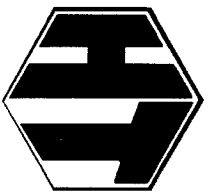


**Customer**  
 FLOW TECHNOLOGY LTD  
 HALF HOUSE LANE  
 HOVE EDGE  
 BRIGHOUSE  
 WEST YORKS. HD6 2PH

**Delivery Address**  
 FLOW TECHNOLOGY LTD  
 HALF HOUSE LANE  
 HOVE EDGE  
 BRIGHOUSE  
 WEST YORKS. HD6 2PH

FLOW TECHNOLOGY LTD  
 TEST CERTIFICATE  
 VERIFIED TRUE  
 COPY OF ORIGINAL



**HI-TECH**  
 Special Steels Limited  
 Rotherham Road, Loughborough Common,  
 Dringington, Sheffield S25 3HF  
 Tel: Dringington (01909) 565455  
 Fax No: (01909) 550682

Report No. **041416** Our Ref. **103021** Date **13/11/17**  
 Test No. **326901** Customer PO No. **014498/JS** Specification **BS EN 10088-3 1.4404**  
 Dispatch Note No. **055906**

Page 1 of 1  
**TEST CERTIFICATE**

Item	Quantity	Weight Kg	Part No.	Heat No.	Batch No.	Description
001	3	73.0		561638	P220087	1.1/2" X 1" FINISHED BAR CONFORMING TO NACE MR0175
		Total				

**A. HEAT TREATMENT SUPPLY CONDITION**  
**B. TEST PIECE TREATMENT CONDITION**  
 MELTING PRACTICE ADD TEST COUPON SIZE

Tensile Tests		Units		Impact Tests		Hardness			
Temp °C	0.20% Proof	Maximum Stress	%Elong 50MM	% Reduction of Area	Temp °C	ENERGY	SHEAR %	LATERAL EXPANSION	Hardness
20	Result: 541 Spec:Min 200	Result: 721 Spec:Min 500	Result: 36 Spec:Min 30	Result: 64 Spec:Min 50	*	1 2 3 MIN AV	1 2 3 MIN AV	1 2 3 MIN AV	21.7 HRC

Component Hardness


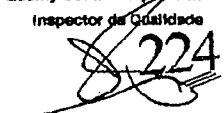

Heat No.	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	Ti	Co	N
<b>561638</b>	0.019	0.540	1.460	0.028	0.035	16.920	10.090	2.040	0.460	0.002	0.272	0.058

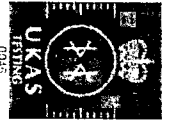
\* Test Direction: L = Longitudinal; T = Transverse  
 TEST CERTIFICATE in accordance with BS EN 10204 3.1 / ISO 10474 3.1  
 Certified that the whole of the supplied detailed hereon, unless otherwise stated, are covered by the Sources Certificate of Conformity/Test Certificate referenced hereon, and has been supplied to the Quality System requirements in accordance with the conditions of our BS EN ISO 9001 registration for lot traceable products.

Signature

Position  
 Certification Dept

F13524  
 T BLOCK G 1/4" CMS DRG 509501785

	Abnahmeprüfzeugnis/Mill Test Certificate/Certif. de Qualidade						No.: / Nr.: / Nr.:	
	EN 10204:2004 / 3.1						0000085381	
Böllinghaus Portugal Aços Especiais, SA DIN EN ISO 9001:2008 TÜV CERT No. 01 100 030458			Unsere Innere Verweisung /Our Int. Ref/ N/ ref int			Datum / Date / Data		
			5600017332 000010			14.12.2012		
<b>Normen / Standards / Normas</b>								
1.4401/1.4404 acc. to BS EN 10088-3:2005 "Improved Machinability" I.C.C. Tested to ASTM A262-10 Practice E, valid in dual certified as AISI 316/316L acc. to ASTM 276-10, ASTM A479/A479M-11, NACE MR 0175, NACE MR 0103.								
<b>Kunde / Customer / Cliente</b>				<b>Endgültiger Kunde / Final Customer / Cliente Final</b>				
Hi-Tech Special Steels Limited Rotherham Road S25 3RF Sheffield				Hi-Tech Special Steels Limited Rotherham Road S25 3RF Sheffield				
Bestell Nr./Order Nr./ Enc.Nr. 004234				Bestell Nr./ Order Nr./ Enc.Nr. 004234.04				
<b>Prüfgegenstand / Product / Produto</b>			<b>Gewicht / Weight / Peso</b>			<b>Bunde / Bundle / Atados</b>		
AISI 316L FLAT 40 x 27 mm			3,419 kg			03		
<b>Werkstoff-Nr. Material-no. Qualidade</b>		<b>Werkstoff-Normbezeichnung / Material standard grade / Norma do material</b>						
1.4404		X 2 CrNiMo 17-12-2						
<b>Beschreibung / Description / Descrição</b>								
Stainless steel flat bars, hot rolled, annealed, pickled, straightened.								
<b>Schmelzen Nr. Cast nr. / Fused no.</b>		<b>Chemische Analyse in % / Chemical composition in % / Análise química em %</b>						
561638		<b>C:</b> 0.019	<b>Si:</b> 0.540	<b>Mn:</b> 1.460	<b>P:</b> 0.035	<b>S:</b> 0.028	<b>Cr:</b> 16.920	<b>Ni:</b> 10.090
EAF		<b>Mo:</b> 2.040	<b>Co:</b> 0.272	<b>Cu:</b> 0.460	<b>N:</b> 0.058	<b>Ti:</b> 0.002	<b>W:</b>	<b>V:</b>
<b>Proben Nr. Test no. Amostra no.</b>		<b>DIN EN 10045</b>			<b>ISO 6892-1</b>			
		<b>Kerbschlagarbeit Impact Test Resiliência</b>	<b>Streckgrenze Yield point Tensão limite</b>	<b>Dehngrenze 1% point Limite de</b>	<b>Zugfestigkeit Tensile strength Tensão de rotura</b>	<b>Dehnung Elongation Alongamento</b>	<b>Einschnürung Reduction of area Coef. Estricção</b>	
		<b>(Charpy V)</b>	<b>Rp 0,2 %</b>	<b>Rp 1,0%</b>	<b>Rm</b>	<b>A (A50-50mm)</b>	<b>Z (A50-50mm)</b>	
		<b>[ J ]</b>	<b>[ MPa ]</b>	<b>[ MPa ]</b>	<b>[ MPa ]</b>	<b>[ % ]</b>	<b>[ % ]</b>	
3030585.01.01		226	291	325	632	64.9		79.4
3030585.01.02		224	296	331	638	64.6		78.8
<b>Visuelle Kontrolle Visual inspection Inspeção visual</b>		<b>DIN EN 6506-1</b>		<b>DIN 3851 - 2A</b>		<b>Wärmebehandlung Heat treatment Tratamento térmico</b>		
<input checked="" type="checkbox"/> OK		Härte Hardness Dureza		Korrosionsbeständigkeit IC Test Corrosão Intermetálica		Solution annealing 1050 °C  (Water quenched)		
		153 [ HB ]		<input checked="" type="checkbox"/> OK				
<b>EN 10058</b>		<b>Korngröße Grain size Tamanho de grão</b>		<b>Werkstoffverständiger Quality Control Representative Inspector de Qualidade</b>				
<input checked="" type="checkbox"/> OK				224 				
<b>Verwechslungsprüfung Test of Identity Teste de identificação</b>		<b>Makroskopische Untersuchung Micrographic test</b>		<b>David Reis</b>				
<input checked="" type="checkbox"/> OK		Material free from segregation defects.		<input checked="" type="checkbox"/> OK				
<b>Bemerkungen / Remarks / Observações</b>				<b>Böllinghaus Portugal - Aços Especiais, SA</b>				
Country of origin: Portugal. No weld repair done. Material is free of mercury and radiation contamination. Certified acc. PED 97/23/EC-EN 764-5 and AD 2000 W0 Notified Body 0035 - TÜV Rheinland Industrie Service GmbH 01 202 926/Q-02 0040				Hiermit bestätigen wir, dass das Material der oben genannten Spezifikation entspricht. We confirm that this material meets the specification according the mentioned standards. Confirmamos que este material respeita as especificações de acordo com as normas referidas.				
I29.A PP				 15/12/12				



**Special Testing Ltd**  
 Bacon Lane, Sheffield S9 3NH  
 Tel: 0114 244 1061  
 Fax: 0114 244 0444 Works  
 Fax: 0114 244 5566 Acc/Admin  
 www.specialtesting.co.uk

**Test Certificate 326901**

AUTHENTICATION CODE 055E9CA1642B  
 ROLLS ROYCE APPROVED LABORATORY  
 Approval No. 11191

CUSTOMER  
 HI-TECH SPECIAL STEELS LTD  
 ALLOY & METAL WORKS, ROTHERHAM RD  
 LAUGHTON COMMON, DUNNINGTON  
 SHEFFIELD S25 3RF  
 DATE RECEIVED 26 May 2016  
 TEST DATE 27 May 2016



CUSTOMER ORDER NO	PRD5574	TEST NUMBER	326901	IDENTITY	P41673	CAST	561638	ALL REQUIREMENTS MIN UNLESS STATED			
SPECIFICATION	BS EN 10088-3:2014 1.404	TEST PIECE FROM*	1.1/2" X 1"								
TENSILE: BS EN ISO 6892-1:2009 A224	SECTION	AREA SQ	UNIT	REQUIREMENTS	RESULTS	ELONG ON	%	R OF A %	COMMENTS		
OR TEMP	SECTION	AREA SQ	UNIT	REQUIREMENTS	RESULTS	ELONG ON	%	R OF A %	COMMENTS		
L RT	10.02mm	78.78mm <sup>2</sup>	MPa	RESULTS	541	647	721	50mm	36.0	64.0	12.5mm below
HARDNESS: BS EN ISO6508-1:2005	DESIGNATION	REQUIREMENTS	RESULTS								
ROCKWELL C (Mid Radial)	HRC			21.7							

END OF CERTIFICATE

REPRESENTING*		No copy is authentic without the embossed seal and signature. This certificate can be authenticated at <a href="http://www.specialtesting.co.uk">www.specialtesting.co.uk</a> with the code 055E9CA1642B This certificate shall not be reproduced, except in full, without the written approval of the laboratory. For and on behalf of <b>SPECIAL TESTING LTD</b> A Member of the Special Steel Group of Companies Kain Elliott Certification Officer
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Test results do not in any way confer approval of the quality of manufacture of the material. All results are subject to uncertainty of measurement budgets, details available upon request.  
 Information marked \* is supplied by the customer.

