



# National Institute of Standards & Technology

## Certificate of Analysis

### Standard Reference Material 649

#### Titanium-Base Alloy (15V-3Al-3Cr-3Sn)

(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 developing and verifying chemical methods of analysis.

Constituent	Certified Value <sup>1</sup> Percent by Weight	Estimated Uncertainty <sup>2</sup>
Vanadium	15.1	0.1
Aluminum	3.08	.02
Tin	3.04	.04
Chromium	2.96	.02
Iron	0.133	.004
Carbon	.011	.001

<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. 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/NIST Research Associate Program.

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

#### 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 NIST was performed by J.A. Norris by optical emission analysis.

Cooperative analyses for certification were performed in the following laboratories:

- Oremet Titanium, Oregon Metallurgical Corp., Albany, Ore., A.D. Fryer.
- RMI Titanium, RMI Company, 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 Company, Eastern Division, North Grafton, Massachusetts, C.M. Beck and K.D. Norlin.

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Gaithersburg, MD 20899

William P. Reed, Acting Chief  
Standard Reference Materials Program

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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.

Element	Concentration % by weight
B	(<0.001)
Cu	(< .001)
Mg	( .004)
Mn	(< .01)
Ni	(< .01)
Nb	(< .01)
N	( .01)