



4-418

SERIAL NUMBER: 4-419 COOK DATE: _____

MOLD SIZE _____ BY _____ PO 4011547

ORDER DATE 11NOV24 SHIP DATE: 12NOV24

FOR: WFR

SIZE 2.350 TYPE MX

THREAD 1" MT OTHER 4 Blade Convex

MATRIX (H) 36846 WEIGHT _____

MATRIX (S) 36844 WEIGHT _____

BINDER 335231 WEIGHT _____

BLANK 1000 217219 TJ 199169

BILLET _____ TUBE _____

WELD Ro MPI SM/Ro MPI PIC SM/Ro BRAZE Richard

THREAD GAGE 1" MT STAND OFF .380

FINAL DIAMOND GRIND SIZE 2.350

LENGTH TO WELD _____

FINISHED PIC TAKEN BY Ro/SM CRATED BY Ro DATE: _____

International _____ domestic _____

SHORT BIT & TOOL CO
225 GOLD STREET
GARLAND TX 75042
972-205-1011
shortbits@gmail.com



Certificate of Conformance

Serial Number	Size	Type	Steel or Matrix	Shank Diameter	Bore
U-418, U-419	2.350	MX	Matrix		

Component	Material	Vender	Lot or Heat Number
Blank	8620	RHW	1000217219
Hard Powder	WC	SURFACE	36846
Soft Capping Powder	W2	SURFACE	36844
Tool Joint	4130	RHW	199169
MIG Weld			
Tubing			

Inspection							
Diamond Grinding To Size							
Weld MPI							
Thread Gaging				1" MT			

Signed By: *P. Boeggs* date: *11/15/2024*



Surface Engineering Powders Certified Material Test Report

Company Short Bits P.O.#: Vickie
 Alloy Type: PWMP010 Size: 80/325 Mesh: 80/325 Micron: 180/45um
 Description MATRIX POWDER H Quantity: 50lbs
 Specification N/A Type/Class: N/A
 Heat Number SE-36846

Chemical Analysis Actual: x Nominal:

The data contained herein were obtained from samples considered to be representative of the products in the subject shipment and are believed to be reliable. All operations performed comply with the material specification and the purchase order.

Element Concentrations (Weight Percent)

Al: B: Be: C: 5.6 Co: Cr: Cu: Fe: 0.16
 Mn: Mo: N2: Nb: Ni: 2.02 O2: P: S:
 Si: Ta: Ti: V: W: Bal Wc: TAO:

Other: Fc:0.03 Analytical Process(es):

Sampling Procedure / Spec: ASTM B215-10 Powder Mesh / Spec: ASTM B214-07-2011
 Hall Flow / Spec: ASTM B213-13 Apparent Density / Spec: ASTM B212-13

Physical Properties

Material Hardness Scale: Rc: N/A HB: Hv: Hk:

Hall Flow N/A Sec./50g Apparent Density: 7.3 g/cm3

Particle Size Distribution: Size Microns(um)/U.S. Sieve (mesh)

180/80:	4.45	150/100:	125/120:	13.25	106/140:
90/170:	13.90	75/200:	63/230:	17.15	53/270:
45/325:	17.00	38/400:	32/450:	25/500:	
20/635:		15/800:	+10:	+5:	

Other:

Surface Engineering Alloy Company hereby certifies the above listed material meets all requirements of the above listed specifications in addition to the confirmation that during the manufacturing process, testing, and inspection, the product was completely void of contact with the element Mercury or any of its compounds. In addition, this certification validates that all test results and operations performed by Surface Engineering Alloy Company, or its subcontractors, are in compliance with the material specification and the specific applicable material requirements of ASME SFA 5.21, of ASME Section II. The requirements of Federal Law, Title 18, Chapter 47 apply to this order and to sub-tier suppliers.

Reporting Officer
 Michael Russell

7/30/2024
 Date

SM-1000-CERT-P Rev A 4/18/2023

2895 46th Ave North
 St. Petersburg, FL
 Main Office: 727.528.7998
 www.surfaceengineering.com



Surface Engineering Powders Certified Material Test Report

Company Short Bits _____ P.O.#: Vickie _____
 Alloy Type: PWCTPM002 Size: 80/325 Mesh: 80/325 Micron: -180/+45um
 Description CTPM CRYSTALLINE W 80 X 325 MESH Quantity: 150lbs
 Specification N/A Type/Class: N/A
 Heat Number SE-36844

Chemical Analysis Actual: X Nominal: _____

The data contained herein were obtained from samples considered to be representative of the products in the subject shipment and are believed to be reliable. All operations performed comply with the material specification and the purchase order.

Element Concentrations (Weight Percent)

Al:	B:	Be:	C: 0.006	Co:	Cr:	Cu:	Fe: 0.0011
Mn:	Mo: 0.007	N2:	Nb:	Ni:	O2: 0.015	P:	S:
Si:	Ta:	Ti:	V:	W: BAL	Wc:	TAO: 0.03	

Other: _____ Analytical Process(es): _____

Sampling Procedure / Spec: ASTM B215-10
 Hall Flow / Spec: ASTM B213-13

Powder Mesh / Spec: ASTM B214-07-2011
 Apparent Density / Spec: ASTM B212-13

Physical Properties

Material Hardness Scale: Rc: N/A HB: _____ Hv: _____ Hk: _____

Hall Flow 9.8 Sec./50g Apparent Density: 8.2 g/cm3

Particle Size Distribution: Size Microns(um)/U.S. Sieve (mesh)

180/80:	0	150/100:	3.3	125/120:	13.5	106/140:	12.1
90/170:	15	75/200:	21.2	63/230:	15.35	53/270:	11.3
45/325:	4.7	38/400:	3.3	32/450:		25/500:	
20/635:		15/800:		+10:		+5:	

Other: _____

Surface Engineering Alloy Company hereby certifies the above listed material meets all requirements of the above listed specifications in addition to the confirmation that during the manufacturing process, testing, and inspection, the product was completely void of contact with the element Mercury or any of its compounds. In addition, this certification validates that all test results and operations performed by Surface Engineering Alloy Company, or its subcontractors are in compliance with the material specification and the specific applicable material requirements of ASME SFA 5.21, of ASME Section II. The requirements of Federal Law, Title 18, Chapter 47 apply to this order and to subtier suppliers.

Reporting Officer
 Dylan Marhafer

9/17/2024
 Date

SM-1000-CERT-P Rev A 4/18/2023

2895 46th Ave North
 St. Petersburg, FL
 Main Office: 727.528.7998
 www.surfaceengineering.com



June 26, 2024

Customer Order No:

VERBAL-VICKIE

Customer ID:

SHORTC

Customer Name:

Short Bits & Tool

Sales Order No:

48182

Certificate of Analysis

Item No: 4483D

Virgin Grade Binder Alloy

Shape: 1/2" x 1/2" x 3/4" Tumbled Sheared Pcs.

335231

CU	47.29
MN	24.43
NI	20.20
ZN	7.75
B	.11
SI	.14
FE	.03
PB	<.05
SN	<.02

BELMONT METALS, INC.

Nasir Naseer

QC Administrator

BELMONT



METALS

Mill Certification

09/12/2022

MTR#: 1136347-3
 Lot #: 100021721920
 2911 E NUCOR ROAD
 PO BOX 309
 NORFOLK, NE 68701 US
 402 644-0200
 Fax: 402 644-0329

Sold To: A M CASTLE & CO
 1420 KENSINGTON RD
 STE 220
 OAK BROOK, IL 60523 US

Ship To: A M CASTLE & CO
 3800 ENTERPRISE DR
 JANESVILLE, WI 53546 US

Customer PO	612018	Sales Order #	10044231 - 1.1
Product Group	Hot Roll - Engineered Bar	Product #	3047442
Grade	8620MDA1	Lot #	100021721920
Size	2.5"	Heat #	1000217219
BOL #	BOL-1231293	Load #	1136347
Description	Hot Roll - Engineered Bar Round 2.5" (2 1/2") 8620MDA1 20' 0" [240"] 6001-10000 lbs	Customer Part #	13775
Production Date	08/25/2022	Qty Shipped LBS	9880
Product Country Of Origin	United States	Qty Shipped EA	30
Original Item Description	Hot Roll - Engineered Bar Round 2.5" (2 1/2") 8620MDA1 20' 0" [240"]	Original Item Number	1028299

I hereby certify that the material described herein has been manufactured in accordance with the specifications and standards listed above and that it satisfies those requirements.

Melting Date: 07/09/2022

Melt Country of Origin : United States

C (%)	Mn (%)	P (%)	S (%)	Si (%)	Ni (%)	Cr (%)	Mo (%)	Cu (%)	Ti (%)	V (%)	B (%)
0.19	0.78	0.008	0.020	0.25	0.57	0.54	0.20	0.19	0.001	0.004	0.0002
Nb (%)	Zr (%)	N (PPM)	O (PPM)	Sn (%)	Al (%)	Pb (%)	Ca (%)	Sb (%)	Zn (%)	As (%)	
0.004	0.001	79	15	0.009	0.024	0.000	0.0021	0.001	0.004	0.004	

DI Calculated (IN) : 1.98

Austenitic fine grain, size 5 or finer, by chemical analysis per the latest revision of ASTM A29.
 Reduction Ratio 8.90 : 1

Jominy Calculated

J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14	J15	J16	J18	J20	J22	J24	J26	J28	J30	J32
44	43	41	34	28	24	23	22	22	21	20	19	18	18	18	17	16	16	15	15	14	14	14	14

ASTM E45 Method A (Average)
 (1) Sulfides T: 1.2 H: 0.4 Alumina T: 0.8 H: 0.3 Silicates T: 0.2 H: 0.0 Globular T: 1.0 H: 0.5

ASTM E45 Method A (Worst)
 (1) Sulfides T: 1.5 H: 0.5 Alumina T: 1.0 H: 1.0 Silicates T: 0.5 H: 0.0 Globular T: 1.0 H: 0.5

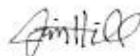
E381 Macroetch

	Macroetch E381 Surface	Macroetch E381 Mid Radius	Macroetch E381 Center
(1)	1	1	3

Comments:

ASTM A304-20
 ASTM A322-13(2018)
 Vacuum Degassed
 8620H
 Hot Rolled
 TEAM IND 730009 Rev F
 JDM AO QL-2
 EN 10204 3.1

All manufacturing processes of the steel materials in this product, including melting, have been performed in the United States.
 Finished product is hot rolled in the United States.



Jim Hill, Division Metallurgist



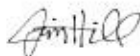
NUCOR®

Mill Certification

09/12/2022

MTR#: 1136347-3
Lot #: 100021721920
2911 E NUCOR ROAD
PO BOX 309
NORFOLK, NE 68701 US
402 644-0200
Fax: 402 644-0329

All products produced are weld free.
Mercury, in any form, has not been used in the production or testing of this material.
Test conform to ASTM A29-20, ASTM E415 and ASTM E1019-resulphurized grades or applicable customer requirements.
All material melted at Nucor Steel Nebraska is produced in an Electric Arc Furnace.
Strand Cast
Tests included in ISO 17025 scope: Chemistry, Tensile, Brinell Hardness, Rockwell Hardness, Inclusion, and Grain Size.
Exporting Country-USA
Sales@nucorne.com



Jim Hill, Division Metallurgist

Sidenor

MILL TEST CERTIFICATE

ISO 9001; IATF 16949; ISO 14001 Y OHSAS 18001

Basauri Plant

SIDENOR ACEROS ESPECIALES S.L.U.
 B. Casate 371, 48570 Basauri (Vizcaya)
 Tlf. 944871673 FAX 944871828
 www.sidenor.com



Product Made in Spain

CUSTOMER: MAGELLAN CORPORATION	WORKS REFERENCE: 1996398
REFERENCE: 212221	SALES ORDER: 311363-1
PRODUCT NR:	HEAT NUMBER: 199169
MASTER REFERENCE: 232266	ROLLED: 08.06.2018

REQUIRED PRODUCT			
AISI4130 ROUND BARS AS ROLLED NORM. QUENCH, TEMP 2.0000° ASTM A-29 (") 20'/24' NORMAL			
EXPEDITION	DELIVERY: 0080641661	WEIGHT (KG): 21.572	BUNDLES: 6 UNITS: 200

MADE ACCORDING TO

ANSI/NACE MR0175/ISO 15156-1 3° EDICION 23.11.2015; ANSI/NACE MR0175/ISO 15156-2 3° EDICION 23.11.2015
 API SPEC 16A 3° EDICION+ERR.11/04 06.2004; API SPEC 16C 1° EDICION (R 2001) 29.01.1993
 API SPEC 6A 20°ED.+ER1&2+AD12.3 03.2013; ASTM A255 10 2014; ASTM A29-A29M 2015 01.11.2015
 ASTM A322 - 2013; ASTM A370 17 01.01.2017; ASTM A388-A388M -16A 01.09.2016; ASTM A751 -14A 01.10.2014
 ASTM E10 2017 01.04.2017; ASTM E112 2013 01.10.2013; ASTM E18 -16 01.05.2016; ASTM E381 -17 01.06.2017
 ASTM E45 - 2013; ASTM E709 -15 01.06.2015; EN 10204 :2004 OCT. 2004 3.1; ISO 10423 4°ED.2009 15.12.2009
 MAGELLAN MIC2016 1 30.01.2012; MAGELLAN MIC2016 AD.12 - 30.10.2014; SAS-AMS-H 6875 B . 11.2010

CHEMICAL ANALYSIS OF HEAT												U: % HEAT NUMBER: 199169		
	C	Mn	Si	P	S	Cr	Ni	Mo	V	Cu	Al			
Min.	0,280	0,400	0,200			0,800		0,150			0,015			
Max.	0,330	0,600	0,300	0,025	0,025	1,100	0,250	0,250	0,020	0,350	0,045			
cer.	0,320	0,560	0,240	0,009	0,003	1,090	0,210	0,220	0,016	0,160	0,028			
	Ca	Nb	H											
Min.														
Max.		0,0350	0,00020											
cer.		0,0006	0,0020	0,00018										
P+S<=0,040;0,012 D.I.ASTM A255 (") >=3,200:3,781														

INCLUSIONS (MICROINCLUSIONS)

Standard (ASTM E45 2013 . . . 2013); Type/method(A); A(t):1; A(h):0,5; B(t):2; B(h):1; C(t):0; C(h):0
 D(t):1; D(h):0,5

MECHANICAL PROPERTIES AS SUPPLIED (CONDITIONS)

Temperature of: (1): Normalizing 1.670°F
 Time: (1): "x" MINUTES Per inch of the section + 60 minutes. 360Minutes; Cooling: (1): Air
 Temperature of: (2): Austenitizing 1.616°F
 Time: (2): "x" MINUTES Per inch of the section + 60 minutes. 150Minutes; Cooling: (2): Water
 Temperature media at the start: (2): 86°F; Temperature media at the finish: (2): 91°F
 Temperature of: (3): Tempering 1.292°F; Time: (3): Per inch of the section 150Minutes

MECHANICAL PROPERTIES AS SUPPLIED (TEST)

Standard (ASTM A370 -17 01.01.2017); Sample: Supply section (bar prolongation)
 Specimen Test location: At 1/2 radius; Tensile direction: Longitudinal
 Ts (100.000/115.000PSI): 110.894PSI; Ys (1) (0,2% >=80.000PSI): 0,2% 95.053PSI
 Ys (2) (0,02% PSI): 0,02% 91.889PSI; El. (2" >=18%): 2" 24,8%; El (>=40%): 72,2%
 Notch impact direction: Longitudinal; Notch Impact sample type (CHARPY-V): CHARPY-V
 Notch Impact Temp. (-75°F): -75°F; K (1): 129Pt.Lb; K (2): 127Pt.Lb; K (3): 123Pt.Lb
 K (average) (>=25Pt.Lb): 126,33Pt.Lb; K (single) (>=15Pt.Lb): 123Pt.Lb
 Lateral expansion: 1.58-1.57-1.55 mm; Shear value: 80-80-80 %
 Hardness Standard (1) (ASTM E10 -17 01.04.2017)
 Hardness Standard (2) (ASTM E18 -16 01.05.2016); Surface hardness (1) (207/235HB): 229HB
 Surface hardness (2) (15/22HRC): 20HRC; Hardness at 1/2 radius (HB): 225HB
 Sample location: Prolongation of the bar. Specimen Test

Provided by: EARLE M. JORGE COMPANY

3/16/19
523657
199169
K657236

TECHNOLOGY & QUALITY CERTIFIES THAT THE PRODUCT FULL FILLS THE ORDER

APPROVED BY: Miren Begoña Hernandez
 DATE: 27.11.2018
 REF.: 100271830000

SIGN:
 Analyst of Quality Certificates

Page 1 of 2



Sidenor

MILL TEST CERTIFICATE

ISO 9001; IATF 16949; ISO 14001 Y OHSAS 18001



Basauri Plant

SIDENOR ACEROS ESPECIALES S.L.U.
Bo. Ugarte S/n. 48970 Basauri (Bizkaia)
TLP. 944871673 FAX 944871626
www.sidenor.com

Product Made in Spain

CUSTOMER: MAGELLAN CORPORATION	WORKS REFERENCE: 1996398
REFERENCE: 212221	SALES ORDER: 311363-1
HEAT NUMBER: 199159	ROLLED: 08.06.2018
PRODUCT NR:	MASTER REFERENCE: 232266

ADDITIONAL TESTS

Standard (ASTM E112 2013 01.10.2013); Grain size: Austenitic 7; Standard (ASTM E381 -17 01.06.2017)
macroetching(1): S 1; macroetching(2): R 1; macroetching(3): C 1; Radioactivity: FREE <= 20procentgens

NON DESTRUCTIVE TESTS

Surface defects standard (ASTM E709 -15 01.06.2015)
U.T. standard(1) (API SPEC 6A 20*ED, ER1&2+AD12.3 . 03.2013); U.T. type/method(1) (PSL3)
U.T. standard(2) (ASTM A388-A388M -16A 01.09.2016); U.T. type/method(2) (FBH)
U.T. standard(3) (ISO 10423 4*ED, 2009 15.12.2009); U.T. type/method(3) (PSL3)
ULTRASONIC INSPECTION 100% : O.K. (1); ULTRASONIC INSPECTION 100% : O.K. (2)
ULTRASONIC INSPECTION 100% : O.K. (3); ANTIMIXING TEST 100%: OK

ADDITIONAL INFORMATION

Reduction ratio: 28,31; Magnetism: < 10 Gauss; CONTINUOUS CASTING 240x240 mm.
MATERIAL ACCORDING TO : API 6A, API 16A, API 16C, " PSL" 1-4
MATERIAL ACCORDING TO : API Material designation 75K
MATERIAL ACCORDING TO : NACE MR0175/ISO 15156-2 y NACE MR0175/ISO 15156-1
Mechanical Properties obtained from one bar; TREATMENT TEMPERATURE MEASURED WITH THERMOCOUPLE TYPE K
COUNTRY OF MELTED AND MANUFACTURED IN SIDENOR BASAURI SPAIN; Surface and volumetric NDT test are OK
Ultrasonic Inspection Results ("Satisfactory per ASTM A388")
Steel is free from harmful radioactive contamination; FURNACE CALIBRATION ACCORDING TO: API-6A; . . .

Material melted and manufactured 100% in Spain through the Electric Arc Furnace and Vacuum Degassing route.
Steel not exposed to Mercury, or to any other metal alloy that is liquid, at ambient temperatures during processing or while in Sidenor's possession.
The Product is free from radioactivity (<0.1Bq/g concerning Co-60).
Steel products were not repaired by welding.
100% anti mix test performed.

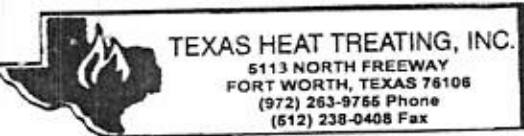
TECHNOLOGY & QUALITY CERTIFIES THAT THE PRODUCT FULL FILLS THE ORDER'S SPECIFICATIONS

APPROVED BY: Miren Regoña Hernandez
DATE: 27.11.2018
REF.: 100271850000

Page 2 of 2

SIGN: *[Signature]*
Analyst of Quality certification

Provided by: EARLE M. JORGAN COMPANY



CERTIFICATION

To: SHORT BIT & TOOL CO.
 225 GOLD STREET

GARLAND TX 75042

Purchase Order No.: THT-199169

Material: 4130
 Customer Spec
 HRC 32-35, Per P.O.

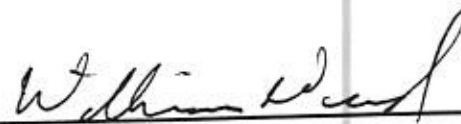
Quantity	Part Number / Part Name / Part Description	Container	Pounds
72	1 MT 2" dia, 4130 w/ machined end	Metal Bin 2 Plastic Crate 1	384.35

- 1) Harden at 1,550°F for 2 hours. Oil quench.
- 2) Temper at 1,000°F for 3 Hours. Air cool.

Insp. Type	Scale	Minimum	Maximum	Insp. Type	Scale	Minimum	Maximum	Value
Customer Requirements:				Results:				
Surface	HRC	32.0	35.0	Surface	HRC	33.1	34.8	
Method: E18				5 Pieces Inspected, Date Tested: 01-24-2020				
Tensile Strength	KSI	.0	156.0	Tensile Strength	KSI			150.3
Method: E8/8M				Date Tested: 01-24-2020				
Yield Strength	KSI		.0	Yield Strength	KSI			137.8
Report Values				0.2% Offset				18.3
Elongation	%			% Elongation	%			
Report Values				1" Initial Gauge				66.96
% Reduction in	%			% Reduction in Area	%			
Report Values				0.254" Initial Diameter				

IMPORTANT STATEMENT:

All test specimens and testing conforms to applicable ASTM Standards, unless otherwise specified per written customer requirement. Reported values apply to the sample(s) tested and/or inspected and are not necessarily indicative of the quality of apparently identical or similar products and does not extend to the lot or batch from which the tested components were drawn. The information in this metallurgical report is intended for the use of Texas Heat Treating's client and may not be published or reproduced except in full without Texas Heat Treating's expressed consent. Texas Heat Treating accepts no responsibility or liability for results due to non-representative test items, improper sampling, insufficient testing or misinformation. Material submitted to metallurgical lab will be discarded after 30 days, except by prior written agreement.


 William Weed
 Quality Representative
 Texas Heat Treating



