



FLOLOK VALVES & SSP VALVES  
TA Luft CERTIFICATION

# ENGINEERING TECHNICAL REPORT

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## SSP INTRODUCTION

Since its inception in 1926, SSP has exhibited an expertise in the precision machining of tight tolerance, high quality fitting components. In fact, SSP's historical reputation for product quality, service and performance is recognized across the country and around the world.

In 1986, SSP relocated to its 25-acre property in Twinsburg, Ohio Southeast of Cleveland in North America's manufacturing heartland. Within its modern 165,000 square foot manufacturing facility, SSP has developed the internal ability to control its manufacturing variables as much or more than any other fittings' manufacturer. SSP designs and produces its own specialty cutting tools to proprietary standards with a 5 axis CNC tool and cutter grinder, high speed 4 axis CNC machining centers and ultra precise EDM's to allow manufacturing to the most stringent dimensional tolerances and surface finishes. Additionally, SSP's tool making capability supports an internal hot, closed-die forging operation. SSP plans, controls and performs its own metal forging operations on all elbows, tees and crosses manufactured into SSP fittings, connectors and adapters. Indeed, SSP's production capacity is among the largest single-site facilities in the entire industry with the capability to allow one-of-a kind, "specials" machining on single spindle CNC's to high volume production on multi-spindle automatics.

Furthermore, SSP's ISO9001 Quality System Certification and Registration by DNV assures conformance to the highest levels of quality. The substantial investment of time and funds to obtain and maintain such status has paid dividends for SSP and its customers in efficiencies in process and supply.

In 2011 SSP unveiled a new line of valves called SSP Valves, as a direct alternative to the line of instrumentation valves manufactured by Swagelok. Following an ISO 9001 design process pattern, the critical elements of design planning, including the detailed documentation of design inputs and outputs occurred for the development of SSP Valves. Examples of such design inputs include:

- Dimensional similarity*
- Material of construction similarity*
- Installation instruction similarity*
- Operation and performance similarity*
- Brand interchangeability*
- Corrosion resistance similarity*
- Applicable ANSI / ASME B 31.3 requirements*

## 1.0 INTRODUCTION

This document's purpose is to report the results obtained in the TA Luft Certification testing witnessed and approved by TUV SUD America Inc. The performance results are measured against the TA Luft standard and criteria.

## 1.1 SCOPE

	Valve Category	Valve Family	Body Material	Packing Material/ Non-metallic material	Min Temp Ratings	@ psi	Max Temp Ratings	@ psi	Pressure Rating Ambient Temp	End Connection Size
<b>FloLok Valves</b>	Medium Pressure Ball Valve	300 series	316 SS	PTFE Seats, Viton o-ring	0 <sup>o</sup> F	500	200 <sup>o</sup> F	1500	1500 psi	1/4"-1/2"
	Medium Pressure Metering Valve	500 Series	316 SS	PTFE	0 <sup>o</sup> F	1000	200 <sup>o</sup> F	250	6000 psi	1/4" - 1/2"
	Medium Pressure Needle Valve	100 Series 600 Series	316 SS	PTFE Kel-F stem tip	0 <sup>o</sup> F	1000	200 <sup>o</sup> F	250	6000 psi	1/4" - 1/2"
	Medium Pressure Lower Packing Needle Valve	400 Series	316 SS	PTFE	0 <sup>o</sup> F	1000	200 <sup>o</sup> F	250	6000 psi	1/4" - 1/2"
	Medium Pressure Rotary Plug Valve	PV Series	316 SS	PTFE Viton O-Ring	0 <sup>o</sup> F	1000	200 <sup>o</sup> F	250	3000 psi	1/4"
	Medium Pressure Check Valve	4000 Series	316 SS	Viton	0 <sup>o</sup> F	1000	200 <sup>o</sup> F	250	6000 psi	1/4"
	Medium Pressure Inline Filter	3100 Series	316 SS	PTFE	0 <sup>o</sup> F	1000	200 <sup>o</sup> F	250	2500 psi	1/4" - 1/2"
<b>SSP Valves</b>	High Pressure Ball Valve	83 and 83X	316 SS	Peek Seats	0 <sup>o</sup> F	1000	200 <sup>o</sup> F	250	6000 psi	1/4" - 1/2"
	High Pressure Check Valve	CH	316 SS	Viton O-RING	0 <sup>o</sup> F	3000	200 <sup>o</sup> F	2600	6000 psi	1/4" - 1/2"
	Medium Pressure Check Valve	CP	316 SS	Viton O-RING	0 <sup>o</sup> F	3000	200 <sup>o</sup> F	2600	3000 psi	1/4" - 1/2"
	Medium Pressure Adjustable Check Valve	CPA	316 SS	Viton O-RING	0 <sup>o</sup> F	3000	200 <sup>o</sup> F	2600	3000 psi	1/4" - 1/2"
	Medium Pressure Quick Couplings	QC	316 SS	Viton O-RING	0 <sup>o</sup> F	250	200 <sup>o</sup> F	250	3000 psi	1/4"
	High Pressure Quick Couplings	QF	316 SS	Viton O-RING	0 <sup>o</sup> F	100	200 <sup>o</sup> F	100	6000 psi	1/4" - 1/2"

\* All valves can be configured with any combination of Duolok, Unilok, Griplok, MNPT, FNPT

## 2.0 TEST PROCEDURES AND RESULTS

### 2.1: HE LEAK TEST (UNDER VACUUM)

**Purpose:** Each test sample was individually plumbed into the hydrogen vacuum tester. The procedure for the helium leak test (under vacuum) is outlined below.

**Test Procedure:** Each test sample shall have their outlet capped and inlet directly plumbed to the vacuum tester and put under vacuum. Once the vacuum is obtained, 100% He was sprayed all around the test sample for 5 minutes. The results were obtained via the mass spectrometer.



Figure 2.1.1

**Acceptance Criteria:** The primary acceptance criteria for all testing are equivalent to those in TA Luft/ VDI 2440. The acceptance criterion for the He leak test (under vacuum) is that of which the OLR (obtained leak rate) must be less than then ALR (Acceptable Leak rate).

$$\text{OLR} < \text{ALR} = \text{VDI (VDI leak rate)} \times \text{MSC (Mean Seal Circumference)}$$

## 2.2: HE LEAK TEST (PRESSURIZED)

**Purpose:** Each test sample was individually plumbed into a line of 100% Helium and pressurized. The procedure for the helium leak test (pressurized) is outlined below.

**Test Procedure:** Each test sample was plumbed into a line of 100% helium with their outlet capped. The test sample was submerged in water and then pressurized to maximum service pressure with 100% He for 5 minutes. The test sample was inspected for leaks resulting in bubbles.



Figure 2.2.1

**Acceptance Criteria:** The primary acceptance criteria for all testing are equivalent to those in TA Luft/ VDI 2440. The acceptance criterion for the He leak test (pressurized) is that of which the OLR (obtained leak rate) must be less than then ALR (Acceptable Leak rate).

$$\text{OLR} < \text{ALR} = \text{VDI (VDI leak rate)} \times \text{MSC (Mean Seal Circumference)}$$

## 2.3: LEAK TEST (LOW TEMPERATURE)

**Purpose:** Each test sample was tested at max service pressure at the low temperature of 0 degrees F. The procedures for leakage testing are outlined below. The test samples were tested individually.

**Test Procedure:** Chamber was conditioned to low component service temperature of 0 degrees F for 2 hours with immersion fluid compatible with the extreme temperature. Both inlet and outlet of components were capped and were conditioned at temperature for 2 hours. After conditioning, the inlet cap was removed and pressurized with He to maximum service pressure. The test samples were observed for leaks for 5 minutes. Cold Snoop was used to detect leaks.



Figure 2.3.1

**Acceptance Criteria:** The primary acceptance criteria for all testing are equivalent to those in TA Luft/ VDI 2440. The acceptance criteria for this low temperature leak test are that leaks are not acceptable.

## 2.4: LEAK TEST (HIGH TEMPERATURE)

**Purpose:** Each test sample was tested at max service pressure at the high temperature of 200 degrees F. The procedures for leakage testing are outlined below. The test samples were tested individually.

**Test Procedure:** Chamber was conditioned to high component service temperature of 200 degrees F for 2 hours with immersion fluid compatible with the extreme temperature. Both inlet and outlet of components were capped and were conditioned at temperature for 2 hours. After conditioning, the inlet cap was removed and pressurized with He to maximum service pressure. The test samples were immersed in fluid and observed for leaks for 5 minutes. If any leaks appear, route funneled tubing to graduated cylinder for leaks measurement. Leaks are not allowed.



Figure 2.4.1

**Acceptance Criteria:** The primary acceptance criteria for all testing are equivalent to those in TA Luft/ VDI 2440. The acceptance criteria for this low temperature leak test are that leaks are not acceptable.



## 2.5: HYDROSTATIC HOLD AND BURST TESTS

**Purpose:** Each test sample was individually plumbed into a hydrostatic burst-test stand. The procedure for the hydrostatic proof and burst test is outlined below. Components must be tested individually to record burst values.

**Test Procedure:** Perform Hydrostatic test to 1.5X WP and then burst test to a minimum of 4X maximum service pressure (5 minute hold) while at ambient temperature.



Figure 2.5.1

**Acceptance Criteria:** The primary acceptance criteria for all testing are equivalent to those in TA Luft/ VDI 2440. Components shall meet both hydrostatic hold and burst tests.

### 3.0 TEST RESULTS SUMMARY

	Valve			TEST				
	Valve Category	Valve Family	End Connection Size	Helium Vacuum	Helium Pressurized	Low Temp Leak	High Temp Leak	1.5 X WP / Burst
<b>FloLok Valves</b>	Medium Pressure Ball Valve	300 series	1/4"-1/2"	PASS	PASS	PASS	PASS	PASS
	Medium Pressure Metering Valve	500 Series	1/4" - 1/2"	PASS	PASS	PASS	PASS	PASS
	Medium Pressure Needle Valve	100 Series 600 Series	1/4" - 1/2"	PASS	PASS	PASS	PASS	PASS
	Medium Pressure Lower Packing Needle Valve	400 Series	1/4" - 1/2"	PASS	PASS	PASS	PASS	PASS
	Medium Pressure Rotary Plug Valve	PV Series	1/4"	PASS	PASS	PASS	PASS	PASS
	Medium Pressure Check Valve	4000 Series	1/4"	PASS	PASS	PASS	PASS	PASS
	Medium Pressure Inline Filter	3100 Series	1/4" - 1/2"	PASS	PASS	PASS	PASS	PASS
<b>SSP Valves</b>	High Pressure Ball Valve	83 and 83X Series	1/4" - 1/2"	PASS	PASS	PASS	PASS	PASS
	High Pressure Check Valve	CH	1/4" - 1/2"	PASS	PASS	PASS	PASS	PASS
	Medium Pressure Check Valve	CP	1/4" - 1/2"	PASS	PASS	PASS	PASS	PASS
	Medium Pressure Adjustable Check Valve	CPA	1/4" - 1/2"	PASS	PASS	PASS	PASS	PASS
	Medium Pressure Quick Couplings	QC	1/4"	PASS	PASS	PASS	PASS	PASS
	High Pressure Quick Couplings	QF	1/4" - 1/2"	PASS	PASS	PASS	PASS	PASS

### 4.0: TEST EQUIPMENT AND INSTRUMENTATION

**Calibration and Standardization:**

1. Description: Torque Wrench  
Range: 0-250 ft\*lbs  
ID #: 50931863  
Calibration Date: 09/02/2011      Due: 09/02/2012
  
2. Description: Gas Pressure Gage  
Range: 0-10,000 psig  
ID #: 74466  
Calibration Date: 01/24/2011      Due: 01/24/2012
  
3. Description: Hydrostatic Pressure Gage  
Range: 0-60,000 psig  
ID #: 09622-1  
Calibration Date: 02/10/2011      Due: 02/10/2012
  
4. Description: Digital Thermometer  
ID #: 1016704  
Calibration Date: 10/08/2009      Due: 10/08/2011

**5.0: QUALITY ASSURANCE PROGRAM**

The preceding lists the Certification Tests that were performed, and the sections which follow describe the tests and outline specific results. All products manufactured at SSP are to approved and controlled engineering documentation, to established process and quality procedures at every stage of manufacture, with fully calibrated quality and process instrumentation, using only certified and traceable materials. Tested products were selected randomly from documented normal production runs. Before and after test samples were retained for reference. All tubing used in testing meets applicable ASTM specifications, and has approved material and chemical certifications.

All SSP tests conducted on products are with laboratory equipment and instrumentation in current calibration in an ISO 17025 accredited laboratory. Trained personnel conducted tests by following approved, written test procedures. All test results were subjected to thorough engineering review and approval before internal publication.

<b>ASTM Material Standards</b>		
<b><u>Standard</u></b>	<b><u>Material Shape</u></b>	<b><u>Description</u></b>
A 182	Forged Fittings, Parts	Standard Specification for Forged or Rolled Alloy – Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service
A 276	Bars	Standard Specification for Stainless Steel Bars and Shapes
A 479	Bar, Shapes	Standard Specification for Stainless Steel Bars and Shapes for use in Boilers and other Pressure Vessels
B 16	Bar, Shapes	Standard Specification for Free-Cutting Brass Rod, Bar and Shapes for use in Screw Machines
B 124	Bar, Shapes	Standard Specification for Copper and Copper Alloy Forging Rod, Bar and Shapes
B 453	Bar, Shapes	Standard Specification for Copper-Zinc-Lead Alloy (Leaded-Brass) Rod

<b>Applicable Codes and Standards</b>	
<b><u>Section</u></b>	<b><u>Test Description</u></b>
ANSI/ASME B 31.1	Power Piping Code
ANSI/ASME B 31.3	Process Piping Code
ANSI/ASME BPV Section VIII	Boiler & Pressure Vessel Code
ISO 7257	Aircraft – Hydraulic tubing joints and fittings – Rotary flexure test

Table 5.0.1

## 6.0: ATTACHMENTS

### A. TEST DATA

#### HELIUM VACUUM TEST

PN	Heat Code / ID	DIA (in.)	MSC (in <sup>2</sup> )	VDI (mbar * L/s)	ALR (mbar * L/s)	OLR (mbar * L/s)	RESULT
5-352-316	.E8	0.376	1.181	1.00E-03	1.18E-03	2.00E-08	PASS
5-320-316	.V3	0.376	1.181	1.00E-03	1.18E-03	2.00E-08	PASS
5-360-316	.XJ	0.376	1.181	1.00E-03	1.18E-03	1.80E-08	PASS
5-520-316	.V3	0.563	1.769	1.00E-03	1.77E-03	2.20E-06	PASS
5-626-K-316	.Z1	0.563	1.769	1.00E-03	1.77E-03	6.00E-08	PASS
654-K-316	.Z1	0.563	1.769	1.00E-03	1.77E-03	2.70E-07	PASS
5-106-K-316	.S4	0.376	1.181	1.00E-03	1.18E-03	2.70E-08	PASS
5-422-316	VG	0.378	1.188	1.00E-03	1.19E-03	2.70E-08	PASS
5-436-316	A8	0.378	1.188	1.00E-03	1.19E-03	3.10E-09	PASS
5-PV4-D4-316	FIC	0.532	1.671	1.00E-03	1.67E-03	4.40E-08	PASS
5-4032-50-316	EGX	0.518	1.627	1.00E-03	1.63E-03	1.90E-09	PASS
5-3008-400-316	.A8	0.675	2.121	1.00E-03	2.12E-03	4.20E-08	PASS
5-3020-400-316	XL	0.675	2.121	1.00E-03	2.12E-03	4.70E-08	PASS
5-3108-400-316	GKO	0.675	2.121	1.00E-03	2.12E-03	1.70E-07	PASS
5-3120-400-316	BDP / ZIN	0.675	2.121	1.00E-03	2.12E-03	2.10E-08	PASS
83XPD4-316	.EMX	0.413	1.297	1.00E-03	1.30E-03	3.50E-07	PASS
83XPD8-316	CPR	0.413	1.297	1.00E-03	1.30E-03	2.40E-08	PASS
CH4D4-10-316	GAD	0.385	1.210	1.00E-03	1.21E-03	5.40E-08	PASS
CH8D8-10-316	FTJ / GFT	0.628	1.973	1.00E-03	1.97E-03	1.50E-08	PASS
5-QC4-D-D4-316	GNP	0.29	0.911	1.00E-03	9.11E-04	8.00E-08	PASS
5-QC4-B-D4-316	GLD	0.29	0.911	1.00E-03	9.11E-04	8.00E-08	PASS
5-QC6-D-D6-316	EQT	0.41	1.288	1.00E-03	1.29E-03	4.80E-08	PASS
5-QC6-B-D6-316	ZPR / GEJ	0.41	1.288	1.00E-03	1.29E-03	4.80E-08	PASS
5-QC8-D-D8-316	FDP	0.532	1.671	1.00E-03	1.67E-03	3.30E-05	PASS
5-QC8-B-D8-316	ZOJ / EAA	0.532	1.671	1.00E-03	1.67E-03	3.30E-05	PASS
QF4-B-D4-316	FSL	0.48	1.508	1.00E-03	1.51E-03	7.00E-09	PASS
QF4-S-D4-316	FSL	0.48	1.508	1.00E-03	1.51E-03	7.00E-09	PASS
QF8-B-D8-316	CRF	0.745	2.340	1.00E-03	2.34E-03	2.60E-08	PASS
QF8-S-D8-316	CPI	0.745	2.340	1.00E-03	2.34E-03	2.60E-08	PASS
1/4" Duolok	FCC	0.25	0.785	1.00E-03	7.85E-04	2.00E-10	PASS
1/2" Duolok	EGY	0.48	1.508	1.00E-03	1.51E-03	2.10E-08	PASS
1/4" Unilok	GDA	0.25	0.785	1.00E-03	7.85E-04	1.40E-07	PASS
1/2" Unilok	FCM	0.48	1.508	1.00E-03	1.51E-03	4.30E-08	PASS
1/4" Griplok	FCA	0.25	0.785	1.00E-03	7.85E-04	2.30E-08	PASS
1/2" Griplok	DSM	0.48	1.508	1.00E-03	1.51E-03	1.40E-07	PASS
1/4" MNPT	EGY	0.538	1.690	1.00E-03	1.69E-03	1.20E-09	PASS
1/4" FNPT	CRM	0.538	1.690	1.00E-03	1.69E-03	2.00E-09	PASS
1/2" MNPT	FDQ	0.84	2.639	1.00E-03	2.64E-03	6.00E-08	PASS
1/2" FNPT	CRG	0.84	2.639	1.00E-03	2.64E-03	7.40E-09	PASS
506-1-316	.S4	0.563	1.769	1.00E-03	1.77E-03	1.20E-08	PASS
5-4012-50-316	GEJ	0.518	1.627	1.00E-03	1.63E-03	9.00E-08	PASS
358-316	.9A	0.376	1.181	1.00E-03	1.18E-03	2.80E-08	PASS

\*Test Date (s): 09/13/11 – 09/16/11

Table 6.1.0

## HELIUM PRESSURIZED TEST

PN	Heat Code / ID	DIA (in.)	MSC (in <sup>2</sup> )	VDI (mbar * L/s)	ALR (mbar * L/s)	OLR (mbar * L/s)	RESULT
5-352-316	.E8	0.376	1.18	1.00E-03	1.18E-03	0	PASS
5-320-316	.V3	0.376	1.18	1.00E-03	1.18E-03	0	PASS
5-520-316	.V3	0.376	1.18	1.00E-03	1.18E-03	0	PASS
5-626-K-316	.Z1	0.563	1.77	1.00E-03	1.77E-03	0	PASS
654-K-316	.Z1	0.563	1.77	1.00E-03	1.77E-03	0	PASS
5-106-K-316	.S4	0.376	1.18	1.00E-03	1.18E-03	0	PASS
5-422-316	VG	0.378	1.19	1.00E-03	1.19E-03	0	PASS
5-436-316	A8	0.378	1.18	1.00E-03	1.18E-03	0	PASS
5-PV4-D4-316	FIC	0.532	1.19	1.00E-03	1.19E-03	0	PASS
5-3108-400-316	GKO	0.675	2.12	1.00E-03	2.12E-03	0	PASS
5-3120-400-316	BDP / ZIN	0.675	2.12	1.00E-03	2.12E-03	0	PASS
83XPD4-316	.EMX	0.413	2.12	1.00E-03	2.12E-03	0	PASS
CH4D4-10-316	GAD	0.385	1.30	1.00E-03	1.30E-03	0	PASS
CH8D8-10-316	FTJ / GFT	0.628	1.30	1.00E-03	1.30E-03	0	PASS
5-QC4-D-D4-316	GNP	0.29	1.21	1.00E-03	1.21E-03	0	PASS
5-QC4-B-D4-316	GLD	0.29	0.91	1.00E-03	9.11E-04	0	PASS
QF4-B-D4-316	FSL	0.48	1.67	1.00E-03	1.67E-03	0	PASS
QF4-S-D4-316	FSL	0.48	1.51	1.00E-03	1.51E-03	0	PASS
QF8-B-D8-316	CRF	0.745	1.51	1.00E-03	1.51E-03	0	PASS
QF8-S-D8-316	CPI	0.745	1.51	1.00E-03	1.51E-03	0	PASS
1/4" Duolok	FCC	0.255	2.34	1.00E-03	2.34E-03	0	PASS
1/2" Duolok	EGY	0.47	2.34	1.00E-03	2.34E-03	0	PASS
1/4" Unilok	GDA	0.255	0.80	1.00E-03	8.01E-04	0	PASS
1/2" Unilok	FCM	0.47	1.48	1.00E-03	1.48E-03	0	PASS
1/4" Griplok	FCA	0.255	0.80	1.00E-03	8.01E-04	0	PASS
1/2" Griplok	DSM	0.47	1.48	1.00E-03	1.48E-03	0	PASS
1/4" MNPT	EGY	0.538	0.80	1.00E-03	8.01E-04	0	PASS
1/4" FNPT	CRM	0.538	1.48	1.00E-03	1.48E-03	0	PASS
1/2" MNPT	FDQ	0.84	1.69	1.00E-03	1.69E-03	0	PASS
1/2" FNPT	CRG	0.84	1.69	1.00E-03	1.69E-03	0	PASS
506-1-316	.S4	0.563	2.64	1.00E-03	2.64E-03	0	PASS
5-4012-50-316	GEJ	0.518	2.64	1.00E-03	2.64E-03	0	PASS
358-316	.9A	0.376	1.77	1.00E-03	1.77E-03	0	PASS

\*Test Date (s): 09/13/11 – 09/16/11

Table 6.1.1

## LOW TEMPERATURE LEAK TEST

PN	Heat Code / ID	DIA (in.)	MSC (in <sup>2</sup> )	VDI (mbar * L/s)	ALR (mbar * L/s)	OLR (mbar * L/s)	RESULT
5-352-316	.E8	0.376	1.181	1.00E-03	0.001181239	0	PASS
5-320-316	.V3	0.376	1.181	1.00E-03	0.001181239	0	PASS
5-358-316	.9A	0.376	1.181	1.00E-03	0.001181239	0	PASS
5-520-316	.Z1	0.563	1.769	1.00E-03	0.001768717	0	PASS
5-626-K-316	.Z1	0.563	1.769	1.00E-03	0.001768717	0	PASS
664-K-316	.J4	0.563	1.769	1.00E-03	0.001768717	0	PASS
5-106-K-316	.S4	0.376	1.181	1.00E-03	0.001181239	0	PASS
5-422-316	.VG	0.378	1.181	1.00E-03	0.001181239	0	PASS
5-436-316	.A8	0.378	1.188	1.00E-03	0.001187522	0	PASS
5-PV4-D4-316	FIC	0.532	1.188	1.00E-03	0.001187522	0	PASS
5-3108-400-316	FBR	0.675	2.121	1.00E-03	0.002120575	0	PASS
5-3120-400-316	BDP	0.675	2.121	1.00E-03	0.002120575	0	PASS
83XPD4-316	EMX	0.413	2.121	1.00E-03	0.002120575	0	PASS
83XPD8-316	CPR	0.413	1.297	1.00E-03	0.001297478	0	PASS
CH4D4-10-316	FBE	0.385	1.297	1.00E-03	0.001297478	0	PASS
CH8D8-10-316	GFT	0.628	1.210	1.00E-03	0.001209513	0	PASS
5-QC4-D-D4-316	GNP	0.29	1.973	1.00E-03	0.00197292	0	PASS
5-QC4-B-D4-316	YCG	0.29	0.911	1.00E-03	0.000911062	0	PASS
QF4-B-D4-316	CRO	0.48	1.671	1.00E-03	0.001671327	0	PASS
QF4-S-D4-316	FSL	0.48	1.508	1.00E-03	0.001507964	0	PASS
QF8-B-D8-316	CRF	0.745	0.801	1.00E-03	0.000801106	0	PASS
QF8-S-D8-316	CPI	0.745	1.477	1.00E-03	0.001476549	0	PASS
1/4" Duolok	FCF	0.255	0.801	1.00E-03	0.000801106	0	PASS
1/2" Duolok	GDF	0.47	1.477	1.00E-03	0.001476549	0	PASS
1/4" Unilok	GDA	0.255	1.508	1.00E-03	0.001507964	0	PASS
1/2" Unilok	BRZ	0.47	1.508	1.00E-03	0.001507964	0	PASS
1/4" Griplok	DSG	0.255	2.340	1.00E-03	0.002340487	0	PASS
1/2" Griplok	DSM	0.47	2.340	1.00E-03	0.002340487	0	PASS
1/4" MNPT	EGY	0.538	1.690	1.00E-03	0.001690177	0	PASS
1/4" FNPT	CRM	0.538	1.690	1.00E-03	0.001690177	0	PASS
1/2" MNPT	FDQ	0.84	2.639	1.00E-03	0.002638938	0	PASS
1/2" FNPT	CRG	0.84	2.639	1.00E-03	0.002638938	0	PASS
506-1-316	R5	0.563	1.769	1.00E-03	0.001768717	0	PASS
5-4012-50-316	GQE	0.518	1.627	1.00E-03	0.001627345	0	PASS
358-316	.9A	0.376	1.181	1.00E-03	0.001181239	0	PASS

\*Test Date (s): 09/13/11 – 09/16/11

Table 6.1.2

## HIGH TEMPERATURE LEAK TEST

PN	Heat Code / ID	DIA (in.)	MSC (in <sup>2</sup> )	VDI (mbar * L/s)	ALR (mbar * L/s)	OLR (mbar * L/s)	RESULT
5-352-316	.E8	0.376	1.181	1.00E-03	1.18E-03	0	PASS
5-320-316	.V3	0.376	1.181	1.00E-03	1.18E-03	0	PASS
5-360-316	.XJ	0.376	1.181	1.00E-03	1.18E-03	0	PASS
5-520-316	.V3	0.563	1.769	1.00E-03	1.77E-03	0	PASS
5-626-K-316	.Z1	0.563	1.769	1.00E-03	1.77E-03	0	PASS
654-K-316	.Z1	0.563	1.769	1.00E-03	1.77E-03	0	PASS
5-106-K-316	.S4	0.376	1.181	1.00E-03	1.18E-03	0	PASS
5-422-316	VG	0.378	1.181	1.00E-03	1.18E-03	0	PASS
5-436-316	A8	0.378	1.188	1.00E-03	1.19E-03	0	PASS
5-PV4-D4-316	FIC	0.532	1.188	1.00E-03	1.19E-03	0	PASS
5-3108-400-316	GKO	0.675	2.121	1.00E-03	2.12E-03	0	PASS
5-3120-400-316	BDP / ZIN	0.675	2.121	1.00E-03	2.12E-03	0	PASS
83XPD4-316	.EMX	0.413	2.121	1.00E-03	2.12E-03	0	PASS
CH4D4-10-316	GAD	0.385	1.297	1.00E-03	1.30E-03	0	PASS
CH8D8-10-316	FTJ / GFT	0.628	1.210	1.00E-03	1.21E-03	0	PASS
5-QC4-D-D4-316	YCG	0.29	1.973	1.00E-03	1.97E-03	0	PASS
5-QC4-B-D4-316	4O	0.29	0.911	1.00E-03	9.11E-04	0	PASS
QF4-B-D4-316	FSL	0.48	1.508	1.00E-03	1.51E-03	0	PASS
QF4-S-D4-316	FSL	0.48	1.508	1.00E-03	1.51E-03	0	PASS
QF8-B-D8-316	CRF	0.745	2.340	1.00E-03	2.34E-03	0	PASS
QF8-S-D8-316	CPI	0.745	2.340	1.00E-03	2.34E-03	0	PASS
1/4" Duolok	FCC	0.255	0.801	1.00E-03	8.01E-04	0	PASS
1/2" Duolok	EGY	0.47	1.477	1.00E-03	1.48E-03	0	PASS
1/4" Unilok	GDA	0.48	1.508	1.00E-03	1.51E-03	0	PASS
1/2" Unilok	FCM	0.48	1.508	1.00E-03	1.51E-03	0	PASS
1/4" Griplok	FCA	0.745	2.340	1.00E-03	2.34E-03	0	PASS
1/2" Griplok	DSM	0.745	2.340	1.00E-03	2.34E-03	0	PASS
1/4" MNPT	EGY	0.538	1.690	1.00E-03	1.69E-03	0	PASS
1/4" FNPT	CRM	0.538	1.690	1.00E-03	1.69E-03	0	PASS
1/2" MNPT	FDQ	0.84	2.639	1.00E-03	2.64E-03	0	PASS
1/2" FNPT	CRG	0.84	2.639	1.00E-03	2.64E-03	0	PASS
506-1-316	.S4	0.563	1.769	1.00E-03	1.77E-03	0	PASS
5-4012-50-316	GEJ	0.518	1.627	1.00E-03	1.63E-03	0	PASS

\*Test Date (s): 09/13/11 – 09/16/11

Table 6.1.3



## 1.5 X WP & BURST TEST

PN	Heat Code / ID	DIA (in.)	MSC (in.^2)	WP (psi)	Leak 1.5 WP (psi)	Result	Burst (psi)	Burst Mode
5-352-316	.E8	0.376	1.181	1500	2250	OK	25000	End connection seal
5-320-316	.V3	0.376	1.181	1500	2250	OK	19600	Leak via seal end connection
5-358-316	.9A	0.376	1.181	1500	2250	OK	14000	Leak via seal end connection
5-520-316	.Z1	0.563	1.769	1500	2250	OK	10000	Leak via stem seal
5-626-K-316	.Z1	0.563	1.769	6000	9000	OK	21000	Leaked safely via valve stem and nut lower than required burst
664-K-316	.J4	0.563	1.769	6000	9000	OK	24000	Leak via stem seal and connection fitting
5-106-K-316	.S4	0.376	1.181	6000	9000	OK	>30000	None
5-422-316	.VG	0.378	1.181	6000	9000	OK	28000	Leak via stem seal
5-436-316	.A8	0.378	1.188	6000	9000	OK	21000	Leaked safely via valve stem and nut lower than required burst
5-PV4-D4-316	FIC	0.532	1.188	3000	4500	OK	>27000	None
5-4032-50-316	CRN	0.518	1.671	6000	9000	OK	14000	Leaked safely via seal end connection
5-3108-400-316	FBR	0.675	2.121	2500	3750	OK	>23000	None
5-3120-400-316	BDP	0.675	2.121	2500	3750	OK	22000	Leak via connection fittings
83XPD4-316	EMX	0.413	1.297	6000	9000	OK	>30000	None
CH4D4-10-316	FBE	0.385	1.297	6000	9000	OK	>33000	None
CH8D8-10-316	GFT	0.628	1.210	6000	9000	OK	28200	Leak at the end connection
5-QC4-D-D4-316	GNP	0.29	1.973	3000	4500	OK	>22000	Leak at the stem body joint
5-QC4-B-D4-316	YCG	0.29	0.911	3000	4500	OK	>22000	Leak at the stem body joint
QF4-B-D4-316	CRO	0.532	1.671	6000	9000	OK	>30000	None
QF4-S-D4-316	FSL	0.532	1.671	6000	9000	OK	>30000	None
QF8-B-D8-316	CRF	0.538	0.801	6000	9000	OK	28000	Leak via the connection fitting
QF8-S-D8-316	CPI	0.538	1.477	6000	9000	OK	28000	Leak via the connection fitting
1/4" Duolok	FCF	0.255	0.785	6000	9000	OK	>30000	None
1/2" Duolok	GDF	0.47	1.508	6000	9000	OK	27000	Leak at the end connection
1/4" Unilok	GDA	0.25	0.785	6000	9000	OK	>30000	None
1/2" Unilok	BRZ	0.48	1.508	6000	9000	OK	28000	Leak via the connection fitting
1/4" Griplok	DSG	0.25	0.785	6000	9000	OK	>30000	None
1/2" Griplok	DSM	0.48	1.508	6000	9000	OK	28000	Leak via the connection fitting
1/4" MNPT	EGY	0.25	1.690	6000	9000	OK	>31000	None
1/4" FNPT	CRM	0.48	1.690	6000	9000	OK	>31000	None
1/2" MNPT	FDQ	0.84	2.639	6000	9000	OK	30900	Leak via threads
1/2" FNPT	CRG	0.84	2.639	6000	9000	OK	30000	Leak via threads
506-1-316	R5	0.563	1.769	1500	2250	OK	12600	Stem leak
5-4012-50-316	GQE	0.518	1.627	6000	9000	OK	>30000	None

\*Test Date (s): 09/13/11 – 09/16/11

Table 6.1.4

SSP Document Number: ILDTR Rev.

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## B. MATERIAL CERTS.

### APPENDIX

PAGE #	Heat Code
18	GCY
19	GCY
20	FQM-CRF
21	ZIN
22	XJ
23	XCG
24	EVX
25	FHF
26	FHF
27	FBE
28	VG
29	J4
30	J4
31	9A
32	R5
33	FSL
34	FPB/CST
35	EAA
36	FHF
37	FHF
38	GLD
39	GLD
40	4O
41	FTJ
42	FTJ
43	GAD
44	GKO
45	GKO
46	GEJ

PAGE #	Heat Code
47	BDP
48	FIC
49	XJ
50	EMX
51	S4
52	GDB/GFY
53	CRG/GEE
54	FPF/FCC
55	GIC/FCF
56	GEI/CRM
57	EOH/CRL
58	EOH/CRL
59	GPC
60	GPC
61	GLN/FDQ
62	GLN/GDF
63	FCM/GEK
64	DID/BRZ
65	FCA/FSL
66	FIE/DSG
67	XL
68	V3
69	E8
70	E8
71	GDB/GFY
72	CRN/EWB
73	CRN/EWB
74	A8
75	Z1
76	GQE

# Acciaierie Valbruna S.p.A.



38100 VICENZA (Italia) - Viale della scienza, 25 z.l.  
Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4  
Clienti / Kundenbeziehungen  
VALBRUNA STAINLESS INC.  
2400 TAYLOR STREET WEST  
46801-FORT WAYNE, IN 46801-US  
Produttore: ACCIAIERIE VALBRUNA S.P.A.  
Hersteller/Produktionsunternehmen

Ambito di Spedizione: D-VII1001312  
Lieferumfang/Polung: MSL

Ordine nr: 28808 STOCK POMPTON  
Bestell-Nr./Bestellnummer

Tipo di Elaborazione: E+A00  
Erweiterungs/Verlängerungsmöglichkeit

## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

Certificato nr: MEST000622/2011/  
Prüfung/Prüfzeugnis

Conferma ordine nr: E11000887  
Bestell-Nr./Bestellnummer

Marchio di Fabbrica:  
Zeichen des Lieferanten  
Trade mark:  
Signe de l'usine: produkte

Funzione del Collaudatore:  
Name des Werkstoffprüfingenieur  
Inspector's description of function



Oggetto Prove: - Annealed GOLD PROCESSED  
Prüfungszustand/Erweiterungsmaßnahme

HC: GCY

### Specifiche Abmessungen / Requiriments / Spezies

VAL 0 316/316L A,CF  
AMS QQ-S-753 B 316/316L A,CF  
ASME SA276 2007 S31600/03 A,CF (2)  
ASTM A192 2010 S31600/03 A (2)  
ASTM A276 2010 S31600/03 A,CF  
ASTM A370 2010  
ML-S-802 B/1 316/316L

AMS 5648 K S31600 A  
ASME SA182 2007 S31600/03 A (2)  
ASME SA320 2007 B8M (2)  
ASTM A192 2010A B8M (6)  
ASTM A214 2006 S31600/03  
ASTM A473 2001 S31600/03 (2)  
NACE MR0175-2 2003 S31600/03 (2)

AMS 5853 F S31603 A  
ASME SA193 2007 B8M (1)  
ASME SA479 2007 S31600/03 A (4)  
ASTM A262 2010 PRACTICE E  
ASTM A320 2010 B8M (7)  
ASTM A479 2010A S31600/03 A

- (2) SEC. II PT. A 2007 EDITION ADD. 2009b
- (1) SEC. II PT. A 2007 EDITION ADD. 2009b
- (2) SEC. II PT. A 2007 EDITION ADD. 2009b
- (3) Chemical analysis only.
- (2) For products machined directly from bar refer to ASTM A479.
- (7) Chemical analysis only.
- (6) "AS 15155-2

- (2) For products machined directly from bar refer to ASME SA479.
- (1) Chemical analysis only.
- (2) SEC. II PT. A 2007 EDITION ADD. 2009b
- (4) SEC. II PT. A 2007 EDITION ADD. 2009b
- (5) Chemical analysis only.
- (8) Chemical analysis only.

Qualità: 316/316L  
Werkstoff/Safetyfactor

Marca: MVAPML MAXIVAL  
Werkstoffbezeichnung/Werkstoffname

Funzionatura: 316/316L  
Sensitivierung/Werkstoffname



Pos. nr.	Oggetto Description Werkstoff	Dimensioni - in Abmessungen Dimensions Diameter	Tolleranze Toleranz Allowance Tolerance	Lunghezza - in Länge Length Longueur	Colore Farbe Color Co-Me	Pezzi Stückzahl Pieces	Peso - LB Gewicht Weight Poids	Lotto nr. Lose Lot nr. Lot n.
0030	Hexagon	1,0000	484-09	150 / 152	252218		6,346	131800750

TEST ALLO STATO DI FORNITURA Test on delivery condition / Prüfung auf Lieferzustand / Prüfung zu Zustandslieferung / Prüfung des Materials bei Anlieferung									
TEST	Prova/Prüfung Description Werkstoff Lay-Up Form Prüfung Beschreibung Werkstoff	*F	Spessore Dicke Thickness Rp 0,2% K.S.L.	Spessore Dicke Thickness Rp 0,2% K.S.L.	Resistenza Tensile strength Resistance à traction Rm k.s.l.	Allungamento Elongation Verlängerung E 4d %	Strizione Reduction of area Striction RA %	Resilienza Resilience Resilienz KJ/m²	Durezza Hardness Dureté HB
Valori richiesti / Anforderungen/Required values Werte erforderlich	min max		30		75	30	50		140 235
A	12,5	6B	L	70	99	48	68		231
TEST					min	max			
A	Grain size for ASTM E112					5			

Mechanical properties according to ASTM A370.

### Analisi chimica Chemische Zusammensetzung/Chemical Analysis/Analyse

Colata con Inhomogeneities	max 0,030	1,00	1,25 2,00	16,00 18,00	2,00 3,00	1,00	10,00 14,00	0,040 0,050	0,050 0,100	
C %	Si %	Mn %	Cr %	Mo %	Cu %	Ni %	P %	S %	N %	
252218	0,016	0,48	1,53	16,73	2,00	0,58	10,06	0,029	0,030	0,057

Produced without class I-II Ozone depleting substances.  
Solution heat treated free from continuous carbide network.  
Annealing temperature: 1940°F for 1 h/water.  
Micro and macro etch test: OK  
Intergranular corrosion test per ASTM A262 pract. E: ok.

YARDE METALS, INC. CERTIFIED THAT  
THIS IS A TRUE COPY OF THE ORIGINAL  
MIL TEST REPORT NOW ON FILE  
RECEIVED AND INSPECTED  
FEB 24 2011  
BY Kathy Bell  
KATHY BELL, CERTIFICATION PROCESSOR

Vicenza, 17/01/11 vices prod MCR	Il collaudatore di stabilimento / der Werkstoffprüfingenieur / Works Inspector / L'agent d'usine M. Rizzotto	Pagina - 1 di 2
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# Acciaierie Valbruna S.p.A.



36100 VICENZA (Italia) - Viale della scienza, 25 s.l.  
 Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4  
 Cliente / Kunden/Client  
 VALBRUNA STAINLESS INC.  
 2400 TAYLOR STREET WEST  
 46801-FORT WAYNE, IN 46801-US  
 Produttore: ACCIAIERIE VALBRUNA S.P.A.  
 Hersteller/Produttore

Avviso di Spedizione: D-VI1001312  
 Lieferungs-Packing list

Ordine nr: 28808 STOCK POMPTON  
 Bestell/Nr. oder Contract

Tipo di Elaborazione: E+ADD  
 Bearbeitungsart/Finishing process/Type of elaboration

## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

Certificato nr: MEST000622/2011/  
 Prüfung/Zustellnr.

Conferma ordine nr: EH0006857  
 Bestell/Nr. Original Nr.

Marchio di Fabbrica:  
 Zeichen des Lieferanten  
 Trade mark  
 Signe de l'usine productrice

Funzione del Collaudatore:  
 Name der Werkstattsachverständigen  
 Inspector / Accepting Inspector of Factory



Oggetto Prove: - Annealed COLD PROCESSED  
 Prüfgegenstand/Item inspected/Produce

HC: GCY

Material is DFARS Compliant

Sono state soddisfatte tutte le condizioni richieste  
 Die genannten Anforderungen sind in Anlage erfüllt  
 The material has been furnished in accordance with the requirements  
 Le matériel a été fourni conforme aux exigences

Controllo anti-inquinazione: OK  
 Umweltüberprüfung: Schadstoffnach-untersuchung  
 Antipolluting testing performed: OK  
 Contrôle anti-polluants test: OK

Controllo visivo e dimensionale: eccedete la esigenza  
 Sichtprüfung und Ausmessung: über Beanspruchung  
 Visual inspection and dimensional check satisfactory  
 Contrôle aspect et dimension: satisfaisant

Melted and manufactured in Italy. No welding or weld repair. Material free from Mercury contamination.  
 We declare that the finished product is checked for radioactive contamination through Portal System when it leaves the production plant.  
 The Quality Management System is Certified acc. Pressure Equipment Directive (97/23/EC) Annex 1, 4.3 by TÜV and LLOYD'S  
 Any act of tempering, modification, alteration, counterfeiting and/or falsification and/or any other action which modifies the contents of this test certificate shall constitute a violation of applicable civil and criminal laws. Acciaierie Valbruna shall protect its rights and interests before any competent court, authority and jurisdiction.  
 Material and/or Valbruna grades/products are manufactured with ladle techniques to control composition, distribution, size and shape of non-metallic inclusions for improved machinability.  
 The supplied product conforms to requirements expressly requested by the purchaser and conforms to requirements specified by certified norms and standards. Should the product be used for more severe, critical and/or in any case different applications than those the material is generally intended for, any different and/or supplementary requirements shall be specifically demanded, at least, upon order of the Product by the Purchaser. Acciaierie Valbruna SpA shall not be responsible for any improper use of the Products.

**DFARS**

Material Heat Code  
 GCY  
 APR 05 2011

Certified by:

*[Signature]*  
 INSP. #5 SSP

Vicenza, 17/01/11 VGGM (M. MEER)	Il collaudatore di stabilimento / der Werkstattsachverständigen / Works Inspector / L'agent d'usine <i>M. Rizzotto</i>	Pagina - 2 di 2
--	---	-----------------

YARDE METALS Inc 04-04-11

10604CV025-1 SSP FITTINGS CO PO: 127794 Part #: 6.00PC 221.00LB



### Certificate of Test

HEAT E101092 ORDER 618973/ 01 BOL 0210146 \* CERTIFICATION \* 01/07/11  
 SHIP TO:  
 YARDE METALS (VMI ORDERS) **FQM-CRF**  
 75 AIRCRAFT RD  
 SOUTHINGTON 064890000

-----  
 C00616TS006 YOUR ORDER & DATE 1/07/11 CUST# 0975001 CUST TAGHC00616TS006  
 -----  
 ITEM DESCRIPTION  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L HRX CDA CONDA 1.0625 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 NAPTA Country of Origin is Country of Melt  
 No weld repair  
 Free of mercury contamination, Free of radiation contamination  
 No NREB relevant substances: Meets EU electrical RoHS  
 Total Bundles 1 Total Weight 1984



WO 2013995 Bundles: 1D  
 MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648R, 5653P SAE AMS-QQ-S-763B  
 ASME SA182 B07, A07-C9, B10 ASME SA193 B10  
 ASME SA479 B07, A07-C9, B10 ASTM A182 09  
 ASTM A262 02a Practice A/E ASTM A276 10  
 ASTM A475/A479M 10 ASTM A464 09  
 ASTM A320 09 B8M Class 1 ASTM A193 09 Gr B8M Class 1D  
 DFARS 225.225.7014 5/09 DFARS 225.7002-3 (B) (1)  
 Federal Spec QQ-S-763P Eddy Current tested  
 NACE MR0175-03, mid-sad hard Prodec Quality  
 EN 10204 Type 1.1 Document NACE MR0175-03, ISO 15156-03  
 Sol Anneal @ 1900F min/MQ

Material Heat Code  
**FQM**  
**JAN 18 2011**

Certified by:

MECHANICAL & OTHER TESTS  
 Hardness as shipped 192 HB  
 Hardness as shipped ( 90 HRB ) 5.5  
 Grain size OK  
 Micro OK  
 Intergranular corrosion OK  
 Tensile strength, KSI (MPa) 92.5 ( 638 )  
 0.2% Yield Strength, KSI (MPa) 65.5 ( 459 )  
 Elongation % in 4D 45.0  
 Reduction of area % 74.0

CHEMICAL COMPOSITION  
 Carbon (C) .018 Manganese (Mn) 1.670  
 Phosphorus (P) .029 Sulphur (S) .026  
 Silicon (Si) .382 Chromium (Cr) 16.860  
 Nickel (Ni) 10.130 Cobalt (Co) .276  
 Copper (Cu) .173 Moly (Mo) 2.040  
 Nitrogen (N) .077 Columbium (Cb) .031  
 Titanium (Ti) .002 Aluminum (Al) .004  
 Tin (Sn) .008 Boron (B) .006  
 Vanadium (V) .060  
 Columbium/ Tantalum (Cb+Ta) .031  
 Iron (Fe) Balance  
 Melt Practice RAP  
 Refining Practice AOD  
 De-long Ferrite

YARDE METALS CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 MILL TEST REPORT NOW ON FILE  
 RECEIVED AND INSPECTED  
**JAN 10 2011**

BY   
 MELISSA GARDNER CERTIFICATION PROCESSOR

Knowingly and willfully falsifying or concealing a material fact 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. Marciano, Quality Manager

Outokumpu Stainless Bar, Inc.  
 3943 Cranberry Pkwy  
 Richburg, NC 28570

YARDE METALS Inc 01-17-11

810117CV002-1 SSP FITTINGS CD PG: 126482 Part 8:  
 24.00PC 975.00LB

ZIN

**WALSIN** WALSIN LIHWA CORPORATION YENSHUI PLANT

ISO9001, ISO14001 CERTIFIED  
 INSPECTION CERTIFICATE

Customer		Yarde Metals, Inc.				Date	2006/02/24		File	2006030293						
Steel Grade		T316/316L		Commodity		Austenitic Stainless Steel Hexagon Bar				Order No.	188967					
P.O.NO		L15920														
Item	Box No.	Heat No.	Size	Quantity(pcs)	Weight(lbs)	Condition		Workmanship								
1	WL6019054	2K092	H 1-1/16"	36	1484	A, CD and P		Material is free from mercury contamination No welding repaired Solution treatment at 1040°C · 1-2 hour · water quenched Grain size test by E112 : fine Macro and micro structure : ok Intergranular corrosion test by ASTM A262 Practice E : CK								
2	WL6019055	2K092	H 1-1/16"	60	2438	A, CD and P										
3	WL6019056	2K092	H 1-1/16"	64	2594	A, CD and P										
Kind of Test						Chemical Composition (WT%)						Mechanical Properties				
	C	Si	Mn	P	S	Ni	Cr	Mo	Cu	N	Hardness (HB)	Tensile Strength (KSI)	Yield Strength (KSI)	Elongation (%)	Reduction of Area (%)	Reliability (HRC)
Spec.	0.03 MAX	1.00 MAX	2.00 MAX	0.045 MAX	0.030 MAX	10.08	16.00	2.00		0.10 MAX						
1	0.02	0.40	1.78	0.027	0.023	10.03	16.65	2.04	0.66	0.05	187	92.12	72.5	61.6	79.1	
2	0.02	0.40	1.78	0.027	0.023	10.03	16.65	2.04	0.66	0.05	187	92.12	72.5	61.6	79.1	
3	0.02	0.40	1.78	0.027	0.023	10.03	16.65	2.04	0.66	0.05	187	92.12	72.5	61.6	79.1	
Condition		A-Annealed P-Polished PL-Peeling				Invoice No. WL6019 Acc. To ASTM A276-04a cond.A, A479-04 cond.A, A641/A641M, A182-02a, A182-04a B8 Class1 A320-01 B8M Class1, A282 Practice E ASME SA479-E01 cond.A, SA103-E01 A02 B8M Class1, SA182-E01 A03, SA320-01a B8M Class1, EN 10204 3.1.5 AMS-QQ-S-783F, AMS 5848K, S553F, UNS-S31600.S31603					Here we certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification.					
MANAGER OF QUALITY ASSURANCE DEPARTMENT: <i>C.H. KAO</i>																

Yarde Metals, Inc. certifies that  
 this is a true copy of the original  
 mill test report now on file.  
 Received and Inspected

INSP. #5  
 SSP  
 7/21/04

4/13/06  
 by *Louisa Despins*  
 Louisa Despins, Certification Analyst



# Certificate of Test

\*\*\*\*\*  
 \* CERTIFICATION \*  
 \*\*\*\*\*

HEAT E90360 ORDER 605389/ 01 BOL 0203202 BUNDLE 2004767/1AA 07/20/09

SHIP TO:  
 YARDE METALS INC  
 10160 PHILIPP PARKWAY  
 STREETSBORO 442410000

HIC: XJ



----- YOUR ORDER & DATE -----  
 P90707D0901 7/20/09 CUST# 0975001 CUST TAG#

----- ITEM DESCRIPTION -----  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L RND CPA CONDA 1.6250 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 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 ROMS

Total Bundles 1 Bundle Weight 1040

----- SPECIFICATIONS -----  
 MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648K, 5653F SAE AMS-QQ-S-763B  
 ASME SA182 E07 ASME SA193 E07  
 ASME SA479 E07, A07 & A08 ASME SA320 B8M CL1 E04 A05  
 ASTM A182 08A ASTM A262 98 PRACTICE E  
 ASTM A276 08A ASTM A314 97  
 ASTM A479/A479M 08 ASTM A484 08  
 ASTM E112 96 ASTM A320 08 B8M CLASS 1  
 ASTM A193 08B B8M DIN 50049/EN 10204 3.1B  
 DFARS 252.225.7014 6/05 DFARS 225.7002-3(B)(1)  
 FEDERAL SPEC. QQ-S-763F NACE MR0175-03, MID-RAD HARD  
 PRODEC QUALITY

----- MECHANICAL & OTHER TESTS -----  
 Hardness as shipped (167 HB )  
 Hardness as shipped 84 HRB  
 Grain size 9.0 Tensile strength, KSI (MPa) 88.5 ( 610)  
 Micro OK 0.2% Yield Strength, KSI (MPa) 45.8 ( 316)  
 Intergranular corrosion OK  
 Macro OK Elongation % in 4D 51.0  
 Reduction of area % 75.0

----- CHEMICAL COMPOSITION -----  
 Carbon (C) .018 Manganese (Mn) 1.720  
 Phosphorus (P) .030 Sulphur (S) .025  
 Silicon (Si) .513 Chromium (Cr) 16.610  
 Nickel (Ni) 10.160 Cobalt (Co) .317  
 Copper (Cu) .439 Moly (Mo) 2.050  
 Nitrogen (N) .068 Columbium (Cb) .039  
 Titanium (Ti) .003 Aluminum (Al) .005  
 Tin (Sn) .014 Tantalum (Ta) .006  
 Vanadium (V) .070  
 Columbium/ Tantalum (Cb+Ta) .045  
 Iron (Fe) Balance  
 Melt Practice EAD  
 Refining Practice AOD  
 De-long Ferrite

YARDE METALS INC CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 MILL TEST REPORT NOW ON FILE  
 RECEIVED AND INSPECTED

JUL 22 2009

BY *Laura Rodriguez*  
 LAURA RODRIGUEZ, CERTIFICATION PROCESSOR

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.

Outokumpu Stainless Bar, Inc.  
 3943 Greenway Hwy.  
 Richburg, SC 29729

M.F. Marcano, Quality Manager

*M.F. Marcano*  
 7/23/09  
 INSP. #5 SSP

YARDE METALS Inc 07-22-09

S90722CV020-1 SSP FITTINGS CO PO: 119718 Part #:

8.00PC 637.00LB

CERTIFICATE OF TESTS ABNAHMEPRUEFZEUGNIS CERTIFICAT DE CONTROL

CERT SERIAL# 000496285  
**CARPENTER**  
 Carpenter Technology Corporation  
 101 West Barn Street, Reading, Pa. 19601

\* THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 67.  
 \* THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE TRACED BY REFERENCE TO THE CARPENTER ORDER NUMBERS.  
 \* MATERIAL IS MANUFACTURED FREE FROM MERCURY, BARIUM, ALPHA AND BETA RADIATION CONTAMINATION.  
 \* THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.

05/04/05  
 CUSTOMER / BESTELLER / CLIENT

SELLER / VERKÄUFER / VENDEUR PAGE 1 OF  
 CARPENTER TECHNOLOGY CORP  
 DUNDEE MI DISTR. CENTER  
 5460 ANN ARBOR ROAD  
 DUNDEE MI 48131

CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATE/DATE	WEIGHT/GEWICHT/POIDS
YCG	L33518		

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 731612  
 PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN

SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03)  
 ASTM-A276-04 TYPE 316/316L  
 ASTM-A479-04 TYPE 316/316L  
 ASME-SA479 2004 EDITION TYPE 316/316L

SIZE 0.625000 IN. ( 15.87 MM) HEX BAR  
 PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)  

C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)
0.017	1.65	0.64	0.025	0.023	16.97
NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)		
11.36	2.04	0.78	0.02		

INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE.  
 HARDNESS AS SHIPPED, HB - 246 (MIDRADIUS)  
 GRAIN SIZE PER ASTM E112: 4

(T)RANSVERSE (L)ONGITUDINAL			
YIELD STRENGTH, (0.20 %) KSI(MPA)	95.0 ( 655)	96.5 ( 665)	95.5 ( 658)
*TENSILE STRENGTH, KSI(MPA)	111.0 ( 765)	110.0 ( 758)	110.0 ( 758)
*ELONGATION IN 2.00", %	28.0	28.0	28.0
REDUCTION OF AREA, %	72.0	72.0	73.0

\*APPROVED PER CUSTOMER (SSP FITTINGS CORP.)  
 CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF SEPTEMBER 2, 2004 TO THE REQUIREMENTS OF ISO 9001:2000 APPROVAL CERTIFICATE 04-0540 BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1.B OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.

*[Signature]*  
 INSP #5 SSP  
 7/14/05

*[Signature]*  
 INSP #5 SSP  
 7/16/05

DAWN E. BOSCH  
 MET RELEASE/REQUIREMENTS ANALYST  
 CARPENTER TECHNOLOGY CORPORATION

*[Signature]*  
 Dawn E. Bosch

This certificate is made as the witness printed on this form. Carpenter neither makes, nor assumes responsibility for, any representation or certification to other parties.  
 Die vorliegende Zertifikatsform ist eine Kopie in deutscher Sprache. Carpenter übernimmt gegenüber Dritten keinerlei Haftung für die Genauigkeit der aufgeführten Daten.



CERTIFICATE OF TESTS ABNAHMEPRUEFZEUGNIS CERTIFICAT DE CONTROLE

CERT-SERIAL# 000765933  
**CARPENTER**  
 Carpenter Technology Corporation  
 101 West Bern Street, Reading, Pa. 19601  
 Tel: (610) 208-2000 (800) 338-4592

- THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 47.
- THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE TRACED BY REFERENCE TO THE CARPENTER ORDER NUMBER.
- MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA AND GAMMA SOURCE CONTAMINATION.
- THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.

03/16/11  
 CUSTOMER/BESTELLER/CLIENT

SELLER/VERKÄUFER/VENDEUR PAGE 1 OF 1

SSP FITTINGS CORP  
 ATTN: JOE MERCER  
 8250 BOYLE PARKWAY  
 TWINSBURG, OH 44087



CARPENTER TECHNOLOGY CORP

101 W. BERN STREET  
 READING, PA 19601

CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS
126212	PHL623101 L29734	03/16/11	1018.000

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 741249

PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN

SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING  
 ASTM-A276-10 TYPE 316/316L  
 ASTM-A479-10A TYPE 316/316L  
 ASME-SA479 2010 EDITION TYPE 316/316L

SIZE 0.750000 IN. ( 19.05 MM) HEX BAR

PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)

C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)
0.019	1.61	0.55	0.035	0.026	16.85
NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)		
11.39	2.04	0.83	0.02		

INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE.  
 SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN  
 BOUNDARY CARBIDE PRECIPITATION (NETWORK).

HARDNESS AS SHIPPED, HRBW - 94 (MIDRADIUS)

YIELD STRENGTH, (0.20 %) KSI (MPA) 83.0 ( 572)  
 TENSILE STRENGTH, KSI (MPA) 95.5 ( 658)  
 ELONGATION IN 2.00", % 37.0  
 REDUCTION OF AREA, % 76.0

GRAIN SIZE PER ASTM E112: 4

Material Heat Code  
 EVX  
 MAR 18 2011

Certified by:  
  
 INSP. #5 SSP

MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIREMENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.

HEIDI L. SUNDAY  
 GROUPLDR - SPECIFICATIONS/CERTIFICATION  
 CARPENTER TECHNOLOGY CORPORATION

This certification is valid to the customer printed on this form. Carpenter neither makes, nor assumes responsibility for, any representation or certification to other parties.  
 Die vorliegende Zertifizierung ist nur für den in diesem Formular genannten Kunden gültig. Carpenter übernimmt gegenüber Dritten keinerlei Haftung für die vorgenannten Daten oder Zertifizierungen.  
 Ce certificat est uniquement valable pour le client dont le nom est imprimé sur ce formulaire. Carpenter n'assume pas de responsabilité pour une certification vis-à-vis d'une tierce personne.

# Acciaierie Valbruna S.p.A.



## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

36100 VICENZA (Italia) - Viale della scienza, 25 z.1.  
Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4  
Clienti / Kunden / Customers / Clients  
VALBRUNA STAINLESS INC.  
2400 TAYLOR STREET WEST  
46801-FORT WAYNE, IN 46801-USA  
Produttore: ACCIAIERIE VALBRUNA S.P.A.  
Herstellere/Hersteller/Produkteur

Arrivo di Spedizione: D-VII0005558  
Lieferung/Transporterichtl.

Certificato nr.: MEST919455/2010/  
Prüfung/Zertifikatnr.

Ordine nr.: 28024 STOCK POMPTON  
Bestell/Nr. und/Comments

Contiene ordine nr.: E110005781  
Enthält/Bestell-Nr.

Materiale di Fabbrica:  
Produkt aus Liefermaterial  
Lieferant  
Signe di Torre produzione



Tipo di Elaborazione: E+A0D  
Herstellung/Produktion, einschließlich/abgeschlossen

Funzione del Collaudatore:  
Befugnis des Prüfingenieur/Prüfer  
Prüfungsbefugnis des/der Prüfer



Oggetto Prova: - Annealed COLD PROCESSED  
Prüfung/Prüfungsbefugnis/Prüfungsbefugnis

### Specifiche: Anforderungen / Requirements / Spezifikationen

VDI 3163/1SL A,CF  
ANSI QQ-S-783 B 3163/1SL A,CF  
ASME SA276 2007 S31600/3 A,CF (2)  
ASTM A182 2010 S31600/3 A (2)  
ASTM A276 2010 S31600/3 A,CF  
ASTM A376 2009A,  
MIL-S-882 B/1 3163/1SL

ANSI 5648 K S31600 A  
ASME SA182 2007 S31600/3 A (2)  
ASME SA320 2007 B8M (2)  
ASTM A193 2010A B8M (2)  
ASTM A314 2008 BS1900/3  
ASTM A473 2001 S31600/3 (2)  
NACE MR0175 2003 S31600/3 (2)

ANSI 5653 F S31600 A  
ASME SA193 2007 B8M (1)  
ASME SA479 2007 S31600/3 A (4)  
ASTM A262 2010 PRACTICE E  
ASTM A320 2010 B8M (7)  
ASTM A479 2010A S31600/3 A

- (2) SEC II PT A 2007 EDITION ADD. 2009b
- (1) SEC II PT A 2007 EDITION ADD. 2009b
- (2) SEC II PT A 2007 EDITION ADD. 2009b
- (2) Chemical analysis only.
- (5) For products machined directly from bar refer to ASTM A479.
- (7) Chemical analysis only.
- (2) ISO 15156-3

- (2) For products machined directly from bar refer to ASME SA479.
- (1) Chemical analysis only.
- (2) SEC II PT A 2007 EDITION ADD. 2009b
- (4) SEC II PT A 2007 EDITION ADD. 2009b
- (2) Chemical analysis only.
- (6) Chemical analysis only.

Dati: 316/31SL  
Material/Grade/Name

Marca: MVAPML MAXIVAL  
Herstellere/Hersteller/Name

Funzione: 316/31SL  
Herstellung/Produktion/Name



Pos. in File in di prova	Oggetto Designation Part description Contour de produit	Dimensioni - In Abmessungen Dia - in / Ø - mm	Tolleranza Abw. max. Tolerance	Lunghezza - In Länge Length Länge	Grado Stufen Grade	Pezzi Stücke Pieces	Peso - LB Gewicht Weight	Lotto nr. Lose Lot no.
0150	Hexagon	0,9375	484-09	150 / 152	249111		2,238	121700600

TEST ALLO STATO DI FORNITURA										
Test in delivery condition Prüfung auf Lieferzustand Prüfung bei Zustellung Prüfung des Materials in dem empfangenen Zustand										
TEST	Provenienza Lieferanten Lieferant Origin	Pos. Stelle Position	Spessore Dicke Thickness	Spessore Dicke Thickness	Resistenza Zugfestigkeit Tensile strength	Resistenza Zugfestigkeit Tensile strength	Alungamento Dehnung Elongation	Strizione Zugdehnung Elongation	Resistenza Zugfestigkeit Tensile strength	Durezza Härte Hardness
Valori richiesti Required values		min max	30	75	30	50		140 235		
A	12,5	68 L	70	95	46	69		229		
TEST	A Grain size for ASTM E112			min	max					
					5					

Mechanical properties according to ASTM A370.

### Analisi chimica

Chemische Zusammensetzung/Chemical Analysis/Analyse Chimica

Code Bezeichnung/Code	min max	0,030 0,035	1,00 1,05	1,25 1,30	18,50 19,50	2,00 2,05	1,00 1,05	18,00 19,00	0,040 0,050	0,020 0,030	E/100			
	C %	Si %	Mn %	Cr %	Mo %	Cu %	Ni %	P %	S %	N %				
249111	0,015	0,52	1,52	18,72	2,09	0,66	10,13	0,029	0,030	0,061				

Produced without class I-II Oxygen depleting substances.  
Solution heat treated free from continuous carbide network.  
Annealing temperature: 1940°F for 1 h/water.  
Micro and macro etch test: OK  
Intergranular corrosion test per ASTM A262 pract. E: ok.

Vicenza, 27/09/10 VIC006 (Dist. M&EPI)	Il collaudatore di stabilimento / der Werksaufseher/Inhouse Inspector / L'agent d'usine <i>M. Rizzotto</i>	Pagina - 1 di 2
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YARDE METALS Inc 05-03-11

S10503CV006-1 SSP FITTINGS CO PO: 123947 Part #: 16.00PC 520.00LB

# Acciaierie Valbruna S.p.A.

36100 VICENZA (Italia) - Viale della siderurgia, 25 z.l.  
 Stab.: 36100 BOLZANO (Italia) - Via A. Volta, 4  
 Cliente / Kunde / Purchaser / Client  
**VALBRUNA STAINLESS INC.**  
 2400 TAYLOR STREET WEST  
 46801-FORT WAYNE, IN 46801-USA  
 Produzione: **ACCIAIERIE VALBRUNA S.P.A.**  
 Prodotto: **VALBRUNA STAINLESS**



## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

Analisi di Specificazione: D-V110026558  
 Liefermenge/Packing list(s)

Certificato nr: MESTB19405/2010/  
 Prüfung/Taxi/Exe

Condizione ordine nr: 0110006781  
 Material Order/Ref nr

Ordine nr: 26024 STOCK POMPTON  
 Bestell/Nr oder Kundenart

Marchio di Fabbrica:  
 Zeichen des Lieferanten  
 Trade Mark  
 Sign. des Lieferanten

Tipo di Elaborazione: E-AOD  
 Erzeugnisgruppe/Werkzeugprozess/Art. - erzeugung

Funzione del Collaudatore:  
 Beauftragter und Ausführende, ohne Unterschrift  
 Valid Approval and Dimensional checks satisfactory  
 Controlleur de réception, titulaire

Oggetto Prova: - Annealed COLD PROCESSED  
 Prüfgegenstand: annealed cold process

### Material is DFARS Compliant

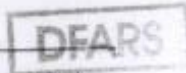
Solo state soddisfatte tutte le condizioni richieste  
 Die gezeigten Abweichungen sind in Anlage angeht  
 The material has been furnished in accordance with the requirements  
 La materia è stata fornita in conformità con le specifiche

Controllo antiradiazioni: OK  
 Strahlungsmessung: Strahlenschutzkonform nach DIN  
 Antineutron testing performed: OK  
 Gamma irradiation test: 1.0.0

Controllo visivo dimensionale: soddisfa le esigenze  
 Zeichnung und Abmessung, ohne Unterschrift  
 Valid Approval and Dimensional checks satisfactory  
 Kontrolle nach in dimensionen: vollständig

Melted and manufactured in Italy No welding or weld repair Material free from Mercury contamination

We declare that the finished product is checked for radioactive contamination through Portal System when it leaves the production plant.  
 The Quality Management System is Certified acc. Pressure Equipment Directive (97/23/EC) Annex 1 s. 4.3 by TÜV and LLOYD'S  
 Any act of tampering, modification, alteration, counterfeiting and/or falsification and/or any other action which modifies the contents of this test certificate shall constitute a violation of applicable civil and criminal laws. Acciaierie Valbruna shall protect its rights and interests before any competent court, authority and jurisdiction.  
 Material and/or Valplus grades products are manufactured with ladle techniques to control composition, distribution, size and shape of non-metallic inclusions for improved machinability.  
 The supplied product conforms to requirements expressly requested by the purchaser and conforms to requirements specified by certified norms and standards. Should the product be used for more severe, critical and/or in any case different applications than those the material is generally intended for, any different and/or supplementary requirements shall be specifically demanded, at least, upon order of the Product by the Purchaser. Acciaierie Valbruna SpA shall not be responsible for any improper use of the Product.



Material Heat Code

FHP  
 MAY 05 2011

Certified by:

*[Signature]*

THIS IS A COPY OF THE ORIGINAL  
 MILL TEST REPORT NOW ON FILE  
 OF THIS AND INSPECTED

MAY 04 2010

BY *[Signature]*  
 MELISSA GAGNER CERTIFICATION PROCESSOR

Vicenza, 27/09/10 VEG008 ANALISI	il collaudatore di stabilimento / der Werkstoffprüfstellen / Works Inspector / L'agent d'usine <i>M. Rizzotto</i>	Pagina - 2 di 2
--	--	-----------------

<b>CERTIFICATE OF TESTS</b> CERT SERIAL# 000740423 <b>CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592	<b>ABNAHMEPRUEFZEUGNIS</b>	<b>CERTIFICAT DE CONTROLE</b>																									
09/30/10 CUSTOMER/BESTELLER/CLIENT  SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG , OH 44087		* THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 47. * THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE TRACED BY REFERENCE TO THE CARPENTER ORDER NUMBER. * MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA AND GAMMA SOURCE CONTAMINATION. * THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.																									
		SELLER/VERKAUFER/VEDEURPAGE 1 OF 1  CARPENTER TECHNOLOGY CORP  101 W. BERN STREET READING , PA 19601																									
CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS																								
0124645 <i>HIC:FBE</i>	PHL212601 L20042	09/30/10	1240.000																								
HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 740316 PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING ----- ASTM-A276-10 TYPE 316/316L ASTM-A479-09 TYPE 316/316L ASME-SA479 2007 EDITION, 2009B ADD TYPE 316/316L SIZE 0.687500 IN. ( 17.46 MM) HEX BAR PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS) <table style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">C (COM)</td> <td style="text-align: center;">MN (XRF)</td> <td style="text-align: center;">SI (XRF)</td> <td style="text-align: center;">P (XRF)</td> <td style="text-align: center;">S (COM)</td> <td style="text-align: center;">CR (XRF)</td> </tr> <tr> <td style="text-align: center;">0.017</td> <td style="text-align: center;">1.60</td> <td style="text-align: center;">0.63</td> <td style="text-align: center;">0.025</td> <td style="text-align: center;">0.030</td> <td style="text-align: center;">16.70</td> </tr> <tr> <td style="text-align: center;">NI (XRF)</td> <td style="text-align: center;">MO (XRF)</td> <td style="text-align: center;">CU (XRF)</td> <td style="text-align: center;">N (FUS)</td> <td colspan="2"></td> </tr> <tr> <td style="text-align: center;">11.30</td> <td style="text-align: center;">2.05</td> <td style="text-align: center;">0.81</td> <td style="text-align: center;">0.02</td> <td colspan="2"></td> </tr> </table> INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK). HARDNESS AS SHIPPED, HRC - 23 (MIDRADIUS) YIELD STRENGTH, (0.20 %) KSI (MPA) 85.0 ( 586) TENSILE STRENGTH, KSI (MPA) 99.0 ( 683) ELONGATION IN 2.00", % 34.0 REDUCTION OF AREA, % 74.0 GRAIN SIZE PER ASTM E112: 5 MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE- MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009, CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2007 TO THE REQUIREMENTS OF ISO 9001:2000 APPROVAL CERTIFICATE 07-0869 BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.				C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)	0.017	1.60	0.63	0.025	0.030	16.70	NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)			11.30	2.05	0.81	0.02		
C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)																						
0.017	1.60	0.63	0.025	0.030	16.70																						
NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)																								
11.30	2.05	0.81	0.02																								
		HEIDI L. SUNDAY GROUPLDR - SPECIFICATIONS/CERTIFICATION CARPENTER TECHNOLOGY CORPORATION 																									
This certification is made to the customer printed on this form. Carpenter neither makes, nor assumes responsibility for, any representation or certification to other parties. Die vorliegende Zertifizierung ist nur für den in diesem Formular genannten Kunden gültig. Carpenter übernimmt gegenüber Dritten keinerlei Haftung für die ausgetragenen Daten oder Zertifizierungen. Ce certificat est uniquement valable pour le client dont le nom est imprimé sur ce formulaire. Carpenter n'assume pas de responsabilité pour une certification vis-à-vis d'une tierce personne.																											



Certificate of Test

\*\*\*\*\*  
 \* CERTIFICATION \*  
 \*\*\*\*\*

HEAT B90014 ORDER 602127/ 03 BOL 0201870 BUNDLE 2002579/1E 03/31/09

SHIP TO:  
 YARDE METALS (SP)  
 10160 PHILIPP PARKWAY  
 STREETSBORO 442410000

H/C: VG



H/C: VG

----- YOUR ORDER & DATE -----  
 P90210D095 3/31/09 CUST# 0975001 CUST TAG#

----- ITEM DESCRIPTION -----  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L RND CFA CONDA 1.0625 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 NAFTA Country of Origin is Country of Melt  
 No weld repair  
 Free of mercury contamination, Free of Radiation Contamination  
 No NREE Relevant Substances; Meets EU Electrical ROHS

Total Bundles 2 Bundle Weight 3064

----- SPECIFICATIONS -----  
 MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648K, 5653F SAE AMS-QQ-S-763B  
 ASME SA182 E07 ASME SA193 E07  
 ASME SA479 E07, A07 & A08 ASME SA320 B8M CL1 ED4 A05  
 ASTM A182 07A ASTM A262 98 PRACTICE E  
 ASTM A276 08 ASTM A314 97  
 ASTM A479/A479M 06A ASTM A484 05B  
 ASTM B112 96 ASTM A320 04 B8M CLASS 1  
 ASTM A193 07 B8M DIN 50049/EN 10204 3.1B  
 DFARS 252.225.7014 6/05 DFARS 225.7002-3(B)(1)  
 FEDERAL SPEC. QQ-S-763F NACE MR0175-03, MID-RAD HARD  
 UNS S31603, AISI 316L

----- MECHANICAL & OTHER TESTS -----  
 Hardness as shipped 150 HB  
 Hardness as shipped ( 79 HRB )  
 Grain size 6.0 Tensile strength, KSI (MPa) 89.6 ( 618 )  
 Micro OK 0.2% Yield Strength, KSI (MPa) 38.5 ( 265 )  
 Intergranular corrosion OK  
 Macro OK Elongation % in 4D 53.5  
 Reduction of area % 75.9

----- CHEMICAL COMPOSITION -----  
 Carbon (C) .028 Manganese (Mn) 1.690  
 Phosphorus (P) .030 Sulphur (S) .026  
 Silicon (Si) .492 Chromium (Cr) 16.450  
 Nickel (Ni) 10.050 Cobalt (Co) .253  
 Copper (Cu) .406 Moly (Mo) 2.040  
 Nitrogen (N) .065 Columbium (Cb) .018  
 Titanium (Ti) .001 Aluminum (Al) .003  
 Tin (Sn) .010 Boron (B) .001  
 Tantalum (Ta) .004 Vanadium (V) .060  
 Columbium/ Tantalum (Cb+Ta) .022  
 Iron (Fe) Balance  
 Melt Practice EAF  
 Refining Practice AOD  
 De-long Ferrite

YARDE METALS, INC. CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 MILL TEST REPORT NOW ON FILE.  
 RECEIVED AND INSPECTED

APR 01 2009

BY *Laura Rodriguez*  
 LAURA RODRIGUEZ, CERTIFICATION PROCESSOR

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.

Outokumpu Stainless Bar, Inc.  
 3043 Greenway Pkwy.  
 Richburg, SC 29728

M.P. Marcanio, Quality Manager

*M.P. Marcanio*

INS.  
 #5  
 SSP  
 4/23/09

YARDE METALS Inc 04-22-05  
 S90422CV012-1 SSP FITTINGS CO PO: 118434 Part #: 32.00PC 1178.00LS

# Acciaierie Valbruna S.p.A.



36100 VICENZA (Italia) - Viale della scienza, 25 z.l.  
 Stab.: 39109 BOLZANO (Italia) - Via A. Volta, 4

Clienti / Kunden / Partners / Clients  
**VALBRUNA STAINLESS INC.**  
 2490 TAYLOR STREET WEST  
 46801 FORT WAYNE, IN 46801-USA

Produttore: **STABILIMENTO DI BOLZANO**  
 Hersteller/Werkstatt/Produktion

Articolo di Spedizione: D-8219000430  
 Lieferangebot/Packing Ref. N.

Ordine nr: 25032 POMPTON STOCK  
 Bestell/Nr. oder Conto

Tipo di Elaborazione: E+A00  
 Systembezeichnung/Herstellung prozessierte Zustand

## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION .EN 10204 (2005) , 3.1

Certificato nr: MEST8290752011V  
 Prüfprot.№/Prot. n.

Contorno ordine nr: E00006005  
 Hersteller-Teilenummer

Materiale di Fabbbrica:  
 Lieferant des Rohmaterials  
 Staat nach  
 Spez. des Rohm. produkt

Posizione del Collaudatore:  
 Standort des Prüftechnologen  
 Hersteller & Werkstoffcode des Collaudator



Oggetto Prove: Polished Annealed Product  
 Prüfgegenstand/Status inspectiert/Produkt

Specifiche:  
 Anforderungen / Requirements / Bedingungen

V510 316/316L A  
 AMS-QQ-S-702 D 316/316L A  
 ASME SA276 2007 S31600/03 A 1  
 ASTM A182 2008A S31600/03 A 1  
 ASTM A276 2008A S31600/03 A  
 ASTM A376 2009A  
 MIL-S-882 S21 316/316L  
 (X) SEC. II PT. A 2007 EDITION ADD. 3000a  
 (1) SEC. II PT. A 2007 EDITION ADD. 3000a  
 (3) SEC. II PT. A 2007 EDITION ADD. 3000a  
 (5) Chemical analysis only and mechanical properties.  
 (7) \* ISO 10156-3

AMS 9548 K S31600 A  
 ASME SA182 2007 S31600/03 A 1  
 ASME SA320 2007 B8M CLASS1 1  
 ASTM A182 2008 B8M CLASS1  
 ASTM A314 2008 S31600/03  
 ASTM A479 2001 S31600/03 1  
 NACE MR0175 2503 S31600/03 1

AMS 9553 F S31603 A  
 ASME SA182 2007 B8M CLASS1 (1)  
 ASME SA479 2007 S31600/03 A (1)  
 ASTM A282 2002A PRACTICE (1)  
 ASTM A320 2008 B8M CLASS1  
 ASTM A479 2008 S31600/03 A

① Chemical analysis only and mechanical properties.  
 ② SEC. II PT. A 2007 EDITION ADD. 3000a  
 ③ SEC. II PT. A 2007 EDITION ADD. 3000a  
 ④ Chemical analysis only.

Qualità: 316/316L  
 Werkstoffbezeichnung

Nome: MVA/PM. MAXVAL  
 Hersteller/Bezeichnung/Werkstoffname

Funzione: 316/316L  
 Anwendung/Anwendungsbereich



Pos. nr. Pos. n. N. di prova	Oggetto Designation Profilo Diametro Diametro Diametro	Dimensioni - H Abmessungen Höhe Höhe Höhe	Tolleranze Toleranzen Toleranzen Toleranzen	Lunghezza - L Länge Länge Länge	Contro Steuerung Steuerung Steuerung	Posiz. Stellung Stellung Stellung	Peso - LB Gewicht Gewicht Gewicht	Lotto nr. Los n. Lot n. Lot n.
0130	Round	1,8250	484-08	156 / 157	423728		2,884	927200590

Sono state soddisfatte tutte le condizioni richieste  
 Die geforderten Anforderungen sind erfüllt.  
 The specified test item fully meets all requirements  
 Le conditions de test ont été satisfaites, voir rapport

Controllo chimico: OK  
 Chemische Analyse: OK  
 Analytische Untersuchung: OK  
 Kontrolle chemische Analyse: OK

Controllo visivo e dimensionale: soddisfa le esigenze  
 Sichtprüfung und Messung: ohne Beanstandung  
 Visual inspection and dimensional check: OK  
 Kontrolle Visuelle Dimension: zufrieden

TEST	Ponderazione Gewicht Weight Gewicht	Temperatura Temperatur Temperature Temperatur	Durezza Härte Hardness Härte	Resistenza Zugfestigkeit Tensile Strength Zugfestigkeit	Allungamento Dehnung Elongation Dehnung	Rottura Bruch Fracture Bruch	Sottilezza Dicke Thickness Dicke	Rovescitura Umkehrung Reversal Umkehrung	Durezza Härte Hardness Härte
A	12,5	88	L	47					182
A	Grain size for ASTM E112								

Mechanical properties according to ASTM A370.

15-Werkstoffbezeichnung, 1-Bezeichnung, 0-Temperaturgruppe

### Analisi chimica

Chemische Zusammensetzung/Chemical Analysis/Analyse

Colore Farbe	min	max	1,25	1,75	2,00	2,50	3,00	3,50	4,00	4,50	5,00	5,50	6,00	6,50	7,00	7,50	8,00	8,50	9,00	9,50	10,00
C %	Si %	Mn %	Cr %	Mo %	Cu %	Ni %	Co %	P %	S %	N %											
423728	0,016	0,51	1,58	17,00	2,03	0,41	10,24	0,091	0,028	0,030	0,067										

Produced without use of C or Zn doping substances.  
 Schmelze hat keine C oder Zn Doping Substanzen.  
 Annealing temperature: 1840 °F for 3 hours.  
 Micro and macro etch test: OK

Bolzano, 29/01/10 09:01 G. M. S. S. S.	Il collaudatore di stabilimento / der Werksachverständiger / Worng Inspector / L'agente d'usine M. Rizzotto	Pagina - 1 di 2
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# Acciaierie Valbruna S.p.A.



36100 VICENZA (Italia) - Viale della scienza, 25 s.l.  
 Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4  
 Cliente / Verkaufszweck:  
 VALBRUNA STAINLESS INC.  
 2400 TAYLOR STREET WEST  
 46801-FORT WAYNE, IN 46801-USA

Produttore: STABILIMENTO DI BOLZANO  
 Produktionsstätte

Oggetto Prova: Polished Annealed Pooled  
 Prüfgegenstand: Importiert Feinguss

Avviso di Spedizione: D-B210000430  
 (Internazionale Italia)

Ordine nr. 06002 POMPTON STOCK  
 Bestellnummer/Contract

Tipo di Siderazione: E+ADD  
 Sinterisierungsverfahren/Art der Sinterung

## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

Certificato nr: MEST8280752010/  
 Prüfzettelnummer

Conferma ordine nr: E09000935  
 Bestellungsauftrag

Marchio di Fabbbrica:  
 Zeichen des Lieferanten  
 Lieferant  
 Signet der Fabrik



Partenza del Collaudatore:  
 Standort des Prüftechnischen  
 Mitarbeiters / Abgangsort des Inspektors



Integrity: no corrosion test per ASTM A262 part. E: ok  
 Material is DFARS Compliant

Melting and manufactured in Italy No welding or weld repair Material free from Mercury contamination  
 We declare that the finished product is checked for radioactive contamination through Portal System when it leaves the production plant.  
 The Quality Management System is Certified acc. Pressure Equipment Directive (PED) Annex 1, p. A2 by TÜV and LLOYD'S



Material Heat Code  
 J4  
 FEB 09 2011

Certified by:

Bolzano, 29/01/10 09:21 00000000	il collectore di stabilimento / der Werkstoffversandpunkt / Inspektor / L' agent of usine M. Rizzotto	Pagina - 2 di 2
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### Certificate of Test

HEAT E101251 ORDER 615013/ 09 BOL 0209124 \* CERTIFICATION \* 10/15/10

SHIP TO:  
 YARDE METALS INC  
 10160 PHILIPP PARKWAY  
 STREETSBORO 442410000

----- YOUR ORDER & DATE -----  
 P00714D0490 10/15/10 CUST# 0975001 CUST TAG#

----- ITEM DESCRIPTION -----  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L RND CPA CONDA 1.6250 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 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 3 Total Weight 6854

WO 2014952 Bundles: 1E, 1F, 1K

----- SPECIFICATIONS -----  
 MPG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648K, 5653F SAB AMS-QQ-S-763B  
 ASME SA182 E07, A07-09, E10 ASME SA193 E10  
 ASME SA479 E07, A07-09, E10 ASME SA320 BSM CL1 E10  
 ASTM A182 09 ASTM A262 96 Practice E  
 ASTM A276 08a ASTM A314 97  
 ASTM A479/A479M 09 ASTM A484 09  
 ASTM E112 96 ASTM A320 08 BSM Class 1  
 ASTM A193 09 BSM DIN 50049/EN 10204 3.1B  
 DFARS 252.225.7014 6/05 DFARS 225.7002-3(B)(1)  
 Federal Spec QQ-S-763F NACE MR0175-03, mid-rad hard  
 Prodec Quality

HIC: 9A  
 DFARS

----- MECHANICAL & OTHER TESTS -----  
 Hardness as shipped 174 HB  
 Hardness as shipped ( 86 HRB )  
 Hardness as tested 00  
 Grain size 7.0 Tensile strength, KSI (MPa) 89.4 ( 616 )  
 Micro OK 0.2% Yield Strength, KSI (MPa) 40.3 ( 278 )  
 Intergranular corrosion OK  
 Elongation % in 4D 54.0  
 Reduction of area % 75.8

----- CHEMICAL COMPOSITION -----  
 Carbon (C) .017 Manganese (Mn) 1.730  
 Phosphorus (P) .030 Sulphur (S) .025  
 Silicon (Si) .435 Chromium (Cr) 16.660  
 Nickel (Ni) 10.070 Cobalt (Co) .274  
 Copper (Cu) .370 Moly (Mo) 2.050  
 Nitrogen (N) .077 Columbium (Cb) .013  
 Titanium (Ti) .001 Aluminum (Al) .004  
 Tin (Sn) .012 Boron (B) .004  
 Vanadium (V) .070  
 Columbium/ Tantalum (Cb-Ta) .013  
 Iron (Fe) Balance  
 Melt Practice RAF  
 Refining Practice AOD  
 De-long Ferrite

*Jm*  
 INSP. #5 SSP  
 11/19/10

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.

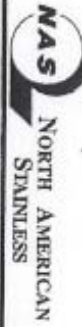
Outokumpu Stainless Bar, Inc.  
 3043 Crenshaw Pkwy.  
 Redburg, NC 29729

M.F. Marcano, Quality Manager

*M.F. Marcano*

----- YARDE METALS Inc 11-18-10 -----  
 801118CV006-1 SSP FITTINGS CO PO: 124172 Part #: 13,00PC 1122.00LB





**METALLURGICAL TEST REPORT**

6870 Highway 42 East  
 Cheml, KY 41045-9615  
 (502) 347-0000

Certificate: 622118 05 Mail To: ALRO STEEL SERVICE CENTER  
 ALRO GROUP JACKSON MI 49104-  
 Customer: 0570 014 Ship To: ALRO STEEL SERVICE CENTER  
 CUSCOBEN PICKUP POTTSVILLE MI 48876  
 PMS Order: LN 69932 1 Item Code: 13901190  
 Date: 2/10/2011 Page: 1 OF 1  
 Steel: 316/316P  
 Finish: Cold Draw  
 Dia./Thk: 1.0625 In  
 Leg Length: 144.00 In  
 Length: 144.00 In  
 Corrosion: ASTM A162 PRG B

**PRODUCT DESCRIPTION:**

Round Bar, Annealed, Cold Draw  
 UNS 31600/31603 ER 10204 3.1, ASTM A484/08  
 ASTM A276/08A, ASTM A479/08, ASTM A482/08A CHEM CRAT,  
 ASTM A479/07, ASTM S182/08A CHEM ONLY  
 AMS 5648K/AMS 5653P, AMS QW-763B, QQS 763P

**REMARKS:**

COMPLIES W/REQUIREMENTS OF DRAWING BY DIRECTIVE 2002.95.  
 EC, BORE, EAF+ACB+CC, NO WELD REPAIR, HEATED AND NEG IM USA  
 FREE FROM MERCHANT AND LOW MELTING ALLOY CONTAMINATION

**DFARS**

Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight
896	3050779	898	EM60863	820						

**CHEMICAL ANALYSIS** CM(Country of Melt) ES(Spain) US(United States) ZA(South Africa) JP(Japan)

Heat	Supplier #	CR	C	CO	CR	CU	NI	NO	N	SI	S
8279		US	.023	.25	17.12	.44	1.41	2.03	.046	10.52	.034
			SI								.0245
			.23								

Material Heat Code: RS

**MECHANICAL PROPERTIES**

Heat	Supplier #	CR	C	CO	CR	CU	NI	NO	N	SI	S
EM60778	R L		191.0	85.24	108.06	67.37	37.50				
EM60779	R L		191.0	85.24	108.06	67.37	37.50				
EM60863	R L		191.0	85.24	108.06	67.37	37.50				

NAS hereby certifies that the analysis on this certification is correct and the material meets the specifications stated.

Certified by: [Signature] **INSF #5 SSP**

**ALRO STEEL/METAL**

RECEIVED AT  
 Alro Pottsville  
 FEB 23 2011

QC ENGINEER: [Signature] ERIC BESS

RT06255 139

CERTIFICATE OF TESTS CERT SERIAL# 000748449	ABNAHMEPRUEFZEUGNIS	CERTIFICAT DE CONTROLE																									
<b style="font-size: 1.2em;">CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592																											
01/31/11 CUSTOMER/BESTELLER/CLIENT  SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG , OH 44087	<div style="border: 1px solid black; padding: 5px; display: inline-block;">DFARS</div>	CARPENTER TECHNOLOGY CORP  101 W. BERN STREET READING , PA 19601																									
		SELLER/VERKÄUFER/VENDEURPAGE 1 OF 1																									
CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS																								
126688 <i>FSL</i>	PHL495101 L39395	01/31/11	1288.000																								
HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 740653 PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING ASTM-A276-10 TYPE 316/316L ASTM-A479-09 TYPE 316/316L ASME-SA479 2007 EDITION, 2009B ADD TYPE 316/316L SIZE 0.562500 IN. ( 14.29 MM) HEX BAR PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS) <table style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">C (COM)</td> <td style="text-align: center;">MN (XRF)</td> <td style="text-align: center;">SI (XRF)</td> <td style="text-align: center;">P (XRF)</td> <td style="text-align: center;">S (COM)</td> <td style="text-align: center;">CR (XRF)</td> </tr> <tr> <td style="text-align: center;">0.019</td> <td style="text-align: center;">1.59</td> <td style="text-align: center;">0.64</td> <td style="text-align: center;">0.026</td> <td style="text-align: center;">0.024</td> <td style="text-align: center;">16.78</td> </tr> <tr> <td style="text-align: center;">NI (XRF)</td> <td style="text-align: center;">MO (XRF)</td> <td style="text-align: center;">CU (XRF)</td> <td style="text-align: center;">N (FUS)</td> <td colspan="2"></td> </tr> <tr> <td style="text-align: center;">11.16</td> <td style="text-align: center;">2.05</td> <td style="text-align: center;">0.81</td> <td style="text-align: center;">0.02</td> <td colspan="2"></td> </tr> </table> INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK). HARDNESS AS SHIPPED, HRBW - 97 (MIDRADIDS) YIELD STRENGTH, (0.20 %) KSI (MPA) 85.0 ( 586) TENSILE STRENGTH, KSI (MPA) 97.5 ( 672) ELONGATION IN 2.00", % 35.0 REDUCTION OF AREA, % 75.0 GRAIN SIZE PER ASTM E112: 5 MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE- MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2007 TO THE REQUIREMENTS OF ISO 9001:2000 APPROVAL CERTIFICATE 07-0869 BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.				C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)	0.019	1.59	0.64	0.026	0.024	16.78	NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)			11.16	2.05	0.81	0.02		
C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)																						
0.019	1.59	0.64	0.026	0.024	16.78																						
NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)																								
11.16	2.05	0.81	0.02																								
			Certified by: 																								
			HEIDI L. SUNDAY GROUP LDR - SPECIFICATIONS/CERTIFICATION CARPENTER TECHNOLOGY CORPORATION <i>Heidi L. Sunday</i>																								
This certification is made to the customer printed on this form. Carpenter neither makes, nor assumes responsibility for, any representation or certification to other parties. Die vorliegende Zertifikatierung ist nur für den in diesem Formular genannten Kunden gültig. Carpenter übernimmt gegenüber Dritten (sonstiger Haftung für die ausgetesteten Teile) oder Zertifikatierung. Ce certificat est uniquement valable pour le client dont le nom est imprimé sur ce formulaire. Carpenter n'assume pas de responsabilité pour une certification vis-à-vis d'une tierce personne.																											

CERTIFICATE OF TESTS CERT SERIAL# 000760466	ABNAHMEPRUEFZEUGNIS	CERTIFICAT DE CONTROLE			
<b>CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592					
<div style="border: 1px solid black; padding: 5px; font-size: small;"> <ul style="list-style-type: none"> <li>THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 47.</li> <li>THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TEST LOT. ORIGINAL DATA RECORDS CAN BE INDEXED BY REFERENCE TO THE CARPENTER ORDER NUMBER.</li> <li>MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA AND GAMMA SOURCE CONTAMINATION.</li> <li>THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.</li> </ul> </div>					
03/02/11 CUSTOMER/BESTELLER/CLIENT	SELLER/VERKÄUFER/VENDEURPAGE 1 OF 1				
SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG , OH 44087	CARPENTER TECHNOLOGY CORP 101 W. BERN STREET READING , PA 19601				
<b>DFARS</b>					
CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS		
126394 <i>FPB - CST</i>	PHL581701 L27050	03/02/11	1088.000		
HEAT NUMBER / SCHMELZE-NR. / N° DE COULÉE: 741148					
PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN					
SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING ----- ASTM-A276-10 TYPE 316/316L ASTM-A479-10A TYPE 316/316L ASME-SA479 2010 EDITION TYPE 316/316L					
SIZE 0.687500 IN. ( 17.46 MM) HEX BAR					
PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)					
C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)
0.019	1.66	0.64	0.025	0.021	16.67
NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)		
11.44	2.04	0.81	0.02		
INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCORDANCE WITH CODE SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK). <i>FPB</i>					
HARDNESS AS SHIPPED, HRC - 40 (MIDRANGE) <i>03 2011</i>					
YIELD STRENGTH, (0.20 %) KSI (MPA) 86.0 ( 593) TENSILE STRENGTH, KSI (MPA) 99.0 ( 683) ELONGATION IN 2.00", % 33.0 REDUCTION OF AREA, % 72.0					
GRAIN SIZE PER ASTM E112: 3					
MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE- MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.					
HEIDI L. SUNDAY GROUPLDR - SPECIFICATIONS/CERTIFICATION CARPENTER TECHNOLOGY CORPORATION <i>Heidi L. Sunday</i>					
This certification is made to the customer printed on this form. Carpenter neither makes, nor assumes responsibility for, any representation or certification to other parties. Die vorstehende Zertifizierung ist nur für den in diesem Formular genannten Kunden gültig. Carpenter übernimmt gegenüber Dritten keinerlei Haftung für die angegebenen Daten oder Zertifizierungen. Ce certificat est uniquement valable pour le client dont le nom est imprimé sur ce formulaire. Carpenter n'assume pas de responsabilité pour une certification vis-à-vis d'une tierce personne.					

**OUTOKUMPU**

**Certificate of Test**

CERTIFICATION  
 YARDE METALS

HEAT E91912 ORDER 611084/ 01 BOL 0205867 BUNDLE 2001614/1E 02/22/10

SHIP TO:  
 YARDE METALS INC  
 10160 PHILIPP PARKWAY  
 STREETSBORO 442410000

HIC: EAA  
**DFARS**

YOUR ORDER & DATE 2/22/10 CUST# 0975001 CUST TAG# P00218AMS01

ITEM DESCRIPTION  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L HEX HEX CONDA .9370 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 NAFTA Country of Origin is Country of Melt

No weld repair  
 Free of mercury contamination, Free of Radiation Contamination  
 No WSEE Relevant Substances; Meets RU Electrical RONS

Total Bundles 2 Bundle Weight 3945

SPECIFICATIONS  
 MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648N, 5653F SAE AMS-QQ-S-763B  
 ASME SA182 R07 A07, A08 & A09 ASME SA193 E07  
 ASME SA479 E07, A07, A08 & A09 ASTM A182 09  
 ASTM A252 02a Practice A/E ASTM A276 08a  
 ASTM A479/A479M 09 ASTM A484 09  
 ASTM A320 08 BSM Class 1 ASTM A193 09 BSM Class 1  
 DFARS 252.225.7014 6/05 DFARS 225.7002-3 (B) (1)  
 Federal Spec QQ-S-763F Eddy Current tested  
 NACE MR0175-03, mid-rad hard Prodec Quality

MECHANICAL & OTHER TESTS  
 Hardness as shipped (210 HB )  
 Hardness as shipped 93 HRB Tensile strength, KSI (MPa) 93.0 ( 641)  
 Grain size 5.5 0.2% Yield Strength, KSI (MPa) 75.0 ( 517)  
 Micro OK  
 Intergranular corrosion OK Elongation % in 4D 42.0  
 Macro OK Reduction of area % 74.0

CHEMICAL COMPOSITION  
 Carbon (C) .025 Manganese (Mn) 1.470  
 Phosphorus (P) .032 Sulphur (S) .025  
 Silicon (Si) .373 Chromium (Cr) 17.340  
 Nickel (Ni) 10.440 Cobalt (Co) .233  
 Copper (Cu) .314 Moly (Mo) 2.030  
 Nitrogen (N) .053 Columbium (Cb) .011  
 Titanium (Ti) .002 Aluminum (Al) .005  
 Tin (Sn) .008 Boron (B) .001  
 Tantalum (Ta) .004 Vanadium (V) .080  
 Columbium/ Tantalum (Cb+Ta) .015  
 Iron (Fe) Balance  
 Melt Practice EAF  
 Refining Practice AOD  
 De-long Ferrite

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. Marciano, Quality Manager

Outokumpu Stainless Bar, Inc. Materials proving deposits will be replaced, but no claims for labor or damage allowed. Please inspect material promptly. All materials subject to minimum ordering charges. Yarde Metals, Inc. will not accept any claims after 30 days of receipt. Shipping tolerance is P/M 10% ordered qty unless otherwise specified and agreed upon at time of contract.

Connecticut 800-444-9494 Florida 888-734-1234 New Hampshire 800-375-2011 New Jersey 800-755-6961 New York 800-332-2024 North Carolina 866-630-1220 Ohio 888-301-6051 Pennsylvania 888-663-705

Aluminum 13.00PC 406.00LB Stainless Carbon Steel Brass



# Acciaierie Valbruna S.p.A.



36100 VICENZA (Italia) - Viale della scienza, 25 r.l.  
Stab.: 36100 BOLZANO (Italia) - Via A. Volta, 4  
Clienti / Kunden / Customers / Clients:  
VALBRUNA STAINLESS INC.  
2400 TAYLOR STREET WEST  
46801-FORT WAYNE, IN 46801-USA  
Produttore: ACCIAIERIE VALBRUNA S.P.A.  
No other technical name possible

Avviso di Spedizione: D-VI10025508  
Lieferungsbescheinigung (LbZ)

Ordine nr: 28024 STOCK POMPTON  
Bestell-Nr. vom Kunde

## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

Certificato nr: MEST919455/2010/  
Möbstl. Nr. des Zertifikats

Confirma ordine nr: E110005781  
Werkz. Nr. des Auftrags

Materiale di Fabbrica:  
Lieferung des Lieferanten  
Tabelle nr. des  
LbZ des Lieferanten



Fuorone del Collaudatore:  
Name des Abnahmepersonals  
Handwritten signature

Oggetto Prove: - Annealed COLD PROCESSED  
Prüfungszustand des Lieferungsgegenstandes

Tipo di Elaborazione: E+AOD  
Erstellungszustand des Lieferungsgegenstandes

### Specifiche: Anforderungen / Requirements / Exigences

UNI 0 316/316L A,CF  
AMS-DC-3-763 9 316/316L A,CF  
ASME SA479 2007 S31600/03 A,CF (2)  
ASTM A182 2010 S31600/03 A (5)  
ASTM A276 2010 S31600/03 A,CF  
ASTM A379 2009A  
MIL-S-882 B/1 316/316L

AMS 5648 K S31600 A  
ASME SA182 2007 S31600/03 A (1)  
ASME SA220 2007 S4M (2)  
ASTM A193 2010A S8M (6)  
ASTM A314 2008 S31600/03  
ASTM A473 2001 S31600/03 (8)  
NACE MR0175-2003 S31600/03 (8)

AMS 5653 F S31603 A  
ASME SA193 2007 S8M (1)  
ASME SA479 2007 S31600/03 A (1)  
ASTM A262 2010 PRACTICE E  
ASTM A320 2010 S8M (7)  
ASTM A479 2010A S31600/03 A

- (1) SEC II PT. A 2007 EDITION ADD. 2009b
- (2) SEC II PT. A 2007 EDITION ADD. 2009b
- (3) SEC II PT. A 2007 EDITION ADD. 2009b
- (4) SEC II PT. A 2007 EDITION ADD. 2009b
- (5) For products machined directly from bar refer to ASTM A479.
- (6) Chemical analysis only.
- (7) Chemical analysis only.
- (8) - ISO 15156-3

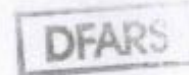
- (1) For products machined directly from bar refer to ASME SA479.
- (2) Chemical analysis only.
- (3) SEC II PT. A 2007 EDITION ADD. 2009b
- (4) SEC II PT. A 2007 EDITION ADD. 2009b
- (5) Chemical analysis only.
- (6) Chemical analysis only.
- (7) Chemical analysis only.
- (8) Chemical analysis only.

Quant: 316/316L

Marca: MVAPML MAXIVAL

Funzione: 316/316L

Pos. nr. Pos. in Abt. in	Oggetto Description Design. Nr. product	Dimensioni - In Nominale Dimension	Tolleranze Tolerance Tolerance	Lunghezze - In Länge Länge	Colori Surface Color	Fatti Surface Finish	Peso - LB Peso Peso	Lotto nr. Lotto Lotto
0150	Hexagon	0,9375	±0,09	150 / 152	249111		2,230	121700500



TEST	Proprietà Eigenschaften Properties	+ F	Pec. Depth mm	Sprengimento Schlagempfindlichkeit Impact strength KJ/m <sup>2</sup>	Sprengimento Schlagempfindlichkeit Impact strength KJ/m <sup>2</sup>	Resistenza Festigkeit Tensile strength N/mm <sup>2</sup>	Allungamento Dehnung Elongation %	Stiratura Formbarkeit Formability %	Resistenza Schweißnaht Weldability	Curezza Härte Hardness HB
A	12,5	68	L	70		90	46		50	229
A	Grain size for ASTM E112						5			

Mechanical properties according to ASTM A370.

### Analisi chimica

Elemento	min	max	Elemento	min	max
C %	0,016	0,52	Cr %	16,72	2,09
Si %	0,52	1,52	Mn %	0,68	10,13
Mn %	1,52	16,72	P %	0,029	0,030
Cr %	16,72	2,09	S %	0,030	0,061
Mo %	2,09	0,68	N %	0,061	-
Cu %	0,68	10,13	-	-	-
Ni %	10,13	0,029	-	-	-
P %	0,029	0,030	-	-	-
S %	0,030	0,061	-	-	-
N %	0,061	-	-	-	-

Produced without class I or II Oxygen depleting substances.  
Solution heat treated free from continuous carbide network.  
Annealing temperature: 1940°F for 1 hr/water.  
Micro and macro etch test: CK  
Intergranular corrosion test per ASTM A262 pract. E: ok

Vicenza, 27/09/10 VC006 (M. Rizzotto)	Il collaudatore è stabilimento / der Werkstoffprüfstelle / Works Inspector / L'opere d'Usine <i>M. Rizzotto</i>	Pagina - 1 di 2
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# Acciaierie Valbruna S.p.A.

36100 VICENZA (Italia) - Viale della scienza, 25 r.l.  
 39100 BOLZANO (Italia) - Via A. Volta, 4  
 Clienti / Kundenbeziehungen  
 VALBRUNA STAINLESS INC.  
 2400 TAYLOR STREET WEST  
 46801-FORT WAYNE, IN 46801-USA  
 Produzione: ACCIAIERIE VALBRUNA S.P.A.  
 Hersteller/Werke/Produktion



## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

Avviso di Spedizione: D-V110026568  
 (Lieferung/Frachtbrief)

Certificato nr: MEST919455/2010/  
 Prüfung/Zeugnis

Conferma ordine nr: EH 0000781  
 Bestellung/Bestellnr

Marchio di Fabbrica:  
 Zeichen des Lieferanten  
 Logo mark  
 Logo Nr / Lieferantensymbol

Funzione del Collaudatore:  
 Name des Prüfer/Verantwortlichen  
 Hersteller / Auftraggeber des T. Material

Ordine nr: 29024 STOCK POMPTON  
 Bestell/Nr oder Kommande

Tipo di Elaborazione: E-A00  
 Erzeugnisgruppen/Herstellungsmethode / -verfahren

Oggetto Prove: - Annealed COLD PROCESSED  
 Prüfgegenstand/Prüfungszustand

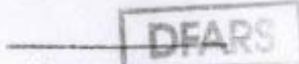
### Material is DFARS Compliant

Sono state soddisfatte tutte le condizioni richieste  
 Die spezifizierten Anforderungen sind erfüllt  
 Die Abnahme ist damit verbunden in Übereinstimmung mit den Anforderungen  
 Le richieste sono state soddisfatte

Controlli antisensibilizzanti: OK  
 Sensibilisierungskontrolle  
 Anlötlötung wurde durchgeführt  
 Gefährliche Verunreinigungen: OK

Controlli visivi e dimensionali: sottile la seguente  
 Bräutigam und Abmessung, ohne Bestimmung  
 Visual inspection and dimensional check satisfactory  
 Controls visual e dimensionali: sottile

Metal and manufactured in Italy No welding or weld repair Material free from Mercury contamination  
 We declare that the finished product is checked for radioactive contamination through Portal System when it leaves the production plant.  
 The Quality Management System is Certified acc. Pressure Equipment Directive (97/23/EC) Annex 1 s. 4.3 by TÜV and LLOYD 'B'  
 Any act of tampering, modification, alteration, counterfeiting and/or falsification and/or any other action which modifies the contents of this test certificate shall constitute a violation  
 of applicable civil and criminal laws. Acciaierie Valbruna shall protect its rights and interests before any competent court, authority and jurisdiction.  
 Material and/or Valplus grades/products are manufactured with ladle techniques to control composition, distribution, size and shape of non-metallic inclusions for improved  
 machinability.  
 The supplied product conforms to requirements expressly requested by the purchaser and conforms to requirements specified by certified norms and standards. Should the  
 product be used for more severe, critical and/or in any case different applications than those the material is generally intended for, any different and/or supplementary  
 requirements shall be specifically demanded, at least, upon order of the Product by the Purchaser. Acciaierie Valbruna SpA shall not be responsible for any improper use of the  
 Product.



Material Heat Code  
 FHF  
 MAY 05 2011

Certified by:

*[Signature]* INSP. #557

YALB. certifies THAT  
 THIS IS A COPY OF THE ORIGINAL  
 MILL TEST REPORT NOW ON FILE  
 REPRODUCED AND INSPECTED

MAY 04 2010

BY *[Signature]*  
 MELISSA GAGNER CERTIFICATION PROCESSOR

Vicenza, 27/09/10  
 # collaudatore di accettazione / der Werkzeugsverifizierer / Prüfung Inspector / L. Agent d'usage  
 M. Rizzotto  
 Pagina - 2 di 2

Customer: S S P FITTINGS CORP Ord #: S830880 Part #: 80200-33- Cust PO#: 0128700



2303 E. Main Road - Modigliana (MC) - Italy  
 Tel. +39074370111 - Fax +39074370112  
 E-mail: www.rodacciai.com - e-mail: info@rodacciai.com



R420686

**CERTIFICATO DI COLLAUDO** Inspection Certif. N. 059861 Date 8/11/2010

Secondo According to . . . . . EN 10204:2004 3.1

<b>DESTINATARIO</b> - Cargo-Receiver	<b>CLIENTE</b> - Customer
EM JORGENSEN CO PO P376499 423 ITEM 511043	RODA SPECIALTY STEEL, INC. 432 DIENS DRIVE 60090 WHEELING, IL



<b>ORDINE</b> - Order	<b>D.d.T.</b> - Delivery note
N. 900586 Date 28/06/2010	N. 13774/13 Date 25/11/2010
<b>Weight</b> lb 3.175,00	<b>ODP N.</b> 2010/A/34740
<b>Tolerance</b> + 0,000 - 0,090 mm	<b>Bars Length</b> 3.650 - 3.710

**QUALITA'** - Grade  
 STANDARD Type 316 / 316L UNS S 31600 - 31603

**Mark** RODACCIAI . . . . . 316 PLUS

**COLATA** - Heat . . . . . 998260

**PROFILO** - Shape . . . . . HEXAGON  
**DIMENSIONE** - Size . . . . . 5/8"  
**ESECUZIONE** - Form of delivery . . . . . COLD DRAWN

**ANALISI CHIMICA DI COLATA** - Cast analysis % by mass

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Co
0,014	1,730	0,300	0,028	0,036	16,500	10,000	2,000	0,380	0,160
N									
0,0240									

**CARATTERISTICHE MECCANICHE ALLO STATO DI FORNITURA**  
 Mechanical properties of delivered material

		Tested	Min	Max
Tensile Strength	Rm PSI	97288,2	75000	125000
Yield Strength	Rp(0,2) PSI	80034,4	30000	
Elongation	A 4 (%)	46,2	35	
Hardness	HBW	210,0	140	241
Hardness	HRC	16,0		22
Reduction of area	Z (%)	67,6	50	

**NOTE** - Notes

According to : ASTM A276-10 - ASTM A479/A 479M - 10a  
 AMS 5648K 2003 AMS QQ-S-763 Rev B 2006 cond.A  
 ASME SA479-10a ASTM A182/A 182M-10 ASME SA182-10  
 ASTM A484/A 484M 10 ASTM A 320/A329M - 10  
 ASTM A193/A 193M 10 GR B8M class 1 Type 316

Pag. 1 / Segue

Customer: S S P FITTINGS CORP Ord #: S830880 Part #: 80200-33- Cust PO#: 0128700



2540 Sesto San Giovanni - 36100 Vicenza - Italia  
Tel. +39044470111 - Fax +39044470112  
Internet: www.rodacciai.com - e-mail: info@rodacciai.com



**Segue certificato di collaudo** N. 059861 Date 8/11/2010  
Inspection Certificate's continuance

**NOTE - Notes**

ASME SA 193 - 10 GR B8M Class 1 Nace MR0175-2003  
AMS 5653G 2010 ASTM A751-08 ASME SA 329 - 10  
Intergranular corrosion tested to ASTM A262-10 practi.E:OK  
The material was produced by EF + A.O.D.  
Micro and Macro structure : Satisfactory  
Free of Mercury contamination - No Weld Repair  
100% crack tested by eddy current method: OK  
Heat treatment = 1940°F quenched in water  
The raw material was melted in Spain.  
This product was manufactured in Italy.  
Grain size by Test Method E 112 = 5-6  
Material according to our specification Nr. 047

We certify hereby, that the above mentioned products are consistent with the order prescriptions. This certificate was generated by data system acc. to EN 10204, it is not necessary to be signed for validity.



Material Heat Code

G-LD  
JUN 08 2011

Certified by:



CERTIFICATE OF TESTS ABNAHMEPRUEFZEUGNIS CERTIFICAT DE CONTROLE

CERT SERIAL# 000485538



Carpenter Technology Corporation  
 101 West Bern Street, Reading, Pa. 19601  
 Tel: (610) 208-2000 (800) 338-4592

• THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 47.  
 • THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE TRACKED BY REFERENCE TO THE CARPENTER ORDER NUMBER.  
 • MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA AND GAMMA SOURCE CONTAMINATION.  
 • THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.

03/01/06  
 CUSTOMER / BESTELLER / CLIENT

SELLER / VERKÄUFER / VENDEUR PAGE 1 OF 1

SSP FITTINGS CORP  
 ATTN: EVONA MYERS  
 8250 BOYLE PARKWAY  
 TWINSBURG ,OH 44087

CARPENTER TECHNOLOGY CORP  
 101 W. BERN STREET  
 READING ,PA 19601

CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER SU./SERIES-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/Poids
0100591 40	PHL739301 L10364	03/01/06	671.000

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 731287

PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN

SPECIFICATION: QQ-S-763F (06/27/96) CLASSES 316/316L, COND A, COLD FINISH  
 -----  
 AMS 5648 REV K (08/ /02) TYPE 316  
 AMS 5653 REV F (08/ /02) TYPE 316L  
 ASTM-A276-04 TYPE 316/316L, CONDITION A, COLD FINISH  
 ASTM-A479-04 TYPE 316/316L, ANNEALED  
 ASME-SA479 2004 EDITION TYPE 316/316L, ANNEALED  
 AMS-QQ-S-763A (02/ /03) CLASSES 316/316L, COND A, COLD FINISH

SIZE 0.437500 IN. ( 11.11 MM) HEX BAR

PRIMARY HEAT CHEMISTRY(WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)

C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)
0.019	1.64	0.59	0.027	0.027	16.91
NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)		
11.14	2.04	0.89	0.02		

INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE.  
 ANNEALED MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE  
 PRECIPITATION (NETWORK).  
 NO WELD REPAIR.

THIS MATERIAL WAS MANUFACTURED IN ACCORDANCE WITH CARPENTER SPECIALTY ALLOYS OPERATIONS QUALITY PROGRAM MANUAL REVISION 24, DATED 10/03.  
 THIS MATERIAL CONFORMS TO THE TECHNICAL REQUIREMENTS OF THE AMS SPECIFICATION REFERENCED ABOVE.

YIELD STRENGTH, (0.20 %) KSI(MPA)	91.0( 627)
TENSILE STRENGTH, KSI(MPA)	105.0( 724)
ELONGATION IN 1.75", %	38.0
REDUCTION OF AREA, %	70.0
HARDNESS, HB	222.0

(CONVERTED FROM TENSILE)

GRAIN SIZE PER ASTM E112: 4

CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF SEPTEMBER 2, 2004 TO THE REQUIREMENTS OF ISO 9001:2000 APPROVAL CERTIFICATE 04-0540 BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.

HEIDI L. SUNDAY  
 MET RELEASE/REQUIREMENTS ANALYST  
 CARPENTER TECHNOLOGY CORPORATION

*Heidi L. Sunday*

This certification is made to the customer stated on this form. Carpenter neither makes, nor assumes responsibility for, any representation or certification to other parties.  
 Die vorliegende Zertifikatsangabe ist nur für den in diesem Formular genannten Kunden gültig. Carpenter übernimmt gegenüber Dritten keinerlei Haftung für die angegebenen Daten oder Zertifikatsangaben.  
 Ce certificat est uniquement valable pour le client dont le nom est imprimé sur ce formulaire. Carpenter n'assume pas de responsabilité pour une certification vis-à-vis d'une tierce personne.

# Acciaierie Valbruna S.p.A.



36100 VICENZA (Italia) - Viale della scienza, 25 z.l.  
 Stab.: 36100 BOLZANO (Italia) - Via A. Volta, 4  
 Cliente / Kunden / Customer  
 VALBRUNA STAINLESS INC.  
 2400 TAYLOR STREET WEST  
 46801-FORT WAYNE, IN 46801-USA

Produttore: ACCIAIERIE VALBRUNA S.P.A.  
 Hersteller/Produzent

Oggetto Prove: - Annealed COLD PROCESSED  
 Prüfgegenstand/Prüfung/Prüfung

Avviso di Spedizione: D-VI10005022  
 Lieferungs/Fracht betref.

Ordine nr: 28655 STOCK POMPTON  
 Bestell/Nr./auftrag/Bestellung

Tipi di Elaborazione: E=ADD  
 Bearbeitungsart/Herstellungsvorgang/Herstellung

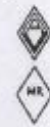
## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005), 3.1

Certificato nr: MEST953012/2010/  
 Prüfzettel nr

Conferma ordine nr: E110018045  
 Verkaufsbefehl nr

Machio di Prodotto:  
 Zeichnung / Lieferzeichnung  
 Trade mark  
 Signifikatur / Beschriftung

Posizione del Collaudatore:  
 Standort der Werkstoffprüfung  
 Standort / Standort / Standort



Specifiche:  
 Anforderungen / Requirements / Wünsche

VSI 0 316/316L A,CF  
 AMS QQ-B-783 B 316/316L A,CF  
 ASME SA275 2007 S31600/03 A,CF (2)  
 ASTM A182 2010 S31600/03 A (1)  
 ASTM A276 2010 S31600/03 A,CF  
 ASTM A276 2010 S31600/03 A,CF  
 MIL-S-882 B/1 316/316L

AMS 5648 K S31603 A  
 ASME SA182 2007 S31600/03 A (2)  
 ASME SA325 2007 BSM (2)  
 ASTM A193 2010A BSM (2)  
 ASTM A314 2008 S31600/03  
 ASTM A473 2001 S31600/03 (2)  
 NACE MR0175 2003-S31600/03 (2)

AMS 5653 F S31603 A  
 ASME SA193 2007 BSM (1)  
 ASME SA479 2007 S31600/03 A (1)  
 ASTM A262 2010 PRACTICE E  
 ASTM A320 2010 BSM (7)  
 ASTM A479 2010A S31600/03 A

- (2) SEC.II P.T.A 2007 EDITION ADD. 2009b
- (1) SEC.II P.T.A 2007 EDITION ADD. 2009b
- (2) SEC.II P.T.A 2007 EDITION ADD. 2009b
- (3) Chemical analysis only.
- (5) For products machined directly from bar refer to ASTM A479.
- (7) Chemical analysis only.
- (6) \* ISO 15156-3

- (2) For products machined directly from bar refer to ASME SA479.
- (1) Chemical analysis only.
- (3) SEC.II P.T.A 2007 EDITION ADD. 2009b
- (4) SEC.II P.T.A 2007 EDITION ADD. 2009b
- (6) Chemical analysis only.
- (8) Chemical analysis only.

Qualità: 316/316L  
 Material/Qualität

Marcia: MVAPML MAXIVAL  
 Markenbezeichnung/Markenname

Purezza: 316/316L  
 Reinheitsgrad/Reinheitsgrade

Pos. nr. Pos. nr. No. of rows	Oggetto Description Bezeichnung	Dimensioni - in Nominale Dimension Dimension	Tolleranza Tolerance Toleranz	Lunghezza - in Länge Length Länge	Colore Farbe Farbe	Peso Gewicht Gewicht	Peso - Lit Gewicht Gewicht	Lotto nr. Lot Lot
0080	Hexagon	1,0000	484-09	149 / 151	252651		2,659	129201150

TEST	Tensile strength Zugfestigkeit		Elongation Dehnung	Reduction of area Zugbrüche	Hardness Härte	Grain size Korngröße
	UTS R <sub>m</sub>	Yield R <sub>eH</sub>				
A	12,5	68	L	70	101	45

Mechanical properties according to ASTM A370.

### Analisi chimica

Colata / Cast Schmelzcode	min min	max max	1,38 1,38	18,30 18,30	2,08 2,08	1,38 1,38	10,00 10,00	0,040 0,040	0,030 0,030	0,180 0,180
	C %	Si %	Mn %	Cr %	Mo %	Cu %	Ni %	P %	S %	N %
252651	0,016	0,63	1,57	16,90	2,08	0,63	10,22	0,031	0,030	0,057

Produced without class I-II Coarse depleting substances.  
 Solution heat treated free from continuous carbide network.  
 Annealing temperature: 1940°F for 1 hr/soak.  
 Micro and macro etch test: OK  
 Intergranular corrosion test per ASTM A262 pract. E: ok.

YARDE METALS, INC. CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 TEST REPORT NOW ON FILE  
 MILL TESTED AND INSPECTED

FEB 24 2011

BY *Kathy Bell*  
 KATHY BELL, CERTIFICATION PROCESSOR

Vicenza, 09/12/10 VICENZA MIL-MC376	# collaudatore di approvvigiono / der Werkstoffprüfer / Lieferant / L'agent d'usine <i>M. Rizzotto</i>	Pagina - 1 di 2
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# Acciaierie Valbruna S.p.A.



36100 VICENZA (Italia) - Viale della scienza, 25 s.l.  
 Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4  
 Daire / Zweigwerk  
 VALBRUNA STAINLESS INC.  
 2400 TAYLOR STREET WEST  
 48801-FORT WAYNE, IN 48801-USA  
 Produttore: ACCIAIERIE VALBRUNA S.P.A.  
 Hersteller/Hersteller

Avviso di Spedizione: D-VI10205322  
 Untersendungsfaktura NR. 11

Ordine nr: 28995 STOCK POMPTON  
 Bestell/Nr. ohne Kommentar

Tipo di Elaborazione: E+ADD  
 Bearbeitungsart: E+ADD

## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

Certificato nr: MEST53012/2010/  
 Fertigungslauf

Confirma ordine nr: E110010045  
 Werkstück Identifiz.

Marchio di Fabbrica:  
 Zeichen des Lieferanten  
 Trade Mark  
 Signe de l'usine productrice



Partizione del Collaudo:  
 Gruppe der Werkstoffprüfungen  
 Inspector: M. Rizzotto



Opgetto Prove: - Annealed COLD PROCESSED  
 Prüfgegenstand: - beheiztes Material

### Material is DFARS Compliant

Sono state soddisfatte tutte le condizioni richieste  
 Die geforderten Anforderungen sind erfüllt  
 The material has been furnished in accordance with all requirements.  
 Le norme di riferimento relative ad esigenze

Controllo antinebulosità: OK  
 Unschmelzprüfung: ohne Nebelbildung  
 Smoking being performed: OK  
 Controllo antiruggine: OK

Controllo visivo e dimensionale: soddisfa le esigenze  
 Beugung und Ausmessung: ohne Beanstandung  
 Visual inspection and dimensioning: comply with requirements  
 Contrôle visuel et dimension: satisfaisant

Metal and manufactured in Italy No welding or weld repair Material free from Mercury contamination  
 We declare that the related product is checked for radioactive contamination through Portal Systems when it leaves the production plant.  
 The Quality Management System is Certified acc. Pressure Equipment Directive (97/23/EC) Annex 1, s. 4.3 by TÜEV and Lloyd's  
 Any act of tampering, modification, alteration, counterfeiting and/or falsification and/or any other action which violates the contents of this test certificate shall constitute a violation of applicable civil and criminal laws. Acciaierie Valbruna shall protect its rights and interests before any competent court, authority and jurisdiction.  
 Metal and/or Valbruna grades/products are manufactured with ladle techniques to control composition, distribution, size and shape of non-metallic inclusions for improved machinability.  
 The supplied product conforms to requirements expressly requested by the purchaser and conforms to requirements specified by certified norms and standards. Should the product be used for more severe, critical and/or in any case different applications than those the material is generally intended for, any different and/or supplementary requirements shall be specifically demanded, at least, upon order of the Product by the Purchaser. Acciaierie Valbruna SpA shall not be responsible for any improper use of the Product.

**DFARS**

Material Heat Code  
 FTJ  
 MAR 01 2011

Certified by:

*[Signature]* **INSP. #5 SSP**

Vicenza, 09/12/10 VCC008 GIAN MESTR	# collaudatore di stabilimento / der Werkstoffprüfingen / Nachh. Inspector / L' agent d' usine <i>M. Rizzotto</i>	Pagina - 2 di 2
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YARDE METALS Inc 02-25-11

S10217CV007-1 SSP FITTINGS CO PO: 126792 Part #: 18-00PC 664.001B

<b>CERTIFICATE OF TESTS</b> CERT SERIAL# 000764149 <b>CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592	<b>ABNAHMEPRUEFZEUGNIS</b>	<b>CERTIFICAT DE CONTROLE</b>																									
03/11/11 CUSTOMER/BESTELLER/CLIENT  SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG, OH 44087	<div style="border: 2px solid black; padding: 5px; display: inline-block;"><b>DFARS</b></div>	* THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 47. * THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE TRACED BY REFERENCE TO THE CARPENTER ORDER NUMBER. * MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA AND GAMMA SOURCE CONTAMINATION. * THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.																									
		SELLER/VERKÄUFER/VEHDEURPAGE 1 OF 1  CARPENTER TECHNOLOGY CORP  101 W. BERN STREET READING, PA 19601																									
CUSTOMER ORDER NO./BESTELL.-NR./N° DE COMMANDE	CARPENTER NO./MERKS.-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS																								
126863	PHL614401 L27066	03/11/11	2227.000																								
HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 741249 PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING ----- ASTM-A276-10 TYPE 316/316L ASTM-A479-10A TYPE 316/316L ASME-SA479 2010 EDITION TYPE 316/316L SIZE 0.687500 IN. ( 17.46 MM) HEX BAR PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS) <table style="width:100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="text-align: center;">C (COM)</td> <td style="text-align: center;">MN (XRF)</td> <td style="text-align: center;">SI (XRF)</td> <td style="text-align: center;">P (XRF)</td> <td style="text-align: center;">S (COM)</td> <td style="text-align: center;">CR (XRF)</td> </tr> <tr> <td style="text-align: center;">0.019</td> <td style="text-align: center;">1.61</td> <td style="text-align: center;">0.55</td> <td style="text-align: center;">0.035</td> <td style="text-align: center;">0.026</td> <td style="text-align: center;">16.85</td> </tr> <tr> <td style="text-align: center;">NI (XRF)</td> <td style="text-align: center;">MO (XRF)</td> <td style="text-align: center;">CU (XRF)</td> <td style="text-align: center;">N (FUS)</td> <td colspan="2"></td> </tr> <tr> <td style="text-align: center;">11.39</td> <td style="text-align: center;">2.04</td> <td style="text-align: center;">0.83</td> <td style="text-align: center;">0.02</td> <td colspan="2"></td> </tr> </table> INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK). HARDNESS AS SHIPPED, HRC - 26 (MIDRADIUS) YIELD STRENGTH, (0.20 %) KSI (MPA) 87.0 ( 600) TENSILE STRENGTH, KSI (MPA) 98.5 ( 679) ELONGATION IN 2.00", % 35.0 REDUCTION OF AREA, % 75.0 GRAIN SIZE PER ASTM E112: 4 MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE- MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.87211, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.				C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)	0.019	1.61	0.55	0.035	0.026	16.85	NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)			11.39	2.04	0.83	0.02		
C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)																						
0.019	1.61	0.55	0.035	0.026	16.85																						
NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)																								
11.39	2.04	0.83	0.02																								
Certified by:  HEIDI L. SUNDAY GROUPLDR - SPECIFICATIONS/CERTIFICATION CARPENTER TECHNOLOGY CORPORATION 																											
This certification is made to the customer printed on this form. Carpenter neither makes, nor assumes responsibility for, any representation or certification to other parties. Die vorliegende Zertifizierung ist nur für den in diesem Formular genannten Kunden gültig. Carpenter übernimmt gegenüber Dritten keinerlei Haftung für die angegebenen Daten oder Zertifizierungen. Ce certificat est uniquement valable pour le client dont le nom est imprimé sur ce formulaire. Carpenter n'assume pas de responsabilité pour une certification vis-à-vis d'une tierce personne.																											

# Acciaierie Valbruna S.p.A.

36100 VICENZA (Italia) - Viale della scienza, 25 s.l.  
 Subs.: 36100 BOLZANO (Italia) - Via A. Volta, 4  
 Clienti / Kunden / Customers:  
 VALBRUNA STAINLESS INC.  
 2400 TAYLOR STREET WEST  
 48001-FORT WAYNE, IN 48001-US  
 Produzione: ACCIAIERIE VALBRUNA S.P.A.  
 Herstellung / Fabrication



## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

Arvio di Spedizione: D-VII1020646  
 Lieferungszeichnung:  
 Ordine nr: 25792 STOCK POMPTON  
 Bestell / Auftragsnummer

Certificato nr: MEST961204/2011/  
 Prüfung / Testbericht

Conferma ordine nr: E110009792  
 Hersteller Order / Nr.

Marchio di Fabbrica:  
 Zeichen des Lieferanten:  
 Trade mark:  
 Signe de fabrica: fabricant



Punzone del Collaudatore:  
 Stempel des Prüfingenieur / Ingenieur:  
 Inspector / Inspecteur

Oggetto Provi: Annealed COLD PROCESSED  
 Prüfgegenstand / Prüfmaterial / Material

Tipo di Elaborazione: E+A00  
 Bearbeitungsart / Fertigungsart / Production

### Specifiche:

ANSI 316/316L A,CF  
 AMS-QQ-S-763 B 316/316L A,CF  
 ASME SA276 2007 S31600/03 A,CF (3)  
 ASTM A182 2010 S31600/03 A (2)  
 ASTM A276 2010 S31600/03 A,CF  
 ASTM A370 2010  
 MIL-S-982 B/1 316/316L

AMS 5648 K S31600 A  
 ASME SA192 2007 S31600/03 A (3)  
 ASME SA320 2007 B8M (3)  
 ASTM A193 2010A B8M (3)  
 ASTM A314 2006 S31600/03 (3)  
 ASTM A473 2001 S31600/03 (3)  
 NACE MR0175 2003 S31600/03 (3)

AMS 5653 F S31603 A  
 ASME SA193 2007 B8M (3)  
 ASME SA479 2007 S31600/03 A (4)  
 ASTM A292 2010 PRACTICE E  
 ASTM A320 2010 B8M (7)  
 ASTM A479 2010A S31600/03 A

- (3) SEC.8 PT.A 2007 EDITION ADD. 2009b
- (1) SEC.8 PT.A 2007 EDITION ADD. 2009b
- (2) SEC.8 PT.A 2007 EDITION ADD. 2009b
- (3) Chemical analysis only.
- (2) For products machined directly from bar refer to ASTM A479.
- (7) Chemical analysis only.
- (\*) ISO 15156-3

- (3) For products machined directly from bar refer to ASME SA479.
- (1) Chemical analysis only.
- (3) SEC.8 PT.A 2007 EDITION ADD. 2009b
- (4) SEC.8 PT.A 2007 EDITION ADD. 2009b
- (3) Chemical analysis only.
- (3) Chemical analysis only.

Quant.: 316/316L  
 Material / Material

Marca: MVAPML MAXVAL  
 Markenbezeichnung / Brandname

Arvio di Spedizione: D-VII1020646  
 Lieferungszeichnung: 316/316L  
 Bestell / Auftragsnummer



Pos. nr. Part. nr. No. de piece	Oggetto Description Design. de produit	Dimensioni - In Abmessungen Dimension	Tolleranza Toleranz Tolerance	Lunghezza - In Länge Length	Colata Schmelze Cast	Parti Stücke Parts	Peso - LB Gewicht Weight	Lotto nr. Lot Lot no.
0220	Hexagon	0,8750	484-09	150 / 152	251932		10,827	123600710

TEST ALLO STATO DI FORNITURA										
Test at delivery condition - Prüfung auf Lieferzustand - Essai à l'état de livraison - Proba sobre el material así como entregado										
TEST	Proprietà / Feature Eigenschaft / Caractéristique Propriedade / Característica	*F	Unit Einheit Unidad	Spaziatura Spacings Espaciamiento	Spaziatura Spacings Espaciamiento	Resistenza Strength Resistencia	Allungamento Elongation Alargamiento	Strizione Strain Deformación	Resistenza Impact Resistencia	Durezza Hardness Dureza
	min			30		75	30	50		140
A	12,5	6B	L	63		99	48	68		235
TEST			min			max				
A	Grain size for ASTM E112					5				

Mechanical properties according to ASTM A370.

### Analisi chimica

Chemical composition / Chemische Zusammensetzung / Composición química

Colata / Cast Schmelze / Casting	min	max	1,00	2,00	18,00	2,00	1,00	13,00	14,00	0,040	0,030	5,100				
	C %	Si %	Mn %	Cr %	Mo %	Cu %	Ni %	P %	S %	N %						
251932	0,016	0,55	1,82	16,82	2,03	0,64	10,69	0,027	0,030	0,063						

Produced without class II Crone depleting substances.  
 Solution heat treated free from continuous carbide network.  
 Annealing temperature: 1840°F for 1 hr/aster.  
 Micro and macro etch test: OK  
 Intergranular corrosion test per ASTM A292 pract. E: ok.

Vicenza, 11/01/11 MEST	Il collaudatore di stabilimento / der Werksachverständiger / Works inspector / L'agent d'usine M. Rizzotto	Pagina - 1 di 2
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# Acciaierie Valbruna s.p.a.

36100 VICENZA (Italia) - Viale della scienza, 25 n.1.  
 Stab.: 36100 BOLZANO (Italia) - Via A. Volta, 4  
 Clienti / Kunden / Customers:  
 VALBRUNA STAINLESS INC.  
 2400 TAYLOR STREET WEST  
 48801-FORT WAYNE, IN 48801-US  
 Produttore: ACCIAIERIE VALBRUNA S.P.A.



## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

Avviso di Spedizione: D-VII11000546  
 Lombruggo/Fortwylg 10/11

Ordine nr: 28792 STOCK POMPTON  
 Bestell/Nr: 28792

Tipi di Elaborazione: E+AOD  
 Bearbeitungsarten: E+AOD

Certificato nr: MEST981204/2011/  
 Pruefzeugnis

Cartella ordine nr: E110008792  
 Bestell/Nr: E110008792

Marchio di Fabbrica:  
 Zeichen des Lieferanten  
 Trade mark  
 Sign of the producer

Funzione del Collaudatore:  
 Funktion des Inspektionstechnikers  
 Inspector's stamp/signature on T. sheet



Oggetto Prove: - Annealed COLD PROCESSED  
 Prüfgegenstand: annealed/Prüfung

### Material is DFARS Compliant

Sono state soddisfatte tutte le condizioni richieste  
 Die genannten Anforderungen sind in Anlage erfüllt  
 The material has been furnished in accordance with the requirements  
 Le matériel a été livré conforme aux exigences

Controllo antirisciacchi: OK  
 Verschleißschutze: Verschleißschutz  
 Antirisciacchi conforme OK  
 Gewährleistung: 12.12.11

Controllo viglie e dimensionale: soddisfa le esigenze  
 Beachtung und Ausmessung: alle Anforderungen  
 Final inspection and dimensional check satisfactory  
 Controllo fuori di tolleranza: nessuna

Metal and manufactured in Italy No welding or weld repair Material free from Mercury contamination  
 We declare that the finished product is checked for radioactive contamination through Portal System when it leaves the production plant.  
 The Quality Management System is Certified acc. Pressure Equipment Directive (97/23/EC) Annex 1, A.3 by TÜV and Lloyd's B  
 Any act of tampering, modification, alteration, counterfeiting and/or falsification and/or any other action which modifies the contents of the test certificate shall constitute a violation  
 of applicable civil and criminal laws. Acciaierie Valbruna shall protect its rights and interests before any competent court, authority and jurisdiction.  
 Material and Valbruna grades/products are manufactured with table techniques of metal composition, distribution, size and shape of non-metallic inclusions for improved  
 machinability.  
 The supplied product conforms to requirements expressly requested by the purchaser and conforms to requirements specified by certified norms and standards. Should the  
 product be used for more severe, critical and/or in any case different applications than those the material is generally intended for, any different and/or supplementary  
 requirements shall be specifically demanded, at least, upon order of the Product by the Purchaser. Acciaierie Valbruna SpA shall not be responsible for any improper use of the  
 Products.



Material Heat Code

GKO

JUN 06 2011

Certified by:

*[Signature]*

Vicenza, 11/01/11 VOOER (FNA-MER)	Collaudatore di stabilimento / der Werkssachverständiger / Works Inspector / L' agent d'usine <i>M. Rizzotto</i>	Pagina - 2 di 2
---	---	-----------------

YAROS METALS Inc 06-02-11

810602CV009-1 SSP FITTINGS CO PO: 128366 Part #: 40.00PC 1127.001R

<b>CERTIFICATE OF TESTS</b> CERT SERIAL# 000769698 <b>CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592	<b>ABNAHMEPRUEFZEUGNIS</b>	<b>CERTIFICAT DE CONTROLE</b>
04/25/11 CUSTOMER/BESTELLER/CLIENT  SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG, OH 44087	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>DFARS</b> </div>	<ul style="list-style-type: none"> <li>• THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 47.</li> <li>• THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE TRACED BY REFERENCE TO THE CARPENTER ORDER NUMBER.</li> <li>• MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA AND GAMMA SOURCE CONTAMINATION.</li> <li>• THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.</li> </ul>
		SELLER/VERKAUFER/VEDEURPAGE 1 OF 1
		CARPENTER TECHNOLOGY CORP 101 W. BERN STREET READING, PA 19601

CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS
127941	PHL732101 L30739	04/25/11	978.000

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 741416

PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN

-----  
 SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING  
 -----  
 ASTM-A276-10 TYPE 316/316L  
 ASTM-A479-10A TYPE 316/316L  
 ASME-SA479 2010 EDITION TYPE 316/316L

SIZE 0.750000 IN. ( 19.05 MM) HEX BAR

PRIMARY HEAT CHEMISTRY(WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)

C (COM)	MN(XRF)	SI(XRF)	P (XRF)	S (COM)	CR (XRF)
0.017	1.80	0.60	0.025	0.024	16.71
NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)		
11.15	2.05	0.82	0.02		

INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE.  
 SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN  
 BOUNDARY CARBIDE PRECIPITATION (NETWORK).

HARDNESS AS SHIPPED, HRBW - 98 (MIDRADIUS)

(T)RANSVERSE (L)ONGITUDINAL	L	
YIELD STRENGTH, (0.20 %) KSI(MPA)	82.0 {	565)
TENSILE STRENGTH, KSI(MPA)	98.5 {	679)
ELONGATION IN 2.00", %	35.0	
REDUCTION OF AREA, %	75.0	

Material Heat Code  
 GEJ  
 APR 26 2011

Certified by:

MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIREMENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.

HEIDI L. SUNDAY  
 GROUPLDR - SPECIFICATIONS/CERTIFICATION  
 CARPENTER TECHNOLOGY CORPORATION

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CERTIFICATE OF TESTS ABNAHMEPRUEFZEUGNIS CERTIFICAT DE CONTROL

CERT SERIAL# 000630992  
  
**CARPENTER**  
 Carpenter Technology Corporation  
 101 West Bern Street Reading, Pa. 19601  
 Tel: (610) 208-2000 (800) 338-4592

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02/18/08  
 CUSTOMER / BESTELLER / CLIENT

SELLER / VERKÄUFER / VENDEUR PAGE 1 OF

SSP FITTINGS CORP  
 ATTN: EVONA MYERS  
 8250 BOYLE PARKWAY  
 TWINSBURG , OH 44087

CARPENTER TECHNOLOGY CORP  
 101 W. BERN STREET  
 READING , PA 19601

CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIS
0113548 H/C: BDP	PHL532201 L33378	02/18/08	2834.00

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 736616

PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN

SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03)  
 -----  
 ASTM-A276-06 TYPE 316/316L  
 ASTM-A479-06A TYPE 316/316L  
 ASME-SA479 2007 EDITION TYPE 316/316L

SIZE 0.875000 IN. ( 22.22 MM) HEX BAR

PRIMARY HEAT CHEMISTRY(WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)

C (COM)	MN(XRF)	SI(XRF)	P (XRF)	S (COM)	CR(XRF)
0.016	1.61	0.66	0.025	0.024	16.77
NI(XRF)	MO(XRF)	CU(XRF)	N (FUS)		
11.35	2.07	0.92	0.02		

INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. (OXALIC)

HARDNESS AS SHIPPED, HBW - 244 (MIDRADIUS)

YIELD STRENGTH, (0.20 %) KSI(MPA)	82.5( 569)
TENSILE STRENGTH, KSI(MPA)	101.0( 696)
ELONGATION IN 2.00", %	32.0
REDUCTION OF AREA, %	73.0

GRAIN SIZE PER ASTM E112: 4 (KALLINGS)

MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIREMENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF SEPTEMBER 2, 2004 TO THE REQUIREMENTS OF ISO 9001:2000 APPROVAL CERTIFICATE 07-0869 BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.

RHT3160875

MICHELE L. HEFFNER  
 MET RELEASE/REQUIREMENTS ANALYST  
 CARPENTER TECHNOLOGY CORPORATION



2/19/08

Michele L. Heffner

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### Certificate of Test

HEAT B91340 ORDER 614843/ 01 BOL 0207985 \* CERTIFICATION \* 07/27/10  
 SHIP TO:  
 YARDE METALS  
 45 NEWELL STREET  
 SOUTHINGTON 064890000

----- YOUR ORDER & DATE -----  
 P00709TS339 7/27/10 CUST# 0975001 CUST TAG#

----- ITEM DESCRIPTION -----  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L SQR CDA CONDA .7500 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 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 1018

NO 2007317 Bundles: 1C

----- SPECIFICATIONS -----  
 MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648X, 5653F SAR AMS-QQ-S-763B  
 ASTM A182 09 ASTM A276 08a  
 ASTM A314 97 Federal Spec QQ-S-763F  
 ASTM A479/A479M 09 ASTM A193 09 B8M  
 DIN 50049/EN 10204 3.1B DFARS 252.225.7014 6/05  
 DFARS 225.7002-3(B)(1) NACE MR0175-03, mid-rad hard  
 Prodec Quality

HIC: FIC  
**DFARS**

----- MECHANICAL & OTHER TESTS -----  
 Hardness as shipped (223 HB )  
 Hardness as shipped 96 HRB  
 Hardness as tested 00  
 Grain size 5.0 Tensile strength, KSI (MPa) 94.5 ( 652)  
 Micro OK 0.2% Yield Strength, KSI (MPa) 73.5 ( 507)  
 Intergranular corrosion OK  
 Macro OK Elongation % in 4D 41.0  
 Reduction of area % 74.0

----- CHEMICAL COMPOSITION -----  
 Carbon (C ) .021 Manganese (Mn) 1.560  
 Phosphorus (P ) .031 Sulphur (S ) .026  
 Silicon (Si) .540 Chromium (Cr) 16.660  
 Nickel (Ni) 10.020 Cobalt (Co) .198  
 Copper (Cu) .452 Moly (Mo) 2.030  
 Nitrogen (N ) .052 Columbium (Cb) .016  
 Titanium (Ti) .001 Aluminium (Al) .004  
 Tin (Sn) .008 Boron (B ) .004  
 Vanadium (V ) .070  
 Columbium/  
 Tantalum (Cb-Ta) .016  
 Iron (Fe) Balance  
 Melt Practice BAP  
 Refining Practice AOD  
 De-long Ferrite

YARDE METALS, Inc. Certifies that  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 MILL TEST REPORT NOW ON FILE  
 RECEIVED AND INSPECTED

JUL 28 2010

BY Kathy Bell  
 KATHY BELL, CERTIFICATION PROCESSOR

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

*[Signature]*  
 INSP. #5 SSP  
 11/22/10  
 M.F. Marcano

Outokumpu Stainless Bar, Inc.  
 3043 Crenshaw Pkwy.  
 Refining St. 21428

30118CV613-1 SSP FITTINGS CO PO: 125705 Part #: 2.00PC 46.00LB

YARDE METALS Inc 11-18-10



Certificate of Test

\*\*\*\*\*  
 CERTIFICATION  
 \*\*\*\*\*

HEAT E90360 ORDER 605389/ 01 BOL 0203202 BUNDLE 2004767/1AA 07/20/09

SHIP TO:  
 YARDE METALS INC  
 10160 PHILIPP PARKWAY  
 STREETSBORO 442410000

HIC: XJ



----- YOUR ORDER & DATE -----  
 P90707DO901 7/20/09 CUST# 0975001 CUST TAG#

----- ITEM DESCRIPTION -----  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L RND CFA CONDA 1.6250 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 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 Bundle Weight 1040

----- SPECIFICATIONS -----  
 MPG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648K, 5653F SAE AMS-QQ-S-763B  
 ASME SA182 E07 ASME SA193 E07  
 ASME SA479 E07, A07 & A08 ASME SA320 BSM CL1 E04 A05  
 ASTM A182 08A ASTM A262 9B PRACTICE E  
 ASTM A276 08A ASTM A314 97  
 ASTM A479/A479M 08 ASTM A484 08  
 ASTM E112 96 ASTM A320 08 BSM CLASS 1  
 ASTM A193 08B BSM DIN 50049/EN 10204 3.1B  
 DFARS 252.225.7014 6/05 DPARS 225.7002-3(B) (1)  
 FEDERAL SPEC. QQ-S-763F NACE MR0175-03, MID-RAD HARD  
 PRODCR QUALITY

----- MECHANICAL & OTHER TESTS -----  
 Hardness as shipped (167 HB )  
 Hardness as shipped 84 HRB  
 Grain size 9.0 Tensile strength, KSI (MPa) 88.5 ( 610)  
 Micro OK D.2½ Yield Strength, KSI (MPa) 45.8 ( 316)  
 Intergranular corrosion OK  
 Macro OK Elongation % in 4D 51.0  
 Reduction of area % 75.0

----- CHEMICAL COMPOSITION -----  
 Carbon (C) .018 Manganese (Mn) 1.720  
 Phosphorus (P) .030 Sulphur (S) .025  
 Silicon (Si) .513 Chromium (Cr) 16.610  
 Nickel (Ni) 10.160 Cobalt (Co) .317  
 Copper (Cu) .439 Moly (Mo) 2.050  
 Nitrogen (N) .068 Columbium (Cb) .039  
 Titanium (Ti) .003 Aluminum (Al) .005  
 Tin (Sn) .014 Tantalum (Ta) .006  
 Vanadium (V) .070 Columbium/ .000  
 Tantalum (Cb+Ta) .045  
 Iron (Fe) Balance  
 Melt Practice EAD  
 Refining Practice AOD  
 De-long Ferrite

YARDE METALS, INC. CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 MILL TEST REPORT NOW ON FILE  
 RECEIVED AND INSPECTED

JUL 22 2009

BY *Laura Rodriguez*  
 LAURA RODRIGUEZ, CERTIFICATION PROCESSOR

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.

Outokumpu Stainless Bar, Inc.  
 3043 Cranshaw Pkwy.  
 Richburg, SC 29729

M.F. Marcano, Quality Manager

*M.F. Marcano*  
 INSP. #5 SSP  
 7/23/09

YARDE METALS Inc 07-22-09

990722CV020-1 SSP FITTINGS CO PO: 119718 Part #:

8.00PC 637.00LB

<b>CERTIFICATE OF TESTS</b> CERT. SERIAL# 000732755 <b>CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592	<b>ABNAHMEPRUEFZEUGNIS</b>	<b>CERTIFICAT DE CONTROLE</b>	
08/09/10 CUSTOMER/BESTELLER/CLIENT  SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG , OH 44087	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>DFARS</b> </div>	<ul style="list-style-type: none"> <li>• THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 47.</li> <li>• THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE TRACED BY REFERENCE TO THE CARPENTER ORDER NUMBER.</li> <li>• MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA AND GAMMA SOURCE CONTAMINATION.</li> <li>• THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.</li> </ul> SELJER/VERKÄUFER/VENDEUR PAGE 1 OF 1	
CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS
123608 <i>HIC: EMX</i>	PHL086301 L20039	08/09/10	2018.000
HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 740080			
PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN			
SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING ----- ASTM-A276-08A TYPE 316/316L ASTM-A479-09 TYPE 316/316L ASME-SA479 2007 EDITION, 2009B ADD TYPE 316/316L			
SIZE 0.687500 IN. ( 17.46 MM) HEX BAR			
PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)			
C (COM) 0.019	MN (XRF) 1.69	SI (XRF) 0.59	P (XRF) 0.026
NI (XRF) 11.13	MO (XRF) 2.04	CU (XRF) 0.82	S (COM) 0.026
		N (FUS) 0.02	CR (XRF) 16.77
INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK).			
HARDNESS AS SHIPPED, HRBW - 93 (MIDRADIUS)			
YIELD STRENGTH, (0.20 %) KSI (MPA) 85.0 ( 586) TENSILE STRENGTH, KSI (MPA) 96.0 ( 662) ELONGATION IN 2.00", % 37.0 REDUCTION OF AREA, % 76.0			
GRAIN SIZE PER ASTM E112: 5			
MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE- MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2007 TO THE REQUIREMENTS OF ISO 9001:2000 APPROVAL CERTIFICATE 07-0869 BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.			
		HEIDI L. SUNDAY GROUPLDR - SPECIFICATIONS/CERTIFICATION CARPENTER TECHNOLOGY CORPORATION <i>Heidi L. Sunday</i>	
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### Certificate of Test

HEAT E110321 ORDER 520922/ 02 BOL 0212092 \* CERTIFICATION \* 05/16/11

SHIP TO:  
 YARDE METALS  
 45 NEWELL STREET  
 SOUTHTINGTON

064890000

----- YOUR ORDER & DATE -----  
 P10215HB007 5/18/11 CUST# 0975001 CUST TAG#

----- ITEM DESCRIPTION -----  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L RND CFA CONDA 1.0625 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 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 2200

WO 2021645 Bundles: 1A

----- SPECIFICATIONS -----  
 MPG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648K, 553P SAE AMS-QQ-S-763B  
 ASME SA182 E07, A07-09, E10 ASME SA193 E10  
 ASME SA479 E07, A07-09, E10 ASME SA320 B8M CL1 E10  
 ASTM A192 10a ASTM A262 98 Practice E  
 ASTM A276 10 ASTM A314 97  
 ASTM A479/A479M 10a ASTM A484 11  
 ASTM E112 96 ASTM A320 10a B8M Class 1  
 ASTM A193 10a B8M DIN 50049/EN 10204 3.1B  
 DFARS 252.225.7014 6/05 DFARS 225.7002-3(B) (1)  
 Federal Spec QQ-S-763F NACE MR0175-03, mid-rad hard  
 Procecl Quality EN 10204 Type 3.1 Document  
 NACE MR0175-03, ISO 15156:03 Sol Anneal @ 1900F min/WQ



Material Heat Code  
 S4  
 JUL 08 2011

Certified by:

*JM*

----- MECHANICAL & OTHER TESTS -----  
 Hardness as shipped 163 HB  
 Hardness as shipped ( 83 HRB )  
 Grain size 7.0  
 Micro OK  
 Intergranular corrosion OK  
 Hardness as tested 00  
 Tensile strength, KSI (MPa) 92.8 ( 640)  
 0.2% Yield Strength, KSI (MPa) 42.3 ( 292)  
 Elongation % in 4D 59.0  
 Reduction of area % 78.1

----- CHEMICAL COMPOSITION -----  
 Carbon (C) .019 Manganese (Mn) 1.720  
 Phosphorus (P) .034 Sulphur (S) .025  
 Silicon (Si) .384 Chromium (Cr) 16.570  
 Nickel (Ni) 10.090 Cobalt (Co) .170  
 Copper (Cu) .484 Moly (Mo) 2.040  
 Nitrogen (N) .074 Columbium (Cb) .007  
 Titanium (Ti) .004 Aluminum (Al) .005  
 Tin (Sn) .010 Boron (B) .004  
 Vanadium (V) .040  
 Columbium/ Tantalum (Cb-Ta) .007  
 Iron (Fe) Balance  
 Melt Practice EAP  
 Refining Practice AOD  
 De-long Ferrite

YARDE METALS, INC. CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 MILL TEST REPORT NOW ON FILE.  
 RECEIVED AND INSPECTED

MAY 20 2011

*Kathy Bell*  
 KATHY BELL, CERTIFICATION PROCESSOR

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.

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

M. F. Marcanio, Quality Manager

*M.F. Marcanio*

YARDE METALS Inc 07-06-11

510706CV022-1 SSP FITTINGS CO PO: 128269 Part #: 6.00PC 221.001B

<b>CERTIFICATE OF TESTS</b> CERT SERIAL# 000770112 <b>CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592	<b>ABNAHMEPRUEFZEUGNIS</b>	<b>CERTIFICAT DE CONTROLE</b>																											
05/06/11 CUSTOMER / BESTELLER / CLIENT  SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG , OH 44087		CARPENTER TECHNOLOGY CORP  101 W. BERN STREET READING , PA 19601																											
• THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 47. • THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE TRACED BY REFERENCE TO THE CARPENTER ORDER NUMBER. • MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA AND GAMMA SOURCE CONTAMINATION. • THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.																													
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CUSTOMER ORDER NO. / BESTELL-NR. / N° DE COMMANDE	CARPENTER NO. / WERKS-NR. / N° DE REFERENCE INTERNE	DATE / DATUM / DATE	WEIGHT / GEWICHT / POIDS																										
128146 <i>GDB &amp; GFY</i>	PHL764401 L28621	05/06/11	1335.000																										
HEAT NUMBER / SCHMELZE-NR. / N° DE COLLEE: 741494 PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING ----- ASTM-A276-10 TYPE 316/316L ASTM-A479-10A TYPE 316/316L ASME-SA479 2010 EDITION TYPE 316/316L SIZE 0.875000 IN. ( 22.23 MM) HEX BAR PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS) <table style="width:100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="text-align: center;">C (COM)</td> <td style="text-align: center;">MN (XRF)</td> <td style="text-align: center;">SI (XRF)</td> <td style="text-align: center;">P (XRF)</td> <td style="text-align: center;">S (COM)</td> <td style="text-align: center;">CR (XRF)</td> </tr> <tr> <td style="text-align: center;">0.016</td> <td style="text-align: center;">1.67</td> <td style="text-align: center;">0.50</td> <td style="text-align: center;">0.027</td> <td style="text-align: center;">0.023</td> <td style="text-align: center;">16.99</td> </tr> <tr> <td style="text-align: center;">NI (XRF)</td> <td style="text-align: center;">MO (XRF)</td> <td style="text-align: center;">CU (XRF)</td> <td style="text-align: center;">N (FUS)</td> <td colspan="2"></td> </tr> <tr> <td style="text-align: center;">11.29</td> <td style="text-align: center;">2.04</td> <td style="text-align: center;">0.82</td> <td style="text-align: center;">0.02</td> <td colspan="2"></td> </tr> </table> INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK). HARDNESS AS SHIPPED, HRBW - 96 (MIDRADIUS) _____ <table style="width:100%; margin-top: 10px;"> <tr> <td style="width:50%; font-size: x-small;">           (T) RANSVERSE (L) ONGITUDINAL            YIELD STRENGTH, (0.20 %) KSI (MPA)            TENSILE STRENGTH, KSI (MPA)            ELONGATION IN 2.00", %            REDUCTION OF AREA, %         </td> <td style="width:50%; text-align: center; font-size: x-small;">           L            83.0 ( 572)            97.5 ( 672)            36.0            77.0         </td> </tr> </table> GRAIN SIZE PER ASTM E112: 4 <div style="text-align: right; margin-top: 10px;">           Material Heat Code  <i>GFY</i>            MAY 09 2011            Certified by:    </div> <p style="font-size: x-small; margin-top: 10px;">           MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A.            MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE-            MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1,            SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009.            CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO            THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE            REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH            3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE            IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.         </p> <p style="text-align: center; margin-top: 10px;">           HEIDI L. SUNDAY            GROUPLDR - SPECIFICATIONS / CERTIFICATION            CARPENTER TECHNOLOGY CORPORATION  <i>Heidi L. Sunday</i> </p> <p style="font-size: x-small; margin-top: 10px;">           This certification is made to the customer printed on this form. Carpenter neither makes, nor assumes responsibility for, any representation or certification to other parties.            Die vorliegende Zertifizierung ist nur für den in diesem Formular genannten Kunden gültig. Carpenter übernimmt gegenüber Dritten keinerlei Haftung für die ausgewiesenen Daten oder Zertifizierungen.            Ce certificat est uniquement valable pour le client dont le nom est imprimé sur ce formulaire. Carpenter n'assume pas de responsabilité pour une certification vis-à-vis d'une tierce personne.         </p>				C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)	0.016	1.67	0.50	0.027	0.023	16.99	NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)			11.29	2.04	0.82	0.02			(T) RANSVERSE (L) ONGITUDINAL YIELD STRENGTH, (0.20 %) KSI (MPA) TENSILE STRENGTH, KSI (MPA) ELONGATION IN 2.00", % REDUCTION OF AREA, %	L 83.0 ( 572) 97.5 ( 672) 36.0 77.0
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### Certificate of Test

HEAT E101618 ORDER 621007/ 01 BOL 0211273 \* CERTIFICATION \* 03/24/11  
 SHIP TO:  
 YARDE METALS(VMI ORDERS)  
 75 AIRCRAFT RD  
 SOUTHRINGTON 064890000

*HC: CRG + GEE*

-----  
 C00921TS412 YOUR ORDER & DATE 3/24/11 CUST# 0975001 CUST TAG#  
 -----  
 ITEM DESCRIPTION  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L HEX CDA CONDA 1.0625 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 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 1937



WO 2017398 Bundles: 10  
 SPECIFICATIONS  
 MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648K, 5653F SAE AMS-QQ-S-763B  
 ASME SA182 E07, A07-09, E10 ASME SA193 E10  
 ASME SA479 E07, A07-09, E10 ASME A182 09  
 ASTM A262 Q2a Practice A/E ASTM A276 10  
 ASTM A479/A479M 10 ASTM A484 09  
 ASTM A320 08 B8M Class 1 ASTM A193 08 Gr B8M Class 1D  
 DFARS 252.225.7014 6/05 DFARS 225.7002-3(B)(1)  
 Federal Spec QQ-S-763F Eddy Current tested  
 NACE MR0175-03, mid-rad hard Prodec Quality  
 Sol Anneal @ 1900F min/WQ NACE MR0175-03, ISO 15156:03  
 EN 10204 Type 3.1 Document

Material Heat Code  
**GEE**  
 APR 15 2011

Certified by:

*[Signature]* **INSPECTION #5 SSP**

MECHANICAL & OTHER TESTS  
 Hardness as shipped (187 HB )  
 Hardness as shipped 89 HRB  
 Grain size 5.0 Tensile strength, KSI (MPa) 92.0 ( 634 )  
 Micro OK 0.2% Yield Strength, KSI (MPa) 64.5 ( 445 )  
 Intergranular corrosion OK  
 Elongation % in 4D 46.0  
 Reduction of area % 74.0

CHEMICAL COMPOSITION  
 Carbon (C) .021 Manganese (Mn) 1.720  
 Phosphorus (P) .033 Sulphur (S) .026  
 Silicon (Si) .384 Chromium (Cr) 16.700  
 Nickel (Ni) 10.080 Cobalt (Co) .192  
 Copper (Cu) .428 Moly (Mo) 2.040  
 Nitrogen (N) .079 Columbium (Cb) .016  
 Titanium (Ti) .002 Aluminum (Al) .006  
 Tin (Sn) .009 Boron (B) .003  
 Vanadium (V) .070  
 Columbium/ Tantalum (Cb-Ta) .016  
 Iron (Fe) Balance  
 Melt Practice EAF  
 Refining Practice AOD  
 De-long Ferrite

YARDE METALS, INC. CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 WILL TEST REPORT NOW ON FILE  
 RECEIVED AND INSPECTED  
 MAR 30 2011

By *Kathy Bell*  
 KATHY BELL, CERTIFICATION PROCESSOR

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 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*

Outokumpu Stainless Bar, Inc.  
 3043 Creechwa Ferry  
 Richburg SC 29729

YARDE METALS Inc 04-14-11

810413CV005-1 SSP FITTINGS CO PO: 127907 Part #: 26.00PC 1000.00LB

<b>CERTIFICATE OF TESTS</b> CERT SERIAL# 000747484 <b>CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592	<b>ABNAHMEPRUEFZEUGNIS</b>	<b>CERTIFICAT DE CONTROLE</b>																									
01/12/11 CUSTOMER / BESTELLER / CLIENT  SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG, OH 44087	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>DFARS</b> </div>	CARPENTER TECHNOLOGY CORP  101 W. BERN STREET READING, PA 19601																									
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126403 <i>HC: FPF &amp; FCC</i>	PHL444101 L23044	01/12/11	733.000																								
HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 740653 PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING ----- ASTM-A276-10 TYPE 316/316L ASTM-A479-10 TYPE 316/316L ASME-SA479 2007 EDITION, 2009B ADD TYPE 316/316L SIZE 0.562500 IN. ( 14.29 MM) HEX BAR PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS) <table style="width:100%; border-collapse: collapse; font-size: small;"> <tr> <td style="text-align: center;">C (COM)</td> <td style="text-align: center;">MN (XRF)</td> <td style="text-align: center;">SI (XRF)</td> <td style="text-align: center;">P (XRF)</td> <td style="text-align: center;">S (COM)</td> <td style="text-align: center;">CR (XRF)</td> </tr> <tr> <td style="text-align: center;">0.019</td> <td style="text-align: center;">1.59</td> <td style="text-align: center;">0.64</td> <td style="text-align: center;">0.026</td> <td style="text-align: center;">0.024</td> <td style="text-align: center;">16.78</td> </tr> <tr> <td style="text-align: center;">NI (XRF)</td> <td style="text-align: center;">MO (XRF)</td> <td style="text-align: center;">CU (XRF)</td> <td style="text-align: center;">N (FUS)</td> <td colspan="2"></td> </tr> <tr> <td style="text-align: center;">11.16</td> <td style="text-align: center;">2.05</td> <td style="text-align: center;">0.81</td> <td style="text-align: center;">0.02</td> <td colspan="2"></td> </tr> </table> INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK). HARDNESS AS SHIPPED, HRBW - 94 (MIDRADIUS)  YIELD STRENGTH, (0.20 %) KSI (MPA) 86.0 ( 593) TENSILE STRENGTH, KSI (MPA) 96.5 ( 665) ELONGATION IN 2.00", % 37.0 REDUCTION OF AREA, % 76.0  GRAIN SIZE PER ASTM E112: 4  MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIREMENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2007 TO THE REQUIREMENTS OF ISO 9001:2000 APPROVAL CERTIFICATE 07-0869 BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.				C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)	0.019	1.59	0.64	0.026	0.024	16.78	NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)			11.16	2.05	0.81	0.02		
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CERTIFICATE OF TESTS	ABNAHMEPRUEFZEUGNIS	CERTIFICAT DE CONTROLE	
CERT-SERIAL# 000760467 <b>CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592			
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <ul style="list-style-type: none"> <li>THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 47.</li> <li>THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE TRACED BY REFERENCE TO THE CARPENTER ORDER NUMBER.</li> <li>MATERIAL IS MANUFACTURED FREE FROM MERCURY, SADIUM, ALPHA AND GAMMA SOURCE CONTAMINATION.</li> <li>THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.</li> </ul> </div>			
05/16/11 CUSTOMER / BESTELLER / CLIENT	SELLER / VERKAUFER / VENDEUR PAGE 1 OF 1		
SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG, OH 44087	CARPENTER TECHNOLOGY CORP <div style="border: 2px solid black; padding: 5px; display: inline-block; margin: 5px;">DFARS</div> 101 W. BERN STREET READING, PA 19601		
CUSTOMER ORDER NO. / BESTELL-NR. / N° DE COMMANDE	CARPENTER NO. / WERKS-NR. / N° DE REFERENCE INTERNE	DATE / DATUM / DATE	WEIGHT / GEWICHT / POIDS
128355 <i>HC: GIC &amp; FCF</i>	PHL783701 L25553	05/16/11	1104.000
HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 741090			
PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN			
SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING			
----- ASTM-A276-10 TYPE 316/316L ASTM-A479-10A TYPE 316/316L ASME-SA479 2007 EDITION, 2009B ADD TYPE 316/316L			
SIZE 0.562500 IN. ( 14.29 MM) HEX BAR			
PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)			
C (COM) 0.017	MN (XRF) 1.64	SI (XRF) 0.63	P (XRF) 0.024
NI (XRF) 11.25	MO (XRF) 2.06	CU (XRF) 0.84	S (COM) 0.022
			CR (XRF) 16.76
INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK).			
HARDNESS AS SHIPPED, HRC - 25 (MIDRADIUS)			
YIELD STRENGTH, (0.20 %) KSI (MPA) 87.0 ( 600)			
TENSILE STRENGTH, KSI (MPA) 98.0 ( 676)			
ELONGATION IN 2.00", % 34.0			
REDUCTION OF AREA, % 74.0			
GRAIN SIZE PER ASTM E112: 4			
MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S. - MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE- MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.			
HEIDI L. SUNDAY GROUPLDR - SPECIFICATIONS / CERTIFICATION CARPENTER TECHNOLOGY CORPORATION <i>Heidi L. Sunday</i>			
Certified by: 			
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127942 <i>GET &amp; CRM</i>	PHL808801 L29735	05/25/11	1137.000																																												
HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 741485 PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING ----- ASTM-A276-10 TYPE 316/316L ASTM-A479-10A TYPE 316/316L ASME-SA479 2010 EDITION TYPE 316/316L SIZE 0.750000 IN. ( 19.05 MM) HEX BAR PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS) <table style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">C (COM)</td> <td style="text-align: center;">MN (XRF)</td> <td style="text-align: center;">SI (XRF)</td> <td style="text-align: center;">P (XRF)</td> <td style="text-align: center;">S (COM)</td> <td style="text-align: center;">CR (XRF)</td> </tr> <tr> <td style="text-align: center;">0.019</td> <td style="text-align: center;">1.62</td> <td style="text-align: center;">0.64</td> <td style="text-align: center;">0.026</td> <td style="text-align: center;">0.026</td> <td style="text-align: center;">16.81</td> </tr> <tr> <td style="text-align: center;">NI (XRF)</td> <td style="text-align: center;">MO (XRF)</td> <td style="text-align: center;">CU (XRF)</td> <td style="text-align: center;">N (FUS)</td> <td colspan="2"></td> </tr> <tr> <td style="text-align: center;">11.23</td> <td style="text-align: center;">2.04</td> <td style="text-align: center;">0.82</td> <td style="text-align: center;">0.02</td> <td colspan="2"></td> </tr> </table> INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK). HARDNESS AS SHIPPED, HRBW - 93 (MIDRADIUS) <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">(T) RANSVERSE (L) ONGITUDINAL</td> <td style="width:50%; text-align: right;">Material Heat Code</td> </tr> <tr> <td>YIELD STRENGTH, (0.20 %) KSI (MPA)</td> <td style="text-align: right;"><i>GET</i></td> </tr> <tr> <td>TENSILE STRENGTH, KSI (MPA)</td> <td style="text-align: right;">MAY 26 2011</td> </tr> <tr> <td>ELONGATION IN 2.00", %</td> <td></td> </tr> <tr> <td>REDUCTION OF AREA, %</td> <td></td> </tr> <tr> <td style="text-align: center;">L</td> <td></td> </tr> <tr> <td style="text-align: center;">81.0 ( 558)</td> <td></td> </tr> <tr> <td style="text-align: center;">96.5 ( 665)</td> <td></td> </tr> <tr> <td style="text-align: center;">37.0</td> <td></td> </tr> <tr> <td style="text-align: center;">76.0</td> <td></td> </tr> </table> GRAIN SIZE PER ASTM E112: 4 MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE- MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS. HEIDI L. SUNDAY GROUPLDR - SPECIFICATIONS/CERTIFICATION CARPENTER TECHNOLOGY CORPORATION <i>Heidi L. Sunday</i> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block; margin-top: 10px;">             INSP.              #5              SSP           </div>				C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)	0.019	1.62	0.64	0.026	0.026	16.81	NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)			11.23	2.04	0.82	0.02			(T) RANSVERSE (L) ONGITUDINAL	Material Heat Code	YIELD STRENGTH, (0.20 %) KSI (MPA)	<i>GET</i>	TENSILE STRENGTH, KSI (MPA)	MAY 26 2011	ELONGATION IN 2.00", %		REDUCTION OF AREA, %		L		81.0 ( 558)		96.5 ( 665)		37.0		76.0	
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# Acciaierie Valbruna S.p.A.



35100 VICENZA (Italia) - Viale della scienza, 25 s.l.  
 Sedi: 39100 BOLZANO (Italia) - Via A. Volta, 4  
 Clienti / Kunden / Customers:  
 VALBRUNA STAINLESS INC.  
 2400 TAYLOR STREET WEST  
 4801 FORT WAYNE, IN 4801-USA  
 Produzione: ACCIAIERIE VALBRUNA S.P.A.  
 Hersteller/Hersteller

Avviso di Spedizione: D-VII1000431  
 Lieferungsbescheinigung

Ordine nr: 20442 STOCK POMPTON  
 Bestell/Nr. über Kunden

Tipo di Elaborazione: E+ADD  
 Bearbeitungs/Herf. prozess/Herf. prozess

HC: EOH & CRL

## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

Certificato nr: ME57834655-2010/  
 Prüfzettelnr:

Conferma ordine nr: E110001151  
 Bestell/Nr. über Kund:

Marchio di Fabbrica:  
 Zeichen des Lieferanten  
 Mark der Fabrik

Funzione del Collaudatore:  
 Beruf des Werkstoffprüfingenieur  
 Beruf des Sachverständigen

Oggetto Provi: - Annealed Cold Drawn  
 Materialbeschreibung: - annealed/Prozess

### Specifiche

- Norme / Normen / Standards:  
 VSI 0 316/316L A,CF  
 AMS-QQ-S-763 B 316 s  
 ASME SA193 2007 B8M s  
 ASME SA479 2007 S31603 A s  
 ASTM A262 2002A PRACTICE B  
 ASTM A320 2008 B8M s  
 ASTM A479 2008 S31603 A  
 (1) Chemical analysis only  
 (2) Chemical analysis only  
 (3) SEC.I PT.A 2007 EDITION ADD. 2008a  
 (4) SEC.I PT.A 2007 EDITION ADD. 2008a  
 (5) SEC.I PT.A 2007 EDITION ADD. 2008a  
 (6) Chemical analysis only

- AMS 5648 K S31600 A  
 AMS-QQ-S-763 B 316L A,CF  
 ASME SA276 2007 S31603 A,CF s  
 ASTM A182 2008A S31603 s  
 ASTM A276 2008A S31603 A,CF  
 ASTM A370 2008A  
 MIL-S-882 B/1 316S16L

- AMS 5653 F S31603 A  
 ASME SA192 2007 S31603 (1)  
 ASME SA320 2007 B8M (4)  
 ASTM A193 2009 B8M (7)  
 ASTM A314 2008 S31603  
 ASTM A473 2001 S31603 (3)

- 1SEC.II PT.A 2007 EDITION ADD. 2008a  
 3SEC.II PT.A 2007 EDITION ADD. 2008a  
 3SEC.II PT.A 2007 EDITION ADD. 2008a  
 4Chemical analysis only  
 4Chemical analysis only  
 8Chemical analysis only

Qualità: 316/316L

Marcia: MYVPM, MAXVAL

Funzione: 316/316L

Pos. nr. No. in W. 10 2008	Copie Copies Copies	Dimensioni - in Abmessungen Dimensionen	Tolleranze Toleranzen Toleranzen	Lunghezza - in Länge Länge	Colata Guss Guss	Pezzi Stück Stück	Peso - LB Gewicht Gewicht	Lotto nr. Lose Lose
0130	Hexagon	0,5625	484-08	153 / 155	247858		2,346	900701310

Tutti i dati sono stati verificati alle condizioni richieste  
 (1) per qualità / alle Normen und in Abh. von  
 The data has been checked in accordance with the requirements  
 in material / die Normen und in Abh. von

Controllo antimescolamento: OK  
 Vermeidungsmischungsprüfung  
 Vermeidungsmischungsprüfung  
 Controllo antimescolamento: OK

Controllo valori e dimensioni: soddisfa le esigenze:  
 Abweichung und Abmessung: erfüllt die esigenze:  
 Check dimension and dimension: meets requirements  
 Controlle values and dimension: satisfies requirements

### TEST ALLO STATO DI FORNITURA

TEST	Proprietà meccanica Mechanical properties Mechanical properties	Forma Form	Resistenza Strength Strength	Resistenza Strength Strength	Resistenza Strength Strength	Resistenza Strength Strength	Resistenza Strength Strength	Resistenza Strength Strength	Durezza Hardness Hardness
Valori richiesti / Required values	min max		30 84	75 106	30 40	40 86		140 255	HR
A	12,5 68	L	84	106	40	86		250	
TEST	min		max						
A	Grain size for ASTM E112				5				

Mechanical properties according to ASTM A370.

### Analisi chimica

Colata / Guss	min- max	1,25 2,05	10,50 10,50	2,00 3,00	1,00 1,00	10,00 14,00	0,040 0,090	0,009 0,100		
	C %	Si %	Mn %	Cr %	Mo %	Cu %	Ni %	Co %	P %	S %
247858	0,012	0,47	1,52	16,93	2,02	0,53	10,12	0,090	0,029	0,030

Produced without class 1B Ozone depleting substances.  
 Solution heat treated free from continuous carbide network.  
 Annealing temperature: 1940°F for 2.5 hr water.

Vicenza, 12/02/10 UCDM Max. NCMH	il collaudatore di stabilimento / der Werkstoffprüfingenieur / Inspector / L'agent d'usine M. Rizzotto	Pagina - 1 di 2
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# Acciaierie Valbruna S.p.A.



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 2400 TAYLOR STREET WEST  
 46801 FORT WAYNE, IN 46801 USA

Produttore: ACCIAIERIE VALBRUNA S.P.A.  
 Hersteller / Fabricator

Coppola Prova: Annealed Cold Drawn  
 Ringversatz / Ringversatz

Micro and macro etch test: OK  
 Intergranular corrosion test per ASTM A262 pract. E: ok  
 Material is DFARS Compliant

Made and manufactured in Italy. No welding or weld repair. Material free from Mercury contamination.  
 We declare that the finished product is checked for radioactive contamination through Portal System when it leaves the production plant.  
 The Quality Management System is Certified acc. Pressure Equipment Directive (97/23/EC) Annex I, 4.3 by TÜV and LLOYD's

Articolo di Spedizione: D-VI10004131  
 Liefermenge / Delivery batch:

Ordine nr.: 25442 STOCK POMPTON  
 Bestell / Purchase Order / Comments:

Tipo di Elaborazione: E+AOD  
 Durchlaufverfahren / Working process / Mode of elaboration:

HC: EOH + CRL  
**CERTIFICATO DI COLLAUDO**  
**ABNAHMEPRUEFZEUGNIS**  
**INSPECTION CERTIFICATE**  
**CERTIFICAT DE RECEPTION**  
 EN 10204 (2005), 3.1

Certificato nr.: MEST034655/2010/  
 Prüfung / Test nr.:

Conferma ordine nr.: E310001151  
 Bestell / Order / Confirmation nr.:

Marchio di Fabbrica:  
 Zeichen des Lieferanten /  
 Trade mark  
 Sign of the manufacturer



Funzione del Collaudatore:  
 Name des Messen / Messer /  
 Funktion: 4. Dienst / Funktion des T. Mitarbeiter



HC: EOH  
**DFARS**

YARDE METALS, INC. CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 WILL TEST REPORT NOW ON FILE.  
 RECEIVED AND INSPECTED

APR 02 2010

BY *Kathy Bell*  
 KATHY BELL, CERTIFICATION PROCESSOR

*[Signature]*  
 INSP.  
 13  
 SSP  
 6/28/10

Vicenza, 12/02/10  
 110004  
 Inc. 10204  
 il collaudatore di stabilimento / der Werksachverständiger / Works Inspector / L'agent d'usine  
*M. Rizzotto*  
 Pagina - 2 di 2

<b>CERTIFICATE OF TESTS</b> CERT SERIAL# 000772804 <b>CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592	<b>ABNAHMEPRUEFZEUGNIS</b>	<b>CERTIFICAT DE CONTROLE</b>																												
07/11/11 CUSTOMER / BESTELLER / CLIENT  SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG , OH 44087	<div style="border: 2px solid black; padding: 5px; display: inline-block; font-weight: bold; font-size: 1.2em;">DFARS</div>	SELLER / VERKÄUFER / VENDEUR PAGE 1 OF 1  CARPENTER TECHNOLOGY CORP 101 W. BERN STREET READING , PA 19601																												
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129134	PHL911301 L29663	07/11/11	1006.000																											
HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: <span style="float: right;">741494</span> PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN ----- SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING ----- ASTM-A276-10 TYPE 316/316L ASTM-A479-10A TYPE 316/316L ASME-SA479 2010 EDITION TYPE 316/316L SIZE 0.562500 IN. ( 14.29 MM) HEX BAR PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS) <table style="width:100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="text-align: center;">C (COM)</td> <td style="text-align: center;">MN (XRF)</td> <td style="text-align: center;">SI (XRF)</td> <td style="text-align: center;">P (XRF)</td> <td style="text-align: center;">S (COM)</td> <td style="text-align: center;">CR (XRF)</td> </tr> <tr> <td style="text-align: center;">0.016</td> <td style="text-align: center;">1.67</td> <td style="text-align: center;">0.50</td> <td style="text-align: center;">0.027</td> <td style="text-align: center;">0.023</td> <td style="text-align: center;">16.99</td> </tr> <tr> <td style="text-align: center;">NI (XRF)</td> <td style="text-align: center;">MO (XRF)</td> <td style="text-align: center;">CU (XRF)</td> <td style="text-align: center;">N (FUS)</td> <td colspan="2"></td> </tr> <tr> <td style="text-align: center;">11.29</td> <td style="text-align: center;">2.04</td> <td style="text-align: center;">0.82</td> <td style="text-align: center;">0.02</td> <td colspan="2"></td> </tr> </table> INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK). HARDNESS AS SHIPPED, HRBW - <span style="margin-left: 100px;">94</span> <span style="float: right;">(MIDRADIUS)</span>  <table style="width:100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width:50%; font-size: 0.8em;">           (T) RANSVERSE (L) ONGITUDINAL            YIELD STRENGTH, (0.20 %) KSI (MPA)            TENSILE STRENGTH, KSI (MPA)            ELONGATION IN 2.00", %            REDUCTION OF AREA, %         </td> <td style="width:50%; font-size: 0.8em; text-align: center;">           L            84.5 ( 583)            96.0 ( 662)            37.0            73.0         </td> <td style="width:50%; text-align: right; vertical-align: top; font-size: 0.8em;">           Material Heat Code  <b>GPC</b>  <b>JUL 12 2011</b> </td> </tr> </table> GRAIN SIZE PER ASTM E112: 4  <div style="font-size: 0.8em;">           MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A.            MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE-            MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1,            SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009.            CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO            THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE            REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH            3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE            IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.         </div> <div style="text-align: right; margin-top: 10px;">           HEIDI L. SUNDAY            GROUPLDR - SPECIFICATIONS / CERTIFICATION            CARPENTER TECHNOLOGY CORPORATION  </div> <div style="text-align: right; margin-top: 10px;">           Certified by:  </div>				C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)	0.016	1.67	0.50	0.027	0.023	16.99	NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)			11.29	2.04	0.82	0.02			(T) RANSVERSE (L) ONGITUDINAL YIELD STRENGTH, (0.20 %) KSI (MPA) TENSILE STRENGTH, KSI (MPA) ELONGATION IN 2.00", % REDUCTION OF AREA, %	L 84.5 ( 583) 96.0 ( 662) 37.0 73.0	Material Heat Code <b>GPC</b> <b>JUL 12 2011</b>
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CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS																																		
129134	PHL911301 L29663	07/11/11	1006.000																																		
HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 741494 PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING ----- ASTM-A276-10 TYPE 316/316L ASTM-A479-10A TYPE 316/316L ASME-SA479 2010 EDITION TYPE 316/316L SIZE 0.562500 IN. ( 14.29 MM) HEX BAR PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS) <table style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">C (COM)</td> <td style="text-align: center;">MN (XRF)</td> <td style="text-align: center;">SI (XRF)</td> <td style="text-align: center;">P (XRF)</td> <td style="text-align: center;">S (COM)</td> <td style="text-align: center;">CR (XRF)</td> </tr> <tr> <td style="text-align: center;">0.016</td> <td style="text-align: center;">1.67</td> <td style="text-align: center;">0.50</td> <td style="text-align: center;">0.027</td> <td style="text-align: center;">0.023</td> <td style="text-align: center;">16.99</td> </tr> <tr> <td style="text-align: center;">NI (XRF)</td> <td style="text-align: center;">MO (XRF)</td> <td style="text-align: center;">CU (XRF)</td> <td style="text-align: center;">N (FUS)</td> <td colspan="2"></td> </tr> <tr> <td style="text-align: center;">11.29</td> <td style="text-align: center;">2.04</td> <td style="text-align: center;">0.82</td> <td style="text-align: center;">0.02</td> <td colspan="2"></td> </tr> </table> INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK). HARDNESS AS SHIPPED, HRBW - 94 (MIDRADIUS)  <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">(T)RANSVERSE (L)ONGITUDINAL</td> <td style="width:50%; text-align: right;">Material Heat Code</td> </tr> <tr> <td>YIELD STRENGTH, (0.20 %) KSI (MPA)</td> <td style="text-align: right;">GPC</td> </tr> <tr> <td>TENSILE STRENGTH, KSI (MPA)</td> <td style="text-align: right;">JUL 12 2011</td> </tr> <tr> <td>ELONGATION IN 2.00", %</td> <td></td> </tr> <tr> <td>REDUCTION OF AREA, %</td> <td></td> </tr> </table> GRAIN SIZE PER ASTM E112: 4  MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE- MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.878.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.  <div style="text-align: right;"> <b>HEIDI L. SUNDAY</b>          GROUPLDR - SPECIFICATIONS/CERTIFICATION          CARPENTER TECHNOLOGY CORPORATION  </div> <div style="text-align: right; margin-top: 10px;">         Certified by:  </div>				C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)	0.016	1.67	0.50	0.027	0.023	16.99	NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)			11.29	2.04	0.82	0.02			(T)RANSVERSE (L)ONGITUDINAL	Material Heat Code	YIELD STRENGTH, (0.20 %) KSI (MPA)	GPC	TENSILE STRENGTH, KSI (MPA)	JUL 12 2011	ELONGATION IN 2.00", %		REDUCTION OF AREA, %	
C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)																																
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TENSILE STRENGTH, KSI (MPA)	JUL 12 2011																																				
ELONGATION IN 2.00", %																																					
REDUCTION OF AREA, %																																					
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CERTIFICATE OF TESTS ABNAHMEPRUEFZEUGNIS CERTIFICAT DE CONTROLE

CERT SERIAL# 000774404



**CARPENTER**

Carpenter Technology Corporation  
 101 West Bern Street, Reading, Pa. 19601  
 Tel: (610) 208-2000 (800) 338-4592

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06/14/11  
 CUSTOMER / BESTELLER / CLIENT

SELLER / VERKÄUFER / VENDEUR PAGE 1 OF 1

SSP FITTINGS CORP  
 ATTN: JOE MERCER  
 8250 BOYLE PARKWAY  
 TWINSBURG , OH 44087



CARPENTER TECHNOLOGY CORP

101 W. BERN STREET  
 READING , PA 19601

CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS
128746 <i>GLN / FDQ</i>	PHL853001 L29455	06/14/11	1364.000

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 741597

PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN

SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING  
 -----  
 ASTM-A276-10 TYPE 316/316L  
 ASTM-A479-10A TYPE 316/316L  
 ASME-SA479 2010 EDITION TYPE 316/316L

SIZE 0.875000 IN. ( 22.23 MM) HEX BAR

PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)

C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)
0.018	1.62	0.63	0.025	0.025	16.65
NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)		
11.16	2.06	0.83	0.02		

INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE.  
 SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN  
 BOUNDARY CARBIDE PRECIPITATION (NETWORK).

HARDNESS AS SHIPPED, HRC - 22 ~~(MIDRADIUS)~~

(T) RANSVERSE (L) ONGITUDINAL	L	
YIELD STRENGTH, (0.20 %) KSI (MPA)	81.0 ( 558)	
TENSILE STRENGTH, KSI (MPA)	102.0 ( 703)	
ELONGATION IN 2.00", %	32.0	
REDUCTION OF AREA, %	74.0	

Material Heat Code  
*GLN*  
 JUN 15 2011

GRAIN SIZE PER ASTM E112: 5

Certified by: *[Signature]*

MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A.  
 MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE-  
 MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1,  
 SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009.  
 CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO  
 THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE  
 REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH  
 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE  
 IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.

HEIDI L. SUNDAY  
 GROUPLDR - SPECIFICATIONS / CERTIFICATION  
 CARPENTER TECHNOLOGY CORPORATION  
*Heidi L. Sunday*

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<b>CERTIFICATE OF TESTS</b>	<b>ABNAHMEPRUEFZEUGNIS</b>	<b>CERTIFICAT DE CONTROLE</b>	
CERT SERIAL# 000774404			
<b>CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592			
<div style="border: 1px solid black; padding: 5px; font-size: small;"> <ul style="list-style-type: none"> <li>• THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 47.</li> <li>• THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE TRACED BY REFERENCE TO THE CARPENTER ORDER NUMBER.</li> <li>• MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA AND GAMMA SOURCE CONTAMINATION.</li> <li>• THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.</li> </ul> </div>			
06/14/11 CUSTOMER / BESTELLER / CLIENT	SELLER / VERKÄUFER / VENDEUR PAGE 1 OF 1		
SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG, OH 44087	DFARS	CARPENTER TECHNOLOGY CORP  101 W. BERN STREET READING, PA 19601	
CUSTOMER ORDER NO. / BESTELL-NR. / N° DE COMMANDE	CARPENTER NO. / WERKS-NR. / N° DE REFERENCE INTERNE	DATE / DATUM / DATE	WEIGHT / GEWICHT / POIDS
128746 <i>GLN / GDF</i>	PHL853001 L29455	06/14/11	1364.000
HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 741597			
PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN			
SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING			
----- ASTM-A276-10 TYPE 316/316L ASTM-A479-10A TYPE 316/316L ASME-SA479 2010 EDITION TYPE 316/316L			
SIZE 0.875000 IN. ( 22.23 MM) HEX BAR			
PRIMARY HEAT CHEMISTRY (WT%) : (TEST METHOD IS SHOWN IN PARENTHESIS)			
C (COM) 0.018	MN (XRF) 1.62	SI (XRF) 0.63	P (XRF) 0.025
NI (XRF) 11.16	MO (XRF) 2.06	CU (XRF) 0.83	S (COM) 0.025
			CR (XRF) 16.65
INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK).			
HARDNESS AS SHIPPED, HRC - 22 <span style="float: right;">(MIDRADIUS)</span>			
(T) RANSVERSE (L) ONGITUDINAL YIELD STRENGTH, (0.20 %) KSI (MPA) 81.0 ( 558) TENSILE STRENGTH, KSI (MPA) 102.0 ( 703) ELONGATION IN 2.00", % 32.0 REDUCTION OF AREA, % 74.0			Material Heat Code <i>GLN</i> JUN 15 2011
GRAIN SIZE PER ASTM E112: 5			
MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE- MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.			
HEIDI L. SUNDAY GROUPLDR - SPECIFICATIONS / CERTIFICATION CARPENTER TECHNOLOGY CORPORATION <i>Heidi L. Sunday</i>			
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CERTIFICATE OF TESTS ABNAHMEPRUEFZEUGNIS CERTIFICAT DE CONTROLE

CERT SERIAL# 000766249



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04/25/11  
 CUSTOMER / BESTELLER / CLIENT

SELLER / VERKÄUFER / VENDEUR PAGE 1 OF 1

SSP FITTINGS CORP  
 ATTN: JOE MERCER  
 8250 BOYLE PARKWAY  
 TWINSBURG, OH 44087



CARPENTER TECHNOLOGY CORP

101 W. BERN STREET  
 READING, PA 19601

CUSTOMER ORDER NO. / BESTELL-NR. / N° DE COMMANDE	CARPENTER NO. / WERKS-NR. / N° DE REFERENCE INTERNE	DATE / DATUM / DATE	WEIGHT / GEWICHT / POIDS
127943 <i>FCM / GEK</i>	PHL733301 L28620	04/25/11	1767.000

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 741183

PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN

SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING  
 ASTM-A276-10 TYPE 316/316L  
 ASTM-A479-10A TYPE 316/316L  
 ASME-SA479 2010 EDITION TYPE 316/316L

SIZE 0.875000 IN. ( 22.23 MM) HEX BAR

PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)

C (COM) 0.015	MN (XRF) 1.61	SI (XRF) 0.57	P (XRF) 0.020	S (COM) 0.028	CR (XRF) 16.77
NI (XRF) 11.18	MO (XRF) 2.05	CU (XRF) 0.89	N (FUS) 0.02		

INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE.  
 SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN  
 BOUNDARY CARBIDE PRECIPITATION (NETWORK).

HARDNESS AS SHIPPED, HRC - 20

(T) RANSVERSE YIELD STRENGTH, (0.20 %) KSI (MPA)	83.5 ( 576)
(L) LONGITUDINAL TENSILE STRENGTH, KSI (MPA)	98.0 ( 676)
ELONGATION IN 2.00", %	36.0
REDUCTION OF AREA, %	76.0

Material Heat Code

*GEK*  
 APR 26 2011

Certified by:

*[Signature]*

MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIREMENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.

HEIDI L. SUNDAY  
 GROUPLDR - SPECIFICATIONS / CERTIFICATION  
 CARPENTER TECHNOLOGY CORPORATION

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**Certificate of Test**

\*\*\*\*\*  
 \* CERTIFICATION \*  
 \*\*\*\*\*

HEAT E81428 ORDER 506731/ 17 BOL 0201954 BUNDLE W035788/1A 04/06/09

SHIP TO:  
 YARDE METALS  
 45 NEWELL STREET  
 SOUTHLINGTON 064890000

*HIC: DID/BRZ*



----- YOUR ORDER & DATE -----  
 P81029AM00 4/06/09 CUST# 0975001 CUST TAG#

----- ITEM DESCRIPTION -----  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L HEX CDA CONDA .8750 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 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 Bundle Weight 2196

----- SPECIFICATIONS -----  
 MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM.  
 AMS 5648K, 5653F SAE AMS-QQ-S-763B  
 ASME SA182 E07 ASME SA193 E07  
 ASME SA479 E07, A07 & A08 ASTM A182 07A  
 ASTM A262 02A PRACTICE A/E ASTM A276 08  
 ASTM A479/A479M 06A ASTM A484 06B  
 ASTM A320 04 B8M CLASS 1 ASTM A193 07 B8M CLASS 1  
 DFARS 252.225.7014 6/05 DFARS 225.7002-3(B)(1)  
 FEDERAL SPEC. QQ-S-763F EDDY CURRENT TESTED  
 UNS S31603, AISI 316L  
 AS SHIPPED HARDNESS AND TENSILE IS CONDITION A PAGE 1 OF 22

----- MECHANICAL & OTHER TESTS -----  
 Hardness as shipped (197 HB )  
 Hardness as shipped 91 HRB  
 Hardness as tested 00 HRC  
 Tensile strength, KSI (MPa) 91.0 ( 627)  
 0.2% Yield Strength, KSI (MPa) 73.0 ( 503)  
 Grain size 5.0  
 Micro OK  
 Intergranular corrosion OK  
 Macro OK  
 Elongation % in 4D 43.0  
 Reduction of area % 75.0

----- CHEMICAL COMPOSITION -----  
 Carbon (C) .024 Manganese (Mn) 1.540  
 Phosphorus (P) .031 Sulphur (S) .023  
 Silicon (Si) .404 Chromium (Cr) 17.230  
 Nickel (Ni) 10.500 Cobalt (Co) .224  
 Copper (Cu) .421 Moly (Mo) 2.040  
 Nitrogen (N) .052 Columbium (Cb) .019  
 Titanium (Ti) .002 Aluminum (Al) .005  
 Tin (Sn) .012 Tantalum (Ta) .003  
 Vanadium (V) .070  
 Columbium/ Tantalum (Cb+Ta) .022  
 Iron (Fe) Balance  
 Melt Practice EAP  
 Refining Practice AOD  
 De-long Ferrite

YARDE METALS, INC. CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 MILL TEST REPORT NOW ON FILE.  
 RECEIVED AND INSPECTED

APR 07 2009

BY *Melissa Gagnier*  
 MELISSA GAGNIER CERTIFICATION PROCESSOR

*JW*  
  
 10/07/09  
*M.F. Marcanio*

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.

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

M.F. Marcanio, Quality Manager

----- YARDE METALS Inc 10-05-09 -----  
 S91005CV020-1 SSP FITTINGS CO PO: 120426 Part #:  
 21.00PC 575.00LB

**CERTIFICATE OF TESTS**      **ABNAHMEPRUEFZEUGNIS**      **CERTIFICAT DE CONTROLE**

CERT SERIAL# 000748449



**CARPENTER**

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01/31/11  
 CUSTOMER / BESTELLER / CLIENT

SELLER / VERKÄUFER / VENDEUR PAGE 1 OF 1

SSP FITTINGS CORP  
 ATTN: JOE MERCER  
 8250 BOYLE PARKWAY  
 TWINSBURG, OH 44087



CARPENTER TECHNOLOGY CORP

101 W. BERN STREET  
 READING, PA 19601

CUSTOMER ORDER NO./BESTELL.-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS
126688 <i>FCA / FSL</i>	PHL495101 L39395	01/31/11	1288.000

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE:      740653

PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN

SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING  
 -----  
 ASTM-A276-10 TYPE 316/316L  
 ASTM-A479-09 TYPE 316/316L  
 ASME-SA479 2007 EDITION, 2009B ADD TYPE 316/316L

SIZE      0.562500 IN. ( 14.29 MM) HEX BAR

PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)

C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)
0.019	1.59	0.64	0.026	0.024	16.78
NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)		
11.16	2.05	0.81	0.02		

INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE.  
 SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN  
 BOUNDARY CARBIDE PRECIPITATION (NETWORK).

HARDNESS AS SHIPPED, HRBW      -      97      (MIDRADIUS)

YIELD STRENGTH, (0.20 %) KSI (MPA)      85.0 ( 586)  
 TENSILE STRENGTH, KSI (MPA)      97.5 ( 672)  
 ELONGATION IN 2.00", %      35.0  
 REDUCTION OF AREA, %      75.0

GRAIN SIZE PER ASTM E112:      5

Material Heat Code  
**FSL**  
 FEB 03 2011

Certified by:

MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIREMENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009. CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2007 TO THE REQUIREMENTS OF ISO 9001:2000 APPROVAL CERTIFICATE 07-0869 BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.

HEIDI L. SUNDAY  
 GROUPLDR - SPECIFICATIONS/CERTIFICATION  
 CARPENTER TECHNOLOGY CORPORATION  
*Heidi L. Sunday*

This certification is made to the customer printed on this form. Carpenter neither makes, nor assumes responsibility for, any representation or certification to other parties.  
 Die vorliegende Zertifizierung ist nur für den in diesem Formular genannten Kunden gültig. Carpenter übernimmt gegenüber Dritten keinerlei Haftung für die ausgewiesenen Daten oder Zertifizierungen.  
 Ce certificat est uniquement valable pour le client dont le nom est imprimé sur ce formulaire. Carpenter n'assume pas de responsabilité pour une certification vis-à-vis d'une tierce personne.

<p><b>CERTIFICATE OF TESTS</b>                  CERT SERIAL# 000744291</p> <p> <b>CARPENTER</b>                  Carpenter Technology Corporation                  101 West Bern Street, Reading, Pa. 19601                  Tel: (610) 208-2000 (800) 338-4592</p> <p>11/18/10                  CUSTOMER / BESTELLER / CLIENT</p> <p>SSP FITTINGS CORP                  ATTN: JOE MERCER                  8250 BOYLE PARKWAY                  TWINSBURG, OH 44087</p>	<p><b>ABNAHMEPRUEFZEUGNIS</b></p>	<p><b>CERTIFICAT DE CONTROLE</b></p>																									
<p><b>DFARS</b></p>																											
<p>SELLER / VERKÄUFER / VENDEUR PAGE 1 OF 1</p> <p>CARPENTER TECHNOLOGY CORP                  101 W. BERN STREET                  READING, PA 19601</p>																											
CUSTOMER ORDER NO. / BESTELL-NR. / N° DE COMMANDE	CARPENTER NO. / WERKS-NR. / N° DE REFERENCE INTERNE	DATE / DATUM / DATE	WEIGHT / GEWICHT / POIDS																								
125711 H/C: FIE / DSC	PHL337501 L39393	11/18/10	1000.000																								
<p>HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 740533</p> <p>PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN</p> <p>SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING                  ASTM-A276-10 TYPE 316/316L                  ASTM-A479-09 TYPE 316/316L                  ASME-SA479 2007 EDITION, 2009B ADD TYPE 316/316L</p> <p>SIZE 0.562500 IN. ( 14.29 MM) HEX BAR</p> <p>PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)</p> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">C (COM)</td> <td style="text-align: center;">MN (XRF)</td> <td style="text-align: center;">SI (XRF)</td> <td style="text-align: center;">P (XRF)</td> <td style="text-align: center;">S (COM)</td> <td style="text-align: center;">CR (XRF)</td> </tr> <tr> <td style="text-align: center;">0.019</td> <td style="text-align: center;">1.73</td> <td style="text-align: center;">0.53</td> <td style="text-align: center;">0.023</td> <td style="text-align: center;">0.028</td> <td style="text-align: center;">16.98</td> </tr> <tr> <td style="text-align: center;">NI (XRF)</td> <td style="text-align: center;">MO (XRF)</td> <td style="text-align: center;">CU (XRF)</td> <td style="text-align: center;">N (FUS)</td> <td colspan="2"></td> </tr> <tr> <td style="text-align: center;">11.15</td> <td style="text-align: center;">2.05</td> <td style="text-align: center;">0.80</td> <td style="text-align: center;">0.02</td> <td colspan="2"></td> </tr> </table> <p>INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE.                  SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN                  BOUNDARY CARBIDE PRECIPITATION (NETWORK).</p> <p>HARDNESS AS SHIPPED, HRBW - 94 (MIDRADIUS)</p> <p>YIELD STRENGTH, (0.20 %) KSI (MPA) 86.5 ( 596)                  TENSILE STRENGTH, KSI (MPA) 98.5 ( 679)                  ELONGATION IN 2.00", % 35.0                  REDUCTION OF AREA, % 74.0</p> <p>GRAIN SIZE PER ASTM E112: 5</p> <p>MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A.                  MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE-                  MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1,                  SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009.                  CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2007 TO                  THE REQUIREMENTS OF ISO 9001:2000 APPROVAL CERTIFICATE 07-0869 BY PERFORMANCE                  REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH                  3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE                  IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.</p>				C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)	0.019	1.73	0.53	0.023	0.028	16.98	NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)			11.15	2.05	0.80	0.02		
C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)																						
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<p></p>		<p>HEIDI L. SUNDAY                  GROUPLDR - SPECIFICATIONS / CERTIFICATION                  CARPENTER TECHNOLOGY CORPORATION  </p>																									
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4- 81



Certificate of Test

\*\*\*\*\*  
 \* CERTIFICATION \*  
 \*\*\*\*\*

HEAT E90237 ORDER 603536/ 01 BOL 0202880 BUNDLE 2003857/1E 06/24/09

SHIP TO:  
 YARDE METALS  
 45 NEWELL STREET  
 SOUTHWINGTON 064890000

H/C: XL **DFARS**

----- YOUR ORDER & DATE -----  
 P90410D0442 6/24/09 CUST# 0975001 CUST TAG#

----- ITEM DESCRIPTION -----  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L RND CFA CONDA 1.1875 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 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 Bundle Weight 2272

----- SPECIFICATIONS -----  
 MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648K, 5653F SAE AMS-QQ-S-763B  
 ASME SA182 E07 ASME SA193 E07  
 ASME SA479 E07, A07 & A08 ASME SA320 B8M CL1 E04 A05  
 ASTM A182 08A ASTM A262 98 PRACTICE E  
 ASTM A276 08A ASTM A314 97  
 ASTM A479/A479M 08 ASTM A484 08  
 ASTM E112 96 ASTM A320 08 B8M CLASS 1  
 ASTM A193 08B B8M DIN 50049/EN 10204 3.1B  
 DFARS 252.225.7014 6/05 DFARS 225.7002-3(B)(1)  
 FEDERAL SPEC. QQ-S-763F NACE MR0175-03, MID-RAD HARD  
 PRODEC QUALITY UNS S31603, AISI 316L

----- MECHANICAL & OTHER TESTS -----  
 Hardness as shipped 156 HB  
 Hardness as shipped ( 81 HRB )  
 Grain size 6.0 Tensile strength, KSI (MPa) 89.6 ( 618 )  
 Micro OK 0.2% Yield Strngth, KSI (MPa) 39.0 ( 269 )  
 Intergranular corrosion OK  
 Macro OK Elongation % in 4D 50.0  
 Reduction of area % 74.7

----- CHEMICAL COMPOSITION -----  
 Carbon (C) .019 Manganese (Mn) 1.710  
 Phosphorus (P) .030 Sulphur (S) .026  
 Silicon (Si) .473 Chromium (Cr) 16.460  
 Nickel (Ni) 10.050 Cobalt (Co) .259  
 Copper (Cu) .373 Moly (Mo) 2.010  
 Nitrogen (N) .059 Columbium (Cb) .030  
 Titanium (Ti) .001 Aluminum (Al) .004  
 Tin (Sn) .010 Boron (B) .001  
 Tantalum (Ta) .003 Vanadium (V) .060  
 Columbium/ Tantalum (Cb+Ta) .033  
 Iron (Fe) Balance  
 Melt Practice EAF  
 Refining-Practice AOD  
 De-long Ferrite

YARDE METALS, INC CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 MILL TEST REPORT NOW ON FILE.  
 RECEIVED AND INSPECTED

JUN 25 2009

By *Kathy Bell*  
 KATHY BELL, CERTIFICATION PROCESSOR

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.

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

M.F. Marcanio, Quality Manager

*JM*  
 INSP  
 #5  
 SSP  
 7/29/09  
*M.F. Marcanio*

YARDE METALS Inc 07-27-09

S90727GK022-2 SSP FITTINGS CO PO: 119757 Part #: 29.00PC 1372.00LB



### Certificate of Test

HEAT E110466 ORDER 620750/ 03 BOL 0212218 \* CERTIFICATION \* 05/27/11

SHIP TO:  
 YARDE METALS  
 45 NEWELL STREET  
 SOUTHTINGTON 064890000

----- YOUR ORDER & DATE -----  
 P10210HB002 5/27/11 CUST# 0975001 CUST TAG#

----- ITEM DESCRIPTION -----  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L RND CPA CONDA 1.3750 x 141.000-156.00  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 NAFTA Country of Origin is Country of Me.

No weld repair  
 Free of mercury contamination, Free of radiation contamination  
 No WEEE relevant substances; Meets EU electrical ROHS

Total Bundles 2 Total Weight 3436

WO 2021831 Bundles: 1A, 1B

----- SPECIFICATIONS -----  
 MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648K, 5653F SAE AMS-QQ-S-763B  
 ASME SA182 E07, A07-09, E10 ASME SA193 E10  
 ASME SA479 E07, A07-09, E10 ASME SA320 B8M CL1 E10  
 ASTM A182 10a ASTM A262 98 Practice E  
 ASTM A276 10 ASTM A314 97  
 ASTM A479/A479M 10a ASTM A484 11  
 ASTM E112 95 ASTM A320 10a B8M Class 1  
 ASTM A193 10a B8M DIN 50049/EN 10204 3.1B  
 DFARS 252.225.7014 6/05 DFARS 225.7002-3(B)(1)  
 Federal Spec QQ-S-763F NACE MR0175-03, mid-rad hard  
 Prodec Quality EN 10204 Type 3.1 Document  
 NACE MR0175-03, ISO 15156:03 Process Annealed 1900Fmin/WQ

YARDE METALS, INC CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 WITH ALL SIGNATURES AND STAMPS INSPECTED  
 JUN 02 2011  
 ELISSA GAGNER CERTIFICATION PROCESSOR



Material Heat Code  
 V3  
 JUN 16 2011

Certified by:  
  
 INSP. #5 SSP

----- MECHANICAL & OTHER TESTS -----  
 Hardness as shipped 167 HB  
 Hardness as shipped ( 84 HRB )  
 Grain size 8.0  
 Micro OK  
 Intergranular corrosion OK  
 Tensile strength, KSI (MPa) 92.7 ( 6390 )  
 0.2% Yield Strength, KSI (MPa) 41.6 ( 287 )  
 Elongation % in 4D 57.0  
 Reduction of area % 79.0  
 Charpy (ft lb) 0 0 0 Avg 99

----- CHEMICAL COMPOSITION -----  
 Carbon (C) .017 Manganese (Mn) 1.780  
 Phosphorus (P) .031 Sulphur (S) .028  
 Silicon (Si) .374 Chromium (Cr) 17.070  
 Nickel (Ni) 10.120 Cobalt (Co) .206  
 Copper (Cu) .333 Moly (Mo) 2.030  
 Nitrogen (N) .075 Columbium (Cb) .011  
 Titanium (Ti) .003 Aluminum (Al) .004  
 Tin (Sn) .006 Boron (B) .003  
 Vanadium (V) .040 .000  
 Columbium/  
 Tantalum (Cb+Ta) .011  
 Iron (Fe) Balance  
 Melt Practice EAF  
 Refining Practice AOD  
 De-long Ferrite

Knowingly & willfully falsifying or concealing a material act on this form,  
 or making false, fictitious or fraudulent statements or representations  
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Outokumpu Stainless Bar, Inc.  
 3043 Crenshaw Pkwy.  
 Richburg, SC 29729

M.F. Marcanio, Quality Manager

*M.F. Marcanio*

YARDE METALS Inc 06-14-11

S10614CV022-1 SSP FITTINGS CO PO: 128825 Part #:  
 34.00PC 2048.00LB

SCHMOLZ+BICKENBACH  
 Providing special steel solutions



CERTIFICATE OF TEST  
 EN 10204/3.1

UGITECH  
 Providing special steel solutions



Cert# 1016076701	Mill Order# 002129414/1/0
Cert Date 7/20/10	Date Rec'd 7/20/10

Schmolz+Bickenbach USA, Inc.  
 1609 East Wilson  
 Batavia, IL 60510

----- Product Description -----  
 AISI 316/316L Ugima XL Round SMQ J9  
 Bright drawn, Solution annealed  
 EN 10088-3/ 1.4404  
 UNS S31600/S31603  
 PO 400256

HIC: E8

DFARS

----- Customer Information -----  
 SSP FITTINGS PO# 0126152 Order# 181223-1  
 Tag#: 1346604

	Size	Qty	Wt (Lbs)
Original	0.8125 x 144.0000	7	12533.00
Delivered	0.8125 x 144.0000	83	1969.00

Heat# 020036

----- Chemical Analysis (Wt%) -----

C	SI	MN	P	S	N	CR	CU	MO	NI
0.021	0.440	1.300	0.033	0.029	0.041	16.580	0.500	2.040	10.13

----- Steel Making Process -----

----- Mechanical Properties -----

Tensile	.02% Yield	Elong	Reduct of	Hardness
RM KSI	RP KSI	% 4D	Area %Z	HB
ACTUAL 106	88	34	58	223

----- Specifications & Remarks -----  
 Eddy current tested  
 Macroetch test acceptable.  
 ASTM A262 Practice A&E acceptable  
 ASTM average grain size 5/8  
 Ni+2Mo = 14.21

B316LA Rev.12  
 ASTM A484/A484M-09/ ASTM A182M-09a/ ASTM A276-08a  
 ASTM A314-08/ ASTM A479/A479M-09/ ASTM A370-09  
 ASME SA182 2007 Sec.II & 04 Addenda  
 ASME SA479 Ed.2007 & Addenda  
 AMS 5648K/ AMS 5653F/ QQ-S-763F/ AMS QQ-S-763A

Free from continuous carbide network.  
 Free from mercury contamination at time of shipment.  
 Free from radioactive contamination at time of shipment.  
 Free from welds or weld repairs.  
 Material according to ROHS+EURO NORME 2002/95 EC.

Technical Department

*Joyce Holtz*

SCHMOLZ + BICKENBACH  
Providing special steel solutions



CERTIFICATE OF TEST  
EN-10204/3.1

UGITECH  
Providing special steel solutions



Cert#	Mill Order#
1016076701	002129414/1/0
Cert Date	Date Rec'd
7/20/10	7/20/10

Schmolz+Bickenbach USA, Inc.  
1609 East Wilson  
Batavia, IL 60510

----- Specifications & Remarks -----  
Material manufactured in the Reach Regulation Respect.

MELTED/HR: UGITECH SA, FRANCE  
MANUFACTURED: UGITECH, ITALY

Compliant per DFARS 252.225-7009(JUL 2009)

*H/Ch ES*

**DFARS**



TM/F032 Rev 1 10/01/05

Technical Department

*Jayce Holtz*

<b>CERTIFICATE OF TESTS</b> CERT SERIAL# 000770112 <b>CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592  05/06/11 CUSTOMER / BESTELLER / CLIENT  SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG , OH 44087	<b>ABNAHMEPRUEFZEUGNIS</b>  <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <b>DFARS</b> </div> CARPENTER TECHNOLOGY CORP  101 W. BERN STREET READING , PA 19601	<b>CERTIFICAT DE CONTROLE</b>  SELIER / VERKÄUFER / VENDEUR PAGE 1 OF 1																																			
CUSTOMER ORDER NO. / BESTELL-NR. / N° DE COMMANDE	CARPENTER NO. / WERKS-NR. / N° DE REFERENCE INTERNE	DATE / DATUM / DATE	WEIGHT / GEWICHT / POIDS																																		
128146 <i>GDB / GFY</i>	PHL764401 L28621	05/06/11	1335.000																																		
HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 741494 PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING ----- ASTM-A276-10 TYPE 316/316L ASTM-A479-10A TYPE 316/316L ASME-SA479 2010 EDITION TYPE 316/316L SIZE 0.875000 IN. ( 22.23 MM) HEX BAR PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS) <table style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">C (COM)</td> <td style="text-align: center;">MN (XRF)</td> <td style="text-align: center;">SI (XRF)</td> <td style="text-align: center;">P (XRF)</td> <td style="text-align: center;">S (COM)</td> <td style="text-align: center;">CR (XRF)</td> </tr> <tr> <td style="text-align: center;">0.016</td> <td style="text-align: center;">1.67</td> <td style="text-align: center;">0.50</td> <td style="text-align: center;">0.027</td> <td style="text-align: center;">0.023</td> <td style="text-align: center;">16.99</td> </tr> <tr> <td style="text-align: center;">NI (XRF)</td> <td style="text-align: center;">MO (XRF)</td> <td style="text-align: center;">CU (XRF)</td> <td style="text-align: center;">N (FUS)</td> <td colspan="2"></td> </tr> <tr> <td style="text-align: center;">11.29</td> <td style="text-align: center;">2.04</td> <td style="text-align: center;">0.82</td> <td style="text-align: center;">0.02</td> <td colspan="2"></td> </tr> </table> INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK). HARDNESS AS SHIPPED, HRBW - 96 (MIDRADIUS) <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">(T) RANSVERSE (L) ONGITUDINAL</td> <td style="width:50%; text-align: right;">L</td> </tr> <tr> <td>YIELD STRENGTH, (0.20 %) KSI (MPA)</td> <td style="text-align: right;">83.0 ( 572)</td> </tr> <tr> <td>TENSILE STRENGTH, KSI (MPA)</td> <td style="text-align: right;">97.5 ( 672)</td> </tr> <tr> <td>ELONGATION IN 2.00", %</td> <td style="text-align: right;">36.0</td> </tr> <tr> <td>REDUCTION OF AREA, %</td> <td style="text-align: right;">77.0</td> </tr> </table> GRAIN SIZE PER ASTM E112: 4 <div style="text-align: right;">           Material Heat Code  <i>GFY</i>            MAY 09 2011            Certified by:    </div> <p style="font-size: small;">MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A.          MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE-          MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1,          SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009.          CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO          THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE          REVIEW INSTITUTE, CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH          3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE          IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.</p> <p style="text-align: center; font-size: small;">HEIDI L. SUNDAY          GROUPLDR - SPECIFICATIONS / CERTIFICATION          CARPENTER TECHNOLOGY CORPORATION  <i>Heidi L. Sunday</i></p>				C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)	0.016	1.67	0.50	0.027	0.023	16.99	NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)			11.29	2.04	0.82	0.02			(T) RANSVERSE (L) ONGITUDINAL	L	YIELD STRENGTH, (0.20 %) KSI (MPA)	83.0 ( 572)	TENSILE STRENGTH, KSI (MPA)	97.5 ( 672)	ELONGATION IN 2.00", %	36.0	REDUCTION OF AREA, %	77.0
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# Acciaierie Valbruna S.p.A.



36100 VICENZA (Italia) - Viale della scienza, 25 z.l.  
 Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4  
 Clienti / Kunden / Customers:  
 VALBRUNA STAINLESS INC.  
 2400 TAYLOR STREET WEST  
 46801-FORT WAYNE, IN 46801-USA  
 Produttore: ACCIAIERIE VALBRUNA S.P.A.  
 Hersteller / Fabricator

Avviso di Spedizione: D-VI10019725  
 Lieferungs-Packing-Verf.

Ordine nr. 27165 STOCK POMPTON  
 Bestell/Purchase-Order

Tipo di Elaborazione: E1 AOD  
 Erhitzungs-/Wärmebehandlungsprozess

## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

Certificato nr: MEST892670/2010/  
 Prüfungs/Inspektion

Conferma ordine nr: E110003941  
 Bestell/Purchase-Order

Marchio di Fabbrica:  
 Firmen-/Werkstempel  
 Trade mark:  
 Signe de l'usine: produkte



Funzione del Collaudatore:  
 Funktion des Werkseinsprechenden  
 Inspector's stamp/Function of the Inspector



Oggetto Prove - Annotated COLD PROCESSED  
 Prüfgegenstand/Prüfungsumstand

**Specifiche**

Abmessungen / Dimensionen / Single size

- VAL 6 316/316L A,CF
- AMS-QC-S-763 B 316/316L A,CF
- ASME SA276 2007 S31600/03 A,CF #
- ASTM A182 2008A S31600/03 A s
- ASTM A276 2008A S31600/03 A,CF
- ASTM A370 2009A
- MIL-S-882 B/1 316/316L
- (1) SEC. II PT. A 2007 EDITION ADD. 2009b
- (2) SEC. II PT. A 2007 EDITION ADD. 2009b
- (3) Chemical analysis only
- (5) Chemical analysis only and mechanical properties
- (7) Chemical analysis only
- (8) \* ISO 15156-3

- AMS 5648 K S31600 A
- ASME SA182 2007 S31600/03 A s
- ASME SA320 2007 B8M s
- ASTM A193 2009 B8M s
- ASTM A314 2008 S31600/03
- ASTM A479 2001 S31600/03 s
- NACE MR0175\* 2003 S31600/03 s

- AMS 5653 F S31603 A
- ASME SA193 2007 B8M (1)
- ASME SA479 2007 S31600/03 A (4)
- ASTM A262 2010 PRACTICE E
- ASTM A320 2008 B8M (1)
- ASTM A479 2010 S31600/03 A

- 0Chemical analysis only and mechanical properties.
- 1Chemical analysis only
- 3SEC. II PT. A 2007 EDITION ADD. 2009b
- 4SEC. II PT. A 2007 EDITION ADD. 2009b
- 5Chemical analysis only
- 6Chemical analysis only
- 7Chemical analysis only
- 8Chemical analysis only

CRN/  
 H/C: EWB  
**DFARS**

Qualità: 316/316L  
 Werkstoff/Grade/Quality

Materie: MVAPML MAXIVAL  
 Materialbezeichnung/Description

Finizatura: 316/316L  
 Finish/Grain/Finishing/Finizage

Pos. nr. Item nr. An. di serie	Oggetto Description Description de l'objet	Dimensioni - in Dimensions Dimensions	Tolleranza Tolerance Tolérance	Lunghezze - in Lengths Längen	Colata Linnote Fusée	Pezzi Pieces Pièces	Peso - LB Weight Poids	Lotto nr. Lot Lot n.
0070	Hexagon	0,8750	484-06	150 / 152	249031		2,698	111700860

Sono state soddisfatte tutte le condizioni richieste  
 Die gestellten Anforderungen sind erfüllt  
 The material has been furnished in accordance with the requirements  
 Le matériel a été livré conforme aux exigences

Controllo antimacchia: OK  
 Verschmutzungsfrei, spezialisiert nach Anwendung  
 Anodizing testing performed: OK  
 Contrôle antimacchia (A) / s

Controllo visivo e dimensionale: soddisfa le esigenze  
 Sichtprüfung und Abmessung ohne Beanstandung  
 Visual inspection on both dimensional criteria satisfactory  
 Contrôle visuel et dimensionnel satisfaisant

TEST ALLO STATO DI FORNITURA										
Test on delivery condition / Prüfung bei Lieferzustand / Test à l'état de livraison / Pruebas sobre el material así como entregado										
TEST	Profilo / Profile Larghezza / Width Bordo / Edge Spessore / Thickness mm	Forma / Shape	Spianamento Smoothing with fine brass wire mesh Rp 0,2µ S.B.L.	Resistenza Resilience Resilienz Resilience Rm k.s.l.	Allungamento Elongation Elongation Elongation E 4d %	Silenzione Surface Finish RA	Reperibilità Repairability Reparatur	Durezza Hardness Dureté HB		
Valori richiesti / Required values / Values requises / Values requises	min		30	75	30		50		140	
A	12,5	68	L	70	100		48	58	230	
TEST				min	max					
A	Grain size for ASTM E112								5	

Mechanical properties according to ASTM A370.

(1) - English/Spa./Fr./Deutsche/It./D./Türkçe/Portuguese

### Analisi chimica

Chemische Zusammensetzung / Chemical Analysis / Matériau chimique

Colata / Heat Schmelze / Course	min max 0,030	1,00	1,25	16,20	2,00	1,00	16,00	0,040	0,020	0,100				
	C %	Si %	Mn %	Cr %	Mo %	Cu %	Ni %	P %	S %	N %				
249031	0,018	0,60	1,49	16,71	2,05	0,49	10,15	0,031	0,030	0,066				

Produced without class I-II Ozone depleting substances.  
 Solution heat treated free from continuous carbide network.  
 Annealing temperature: 1940°F for 1 h/water.

Vicenza, 06/07/10 V0008	il collaudatore di stabilimento / der Werkseinsprechende / Works inspector / L'agent d'usine M. Rizzotto	Pagina - 1 di 2
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YARDE METALS Inc 08-31-10

S00827CM021-3 SSP FITTINGS CO. PO: 0124530 Part #: 114.03PC 3214.00LB

# Acciaierie Valbruna S.p.A.



36100 VICENZA (Italia) - Viale della scienza, 25 z.l.  
 Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4  
 Cliente / Customer / Purchaser / Client:  
 VALBRUNA STAINLESS INC.  
 2400 TAYLOR STREET WEST  
 46801-FORT WAYNE, IN 46801-USA  
 Produttore: ACCIAIERIE VALBRUNA S.P.A.  
 Hersteller / Fabricator / Producer

Avviso di Spedizione: D-V110019723  
 Lieferungs/Packing list N.L.

Ordine nr: 26984 STOCK POMPTON  
 Bestell/Nr order/Commande

Tipo di Elaborazione: E+AOD  
 Erzeugnis/herstellung process/Mode of elaboration

## CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

Certificato nr: MEST892668/2010/  
 Prüfzertifikat

Conferma ordine nr: E110003340  
 Bestell/Nr. Order/Nr.

Marchio di Fabbrica:  
 Zeichen des Lieferanten  
 Trade mark  
 Signe de l'usine productrice



Funzione del Collaudatore:  
 Funktion des Prüfmaschinenbedieners  
 Inspector / Agent of ushine

Oggetto Prove: - Anisaid COLD PROCESSED  
 Prüfgegenstand/Prüfteil: Anisaid COLD PROCESSED

Micro and macro etch test: OK  
 Intergranular corrosion test per ASTM A262 pract. E: ok  
 Material is DFARS Compliant

Material and manufactured in Italy No welding or weld repair Material free from Mercury contamination  
 We declare that the finished product is checked for radioactive contamination through Ponel System when it leaves the production plant.  
 The Quality Management System is Certified acc. Pressure Equipment Directive (97/23/EC) Annex 1, s. 4.3 by TÜV and LLOYD'S

CRN/  
 H/C: EWB  
 DFARS

YARDE METALS, INC CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 MILL TEST REPORT NOW ON FILE  
 RECEIVED AND INSPECTED

AUG 17 2010

by *Kathy Bell*  
 KATHY BELL, CERTIFICATION PROCESSOR

*[Signature]*  
 INSP. #5 SSP

8/31/10

Vicenza, 06/07/10 VCO08 (Max. MCF 1)	Il collaudatore di stabilimento / der Werksachverständiger / Works Inspector / L' agent d'usine M. Rizzotto <i>[Signature]</i>	Pagina - 2 di 2
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YARDE METALS Inc 09-31-10

S00827CM023-3 SSP FITTINGS CO PO: 0124530 Part #: 114.00PC 3214.00LB



### Certificate of Test

HEAT E101250 ORDER 615013/ 04 BØL 0209014 \* CERTIFICATION \* 10/07/10

SHIP TO:  
 YARDE METALS INC  
 10160 PHILIPP PARKWAY  
 STREETSBORO 442410000

----- YOUR ORDER & DATE -----  
 P00714DO490 10/07/10 CUST# 0975001 CUST TAG#

----- ITEM DESCRIPTION -----  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L RND CFA CONDA 1.2500 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 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 13 Total Weight 27066

WO 2015155 Bundles: 1A WO 2015156 Bundles: 1D, 1E, 1F, 1G, 1H, 1I, 1J, 1K, 1L,  
 1M, 1N WO 2015253 Bundles: 1C

----- SPECIFICATIONS -----  
 MPG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648K, 5653F SAE AMS-CQ-S-763B  
 ASME SA182 E07, A07-09, E10 ASME SA193 E10  
 ASME SA479 E07, A07-09, E10 ASME SA320 B8M CL1 E10  
 ASTM A182 09 ASTM A262 98 Practice E  
 ASTM A276 08a ASTM A314 97  
 ASTM A479/A479M 09 ASTM A484 09  
 ASTM E112 96 ASTM A320 08 B8M Class 1  
 ASTM A193 09 B8M DIN 50049/EN 10204 3.1B  
 DFARS 252.225.7014 6/05 DFARS 225.7002-3(B)(1).  
 Federal Spec QQ-S-763F NACE MR0175-03, mid-rad hard  
 Prodec Quality

*H/c: AS*



----- MECHANICAL & OTHER TESTS -----  
 Hardness as shipped 170 HB  
 Hardness as shipped ( 85 HRB )  
 Grain size 7.0  
 Micro OK  
 Intergranular corrosion OK  
 Macro OK  
 Hardness as tested 00  
 Tensile strength, KSI (MPa) 90.1 ( 621)  
 0.2% Yield Strength, KSI(MPa) 40.0 ( 276)  
 Elongation % in 4D 52.5  
 Reduction of area % 74.2

----- CHEMICAL COMPOSITION -----  
 Carbon (C ) .015 Manganese (Mn) 1.690  
 Phosphorus (P ) .031 Sulphur (S ) .024  
 Silicon (Si) .323 Chromium (Cr) 16.680  
 Nickel (Ni) 10.090 Cobalt (Co) .215  
 Copper (Cu) .373 Moly (Mo) 2.050  
 Nitrogen (N ) .076 Columbium (Cb) .014  
 Titanium (Ti) .001 Aluminum (Al) .004  
 Tin (Sn) .007 Boron (B ) .003  
 Vanadium (V ) .060 .000  
 Columbium/  
 Tantalum (Cb+Ta) .014  
 Iron (Fe) Balance  
 Melt Practice EAF  
 Refining Practice AOD  
 De-long Ferrite

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.

*JM*  
 INSP. #5 SSP  
 10/25/10

Outokumpu Stainless Bar, Inc.  
 3043 Crenshaw Pkwy  
 Richburg, SC 291729

M.F. Marcanio, Quality Manager

*M.F. Marcanio*

YARDE METALS Inc 10-22-10

S01020CV029-1 SSP FITTINGS CO PO: 125280 Part #:  
 70.00PC 3556.00LB



# Certificate of Test

HEAT E110583 ORDER 620750/ 04 BOL 0212327 \* CERTIFICATION \* 06/03/11

SHIP TO:  
 YARDE METALS  
 45 NEWELL STREET

SOUTHINGTON 064890000

----- YOUR ORDER & DATE -----  
 P10210HB002 6/03/11 CUST# 0975001 CUST TAG#

----- ITEM DESCRIPTION -----  
 GRADE 316L/316 Ship Condition CONDA  
 Size 316L RND CFA CONDA 1.3750 x 144.000 RL  
 Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
 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 2 Total Weight 3256

WO 2021905 Bundles: 1C, 1H

----- SPECIFICATIONS -----  
 MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
 AMS 5648K, 5653F SAE AMS-QQ-S-763B  
 ASME SA182 E07, A07-09, E10 ASME SA193 E10  
 ASME SA479 E07, A07-09, E10 ASME SA320 B8M CL1 E10  
 ASTM A182 10a ASTM A262 98 Practice E  
 ASTM A276 10 ASTM A314 97  
 ASTM A479/A479M 10a ASTM A484 11  
 ASTM E112 96 ASTM A320 10a B8M Class 1  
 ASTM A193 10a B8M DIN 50049/EN 10204 3.1B  
 DFARS 252.225.7014 6/05 DFARS 225.7002-3(B) (1)  
 Federal Spec QQ-S-763F NACE MR0175-03, mid-rad hard  
 Prodec Quality Process Annealed 1900Fmin/WQ  
 NACE MR0175-03, ISO 15156:03 EN 10204 Type 3.1 Document



Material Heat Code

Z1  
 JUL 29 2011

Certified by:

*[Signature]* INSP. #5 SEP

----- MECHANICAL & OTHER TESTS -----  
 Hardness as shipped 170 HB  
 Hardness as shipped ( 85 HRB )  
 Grain size 7.0  
 Micro OK  
 Intergranular corrosion OK  
 Hardness as tested 00  
 Tensile strength, KSI (MPa) 92.6 ( 638)  
 0.2% Yield Strngth, KSI (MPa) 42.2 ( 291)  
 Elongation % in 4D 56.0  
 Reduction of area % 78.2

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

Carbon (C) .018	Manganese (Mn) 1.680
Phosphorus (P) .032	Sulphur (S) .025
Silicon (Si) .389	Chromium (Cr) 16.640
Nickel (Ni) 10.070	Cobalt (Co) .167
Copper (Cu) .382	Moly (Mo) 2.020
Nitrogen (N) .075	Columbium (Cb) .013
Titanium (Ti) .006	Aluminum (Al) .005
Tin (Sn) .009	Boron (B) .002
Vanadium (V) .050	
Columbium/	
Tantalum (Cb+Ta) .013	
Iron (Fe) Balance	
Melt Practice EAF	
Refining Practice AOD	
De-long Ferrite	

YARDE METALS, INC. CERTIFIES THAT  
 THIS IS A TRUE COPY OF THE ORIGINAL  
 MILL TEST REPORT NOW ON FILE.  
 RECEIVED AND INSPECTED

JUN - 6 2011

BY *[Signature]*  
 MARCEL BEAUDET, CERTIFICATION PROCESSOR

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.

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

M.F. Marcanio, Quality Manager

*[Signature]*

YARDE METALS Inc 07-27-11

S10726CV010-1 SSP FITTINGS CO PO: 129367 Part #:

34.00PC 2164.00LB

<b>CERTIFICATE OF TESTS</b> CERT SERIAL# 000778277 <b>CARPENTER</b> Carpenter Technology Corporation 101 West Bern Street, Reading, Pa. 19601 Tel: (610) 208-2000 (800) 338-4592  08/01/11 <u>CUSTOMER / BESTELLER / CLIENT</u>  SSP FITTINGS CORP ATTN: JOE MERCER 8250 BOYLE PARKWAY TWINSBURG, OH 44087	<b>ABNAHMEPRUEFZEUGNIS</b>  <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80px; text-align: center;"> <b>DFARS</b> </div> CARPENTER TECHNOLOGY CORP 101 W. BERN STREET READING, PA 19601	<b>CERTIFICAT DE CONTROLE</b>  <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80%; font-size: 0.8em;"> <ul style="list-style-type: none"> <li>• THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 47.</li> <li>• THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE TRACED BY REFERENCE TO THE CARPENTER ORDER NUMBER.</li> <li>• MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA AND GAMMA SOURCE CONTAMINATION.</li> <li>• THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.</li> </ul> </div> SELLER / VERKÄUFER / VENDEUR PAGE 1 OF 2																											
CUSTOMER ORDER NO. / BESTELL.-NR. / N° DE COMMANDE	CARPENTER NO. / WERKS.-NR. / N° DE REFERENCE INTERNE	DATE / DATUM / DATE	WEIGHT / GEWICHT / POIDS																										
129182	PHL958401 L29735 - 1	08/01/11	1014.000																										
HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 741755 PRODUCT DESCRIPTION: PROJECT 70+ TYPE 316/316L STAINLESS ANNEALED COLD DRAWN SPECIFICATION: SSP RMT316 REV B (09/11/01) EXCPT LTR (04/11/03) PENDING ----- ASTM-A276-10 TYPE 316/316L ASTM-A479-10A TYPE 316/316L ASME-SA479 2010 EDITION TYPE 316/316L  SIZE 0.750000 IN. ( 19.05 MM) HEX BAR PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS) <table style="width:100%; border-collapse: collapse; font-size: 0.8em;"> <tr> <td style="text-align: center;">C (COM)</td> <td style="text-align: center;">MN (XRF)</td> <td style="text-align: center;">SI (XRF)</td> <td style="text-align: center;">P (XRF)</td> <td style="text-align: center;">S (COM)</td> <td style="text-align: center;">CR (XRF)</td> </tr> <tr> <td style="text-align: center;">0.015</td> <td style="text-align: center;">1.59</td> <td style="text-align: center;">0.62</td> <td style="text-align: center;">0.024</td> <td style="text-align: center;">0.024</td> <td style="text-align: center;">16.75</td> </tr> <tr> <td style="text-align: center;">NI (XRF)</td> <td style="text-align: center;">MO (XRF)</td> <td style="text-align: center;">CU (XRF)</td> <td style="text-align: center;">N (FUS)</td> <td colspan="2"></td> </tr> <tr> <td style="text-align: center;">11.22</td> <td style="text-align: center;">2.05</td> <td style="text-align: center;">0.83</td> <td style="text-align: center;">0.02</td> <td colspan="2"></td> </tr> </table> INTERGRANULAR CORROSION TESTED TO ASTM-A262, PRACTICE A - ACCEPTABLE. SOLUTION ANNEALED TO PROVIDE A MICROSTRUCTURE FREE FROM CONTINUOUS GRAIN BOUNDARY CARBIDE PRECIPITATION (NETWORK).  HARDNESS AS SHIPPED, HRC - 23 (MIDRADIUS)  <table style="width:100%; border-collapse: collapse; font-size: 0.8em;"> <tr> <td style="width:50%; vertical-align: top;">           (T) RANSVERSE (L) ONGITUDINAL            YIELD STRENGTH, (0.20 %) KSI (MPA)            TENSILE STRENGTH, KSI (MPA)            ELONGATION IN 2.00", %            REDUCTION OF AREA, %         </td> <td style="width:50%; vertical-align: top;">           L            83.0 ( 572)            96.5 ( 665)            37.0            76.0         </td> </tr> </table> <div style="text-align: right; margin-top: 10px;"> <b>Material Heat Code</b>  <b>GQE</b>  <b>AUG 02 2011</b> </div> <p style="text-align: right; margin-top: 10px;"> <b>Certified by:</b>    </p>				C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)	0.015	1.59	0.62	0.024	0.024	16.75	NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)			11.22	2.05	0.83	0.02			(T) RANSVERSE (L) ONGITUDINAL YIELD STRENGTH, (0.20 %) KSI (MPA) TENSILE STRENGTH, KSI (MPA) ELONGATION IN 2.00", % REDUCTION OF AREA, %	L 83.0 ( 572) 96.5 ( 665) 37.0 76.0
C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)																								
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GRAIN SIZE PER ASTM E112: 4  MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A. MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE- MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.11 SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009 THIS ORDER WAS MANUFACTURED IN ACCORDANCE WITH CARPENTER SPECIALTY ALLOYS OPERATIONS QUALITY PROGRAM MANUAL, REVISION 29 DATED 09/01/10.  CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED AS OF NOVEMBER 24, 2010 TO THE REQUIREMENTS OF ISO 9001:2008 APPROVAL CERTIFICATE 10-1385R BY PERFORMANCE REVIEW INSTITUTE. CERTIFICATE OF TEST IS PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1 OF EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.																													
HEIDI L. SUNDAY GROUPLDR - SPECIFICATIONS / CERTIFICATION CARPENTER TECHNOLOGY CORPORATION																													
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