

2.750 PX PRONG HOUSING 9-CHROME

3" 9Cr1Mo



Tata Steel UK Limited
Stockbridge
Sheffield
S38 2JA
United Kingdom
Telephone: +44 (0) 114 2852381
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 SCHLAUMBURG
ILLINOIS 60173 - 2222
USA



Cast No. A0011Y

Works Order No. CB880866

Date of Issue 27-MAR-2015

Customer Order No. PO3614-002

Certificate No. 00562023/1

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SPECIFICATIONS ASSOCIATED WITH THIS ORDER -
9CR TO BMS S601 REV D + WS801 REV M + (2) ADD SPEC
SCHLUMBERGER CMS-Z2A10.0 AS
HALLIBURTON ES-MA-2-7 REV J

PRODUCT INFORMATION -

SIZE - 3"
QUANTITY/WEIGHT - 26 BARS 6.084 TONNES APPROX
CONDITION OF MATERIAL - H&T, SM TURN, STR REL
STEELMAKING PROCESS/PROCESS OF MANUFACTURE - Electric VDG Ingot

HEAT TREATMENT OF MATERIAL - W52147

Harden at 980° C; for 02:00; time to 02:29; total time 04:29; Oil Quenched from 47° C.
Temper at 656° C; for 03:00; time to 04:09; total time 07:09; Air Cooled.
Stress Relieve at 625° C; for 01:00; time to 03:59; total time 04:59; Air Cooled.

ANALYSIS -

Cast No	C	Si	Mn	P	S	Cr	Mo	Ni	Cu
Cast Analysis									
A0011Y	.125	.32	.52	.011	.0027	8.28	.94	.09	.05

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	U.T.S	Elong	R of A	Hardness	Hardness	Tensile Dia.
					C	KPSI	KPSI	%	%	HBW10/3000	HBW10/3000	Inches
2632041		M	Mid-Radial	Lo	23	86.3	110.0	26.0	70.0	232	232	0.80

Test No.	Ingot Id	Ingot Pos.	Sample Pos.	Orient	Temp.	Tensile G.L.	Frac Pos.
					C	Inches	
2632041		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	% Rtt
						C	FILbs	FILbs	FILbs	FILbs	%
2632042		M	Mid-Radial	CH2MMV(B)	Lo	-10	104	100	101	111	80.0



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Sheffield
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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.
Units					C	kPSI	kPSI	%	%	HBW10/3000	HBW10/3000	
Result	2632041	M	Mid-Radial	Lo	23	86.3	110.0	26.0	70.0	232	232	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.
Units					C	PSI	PSI	%	%	HRc	
Result	2632043	M	Mid-Radial	Lo	23	86500	111000	26.0	70.0	22.0	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.
Units					C	kPSI	kPSI	%	%	HRc	HRc	
Result	2632043	M	Mid-Radial	Lo	23	86.6	111.0	26.0	70.0	22.0	22.0	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
Units						C	FTLbs	FTLbs	FTLbs	FTLbs
Result	2632044	M	Mid-Radial	CH2MMV(B)	Lo	0	139	137	133	146

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

Tested at a magnification of X100

Test No.	Ingot Id	Ingot Pos.	G.Size	G.Size	Etohanl
Result	2632040	M	7	8	Vitellae

Surface Hardness -

Test No.	Ingot Id	Ingot Pos.	Hardness	Hardness
Units			HBW10/3000	HBW10/3000
Result	2632045		235	235



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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: 44.38:1

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 hereon.

Approved Signatory - Lee Ibbitson - 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

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