

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
Fax (34345) 2-47-36, 2-05-00
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		Cu	Sn	C	Fe	B	O ₂	N ₂	H ₂	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	max
TOP	6,35	0,602	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	0,174	0,008	0,0014	0,0012	0,062	0,0030	<0,10	0,066	0,0030	<0,0004
BOTTOM	6,48	0,603	0,020	3,93	0,020	0,007	0,003	0,004	0,075	0,0081	0,0014	0,183	0,007	0,0012	0,066	0,0030	0,0030	0,0030	0,0030	0,0030	0,0030	<0,10	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	

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





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ANNEX TO
INSPECTION
CERTIFICATE

EN 10204-3.18 ISO 9002 CERT. No 00.100.95280



ANNEX 1 CERTIFICATE 04267Y03B

Purchaser: VSMPO TIRUS, USA

Requirement: C50TF22-S17 CLC par. 3.1 (CIA)

Quantity of Bars 405

Heat Lot 8-46-3033

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	195	209-4	222	238	249-6
12	23	38	48-4	59-5	73	84	90	109-5	119-6	134	149	169-5	173	188	199	209-5	223	238	249-6
13	24	39	48-5	59-6	74	85	95-1	109-6	119-7	135	149	169-6	174	189	199-1	209-6	224	239-1	249-7
14	25	39-1	49-6	59-7	75	86	95-2	109-7	121	136	149-2	169-7	175	189-1	199-2	209-7	225	239-2	249-8
15	26	39-2	49-7	61	76	87	95-3	109-8	122	137	149-3	161	176	189-2	199-3	211	226	239-3	249-9
16	27	39-3	49-8	62	77	88	95-4	109-9	123	138	149-4	162	177	189-3	199-4	212	227	239-4	249-10
17	28	39-4	49-9	63	78	89	95-5	109-10	124	139	149-5	163	178	189-4	199-5	213	228	239-5	249-11
18	29	39-5	49-10	64	79	90-1	95-6	109-11	125	139	149-6	164	179	189-5	199-6	214	229	239-6	249-12
19	29-1	39-6	49-11	65	79-1	90-2	95-7	111	126	139-1	149-7	165	179-1	189-6	199-7	215	229-1	241	249-13
19-1	29-2	39-7	51	66	79-2	90-3	101	112	127	139-2	151	166	179-2	189-7	201	216	229-2	242	249-14
19-2	29-3	41	52	67	79-3	89-4	102	113	128	139-3	152	167	179-3	189-8	202	217	229-3	243	249-15
19-3	29-4	42	53	68	79-4	89-5	103	114	129	139-4	153	168	179-4	189-9	203	218	229-4	244	249-16
19-4	29-5	43	54	69	79-5	89-6	104	115	130	139-5	154	169	179-5	189-10	204	219	229-5	245	249-17
19-5	29-6	44	55	70	79-6	89-7	105	116	131	139-6	155	170	179-6	189-11	206	219-1	229-6	246	249-18
19-6	29-7	45	56	70-1	79-7	91	106	117	132	141	156	170-1	179-7	191	206	219-2	231	247	249-19
19-7	31	46	57	69-2	79-8	92	107	118	133	142	157	170-2	181	192	207	219-3	232	248	249-20
19-8	32	47	58	69-3	79-9	93	108	119	134	143	158	170-3	182	193	208	219-4	233	249	249-21
19-9	33	48	59	69-4	79-10	94	109	120	135	144	159	170-4	183	194	209	219-5	234	249-1	249-22
19-10	34	49	59-5	69-5	79-11	95	109-1	121	136	145	160	170-5	184	195	209-1	219-6	235	249-2	249-23
19-11	35	49-1	69-6	69-6	79-11	95	109-2	122	137	146	161	170-6	185	196	209-2	219-7	236	249-3	249-24
21	38	49-2	59-3	71	82	87	109-3	123	138	147	162	171	186	197	209-3	221	237	249-4	249-25

Notes:

1. Total quantity of bars: 408
2. Bars excluded from the lot: N/A
3. Bars excluded from the lot due to US-results: N/A
Weight: kg
Internal Defects:
Surface Defects:

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

Signature: *O. Vasileva*



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
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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
 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.