



SERIAL NUMBER: N-151 COOK DATE 6-29-18

MOLD SIZE 6.130 x 4.530 BY UH

ORDER DATE 28 Jun 18 SHIP DATE: ^{BY} 04 July 18 PO _____

SIZE 6.100 x 4.500 TYPE XDSS FOR SLB

needed \downarrow to 2 7/8 x 8"
THREAD W 2 3/8 DAC OTHER 1 3/4" swallow 8" FIN ϕ 2.875

NOTES _____

MATRIX (H) 1874

WEIGHT _____

MATRIX (S) 1876

WEIGHT _____

BINDER 23779

WEIGHT _____

BLANK _____

TJ D1712717

BILLET MM16103148

TUBE 585809

WELD BY A-H MPI BY UH

MPI PIC UH

THREAD GAGE 48466

STAND OFF .625

FINAL DIAMOND GRIND SIZE 6.100 x 4.500

LENGTH TO WELD END to front 13 1/2 front to end 22 3/4

FINISHED PIC TAKEN BY UH SHIPPED BY JM DATE: 7-5-18

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-151	6.1" x 4.5"	XDSS	Matrix		
Component		Material	Vender	Lot or Heat Number	
Blank		4130	RHW	MM16103148	
Hard Powder		WC	HMP	1874	
Soft Capping Powder		W2	HWP	1876	
Tool Joint		4140	HALFORD	D1712717	
MIG Weld					
WP Tube		P110	REDWING	585809	
Inspection					
Diamond Grinding To Size					
Weld MPI		Alan			
Thread Gaging		#48466 .625" stand-off	2 3/8 PAC		
Signed By: <i>P. Begg</i>			date: <i>7/6/2015</i>		

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

Document Number:	F-Q-018
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Page:	PAGE 1 OF 1



Title: MATERIAL PROPERTIES CERTIFICATION

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	Minimum	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
-	-	-	-



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

Sold To:

Ship To:

Customer P.O.	31360	Sales Order	154101.1
Product Group	Special Bar Quality	Part Number	30006250267NTG0
Grade	AISI 8620/8622H (S .020-.030%; DI 2.0-2.3) MAC, MEC, MIC	Lot #	MM1610314802
Size	6-1/4" (6.2500) Round	Heat #	MM16103148
Product	6-1/4" (6.2500) Round 22' 3" 8620-C1Q2	B.L. Number	G1-310658
Description	8620-C1Q2	Load Number	G1-169511
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.

Roll Date: 8/5/2016 Melt Date: 6/30/2016 Qty Shipped LBS: 7,245 Qty Shipped Pcs: 3

C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Al	B
0.21%	0.81%	0.007%	0.020%	0.25%	0.28%	0.46%	0.47%	0.21%	0.002%	0.025%	0.0002%
Sn	Ti	Cb	Co	Ca	Pb	As	Sb	Zr	Zn	N	H
0.006%	0.0018%	0.004%	0.0096%	0.0009%	0.0000%	0.004%	0.0016%	0.002%	0.013%	0.0079%	1.8 ppm

Austenitic fine grain by chemical analysis per the latest revision of ASTM A29

DI value: 2.10

Simulated 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
45	45	42	36	30	26	25	24	23	22		20		19		18	18		17	16		15		14

E381 Mid Radius (Back) 1

Silicate Cleanliness: SAE J422 0.0

Brinell: 170bhn

Reduction Ratio 10.4 :1

E381 Surface (Back) 1

Oxide Cleanliness: SAE J422 0.0

Brinell Converted Mid-Radius: 174.0bhn

E381 Center (Back) 1

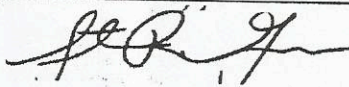
Total Oxygen per ASTM E1019 = 15.0000ppm

Brinell Converted Surface: 170.0bhn

ASTM E381

Surface: 1 Mid Radius: 1 Center: 1

- All manufacturing processes, including melting have been performed in the U.S.A.
- No mercury, mercury compounds or mercury containing devices came into contact with this product.
- Welding or weld repair was not performed on this material.
- This material conforms to the specifications described on this document and may not be reproduced except in full, without written approval of Nucor Corporation.
- This product is NAFTA certified under Paragraph "B" of the NAFTA rule of origin.
- Material is Free of Radioactive Contamination.
- This document is in compliance with EN 10204 "type 3.1"
- Test procedures followed with asterisk(*) are outside of NSMEM - ISO17025 Accreditation scope
- Results reported for ASTM E45 (Inclusion content) and ASTM E112 (Grain size) are provided as interpretation of ASTM procedures.
- Test procedures performed in compliance with the following ASTM standards: Chemical Analysis: E415, Total Oxygen: E1019, Grain Size: E112, Macroetch: E381, Tensile and Hardness Testing: A370, Charpy Impact: E23, Decarburization Depth: E1077, Microcleanliness: E45.
- ASTM E23 tests conducted with 8mm striker radius upon 10mm x 10mm V notch specimen.
- Export Country: USA email Memphis.Sales@nsmem.nucor.com



Steven Gage
 Division Metallurgist

Sold To:

Ship To:

Customer P.O.	31360	Sales Order	154101.1
Product Group	Special Bar Quality	Part Number	30006250267NTG0
Grade	AISI 8620/8622H (S .020-.030%; DI 2.0-2.3) MAC, MEC, MIC	Lot #	MM1610314802
Size	6-1/4" (6.2500) Round	Heat #	MM16103148
Product	6-1/4" (6.2500) Round 22' 3" 8620-C1Q2	B.L. Number	G1-310658
Description	8620-C1Q2	Load Number	G1-169511
Customer Spec		Customer Part #	

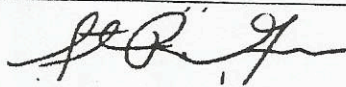
I hereby certify that the material described herein has been manufactured in accordance with the specifications and standards listed above and that it satisfies those requirements.

ASTM E45 Method A (Worst)

Sulfides: T: 1.5 H: 1.5 Alumina: T: 0.0 H: 0.0 Silicates: T: 0.0 H: 0.0 Globular: T: 0.5 H: 0.5

Specification Comments:

1. All manufacturing processes, including melting have been performed in the U.S.A.
2. No mercury, mercury compounds or mercury containing devices came into contact with this product.
3. Welding or weld repair was not performed on this material.
4. This material conforms to the specifications described on this document and may not be reproduced except in full, without written approval of Nucor Corporation.
5. This product is NAFTA certified under Paragraph "B" of the NAFTA rule of origin.
6. Material is Free of Radioactive Contamination.
7. This document is in compliance with EN 10204 "type 3.1"
8. Test procedures followed with asterisk(*) are outside of NSMEM - ISO17025 Accreditation scope
9. Results reported for ASTM E45 (Inclusion content) and ASTM E112 (Grain size) are provided as interpretation of ASTM procedures.
10. Test procedures performed in compliance with the following ASTM standards: Chemical Analysis: E415, Total Oxygen: E1019, Grain Size: E112, Macroetch: E381, Tensile and Hardness Testing: A370, Charpy Impact: E23, Decarburization Depth: E1077, Microcleanliness: E45.
11. ASTM E23 tests conducted with 8mm striker radius upon 10mm x 10mm V notch specimen.
12. Export Country: USA email Memphis.Sales@nsmem.nucor.com



Steven Gage
 Division Metallurgist

8" 4140

D1712717



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



KALİTE BELGESİ
QUALITY CERTIFICATE / MILL TEST CERTIFICATE



Customer	SEBA TUBULAR LTD.	Date	01.08.2017
Heat no	D1712717	Quality	SAE 4140 QT+SR
Dimension	ØD 6,50 inch	Weight	24.969 LB / 11.325 KG
Your Order No	40230-17-259/B	Number of bars	15
Our Order No	1200003192 / 000010	Doc. Norm / Number	EN 10204/3.1 - 1707501
Casting type	Ingot Cast	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 YFX 17-032
LATEST EDITIONS OF ASTM A29, A304, A322, A370, A388, A751, E45, E112, E709, AMS 2750, API 6A PSL 3.
WE CERTIFY THAT THE MATERIAL IS AN ALLOY STEEL / ORDER NO: 40230
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	0.38	0.15	0.25			0.80	0.15								
Max	0.43	0.35	1.00	0.025	0.025	1.10	0.25	0.25				0.030	0.035	0.0030	0.00027
Sample	0.42	0.31	1.00	0.013	0.013	1.07	0.24	0.20	0.024	0.22	0.014	0.026	0.030	0.0021	0.00007

Product Chemical Composition (%)

	C	Si	Mn	P	S	Cr	Mo	Ni	Al	Cu	Sn	V	Nb	O	H
Sample-1	0.42	0.31	1.00	0.013	0.009	1.07	0.24	0.20	0.024	0.22	0.014	0.025	0.029	0.0020	0.00008
Sample-2	0.42	0.30	1.01	0.009	0.010	1.08	0.25	0.19	0.025	0.21	0.014	0.022	0.031	0.0020	0.00008

Joinery - Inch

	1,0 Inch	4,0 Inch	8,0 Inch	16,0 Inch	28,0 Inch
Min	57	56	54	48	44
Max	63	62	61	58	57
Result-1	59,9	58,9	57,9	57,5	57

Hardness

Customer Req.		Asil Çelik Result		Unit	Test Loc.
Min	Max	Hardness			
285	341	321		HB	SURFACE
28	37	32		HRC	SURFACE

Mechanical Properties (Required)

Test	Min	Max	Unit	Test Loc.	Temp.	Direction	Notch Type	Result-1
Yield strength (NO,2)	110000		Psi	1"				137511
Yield strength (NO,2)			Psi	MIDRADIUS				121845
Tensile Strength	135000		Psi	1"				152161
Tensile Strength			Psi	MIDRADIUS				140412
Elongation	15		%	1"				17,80
Elongation			%	MIDRADIUS				18,40
Reduction	45		%	1"				54,00
Reduction			%	MIDRADIUS				51,90
Shear (%)			%	1"	-20 °F	Longitudinal		45
Lateral Expansion (mm)			mm	1"	-20 °F	Longitudinal		0,88
Shear (%)			%	1"	72 °F	Longitudinal		65
Lateral Expansion (mm)			mm	1"	72 °F	Longitudinal		0,82
Impact Strength-1			ft-lbs	1"	-20 °F	Longitudinal	ISO-V	48,68
Impact Strength-2			ft-lbs	1"	-20 °F	Longitudinal	ISO-V	51,63
Impact Strength-3			ft-lbs	1"	-20 °F	Longitudinal	ISO-V	51,63
Impact Strength-Average			ft-lbs	1"	-20 °F	Longitudinal	ISO-V	50,99
Impact Strength-1			ft-lbs	1"	-20 °F	Transversal	ISO-V	23,60
Impact Strength-2			ft-lbs	1"	-20 °F	Transversal	ISO-V	22,13
Impact Strength-3			ft-lbs	1"	-20 °F	Transversal	ISO-V	20,69
Impact Strength-Average			ft-lbs	1"	-20 °F	Transversal	ISO-V	22,13
Impact Strength-1			ft-lbs	1"	72 °F	Longitudinal	ISO-V	67,66
Impact Strength-2			ft-lbs	1"	72 °F	Longitudinal	ISO-V	64,91
Impact Strength-3			ft-lbs	1"	72 °F	Longitudinal	ISO-V	66,38
Impact Strength-Average			ft-lbs	1"	72 °F	Longitudinal	ISO-V	66,38
Impact Strength-1			ft-lbs	1"	72 °F	Transversal	ISO-V	32,45
Impact Strength-2			ft-lbs	1"	72 °F	Transversal	ISO-V	29,50
Impact Strength-3			ft-lbs	1"	72 °F	Transversal	ISO-V	33,93
Impact Strength-Average			ft-lbs	1"	72 °F	Transversal	ISO-V	32,71

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)		5,5	0,1%	7,93

Heat Treatment Parameters

QUENCH TEMPERATURES AT START & FINISH: 105/120 °F

COOLING MEDIA: AIR / QUENCH MEDIA: POLYMER

AUSTENITIZING TEMP. / TIME	1580 °F	4,50	HOURS
TEMPERING TEMP. / TIME	1186 °F	6,00	HOURS
STRESS-RELIEVE TEMP. / TIME	952 °F	4,50	HOURS

MECHANICAL PROPERTIES TAKEN FROM PROLONGATION:

LENGTH OF PROLONGATION : 20 mm / TENSILE SPECIMEN : RND 12,5 mm

GAGE LENGTH (in) : 2 inch / FBH SIZE MAX. 9,2 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

95.23.140.44 (1)

95.23.140.44 (1)

Satral / Central
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Faks : +90 224 280 62 00

Fabrika /Head Office & Plant
Gemiköyü Meydanı 16800 Orhangazi / BURSA

İç Satış / Domestic Sales
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Yerel Dağıtım : Büyük Mükemmellik Yeri / Dağıtım Başkanlığı
Yerel No : 0860052518 / Ticaret Sicil : 15917

Diş Satış / Export
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585809

Benteler Steel/Tube GmbH
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33043 Paderborn
Deutschland
Tel.: +49.5254.81-0 Fax: +49.5254.13666

BENTELER 
Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1
EN 10204:2005-01

Benteler Steel/Tube GmbH - Postfach 1340 - 33043 Paderborn - Deutschland

Dokument-Nr.: 65-816835/001/P
Document No.:
No. du document:

Kunden-Bestell-Nr.: BST 46002104
Purchase Order No.:
No. de commande du client:

Benteler Auftrags-Nr.: 1598213
Benteler Order No.:
No. de commande Benteler:

Versandanzeigen-Nr.: 6543483
Dispatch Note No.:
No. d'avis d'expédition:

Produkt: NAHTLOSE STAHLROHRE
Product: SEAMLESS STEEL TUBES
Produit: TUBES D'ACIER SANS SOUDURE

Prüf-Nr.:
Inspection No.:
No. du certificat:

Hersteller: Warmrohrwerk Dinslaken
Manufacturer: (DIN EN ISO 9001, ISO/TS-16949 CERTIFIED BY TUEV NORD CERT)
Producteur: (PED 97/23/EC CERTIFIED BY TUEV NORD SYSTEMS)

Herstellerzeichen:
Manufacturer's brand:
Marque du producteur:



Stempel des Abnahmebeauftragten: WA
Stamp of the inspection representative:
Poinçon du contrôleur:

Stahlschmelzungsverfahren: ELEKTROSTAHL
Steelmaking process: ELECTRIC FURNACE
Procédé d'élaboration de l'acier: FOUR ELECTRIQUE

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Page:
Page:

Lieferbedingungen: API Spec. 5CT Ninth Edition, July 2011, Errata 09.2012
Terms of delivery:
Conditions de livraison:

Maße - Toleranzen: API Spec. 5CT Ninth Edition, July 2011, Errata 09.2012
Dimensions-tolerances:
Dimensions-tolérances:

Stahlsorte: **GRADE P110**
Steel grade:
Nuance d'acier:

Lieferzustand: Q
Delivery condition:
État de livraison:

Produktkennzeichnung: FK: Coloured rings: one white, at the same end as the marking
Product marking: FS: BENTELER SIGN API 5CT-0194 API SIGN YEAR/QUARTER PE DIMENSIONS LB/FT P S P TEST
Marquage du produit: PRESSURE D WA HEAT-NO.

AEZ = Ätzstrahlbeschriftung, Etching ink marking, Gravure à l'encre . FK = Farbkennzeichnung, colour marking, marquage par couleur . FS = Farbschablonierung, paint stencilling, marquage par peinture . FSD = Farbstrahlrucker, Colour jet printer, imprimante à jet d'encre de couleur . LK = Laserkennzeichnung, Laser marking, Marquage laser . PKE = Etikettenkennzeichnung, tag marking, marquage sur étiquette . PS = Prägestempel, die stamp, marquage par poinçonnage . TS = Tintenstrahlkennzeichnung, Ink jet spray marking, imprimante à jet d'encre .

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BENTELER 
 Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
 INSPECTION CERTIFICATE EN 10204-3.1
 CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: 65-816835/001/P
 Document No.:
 No. du document:

Prüf-Nr.:
 Inspection No.:
 No. du certificat:

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Pos.	Stück	Maße	Länge	Gewicht	Schmelzen-Nr.	Prüfdruck	Rohr-Nr.-Gruppe	Vielfachlängen
Item	Number	Dimensions	Length	Weight	Heat No.	Test pressure	Tube number group	Multiple lengths
Poste	Nombre	Dimensions	Longueur	Poids	No. de coulée	Pression d'épreuve	Série de no. des tubes	Longueurs multiples
			feet	lbs		PSI		
0001	128	5.750" O.D. * 0.312" WT 34 FT - 36 FT	4396,33	80954	585809	9600	5	

Schmelzenanalyse [%] / Heat analysis [%] / Analyse sur coulée [%]

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI	CU	AL
Item	Heat No.										
Poste	No. de coulée										
0001	585809	0,310	0,260	0,74	0,005	0,002	1,01	0,04	0,13	0,14	0,035

Produktanalyse [%] / Product analysis [%] / Analyse sur produit [%]

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI	CU	AL
Item	Heat No.										
Poste	No. de coulée										
0001	585809	0,310	0,240	0,75	0,004	0,003	1,02	0,05	0,14	0,13	0,035
0001	585809	0,300	0,230	0,75	0,005	0,003	1,02	0,05	0,14	0,13	0,035

Prüfergebnisse / Test results / Résultats des essais

Die Rohre sind auf Dichtheit geprüft durch: The tubes have been submitted to a leak tightness test by: Les tubes ont passé un contrôle d'étanchéité par:	Hydrostatic test: acc. to API 5CT, holding time min 5 seconds, Test pressure/Time-record	PASSED
Drifttest: Drift test: Contrôle avec un mandrin:	acc. to API 5CT, mandrel diameter = ID - 3,18 mm, over the whole tube length; Drift mandrel diameter: 127,000 mm; Drift mandrel length: 152,0 mm; Drift mandrel diameter: 5.000 "; Drift mandrel length: 6 "	PASSED
Die Rohre wurden zerstörungsfrei geprüft: The tubes are non destructive tested: Les tubes ont passé un essai non destructif:	UT-longitudinal imperfections: acc. to API 5CT; Outside notch depth: 5,0 %; Inside notch depth: 5,0 %; Notch length: 50,0 mm; UT-transv. imperfections: acc. to API 5CT; Outside notch depth: 5,0 %; Inside notch depth: 5,0 %; Notch length: 50,00 mm; Geometric inspection: with ultrasonic; wall thickness	PASSED
Augensichtkontrolle: Visual inspection: Examen visuel:	Maßkontrolle: Dimensions examination: Vérification des dimensions:	PASSED PASSED

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
 INSPECTION CERTIFICATE EN 10204-3.1
 CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: 65-816835/001/P
 Document No.:
 No. du document:

Prüf-Nr.:
 Inspection No.:
 No. du certificat:

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Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques

Die Probennahme erfolgte an Vielfachlängen.
 The sampling was carried out on multiple lengths.
 L'échantillonnage était réalisé aux longueurs multiples.

Zugversuch längs Streifenprobe / Tensile test longitudinal Strip test specimen / Essai de traction longitudinale Bande decoupee sur tube

Pos. Item Poste	Proben-Nr. Specimen No. No. de l'éprouvette	Schmelzen-Nr. Heat No. No. de coulée	Probenabmessung Specimen dimensions Dimensions de l'éprouv.	Streckgrenze Yield strength Limite élastique	Zugfestigkeit Tensile strength Résistance à la traction	Dehnung Elongation Allongement	Einschnürung Area reduction Coefficient de striction
Anforderungen Requirements Exigences			mm	RT 0,6 % KSI 110-140	Rm KSI MIN 125	A2" %	1. Formel 1. Formula 1. Formule
0001	000001	585809	25,40 X 8,50	126	136	21,00	13,00
0001	000002	585809	25,40 X 8,10	124	135	20,00	12,87

Formeln zur Dehnung / Elongation formula / Formule de l'allongement

1. Formel METRIC FORMULA $E = 1942,57 * A^{0,2} / U^{0,9}$

Kerbschlagbiegeversuch Notched bar impact test / Essai de flexion par choc (résilience) [1 CHARPY_V]

Pos. Item Poste	Proben-Nr. Specimen No. No. de l'éprouv.	Schmelzen-Nr. Heat No. No. de coulée	Probenabmessung Specimen dimensions Dimensions de l'éprouvette			Probenlage Specimen position Position de l'éprouvette	Prüftemperatur Test temperature Température d'essai	Kerbschlagarbeit Absorbed energy Energie absorbée		Kerbschlagzähigkeit Impact strength Résistance au choc		Verf.-Bruchanteil Shear fracture Rupture ductile	
			Länge Length Longueur	Breite Width Largeur	Höhe Height Hauteur			längs (L) longitudinal (L) longitudinal (L)	quer (Q) transversal (Q) transversal (Q)	°C	J	J	J/cm²
Anforderungen Requirements Exigences			mm	mm	mm		GRAD						
			55	5,00	10,00	Q	+0						
				5,00	10,00			50					
				5,00	10,00			51					
				5,00	10,00			53	51				
				5,00	10,00	Q	+0						
				5,00	10,00			58					
				5,00	10,00			59					
				5,00	10,00			61	59				

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BENTELER 
Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: 65-816835/001/P
Document No.:
No. du document:

Prüf-Nr.:
Inspection No.:
No. du certificat:

Blatt: 4 / 4
Page:
Page:

Konservierung / Conservation / Conservation

outside surface varnished

Wärmebehandlung / Heat treatment / Traitement thermique

Hardening temperature: 870°C, Holding time: 1 min, Cooling: water / Tempering temperature: 620°C, Holding time: 4 min, Cooling:
air

Vermerk / Remark / Remarque

Certificate-Remark: The steel is produced in an electric arc furnace, ladle and continuous casting machine, argon purged. This process is commonly referred to as "clean steel process". The steel is fully killed.; Hardenability test: acc. to API 5CT, HRC min = 52 X %C + 21, equivalent to min 50% Martensite fraction, Hardenability test after hardening., 1 measurement point, measurement point: quadrant, 9 indentations

Grain size: acc. to ASTM-E 112; Grain size and finer: 5

Verkäufer(in) / Sales personal / Personne chargée : Mr Storm, Tel.: 05254 81-204274, Fax: 204289

Dinslaken, 13.06.2014, TEL.: 02064.623-5360 FAX: 02064.623-5390

Abnahmebeauftragter
Inspection representative
Contrôleur

DR. BASEL KEITA / SEMIZ

Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen. Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgültig.
We certify that the supplied products comply with the order specification. This document was prepared by means of electronic data processing and is valid without signature.
Nous attestons que les produits livrés sont conformes aux stipulations de la commande. Ce document a été établi par traitement électronique de l'information et est valide sans signature.

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BENTELER 
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Empfangsprüfzeugnis EN 10204-3.1 / Anhang
 Inspection Certificate EN 10204-3.1 / appendix
 Certificat de réception EN 10204-3.1 / appendice

Dokument-Nr.: 65-816835/001/P
 Document No.:
 No. du document:

Anlage: 1
 Attachment: 1

Werkzeuguntersuchung: Stahlsorte P 110 / Semi finished product examination: Grade P 110 / Produit semi-fini: Nuance P 110

Schmelzen-Nr. Heat No. Coulée No.	Position Item Poste	Kohlenstoffanteil % Carbon % Carbone C (Gew.-%)	Härtbarkeit (min. Anforderungen) Hardenability (min. requirements) Trempeabilité (exigence min.) API Specification 5CT / ISO 11960	Härtbarkeit (IST-Werte) Hardenability (current value) Trempeabilité (valeur réelle)			
			HRC min = 52 x (%Carbon) +21				
585809	1	0,310	37	50,3			

Bemerkung / Remark / Remarqué

Der Stahl ist frei von Quecksilberverunreinigungen.
 The steel is free of mercury contamination.
 L'acier est libre des contaminations de mercure.

Dinstag den 13.06.2014
 Tel. +49.2064.623-5360
 Fax. +49.2064.623-5390

Contrôleur
 Abnahmebeauftragter
 Inspection representative

DR. BASEL KEITA