

# National Bureau of Standards

## Certificate of Analysis

### Standard Reference Material 648

### Titanium-Base Alloy 5Al-2Sn-2Zr-4Cr-4Mo

(In Cooperation with the American Society for Testing and Materials)

This Standard Reference Material (SRM) is in the form of chips sized between 0.50 and 1.18 mm sieve openings (35 and 16 mesh). It is intended for use primarily in chemical methods of analysis. Material from the same lot is available in disk form as SRM 1133, primarily for use in optical emission and x-ray spectrometric methods of analysis.

<u>Constituent</u>	<u>Certified Value<sup>1</sup> Percent by Weight</u>	<u>Estimated Uncertainty<sup>2</sup></u>
Aluminum	5.13	0.05
Molybdenum	3.75	.05
Chromium	3.84	.03
Tin	1.98	.02
Zirconium	1.84	.04
Iron	0.15	.01
Silicon	.027	.003
Carbon	.011	.002

<sup>1</sup> The certified value listed for a constituent is the present best estimate of the "true" value based on the results of the Cooperative Program for Certification.

<sup>2</sup> The estimated uncertainty listed for a constituent is based on judgment and represents an evaluation of the combined effects of method imprecision, possible systematic errors among methods, and material variability for samples of 0.5 gram or more. (No attempt was made to derive exact statistical measures of imprecision because several methods were involved in the determination of most constituents.)

The overall coordination of the technical measurements leading to certification was performed under the direction of J.I. Shultz, Research Associate, ASTM/NBS Research Associate Program.

The technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by W.P. Reed and R. Alvarez.

June 15, 1987  
Gaithersburg, MD 20899

Stanley D. Rasberry, Chief  
Office of Standard Reference Materials

## PLANNING, PREPARATION, TESTING, ANALYSIS

The material for this Standard Reference Material was provided by Timet, Henderson, Nevada, courtesy of G.F. Boesenecker.

Homogeneity testing at NBS was performed by T.W. Vetter and J.A. Norris by optical emission analysis.

Cooperative analyses for certification were performed in the following laboratories:

- Analytical Associates, Inc. Detroit, Michigan, C.K. Deak and R.E. Swartz.
- Ladish Co., Inc., Cudahy, Wisconsin, G.G. Bugalski and J.E. Rafalski.
- Ormet Titanium, Oregon Metallurgical Corp., Albany, Oregon, A.D. Fryer.
- R.M.I. Titanium, RMI Co., Niles, Ohio, F.Kubli, Jr.
- Timet, Titanium Metals Corporation of America, Henderson Technical Laboratory, Henderson, Nevada, G.F. Boesenecker.
- Timet, Titanium Metals Corporation of America, Process Control Laboratory, Henderson, Nevada, K.E. Weiss.
- Wyman-Gordon Co., Eastern Division, North Grafton, Massachusetts, J.S. Fipphen and K.D. Norlin.

Elements other than those certified may be present in this material as indicated below. These are not certified, but are given as additional information on the composition.

<u>Element</u>	<u>Concentration % by weight</u>
B	(0.001)
Cu	(< .01)
Mg	(< .01)
Mn	(< .01)
Ni	(< .005)
N	(0.01)
V	(< .02)