

5374.5



Verkhneya Salda  
Metallurgical Production Association

1, Parkovaya St., Verkhneya Salda, Sverdlovsk rep.  
624 600, RUSSIA  
Phone (34345) 2-38-32, 2-17-66  
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Telex 348176, 348177 "SEVER"

# 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 : C50TF22-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		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	
TOP	6,35	0,002	0,019	4,01	0,020	0,007	0,008	0,008	0,004	0,075	0,0014	0,20	0,06	0,0125	0,0014	0,0012	0,062	0,0030	as-pickled
BOTTOM	6,48	0,003	0,020	3,93	0,020	0,007	0,003	0,004	0,075	0,0014	0,174	0,008	0,007	0,0014	0,0012	0,066	0,0030	<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	
C50TF22-S17 Cl.C	827	856	1008	856	10	25	1810,4	1819,4	1274	30 min	cooling	
	924	934	1011	987	10,9	25	1810,4	1819,4	1274	30 min	cooling	

Macrostructure testing As per AMS 2380F Level 10, P3TF25 no defects.  
C50TF22  
No segregation detected  
Microstructure testing As per C50TF22 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  
Name: Levina O.V.  
Vasileva O.V.

signature  
0.0.0  
stamp





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# ANNEX TO INSPECTION CERTIFICATE

EN 10204-3.16 ISO 9002 CERT. No. 00100 95280



Purchaser: VSMPO TIRUS, USA  
Quantity of Bars 406

Requirement C50TF22-S17 CLC par. 3.1 (CIA)

Heat Lot 8-46-3033  
Lot 618

Product: Bar  
Quantity of Samples

Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #	Bar #
11	22	37	49-3	58-4	72	83	88	109-4	119-5	133	148	168-4	172	187	188	189	199-1	199-2	209-7	211	225	238-3	248-9	249-6	
12	23	38	49-4	58-5	73	84	90	109-5	119-6	134	149	169-5	173	188	189	199-2	209-8	212	226	239-4	249-10	249-7	249-3	249-5	
13	24	39	49-5	59-6	74	85	91	109-6	119-7	135	150	170-2	174	189	190	199-3	209-9	213	227	240-1	249-8	249-4	249-2	249-1	
14	25	40-1	49-6	59-7	75	86	92	109-7	121	136	151	171	187	189	190	199-4	209-10	214	228	241	249-11	249-8	249-4	249-1	
15	26	40-2	49-7	59-8	76	87	93	109-8	122	137	152	172	188	190	191	199-5	209-11	215	229	242	249-12	249-9	249-5	249-2	
16	27	40-3	49-8	59-9	77	88	94	109-9	123	138	153	173	189	191	192	199-6	209-12	216	230	243	249-13	249-10	249-6	249-3	
17	28	40-4	49-9	59-10	78	89	95	109-10	124	139	154	174	190	192	193	199-7	209-13	217	231	244	249-14	249-11	249-7	249-4	
18	29	40-5	49-10	59-11	79	90	96	109-11	125	140	155	175	191	193	194	199-8	209-14	218	232	245	249-15	249-12	249-8	249-5	
19	30	40-6	49-11	59-12	80	91	97	110	126	141	156	176	192	194	195	199-9	209-15	219	233	246	249-16	249-13	249-9	249-6	
19-1	31	41	52	67	79-2	89-3	101	112	127	139-3	151	166	179-2	189-6	190	199-10	209-16	220	234	247	249-17	249-14	249-10	249-7	
19-2	32	42	53	68	79-3	89-4	102	113	128	140	152	167	179-3	189-7	190	199-11	209-17	221	235	248	249-18	249-15	249-11	249-8	
19-3	33	43	54	69	79-4	89-5	103	114	129	141	153	168	179-4	189-8	190	199-12	209-18	222	236	249	249-19	249-16	249-12	249-9	
19-4	34	44	55	70-5	89-6	104	115	129-1	142	143	154	169	179-5	189-9	190	199-13	209-19	223	237	250	249-20	249-17	249-13	249-10	
19-5	35	45	56	70-6	89-7	105	116	129-2	143	144	155	170	179-6	189-10	190	199-14	209-20	224	238	251	249-21	249-18	249-14	249-11	
19-6	36	46	57	70-7	89-8	106	117	129-3	144	145	156	171	179-7	189-11	190	199-15	209-21	225	239	252	249-22	249-19	249-15	249-12	
19-7	37	47	58	70-8	89-9	107	118	129-4	145	146	157	172	179-8	189-12	190	199-16	209-22	226	240	253	249-23	249-20	249-16	249-13	
19-8	38	48	59	70-9	89-10	108	119	129-5	146	147	158	173	179-9	189-13	190	199-17	209-23	227	241	254	249-24	249-21	249-17	249-14	
19-9	39	49	60-6	70-10	89-11	109	120	129-6	147	148	159	174	179-10	189-14	190	199-18	209-24	228	242	255	249-25	249-22	249-18	249-15	
19-10	40	50-1	60-7	70-11	89-12	110	121	129-7	148	149	160	175	179-11	189-15	190	199-19	209-25	229	243	256	249-26	249-23	249-19	249-16	
19-11	41	50-2	60-8	70-12	89-13	111	122	129-8	149	150	161	176	179-12	189-16	190	199-20	209-26	230	244	257	249-27	249-24	249-20	249-17	
21	38	49-2	59-3	71	82	87	109-3	119-1	132	147	162	177	186	196	200-1	200-2	219-7	221	237	249-3	249-4	249-1	249-2	249-3	

Notes:

- 1. Total quantity of bars: 406
- 2. Bars excluded from the lot: N/A
- 3. Bar length min 2440 mm: 11, 29, 129-6, 34, 54, 57, 65, 69, 73, 68-7, 94, 98, 99, 2, 141, 193, 194, 230-3, 129
- 4. Bars excluded from the lot due to US-results: N/A
- Weight: N/A kg
- Internal Defects: N/A
- Surface Defects: N/A

Prepared by Levina O.V.  
Name Vasileva O.V.

signature: *C. J.*

stamp:

**CERTIFICATE OF REPORT  
NF & M INTERNATIONAL, INCORPORATED**

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

Page 1 of 1

**Customer:**

VSMPO - TIRUS, US - LEETSDALE  
401 RIVERPORT DRIVE  
LEETSDALE PA 15056  
ATTN: ACCOUNTS PAYABLE

**Ship To:**

VSMPO - TIRUS PA WAREHOUSE  
401 RIVERPORT DRIVE  
LEETSDALE PA 15056  
ATTN: CHRIS CHMURA

NF&M Work Order	Ingot No.	Size	Customer P.O.
09884	8-46-3035	17500 In RND	29463-NI
NF&M Sales Order	Material	Description	Report Date
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, 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.