OUTOKUMPU

# Certificate of Test

E81398

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* CERTIFICATION *
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HEAT E81398 ORDER 0504233/001 SON 76662A BOL 0151164 TAG 2022161 08/27/08

SHIP TO:
ASA ALLOYS EDMONTON
20 CHALLENGER CRESCENT

SHERWOOD PARK, ALBE CA T8H2R

2" TBR 160

---------- YOUR ORDER & DATE ----------

| P016270 | 8/27/08 | CUST# ASAALL01 | CUST TAG# |
|---|---|---|---|

---------- ITEM DESCRIPTION ----------

GRADE 316L/316
Size 316L CFA RND BAR 1-3/4 STD
Ship Condition A

Country of Melt: BRI
Country of Mfg.: USA
NAFTA Country of Origin is Country of Melt

Total Bundles 5 SON Weight 10530

---------- SPECIFICATIONS ----------

MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED FROM BRITAIN
AMS 5648K, 5653F
ASME SA182 E07 CHEM. ONLY
ASME SA479 E07
ASTM A182-07A CHEMISTRY
ASTM A262 98 PRACTICE E
ASTM A479 06A
DIN 50049/EN 10204 3.1B
FEDERAL SPEC. QQ-S-763E AM 1
SOLUTION ANNEALED CONDITION
NO WELD REPAIR
DFARS 252.225.7014 6/05
SOL ANNEAL @ 1900F MIN/WQ
NACE MR0175-03, ISO 15156:2003
SAE-AMS QQ-S-763B
ASME SA193 B8M CL1 E07
ASME SA320 B8M CL1 E04 A05
ASTM A193 07 B8M CLASS 1D
ASTM A276 08
ASTM A320 04 B8M CLASS 1
FEDERAL SPEC. QQ-S-763F
PRODEC QUALITY
FREE OF CONT. CARBIDE NETWORK
FREE OF MERCURY CONTAMINATION
BS EN 10204 TYPE 3.1
TIME SUFF. TO SOLN CARBIDES
HARDNESS TESTED AT MID-RADIUS

---------- MECHANICAL & OTHER TESTS ----------

| | | | |
|---|---|---|---|
| Test Condition | A | | |
| Hardness as shipped | 174 HBW | | |
| Hardness as shipped | ( 86 HRBS) | | |
| Grain size | 7.0 | Tensile strength,KSI (MPa) | 91.9 ( 634) |
| Micro | OK | 0.2% Yield Strngth,KSI(MPa) | 57.0 ( 393) |
| Intergranular corrosion | OK | | |
| Macro | OK | Elongation % in 4D | 47.8 |
| | | Reduction of area % | 76.0 |

---------- CHEMICAL COMPOSITION ----------

| | | | | | |
|---|---|---|---|---|---|
| Carbon | (C ) | .017 | Manganese | (Mn) | 1.930 |
| Phosphorus | (P ) | .038 | Sulphur | (S ) | .026 |
| Silicon | (Si) | .531 | Chromium | (Cr) | 16.510 |
| Nickel | (Ni) | 10.130 | Cobalt | (Co) | .203 |
| Copper | (Cu) | .463 | Moly | (Mo) | 2.050 |
| Nitrogen | (N ) | .068 | Columbium | (Cb) | .030 |
| Titanium | (Ti) | .002 | Aluminum | (Al) | .004 |
| Tin | (Sn) | .016 | Boron | (B ) | .001 |
| Tantalum | (Ta) | .001 | Vanadium | (V ) | .060 |
| Columbium/ Tantalum | (Cb+Ta) | .031 | | | |
| 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.

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

E17043

M.F. Marcanio, Quality Manager M.F. Marcanio