

HEAT E150800 ORDER 662216/ 03 BOL 0233571 \* CERTIFICATION \* 10/02/15

SHIP TO:  
COPPER & BRASS  
9451 45 AVE NW

EDMONTON, AB T6E 6B 000000000

----- YOUR ORDER & DATE -----  
5400277254 9/29/15 CUST# 0316001 CUST TAG#SSRD01323

----- ITEM DESCRIPTION -----  
GRADE 316L/316 Ship Condition CONDA  
Size 316L RND HRART CONDA 4.0000 x 144.000 RL  
Country of Melt: UNITED KINGDOM Country of Mfg.: SWEDEN  
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 1855 Approx. Hot Red. Ratio 13:1

WO 2063723 Bundles: 1G

----- SPECIFICATIONS -----

AMS 5648L, 5653H	SAE AMS-QQ-S-763D
ASME SA479 2007-2013 Ed.	ASTM A182 15
ASTM A262 15 Practice A/E	ASTM A276-15
ASTM A479/A479M 15	ASTM A484 15
ASTM E112 96	ASTM A320 11 B8M Class 1
ASTM A193 15 B8M	DIN 50049/EN 10204 Type 3.1
DFARS 252.225.7009 10/4/11	Federal Spec QQ-S-763F
Copper & Brass 316L MAXX	NACE MR0175-09, mid-rad hard
NACE MR0103-10	

----- MECHANICAL & OTHER TESTS -----

Hardness as shipped (154 HB )			
Hardness as shipped 80 HRB			
Grain size 6.0	Tensile strength, KSI (MPa)	87.7 ( 605)	
Micro OK	0.2% Yield Strngth, KSI (MPa)	40.6 ( 280)	
Intergranular corrosion OK			
	Elongation % in 4D	54.0	
	Reduction of area %	74.0	

----- CHEMICAL COMPOSITION -----

Carbon (C)	.019	Manganese (Mn)	1.640
Phosphorus (P)	.034	Sulphur (S)	.026
Silicon (Si)	.420	Chromium (Cr)	16.780
Nickel (Ni)	10.050	Cobalt (Co)	.317
Copper (Cu)	.570	Moly (Mo)	2.150
Nitrogen (N)	.081	Columbium (Cb)	.040
Titanium (Ti)	.006	Aluminum (Al)	.006
Tin (Sn)	.009	Tantalum (Ta)	.002
Vanadium (V)	.050	Tungsten (W)	.080
Columbium/ Tantalum (Cb+Ta)	.042		
Iron (Fe)	Balance		
Melt Practice	EAF		
Refining Practice	AOD		
De-long Ferrite	1.6		

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.

M.F. Marcano, Quality Manager

*M.F. Marcano*