

# National Bureau of Standards

## Certificate of Analysis

### Standard Reference Material 1223

#### Chromium Steel

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

This Standard Reference Material (SRM) is in the form of a disk, approximately 32 mm (1 1/4 in) in diameter and 19 mm (3/4 in) thick, intended for use in calibrating optical emission and x-ray spectrometric methods of analysis. Material from the same lot is available in the form of chips as SRM 133b for use in checking chemical methods of analysis.

<u>Constituent</u>	<u>Certified Value<sup>1</sup></u> <u>Percent by Weight</u>	<u>Estimated<sup>2</sup></u> <u>Uncertainty</u>
Carbon	0.127	0.003
Manganese	1.08	.01
Phosphorus	0.018	.001
Sulfur	.329	.009
Silicon	.327	.005
Copper	.081	.004
Nickel	.232	.004
Chromium	12.64	.03
Vanadium	0.068	.002
Molybdenum	.053	.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-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.

Gaithersburg, MD 20899  
September 5, 1985

Stanley D. Rasberry, Chief  
Office of Standard Reference Materials

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**PLANNING, PREPARATION, TESTING, ANALYSIS:**

The material for this SRM was provided by the Republic Steel Corporation through the courtesy of R. W. Jones.

Homogeneity testing was performed at NBS by optical emission spectrometric analysis, J.A. Norris, B.I. Diamondstone, and T.W. Vetter, Inorganic Analytical Research Division of NBS and by R.K. Bell, ASTM-NBS Research Associate Program.

Cooperative analyses for certification were performed in the following laboratories:

Amax Materials Research Center, Ann Arbor, Michigan, R.C. Binns.

LTV Steel Company, Bar Division, Canton, Ohio; B. Pitts, J. Lawrence and C. Myers.

National Bureau of Standards, Inorganic Analytical Research Division, Gaithersburg, Maryland, B.I. Diamondstone, T.W. Vetter and R.K. Bell, ASTM-NBS Research Associate Program.

The Timken Company, Canton, Ohio; N.J. Stecyk.

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>
Aluminum	(<0.005)
Calcium	( <.0005)
Lead	( .0001)
Magnesium	( <.0005)
Tin	( .004)
Nitrogen	( .05)