



ACCIAIERIE BERTOLI SAFAU  
ABSOLUTE STEEL QUALITY

# CERTIFICATO DI COLLAUDO

N. 125226 / 2  
Data 04.06.2015  
COLATA N. 229371  
Pag. 1 / 2

ACCIAIERIE BERTOLI SAFAU SpA  
Via Buttrio n.28 - Frazione Cargnacco - 33050 Porzuolo del Friuli (UD)  
Tel. +39 0432 613211 - Fax +39 0432 613209 - www.absaccol.it

Inspection Certificate 3.1/Certificat de reception 3.1/  
Abnahmeprüfzeugnis 3.1

CLIENTE MAGELLAN CORPORATION ORDINE 210269  
Customer-Client-Besteller Order-Commande-Bestellung  
PROFILO HOT ROLLED ROUND BARS, 165,1 MM - 6 STATO DI FORNITURA Q.T. & STRESS RELIEV  
Shape-Section-Profil 1/2" Delivery-Status Lieferzustand  
ACCIAIO AISI 4140 Commessa/Pos 1029132/100  
Steel-Acier-Stahl  
CAPITOLATO ABS: ABS  
Technical Specification:  
CAPITOLATO DI ANALISI: MAGELLAN MIC 6016/2010 ADD.30 28/08/2013  
Material Specification:  
CAPITOLATO DI FORNITURA: MAGELLAN MIC 6016-10 12.22.2010  
Technical Delivery Requirements:

1/3

### COMPOSIZIONE CHIMICA %

	C	Mn	Si	P	S	Cr	Ni	Mo	Al (T)	Cu	Sn	Ti
Min	0,400	0,75	0,15			0,90		0,15	0,015			
Max	0,430	1,00	0,35	0,025	0,025	1,10	0,25	0,25	0,035	0,25	0,100	0,0500
Colata/Heat	0,412	0,94	0,25	0,010	0,003	1,06	0,17	0,23	0,035	0,16	0,008	0,0028
	B (T)	V	Nb	As	Ca	Sb	Co	Pb	O2/ppm	H2/ppm	P+S	D.I. INCH
Min												5,40
Max	0,0008	0,030	0,060	0,100	0,1000	0,100	0,300	0,4000	20,00	2,00	0,040	
Colata/Heat	0,0001	0,006	0,004	0,006	0,0013	0,001	0,009	0,0030	10,00	1,00	0,013	6,67

VACUUM DEGASSED  
"FULLY KILLED, GRAIN FINE, FLAKES ABSENCE"  
ELECTRICAL FURNACE MELTED  
ANALYSIS TOLERANCE SAE J409 TAV.3

### COMPOSIZIONE CHIMICA SOLIDO %

	C	Mn	Si	P	S	Cr	Ni	Mo	Al (T)	Cu	Sn	Ti
Min												
Max												
Colata/Heat	0,418	0,93	0,24	0,009	0,004	1,05	0,18	0,22	0,034	0,17	0,009	0,0027
	B (T)	V	Nb	As	Ca	Sb	Co	Pb	O2/ppm	H2/ppm	P+S	Diametro Ideale in
Min												
Max												
Colata/Heat	0,0001	0,006	0,004	0,006	0,0013	0,001	0,009	0,0030	10,00	1,00	0,013	6,50

### CARATT. MECCANICHE

MECHANICAL PROPERTIES - CARACTERISTIQUES MECANIQUE - MECHANISCHE EIGNSCHAFTEN

TENSILE/IMPACT TEST ON PRODUCT TRATTAMENTO TERMICO HEAT TREATMENT

TRAZIONE  
TENSILE TEST

ATTACHED MECHANICAL PROPERTIES (125226/2-A-)

### PROVA JOMINY

JOMINY TEST - ESSAI JOMINY - STIRNABSCHRECKVERSUCH

	J1/16" - HRC	J2/16" - HRC	J3/16" - HRC	J4/16" - HRC	J5/16" - HRC	J6/16" - HRC	J7/16" - HRC	J8/16" - HRC	J9/16" - HRC	J10/16" - HRC	J12/16" - HRC	J14/16" - HRC
Min	53	53	52	51	51	50	48	47	44	42	39	37
Max	60	60	60	59	59	58	58	57	57	57	55	54
Colata/Heat	58,3	58	57,5	57,1	56,7	56,3	56,2	55,7	54,9	54,2	53,4	51,4
	J16/16" - HRC	J18/16" - HRC	J20/16" - HRC	J22/16" - HRC	J24/16" - HRC	J26/16" - HRC	J28/16" - HRC	J30/16" - HRC	J32/16" - HRC			
Min	35	34	33	33	32	32	31	31				
Max	53	52	51	49	48	47	46	45				
Colata/Heat	50,6	49,7	48,6	47,4	45,8	44	42,1	41,2	40,3			

AUSTENITIZING TEMPERATURE 845°C

### INCLUSIONI NON METALLICHE

NON METALLIC INCLUSION - INCLUSIONS NON METALLIQUES - PRUFUNG NICHTMETALLISCHE EINSCHLUSSE

P114101 R137-531 I-534922 H-229371 875



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Heat-Quen-Schmelze  
Pag. 2 / 2

	Tipo A Type A	Tipo B Type B	Tipo C Type C	Tipo D Type D
Fine Thin	1	0.5	0	1.5
Grosso Heavy	1	1.5	0	1

MICROINCLUSIONS : METHOD "A"

MICROINCLUSIONS: STANDARD ASTM E45

GRANO  
GRAIN - GRAIN - KORNGROSSE

AUSTENITIC GRAIN : STANDARD ASTM E112/ASTM A29

AUSTENITIC GRAIN SIZE 8

ALTRE PROVE  
OTHER TESTS - AUTRES ESSAIS - SONSTIGE PRUFUNGEN

MACROGROETCHING C 1

MACROGROETCHING R 1

MACROGROETCHING S 1

MACRO TEST = "ACC. TO ASTM E381"

### NOTE

SURFACE DEFECTS: ASTM E709-08

INTERNAL DEFECT METHOD UT 100% ACC. TO ASTM A388/A388M LAST EDITION

INTERNAL DEFECTS ACCEPTANCE CRITERIA PAR. 7.4.2.3.15 (PSL3)

INTERNAL DEFECTS ACCEPTANCE CRITERIA PAR. 7.4.2.4.11 (PSL4)

INTERNAL DEFECTS MATERIAL CONTROL WITH DAC CURVE

ANTIMIX 100 %

R/R = 13

TEST CERTIFICATE ISSUED ACCORDING TO: EN 10204 3.1

"NO REPAIR WELDING"

CALCIUM ALLUMINUM TREATMENT

"ULTRASONIC INSPECTION SATISFACTORY"

ASTM A29-12;A304-11;A255-10;A370-12;E112-13;E45-13;E709-08;A388-11;E381-12;A322-13;A751-11.

STARTING PRODUCT : INGOT

ACC. TO NACE MR-01-75-2003

ACC. TO AISI4140, NACE MR-01-75/ISO 15156 2009 ANNEX A.2.1.2

ACC. TO API 6A PSL1 THROUGH 4 PSL 75K 20ed. 2010

COUNTRY OF ORIGIN : ITALY

- Material free from lead, mercury, cadmium and hexavalent chromium (dir. 2000/53/CE - dir. 2011/65/UE as amended)

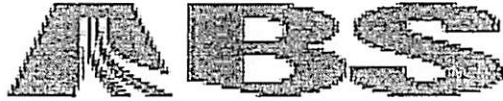
- Material with radioactivity not exceeding 0,1Bq/g (d.lgs. 230/1995 as amended)

CONTROLLO QUALITA'  
QUALITY CONTROL - CONTROLE DE QUALITE - QUALITATSSTEILE

Company with a management system certified by IGQ to  
ISO 9001 and ISO/TS 16949

Verif.:Giovanna Rojatti

*Giovanna Rojatti*



ACCIAIERIE BERTOLI SAFAU

INSPECTION CERTIFICATE N° 125226/2-A-

DATE 04/06/2015

HEAT 229371

STEEL GRADE AISI 4140

**MECHANICAL PROPERTIES**

POSITION TEST	YS 0,2% [PSI]	YS 0,5% [PSI]	TS [PSI]	E% 2"	R.A.%	Kv +32°F [ft.lbs] long.				Kv-75°F [ft.lbs] long.			
1/2 radius	80.350	81.002	106.747	23,0	60	98	99	90		31	32	41	
Average									96				35
Exp. Lat. mm.						1,47	1,36	1,22		0,52	0,54	0,55	
Shear area %						82	80	87		47	52	48	

BHN = 229 ON SURFACE

BHN = 219 AT HALF RADIUS

HRC = 20 ON SURFACE

HRC = 18,5 AT HALF RADIUS

MECHANICAL PROPERTIES OBTAINED FROM PROLONGATION OF THE BAR ACC.TO ASTM A370.

LONGITUDINAL TEST. TEST DRAWN AT HALF RADIUS FROM SURFACE.

LENGHT OF TEST SPECIMEN 130 mm. (ACC.TO ASTM A370 SPECIMEN N°4)

AUSTENITIZE 1616°F WATER X 353' TEMPERED 1274°F AIR x 450' STRESS RELIEVED 1139°F X 390'.

QUENCH WATER TEMPERATURE: BEFORE 86°F AFTER 108°F.

FURNACE CALIBRATED IN ACCORDANCE TO: API 6A APPENDIX-H.

ACC.TO: API6A PSL1 THROUGH 4 PSL75K,NACE MR-0175.

QUALITY CONTROL

ACCIAIERIE BERTOLI SAFAU S.p.A.  
 Servizio Clienti e Qualità