



"VSMPO-AVISMA Corporation"

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624 760, RUSSIA

Phone (34345) 2-38-32, 2-17-66
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INSPECTION CERTIFICATE

SABRE

EN 10204-3.1, AS 9100EN ISO 9001 CERT. № 01 117 043312

CERTIFICATE № 24696Y11C

Date: 21.11.2011

Purchaser: Tirus International SA., Switzerland

Quality/alloy: Ti-6Al-4V

Condition of delivery: Hot Rolled, Machined, Annealed & Pickled

Contract: 82640349TEK Annex 14

Terms of delivery: AMS 4928S, ASTM B 348-10, BS 371A11:2009, BS7252-3 Part 3:1997, WL 3.7164, Part 2:1990, AIR 9183 (21/11/1996), ISO 5832-3 Part 3:1996(E), AMS 6931A, MSRR 8652 Iss.16

Bar № Units Weight, (kg) Object Dimensions (mm) or Drawing № Heat № Lot №

Chemical Composition, % Ti-remainder BAR dia 65^{+0.65/-0} x 3000-4000 8-31-04157 927

Requirement:

AMS 4928S, BS 371A11:2009, BS 7252-3 Part 3:1997, WL 3.7164, Part 2:1990, AIR 9183 (21/11/1996), ISO 5832-3 Part 3:1996(E), AMS 6931A, ASTM B 348-10, MSRR 8652 Iss.16

	Al	V	Fe	C	N	O	Y	H	Residuals, %
									each
5.5 -	3.5 -	max	max	max	0.14 -	max	max	max	total
6.75	4.5	0.25	0.08	0.030	0.20	0.0050	0.010	0.10	0.40
TOP	6.53	4.08	0.19	0.006	0.002	0.194	<0.001	0.0004	<0.10
BOTTOM	6.54	4.09	0.19	0.004	0.003	0.194	<0.001	0.0018	<0.10

Requirement:

0.20% proof stress Tensile strength Elongation Reduction of area In the part, % as-pickled H Beta-Transus T°C Heat treatment T°C time

AMS 6931A, AMS 4928S

ASTM B 348-10

ISO 5832-3 Part 3:1996(E)

BS 7252-3:1997

11 891 979 17.2 45.4 11 0.0036 152 0.0038 1003 Top 700° 2 h air cooling

203 930 1017 16.8 46.4 182 0.0034 Bottom 993

Longitudinal

hbar hbar % %

min min min min

82 113 10 25

AIR 9183 (21.11.1996)

Longitudinal

11 89.1 97.9 17.2 45.4

203 93.0 101.7 16.8 46.4

Longitudinal

hbar hbar % %

min min min min

82 113 10 25

Prepared by Dushina A.A.

Name Dushina A.A. signature

Stamp VSMPO 13

VSMPO QA 32 TIRUS



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ANNEX 1 TO CERTIFICATE

24696Y11C

EN 10204-3.1, AS 9100/EN ISO 9001 CERT. № 01 117 048312

Requirement:

MSRR 8652, iss. 16
WL 3.7164, Part.2
BS 3TA 11:2009

0,20% proof stress	Tensile strength	Elonga- tion	Reduc- tion	Heat treatment T°, C	time
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Mpa Mpa % %

min 900-
830 1160

min 10

min 25

700°
air cooling

2 h

Requirement:

HBW
AIR 9183
(21.11.1996)

272-
352

11 302,0
63 302,0
102 302,0
131 302,0
153 306,0
203 307,0

AIR 9183
(21.11.1996)

Impact
strength
KCV
actual
11 35,31

Prepared by
Name

Dushina A.A.
Dushina A.A.

signature

stamp



416005091002206

VSMPO
QA 32
TIRUS