

Mill Test Certificate

Bri-Steel Manufacturing Inc. 2125-64 Avenue, Edmonton, AB Canada T6P 1Z4
Tel: 001 (780) 469-6603

Tel: 001 (780) 469-6603 Fax: 001 (780) 469-6986

www.brichemsteel.com

Product: Seamless Carbon Steel Pipe

Product Heat Number: BSM-16

BSM-1665 Product Size: 16XS

Production Date: Feb 25, 2014

הטואו-דססט צוסמתרר טובבי

Certificate No.: MTR- 000910

Production Method: Hot Expansion Product Heat Treatr

Product Standards: ASME B36.10-2004, API 5L-45th Ed. Grade B PSL1

Product Markings

Product Heat Treatment: As-rolled

ASME B36.10-2004, API 5L-45th Ed. Grade B PSL1, ASTM/ASME A/SA106-2013 Grade B NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009 MR0103-2010

HEAT BSM-1665 (PIPE # LENGTH MASS) 82.77lb/ft ASTM/ASME A/SA106 GR B A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

| CAPI & L/C No. > API SPEC 5L NPS 16 XS 0.500 INCHWT GR B PSL1 SMLS 2014/02 NDE 2240PSI

Heat Test Type Product Size Pieces Length Mass Geiger lb/ft Res. Mag. lb/ft Visual long OD UT ET HydroTest End BSM-1665 Heat NPS 16 XS 0.500in. WT 9 DRL 82.77 <5 <10 Pass 80 dition Heat NPS 16 XS 0.500in. WT 9 DRL 82.77 <5 <10 Pass 80 devel Heat Steelmaking Method Test Type C Mn P S Si Cr Cu Mo Ni V Ti Nb B CE(IW) CE(CSA)							
Pieces Length Mass Geiger Res. Mag. Visual OD UT ET Ib/ft μR/hr Gauss Insp. WT ASTM E213 ASTM m. WT 9 DRL 82.77 <5 <10 Pass Pass Pass Pass Pass Pass Chemical Analysis (wt%) Test Type C Mn P S Si Cr Cu Mo Ni V Ti Nb Heat 0.20 0.87 0.015 0.004 0.25 0.06 0.06 0.01 0.04		Heat		BSM-1665		Heat	
Pieces Length Mass Geiger Res. Mag. Visual OD UT ET Ib/ft μR/hr Gauss Insp. WT ASTM E213 ASTM m. WT 9 DRL 82.77 <5 <10 Pass Pass Pass Pass Pass Pass Chemical Analysis (wt%) Test Type C Mn P S Si Cr Cu Mo Ni V Ti Nb Heat 0.20 0.87 0.015 0.004 0.25 0.06 0.06 0.01 0.04	Blast Furnace; E	Stee		Heat		Test Type	
Pieces Length Mass Geiger µκ/hr Res. Mag. Visual Gauss OD NT UT NT ET NT 9 DRL 82.77 <5	AF; Ladle Refining; Vacuum	Imaking Method		NPS 16 XS 0.500in. V		Product Size	הוסמתכו. טפ
C Mn P S Ciger Res. Mag. Visual OD UT ET	Heat	Test Type		VT		Pi	raiis
ength Mass Geiger lp/ft Res. Mag. lp/ft Visual lnsp. OD lp/ft UT lp/ft ET lp/ft ET lp/ft ET lp/ft ET lp/ft UT lp/ft ET lp/ft	0.20	С		9		eces	
No. No.		Mn		DRL		Length	
No. No.	0.015	Р	0	82.77	lb/ft	Mass	
No. No.	0.004	S	hemical Ar	<5	μR/hr	Geiger	
Visual OD UT UT ET Insp. WT ASTM E213 ASTM	0.25	Si	alysis (_			
OD	90.0	Cr	wt%)	10	ssue	Mag.	
Pass Pass Pass Ni V Ti Nb 0.04	0.06	Cu		Pass	Insp.	Visual	
ET 3 ASTM Pass	10.0	Mo		Pass		OD	N
ET 3 ASTM Pass	0.04	N:		Pass	WΤ	TU	טוו-הפגנומנ
		V T		Pass	ASTM E213	TU	Gillsa Lavin
		i Nb		Pass	ASTM	ET	
Test End ' 5 s Condition s 34° Bevel CE(IIW) CE(CSA	0.0002	В		Pas	2240 PSI/	Hydro	0.00
End Condition 34° Bevel		CE(IIW)			, 5s (Test	
	1) CE(CSA)		34° Bevel	Condition	End	

Degas; Fully Killed

Product

0.21

0.86

0.012

0.003

0.26

0.05

0.07

0.02

0.04

0.002

0.001

0.001 0.0002

0.37

0.37

43	55.0	71,000	38,900	Longitudinal; 38.1 mm x WT	Pass	76 HRBW	Ferrite & Pearlite	Heat	BSM-1665
%	(Rt0.5/Rm)	psi	psi	50mm GL					
Elongation (A)	Υ/Т	Tensile (Rm)	Yield (Rt0.5)	Tension Test	Flattening Test	Hardness	Microstructure	Test Type	Heat
		al :		Mechanical Properties					

BSM-1665		Heat
_	Standard	Test
٠	Sample Details	Impact Test
-)°	Temp
ı	J	
t	Ĺ	Impact
ı	Į	Energy
1	AVG	
-	%	
-	%	% Shear
ŧ	%	ıear
ı	AVG	
E	mm	
	mm	Lateral Expansion
Ť	mm	pansion
Ĭ.	AVG	

Additional Details:

- \checkmark We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API 5L-45th Ed., ASTM/ASME A/SA106-2013 Grade B A/SA53-2012, and the purchase order requirements, and that the results meet the corresponding requirements.
- √This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service-2009 NACE MR0103-2010 Section 2.1
- ✓ No weld repairs have been performed on this product.
- \checkmark This product has not come into contact with mercury during the Bri-Steel Manufacturing processes.
- \checkmark This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

Mill Test Certificate approved by:

2014 Mar3

Kenton Dechant, P.Eng.
Manager of Quality and R&D



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Seamless Carbon Steel Pipe Product Heat Number: BSM-1665 Product Size: 16 X 0.475 Production Date: Feb 25, 2014

Production Method: Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 000911

Product Standards: ASME B36.10-2004, API 5L-45th Ed. Grade B PSL1, ASTM/ASME A/SA106-2013 Grade B NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009 MR0103-2010

Product Markings | API & L/C No.> API SPEC 5L NPS 16 X 0.475 INCHWT GR B PSL1 SMLS 2014/02 NDE 2240PSI

MEAT BSM-1665 (PIPE # LENGTH MASS) 78.63lb/ft ASTM/ASME A/SA106 GR B A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

BSM-1665		Heat	
Heat		Test Type	
NPS 16 X 0.475in. WT		Product Size	Product: Details
9		Pieces	
DRL		Length	
78.63	lb/ft	Mass	
<5	μR/hr	Geiger	
<10	Gauss	Res. Mag.	
Pass	Insp.	Visual	
Pass		OD	Z
Pass	WT	TU	on-Destruc
Pass	ASTM E213	TU	Non-Destructive Testing
Pass	ASTM	ET	
Pass	2240PSI/ 5 s	HydroTest	
34° Bevel	s Condition	End	

						Chemical Analysis (wt%)	۱) Analysis	wt%)									
Heat	Steelmaking Method	Test Type	С	Μ'n	Р	S	Si	Cr	Cn	Mo	<u>Z</u> .	<	Ħ	Nb	В	CE(IIW)	CE(CSA)
BSM-1665		Heat	0.20	0.87	0.015	.5 0.004	0.25	0.06	0.06	0.01	0.04		77.00		0.0002	1	ı
	regas, runy nineo	Product	0.21 0.86	0.86	0.012	0.003	0.26	0.05	0.07	0.02	0.04	0.002	0.001	0.001	0.0002	0.37	0.37

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BSM-1665		Heat		BSM-1665		Heat					
1	Standard	Test		Heat		Test Type					
	rd.	-		Ferrite & Pearlite		Microstructure					
	Samp	lmpa		earlite		ıcture					
•	Sample Details	Impact Test		76 HRBW		Hardness					
1	°C	Temp		Pass		Flattening Test					
1	J	10101988		_			Mechar				
ı	J	Impact Energy		Longitudinal; 38.1 mm x	50	Ten	Mechanical Properties				
1	J	nergy		l; 38.1 m	50mm GL	Tension Test	rties				
	AVG			m x WT							
1	%	ndS %	% Shear	% She	% Sh	% Sh				Yie	2000
1	%						% Sh	% Sh	% She	% Sh	% Sh
•	%	ear		71	_	Tensi					
1	AVG			71,000	osi	Tensile (Rm)					
1	mm	-		0.55	(Rt0.5/Rm)	۲/۲					
ī	mm	Lateral Expansion			(m)						
1	mm	pansion		43	%	Elongation (A)					
1	AVG				38533	on (A)					

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API 5L-45th Ed., ASTM/ASME A/SA106-2013 Grade B A/SA53-2012, and the purchase order requirements, and that the results meet the corresponding requirements.
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