

Travel Sheet

Authorized Inspector to be given travel sheet prior to construction so that he can indicate hold points and Inspection Points.

"A"-Hold Point, "I"- Inspection Point, "R"-Revision, "W"- Witness Point

Hold Points established - Sign & Date

(Authorized Inspector)

Vessel Serial #		12209		DWG #		V85-05		(A) #	
Vessel Title:		8" Fuel Gas Scrubber		CRN #		F6388.231			
ITEM		COMMENTS	AUTH Insp., Hold Rev., Witness POINTS	DATE FUNCTION COMPLETE & INSPECTORS INITIALS					
				QC INSPECTOR	AUTHORIZED INSPECTOR				
APPROVED DRAWING				July 21, 2011	<i>PD</i>				
CALCULATIONS ON FILE				July 21, 2011	<i>PD</i>				
MATERIAL CHECKED AGAINST DRAWING, MATERIAL LIST				July 21, 2011	<i>PD</i>				
MTR'S CHECKED				July 21, 2011	<i>PD</i>				
VESSEL LAYOUT				July 21, 2011	<i>PD</i>				
NOZZLES & FITTINGS FIT UP	ORIENTATION			July 22, 2011	<i>PD</i>				
	RATINGS			July 22, 2011	<i>PD</i>				
	NOZZLES&FITTINGS			July 25, 2011	<i>PD</i>				
	SHELL & HEAD			July 25, 2011	<i>PD</i>				
INTERNALS (tray, baffles, etc)									
INTERNAL INSPECTION									
WELD SIZES				July 26, 2011	<i>PD</i>				
WELDERS I.D.				July 26, 2011	<i>PD</i>				
EXTERNAL AFTER COMPLETION OF ALL WELDING				July 26, 2011	<i>PD</i>				
RADIOGRAPHS									
OTHER N.D.E.									
IMPACT TESTS									
POST WELD HEAT TREATMENT		YES: <i>PD</i> NO: ☒							
EXTERNAL BEFORE PWHT									
PWHT CHART CHECKED									
NAMEPLATE				July 29, 2011	<i>PD</i>				
HYDROSTATIC TEST				July 29, 2011	<i>PD</i>				
DATA REPORT				July 29, 2011	<i>PD</i>				
NONCONFORMANCES									

		SPECIFICATIONS		HEAT NUMBER		VERIFIED THICKNESS
SHELL	C1	SA-106-B	D08-2-8014	☒	8.1mm	
	C2					
HEADS	1	SA-234-WPB	OY291	☒	7.16mm	
	2	SA-516-70	78902-16760	☒	19.05mm	
	3					
REPADS	1					
	2					
	3					
	4					
		SPECIFICATIONS	SIZE	SCHEDULE		
NOZZLES						
FITTINGS		SA-105	1", 2", 3/4"	#3000 cplg.		
TUBES						

89EH0680
D08-2-8014

江陰市無縫鋼管總廠

产品质量证明书 (EN10204.3.1)
MILL TEST CERTIFICATE

江苏省江阴市夏港镇澄江路375号

No. 375, Zhencheng Rd. Xiangyang Town Jiangyin City
Jiangsu Province, China (214442) <http://www.sjkg.com>
Tel: 86-510-86160723 Fax: 86-510-86160732

MILL TEST CERTIFICATE

零件名称 Part Name		总重量 Total Weight		日期 Date		合同编号 Contract No.	
零件名称 Part Name		总重量 Total Weight		日期 Date		合同编号 Contract No.	
CARBON STEEL SEAMLESS PIPE		ASTM A106-04/ASME SA106-04/PSI, NACE MR0175-02		2008年10月23日		0503	
规格 Specification		牌号 Steel Type		交货状态 Delivery Status		执行标准 Standard	
NPS 8" SCH 40		B		ASME		API 5L	
序号 Item No.		批号 Batch No.		重量 Weight		尺寸 Dimension	
序号 Item No.		批号 Batch No.		重量 Weight		尺寸 Dimension	
1	08204768	Y20808-716	37	185	50.357	*1-A2	50
2	08204768	Y20808-716	37	185	50.357	*1-A2	50
3	08204768	Y20808-716	37	185	50.357	*1-A2	50
4	08204768	Y20808-716	37	185	50.357	*1-A2	50
化学成分(%) Chemical Composition							
C	Si	Mn	P	S	Cr	Ni	Cu
0.28	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.28	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.28	0.04	0.04	0.04	0.04	0.04	0.04	0.04
0.28	0.04	0.04	0.04	0.04	0.04	0.04	0.04
力学性能 Mechanical Properties							
屈服强度 Yield Strength		抗拉强度 Tensile Strength		伸长率 Elongation		断面收缩率 Reduction of Area	
屈服强度 Yield Strength		抗拉强度 Tensile Strength		伸长率 Elongation		断面收缩率 Reduction of Area	
205	205	205	205	205	205	205	205
205	205	205	205	205	205	205	205
205	205	205	205	205	205	205	205
205	205	205	205	205	205	205	205
金相分析 Metallography							
晶粒度 Grain Size		夹杂物 Inclusion		显微组织 Microstructure		硬度值 Hardness	
晶粒度 Grain Size		夹杂物 Inclusion		显微组织 Microstructure		硬度值 Hardness	
1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1
无损检测 Nondestructive Testing							
射线检测 Radiography		超声波检测 Ultrasonic		磁粉检测 Magnetic		渗透检测 Penetrant	
射线检测 Radiography		超声波检测 Ultrasonic		磁粉检测 Magnetic		渗透检测 Penetrant	
OK	OK	OK	OK	OK	OK	OK	OK
OK	OK	OK	OK	OK	OK	OK	OK
OK	OK	OK	OK	OK	OK	OK	OK
OK	OK	OK	OK	OK	OK	OK	OK
备注 Remarks							
备注 Remarks							
NOV 2008							
NOV 2008							
NOV 2008							
NOV 2008							

质量管理部负责人:
Quality Manager:

市發人:
Auditor:

証人: _____
Certification: _____

**Awaji****INSPECTION CERTIFICATE****AWAJI MATERIA (THAILAND) CO.,LTD.**81,MOO4, PRAKASA ROAD, TAMBOL BANGMAJANG, AMPHUR MUANG
SAMUTPRAKARN THAILAND 10270, Tel : (662)701-5226

Purchaser : THE BROADHEAD GROUP/MCJUNKIN CANADA

MADE FROM SEAMLESS STEEL PIPE

Date : FEBRUARY 28, 2011

Certificate No. : T11-2927/1

Order No.	Job No.	Product	Raw Material Pipe Maker
CS759-074521/WPB/16	-	CARBON STEEL BUTT WELDING FITTINGS	SUMITOMO METAL INDUSTRIES, LTD.
Inspection Standard	Material Standard	Appearance	GOOD
ASME B16.9-07 ASTM A350-08a NACE MR-0175-03, MR-0103-05	ASTM A234-07 WPB ASME SA234-07 WPB CSA Z245.11-05, CR241 CAT1	GOOD	GOOD
Manufacturing No.	Product code	Material	Note.
07291		WPB	"ALL FITTING MANUFACTURED BY AWAJI MATERIA (THAILAND) CO.,LTD. ARE PRODUCED FROM A106 GRB SEAMLESS PIPE"
Quantity	Article & Size	Dimension	Quantity
91 Pcs.	STD CAP 8"	8"	91 Pcs.

ISO 9001: 2008 Manufacturing Company Certified by BV. Certificate No. TH10000101									
Inspection Certificate : ACCORDING TO EN 10204, 3.1 : 2804									
C.E. = C + $\frac{Mn}{5}$ + $\frac{Cr+Mo+V}{5}$ + $\frac{Ni+Cu}{15}$									
*1 Y.S.= Yield Strength, T.S.= Tensile Strength, E = Elongation, *3 UT = Ultrasonic thickness inspection.									
*2 For each reduction of 0.01% below the specified carbon(C) Maximum, an increase of 0.05% manganese(Mn) above specified maximum will be permitted, up to a maximum of 1.35% as per foot note D of ASTM A234/A234M-07 Table 1.									

ISO 9001: 2008 Manufacturing Company
Certified by BV, Certificate No, TH10900101

Inspection Certificate : ACCORDING TO EN 10204, 3.1 : 2004

*1 Y.S.= Yield Strength, T.S.= Tensile Strength, E = Elongation, *3 UT = Ultrasonic thickness inspection.

*2 For each reduction of 0.01% below the specified carbon(C) Maximum, an increase of 0.08% manganese(Mn) above specified maximum will be permitted, up to a maximum of 1.35% as per foot note D of ASTM A234/A334M-07 Table 1.

ELBOW / Forming temperature 780°C- 930°C and cooled in still air
TEE, REDUCER & CAP / Normalizing : 900°CWe hereby certify that the material described herein has been duly
inspected and conforms to the standard as specified above.

AT-24(2)12

Surveyor to

Chief of Inspection Section S.MAEKAWA



edmonton exchanger
& manufacturing ltd.



CERTIFICATE OF COMPLIANCE

5545-89 Street Edmonton, Alberta Canada T6E 5W9

www.edmontonexchanger.com

tel 780.468.6722 • QC fax 780.468.4668 • sales fax 780.466.5155

Customer RJV GASFIELD LTD.

PO 2660

Work Order C87535 Date 2010/12/17 CofC# 21303

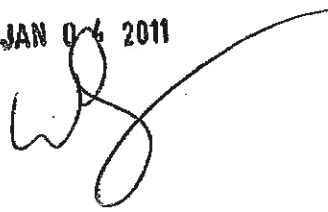
Page 1 of 1

Item#	Description	Qty	Heat#	Tag Code
P87535-1	DISC(S) - 0.7500" NOM X 12" OD (Material Spec: SA 516-70 Normalized)	8	SB56276-PB25630503	A
		6	292924-99513	B
		6	SB78542-PB90712703	C
		6	78902-16760	D
		22	SB96741-PB46803303	E

Material being supplied conforms to the latest ASME Code Section II, Part A, 2007 Edition, Addenda July 1, 2009. All welders and procedures are qualified to ASME Code Section IX.

Supplementary Examination - Items

JAN 04 2011





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		A09 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991		214210-28.05.06	306374-004	1/...
MATERIAL TEST REPORT (MTR)				
A05 Established inspecting body DH	A06 Purchaser Final receiver	A07.1 No. 60115 A07.2 No. E10372-J1010-LG	B01 Product HOT ROLLED PLATES	
B02/ Steel grade B03 Specifications		SA20-S5		
SA516-70 ASME-2A:04 DIL-HUE2:REV.19-03.10.05				



12689

B01-B99 Product description

B09 Item No.	B10 Quantity	B11 Thickness	B12 Width	B13 Length	B14 Mass theoretical	B14 KG	B04 Delivery condition	B08 Heat No.	B07 Rolled plate No./ Test No.	B16 Customer reference
01	1	0,7500 x	120,50000 x	480,00000	5580	N		78902	16750-02	ITEM 1
01	1	0,7500 x	120,50000 x	480,00000	5580	N		78902	16760-02	ITEM 1
01	1	0,7500 x	120,50000 x	480,00000	5580	N		78902	16761-01	ITEM 1
01	1	0,7500 x	120,50000 x	480,00000	5580	N		78902	16761-02	ITEM 1
01	1	0,7500 x	120,50000 x	480,00000	5580	N		78902	16761-03	ITEM 1
01	1	0,7500 x	120,50000 x	480,00000	5580	N		78903	16744-02	ITEM 1
**	6				33480					
02	1	1,0000 x	96,50000 x	480,00000	5959	N		78901	16769-02	ITEM 2
02	1	1,0000 x	96,50000 x	480,00000	5959	N		78901	16775-01	ITEM 2
**	2				11918					
**	8				45398					

B04 Delivery condition / Heat treatment of plates

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

B06 Marking

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

A04	201/202 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			
Trademark		Inspector's stamp	Date 29.05.06
		Test House Manager	PP 1



DILLINGER HÜTTE

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

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991		A09 Advice of dispatch No./ Date of dispatch 214210-28.05.06	A08 Manufacturer's order/ A03 Certificate No. 306374-004	Sheet 2/...
A05 Established inspecting body DH		A06 Purchaser ARCELOR CANADA, BURLI A07.1 No. 60115 Final receiver EDMONTON STEEL, EDMON A07.2 No. E10372-J1010-LG SA20-S5		
B02/ Steel grade SA516-70				
B03 Specifications ASME-2A:04 DIL-HUE2:REV.19-03.10.05				

C10-C29 Tensile test

B09 Item No.	B08 Heat No.	B07 Roll plate/ Test No.	B05 Reference condition	C01 C02/ C03 C01 Temp. GRF	C10 C11 KSI RP02	C12 RM	C13 % A L0-0IN	C14-C15
01	78902	16750		K1 Q	RT	48,9	74,1	29,9
01	78902	16760		K1 Q	RT	49,3	74,4	29,4
01	78902	16761		K1 Q	RT	47,7	74,2	29,4
01	78903	16744		K1 Q	RT	47,1	73,4	30,9
02	78901	16769		K1 Q	RT	48,6	74,5	29,9
02	78901	16775		K1 Q	RT	49,3	74,8	30,9

C30-C39 Hardness test

B09 Item No.	B08 Heat No.	B07 Roll plate/ Test No.	B05 Reference condition	C01 C02/ C03 C01 Temp. GRF	C33 Temp. GRF	C33 Testing method	C35 Individual values	C37 Average value
01	78902	16750		K1 O	RT	HEW 10/3000	HB 142	143
01	78902	16760		K1 O	RT	HEW 10/3000	HB 144	144
01	78902	16761		K1 O	RT	HEW 10/3000	HB 142	142
01	78903	16744		K1 O	RT	HEW 10/3000	HB 143	143
02	78901	16769		K1 O	RT	HEW 10/3000	HB 144	144
02	78901	16775		K1 O	RT	HEW 10/3000	HB 144	146

C40-C49 Impact test

B09 Item No.	B08 Heat No.	B07 Roll plate/ Test No.	B05 Reference condition	C01 C02/ C03 C01 Temp. GRF	C41 Specimen width	C40 Type of specimen	C44 Testing method	C46 Energy	C42 Individual values	C43 Average value
01	78902	16750		K1 LV	-51	CHP-V	CHP-V	AV 111	136	151
01	78902	16760		K1 LV	-51	CHP-V	CHP-V	AV 107	125	126
01	78902	16761		K1 LV	-51	CHP-V	CHP-V	AV 83	140	122
01	78903	16744		K1 LV	-51	CHP-V	CHP-V	AV 161	144	156

A04	201/202 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.		AG der Dillinger Hüttenwerke	
				Postfach 1580, D-66748 Dillingen/Saar Inspection department
QM-System: Certification as per ISO 9001		Inspector's stamp B. MUELLER Test House Manager		Date 29.05.06 PP 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		A08 Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991		214210-28.05.06	306374-004	3/...
MATERIAL TEST REPORT (MTR)				
A05 Established inspecting body	A06 Purchaser	B01 Product		
DE	Final receiver	HOT ROLLED PLATES		
SA20-S5				
B02 Steel grade	SA516-70			
B03 Specifications	ASME-2A:04 DIL-HUE2:REV.19-03.10.05			
A071 No. 50115				
A072 No. E10372-J1010-LG				

C40-C49 Impact test

B08 Heat No.	B07 Roll plate/ Test No.	B05 Reference condition	C01	C02/ C01	C03 Temp. GR.F	C41 Specimen width	C40 Type of specimen	C44 Testing method	C46 Energy	C45 Individual values AV=FT.LBF	C42	C43 Average value
02 78901	16769		K1 LV	-51		CHP-V	CHP-V			119	111	119
02 78901	16775		K1 LV	-51		CHP-V	CHP-V			162	142	138

C70-C99 Chemical composition % - Heat analysis

B08 Heat	C	Si	Mn	P	S	N	AL	CU	MO	NI	CR	V	NB	SN
78901	Y	0,186	0,339	1,18	0,012	0,0008	0,0047	0,012	0,005	0,019	0,054	0,000	0,000	0,000
78902	Y	0,179	0,373	1,20	0,010	0,0007	0,0060	0,015	0,004	0,021	0,038	0,000	0,000	0,000
78903	Y	0,169	0,360	1,18	0,012	0,0009	0,0053	0,016	0,005	0,070	0,035	0,001	0,000	0,001

C94 Heat analysis Carbon equivalent / Alloying restrictions

B08 Heat	FO-02=	FO-02=	FO-02=	FO-55=	FO-55=	FO-78=	FO-78=	FO-91=	FO-91=
78901				0,40	0,39	0,09	0,06	6,3	6,7
78902				0,39	0,38	0,08	0,04	6,7	7,0
78903				0,38	0,38	0,13	0,04	7,0	

C95 Ladle treatment

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

A04	 Z01UZ02 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 Date 29.05.06 Inspector's stamp Test House Manager PP 1
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DILLINGER HÜTTE

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

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991 MATERIAL TEST REPORT (MTR)		A09 Advice of dispatch No./ Date of dispatch 214210-28.05.06	A08 Manufacturer's order/ A03 Certificate No. 306374-004	Sheet 4/...
A05 Established inspecting body DH	A06 Purchaser ARCELOR CANADA, BURLI EDMONTON STREET, EDMON	A07.1 No. 60115 A07.2 No. E10372-J1010-LG	B01 Product HOT ROLLED PLATES	
B02/ Steel grade SA516-70	SA20-S5			
B03 Specifications ASME-2A:04 DIL-HUE2:REV.19-03.10.05				

C70-C99 Chemical composition % - Product analysis

B08 Heat	B07 Test No.	C01	C	Si	MN	P	S	N	AL	CU	MO	NI	CR	V	NE	SN
78901	16769	K1	0,176	0,317	1,16	0,010	0,0008	0,0040	0,036	0,012	0,004	0,018	0,051	0,000	0,000	0,000
78902	16767	K1	0,181	0,339	1,16	0,009	0,0010	0,0053	0,030	0,013	0,004	0,020	0,044	0,001	0,000	0,000
78902	16768	K1	0,185	0,321	1,16	0,010	0,0011	0,0040	0,034	0,013	0,005	0,018	0,050	0,000	0,000	0,000
78903	16749	K1	0,172	0,364	1,20	0,009	0,0003	0,0055	0,037	0,014	0,003	0,020	0,035	0,000	0,000	0,000

C94 Product analysis Carbon equivalent / Alloying restrictions

B08 Heat	B07 Test No.	C01	TI	S
78901	16769	K1	0,001	0,0002
78902	16767	K1	0,001	0,0001
78902	16768	K1	0,001	0,0000
78903	16749	K1	0,001	0,0000

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

A04	 201202 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	Inspector's stamp Date 29.05.06 PP 1
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DILLINGER HÜTTE

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

A02	INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004		A09	Advice of dispatch No./ Date of dispatch	A08/ Manufacturer's order/ A03 Certificate No.	Sheet		
	INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991			214210-28.05.06	306374-004	5		
MATERIAL TEST REPORT (MTR)								
A05	Established inspecting body	A06	Purchaser	ARCELOR CANADA, BURLI		A07.1	No.	60115
DH	Final receiver	EDMONTON STEEL, EDMON		A07.2	No.	E10372-J1010-LG	SA20-S5	
B02/	Steel grade	SA516-70						
B03	Specifica- tions	ASME-2A:04						
DIL-HUE2:REV.19-03.10.05								

D01 Checking of marking, surface, shape and dimensions

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



Z01Z02 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

AHB

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

B. MOELLER
Test House Manager

Inspector's stamp

Date 29.05.06

PP 1

POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호: 0611110-PPSA-002-015
Date of issue/발행일자: Nov., 17, 2006

Order No./계약번호: 0002574516

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

Customer/고객사: EDMONTON EXCHANGER

PO No./주문번호: E10568
(ASME2004 EDITION)

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

Spec & Type/규격: ASTM SA516-70 (VACUUM DEGASSED)



Size/지수	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/화학성분(%)													
							D C V I S I O N	C	Si	Mn	P	S	Cr	Ni	Cu	Mo	Nb	Ti	V	Sn-Al
0.75"x96.5"x480"	PC21414101-4102	2	8,934 19,696	SB56276	T 51.9 78.0 28	A-112 1:89 2:89 3:96 A-91 1:114 2:122 3:117 A-118 147,719 (LBS)	L	1878	353	1142	102	16	3	22	111	Tr	1	1	17	28
0.75"x96.5"x480"	PC21414201-4202	2	8,934 19,696	SB56276	T 52.2 78.3 28	1:114 2:122 3:117 A-118 147,719 (LBS)	L	1878	353	1142	102	16	3	22	111	Tr	1	1	17	28
*** Sub Total (930) *** *** HEAT TREATMENT *** 0.75"x120.5"x480"	PB25630001-0008	3	16,737 36,897	SB56272	T 50.9 75.1 27	1:110 2:117 3:117 A-115 1:115 2:95 3:116 A-108	L	1922	368	1131	91	19	2	21	93	Tr	1	1	17	30
0.75"x120.5"x480"	PB25630101-0103	3	16,737 36,897	SB56272	T 51.9 77.0 28	1:115 2:95 3:116 A-108	L	1922	368	1131	91	19	2	21	93	Tr	1	1	17	30

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

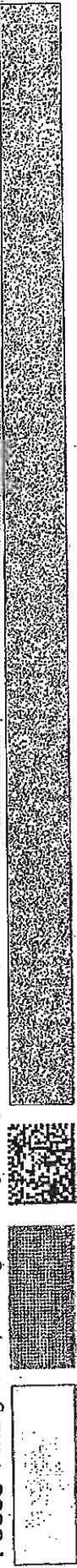
A) This material was produced under a quality system manual Rev.5 dated JUL.01.2006 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME- Sec. III NCA-3800 and (or) KEPIC MINA/ SNA4300.
B) No repair welding was performed to the products.
C) The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

Surveyor To:

Na, Chai Bong

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

Chief of material testing section Na, C.B



POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 061110-PPSA-002-016
Date of Issue/발행일자: Nov., 17, 2006

Order No./계약번호: 0002574516

PO No./주문번호: E10568
(ASME2004 EDITION)

Supplier/주문자: DAE WOO INTERNATIONAL CORP.

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

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASTM SA516-70 (VACUUM DEGASSED)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 재강번호	Position	Tensile/인장시험 YP TS EL (KSI) (%)	Impact/충격시험 V Notch 50°F Energy SF (FT-LBS) (%)	D	Chemical Composition/화합성분(%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
0.75"X120.5"X480"	PB25630201-0203	3	16,737 36,897	SB56272	T	52.6 77.3 28	1.85 2:108 3:111 A:102	L	1922	368	1131	91	19	2	21	93	Tr	Tr	1	17	30																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</

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

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

* Division : L-Ladle Analysis

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

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

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

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

B) No repair welding was performed to the products.

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

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

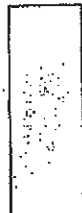
* This Mill Test Certificate cannot be copied for any purpose.

Surveyor To:

Na, Cha: Bong

POSCO Pohang Works, 5 Dongchon-dong, Nam-gu, Pohang-si, Gyeongsangbuk-do, 780-785, Korea

Chief of material testing section Na, C.B



POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 061110-PPSA-002-017
Date of Issue/발행일자 : Nov., 17, 2006

Order No./계약번호 : 0002574516

PO No./주문번호 : E10568
(ASME2004 EDITION)

Supplier/주문자 : DAE WOO INTERNATIONAL CORP.

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

Customer/고객사 : EDMONTON EXCHANGER

Spec & Type/규격 : ASTM SA516-70 (VACUUM DEGASSED)

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/화학성분(%)															
						YP (KSI)	TS (KSI)	EL (%)			C	Si	Mn	P	S	Cr	Ni	Cu	Mo	Nb	Ti	V	Al			
0.75"x120.5"x480"	PB25629901-9902	2	11,158 24,598	SB56276	T	51.9	77.2	27	A-117 1:126 2:100 3:96	L	1878	353	1142	102	16	3	22	111	Tr	1	1	17	28			
0.75"x120.5"x480"	PB25630301-0303	3	16,737 36,897	SB56276	T	52.1	76.9	27	A-107 1:121 2:101 3:98	L	1878	353	1142	102	16	3	22	111	Tr	1	1	17	28			
0.75"x120.5"x480"	PB25630401-0403	3	16,737 36,897	SB56276	T	51.3	77.3	28	A-107 1:195 2:214 3:193	L	1878	353	1142	102	16	3	22	111	Tr	1	1	17	28			
0.75"x120.5"x480"	PB25630501-0503	3	16,737 36,897	SB56276	T	52.2	77.7	30	A-201 1:207 2:207 3:195	L	1878	353	1142	102	16	3	22	111	Tr	1	1	17	28			
0.75"x120.5"x480"	PB25630601-0603	3	16,737	SB56276	T	52.4	77.6	28	A-204 1:129	L	1878	353	1142	102	16	3	22	111	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 : Longitudinal.

* T.L.R. (Trans Longitudinal Ratio)

* Division : L : Ladle Analysis

* Chemical Composition Unit : 0.01%, 0.001%, 0.0001%, 0.00001%

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

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

A) This material was produced under a quality system manual Rev.5 dated JUL 01, 2006 and 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 KSPIC MINA SNA4300.

B) No repair welding was performed to the products.

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

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



Surveyor To:

Na, Chai Bong

KT-01 & MS-01-2006

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

Chief of material testing section

Na, C.B

POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 061110-PPSA-002-018
Date of Issue/발행일자 : Nov., 17, 2006

Order No./계약번호 : 0002574516

PO No./주문번호 : E10568
(ASME2004 EDITION)

Supplier/주문자 : DAE WOO INTERNATIONAL CORP.

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

Customer/고객사 : EDMONTON EXCHANGER

Spec & Type/규격 : ASTM SA516-70 (VACUUM DEGASSED)

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 I V I S I O N	Chemical Composition/화학성분(%)															
					YP (KSI)	TS (KSI)	EL (%)	P O S I T I O N			C	Si	Mn	P	S	Cr	Ni	Cu	Mo	Nb	Ti	V	Al			
0.75"x120.5"x480"	PB25642701-2703	3	16,737 36,897	S856276	T	51.3	76.7	27	2.94 3.131 A:118 1:104 2.96 3.85 A:95	L	1878	353	1142	102	16	3	22	111	Tr	1	1	17	28			
	PB25675301-5303	3	16,737 36,897	S856276	T	50.6	76.9	28	1.92 2.72 3:100 A:88	L	1878	353	1142	102	16	3	22	111	Tr	1	1	17	28			
0.75"x120.5"x480"	PB25685301-5303	3	16,737 36,897	S856276	T	51.2	76.9	30	1:128 2:142 3:120 A:130	L	1878	353	1142	102	16	3	22	111	Tr	1	1	17	28			
	PB26020201-0203	3	16,737 36,897	S856918	T	51.8	77.8	28	1:97 2:117 3:129 A:114	L	1842	339	1168	81	20	2	24	105	Tr	Tr	1	18	34			

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

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

* Division: L.Ladle Analysis

* Chemical Composition Unit: 2x1/100, -3x1/100, -4x1/100, -5x1/100,000

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

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

A) This material was produced under a quality system manual Rev.5 dated JUL.01.2006 and PQG01 Rev.0 dated JUL.01.2005 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and/or KEPIC MNAV SNA4300.

B) No repair welding was performed to the products.

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

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

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



Surveyor To:

Na, Chai Beng

KT-01.10 MAR.01.2005

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

Chief of material testing section NA, C.B

POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호: 061110-PPSA-002-019
Date of Issue/발행일자: Nov., 17, 2006

Order No./계약번호: 0002574516
Supplier/주문자: DAE WOO INTERNATIONAL CORP.
Customer/고객사: EDMONTON EXCHANGER

PO No./주문번호: E10568
(ASME2004 EDITION)
Commodity/품명: HR STEEL PLATE (ISO10474/3.1B)
Spec & Type/규격: ASTM SA516-70 (VACUUM DEGAISED)

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) (%)	Chemical Composition/화합성분(%)	C	Si	Mn	P	S	Cr	Ni	Cu	Mo	Nb	Ti	V	Sol-Al
0.75"x120.5"x480"	PB26020301-0302	3	16,737 36,897	SB56919	T	51.5 77.3 30	130 283 378 A-83	1842 339 1168 81 20 2 24 105 Tr Tr 1 18 34	4	-3	-3	-4	-4	-2	-2	-3	-2	-3	-3	-3	-3
*** Sub Total : (640) ***			50																		
*** HEAT TREATMENT *** 1"x96.5"x480"	PB25641401-1403	3	17,874 39,405	SB56272	T	51.3 77.7 32	134 289 374 A-86	1922 368 1131 91 19 2 21 93 Tr Tr 1 17 30													
1"x96.5"x480"	PB25665101-5103	3	17,874 39,405	SB56276	T	50.3 75.9 28	1130 2162 3125 A-139	1878 353 1142 102 16 3 22 111 Tr 1 17 28													
1"x96.5"x480"	PB25667101-7103	3	17,874 39,405	SB56276	T	50.3 75.9 31	1124 2105 3108 A-112	1878 353 1142 102 16 3 22 111 Tr 1 17 28													
1"x96.5"x480"	PC21563801	1	5,958	SB56919	T	52.2 76.7 31	189	1842 339 1168 81 20 2 24 105 Tr Tr 1 18 34													

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

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

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

* Tr : It is within the standard range (<0.008%) and include trace element.
* Supply Condition : As-Rolled unless otherwise Heat Treated.



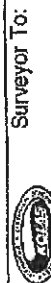
A) This material was produced under a quality system manual Rev.5 dated JUL.01.2006 and PQ001 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. II NCA-3800 and/or KEPCO MNAI SNA4300.

B) No repair welding was performed to the products.

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

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

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



Surveyor To:

Na, Chai Bong

KT-101, 10 MAR. 03.2006

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

Chief of material testing section Na, C.B



DILLINGER HÜTTE

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

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004		A10 Advice of dispatch No./ Date of dispatch		A08 Manufacturer's order A09 Certificate No.		Sheet	
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991		252001-05.04.07		318453-002		1/...	
MATERIAL TEST REPORT (MTR)							
A05 Established inspecting body		A06 Purchaser		A07.1 No. 61216		A01 Product	
DH		ARCELOR CANADA, BURLI		EDMONTON STEEL, EDMON		HOT ROLLED PLATES	
B02/ Steel design.		SA516-70					
B03 Any suppl. requirements		ASME-2A:04+A05 DIL-HUB-2:R21-2006-04-27					



13292

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
02	1	0,7500 x	172,00000 x	344,00000 x	5708 N		292924	99513-01	ITEM 2
02	1	0,7500 x	172,00000 x	344,00000 x	5708 N		292924	99513-02	ITEM 2
02	1	0,7500 x	172,00000 x	344,00000 x	5708 N		292924	99513-03	ITEM 2
02	1	0,7500 x	172,00000 x	344,00000 x	5708 N		292924	99513-04	ITEM 2
***	4				22832				
***	4				22832				

B04 Product delivery condition

ITEM NO.: 01-02
N: HF: 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 MTLV SA516 60 MTLV
HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

C10-C29 Tensile test

B14 Item No.	B07.1 Heat No.	B05 Reference (heat) treatment	C01 C02/ C03 C01 Temp. GR.F	C10 C11 KSI RP02	C12 RM	C13	A % LO-BIN	C14-C15
02	292924	99513	K1 Q RT	52,2	76,3		28,0	

A04 Z01Z02Z03 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 05.04.07

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		A10 Advice of dispatch No./ Date of dispatch		A08/ Manufacturer's order/ A03 Certificate No.		Sheet	
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:1991		252001-05.04.07		318453-002		2/...	
MATERIAL TEST REPORT (MTR)				B01 Product		HOT ROLLED PLATES	
A05 Established inspecting body		A06 Purchaser		A07.1 No. 61216			
DH		Final receiver		ARCELOR CANADA, BURLI		A07.2 No. E10421-J1010-LG	
B02/ Steel design.		SA516-70					
B03 Any suppl. requirements		ASME-2A: 04+A05					
		DIL-HOE-2: R21-2006-04-27					

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 Individual values	C34 Individual values	C32 Average value
02	292924	99513		K1	O	RT	HBW 10/3000	HB 146	146	146

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	C45 Individual values	C42 Average value
02	292924	99513		K1	LV	-51		CHP-V		AV 164	148

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat No.	C70	C	SI	MN	P	S	N	AL	CU	MO	NI	CR	V	NB	SN
292924	Y	0,183	0,371	1,19	0,008	0,0006	0,0067	0,036	0,028	0,027	0,056	0,032	0,000	0,000	0,001
B07.2 Heat No.	C70	TI	B												
292924	Y	0,001	0,0001												

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat No.	C94	FO-02=	0,40	FO-55=	0,14	FO-78=	0,06	FO-91=	6,5
292924									

C95 Ladle treatment

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

A04		2012/02/203 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.		A01	
				AG der Dillinger Hüttenwerke Postfach 1590, D-66748 Dillingen/Saar Inspection department	
QM-System: Certification as per ISO 9001		B. MUELLER Test House Manager		Inspector's stamp Date 05.04.07	
Manufacturer's mark		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		A10 Advice of dispatch No./ Date of dispatch	A08 Manufacturer's order/ Certificate No.	Sheet
INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+AL:1995 + AS PER ISO 10474:1991		252001-05.04.07	318453-002	3
MATERIAL TEST REPORT (MTR)				
A05 Established inspecting body DH	A06 Purchaser Final receiver	B01 Product HOT ROLLED PLATES		
B02/ Steel design. SA516-70	ARCELOR CANADA, BURLI	A07.1 No. 61216		
B03 Any suppl. requirements	EDMONTON STEEL, EDMON	A07.2 No. E10421-J1010-LG		
ASME-2A:04+A05 DIL-HUE-2:R21-2006-04-27				

C70-C99 Chemical composition % - Product analysis

Heat	Test No.	C	SI	MN	P	S	N	AL	CU	MO	NI	CR	V	NE	SN
B07.2	292924	0,176	0,361	1,16	0,008	0,0010	0,0062	0,033	0,024	0,022	0,049	0,033	0,000	0,000	0,001
B07.1	292924	0,002	0,0001												

C94 Product analysis Carbon equivalent / Alloying restrictions

Heat	Test No.	FO-02	FO-55	FO-78	FO-91
B07.2	292924	0,39	0,13		
B07.1	292924				

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 Z01/202/203 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.



QM-System: Certification as per ISO 9001

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

ADB

B. MUELLER
Test House Manager

Inspector's stamp

Date 05.04.07

KW

1

POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 080222-PPSA-006-005
Date of Issue/발행일자 : Feb., 27, 2008



Order No./계약번호 : 0003114506
Supplier/주문자 : DAE WOO INTERNATIONAL CORP.
Customer/고객사 : EDMONTON EXCHANGER
PO No./주문번호 : E 10634-1 (ASME2004 EDITION)
Commodity/품명 : HR STEEL PLATE (EN10204 3.1B)
Spec & Type/규격 : ASME SA516-70 AND SA 20(ASME2004 EDITION)

Size/지수	Product No. 제품번호	COIL Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	P O S T T O N	Tensile/인장시험 YP TS (KSI) (%)	Impact/충격시험 V Notch Energy (FT-LBS) (%)	Chemical Composition/화학성분(%) C Si Mn P S Cr Ni B Cu Nb Ti V Sol-Al
0.625"x120.50"x480"	PB47919902	1	4,650 10,251	SB98670	T	53.7 76.6 29	3136 A139	L 1817 342 1151 68 15 2 23 Tr 89 Tr 1 19 25
0.625"x120.50"x480"	PB47919904	1	4,650 10,251	SB98670	T	53.7 76.6 29	3136 A138	L 1817 342 1151 68 15 2 23 Tr 89 Tr 1 19 25
0.625"x120.50"x480"	PB47919801-9804	4	18,600 41,004	SB98670	T	55.7 80.4 27	1173 2151 3148 A157	L 1817 342 1151 68 15 2 23 Tr 89 Tr 1 19 25
*** Sub Total (050) ***			40			186,000 (kg)	410,054 (LBS)	
*** HEAT TREATMENT ***			30min					
0.750"x96.50"x480"	PB4680301-3304	4	17,868 39,392	SB96741	T	50.3 76.4 26	1137 2148	L 1912 343 1151 120 9 2 22 1 100 Tr 1 19 23

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

A) This material was produced under a quality system manual Rev.5 dated JUL 01, 2006 and PQG01 Rev.0 dated JUL 01, 2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and/or KEPIC 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 : 080222-PPSA-006-006
Date of Issue/발행일자: Feb., 27, 2008

Order No./계약번호: 0003114506

PO No./주문번호: E 10634-1
(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 SA 20(ASME2004 EDITION)

Size/치수	Product No. 제품번호	COIL Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	P. S. T. O. N.	Tensile/인장시험 YP TS (KSI) (%)	Impact/충격시험 V Notch Energy (FT-LBS) (%)	Chemical Composition/화학성분(%) C Si Mn P S Cr Ni Cu Mo Nb Ti V Sol-Al
0.750"x96.50"x480"	PB46805701-5704	4	17,868 39,392	SB96741	T	51.9 76.7 29	3.134 A:139 1.140 2.156 3.121	L 1912 343 115f 120 9 2 22 1 100 Tr 1 19 23
0.750"x96.50"x480"	PB46806501-6504	4	17,868 39,392	SB96743	T	52.1 77.5 29	A:139 1.141 2.141 3.125	L 1941 334 1183 88 20 2 20 1 93 Tr 1 16 34
0.750"x96.50"x480"	PB4680102-0104	3	13,401 29,544	SB96749	T	50.9 76.1 30	A:136 1.135 2.131 3.145	L 1950 330 1144 78 14 2 23 Tr 94 Tr 1 18 38
*** Sub Total (060) ***		15				67,005 (kg)	A:137 147.718 (LBS)	
0.750"x120.50"x480"	PC37142301	1	5,579 12,299	SA81498	T	49.9 78.6 30	1.94 2.104 3.91	L 1901 381 1170 93 15 3 24 Tr 108 Tr 2 19 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 : Longitudinal

* T.L.R (Trans Longitude Ratio)

* Division - L: Ledge Analysis

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

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

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

A) This material was produced under a quality system manual Rev.5 dated JUL 01, 2006 and POG01 Rev.0 dated JUL 01, 2006 audited and approved by customer as conforming to the requirements of ASME Sec. III, NCA-3800 and/or KEPIC MNA/ SNA4300.

B) No repair welding was performed to the products.

C) The product numbers listed on this 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 : 080222-PPSA-006-007
Date of issue/발행일자 : Feb., 27, 2008

Order No./계약번호 : 0003114506

Supplier/주문자 : DAE WOO INTERNATIONAL CORP.

PO No./주문번호 : E 10634-1
(ASME2004 EDITION)

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

Customer/고객사 : EDMONTON EXCHANGER

Spec & Type/규격 : ASME SA516-70 AND SA 20 (ASME2004 EDITION)

Size/치수	Product No. 제품번호	COIL Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 재질번호	Tensile YS (KSI)	TS (%)	EL (%)	Impact V notch -50°F Energy SF (FT-LBS)	Chemical Composition/화학성분 (%)	C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Tr	Tr	V	Sol-Al
0.750"x120.50"x480"	PB46845701-5703	3	16,737 36,897	S866741	53.7 90.1	30	30	A-97 1:195 2:145 3:139	L 1912 343 1151 120 9 2 22 1 100 Tr 1 19 23	L	1912	343	1151	120	9	2	22	1	100	Tr	Tr	1	19	23
0.750"x120.50"x480"	PB46808401-8403	3	16,737 36,897	S866741	50.3 76.3	29	29	A-139 1:125 2:137 3:150	L 1912 343 1151 120 9 2 22 1 100 Tr 1 19 23	L	1912	343	1151	120	9	2	22	1	100	Tr	Tr	1	19	23
0.750"x120.50"x480"	PB46808301-8302	2	11,158 24,598	S866741	50.2 76.0	30	30	A-138 1:136 2:116 3:116	L 1912 343 1151 120 9 2 22 1 100 Tr 1 19 23	L	1912	343	1151	120	9	2	22	1	100	Tr	Tr	1	19	23
0.750"x120.50"x480"	PB46881801-1803	3	16,737 36,897	S866743	53.1 77.5	29	29	A-122 1:128 2:159 3:142	L 1941 334 1183 88 20 2 20 1 93 Tr 1 16 34	L	1941	334	1183	88	20	2	20	1	93	Tr	Tr	1	16	34
0.750"x120.50"x480"	PB46808001-8003	3	16,737 36,897	S866743	50.5 76.4	28	28	A-141 1:114 2:124	L 1941 334 1183 88 20 2 20 1 93 Tr 1 16 34	L	1941	334	1183	88	20	2	20	1	93	Tr	Tr	1	16	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 : 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 (<0.008%) and include trace element.
Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.5 dated JUL 01, 2006 and POG01 Rev.0 dated JUL 01, 2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and (or) KEPIC MNAI SNA-4500.
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:080222-PPSA-006-008
Date of Issue/발행일자:Feb., 27, 2008

Order No./계약번호:0003114506

Supplier/주원자:DAE WOO INTERNATIONAL CORP.

Customer/고객사:EDMONTON EXCHANGER

PO No./주문번호:E 10634-1
(ASME2004EDITION)

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

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

Size/지수	Product No. 제품번호	COIL 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) (%)	Chemical Composition(화합성분(%)) P V I S C S I M n P S C r N i B C u M o N b T i V S o -A l																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

* Position - T : Top, M : Middle, B : Bottom
* Tensile Test. Direction : Transverse, Gauge Length : 200mm(Reictangular).
* YP Method : 0.2% offset
* Impact Test. Direction : Longitudinal,
* T.L.R.(Trans Longitude Rate)
* Division - L:Ladle Analysis
* Chemical Composition Unit: -2x1/100, -4x1/1000, -5x1/10000.
* Tr : It is within the standard range(<0.003%) and include trace element.
* Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.5 dated JUL.01.2006 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and/or KEPIC MINA/ SNA4300.
B) No repair welding was performed to the products.
C) The product numbers listed on this test report identifies the material.
- We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.
This 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:080222-PPSA-006-009
Date of Issue/발행일자:Feb., 27, 2008

Order No./계약번호:0003114506

PO No./주문번호:E 10634-1
(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	COIL Quantity 수량	Weight 중량 (LBS)	Heat No. 재강번호	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/화합성분(%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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*** HEAT TREATMENT			890 C 35min. **																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

Position - T : Top, M : Middle, B : Bottom
Tensile Test Direction : Transversal, Gauge Length : 200mm(Refractangular),
Y/P Method : 0.2% off-set

Impact Test Direction : 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(<0.008%) and include trace element.

Supply Condition : As-Rolled unless otherwise Heat Treated.

A) This material was produced under a quality system manual Rev.5 dated JUL.01.2006 and PQG01 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and/or) KEPIC KNA/ 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: 080225-PPSA-004-001
Date of Issue/발행일자: Feb., 27, 2008

Order No./계약번호: 0003114506

PO No./주문번호: E 10634-1
(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 SA 20 (ASME2004 EDITION)

Size/지수	Product No. 제품번호	COIL Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 제강번호	Tensile YS (KSI)	Tensile TS (KSI)	Impact V notch Energy (FT-LBS)	Chemical Composition/화학성분(%)	C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Sol-Al
0.875"x120.50"x480"	PC37634801	1	6,512 14,356	SB98870	53.4	77.3	20	1:119 2:142 3:193 A:131 14,356 (LBS)	1817	342	1151	68	15	2	23	Tr	89	Tr	Tr	1	19	25
*** Sub Total (090) ***																						
*** HEAT TREATMENT *** Normalized : 890°C 45min. ***																						
*** Lot Total ***																						
*** Grade Total ***																						
*** Grand Total ***																						

* LOT NO ==> VACUUM DEGASSED



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

- A) This material was produced under a quality system manual Rev.5 dated JUL.01.2006 and approved by customer as conforming to the requirements of ASME Sec. II 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 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





DAEWOO
INTERNATIONAL
WWW.DAEWOOINTL.CO.M

100-714 서울 중구 남대문로 5가 541 대우인터내셔널빌딩 2810호

C.P.O Box 2810 Seoul 100-714, Korea TEL: 753-2114 / FAX: 753-9439

Mar 11, 2008

ATTN : Edmonton Exchanger.
C.C : To whom it may concern.

Subject: Posco Plate SA516 Grade 70 for Pressure Vessel Quality.

This letter is written to certify that Posco/Daewoo comply with DIN 50049/3.1B, EN10204(2004)/3.1B and ISO 10474/3.1B, also guarantee ASME 2004 Edition-2008 Addendum for PO no. 10623 and 10634 which was supplied by Posco for Edmonton Exchanger. Due to limited space in MTR electric system, it only shows ASME 2004 Edition and EN10204 3.1(or ISO10474 3.1B) which please understand.

Best Regard,

Y.H.KIM

Team Leader

Hot Rolled Steel Team 3, Steel Division 1
Daewoo International Corporation



POSCO Mill Test Certificate/검사증명서

Certificate No./증명서번호: 100818-PPSA-004-011
Date of Issue/발행일자: Aug., 20, 2010

Order No./계약번호: 0004291917

PO No./주문번호: 4291917
(ASME2007EDITION)

Supplier/주원자: DAE WOO INTERNATIONAL CORP.

Commodity/품명: HR STEEL PLATE (EN10204 3.1)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70 AND SA 20(ASME2007EDITION)



Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 재강번호	Tensile/인장시험 Y.P. (KSI) (%)	Impact/충격시험 Value (50°F) Energy (FT-LBS) (%)	Chemical Composition/화합성분(%)														
							C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Al	
0.5"x120.5"x48"	PB90744101-4104	4	14,884	SB78545	53.5 77.7 27	A-85 1119 2123 3118	L	1807	343	1139	112	16	3	25	Tr	100	1	1	1	18	26
			P				1784	343	1122	98	16	2	24	99	1	2	1	18	26		
0.5"x120.5"x48"	PB91473501-3503	3	11,193	SB78545	54.4 80.4 25	A-120 1106 2751 3119 A-100	L	1807	343	1139	112	16	3	25	Tr	100	1	1	1	18	26
			P				1825	342	1134	115	18	2	24	93	1	Tr	1	18	27		
Sub Total (030) ***		50	166,050 (kg)		410,164 (LBS)																
HEAT TREATMENT ==> Normalized 881°C 25min ***																					
0.75"x120.5"x48"	PB9073001-3003	3	16,737	SB78539	54.5 78.3 27	A-108 1108 2118 3386	L	1804	349	1148	98	17	2	25	Tr	88	1	2	1	18	31
			P				1788	340	1132	92	20	3	22	77	2	5	1	18	31		
0.75"x120.5"x48"	PB90860201-0203	3	16,737	SB78539	54.2 79.9 29	A-109 1122 2129 3134	L	1804	349	1148	98	17	2	25	Tr	88	1	2	1	18	31
			P				1862	344	1147	95	16	3	23	73	2	4	1	12	29		

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

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

YP Method: 0.2% Offset

* Impact Test - Direction: 1/4T Longitudinal

T.L.R (Trans-Longitudinal Ratio)

* Division: L: Ladle Analysis, P: Products 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.3 dated Sept.12.2003 and PGG01 Rev.0 dated JUL.01.2008, audited and approved by customer as conforming to the requirements of ASME Sec. III NCA-3800 and (or) KEPIC MINA/ SNA-4300.

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: 100818-PPSA-004-012
Date of Issue/발행일자: Aug., 20, 2010

Order No./계약번호: 0004291917

PO No./주문번호: 4291917
(ASME2007 EDITION)

Supplier/주조사: DAE WOO INTERNATIONAL CORP

Commodity/품명: HR STEEL PLATE (EN10204 3.1)

Customer/고객사: EDMONTON EXCHANGER

Spec & Type/규격: ASME SA516-70 AND SA 20 (ASME2007 EDITION)

Size/치수	Product No. 제품번호	Weight 중량 (kg) (LBS)	Quantity 수량	Heat No. 제강번호	Tensile/인장시험		Impact/충격시험 V-notch, 90° Energy SF (FT-LBS) (%)	P S T O N	Chemical Composition/화합성분 (%)																	
					Y _P (KSI)	T _S (KSI) (%)			C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V	Al				
0.75"x120.5"x480"	PB90689401-0403	16,737 36,897	3	SB78539	T	53.7 79.2 29	1-123	L	1804	349	1148	96	17	2	25	1	88	1	2	1	18	31				
					P		2-105	P	1837	342	1123	90	15	3	24	1	76	1	3	1	15	30				
					A		3-133																			
0.75"x120.5"x480"	PC68892501-2502	11,158 24,596	2	SB78542	T	52.8 77.3 28	1-117	L	1781	334	1135	103	19	2	25	Tr	97	Tr	1	1	20	26				
					P		2-85	P	1792	327	1128	107	21	2	26	Tr	96	Tr	Tr	Tr	19	28				
					A		3-118																			
0.75"x120.5"x480"	PB90712901-2903	16,737 36,897	3	SB78542	T	52.8 77.0 29	1-108	L	1781	334	1135	103	19	2	25	Tr	97	Tr	1	1	20	26				
					P		2-100	P	1746	326	1129	105	22	2	24	Tr	94	Tr	2	1	19	28				
					A		3-114																			
0.75"x120.5"x480"	PB90712701-2703	16,737 36,897	3	SB78542	T	52.5 76.6 27	1-114	L	1761	334	1135	108	19	2	25	Tr	97	Tr	1	1	20	26				
					P		2-97	P	1756	324	1132	110	22	2	24	Tr	96	Tr	2	1	19	27				
					A		3-110																			
0.75"x120.5"x480"	PB90712801-2803	16,737 36,897	3	SB78545	T	52.8 77.5 28	1-126	L	1807	343	1139	112	16	3	25	Tr	100	1	1	1	18	26				
					P		2-107	P	1813	332	1133	116	18	2	24	Tr	94	Tr	Tr	Tr	19	27				
					A		3-100																			

A) This material was produced under a quality system manual Rev.7 dated Sept.12,2008 and PQQ07 Rev.0 dated JUL 01 2008 audited and approved by customer as conforming to the requirements of ASME Sec. II, NCA-3800 and/or KEPCO MNA/ SNA4300.

B) No repair welding was performed to the products.

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

D) 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.

E) This material is fine grained steel.

F) 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



A) This material was produced under a quality system manual Rev7 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-3600 and (or) KEPIC JINJA 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.

posco Mill Test Certificate/검사증명서

Certificate No./증명서번호 :100818-PPSA-004-013
Date of Issue/발행일자:Aug., 20, 2010

Order No./계약번호:0004291917

PO No./주문번호:4291917

(ASME2007EDITION)

Supplier/주문자:DAE WOO INTERNATIONAL CORP.

Commodity/품명:HR STEEL PLATE (EN10204 3.1)

Customer/고객사:EDMONTON EXCHANGER.

Spec & Type/규격:ASME SA516-70 AND SA 20(ASME2007EDITION)

Size/치수	Product No. 제품번호	Quantity 수량	Weight 중량 (kg) (LBS)	Heat No. 재장번호	Position	Tensile/인장시험			Impact/충격시험 V Notch : 40°F Energy (FT-LBS) (%)	Chemical Composition/화학성분(%)																
						YP (KSI)	TS (KSI)	EL (%)		C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V Solu				
0.75"x120.5"x480"	P990910601-0602	2	11,158 24,598	SB78545	T	51.9	77.0	27	A111 1:103 2:103 3:71 A32		L	1807	343	1139	112	16	3	25	Tr	100	1	1	1	16	25	
											P	1744	330	1114	103	16	3	25		88	1	Tr	1	18	25	
1.25"x121"x480"	P990677601-7602	2	18,676 41,172	SB78542	T	50.9	75.0	31	1:105 2:113 3:117 A111 1:122 2:121 3:113 A116 1:128 2:100 3:113		L	1761	334	1135	108	19	2	25	Tr	97	1	1	1	20	26	
											P	1947	337	1127	102	17	2	25		93	Tr	1	1	16	28	
1.25"x121"x480"	P990677501-7502	2	18,676 41,172	SB78542	T	50.2	75.6	31			L	1761	334	1135	108	19	2	25	Tr	97	1	1	1	20	26	
											P	1761	332	1121	101	16	2	25		95	Tr	1	1	18	26	
1.25"x121"x480"	P990713201-3202	2	18,676 41,172	SB78542	T	49.9	77.0	32			L	1761	334	1135	108	19	2	25	Tr	97	1	1	1	20	26	
											P	1738	327	1106	96	22	2	25		96	Tr	1	1	19	26	

* Position - T: Top, M: Middle, B: Bottom.
* Tensile Test. Direction: Transversal. Gauge Length: 200mm (Rectangular).
* YP Method: 0.2% offset
* Impact Test. Direction: 1/4T Longitudinal
T.L.R (Trans Longitude Ratio)
* Division - L: Ladle Analysis, P: Products 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 PQAG07 Rev.0 dated JUL.01.2006 audited and approved by customer as conforming to the requirements of ASME Sec. II 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:

M.S. JANG

Chief of material testing section Man Soo, Jang

POSCO Pohang Works, 5 Dongchon-dong, Nam-gu, Pohang-si, Gyeongsangbuk-do, 790-785, 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 - 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 0004242127,
0004291917

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 0004242127-080
, 0004291917-010 ~ 070 means the following

Order No	Heat No	C (%)	Nb (%)	B (ppm)	Mo (%)
0004242127-080	SA49752	0.1889	0	0	0.01
	SA49754	0.1899	0	0	0
	SB78589	0.1804	0.002	1	0.01
0004291917-010 ~ 070	SB78542	0.1761	0.001	0	0.01
	SB78545	0.1807	0.002	0	0
	SB81442	0.1754	0.002	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 : 29th . Sept . 2010

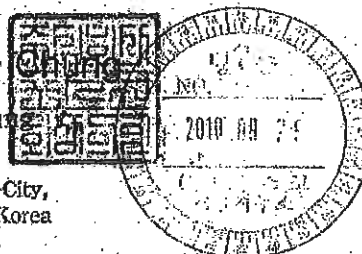


POSCO

CEO Joon Yang -

Joon-Yang Chung
CEO
posco

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





PURCHASE ORDER #

2746a

DATE July 21, 2011

VENDOR **V.E.G. Oilfield Supply**

DATE REQUIRED	All
---------------	-----

[illegible]

VESSEL SER#

4901 Bruce Road Vegreville, Alberta T9C 1C3

Phone: (780) 632-7774

[illegible]

1. The above items are to be formed to meet the requirements of ASME Section VII, Div. 1 USC 79(d).
2. Tack welds that are welded must use procedures and welders qualified to ASME Section IX
3. On all code required material, Markings must be accurately transferred to formed material or cut pieces.

Authorized
Signature





Hydro Test Record Sheet
Vessel Name Plate Travel Sheet

Vessel Serial Number:	12209	
Vessel Name:	Fuel Gas Scrubber	
Vessel DWG #:	V85-05	
Vessel C.R.N. #	F6388.231	
Vessel Design Pressure:	150psi.	Hydro Pressure: 225psi.
Plate Originator:	<i>[Signature]</i>	Date: <i>July 14/11</i>
Engraved By:	<i>[Signature]</i>	Date: <i>July 17-11</i>
Checked By:	<i>David Hance</i>	Date: <i>July 19/2011</i>
Picked Up By:	<i>David Hance</i>	Date: <i>July 19/2011</i>
Hydro To:	<i>225psi</i>	Date: <i>July 29/2011</i>
Test Gauge No.	<i>#1</i>	
Temperature:	<i>+ 20 °C</i>	
Hydro By:	<i>[Signature]</i>	Signature: <i>[Signature]</i>

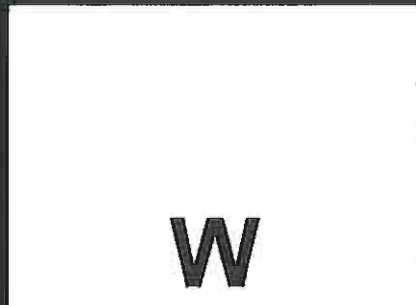
Print Name Clearly

Original to be returned to Q.C. on completion of hydro.

Revision 1

Date: July 13, 2011

7. The first of these is the
fact that the system is
not in a steady state. The
second is that the system
is not in a steady state.
The third is that the system
is not in a steady state.



Certified By

RJV **GAS FIELD
SERVICES**

Vegreville, Alberta
Phone (780)632-7774

UNIT NAME

Fuel Gas Scrubber

M.A.W.P. Internal

150 p.s.i.
1035 Kpa.

HYDRO TEST

225 p.s.i.
1555 Kpa.

DESIGN TEMP.

100 °F
38 °C

C.R. NUMBER

F6388.231

SERIAL NO.

12209

CORR. ALLOW.

3.17 mm

SHELL MAT'L

SA-106-B

SHELL THICK.

8.1 mm

HEAD THICK.

Top - 7.16 mm

Bottom - 19.05 mm

HEAT TREATMENT

NIL

HEAD MAT'L

Top -SA-234-WPB

Bottom - SA-516-70

SIZE

219 X 762 mm

WEIGHT

50 Kg.

MIN. DESIGN METAL TEMPERATURE

TEMPERATURE @

-20 °F

-29 °C

DATE MFG.

PRESSURE

@ **150** p.s.i.

@ **1035** Kpa.

July 2011



ALBERTA MUNICIPAL AFFAIRS

ABSA, the pressure equipment safety authority

9410 – 20th Avenue

Edmonton, AB T6N 0A4

MANUFACTURER'S DATA REPORT**FOR MINIATURE PRESSURE VESSEL****DÉCLARATION DE CONFORMITÉ DU CONSTRUCTEUR****D'APPAREILS SOUS PRESSION**

Upon shipment of a pressure vessel, this form fully and correctly filled in must be mailed to the office of the Chief Inspector in the province of installation in accordance with the regulations under the Act, governing the construction and installation of pressure vessels.

Au moment de l'expédition d'un appareil sous pression, ce formulaire complété correctement, doit être envoyé au bureau de l'inspecteur en chef de la province d'installation tel que prévu dans les règlements de la loi sur les appareils sous pression.

Manufactured by <i>Construit par</i>	Name and address of Manufacturer/ <i>Nom et adresse du constructeur</i> RJV Gasfield Services 4901 Bruce Road, Vegreville, Alberta, T9C 1C3
Manufactured for <i>Construit pour</i>	Name and address of Purchaser or Consignee/ <i>Nom et adresse du client ou de son représentant</i> RJV Gasfield Services 4901 Bruce Road, Vegreville, Alberta, T9C 1C3
Ultimate owner <i>Utilisateur</i>	Name and address/ <i>Nom et adresse</i> Stock
Location of installation <i>Lieu d'installation</i>	Name and address/ <i>Nom et adresse</i> Stock

Pressure vessel/ Appareil

Type/ <i>Genre</i> Vertical Fuel Gas Scrubber	Overall Length/ <i>Longueur totale</i> 762mm sm/sm	Serial No./ <i>N° de série</i> 12209	Year built/ <i>Année de fabrication</i> 2011
Provincial Registration No. – C.R.N./ <i>N° d'enregistrement provincial</i> - N.E.C. F6388.231			Drawing No./ <i>N° de dessin</i> V85-05 Rev.2

The chemical and physical properties of all parts meet the requirements of material specifications of the A.S.M.E. Code.

Les propriétés chimiques et physiques de toutes les composantes respectent les exigences des spécifications de matériaux de code ASME.

The design, construction and workmanship conform to CSA B51. <i>La conception, la construction et la façon sont conformes à ACNOR B51.</i>	ASME Section VIII	Division 1	Addenda/ <i>Supplément</i> 2010	Code case No. <i>N° de cas</i> N/A
Manufacturer's partial data reports properly identified and signed by authorized inspectors have been furnished for the following items of the report, and attached to this report: <i>Les rapports partiels du constructeur adéquatement identifiés et signés par les inspecteurs autorisés ont été produits pour les items suivants du rapport, et attachés à ce rapport:</i>				
Names of parts/ <i>Nom de la composante</i>	Item No./ <i>N° d'item</i>	Manufacturer's Name/ <i>Nom du constructeur</i>	Identifying Stamp/ <i>Etampe d'identification</i>	

Shell/ Virole

Description	Material <i>Matériau</i>	Thickness <i>Épaisseur</i>	Corr. Allow. <i>Surépais. de corr.</i>	Diameter <i>Diamètre</i>	Longitudinal Joints <i>Joints longitudinaux</i>			P.W.H.T. <i>Traitement therm</i>		Girth Joints <i>Joints de circonférence</i>		Number of courses <i>Nombre de sections</i>
					Type	R.T. <i>Radiog.</i>	Efficiency <i>Efficacité</i>	Temp.	Time <i>Durée</i>	Type	R.T. <i>Radiog.</i>	
Shell	SA-106-B	8.1mm	3.17mm	219mm	1	sm/s	100%	-----	-----	None	None	1

Heads/ Tetes

Description	Material <i>Matériau</i>	Min. Thickn. <i>Épais min.</i>	Corr. Allow <i>Surép. Corr.</i>	Crown Radius <i>Rayon couron.</i>	Knuckle Radius <i>Petit rayon</i>	Ellipse Ratio <i>Rapp. ellipse</i>	Conical Apex Angle <i>Angle conique</i>	Hemisph. Radius <i>Ray. Hémisph</i>	Flat Diameter <i>Diam.plat</i>	Side to pressure <i>Côte sous pression</i>
Top	SA-234-WPB	7.16mm	3.17 mm	-----	-----	Weld Cap	-----	-----	-----	Concave
Bottom	SA-516-70	19.05mm	3.17 mm	-----	-----	-----	-----	-----	305 mm	Flat
Removable bolts used (describe other fastenings) <i>Boulons amovible utilisés (décrire tout autre attache)</i>					Mat'l Spec./ <i>Spéc. du mat.</i>			Grade		Size/ <i>Dimension</i>

Pressure - Temperature/ Pression - température

Pressure Vessel Part <i>Partie de l'appareil</i>	Constructed for max. allowable working pressure <i>Construit pour une pression maximale de marche permise</i>	At max. temp. <i>A une temp. max.</i>	Minimum design metal temp. <i>Temp. min.</i>	Test pressure (hydro-pneumatic or combination) <i>Pression d'épreuve (hydro-pneumatique ou combinaison)</i>
Vessel	1035 Kpa	38°	-29°	1555 kPA

Tube Section/ Faisceau tubulaire

Tube/Sheet/ Plaque tubulaire	Material/ Matériau	Diameter/ Diamètre	Nominal Thickness Épaisseur nominale	Corr. Allow. Surépais. corrosion	Attachment Mode d'attachement
Tube material/ Matériau des tubes	Diameter/ Diamètre	Nominal Thickness (gauge) Épaisseur nominale (calibre)	Number/ Nbre	Type (Straight or U) Type (Droit ou U)	Heating Surface Surface de chauffe

Jacket/ Chemise

Type of jacket/ Genre de chemise	Jacket closure Fermeture de chemise	Proof Test Pression d'épreuve	Heating Surface Surface de chauffe	Sketch/ Schéma
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Safety Valve Outlets/ Soupapes de sûreté

Number/ Nombre 1	Dimension 33.4MM	Location/ Endroit Shell
---------------------	---------------------	----------------------------

Nozzles and Openings/ Tubulures et ouvertures

Purpose/ But	Number Nombre	Dimension	Type	Material Matériau	Nominal Thickness Épaisseur nominale	Reinforcement material Matériau de renfort	How attached Genre d'attaches	Location/ Endroit
Outlet	1	60.3mm	Coupling	SA-105	CL3000	N/A	UW16.1{c}	Top Head
Inlet/Drain/P.S.V.	3	33.4mm	Coupling	SA-105	CL3000	N/A	UW16.1{c}	Shell

Supports/ Supports

Skirt/ Jupe Yes/ Oui No/ Non ☐ ☒	Lugs/ Orelles No./ Nbre No	Legs/ Pieds No./ Nbre No	Other/ Autres (Description) N/A	Attached/ Attaches (Where and How/ Méthode et endroit) Flat bottom head welded to shell
---	----------------------------------	--------------------------------	------------------------------------	---

Remarks/ Observations (Cubical capacity/ Volume)

Volume-(.022 cubic meters)
Exempt from impact test requirements as per UG 20(f) 1 to 5
Flat head o.d. is 203mm
Hydrostatically tested in the Vertical Position

Certificate of Compliance/ Certificat de conformité

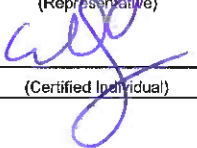
We certify that the statements made in this data report are correct and that the said vessel has been constructed in accordance with the Provincial Registered design below and the requirements of standard CSA B51.

Nous certifions que les données de la déclaration de conformité sont correctes et que l'appareil a été construit en accord avec l'enregistrement provincial ci-dessous et les exigences de la norme ACNOR B51.

Provincial Registered Design
Enregistrement provincial **F6388.231**

Manufacturer
Constructeur **RJV Gasfield Services**

Signature  Date **JUL 29 2011**
(Representative)

Signature  Date **JUL 29 2011**
(Certified Individual)