



SERIAL NUMBER: N-220 COOK DATE: _____

MOLD SIZE 5.915 x 4.780 BY RB

ORDER DATE 8/11/18 SHIP DATE: 8/17/18 PO 593982

SIZE 5 7/8 x 4 3/4 TYPE XDS FOR SLB

THREAD 2 3/8 FAC OTHER 30 deg. taper to 12" long F/M

NOTES 51" Swallow

MATRIX (H) 1874 WEIGHT _____

MATRIX (S) 2022 WEIGHT _____

BINDER 23679 WEIGHT _____

BLANK B14472 TJ D1712717

BILLET _____ TUBE _____

WELD BY AH MPI BY AH MPI PIC AH

THREAD GAGE _____ STAND OFF 620

FINAL DIAMOND GRIND SIZE 5 7/8 x 4 3/4

LENGTH TO WELD _____

FINISHED PIC TAKEN BY _____ SHIPPED BY AH DATE: 8-21-18

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-220	5.875" x 4.750"	XDS	Matrix		
Component					
	Material	Vender	Lot or Heat Number		
Blank	8620 Steel	RHW	B14472		
Hard Powder	WC	HMP	1874		
Soft Capping Powder	W2	HWP	2022		
Tool Joint	4140 Steel	RHW	D1712717		
MIG Weld					
WP Tube					
Inspection					
Diamond Grinding To Size	5.875" x 4.750"				
Weld MPI	Alan				
Thread Gaging	.620" stand-off	2 3/8 PAC			

Signed By:

T. Beegh

date:

8-22-2018

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



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	Minimum	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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CUSTOMER:	SHORT BITS
CUSTOMER PO#:	6000959
ITEM ID:	PWCTPM002
ITEM DESCRIPTION	CTPM CRYSTALLINE W 80 X 325 MESH
ITEM LOT #	MPW2022
DATE	7/13/18
WEIGHT	100.0 LB.

**CHEMICAL COMPOSITION
(Weight Percent)**

Element	Minimum	Maximum	RESULT
Tungsten (T)			99.90

**PRODUCT SIZING
(Weight Percent)**

Sieve	Minimum	Maximum	RESULT
(U.S. Standard Mesh per ASTM B214)			
+80	-	5.0	0.9
-80 + 325	-	-	98.4
-325	-	10.00	0.6

PHYSICAL PROPERTIES

Testing Procedure	Minimum	Maximum	RESULT
Apparent Density ASTM B212 (g/cc)	7.2	8.1	7.7
Tap Density ASTM B527 (g/cc)	9.2	10.4	10.4
Hall Flow Rate ASTM B213 (sec/50g)		Must Flow	11.5
			-
			-



330 Belmont Avenue, Brooklyn, NY 11207-4000 U.S.A
tel:+1.718.342.4900 fax:+1.718.342.0175

Certificate of Analysis

July 27, 2018

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

Customer Order No: Phone/Vicki

Customer ID: SHORTC

Sales Order No: 31363

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 Administrat

BELMONT



METALS

8" 4140

D1712717



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KALİTE BELGESİ QUALITY CERTIFICATE / MILL TEST CERTIFICATE



Customer: SEBA TUBULAR LTD., Heat no: D1712717, Dimension: RD 8,00 inch, Your Order No: 40290-17-259/B, Our Order No: 1200005192 / 000010, Casting type: Ingot Cast, Date: 01.08.2017, Quality: SAE 4140 QT-SR, Weight: 24,969 LB / 11,335 KG, Number of bars: 15, Doc. Norm / Number: EN 10204/3.1 - 1707501, Reduction Ratio: 12.8 /1

Product: PRIME NEWLY PRODUCED ROUND STEEL BARS, HOT ROLLED QUENCHED & TEMPERED AND STRESS-RELIEVED, ACC. TO RHW SPEC. 4140 HT REV.05 (JAN 2016) AND YPK 17-032, LATEST EDITIONS OF ASTM A29, A304, A322, A370, A388, A751, E45, E312, E709, AMS 2750, API 6A PSL 3, WE CERTIFY THAT THE MATERIAL IS AN ALLOY STEEL / ORDER NO: 40290, Electric Arc Furnace/EAF, Ladle Furnace/LF, Vacuum Degassing/VD

Ladle Chemical Composition (%) table with columns C, Si, Mn, P, S, Cr, Mo, Ni, Al, Cu, Sn, V, Nb, O, H and values for Min, Max, and Sample.

Product Chemical Composition (%) table with columns C, Si, Mn, P, S, Cr, Mo, Ni, Al, Cu, Sn, V, Nb, O, H and values for Sample-1 and Sample-2.

Jominy - Inch table with columns 1.0 inch, 4.0 inch, 8.0 inch, 16.0 inch, 28.0 inch and values for Min, Max, and Result-1.

Hardness table with columns Customer Req. and Asil Çelik Result, and rows for Min, Max, and Unit (HB, HRC).

Mechanical Properties (Required)

Mechanical Properties table with columns Test, Min, Max, Unit, Test Loc., Temp., Direction, Notch Type, and Result-1. Includes Yield strength, Tensile Strength, Elongation, Reduction, Shear, Lateral Expansion, and Impact Strength tests.

Metallography Tests (Required)

Metallography Tests table with columns Test, Min, Max, Unit, Standard, and Result-1. Includes Austenite Grain Size.

Special Chemical Analysis Requests

Special Chemical Analysis Requests table with columns Formulas, Min, Max, Unit, and Value. Includes DI (ASTM A255-10).

Heat Treatment Parameters

Heat Treatment Parameters table with columns Parameter, Value, and Unit. Includes Quench Temperatures, Cooling Media, and Tempering parameters.

MECHANICAL PROPERTIES TAKEN FROM PROLONGATION, LENGTH OF PROLONGATION : 20 cm / TENSILE SPECIMEN : RND 12.5 mm, GAGE LENGTH (IN) : 2 inch / FBH SIZE MAX. 5.2 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 Q&T+SR ACCEPTANCE CRITERIA, API 6A/ISO 10423 PSL 3 & 100% MIX-LIP 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

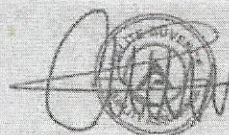
Approved by: Mert ÜLKER

33 23 760-44 (1)

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Dis Satış / Export, +90 262 781 60 00, +90 262 781 60 05



**SēAH Besteel**522, Oehang-ro, Gunsan-si,
Jeollabuk-do, Korea (573-711)

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ACCORDING TO EN10204:2004, Type 3.1

Date : 2014-01-22
Cert. No. : 201401-013314
Customer : DSI
Heat No. : B14472
Serial-No. :Specification :
Steel Grade : 8620H
Shape of Product : Round Bar
Delivery Condition : As Rolled
Melting Process : EAF-LF-VD(RH)-CCSize (Inch) : 6
Length (mm) : 7,000
Weight (kg) : 21,794
Quantity (pcs) : 21

Inspection Items	Chemical Composition (wt. %)																
	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Al	Sn	Ti	W	Ca	DI	P+S
	×100	×100	×100	×1000	×1000	×100	×100	×100	×100	×1000	×1000	×1000	×100	×100	×10000	×100	×1000
Spec. Min.	18	15	70	25	10	40	40	15									
Spec. Max.	23	35	90	25	25	35	70	60	25	50			3	20			40
Result	19	25	79	14	11	13	55	50	20	8	18	8	0	0	5	187	26

Inspection Items	Hardenability(End Quenching Method) HRC, 1/16Inch, ASTM A 255																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32
Spec. Min.																								
Spec. Max.																								
Result	44	43	40	33	27	23	22	21	20	20	19	18	17	17	17	16	16	15	15	14	14	13	13	13

Inspection Items	Nonmetallic Inclusion (ASTM E-45)							
	A(T)	A(H)	B(T)	B(H)	C(T)	C(H)	D(T)	D(H)
Spec. Min.	2.5	2	2.5	2	2.5	2	2.5	2
Spec. Max.	2.5	2	2.5	2	2.5	2	2.5	2
Result	2.0	1.0	.0	.0	.0	.0	1.0	.0

Inspection Items	Tensile Test (ksi) (ASTMA370-12 12.5mm dia. longitudinal test) (Sample Location: 1" Below of Surface)			
	TS	YS	EL(%)	ROA(%)
Spec. Min.				
Spec. Max.				
Result	85.45	49.27	22.97	44.46

Inspection Items	Austenite Grain Size (ASTM E112-12)		Inspection Items	Decarburized Layer (mm) (ASTM E1077-01)		Inspection Items	Gas Analysis (ppm)	
	Min.	Max.		DM-T			O ₂	H ₂
Spec. Min.	5		Spec. Min.			Spec. Min.		
Spec. Max.	8		Spec. Max.	1		Spec. Max.		
Result	7.0		Result	.26		Result	7.77	.50

We hereby certify that the material described herein has been made in accordance with the rules of the contract.

Our quality system is certified in accordance with ISO/TS 16949:2009 by KSA

Certified by

S. W. Hong

Manager of Quality Assurance Dept.

**S&AH Besteel**522, Oehang-ro, Gunsan-si,
Jeollabuk-do, Korea (573-711)

MATERIAL CERTIFICATE

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ACCORDING TO EN10204:2004, Type 3.1

Date : 2014-01-22
Cert. No. : 201401-013314
Customer : DSI
Heat No. : B14472
Serial-No. :Specification :
Steel Grade : 8620H
Shape of Product : Round Bar
Delivery Condition : As Rolled
Melting Process : EAF-LF-VD(RH)-CCSize (Inch) : 6
Length (mm) : 7,000
Weight (kg) : 21,794
Quantity (pcs) : 21

Inspection Items		Macro Structure (ASTM E381-01(2012), Plate I)			Inspection Items		Reduction Ratio		Inspection Items		Surface Inspection (mm)	
Spec.	Min. Max.	SURFACE	RANDOM	CENTER	Spec.	Min. Max.			Spec.	Min. Max.		
		2	2	2			6					
Result		1.0	1.0	1.0	Result		10.9		Result		PASSED	

Inspection Items		Ultrasonic Test (ASTM A388/A388M-11 In-line UT max.4mm FBH)		
Spec.	Min. Max.			
Result		PASSED		

- <<Remark>> * Steel Making Process : EAF-LHF-VD-CC Bloom
 * Bloom Cast 390mm×510mm, Double EMS
 * No mercury contamination, Non radioactive, No Weld Repair
 * Acc. to EN 10204/3.1B
 * Acc. to ASTM A29/A29M-12 Imperial, ASTM 576-90B
 * Macrostructure : ASTM E381-01(2012)
 * Austenite Grain size : ASTM E112-12, * Decarburization : ASTM E1077-01
 * Non metallic Inclusions : ASTM E45-13 Method A
 * Mechanical Properties : ASTM A370-12 / YS 0.2% off-set, elongation in 50.8mm gage
 * Hardenability : ASTM A304-11 and ASTM A255-10(Calculated Value)
 * UT test : ASTM A388/A388M-11 and EN 10228 class 3 (Calibration to 4mm FBH)
 * SPEC NO. : DSI-29 (RE-APPROVED DATE : DEC 03 2013)

* MADE IN KOREA / * P.O.# : 1103119535

We hereby certify that the material described herein has been made in accordance with the rules of the contract.

Our quality system is certified in accordance with ISO/TS 16949:2009 by KSA

Certified by

S. W. Hong

Manager of Quality Assurance Dept.