

Attachment to Product Certification

Customer P.O. Number/Date
15-7616 Rel 2/Mar 23, 2015

TIMET Sales Order Number/Date
437226/Mar 24, 2015

TIMET Packing List Number/Scheduled Ship Date
80671909/Jun 26, 2015

St. Louis Mill Sales
109 Interstate Drive
WENTZVILLE MO 63385
USA
Tel:800-753-1550 Fax:636-887-9098
Shipping Plant: St. Louis Service Center

Sold-to Address
Titanium Metal Supply
12215 Kirkham Road, Suite 300
POWAY CA 92064
USA

Ship-to Address
Titanium Metal Supply
12215 Kirkham Road, Suite 300
POWAY CA 92064
USA

TIMET Item #	Material #	Material Description	Quantity	Weight
Customer Item #	Customer Material #			
000010	125530	TIMETAL® 65A Titanium Aero Sheet		
		110.000PC 340.000LB		
		Specifications		
		: AMS 4900 * P		
		: AMS-T-9046 * A CP-2		
		: MIL-T-9046J AM-2 CP-2		
		: HN3165-Y13		
		: 0.020" X 36.000" X 27.000"		
		: 110.000		
		: USA		
		: HN3165		
		: 01 HN3165-M		
		: 02 M2		
		: W16313		
		Test Number		
		: W16313		
		B-Additional customer req		
		: DFARS 252.225-7008		

Results are from TIMET Quality Control Records on file. The undersigned has verified that the information on the attached mill product certification meets the requirements of the above referenced order. This Attachment to Product Certification is specific to your referenced order, is an integral part of and amends the physical and chemical test reports attached. All specification(s) and revision(s) that differ from the attached have been approved for inclusion by the producing facility.

Authorized TIMET Signature

Date



Titanium Metals Corporation

Approved Certificate

100 Titanium Way
Toronto, OH, 43964

Telephone (740) 537-5694, Fax (740) 537-5653

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CERT ID

HN3165-M

09 JUN 2015 19:14:19 GMT

PURCHASE ORDER

20119727

SOLD TO CUSTOMER

TIMET Service Center St. Louis
109 Interstate Drive, Wentzville, MO 63385

HEAT NUMBER

HN3165

GRADE

TIMETAL®65A

SHIP TO ADDRESS

TIMET Service Center St. Louis
109 Interstate Drive, Wentzville, MO 63385

TEST NUMBER

W16313

PRODUCT DESCRIPTION

0.020" SQ Coil

DELIVERY CONDITION

Annealed & Pickled

Specifications

This material complies with the following specifications:

AMS 4900 N

AMS-T-9046 A CP-2

ASTM B 265 -13ae1 Grade 3

ASTM F 67 -13 Grade 3

MS-TI 55 3

SPD #2 13 Grade 55

Melt Method

EB

Melt/Process Location

TIMET - Morgantown, PA, USA /

TIMET - Toronto, OH, USA

Compliance Statements

1. Surface free from alpha case and product conforms to the other technical requirements of the referenced specification(s).
2. Microstructure examined and acceptable to the order specifications.
3. Bend testing performed meets or exceeds the requirements of the ordered specifications.
4. During the manufacturing process, this material has not come in contact with mercury or radioactive luminescent materials; as such, it is certified to be free of mercury and radioactivity.
5. No weld repair has been performed on this material.
6. Material complies with DFARS 252.225-7008.
7. Material certificate in compliance with EN 10204:2004 Type 3.1.
8. The recording of false, fictitious, or fraudulent statements or entries on this document may be punishable as a felony under Federal Statutes including federal law, Title 18, Chapter 47.
9. Material melted in accordance with DMS 2442E R-1.
10. TIMET-Morgantown, PA, is an approved ingot source supplier of the Boeing Company per DMS QPL-2442 Issue 20.
11. TIMET-Toronto is an Approved Process Source for The Boeing Company as specified in D1-4426, processor code number BE10041722.
12. TIMET's Quality System is in compliance with Boeing Quality Management System (BQMS) D6-82479 Appendix A.
13. TIMET-Toronto has a Quality Management System that is in compliance with ISO 9001:2008, and AS 9100:2009 Revision C. (AS9100 certificate is available at www.timet.com)

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SOLD TO CUSTOMER

TIMET Service Center St. Louis

102 Interstate Drive, Wentzville, MO 63385

Ingot Chemical Analysis
(Weight percent)

Unless otherwise noted, Ingot Chemical Analysis performed at Morgantown Process Lab, 900 Hemlock Road, Morgantown, PA, 19543, USA

	Fe	C	O	N
Sample ID				
TOP	0.12	0.011	0.20	0.006
BOT	0.13	0.007	0.19	0.007

Product Analysis
(Weight percent)

Unless otherwise noted, Product Analysis performed at Toronto Laboratory, 100 Titanium Way, Toronto, OH, 43964, USA

	H
Sample ID	
F	20
B	18

Chemistry Statements

- Hydrogen values reported in PPM. Hydrogen determined by inert gas fusion per ASTM E1447. Carbon determined by combustion per ASTM E1941. Oxygen and Nitrogen determined by inert gas fusion per ASTM E1409. Henderson Melt: Metallics determined by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) per ASTM E2371. Morgantown Melt: Copper and Boron by atomic spectrometry (ingot only) and all other elements by x-ray fluorescence spectrometry.
- Residual elements 0.05% maximum each, 0.30% maximum total.
- Balance titanium.

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PURCHASE ORDER

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SOLD TO CUSTOMER

TIMET Service Center St. Louis

100 Interstate Drive, Wentzville, MO 63385

Mechanical Properties

Unless otherwise noted, testing performed at Toronto Laboratory, 100 Titanium Way, Toronto, OH, 43964, USA

Bend Test, L-Direction, R/T, (ASTM E 290)

BF 2.0

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1310°F + leveling

20X105

Sample ID

P/F

F

PASS

B

PASS

Bend Test, L-Direction, R/T, (ASTM E 290)

BF 2.0

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1310°F + leveling

10X180

Sample ID

P/F

F

PASS

B

PASS

Bend Test, T-Direction, R/T, (ASTM E 290)

BF 2.0

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1310°F + leveling

20X105

Sample ID

P/F

F

PASS

B

PASS

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19 JUN 2015 19:14 19 GMT

PURCHASE ORDER

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SOLD TO CUSTOMER

TIMET Service Center St. Louis

109 Interstate Drive, Wentzville, MO 63385

Bend Test, T-Direction, R/T, (ASTM E 290)

BF 2.0

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1310°F + leveling

10X180

Sample ID

P/F

F

PASS

B

PASS

Elevated Tensile - 450F - Longitudinal (ASTM E 21)

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1310°F + leveling

0.2YS

Sample ID

ksi

B

29.5

Elevated Tensile - 450F - Transverse (ASTM E 21)

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1310°F + leveling

0.2YS

Sample ID

ksi

B

30.5

RTT - Longitudinal (ASTM E 8)

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1310°F + leveling

0.2YS

U.T.S.

2inEL

Sample ID

ksi

ksi

%

F

68

85

22

B

65

83

22

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Toronto, OH, 43964

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CERT ID
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20119727

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TIMET Service Center St. Louis
100 Interstate Drive, Wentzville, MO 63385

19-JUN-2015 19:14:19 GMT

RTT - Transverse (ASTM E 8)

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1310°F + leveling

0.2YS U.T.S. 2inEL

Sample ID	ksi	ksi	%
F	66	88	20
B	63	85	22

Metallurgical Properties

Unless otherwise noted, testing performed at Toronto Laboratory, 100 Titanium Way, Toronto, OH, 43964, USA

Grain Size (ASTM E 112)

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1310°F + leveling

GRAIN SIZE

Sample ID	Grn
F	8.5
B	8.5

Micro Exam - Longitudinal

AMS-T-9046A, KROLLS, 200X

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1310°F + leveling

OVERALL

Sample ID	P/F
F	PASS
B	PASS

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PURCHASE ORDER


20119727

SOLD TO CUSTOMER

TIMET Service Center St. Louis
109 Interstate Drive, Wentzville, MO 63385

Results are from TIMET Quality Control Records on file
Sales Order # 427224
v.1

Item # 10

Michael Giovannone 

Digitally signed by
Michael Giovannone

Date: 2015.06.19
15:15:35 -04'00'

Michael Giovannone - Certification Specialist

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