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Verkhneya Salda  
Metallurgical Production Association

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# INSPECTION CERTIFICATE

EN 10243.3.1.B ISO 9002 CERT. No 99 100 92260

**CERTIFICATE No 04287Y03E** date 26.06.2003

Purchaser: VSMPO TIRUS, U.S.A.  
Grade/Alloy: T6AMV

Condition of delivery Hot Rolled, Machined, Pickled

Contract : 8405431T Annex 4  
Purchaser order : 10804

Terms of delivery: GS0TF22-S17 Cl.C par. 3.1 (C.I.A.)



Item No	Units	Weight (kg/LB)	Object	Dimensions (mm/inch) or Drawing	Heat No	Lot No
406		1675/3690	BAR	dia 19,05 x 3050 - 3660 / 0,750x120-144	8-46-3035	616

Chemical Composition, %	Al		Mn		Mo		V		Ti-remainder		Cu	Sn	C	Fe	B	O <sub>2</sub>	N <sub>2</sub>	H <sub>2</sub>	Residuals, %		In the Part, %			
	5,50-8,75	max	0,10	max	0,10	max	0,10	max	0,10	max									each	total		max	max	max
TOP	6,35	0,002	0,019	4,01	0,020	0,007	0,008	0,10	0,06	0,30	0,014	0,20	0,06	0,0125	0,0014	0,174	0,008	0,0014	0,0012	0,062	0,0030	<0,10	0,066	<0,0003
BOTTOM	6,48	0,003	0,020	3,93	0,020	0,007	0,003	0,004	0,075	0,075	0,0081	0,007	0,0012	0,183	0,007	0,0012	0,062	0,0030	0,0030	0,0030	<0,10	0,066	<0,0004	

Requirement	0,20% proof stress		Tensile strength		Elongation		Reduction		Beta-transition		Heat treatment	
	MPa	min	MPa	min	%	min	%	min	T, F	T, F	time	
GS0TF22-S17 Cl.C	827	856	1008	1011	17,7	10	51,0	25	1810,4	1274	30 min cooling	
11	924	1008	17,7	10	51,0	25	1810,4	1274	30 min cooling			
12	934	1011	16,5	10	51,3	25	1819,4	1274	air			
249-10	917	967	16,7	10,9	50,0	25	51,7					
249-11	915	969	10,9		51,7							

Macrostructure testing As per AMS 2380F Level 10, P3TF25 no defects.  
GS0TF22  
No segregation detected  
Microstructure testing As per GS0TF22 Levels 10,20, single area 50 per 3.3.8 (free from alpha-case),  
Photo 320817, 320819  
Ultrasonic inspection As per P3TF34, S4, C.I.A. Longitudinal shear wave, immersion method.

We certify that, subject to exceptions for concentrations listed hereafter, the supplies detailed have been manufactured in accordance with the technical specifications of the contract, order or sub-order and that, all inspection operations and tests, having been completed, the supplies comply in every respect with the relevant particular specifications, drawings, and reference standards and regulations in force.  
Information particular to this supply delivered:  
Product is manufactured by VSMPO.  
Bar production to the established process.  
GEAR/VSMPO SAL-1 Agreement, MP 39.00.16.C.00 Rev.1, MP 38.00.6E.00 Rev.D, MP 39.01.26E.00 Rev.F.  
See Annex 1  
100% analysis for alloy compliance; no burnt areas.

Prepared by: Levina O.V.  
Name: Vasileva O.V.  
Signature: *[Signature]*  
Stamp: *[Stamp]*







# CERTIFICATE OF REPORT

## NF & M INTERNATIONAL, INCORPORATED

1729 PENNSYLVANIA AVENUE, MONACA, PENNSYLVANIA 15061 Ph. 724-774-9200/FAX 724-728-2544

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<b>Customer:</b> VSMPO - TIRUS, US - LEETSDALE 401 RIVERPORT DRIVE LEETSDALE PA 15056 ATTN: ACCOUNTS PAYABLE	<b>Ship To:</b> VSMPO - TIRUS PA WAREHOUSE 401 RIVERPORT DRIVE LEETSDALE PA 15056 ATTN: CHRIS CHMURA
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<b>NF&amp;M Work Order</b>	<b>Ingot No.</b>	<b>Size</b>	<b>Customer P.O.</b>
09884	8-46-3035	17500 In RND	29463-NI
<b>NF&amp;M Sales Order</b>	<b>Material</b>	<b>Description</b>	<b>Report Date</b>
0C3686-00	Titanium 6-4	ANNEALED BAR	12/02/2013

**SPECIFICATIONS: AMS4928T, ASTM B348-13**

**PRODUCT CHEMISTRY**

Sample	17	63	
Hydrogen (ppm) surface	8	7	Hot extraction method.

**TENSILE PROPERTIES (HEAT TREAT ID 1) (FULL SECTION PROPERTIES)**

Sample/Dir	22/L	32/L	
Ultimate (KSI)	145	147	
Yield (KSI) (0.2% offset)	135	139	
4D Elongation (%)	18	18	
Reduction (%)	50	51	

**HEAT TREATMENT**

Type: VACUUM ANNEALED  
 1) Temp (F): 1300 Duration (Hrs): 1.25 Argon Quenched.  
 Performed at Solar Atmospheres Inc.; 30 Industrial Road; Hermitage, PA 16148

**MACRO**

Acceptable to AMS2380 REV. F, LEVEL 10

**MICRO**

Acceptable to AMS4928T Para 3.5.1.2.1 (L)

**REMARKS**

Material conforms to the requirements of this purchase order.  
 ALLOY TYPE TESTING - OK  
 No Alpha Case present.  
 All properties performed at room temperature unless specified otherwise.  
 All testing performed at NF&M INTERNATIONAL unless specified otherwise  
 Material supplied or processed on this purchase order has not come in direct contact with mercury or it's compounds nor with any mercury containing device employing a single boundary of containment

**SHIPPING DATA**

Weight: 3695#

**QUALITY CONTROL**

*Jeffrey Keefer*  
 JEFFREY KEEFER, LAB TECHNICIAN CLASS 2



THE RECORDING OF FALSE, FICTITIOUS, OR FRAUDULENT STATEMENTS OR ENTRIES ON THE CERTIFICATE MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL LAW.  
 THE TEST REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF NF&M QUALITY.