



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: 120415270

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



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3707 97 St.
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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	S8256		BALL, 1-1/2", w/1/8" HOLE FOR ANTI-STATIC	5A-115015B1617015



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.

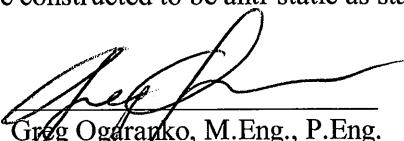
The minimum service temperature of these valves is -46°C/-50°F. Impact testing has been performed in accordance with applicable ASTM requirements and those of CSA Z245.15 for Category II M45C Service.

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.

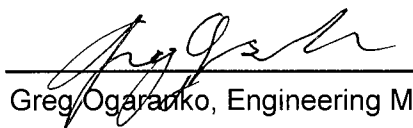
Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

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 Ogarko, 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

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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 (bbl.)	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
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

品質保證

REGISTERED

ISO 9001 : 2008

ID : 5MBY004

確認簽章

張加良

秤量單
編號
SHIPPING
NO.

23244F2 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
SATISFACTOR 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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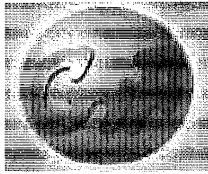
確認簽章 原加銀

80

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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

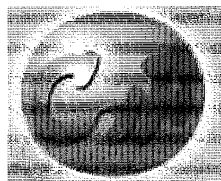
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Q.A.CHIEF:

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, CAILANG 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	

重量 DIA. (mm)	長度 LEN. (m)	數量 QTY (bdl.)	重量 WEIGHT (kg)	爐號 HEAT NO	TENSILE		伸長率 EL.(%)	化學成分(%)CHEMICAL ANALYSIS																重量 總重 SHIPPING NO.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
					屈服強度 /mm ²	抗拉強度 /mm ²		C	Si	Mn	P	S	Ni	Cr	Mo	Cu	Pb	Al	Nb	V	B																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
38	6	4	7488	332270					X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100	X100

TOTAL: 4 BUNDLES 7,488 kgs.

2540 LIT

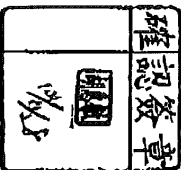
USB-4FF4F2

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.

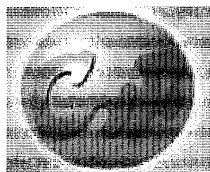
郭志毅

ISO 9001 : 2008
ID : 5MSY004



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

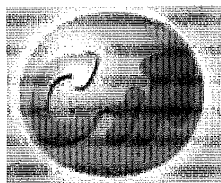
空 白
B L A N K

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
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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 寶 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

[illegible]

R6171

UNITED STATES DEPARTMENT OF THE INTERIOR

	C	Si	Mn	P	S	Ni	Cr
Wt.-%					0.005	3.00	15.00
Max. wt.-%	0.67	1.00	1.00	0.040	0.030	5.00	17.50
Min. wt.-%	0.00	0.49	0.64	0.029	0.023	4.36	15.04

	Mo	Co	Nb+Ta	Nb
Wt.-%	0.00	0.00	0.05	0.00
Max. wt.-%	0.20	0.00	0.45	0.45
Min. wt.-%	0.00	0.00	0.05	0.00

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 84

| Country | Number of countries | Year | Value |
|--------------------------------|---------------------|------|-------|
| China | 1 | 1990 | 1.0 |
| India | 1 | 1990 | 1.0 |
| Japan | 1 | 1990 | 1.0 |
| USA | 1 | 1990 | 1.0 |
| UK | 1 | 1990 | 1.0 |
| France | 1 | 1990 | 1.0 |
| Germany | 1 | 1990 | 1.0 |
| Italy | 1 | 1990 | 1.0 |
| Spain | 1 | 1990 | 1.0 |
| Sweden | 1 | 1990 | 1.0 |
| Norway | 1 | 1990 | 1.0 |
| Denmark | 1 | 1990 | 1.0 |
| Finland | 1 | 1990 | 1.0 |
| Belgium | 1 | 1990 | 1.0 |
| Netherlands | 1 | 1990 | 1.0 |
| Portugal | 1 | 1990 | 1.0 |
| Greece | 1 | 1990 | 1.0 |
| Ireland | 1 | 1990 | 1.0 |
| Austria | 1 | 1990 | 1.0 |
| Switzerland | 1 | 1990 | 1.0 |
| Luxembourg | 1 | 1990 | 1.0 |
| Belarus | 1 | 1990 | 1.0 |
| Ukraine | 1 | 1990 | 1.0 |
| Russia | 1 | 1990 | 1.0 |
| Poland | 1 | 1990 | 1.0 |
| Czech Republic | 1 | 1990 | 1.0 |
| Slovakia | 1 | 1990 | 1.0 |
| Hungary | 1 | 1990 | 1.0 |
| Slovenia | 1 | 1990 | 1.0 |
| Croatia | 1 | 1990 | 1.0 |
| Serbia | 1 | 1990 | 1.0 |
| Bosnia and Herzegovina | 1 | 1990 | 1.0 |
| Montenegro | 1 | 1990 | 1.0 |
| Albania | 1 | 1990 | 1.0 |
| Macedonia | 1 | 1990 | 1.0 |
| Bulgaria | 1 | 1990 | 1.0 |
| Romania | 1 | 1990 | 1.0 |
| Moldova | 1 | 1990 | 1.0 |
| Uzbekistan | 1 | 1990 | 1.0 |
| Kazakhstan | 1 | 1990 | 1.0 |
| Kyrgyzstan | 1 | 1990 | 1.0 |
| Tajikistan | 1 | 1990 | 1.0 |
| Trinidad and Tobago | 1 | 1990 | 1.0 |
| Barbados | 1 | 1990 | 1.0 |
| Antigua and Barbuda | 1 | 1990 | 1.0 |
| St. Kitts and Nevis | 1 | 1990 | 1.0 |
| St. Lucia | 1 | 1990 | 1.0 |
| St. Vincent and the Grenadines | 1 | 1990 | 1.0 |
| Dominica | 1 | 1990 | 1.0 |
| Grenada | 1 | 1990 | 1.0 |
| Suriname | 1 | 1990 | 1.0 |
| Guatemala | 1 | 1990 | 1.0 |
| Belize | 1 | 1990 | 1.0 |
| Honduras | 1 | 1990 | 1.0 |
| El Salvador | 1 | 1990 | 1.0 |
| Nicaragua | 1 | 1990 | 1.0 |
| Costa Rica | 1 | 1990 | 1.0 |
| Panama | 1 | 1990 | 1.0 |
| Cuba | 1 | 1990 | 1.0 |
| Venezuela | 1 | 1990 | 1.0 |
| Colombia | 1 | 1990 | 1.0 |
| Ecuador | 1 | 1990 | 1.0 |
| Peru | 1 | 1990 | 1.0 |
| Bolivia | 1 | 1990 | 1.0 |
| Paraguay | 1 | 1990 | 1.0 |
| Uruguay | 1 | 1990 | 1.0 |
| Argentina | 1 | 1990 | 1.0 |
| Chile | 1 | 1990 | 1.0 |
| Brazil | 1 | 1990 | 1.0 |
| Uruguay | 1 | 1990 | 1.0 |
| Paraguay | 1 | 1990 | 1.0 |
| Bolivia | 1 | 1990 | 1.0 |
| Peru | 1 | 1990 | 1.0 |
| Ecuador | 1 | 1990 | 1.0 |
| Colombia | 1 | 1990 | 1.0 |
| Venezuela | 1 | 1990 | 1.0 |
| Cuba | 1 | 1990 | 1.0 |
| Panama | 1 | 1990 | 1.0 |
| Costa Rica | 1 | 1990 | 1.0 |
| Nicaragua | 1 | 1990 | 1.0 |
| El Salvador | 1 | 1990 | 1.0 |
| Honduras | 1 | 1990 | 1.0 |
| Belize | 1 | 1990 | 1.0 |
| Guatemala | 1 | 1990 | 1.0 |
| Suriname | 1 | 1990 | 1.0 |
| Grenada | 1 | 1990 | 1.0 |
| Dominica | 1 | 1990 | 1.0 |
| St. Vincent and the Grenadines | 1 | 1990 | 1.0 |
| St. Lucia | 1 | 1990 | 1.0 |
| St. Kitts and Nevis | 1 | 1990 | 1.0 |
| Antigua and Barbuda | 1 | 1990 | 1.0 |
| Barbados | 1 | 1990 | 1.0 |
| Trinidad and Tobago | 1 | 1990 | 1.0 |
| Tajikistan | 1 | 1990 | 1.0 |
| Kyrgyzstan | 1 | 1990 | 1.0 |
| Kazakhstan | 1 | 1990 | 1.0 |
| Uzbekistan | 1 | 1990 | 1.0 |
| Moldova | 1 | 1990 | 1.0 |

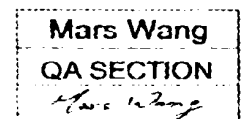
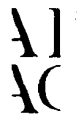
Figure 1. The effect of the concentration of the *Agrobacterium* suspension on the transformation efficiency of *Agrobacterium* strains.

[illegible]

| Elongation(A) | Tensile Strength(Rm) | Yield Strength(0.2% Rp) | Reduction of Area(Z) |
|---------------|----------------------|-------------------------|----------------------|
|---------------|----------------------|-------------------------|----------------------|

| | 1/2R L | 1/2R L | 1/2R L |
|-----|--------|--------|--------|
| | (Ave) | (Ave) | (Ave) |
| ASL | ASL | ASL | % |
| 105 | 105 | 105 | 55 |
| 69 | 69 | 69 | 69 |

22. 10. 1991



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: 宏和鋼鐵股份有限公司
 Order No.: 100000025
 PO No.: 100-100-1005-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.: 宏和鋼鐵 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

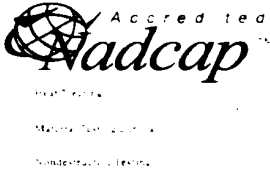
| | Hardness | Hardness | Grain Size | Delta-Ferrite |
|------------|----------|----------|------------|---------------|
| | HRC | Surface | ASTM E112 | AMS 2430 |
| Condition | | | | |
| Spec. Min. | 59HRC | | | |
| Spec. Max. | 63HRC | 63HRC | 8 | 5% |
| Result | 61HRC | 61HRC | 8 | 0.4% |

| | Impact (J) | Impact (J) | Impact (J) | Impact (Ave) |
|------------|------------|------------|------------|--------------|
| Condition | | | | |
| Spec. Min. | 27J | 27J | 27J | 27J |
| Spec. Max. | 27J | 27J | 27J | 27J |
| Result | 89J | 89J | 89J | 89J |

| | Elongation(A) | Tensile Strength(Rm) | Yield Strength(0.2%Rp) | Reduction of Area(Z) |
|------------|---------------|----------------------|------------------------|----------------------|
| Condition | | | | |
| Spec. Min. | 12%L | 12%L | 12%L | 12%L |
| Spec. Max. | 12%L | 12%L | 12%L | 12%L |
| Result | 12% | 140 | 120 | 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

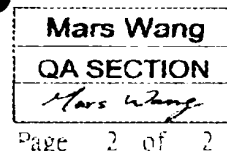
Weight: 979.0KG

Pcs: 89

1. ASTM A564M-04.
2. AMS 5643Q.
3. NACE 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. 檢驗項目: 機械性能, 化學成分, 尺寸公差
 5. 檢驗方法: 拉伸試驗, 洛氏硬度, 光學顯微鏡
 6. 檢驗結果: 符合規格
 7. 檢驗日期: 2014/10/15
 8. 檢驗地點: 本公司實驗室
 9. 檢驗人員: 王明華
 10. 檢驗設備: 拉力試驗機, 洛氏硬度計, 顯微鏡

11. 品名: 鋼板
 12. 規格: 1000x2000x10
 13. 廠牌: 台灣中鋼
 14. 檢驗項目: 機械性能, 化學成分, 尺寸公差
 15. 檢驗方法: 拉伸試驗, 洛氏硬度, 光學顯微鏡
 16. 檢驗結果: 符合規格
 17. 檢驗日期: 2014/10/15
 18. 檢驗地點: 本公司實驗室
 19. 檢驗人員: 王明華
 20. 檢驗設備: 拉力試驗機, 洛氏硬度計, 顯微鏡

FO

| 項目 | 單位 | 規格 | 試驗結果 | 單位 | 規格 | 試驗結果 |
|-------|-----|------|------|-------|-----|------|
| 屈服強度 | MPa | 355 | 355 | 抗拉強度 | MPa | 510 |
| 斷裂延伸率 | % | 22 | 22 | 斷裂縮小率 | % | 55 |
| 硬度 | HRC | 20 | 20 | 硬度 | HRC | 20 |
| 晶粒尺寸 | 級 | 8 | 8 | 晶粒尺寸 | 級 | 8 |
| 脫碳層深度 | mm | 0.02 | 0.02 | 脫碳層深度 | mm | 0.02 |
| 表面缺陷 | mm | 0.05 | 0.05 | 表面缺陷 | mm | 0.05 |
| 尺寸公差 | mm | ±0.1 | ±0.1 | 尺寸公差 | mm | ±0.1 |

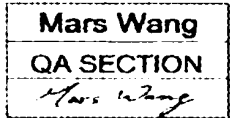
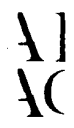
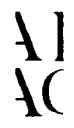
檢驗結果: 符合規格

1. 品名: 鋼板
 2. 規格: 1000x2000x10
 3. 廠牌: 台灣中鋼
 4. 檢驗項目: 機械性能, 化學成分, 尺寸公差
 5. 檢驗方法: 拉伸試驗, 洛氏硬度, 光學顯微鏡
 6. 檢驗結果: 符合規格
 7. 檢驗日期: 2014/10/15
 8. 檢驗地點: 本公司實驗室
 9. 檢驗人員: 王明華
 10. 檢驗設備: 拉力試驗機, 洛氏硬度計, 顯微鏡

11. 品名: 鋼板
 12. 規格: 1000x2000x10
 13. 廠牌: 台灣中鋼
 14. 檢驗項目: 機械性能, 化學成分, 尺寸公差
 15. 檢驗方法: 拉伸試驗, 洛氏硬度, 光學顯微鏡
 16. 檢驗結果: 符合規格
 17. 檢驗日期: 2014/10/15
 18. 檢驗地點: 本公司實驗室
 19. 檢驗人員: 王明華
 20. 檢驗設備: 拉力試驗機, 洛氏硬度計, 顯微鏡

| 項目 | 單位 | 規格 | 試驗結果 | 單位 | 規格 | 試驗結果 |
|-------|-----|------|------|-------|-----|------|
| 屈服強度 | MPa | 355 | 355 | 抗拉強度 | MPa | 510 |
| 斷裂延伸率 | % | 22 | 22 | 斷裂縮小率 | % | 55 |
| 硬度 | HRC | 20 | 20 | 硬度 | HRC | 20 |
| 晶粒尺寸 | 級 | 8 | 8 | 晶粒尺寸 | 級 | 8 |
| 脫碳層深度 | mm | 0.02 | 0.02 | 脫碳層深度 | mm | 0.02 |
| 表面缺陷 | mm | 0.05 | 0.05 | 表面缺陷 | mm | 0.05 |
| 尺寸公差 | mm | ±0.1 | ±0.1 | 尺寸公差 | mm | ±0.1 |

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 A562M-03

AMS 2049

Surface Finish: 125µm Ra

Remarks:

1. INSTRUCTIONS: 1. ALL DIMENSIONS ARE TO BE TAKEN FROM THE SURFACE.

2. ALL DIMENSIONS ARE TO BE TAKEN FROM THE SURFACE UNLESS OTHERWISE SPECIFIED.

3. ALL DIMENSIONS ARE TO BE TAKEN FROM THE SURFACE UNLESS OTHERWISE SPECIFIED.

4. ALL DIMENSIONS ARE TO BE TAKEN FROM THE SURFACE UNLESS OTHERWISE SPECIFIED.

5. ALL DIMENSIONS ARE TO BE TAKEN FROM THE SURFACE UNLESS OTHERWISE SPECIFIED.

6. ALL DIMENSIONS ARE TO BE TAKEN FROM THE SURFACE UNLESS OTHERWISE SPECIFIED.

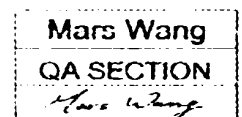
7. ALL DIMENSIONS ARE TO BE TAKEN FROM THE SURFACE UNLESS OTHERWISE SPECIFIED.

8. ALL DIMENSIONS ARE TO BE TAKEN FROM THE SURFACE UNLESS OTHERWISE SPECIFIED.

9. ALL DIMENSIONS ARE TO BE TAKEN FROM THE SURFACE UNLESS OTHERWISE SPECIFIED.

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)

P.O. NO: 2014000323-A
Date: 01/20/2014
Weight: 1839.0KG
Pics: 67

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 | 0.01 | | |
| Result | | 0.04 | 0.02 | 0.02 | 0.01 | | |

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 |

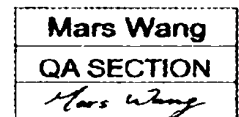
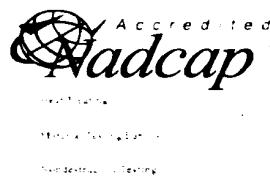
Tensile Test

| | 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. | 10% | 850 | 650 | 5% |
| Spec. Max. | | | | |
| Result | 12% | 910 | 620 | 6% |

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.

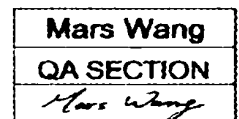
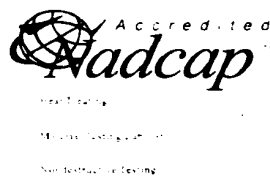
Messrs: 益新鋼鐵股份有限公司
Order No.: 2013008179
Job No.: 2014000513-A
Grade: 680(100120)
Size: 27mm
JMS Lot No.: SD2214-070
Condition: 18-Solution Annealed-Double Aged-Smooth Turned(-Stress Relief)

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

- 1.ASTM A564M-04
- 2.AMS 5643Q
- 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 (22,111)
 Code: 901-101-000000
 Material: 101-000000
 Spec: 1010000000
 Surface: 201-000000
 Material: 101-000000
 Condition: 101-000000

Date: 04/02/2014
 Report: 987-000000
 Test: 101-000000

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 |
| Result | 0.00 | 0.00 | 0.05 | 0.05 |

| Mechanical Properties (Spec) | | | | |
|------------------------------|---------------|----------------|---------------|----------------|
| Hardness (HRC) | Hardness (HV) | Hardness (HRC) | Hardness (HV) | Hardness (HRC) |
| Max. | 0.00 | 0.00 | 0.00 | 0.00 |
| Result | 0.00 | 0.00 | 0.00 | 0.00 |

| Impact (J) | Impact (J) | Impact (J) | Impact (J) |
|------------|------------|------------|------------|
| Max. | 0.00 | 0.00 | 0.00 |
| Result | 0.00 | 0.00 | 0.00 |

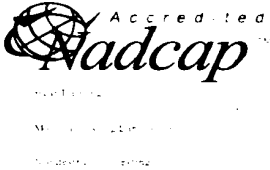
| Mechanical Properties (Spec) | | | |
|------------------------------|-----------------------|--------------------------|-----------------------|
| Elongation (A) | Tensile Strength (Rm) | Yield Strength (0.2% Rp) | Reduction of Area (Z) |
| Max. | 0.00 | 0.00 | 0.00 |
| Result | 0.00 | 0.00 | 0.00 |

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(enh150)

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: 04/02/2014

Weight: 987.0KG

Pcs: 18

1. ASTM A563W-01

2. MS 5643G

3. NADCAP MR0150099 JNS S17400

Notes:

1. VANDERLUGHE PROCESS: PARTS+VOLL. PURGED OR HOT ROLLING

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

3. DOUBLE AGED: PARTS+VOLL. PURGED OR HOT ROLLING AND COOLING TO BELOW 90 DEGREE IN AIR

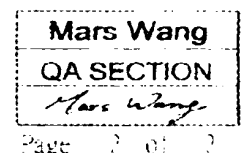
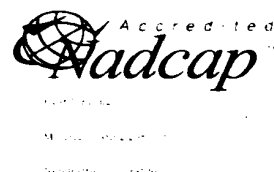
4. SMOOTH TURNING: SURFACE ROUNDED 4 HOURS MINIMUM AND COOLING TO BELOW 90 DEGREE IN AIR

5. STRESS RELIEF: PARTS+VOLL. PURGED OR HOT ROLLING AND COOLING TO BELOW 90 DEGREE IN AIR

6. VANDERLUGHE PROCESS: PARTS+VOLL. PURGED OR HOT ROLLING

7. VANDERLUGHE PROCESS

8. VANDERLUGHE PROCESS: PARTS+VOLL. PURGED OR HOT ROLLING



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
 寬度: 1250mm
 長度: 2500mm
 重量: 31.2kg
 材質: S45C
 檢驗項目: 機械性能, 尺寸, 表面
 檢驗結果: 符合規格
 檢驗日期: 10/15/14
 檢驗人員: Mars Wang

58301
 58251
 58081

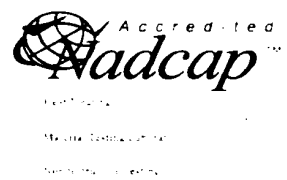
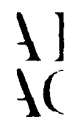
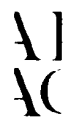
| 項目 | 單位 | 規格 | 試驗值 | 單位 | 規格 | 試驗值 |
|-------|-----|-----|-----|-------|-----|-----|
| 抗拉強度 | MPa | 510 | 510 | 屈服強度 | MPa | 355 |
| 斷裂伸長率 | % | 22 | 22 | 斷裂伸長率 | % | 22 |
| 斷裂縮小率 | % | 40 | 40 | 斷裂縮小率 | % | 40 |
| 硬度 | HRC | 28 | 28 | 硬度 | HRC | 28 |
| 衝擊功 | J | 30 | 30 | 衝擊功 | J | 30 |
| 夏比功 | J | 30 | 30 | 夏比功 | J | 30 |

檢驗方法: 機械性能: 拉伸試驗, 沖擊試驗, 硬度試驗
 尺寸: 卡尺, 卷尺
 表面: 目視, 顯微鏡
 檢驗設備: 拉力試驗機, 沖擊試驗機, 硬度計, 卡尺, 卷尺, 顯微鏡
 檢驗場所: 本公司實驗室
 檢驗人員: Mars Wang
 檢驗日期: 10/15/14

檢驗結果: 符合規格
 檢驗日期: 10/15/14
 檢驗人員: Mars Wang

| 項目 | 單位 | 規格 | 試驗值 | 單位 | 規格 | 試驗值 |
|-------|-----|-----|-----|-------|-----|-----|
| 抗拉強度 | MPa | 510 | 510 | 屈服強度 | MPa | 355 |
| 斷裂伸長率 | % | 22 | 22 | 斷裂伸長率 | % | 22 |
| 斷裂縮小率 | % | 40 | 40 | 斷裂縮小率 | % | 40 |
| 硬度 | HRC | 28 | 28 | 硬度 | HRC | 28 |
| 衝擊功 | J | 30 | 30 | 衝擊功 | J | 30 |
| 夏比功 | J | 30 | 30 | 夏比功 | J | 30 |

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



Mars Wang
 QA SECTION
 Mars Wang



1940

1. NAME - CHANG-A-SHUN WEN S. ZHANG, JR. DATE 11/11/11



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.

49942

58252
58211
58171
58082
58021

Messy No.: 華新鋼鐵股份有限公司
Order No.: 2013009260
Part No.: 101408-S29-A
Product: 050(011120)
Material: 050-101408
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. | 0.05 | 0.15 | 0.15 | 0.05 |
| 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 1510 |
| 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 |

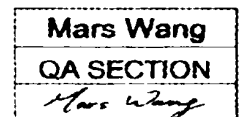
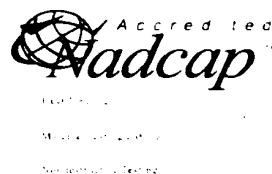
Tensile Test

| | Yield Strength | Tensile Strength(Rm) | Yield Strength(0.2% Rp) | Reduction of Area(Z) |
|------------|----------------|----------------------|-------------------------|----------------------|
| | 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. | 135 | 135 | 135 | 55 |
| Spec. Max. | 135 | 135 | 135 | 55 |
| Result | 135 | 137 | 139 | 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.

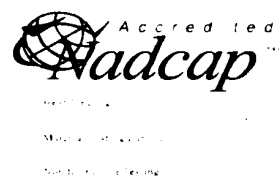
51FV

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 MR0175-099 UNS S17400.

Remarks:
1. MANUFACTURING PROCESS: FAF+HE+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: 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 2000
9. VOLTAGE 8.5 VOLTS 4.5 AMPERE 8.5 ZIN 100W*55W, 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: 10.00mm
 重量: 2491.0KG
 件數: 8
 檢驗項目: 100% Solution Annealed-Double Aged-Smooth Turnect-(Stress Relief)

58306
 58213

| Chemical Composition (wt%) | | | | | | |
|----------------------------|-------|-------|-------|-------|------|-------|
| C | Si | Mn | P | S | Ni | Cr |
| Max | | | | 0.005 | 3.00 | 15.00 |
| Max | 0.01 | 1.00 | 0.040 | 0.030 | 5.00 | 17.50 |
| Max | 0.03 | 0.30 | 0.023 | 0.024 | 4.67 | 15.38 |
| Mo | Al | Nb+Ta | Nb | | | |
| Max | 0.005 | 0.02 | 0.01 | | | |
| Max | 0.005 | 0.02 | 0.01 | | | |
| Max | 0.005 | 0.02 | 0.01 | | | |

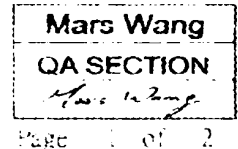
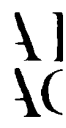
100% Solution Annealed-Double Aged-Smooth Turnect-(Stress Relief)
 100% Solution Annealed-Double Aged-Smooth Turnect-(Stress Relief)
 100% Solution Annealed-Double Aged-Smooth Turnect-(Stress Relief)

100% Solution Annealed-Double Aged-Smooth Turnect-(Stress Relief)
 100% Solution Annealed-Double Aged-Smooth Turnect-(Stress Relief)
 100% Solution Annealed-Double Aged-Smooth Turnect-(Stress Relief)

| Impact Test | Impact Test | Impact Test | Impact Test |
|-------------|-------------|-------------|-------------|
| Temp (°F) | Temp (°F) | Temp (°F) | Temp (°F) |
| Temp (°F) | Temp (°F) | Temp (°F) | Temp (°F) |
| Temp (°F) | Temp (°F) | Temp (°F) | Temp (°F) |
| Temp (°F) | Temp (°F) | Temp (°F) | Temp (°F) |

| Tension Test | Tension Test | Tension Test | Tension Test |
|---------------|----------------------|-------------------------|----------------------|
| Elongation(A) | Tensile Strength(Rm) | Yield Strength(0.2% Rp) | Reduction of Area(Z) |
| Elongation | Elongation | Elongation | Elongation |
| Elongation | Elongation | Elongation | Elongation |
| Elongation | Elongation | Elongation | Elongation |
| Elongation | Elongation | Elongation | Elongation |

APPROVED
 By laia at 1:25 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.

Buyer: 南鋼鋼鐵股份有限公司
Order No: 2013009560
Lot No: 2014001925-A
Product: 6800mm1001
Material: 42CrMo
Heat No: 10510001-010
Condition: 1X-No Solution Anneal-nd-Double Anneal-Smooth Turned-(Stress Relief)

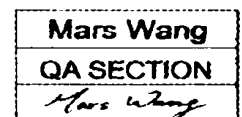
P.O.No: 1
Date: 03/29/2014
Weight: 1491.0KG
Pcs: 18

Inspection Method:
Visual 20X
Surface 20X-100X(EN 10243-1)

Material:
1. Material is 100% stress relieved and forged or hot rolled.
2. Heat treatment: 900 degree F for 30 minutes (minimum of 1 hour), fast air cooling to below 90 degree F.
3. Stress relieving: 900 degree F for 4 hours minimum and cooled to below 90 degree F in air.
4. Stress relieving: 900 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. Vacuum test: OK.
9. Impact test: CHARPY-A, SPECIMEN SIZE: 10*10MM*55MM, 1/2R, LONGITUDINAL.

APPROVED

By Iai 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.

Wen ZoneISO 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. 140825- 5
DATE: 25-Aug-14 | | | | | |
|--|----------------------------|-----------------|-----------------|-----------------------|-----------------------|---|---------------------|-----------------------|-------------------------------------|-----------------|---------------|
| To. CAMERON CANADA CORPORATION
3707-97th Street, EDMONTON, AB T6E 6J2, CANADA | | | | | | | | | | | |
| INVOICE NO. WZ-140825A | | | | | | YOUR ORDER NO. 4510433136 | | | | | |
| Material Specification: ASTM A479 UNS S32750 | | | | | | Heat Treatment:
Solution Anneal and Water Quench | | | | | |
| Q'TY | PART NAME | DRAWING NO. | Heat Code | Mechanical Properties | | | | | | | |
| | | | | Y.S.(MPa) | T.S.(MPa) | ELO.(%) | RA (%) | HBW | Joule (-46°C) | | |
| 7 | 5A-113015B1617001 Stem 1½" | #02038 | FK | <u>550 min</u>
603 | <u>800 min</u>
840 | <u>15 min</u>
42 | <u>45 min</u>
80 | <u>226-310</u>
251 | <u>42 Ave/33 min</u>
321/329/313 | | |
| 7 | 5A-115015B1617015 Ball 1½" | #06079 | S8256 | 561/553 | 813/820 | 44/44 | 80/79 | 253/254 | 325/295/330
296/328/303 | | |
| Heat Code | Chemical Composition (%) | | | | | | | | | | |
| | C | Mn | Si | S | P | Cr | Ni | Mo | N | Cu | PREN |
| | <u>0.03 max</u> | <u>1.20 max</u> | <u>0.80 max</u> | <u>.020 max</u> | <u>.035 max</u> | <u>24.0-26.0</u> | <u>6.0-8.0</u> | <u>3.0-5.0</u> | <u>0.24-.032</u> | <u>0.50 max</u> | <u>40 min</u> |
| FK | 0.021 | 0.80 | 0.44 | 0.0010 | 0.025 | 25.10 | 6.98 | 3.78 | 0.300 | 0.20 | 42.374 |
| S8256 | 0.024 | 0.82 | 0.40 | 0.0008 | 0.025 | 25.25 | 6.88 | 3.81 | 0.294 | 0.24 | 42.527 |
| Re: Orig Heat #307087 for FK; #381463 for S8256 | | | | | | | | | | | |
| NOTE: Certificate according to EN 10204/3.1.B | | | | | | | | | | | |
| QUALITY CONTROL INSPECTOR | | | | | | MANAGER | | | | | |
| Sandy Yeh | | | | | | Grant Hsu | | | | | |

APPROVED

By Iai at 3:25 pm, 9/17/14



DTQ08-163

尚智貿易股份有限公司 AJEI International Co. Ltd.

新竹縣湖口鄉榮光路160號

NO. 160, Rongguang Rd., Hukou Township, Hsinchu County 303 TAIWAN, R.O.C

TEL : 03-598 2916

FAX : 03-598 2917

INSPECTION CERTIFICATE

Grade 材質 : UNS S32750/F53

Heat NO. 爐號 : 307087

Lot NO. 批號 :

Certificate No : EI130103

Date : 2013.12.27

Weight : 698 Kg

Dimension : 28.575 mm

P'cs : 25 PCS

Condition : hot rolled annealed, peeled round bar

FK

APPLICABLE SPECIFICATIONS 適用規範 :

ASTM A276-10 ;

ASTM A182/A182M-11

ASTM A479/A479M -11 ;

NORSOK MDS D57 REV.4 09/10 ;

NACE MR0175/ISO 15156-1 2009 ;

MELT PROCESS 熔煉過程 : E-VOD

SOLUTION TREATMENT 熱處理 :

1100°C 2hours. water quenching

CHEMICAL COMPOSITION IN WEIGHT % 元素含量百分比

| | C | Si | Mn | P | S | Cr | Mo | Ni | N | Cu | W | PRE | | |
|---------|-------|------|------|-------|--------|-------|------|------|-------|------|---|--------|--|--|
| Min. | | | | | | 24.00 | 3.00 | 6.00 | 0.240 | | | | | |
| Max. | 0.030 | 0.80 | 1.20 | 0.035 | 0.020 | 26.00 | 5.00 | 8.00 | 0.320 | 0.50 | | | | |
| Result. | 0.021 | 0.44 | 0.80 | 0.025 | 0.0010 | 25.10 | 3.78 | 6.98 | 0.300 | 0.20 | | 42.374 | | |

TENSILE TEST 拉伸測試

| | YIELD
STRENGTH
降伏強度 | TENSILE STRENGTH
(Mpa)
拉伸強度 | ELONGATION
(%)
拉伸比 | R.A.
(%)
斷面收縮率 |
|-----------------|---------------------------|-----------------------------------|--------------------------|----------------------|
| | Rp0.2
≥550 | Rm
≥800 | A4 2"
≥15 | Z |
| Probe1
test1 | 603 | 840 | 42 | 80 |
| test2 | | | | |

MECHANICAL PROPERTIES 機械性質

| | Hardness
硬度測試 | Impact test
(J)
衝擊測試 | later. expansion
(mm)
側膨脹值 | shear fracture
(%) |
|------------------|----------------------------|---|-----------------------------------|-----------------------------------|
| | 1/2R
HRC HB
≤32 ≤310 | 1/2RL (°C) T(°C)
RT -46 -50 -101
≥100 ≥45 ≥45 ≥45 | longitudinal (°C)
-46 -50 -101 | longitudinal (°C)
-46 -50 -101 |
| Probe 1
test1 | 22 251 | 321 | 2.3 | 100 |
| test2 | | 329 | 2.4 | 100 |
| test3 | | 313 | 2.3 | 100 |
| Probe 2
test1 | | | | |
| test2 | | | | |
| test3 | | | | |

NOTE:

APPROVED

By laia at 3:26 pm, 9/17/14

P04-28A



DTQ08-163

尚智貿易股份有限公司 AJEI International Co. Ltd.

新竹縣湖口鄉榮光路160號

NO. 160, Rongguang Rd., Hukou Township, Hsinchu County 303 TAIWAN, R.O.C

TEL : 03-598 2916

FAX : 03-598 2917

INSPECTION CERTIFICATE

Grade 材質 : UNS S32750/F53

Heat NO. 爐號 : 307087

Lot NO. 批號 :

Weight : 698 Kg

Dimension : 28.575 mm

Certificate No : EI130103

Date : 2013.12.27

P'cs : 25 PCS

Condition : hot rolled annealed, peeled round bar

Remark備註

tensile test and hardness test temperature in RT

corrosion test(acc. to ASTM G48 Meth. A 50°C/24H.):no pitting observed, weight loss 0.026 g/m2

sample pickles (20% HNO3+5%HF60°C 5minutes pickled) : assesment by 20 times magnification

ferrite delta (ASTM E562):near surface 51% mid radius 52%

no weld repaired.

Radioactivity inspection without objection, the measured value is below the detection limit of 0.1 Bq/q

free from mercury contamination

amount of working : 14.8:1

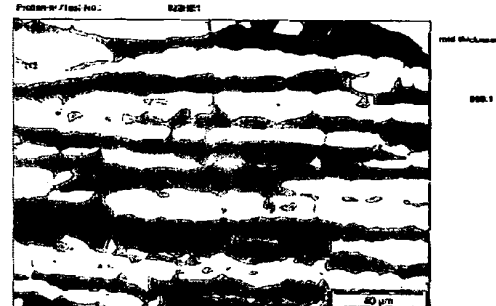
inspection of identification and dimension no objection

ultrasonic- test acc. to ASTM A388(KSR/FBH max. 1.5mm): no objection.

PED 97/23/EC Annex I, 4.3 by Notified Body 0036

Manufacturer complies with NORSOK M-650 up to 120.65mm & EN10204 3.1

Microstructure free from intermetallic phases or other detrimental phases



ISO 9001 : 2008 品質證明專用章

尚智貿易有限公司

出貨單號 :1030714002

出貨日期 :103.07.14

P.O.NO. : R611-S825-SC43

APPROVED

By laia at 3:27 pm, 9/17/14



BGH Edelstahl Freital GmbH

Zeugnis-Nr. 355648
Certificate no.
No. de certificatBescheinigung über Werkstoffprüfung nach DIN EN 10204
Certificate of material tests according to DIN EN 10204 3.1
Certificat des essais des matériaux selon DIN EN 10204Die Lieferung entspricht den vereinbarten Lieferbedingungen.
Delivery in accordance with the agreed terms of delivery.
La livraison correspond aux conditions de livraison convenues.Zeichen des Lieferwerkes Stempel des Werkstoffverständigen
Trade mark Inspector's stamp
Signe du fournisseur Poinçon de l'inspecteurKunden-Bestell-Nr. 08663100200
Customer order no.
Cde no du client *Rev.1 15.11.2013BGH-Auftrags-Nr. 086631-002
BGH works no.
BGH referenceBGH
Q404.

FK

| | | | | | | | | | | | |
|---|---|---|----------------------------|-------------------------------------|--|---|--------|---------------------------------------|---|--------------------------------|--------|
| Erzeugnisform
Product | Stab, rund, geschält
Round bars, peeled | | | | | | | | | | |
| Werkstoff - Quality | UNS S32750 - F53 | | | | | | | | | | |
| Anforderungen
Requirements | UNS S32750 - F53 ASTM A 276 - 10
UNS S32750 - F53 ASTM A 182 / A 182M - 11a
UNS S32750 ASTM A 479 / A479M - 11
UNS S32750 NORSOK MDS - D 57 Rev. 4 09/10
UNS S32750 NACE MR 0175 ISO15156-1 2009
DGR 97/23/EG Anhang I, 4.3 durch NOBO 0036
BGH Freital ist nach NORSOK M-650, Rev. 3 für Stabstahl bis Abmessungen 120,65 mm (4.75") qualifiziert.
PED 97/23/EG Annex I, 4.3 by NOBO 0036
BGH Freital is qualified in accordance with NORSOK M-650, Rev. 3 for bars up to 120.65 mm (4.75") dia. | | | | | | | | | | |
| Besichtigung und Maßnachprüfung
Inspection and dimensional control
Inspection et contrôle de dimension | ohne Beanstandung
without objection | | | | | Erschmelzung/Nachbehandlung
Melting process/secondary refining
Mode d'élaboration/traitement ultérieur
E - VOD | | | Verwechslungsprüfung (spektroanalytisch)
Identification test (spectral analysis)
Examination d'identification/analyse spectrale
ohne Beanstandung
without objection | | |
| Pos.
Item | Anzahl
Quantity | Abmessung
Dimension | | | | Gewicht
Weight | | kg | Schmelz-Nr.
Heat No. | | |
| 2 | 25 | 28,575 RD | | | | 698 | | | 307087 | | |
| Schmelze
Heat | C | Si | Mn | P | S | Cr | Mo | Ni | Cu | N | PRE |
| 307087 | 0,021 | 0,44 | 0,80 | 0,025 | 0,0010 | 25,10 | 3,78 | 6,98 | 0,20 | 0,3000 | 42,374 |
| Wärmebehandlungszustand
Condition of heat treat | Lösungsgeglüht
solution annealed | | | | | | | | | | |
| Probe-Nr.
Test-No. | Lage
°C | Temp.
°C | RP0,2
N/mm ² | K _m
N/mm ² | | A4
% | 2
% | Kerbschlagarbeit
Impact value
J | Probenform
Shape of test piece
Charpy-V °C | Härte
Hardness
HRC / HBW | |
| Soll/Req. | L | RT | > 550 | > 800 | | > 25 | | > 45 | -46 | <= 32 / <= 310 | |
| 022HE1 | T | RT | 60% | 840 | | 42 | 80 | 120 | 329 | 315 | 46 |
| Prob-Nr.
Test-No. | Temp.
°C | later. Breitenexp. mm
later. expansion | | | Scherbruchant. %
shear fracture | | | | | | |
| 022HE1 | -46 | 2,3 2,4 2,3 | | | 100 100 100 (längs/longitudinal) | | | | | | |
| Korros.-Test ASTM G48 Meth.A: 50°C/24h: kein Lochfraß - no pitting is observed
corrosion test Meth.A: Gewichtsverlust/weight loss: 0,026 g/m ² | | | | | | | | | | | |
| Proben gebeizt (20% HNO ₃ + 5% HF, 60 °C, 5 Minuten)
Samples pickled (20% HNO ₃ + 5% HF, 60 °C, 5 minutes)
Beurteilung bei 20-facher Vergrößerung/assessment by 20x magnification | | | | | | | | | | | |
| Anagen
Enc.
Annex | US-certificate / Protokoll
Glühbesch./Heat treatment cer
Gefügeaufnahme/micrograph | | | | Freital, den
Place and date
Lieu et date
20.09.2012 | | | | Abnahmebeauftragter
Inspector representative
inspecteur de réception
Bremer | | |
| Das Zeugnis wurde maschinell erstellt und ist auch ohne Unterschrift gültig.
Ce certificat a été établi sur système informatique et est valide sans signature aussi. | | | | | | | | | | | |

APPROVED
By laia at 3:28 pm, 9/17/14



BGH

BGH Edelstahl Freital GmbH

Zeugnis-Nr. **355648**
Certificate no.
No. de certificat

Bescheinigung über Werkstoffprüfung nach DIN EN 10204
Certificate of material tests according to DIN EN 10204 **3.1**
Certificat des essais des matériaux selon DIN EN 10204

Die Lieferung entspricht den vereinbarten Lieferbedingungen.
Delivery in accordance with the agreed terms of delivery.
La livraison correspond aux conditions de livraison convenues.

Zeichen des Lieferwerkes Stempel des Werkstoffprüfstandortes
Trade mark Inspector's stamp
Signe du fournisseur Poinçon de l'inspecteur

Kunden-Bestell-Nr. **08663100200**
Customer order no.
Cde. no. du client ***Rev.1 15.11.2013**

BGH-Auftrags-Nr. **086631-002**
BGH works no.
BGH reference



BGH
Q404

Deltaferrit/ ferrite delta: Rand-near surface = 51%; D/2 mid thickness = 52%

Material wurde nicht reparaturgeschweißt/ material no weld repaired.

Material ist frei von Quecksilberverunreinigungen.
Material is free from mercury contamination.

*Kontrolle auf Radioaktivität ohne Befund, der Messwert liegt unter der
*Nachweisgrenze von 0,1 Bq/g.

*Radioactivity inspection without objection, the measured value is below the
*detection limit of 0.1 Bq/g.

*Verformungsgrad / amount of working: 14,8:1

Anlagen US-certificate / Protokoll
ENC. Glühbesch / Heat treatment per
Anlage Gefügeaufnahme/micrograph

Freital, den
Place and date
Lieu et date
20.09.2012

Abnahmebeauftragter
Inspector representative
inspecteur de réception
Bremer

Das Zeugnis wurde maschinell erstellt und ist auch ohne Unterschrift gültig.

This certificate was generated by data system and it is valid without signature as well.
Ce certificat a été établi sur système informatique et est valable sans signature aussi.

APPROVED

By laia at 3:28 pm, 9/17/14



BGH Edelstahl Freital GmbH

Kunden Bestell-Nr. **08663100200**
Customer order no.
Ordre no. du client **SI:086631_002**

BGH Auftrags-Nr. **434899-01**
BGH works no.
BGH référence

Zeugnis-Nr. **355648**
Certificate no.
No. de certificat

Erzeugnisform : Stab, rund, geschält
Product : Round bars, peeled
Werkstoff/Quality : UNS S32750 F53 Schmelze: 307087
Abmessung/Dimension: 28,575 RD
Anzahl/Quantity : 25 Gewicht /Weight : 698 kg
Wärmebehandlungszustand : lösungsgeglüht
Condition of heat treat : solution annealed

Prüfrichtlinie

Specification

US: nach A388/A 388 M (latest Revision)
(KSR/FBH max. 1,5 mm)

Bearbeitungszustand : geschält
Machining condition : peeled

Prüfgerät : Krautkrämer ROWA PAT 160 VIS
Test equipment

Prüfkopf : 4 Arrays á 90° - Radius: 57,5mm
16 Elemente - 5 MHz

Probe

Kopplungsmittel : Wasser
Coupling medium : water

Prüfumfang : vollständig
Extent of examination : completely

Einschallrichtung : senkrecht und in Winkelschallung 45°
Direction of incidence : perpendicular and angle beam 45°

Registriergrenze : Prüfung und Justierung erfolgten gemäß obiger Spezifikation.
Registration level : Test and adjustment acc. to a. n. specification.

Befund : keine registrierpflichtigen Anzeigen
Result : no reportable indications

Prüfdatum : 13.09.2012
Examination date

Freital, den
Place and date
Lieu et date
21.09.12

Prüfer
Testing operator
Opérateur
Richter O.
Stufe 2 EN 473

Abnahmebeauftragter
Inspector representative
Inspecteur de réception
JUNGKUNZ
Level III SNT-TC 1A

Überwacher
Supervisor
Surveilleur
BGH
Q414

Das Zeugnis wurde maschinell erstellt und ist auch ohne Unterschrift gültig.

This certificate was generated by data system and it is valid without signature as well.
Ce certificat a été établi sur système informatique et est valide sans signature aussi.

APPROVED

By laia at 3:28 pm, 9/17/14

Wärmebehandlungsbescheinigung

Heat treatment certificate

Attestation de traitement thermique



BGH Edelstahl Freital GmbH

Kunden Bestell-Nr. **08663100200**
Customer order no.
Cde. no. du client **SI:086631_002**

BGH Auftrags-Nr. **43489901**
BGH works no.
BGH reference

Zeugnis-Nr. **355648**
Certificate no.
No. de certificat

Wärmebehandlungszustand: **lösungsgeglüht**
Condition of heat treatment: **solution annealed**
État de traitement thermique: **recuit de mise en solution**

Datum:
Date: **02.08.2012**
Date:

Ofen-Nr.:
Furnace no.: **474**
No. du four:

Aufheizzeit:
Heating up time: **4,5 h**
Temps de montée en température:

Haltetemperatur:
Holding temperature: **1100 °C**
Température de maintien:

Haltezeit:
Holding time: **2 h**
Temps de maintien:

Abkühlmedium:
Quenching medium: **Wasser / water / eau (<260 °C)**
Moyen de refroidissement:

Datum:
Date:
Date:

Ofen-Nr.:
Furnace no.:
No. du four:

Haltezeit:
Holding time:
Temps de maintien:

Abkühlmedium:
Quenching medium:
Moyen de refroidissement:

Wärmebehandlungs-Nr.: **474/3512 (022HE)**
Heat treatment lot no.:
No. du lot de traitement thermique:

gemäß ASTM A182

APPROVED

By Iaia at 3:29 pm, 9/17/14

Diagramm:
Diagram:
Diagramme

Datum:
Date: **21.09.2012**
Date:

Abnahmebeauftragter
Inspector representative
Inspecteur de réception
JUNGKUNZ

BGH
Q414

Das Zeugnis wurde maschinell erstellt und ist auch ohne Unterschrift gültig.

This certificate was generated by data system and it is valid without signature as well.
Ce certificat a été établi sur système informatique et est valable sans signature aussi.

追蹤號碼：



尚智貿易股份有限公司 AJEI International Co. Ltd.

新竹縣湖口鄉榮光路160號

NO. 160, Rongguang Rd., Hukou Township, Hsinchu County 303 TAIWAN, R.O.C

DTQ08-163

TEL : 03-598 2916

FAX : 03-598 2917

INSPECTION CERTIFICATE

Grade 材質 : UNS S32750/F53

Certificate No : EI130094

Heat NO. 爐號 : 381463

Lot NO. 批號 : 205AM1/206AM1

Date : 2013.12.25

Weight : 5630 Kg

Dimension : 65 mm

P'cs : 40 PCS

Condition : hot rolled annealed, peeled round bar

58256

APPLICABLE SPECIFICATIONS 適用規範：

ASTM A276-10 ;

ASTM A182/A182M-12a

ASTM A479/A479M -11 ;

NORSOK MDS D57 REV.4 09/10 ;

NACE MR0175/ISO 15156-1 2009 ;

MELT PROCESS 熔煉過程：E-VOD

SOLUTION TREATMENT 熱處理：

1100°C 2hours. water quenching

CHEMICAL COMPOSITION IN WEIGHT % 元素含量百分比

| | C | Si | Mn | P | S | Cr | Mo | Ni | N | Cu | | PRE | | |
|---------|-------|------|------|-------|--------|-------|------|------|--------|------|--|--------|--|--|
| Min. | | | | | | 24.00 | 3.00 | 6.00 | 0.2400 | | | | | |
| Max. | 0.030 | 0.80 | 1.20 | 0.035 | 0.0200 | 26.00 | 5.00 | 8.00 | 0.3200 | 0.50 | | | | |
| Result. | 0.024 | 0.40 | 0.82 | 0.025 | 0.0008 | 25.25 | 3.81 | 6.88 | 0.2940 | 0.24 | | 42.527 | | |

TENSILE TEST 拉伸測試

| | YIELD STRENGTH
降伏強度 | TENSILE STRENGTH
(Mpa)
拉伸強度 | ELONGATION
(%)
拉伸比 | R.A.
(%)
斷面收縮率 |
|--------------|------------------------|-----------------------------------|--------------------------|----------------------|
| | Rp0.2
≥515 | Rm
≥760 | A4 2"
≥15 | Z |
| Probe1 test1 | 561 | 813 | 44 | 80 |
| test2 | 553 | 820 | 44 | 79 |

MECHANICAL PROPERTIES 機械性質

| | Hardness
硬度測試 | Impact test
(J)
衝擊測試 | later. expansion
(mm)
側膨脹值 | shear fracture
(%) |
|---------------|----------------------------|---|-----------------------------------|-----------------------------------|
| | 1/2R
HRC HB
≤32 ≤310 | 1/2RL (°C) T(°C)
RT -46 -50 -101
≥100 ≥45 ≥45 ≥45 | longitudinal (°C)
-46 -50 -101 | longitudinal (°C)
-46 -50 -101 |
| Probe 1 test1 | 22 253 | 325 | 2.2 | 100 |
| test2 | | 295 | 2.1 | 100 |
| test3 | | 330 | 2.2 | 100 |
| Probe 2 test1 | 22 254 | 296 | 2.1 | 100 |
| test2 | | 328 | 2.2 | 100 |
| test3 | | 303 | 2.1 | 100 |

NOTE:

APPROVED

By laia at 3:29 pm, 9/17/14

P04-28A

追蹤號碼：



尚智貿易股份有限公司
AJEI International Co. Ltd.
新竹縣湖口鄉榮光路160號

NO. 160, Rongguang Rd., Hukou Township, Hsinchu County 303 TAIWAN, R.O.C
TEL : 03-598 2916 FAX : 03-598 2917

DTQ08-163

INSPECTION CERTIFICATE

Grade 材質 : UNS S32750/F53

Heat NO. 爐號 : 381463

Weight : 5630 Kg

Condition : hot rolled annealed, peeled round bar

Lot NO. 批號 : 205AM1/206AM1

Dimension : 65 mm

Certificate No : EI130094

Date : 2013.12.25

P'cs : 40 PCS

Remark備註

tensile test and hardness test temperature in RT

corrosion test(acc. to ASTM G48 Meth. A 50°C/24H.):no pitting observed, weight loss 0.026 g/m²

sample pickles (20% HNO₃+5%HF60°C 5minutes pickled) : assesment by 20 times magnification

ferrite delta (ASTM E562):near surface 46/47% midr radius 50/47%

no weld repaired.

Radioactivity inspection without objection, the measured value is below the detection limit of 0.1 Bq/q

amount of working : 42:1

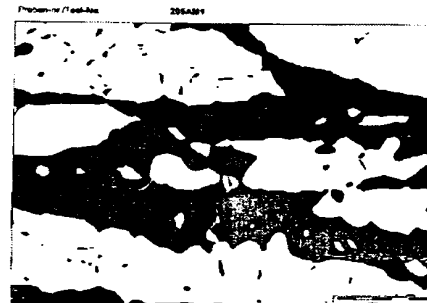
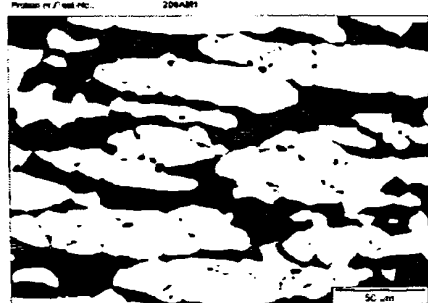
inspection of identification and dimension: without objection

ultrasonic- test acc. to ASTM A388(KSR/FBH max. 3mm): no objection.

PED 97/23/EC A/nnex I, 4.3 by Notified Body 0036

Manufacturer complies with NORSOK M-650 up to 120.65mm & EN10204 3.1

Microstructure free from intermetallic phases or other detrimental phases



ISO 9001 : 2008 品質證明專用章

尚智貿易有限公司

出貨單號：

出貨日期：

P.O.NO.：

APPROVED

By laia at 3:30 pm, 9/17/14

P04-28A



BGH Edelstahl Freital GmbH

Zeugnis-Nr. 363294
Certificate no.
No. de certificat

Bescheinigung über Werkstoffprüfung nach DIN EN 10204
Certificate of material tests according to DIN EN 10204 3.1
Certificat des essais des matériaux selon DIN EN 10204

Die Lieferung entspricht den vereinbarten Lieferbedingungen.
Delivery in accordance with the agreed terms of delivery.
La livraison correspond aux conditions de livraison convenues.

Zeichen des Lieferwerkes Stempel des Werkstoffverständigen
Trade mark Inspector's stamp
Signe du fournisseur Poinçon de l'inspecteur



BGH
Q421

58256

Kunden-Bestell-Nr. 08791600300
Customer order no.
Cde. no. du client *Rev.1 15.11.2013

BGH-Auftrags-Nr. 087916-003
BGH works no.
BGH reference

| | | | | | | | | | | | |
|--|--|------------------------|-------------------|---|------------------|--|----------------------------------|--|-------------------|--------|----------|
| Erzeugnisform
Product | Stab, rund, geschält
Round bars, peeled | | | | | | | | | | |
| Werkstoff / Quality | UNS S32750 - F53 | | | | | | | | | | |
| Anforderungen
Requirements | UNS S32750 - F53 ASTM A 276 - 10
UNS S32750 - F53 ASTM A 182 /A 182M - 12a
UNS S32750 ASTM A 479 /A479M - 11
UNS S32750 NORSOK MDS - D 57 Rev. 4 09/10
UNS S32750 NACE MR 0175 ISO15156-1 2009
DGRL 97/23/EG Anhang I, 4.3 durch NOBO 0036
BGH Freital ist nach NORSOK M-650, Rev. 3 für Stabstahl bis Abmessungen 120,65 mm (4.75") qualifiziert.
PED 97/23/EG Annex I, 4.3 by NOBO 0036
BGH Freital is qualified in accordance with NORSOK M-650, Rev. 3 for bars up to 120.65 mm (4.75") dia. | | | | | | | | | | |
| Besichtigung und Maßnachprüfung
Inspection and dimensional control
Inspection et contrôle de dimension
ohne Beanstandung
without objection | Erschmelzung/Nachbehandlung
Melting process/secondary refining
Mode d'élaboration/traitement ultérieur
E - VOD | | | | | Verwechslungsprüfung (spektralanalytisch)
Identification test (spectral analysis)
examination d'identification/analyse spectrale
ohne Beanstandung
without objection | | | | | |
| Pos.
Item | Anzahl
Quantity | Abmessung
Dimension | | Gewicht
Weight | | Schmelz-Nr.
Heat No. | | | | | |
| 3 | 40 | 65,00 RD | | 5630 | | 381463 | | | | | |
| Schmelze
Heat | C | Si | Mn | P | S | Cr | Mo | Ni | Cu | N | PRE |
| 381463 | 0,024 | 0,40 | 0,82 | 0,025 | 0,0008 | 25,25 | 3,81 | 6,88 | 0,24 | 0,2940 | 42,527 |
| Wärmebehandlungszustand
Condition of heat treat | Lösungsgeglüht
solution annealed | | | | | | | | | | |
| Probe-Nr. | Lage | Temp. | Rp0,2 | Rm | A4 | Z | Kerbschlagarbeit
Impact value | Probenform
Shape of test piece | Härte
Hardness | | |
| Test-No. | | °C | N/mm ² | N/mm ² | % | J | Charpy-V °C | HRC / HBW | | | |
| Seitl./Req. | L | RT | > 550 | > 760 | > 25 | > 45 | -16 | <= 32 / <= 310 | | | |
| 205AM1 | T | RT | 561 | 813 | 44 | 20 | 275 | 295 | 330 | -46 | 22 / 214 |
| 206AM1 | L | RT | 553 | 820 | 44 | 79 | 296 | 328 | 303 | 46 | 22 / 214 |
| Prob.-Nr. | Temp. | later. Breitung mm | | | Scherbruchant. % | | | | | | |
| Test-No. | °C | later. expansion | | | shear fracture | | | | | | |
| 205AM1 | -46 | 2,2 | 2,1 | 2,2 | 100 | 100 | 100 | (längs/longitudinal) | | | |
| 206AM1 | -46 | 2,1 | 2,2 | 2,1 | 100 | 100 | 100 | (längs/longitudinal) | | | |
| 205AM1: 206AM1: | | | | | | | | | | | |
| Deltaferrit/ferrite delta ASTM E562: Rand / near surface: 46% 47% | | | | | | | | | | | |
| D/4 / mid radius: 50% 47% | | | | | | | | | | | |
| Korros.-Test ASTM G48 Meth.A: 50°C/24h: kein Lochfraß/no pitting is observed | | | | | | | | | | | |
| Antrag
Enc.
Antrag | US-certificate / Protokoll
Glühbesch / Heat treatment cer
Gefügeaufnahme/micrograph | | | Freita, den
Place and date
Lieu et date
12.02.2013 | | | | Abnahmebeauftragter
Inspector representative
Inspecteur de réception
Bremer | | | |
| Das Zeugnis wurde maschinell erstellt und ist auch ohne Unterschrift gültig.
Ce certificat a été établi sur système informatique et est valable sans signature aussi. | | | | | | | | | | | |

APPROVED

By laia at 3:31 pm, 9/17/14



BGH

BGH Edelstahl Freital GmbH

Zeugnis-Nr. 363294
Certificate no.
No. de certificat

Beschreibung über Werkstoffprüfung nach DIN EN 10204
Certificate of material tests according to DIN EN 10204 **3.1**
Certificat des essais des matériaux selon DIN EN 10204

Die Lieferung entspricht den vereinbarten Lieferbedingungen.
Delivery in accordance with the agreed terms of delivery.
La livraison correspond aux conditions de livraison convenues.

Zeichen des Lieferwerkes **Stempel des Werkstoffsachverständigen**
Trade mark Inspector's stamp
Signe du fournisseur Poinçon de l'inspecteur



BGH
Q421

Kunden-Bestell-Nr. 08791600300
Customer order no.
Cde. no. du client ***Rev.1 15.11.2013**

BGH-Auftrags-Nr. 087916-003
BGH works no.
BGH reference

corrosion test Meth.A: Gewichtsverlust/weight loss: 0,026 g/m²
Beurteilung bei 20-facher Vergrößerung/assessment at 20 times magnification
Proben gebeizt (20% HNO₃ + 5% HF, 60 °C, 5 Minuten)
Samples pickles (20% HNO₃ + 5% HF, 60 °C, 5 minutes)

Material wurde nicht reparaturgeschweißt.
Gefüge frei von intermetallischen und anderen schädlichen Phasen.
Material ist frei von Quecksilberverunreinigungen.

Material no weld repaired.
Microstructure free from intermetallic or other detrimental phases.
Material is free from mercury contamination.

*Kontrolle auf Radioaktivität ohne Befund, der Messwert liegt unter der
*Nachweisgrenze von 0,1 Bq/g.
*Radioactivity inspection without objection, the measured value is below the
*detection limit of 0.1 Bq/g.

*Verformungsgrad / amount of working: 42:1

Anlagen US-certificate / Protokoll
Enc. Glühbesch / Heat treatment cer
Annexe Gefügeaufnahme/micrograph

Freital, den
Place and date
Lieu et date
12.02.2013

Abnahmebeauftragter
Inspector representative
inspecteur de réception
Bremer

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By IaiA at 3:31 pm, 9/17/14

Ultraschallprüfung
Ultrasonic testing

DIN EN 10204-01/05 3.1



BGH Edelstahl Freital GmbH

Kunden Bestell-Nr. **08791600300**
Customer order no.
Cde. no. du client **SI:087916_003**

BGH Auftrags-Nr. **536947-01**
BGH works no.
BGH reference

Zeugnis-Nr. **363294**
Certificate no.
No. de certificat

Erzeugnisform : Stab, rund, geschält
Product : Round bars, peeled
Werkstoff/Quality : UNS S32750 F53 Schmelze: 381463
Abmessung/Dimension: 65,00 RD
Anzahl/Quantity : 40 Gewicht /Weight : 5630 kg
Wärmebehandlungszustand : lösungsgeglüht
Condition of heat treat : solution annealed

Prüfrichtlinie

Specification

US: nach A388/A 388 M (latest Revision)
(KSR/FBH max. 3 mm)

Bearbeitungszustand : geschält
Machining condition : peeled

Prüfgerät : Deutsch-STPS Echograph 1135
Test equipment

Prüfkopf : 15XTS12WB4
Probe

Kopplungsmittel : Wasser
Coupling medium : water

Prüfumfang : vollständig
Extent of examination : completely

Einschallrichtung : senkrecht und in Winkelschallung 40°
Direction of incidence : perpendicular and angle beam 40°

Registriergrenze : Prüfung und Justierung erfolgten gemäß obiger Spezifikation.
Registration level : Check and adjustment were carried out according to specification.

Befund : keine registrierpflichtigen Anzeigen
Result : no reportable indications

Prüfdatum : 10.02.2013
Examination date

Freital, den
Place and date
Lieu et date
12.02.13

Prüfer
Testing operator
Opérateur
Leiblich
Stufe 2 EN 473

Abnahmebeauftragter
Inspector representative
Inspecteur de réception
JUNGKUNZ
Level III SNT-TC 1A

Überwacher
Supervisor
Surveilleur
BGH
Q414

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By laia at 3:31 pm, 9/17/14

Wärmebehandlungsbescheinigung
Heat treatment certificate
Attestation de traitement thermique



BGH Edelstahl Freital GmbH

Kunden Bestell Nr. **08791600300**
Customer order no.
Cde. no. du client **SI:087916_003**

BGH Auftrags-Nr. **53694701**
BGH works no.
BGH référence

Zeugnis Nr. **363294**
Certificate no.
No. de certificat

Wärmebehandlungszustand: **lösungsgeglüht**
Condition of heat treatment: **solution annealed**
État de traitement thermique: **recuit de mise en solution**

Datum:
Date: **31.01.2013**
Date:

Ofen-Nr.:
Furnace no.: **722**
No. du four:

Aufheizzeit:
Heating up time: **3 h**
Temps de montée en température:

Haltezeit:
Holding temperature: **1100 °C**
Température de maintien:

Haltezeit:
Holding time: **2 h**
Temps de maintien:

Abkühlmedium:
Quenching medium: **Wasser / water / eau (<260 °C)**
Moyen de refroidissement:

Datum:
Date:
Date:

Ofen-Nr.:
Furnace no.:
No. du four:

Haltezeit:
Holding time:
Temps de maintien:

Abkühlmedium:
Quenching medium:
Moyen de refroidissement:

Wärmebehandlungs-Nr.: **722/2143**
Heat treatment lot no.:
No. du lot de traitement thermique:
acc. to ASTM A182

APPROVED

By laia at 3:31 pm, 9/17/14

Diagramm:
Diagram:
Diagramme:

Datum:
Date: **12.02.2013**
Date:

Abnahmebeauftragter
Inspector representative
Inspecteur de réception
JUNGKUNZ

BGH
Q414

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