

G17054

SCOT FORGE

8001 Winn Rd., Box 8
Spring Grove, IL 60081
847/587-1000
FAX 847/587-2000

PO # 8211

MATERIAL CERTIFICATION

H00160 3 SS
Heat # G17054

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S O T L O D	CASTLE METALS 3400 N WOLF RD FRANKLIN PARK, IL 60131-1319	Shipping Information		Material Cert Number
		DATE Shipped: 12/01/2010 Via: KELRON DIST. Bill: 3-86104		685293 p1051R1
				Revision Date
				11/12/2012

Item 1 of 1	
Material	316/316L Stainless Steel in accordance with Castle Metals specification 3316-98 Rev 36, ASTM A 193-10, ASME SA 193 2007 Edition 2009 Addenda, ASTM A 276-10, ASTM A 479-08, ASME SA 479 2007 Edition 2009 Addenda, Chemistry of ASTM A 192-09a, Chemistry of ASME SA 192 2007 Edition 2009 Addenda, AMS 5648K, AMS 5653F, AMS QQ-S-763B, NACE MR0175
Heat Treat	per Specification
Destructive Test	per Specification
Finish	Rough Machine to sizes shown Straightness = 1/8" in 5 FT
Reference	Access Code: 31022
Size	OD Random Len (inches) 11 108 to 156
Surface	500 RMS Saw Cut

Heat Number	# of Pieces	(MILL - UNIVERSAL STAINLESS)
G17054	1	MSDS Previously Sent

Note: Additional prefix letter stamped on product with heat number is for our inventory purposes only and not relevant to heat number.

Chemical Composition (Wt. %)

C	Mn	P	S	Si	Ni	Cr	Mo	Cu	Al	V
0.027	1.75	0.021	0.019	0.31	10.29	16.44	2.08	0.33	<0.01	0.04
N	B	Cb	Co	Sn	Ti	W				
0.083	0.002	0.03	0.07	0.004	<0.01	<0.05				


Mechanical Properties:

Pcs	Tensile PSI	Yield ¹ PSI	Elongation %	Reduction of Area %	Comments
1	76,786	35,085	62.2	78.8	LONGITUDINAL

¹(Offset: .2%)

Brinell Hardness Results:

Pcs	3000 Kg Load
1	167


Jerry Giessinger
 Corporate Quality Assurance Manager
 This certification has been created and reviewed in compliance with the Scot Forge QMS

Note: The recording of false, fictitious or fraudulent statements or entries on this document may be punishable as a felony under Federal Statute.

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CASTLE METALS

Other Testing or Inspections:

Solution anneal at 1925 degrees F for 9 hours

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE UNITED STATES

COOLING METHOD SOLUTION ANNEAL: WATER

PIECE TEMP AT START OF SOLUTION ANNEAL: 1925 DEG F

PIECE TEMP AT FINISH OF SOLUTION ANNEAL: 59 DEG F

5.95:1 FORGING REDUCTION FROM ORIGINAL INGOT

CAST METHOD - INGOT

NO WELD REPAIR PERFORMED

MICRO-EXAM PERFORMED PER ASTM E-112; RESULTS GRAIN SIZE - 2.

CORROSION SENSITIVE TEST PERFORMED PER ASTM A-262, RESULTS STEP STRUCTURE, ACCEPTABLE.

MACROETCH PERFORMED PER ASTM E381; RESULTS S1,R1,C1; NO PIPER, CRACKS, ETC.

Compliance Statements:

We certify that the material listed was not processed with mercury bearing instruments and/or equipment which might cause contamination, nor was mercury handled in the immediate vicinity during the manufacturing process. We also certify that the material was not processed or cleaned with low melting point materials as alloying constituents, i.e. lead, zinc, cadmium, tin, antimony, bismuth, sulfur, or their compounds.

In accordance with the requirements of the Pressure Equipment Directive, all testing, inspection, and documentation is produced in accordance with EN 10204:2004 Type 3.1 and ISO 10474 Type 3.1.B

Material provided has been produced by Scot Forge under an approved quality program as defined within the Scot Forge Quality Management System Manual, Revision 4, dated 10/15/12.

The products supplied are in compliance with the quantity and quality requirements of the purchase order and specifications noted. The test reports represent the actual attributes of the items furnished and the test results are in full compliance with all applicable specifications and order requirements.

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Jerry Glessinger
Corporate Quality Assurance Manager
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