



BUILD SHEET: N-102 DATE _____
MOLD CHECK _____ COOKED
ORDER DATE 17 APR 18 SHIP BY DATE: 20 APR 18
FOR SLB-UAE PO NO NK IW 1257A
SIZE 2.355 TYPE Blind Box
THREAD 1 1/2 MT-Box OTHER GRIND TO SIZE ^{4 Jets}
MATRIX (H) _____ WEIGHT _____
MATRIX (S) _____ WEIGHT _____
BINDER _____ WEIGHT _____
BLANK 22551 TJ _____
CUTTER _____
BILLET _____ TUBE _____
WELD BY _____ MPI BY _____
THREAD GAGE 47711 STAND OFF Flush
LENGTH TO WELD
FINAL DIAMOND GRIND SIZE 2.355
SHIPPED BY JM DATE 4-20-18

SHORT BIT & TOOL CO
225 GOLD STREET
GARLAND TX 75042
972-205-1011
main@shortbits.com



Certificate of Conformance

Serial Number	Size	Type	Steel or Matrix	Shank Diameter	Bore
N-102	2.355	Blind Box	Steel		
Component					
Blank	4140 Steel		RHW		22551†
Hard Powder					
Soft Capping Powder					
Tool Joint					
MIG Weld					
WP Tube					
Inspection					
Diamond Grinding To Size					
Weld MPI					
Thread Gaging	#47711				

Signed By: *P. Beggs* date: *4-24-2018*



ACCIAIERIE BERTOLI SAFAU

CERTIFICATO DI COLLAUDO

N. 146791 / 1
 Data 11.05.2016
 COLATA N. 225511
 Heat-Ceutée-Schmelze
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ACCIAIERIE BERTOLI SAFAU SpA
 Via Buttrio n.28 - Frazione Cargnacco - 33050 Pozzuolo del Friuli (UD)
 +39 0432 613211 - Fax +39 0432 613209 - www.absacciai.it

Inspection Certificate 3.1/Certificat de reception 3.1/
 Abnahmeprüfzeugnis 3.1

CLIENTE MAGELLAN CORPORATION **212** ORDINE 209765
 Customer-Client-Besteller Order-Commande-Bestellung
 PROFILO HOT ROLLED ROUND BARS , 63,5 MM - 2 STATO DI FORNITURA Q.T. & STRESS RELIEF
 Shape-Section-Profil Delivery State-Etat de livraison Lieferzustand
 ACCIAIO AISI 4140 Commessa/Pos 2002905/30
 Steel-Acier-Stahl
 CAPITOLATO ABS: ABS
 Technical Specification:
 CAPITOLATO DI ANALISI: MAGELLAN MIC 6016/2010 ADD.11 10/04/2014
 Material Specification:
 CAPITOLATO DI FORNITURA: MAGELLAN MIC 6016-10 12.22.2010
 Technical Delivery Requirements:

COMPOSIZIONE CHIMICA %

CHEMICAL ANALYSIS % - COMPOSITION CHIMIQUE % - CHEMISCHER ZUSAMMENSETZUNG %

	C	Mn	Si	P	S	Cr	Ni	Mo	Al (T)	Cu	Sn	Ti
Min	0,400	0,75	0,15			0,90		0,15	0,020			
Max	0,430	1,00	0,35	0,025	0,025	1,10	0,25	0,25	0,050	0,25	0,100	0,0500
Colata/Heat	0,411	0,94	0,26	0,005	0,002	1,07	0,18	0,23	0,024	0,19	0,011	0,0036
	B (T)	V	Nb	As	Ca	Sb	Co	Pb	O2/ppm	H2/ppm	P+S	D.L INCH
Min												5,50
Max	0,0008	0,050	0,060	0,100	0,1000	0,100	0,100	0,3000	20,00	3,00	0,040	
Colata/Heat	0,0001	0,006	0,004	0,006	0,0009	0,001	0,010	0,0001	13,00	1,30	0,007	6,84

VACUUM DEGASSED

ACC. TO ASTM A751-11

ELECTRICAL FURNACE MELTED

ANALYSIS TOLERANCE ASTM A29/A29M-12

CARATT. MECCANICHE

MECHANICAL PROPERTIES - CARACTERISTIQUES MECANIQUE - MECHANISCHE EIGENSCHAFTEN

TENSILE/IMPACT TEST ON PRODUCT

TRATTAMENTO TERMICO HEAT TREATMENT

TRAZIONE
TENSILE TEST

"ACC. TO ASTM E10-12"

ATTACHED MECHANICAL PROPERTIES(146791/1-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	J11/16" - HRC	J12/16" - HRC
Min	55	55	54	53	53	52	51	50	49	47	46	44
Max	60	60	60	59	59	58	58	57	57	56	56	55
Colata/Heat	58,4	58,1	57,6	57,2	56,8	56,4	56,2	55,8	55	54,4	54	53,5
	J13/16" - HRC	J14/16" - HRC	J15/16" - HRC	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	42	41	40	39	37	36	35	34	34	34	33	33
Max	55	54	54	53	52	51	49	48	47	46	45	44
Colata/Heat	53,1	52,7	52	51,4	50,1	48,8	47,5	46	44,5	43	42	40,7

AUSTENITIZING TEMPERATURE 850°C

ACC. TO ASTM A304

INCLUSIONI NON METALLICHE

NON METALLIC INCLUSION - INCLUSIONS NON METALLIQUES - PRUFUNG NICHEMETALLISCHE EINSCHLUSSE

	Tipo A Type A	Tipo B Type B	Tipo C Type C	Tipo D Type D
Fine Thin	0,5	0	0	1
Grosso Heavy	0,5	0	0	0,5

MICROINCLUSIONS : METHOD A

MICROINCLUSIONS: STANDARD ASTM E45

GRANO

GRAIN - GRAIN - KORNGROSSE

AUSTENITIC GRAIN : STANDARD ASTM E112/ASTM A29

AUSTENITIC GRAIN SIZE 7



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S.p.A.

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N. 146791 / 1

Data 11.05.2016

COLATAN. 225511
Real-Coulee-Schmelze

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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: 100% SURFACE CONTROL

SURFACE DEFECTS: ASTM E709

INTERNAL DEFECT METHOD UT 100%

NUMBER TREATED BARS: = 116

INTERNAL DEFECTS ACC. TO ASTM A388/A388M - S1 2011

ANTIMIX 100 %

R/R = 18

TEST CERTIFICATE ISSUED ACCORDING TO: EN 10204/3.1

"NO REPAIR WELDING"

"ULTRASONIC INSPECTION SATISFACTORY"

STARTING PRODUCT : CONTINUOUS CASTING

CALCIUM ALUMINUM TREATED

"CONFORMING TO AISI4140 / AISI4142"

"ACC. TO ASTM A434-04 CL. BD"

ASTM A29-12e1;A788-11;A576-90b;A322-13;A751-14a;E381-01R12;E112-13;E45-13;A255-10;A304-11;A370-14;A388-11;E709-14.

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 - QUALITATSSTELLE

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

Verif.:Giovanna Rojatti

Giovanna Rojatti



INSPECTION CERTIFICATE N° 146791/1-A-
 DATE 11/05/2016
 HEAT 225511
 STEEL GRADE AISI 4140

MECHANICAL PROPERTIES

POSITION TEST	YS 0,2% [KSI]	TS [KSI]	E% 2"	R.A.%	Kv +32°F [ft.lbs] long.			AVERAGE	Kv -20°F [ft.lbs] long.			AVERAGE
					Kv +32°F [ft.lbs] long.	Kv +32°F [ft.lbs] long.	Kv +32°F [ft.lbs] long.	Kv +32°F [ft.lbs] long.	Kv -20°F [ft.lbs] long.	Kv -20°F [ft.lbs] long.	Kv -20°F [ft.lbs] long.	
1/2 RADIUS	134	149	17,4	55	62	66	69	66	55	52	49	52
Exp. Lat. mm.					1,03	0,99	1,12		0,74	0,69	0,68	
Shear area %					72	69	62		55	51	55	

BHN = 310 ON SURFACE

BHN = 304 AT HALF RADIUS

MECHANICAL PROPERTIES OBTAINED FROM PROLONGATION OF THE BAR ACC.TO ASTM A370.
 LONGITUDINAL TEST, ACC.TO ASTM A 370.
 LENGHT OF TEST SPECIMEN 130 mm. (ACC.TO ASTM A370 SPECIMEN N°4)
 TENSILE SPECIMEN SIZE 0,500"
 IMPACT SPECIMEN SIZE 10 mm. X 10 mm.
 ATMOSPHERIC THERMOCOUPLE TYPE K CLASS 1 IEC 60584-2/1998.

AUSTENITIZE 1616°F WATER x 135' TEMPERED 1202°F AIR x 210' STRESS RELIEVED 1112°F x 150'

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

QUALITY CONTROL

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