



50203

<b>MATERIAL CERTIFICATION REPORT and CERTIFICATION OF QUALITY CONFORMANCE</b>   	<b>Customer Address</b> COPPER & BRASS SALES ACCOUNTS PAYABLE 22355 WEST 11 MILE ROAD SOUTHWFIELD, MI 48034-4735	<b>Shipping Address</b> COPPER & BRASS SALES 10648 WEST LITTLE YORK SUITE 400 HOUSTON, TX 77041	<b>Print Date Time</b> 01-Apr-2011 9:35  <b>Certification ID</b> 110484-1  <b>Customer Order</b> 5400094841-R05	<b>Ship Note</b> 110201  <b>Sales Order</b> 109129
	175 Main Street OH City PA 16381 1 (800) 458-7273			

Grade: 316L  
 Specification: Type 316/316L(UNS S31600/S31603) - ASTM A262 practice E, ASTM A182/A182M-07, AMS 5 648K, AMS 5653F ASTM A193/A193M-07,(316), ASTM A320/A320M-07 (316), ASTM A479/A479M-06a ASTM A314-97 (Reapproved 2002), ASTM A473-01, ASTM A 276-06, NACE Std-MR0175-99, QQ-S-763F, ASTM A336/A536M-07, ASME SA-182/SA-182M, ASME SA-336/SA-336 M, ASME SA - 320/SA-320MO2, (316)ASME SA-479/SA-479M, ASTM A4 84/A484M-06b, SA-193M-94 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
109129-1	1	50203	50203-4B	4,240 LB	Diam: 10.5760 in; Length: 168.0000 in	

Lot	Test	Result	Low Limit	High Limit	50203-4B	(BHN)	159	140	200
<b>SPECIFICATION RESULTS</b>									
<b>FINAL LADLE CHEMISTRY FOR AIRMELT</b>									
50203	C	0.010	0.000	0.030					
50203	Mn	1.78	1.25	2.00					
50203	P	0.029	0.000	0.040					
50203	S	0.022	0.020	0.025					
50203	Si	0.52	0.00	1.00					
50203	Cr	16.40	16.00	18.00					
50203	Ni	10.15	10.00	14.00					
50203	Mo	2.08	2.00	3.00					
50203	Cu	0.52	0.00	0.75					
50203	N	0.077	0.000	0.100					
50203	Co	0.20	0.00	0.20					
<b>PASS / FAIL TESTS</b>									
50203-4B	Carb Net	PASS							
50203-4B	Macro Etch	PASS							
<b>REDUCTION AREA</b>									
50203-4B	LT (%)	74	50	999					
<b>TENSILE</b>									
50203-4B	LT (PSI)	88500	75000	400000					
<b>.2% YIELD</b>									
50203-4B	LT (PSI)	45600	30000	400000					
<b>ELONGATION 4D</b>									
50203-4B	LT (%)	54	45	999					
<b>BRINELL</b>									
					50203-4B	GRAIN SIZE	3.5	0	9999
					ASTM PRACTICES - ASTM A262				
					50203-4B	Prac E LT	PASS		

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



**ELECTRALLOY  
G. O. CARLSON PLATE**

175 Main Street  
OH 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  
10648 WEST LITTLE YORK  
SUITE 400  
HOUSTON, TX 77041

**Print Date Time**

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**Quality Statements:**

ASTM E1019-03, ASTM E572-02a, and ASTM E1086-94 are the methods used to determine the chemical analysis for Fe base (High Alloy), Ni base and Cu base alloys.

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

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

Material represented was melted and manufactured in the USA

Material represented was not weld repaired.

The reported results represent the actual attributes of the material furnished and indicate full compliance with all applicable specification and contract requirements.

Material represented was solution annealed at 1925 degrees F +/-25 degrees F, held 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 represented was produced in accordance with the Electricalloy 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.

The mechanical tests have been performed at Modern Industries, Materials Research Division located at 613 West 11th Street Erie, PA 16512-0399  
Stainless Steel Bar, electric arc furnace melted, A.O.D. refined.

SOLD TO: M2M Machining  
DATE: 02-24-2012 2012-120 IPC  
CUSTOMER: 2401717023 JB  
BY: [Signature]

Meets EU Electrical "RoHS". Contains NO "WEEE" relevant substances. Complies with DFARS-225.1-Buy American Act-Supplies. HWRR = Minimum Hot Working Reduction Ratio. Electricalloy only accepts residual and trace elements to the limits invoked by the specification and customer. This document shall not be reproduced, except in full, without the written approval of Electricalloy / 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: William A. Deets**

**Title: QC Technician/Works Inspector**

**By:**

[Signature]

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.