



# Certificate of Analysis and Tests

**852342-3A**

OUR ORDER 0277069 - 01

HEAT & PIECE 852342-3A 09/02/11

SOLD TO: ROLLED ALLOYS  
P O BOX 310

SHIP TO: ROLLED ALLOYS INC  
9818 EAST HARDY ROAD  
PH: 713-691-4967  
HOUSTON TX 77093

TEMPERANCE MI 48182

J16725 7/27/11 YOUR ORDER & DATE TAG# 3903-3999-02-1

HEAT & PIECE 852342 - 3A  
WEIGHT 9045  
FINISH 1  
GRADE 2205+2 / 2205 UNS-S32205 / UNS-S31803  
DIMENSIONS 1.250 X 96.000 X 256.000 EXACT

**SPECIFICATIONS**

\*\*\* MFG IN NEW CASTLE, IN, USA FROM SLABS IMPORTED FROM BRITAIN  
ASTM A240-11A ASME SA240-10E ASTM A480-11A ASMESA480 10ED  
ASTM A 923-06 METH A,B,& C REFINED A.O.D. PROCESS  
MELTED ELECTRIC ARC METHOD NACE MR0175-2003/ISO 15156  
UHA 51 CHARPY @ -40F (-40C) ROLLED ALLOYS SPEC 2205+2  
CONTAINS 40% TO 60% FERRITE E562 POINT CT FERRITE 40-50%  
NAFTA CTRY ORIGIN= SLAB CTRY MEETS EU ELECTRICAL ROHS  
LIST HEAT/PCE/SIZE ON INVOICE EXXONMOBIL DSS1R10 R6 W/EXCP

PLATES & TEST PCS SOLUTION ANNEALED @ 1950 DEGREES FAHRENHEIT MINIMUM.  
THEN WATER QUENCHED  
FREE FROM MERCURY CONTAMINATION AT CURRENT DETECTION LIMITS  
HOT ROLLED, ANNEALED & PICKLED (HRAP)

**MECHANICAL & OTHER TESTS**

HARDNESS HRC 15  
YIELD STRENGTH (PSI) 73597  
TENSILE STRENGTH (PSI) 106130  
ASTM A923 METHOD A OK  
ELONGATION % IN 2" 38.7  
REDUCTION OF AREA % 70.9  
CHARPY TEST AT -40F (TRANS) 222 FT-LBS. SAMPLE SIZE FULL  
A923 METHOD C CORROSION TEST M.D.D. - 0.00 @ 25 DEGREES C 24HRS  
CHARPY TEST AT -40F (TRANS) 237, 240, 222 FT-LBS. FULL SAMPLE SIZE  
SHEAR % = 100%, 100%, 100% LATERAL EXPANSION = 98, 104, 100 (MILS)  
ASTM E-562 POINT COUNT FERRITE = 45% AT 10% RELATIVE ACCURACY  
CALCULATED E-LONG = 41.9%

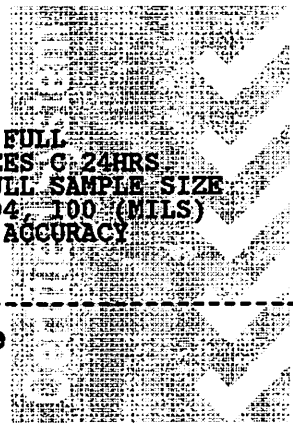
**CHEMICAL COMPOSITION**

|            |      |       |
|------------|------|-------|
| CARBON     | (C)  | .017  |
| MANGANESE  | (MN) | 1.40  |
| PHOSPHORUS | (P)  | .017  |
| SULFUR     | (S)  | .001  |
| SILICON    | (SI) | .45   |
| CHROMIUM   | (CR) | 22.33 |
| NICKEL     | (NI) | 5.67  |
| COBALT     | (CO) | .13   |
| COPPER     | (CU) | .07   |
| MOLY       | (MO) | 3.12  |
| NITROGEN   | (N)  | .18   |
| COLUMBIUM  | (CB) | .007  |
| TITANIUM   | (TI) | .004  |
| ALUMINUM   | (AL) | .016  |
| TIN        | (SN) | .010  |
| TANTALUM   | (TA) | .008  |

**Roller Alloy Quality Assurance**

Approved

Date 9-6-11



ISO 9001-2008

SAL Cert# CBPI-0033834

HEAT# 852342



WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE LISTED SPECIFICATION(S) AND THAT THE RESULTS OF ALL TESTS ARE ACCEPTABLE.

JAMES DOUBMAN, QUALITY ASSURANCE MANAGER