



Thursday Dec-18-2014

From:

Cameron Canada Corporation
3707 97 St.

Edmonton, Alberta, Canada
T6E 6J2
780-468-2732

www.c-a-m.com

To:

..

Subject:

Serial: 120415271

Quantity/Series: 35

Comment:

Part Number: 5A-T3F05S20LZ3

Description: BV F05 FNPT NUTRON T3 2000 WOG SOUR LT

Sales Order: N/A

Purchase Order: N/A



Thursday Dec-18-2014

From:

Cameron Canada Corporation
3707 97 St.
Edmonton, Alberta, Canada
T6E 6J2
780-468-2732

To:

..

www.c-a-m.com

Document Summary Page

The MTR's are printed in the following order:

#	Heat #	Heat Code	Part Description	Product
1	L	LOC	Nutron T3, B3, B2, TT Sour Low Temp.	--LOC
2	Hydro Test	598	API 598	-Hydro Test
3	332270		BODY, 1/2" 6000 WOG T3	5A-10000532600
4	Z105D959		CAP, 1/2" FP 4000 WOG FNPT, ASTM A350 GR	5A-1020100531400
5	R6171		STEM, 1/2", ANTI-STATIC, ASTM A564 17-4	5A-11300513617001
6	S8254		BALL, 1/2", MODEL T3/B3E, ASTM A479 (LATEST	5A-11500510617015



VALVES & MEASUREMENT
Cameron Canada Corporation
3707 - 97 Street
Edmonton Alberta Canada T6E 6J2
Phone 780.463.6868
Fax 780.465.1244
www.c-a-m.com

GENERAL LETTER OF COMPLIANCE

for:

**Nutron Models
T3, B3 & B2 & TT**

Style 'L': Sour Low Temperature Service

Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Sour Low Temperature Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), API 6D (TT only), ASME B16.34, CSA Z245.15 Sour Service (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25. The valve has also been marked "SOUR" as required by CSA Z245.15 marking requirements for Sour Service.

The materials of construction for this valve conform to the metallurgical requirements of NACE MR0175/ISO 15156:2009 (Parts 1 & 2 for Carbon & Alloy Steels in SSC Region 3 Sour Service and Parts 1 & 3 for CRA's as specified in CSA Z245.15 Chapter 13). Per NACE MR0175-2009/ISO 15156, it is the customer's/user's responsibility to ensure that the valve materials will be satisfactory in the intended service.

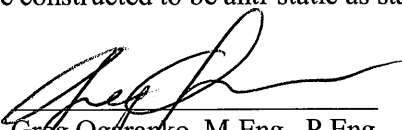
The minimum service temperature of these valves is -46°C/-50°F. Impact testing has been performed in accordance with applicable ASTM requirements and those of CSA Z245.15 for Category II M45C Service.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

The B2 and TT valve models are constructed to be anti-static as standard.

Approved by:


Greg Ogarko, M.Eng., P.Eng.
Engineering Manager

**VALVES & MEASUREMENT**

Cameron Canada Corporation
3707-97th St.
Edmonton Alberta Canada T6E 6J2
Phone 780.468.2732
www.c-a-m.com

CERTIFICATE OF CONFORMANCE**API 598 Pressure Testing – Carbon Steel
(2" RP and Smaller)**

COMPLIANCE: These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

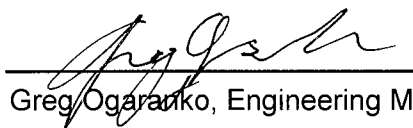
Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

Carbon Steel
Shell and Seat Test Pressures
(Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

Valve Class	Maximum Working Pressure	Hydrostatic Shell Test Pressure (PSI)	Air Seat Test Pressure +/- 10 PSI
150 ANSI	285	450	80
300 ANSI	740	1125	80
600 ANSI	1480	2225	80
800 ANSI	1975	3000	80
900 ANSI	2220	3350	80
1500 ANSI	3705	5575	80
2500 ANSI	6170	9275	80
275 WOG	275	425	80
720 WOG	720	1100	80
1000 WOG	1000	1500	80
1440 WOG	1440	2175	80
1500 WOG	1500	2250	80
2000 WOG	2000	3000	80
2160 WOG	2160	3250	80
3000 WOG	3000	4500	80
3600 WOG	3600	5400	80
4000 WOG	4000	6000	80
5000 WOG	5000	7500	80
6000 WOG	6000	9000	80


Greg Ogaranko, Engineering Manager

MTR COVER SHEET

Company: ZINTRON INDUSTRIAL LTD
Address: No.198-1, Sinhe Rd, Hsin Feng Hsiang,Hsinchu, Taiwan, R.O.C.

Phone: 886-3-568-7100
Fax: Line 1: 886-3-568-7119
E-Mail: zintron@zintron.com.tw

Date:	2014/8/8				
Customer :	CAM DISTRIBUTED VAL EDMONTON				
Address:	COOPER CAMERON CANADA CORP 3707-97 Street Edmonton, Alberta T6E 6J2				
Customer PO:	4510387974	Item No.	90	Date:	2014/10/17
Part No.	5A-10000532600 REV 02	Part Desc.:	BODY,1/2" 6000 WOG,ASTM A350 (LATEST EDITION) Gr LF2		
Heat No.	342375_,332270_..	Heat Code:			

S.O.No.:		Item No.:		Date:	
Quantity:		Weight:			

We hereby certifies that the parts shipped on your purchase order specified above have been produced in accordance with purchase order instructions and specification.

APPROVED BY: Martin
Authorized Signature: QA Manager: Martin Chu
Print Name: Martin Chu
Title: QA Manager

Original MTR/Certification provided by(attached):

Supplier: ZINTRON INDUSTRIAL LTD
Address: No.198-1, Sinhe Rd, Hsin Feng Hsiang,Hsinchu, Taiwan, R.O.C.

Phone: 886-3-568-7100
Fax: Line 1: 886-3-568-7119
E-Mail: zintron@zintron.com.tw

221

Note: MTR/Certification shall be legible for electronic archiving.



MTR HEAT NUMBER ANNEX FORM

Part Number: 5A-10000532600 REV 02

PO: 4510387974-90

Quantity: 4500

[illegible]

APPROVED

By laia at 11:21 am, 10/23/14



Zintron Industrial LTD

No.198-1, Sinhe Rd., Sinfong Township, Hsinchu County 304, Taiwan (R.O.C.)
 Tel : 886-3-568-7100
 Fax : 886-3-568-7119
 E-mail : zintron@zintron.com.tw

[T3-1/2"B 6000 WOG,ASTM A350 LF2]

Report No: 2324-221

MILL TEST CERTIFICATE REPORT

Client	Cooper Cameron Valves Canada	Shipping Date	Aug.08.2014
Product	BODY,1/2" 6000 WOG,ASTM A350 (LATEST EDITION) Gr LF2	Material	ASTM A350 LF2
Order No	4510387974-90	Condition	forge
Part No	5A-10000532600 REV 02		
Order Q'ty	4500 pcs	Shipping Q'ty	4500 pcs

CHEMICAL PROPERTIES

Material Spec.	Chemical Composition %															
		C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Cb	Residue	C.E.	Cr+Mo	
	Max.	0.210	0.300	1.350	0.030	0.030	0.400	0.300	0.120	0.400	0.050	0.020	1.000	0.430	0.320	
	Min.		0.150	0.600												
Heat No: 342375_		0.190	0.200	0.840	0.014	0.011	0.070	0.090	0.020	0.190	0.003	0.002	0.373	0.370	0.110	
Heat No: 332270_..		0.190	0.210	0.840	0.018	0.004	0.050	0.110	0.010	0.140	0.002	0.001	0.312	0.370	0.120	

MECHANICAL PROPERTIES

Material Spec.		Tensile Strength	Yield Strength	Elong.%	R.A.%	Hardness1	Hardness2		
	Max.	95000 psi				197 HB	197 HB		
	Min.	70000 psi	36000 psi	22 %	30 %	143 HB	143 HB		
Heat No: 342375_		77373 psi	49098 psi	34 %	73 %	170 HB	179 HB		
Heat No: 332270_..		76790 psi	50108 psi	37 %	73.4 %	143 HB	149 HB		

Charpy V-Notch Impact Test for Standard Size 10x10mm Specimen

Material Spec.	-46°C V-Notch Impact	Impact No.1	Impact No.2	Impact No.3		
Heat No: 342375_	55.55 ft-lbs	73.66 ft-lbs	67.28 ft-lbs	25.72 ft-lbs		
Heat No: 332270_..	67.17 ft-lbs	56.83 ft-lbs	40.74 ft-lbs	103.93 ft-lbs		

Heat Treatment Procedure as follows:

1. Austenitize at 1550-1700°F(843-930°C). Cycle time shall be one hour minimum.
2. Oil quench.
3. Temper at 1100-1300°F(590-704°C),holding at temperature a minimum of 30 min/in.(30min/25mm) of maximum thickness but in no case less than 30 min.
4. Air cool.

- 1.The material specification followed MS-021009-01-03 REV.16
- 2.C.E.= %C+%Mn/6 + (%Cr+%Mo + %V)/5 +(%Ni+%Cu)/15
- 3.The Charpy V-notch impact test was implemented as below:
 (1)Specimen Size :ASTM E23 10 mm x 10 mm x 55 mm V-Notch
 (2)The test specimen orientation: longitudinal.

We hereby certify that the material provided complies with all CVM requirements as stated in the applicable purchase order and that inspections were performed and certificates issued in accordance with EN 10204, 3.1, 2004.

APPROVED BY:

Martin

QA Manager: Martin Chu

APPROVED

By laia at 11:23 am, 10/23/14



Global
 ISO 9001:2008
 Registration Number: 69Q15438

HEAT TREATMENT ANNEX FORM

[illegible]

APPROVED

By laia at 11:23 am, 10/23/14



無放射性污染暨品質證明書

(出廠證明書)

TEST CERTIFICATE

OFFICE: 臺中市后里區甲后路702號

702, CHIAHOU ROAD, HOU LI SHIUNG

TAICHUNG HSIEN, TAIWAN, ROC

TEL : (04)25565101

FAX : (04)25566955

客 戶 名 稱 CUSTOMER NAME		產 品 名 稱 PRODUCT	HOT ROLLED STRAIGHT ROUND BAR 熱軋直棒鋼	證 明 書 編 號 CERTIFICATE NO.	234E0388-001
				交 運 日 期 SHIPPING DATE	2014/04/18 ~ 2014/04/18
規 格 名 稱 SPEC.	ASTM A105			證 明 書 列 印 日 期 CERTIFICATE DATE	2014/04/21

尺寸及規格		MATERIAL DESCRIP.			爐號 HEAT NO	拉力試驗 TENSILE		化學成分(%)CHEMICAL ANALYSIS														
直徑 DIA. (mm)	長度 LEN. (m)	數量 QTY (bdl.)	重量 WEIGHT (kg)	降伏VP /mm²		抗拉TS /mm²	伸長率 EL(%)	C	Si	Mn	P	S	Ni	Cr	Mo	Cu	Pb	Al	Nb	V	B	CO
								X100			X1000				X100			X1000			X10000	X100
50	6	3	5595	342375				18	15	80	30	30	40	30	12	40			20	30		
								20	30	100	MAX	MAX	MAX	MAX	MAX	MAX			MAX	MAX		
								19	20	84	14	11	7	9	2	19	0		2	3	3	1
TOTAL: 3 BUNDLES				5,595 kgs.																		
REMARK:																						

ISO 9001
REGISTERED

ISO 9001 : 2008
ID : 5MBY004

確章
認發
章

重量單
編號
SHIPPING
NO.

2324LF2 208-

※茲證明本表所列產品,均依材料規格製造及試驗並符合規格之要求
WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS MANUFACTURED AND TESTED WITH
SATISFACTION RESULTS IN ACCORDANCE WITH THE REQUIREMENT OF THE ABOVE MATERIAL SPECIFICATION.

冶金研發處處長
MANAGER
METALLURGICAL R&D DEP.

學科數

西昌縣志

509001:2008

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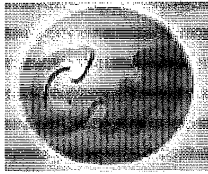
確認簽章 原加銀

80

66

APPROVED

By laia at 11:24 am, 10/23/14



Giant Young Machinery Component Parts Co., Ltd.

No. 13 Fang Yuan Ind. Park 4 th Rd. , Chang Hwa Hsien , Taiwan

TEL: 886-4-8965977

FAX: 886-4-8965981

機械性質測試證明
MECHANICAL PROPERTIES CERTIFICATE

材質 (Material): ASTM A350 LF2 報告編號 (Report No): GF20141013037
數量 (Quantity): 1PC 訂單號碼 (Order No): GF1031013
日期 (Date): OCT.13.2014 試片 (Specimen): Forged Specimen

拉伸試驗 Tension Test

Heat No.	試片 Test specimen		抗拉強度 T.S	降伏強度 Y.S	伸長率 Elongation	斷面縮率 R.A	硬度值 1 Hardness 勃氏硬度	硬度值 2 Hardness 勃氏硬度
	標點長(mm) Gauge Length	直徑 (mm) Dia	kgf/mm ²	0.2% offset kgf/mm ²	%	%	Brinell HB	Brinell HB
342375	25	6.20	54.40 (77373 psi)	34.52 (49098 psi)	34	73	170	179

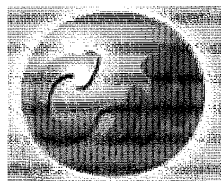
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Q.A.CHIEF:

陳加鎮

APPROVED

By laia at 11:25 am, 10/23/14



Giant Young Machinery Component Parts Co., Ltd.

No. 13 Fang Yuan Ind. Park 4 th Rd. , Chang Hwa Hsien , Taiwan

TEL: 886-4-8965977

FAX: 886-4-8965981

衝擊試驗報告表 IMPACT TEST REPORT

客戶:

品名:

檢驗編號:

Customer: Cameron International Corporation Product: Forged specimen Application No: GF20141013003

委託事項:

衝擊試驗

材質:

檢驗日期:

Job Description: Impact Testing

Material: ASTM A350 LF2

Date Issued: Oct.13,2014

1. Testing specification: ASTM A-350 LF2
2. Testing Instrument: Impact Tester
3. Specimen Size :ASTM E23 10 mm x 10 mm x 55 mm V-Notch
4. Testing Temperature: - 50⁰ F
5. The test specimen orientation:longitudinal

Testing Result:

試片編號 Specimen No	衝擊值 Energy Value (Ft-Lbs)			平均值 Average Value(Ft-Lbs)	備註 Remark
	No. 1	No. 2	No. 3		
342375	73.66	67.28	25.72	55.55Ft-Lbs	

Q.A.CHIEF: 陳加鎮

APPROVED

By laia at 11:25 am, 10/23/14

豐興鋼鐵股份有限公司
FENG HSIANG IRON & STEEL CO., LTD.

品質證明書
(出廠證明書)
TEST CERTIFICATE

OFFICE : 臺中縣后里鄉豐后路702號
702, CEILANG ROAD, HOU LI TOWNSHIP,
TAICHUNG M.S.I.E.N, TAIWAN, R.O.C.
TEL : (04)25565101
FAX : (04)25566535

客戶名稱 CUSTOMER NAME	ASTM A105		產品名稱 PRODUCT	熱軋直棒鋼	證明書編號 CERTIFICATE NO.	21BP0460-001
規格名稱 SPEC.	ASTM A105		產品名稱 PRODUCT	熱軋直棒鋼	交運日期 SHIPPING DATE	2012/11/18
				證明書列印日期 CERTIFICATE DATE	2012/11/27	

尺寸及規格 DIM. (mm)	長度 LEN. (m)	數量 QTY (bdl.)	重量 WEIGHT (kg)	爐號 HEAT NO	機械性能		化學成分(%) CHEMICAL ANALYSIS												重量 總重 SHIPPING NO.	
					屈服強度 YIELD STRENGTH /mm ²	抗拉強度 TENSILE STRENGTH /mm ²	C	Si	Mn	P	S	NI	Cr	Mo	CU	PB	Al	NB		V
38	6	4	7488	332270			18	15	80	30	30	40	30	12	40		20	30		201B18062
							20	30	100	MAX	MAX	MAX	MAX	MAX	MAX		MAX	MAX		
							19	21	84	18	4	5	11	1	14		1	2	2	

ISO 9001

BSI

REGISTERED

認可商標

330 9001

ID: 5M8Y

確信

4 BUNDLES

7,488 kgs.

TOTAL:

REMARK:

TOTAL: 4 BUNDLES 7,488 kgs.

2540 LIT

USB-4FF4F2

茲證明本表所列產品均按材料規格製造及檢驗並符合規格之要求
WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS MANUFACTURED AND TESTED WITH
SATISFACTORY RESULTS IN ACCORDANCE WITH THE REQUIREMENT OF THE ABOVE MATERIAL SPECIFICATION.

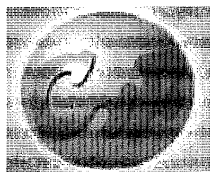
冶金研發處長
MANAGER
METALLURGICAL R&D DEP.

郭志毅

ISO 9001 : 2008
ID : 5MSY004

確認簽章
10/25

APPROVED
By laia at 11:26 am, 10/23/14



Giant Young Machinery Component Parts Co., Ltd.

No. 13 Fang Yuan Ind. Park 4 th Rd. , Chang Hwa Hsien , Taiwan

TEL: 886-4-8965977

FAX: 886-4-8965981

機械性質測試證明 MECHANICAL PROPERTIES CERTIFICATE

材質 (Material): ASTM A350 LF2 報告編號 (Report No): GF20141013041
數量 (Quantity): 1PC 訂單號碼 (Order No): GF1031013
日期 (Date): OCT.13.2014 試片 (Specimen): Forged Specimen

拉 伸 試 驗 Tension Test								
Heat No.	試 片 Test specimen		抗拉強度 T.S	降伏強度 Y.S	伸長率 Elongation	斷面縮率 R.A	硬度值 1 Hardness 勃氏硬度	硬度值 2 Hardness 勃氏硬度
	標點長(mm) Gauge Length	直徑 (mm) Dia	kgf/mm ²	0.2% offset kgf/mm ²	%	%	Brinell HB	Brinell HB
332270	25	6.22	53.99 (76790 psi)	35.23 (50108 psi)	37	73.4	143	149

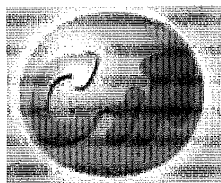
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Q.A.CHIEF:

陳加鎮

APPROVED

By laia at 11:26 am, 10/23/14



Giant Young Machinery Component Parts Co., Ltd.

No. 13 Fang Yuan Ind. Park 4 th Rd. , Chang Hwa Hsien , Taiwan

TEL: 886-4-8965977

FAX: 886-4-8965981

衝 擊 試 驗 報 告 表 IMPACT TEST REPORT

客 戶:

品 名:

檢驗編號:

Customer: Cameron International Corporation Product: Forged specimen Application No: GF20141013007

委託事項:

衝擊試驗

材 質:

檢驗日期:

Job Description: Impact Testing

Material: ASTM A350 LF2

Date Issued: Oct.13,2014

1. Testing specification: ASTM A-350 LF2
2. Testing Instrument: Impact Tester
3. Specimen Size :ASTM E23 10 mm x 10 mm x 55 mm V-Notch
4. Testing Temperature: - 50⁰ F
5. The test specimen orientation:longitudinal

Testing Result:

試片編號 Specimen No	衝 擊 值 Energy Value (Ft-Lbs)			平均值 Average Value(Ft-Lbs)	備註 Remark
	No. 1	No. 2	No. 3		
332270	56.83	40.74	103.93	67.17Ft-Lbs	

Q.A.CHIEF:

陳加鎮

APPROVED

By laia at 11:31 am, 10/23/14

Campex Inc.

PART No. 5A-1020100531400 Rev. 03

PRODUCT CAP, 1/2" FP 4000 WOG FNPT

PO No. 4510451952

QTY	3000
-----	------

MS-021034-01-03 Rev.01

MATERIAL: ASTM A350 Gr. LF2

CHEMICAL COMPOSITION

MECHANICAL PROPERTY TEST REPORT

CHECKED BY: LIU NING

APPROVED BY: ZHANG ZENGKUI

REPORTED DATE: NOVEMBER 6, 2014

[illegible]

Mechanical Property testing performed after heat treatment using standard round 2" specimen.

Testing performed by Shandong Molong Petroleum Machinery Co., Ltd





TUV ISO 9001
No. 01 100 029186

原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 32068, Taiwan
32068 桃園縣中壢市中華路二段 185 號 3 樓 統一編號: 16879927
Tel: +886-3-4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES				CERTIFICATE NO. 140922- 1 DATE: 22-Sep-14							
To. CAMERON CANADA CORPORATION 3707-97th Street, EDMONTON, AB T6E 6J2, CANADA											
INVOICE NO. WZ-140922A				Your Order No.4510433136/471620/471657/500141/507022							
MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D											
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties							
				Y.S.(KSI)	T.S.(KSI)	ELO.(%)	HRC	RA (%)	ft-lbf (-75°F)		
				<u>105 min</u>	<u>125 min</u>	<u>16 min</u>	<u>29~33</u>	<u>50 min</u>	<u>15 min</u>		
5,400	5A-11300513617001 Stem ½"	#02039	R6171	129	137	21	32	69	89/88/91		
2,320	5A-11301013617001 Stem 7/8"	#02040	R6102	122	140	21	32	70	90/87/89		
1,191	5A-11301513617001 Stem 1½"	#02038	FO	127	138	22	32	72	96/86/100		
9	5A-11301513617001 Stem 1½"	#02038	FD	124	139	21	32	67	83/86/88		
200	5A-11302013617001 Stem 2"	#02041	FH	126	138	22	33	69	92/86/88		
1,400	5A-11500513617015 Ball 1/2"	#06076	S8301	130	143	22	32	66	83/78/76		
180	5A-11501013617026 Ball 7/8"	#06082	S8252	119	137	23	30	69	120/105/113		
317	5A-11502013617015 Ball 2"	#06080	S8306	121	135	20	32	71	72/78/80		
Heat Code	Chemical Composition (%)										
	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta	
	<u>0.07max</u>	<u>1.0max</u>	<u>1.0max</u>	<u>.030max</u>	<u>.040max</u>	<u>15-17.5</u>	<u>3.0-5.0</u>	<u>0.5 max</u>	<u>3.0-5.0</u>	<u>0.15-0.45</u>	
R6171	0.02	0.64	0.49	0.023	0.029	15.04	4.36	0.19	3.40	0.23	
R6102	0.03	0.64	0.47	0.018	0.030	15.40	4.27	0.13	3.46	0.23	
FO	0.02	0.63	0.51	0.023	0.029	15.17	4.32	0.18	3.40	0.23	
FD	0.02	0.62	0.44	0.023	0.031	15.16	4.39	0.14	3.51	0.21	
FH	0.02	0.64	0.49	0.023	0.029	15.04	4.36	0.19	3.40	0.23	
S8301	0.02	0.62	0.44	0.023	0.031	15.16	4.39	0.14	3.51	0.21	
S8252	0.02	0.72	0.36	0.024	0.023	15.38	4.67	0.10	3.30	0.28	
S8306	0.02	0.72	0.36	0.024	0.023	15.38	4.67	0.10	3.30	0.28	
Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air Charpy Impact Test Specimens: 10*10*55mm(Longitudinal) Re Orig Heat #SE0302-GF0 for R6171; #SD2215-GJ0 for R6102; #SE0082-BA2 for FO; #SD2214-G701 for FD; #SE0302-GM0 for FH; #SD2214-G90 for S8301; #9SD0304-G13 for S8252; #9SD0304-GP0 for S8306 NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B											
QUALITY CONTROL INSPECTOR						MANAGER					
Sandy Yeh						Grant Hsu					

APPROVED

By laia at 1:07 pm, 10/15/14

品名: 鋼線
規格: 10mm
材質: 304
重量: 937.0kg
件數: 100
條件: 100% Solution Annealed-Double Aged-Smooth Turned-(Stress Relief)

R6171

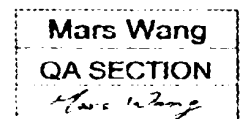
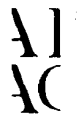
Chemical Composition (wt%)						
C	Si	Mn	P	S	Ni	Cr
Max. 0.07	1.00	1.00	0.040	0.030	3.00	15.00
Max. 0.04	0.49	0.64	0.029	0.023	4.36	15.04
Mo	Cu	Nb+Ta	Nb			
Max. 0.10	0.10	0.15	0.15			
Max. 0.04	0.10	0.15	0.15			

Mechanical Properties (Spec)

Item	Unit	Requirement	Result
Tensile Strength	MPa	≥ 520	520
Yield Strength	MPa	≥ 205	205
Elongation	%	≥ 40	40
Reduction of Area	%	≥ 40	40
Impact	J	≥ 27	27

Elongation(A)	Tensile Strength(Rm)	Yield Strength(0.2% Rp)	Reduction of Area(Z)
Max. 100	520	205	40
Ave. 100	520	205	40
Min. 100	520	205	40
Max. 100	520	205	40
Ave. 100	520	205	40
Min. 100	520	205	40

APPROVED
By laia at 1:07 pm, 10/15/14



Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.



台南市新營區新中路35號
NO.35,HSIN CHUNG RD.,HSIN YING.
TAINAN,TAIWAN
TEL:886-6-6520031
FAX:886-6-6520088

100

1. *Agave* spp. (Agavaceae)

$$\frac{1}{2} \frac{d}{dt} \|u\|_{L^2}^2 + \frac{1}{2} \|u\|_{L^2}^2 = \frac{1}{2} \|u\|_{L^2}^2 + \frac{1}{2} \|u\|_{L^2}^2.$$

By laia at 1:09 pm, 10/15/14



Page 2 of 2

Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

Vendor: 宏利鋼鐵股份有限公司
Order No.: 20140625-5
Part No.: 20140625-A
Product: 6061-T6
Size: 1/2" x 1/2" x 1/2"
Manufacturer: SU2215-010
Condition: 100%-Solution Annealed-100%-Aged-Mechanically-Treated-(Stress Relief)

Part No.: 宏利管貨2013091221
Date: 10/15/2014
Weight: 979.0kg
Lot: 89

R6102
R6004

Chemical Composition (wt%)						
	C	Mn	P	S	N	Cr
Min.				0.005	3.00	15.00
Max.	0.07	1.00	0.040	0.030	5.00	17.50
Result	0.05	0.47	0.030	0.018	4.27	15.40

	Mo	Cu	Nb-Ta	Nb
Min.		3.00	0.15	5.0
Max.	0.50	5.00	0.45	0.45
Result	0.13	3.46	0.23	0.23

Mechanical Properties Spec

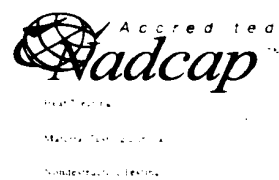
	Hardness	Hardness	Grain Size	Delta-Ferrite
	HRC	Surface	ASTM E112	AMS 2420
Condition				
Spec. Min.	59HRC			
Spec. Max.	63HRC	63HRC	8	5%
Result	61HRC	61HRC	8	0.4%

	Impact (J)	Impact (J)	Impact (J)	Impact (Ave)
	17ER	17ER	17ER L	17ER L
Condition				
Spec. Min.	-27 J	-27 J	-27 J	-27 J
Spec. Max.	89 J	89 J	89 J	89 J
Result	89 J	89 J	89 J	89 J

	Elongation(A)	Tensile Strength(Rm)	Yield Strength(0.2%Rp)	Reduction of Area(Z)
Condition				
	17ER L	17ER L	17ER L	17ER L
	(Ave)	(Ave)	(Ave)	(Ave)
Unit	%	ksi	ksi	%
Min.	18	30	105	55
Max.				
Result	31	140	122	70

APPROVED
By laia at 1:10 pm, 10/15/14

Specifications:



Mars Wang
QA SECTION
Mars Wang

Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

Messrs: 金統鋼鐵股份有限公司

Order No: 2013008285

FILE NO: 2014001925-A

Grade: 630C(H1150)

Size: 17.2mm

HEAT-Lot No: SD2215-G10

Condition: HR-Solution Annealed-Double Aped-Smooth Turned(-Stress Relief)

P.O.NO.: 北營備貨/2013001224

Date: 03/29/2014

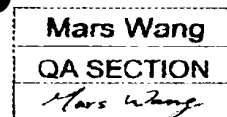
Weight: 979.0KG

Pcs: 89

1. ASTM A564M-04.
2. AMS 5643Q.
3. NACP MR0175(99) UNS S17400.

Remark:

1. MANUFACTURING PROCESS: FAF4HB-AVD, FORGED OR HOT ROLLED.
2. SOLUTION TREATMENT: 1900 DEGREE F FOR 30 MIN/INCH (MINIMUM OF 1 HOUR), FAST AIR COOLING TO BELOW 90 DEGREE F.
3. FIRST AGING: 1150 DEGREE F FOR 4 HOURS MINIMUM AND COOLED TO BELOW 90 DEGREE F IN AIR.
4. SECOND AGING: 1150 DEGREE F FOR 4 HOURS MINIMUM AND COOLED TO BELOW 90 DEGREE F IN AIR.
5. MATERIAL IS FREE FROM KNOWN CONTACT WITH MERCURY AND RADIUM.
6. MATERIAL IS FREE FROM WELDS OR WELD REPAIRS.
7. ULTRASONIC TEST: OK.
8. MACRO/MICRO OK.
9. IMPACT TEST: CHARPY-V, SPECIMEN SIZE: 10*10MM*55MM, 1/2R, LONGITUDINAL.



Page 2 of 2

Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

1. 品名: 鋼板
 2. 規格: 1000x2000x10
 3. 廠牌: 台灣中鋼
 4. 品號: 1000x2000x10
 5. 品名: 鋼板
 6. 規格: 1000x2000x10
 7. 廠牌: 台灣中鋼
 8. 品號: 1000x2000x10
 9. 品名: 鋼板
 10. 規格: 1000x2000x10
 11. 廠牌: 台灣中鋼
 12. 品號: 1000x2000x10

13. 品名: 鋼板
 14. 規格: 1000x2000x10
 15. 廠牌: 台灣中鋼
 16. 品號: 1000x2000x10
 17. 品名: 鋼板
 18. 規格: 1000x2000x10
 19. 廠牌: 台灣中鋼
 20. 品號: 1000x2000x10

FO

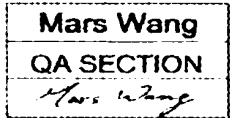
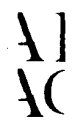
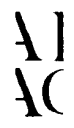
品名	規格	廠牌	品號	品名	規格	廠牌	品號
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10

Material Properties Spec.

品名	規格	廠牌	品號	品名	規格	廠牌	品號
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10

品名	規格	廠牌	品號	品名	規格	廠牌	品號
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10
鋼板	1000x2000x10	台灣中鋼	1000x2000x10	鋼板	1000x2000x10	台灣中鋼	1000x2000x10

APPROVED
 By laia at 1:11 pm, 10/15/14



Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

客戶名稱: 中航飛機股份有限公司

Order No: 2014000307

Draw No: 2014003374-A

Material: 6061T6 AL

Size: 127mm

Part No: S00082-002

Condition: 1X-Solution Annealed-Double Aged-Smooth Turned(-Stress Relief)

P.O.No:

Date: 05/29/2014

Weight: 996KG

Plot: 36

ASTM A562W-02

AMS 2019G

Surface Finish: 125µm Ra

Remarks:

1. IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER.

2. THE MATERIAL IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER, AND IS IN COMPLIANCE WITH THE ORDER.

3. THE MATERIAL IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER, AND IS IN COMPLIANCE WITH THE ORDER.

4. THE MATERIAL IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER, AND IS IN COMPLIANCE WITH THE ORDER.

5. THE MATERIAL IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER, AND IS IN COMPLIANCE WITH THE ORDER.

6. THE MATERIAL IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER, AND IS IN COMPLIANCE WITH THE ORDER.

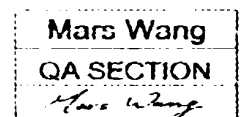
7. THE MATERIAL IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER, AND IS IN COMPLIANCE WITH THE ORDER.

8. THE MATERIAL IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER, AND IS IN COMPLIANCE WITH THE ORDER.

9. THE MATERIAL IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER, AND IS IN COMPLIANCE WITH THE ORDER.

APPROVED

By laia at 1:11 pm, 10/15/14



Page 2 of 2

Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

Messrs: 金統鋼鐵股份有限公司
Order No: 2013008279
P.O. NO: 2014000323-A
Grade: 630(H1150)
Size: 27mm
HbAl-Lot No: SD2214-(70)
Condition: HR-Solution Annealed-Double Aged-Smooth Turned(-Stress Relief)

ED

Chemical Composition (wt%)		C	Mn	P	S	Ni	Cr
Max.		0.00	1.00	0.040	0.005	3.00	15.00
Result		0.002	0.44	0.02	0.003	4.39	15.16
		Mo	Cu	Nb+Ta	Nb		
Max.		0.06	0.05	0.02	SC		
Result		0.04	0.05	0.02	0.02		

Mechanical Properties Spec.

	Hardness	Hardness	Grain Size	Delta-Ferrite
	1/2R	Surface	ASTM E113	AMS 2318
Condition			1	-
Spec. Min.	39HRC			
Spec. Max.	53HRC	53HRC		5%
Result	32HRC	52HRC	1	0.3%
	Impact(1)	Impact(2)	Impact(3)	Impact(Ave)
	1/2R L	1/2R L	1/2R L	1/2R L
	-75°F	-75°F	-75°F	-75°F
Spec. Min.	15Ft.Lbs	15Ft.Lbs	15Ft.Lbs	15Ft.Lbs
Spec. Max.				
Result	83Ft.Lbs	86Ft.Lbs	88Ft.Lbs	86Ft.Lbs

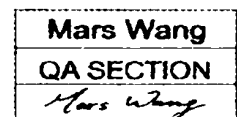
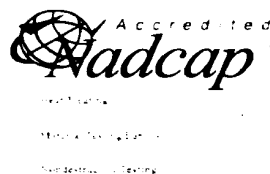
Tensile Test

	Elongation(A)	Tensile Strength(R _m)	Yield Strength(0.2% Rp)	Reduction of Area(Z)
Condition				
	1/2R L	1/2R L	1/2R L	1/2R L
	(Ave)	(Ave)	(Ave)	(Ave)
Spec. Min.	5%	850	650	30%
Spec. Max.				
Result	12%	910	620	67%

Specification:

APPROVED

By laia at 1:12 pm, 10/15/14



Page 1 of 2

Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

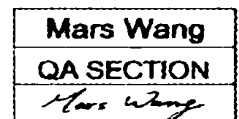
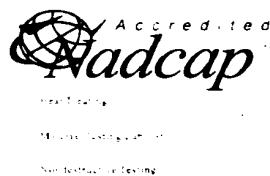
Messrs: 益新鋼鐵股份有限公司
Order No.: 2013008179
Job No.: 2014006513-A
Grade: 680(1H1120)
Size: 27mm
JMS Lot No.: SD2214-070
Condition: 18-Solution Annealed-Double Aged-Smooth Turned(-Stress Relief)

P.O.No.:
Date: 01/20/2014
Weight: 1839.0KG
Pcs: 67

- 1.ASTM A564M-04
- 2.AMS S643Q
- 3.NACE MR0175(99) UNS S17400.

Remark:

- 1.MANUFACTURING PROCESS: SAF+LHF+VOD, FORGED OR HOT ROLLED.
- 2.SOLUTION TREATMENT: 1900 DEGREE F FOR 30 MIN/INCH (MINIMUM OF 1 HOUR), FAST AIR COOLING TO BELOW 90 DEGREE F.
- 3.FIRST AGING: 1150 DEGREE F FOR 4 HOURS MINIMUM AND COOLED TO BELOW 90 DEGREE F IN AIR.
- 4.SECOND AGING: 1150 DEGREE F FOR 4 HOURS MINIMUM AND COOLED TO BELOW 90 DEGREE F IN AIR.
- 5.MATERIAL IS FREE FROM KNOWN CONTACT WITH MERCURY AND RADIUM.
- 6.MATERIAL IS FREE FROM WELDS OR WELD REPAIRS.
- 7.ULTRASONIC TEST: OK.
- 8.MACRO/MICRO OK.
- 9.IMPACT TEST:CHARNY-V, SPECIMEN SIZE: 10*10MM*55MM, 1/2R, LONGITUDINAL.



Page 2 of 2

Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

Vessel: 台航多羅安輪船 (DORAN)
 Code: 901-00000000
 Material: 1000000000
 Spec: 1000000000
 Status: 2014-02-17
 Date of Test: 2014-02-17
 Condition: 1000000000

Date: 04/02/2014
 Report: 987-000
 Test: 1000000000

FH

Chemical Composition (wt.%)						
	C	S	Mn	P	S	Cr
Max.	0.02	0.04	0.04	0.040	0.030	15.00
Result	0.02	0.49	0.64	0.029	0.023	15.04

	Mo	Cu	Nb+Ta	Ni
Max.	0.00	0.00	0.05	0.05
Max.	0.00	0.00	0.45	0.45
Result	0.00	0.40	0.03	0.03

Mechanical Properties (Spec)

Hardness		Tensile Strength		Reduction of Area	
ASTM A270		ASTM A270		ASTM A270	
Rockwell C	Rockwell C	Tensile Strength	Tensile Strength	Reduction of Area	Reduction of Area
Max.	Max.	Max.	Max.	Max.	Max.
Result	Result	Result	Result	Result	Result

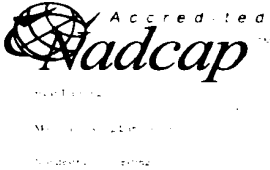
Elongation (A)		Tensile Strength (R _m)		Reduction of Area (Z)	
ASTM A270		ASTM A270		ASTM A270	
Max.	Max.	Max.	Max.	Max.	Max.
Result	Result	Result	Result	Result	Result

APPROVED
 By laia at 1:13 pm, 10/15/14

Specification:







Mars Wang
QA SECTION
Mars Wang
 Page 1 of 2

Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

Messrs.: 金銀鋼鐵股份有限公司

Order No.: 2014000007

Order No.: 2014000089-A

Grades: 630(1H1150)

Size: 38x1mm

Material No.: S6002-040

Condition: 18-Solution Annealed-Double Aged-Smooth Turned(-Stress Relief)

P.O.No.: 北營新貨-隆明(隆橋)/2014000007

Date: 01/02/2014

Weight: 987.0KG

Pls.: 18

1. ASTM A563W-01

2. MS 5643G

3. NADCAP MRG 75000 TNS S17000

Notes:

1. VANDERLUGHE PROCESS: PARTS MUST BE PURGED OR HOT ROLLED.

2. SOLUTION ANNEALING: 900 DEGREE FOR 30 MINIMUM (MINIMUM OF 1 HOUR), FAST AIR COOLING TO BELOW 90 DEGREE.

3. DOUBLE AGED: PARTS MUST BE HEATED TO 600 DEGREE MINIMUM AND COOL TO BELOW 90 DEGREE IN AIR.

4. SMOOTH TURNING: SURFACE RUGOSITY 4 DAUXS MINIMUM AND COOL TO BELOW 90 DEGREE IN AIR.

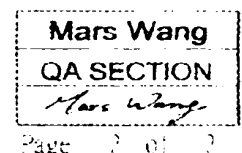
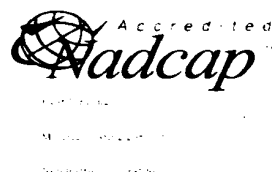
5. STRESS RELIEF: PARTS MUST BE HEATED TO 600 DEGREE MINIMUM AND COOL TO BELOW 90 DEGREE IN AIR.

6. VANDERLUGHE PROCESS: PARTS MUST BE PURGED OR HOT ROLLED.

7. VANDERLUGHE PROCESS:

8. VANDERLUGHE PROCESS:

9. VANDERLUGHE PROCESS: PARTS MUST BE HEATED TO 600 DEGREE MINIMUM AND COOL TO BELOW 90 DEGREE IN AIR.



Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

品名: 鋼板
 規格: 10mm
 厚度: 10mm
 重量: 10kg
 產地: 台灣
 檢驗項目: 機械性能, 化學成分, 尺寸公差
 檢驗結果: 符合規格
 檢驗日期: 2014/10/15
 檢驗人員: Mars Wang

58301
 58251
 58081

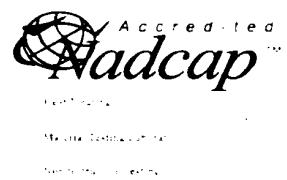
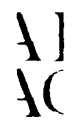
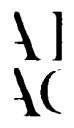
項目	單位	規格	試驗值	單位	規格	試驗值
屈服強度	MPa	355	355	抗拉強度	MPa	510
斷裂延伸率	%	22	22	斷裂延伸率	%	22
斷裂縮短率	%	55	55	斷裂縮短率	%	55
斷裂功	J/m²	100	100	斷裂功	J/m²	100
斷裂功	J/m²	100	100	斷裂功	J/m²	100
斷裂功	J/m²	100	100	斷裂功	J/m²	100
斷裂功	J/m²	100	100	斷裂功	J/m²	100
斷裂功	J/m²	100	100	斷裂功	J/m²	100
斷裂功	J/m²	100	100	斷裂功	J/m²	100
斷裂功	J/m²	100	100	斷裂功	J/m²	100

檢驗項目: 機械性能, 化學成分, 尺寸公差
 檢驗結果: 符合規格
 檢驗日期: 2014/10/15
 檢驗人員: Mars Wang

品名: 鋼板
 規格: 10mm
 厚度: 10mm
 重量: 10kg
 產地: 台灣
 檢驗項目: 機械性能, 化學成分, 尺寸公差
 檢驗結果: 符合規格
 檢驗日期: 2014/10/15
 檢驗人員: Mars Wang

項目	單位	規格	試驗值	單位	規格	試驗值
屈服強度	MPa	355	355	抗拉強度	MPa	510
斷裂延伸率	%	22	22	斷裂延伸率	%	22
斷裂縮短率	%	55	55	斷裂縮短率	%	55
斷裂功	J/m²	100	100	斷裂功	J/m²	100
斷裂功	J/m²	100	100	斷裂功	J/m²	100
斷裂功	J/m²	100	100	斷裂功	J/m²	100
斷裂功	J/m²	100	100	斷裂功	J/m²	100
斷裂功	J/m²	100	100	斷裂功	J/m²	100
斷裂功	J/m²	100	100	斷裂功	J/m²	100

APPROVED
 By laia at 1:13 pm, 10/15/14



Mars Wang
 QA SECTION
 Mars Wang

49942

58252
58211
58171
58082
58021

Material: 中軋鋼股份有限公司
Order No.: 2013009260
Part No.: 101408-S29-A
Product: 050(011120)
Size: 10.0mm
Part No.: 0500504-015
Condition: 10x-Solution Annealed-Double Aged-Strain Hardened-Stress Relieved

Chemical Composition (wt%)

	C	Mn	P	S	Ni	Cr
Max.				0.005	3.00	15.00
Max.	0.07	1.00	0.040	0.030	5.00	17.50
Result	0.02	0.39	0.01	0.024	4.67	15.38

	Mo	Cu	Nb+Ta	Nb
Max.	0.08	0.15	0.45	0.45
Max.	0.50	5.00	0.45	0.45
Result	0.10	3.40	0.28	0.28

Mechanical Properties Spec.

	Hardness	hardness	Grain Size	Delta-Ferrite
	HR	Surface	ASTM E112	AMS 1515
Condition				
Spec. Min.	190HR			
Spec. Max.	200HR	190HR		5%
Result	190HR	190HR		1.1%

	Impact(J)	Impact(J)	Impact(J)	Impact(Ave)
	1/2R L	1/2R L	1/2R L	1/2R L
Condition	1/2R L	1/2R L	1/2R L	1/2R L
Spec. Min.	120J	120J	120J	120J
Spec. Max.	120J	120J	120J	120J
Result	120J	120J	120J	120J

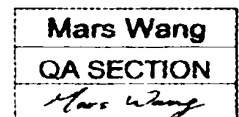
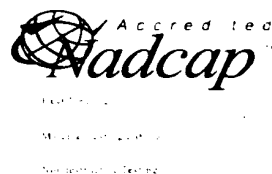
Tensile Test

	Elongation(%)	Yield Strength(Rm)	Tensile Strength(Rp)	Reduction of Area(Z)
	1/2R L	1/2R L	1/2R L	1/2R L
	(Ave)	(Ave)	(Ave)	(Ave)
Spec. Min.	45	450	550	55
Spec. Max.	45	435	405	55
Result	45	437	419	69

Specification:

APPROVED

By laia at 1:20 pm, 10/15/14



Page 1 of 2

Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

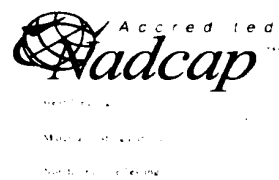
51FV

Messrs: 南紡鋼鐵股份有限公司
Order No: 2013009560
P.O. NO: 2014001529-A
Grade: 630CH1150
Size: 38.1mm
HEAT-Lot No: 9SD0304-013
Condition: HR-Solution Annealed-Double Aged-Smooth Turned(-Stress Relief)

- 1. ASTM A564M-03.
- 2. AMS 5643Q.
- 3. NACE MR0175-09/ UNS S17400.

Remarks:
1. MANUFACTURING PROCESS: FAF+HE+VD, FORGED OR HOT ROLLED.
2. SOLUTION TREATMENT: 1900 DEGREE F FOR 30 MIN/INCH (MINIMUM OF 1 HOUR), FAST AIR COOLING TO BELOW 90 DEGREE F.
3. FIRST AGING: 1900 DEGREE F FOR 4 HOURS MINIMUM AND COOLED TO BELOW 90 DEGREE F IN AIR.
4. SECOND AGING: 1900 DEGREE F FOR 4 HOURS MINIMUM AND COOLED TO BELOW 90 DEGREE F IN AIR.
5. SURFACES FREE FROM EXPOSED CONTACT WITH MERCURY AND RADIUM.
6. SURFACES FREE FROM FOLD, WELLS OR WELD CRACKS.
7. ALL RASPS CUTS.
8. MAXIMUM 1200.
9. VOLUME: 8.5 INCH*4.5 INCH*1.5 INCH SIZE: 10.00W*5.50W, 1/2R, LONGITUDINAL.

APPROVED
By laia at 1:21 pm, 10/15/14



Mars Wang
QA SECTION
Mars Wang
Page 2 of 2

Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

品名: 鋼板
 規格: 1000*1000*10
 材料: 1000*1000*10
 厚度: 0.001mm
 重量: 0.001kg
 測試: 8
 條件: 100-Solution Annealed-Double Aged-Smooth Turnect-(Stress Relief)

58306
 58213

Chemical Composition (wt%)						
C	Si	Mn	P	S	Ni	Cr
Max	0.00	0.00	0.040	0.005	3.00	15.00
Max	0.00	0.00	0.023	0.030	5.00	17.50
Max	0.00	0.00	0.023	0.024	4.67	15.38
Mo	Co	Nb+Ta	Nb			
Max	0.00	0.00	0.00			
Max	0.00	0.00	0.00			
Max	0.00	0.00	0.00			

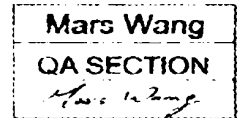
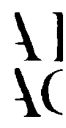
1000*1000*10
 1000*1000*10
 1000*1000*10
 1000*1000*10

1000*1000*10
 1000*1000*10
 1000*1000*10
 1000*1000*10

Impact Test	Impact Test	Impact Test	Impact Test
Temp	Temp	Temp	Temp
1000*1000*10	1000*1000*10	1000*1000*10	1000*1000*10
1000*1000*10	1000*1000*10	1000*1000*10	1000*1000*10
1000*1000*10	1000*1000*10	1000*1000*10	1000*1000*10

Tension Test	Tension Test	Tension Test	Tension Test
Elongation(A)	Tensile Strength(Rm)	Yield Strength(0.2% Rp)	Reduction of Area(Z)
1000*1000*10	1000*1000*10	1000*1000*10	1000*1000*10
1000*1000*10	1000*1000*10	1000*1000*10	1000*1000*10
1000*1000*10	1000*1000*10	1000*1000*10	1000*1000*10
1000*1000*10	1000*1000*10	1000*1000*10	1000*1000*10

APPROVED
 By laia at 1:25 pm, 10/15/14



Page 1 of 2

Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.



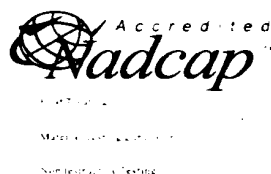
台南市新營區新中路35號
NO.35,HSIN CHUNG RD.,HSIN YING,
TAINAN.TAIWAN
TEL:886-6-6520031
FAX:886-6-6520088

1990

1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 26

COMPACT TENSILE CHARTER-V, SPECIMEN SIZE: 10*10MM*55MM, 1/2R LONGITUDINAL.

By laia at 1:25 pm, 10/15/14



Page 2 of 2

Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.



tuv ISO 9001
No. 01 100 029186

原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 32068, Taiwan

32068 桃園縣中壢市中華路二段 185 號 3 樓 統一編號: 16879927

Tel: +886-3-4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

CERTIFICATE OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES						CERTIFICATE NO. 140922- 7 DATE: 22-Sep-14					
To. CAMERON CANADA CORPORATION 3707-97th Street, EDMONTON, AB T6E 6J2, CANADA											
INVOICE NO. WZ-140922A						YOUR ORDER NO. 4510471657					
Material Specification: ASTM A479 type:316						Heat Treatment: Solution Annealed					
Q'TY	PART NAME	DRAWING No.	Heat Code	Mechanical Properties							
				Y.S.(Mpa)	T.S.(Mpa)	EL.O.(%)	RA(%)	HB			
2,980	5A-11500510617015 Ball ½"	#06076	S8254	<u>205 min</u> 236	<u>515 min</u> 590	<u>30 min</u> 56	<u>40 min</u> 78	 156			
Heat Code	Chemical Composition (%)										
	C	Mn	Si	S	P	Cr	Ni	Mo	N		
S8254	<u>0.08_{max}</u>	<u>2.0_{max}</u>	<u>1.0_{max}</u>	<u>.030_{max}</u>	<u>.045_{max}</u>	<u>16-18</u>	<u>10-14</u>	<u>2.0-3.0</u>	...		
	0.029	1.08	0.33	0.001	0.034	16.30	10.13	2.04	0.05		
Re: Orig Heat # 9SC0103-LE2											
NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B											
QUALITY CONTROL INSPECTOR						MANAGER					
Sandy Yeh						Grant Hsu					

APPROVED

By Iaia at 3:03 pm, 10/15/14

S8254
S8091
S7865
S7772
S7701

K5741-A35

Messrs: 金松鋼鐵股份有限公司
Order No: 2012009716
FILE NO: 2012008233-A
Grade: 316
Size: 25.4mm
HEAT-Lot No: 9SC0103-LE2
Condition: HR-Solution Annealed-Smooth Turned

P.O.NO.:
Date: 12/30/2012
Weight: 3212.0KG
P'cs: 125

Chemical Composition (wt%)							
	C	Si	Mn	P	S	Ni	Cr
Min.						10.00	16.00
Max.	0.080	1.00	2.00	0.045	0.030	14.00	18.00
Result	0.029	0.33	1.08	0.034	0.001	10.13	16.30
	Mo	N					
Min.	2.00						
Max.	3.00	0.10					
Result	2.04	0.05					

Mechanical Properties Spec.

	Hardness	Grain Size
		ASTM E112
	1/2R	T
Spec.Min.		
Spec.Max.		
Result	156HBW	7.5

Tensile Test				
	Elongation(A)	Tensile Strength(Rm)	Yield Strength(0.2% Rp)	Reduction of Area(Z)
	1/2R L	1/2R L	1/2R L	1/2R L
	(Ave)	(Ave)	(Ave)	(Ave)
Unit	%	Mpa	Mpa	%
Min.	40	515	205	50
Max.				
Result	56	590	236	78

Specification:

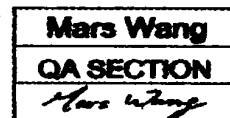
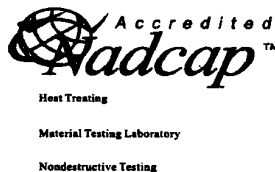
1. EN 10204 3.1.
2. ASTM A182, A276, A479..

Remark:

1. MATERIAL IS FREE FROM MERCURY.
2. MATERIAL IS NO REPAIRED BY WELDING.
3. MELTING PROCESS : BAF -> LHF -> VOD -> VCD..

APPROVED

By laia at 3:03 pm, 10/15/14



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Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.