

E120229\_8.5



Certificate of Test

HEAT E120229 ORDER 639259/ 01 BOL 0222437 \* CERTIFICATION \* 05/15/13

SHIP TO:
ROLLED ALLOYS INC.
9818 EAST HARDY ROAD

HOUSTON 770930000

YOUR ORDER & DATE
J19066 5/15/13 CUST# 0773001 CUST TAG#539046003011-01

ITEM DESCRIPTION
GRADE 2205/2205+2 Ship Condition CONDA
Size 2205 RND HRART CONDA 8.5000 x 192.000 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

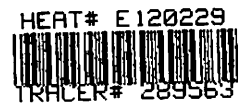
Total Bundles 1 Total Weight 3721

WO 2041048 Bundles: 1A

SPECIFICATIONS
ASME SA479 E07-E10 A11 ASME SA182 F51 E10 A11a chem
ASTM A276 10 ASTM A479/A479M 13
ASTM A923 08 Practice A ASTM A182 12 F51 chemistry
ASTM A923 08 Practice B ASTM A923 08 Practice C
ASTM E562 met point count DIN 50049/EN 10204 Type 3.1
Sol Ann @1950F/hold 45min/WQ NACE MR0175-09, ISO 15156:09
UNS S31803, AISI 2205 UNS S32205, AISI 2205
DFARS 252.225.7009 10/4/11 EN 10204 Type 3.1 Document
ASTM A923 08 Practice B
No pitting, no mass loss

MECHANICAL & OTHER TESTS
Hardness as shipped 231 HB
Hardness as shipped 021 HRC
Micro OK
Intergranular corrosion OK
Corrosion Rate (mdd) .0
Ferrite 43.3
Tensile strength, KSI (MPa) 104.0 ( 717)
0.2% Yield Strngth, KSI (MPa) 72.5 ( 500)
Elongation % in 4D 44.6
Reduction of area % 74.0
Charpy (ft lb) 44 53 105 Avg 67
Charpy Test Temperature - 50F (- 46C)
Lateral Exp (mils) 51 79 103 Avg 77

CHEMICAL COMPOSITION
Carbon (C) .019 Manganese (Mn) 1.210
Phosphorus (P) .022 Sulphur (S) .001
Silicon (Si) .490 Chromium (Cr) 22.390
Nickel (Ni) 5.610 Cobalt (Co) .068
Copper (Cu) .088 Moly (Mo) 3.230
Nitrogen (N) .187 Columbium (Cb) .007
Titanium (Ti) .004 Aluminum (Al) .007
Tin (Sn) .009 Boron (B) .002
Tantalum (Ta) .004 Vanadium (V) .060
Tungstem (W) .010 .000
Columbium/
Tantalum (Cb+Ta) .011
Iron (Fe) Balance
Melt Practice EAF
Refining Practice AOD
De-long Ferrite



Rollod Alloys Quality Assurance

Approved [Signature]

Date 5-17-13

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.

[Signature: M.F. Marcanio]