

3.813" PX PLUG FISHNECK

23/4" 9Cr1Mo

From: ESP Specialty Steel Products Date: 3/30/2017 To: HOWCO METALS MANAGEMENT, LP (TE SO#: S097619 Ln#: 1 PO#: HOU-1007016 Part: 11S02755
Qty: 4283 Heat#: A0011Y Tag: 148168



Tata Steel UK Limited
Stockbridge
Sheffield
S36 2JA
United Kingdom
Telephone: +44 (0) 114 2862361
Fax: +44 (0) 114 2832079
Website: www.tatasteel.com

INSPECTION CERTIFICATE TYPE 3.1 to BS EN10204

TATA STEEL INT (AMERICAS) INC.
475 NORTH MARTINGALE DRIVE
SUITE 400 SCHAUMBURG
ILLINOIS 60173 - 2222
USA



Cast No. A0011Y

Works Order No. CB880865

Customer Order No. PO3614-001

Date of Issue 16-MAR-2015

Certificate No. 00552017/1

Page No. 1 of 3

SPECIFICATIONS ASSOCIATED WITH THIS ORDER -
9CR TO BMS S501 REV D + WS801 REV M + (2) ADD SPEC
SCHLUMBERGER CMS-ZZA10.0 AS
HALLIBURTON ES-MA-2-7 REV J

PRODUCT INFORMATION -

SIZE - 2.75"

QUANTITY/WEIGHT - 20 BARS 4.030 TONNES APPROX

CONDITION OF MATERIAL - H&T, SM TURN, STR REL

STEELMAKING PROCESS/PROCESS OF MANUFACTURE - Electric VDG Ingot

HEAT TREATMENT OF MATERIAL - W52656

Harden at 850° C; for 02:00; time to 02:04; total time 04:04; Oil Quenched from 44° C.

Temper at 655° C; for 03:00; time to 05:44; total time 08:44; Air Cooled.

Stress Relieve at 625° C; for 01:00; time to 01:52; total time 02:52; Air Cooled.

ANALYSIS -

Cast No	C	Si	Mn	P	S	Cr	Mo	Ni	Cu
Cast Analysis									
A0011Y	.126	.32	.52	.011	.0027	8.28	.84	.09	.06

Mechanical Test - Tested to ASTM A370 - 13
Material Specification ES-MA-2-7

Test No.	Ingot Id	Ingot Pos.	Sample Pos.	Orient	Temp.	0.2% PS	UTS	Elong	R of A	Hardness	Hardness	Tensile Dia
Units					C	kPSI	kPSI	%	%	HBW10/3000	HBW10/3000	Inches
Result	2631727	M	Mid-Radial	Lo	23	66.3	112.0	25.0	73.0	235	235	0.50

Test No.	Ingot Id	Ingot Pos.	Sample Pos.	Orient	Temp.	Tensile G.L	Frac Pos.
Units					C	Inches	
Result	2631727	M	Mid-Radial	Lo	23	2.00	A

Impact Test - Tested to ASTM E23 - 12c
Material Specification ES-MA-2-7

Test No.	Ingot Id	Ingot Pos.	Sample Pos.	Geometry	Orient	Temp.	Imp Mean	Impact	Impact	Impact	% Ratio
Units						C	FILbs	FILbs	FILbs	FILbs	%
Result	2631728	M	Mid-Radial	CH2MMV(8)	Lo	-10	118	122	109	122	89.0



Tata Steel UK Limited
Stockbridge
Sheffield
S36 2JA
United Kingdom
Telephone: +44 (0) 114 2862361
Fax: +44 (0) 114 2832979
Website: www.tatasteel.com

INSPECTION CERTIFICATE TYPE 3.1 to BS EN10204

Cast No. **A0011Y**

Works Order No. **CB880865**

Customer Order No. **PO3614-001**

Date of Issue **16-MAR-2015**

Certificate No. **00552017/1**

Page No. **2 of 3**

Mechanical Test - Tested to ASTM A370 - 13
Material Specification BAKER BMS S501

Test No.	Ingot Id	Ingot Pos.	Sample Pos.	Orient	Temp.	0.2% PS	U.T.S	Elong	R of A	Hardness	Hardness	Frac Pos.
					C	kPSI	kPSI	%	%	HBW10/3000	HBW10/3000	
Result	2831730	M	Mid-Radial	Lo	23	86.3	112.0	26.0	73.0	235	235	A

Mechanical Test - Tested to ASTM A370 - 13
CMS-Z2A10.0

Test No.	Ingot Id	Ingot Pos.	Sample Pos.	Orient	Temp.	0.2% PS	U.T.S	Elong	R of A	Hardness	Frac Pos.
					C	PSI	PSI	%	%	HRc	
Result	2831731	M	Mid-Radial	Lo	23	85500	112000	24.0	71.0	19.3	A

Mechanical Test - Tested to ASTM A370 - 13
WS801

Test No.	Ingot Id	Ingot Pos.	Sample Pos.	Orient	Temp.	0.2% PS	U.T.S	Elong	R of A	Hardness	Hardness	Frac Pos.
					C	kPSI	kPSI	%	%	HRc	HRc	
Result	2831732	M	Mid-Radial	Lo	23	85.3	112.0	24.0	71.0	17.8	19.3	A

Impact Test - Tested to ASTM E23 - 12c
WS801

Test No.	Ingot Id	Ingot Pos.	Sample Pos.	Geometry	Orient	Temp.	Imp Mean	Impact	Impact	Impact
						C	FILbs	FILbs	FILbs	FILbs
Result	2831733	M	Mid-Radial	CH2MMV(8)	Lo	0	129	131	131	127

Grain Size Test - Tested to ASTM E112 - 13 (Comparison Method)
MacQuaid Ehn Grain Size - Cerburised at 925 Deg C 8 Hours Furnace Cooled.

Tested at a magnification of X100

Test No.	Ingot Id	Ingot Pos.	G.Size	G.Size	Elchant
Result	2831728	M	7	8	Villelae

Surface Hardness -

Test No.	Ingot Id	Ingot Pos.	Hardness	Hardness
			HBW10/3000	HBW10/3000
Result	2831734		223	223



Tata Steel UK Limited
Stockbridge
Sheffield
S30 2JA
United Kingdom
Telephone: +44 (0) 114 2862361
Fax: +44 (0) 114 2832079
Website: www.tatasteel.com

INSPECTION CERTIFICATE TYPE 3.1 to BS EN10204

Cast No. A0011Y

Works Order No. CB880865

Date of Issue 16-MAR-2015

Customer Order No. PQ3614-001

Certificate No. 00552017/1

Page No. 3 of 3

Ultrasonic Test - Tested to ASTM A388/A388M - 11
Satisfactory to 3.0mm FBH ASTM A388/M95
MEETS API 6A CLAUSE 7.4.2.3.15 PSL 3 & 7.4.2.4.11(PSL 4)
US SATISFACTORY TO API 6A PSL 3+ 4

Ultrasonic Test - Tested to UT ANGLE BEAM PROCEDURE
Angle beam inspection satisfactory to 1/16" side drilled holes.


MISCELLANEOUS INFORMATION -

NACE MR-01-75/ISO 15156
ULTRASONIC TEST MEETS SCHLUMBERGER NDE 31
ULTRASONIC TEST METHOD ASTM A388.
REDUCTION RATIO: 52.91:1
VAC DEGASSED AND SECONDARY REFINED STEEL
Material type tested satisfactorily
Method of Analysis
- Elemental Analysis (combustion/fusion) tested at our Rotherham laboratory C S
- Atomic Emission Spectroscopy (OES) tested at our Rotherham laboratory Si Mn P Cr Mo Ni Cu
Radioactivity < 0.1Bq/g on ladle sample.
This product is mercury free.
No weld repair carried out on this product.
Our quality management system is accredited to the following standards : ISO9001 and AS/EN9100.
Our environmental management system is accredited to ISO14001.
Material is melted and manufactured in the United Kingdom.

AUTHORISED SIGNATURE -

Certified by our Stockbridge Works that, unless otherwise stated above, the whole of the above mentioned materials have been manufactured, tested & inspected in accordance with the terms of the acknowledged contract/order applicable thereto and conform fully to the standards/specifications quoted herein.

Approved Signatory - Lee Ibbittson - Certification and Accreditation Manager


Signed.....

For Tata Steel UK Limited

This inspection certificate shall not be reproduced except in full, without the written approval of Tata Steel UK Limited
End Of Certificate

Customer PO#	Sales Order#	Howco Disp Cert#	Date	Authorized by	Page No.	Total Pages
203233	2056158-1	2056158-1	Apr 12 2017	Jaron Kubala	3	3