

National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 1222

Chromium-Nickel-Molybdenum Steel

(AISI 8640)

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

This SRM is in the form of an annealed disk 32 mm (1 1/4 in) in diameter and 19 mm (3/4 in) thick, intended for use in optical emission and x-ray spectrometric methods of analysis¹.

<u>Constituent</u>	<u>Certified Value²</u> <u>Percent by weight</u>	<u>Estimated</u> <u>Uncertainty³</u>
Carbon	0.43	0.01
Manganese	.78	.01
Phosphorus	.013	.001
Sulfur	.022	.002
Silicon	.24	.01
Copper	.097	.005
Nickel	.51	.01
Chromium	.48	.01
Vanadium	.005	.001
Molybdenum	.18	.01

¹This material is also available in the form of chips, SRM 1296, intended for use in checking chemical methods of analysis.

²The certified value listed for a constituent is the present best estimate of the "true" value.

³The 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 analysis of most constituents.)

Gaithersburg, MD 20899
September 13, 1990
(Revision of certificate dated 10-3-78)

William P. Reed, Acting Chief
Standard Reference Materials Program

(over)

PLANNING, PREPARATION, TESTING, ANALYSIS: For many metal SRMs it is desirable to make the material available in the form of chips for chemical methods of analysis, and solids for optical emission and x-ray spectrochemical methods of analysis. Prior to the preparation of SRM 139b (chip form) plans were also made to provide this material as SRM 1222 (solid form).

The material for this SRM was provided by the Bethlehem Steel Corporation, Bethlehem, PA. Selected sections were rolled to rounds approximately 130 mm (5 1/4 in) in diameter. At NIST these were lathe cut to a diameter of about 85 mm (3 1/4 in) to provide chips for SRM 139b. The remaining cores were processed at the Naval Research Laboratory, Washington, D.C., by forging and forge rolling to oversized rods 32mm (1 1/4 in) in diameter, followed by annealing (T. Kissilnitkie).

Cooperative analyses for certification of SRM 139b were performed in the following laboratories:

Bethlehem Steel Corporation, Sparrows Point Plant, Sparrows Point, MD, F.G. Fick.

Department of the Army, Army Materials and Mechanics Research Center, Watertown, MA, F.P. Valente and G.J. Bluteau.

Joslyn Stainless Steels, Fort Wayne, IN, C.A. Spellman.

Homogeneity testing of SRM 1222 and comparative analysis of it to SRM 139b for certification, were performed in the NIST Center for Analytical Chemistry by B.I. Diamondstone and J.A. Norris.

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 revision, update and issuance of this Standard Reference Material were coordinated through the Standard Reference Materials Program by P. Lundberg. The original coordination of certification efforts was performed by R.E. Michaelis.

ADDITIONAL INFORMATION ON THE COMPOSITION: Certification is made only for the elements indicated. Although not certified, additional information on the composition is presented as follows:

<u>Constituent</u>	<u>Approximate value (wt. %)</u>
Aluminum (Total)	(0.038)
Cobalt	(.016)
Nitrogen	(.007)
Niobium	(.002)
Titanium	(.002)
Zirconium	(.001)