

Page:

Page:

Dinslaken, 05.02.2007, TEL.: 02064.623-537 FAX: 02064.623-539

Abnahmebeauftragter
Inspection representative
Contrôleur

ROLF TRINDEL / WAG



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

Nous attestons que les produits livrés sont conformes aux stipulations de la commande. Ce document a été établi par traitement électronique de l'information et est valide sans signature.

98476

4" S160 A106

MATERIAL ACCEPTED

Code Edition used for verification 07 Addenda 09
QC 00 date DEC 16/10

Contract No.: 2110000553-2
L/C NO.: N.I.L.C.02942
Name of Customer: NATIONAL OILWELL
ORDER NO.: MSI-5295 (LOT B) P.O. NO.: 1116399
DESCRIPTION: SEAMLESS CARBON STEEL PIPE
TOTAL: 479PIECES, 8BUNDLES, 10.930MT, 10059FT
HENGYANG VALIN STEEL TUBE CO., LTD
MILL CERTIFICATE
Date: MAY 12, 2008 Page: 1/2
Add: 10 Dalixincun, Hengyang City, Hunan, China
Tel and Fax: +86 734 8873739 8872942
Cable: 6993
P.C. 421001

SPEC: ASTM A53B-2002/A106B-2002a, ASME SA53B/SA106B-2004, API 5LB, PSL1-2004, NACE MR-0175-2003															CERTIFICATE NO: 08-02-0403						
NO.	BATCH NO.	HEAT NO.	STEEL GRADE	SIZE	BUNDLES	PIECES	FEET	QUANTITY (MT)	ACTUAL WEIGHT(MT)												
				CHEMICAL COMPOSITION %																	
DELIVERY				NONDESTRUCTIVE TEST																	
NO.	CONDITION		ET	UT	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Al	V	Ti	B				
1	NORMALIZED		OK	N/A	0.18	0.22	0.48	0.014	0.029	0.03	0.01	0.03	0.01	0.01	0.01	0.01	0.000	0.000			
2	NORMALIZED		OK	N/A	0.19	0.21	0.49	0.012	0.03	0.03	0.01	0.03	0.01	0.00	0.01	0.000	0.000				
3	NORMALIZED		OK	N/A	0.23	0.2	0.41	0.012	0.017	0.02	0.01	0.03	0.01	0.00	0.01	0.000	0.000				
TENSILE STRENGTH		σ_s (PSI)		YIELD STRENGTH		δ (%)		ELONGATION		AK (J)		IMPACT		HARDNESS		HYDROSTATIC TEST (Psi)		FLATTEN TEST		BEND TEST	
				full-section, L, Lo=50mm				44.5		N/A		Ord/Tem		HRC 2		700		N/A		OK	
1	69600		44950					47		N/A				HRC 2		1000		N/A		OK	
2	69600		44950																		
		strip, L, bo=19, Lo=50mm																			
3	70325		47125		35					N/A				HRC 3		2300		N/A		OK	

REMARKS: 1. We hereby certify that the material has been manufactured, sampled, tested and inspected in accordance with the required standards.

2. Properties compliance to DIN 50049 3.1.B/UNI EN 10204 3.1B.
3. BRINELL /Rockwell hardness certified to NACE MR-0175-2003.
4. SPECIMEN SIZE: (Pipe end, Longitudinal, Gauge Length=2")
A. For pipes $\leq 1"$ full length specimen were used;
B. For pipes $> 1"$ longitudinal strip specimen were used; the width of the gauge length portion is 3/4".
5. Origin: Made in China.

QUALITY MANAGER: 何世宇

103843

Contract No.: 2110000553-2
I/C NO.: N.ILC.02942

Name of Customer: NATIONAL OIL WELL
ORDER NO.: MSI-5295 (LOT B) P.O. NO.: 1116399
DESCRIPTION: SEAMLESS CARBON STEEL PIPE
TOTAL: 170PIECES, 18BUNDLES, 36,980MT, 3570FT

HENGYANG VALIN STEEL TUBE CO., LTD

MILL CERTIFICATE

Add: 10 Dalixincun, Hengyang City, Hunan, China
Tel and Fax: +86 734 8873739 8872942
Cable: 6993
P.C. 421001

Date: MAY 12, 2008

Page: 2/2

TOTAL: 120 PAGES, 2200 LBS.

SPEC: ASTM A53B-2002/A106B-2002a, ASME SA53B/A106B-2004, API 5L B X42, PSL1-2004, NACE MR-0175-2003

CERTIFICATE NO: 08-02-0403

NO.	BATCH NO.	HEAT NO.	STEEL GRADE	SIZE	BUNDLES	PIECES	FEET	QUANTITY (MT)	ACTUAL WEIGHT(MT)	CHEMICAL COMPOSITION %														
										NONDESTRUCTIVE TEST					HYDROSTATIC TEST (Psi)									
NO.	DELIVERY CONDITION	UT	ET	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Al	V	Ti	B	FLATTEN TEST	HYDROSTATIC TEST (Psi)	HARDNESS	IMPACT	SIZE	AK	Or/Tem	
																								σ s (PSI)
strip, L, bo=25, Lo=50mm																								
4	76125		49300	43														OK	3000	HRC 5.5		N/A		
	74675		54375	38														OK	3000	HRC 6		N/A		
	75400		50750	37														OK	3000	HRC 5.5		N/A		
	75400		48575	41														OK	3000	HRC 5		N/A		
5	71775		52200	47														OK	3000	HRC 4.5		N/A		

REMARKS: 1. We hereby certify that the material has been manufactured, sampled, tested and inspected in accordance with the required standards.

- Properties compliance to DIN 50049 3.1.B/UNI EN 10204 3.1B.
- BRINELL /Rockwell hardness certified to NACE MR-0175-2003.
- SPECIMEN SIZE: (Pipe end, Longitudinal, Gauge Length=2")
- For pipes ≤ 1" full length specimen were used;
- For pipes > 1" longitudinal strip specimen were used; the width of the gauge length portion is 3/4"
- Origin: Made in China.

QUALITY MANAGER:

(Signature)

103843A

Material Receiving Report

DYNACORP
AEROSPACE • AUTOMOTIVE • BUILDING • CONSUMER • ELECTRONICS • ENERGY • ENVIRONMENTAL • FOOD • HEALTHCARE • INDUSTRIAL • MARINE • MEDICAL • MINING • OIL & GAS • RETAIL • SECURITY • SPORTS • TELECOM • TRANSPORTATION • UTILITIES • WATER

[illegible]



CERTIFICATE OF COMPLIANCE

5545-89 Street Edmonton, Alberta Canada T6E 5W9

www.edmontonexchanger.com

tel 780.468.6722 • QC fax 780.466.4668 • sales fax 780.466.5155

Customer DYNACORP FABRICATORS INC.

PO 1P5854

Work Order C86373 Date 2010/10/06 CofC# 19462 Page 1 of 1

Item#	Description	Qty	Heat#	Form. Proc.
S86373-1	ROLLED PLATE - 0.3750" NOM X 12" X 50" (Material Spec: SA 516-70 Normalized)	1	4981K-48326	4
		7	320995-32134	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, 2007 Edition, Addenda July 1, 2009.

Supplementary Examination - Items**MATERIAL ACCEPTED**

Code Edition used 07 Addenda 09
for verification CMWS 10/26/10
QC date



DILLINGER HÜTTE

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

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004

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

MATERIAL TEST REPORT (MTR)

MATERIAL TEST REPORT		A07.1 No.		A07.2 No.		SA20-S5	
A05 Established inspecting body		A06 Purchaser		EDMONTON STEEL, EDMON		EDMONTON STEEL, EDMON	
DH		Final receiver					
B02/ Steel design.		SA516-70					
B03 Any suppl. requirements		ASME-2A:07					
		DIL-HUE-1:R23-2007-11-20					



14401

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32122-01	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32122-02	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32122-03	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32123-01	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32123-03	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32129-01	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32129-02	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32129-03	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32133-01	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32133-02	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32133-03	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32134-01	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32134-02	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32134-03	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32135-01	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32135-02	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32136-02	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32137-01	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32137-02	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32137-03	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32140-01	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32140-02	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32140-03	

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



QM-System: Certification as per ISO 9001

B. MUELLER
Test House Manager

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

Inspector's stamp Date 13.05.08

KW 1



DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)		A10 Advice of dispatch No./ Date of dispatch		A08/ Manufacturer's order/ A03 Certificate No.		Sheet
A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004		300285-13.05.08		337106-002		2/...
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991						
MATERIAL TEST REPORT (MTR)						
A05 Established inspecting body		A06 Purchaser		A07.1 No. E10479-J1010-LG		
DH		Final receiver		A07.2 No. EDMONTON STEEL, EDMON		
				EDMONTON STEEL, EDMON		
B02/ Steel design.		SA516-70		SA20-S5		
B03 Any suppl. requirements		ASME-2A:07				
		DIL-HUE-1:R23-2007-11-20				

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32141-01	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32141-02	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	320995	32141-03	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	321685	65757-01	
01	1	0,3750 x	120,50000 x	480,00000 x	2790	N	321685	65757-02	
**	28	0,3750 x	120,50000 x	480,00000 x	78120	N	320884	25687-03	
02	1	0,5000 x	120,50000 x	480,00000 x	3720	N	320884	38750-01	
02	1	0,5000 x	120,50000 x	480,00000 x	3720	N	320884	38750-02	
02	1	0,5000 x	120,50000 x	480,00000 x	3720	N	320884	38750-03	
02	1	0,5000 x	120,50000 x	480,00000 x	3720	N	320884	38750-03	
**	4	0,5000 x	120,50000 x	480,00000 x	14880	N			
***	32				93000	N			

B04 Product delivery condition

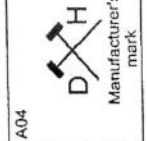
ITEM NO.: 01-02

N: HT: 1670 GR.F +36 -27 GR.F
SOAKING TIME TO ATTAIN THE TARGET TEMPERATURE OVER THE WHOLE SECTION: 1-1,75 MIN/MM (25-45 MIN/INCH)
COOLING IN STILL AIR

B06 Marking of the product

ITEM NO.: 01-02

STEEL DESIGNATION SA516 70 MTLTV SA516 60 MTLTV
HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP



A04

Z017020Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.

QM-System: Certification as per ISO 9001



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

A01

B. MUELLER
Test House Manager

Inspector's stamp Date 13.05.08

KW 1



DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)		A10 Advice of dispatch No./ Date of dispatch		A08/ Manufacturer's order/ A03 Certificate No.		Sheet	
A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004		300285-13.05.08		337106-002		3/...	
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991				B01 Product			
MATERIAL TEST REPORT (MTR)				HOT ROLLED PLATES			
A05 Established inspecting body		A06 Purchaser		A07.1 No.		A07.2 No.	
DH		EDMONTON STEEL, EDMON		E10479-J1010-LG			
Final receiver		EDMONTON STEEL, EDMON					
B02/ Steel design.		SA516-70					
B03 Any suppl. requirements		ASME-2A:07					
		DIL-HUE-1:R23-2007-11-20					
		SA20-S5					

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.F	C10	C11 KSI RP02	C12 RM	C13	A % L0=8IN	C14-C15
01	320995	32122		K1 Q		RT		52,5	75,5		27,5	
01	320995	32123		K1 Q		RT		51,3	75,3		27,5	
01	320995	32129		K1 Q		RT		52,1	75,7		27,0	
01	320995	32133		K1 Q		RT		52,8	76,3		27,5	
01	320995	32134		K1 Q		RT		52,2	75,1		27,5	
01	320995	32135		K1 Q		RT		53,1	75,7		25,5	
01	320995	32136		K1 Q		RT		52,6	75,5		27,0	
01	320995	32137		K1 Q		RT		52,8	76,0		28,4	
01	320995	32140		K1 Q		RT		51,6	74,8		27,0	
01	320995	32141		K1 Q		RT		52,5	75,4		27,5	
01	321685	65757		K1 Q		RT		52,8	76,0		25,0	
02	320884	25687		K1 Q		RT		51,3	74,4		28,0	
02	320884	38750		K1 Q		RT		50,6	74,2		26,5	

C30-C39 Hardness test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03 Temp. GR.F	C33 Testing method	C35	C31 Individual values	C32 Mean value	A01
01	320995	32122		K1	O	RT	HBW 5/750	HB 147	149	148	
01	320995	32123		K1	O	RT	HBW 5/750	HB 146	148	147	
01	320995	32129		K1	O	RT	HBW 5/750	HB 149	149	149	
01	320995	32133		K1	O	RT	HBW 5/750	HB 150	150	148	
01	320995	32134		K1	O	RT	HBW 5/750	HB 146	144	145	
01	320995	32135		K1	O	RT	HBW 5/750	HB 158	155	155	
01	320995	32136		K1	O	RT	HBW 5/750	HB 151	147	149	

Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.		AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar	
			
QM-System: Certification as per ISO 9001		Inspector's stamp	
		Date 13.05.08	
		KW	



DILLINGER HÜTTE

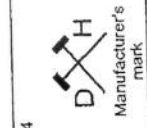
Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)		A10 Advice of dispatch No./ Date of dispatch		A08/ Manufacturer's order/ A03 Certificate No.		Sheet
A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004		300285-13.05.08		337106-002		4/...
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991				B01 Product		
MATERIAL TEST REPORT (MTR)				HOT ROLLED PLATES		
A05 Established inspecting body		A06 Purchaser		A07.1 No.		
DH		Final receiver		EDMONTON STEEL, EDMON		
				A07.2 No.		
				EDMONTON STEEL, EDMON		
B02/ Steel design.		SA516-70		SA20-S5		
B03 Any suppl.		ASME-2A:07				
requirements		DIL-HUE-1:R23-2007-11-20				

C30-C39 Hardness test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03 Temp. GR.F	C33 Testing method	C35	C31 Individual values	C32 Mean value
01	320995	32137		K1	O	RT	HBW 5/750	HB 148	149	148
01	320995	32140		K1	O	RT	HBW 5/750	HB 149	149	149
01	320995	32141		K1	O	RT	HBW 5/750	HB 150	156	154
01	321685	65757		K1	O	RT	HBW 5/750	HB 150	150	150
02	320884	25687		K1	O	RT	HBW 10/3000	HB 148	147	148
02	320884	38750		K1	O	RT	HBW 10/3000	HB 148	154	151

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.F	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy	C45 Individual values AV=FT.LBF	C43 Mean value
01	320995	32122		K1	LV	-51	3/4	CHP-V	CHP-V	AV 104	150	106
01	320995	32123		K1	LV	-51	3/4	CHP-V	CHP-V	AV 114	119	118
01	320995	32129		K1	LV	-51	3/4	CHP-V	CHP-V	AV 108	151	125
01	320995	32133		K1	LV	-51	3/4	CHP-V	CHP-V	AV 109	139	128
01	320995	32134		K1	LV	-51	3/4	CHP-V	CHP-V	AV 105	145	131
01	320995	32135		K1	LV	-51	3/4	CHP-V	CHP-V	AV 128	151	142
01	320995	32136		K1	LV	-51	3/4	CHP-V	CHP-V	AV 128	145	129
01	320995	32137		K1	LV	-51	3/4	CHP-V	CHP-V	AV 139	139	139
01	320995	32140		K1	LV	-51	3/4	CHP-V	CHP-V	AV 148	127	137
01	320995	32141		K1	LV	-51	3/4	CHP-V	CHP-V	AV 142	148	144
01	321685	65757		K1	LV	-51	3/4	CHP-V	CHP-V	AV 134	136	130
02	320884	25687		K1	LV	-51		CHP-V	CHP-V	AV 128	107	102
02	320884	38750		K1	LV	-51		CHP-V	CHP-V	AV 83	55	67



QM-System: Certification as per ISO 9001

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

B. MUELLER
Test House Manager



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

Inspector's stamp
Date 13.05.08

KW 1

A01

A04



DILLINGER HÜTTE

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

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991

MATERIAL TEST REPORT (MTR)

A05 Established inspecting body A06 Purchaser EDMONTON STEEL, EDMON A07.1 No. E10479-J1010-IG

DH Final receiver EDMONTON STEEL, EDMON A07.2 No. SA20-SS

B02/ Steel design. SA516-70

B03 Any suppl. ASME-2A:07

requirements DIL-HUE-1:R23-2007-11-20

A10 Advice of dispatch No./
Date of dispatch

300285-13.05.08

A08/ Manufacturer's order/
A03 Certificate No.

337106-002

Sheet

5/...

B01 Product
HOT ROLLED PLATES

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
320884	Y	0,171	0,323	1,14	0,008	0,0009	0,0054	0,023	0,061	0,054	0,061	0,000	0,001	0,001	0,002
320995	Y	0,175	0,371	1,17	0,009	0,0009	0,0069	0,039	0,010	0,039	0,039	0,001	0,001	0,002	0,003
321685	Y	0,170	0,372	1,17	0,011	0,0019	0,0062	0,030	0,010	0,038	0,044	0,002	0,000	0,002	0,002

B07.2 Heat

320884 Y

320995 Y

321685 Y

C94 Heat analysis Carbon equivalent / Alloying restrictions

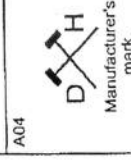
B07.2 Heat	FO-02=	FO-55=	FO-78=	FO-91=
320884	0,39	0,20	0,12	6,7
320995	0,39	0,13	0,05	6,7
321685	0,38	0,12	0,05	6,9

C95 Ladle treatment

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

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
320884	K1	0,169	0,358	1,13	0,007	0,0008	0,0052	0,021	0,061	0,052	0,061	0,000	0,001	0,000	0,002
320995	K1	0,168	0,367	1,15	0,009	0,0008	0,0065	0,040	0,010	0,039	0,039	0,001	0,000	0,003	0,003
321685	K1	0,166	0,371	1,17	0,011	0,0019	0,0063	0,031	0,010	0,039	0,044	0,002	0,000	0,003	0,002



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

QM-System: Certification as per ISO 9001

B. Mueller

B. MUELLER
Test House Manager

ADB

AG der Dillinger Hüttenwerke

Postfach 1580, D-66748 Dillingen/Saar

Inspection department

Inspector's stamp

Date 13.05.08

KW 1

A01



DILLINGER HÜTTE

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

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004

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

MATERIAL TEST REPORT (MTR)

A05 Established inspecting body

DH

A06 Purchaser

SA516-70

B02/ Steel design.

ASME-2A:07

B03 Any suppl. requirements

DIL-HUE-1:R23-2007-11-20

A10 Advice of dispatch No./

Date of dispatch

300285-13.05.08

A08/ Manufacturer's order/

A03 Certificate No.

337106-002

Sheet

6

B01 Product

HOT ROLLED PLATES

A07.1 No. E10479-J1010-LG

A07.2 No.

SA20-S5

EDMONTON STEEL, EDMON

EDMONTON STEEL, EDMON

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	B	CA	AL-T
320884	25683	K1	0,0000	0,0016	0,037
320995	32122	K1	0,0002	0,0018	0,037
321685	65757	K1	0,0002	0,0019	0,038

C94 Product analysis Carbon equivalent / Alloying restrictions

C94 Product analysis - Carben eq.						
B07.2		B07.1		C01		
Heat	Test No.					
320884	25683	K1	FO-02=	0,39	FO-55=	0,20
320995	32122	K1	FO-02=	0,37	FO-55=	0,13
321685	65757	K1	FO-02=	0,38	FO-55=	0,12

C94 Carbon equivalent formula / Alloying restrictions

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

FO-55 = CU+MO+NI+CR

FO-78 = CR+MO

FO-91 = MN/C

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

ITEM NO.: 01-02

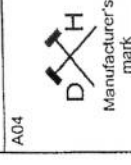
RESULT OF MARKING, SURFACE, SHAPE AND DIMENSIONS: NO REMARKS

SURFACE AS PER ASME-SA20

THICKNESS AS PER ASME-SA20

LENGTH AND WIDTH AS PER ASME-SA20

FLATNESS AS PER 1/2-ASME-SA20



A04

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

QM-System: Certification as per ISO 9001



AG der Dillinger Hüttenwerke

Postfach 1580, D-66748 Dillingen/Saar

Inspection department

B. MUELLER

Test House Manager

Inspector's stamp

Date 13.05.08

KW

1



ESSAR Steel Algoma Inc.

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

CUSTOMER PURCHASE ORDER NUMBER E10723-J1010ER	ENTRY DATE 2010/05/18	SHIP DATE 2010/07/23	TALLY NUMBER 186816	SHIP TO CUSTOMER NAME & ADDRESS EDMONTON STEEL PLATE SWITCH Z057 / EAST EDMONTON CLOVER BAR, AB	CARRIER CN	MILL ORDER 62663
--	--------------------------	-------------------------	------------------------	--	---------------	---------------------

CHARGE TO CUSTOMER NAME & ADDRESS

MILL TEST REPORTS

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

Alan McLean
M. MCLEAN
MANAGING METALLURGIST

SUPPLEMENTARY INSTRUCTIONS

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

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

INSP T/R 2010-08-31 SUPPLEMENTAL TO: HEAT 4981K TI=.002%

2010/07/28 07:03

CUSTOMER ITEM 00001 PRESSURE VESSELS

MEETS EN 10204 3.1

ISO QUALITY AND ENVIRONMENTAL CERTIFICATES AVAILABLE AT WWW.ESSARSTEELALGOMA.COM

ALL HEATS FULLY KILLED

HEATS INDICATED WITH (+) FINE GRAINED

HEATS INDICATED WITH (*) MADE IN CANADA WITH DOMESTIC AND NORTH AMERICAN MATERIALS

***** P R O D U C T S H I P P E D *****

CUSTOMER ITEM 00001 OUR ITEM 001 DIMENSIONS .375 X 96.5 X 480 "

PLATE NUMBER	HEAT-MS	PIECES	NO.	WEIGHT	PLATE NUMBER	HEAT-MS	PIECES	NO.	WEIGHT
48318	4981K-02	2	2	9852	48319	4981K-02	2	9852	9852
48321	4981K-04	2	2	9852	48324	4981K-04	1	4926	4926
48326	4981K-05	2	2	9852	48329	4981K-05	1	4926	4926
48334	4981K-06	2	2	9852					

TENSILE TESTS:

HEAT	PLATE NUMBER	SAMPLE	GAUGE	COND	METH	DIR	YIELD	TENSILE	% ELONG
4981K	48318	166"	.3750	N	.2	T	53.1	77.0	23(8")
4981K	48319	166"	.3750	N	.2	T	53.4	76.3	24(8")
4981K	48321	166"	.3750	N	.2	T	53.0	76.0	25(8")
4981K	48324	166"	.3750	N	.2	T	53.3	76.2	25(8")
4981K	48326	166"	.3750	N	.2	T	54.0	76.0	26(8")
4981K	48329	166"	.3750	N	.2	T	54.0	77.0	23(8")
4981K	48334	166"	.3750	N	.2	T	52.3	74.3	28(8")

PAGE 1 OF 10

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

WARNING



LAB
ALG
ALG
ALG
ALG
ALG
ALG

DYNACORP

7
4
5
3
6
2
1

Supplier:

Edmonton Exchanger

By: CLB

Record of Actual Code Required Markings

[illegible]

MATERIAL ACCEPTED

Code Edition used for verification 07 Addenda 09
00 Dec 2/10
 QC date



Erfahrungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)		A10 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004		308330-18.07.08	337322-001	1/....
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991				
MATERIAL TEST REPORT (MTR)				
A05 Established inspecting body	A06 Purchaser	A07.1 No.	A07.2 LG	
DH	EDMONTON STEEL, EDMON	EDMONTON STEEL, EDMON	HOT ROLLED PLATES	
Final receiver		SA20-S5		
B02/ Steel design.	SA516-70			
B03 Any suppl. requirements	ASME-2A:07			
DIL-HUE-1:R23-2007-11-20				



B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
01	1	0,3750 x	146,00000	x	480,00000	N	323625	26051-01	
01	1	0,3750 x	146,00000	x	480,00000	N	323625	26051-02	
01	1	0,3750 x	146,00000	x	480,00000	N	323809	30304-01	
01	1	0,3750 x	146,00000	x	480,00000	N	323809	30304-02	
**	4				13524				
02	1	0,5000 x	146,00000	x	480,00000	N	323811	17770-01	
02	1	0,5000 x	146,00000	x	480,00000	N	323811	17770-02	
02	1	0,5000 x	146,00000	x	480,00000	N	323811	17785-01	
02	1	0,5000 x	146,00000	x	480,00000	N	323811	17785-02	
**	4				18028				
***	8				31552				

B04 Product delivery condition

ITEM NO.: 01-02
 N: HT: 1670 GR.F +36 -27 GR.F
 SOAKING TIME TO ATTAIN THE TARGET TEMPERATURE OVER THE WHOLE SECTION: 1-1,75 MIN/MM (25-45 MIN/INCH)
 COOLING IN STILL AIR

B06 Marking of the product

ITEM NO.: 01-02
 STEEL DESIGNATION SA516 70 MTLTV SA516 60 MTLTV
 HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

A04	Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.		A01
			AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar Inspection department
QM-System: Certification as per ISO 9001		Inspector's stamp	Date 18.07.08
Manufacturer's mark		Test House Manager B. MUELLER	KW 1



DILLINGER HÜTTE

Erklärungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)		A10 Advice of dispatch No./ Date of dispatch		A08/ Manufacturer's order/ A03 Certificate No.		Sheet	
A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004		308330-18.07.08		337322-001		2/...	
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991							
MATERIAL TEST REPORT (MTR)							
A05 Established inspecting body		A06 Purchaser		A07.1 No.		A07.2 No.	
DH		Final receiver		EDMONTON STEEL, EDMON		EDMONTON STEEL, EDMON	
B02/ Steel design.		SA516-70		A07.1 No.		E10489-J1010-LG	
B03 Any suppl.		ASME-2A:07		A07.2 No.		SA20-S5	
requirements		DIL-HUE-1:R23-2007-11-20					
C10-C29 Tensile test							
C14-C15							
C30-C39 Hardness test							
C40-C49 Impact test							
C43 Mean value							
C46 Energy							
C44 Testing method							
C40 Type of test piece							
C41 Width of test piece							
C03 Temp. GR.F							
C02/ C01							
C01							
B05 Reference (heat) treatment							
B07.1 Rol./plate/ Test No.							
B07.2 Heat No.							
B14 Item No.							
B01 B02 B03 B04 B05 B06 B07 B08 B09 B10 B11 B12 B13 B14 B15 B16 B17 B18 B19 B20 B21 B22 B23 B24 B25 B26 B27 B28 B29 B30 B31 B32 B33 B34 B35 B36 B37 B38 B39 B40 B41 B42 B43 B44 B45 B46 B47 B48 B49 B50 B51 B52 B53 B54 B55 B56 B57 B58 B59 B60 B61 B62 B63 B64 B65 B66 B67 B68 B69 B70 B71 B72 B73 B74 B75 B76 B77 B78 B79 B80 B81 B82 B83 B84 B85 B86 B87 B88 B89 B90 B91 B92 B93 B94 B95 B96 B97 B98 B99 B100							

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

QM-System: Certification as per ISO 9001

B. MUELLER
Test House Manager

AHB

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

Inspector's stamp Date 18.07.08

KW 1



A01



DILLINGER HÜTTE

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

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004		A10 Advice of dispatch No./ Date of dispatch	A06/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991		308330-18.07.08	337322-001	3/....
MATERIAL TEST REPORT (MTR)				
A05 Established Inspecting body	A06 Purchaser	A07.1 No.	B01 Product	
DH	Final receiver	EDMONTON STEEL, EDMON	HOT ROLLED PLATES	
		EDMONTON STEEL, EDMON		
SA20-S5				
B02/ Steel design.	SA516-70			
B03 Any suppl. requirements	ASME-2A:07			
	DIL-HUE-1:R23-2007-11-20			

C70-C99 Chemical composition % - Heat analysis

	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
B07.2 Heat															
323625	Y	0,189	0,367	1,16	0,011	0,0015	0,0054	0,036	0,008	0,031	0,032	0,001	0,000	0,002	0,003
323809	Y	0,171	0,372	1,18	0,009	0,0009	0,0066	0,016	0,003	0,017	0,021	0,001	0,000	0,001	0,002
323811	Y	0,152	0,357	1,17	0,008	0,0015	0,0074	0,029	0,005	0,026	0,019	0,001	0,000	0,001	0,001
B07.2 Heat															
323625	Y	0,0002	0,0029	0,030											
323809	Y	0,0002	0,0019	0,037											
323811	Y	0,0002	0,0023	0,038											

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat															
323625		FO-02=	0,39	FO-55=	0,11	FO-78=	0,04	FO-91=	6,1						
323809		FO-02=	0,37	FO-55=	0,06	FO-78=	0,02	FO-91=	6,9						
323811		FO-02=	0,36	FO-55=	0,08	FO-78=	0,02	FO-91=	7,7						

C95 Ladle treatment

ITEM NO.: 01-02

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

C70-C99 Chemical composition % - Product analysis

	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
B07.2 Heat															
323625	K1	0,192	0,375	1,16	0,009	0,0013	0,0062	0,034	0,009	0,030	0,031	0,001	0,000	0,002	0,003
323809	K1	0,167	0,366	1,17	0,007	0,0013	0,0064	0,017	0,004	0,018	0,021	0,001	0,000	0,001	0,002
323811	K1	0,145	0,358	1,17	0,008	0,0014	0,0072	0,036	0,006	0,031	0,018	0,001	0,000	0,002	0,002

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

QM-System: Certification as per ISO 9001



AG der Dillinger Hüttenwerke

Postfach 1580, D-66748 Dillingen/Saar

Inspection department

B. Mueller

B. MUELLER
Test House Manager

Inspector's stamp Date 18.07.08

KW 1





DILLINGER HÜTTE

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

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991 MATERIAL TEST REPORT (MTR)		A10 Advice of dispatch No./ Date of dispatch 308330-18.07.08	A08/ Manufacturer's order/ A03 Certificate No. 337322-001	Sheet 4																																																
A05 Established inspecting body DH		A08 Purchaser EDMONTON STEEL, EDMON A07.1 No. E10489-J1010-LG Final receiver EDMONTON STEEL, EDMON A07.2 No. SA20-S5																																																		
B02/ Steel design. SA516-70 B03 Any suppl. ASME-2A:07 requirements DIL-HUE-1:R23-2007-11-20																																																				
C70-C99 Chemical composition % - Product analysis																																																				
<table><thead><tr><th colspan="2">B07.2 Heat</th><th colspan="2">B07.1 Test No.</th><th colspan="2">C01</th><th colspan="2">B</th><th colspan="2">CA</th><th colspan="2">AL-T</th></tr></thead><tbody><tr><td>323625</td><td>26051</td><td>K1</td><td>0,0002</td><td>0,0020</td><td>0,028</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>323809</td><td>30304</td><td>K1</td><td>0,0000</td><td>0,0019</td><td>0,034</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>323811</td><td>17770</td><td>K1</td><td>0,0001</td><td>0,0024</td><td>0,039</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>					B07.2 Heat		B07.1 Test No.		C01		B		CA		AL-T		323625	26051	K1	0,0002	0,0020	0,028							323809	30304	K1	0,0000	0,0019	0,034							323811	17770	K1	0,0001	0,0024	0,039						
B07.2 Heat		B07.1 Test No.		C01		B		CA		AL-T																																										
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<table><thead><tr><th colspan="2">B07.2 Heat</th><th colspan="2">B07.1 Test No.</th><th colspan="2">C01</th></tr></thead><tbody><tr><td>323625</td><td>26051</td><td>K1</td><td>FO-02=</td><td>0,40</td><td>FO-55= 0,10</td></tr><tr><td>323809</td><td>30304</td><td>K1</td><td>FO-02=</td><td>0,37</td><td>FO-55= 0,06</td></tr><tr><td>323811</td><td>17770</td><td>K1</td><td>FO-02=</td><td>0,35</td><td>FO-55= 0,09</td></tr></tbody></table>					B07.2 Heat		B07.1 Test No.		C01		323625	26051	K1	FO-02=	0,40	FO-55= 0,10	323809	30304	K1	FO-02=	0,37	FO-55= 0,06	323811	17770	K1	FO-02=	0,35	FO-55= 0,09																								
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323811	17770	K1	FO-02=	0,35	FO-55= 0,09																																															
C94 Carbon equivalent formula / Alloying restrictions FO-02 = $C + (Mn/6) + (Cr+Mo+V) / 5 + (Ni+Cu) / 15$ FO-55 = $CU+MO+NI+CR$ FO-78 = $CR+MO$ FO-91 = MN/C																																																				
D01 Marking and identification, surface appearance, shape and dimensional properties																																																				
ITEM NO.: 01-02 RESULT OF MARKING, SURFACE, SHAPE AND DIMENSIONS: NO REMARKS SURFACE AS PER ASME-SA20 THICKNESS AS PER ASME-SA20 LENGTH AND WIDTH AS PER ASME-SA20 FLATNESS AS PER 1/2-ASME-SA20																																																				
																																																				
A04		A01																																																		
 Manufacturer's mark		AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar Inspection department Date 18.07.08 Inspector's stamp KW 1																																																		
Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.		B. MUELLER Test House Manager																																																		
QM-System: Certification as per ISO 9001																																																				

B

注 文 者 : HANWA CO., LTD.

注 文 者 照 合 番 号 : 228-38591010

契 約 番 号 : 0-831-H1-5-1-A101

商 品 名 : HOT ROLLED STEEL PLATES

規 格 : ASME SA-516 GRADE 70-E07-A08

文 書 番 号 : 需要家 番号 : EDIMONTON EXCHANGER GROUP OF C-

DOCUMENT NO. CUSTOMER COMPANIES

新日本製鐵株式會社
Nippon Steel Corporation

鋼 材 檢 査 証 明 書

INSPECTION CERTIFICATE

(AS PER EN 10204 CERTIFICATE ON MATERIAL

TESTS 3.1)

需要家 番号 : EDIMONTON EXCHANGER GROUP OF C-

CUSTOMER COMPANIES

本 社 : 〒100-8071 東京都千代田区丸の内二丁目6番1号
HEAD OFFICE : 2-6-1, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
君 津 製 鐵 所 : 〒299-1141 千葉県君津市君津 1 番地
KIMITSU WORKS : 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN

証 明 書 番 号 : P-04617 PAGE : 2

発 行 年 月 日 : 2010-02-18

DATE OF ISSUE : 1001

需要家 管理番号 : E3001P07Q0 E07

寸 法	DIMENSION	員 数	質 量	CAST No.	TEST No.	製品番号	PLATE No.	引 張 試 験				衝 撃 試 験				化 学 成 分													
								Y.S.	T.S.	E.L.	%	2V - 50F	FT. LB	平均値	個々値														
0.5" X 120.5" X 480"	01	3	11.163	G8507FROM 69038	69038	X71770130	TO X71770132	55	77	28		285	306			AVG	15	38	143	7	2	2	2	0	11	2	0	013	02640
0.5" X 120.5" X 480"	01	1	3721	G8507TESTED-PL 69039	69039	X71770101	TO X71770104	55	76	29		294	317	292		AVG	15	38	143	7	2	2	2	0	11	2	0	013	02640
0.5" X 120.5" X 480"	01	3	11.163	G8507FROM 69039	69039	X71770102	TO X71770104	55	76	29		294	317	292		AVG	15	38	143	7	2	2	2	0	11	2	0	013	02640

注 釈 NOTES 1 Location Orientation 位置・方向, T: 縦面 Top, B: 底面 Bottom, L: 正面方向 Longitudinal, C: 垂直方向 Transverse, Z: 板厚方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis

2 G.L. 板厚 Gauge Length, A: 50mm 平形試験片 Rectangular, B: 80mm 平形試験片 Rectangular, E: 80mm 平形試験片 Rectangular, F: 80mm 平形試験片 Rectangular, G: 200mm, H: 2, I: 8, J: 5.65/S₀, K: 4, S₀

3 RA: 板厚 Reduction of Area, Y.R.: 断口比 Yield Ratio, 4 A: 合格 Acceptable, 5 F: 標準寸法 FULL SIZE, 2: 2.5mm, 3: 3.3mm, 4: 3.3mm, 5: 5.0mm, 6: 6.67mm, 7: 7.5mm, 8: 6.7mm, 9: 製品板厚 Plate Thickness, 6 P: 製品分析 Product Analysis

7 N: 焼戻 Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, C.L.C.: CLC Process/TMC Process, A.R.: As Rolled, T.M.R.: TMR Process/TMC Process, N.R.: Normalizing Rolled

S.H.: 延性断面率 Shear Fracture, C.P.: 断口断面率 Crystallinity Fracture, I.F.: 横断面 Lateral Expansion, A.G.S.: オーステナイト相度 Austenite Grain Size, F.G.S.: フェライト相度 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.

J. Adachi

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

新日本製鐵株式會社
Nippon Steel Corporation

鋼材検査証明書 INSPECTION CERTIFICATE

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

注文者 HANWA CO., LTD.
注文者照会番号 228-38591010
契約番号 0-831-H1-5-1-A101
CONTRACT No.
商品名 HOT ROLLED STEEL PLATES
規格 ASME SA-516 GRADE 70-E07-A08
SPECIFICATION
文書番号 DOCUMENT No.

証明番号 頁 3
CERTIFICATE No. P-04617 PAGE
発行年月日 2010-02-18
DATE OF ISSUE
需要家管理番号 1001
CUSTOMER'S CONTROL No.
(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
需要家 EDMONTON EXCHANGER GROUP OF COMPANIES
EDMONTON EXCHANGER GROUP OF COMPANIES

寸法 DIMENSION mm, inch, feet	数量 QUANTITY	質量 MASS KG	製鋼番号 CAST No. 試験番号 TEST No.	製品番号 PLATE No.	位置 LOCATION ORIENTATION	引張試験 TENSILE TEST				化学成分 CHEMICAL COMPOSITION %									
						0.2%	YS	TS	EL	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V
0.5' X 120.5' X 480'	01	3721	G8507 69040	TESTED-PL X71770113IC1	第1号	55	76	31		15	38	143	7	2	2	2	2	2	0
					第2号					34	34	2	6	0	11	2	0	0	0
					第3号					AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG
					第4号					309	288	315	309	288	315	309	288	315	309
0.5' X 120.5' X 480'	01	11163	G8507 69040	TESTED-PL X71770114IC1	第1号	55	76	31		15	38	143	7	2	2	2	2	2	0
					第2号					34	34	2	6	0	11	2	0	0	0
					第3号					AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG
					第4号					309	288	315	309	288	315	309	288	315	309
0.5' X 120.5' X 480'	01	3721	G8507 69041	TESTED-PL X71770105IC1	第1号	55	77	28		15	38	143	7	2	2	2	2	2	0
					第2号					34	34	2	6	0	11	2	0	0	0
					第3号					AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG
					第4号					298	287	296	298	287	296	298	287	296	298

注釈 NOTES 1. 位置 2. 板厚方向 Transverse, Z: 板厚方向 Through Thickness, R: 45° 方向 45Deg to the Longitudinal Axis
3. 検査 4. 検査 5. 検査 6. 検査 7. 検査 8. 検査 9. 検査 10. 検査 11. 検査 12. 検査 13. 検査 14. 検査 15. 検査 16. 検査 17. 検査 18. 検査 19. 検査 20. 検査 21. 検査 22. 検査 23. 検査 24. 検査 25. 検査 26. 検査 27. 検査 28. 検査 29. 検査 30. 検査 31. 検査 32. 検査 33. 検査 34. 検査 35. 検査 36. 検査 37. 検査 38. 検査 39. 検査 40. 検査 41. 検査 42. 検査 43. 検査 44. 検査 45. 検査 46. 検査 47. 検査 48. 検査 49. 検査 50. 検査 51. 検査 52. 検査 53. 検査 54. 検査 55. 検査 56. 検査 57. 検査 58. 検査 59. 検査 60. 検査 61. 検査 62. 検査 63. 検査 64. 検査 65. 検査 66. 検査 67. 検査 68. 検査 69. 検査 70. 検査 71. 検査 72. 検査 73. 検査 74. 検査 75. 検査 76. 検査 77. 検査 78. 検査 79. 検査 80. 検査 81. 検査 82. 検査 83. 検査 84. 検査 85. 検査 86. 検査 87. 検査 88. 検査 89. 検査 90. 検査 91. 検査 92. 検査 93. 検査 94. 検査 95. 検査 96. 検査 97. 検査 98. 検査 99. 検査 100. 検査 101. 検査 102. 検査 103. 検査 104. 検査 105. 検査 106. 検査 107. 検査 108. 検査 109. 検査 110. 検査 111. 検査 112. 検査 113. 検査 114. 検査 115. 検査 116. 検査 117. 検査 118. 検査 119. 検査 120. 検査 121. 検査 122. 検査 123. 検査 124. 検査 125. 検査 126. 検査 127. 検査 128. 検査 129. 検査 130. 検査 131. 検査 132. 検査 133. 検査 134. 検査 135. 検査 136. 検査 137. 検査 138. 検査 139. 検査 140. 検査 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新日本製鐵株式會社
Nippon Steel Corporation

鋼材検査証明書

INSPECTION CERTIFICATE

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

注文者 HANWA CO., LTD.
注文者照合番号 228-38591010
契約番号 0-831-H1-5-1-A101
商品名 HOT ROLLED STEEL PLATES
規格 ASME SA-516 GRADE 70-E07-A08
文書番号 0000000000
DOCUMENT No.

証明書番号 P-04617
CERTIFICATE No. P-04617
発行年月日 2010-02-18
DATE OF ISSUE 2010-02-18

*****CE*****
*****E3001P07Q0 E07

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
需要家管理番号 鋼材検査証明書
CUSTOMER'S CONTROL No. 鋼材検査証明書

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注 釈 NOTES 案1 Location Orientation 位置・方向, T: 頂部 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
案2 G.L. 標点距離 Gage Length, A: 50mm 半形試験片 Rectangular, B: 50mm 半形試験片 Rectangular, D: 70mm 半形試験片 Rectangular, E: 80mm 半形試験片 Rectangular, F: 80mm 半形試験片 Rectangular, G: 200mm, H: 2°, I: 8°, J: 5.65/√S, K: A/√S
案3 RA: 絞り Reduction of Area, Y.R: 焼入れ Yield Ratio, 案4 A: 合格 Acceptable, 案5 J: 標準 JIS FULL SIZE, 2: 2.5mm, 3: 3.3mm, 4: 3.3mm, 5: 5.0mm, 6: 6.67mm, 7: 7.5mm, 8: 6.67mm, 9: 6.67mm, 10: 6.67mm, 11: 6.67mm, 12: 6.67mm, 13: 6.67mm, 14: 6.67mm, 15: 6.67mm, 16: 6.67mm, 17: 6.67mm, 18: 6.67mm, 19: 6.67mm, 20: 6.67mm, 21: 6.67mm, 22: 6.67mm, 23: 6.67mm, 24: 6.67mm, 25: 6.67mm, 26: 6.67mm, 27: 6.67mm, 28: 6.67mm, 29: 6.67mm, 30: 6.67mm, 31: 6.67mm, 32: 6.67mm, 33: 6.67mm, 34: 6.67mm, 35: 6.67mm, 36: 6.67mm, 37: 6.67mm, 38: 6.67mm, 39: 6.67mm, 40: 6.67mm, 41: 6.67mm, 42: 6.67mm, 43: 6.67mm, 44: 6.67mm, 45: 6.67mm, 46: 6.67mm, 47: 6.67mm, 48: 6.67mm, 49: 6.67mm, 50: 6.67mm, 51: 6.67mm, 52: 6.67mm, 53: 6.67mm, 54: 6.67mm, 55: 6.67mm, 56: 6.67mm, 57: 6.67mm, 58: 6.67mm, 59: 6.67mm, 60: 6.67mm, 61: 6.67mm, 62: 6.67mm, 63: 6.67mm, 64: 6.67mm, 65: 6.67mm, 66: 6.67mm, 67: 6.67mm, 68: 6.67mm, 69: 6.67mm, 70: 6.67mm, 71: 6.67mm, 72: 6.67mm, 73: 6.67mm, 74: 6.67mm, 75: 6.67mm, 76: 6.67mm, 77: 6.67mm, 78: 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新日本製鐵株式會社
Nippon Steel Corporation

鋼材検査証明書
INSPECTION CERTIFICATE

本 社 千100-8071 東京都千代田区丸の内二丁目6番1号
HEAD OFFICE 千2-6-1 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
君津製鐵所 千299-1141 千葉県君津市君津一番地
KIMITSU WORKS 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN

注文者 HANWA CO., LTD.
注文者照合番号 228-38591010
契約番号 0-831-H1-5-1-A101
商品名 HOT ROLLED STEEL PLATES
規格 ASME SA-516 GRADE 70-E07-A08
文書番号 DOCUMENT No.

証明番号 P-04617
CERTIFICATE No. P-04617
発行年月日 2010-02-18
DATE OF ISSUE 2010-02-18
需要家管理番号 E3001P07Q0 E07
CUSTOMER'S CONTROL No.

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
EDMONTON EXCHANGER GROUP OF C-
COMPANIES

DOCUMENT No.		CUSTOMER		COMPANIES		引張試験 TENSILE TEST				衝撃試験 IMPACT TEST				化学成分 CHEMICAL COMPOSITION %														E3001P0790	
寸法 DIMENSION mm, inch, feet	数量 QUANTITY	質量 MASS KG	製鋼番号 CAST No. 試験番号 TEST No.	製品番号 PLATE No.	位置 LOCATION ORIENTATION	耐力降伏比 Y.S. - Y.P. 0.2%			引張強さ T.S.	伸び E.L.	断面収縮 RED. TEST SECTION	平均値 AVG	個々値 EACH	位置 LOCATION ORIENTATION	2V - 50F FT. LB	C ×100	Si ×100	Mn ×100	P ×1000	S ×1000	Cu ×100	Ni ×100	Cr ×100	Mo ×100	Nb ×1000	V ×1000	Al ×100	Co ×100	
						Y.S.	Y.P.																						
0.5' X 120.5' X 480'	01	3721	G8507 69043	TESTED-PL X71770121	IC1	55	77	28	TLF299	292	299	TLF299	292	306	299	15	38	143	7	2	2	2	2	2	0.13	0.2640			
0.5' X 120.5' X 480'	01	1163	G8507 69043	FROM X71770122 TO X71770124	IC1	55	77	28	TLF299	292	299	TLF299	292	306	299	15	38	143	7	2	2	2	2	2	0.13	0.2640			
0.5' X 120.5' X 480'	01	3721	G8507 69044	TESTED-PL X71770117	IC1	55	76	29	TLF305	295	321	TLF305	295	300	321	15	38	143	7	2	2	2	2	2	0.13	0.2640			

注釈 NOTES 1. 位置 Orientation 位置・方向, T: 頂部 Top, B: 底部 Bottom, L: 左側方向 Longitudinal, C: 横側方向 Transverse, Z: 断面方向 Through Thickness, R: 45° 方向 45Deg to the Longitudinal Axis
2. G.L. 橋梁距離 Gauge Length, A: 50mm 平形試験片 Rectangular, B: 50mm 平形試験片 Rectangular, C: 70mm 平形試験片 Rectangular, D: 70mm 平形試験片 Rectangular, F: 80mm 平形試験片 Rectangular, G: 80mm 平形試験片 Rectangular, H: 80mm 平形試験片 Rectangular, I: 80mm 平形試験片 Rectangular, J: 80mm 平形試験片 Rectangular, K: 4/5 So
3. R.A. 絞り Reduction of Area, Y.R. 降伏比 Yield Ratio, 4. 合格 Acceptable, 5. F: 標準寸法 FULL SIZE, 2: 2.5mm, 3: 3.3mm, 4: 3.3mm, 5: 5.0mm, 6: 6.67mm, 7: 7.5mm, 8: 8.7mm, 9: 9.5mm, 10: 10.5mm, 11: 11.5mm, 12: 12.5mm, 13: 13.5mm, 14: 14.5mm, 15: 15.5mm, 16: 16.5mm, 17: 17.5mm, 18: 18.5mm, 19: 19.5mm, 20: 20.5mm, 21: 21.5mm, 22: 22.5mm, 23: 23.5mm, 24: 24.5mm, 25: 25.5mm, 26: 26.5mm, 27: 27.5mm, 28: 28.5mm, 29: 29.5mm, 30: 30.5mm, 31: 31.5mm, 32: 32.5mm, 33: 33.5mm, 34: 34.5mm, 35: 35.5mm, 36: 36.5mm, 37: 37.5mm, 38: 38.5mm, 39: 39.5mm, 40: 40.5mm, 41: 41.5mm, 42: 42.5mm, 43: 43.5mm, 44: 44.5mm, 45: 45.5mm, 46: 46.5mm, 47: 47.5mm, 48: 48.5mm, 49: 49.5mm, 50: 50.5mm, 51: 51.5mm, 52: 52.5mm, 53: 53.5mm, 54: 54.5mm, 55: 55.5mm, 56: 56.5mm, 57: 57.5mm, 58: 58.5mm, 59: 59.5mm, 60: 60.5mm, 61: 61.5mm, 62: 62.5mm, 63: 63.5mm, 64: 64.5mm, 65: 65.5mm, 66: 66.5mm, 67: 67.5mm, 68: 68.5mm, 69: 69.5mm, 70: 70.5mm, 71: 71.5mm, 72: 72.5mm, 73: 73.5mm, 74: 74.5mm, 75: 75.5mm, 76: 76.5mm, 77: 77.5mm, 78: 78.5mm, 79: 79.5mm, 80: 80.5mm, 81: 81.5mm, 82: 82.5mm, 83: 83.5mm, 84: 84.5mm, 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注 文 者 : HANWA CO., LTD.
SHIPPER
注文者照合番号 : 228-38591010
契約番号 : 0-831-H1-5-1-A101
CONTRACT NO.
商品名 : HOT ROLLED STEEL PLATES
COMMODITY
規格 : ASME SA-516 GRADE 70-E07-A08
SPECIFICATION
文書番号 :
DOCUMENT NO.

新日本製鐵株式會社
Nippon Steel Corporation

鋼材検査証明書

INSPECTION CERTIFICATE

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

証明書番号 : P-04617
CERTIFICATE NO. : P-04617
発行年月日 : 2010-02-18
DATE OF ISSUE : 2010-02-18
頁 : 7
PAGE : 7

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)

需要家 : EDMONTON EXCHANGER GROUP OF C-
CUSTOMER : EDMONTON EXCHANGER GROUP OF C-
需要家管理番号 : CUSTOMERS CONTROL NO. E3001P07Q0 E07

DOCUMENT NO.	寸 法 DIMENSION mm, inch, feet	負数 QUAN- TITY	質 量 MASS KG	製鋼番号		製品番号	引 張 試 験				衝 撃 試 験				HBW	化 学 成 分 CHEMICAL COMPOSITION %																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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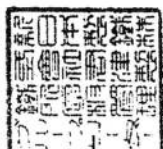
注 記 NOTES 1. 位置 Orientation 位置・方向, T: 頂部 Top, B: 底部 Bottom, L: 長さ方向 Longitudinal, C: 幅方向 Transverse, Z: 板厚方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis
2. G.L. 端点距離 Gage Length, A: 50mm 矩形試験片 Rectangular, B: 80mm 矩形試験片 Rectangular, F: 80mm 矩形試験片 Rectangular, P: 80mm 矩形試験片 Rectangular, R: 80mm 矩形試験片 Rectangular, S: 80mm 矩形試験片 Rectangular, T: 80mm 矩形試験片 Rectangular, U: 80mm 矩形試験片 Rectangular, V: 80mm 矩形試験片 Rectangular, W: 80mm 矩形試験片 Rectangular, X: 80mm 矩形試験片 Rectangular, Y: 80mm 矩形試験片 Rectangular, Z: 80mm 矩形試験片 Rectangular
3. R.A. 絞り Reduction of Area, Y.R. 降伏比 Yield Ratio, 4. A: 合格 Acceptable, 5. F: 標準寸法 FULL SIZE, 2: 2.5mm, 3: 3.3mm, 4: 3.3mm, 5: 5.0mm, 6: 6.67mm, 7: 7.5mm, 8: 6.7mm, 9: 製品板厚 Plate Thickness, 6. 製品板厚 Product Analysis, 7. N: 標準 Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, C.R.: Controlled Rolled, N1C: 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
8. 焼入れ焼戻し Shear Fracture, C.F.: 断面縮減率 Crystallinity Fracture, L.E.: 後彫出 Lateral Expansion, A.G.S.: オーステナイト粒度 Austenite Grain Size, F.G.S.: フェライト粒度 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.

J. Adachi

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



B

注 文 者 : HANWA CO., LTD.

注文者照会番号 : 228-38591010

契約番号 : 0-831-H1-5-1-A101

商品名 : HOT ROLLED STEEL PLATES

規格 : ASME SA-516 GRADE 70-E07-A08

文書番号 : DOCUMENT No.

新日本製鐵株式會社
Nippon Steel Corporation

鋼材検査証明書 INSPECTION CERTIFICATE

本 社 : 〒100-8071 東京都千代田区丸の内二丁目6番1号
HEAD OFFICE : 2-6-1, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
君津製鐵所 : 〒799-1141 千葉県君津市君津1番地
KIMITSU WORKS : 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF, 299-1141 JAPAN

証明番号 : P-04617
CERTIFICATE No. : P-04617
発行年月日 : 2010-02-18
DATE OF ISSUE : 2010-02-18

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)

需要家管理番号 : E3001P07Q0 E07
CUSTOMER'S CONTROL No. : E3001P07Q0 E07

寸 法 DIMENSION mm, inch, feet	数量 QUANTITY	質量 MASS KG	製鋼番号 CAST No. 試験番号 TEST No.	製品番号 PLATE No.	位置 LOCATION ORIENTATION	引張試験 TENSILE TEST				衝撃試験 IMPACT TEST				化 学 成 分 CHEMICAL COMPOSITION %											
						耐力降伏比 Y.S. - Y.P. 0.2%	引張強さ T.S.	伸び E.L.	断面収縮 R.A.	平均値 AVG	個々値 EACH	位置 LOCATION	位置 ORIENTATION	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Nb	V	Ti
0.5' X 120.5' X 480'	01	3721	G8508 69056	TESTED-PL X71770137TCI	7012	55	76	29		307 281 245		TLF278		15	38	144	8	2	1	2	2	0	0	0	0
0.5' X 120.5' X 480'	01	11163	G8508 69056	FROM X71770138TCI TO X71770140	7012	55	76	29		307 281 245		TLF278		15	38	144	8	2	1	2	2	0	0	0	0
0.5' X 120.5' X 480'	01	3721	G8508 69057	TESTED-PL X71770141TCI	7012	55	77	29		305 316 177		TLF266		15	38	144	8	2	1	2	2	0	0	0	0

注 釈 NOTES [※1] Location Orientation 位置・方向, T: 縦断 Top, B: 底面 Bottom, L: 主要方向 Longitudinal, C: 横断方向 Transverse, Z: 板厚方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis
[※2] G.L. 板長 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 Rectangular, F: 80mm 丸形試験片 Round, G: 200mm, 11: 2', 1: 8', 3: 5.65/So, K: 4/50
[※3] R.A.: 絞り Reduction of Area, Y.R.: 降伏比 Yield Ratio, [※4] A: 合格 Acceptable, [※5] F: 標準寸法 FULL SIZE, 2: 2.5mm, 3: 3.3mm, 4: 3.3mm, 5: 5.0mm, 6: 6.67mm, 7: 7.5mm, 8: 6.7mm, 9: 製品板厚 Plate Thickness, [※6] P: 製品分析 Product Analysis, [※7] N: 焼戻 Normalized, 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.: 延性断面率 Shear Fracture, C.F.: 脆性断面率 Crystallinity Fracture, L.E.: 側面出 Lateral Expansion, A.G.S.: オーステナイト粒径 Austenite Grain Size, F.G.S.: フェライト粒径 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.

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

新日本製鐵株式會社
Nippon Steel Corporation

鋼材検査証明書
INSPECTION CERTIFICATE

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

注文者 HANWA CO., LTD.
注文者照合番号 228-38591010
契約番号 0-831-H1-5-1-A101
商品名 HOT ROLLED STEEL PLATES
規格 ASME SA-516 GRADE 70-E07-A08
文書番号 DOCUMENT No.

証明番号 1001
CERTIFICATE No. P-04617
発行年月日 2010-02-18
DATE OF ISSUE
需要家管理番号 E3001P07Q0 E07
CUSTOMER'S CONTROL No.

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)
EDMONTON EXCHANGER GROUP OF C-
COMPANIES

寸法	DIMENSION	数量	質量	製造番号	製品番号	位置	引張試験				衝撃試験				化学成分													
							Y.S.	T.S.	伸び	位置	2V-50F	平均値	位置	位置														
mm, inch, feet			KG	CAST No.	TEST No.	PLATE No.	0.2%	KS	%	位置	FT. LB	AVG EACH	位置	位置	C	Si	Mn	P	S	CU	Ni	Mo	NO	V	TAI	CO	位置	位置
0.5' X 120.5' X 480'	01	3	11163	G8508 69057	X71770142 TO	X71770144	55	77	29	位置	305	177	位置	位置	15	38	144	8	2	1	2	2	0	012	02840	位置	位置	位置
0.5' X 120.5' X 480'	01	1	3721	G8508 69058	X71770145 TO	X71770148	55	76	30	位置	310	301	位置	位置	15	38	144	8	2	1	2	2	0	012	02840	位置	位置	位置
0.5' X 120.5' X 480'	01	3	11163	G8508 69058	X71770146 TO	X71770148	55	76	30	位置	310	301	位置	位置	15	38	144	8	2	1	2	2	0	012	02840	位置	位置	位置

注釈 NOTES
※1 位置 Orientation 位置・方向, T: 縦部 Top, B: 底部 Bottom, L: 圧延方向 Longitudinal, C: 垂直方向 Transverse, Z: 板厚方向 Through Thickness, R: 15° 方向 45Deg. to the Longitudinal Axis
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Head of Department
PLATE QUALITY CONTROL DEPT.
KIMITSUWORKS



B

注 文 者 : HANWA CO., LTD.
 SHIPPER :
 注文者照合番号 : 228-38591010
 契約番号 : 0-831-H1-5-1-A101
 CONTRACT No. :
 商品名 : HOT ROLLED STEEL PLATES
 COMMODITY :
 規格 : ASME SA-516 GRADE 70-E07-A08
 SPECIFICATION :
 文書番号 :
 DOCUMENT No. :

新日本製鐵株式會社
 Nippon 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
 君津製鐵所 : 〒299-1141 千葉県君津市君津 1 番地
 KIMITSU WORKS : 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN

鋼材検査証明書 INSPECTION CERTIFICATE

証明番号 : P-04617
 CERTIFICATE No. :
 発行年月日 : 2010-02-18
 DATE OF ISSUE :
 頁 : 12
 PAGE :

(AS PER EN 10204 CERTIFICATE ON MATERIAL
 TESTS 3.1)

需要家 : EDMONTON EXCHANGER GROUP OF C-
 CUSTOMER :
 需要家管理番号 :
 CUSTOMER'S CONTROL No. :

2**DM*****
 *****CEW**
 E3001P07Q0 E07

DOCUMENT No. :
COMPANIES
CUSTOMER

01
0.5' X 120.5' X 480'
DIMENSION
mm, 'inch, 'feet

3
11163
G8508FROM
69060
TEST No.
CAST No.

PLATE No.
X717701701
TO
X71770172

引張試験
TENSILE TEST

0.2%
Y.S. Y_{0.2}

引張強さ
T.S.

伸び
E.L.

平均値
AVG

個々値
E.L.B

2V - 50F
FT. LB

位置
LOCATION

衝撃試験
IMPACT TEST

296
TLF299
300
300

化学成分
CHEMICAL COMPOSITION %

HBW

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×100
×1000
×10000
×100000
×1000000
×10000000
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注 釈 NOTES 1. 位置 2. 位置 3. 位置 4. 位置 5. 位置 6. 位置 7. 位置 8. 位置 9. 位置 10. 位置 11. 位置 12. 位置 13. 位置 14. 位置 15. 位置 16. 位置 17. 位置 18. 位置 19. 位置 20. 位置 21. 位置 22. 位置 23. 位置 24. 位置 25. 位置 26. 位置 27. 位置 28. 位置 29. 位置 30. 位置 31. 位置 32. 位置 33. 位置 34. 位置 35. 位置 36. 位置 37. 位置 38. 位置 39. 位置 40. 位置 41. 位置 42. 位置 43. 位置 44. 位置 45. 位置 46. 位置 47. 位置 48. 位置 49. 位置 50. 位置 51. 位置 52. 位置 53. 位置 54. 位置 55. 位置 56. 位置 57. 位置 58. 位置 59. 位置 60. 位置 61. 位置 62. 位置 63. 位置 64. 位置 65. 位置 66. 位置 67. 位置 68. 位置 69. 位置 70. 位置 71. 位置 72. 位置 73. 位置 74. 位置 75. 位置 76. 位置 77. 位置 78. 位置 79. 位置 80. 位置 81. 位置 82. 位置 83. 位置 84. 位置 85. 位置 86. 位置 87. 位置 88. 位置 89. 位置 90. 位置 91. 位置 92. 位置 93. 位置 94. 位置 95. 位置 96. 位置 97. 位置 98. 位置 99. 位置 100. 位置 101. 位置 102. 位置 103. 位置 104. 位置 105. 位置 106. 位置 107. 位置 108. 位置 109. 位置 110. 位置 111. 位置 112. 位置 113. 位置 114. 位置 115. 位置 116. 位置 117. 位置 118. 位置 119. 位置 120. 位置 121. 位置 122. 位置 123. 位置 124. 位置 125. 位置 126. 位置 127. 位置 128. 位置 129. 位置 130. 位置 131. 位置 132. 位置 133. 位置 134. 位置 135. 位置 136. 位置 137. 位置 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22

Nippon Steel Corporation

ト記号は指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。

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

T. Adachi

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

[illegible]

AY408501272

注 文 者 :	HANWA CO., LTD.
SHIPPER	
注文者照合番号	
REFERENCE No.	228-38591010
契約番号	
CONTRACT No.	0-831-H1-5-1-AT01
商 品 名	
COMMODITY	HOT ROLLED STEEL
規 格	
SPECIFICATION	ASME SA-516 GRADE
文 書 番 号	
DOCUMENT No.	

新日本製鐵株式會社
Nippon Steel Corporation

鋼材檢驗明証書

INSPECTION CERTIFICATE

COMMODITY : HOT ROLLED STEEL PLATES

規格 : ASME SA-516 GRADE 70-E07-A08
SPECIFICATION

文書番号
DOCUMENT NO.

(AS PER EN 10204 CERTIFICATE ON MATERIAL TESTS 3.1)

EDMONTON EXCHANGER GROUP OF C-
COMPANIES

證明書番號 : P-04617
頁 : PAGE 15

発行年月日 : 2010-02-18
DATE OF ISSUE : 1001

2**DMCEW**

E3001P0700 E07

[illegible]

7. 核孔徑分布 Transverse R: 45° 方向 45Deg. to the Longitudinal Axis

[illegible]

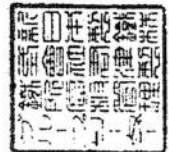
※3: 絞り 絞り率 FULL SIZE, 2: 2.5mm, 3: 3.0mm, 4: 3.5mm, 5: 4.0mm, 6: 4.5mm, 7: 5.0mm, 8: 5.5mm, 9: 6.0mm, 10: 6.5mm, 11: 7.0mm, 12: 7.5mm, 13: 8.0mm, 14: 8.5mm, 15: 9.0mm, 16: 9.5mm, 17: 10.0mm, 18: 10.5mm, 19: 11.0mm, 20: 11.5mm, 21: 12.0mm, 22: 12.5mm, 23: 13.0mm, 24: 13.5mm, 25: 14.0mm, 26: 14.5mm, 27: 15.0mm, 28: 15.5mm, 29: 16.0mm, 30: 16.5mm, 31: 17.0mm, 32: 17.5mm, 33: 18.0mm, 34: 18.5mm, 35: 19.0mm, 36: 19.5mm, 37: 20.0mm, 38: 20.5mm, 39: 21.0mm, 40: 21.5mm, 41: 22.0mm, 42: 22.5mm, 43: 23.0mm, 44: 23.5mm, 45: 24.0mm, 46: 24.5mm, 47: 25.0mm, 48: 25.5mm, 49: 26.0mm, 50: 26.5mm, 51: 27.0mm, 52: 27.5mm, 53: 28.0mm, 54: 28.5mm, 55: 29.0mm, 56: 29.5mm, 57: 30.0mm, 58: 30.5mm, 59: 31.0mm, 60: 31.5mm, 61: 32.0mm, 62: 32.5mm, 63: 33.0mm, 64: 33.5mm, 65: 34.0mm, 66: 34.5mm, 67: 35.0mm, 68: 35.5mm, 69: 36.0mm, 70: 36.5mm, 71: 37.0mm, 72: 37.5mm, 73: 38.0mm, 74: 38.5mm, 75: 39.0mm, 76: 39.5mm, 77: 40.0mm, 78: 40.5mm, 79: 41.0mm, 80: 41.5mm, 81: 42.0mm, 82: 42.5mm, 83: 43.0mm, 84: 43.5mm, 85: 44.0mm, 86: 44.5mm, 87: 45.0mm, 88: 45.5mm, 89: 46.0mm, 90: 46.5mm, 91: 47.0mm, 92: 47.5mm, 93: 48.0mm, 94: 48.5mm, 95: 49.0mm, 96: 49.5mm, 97: 50.0mm, 98: 50.5mm, 99: 51.0mm, 100: 51.5mm, 101: 52.0mm, 102: 52.5mm, 103: 53.0mm, 104: 53.5mm, 105: 54.0mm, 106: 54.5mm, 107: 55.0mm, 108: 55.5mm, 109: 56.0mm, 110: 56.5mm, 111: 57.0mm, 112: 57.5mm, 113: 58.0mm, 114: 58.5mm, 115: 59.0mm, 116: 59.5mm, 117: 60.0mm, 118: 60.5mm, 119: 61.0mm, 120: 61.5mm, 121: 62.0mm, 122: 62.5mm, 123: 63.0mm, 124: 63.5mm, 125: 64.0mm, 126: 64.5mm, 127: 65.0mm, 128: 65.5mm, 129: 66.0mm, 130: 66.5mm, 131: 67.0mm, 132: 67.5mm, 133: 68.0mm, 134: 68.5mm, 135: 69.0mm, 136: 69.5mm, 137: 70.0mm, 138: 70.5mm, 139: 71.0mm, 140: 71.5mm, 141: 72.0mm, 142: 72.5mm, 143: 73.0mm, 144: 73.5mm, 145: 74.0mm, 146: 74.5mm, 147: 75.0mm, 148: 75.5mm, 149: 76.0mm, 150: 76.5mm, 151: 77.0mm, 152: 77.5mm, 153: 78.0mm, 154: 78.5mm, 155: 79.0mm, 156: 79.5mm, 157: 80.0mm, 158: 80.5mm, 159: 81.0mm, 160: 81.5mm, 161: 82.0mm, 162: 82.5mm, 163: 83.0mm, 164: 83.5mm, 165: 84.0mm, 166: 84.5mm, 167: 85.0mm, 168: 85.5mm, 169: 86.0mm, 170: 86.5mm, 171: 87.0mm, 172: 87.5mm, 173: 88.0mm, 174: 88.5mm, 175: 89.0mm, 176: 89.5mm, 177: 90.0mm, 178: 90.5mm, 179: 91.0mm, 180: 91.5mm, 181: 92.0mm, 182: 92.5mm, 183: 93.0mm, 184: 93.5mm, 185: 94.0mm, 186: 94.5mm, 187: 95.0mm, 188: 95.5mm, 189: 96.0mm, 190: 96.5mm, 191: 97.0mm, 192: 97.5mm, 193: 98.0mm, 194: 98.5mm, 195: 99.0mm, 196: 99.5mm, 197: 100.0mm, 198: 100.5mm, 199: 101.0mm, 200: 101.5mm, 201: 102.0mm, 202: 102.5mm, 203: 103.0mm, 204: 103.5mm, 205: 104.0mm, 206: 104.5mm, 207: 105.0mm, 208: 105.5mm, 209: 106.0mm, 210: 106.5mm, 211: 107.0mm, 212: 107.5mm, 213: 108.0mm, 214: 108.5mm, 215: 109.0mm, 216: 109.5mm, 217: 110.0mm, 218: 110.5mm, 219: 111.0mm, 220: 111.5mm, 221: 112.0mm, 222: 112.5mm, 223: 113.0mm, 224: 113.5mm, 225: 114.0mm, 226: 114.5mm, 227: 115.0mm, 228: 115.5mm, 229: 116.0mm, 230: 116.5mm, 231: 117.0mm, 232: 117.5mm, 233: 118.0mm, 234: 118.5mm, 235: 119.0mm, 236: 119.5mm, 237: 120.0mm, 238: 120.5mm, 239: 121.0mm, 240: 121.5mm, 241: 122.0mm, 242: 122.5mm, 243: 123.0mm, 244: 123.5mm, 245: 124.0mm, 246: 124.5mm, 247: 125.0mm, 248: 125.5mm, 249: 126.0mm, 250: 126.5mm, 251: 127.0mm, 252: 127.5mm, 253: 128.0mm, 254: 128.5mm, 255: 129.0mm, 256: 129.5mm, 257: 130.0mm, 258: 130.5mm, 259: 131.0mm, 260: 131.5mm, 261: 132.0mm, 262: 132.5mm, 263: 133.0mm, 264: 133.5mm, 265: 134.0mm, 266: 134.5mm, 267: 135.0mm, 268: 135.5mm, 269: 136.0mm, 270: 136.5mm, 271: 137.0mm, 272: 137.5mm, 273: 138.0mm, 274: 138.5mm, 275: 139.0mm, 276: 139.5mm, 277: 140.0mm, 278: 140.5mm, 279: 141.0mm, 280: 141.5mm, 281: 142.0mm, 282: 142.5mm, 283: 143.0mm, 284: 143.5mm, 285: 144.0mm, 286: 144.5mm, 287: 145.0mm, 288: 145.5mm, 289: 146.0mm, 290: 146.5mm, 291: 147.0mm, 292: 147.5mm, 293: 148.0mm, 294: 148.5mm, 295: 149.0mm, 296: 149.5mm, 297: 150.0mm, 298: 150.5mm, 299: 151.0mm, 300: 151.5mm, 301: 152.0mm, 302: 152.5mm, 303: 153.0mm, 304: 153.5mm, 305: 154.0mm, 306: 154.5mm, 307: 155.0mm, 308: 155.5mm, 309: 156.0mm, 310: 156.5mm, 311: 157.0mm, 312: 157.5mm, 313: 158.0mm, 314: 158.5mm, 315: 159.0mm, 316: 159.5mm, 317: 160.0mm, 318: 160.5mm, 319: 161.0mm, 320: 161.5mm, 321: 162.0mm, 322: 162.5mm, 323: 163.0mm, 324: 163.5mm, 325: 164.0mm, 326: 164.5mm, 327: 165.0mm, 328: 165.5mm, 329: 166.0mm, 330: 166.5mm, 331: 167.0mm, 332: 167.5mm, 333: 168.0mm, 334: 168.5mm, 335: 169.0mm, 336: 169.5mm, 337: 170.0mm, 338: 170.5mm, 339: 171.0mm, 340:

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

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

J. Adachi

Head of Department
PLATE QUALITY CONTROL DEPT.
KIMTSU WORKS



注 文 者	:	HANWA CO., LTD.
SHIPPER	:	
注文者照合番号	:	228-38591010
REFERENCE No.	:	
契約番号	:	0-831-H1-5-1-A101
CONTRACT No.	:	
商 品 名	:	HOT ROLLED STEEL
COMMODITY	:	
規 格	:	ASME SA-516 GRADE
SPECIFICATION	:	
文 書 番 号	:	
DOCUMENT No.	:	

新日本製鐵株式會社
Nippon Steel Corporation

注文者照合番号	228-38591010
REFERENCE No.	
契約番号	0-831-H1-5-1-A101
CONTRACT No.	
商 品 名	HOT ROLLED STEEL
COMMODITY	
規 格	ASME SA-516 GRADE
SPECIFICATION	
文 書 番 号	
DOCUMENT No.	

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

INSPECTION CERTIFICATE

COMMODITY : HOT ROLLED STEEL PLATES

規格 : ASME SA-516 GRADE 70-E07-A08

歌 徒
吟 希 藝 文

DOCUMENT No. CUSTOMER

AS PER EN 10204 CERTIFICATE ON MATERIAL

TESTS 3.1)

N EXCHANGER GROUP OF C-

[illegible]

證明書番號 : P-04617
頁 : 16

發行年月日

DATE OF ISSUE : 2010-02-18

1001

F300

化学组成

[illegible]

θ : 射角
Z: 厚度方向
 $R=45^\circ$: 与纵向轴成45度角的方向
Transverse: 横向
Through Thickness: 厚度方向

[illegible]

※3	RA : 絞り Reduction of Area, Y.R : 降伏比 Yield Ratio,	※4	A : 合格 Acceptable,	※5	寸法公差 FULL SIZE, 2 : 2.5mm, 3 : 3.5mm, 4 : 4.5mm, 5 : 5.0mm, 6 : 6.0mm, 7 : 7.0mm, 8 : 8.0mm, 9 : 9.0mm, 10 : 10.0mm, 11 : 11.0mm, 12 : 12.0mm, 13 : 13.0mm, 14 : 14.0mm, 15 : 15.0mm, 16 : 16.0mm, 17 : 17.0mm, 18 : 18.0mm, 19 : 19.0mm, 20 : 20.0mm, 21 : 21.0mm, 22 : 22.0mm, 23 : 23.0mm, 24 : 24.0mm, 25 : 25.0mm, 26 : 26.0mm, 27 : 27.0mm, 28 : 28.0mm, 29 : 29.0mm, 30 : 30.0mm, 31 : 31.0mm, 32 : 32.0mm, 33 : 33.0mm, 34 : 34.0mm, 35 : 35.0mm, 36 : 36.0mm, 37 : 37.0mm, 38 : 38.0mm, 39 : 39.0mm, 40 : 40.0mm, 41 : 41.0mm, 42 : 42.0mm, 43 : 43.0mm, 44 : 44.0mm, 45 : 45.0mm, 46 : 46.0mm, 47 : 47.0mm, 48 : 48.0mm, 49 : 49.0mm, 50 : 50.0mm, 51 : 51.0mm, 52 : 52.0mm, 53 : 53.0mm, 54 : 54.0mm, 55 : 55.0mm, 56 : 56.0mm, 57 : 57.0mm, 58 : 58.0mm, 59 : 59.0mm, 60 : 60.0mm, 61 : 61.0mm, 62 : 62.0mm, 63 : 63.0mm, 64 : 64.0mm, 65 : 65.0mm, 66 : 66.0mm, 67 : 67.0mm, 68 : 68.0mm, 69 : 69.0mm, 70 : 70.0mm, 71 : 71.0mm, 72 : 72.0mm, 73 : 73.0mm, 74 : 74.0mm, 75 : 75.0mm, 76 : 76.0mm, 77 : 77.0mm, 78 : 78.0mm, 79 : 79.0mm, 80 : 80.0mm, 81 : 81.0mm, 82 : 82.0mm, 83 : 83.0mm, 84 : 84.0mm, 85 : 85.0mm, 86 : 86.0mm, 87 : 87.0mm, 88 : 88.0mm, 89 : 89.0mm, 90 : 90.0mm, 91 : 91.0mm, 92 : 92.0mm, 93 : 93.0mm, 94 : 94.0mm, 95 : 95.0mm, 96 : 96.0mm, 97 : 97.0mm, 98 : 98.0mm, 99 : 99.0mm, 100 : 100.0mm, 101 : 101.0mm, 102 : 102.0mm, 103 : 103.0mm, 104 : 104.0mm, 105 : 105.0mm, 106 : 106.0mm, 107 : 107.0mm, 108 : 108.0mm, 109 : 109.0mm, 110 : 110.0mm, 111 : 111.0mm, 112 : 112.0mm, 113 : 113.0mm, 114 : 114.0mm, 115 : 115.0mm, 116 : 116.0mm, 117 : 117.0mm, 118 : 118.0mm, 119 : 119.0mm, 120 : 120.0mm, 121 : 121.0mm, 122 : 122.0mm, 123 : 123.0mm, 124 : 124.0mm, 125 : 125.0mm, 126 : 126.0mm, 127 : 127.0mm, 128 : 128.0mm, 129 : 129.0mm, 130 : 130.0mm, 131 : 131.0mm, 132 : 132.0mm, 133 : 133.0mm, 134 : 134.0mm, 135 : 135.0mm, 136 : 136.0mm, 137 : 137.0mm, 138 : 138.0mm, 139 : 139.0mm, 140 : 140.0mm, 141 : 141.0mm, 142 : 142.0mm, 143 : 143.0mm, 144 : 144.0mm, 145 : 145.0mm, 146 : 146.0mm, 147 : 147.0mm, 148 : 148.0mm, 149 : 149.0mm, 150 : 150.0mm, 151 : 151.0mm, 152 : 152.0mm, 153 : 153.0mm, 154 : 154.0mm, 155 : 155.0mm, 156 : 156.0mm, 157 : 157.0mm, 158 : 158.0mm, 159 : 159.0mm, 160 : 160.0mm, 161 : 161.0mm, 162 : 162.0mm, 163 : 163.0mm, 164 : 164.0mm, 165 : 165.0mm, 166 : 166.0mm, 167 : 167.0mm, 168 : 168.0mm, 169 : 169.0mm, 170 : 170.0mm, 171 : 171.0mm, 172 : 172.0mm, 173 : 173.0mm, 174 : 174.0mm, 175 : 175.0mm, 176 : 176.0mm, 177 : 177.0mm, 178 : 178.0mm, 179 : 179.0mm, 180 : 180.0mm, 181 : 181.0mm, 182 : 182.0mm, 183 : 183.0mm, 184 : 184.0mm, 185 : 185.0mm, 186 : 186.0mm, 187 : 187.0mm, 188 : 188.0mm, 189 : 189.0mm, 190 : 190.0mm, 191 : 191.0mm, 192 : 192.0mm, 193 : 193.0mm, 194 : 194.0mm, 195 : 195.0mm, 196 : 196.0mm, 197 : 197.0mm, 198 : 198.0mm, 199 : 199.0mm, 200 : 200.0mm, 201 : 201.0mm, 202 : 202.0mm, 203 : 203.0mm, 204 : 204.0mm, 205 : 205.0mm, 206 : 206.0mm, 207 : 207.0mm, 208 : 208.0mm, 209 : 209.0mm, 210 : 210.0mm, 211 : 211.0mm, 212 : 212.0mm, 213 : 213.0mm, 214 : 214.0mm, 215 : 215.0mm, 216 : 216.0mm, 217 : 217.0mm, 218 : 218.0mm, 219 : 219.0mm, 220 : 220.0mm, 221 : 221.0mm, 222 : 222.0mm, 223 : 223.0mm, 224 : 224.0mm, 225 : 225.0mm, 226 : 226.0mm, 227 : 227.0mm, 228 : 228.0mm, 229 : 229.0mm, 230 : 230.0mm, 231 : 231.0mm, 232 : 232.0mm, 233 : 233.0mm, 234 : 234.0mm, 235 : 235.0mm, 236 : 236.0mm, 237 : 237.0mm, 238 : 238.0mm, 239 : 239.0mm, 240 : 240.0mm, 241 : 241.0mm, 242 : 242.0mm, 243 : 243.0mm, 244 : 244.0mm, 245 : 245.0mm, 246 : 246.0mm, 247 : 247.0mm, 248 : 248.0mm, 249 : 249.0mm, 250 : 250.0mm, 251 : 251.0mm, 252 : 252.0mm, 253 : 253.0mm, 254 : 254.0mm, 255 : 255.0mm, 256 : 256.0mm, 257 : 257.0mm, 258 : 258.0mm, 259 : 259.0mm, 260 : 260.0mm, 261 : 261.0mm, 262 : 262.0mm, 263 : 263.0mm, 264 : 264.0mm, 265 : 265.0mm, 266 : 266.0mm, 267 : 267.0mm, 268 : 268.0mm, 269 : 269.0mm, 270 : 270.0mm, 271 : 271.0mm, 272 : 272.0mm, 273 : 273.0mm, 274 : 274.0mm, 275 : 275.0mm, 276 : 276.0mm, 277 : 277.0mm, 278 : 278.0mm, 279 : 279.0mm, 280 : 280.0mm, 281 : 281.0mm, 282 : 282.0mm, 283 : 283.0mm, 284 : 284.0mm, 285 : 285.0mm, 286 : 286.0mm, 287 : 287.0mm, 288 : 288.0mm, 289 : 289.0mm, 290 : 290.0mm, 291 : 291.0mm, 292 : 292.0mm, 293 : 293.0mm, 294 : 294.0mm, 295 : 295.0mm, 296 : 296.0mm, 297 : 297.0mm, 298 : 298.0mm, 299 : 299.0mm, 300 : 300.0mm, 301 : 301.0mm, 302 : 302.0mm, 303 : 303.0mm, 304 : 304.0mm, 305 : 305.0mm, 306 : 306.0mm, 307 : 307.0mm, 308 : 308.0mm, 309 : 309.0mm, 310 : 310.0mm, 311 : 311.0mm, 312 : 312.0mm, 313 : 313.0mm, 314 : 314.0mm, 315 : 315.0mm, 316 : 316.0mm, 317 : 317.0mm, 318 : 318.0mm, 319 : 319.0mm, 320 : 320.0mm, 321 : 321.0mm, 322 : 322.0mm, 323 : 323.0mm, 324 : 324.0mm, 325 : 325.0mm, 326 : 326.0mm, 327 : 32
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ト社注文品は額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.

T. Adachi

[illegible]

君津製鐵所厚板管理グループ外

Head of Department

PLATE QUALITY CONTROL DEPT. I
KIMTSU IWORKS

注 文 者	:	HANWA CO., LTD.
SHIPPER	:	
注文者照台番号	:	228-38591010
契約番号	:	0-831-11-5-1-A1
CONTRACT NO.	:	
商 品 名	:	HOT ROLLED STEEL
COMMODITY	:	
規 格	:	ASME SA-516 GRA
SPECIFICATION	:	
文 書 番 号	:	
DOCUMENT No.	:	

鋼材検査証明書
INSPECTION CERTIFICATE

COMMODITY : HOT ROLLED STEEL PLATES

規格 : ASME SA-516 GRADE 70-F07-A08

ASME SA-310 GRADE 15
SPECIFICATION
A 310 GRADE 15
SEAMLESS
PIPE

CUSTOMER COMPANIES

(AS PER EN 10204 CERTIFICATE ON MATERIAL

TESTS 3.1)

EXCHANGER GROUP OF C-

叫 審 理 家 要 能

CUSTOMER'S CONTROL No.

証 明 書 番 号 : P-04617
CERTIFICATE No. 17
頁 : PAGE

社 本 部 東京千代田区丸の内二丁目6番1号
 HEAD OFFICE 2-6-1, MARUNOUCHI, CHITODA-KU, TOKYO 100-8071, JAPAN
 君 著 製 造 所 〒239-1141 千葉県君津市君津1番地
 KIMITSU WORKS 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF, 239-1141 JAPAN

主 要 注 意 事 項

※1 Location Orientation 方向、T: 頂部 Top, B: 底部 Bottom, L: 注圧方向 Longitudinal, C: 貫向方向 Transverse, Z: 板厚方向 Through Thickness, R: 45° 方向 45Deg. to the Longitudinal Axis

※2 G.L. 標点距離 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 Rectangular, F: 80mm 丸形試験片 Round, G: 200mm, H: 2° 1' 8", J: 5.65√So, K: 4/√So

※3 RA: 絞り Reduction of Area, Y.R: 伸び率 Yield Ratio. ※4 A: 合格 Acceptable, ※5 F: 標準寸法 FULL SIZE, Z: 2.5mm, 3: 3.3mm, 4: 9.33mm, 5: 5.0mm, 6: 6.67mm, 7: 7.5mm, 8: 6.7mm, 9: 製造原厚 Plate Thickness, ※6 P: 製品分析 Product Analysis, ※7 N: 焼却 Normalized, Q: 焼入れ Quenched, T: 焼戻し Tempered, C.R: Controlled Rolled, N.I.C: NIC Process/TMC Process, A.R: As Rolled, T.M.R: TMR Process/TMC Process, S.R: Stress Relieved/Post Weld Heat Treatment

温度 Temperature 温度 Temperature

℃	°F
100	212
150	302
200	392
250	482
300	572
350	662
400	752
450	842
500	932
550	1022
600	1112
650	1202
700	1292
750	1382
800	1472
850	1562
900	1652
950	1742
1000	1832

上記の注は、価格の指定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.

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

精製鐵樹皮
神效金匱丸
新製金匱丸

posco Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 100129-PPSA-002-001
Date of Issue/발행일자 : Mar., 05, 2010

Order No./계약번호 : 0004005387

PO No./주문번호 : E10689
(ASME2004EDITION)

ORIGINAL

Supplier/주문자 : DAE WOO INTERNATIONAL CORP.

Commodity/품명 : HR STEEL PLATE (EN10204 3.1B)

Customer/고객사 : EDMONTON EXCHANGER

Spec & Type/규격 : ASME SA516-70 AND SA20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Quantity 수량 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	P O S I T I O N	Tensile/인장시험			Impact/충격시험 V Notch : -50°F Energy SF (FT-LBS) (%)	D I V I S I O N	Chemical Composition/화합성분(%)													
						YP (KSI)	TS (%)	EL (%)			C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Al
0.5"x120.5"x480"	PB82423601-3604	4	14,884 32,812	SB62742	T	53.4	78.3	27	1:114 2:117 3:129 A:120	L	1841	344	1163	101	15	2	24	Tr	76	Tr	1	1	18	29
0.5"x120.5"x480"	PB82432701-2704	4	14,884 32,812	SB62742	T	53.5	78.8	28	1:128 2:133 3:81 A:114	L	1841	344	1163	101	15	2	24	Tr	76	Tr	1	1	18	29
0.5"x120.5"x480"	PB82433601-3604	4	14,884 32,812	SB62742	T	54.1	78.0	27	1:128 2:131 3:127 A:128	L	1841	344	1163	101	15	2	24	Tr	76	Tr	1	1	18	29
0.5"x120.5"x480"	PB82433501-3504	4	14,884 32,812	SB62742	T	53.8	78.0	29	1:103 2:131 3:131 A:121	L	1841	344	1163	101	15	2	24	Tr	76	Tr	1	1	18	29
0.5"x120.5"x480"	PB82433401-3404	4	14,884 32,812	SB62742	T	54.2	78.5	29	1:120 2:140 3:128	L	1841	344	1163	101	15	2	24	Tr	76	Tr	1	1	18	29

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

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

YP Method : 0.2% off-set

* Impact Test. Direction : 1/4T Longitudinal,

T.L.R.(Trans Longitude Ratio)

* Division - L:Ladle Analysis

* Chemical Composition Unit: -2x1/100, -3x1/1000, -4x1/10000, -5x1/100000

* Tr : It is within the standard range and include trace element.

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

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PQG01 Rev.0 dated JUL.01,2006 audited and approved by customer as conforming to the requirements of ASME Sec. III

NCA-3800 and(or) KEPIC MNAJ SNA4300.

B) No repair welding was performed to the products.

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

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

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

This material is fine grained steel.

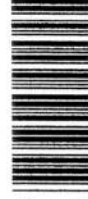
* This Mill Test Certificate cannot be copied for any purpose.

Surveyor To:

W.G. Jo

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

Chief of material testing section Jo, Won Gook



POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 100129-PPSA-002-002
Date of Issue/발행일자 : Mar., 05, 2010

Order No./계약번호 : 0004005387

PO No./주문번호 : E10689
(ASME2004EDITION)

Supplier/주문자 : DAE WOO INTERNATIONAL CORP.

Commodity/품명 : HR STEEL PLATE (EN10204 3.1B)

Customer/고객사 : EDMONTON EXCHANGER

Spec & Type/규격 : ASME SA516-70 AND SA20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	POSITION	Tensile/인장시험			Impact/충격시험 V Notch -50°F Energy SF (FT-LBS) (%)	DIVISION	Chemical Composition/화합성분(%)															
						YP (KSI)	TS (KSI)	EL (%)			C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Sol-Al		
0.5"x120.5"x480"	PB82462301-2304	4	14,884 32,812	SB62742	T	52.8	78.6	26	A130 1:125 2:145 3:114 A128 1:135 2:149 3:140 A142	L	1841	344	1163	101	15	2	24	Tr	76	Tr	1	1	18	29		
0.5"x120.5"x480"	PB82432601-2604	4	14,884 32,812	SB62742	T	53.4	78.8	26	A125 2:177 3:123 A142 1:111 2:119 3:133 A121	L	1841	344	1163	101	15	2	24	Tr	76	Tr	1	1	18	29		
0.5"x120.5"x480"	PB82461301-1304	4	14,884 32,812	SB62745	T	53.8	78.3	26	A125 2:177 3:123 A142 1:111 2:119 3:133 A121	L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34		
0.5"x120.5"x480"	PB82461201-1204	4	14,884 32,812	SB62745	T	52.5	78.2	28	A125 2:177 3:123 A142 1:111 2:119 3:133 A121	L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34		
0.5"x120.5"x480"	PB82462201-2204	4	14,884 32,812	SB62745	T	52.2	77.9	26	A125 2:177 3:123 A142 1:111 2:119 3:133 A121	L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34		

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

* Tensile Test : Direction : Transversal, Gauge Length : 200mm(Rectangular),
YP Method : 0.2% off-set

* Impact Test : Direction : 1/4T Longitudinal,
T L R (Trans Longitude Ratio)

* Division - L : Ladle Analysis

* Chemical Composition Unit : -2x1/100, -3x1/1000, -4x1/10000, -5x1/100000

* Tr : It is within the standard range and include trace element.

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

A) This material was produced under a quality system manual Rev.7 dated Sept.12.2008 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and/or KEPIC MNA/ SNA4300

B) No repair welding was performed to the products.

C) The product numbers listed on this test report identifies the material
- We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.

This material is fine grained steel.

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

Surveyor To:

W.G. Jo

MATERIAL ACCEPTED

Code Edition used for verification 07 Addenda 09

POSCO Mill Test Certificate/검사증명서 Certificate No./증명서번호 : 100129-PPSA-002-003 Date of Issue/발행일자 : Mar., 05, 2010

Order No./계약번호 : 0004005387

Supplier/주문자 : DAE WOO INTERNATIONAL CORP.

Customer/고객사 : EDMONTON EXCHANGER

PO No./주문번호 : E10689 (ASME2004 EDITION)

Commodity/품명 : HR STEEL PLATE (EN10204 3.1B)

Spec & Type/규격 : ASME SA516-70 AND SA20(ASME2004 EDITION)

Size/치수	Product No. 제품번호	Qua- nity 수량	Weight 중량 (kg) (LBS)	Heat No. 재강번호	Tensile(인장)시험			Impact/충격시험 V Notch -50°F Energy (FT-LBS) SF (%)	D I V I S I O N	Chemical Composition/화합성분(%)																																																																																																																																																																																																																																																																					
					Y P (KSI)	T S (%)	E L (%)			C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Sol-Al																																																																																																																																																																																																																																																								
0.5"x120.5"x480"	PB82462701-2704	4	14,884 32,812	SB62745	T 52.1 77.9 27	3128 A105 1105 2123 3111 A113	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34	L

- * Position - T : Top, M : Middle, B : Bottom
- * Tensile Test. Direction : Transversal. Gauge Length : 200mm (Rectangular).
- YP Method : 0.2% off-set
- * Impact Test. Direction : 1/4T Longitudinal.
- T.L.R (Trans Longitude Ratio)
- * Division - L: Ladle Analysis
- * Chemical Composition Unit : -2x1/100, -3x1/1000, -4x1/10000, -5x1/100000
- * Tr : It is within the standard range and include trace element.
- * Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PQG01 Rev.0 dated JUL.01,2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and/or KEPIC MNA/ SNA4300.
B) No repair welding was performed to the products.
C) The product numbers listed on this test report identifies the material
- We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.
This material is fine grained steel.
* This Mill Test Certificate cannot be copied for any purpose.

Surveyor To:

W.G. Jo

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

Chief of material testing section Jo, Won Gook

MATERIAL ACCEPTED

Code Edition used for verification 07 Addenda 09
 Certificate No./증명서번호: 100129-PPSA-002-004
 Date of Issue/발행일자: Mar., 05, 2010

posco Mill Test Certificate/검사증명서

Order No./계약번호: 0004005387

PO No./주문번호: E10689

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

Commodity/품명: HR STEEL PLATE (EN10204 3.1B)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70 AND SA20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	P o s i t i o n	Tensile/인장시험 YP TS EL (KSI) (%)	Impact/충격시험 V Notch -50°F Energy SF (FT-LBS) (%)	D i r e c t i o n	Chemical Composition/화학성분(%) C Si Mn P S Cr Ni B Cu Nb Mo Ti V Sol-Al
0.5"x120.5"x480"	PB82433801-3804	4	14,884 32,812	SB62745	T	54.8 78.2 28	2:105 3:95 A:83 1:127 2:129 3:122 A:126 1:131 2:124 3:124 A:126 1:103 2:111 3:108 A:106	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34
0.5"x120.5"x480"	PB82433701-3704	4	14,884 32,812	SB62745	T	53.1 79.6 24	2:105 3:95 A:83 1:127 2:129 3:122 A:126 1:131 2:124 3:124 A:126 1:103 2:111 3:108 A:106	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34
0.5"x120.5"x480"	PB82461601-1604	4	14,884 32,812	SB62745	T	53.5 78.2 28	2:105 3:95 A:83 1:127 2:129 3:122 A:126 1:131 2:124 3:124 A:126 1:103 2:111 3:108 A:106	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34
0.5"x120.5"x480"	PB82461501-1504	4	14,884 32,812	SB62745	T	52.8 78.2 27	2:105 3:95 A:83 1:127 2:129 3:122 A:126 1:131 2:124 3:124 A:126 1:103 2:111 3:108 A:106	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34

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

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

* YP Method : 0.2% off-set

* Impact Test, Direction : 1/4T Longitudinal,

T.L.R.(Trans Longitude Ratio)

* Division - L:Ladle Analysis

* Chemical Composition Unit: -2x1/100, -3x1/1000, -4x1/10000, -5x1/100000

* Tr : It is within the standard range and include trace element.

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

A) This material was produced under a quality system manual Rev.7 dated Sept.12.2008 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III

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

B) No repair welding was performed to the products.

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

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

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

This material is fine grained steel.

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

Surveyor To:

U.G. Jo

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

Chief of material testing section Jo, Won Gook

posco Mill Test Certificate/검사증명서

Certificate No./증명서번호:100129-PPSA-002-005
Date of Issue/발행일자:Mar., 05, 2010

Order No./계약번호:0004005387

PO No./주문번호:E10689
(ASME2004EDITION)

Supplier/주문자:DAE WOO INTERNATIONAL CORP.

Commodity/품명:HR STEEL PLATE (EN10204 3.1B)

Customer/고객사:EDMONTON EXCHANGER

Spec & Type/규격:ASME SA516-70 AND SA20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	POSITION	Tensile/인장시험			Impact/충격시험		POSITION	Chemical Composition/화학적분(%)																
						YP	TS	EL (%)	V Notch -50°F	Energy SF (FT-LBS) (%)		C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Sol:Al			
0.5"x120.5"x480"	PB82461401-1404	4	14,884 32,812	SB62745	T	53.7	78.5	27	1:130 2:132 3:84 A:115		L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34			
0.5"x120.5"x480"	PB82462101-2104	4	14,884 32,812	SB62745	T	52.2	77.9	26	1:146 2:118 3:97 A:120		L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34			
0.5"x120.5"x480"	PB82462001-2004	4	14,884 32,812	SB62745	T	51.9	77.9	25	1:101 2:109 3:106 A:105		L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34			
0.5"x120.5"x480"	PB82461001-1004	4	14,884 32,812	SB62745	T	52.6	78.3	29	1:99 2:94 3:116 A:103		L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34			
0.5"x120.5"x480"	PB82423501-3504	4	14,884 32,812	SB62745	T	52.4	77.9	26	1:121 2:108		L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34			

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

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

YP Method : 0.2% off-set

* Impact Test. Direction : 1/4T 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 and include trace element.

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

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PQG01 Rev.0

dated JUL.01,2006 audited and approved by customer as conforming to the requirements of ASME Sec. III

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

B) No repair welding was performed to the products

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

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

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

This material is fine grained steel.

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

Surveyor To:

W.G. Jo

posco Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 100129-PPSA-002-006
Date of Issue/발행일자: Mar., 05, 2010

Order No./계약번호: 0004005387

PO No./주문번호: E10689
(ASME2004EDITION)

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

Commodity/품명: HR STEEL PLATE (EN10204 3.1B)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70 AND SA20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Qua- ntity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	Tensile/인장시험			Impact/ 충격시험		Chemical Composition/화합성분(%)														
					YP (KSI)	TS (%)	EL (%)	V Notch -50°F Energy (FT-LBS)	SF (%)	C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Sol-Al	
0.5"x120.5"x480"	PB82423401-3404	4	14,884 32,812	SB62745	52.6	78.2	28	3.119 A.117 1.139 2.153 3.110 A.134		L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34
*** Sub Total (010) ***		100	372,100 (kg)		820,328 (LBS)																			
*** HEAT TREATMENT ***			Normalized : 891°C 25min. ***																					
*** Lot Total ***		100	372,100 (kg)		820,328 (LBS)																			
*** Grade Total ***		100	372,100 (kg)		820,328 (LBS)																			
*** Grand Total ***		100	372,100 (kg)		820,328 (LBS)			=== Last Item ===																
* LOT NO ==> VACUUM DEGASSED CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5																								

* LOT NO ==> VACUUM DEGASSED
CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5

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

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

YP Method : 0.2% off-set

* Impact Test Direction : 1/4T Longitudinal,

T.L.R(Trans Longitude Ratio)

* Division - L:Ladle Analysis

* Chemical Composition Unit: -2x1/100, -3x1/1000, -4x1/10000, -5x1/100000

* Tr : It is within the standard range and include trace element

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

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III

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

B) No repair welding was performed to the products

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

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

This material is fine grained steel.

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

Surveyor To:

U.G. Jo

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

Chief of material testing section Jo, Won Gook



POSCO Mill Test Certificate/검사증명서

(Attached - Sheet)

Certificate No./증명서번호: 100129-PPSA-002-001
Date of Issue/발행일자: Mar., 05, 2010

Order No./계약번호: 0004005387

PO No./주문번호: E10689
(ASME2004 EDITION)

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

Commodity/품명: HR STEEL PLATE (EN10204 3.1B)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70 AND SA20(ASME2004 EDITION)

Product No. 제품번호	D I V I S I O N		Chemical Composition/화학성분(%)
	CEQ	-3	
PB82423601-3604	L 407		
PB82432701-2704	L 407		
PB82433601-3604	L 407		
PB82433501-3504	L 407		
PB82433401-3404	L 407		
PB82462301-2304	L 407		
PB82432601-2604	L 407		
PB82461301-1304	L 399		
PB82461201-1204	L 399		
PB82462201-2204	L 399		
PB82462701-2704	L 399		
PB82462601-2604	L 399		
PB82461101-1104	L 399		
PB82462501-2504	L 399		
PB82462401-2404	L 399		
PB82433801-3804	L 399		
PB82433701-3704	L 399		
PB82461601-1604	L 399		
PB82461501-1504	L 399		

A) This material was produced under a quality system manual Rev.7 dated Sept.12.2008 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and(or) KEPIC MNA/ SNA4300.

B) No repair welding was performed to the products.

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

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

This material is fine grained steel

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

Surveyor To:

W.G. Jo

POSCO Mill Test Certificate/검사증명서

(Attached-Sheet)

Certificate No./증명서번호: 100129-PPSA-002-002
Date of Issue/발행일자: Mar., 05, 2010

Order No./계약번호: 0004005387

PO No./주문번호: E10689
(ASME2004EDITION)

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

Commodity/품명: HR STEEL PLATE (EN10204 3.1B)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70 AND SA20(ASME2004EDITION)

Product No. 제품번호	D I V I S I O N	Chemical Composition/화합성분(%)	
		CEQ	-3
PB82461401-1404	L	399	
PB82462101-2104	L	399	
PB82462001-2004	L	399	
PB82461001-1004	L	399	
PB82423501-3504	L	399	
PB82423401-3404	L	399	
*** Sub Total	010) ***	100	372,100 (kg)
*** HEAT TREATMENT ***	Normalized : 891 °C 25min. ***		
*** Lot Total ***		100	372,100 (kg)
*** Grade Total ***		100	372,100 (kg)
*** Grand Total ***		100	372,100 (kg)
		*** Last Item ***	

* LOT NO ==> VACUUM DEGASSED
CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5



A) This material was produced under a quality system manual Rev.7 dated Sept 12,2008 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and(or) KEPIC MNA/ SNA4300.

B) No repair welding was performed to the products.

C) The product numbers listed on this test report identifies the material
- We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.
This material is fine grained steel

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Surveyor To:

W.G. Jo

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

Chief of material testing section Jo, Won Gook



posco

소라없이 세상속 움직입니다
www.posco.co.kr

(135-777) POSCO Center 892, Daechi 4-dong, Gangnam-gu, Seoul, Korea, Gangnam P.O. Box 777
Tel (82-2) 3457 - 0742 / Fax (82-2) 3457 - 1980 / Sender: Mo-Chang, Kang

To :
EDMONTON EXCHANGER GROUP OF COMPANIES
5545 89 STREET EDMONTON ALBERTA
CANADA T6E 5W9
MR. ERNEST REIMER

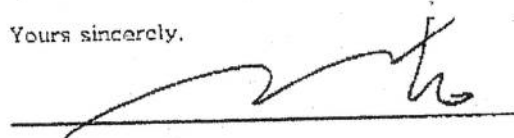
Subject : Confirmation letter for Mo Composition with Order No 0004005387-010

This letter is to certify that the Chemical Composition of Molybdenum marked as "Tr" on the Mill Test Certificates for steel plates supplied to Edmonton Exchanger with Order No.0004005387-010 means the following:

Order No.	Heat No	Mo(%)	
		MTC Marked	Ladle Analysis
0004005387-010	SB62742	Tr	0% (Non-Detected)

If you have any further problems in this project, please do not hesitate and contact us.

Yours sincerely,



Byung Yoon, Cho
Plate Part-Loader
Hot Rolled Product Technical Service Group
Order Processing & Technical Service Dept.
POSCO

posco

소리없이 세상론 움직입니다
www.posco.co.kr

(135-777) POSCO Center 892, Daechi 4-dong, Gangnam-gu, Seoul, Korea, Gangnam P.O. Box 777
Tel (82-2) 3457 - 0783 / Fax (82-2) 3457 - 1980 / Sender : Jae, Hak, Ok

To : EDMONTON EXCHANGER GROUP OF COMPANIES
(5545 89 STREET EDMONTON ALBERTA CANADA T6E 5W9)

Attn.: MR. ERNEST REIMER

Cc :

Subject : Confirmation letter for Nb, Mo, B composition with Order No 0004096698,
0004005387

This letter is to certify that the Chemical composition of Nb, Mo, B marked as "Tr" on the Mill
Test Certificates for steel plates supplied to Edmonton Exchanger with order No 0004096698-010
~080, 0004005387-010 means the following

Order No	Heat No	C (%)	Nb (%)	B (ppm)	Mo (%)
0004096698-010 ~ 080 0004005387-010	SB62646	0.179	0.001	1	0.01
	SB62742	0.1841	0.001	0	0
	SB62745	0.1788	0.001	0	0.01
	SB69529	0.1872	0.001	0	0
	SB69532	0.1771	0.001	0	0
	SB69534	0.1757	0.001	0	0
	SB69538	0.1749	0	0	0
	SB71274	0.1792	0.001	0	0

If you have any further problems in this project, please do not hesitate and contact us.

Tel : 82-2-3457-0783, M.P:82-80-11-9377-8336

Thanks in advance with best regards

Yours sincerely.,

Date : 28th . June . 2010

POSCO

CEO Joon Yang Chung
posco
#1, Goedong, Pohang-City,
Gyeong Sang Buk-Do, Korea



MATERIAL ACCEPTED

Code Edition used
for verification

01

Addenda

Certificate No./증명서번호: 100504-PPSA-002-001
Date of Issue/발행일자: May., 11, 2010

POSCO Mill Test Certificate/검사증명서

Order No./계약번호: 0004096698

Supplier/주원자: DAE WOO INTERNATIONAL CORP.

Commodity/품명: HR STEEL PLATE (EN10204 3.1B)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70 AND SA 20(ASME2004EDITION)

PO No./주문번호: E10709

(ASME2004EDITION)

date

Dec 21 10

ORIGINAL



15440

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	P O S I T I O N	Tensile/인장시험			Impact/ 충격시험		Chemical Composition/화합성분(%)
						YP (KSI)	TS (KSI)	EL (%)	V Notch -50°F	Energy SF (FT-LBS)	
0.5"x120.5"x480"	PB86506101-8104	4	14,884 32,812	SB69532	T	51.2	78.3	26	1.62 2.143 3.131 A:112		L 1771 334 1200 65 21 2 23 Tr 71 Tr 1 1 17 36
0.5"x120.5"x480"	PB86948101-8104	4	14,884 32,812	SB69532	T	53.4	78.5	26	1.129 2.142 3.125 A:132		L 1771 334 1200 65 21 2 23 Tr 71 Tr 1 1 17 36
0.5"x120.5"x480"	PB86948301-8303	3	11,163 24,609	SB69532	T	54.5	80.9	25	1.112 2.136 3.155 A:134		L 1771 334 1200 65 21 2 23 Tr 71 Tr 1 1 17 36
0.5"x120.5"x480"	PB86159301-9304	4	14,884 32,812	SB69532	T	53.1	78.6	26	1.121 2.121 3.91 A:111		L 1771 334 1200 65 21 2 23 Tr 71 Tr 1 1 17 36
0.5"x120.5"x480"	PB86159201-9204	4	14,884 32,812	SB69532	T	54.4	80.6	27	1.129 2.152 3.141		L 1771 334 1200 65 21 2 23 Tr 71 Tr 1 1 17 36

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

* Impact Test. Direction : 1/4T 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 and include trace element.

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

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PQG01 Rev.0 dated JUL.01,2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and(or) KEPIC MNA/ SNA4300

B) No repair welding was performed to the products.

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

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

This material is fine grained steel.

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

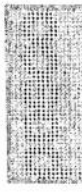
Surveyor To:

M.S. JANG

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

Chief of material testing section

Man Soo. Jang



posco Mill Test Certificate/검사증명서

Certificate No./증명서번호:100504-PPSA-002-002
Date of Issue/발행일자:May., 11, 2010

Order No./계약번호:0004096698

Supplier/주문자:DAE WOO INTERNATIONAL CORP.

Customer/고객사:EDMONTON EXCHANGER

PO No./주문번호:E10707

(ASME2004EDITION)

Commodity/품명:HR STEEL PLATE (EN10204 3.1B)

Spec & Type/규격:ASME SA516-70 AND SA 20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	Tensile/인장시험			Impact/충격시험 V Notch -50°F Energy SF (FT-LBS) (%)	Chemical Composition/화합성분(%)													D I S T R I B U T I O N	
					YP	TS	EL (%)		C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V		Al
0.5"x120.5"x480"	PB86159101-9104	4	14,884 32,812	SB69532	54.7	80.9	28	A:141 1:146 2:127 3:137 A:136	L	1771	334	1200	65	21	2	23	Tr	71	Tr	1	1	17	36
	PB86506001-6004	4	14,884 32,812	SB69534	54.7	80.8	26	1:113 2:141 3:138 A:131	L	1757	340	1174	63	25	2	25	Tr	96	Tr	1	1	18	34
0.5"x120.5"x480"	PB86505801-5804	4	14,884 32,812	SB69534	54.8	80.6	27	1:133 2:136 3:137 A:136	L	1757	340	1174	63	25	2	25	Tr	96	Tr	1	1	18	34
	PB86505901-5903	3	11,163 24,609	SB69534	55.0	80.8	27	1:102 2:142 3:137 A:127	L	1757	340	1174	63	25	2	25	Tr	96	Tr	1	1	18	34
0.5"x120.5"x480"	PB86502101-2103	3	11,163 24,609	SB69534	54.2	78.3	26	1:173 2:131	L	1757	340	1174	63	25	2	25	Tr	96	Tr	1	1	18	34

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

* Impact Test. Direction : 1/4T Longitudinal,
T.L.R.(Trans Longitude Ratio)

* Division - L:Ladle Analysis
* Chemical Composition Unit: -2x1/100, -3x1/1000, -4x1/10000, -5x1/100000
* Tr : It is within the standard range and include trace element.
* Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PQG01 Rev.0 dated JUL.01,2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and(or) KEPIC MNA/ SNA4300.

B) No repair welding was performed to the products.

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

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

This material is fine grained steel.

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

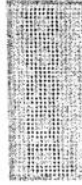
Surveyor To:

M.S. JANG

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

Chief of material testing section

Man Soo. Jang



posco Mill Test Certificate/검사증명서

Certificate No./증명서번호:100504-PPSA-002-003
Date of Issue/발행일자:May., 11, 2010

Order No./계약번호:0004096698

Supplier/주문자:DAE WOO INTERNATIONAL CORP.

Customer/고객사:EDMONTON EXCHANGER

PO No./주문번호:E10707
(ASME2004EDITION)

Commodity/품명:HR STEEL PLATE (EN10204 3.1B)

Spec & Type/규격:ASME SA516-70 AND SA 20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	POSITION	Tensile/인장시험 YP TS EL (KSI) (%)	Impact/충격시험 V Notch -50°F Energy SF (FT-LBS) (%)	DISTRI BUTION	Chemical Composition/화합성분(%)															
									C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Sol-Al		
0.5"x120.5"x480"	PB86501801-1804	4	14,884 32,812	SB69534	T	53.7 79.3 25	3:136 A:147 1:145 2:123 3:147	L	1757	340	1174	63	25	2	25	2	25	Tr	96	Tr	1	1	18	34
0.5"x120.5"x480"	PB86501701-1703	3	11,163 24,609	SB69534	T	52.6 78.6 28	A:138 1:139 2:152 3:162	L	1757	340	1174	63	25	2	25	2	25	Tr	96	Tr	1	1	18	34
0.5"x120.5"x480"	PB86215601-5604	4	14,884 32,812	SB69538	T	52.9 78.2 27	A:151 1:160 2:137 3:149	L	1749	366	1164	64	23	2	27	2	27	Tr	91	Tr	Tr	2	18	35
0.5"x120.5"x480"	PB86215501-5504	4	14,884 32,812	SB69538	T	54.4 80.2 26	A:149 1:148 2:147 3:139	L	1749	366	1164	64	23	2	27	2	27	Tr	91	Tr	Tr	2	18	35
0.5"x120.5"x480"	PB86215401-5404	4	14,884	SB69538	T	52.6 77.9 28	A:145 1:139	L	1749	366	1164	64	23	2	27	2	27	Tr	91	Tr	Tr	2	18	35

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

YP Method : 0.2% off-set

* Impact Test. Direction : 1/4T Longitudinal.

T.L.R.(Trans Longitude Ratio)

* Division - L:Ladle Analysis

* Chemical Composition Unit: -2x1/100, -3x1/1000, -4x1/10000, -5x1/100000

* Tr : It is within the standard range and include trace element.

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

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PQG01 Rev.0 dated JUL 01,2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and(or) KEPIC MNA/ SNA4300.

B) No repair welding was performed to the products.

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

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

This material is fine grained steel.

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

Surveyor To:

M.S. JANG

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

Chief of material testing section Man Soo, Jang



posco Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 100504-PPSA-002-004
Date of Issue/발행일자 : May., 11, 2010

Order No./계약번호 : 0004096698

PO No./주문번호 : E10707
(ASME2004EDITION)

Supplier/주문자 : DAE WOO INTERNATIONAL CORP.

Commodity/품명 : HR STEEL PLATE (EN10204 3.1B)

Customer/고객사 : EDMONTON EXCHANGER

Spec & Type/규격 : ASME SA516-70 AND SA 20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 재간번호	Tensile/인장시험 YP TS EL (KSI) (%)	Impact/ 충격시험 V Notch -50°F Energy SF (FT-LBS) (%)	Chemical Composition/화학성분(%)														
							D	P	C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V
0.5"x120.5"x480"	PB87173401-3404	4	14,884 32,812	SB71274	55.7 80.2 26	2:127 3:136 A:134 1:140 2:103 3:122 A:122	L	1792	353	1173	112	24	3	25	Tr	99	Tr	1	1	18	30
*** Sub Total *** HEAT TREATMENT *** 0.625"x120.5"x480"	(010) *** PB86475301-5303	60 3	223,260 (kg) 13,950 30,753	SB71274 SB69529	492,197 (LBS) 54.5 80.6 27	1:146 2:150 3:139 A:145	L	1872	342	1170	99	29	2	26	Tr	140	Tr	1	1	17	28
0.625"x120.5"x480"	PB86394601-4604	4	18,600 41,004	SB69529	54.4 78.6 27	1:118 2:89 3:134 A:114	L	1872	342	1170	99	29	2	26	Tr	140	Tr	1	1	17	28
0.625"x120.5"x480"	PB86161701-1704	4	18,600 41,004	SB69529	54.8 80.8 27	1:133 2:131	L	1872	342	1170	99	29	2	26	Tr	140	Tr	1	1	17	28

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

* Impact Test : Direction : 1/4T Longitudinal,
T.L.R (Trans Longitude Ratio)

* Division - L : Ladle Analysis

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

* Tr : It is within the standard range and include trace element.

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

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and(or) KEPIC MNA/ SNA4300.

B) No repair welding was performed to the products.

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

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

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

Surveyor To:

M.S. JANG

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

Chief of material testing section

Man Soo, Jang

posco Mill Test Certificate/검사증명서

Certificate No./증명서번호: 100504-PPSA-002-016
Date of Issue/발행일자: May., 11, 2010

Order No./계약번호: 0004096698

Supplier/주원자: DAE WOO INTERNATIONAL CORP.

PO No./주원번호: E10707

Commodity/품명: HR STEEL PLATE (EN10204 3.1B)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70 AND SA 20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	Tensile/인장시험 YP TS EL (KSI) (%)	Impact/충격시험 V Notch -50°F Energy SF (FT-LBS) (%)	Chemical Composition/화합성분(%)										
1.5"x121"x480"	PB86180301	1	11,207 24,707	SB69534	50.3 75.1 32	1.130 2.135 3.134 A.133	C 1757	Si 340	Mn 1174	P 63	S 25	Cr 2	Ni 25	B 2	Mo 96	Nb 1	Ti 18
Sub Total (080) ***		12	134,484 (kg)		296,482 (LBS)												
HEAT TREATMENT ==> Normalized : 891°C 71min. ***																	
Lot Total **		170	1,004,694 (kg)		2,214,938 (LBS)												
Grade Total **		170	1,004,694 (kg)		2,214,938 (LBS)												
Grand Total **		170	1,004,694 (kg)		2,214,938 (LBS)												

* LOT NO ==> VACUUM DEGASSED
CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5



* Position - T : Top, M : Middle, B : Bottom.
* Tensile Test Direction : Transversal, Gauge Length : 200mm (Rectangular),
YP Method : 0.2% off-set
* Impact Test Direction : 1/4T Longitudinal,
T.L.R (Trans Longitude Ratio)
* Division - L: Ladle Analysis
* Chemical Composition Unit: -2x1/100, -3x1/1000, -4x1/10000, -5x1/100000
* Tr : It is within the standard range and include trace element.
* Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.7 dated Sept.12.2008 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and/or KEPIC MNA/ SNA4300.
B) No repair welding was performed to the products.
C) The product numbers listed on this test report identifies the material

- We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.
This material is fine grained steel.
* This Mill Test Certificate cannot be copied for any purpose.

Surveyor To:

M.S. JANG

posco

소각없이 세상은 움직입니다
www.posco.co.kr

(135-777) POSCO Center 892, Daechi 4-dong, Gangnam-gu, Seoul, Korea, Gangnam P.O. Box 777
Tel (82-2) 3457 - 0783 / Fax (82-2) 3457 - 1980 / Sender: Jae. Hak. Ok

To : EDMONTON EXCHANGER GROUP OF COMPANIES

(5545 89 STREET EDMONTON ALBERTA CANADA T6E 5W9)

Attn.: MR. ERNEST REIMER

Cc :

Subject : Confirmation letter for Nb, Mo, B composition with Order No 0004096698,
0004005387

This letter is to certify that the Chemical composition of Nb, Mo, B marked as "Tr" on the Mill Test Certificates for steel plates supplied to Edmonton Exchanger with order No 0004096698-010 ~080, 0004005387-010 means the following

Order No	Heat No	C (%)	Nb (%)	B (ppm)	Mo (%)
0004096698-010 ~ 080	SB62646	0.179	0.001	1	0.01
	SB62742	0.1841	0.001	0	0
	SB62745	0.1788	0.001	0	0.01
	SB69529	0.1872	0.001	0	0
0004005387-010	SB69532	0.1771	0.001	0	0
	SB69534	0.1757	0.001	0	0
	SB69536	0.1749	0	0	0
	SB71274	0.1792	0.001	0	0

If you have any further problems in this project, please do not hesitate and contact us.

Tel : 82-2-3457-0783, M.P:82-80-11-9377-8336

Thanks in advance with best regards

Yours sincerely,,

Date : 28th . June . 2010

POSCO

CEO Joon Yang Chung
posco

#1, Goedong, Pohang-City,
Gyeong Sang Buk-Do, Korea



posco

소리없이 세상만 움직입니다
www.posco.co.kr

(135-777) POSCO Center 892, Daechi 4-dong, Gangnam-gu, Seoul, Korea, Gangnam P.O. Box 777
Tel (82-2) 3457 - 0783 / Fax (82-2) 3457 - 1980 / Sender: Jae, Hak, Ok

To : EDMONTON EXCHANGER GROUP OF COMPANIES
(5545 89 STREET EDMONTON ALBERTA CANADA T6E 5W9)

Attn.: MR. ERNEST REIMER

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Subject : Confirmation letter for Nb, Mo, B composition with Order No 0004096698,
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Test Certificates for steel plates supplied to Edmonton Exchanger with order No 0004096698-010
~080, 0004005387-010 means the following

Order No	Heat No	C (%)	Nb (%)	B (ppm)	Mo (%)
0004096698-010 ~ 080	SB62646	0.179	0.001	1	0.01
	SB62742	0.1841	0.001	0	0
	SB62745	0.1788	0.001	0	0.01
	SB69529	0.1872	0.001	0	0
0004005387-010	SB69532	0.1771	0.001	0	0
	SB69534	0.1757	0.001	0	0
	SB69538	0.1749	0	0	0
	SB71274	0.1792	0.001	0	0

If you have any further problems in this project, please do not hesitate and contact us.

Tel : 82-2-3457-0783, M.P:82-80-11-9377-8336

Thanks in advance with best regards

Yours sincerely..

MATERIAL ACCEPTED

Code Edition used
for verification

67

Addenda

09

QC

date

Rec 1/10

Date : 28th . June . 2010

POSCO

CEO Joon Yang Chung
posco

#1, Goedong, Pohang-City,
Gyeong Sang Buk-Do, Korea





소리없이 세상을 움직입니다
www.posco.co.kr

(135-777) POSCO Center 892, Daechi 4-dong, Gangnam-gu, Seoul, Korea, Gangnam P.O. Box 777
Tel (82-2) 3457 - 0742 / Fax (82-2) 3457 - 1980 / Sender : Mo-Chang, Kang

To :

EDMONTON EXCHANGER GROUP OF COMPANIES

5545 89 STREET EDMONTON ALBERTA

CANADA T6E 5W9

MR. ERNEST REIMER

Subject : Confirmation letter for Mo Composition with Order No 0004005387-010

This letter is to certify that the Chemical Composition of Molybdenum marked as "Tr" on the Mill Test Certificates for steel plates supplied to Edmonton Exchanger with Order No.0004005387-010 means the following:

Order No.	Heat No	Mo(%)	
		MTC Marked	Ladle Analysis
0004005387-010	SB62742	Tr	0% (Non-Detected)

If you have any further problems in this project, please do not hesitate and contact us.

Yours sincerely,

Byung Yoon, Cho

Plate Part-Leader

Hot Rolled Product Technical Service Group

Order Processing & Technical Service Dept.

POSCO

posco Mill Test Certificate/검사증명서

(Attached - Sheet)

Certificate No./증명서번호: 100129-PPSA-002-002
Date of Issue/발행일자: Mar., 05, 2010

Order No./계약번호: 0004005387

PO No./주문번호: E10689

(ASME2004EDITION)

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

Commodity/품명: HR STEEL PLATE (EN10204 3.1B)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70 AND SA20(ASME2004EDITION)

Product No. 제품번호	Chemical Composition/화합성분(%)				CEQ	D I V I S I O N
					-3	
PB82461401-1404	L	399				
PB82462101-2104	L	399				
PB82462001-2004	L	399				
PB82461001-1004	L	399				
PB82423501-3504	L	399				
PB82423401-3404	L	399				
*** Sub Total	010) ***	100	372,100 (kg)	820,328 (LBS)		
*** HEAT TREATMENT ***	Normalized : 891 °C 25min, ***					
*** Lot Total ***		100	372,100 (kg)	820,328 (LBS)		
*** Grade Total ***		100	372,100 (kg)	820,328 (LBS)		
*** Grand Total ***		100	372,100 (kg)	820,328 (LBS)		
				*** Last Item ***		
				*** LOT NO ==> VACUUM DEGASSED		
				CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5		

MTR APPROVED



EDMONDO S. CHAMER

• LOT NO ==> VACUUM DEGAISED
CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5



=== Last Item ===

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2003 and PQG01 Rev.0 dated JUL.01,2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and(or) KEPIC MNA/ SNA4300.

B) No repair welding was performed to the products.

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

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

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

Surveyor To:

W.G. Jo

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

Chief of material testing section Jo, Won Gook



POSCO Mill Test Certificate/검사증명서

(Attached - Sheet)

Certificate No./증명서번호 : 100129-PPSA-002-001
Date of Issue/발행일자 : Mar., 05, 2010

Order No./계약번호 : 0004005387

PO No./주문번호 : E10689
(ASME2004EDITION)

Supplier/주문자 : DAE WOO INTERNATIONAL CORP.

Commodity/품명 : HR STEEL PLATE (EN10204 3.1B)

Customer/고객사 : EDMONTON EXCHANGER

Spec & Type/규격 : ASME SA516-70 AND SA20(ASME2004EDITION)

Product No. 제품번호	D I V I S I O N	Chemical Composition/화학성분(%)	
		CEQ	-3
PB82423601-3604	L	407	
PB82432701-2704	L	407	
PB82433601-3604	L	407	
PB82433501-3504	L	407	
PB82433401-3404	L	407	
PB82462301-2304	L	407	
PB82432601-2604	L	407	
PB82461301-1304	L	399	
PB82461201-1204	L	399	
PB82462201-2204	L	399	
PB82462701-2704	L	399	
PB82462801-2804	L	399	
PB82461101-1104	L	399	
PB82462501-2504	L	399	
PB82462401-2404	L	399	
PB82433801-3804	L	399	
PB82433701-3704	L	399	
PB82461601-1604	L	399	
PB82461501-1504	L	399	

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and/or) KEPIC MNA/ SNA4300.
B) No repair welding was performed to the products.
C) The product numbers listed on this test report identifies the material
- We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.
This material is fine grained steel.
* This Mill Test Certificate cannot be copied for any purpose.

Surveyor To:

W.G. Jo

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

Chief of material testing section Jo, Won Gook



posco Mill Test Certificate/검사증명서

Certificate No./증명서번호 :100129-PPSA-002-006
Date of Issue/발행일자:Mar., 05, 2010

Order No./계약번호:0004005387

PO No./주문번호:E10689

(ASME2004EDITION)

Supplier/주문자:DAE WOO INTERNATIONAL CORP.

Commodity/품명:HR STEEL PLATE (EN10204 3.1B)

Customer/고객사:EDMONTON EXCHANGER

Spec & Type/규격:ASME SA516-70 AND SA20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	Tensile/인장시험			Impact/ 충격시험		Chemical Composition/화합성분(%)														
					YP (KSI)	TS (%)	EL (%)	V Notch -50°F	Energy SF (FT-LBS)	C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Al	
0.5"x120.5"x480"	PB82423401-3404	4	14,884 32,812	SB82745	T	52.6	78.2	28	3.119 A117 1.139 2.153 3.110 A134		L	1788	343	1142	104	22	2	23	78	1	1	1	17	34
*** Sub. Total (010) ***		100	372,100 (kg)																					
*** HEAT TREATMENT ***			Normalized : 891°C 25min.																					
*** Lot Total ***		100	372,100 (kg)																					
*** Grade Total ***		100	372,100 (kg)																					
*** Grand Total ***		100	372,100 (kg)																					
										* LOT NO ==> VACUUM DEGASSED CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5														
										Last Item ==														

* LOT NO ==> VACUUM DEGAISED
CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5

=== Last Item ===

- * Position - T : Top, M : Middle, B : Bottom.
- * Tensile Test. Direction : Transversal, Gauge Length : 200mm(Rectangular).
- * YP Method : 0.2% off-set
- * Impact Test. Direction : 1/4T Longitudinal.
- * T.L.R(Trans Longitude Ratio)
- * Division - L:Ladle Analysis
- * Chemical Composition Unit: -2x1/100, -3x1/1000, -4x1/10000, -5x1/100000
- * Tr : It is within the standard range and include trace element.
- * Supply Condition : As-Rolled unless otherwise Heat Treated.

- A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PQ001 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and/or) KEPIC MNA/ SNA4300.
- B) No repair welding was performed to the products.
- C) The product numbers listed on this test report identifies the material
- We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.
- This material is fine grained steel.
- * This Mill Test Certificate cannot be copied for any purpose.

Surveyor To:

W.G. Jo

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

Chief of material testing section Jo, Won Gook

posco Mill Test Certificate/검사증명서

Certificate No./증명서번호: 100129-PPSA-002-005
Date of Issue/발행일자: Mar., 05, 2010

Order No./계약번호: 0004005387

PO No./주문번호: E10689
(ASME2004EDITION)

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

Commodity/품명: HR STEEL PLATE (EN10204 3.1B)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70 AND SA20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	Tensile/인장시험		Impact/충격시험		Chemical Composition/화합성분(%)																
					YS (KSI)	TS (%)	EL (%)	V Notch -50°F	Energy (FT-LBS)	SF (%)	C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Sol-Al	
0.5"x120.5"x480"	PB82461401-1404	4	14,884 32,812	SB62745	T	53.7	78.5	27	1130 2132 384 A-115 1146 2118 397 A120	L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34	
0.5"x120.5"x480"	PB82462101-2104	4	14,884 32,812	SB62745	T	52.2	77.9	26	1101 2109 3106 A-105 1199 294 3116 A-103 1121 2108	L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34	
0.5"x120.5"x480"	PB82462001-2004	4	14,884 32,812	SB62745	T	51.9	77.9	25		L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34	
0.5"x120.5"x480"	PB82461001-1004	4	14,884 32,812	SB62745	T	52.6	78.3	29		L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34	
0.5"x120.5"x480"	PB82423501-3504	4	14,884 32,812	SB62745	T	52.4	77.9	26		L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34	

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

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

YP Method: 0.2% off-set

* Impact Test. Direction: 1/4T Longitudinal,

T.L.R. (Trans Longitude Ratio)

* Division - L: Ladle Analysis

* Chemical Composition Unit: -2x1/100, -3x1/1000, -4x1/10000, -5x1/100000

* Tr: It is within the standard range and include trace element.

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

A) This material was produced under a quality system manual Rev 7 dated Sept.12.2008 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and/or KEPIC MINA/ SNA4300.

B) No repair welding was performed to the products.

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

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

This material is fine grained steel.

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

Surveyor To:

U.G. Jo

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

Chief of material testing section Jo, Won Gook



posco Mill Test Certificate/검사증명서

Certificate No./증명서번호: 100129-PPSA-002-004
Date of Issue/발행일자: Mar., 05, 2010

Order No./계약번호: 0004005387

PO No./주문번호: E10689
(ASME2004 EDITION)

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

Commodity/품명: HR STEEL PLATE (EN10204 3.1B)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70 AND SA20(ASME2004 EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	P O S I T I O N	Tensile/인장시험 Yp TS EL (KSI) (%)	Impact/충격시험 V Notch -50°F Energy SF (FT-LBS) (%)	D I S T R I B U T I O N	Chemical Composition/화학성분(%) C Si Mn P S Cr Ni B Cu Mo Nb Ti V Sol-Al
0.5"x120.5"x480"	PB82433801-3804	4	14,884 32,812	SB62745	T	54.8 78.2 28	2,105 3,95 A83 1,127 2,129 3,122 A126 1,131 2,124 3,124 A126 1,103 2,111 3,108 A108 1,106 2,70 3,58 A81	L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34
0.5"x120.5"x480"	PB82433701-3704	4	14,884 32,812	SB62745	T	53.1 78.6 24		L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34
0.5"x120.5"x480"	PB82461601-1604	4	14,884 32,812	SB62745	T	53.5 78.2 28		L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34
0.5"x120.5"x480"	PB82461501-1504	4	14,884 32,812	SB62745	T	52.8 78.2 27		L	1788 343 1142 104 22 2 23 Tr 78 1 1 1 17 34

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

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

YP Method : 0.2% off-set

* Impact Test, Direction : 1/4T Longitudinal,

T.L.R.(Trans Longitud Ratio)

* Division - L:Ladle Analysis

* Chemical Composition Unit: -2x1/100, -3x1/1000, -4x1/10000, -5x1/100000

* Tr : It is within the standard range and include trace element.

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

A) This material was produced under a quality system manual Rev.7 dated Sept 12,2008 and PQG01 Rev.0 dated JUL 01 2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and/or KEPIC MNA/ SNA4300

B) No repair welding was performed to the products.

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

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

This material is fine grained steel.

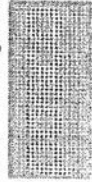
* This Mill Test Certificate cannot be copied for any purpose.

Surveyor To:

W.G. Jo

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

Chief of material testing section Jo, Won Gook



posco Mill Test Certificate/검사증명서

Certificate No./증명서번호:100129-PPSA-002-003
Date of Issue/발행일자:Mar., 05, 2010

Order No./계약번호:0004005387

PO No./주문번호:E10689
(ASME2004EDITION)

Supplier/주문자:DAE WOO INTERNATIONAL CORP.

Commodity/품명:HR STEEL PLATE (EN10204 3.1B)

Customer/고객사:EDMONTON EXCHANGER

Spec & Type/규격:ASME SA516-70 AND SA20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	P O S I T I O N	Tensile/인장시험			Impact/충격시험		D I S T R I B U T I O N	Chemical Composition/화학성분(%)																														
						YP (KSI)	TS (KSI)	EL (%)	V-Notch -50°F	Energy SF (FT-LBS)		C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Sol-Al																	
0.5"x120.5"x480"	PB82462701-2704	4	14,884 32,812	SB62745	T	52.1	77.9	27	3128 A105	-	L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34																	
																										1105	2123	3111	A113	1199	283	3114	A98	1123	2103	374	A100	1128	281	392	A100	149
0.5"x120.5"x480"	PB82462801-2804	4	14,984 32,812	SB62745	T	52.1	77.9	28	283	3114	L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34																	
																										1105	2123	3111	A113	1199	283	3114	A98	1123	2103	374	A100	1128	281	392	A100	149
0.5"x120.5"x480"	PB82461101-1104	4	14,884 32,812	SB62745	T	52.5	77.9	27	A98	-	L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34																	
																										1105	2123	3111	A113	1199	283	3114	A98	1123	2103	374	A100	1128	281	392	A100	149
0.5"x120.5"x480"	PB82462501-2504	4	14,884 32,812	SB62745	T	51.8	77.5	28	A100	-	L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34																	
																										1105	2123	3111	A113	1199	283	3114	A98	1123	2103	374	A100	1128	281	392	A100	149
0.5"x120.5"x480"	PB82462401-2404	4	14,884	SB62745	T	53.2	78.8	28	A100	-	L	1788	343	1142	104	22	2	23	Tr	78	1	1	1	17	34																	
																										1105	2123	3111	A113	1199	283	3114	A98	1123	2103	374	A100	1128	281	392	A100	149

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

* Impact Test : Direction : 1/4T Longitudinal,
T.L.R (Trans Longitude Ratio)

* Division - L:Ladle Analysis
* Chemical Composition Unit: -2x1/100, -3x1/1000, -4x1/10000, -5x1/100000
* Tr : It is within the standard range and include trace element.
* Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and (or) KEPIC MNA/ SNA4300.

B) No repair welding was performed to this products.

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

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

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

Surveyor To:

W.G. Jo

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

Chief of material testing section Jo, Won Gook

POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 100129-PPSA-002-002
Date of Issue/발행일자 : Mar., 05, 2010

Order No./계약번호 : 0004006387

PO No./주문번호 : E10689
(ASME2004EDITION)

Supplier/주문자 : DAE WOO INTERNATIONAL CORP.

Commodity/품명 : HR STEEL PLATE (EN10204 3.1B)

Customer/고객사 : EDMONTON EXCHANGER

Spec & Type/규격 : ASME SA516-70 AND SA20(ASME2004EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	Tensile/인장시험			Impact/충격시험 V-Notch 50°F Energy (FT-LBS) (%)	D I V S O N	Chemical Composition/화학성분(%)															
					YP (KSI)	TS (KSI)	EL (%)			C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Al		
0.5"x120.5"x480"	PB82462301-2304	4	14,884 32,812	SB62742	T	52.8	78.6	26	A-130 1:125 2:145 3:114 A-128	L	1841	344	1163	101	15	2	24	24	Tr	76	Tr	1	1	18	29
											1841	344	1163	101	15	2	24	24	Tr	76	Tr	1	1	18	29
0.5"x120.5"x480"	PB82461301-1304	4	14,884 32,812	SB62745	T	53.8	78.3	26	A-142 1:125 2:177 3:123 A-142	L	1788	343	1142	104	22	2	23	23	Tr	78	1	1	1	17	34
											1788	343	1142	104	22	2	23	23	Tr	78	1	1	1	17	34
0.5"x120.5"x480"	PB82462201-2204	4	14,884 32,812	SB62745	T	52.2	77.9	26	A-121 1:65 2:124	L	1788	343	1142	104	22	2	23	23	Tr	78	1	1	1	17	34
											1788	343	1142	104	22	2	23	23	Tr	78	1	1	1	17	34

* Position : T : Top, M : Middle, B : Bottom
* Tensile Test. Direction : Transversal, Gauge Length : 200mm (Rectangular).
* Impact Test. Direction : 1/4T Longitudinal, YP Method : 0.2% off-set

* TLR(Trans Longitude Ratio)
* Division - L: Ladle Analysis

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

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

A) This material was produced under a quality system manual Rev.7 dated Sept.12.2008 and PQG01 Rev.0 dated JUL 01. 2008 audited and approved by customer as conforming to the requirements of ASME Sec. II NCA-3800 and/or) KEPIC MNA/ SNA4300.

B) No repair welding was performed to the products.

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

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

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Surveyor To:

W.G. Jo

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

Chief of material testing section Jo, Won Gook



POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호: 100129-PPSA-002-001
Date of Issue/발행일자: Mar., 05, 2010

Order No./계약번호: 0004005387

PO No./주문번호: E10689

(ASME2004EDITION)

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

Commodity/품명: HR STEEL PLATE (EN10204 3.1B)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70 AND SA20(ASME2004EDITION)

ORIGINAL

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 재간번호	Tensile/인장시험			Impact/충격시험 V Notch -50°F Energy SF (FT-LBS) (%)	D V S T O N	Chemical Composition/화학성분(%)															
					YS (KSI)	TS (KSI)	EL (%)			C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Sol-Al		
0.5"x120.5"x480"	PB82433601-3604	4	14,884 32,812	SB62742	T 53.4	78.3	27	1:114 2:117 3:129 A:120	L	1841	344	1163	101	15	2	24	Tr	76	Tr	1	1	18	29		
0.5"x120.5"x480"	PB82432701-2704	4	14,884 32,812	SB62742	T 53.5	78.8	26	1:128 2:133 3:81 A:114	L	1841	344	1163	101	15	2	24	Tr	76	Tr	1	1	18	29		
0.5"x120.5"x480"	PB82433601-3604	4	14,884 32,812	SB62742	T 54.1	78.0	27	1:128 2:131 3:127 A:128	L	1841	344	1153	101	15	2	24	Tr	76	Tr	1	1	18	29		
0.5"x120.5"x480"	PB82433501-3504	4	14,884 32,812	SB62742	T 53.8	78.0	29	1:103 2:131 3:131 A:121	L	1841	344	1163	101	15	2	24	Tr	76	Tr	1	1	18	29		
0.5"x120.5"x480"	PB82433401-3404	4	14,884 32,812	SB62742	T 54.2	78.5	29	1:120 2:140 3:128	L	1841	344	1163	101	15	2	24	Tr	76	Tr	1	1	18	29		

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

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

* YP Method : 0.2% off-set

* Impact Test Direction : 1/4T Longitudinal,

T.L.R.(Trans Longitude Ratio)

* Division - L:Ladle Analysis

* Chemical Composition Unit: -2x1/100, -4x1/1000, -5x1/10000

* Tr : It is within the standard range and include trace element.

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

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PGS01 Rev.0 dated JUL.01,2006 audited and approved by customer as conforming to the requirements of ASME Sec. III- NCA-3800 and/or KEPIC MNA/ SNA4300.

B) No repair welding was performed to the products.

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

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

This material is fine grained steel.

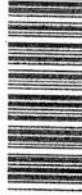
* This Mill Test Certificate cannot be copied for any purpose.

Surveyor To:

W.G. Jo

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

Chief of material testing section Jo Won Gook



WELDING PROCEDURE SPECIFICATION NO.: WOM-5 (Rev.2)

WELDING PROCEDURE QUALIFICATION RECORD NO.(S):
WOM-5-1, WOM-5-2, WOM-5-3

QUALIFIED FOR

Base Metal (Typical): P1 Groups 1 & 2 to P1 Groups 1 & 2
(SA 333 Gr. 6, SA 350 Gr. LF2, SA 420 WPL6, SA 516 Gr. 70, etc.)
Process(es): GMAW / SMAW / SAW Weld Types: GROOVE & FILLET
Diameter: ALL DIAMETERS
Position: GMAW & SMAW: ALL POSITIONS SAW: FLAT & HORIZONTAL
Filler Metal: Std. Appl. GTAW: ER70S-2, 3 or 6 SMAW: E7018 or E7018-1
SAW: F7A6-EM12K
Notch Appl. GMAW: ER70S-2 SMAW: E7018-1 SAW: F7A6-EM12K

BASE METAL CONDITIONS & GROOVE THICKNESS RANGE QUALIFIED:

BASE METAL THICKNESS RANGE

STANDARD APPLICATIONS WITH P.W.H.T.

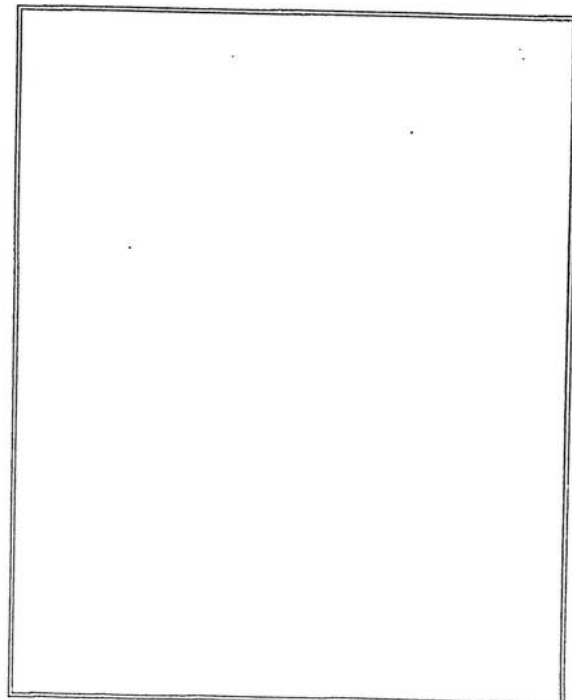
NOTCH TOUGHNESS APPLICATIONS TO 4.8 to 203 mm (0.188 to 8.00 in.) inclusive
-46°C WITH P.W.H.T.
9.5 to 203 mm (0.375 to 8.00 in.) inclusive

COMBINED DEPOSITED WELD METAL THICKNESS

ASME B31.1 203 mm (8.00 in.) maximum
ASME B31.3 203 mm (8.00 in.) maximum
ASME SECT. VIII, DIV.1 203 mm (8.00 in.) maximum

ALBERTA BOILERS SAFETY ASSOCIATION	
PROVINCE OF ALBERTA	
SAFETY CODES ACT	
WELDING PROCEDURE	
Reg. No. WP	<u>1073.2</u>
Spec No.	<u>WOM-5 (REV 2)</u>
Weld Process	<u>GMAW/SMAW/SAW</u>
Matl. Gr. P No.	<u>1 Gr. 1+2</u> to P No. <u>1 Gr. 1+2</u>
Elec. Gr. F No.	<u>6+4+6</u> A No. <u>1</u>
Th. Qual. For	<u>203mm</u> PWHT <u>YES</u>
Min Th. Qual	<u>9.5mm</u> CVT <u>-46°C</u>
Yr. <u>05</u> Mo. <u>10</u> Day <u>2</u> Signed <u>[Signature]</u>	
R. ROSEBERG, P.ENG. WELDING SPECIALIST	

PROVINCIAL REGISTRATION



DYNACORP FABRICATORS INC.

Welding Procedure Specification

in accordance with

ASME Sections VIII, IX, B31.1 & B31.3

Welding Procedure Specification No.:

DYN-10

Supporting PQR No. (s):

DYN-10-1, DYN-10-2

Qualified for

Process(es): SMAW / FCAW / SMAW Position(s): All
Filler Metal F-No.: F-3 / F-6 / F-4 A-No.: A-1 / A-1 / A-1
AWS Class.: E6010 / E71T-1M (J) / E7018-1 Weld Type(s): Groove, Fillet
Base Metal: P-1 Group 1 and 2 To: P-1 Group 1 and 2
Typical Materials P-1 Gr. 1: SA-36, SA-53, SA-106 A/B, SA-234 WPB, SA-350 LF1, SA-516 60/65, SA-CSA G40.21 Gr. 38W / 44W
P-1 Gr. 2: SA-105, SA-106 C, SA-234 WPC, SA-350 LF2, SA-516 70, SA-537 Cl. 1, SA-660 WCB / WCC
Diameter Range: All Condition(s): Postweld Heat Treated
Thickness Range: 0.062" to 8.00" Normal and Sour Service
0.375" to 8.00" Low Temperature to - 46 °C (-50 °F)

Provincial Registration

ALBERTA BOILERS SAFETY ASSOCIATION

PROVINCE OF ALBERTA

SAFETY CODES ACT

WELDING PROCEDURE

Reg. No. WP 1073.2

Spec No. DYN-10

Weld Process SMAW/FCAW/SMAW

Matl. Gr. P No. 1 Gr 1+2 to P No. 1 Gr 1+2

Elec. Gr. F No. 3+6+4 A No. 1

Th. Qual. For 203mm PWHT YES

MIN Th. QUAL 9.5mm CVN -46°C

Yr 02 Mo 08 Day 01 Signed [Signature]

R. ROSEBERG, P.ENG.
WELDING SPECIALIST

**DYNACORP FABRICATORS INC
WELDERS'S LOG**

Location:

WELDER	SYMBOL	PROCESS /METHOD	BASE METALS	FILLER METAL "F" NUMBER (S)	BACKING	MINIMUM OD (in)	DEPOSIT THICKNES S (IN)	POSITIONS	UPHILL/ DOWNHILL	CORED/ SOLID	INSERT	BACKING GAS	GTAW CURRENT	X-FER	EXPIRY DATE P.Q. CD
Nick Wanke W-23775	"A"	SAW	P1 / P1	"F"6	With Metal	NPS 2 7/8"OD	Max to be welded	1G	FLAT						Aug 15/2011
Nick Wanke W-23775	"A"	SMAW / FCAW	P1	"F"3 / "F"6	With or without / WM	NPS 1"	.250 max to be welded	ALL	UPHILL						May 3/2011
Nick Wanke W-23775	"A"	GMAW / SMAW	P1	"F"6 / "F"4	With or without / WM	NPS 1"	.110"/Max to be welded	1G/ALL	DOWNHILL / UPHILL						May 3/2012
Kevin Cabral W-22216	"K"	SMAW / SMAW	P1 / P1	"F"3 / "F"4	With or with out / WM	NPS 1"	.188"/.500"	ALL	UPHILL						July 30/2011
Kevin Cabral W-22216	"K"	GMAW / SMAW	P1 / P1	"F"6 / "F"4	With or with out / WM	NPS 1"	.110"/Max to be welded	1G/ALL	DOWNHILL/UPHILL						Dec 5/2011
Kevin Cabral W-22216	"K"	SMAW / FCAW	P1 / P1	"F"3 / "F"6	With or with out / WM	NPS 1"	.250"/Max to be welded	ALL	UPHILL						May 29/2012
Terry Hanson MW-71638	"D"	SAW	P1 / P1	"F"6	With Metal	NPS 2 7/8"	Max to be welded	1G	FLAT						Dec 3/2011
Cameron Blair W-27172	"C"	SMAW / SMAW	P1 / P1	"F"3 / "F"4	With or with out / WM	NPS 2 1/2"	.236"/.630"	ALL	UPHILL						Nov 5/2011
Cameron Blair W-27172	"C"	SMAW / FCAW	P1 / P1	"F"3 / "F"6	With or with out / WM	NPS 1"	.250"/Max to be welded	ALL	UPHILL						Dec 5/2011
Cameron Blair W-27172	"C"	GMAE / SMAW	P1/P1	"F"6"/F"4	With or with out / WM	NPS 1"	.110"/Max to be welded	1G/ALL	DOWNHILL/UPHILL						May 3/2012
Nathan Alexander W-28127	"W"	SMAW / SMAW	P1 / P1	"F"3 / "F"4	With or with out / WM	NPS 2 1/2"	.236"/.630"	ALL	UPHILL						Dec 3/2011
Nathan Alexander W-28127	"W"	SMAW / FCAW	P1 / P1	"F"3 / "F"6	With or with out / WM	NPS 1"	.250"/Max to be welded	ALL	UPHILL						Dec 5/2011
Nathan Alexander W-28127	"W"	GMAW / SMAW	P1 / P1	"F"6 / "F"4	With or with out / WM	NPS 1"	.250"/Max to be welded	1G/ALL	DOWN/ UPHILL						Dec 5/2011
Mike Sornberger MW-71638	"M"	SAW	P1 / P1	"F"6	With Metal	NPS 2 7/8"OD	Max to be welded	1G	FLAT						Dec 3/2011
Kyle Radcliffe W-28133	"T"	SMAW / FCAW	P1 / P1	"F"3 / "F"6	With or Without/ WM	NPS 1"	0.250" / Max to be Welded	ALL	UPHILL						May 29/2012
Kyle Radcliffe W-28133	"T"	GMAW / SMAW	P1 / P1	"F"6 / "F"4	With or Without/ WM	NPS 1"	0.110" / Max to be Welded	1G / ALL	DOWNHILL / UPHILL						May 29/2012
Dan Hayden W-19785	"6"	SMAW / SMAW	P1 / P1	"F"3 / "F"4	With or Without/ WM	NPS 1"	.250" / .438"	ALL	UPHILL						March 11/2011
Dan Hayden W-19785	"6"	GMAW / SMAW	P1/P1	"F"6 / "F"4	With or Without/ WM	NPS 1"	0.110" / Max to be Welded	1G / ALL	DOWNHILL / UPHILL						July 10/2012
Dan Hayden W-19785	"6"	SMAW / FCAW	P1/P1	"F"3 / "F"6	With or Without/ WM	NPS 1"	0.250" / Max to be Welded	ALL	UPHILL						JULY 10/2012
Clint Simmons W-28140	"3"	SMAW / SMAW	P1 / P1	"F"3 / "F"4	With or Without/ WM	NPS 1"	.188" / .684"	ALL	UPHILL						March 22/2012
Clint Simmons W-28140	"3"	SMAW / SMAW	P1 / P1	"F"3 / "F"4	With or Without/ WM	NPS 1"	.248" / .188"	ALL	DOWN / UPHILL						March 22/2012
Clint Simmons W-28140	"3"	GMAW / SMAW	P1 / P1	"F"6 / "F"4	With or Without/ WM	NPS 1"	.110" / .Max to be Welded	1G / ALL	DOWN / UPHILL						May 29/2012
Craig Read	"7"	SAW	P1 / P1	"F"6	With Metal	NPS 2 7/8"	Max to be welded	1G	FLAT						Dec 3/2011
Jamie French	"F"	SAW	P1 / P1	"F"6	With Metal	NPS 2 7/8"	Max to be welded	1G	FLAT						Dec 3/2011
Patrick Hanes	"2"	SAW	P1 / P1	"F"6	With Metal	NPS 2 7/8"	Max to be welded	1G	FLAT						Dec 3/2011

Location:

Quality Control Manual Exhibit 11.2



Alberta

14980

Grade "W" Pressure Welder's

Certificate of Competency
Dan Hayden

This is to certify that
having complied with provisions of the Safety Codes Act, is authorized to engage
in pressure welding in accordance with the prescribed Regulations.



W-19785

File no.

Dated at Edmonton
March 15, 2002

Chief Inspector and Administrator

ABSA

the pressure equipment safety authority

Card

004135

PERFORMANCE QUALIFICATION

Process(es)	SAW SAW	Materials (P. No.)	Pi-Pi
Filler Metal		Min. Outside	
Group (F.No.)	E3 F4	Pipe Diameter	100
Max Deposited		Position(s)	
Weld Metal	1250 438	Qualified	ALL
Backing	with/without/with	Backing Gas	
Progression	uphill downhill		
P.Q. Expiry Date	Mar 28/11	Welding Examiner Signature	E-00357
		Examiner File No.	

Card No

4419

PERFORMANCE QUALIFICATION

Process(es)	SAW SAW	Materials (P. No.)	Q1-Q1
Filler Metal		Min. Outside	
Group (F.No.)	E6 FH	Pipe Diameter	100
Max Deposited		Position(s)	
Weld Metal	0.110" MAX TO BE WELDED	Qualified	1G/ALL
Backing	with with	Backing Gas	
Progression	down uphill		
P.Q. Expiry Date	July 10/12	Welding Examiner Signature	E-00357
		Examiner File No.	

Card No

4420

PERFORMANCE QUALIFICATION

Process(es)	SAW FAW	Materials (P. No.)	Q1-Q1
Filler Metal		Min. Outside	
Group (F.No.)	E3 E6	Pipe Diameter	100
Max Deposited		Position(s)	
Weld Metal	0.250" MAX TO BE WELDED	Qualified	ALL
Backing	with with	Backing Gas	
Progression	uphill downhill		
P.Q. Expiry Date	July 10/12	Welding Examiner Signature	E-00357
		Examiner File No.	

012/842194

45995A

JOURNEYMAN CERTIFICATE

THIS IS TO CERTIFY THAT
DANIEL JAMES HAYDEN
HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED
THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND
INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A
JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

WELDER

EFFECTIVE DATE
April 2nd, 2002

ISSUE DATE
April 9th, 2002

DR. LYLE CREECH
MINISTER OF LEARNING

SHIRLEY DUL, EXECUTIVE
DIRECTOR OF APPRENTICESHIP
& INDUSTRY TRAINING

A.O.Q.P. No. 7111-C



WELDER PERFORMANCE QUALIFICATION CARD

NAME: Daniel Hayden ABSA FILE NO. W-19785
This card is issued pursuant to the Alberta Safety Codes Act and the Pressure
Welders' Regulation. The Performance Qualification is in accordance with Section IX
of the ASME Code and subject to the limitations on the reverse side.
Date of Test: Mar 28, 2009
Signature of Welder or Machine Operator: [Signature]
Welding Examiner (Print/Type): Barry Nichol
Card: 004135

A.O.Q.P. No. 7111-C



WELDER PERFORMANCE QUALIFICATION CARD

NAME: Dan Hayden ABSA FILE NO. W-19785
This card is issued pursuant to the Alberta Safety Codes Act and the Pressure
Welders' Regulation. The Performance Qualification is in accordance with Section IX
of the ASME Code and subject to the limitations on the reverse side.
Date of Test: July 10, 2010
Signature of Welder or Machine Operator: [Signature]
Welding Examiner (Print/Type): Dylan Deagle
Card No: 4419

A.O.Q.P. No. 7111-C



WELDER PERFORMANCE QUALIFICATION CARD

NAME: Dan Hayden ABSA FILE NO. W-19785
This card is issued pursuant to the Alberta Safety Codes Act and the Pressure
Welders' Regulation. The Performance Qualification is in accordance with Section IX
of the ASME Code and subject to the limitations on the reverse side.
Date of Test: July 10, 2010
Signature of Welder or Machine Operator: [Signature]
Welding Examiner (Print/Type): Dylan Deagle
Card No: 4420

THIS IS TO CERTIFY THAT
NATHAN ROBERT ALEXANDER
HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED
THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND
INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A
JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

WELDER

EFFECTIVE DATE
August 6th, 2009ISSUE DATE
August 20th, 2009HONOURABLE DOUG MORNER
MINISTER OF ADVANCED EDUCATION
AND TECHNOLOGYAlberta
GovernmentDARLENE BOUWSEMA, EXECUTIVE
DIRECTOR OF APPRENTICESHIP
& INDUSTRY TRAININGAlberta
MUNICIPAL AFFAIRS

ABSA

WELDING PERFORMANCE QUALIFICATION

NATHAN R. ALEXANDER
Nameis qualified as a Grade B Pressure Welder. This card is issued pursuant to
the Safety Codes Act and Pressure Welders Regulation, subject to the
limitations on the reverse side.Dec 03 2009
Date of Test

Signature of Welder

MARCUS CLARK
Safety Codes Officer

File W- 28127

PERFORMANCE QUALIFICATION
(In accordance with Section IX, A.S.M.E. Code)
Form No. AB-118 Rev (10/2006)

Process	SMAW	SMAW	Material	P1 to P1
Max Deposited Weld Metal	6 mm	16 mm	Minimum Pipe Dia.	NPS 2 1/2
Filler Metal Group	F3	F4	Position Qualified	ALL
Backing	No	Yes	Progression	Uphill

Dec 03 2011
Date of Expiry

Signature of Safety Codes Officer

Card No 4326

PERFORMANCE QUALIFICATION

Process(es)	SMAW SCRW	Materials (P. No.)	P1-P1
Filler Metal Group (F.No.)	F3 F6	Min. Outside Pipe Diameter	1" OD
Max Deposited Weld Metal	1/80" MAX TO BE WELDED	Position(s) Qualified	ALL
Backing	with/without/with	Backing Gas	-
Progression	uphill		
P.Q. Expiry Date	Dec 5/11	Welding Examiner Signature	Exam 39
		Examiner File No.	



A.O.Q.P. No. 7111-C

WELDER PERFORMANCE QUALIFICATION CARD

NAME: NATHAN ALEXANDER ABSA FILE No. W-28127

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure
Welders' Regulation. The Performance Qualification is in accordance with Section IX
of the ASME Code and subject to the limitations on the reverse side.Dec 5, 2009
Date of Test

Signature of Welder or Machine Operator

Barry Nichol
Welding/Examiner (Print/Type)

Card No 4326



A.O.Q.P. No. 7111-C

WELDER PERFORMANCE QUALIFICATION CARD

NAME: Nathan Alexander ABSA FILE No. W-28127

This card is issued pursuant to the Alberta Safety Codes Act and the Pressure
Welders' Regulation. The Performance Qualification is in accordance with Section IX
of the ASME Code and subject to the limitations on the reverse side.Dec 5, 2009
Date of Test

Signature of Welder or Machine Operator

Barry Nichol
Welding Examiner (Print/Type)

Card No 4875

PERFORMANCE QUALIFICATION

Process(es)	GMAW SMAW	Materials (P. No.)	P1-P1
Filler Metal Group (F.No.)	F6 F4	Min. Outside Pipe Diameter	1" OD
Max Deposited Weld Metal	1/10" MAX TO BE WELDED	Position(s) Qualified	1G/ALL
Backing	with/without/with	Backing Gas	-
Progression	down uphill		
P.Q. Expiry Date	Dec 5/11	Welding Examiner Signature	Exam 39
		Examiner File No.	

SYMBOL "W"



Grade "C" Pressure Welder's
Certificate of Competency



This is to Certify that: CHRISTOPHER J. CAMPBELL
(Name of Welder)

has passed a Performance Qualification Test and is permitted to engage in pressure welding in accordance with the prescribed Regulation while in the employment of DYNACORP at GRAND PRAIRIE
(Name of Company) (Location of Job)

who have complied with the provisions of The Safety Codes Act.



CERTIFICATE No. Dated this Oct 16 2010

18195

Chief Inspector and Administrator

THIS CERTIFICATE EXPIRES SEPT 13/11

Form No. AB-114 Rev (10/2006)



Grade "C" Pressure Welder's
Certificate of Competency



This is to Certify that: CHRISTOPHER J. CAMPBELL
(Name of Welder)

has passed a Performance Qualification Test and is permitted to engage in pressure welding in accordance with the prescribed Regulation while in the employment of DYNACORP at GRAND PRAIRIE
(Name of Company) (Location of Job)

who have complied with the provisions of The Safety Codes Act.



CERTIFICATE No. Dated this Oct 16 2010

18194

Chief Inspector and Administrator

THIS CERTIFICATE EXPIRES SEPT 13/11

Form No. AB-114 Rev (10/2006)

PERFORMANCE QUALIFICATION
GRADE "C" PRESSURE WELDER
(In accordance with Section IX, A.S.M.E. Code)

This qualification becomes null and void on termination of employment with the company, named on the Certificate on the reverse side, or upon the expiry date of the Certificate.

Process(es) SMAN SMAN Material (P.No.) PI 6 P1
Max Deposited Weld Metal 0.25" 0.622 Minimum Pipe Dia. IMPS (1")
Filler Metal Group (F.No.) F3 F4 Position(s) Qualified ALL
Backing NO YES Progression UPHILL
Sept 13 2010 Date of Test Henry P. Waddy Signature of Safety Codes Officer



Grade "C" Pressure Welder's
Certificate of Competency



This is to Certify that: CHRISTOPHER J. CAMPBELL
(Name of Welder)

has passed a Performance Qualification Test and is permitted to engage in pressure welding in accordance with the prescribed Regulation while in the employment of DYNACORP at GRAND PRAIRIE
(Name of Company) (Location of Job)

who have complied with the provisions of The Safety Codes Act.



CERTIFICATE No. Dated this SEPT 13 2010

18193

Chief Inspector and Administrator

THIS CERTIFICATE EXPIRES SEPT 13 2011 Form No. AB-114 Rev (10/2006)

PERFORMANCE QUALIFICATION
GRADE "C" PRESSURE WELDER
(In accordance with Section IX, A.S.M.E. Code)

This qualification becomes null and void on termination of employment with the company, named on the Certificate on the reverse side, or upon the expiry date of the Certificate.

Process(es) SMAN KAN Material (P.No.) PI 6 P1
Max Deposited Weld Metal 0.25" MAX Minimum Pipe Dia. 1" NPS
Filler Metal Group (F.No.) F3 F6 Position(s) Qualified ALL
Backing NO YES Progression UPHILL
Oct 16 2010 Date of Test Henry P. Waddy Signature of Safety Codes Officer

PERFORMANCE QUALIFICATION
GRADE "C" PRESSURE WELDER
(In accordance with Section IX, A.S.M.E. Code)

This qualification becomes null and void on termination of employment with the company, named on the Certificate on the reverse side, or upon the expiry date of the Certificate.

Process(es) SMAN SMAN Material (P.No.) PI 6 P1
Max Deposited Weld Metal 0.110" MAX Minimum Pipe Dia. 1" OD
Filler Metal Group (F.No.) F6 F4 Position(s) Qualified ALL
Backing NO YES Progression UPHILL
Oct 16 2010 Date of Test Henry P. Waddy Signature of Safety Codes Officer

SYMBOL "V"

Card No 4513

PERFORMANCE QUALIFICATION

Process(es) EMAW SMAW Materials (P. No.) P1-P1
 Filler Metal Group (F.No.) F6 F4 Min. Outside Pipe Diameter 1"OD
 Max Deposited Weld Metal .110" max to be welded Position(s) Qualified 1B/ALL
 Backing with/wo with Backing Gas AR/CO2
 Progression Down uphill
 P.Q. Expiry Date Dec 3/12 Welding Examiner Signature Barry Nichol Examiner File No. Em39

A.O.Q.P. No. 7111-C



Grande Prairie Regional College

WELDER PERFORMANCE QUALIFICATION CARD

NAME Ryan Young ABSA FILE No. W-28161
 This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulation. The Performance Qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.
 Date of Test Dec 3/2010
 Signature of Welder or Machine Operator Ryan Young
 Welding Examiner (Print/Type) Barry Nichol Card No 4513

Card No 4514

PERFORMANCE QUALIFICATION

Process(es) SMAW FCAW Materials (P. No.) P1-P1
 Filler Metal Group (F.No.) F3 F6 Min. Outside Pipe Diameter 1"OD
 Max Deposited Weld Metal .250" max to be welded Position(s) Qualified ALL
 Backing with/wo with Backing Gas -
 Progression uphill uphill
 P.Q. Expiry Date Dec 3/12 Welding Examiner Signature Barry Nichol Examiner File No. Em39

A.O.Q.P. No. 7111-C



Grande Prairie Regional College

WELDER PERFORMANCE QUALIFICATION CARD

NAME Ryan Young ABSA FILE No. W-28161
 This card is issued pursuant to the Alberta Safety Codes Act and the Pressure Welders' Regulation. The Performance Qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.
 Date of Test Dec 3/2010
 Signature of Welder or Machine Operator Ryan Young
 Welding Examiner (Print/Type) Barry Nichol Card No 4514

PERFORMANCE QUALIFICATION

(In accordance with Section IX, A.S.M.E. Code)

Form No. AB-118 Rev (10/2006)

Process	SMAW	SMAW	Material	P1 to P1
Max Deposited Weld Metal	6 mm	16 mm	Minimum Pipe Dia.	NPS 2 1/2
Filler Metal Group	F3	F4	Position Qualified	ALL
Backing	No	Yes	Progression	Uphill

Dec 3/12
Date of Expiry

Barry Nichol
Signature of Safety Codes Officer

WELDING PERFORMANCE QUALIFICATION

Name Ryan Young
 is qualified as a Grade B Pressure Welder. This card is issued pursuant to the Safety Codes Act and Pressure Welders Regulation, subject to the limitations on the reverse side.

Dec 3/2010
Date of Test

Barry Nichol
Safety Codes Officer

File W- 28161

012-0/846562

111079A

THIS IS TO CERTIFY THAT
 RYAN JOHN YOUNG
 HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

WELDER

EFFECTIVE DATE
 April 29th, 2010

ISSUE DATE
 May 13th, 2010

HONOURABLE DOUG HORNER
 MINISTER OF
 ADVANCED EDUCATION
 AND TECHNOLOGY

DARLENE BOUTSEMA
 EXECUTIVE DIRECTOR
 OF APPRENTICESHIP
 & INDUSTRY TRAINING

24021

the pressure equipment safety authority

This is to certify that Ryan Young
 having complied with provisions of the Safety Codes Act, is authorized to engage in pressure welding in accordance with the prescribed Regulations.

Dated at Edmonton
 September 02, 2010



W-28161
 File no.

John
 Chief Inspector and Administrator

File NO.

Chief Inspector and Administrator

SYMBOL "Y"

WELDING PERFORMANCE QUALIFICATION

JAMIE FRENCH

Name

File No.

This card is issued pursuant to the Safety Codes Act and Pressure Welders Regulation, subject to the limitations on the reverse side.

JUNE 15 2010

Date of Test

Chris Lee

Signature of Welder or Operator

UTRIS A. WONG

Safety Codes Officer

CARD

71644

PERFORMANCE QUALIFICATION

(In accordance with Section IX, A.S.M.E. Code)

Form No. AB-119 Rev (10/2006)

Process(es)

SAW

Material (P.No.)

P1 & P1

Max Deposited

AS WELDED

Minimum

2.875"

Weld Metal

Filler Metal

F6

Position(s)

16 FLAT

Group (F.No.)

Backing

YES

Progression

—

JUNE 15 2012

Date of Expiry

Chris Lee

Signature of Safety Codes Officer



8600 92 Street
Grande Prairie, AB T8V 7S3

CERTIFYING STATEMENT

I have reviewed the:

Written Practice:	Second Edition Feb 17, 2007 Revision 3
NDE Procedures:	RT:- 1, 2, 3, 4, 5, 6 MT:-1 PT:-1
and personnel certification records and vision examination records of all Examiners that will perform NDE at Emission Control International Ltd.	

For: **Inspectrum Testing Inc. Box 736, Grande Prairie, AB T8V 3R5**

It is my opinion that the specified NDE procedures are in accordance with ASME Section V requirements as referenced by the applicable construction Code and that the Written Practice complies in all respects with the requirements of the construction Code accepted Edition/Addenda of SNT-TC-1A.

Based upon my review of the above referenced documents I hereby certify that personnel performing and evaluating NDE have been qualified and certified in accordance with their employers written practice and that the demonstration of procedure(s) to the satisfaction of the AI, as required by the ASME Code, Section V, paragraph T-150, has been completed as specified within the Emission Control International Ltd. written quality system.

Therefore:

Inspectrum Testing Inc.
(Name of NDE Company)

are hereby appointed to perform:

RT, PT, MT
(RT, UT, PT, MT, ET, VT and/or LT)

For:

Dynacorp Fabricators Inc.

APPOINTMENT OF LEVEL III EXAMINERS

Joel Kish is by this statement appointed to act as the Level III Examiners on behalf of:

Dynacorp Fabricators Inc.

in the following methods:

RT, PT, MT

(Signature of QCM)

October 20, 2009

(Date)

October 20, 2011

(Appointment Expiry Date)

LEVEL III EXAMINER ACCEPTANCE OF APPOINTMENT:

I hereby accept the appointment as indicated above.

(Signature of Level III Examiner)

P.O. Box 736
Grande Prairie, AB.
T8V 3R5
Fax # 780 539-1777
Toll Free 1-866-NDT XRAY

Ph. # 780 539-0000

INSPECTRUM TESTING INC.

Radiographic Inspection

75242

Page 1 of 2

Client: DYNACORP AFE# _____
Location: GRANDE PRAIRIE Date: Dec. 2/10 P.O.# 1P6518
Item Inspected: BLOWDOWN VESSEL (LONG SEAM & CIRC'S) Job# 1J105033-2
Exposure Device: E1050 Source#: 64401B EFSS: 3.089 IR-192 ☒ Cobalt 60 ☐ X-Ray ☐
Acceptance Code: ASME VIII Div. 1 Film Brand: AGEA Class: 1
Material: C/S #Film/Cassette: 1

Film #	Size, Location, Thickness	Welder ID	Insp. Tech	# of Exp.	SOD in.	OFD in.	Type and Location of Discontinuities (rejectable discontinuities circled)	Accept	Reject
LS1	60" x .500"								
	1 - 15"		R2	1	12	.500	LF @ -1 - +1 CM.		X
	15 - 30"							✓	
	30 - 45"							✓	
	45 - 60"							✓	
CS1	60" ID x .500"								
	1 - 15"		R1	1	30	.500	P@ 13" CM.	✓	
	15 - 30							✓	
	30 - 45						P@ 38" CM.	✓	
	45 - 60							✓	
	60 - 75							✓	
	75 - 90							✓	
	90 - 105						P@ 93, 97" CM. IF 101-105" CM.		X
	105 - 120						CLUSTER Por. IN BEAD 108" - 111"		X
	120 - 135						CLUSTER Por. IN BEAD 123 - 125"		X
	135 - 150							✓	
	150 - 165						WORMHOLE Por. @ 154 - 156"		X
	165 - 180							✓	
	180 - 0						CLUSTER IN CAP POROSITY @ 183 - 184", 189 - 190"		X

Inspection Technique
Single Wall Exposure:
R1, R2, R2A, R6
Double Wall Exposure
R3, R3A, R4, R5

Viewing Technique
Single Wall
R1, R2, R3, R6
Double Wall
R4, R5

AB - Arc Burn
BT - Burn Through
CK - Crack
EP - Excessive Penetration
P - Porosity

EUC - External Undercut
IUC - Internal Undercut
HB - Hollow Bead
IP - Incomplete Penetration

S - Slag
IC - Internal Concavity
LF - Lack of Fusion
LR - Low Reinforcement
MA - Misalignment

Inspection Performed By:

PHIL BORN

SNT-TC-1A II

CGSB L II

CGSB # 13053

Consumables:

17 - 4.5" x 17"

Unit# _____ Km _____

In _____ Out _____

Personnel KEVIN

I am in full agreement of report contents

Client Representative [Signature]

Cost Estimate:

\$ _____ + Tax
(Invoice to follow by mail)

**INSPECTRUM
TESTING INC.**

75243

Page 2 of 2

Date: Dec. 2/10

P.O.# 1P6518

Job# 1J105033-2

Exposure Device: E1050 Source#: 64401B

EFSS: 3.089 ml IR-192 ☒ Cobalt 60 ☐ X-Ray ☐

Acceptance Code: ASME VIII Div. 1

Film Brand: AGFA Class: 1

Material: C/S

#Film/Cassette: 1

P @ 144", S @ 149"

SNT-TC-1A 11CGSB L 11

(Print)



(Signature)

CGSB # 13053

Consumables:

13 - 4.5" x 17" film

Unit# _____ Km _____

In _____ Out _____

Personnel KEVIN

I am in full agreement of report contents

Client Representative

| Cost Estimate:

\$ _____ + Tax
(Invoice to follow by mail)

P.O. Box 736
Grande Prairie, AB.
T8V 3R5
Fax # 780 539-1777
Toll Free 1-866-NDT XRAY

Ph. # 780 539-0000

INSPECTRUM TESTING INC.

Radiographic Inspection

75246

Page 1 of 1

Client: DYNACORP AFE# _____
Location: GRANDE PRAIRIE Date: Dec. 3/10 P.O.# 1P6535
Item Inspected: BLOWDOWN (VESSEL) Job# 1J105033-2
Exposure Device: E1050 Source#: 64401B EFSS: 3.089mm IR-192 ☒ Cobalt 60 ☐ X-Ray ☐
Acceptance Code: ASME VIII Div. 1 Film Brand: AGFA Class: 1
Material: C/S #Film/Cassette: 1

Film #	Size, Location, Thickness	Welder ID	Insp. Tech	# of Exp.	SOD in.	OFD in.	Type and Location of Discontinuities (rejectable discontinuities circled)	Accept	Reject
<u>LSIR</u>	<u>60" x .500"</u> <u>1-15</u>		<u>R2</u>	<u>1</u>	<u>12</u>	<u>.500</u>	<u>repaired</u> <u>LF @ -1-1cm</u>		<u>X</u>
<u>CSIR</u>	<u>60" ID x .500"</u> <u>90-105</u> <u>105-120</u> <u>120-135</u> <u>150-165</u> <u>180-0</u>		<u>R1</u>	<u>1</u>	<u>30</u>	<u>.500</u>	<u>repaired</u> <u>WORMHOLE POR. @ 154-156"</u>	<u>✓</u> <u>✓</u> <u>✓</u> <u>✓</u> <u>✓</u>	<u>X</u>
<u>LSIR</u>	<u>60" x .500"</u> <u>1-15</u>		<u>R2</u>	<u>1</u>	<u>12</u>	<u>.500</u>	<u>repaired</u>	<u>✓</u>	
<u>CSIR</u>	<u>60" ID x .500"</u> <u>150-165"</u>		<u>R2</u>	<u>1</u>	<u>12</u>	<u>.500</u>	<u>repaired</u>	<u>✓</u>	

Inspection Technique
Single Wall Exposure:
R1, R2, R2A, R6
Double Wall Exposure
R3, R3A, R4, R5

Viewing Technique
Single Wall
R1, R2, R3, R6
Double Wall
R4, R5

AB - Arc Burn
BT - Burn Through
CK - Crack
EP - Excessive Penetration
P - Porosity

EUC - External Undercut
IUC - Internal Undercut
HB - Hollow Bead
IP - Incomplete Penetration

S - Slag
IC - Internal Concavity
LF - Lack of Fusion
LR - Low Reinforcement
MA - Misalignment

Inspection Performed By:

PHIL BORN

(Print)

[Signature]

(Signature)

SNT-TC-1A II

CGSB L II

CGSB # 13053

Consumables:

8-4.5" x 17" film

Unit# _____ Km _____

In _____ Out _____

Personnel KEVIN

I am in full agreement of report contents

Client Representative [Signature]

Cost Estimate:

\$ _____ + Tax
(Invoice to follow by mail)

INSPECTRUM FORM #2

351
2161

HEAT TREATMENT INSTRUCTIONS

JOB NO.: 1J105032-2 & 1J105033-2 CUSTOMER: Paramount Resources DATE: Dec 8/10 PO # 1P6604

COMPONENT DESCRIPTION: Blowdown Vessel

DWG. NO. AND LINE NO.	DIAMETER	THICKNESS	MATERIAL	LENGTH	WEIGHT
5005-0001 Rev B2	60" ID	0.500"	SA 516 70N	60"	

TYPE OF HEAT TREATMENT: PRESSURE VESSEL STRESS RELIEF P-No. 1

HEATINGTemperature to be raised from 800°F (427°C) to 1100°F (594°C) at a maximum rate of 400 °F(°C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 400°F (222°C) PER HOUR.

[Calculated rate = 400 degrees F/hr. (222 degrees C/hr.) Divided by the maximum metal thickness of the shell or head plate in inches]

HOLDINGTemperature to be held at a minimum of 1150°F (621°C) for 30 minutes.

[Holding time to be determined by Table UCS-56 for Nominal Thickness as specified in UW-40(f)]

COOLINGTemperature to be lowered from 1100°F (594°C) to 800°F (427°C) at a maximum rate of 500 °F(°C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 500°F (278°C) PER HOUR.

[Calculated rate = 500 degrees F/hr. (278 degrees C/hr.) Divided by the maximum metal thickness of the shell or head plate in inches]

From 800°F (427°C) Items may be cooled in still air.

Additional requirements:

- ♦ Job number and description required on heat treatment charts along with the operator's signature & date.
- ♦ Reporting of thermocouple attachment method and location, and verification of furnace thermocouple calibration is required.
- ♦ A sufficient number of thermocouples shall be located to control and maintain uniform distribution of temperature on all vessels and parts. Thermocouples shall be directly attached to the item or provision shall be made for thermocouple placement at bottom, centre and top of the furnace charge in accordance with the ASME Code.
- ♦ During the heating period, there shall not be a greater variation in temperature throughout the portion of the vessel being heated than 250°F (139°C) within any 16 ft. (4.6 m) interval of length. An adequate number of thermocouples must be used to ensure this Code requirement is met. This limitation is also applicable to the temperature variations between the different thicknesses of various vessel components.
- ♦ During the holding period, there shall not be a greater difference than 150°F (83°C) between the highest and lowest temperature throughout the portion of the vessel being heat treated, except where the range is further limited by these instructions.
- ♦ If Capacitor Discharge welding is used to attach thermocouples an ASME Code Section IX Welding Procedure Specification is required (WPS qualification is not required), and the energy output must be limited to 125 Watt-Seconds. No other welding is permitted on vessels or parts. $[0.5 \times \text{Capacitance in farads} \times \text{Voltage}^2 = \text{W-Sec.}]$
- ♦ The method of thermocouple removal shall not damage the heat treated item.

Quality Control Inspector Signature: *Ac Booth*Date: *Dec 8/10*

Thermocouple Attachment Method:

Location(s):

Furnace Heat Number: *22763*Furnace Operator Signature: *A Muller*Date: *Dec 08, 10*

FAX: (780) 539-5916

4

DATE _____

NORWELD STRESS LTD.

CERTIFICATE OF CALIBRATION

Owner <u>Norweld Stress</u>	Job No.	Certificate No. <u>0268</u>
Instrument Model <u>Yokogawa 224120</u>		
Range: ☒ 0 - 2000°F ☐ Other		Serial No. <u>12C719120</u>
Environmental Conditions: Temperature <u>20</u> °C		Sensor Type: ☒ K ☐ Other
Date of Cal. <u>Oct 05, 2010</u>		Humidity <u>52</u> %
Next Cal. Due <u>JAN 05, 2011</u>		

INSTRUMENT USED TO PERFORM CALIBRATION

Certificate No. 564290-00-1 Serial No. 3011329 Next Cal. Due June 07, 2011

CALIBRATION DATA

ALL ENTRIES ARE °F UNLESS OTHERWISE NOTED

Signal Input	As Found	As Left	Accuracy (Tolerance)
Test Temp. "a" <u>200</u>	<u>200</u>	<u>200</u>	± <u>6</u>
Test Temp. "b" <u>500</u>	<u>501</u>	<u>501</u>	± <u>6</u>
Test Temp. "c" <u>700</u>	<u>700</u>	<u>700</u>	± <u>6</u>
Test Temp. "d" <u>1000</u>	<u>1001</u>	<u>1001</u>	± <u>6</u>
Test Temp. "e" <u>1400</u>	<u>1401</u>	<u>1401</u>	± <u>6</u>

CONDITION FOUND: ☒ In Tolerance ☐ Out of Tolerance

I, LEE MULLER (print name) certify that the above work was performed and that calibration was within Norweld Stress Ltd. quality assurance guidelines.



L Muller
Signature

No# 9
Employee No.

Grande Prairie, Alberta
Office

YOKOGAWA

CHART NO. E906ANJ

YOKOGAWA

CHART NO. E906ANJ

5
4
3
2
1
0
24
23
22
21
20

Dec 08, 2010
50mm/h

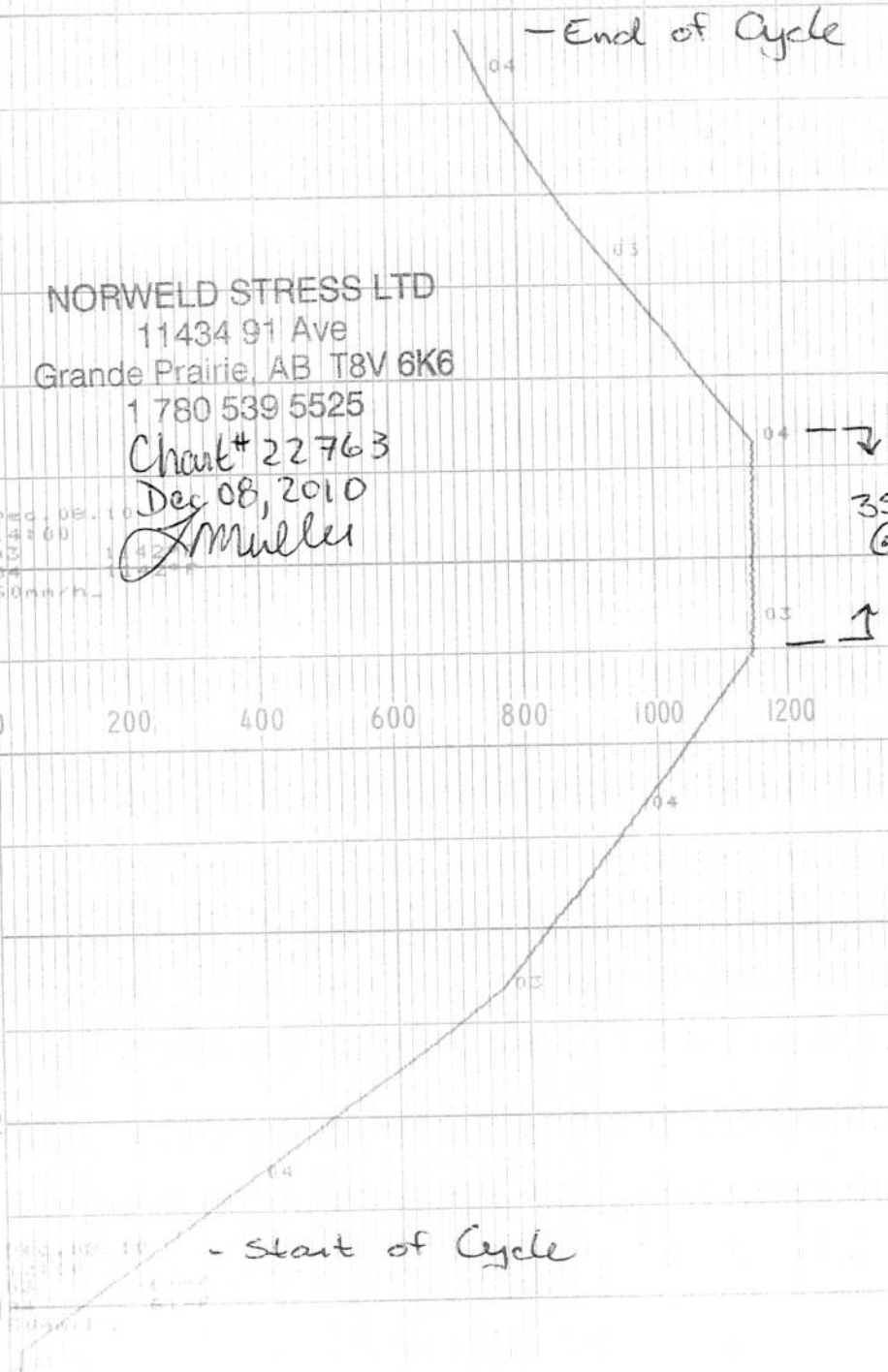
NORWELD STRESS LTD
11434 91 Ave
Grande Prairie, AB T8V 6K6
1 780 539 5525
Chart # 22763
Dec 08, 2010
Amullee

- End of Cycle

35min Soak
@ 1150 ± 25

1J105033-2
12/13/10
CME

- Start of Cycle





HYDRO TEST REPORT

JOB # 1J105033-2

Date of Test: December 14, 2010

Job Description: Vertical Knockout

Check Box ☒ Test Witnessed by ABSA

Name of ABSA Inspector: Harvey Waddy

PRE TEST INFORMATION

ACTUAL TEST INFORMATION

Test Medium:

Water

Time On:

06:30 am

Ambient Temperature

70F

Time Off:

08:15 am

Specific Test Pressure

255 psi

Actual Test Pressure

255 psi

Specified Test Hold Time

60 min.

Actual Hold Time

105 min.

Chart Recorder #

PT-41

Calibration Date

12/28/09

Test Gauge Number (s)

DYNG- 101

Test Gauge Range

0-1000 psi

Gauge Calibration Date

11/24/10

Remarks:

Claude McDonald QCM

QC Manager or QC Inspector

Test Performed by: Richard Marshall

Certificate of Calibration

Report number Arkane-Cal Report08909

ARKANE WORKS

Manufacturer	Model	Company / Unit	Gauge Number	Serial Number	Calibration Date	Expiration Date
MDI	GAUGETECH 1,000	DYNACORP	DYNG 102	PG-1000-02	07/04/2010	07/04/2011

All instrument calibrations are verified for accuracy before they are shipped. The recommended calibration interval for this instrument is 12 months from the date of verification.

As Received Condition:

In tolerance

As Left Condition:

In tolerance

All calibrations are performed in a controlled environment by qualified personnel using instrumentation and methods which guarantee that specifications claimed are reliable. Calibrations conform to ANSI/NCSL Z540-1-1994, MIL-STD 45662A, 10CFR21 and 10CFR50 when specified by customer documentation. Laboratory ambient conditions throughout this calibration were:

Temperature 20 to 24° C
Humidity 30 to 55% RH
Pressure 100 to 103 kPa

Reference Standards used in this calibration are traceable to the National Institute of Standards and Technology through the following report numbers:

Manufacturer	Model	Serial Number	Report Number	Due Date	Reference Uncertainty
Crystal Engineering	10KPSIXP21	66468	110515	4-Mar-11	0-20% of FS: +/- 0.02% FS, 20%-100% of FS: +/- 0.1% reading

As Received Test Results

This certificate shall not be reproduced except in full, without written approval.

1000 PSI

Reference Reading	Gauge Reading	Condition	Difference	Difference (% of Reading)	Allowable Tolerance
0	0	Pass	0		10
252	250	Pass	-2	-0.80%	10
509	500	Pass	-9	-1.80%	10
760	750	Pass	-10	-1.33%	10
1005	1000	Pass	-5	-0.50%	10
0	0	Pass	0		10

As Left Test Results

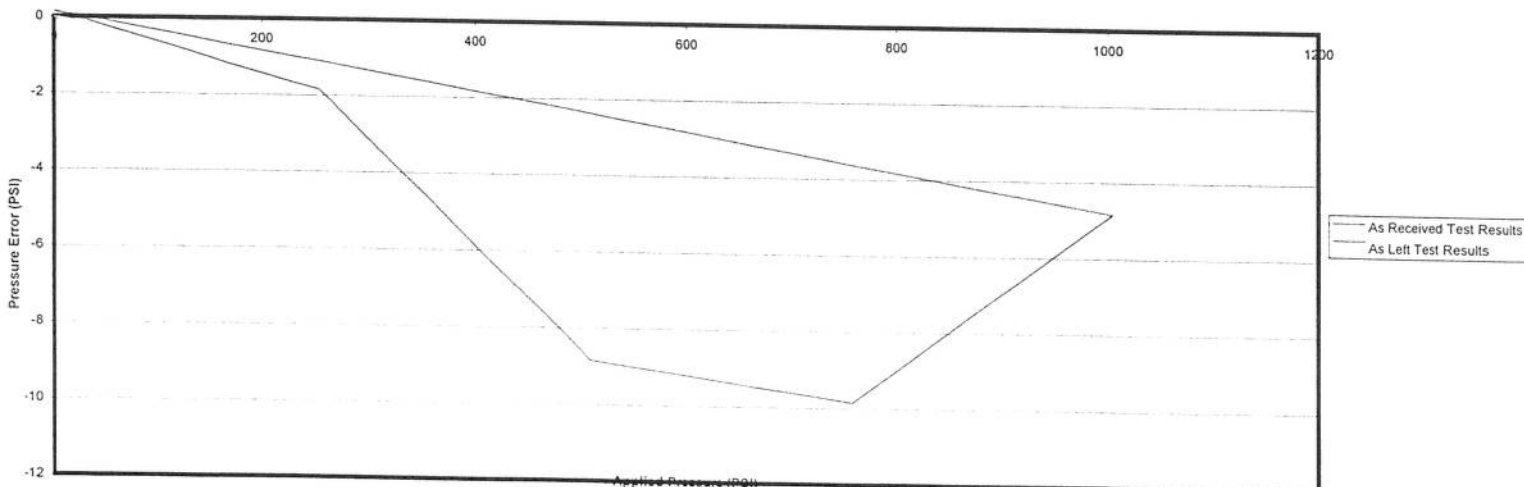
1000 PSI

Reference Reading	Gauge Reading	Condition	Difference	Difference (% of Reading)	Allowable Tolerance
0	0	Pass	0		10
252	250	Pass	-2	-0.80%	10
509	500	Pass	-9	-1.80%	10
760	750	Pass	-10	-1.33%	10
1005	1000	Pass	-5	-0.50%	10
0	0	Pass	0		10

Gwen Tetrault

Laboratory Representative
Gwen T/Darren M/Julie G/Q Hatch

Pressure Error Graph for Gauge # DYNG 102, S/N GAUGETECH-1,000, Report # Arkane-Cal Report08909



Certificate of Calibration

Report number Arkane-Cal Report05072

ARKANE WORKS

Manufacturer	Model	Gauge Number	Serial Number	Calibration Date	Expiration Date
Mercury	MERCURY 1000 PSI	DYNACORP-816334 S	816334	28/12/2009 7:42:28 AM	28/12/2010 7:42:28 AM

All instrument calibrations are verified for accuracy before they are shipped. The recommended calibration interval for this instrument is 12 months from the date of verification.

As Received Condition: In tolerance As Left Condition: In tolerance

All calibrations are performed in a controlled environment by qualified personnel using instrumentation and methods which guarantee that specifications claimed are reliable. Calibrations conform to ANSI/NCSL Z540-1-1994, MIL-STD 45662A, 10CFR21 and 10CFR50 when specified by customer documentation.

Laboratory ambient conditions throughout this calibration were:

Temperature 20 to 24° C
Humidity 30 to 55% RH
Pressure 100 to 103 kPa

Reference Standards used in this calibration are traceable to the National Institute of Standards and Technology through the following report numbers:

Manufacturer	Model	Serial Number	Report Number	Due Date	Reference Uncertainty
Crystal Engineering	AX33-36/5000PSI	3471-738613	169875	31/03/2010 12:00:00 AM	+/- (0.05% of Reading + 0.005% of F.S.)

This certificate shall not be reproduced except in full, without written approval.

As Received Test Results

1000 PSI

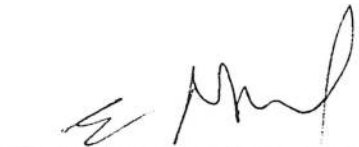
Reference Reading	Gauge Reading	Condition	Difference	Difference (% of Reading)	Allowable Tolerance
0.0	0	Pass	0.0	0.0%	20.0
253.5	250	Pass	-3.5	-1.40%	10.0
502.0	500	Pass	-2.0	-0.40%	10.0
748.9	750	Pass	1.1	0.15%	10.0
994.4	1000	Pass	5.6	0.56%	20.0
490.8	500	Pass	9.2	1.84%	10.0
0.0	0	Pass	0.0	0.0%	20.0

As Left Test Results

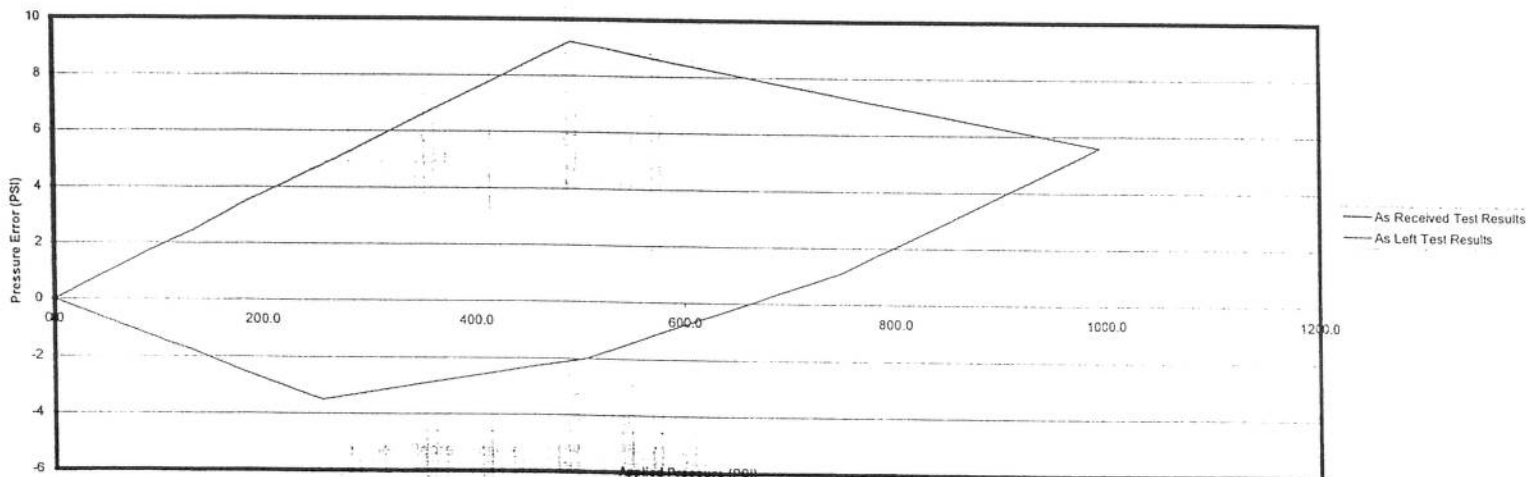
1000 PSI

Reference Reading	Gauge Reading	Condition	Difference	Difference (% of Reading)	Allowable Tolerance
0.0	0	Pass	0.0	0.0%	20.0
253.5	250	Pass	-3.5	-1.40%	10.0
502.0	500	Pass	-2.0	-0.40%	10.0
748.9	750	Pass	1.1	0.15%	10.0
994.4	1000	Pass	5.6	0.56%	20.0
490.8	500	Pass	9.2	1.84%	10.0
0.0	0	Pass	0.0	0.0%	20.0


Laboratory Representative
Gwen Thetraul or Darren Miller


Quality Representative
Ted Hornsby or Darren Miller

Pressure Error Graph for Gauge # DYNACORP-816334-S, S/N MERCURY 1000 PSI, Report # Arkane-Cal Report05072





PRESSURE TEST EXAMINATION GUIDE		1J105033-2
PRESSURE TEST PREPARATION	Q.C. INSP.	
All punch list items corrected.	CNS	
Test blinds are of correct thickness.	CNS	
All items which could be damaged by test isolated or removed (control valves, safety valves, instruments, expansion joints, etc.)	CNS	
Equipment with internals (i.e. filters) that could be damaged is isolated as required.	CNS	
Vents and drains correctly installed.	CNS	
Open and Closed position of all valves verified.	CNS	
Shipping bars in place – bellows.	—	
Hanger stops in place.	—	
PRESSURE TEST COMPLETION	Q.C. INSP.	
All temporary blinds (blanks) removed.	CNS	
Temporary gaskets changed for correct gaskets.	CNS	
Temporary supports removed.	CNS	
Shipping bars removed from bellows.	—	
Spring hanger stops removed - cold setting checked.	—	
Pressure Relief Valves – “UV” or “V” symbol as applicable and at correct set pressure and capacity installed.	CNS	
Safety valve vents are correct size - adequately supported - drain holes and or weather hoods installed.	CNS	
Screens for pumps and compressors installed (initial start-up and permanent screens).	—	
Date: December 14, 2010		