

**MATERIAL CERTIFICATION REPORT and
CERTIFICATION OF QUALITY CONFORMANCE**

Customer Address

Shipping Address

Print Date Time

Ship Net

COPPER & BRASS SALES
ACCOUNTS PAYABLE
22355 WEST 11 MILE ROAD
SOUTHFIELD, MI 48034-4735

COPPER & BRASS SALES
10648 WEST LITTLE YORK
SUITE 400
HOUSTON, TX 77041

09-Aug-2011 10:31

112176



ELECTRALLOY
G. O. CARLSON PLATE



175 Main Street
OK City PA 16341
1 (800) 458-7273

Certification ID

112545-1

Customer Order

5400111626-R05

Sales Order

110955

Grade: 316L

Specification: Type 316/316L(UNS S31600/S31603) - ASTM A182/A182M-08a (F316,F316L) AMS 5648K, AMS 5653F ASTM A193/A193M-08b,(316), ASTM A479/A479M-10a, ASTM A 276-08a, NACE Std-MR0175/ISO 15156-3 QQ-S-763F, ASME SA-182/SA-182M, SA-479/SA-479M, ASTM A484/A484M-08, ASME SA-193/ SA-193M, ASTM A262 practice E (A allowed)

and any additional specifications which may be listed below.

Condition: HOT ROLLED / HOT FORGED, ANNEALED

Finish: ROUGH TURNED

49806

Sales Order	Quantity	Heat	Lot ID	Weight	Size	Customer Mark
110955-1	1	49806	49806-2A	7,270 LB	Diam: 15.1610 in; Length: 139.5000 in	

Lot	Test	Result	Low Limit	High Limit
SPECIFICATION RESULTS				
FINAL LADLE CHEMISTRY FOR ANALYT				
49806	C	0.017	0.000	0.030
49806	Mn	1.84	1.25	2.00
49806	P	0.026	0.000	0.040
49806	S	0.002	0.000	0.030
49806	Si	0.48	0.00	1.00
49806	Cr	16.60	16.00	18.00
49806	Ni	10.26	10.00	14.00
49806	Mo	2.10	2.00	3.00
49806	Cu	0.53	0.00	1.00
49806	N	0.076	0.000	0.100
49806	Co	0.16	0.00	0.20
PASS / FAIL TESTS				
49806-2A	Carb Net	PASS		
49806-2A	Macro Etch	PASS		
REDUCTION AREA				
49806-2A	LT (%)	81.9	50	999
TENSILE				
49806-2A	LT (PSI)	85000	75000	400000
.2% YIELD				
49806-2A	LT (PSI)	45000	30000	400000
ELONGATION 4D				
49806-2A	LT (%)	63.5	45	999
BRINELL				
49806-2A	(BHN)	143	140	200

Lot	Test	Result	Low Limit	High Limit
GRAIN SIZE				
49806-2A	Grain Size TT (GRS)	4	0	9999
ASTM PRACTICES - ASTM A262				
49806-2A	Prac E LT	PASS		

Copper & Brass Sales

Customer: _____

Customer PO: _____

Qty: _____ Weight: _____

Ship/Deliv#: _____

By: _____

The recording of false, fictitious, or fraudulent statements or entries on this document may be punishable as a felony under Federal Statute.

Above are true and correct results of tests on samples of the material. Results conform to the specification(s) listed above and are on record.

**MATERIAL CERTIFICATION REPORT and
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G. O. CARLSON PLATE**



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112545-1	
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5400111626-R05	110955

Quality Statements:

ASTM E1019-08, ASTM E572-02a (2006)c2 and ASTM E1086-08 are methods used to determine the chemical analysis for Fe Base (High Alloy) alloys utilizing XRF, OES and Combustion and Fusion Methods.

All items are in full compliance with all purchase order and specification requirements.

At time of shipment, items and/or material produced under this order have not come in contact with Mercury or its compounds.

HWRR = 6.4:1 starting ingot size - 34" square.

Material Certification conforms to Certificate 3.1 as in EN 10204:2004

Material represented was held at 1925 degrees F (+/- 25 degrees F) for 30 minutes per inch of maximum section size then water quenched.

The mechanical tests have been performed at Modern Industries, Materials Research Division located at 613 West 11th Street Erie, PA 16512-0399

Material represented was not weld repaired.

Material represented was produced in accordance with the Electralloy Quality Control Program dated 08/23/2010, which meets the requirements of ISO9001(2008), MIL-I-45208A and ASME Code Section 3, Subsection NCA 3800.

Material represented was ultrasonically inspected in accordance with ASTM A388 and found acceptable using a 1/8" flat bottom hole as the acceptance criteria.

Melting and Refining Source - Electralloy

Method of Manufacture: Electric Arc Furnace melted, A.O.D. refined.

Material represented was melted and manufactured in the USA

Meets EU Electrical "RoHS". Contains NO "WEEE" relevant substances. Complies with DFARS-225.1-Buy American Act-Supplies. HWRR - Minimum Hot Working Reduction Ratio. Electralloy only accepts residual and trace elements to the limits invoked by the specification and or customer. This document shall not be reproduced, except in full, without the written approval of Electralloy / GOC Plate. We hereby affirm that the reported results on this certification are correct and accurate. All tests and results and operations performed by (Electralloy/G.O. Carlson Plate) or its subcontractors are in compliance with the applicable material/customer specification(s).

Name: Napua L. Froman

Title: QC Technician

By:

The parties agree that when title transfers for the products subject to this agreement, or when the products are delivered to purchaser, whichever occurs first, responsibility for the submission of any required export or re-export licenses or related export control approvals for these products also transfers to purchaser. Any export license requirement under any applicable export control statute, regulation, or practice, from any U.S. government agency, including but not limited to the Department of Commerce's Bureau of Industry and Security, the Department of Treasury, Office of Foreign Assets Control, the U.S. Department of State, Directorate of Defense Trade Controls, and the Nuclear Regulatory Commission, are solely the responsibility of the purchaser. Further, purchaser warrants that it will comply with all applicable export and re-export controls related to these products.

The recording of false, fictitious, or fraudulent statements or entries on this document may be punishable as a felony under Federal Statute.
The above are true and correct results of tests on samples of the material. Results conform to the specification(s) listed above and are on record.