



Certificate of Test

E 101809

HEAT E101809 ORDER 624271/ 01 BOL 0215501 * CERTIFICATION * 01/13/12

SHIP TO:
COPPER AND BRASS SALES
8001 THYSSENKRUPP PARKWAY

NORTHWOOD 436190000

CPA 016/017

----- YOUR ORDER & DATE -----
5400109661 1/13/12 CUST# 0316001 CUST TAG#SSRD00147

----- ITEM DESCRIPTION -----
GRADE 316L/316 Ship Condition CONDA
Size 316L RND HRART CONDA 8.5000 x 144.000 RL
Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED KINGDOM
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 2165

WO 2029114 Bundles: 1CA

----- SPECIFICATIONS -----
AMS 5648L, 5653G SAE AMS-QQ-S-763B
ASME SA479 E07-E10 A11 ASTM A182 10a
ASTM A262 10 Practice A/E ASTM A276 10
ASTM A479/A479M 11 ASTM A484 11
ASTM E112 96 ASTM A320 11 B8M Class 1
ASTM A193 11 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 MR0175-03, mid-rad hard

----- MECHANICAL & OTHER TESTS -----
Hardness as shipped (145 HB)
Hardness as shipped 77 HRB
Grain size 6.0 Tensile strength, KSI (MPa) 82.0 (565)
Micro OK 0.2% Yield Strngth, KSI (MPa) 32.7 (225)
Intergranular corrosion OK
Elongation % in 4D 56.6
Reduction of area % 76.0
Charpy (ft lb) 0 0 0 Avg 84

----- CHEMICAL COMPOSITION -----
Carbon (C) .016 Manganese (Mn) 1.620
Phosphorus (P) .032 Sulphur (S) .026
Silicon (Si) .336 Chromium (Cr) 16.680
Nickel (Ni) 10.120 Cobalt (Co) .259
Copper (Cu) .437 Moly (Mo) 2.030
Nitrogen (N) .070 Columbium (Cb) .024
Titanium (Ti) .002 Aluminum (Al) .004
Tin (Sn) .007 Tantalum (Ta) .003
Vanadium (V) .070
Columbium/
Tantalum (Cb+Ta) .027
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.

M.F. Marcanio, Quality Manager

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

Copper & Brass Sales

Customer: M 2 M
Customer PO: 2012-123
Qty: 11 Weight: 174
Ship/Deliv #: 2401741591
By: AP

M.F. Marcanio