OUTOKUMPU

Certificate of Test

E61323.

****
* CERTIFICATION *
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HEAT E61323 ORDER 0491581/009 SON D60490 BOL 0143327 TAG 1819915 05/11/07

---------- YOUR ORDER & DATE ----------

18699-OP 5/11/07 CUST# CUST TAG#11405255

---------- ITEM DESCRIPTION ----------

GRADE 316L/316
Size 316L HRART RND BAR 5-1/4 STD Country of Melt: BRI
Ship Condition A Country of Mfg.: SWE
NAFTA Country of Origin is Country of Melt

Total Bundles 1 SON Weight 2515

---------- SPECIFICATIONS ----------

AMS 5648K, 5653F	SAE-AMS QQ-S-763
ASME SA182 E04 A06 CHEM. ONLY	ASME SA193 B04 A06
ASME SA479 E04 A06	ASME SA320 B8M CL1 E04 A05
ASTM A182-05A CHEMISTRY	ASTM A262 98 PRACTICE E
ASTM A276 05A	ASTM A314 97
ASTM A479 06	ASTM A484 06A
ASTM B112 96	ASTM A320 04 B8M CLASS 1
ASTM A193 04B B8M	DIN 50049/EN 10204 3.1B
MIL-S-7720A	SOL ANNEAL @ 1900F MIN/WQ
TIME SUFF. TO SOLN CARBIDES	NACE MR0175-03 EXCEPT SURFACE
ISO 15156:2003 EXCEPT SURFACE	FEDERAL SPEC. QQ-S-763F
UNS S31600/S31603,AISI316/316L	PRODEC QUALITY
ESP/UNALLOY-IWRC MS-881 REV 3	SOLUTION ANNEALED CONDITION
FREE OF CONT. CARBIDE NETWORK	NO WELD REPAIR
FREE OF MERCURY CONTAMINATION	

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

Test Condition	A		
Hardness as shipped	(141 HBW)		
Hardness as shipped	76 HRBS		
Grain size	5.0	Tensile strength,KSI (MPa)	84.1 (580)
Micro	OK	0.2% Yield Strngth,KSI(MPa)	35.7 (246)
Intergranular corrosion	OK		
Macro	OK	Elongation % in 4D	62.0
		Reduction of area %	74.0

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

Carbon	(C)	.025	Manganese	(Mn)	1.710
Phosphorus	(P)	.035	Sulphur	(S)	.025
Silicon	(Si)	.540	Chromium	(Cr)	16.530
Nickel	(Ni)	10.080	Cobalt	(Co)	.320
Copper	(Cu)	.470	Moly	(Mo)	2.050
Nitrogen	(N)	.064	Columbium	(Cb)	.015
Titanium	(Ti)	.003	Aluminum	(Al)	.004
Tin	(Sn)	.009	Vanadium	(V)	.060
Columbium/ Tantalum	(Cb+Ta)	.015			
Iron	(Fe)	Balance			
Melt Practice		EAF			
Refining Practice		AOD			
De-long Ferrite					

This is a copy of original mill certificate and verifies that the product meets the requirements as originally ordered by

DATE: May 6/07 VERIFIED BY CMP

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 specifications, codes, and standards listed above.

Outokumpu Stainless Inc.
3043 Crenshaw Pkwy.
Richburg, SC 29729

M.F. Marcanio, Quality Manager

M F Marcanio

E16913