

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 689

Ferrochromium Silicon

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

This material is in the form of fine powder for use in checking chemical methods of analysis and in calibration with instrumental methods of analysis.

Constituent	Certified Value, ¹ Percent by Weight	Estimated Uncertainty ²
Carbon	0.043	0.002
Manganese	.32	.01
Phosphorus	.026	.002
Sulfur	.002	.001
Silicon	39.5	.4
Copper	0.013	.002
Nickel	.20	.03
Chromium	36.4	.2
Vanadium	0.09	.01
Aluminum	.049	.004
Titanium	.40	.01
Cobalt	.034	.003
Iron	23.2	.2
Boron	0.0017	.0004

¹The certified values listed for a constituent is the present best estimate of the "true" value based on the results of the cooperative program for certification.

²The 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 0.5 g 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 R.E. Michaelis.

Washington, D.C. 20234
February 24, 1982

George A. Uriano, Chief
Office of Standard Reference Materials

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PLANNING, PREPARATION, TESTING, ANALYSIS:

The material for this standard was provided by SKW Alloys, Inc., Niagara Falls, New York, courtesy of J.E. Cumbo.

The crushing, grinding, and sieving were performed by the Elkem Metals Co., Marietta, Ohio, courtesy of H.H. Hall.

Following sieving and blending operations at NBS, homogeneity testing was performed by J.E. Cumbo, SKW Alloys, Inc., Niagara Falls, New York. The material variability was determined to be within the method imprecision.

Cooperative analyses for certification were performed in the following laboratories:

Allegheny Ludlum Steel Corp., Flat Rolled Products Division, Brackenridge, Pa.; A.I. Fulton and C.W. Hartig.

Andrew S. McCreath & Son, Inc., Harrisburg, Pa.; R.F. Lippi.

Elkem Metals Co., Marietta, Ohio; H.H. Hall.

Interlake, Inc., Globe Metallurgical Division, Beverly, Ohio; J.C. Cline and R. Pontello.

National Bureau of Standards; R.K. Bell, ASTM-NBS Research Associate Program.

Republic Steel Corp., Central Alloy Division, Canton, Ohio; R.W. Jones and B.G. Brainard.

SKW Alloys, Inc., Niagara Falls, New York; J.E. Cumbo.

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>
Pb	(0.004)
Bi	(<.003)
As	(.009)
O	(.06)
N	(.002)