



"VSMPO-AVISIMA Corporation"

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INSPECTION CERTIFICATE

EN 10204-3.1 AS 9102EN ISO 9001 CERT. No 01 117 048312



CERTIFICATE No 24233Y11A

Date: 10.11.2011

Purchaser : Tirus International SA, Switzerland

Condition of delivery: Hot Rolled, Machined, Annealed, Pickled, Ground, (Without subsequent pickling)

Contract: 84054105TDD Annex 32
Purchaser order: 27423-RM
ASTM F 67-06
ASTM B 348 -13

Quality/ality: GRADE2

Object: BAR

Dimensions (mm) or Drawing No: dia 12.7x 2000-3000

Heat No: 8-42-05709

Lot No: 943-1

Item No	Units	Weight, (kg)	Residuals, max. %
	96	149	

Chemical Composition, % Requirement	Ti-remainder			
	O	Fe	C	N
ASTM B 348 - 13 max 0.25	max 0.30	max 0.08	max 0.03	max 0.015
ASTM F 67-06 0.166	0.048	0.004	0.002	1
0.148	0.049	0.004	0.001	0.0044

Requirement	0.20% proof stress		Tensile strength		Elongation		Reduction		Beta-transus		Heat treatment	
	MPa	min	MPa	min	%	min	%	T° C	T° C	time		
ASTM B 348 - 13		275		345	20	30					650	1 h
ASTM F 67-06		339		492	30.4	49.7					air cooling	
		323		479	30.8	53.3						

Macrostructure testing N/A

Microstructure testing As per ASTM F 67-06 par. 9.1. (free from alpha-case).

Ultrasonic inspection AMS 2631C Cl. AA. Longitudinal wave. Immersion method. Focused transducers.

We certify that, subject to exceptions or concessions listed hereafter, the supplies detailed here were manufactured in accordance with the technical specifications of the contract, order or sub-order and that, all inspections operations and tests having been completed, the articles comply in every respect with the relevant particular specifications, drawings and relevant standards and regulations in force. Information particular to the supplies delivered. Specify the reference of concessions granted.

Bar Heat Treatment 650° C, 1 h, air cooling.
Mercury Free.
Production start-up date: 01.10.2011
Diameter tolerance per ASTM E 67-06 h11 (+0/-0.130 mm)

Prepared by: Dushina A.A.
Name: Dushina A.A.

signature

stamp

