

Certificate of Test

E130797-5.0in Page: 1

HEAT E130797 ORDER 641894/ 05 BOL 0224819 * CERTIFICATION * 10/28/13

SHIP TO:
 COPPER & BRASS
 9451 45 AVE NW

EDMONTON, AB T6E 6B 00000000

----- YOUR ORDER & DATE -----
 5400186206 10/28/13 CUST# 0316001 CUST TAG#SSRD00696

----- ITEM DESCRIPTION -----
 GRADE 316L/316 Ship Condition CONDA
 Size 316L RND HRART CONDA 5.0000 x 144.000 RL
 Country of Melt: UNITED KINGDOM Country of Mfg.: SWEDEN
 NAFTA Country of Origin is Country of Melt

No weld repair
 Free of mercury contamination, Free of radiation contamination
 No WEEE relevant substances; Meets EU electrical ROHS

Total Bundles 1 Total Weight 1715

WO 2042109 Bundles: 1M

AMS 5648L, 5653H	SPECIFICATIONS
ASME SA479 E07-E10 A11	SAE AMS-QQ-S-763B
ASTM A262 10 Practice A/E	ASTM A182 13
ASTM A479/A479M 13	ASTM A276 13
ASTM E112 96	ASTM A484 13
DFARS 252.225.7009 10/4/11	DIN 50049/EN 10204 Type 3.1
Copper & Brass 316L MAXX	Federal Spec QQ-S-763F
CBS316L.NACE R0 w/excepts	NACE MR0175-09, mid-rad hard
NACE MR0175-09, mid-rad hard	Sol Anneal @ 1900F min/WQ
Hot rolled at Degerfors, SE	Reduction Ratio 4:1 minimum
Heat treated at Allvac, SC	Tested at Element Lab CLT NC

----- MECHANICAL & OTHER TESTS -----

Hardness as shipped (153 HB)		Hardness as tested	00
Hardness as shipped 80 HRB		Tensile strength, KSI (MPa)	88.8 (612)
Grain size 6.0		0.2% Yield Strngth, KSI (MPa)	41.5 (286)
Micro OK		Elongation % in 4D	53.0
Intergranular corrosion OK		Reduction of area %	73.0

----- CHEMICAL COMPOSITION -----

Carbon (C)	.017	Manganese (Mn)	1.580
Phosphorus (P)	.031	Sulphur (S)	.023
Silicon (Si)	.330	Chromium (Cr)	17.260
Nickel (Ni)	10.130	Cobalt (Co)	.281
Copper (Cu)	.360	Moly (Mo)	2.050
Nitrogen (N)	.083	Columbium (Cb)	.020
Titanium (Ti)	.002	Aluminum (Al)	.004
Tin (Sn)	.009	Boron (B)	.001
Tantalum (Ta)	.001	Vanadium (V)	.060
Tungstem (W)	.080		.000
Columbium/			
Tantalum (Cb+Ta)	.021		
Iron (Fe)	Balance		
Melt Practice	EAF		
Refining Practice	AOD		
De-long Ferrite			

Knowingly & willfully falsifying or concealing a material act on this form, or making false, fictitious or fraudulent statements or representations herein could constitute a felony punishable under federal statutes. We hereby certify that the test results shown in this report are correct and accurate as contained in the records of the company and are in compliance with the specifications, codes, and standards listed above.

Outokumpu Stainless Bar, Inc.
 3043 Crenshaw Pkwy
 Richburg, SC 29729

M.F. Marcanio, Quality Manager

M.F. Marcanio

From: Copper and Brass Sales CA

Cust. M2M MACHINING

Del.: 2403376125

CstAr

CstOr No. 2012-504

Wgt.: 489 LB

Date 09/09/2014

John L. Zambetti