SERIAL NUMBER: N-185 COOK DATE: 7/18/18

MOLD SIZE _____ BY _____

ORDER DATE 7/18/18 SHIP DATE: 7/23/18 PO NN0108585Z

SIZE 3 1/8 TYPE MDX FOR SLB

THREAD 2 3/8 PAC OTHER _____

NOTES _____

MATRIX (H) MPW 1874 WEIGHT _____

MATRIX (S) MPW 1876 WEIGHT _____

BINDER 23679 WEIGHT _____

BLANK NF111004400C TJ D1711316

BILLET _____ TUBE _____

WELD BY JM MPI BY AH MPI PIC AH

THREAD GAGE 4846c STAND OFF .620

FINAL DIAMOND GRIND SIZE 3 1/8

LENGTH TO WELD _____ / _____

FINISHED PIC TAKEN BY AH SHIPPED BY A-H DATE: 7-21-18

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

Certificate of Conformance

Serial Number	Size	Type	Steel or Matrix	Shank Diameter	Bore
N-185, N-186	3 1/8	MDX	Matrix		

Component	Material	Vender	Lot or Heat Number
Blank	8620 Steel	RHW	NF11100400C
Hard Powder	WC	HMP	1874
Soft Capping Powder	W2	HMP	1876
Tool Joint	4130 Steel	RHW	D1711316
MIG Weld			
WP Tube			
Inspection			
Diamond Grinding To Size			
Weld MPI			
Thread Gaging	#48466 .620 standoff	2 3/8 PAC	

Signed By: PBegg date: 7/23/2018

Document Number:	F-Q-018
Revision:	Orig.
Date of Origin:	8/12/2012
Manual:	P-Q-001
Page:	PAGE 1 OF 1
Title:	MATERIAL PROPERTIES CERTIFICATION

MATRIX POWDER WORKS

CUSTOMER:	Short Bits
CUSTOMER PO#:	VICKIE E MAIL 04-12-18
ITEM ID:	PWMP010
ITEM DESCRIPTION	MP MATRIX POWDER H
ITEM LOT #	MPW1874
DATE	4/16/2018
WEIGHT	100 lb.

CHEMICAL COMPOSITION (Weight Percent)

Element	Minimum	Maximum	RESULT
Total Carbon (Tc)	5.4	5.90	5.65
Free Carbon (Fc)	-	0.04	0.03
Iron (Fe)	-	1.00	0.02
Nickel (Ni)	1.5	2.50	1.70
Tungsten (T)			Balance

PRODUCT SIZING (Weight Percent)

Sieve	Minimumm	Maximum	RESULT
(U.S. Standard Mesh per ASTM B214)			
+80	4.0	8.0	6.7
-80 + 120	13.0	17.0	15.5
-120+ 170	13.0	17.0	15.6
-170 + 230	13.0	17.0	15.4
-230 + 325	13.0	17.0	14.5
-325	29.00	37.00	32.1

PHYSICAL PROPERTIES

Testing Procedure	Minimum	Maximum	RESULT
Apparent Density ASTM B212 (g/cc)	7.2	8.1	7.5
Tap Density ASTM B527 (g/cc)	9.2	10.4	10.1
Hall Flow Rate ASTM B213 (sec/50g)		Must Flow	13.4

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Page:	PAGE 1 OF 1
Title:	MATERIAL PROPERTIES CERTIFICATION

MATRIX POWDER WORKS

CUSTOMER:	Short Bits
CUSTOMER PO#:	VICKIE E MAIL 04-12-18
ITEM ID:	PWCTPM002
ITEM DESCRIPTION	CTPM CRYSTALLINE W 80 X 325 MESH
ITEM LOT #	MPW1876
DATE	4/16/2018
WEIGHT	100 lb.

CHEMICAL COMPOSITION (Weight Percent)

Element	Minimum	Maximum	RESULT
Tungsten (W)	99.5	-	99.99

PRODUCT SIZING (Weight Percent)

Sieve	Minimumm	Maximum	RESULT
(U.S. Standard Mesh per ASTM B214)			
+80	-	5.0	0.2
-80 + 325	-	-	90.8
-325	-	10.00	9.0

PHYSICAL PROPERTIES

Testing Procedure	Minimum	Maximum	RESULT
Apparent Density ASTM B212 (g/cc)	7.2	9.2	7.7
Tap Density ASTM B527 (g/cc)	9.0	10.5	10.4
Hall Flow Rate ASTM B213 (sec/50g)		Must Flow	10.6

Belmont METALS INC
THE NON FERROUS SPECIALISTS SINCE 1896
330 Belmont Avenue, Brooklyn, NY 11207-4000 U.S.A
tel:+1.718.342.4900 fax:+1.718.342.0175

Certificate of Analysis

September 06, 2017

To: **Short Bits & Tool**
225 Gold Street
Garland, TX 750426648 USA

Customer Order No: **Verbal/Vicki**

Customer ID: **SHORTC**

Sales Order No: **28918**

Material: **4483D** **BELMONT** *Virgin Grade Binder Alloy*

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

Packaging: *250 Lb. Drums*

Lot:	23679
Copper (Cu)	47.68
Manganese (Mn)	23.60
Nickel (Ni)	20.06
Zinc (Zn)	8.18
Boron (B)	0.19
Iron (Fe)	0.07
Silicon (Si)	0.17
Lead (Pb)	< 0.05
Tin (Sn)	< 0.05

BELMONT METALS, INC.

Nasir Naseer

QC Administraot

BELMONT METALS

NUCOR

Mill Certification

6/15/2011

2000 East First Street
MARYVILLE, MO 64468
(660) 582-3127
Fax: (660) 582-7730

NUCOR-LMP INC

Sold To: TRIDENTALTAIR
PO BOX 60148
MIDLAND, TX 79711-0000
(432) 561-5446
Fax: (432) 561-5477

Ship To: TRIDENTALTAIR
12910 W I-20
MIDLAND, TX 79711-0000
(432) 561-5446
Fax: (432) 561-5477

Customer P.O.	09018146	Sales Order	503017.1
Product Group	Cold Finish Bar	Part Number	334560
Grade	8620 ASTM A108-07	Lot ID	E1125749
Size	Round 3.0000 (.0060)	Heat ID	NF11100400C
Product	RD 3.0000" 8620HLA 12-0 CD	B.L. Number	L1-401914
Description	CF Grade C8620HLA	Load Number	L1-102042
Customer Spec		Customer Part #	

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.

Part Detail: RD 3.0000" 8620HLA 12-0 Cold Drawn
Process: Cold Drawn

C	Mn	P	S	Si	Cu	Cr	Ni	Mo	Sn	V	Cb
0.20%	0.76%	0.014%	0.022%	0.24%	0.19%	0.57%	0.61%	0.200%	0.007%	0.003%	0.002%
Al	N	Pb	CRNIMO								
0.022%	73.0 ppm	0.000%	1.38%								

CRNIMO: Cr+Ni+Mo

DI value: 2.09 | Melting Mill: NUCOR-NE | Country of Melting: USA

Grain Practice: FINE

Actual Hardenability Band

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	44	38	32	29	28	25	23	23	24	24	22	24	23	22	20	20	18	17	17	16	14	14	14

Reduction Ratio 6 :1 | Country of Rolling: USA | Rolling Mill: NUCOR-NE

Rockwell B Surface: 88.3 HRB | Brinell Converted Mid-Radius: 0.0 HB | Brinell Converted Surface: 177.0 HB

1. This material is free of mercury contamination.
2. No welding or weld repair was performed on this material.
3. ISO 9001:2000 certified. Certificate NO: 990515, Expires October 29, 2011.

J Clark Lenz

Clark Lenz
DIVISION METALLURGIST

ASİL ÇELİK
SANAYİ ve TİCARET A.Ş.
www.asilcelik.com.tr

KALİTE BELGESİ
QUALITY CERTIFICATE /MILL TEST CERTIFICATE

Customer	SEBA TUBULAR LTD.	Date	05.06.2017
Heat no	D1711316	Quality	SAE 4130 NQT
Dimension	RD 3,00 inch	Weight	23,369 LB
Your Order No	40194_17_107_10	No of pieces	54
Our Order No	1200002667 / 000010	Doc. Norm / Number	EN 10204/3.1 - 1705260
Casting type	Ingot Cast.	Reduction Ratio	51.5 /1

Product

PRIME NEWLY PRODUCED ROUND STEEL BARS
HOT ROLLED, NORMALIZED, QUENCHED AND TEMPERED, STRESS RELIEVED
ACC.TO 4130 NQT ROLLED SIZES SPEC REV.8 (JAN. 2016), YPX-17/001 REV.1 AND
LATEST EDITIONS OF ASTM A370, ASTM A751, NACE MR-01-75/ISO 15156, API 6A-API 16A TYPE 75K PSL3
WE CERTIFY THAT THE MATERIAL IS AN ALLOY STEEL / L/C NUMBER : IC5015241US

Steelmaking Process:

Electric Arc Furnace/EAF, Ladle Furnace/LF, Vacuum Degassing/VD

Ladle Chemical Composition (%)

	C	Si	Mn	P	S	Cr	Mo	Ni	Al	Cu	Sn	V	Nb	O	H
Min	0,28	0,15	0,40			0,80	0,15								
Max	0,33	0,35	0,60	0,025	0,025	1,10	0,25	0,50				0,020			
Sample	0,32	0,29	0,58	0,009	0,010	1,04	0,24	0,20	0,017	0,24	0,021	0,015	0,028	0,0016	0,00010

Product Chemical Composition (%)

	C	Si	Mn	P	S	Cr	Mo	Ni	Al	Cu	Sn	V	Nb	O	H
Sample-1	0,33	0,28	0,58	0,009	0,008	1,04	0,24	0,20	0,016	0,24	0,021	0,015	0,030	0,0020	0,00010

Hardness

Customer Req.		Asil Çelik Result			
Min	Max	Hardness		Unit	Test Loc.
217	235	233		HB	SURFACE
		212		HB	MIDRADIUS

Mechanical Properties (Required)

Test	Min	Max	Unit	Test Loc.	Temp.	Direction	Notch Type	Result-1
Yield strength (%0,2)	75000		Psi	MIDRADIUS				87177,3
Tensile Strength	100000		Psi	MIDRADIUS				103568
Elongation	18		%	MIDRADIUS				24,80
Reduction	35		%	MIDRADIUS				68,60
Shear (%)			%	MIDRADIUS	-75 °F	Longitudinal		85
Lateral Expansion (mm)			mm	MIDRADIUS	-75 °F	Longitudinal		1,04
Impact Strength-1	15		ft-lbs	MIDRADIUS	-75 °F	Longitudinal	ISO-V	95,88
Impact Strength-2	15		ft-lbs	MIDRADIUS	-75 °F	Longitudinal	ISO-V	95,88
Impact Strength-3	15		ft-lbs	MIDRADIUS	-75 °F	Longitudinal	ISO-V	95,88
Impact Strength-Average	20		ft-lbs	MIDRADIUS	-75 °F	Longitudinal	ISO-V	95,88
Impact Strength-1	31		ft-lbs	MIDRADIUS	-4 °F	Longitudinal	ISO-V	115,06
Impact Strength-2	31		ft-lbs	MIDRADIUS	-4 °F	Longitudinal	ISO-V	119,49
Impact Strength-3	31		ft-lbs	MIDRADIUS	-4 °F	Longitudinal	ISO-V	118,01
Impact Strength-Average	31		ft-lbs	MIDRADIUS	-4 °F	Longitudinal	ISO-V	117,27

Metallography Tests (Required)

Test	Min	Max	Unit	Standard	Result-1
Austenite Grain Size	5			ASTM E112	8

Special Chemical Analysis Requests

Formula	Min	Max	Unit	Value
DI (ASTM A255-10)	0	0		4,08
P+S	0	0,4		0,019

Heat Treatment Parameters

QUENCH TEMPERATURES AT START & FINISH: 100/120 °F
COOLING MEDIA: AIR / QUENCH MEDIA: WATER

NORMALIZING TEMP. / TIME:	1670	°F	2,50	HOURS
AUSTENITIZING TEMP. / TIME:	1607	°F	2,50	HOURS
TEMPERING TEMP. / TIME:	1274	°F	4,00	HOURS

MECHANICAL PROPERTIES TAKEN FROM PROLONGATION
LENGTH OF PROLONGATION : 20 cm / TENSILE SPECIMEN : RND. 12,5 mm
GAGE LENGTH (%) : 2 inch / FBH SIZE MAX. 3,2 mm & RESULTS WERE OK
METHOD OF MONITORING TEMPERATURE : FURNACE TYPE THERMOCOUPLE / FURNACE CALIBRATION : AMS 2750
ULTRASONIC TESTING 100 %-ASTM A-388/SA 388-07, AFTER NQ&T ACCEPTANCE CRITERIA
API 6A/ISO 10423 PSL 3 & 100 % MIX-UP CONTROLLED & SURFACE CRACK TESTED & RESULTS WERE OK.
"FREE FROM RADIOACTIVITY & FREE FROM MERCURY. NO WELD REPAIR PERFORMED"
"WE HEREBY CERTIFY, MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLIES WITH THE TERMS OF ORDER CONTRACT"

Approved by Mert ÜLKER

33.23.169.A4 (1)

Santral / Central
Tel. : +90 224 280 61 00
Faks : +90 224 280 62 00
Fabrika /Head Office & Plant
Gemiç Köyü Mevkii 16800 Orhangazi / BURSA

İç Satış / Domestic Sales
+90 262 781 60 00
+90 262 781 60 05

Dış Satış / Export
+90 262 781 60 00
+90 262 781 60 05

Vergi Dairesi : Büyük Mükellefler Vergi Dairesi Başkanlığı
Vergi No : 0860052518 Ticaret Sicil: 18917

TEXAS HEAT TREATING, INC.
5113 NORTH FREEWAY
FORT WORTH, TEXAS 76106
(972) 263-9755 Phone
(512) 238-0408 Fax

CERTIFICATION

Order No.: 315121
Date: 12/04/2017

To: SHORT BIT & TOOL CO.
225 GOLD STREET

GARLAND TX 75042

Purchase Order No.: THT-D17113
Material: 4130
Customer Spec
HRC 32-35, Per P.O.

Quantity	Part Number / Part Name / Part Description	Container	Pounds
52	2 3/8 PAC	SharesConta 1	364

[1] Harden at 1,550°F for 2 hours. Oil quench.
[2] Temper at 1,000°F for 3 hours. Air cool.
[3] Temper at 1,035°F for 4 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	34.0	34.6	
Method: E18				5 Pieces Inspected, Date Tested: 11-30-2017				
Tensile Strength	KSI	.0	157.0	Tensile Strength	KSI			156.8
Method: E8/8M				Date Tested: 11-04-2017				
Yield Strength	KSI		.0	Yield Strength	KSI			138.1
Report Values				0.2% Offset				
% Elongation	%			% Elongation	%			23.9
Report Values				1" Initial Gauge				
% Reduction in	%			% Reduction in Area	%			58.75
Report Values				0.246" 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