



Certificate of Test

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HEAT E140515 ORDER 653095/ 05 BOL 0230039 * CERTIFICATION * 11/19/14

SHIP TO:
 COPPER & BRASS
 VANCOUVER
 19044 95A AVENUE SURREY
 VANCOUVER BC V4N 4 000000000

----- YOUR ORDER & DATE -----
 5400230383 7/24/14 CUST# 0316001 CUST TAG#SSRD00372

----- ITEM DESCRIPTION -----
 GRADE 316L/316 Ship Condition CONDA
 Size 316L RND HRART CONDA 6.2500 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 2735 Approx. Hot Red. Ratio 5:1

WO 2049975 Bundles: 1L

----- SPECIFICATIONS -----
 AMS 5648L, 5653H SAF AMS-QQ-S-763C
 ASME SA479 2007-2013 Ed. ASTM A182 13a
 ASTM A262 13 Practice A/E ASTM A276 13a
 ASTM A479/A479M 14 ASTM A484 14
 ASTM E112 96 ASTM A320 11 B8M Class 1
 ASTM A193 12b B8M 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

----- MECHANICAL & OTHER TESTS -----
 Hardness as shipped (151 HB)
 Hardness as shipped 80 HRB
 Grain size 5.5 Tensile strength, KSI (MPa) 85.7 (591)
 Micro OK 0.2% Yield Strngth, KSI (MPa) 38.0 (262)
 Intergranular corrosion OK
 Elongation % in 4D 56.0
 Reduction of area % 75.0

----- CHEMICAL COMPOSITION -----
 Carbon (C) .023 Manganese (Mn) 1.620
 Phosphorus (P) .034 Sulphur (S) .028
 Silicon (Si) .400 Chromium (Cr) 17.180
 Nickel (Ni) 10.020 ✓ Cobalt (Co) .274
 Copper (Cu) .440 Moly (Mo) 2.090 ✓
 Nitrogen (N) .081 Columbium (Cb) .010
 Titanium (Ti) .002 Aluminum (Al) .004
 Tin (Sn) .010 Tantalum (Ta) .001
 Vanadium (V) .050 Tungsten (W) .120
 Columbium/ Tantalum (Cb+Ta) .011
 Iron (Fe) Balance
 Melt Practice EAF
 Refining Practice AOD
 De-long Ferrite 2.6

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.

M.F. Marcanio, Quality Manager

Aug 27, 16

M.F. Marcanio
 JZ