
 2020 Ashcraft Avenue, Monroe, NC 28110 US	CERTIFICATE OF TEST Cert No.56506 Rev.1		Batch - 79241
	 Timothy B. Cutwright Certification Auditor Date : July 09, 2015		Heat - B5E88

Customer Name & Address	Purchase Order No	Purchase Order Line No	Sales Order No	Sales Order Line No
	PTG55457 ✓	1	48916	1.1
Size (in)	Cross section	No Pcs	Weight (lbs)	Alloy
0.7500 ✓	Round	132 ✓	1.425 ✓	ATI 6-4 Alloy
Remarks:				
Diameter Tolerances: +/- 0.002" ✓				

Specifications

Spec Name	Rev	Class	Compliance Condition
✓ 100679343	AA		Compliant
✓ AMS 2631	D	CLASS=AA	Compliant
✓ AMS 4928	U		Compliant
✓ AMS 4967	L		Compliant
✓ AMS 6931	C		Compliant
✓ AMS-H-81200	D		Compliant
✓ AMS-STD-2154	A	TYPE=I, CLASS=AA	Compliant
✓ AMS-T-9047	05/03	COMPOSITION=6-4	Compliant
✓ AMS-T-9047	A		Compliant
✓ AS 6279	01/14		Compliant
✓ ASME II SB-348	2013	GRADE=5	Compliant
✓ ASTM B348	2013	GRADE=5	Compliant
✓ ASTM F1472	2008*1		Compliant
✓ CMMP015	D	ALLOY=6AL4V	Compliant
✓ D1-4426	10		Compliant
✓ DMS 1570	C		Compliant
✓ DMS 1570C SPE096-062	01/16/97		Compliant
✓ DMS 1570C SPE098-009	A		Compliant
✓ EN 10204	10-2004		Compliant
✓ MIL-H-81200	B		Compliant
✓ MIL-STD-2154	09/30/82	TYPE=I, CLASS=AA	Compliant
✓ MIL-T-9047	G AM2	COMPOSITION=6-4	Compliant
✓ MIL-T-9047 G AM2 N01	02/08/93		Compliant
✓ MIL-T-9047 G AM2 N02	04/04/98		Compliant
✓ S-1000	12/04/2013		Compliant
✓ S-400	02/21/2014		Compliant

Remarks:
 UNS R56400
 Material certified in accordance with EN 10204 Type 3.1.

As Shipped Condition

Heat Treat	Heat Treat Cycles	Hot Work Type
Mill Annealed	✓ Heat To 1300 F Hold 2 Hr(s) Air Cool	Rolled
Remarks:		
Material was heat treated at ATI Richburg Operations.		
Surface Finish		
Peel/Shave & Polish		

Batch - 79241

Heat - B5E88

Melt Method Details

Primary Melt	Facility	Address
Plasma Arc Melt	ATI Bakers North Operations	6400 Alloy Way, Monroe, NC 28110-8329 US
Remelt	Facility	Address
Vacuum Arc Remelt	ATI Bakers North Operations	6400 Alloy Way, Monroe, NC 28110-8329 US

Conversion Method Details

Conversion Type	Facility	Address
Rolling	ATI Richburg Operations	4374 Lancaster Highway, Richburg, SC 29729 US

CHEMISTRY

Sample Source	Top	Bottom
Test Facility	ATI Monroe Operations	ATI Monroe Operations
Elements	UOM	Method
Al	%	XRF
V	%	XRF
Fe	%	XRF
O	%	GAS
C	%	CS
N	%	GAS
Y	%	WET
Ti	%	XRF

Test Comments: CS = Combustion/IR Detection
 XRF = X-Ray Fluorescence
 GAS = Inert Gas Fusion
 WET = Inductively Coupled Plasma Emission

Sample Source	Lead	Trail
Test Facility	ATI Monroe Operations	ATI Monroe Operations
Elements	UOM	Method
H	%	GAS

Test Description: Product - Lead and Trail

Remarks:
 GAS = Inert Gas Fusion

Remarks:
 Test Methods: C = ASTM E1941 (2010); O/N = ASTM E1409 (2013); H = ASTM E1447 (2009); ICP = ASTM E2371 (2013); XRF = ASTM E539 (2011)

MECHANICAL

As Shipped

Plant: 1300F, 2hrs, AC

Hardness

Hardness Value (Rockwell)	Hardness Type	Test Facility
38	HRC	ATI Monroe Operations

Remarks:
 ASTM E18 (2014a)
 Results reported for information only.

Tensile

Sample Direction	Sample Location	Test Temperature	Ultimate Strength (ksi)	.2% Yield Strength (ksi)	4D-Elongation (%)	Reduction of Area (%)	Initial Gage Length (in)	Initial Diameter (in)	Crosshead Speed	Strain Rate (in/in/min)	Test Facility
L	C	ROOM	154.5	145.5	18.8	46.2	0.9980	0.2530	0.05	0.005	ATI Monroe Operations
L	C	ROOM	152.5	142.8	19.2	45.4	0.9980	0.2530	0.05	0.005	ATI Monroe Operations

Remarks:
 ASTM E8/E8M (2015)

Sample Direction	Sample Location	Test Temperature (F)	Ultimate Strength (ksi)	.2% Yield Strength (ksi)	4D-Elongation (%)	Reduction of Area (%)	Initial Gage Length (in)	Initial Diameter (in)	Crosshead Speed	Strain Rate (in/in/min)	Test Facility
L	C	400	126.4	111.8	21.0	54.3	1.0000	0.2527	0.05	0.005	Westmoreland Mechanical Testing

continued...

Batch - 79241

Heat - B5E88

Remarks:

ASTM E21 (2009)

Test Specimen Heat Treatment(s)

Plant: 1300F, 2hrs, AC

Laboratory: 1750F, 1hr, RWQ - 1000F, 4hrs, AC

Tensile

Sample Direction	Sample Location	Test Temperature	Ultimate Strength (ksi)	.2% Yield Strength (ksi)	4D-Elongation (%)	Reduction of Area (%)	Initial Gage Length (in)	Initial Diameter (in)	Crosshead Speed	Strain Rate (in/in/min)	Test Facility
L	C	ROOM	172.4	160.1	16.7	50.2	0.9980	0.2530	0.05	0.005	ATI Monroe Operations

Remarks:

ASTM E8/EBM (2015)

Remarks:

L = Longitudinal

C = Center

METALLOGRAPHY

As Shipped

Plant: 1300F, 2hrs, AC

Microstructure

Remarks:

Microstructure evaluated in accordance with referenced specifications and found acceptable.

Alpha Case

Remarks:

Material guaranteed to be free of alpha case.

Beta Transus - DTA

Sample Source	DTA Temperature (Fahrenheit)	Test Facility
Top	1850	ATI Monroe Operations
Bottom	1870	ATI Monroe Operations

Ultrasonic

Test Facility: ATI Monroe Operations

Remarks:

Material ultrasonically inspected and found acceptable to the requirements of:

AMS 2631D, Class AA (exceeds Class A1)

AMS-STD-2154, Type I, Class AA

MIL-STD-2154, Type I, Class AA

Macro

Test Facility	Echant	Magnification
ATI Monroe Operations	Ammonium Bifluoride	1X

Remarks:

Material macro evaluated and found acceptable in accordance with AMS 2643E. Macro evaluation found to be similar to AMS 2380F Level 10.

Outside Source Addresses

Outside Testing Laboratory

Facility	Address
Westmoreland Mechanical Testing	221 Westmoreland Drive, Youngstown, PA 15696 USA
Subcontracted Operations	
Facility	Address
ATI Richburg Operations	4374 Lancaster Hwy., Richburg, SC 29729 USA

Special Remarks

Material is RoHS compliant.

NAFTA country of origin: USA

GEAE S-400 (GT193) Supplier Codes:

ATI Allvac Monroe No. 87012

Westmoreland No. T7889

ATI Specialty Materials has complied with all producer requirements of AS 6279 Rev. 01/14.

Remarks

Material has been produced, sampled, inspected and tested in accordance with the customer purchase order and referenced specifications and conforms to the requirements unless otherwise noted in this Certificate of Test.

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Heat - B5E88

Remarks

If customer purchase order does not specifically reference a revision to a specification, ATI Specialty Materials will work to the latest revision on file and in effect at the time of order placement.

Any chemical elements analyzed and found to have values below the actual limits of detection may be reported as < less than or reported at the detection level.

When values are reported to the significant places called for in the specifications, rounding will be done in accordance with ASTM E29.

✓ This is to certify that during the manufacturing, handling, testing and inspection, this material did not come in direct contact with mercury or any device employing a single boundary of containment.

ATI Specialty Materials products have not come in contact with radioactive materials during manufacturing or processing.

No weld repair has been performed on this material.

✓ Material melted and manufactured in the United States of America unless otherwise noted in this Certificate of Test.

The recording of false, fictitious, or fraudulent statements or entries on this document may violate Federal statutes, including but not limited to Title 18, Chapter 47 of the United States Code and may be punishable as a felony.

This Certificate of Test shall not be reproduced, except in full, without the written approval of ATI Specialty Materials Quality.

Material Safety Data Sheets (MSDS) - View or print from our site: www.atimetals.com
Printed copies are available upon request from the ATI Specialty Materials Sales Department.