U. S. Department of Commerce
Malcolm Baldrige
Secretary

National Bureau of Standards
Ernest Ambler, Director

National Bureau of Standards Certificate of Analysis

Standard Reference Material 334

Gray Cast Iron

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

This SRM is in the form of fine chips and is intended for use in calibrating instruments used in the determination of carbon and sulfur.

This standard contains an appreciable amount of graphitic carbon and should be mixed gently before use.

Constituent	Total Carbon	Sulfur
Certified Value, % by wt.[1]	2.83	0.043
Estimated Uncertainty[2]	0.03	0.001
Labs		
1	2.82[a] 2.85[b]	0.043[b]
2	2.83	.043[c]
3	2.81[b]	.042[b]
4	2.86	.044
5	2.80[d]	.043[c] .044[b]
6	2.86[a]	.042[c]

[1] 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.

[2] 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 g or more. (No attempt was made to derive exact statistical measures of imprecision because several methods were involved in the determination of the constituents.)

[a] Combustion-gravimetric
[b] Combustion-infrared detection
[c] Combustion-iodate titration
[d] Combustion-volumetric

The overall coordination of the technical measurements leading to certification were 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
March 30, 1982

George A. Uriano, Chief
Office of Standard Reference Materials

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PLANNING, PREPARATION, TESTING, ANALYSIS:

The material for this standard was prepared at the American Cast Iron Pipe Company, Birmingham, Ala.

Preliminary homogeneity testing was performed at the American Cast Iron Pipe Company by spectrochemical analyses on samples before and following casting of the material.

Following chipping of the material, final homogeneity testing was performed at NBS for total carbon. Determinations were made using 0.25 g samples on selected portions representing the entire lot.

Cooperative analyses were performed in the following laboratories:

American Cast Iron Pipe Company, Birmingham, Ala., R.N. Smith and W.R. Kennedy.

Ford Motor Company, Central Laboratory Services, Dearborn, Michigan, H.B. Aaron and C.J. Kelly.

Jones & Laughlin Steel Corporation, Pittsburgh, Pa., M.L. Harmon.

National Bureau of Standards, B.I. Diamondstone and S.A. Wicks.

U.S. Pipe & Foundry Company, Birmingham, Ala., J.P. Anderson and G.L. Reifsnyder.

Youngstown Sheet & Tube Co., Youngstown, Ohio, L.E. Chalker.

Although *not certified,* additional information on the composition is given below.

Constituent	Non-Certified Value, Percent by Weight	Constituent	Non-Certified Value, Percent by Weight
Graphitic Carbon	(2.3)	Molybdenum	(0.040)
Manganese	(0.82)	Aluminum	(.004)
Phosphorus	(.14)	Antimony	(<.001)
Silicon	(1.3)	Arsenic	(.03)
Copper	(0.24)	Lead	(.001)
Nickel	(.04)	Nitrogen	(.0017)
Chromium	(.12)	Tin	(.004)
Vanadium	(.025)	Titanium	(.03)