

U. S. DEPARTMENT OF COMMERCE  
 WASHINGTON 25, D. C.  
 NATIONAL BUREAU OF STANDARDS  
 PROVISIONAL CERTIFICATE OF ANALYSES  
 (Revised)

ZIRCONIUM METAL STANDARDS

FOR

SPECTROCHEMICAL ANALYSIS

NBS No. <u>1/</u> Designation	1210 Zirconium A	1211 Zirconium B
Element <u>2/</u>	Percent	
Iron	0.25	0.10 <sub>2</sub>
	Parts per Million	
Aluminum	(60) <sup>3/</sup>	(90)
Boron	(<0.25)	---
Chromium	95	95
Copper	10	44
Manganese	( 5)	( 7)
Molybdenum	--	22
Nickel	8	26
Silicon	(30)	(100)
Titanium	26	50
Tungsten	( 4)	(40)
Uranium	1.8	2.3

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- 1/ Size: Samples are disks 1 1/4 in. in diameter and 3/4 in. thick.  
2/ Other elements also are contained in the standards: Cd, Co, Hf, Pb, V, P, Zn, Sn, Gd, Yb, C, O, and N. Some of these may be certified later.  
3/ Values in parentheses are not certified, but are given for additional information on the composition.

The material for the standards was provided by the U. S. Atomic Energy Commission. For each standard, the sponge together with suitable additions was triple arc-melted in vacuum by the Albany, Oregon Station of the U. S. Bureau of Mines. The molten metal was poured from a skull into a graphite mold to form a single ingot, the casting also being done under vacuum.

After cropping top and bottom, the ingot was cut lengthwise to remove the center section, approximately one-fourth of the ingot, which was discarded. The remaining sections then were fabricated to rods, annealed, and centerless ground to 1 1/4 in. in diameter.

Homogeneity testing was performed by spectrochemical and chemical analyses at the National Bureau of Standards, Washington 25, D. C., and by the following cooperating laboratories:

Columbia-National Corp., Pensacola, Fla.  
Reactive Metals Inc., Ashtabula, Ohio  
Westinghouse Electric Corp., Bettis Plant, Pittsburgh, Pa.

Chemical analyses, and spectrochemical analyses relative to carefully prepared synthetic standards, were made on millings cut from the cross section of the rods by the following laboratories:

National Bureau of Standards, Washington 25, D. C.  
The Carborundum Co., Akron, N. Y.  
General Electric Co., Knolls Atomic Power Laboratory, Schenectady, N. Y.  
Oregon Metallurgical Corp., Albany, Oregon  
U. S. Atomic Energy Commission, New Brunswick Lab., New Brunswick, N. J.  
U. S. Department of the Interior, Bureau of Mines, Albany, Oregon  
Wah Chang Corp., Albany, Ore.  
Westinghouse Electric Corp., Bettis Plant, Pittsburgh, Pa.

Chemical analyses were also made by the following laboratories:

Metals and Control Inc., Attleboro, Mass.  
Westinghouse Electric Corp., Atomic Fuels Dept., Cheswick, Pa.

Spectrographic analyses were also made by the following laboratories:

Babcock and Wilcox Co., Nuclear Facilities Plant, Lynchburg, Va.  
Reactive Metals Inc., Ashtabula, Ohio  
United Nuclear Corporation, New Haven, Conn.

*Harry C. Allen, Jr.*  
Harry C. Allen, Jr., Chief  
Analytical & Inorganic Chemistry  
Division

Washington 25, D. C.  
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(Supersedes certificate dated December 29, 1961)