



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 1233

Valve Steel

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

This Standard Reference Material (SRM) is in the form of a disk, approximately 35 mm (1 3/8 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 346a for use in checking chemical methods of analysis.

<u>Constituent</u>	<u>Percent by Weight¹</u>	<u>Estimated Uncertainty₂</u>
Carbon	0.502	0.004
Manganese	9.16	0.03
Phosphorus	0.031	0.003
Sulfur	0.002	0.001
Silicon	0.219	0.009
Copper	0.375	0.005
Nickel	3.43	0.02
Chromium	21.08	0.06
Vanadium	0.096	0.004
Molybdenum	0.237	0.003

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. 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 P.A. Lundberg.

Gaithersburg, MD 20899
March 6, 1992
(Revision of certificate dated 2-3-86)

William P. Reed, Chief
Standard Reference Materials Program

(over)

PLANNING, PREPARATION, TESTING, ANALYSIS

The material for this SRM was provided by Armco Steel, Stainless Division, Baltimore, Maryland.

Homogeneity testing was performed at NIST by B.I. Diamondstone, R.C. Gauer, J.A. Norris and by R.K. Bell, ASTM/NIST Research Associate Program.

Cooperative analyses for certification were performed in the following laboratories:

- Allegheny Ludlum Steel Corporation, Brackenridge Chemical Laboratory, Brackenridge, Pennsylvania; A.I. Fulton, C.W. Hartig, R.M. Crain and G. Bergstrom.
- Armco Inc., Research and Technology, Middletown, Ohio; C.C. Borland, O. Brezny, J.D. Holland, J.W. Leeker, G.D. Smith, R.L. Swigert, B.J. Young, N.G. Sellers and D.E. Gillum.
- Carpenter Technology Corporation, Carpenter Steel Division, Reading, Pennsylvania, T.R. Dulski.
- Colt Industries, Crucible Research Center, Pittsburgh, Pennsylvania; G.L. Vassilaros and C.J. Byrnes.
- Colt Industries, Specialty Metals Division, Syracuse, New York; R. Wlodarczyk and H.P. Mortimer.
- Leco Corporation, St. Joseph, Michigan; R.B. Fricioni.
- National Institute of Standards & Technology, Inorganic Analytical Research Division, Gaithersburg, Maryland; B.I. Diamondstone, T.W. Vetter, R.C. Gauer, and R.K. Bell, ASTM/NIST Research Associate Program.

Elements other than those certified are present in this material as indicated below. These are not certified, but are given as additional information on the composition.

<u>Element</u>	<u>Percent by Weight</u>
Aluminum	(0.001)
Boron	(<.001)
Cobalt	(0.05)
Lead	(<.0001)
Niobium	(0.01)
Tin	(0.008)
Titanium	(<.001)
Tungsten	(0.01)