

PD 64645 FL 300710P #21854

WESTERN FORGE & FLANGE CO.

687 COUNTY ROAD 2201
CLEVELAND, TX 77327
PH (281) 727-7000 FAX (281) 727-7062



CERTIFIED MATERIAL TEST REPORT

CERTIFIED IAW EN10204 3.1 (MADE IN USA)

TO: T.W. METALS INC.	WFF SO NO: 22622-3
PO: D75113087	HEAT NO: 2650 2 6826
SPECIFICATIONS: ASTM B564-11, B446-03 N06625 GRADE-2 (SOLUTION ANNEALED) FORGED PER B564 PRACTICE H.T. (GRADE 2) & MECH. PER B446 DIM/TOL PER ASME B16.5-2009	

QTY	ITEM DESCRIPTION
2	4" 600# WN RF S80
	GAYESCO PO# 64645

TYPE	C	MN	P	S	SI	NI	CR	MO	NB+TA
N06625	.031	.28	.009	<.002	.17	60.59	21.63	8.63	3.55
MILL	FE	AL	TI						
Haynes Int'l	4.42	.16	.29						

HEAT NO.	YIELD .2% OFF-PSI	TENSILE-PSI	% ELONG	% RED AREA	HARDNESS	GRAIN SIZE (ASTM)
2650 2 6826	55,250	122,740	62.0	60.9	194 HBW	
	GMI Lab#	58498				

- NO WELDING PERFORMED ON THE FORGINGS OF THIS ORDER.
- MATERIAL HEREIN IS CERTIFIED FREE FROM ANY FORM OF MERCURY, RADIUM OR ALPHA PARTICLE CONTAMINATION THROUGHOUT ALL PHASES OF MANUFACTURE AND SHIPMENT.
- Solution annealed for 1-½ hours @ 2050°F and water quenched.
- The forgings on this order conform to the specified dimensional requirements.
- The forgings on this order were manufactured IAW WFF QA Program WF08.10 Rev. 04 dated 04/17/13 as audited & approved by DNV (Notified Body) IAW PED Annex-I Section 4.3.

WE CERTIFY THE MATERIAL DESCRIBED HEREIN HAS BEEN MANUFACTURED, TESTED AND EXAMINED IAW AND MEETS ALL THE REQUIREMENTS OF ABOVE PURCHASE ORDER AND REFERENCED SPECIFICATIONS.

09/05/2013

DATE

Rose Kay

ROSE KAY, QUALITY ASSURANCE ASSISTANT
WESTERN FORGE & FLANGE CO.

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RECERTIFIED
TO ASME

SB564

PMI

9/13/13

CERTIFICATION OF TESTS • RAPPORT D'ESSAIS CERTIFIE • WERKSZEUGNIS					
Sales Order No Reference Commande Bestellungs Nr 672946003-0	Date Entered Date De Commande Bestelldatum 12/21/12	Customer Reference Reference Client Kundenbestelldaten 10591	Report No. Rapport No Zeugnis Nr 20121228063	Pages of Pages Page de Pages Anzahl der Seiten 2 Of 3	

HAYNES
International

CUSTOMER COPY
Haynes International
1020 West Park Avenue
PO Box 9013
Kokomo, Indiana, 46902

Tensile Test at Room Temperature • Essai De Traction A Temp. Ambiante • Zugversuch Bei Raum Temp.						Tensile Test at Elevated Temperature • Essai De Traction A Hie.Temp. Warm Zugversuch						Stress Rupture Temperature • Essai A Charge De Rupture Zeistandversuch					
Ultimate Zugfestigkeit	1% Yield Lim. Elast. A 1% 1% Streckgrenze	0.2% Yield Lim. Elast. A 0.2% 0.2% Streckgrenze	% Elong In % Allong EN % Dehnung	%RA		Test Essai Versuch	Ultimate Zugfestigkeit	1% Yield Lim. Elast. A 1% 1% Streckgrenze	0.2% Yield Lim. Elast. A 0.2% 0.2% Streckgrenze	% Elong In % Allong EN % Dehnung	%RA	Test Essai Versuch	Stress Contrainte Spannung	Hours Heures Stunden	% Elong In % Allong EN % Dehnung	% RA	
138000 PSI		77000 PSI	41 %	46 %	1)A)	Temp:						Temp:					

Annealed Hardness Durete Recuit Gegluht Haerte	Aged Hardness Durete Vieilli Gealtert Haerte		Grain Size Grosseur De Grain Korngrösse					IGA	Uniformity	Corrosion Rate		Oxidation Rate	Charpy Impact Test				Creep Rupture				
			Grain Size	Predominant Grain Size	Recry. Grain	Unrecry. Grain %	ALA	P&W Figure Number	Attack Depth	Corrosion	Test Method		Toughness Avg	Toughness 1	Toughness 2	Toughness 3	Test Essai Versuch	Stress Contrainte Spannung	Hours Heures Stunden	% Elong In % Allong EN % Dehnung	% Elong @ 15 Hrs
98 HRBW		1)A)	7							MPY			Ft. Lbs.	Ft. Lbs.	Ft. Lbs.	Ft. Lbs.	Temp:	PSI			

Certified By • Certifié Par • Bescheinigt Durch: Chuck Stansell
Certification Technician

12/28/2012

1) 136536321

Chuck J. Stansell

WFF
QA REVIEW
Approved: *PK*
Date: 01/10/13

CERTIFICATION OF TESTS • RAPPORT D'ESSAIS CERTIFIÉ • WERKSZEUGNIS

Sales Order No Reference Commande Bestellungs Nr 672946003-0	Date Entered Date De Commande Bestelldatum 12/21/12	Customer Reference Reference Client Kundenbestelldaten 10591	Report No. Rapport No Zeugnis Nr 20121228063	Pages of Pages Page de Pages Anzahl der Seiten 3 Of 3
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HAYNES
International

CUSTOMER COPY

Haynes International
1020 West Park Avenue
PO Box 9013
Kokomo, Indiana, 46902

All tests and inspections have been performed and results meet specification requirements.

THIS MATERIAL IS FREE FROM MERCURY, CADMIUM, RADIUM, AND ALPHA SOURCE CONTAMINATION.

THIS MATERIAL WAS MELTED AND MANUFACTURED IN THE UNITED STATES.

When microstructure analysis is performed, the etchant used is H2O2 and HCl. Samples were viewed at 100-500x magnification. Grain size evaluation is performed to the requirements of ASTM E112- 96(2004)e2 Plate 1. Samples are prepared per ASTM E3-01. The material has been evaluated for alloy depletion.

No welding performed on this material.

This material was air melted followed by consumable remelting.

Material has NOT been annealed.

Test results were obtained from an upset forged sample.

Supplied billet stock is capable of meeting mechanical and chemistry requirements of ASTM-B-564.

Mill Orders Used: 1365363211 (5302 LB)

A) 1700 °F to 1900 °F

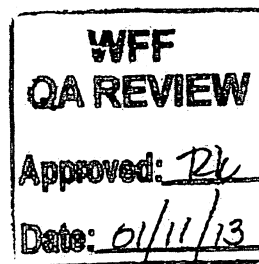
Method of Chemistry Analysis for Heat# 26826 BUTT END *04: O.E. (Al,P,Si); LECO (C,S); XARL LINFIT (CBTA,Co,Cr,Fe,Mn,Mo,Ni,Ti);

Certified By • Certifié Par • Bescheinigt Durch: Chuck Stansell

12/28/2012

Certification Technician

Chuck J. Stansell





GILL Metallurgical Inc.

691 County Road 2201
Cleveland, TX 77327
Ph. 281-593-0807 Fax 281-593-0907
WWW.GILLMET.COM



ISO 9001:2008

CERTIFIED TEST REPORT

Customer: Western Forge & Flange Co.
687 County Road 2201
Cleveland, TX 77327
Attention: Rose Kay

Test Report No: 58498
Revision: A
Report Date: 09/05/13
Customer PO No: M33777

Specification: B564-11, B446-03
Material: N06625
Heat ID: 2650 2 6826
Description: Item 3: 4" 600#WN
Reference: T. W. Metals Inc. PO# D75113087

TENSILE TEST RESULTS

S/N	DIMENSIONS		YIELD		TENSILE		ELONGATION		REDUCTION AREA	
	WIDTH (INCH)	AREA (INCH ²)	LOAD (LBS)	Y.S. (PSI)	LOAD (LBS)	T.S. (PSI)	INCH	%	RED WIDTH	%
1	.502	.198	10934	55250	24291	122740	3.241	62.0	.314	60.9
MAXIMUM REQUIREMENT:										
MINIMUM REQUIREMENT:				40,000		110,000		30		
LOCATION: AS SUPPLIED			YIELD STRENGTH AT: .2% OFFSET			GAGE LENGTH: 2" (4D)				

HARDNESS TEST RESULTS

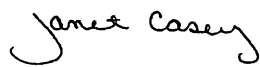
HARDNESS REQUIRED:		ACTUAL HARDNESS:	194 HBW
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Hardness results are an average of at least three readings. Where applicable, hardness results were converted using ASTM E140.

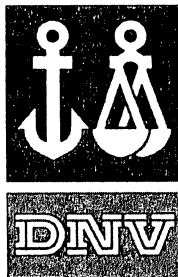
QMS Rev. 3 dated 04/27/12; ISO 9001:2008 Registered; ABS Q.E. Certificate No: 47342; also audited and approved by WFF on 10/20/12 applies.

MATERIAL CONFORMS TO SPECIFICATION



Certified by: 
Janet M. Casey
Assistant Quality Manager

The information contained in this certification represents only the material submitted and is certified only for the quantities tested. Reproduction except in full is reserved pending written approval. All test specimens and testing conforms to applicable ASTM test methods in effect at the time of testing, unless otherwise stated. The recording of false, fictitious, or fraudulent statements or entries on the certificate may be punishable as a felony under federal law. All testing was performed in a mercury free environment.



DET NORSKE VERITAS

MATERIAL MANUFACTURE CERTIFICATE

*Application of the Council Directive 97/23/EC of 29 May 1997 on Pressure Equipment,
as amended.*

CERTIFICATE NO. 50137-2009-CE-HOU-DNV REV. 1

This Certificate consists of 5 pages

This is to verify that

WESTERN FORGE AND FLANGE COMPANY

691 County Road 2201,
Cleveland, TX 77327, USA

*has implemented and is maintaining a certified quality assurance system
which has undergone a*

SPECIFIC ASSESSMENT FOR MATERIALS

*for applications covered by Council Directive 97/23/EC of 29 May 1997
on Pressure Equipment, and is found to comply with Annex 1, section 4.3, for*

ACCEPTANCE OF TYPE 3.1 MATERIAL CERTIFICATES ACCORDING TO EN 10204:2004

The specific assessment for materials has been carried out according to
Det Norske Veritas AS' Technical Information No. MT 05:01E/C

Applications/Limitations:

See page 2

Place and date:

Høvik, 2012-04-16

This Certificate is valid until:

2015-04-16

 **DET NORSKE VERITAS AS**

Giorgio Saia

Acting Head of Section NACNO378

Michael D. Norman
Technical Reviewer

Notice: The certificate is subject to terms and conditions overleaf. Any significant changes in design or construction may render this certificate invalid.

The digitally signed and electronically distributed document is the original and valid certificate. Ref.: www.dnv.com/digitalsignatures

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 300 000. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

ABS Quality Evaluations

Certificate Of Conformance

This is to certify that the Quality Management System of:

Western Forge & Flange Co.

687 County Road 2201

Cleveland, TX 77327

U.S.A.

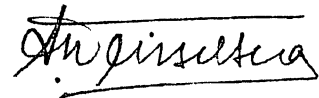
has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:

ISO 9001:2008

The Quality Management System is applicable to:

MANUFACTURER OF FORGINGS AND FLANGES

Certificate No: 48137
Effective Date: 18 May 2013
Expiration Date: 17 May 2016
Revision Date: 18 May 2013



Alex Weisselberg, President



Validity of this certificate is based on the periodic audits of the management system defined by the above scope and is contingent upon prompt, written notification to ABS Quality Evaluations, Inc. of significant changes to the management system or components thereof.

ABS Quality Evaluations, Inc. 16855 Northchase Drive, Houston, TX 77060, U.S.A.

Validity of this certificate may be confirmed at www.abs-qe.com/cert_validation.

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Receiving Inspection / PMI Report



TEMPERATURE SPECIALISTS

VC: <u>JWMEJ</u>	Date: <u>9/12/13</u>	Time In: <u>11:15 AM</u>
Gayesco PO #: <u>64645</u>	SO#: _____	Customer or Stock: <u>BR 94463P, FL05098SP</u>
Description: <u>1 Bar Round 6 5/8 Forging A625 Grade 2 Heat treated 3 Flange 1/2" 600# RFWN 8280 AEC</u> <u>A625 4 Flange 4" 600# RFWN 8280 A625 Grade 2 Heat treated PED</u>		

Item	Qty	Log #	Brief Description	Specified Alloy	Heat #	Read #	Cr	Ni	Mn	Fe	Nb	Mo	Ti	PMI/Grade Results <small>PMI Instrument used Niton XRF, XL3t S/N 84931</small>	% Done
1	10"	21852	Roll Bar 6 5/8	A625	2650 2 6826	9-10	21.75	61.36			3.50	8.20		PMI	100
3	2	21853	Flange 1/2" 600# RFWN	A625	2650 2 6827	11-12	21.50	61.60			3.54	8.50			100
4	2	21854	Flange 4" 600# RFWN	A625	2650 2 6826	13-14	21.25	61.10			3.62	8.40			100

MTRs Reviewed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	By: <u>[Signature]</u> Date: <u>9/13/13</u>
Radiation Check Per Procedure WI-10017 $\leq 3\mu$ Sv/hr. <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Dimensional and/or Visual Inspection performed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

List Any Discrepancies or Nonconformances: N/A

Action Taken: N/A

Status: (Circle One) Accepted Rejected Accept As Is Return to vendor Pending

Comments: _____

Inspector: <u>[Signature]</u>	Date: <u>9/13/13</u>	Time Out: <u>10:00 AM</u>
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