

OUTOKUMPU

Certificate of Test

61323



* CERTIFICATION *

HEAT E61323 ORDER 0491581/009 SON D60490 BOL 0143327 TAG 1819915 05/11/07

----- YOUR ORDER & DATE -----
18699-OP 5/11/07 CUST# CUST TAG#11405255

----- ITEM DESCRIPTION -----
GRADE 316L/316
Size 316L HRART RND BAR 5-1/4 STD Country of Melt: BRI
Ship Condition A NAFTA Country of Origin is Country of Melt

Total Bundles 1 SON Weight 2515

----- SPECIFICATIONS -----
AMS 5648K, 5653F
ASME SA182 E04 A06 CHEM. ONLY
ASME SA479 E04 A06
ASTM A182-05A CHEMISTRY
ASTM A276 05A
ASTM A479 06
ASTM E112 96
ASTM A193 04B B8M
MIL-S-7720A
TIME SUFF. TO SOLN CARBIDES
ISO 15156:2003 EXCEPT SURFACE
UNS S31600/S31603, AISI316/316L
KSP/UNALLOY-IWRC MS-SS1 REV 3
FREE OF CONT. CARBIDE NETWORK
FREE OF MERCURY CONTAMINATION

SAB-AMS QQ-S-763
ASME SA193 E04 A06
ASME SA320 B8M CL1 E04 A05
ASTM A262 98 PRACTICE F
ASTM A314 97
ASTM A484 06A
ASTM A320 04 B8M CLASS 1
DIN 50049/EN 10204 3.1B
SOL ANNEAL @ 1900F MIN/WQ
NACE MR0175-03 EXCEPT SURFACE
FEDERAL SPEC. QQ-S-763F
PRODEC QUALITY
SOLUTION ANNEALED CONDITION
NO WELD REPAIR

----- MECHANICAL & OTHER TESTS -----
Test Condition A
Hardness as shipped (141 HRW)
Hardness as shipped 76 HRBS
Grain size 5.0 Tensile strength, KSI (MPa) 84.1 (580)
Micro OK 0.2% Yield Strength, KSI (MPa) 35.7 (246)
Interganular corrosion OK
Macro OK Elongation % in 4D 62.0
Reduction of area % 74.0

----- CHEMICAL COMPOSITION -----
Carbon (C) .025 Manganese (Mn) 1.710
Phosphorus (P) .035 Sulphur (S) .025
Silicon (Si) .540 Chromium (Cr) 16.530
Nickel (Ni) 10.080 Cobalt (Co) .320
Copper (Cu) .470 Moly (Mo) 2.050
Nitrogen (N) .064 Columbium (Cb) .015
Titanium (Ti) .003 Aluminum (Al) .004
Tin (Sn) .009 Vanadium (V) .060
Columbium/ Tantalum (Cb+Ta) .015
Iron (Fe) Balance
Melt Practice EAF
Refining Practice AOD
De-long Ferrite

This certificate is a copy of original
mill certificate and verifies
that the product meets the
requirements as originally ordered
by

DATE: May 18, 2007 VERIFIED BY: M.F. Marcanio

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
3043 Creechway Pkwy
Richburg, SC 29729

M.F. Marcanio, Quality Manager

M.F. Marcanio

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