



Titanium Metals Corporation

100 Titanium Way
Toronto, OH, 43964

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

Approved Certificate

CERT ID

GN3583-B2B

20-AUG-2019 17:51:28 GMT

SOLD TO CUSTOMER

PURCHASE ORDER 7106 line 3

HEAT NUMBER

GN3583

GRADE

TIMETAL®45A

SHIP TO ADDRESS

TEST NUMBER

W14879

PRODUCT DESCRIPTION

0.028" IQ Coil

DELIVERY CONDITION

Annealed & Pickled

Specifications

This material complies with the following specifications:
ASTM B 265 -15 Grade 2

Additional Specifications

ASME SB 265 -17 Grade 2

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. Bend testing performed meets or exceeds the requirements of the ordered specifications.
3. TIMET-Toronto has a Quality Management System that is in compliance with ISO 9001:2015, and AS 9100:2016 Revision D. (AS9100 certificate is available at www.timet.com)
4. Customer accepts material (randon width) per attached electronic mail message dated 23 May 2019.
5. This revised certificate supersedes all previously issued certificates but does not in any way alter, amend, waive, or modify the terms and conditions of the original sale as contained on TIMET's sales acknowledgement.
6. Material certificate in compliance with EN 10204:2004 Type 3.1 in accordance with PED DIRECTIVE 2014/68/EU.

Ingot Chemical Analysis

(Weight percent)

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

Sample ID	Fe	C	O	N
TOP	0.04	0.008	0.10	0.004
BOT	0.05	0.009	0.10	0.004

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Product Analysis (Weight percent)

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

H

Sample ID

F 23

B 14

Chemistry Statements

1. 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.
2. Residual elements each less than 0.10% maximum, 0.40% maximum total.
3. Balance titanium.

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First in Titanium Worldwide



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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 @ 1440°F

20X105

Sample ID

P/F

F

PASS

B

PASS

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

BF 1.5

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1440°F

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 @ 1440°F

20X105

Sample ID

P/F

F

PASS

B

PASS

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

BF 1.5

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1440°F

10X180

Sample ID

P/F

F

PASS

B

PASS

RTT - Longitudinal (ASTM E 8) After Fracture

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1440°F

0.2YS

U.T.S.

2inEL

Sample ID

ksi

ksi

%

B

46

65

26

F-1

44

65

26

F-2

44

65

26

RTT - Transverse (ASTM E 8) After Fracture

Test Condition: [MILL] CVA 3 to 14 Minutes @ 1440°F

0.2YS

U.T.S.

2inEL

Sample ID

ksi

ksi

%

F

47

65

27

B

47

66

26

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Results are from TIMET Quality Control Records on file
Sales Order # 583103 Item # 10

Michael Giovannone



**Michael
Giovannone**

2019.08.20

13:52:21 -04'00'

Michael Giovannone - Certification Specialist

Version History

v.1 24-MAY-2019 Original Version

v.2 20-AUG-2019 Certificate revised, per customer request, to add ASME SB 265-17 Grade 2 and the following statement:
Material certificate in compliance with EN 10204:2004 Type 3.1 in accordance with PED DIRECTIVE 2014/68/EU.

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