



Certificate of Test E130555-4.0in

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HEAT E130555 ORDER 641894/ 04 BOL 0224819 * CERTIFICATION * 10/28/13

SHIP TO:
COPPER & BRASS
9451 45 AVE NW

EDMONTON, AB T6E 6B 000000000

----- YOUR ORDER & DATE -----
5400186206 10/28/13 CUST# 0316001 CUST TAG#SSRD01323

----- ITEM DESCRIPTION -----
GRADE 316L/316 Ship Condition CONDA
Size 316L RND HRART CONDA 4.0000 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 1085

WO 2041044 Bundles: 1L

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

----- MECHANICAL & OTHER TESTS -----
Hardness as shipped (158 HB)
Hardness as shipped 81 HRB
Grain size 6.5
Micro OK
Intergranular corrosion OK
Hardness as tested 00
Tensile strength, KSI (MPa) 87.9 (606)
0.2% Yield Strngth, KSI (MPa) 40.3 (278)
Elongation % in 4D 54.0
Reduction of area % 74.0

----- CHEMICAL COMPOSITION -----
Carbon (C) .019 Manganese (Mn) 1.670
Phosphorus (P) .039 Sulphur (S) .027
Silicon (Si) .290 Chromium (Cr) 17.390
Nickel (Ni) 10.090 Cobalt (Co) .238
Copper (Cu) .440 Moly (Mo) 2.030
Nitrogen (N) .084 Columbium (Cb) .010
Titanium (Ti) .002 Aluminum (Al) .005
Tin (Sn) .009 Tantalum (Ta) .003
Vanadium (V) .040 Tungstem (W) .060
Columbium/
Tantalum (Cb+Ta) .013
Iron (Fe) Balance
Melt Practice EAF
Refining Practice AOD
De-long Ferrite 2.4

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

From: Copper and Brass Sales CA

Cust. M2M MACHINING

Del.: 2403345721

CstAr

CstOr 2012-495

Wgt.: 767.500 LB

Date 08/22/2014