

53590

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



ELECTRALLOY  
G. O. CARLSON PLATE



175 Main Street  
Oil City PA 16301  
1 (800) 458-7273

**Customer Address**

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

**Shipping Address**

COPPER & BRASS SALES  
TKX LOGISTICS  
8001 THYSSENKRUPP PARKWAY  
NORTHWOOD, OH 43619

**Print Date Time**

11-Oct-2013 15:55

**Ship Note**

124827

**Certification ID**

151376-1

**Customer Order**

5400199375-R02

**Sales Order**

118413

Grade: 316L

Specification: Type 316/316L(UNS S31600/S31603) - ASTM A182/A182M-13, AMS 5648L, AMS 5653H, ASTM A193/A193M-12b,(316), ASTM A320/A320M-11a (316), ASTM A479/A479M-13a, ASTM A314-08, ASTM A473-01(2009), ASTM A 276-13,NACE Std-MR0175-03, QQ-S-763F, ASTM A336/A336M-10a, ASME SA-182/SA-182M, ASME SA-336/SA-336M, ASME SA-320/SA-320M (316), ASME SA-479/SA-479M, ASTM A484/A484M-12, SA-193/A193M All ASME include 2011 Addenda and any additional specifications which may be listed below.

Condition: HOT ROLLED / HOT FORGED, ANNEALED

Finish: ROUGH TURNED

Sales Order	Quantity	Heat	Lot ID	Weight	Size	Customer Mark
118413-4	1	53590	53590-3A	7,660 LB	Diam: 15.1600 in; Length: 147.8700 in	

Lot	Test	Result	Low Limit	High Limit			
<b>SPECIFICATION RESULTS</b>					<b>BRINELL</b>		
53590-3A	(BHN)				148	140	200
<b>FINAL LADLE CHEMISTRY FOR AIRMELT</b>					<b>GRAIN SIZE</b>		
53590	C	0.017	0.000	0.030	53590-3A	Grain Size TT (GRS)	1 0 9999
53590	Mn	1.75	1.25	2.00	<b>ASTM PRACTICES - ASTM A262</b>		
53590	P	0.033	0.000	0.040	53590-3A	Prac E LT	PASS
53590	S	0.001	0.000	0.025			
53590	Si	0.48	0.00	1.00			
53590	Cr	16.53	16.00	18.00			
53590	Ni	10.40	10.00	14.00			
53590	Mo	2.10	2.00	3.00			
53590	Cu	0.41	0.00	0.50			
53590	N	0.073	0.000	0.100			
53590	Co	0.19	0.00	0.20			
<b>PASS / FAIL TESTS</b>							
53590-3A	Carb Net	PASS					
53590-3A	Macro Etch	PASS					
<b>REDUCTION AREA</b>							
53590-3A	LT (%)	82.8	50	999			
<b>TENSILE</b>							
53590-3A	LT (PSI)	85000	75000	400000			
<b>.2% YIELD OFFSET</b>							
53590-3A	LT (PSI)	43900	30000	400000			
<b>ELONGATION 4D</b>							
53590-3A	LT (%)	59.7	45	999			

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

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**Quality Statements:**

ASTM E1019-08, ASTM E572-02a (2006)e2 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.

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

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Compliant with DFARS 252.225-7014 Alt. 1. Preference for Domestic Specialty Metals

HWRR - 7.6:1 from a 34"x34" square ingot.

Material Certification conforms to Certificate 3, 1 as in EN 10204:2010

Material represented was melted and manufactured in the USA

Material represented was not weld repaired.

Material represented was produced in accordance with the Electralloy Quality Control Program dated 11/14/2012, which meets the requirements of AS9100C ISO9001(2008), MIL-I-45208A including Amendment 1 and 2, ASME Code Section 3, Subsection NCA 3800.

Material represented was solution annealed at 1925 degrees F +/-25 degrees F, held minimum 30 minutes per inch of thickness and water quenched.

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

Material was not exposed to Radium or other radioactive materials while at our facility.

Melting and Refining Source - Electralloy

Method of Manufacture - Electric Arc Furnace Melt AOD Refined

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

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: Bart Plyler

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.

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