

HEAT E141270 ORDER 655271/ 01 BOL 0229682 * CERTIFICATION * 10/24/14

SHIP TO:
COPPER & BRASS SALES
19044 95A AVE
SURREY BC V4N 4P2
SURREY 000000000

----- YOUR ORDER & DATE -----
5400238931 10/20/14 CUST# 0316001 CUST TAG#SSRD00244

----- ITEM DESCRIPTION -----
GRADE 316L/316 Ship Condition CONDA
Size 316L RND HRART CONDA 11.0000 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 2 Total Weight 8649 Approx. Hot Red. Ratio 6:1

WO 2055563 Bundles: 1B, 1D

----- SPECIFICATIONS -----
AMS 5648L, 5653H SAE 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 (149 HB)
Hardness as shipped 78 HRB
Grain size 3.0 Tensile strength, KSI (MPa) 79.0 (545)
Micro OK 0.2% Yield Strngth, KSI (MPa) 38.9 (268)
Intergranular corrosion OK
Elongation % in 4D 59.6
Reduction of area % 77.0

----- CHEMICAL COMPOSITION -----
Carbon (C) .020 Manganese (Mn) 1.620
Phosphorus (P) .034 Sulphur (S) .025
Silicon (Si) .480 Chromium (Cr) 16.740
Nickel (Ni) 10.150 Cobalt (Co) .190
Copper (Cu) .350 Moly (Mo) 2.040
Nitrogen (N) .080 Columbium (Cb) .017
Titanium (Ti) .002 Aluminum (Al) .006
Tin (Sn) .009 Vanadium (V) .050
Tungsten (W) .051 .000
Columbium/
Tantalum (Cb+Ta) .017
Iron (Fe) Balance
Melt Practice EAF
Refining Practice AOD
De-long Ferrite 1.6

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

Outokumpu Stainless Bar, LLC
3043 Crenshaw Pkwy
Richburg, SC 29729

M.F. Marcanio

From: TK Materials CA, Ltd.

Cust. M2M MACHINING

Del.: 2404492879

CstAr

CstOr 2016-640

Wgt.: 86 LB

Date 04/20/2016

Tomas Sanchez