



# National Bureau of Standards

## Certificate of Analysis

### Standard Reference Material 1157

#### Tool Steel (AISI M2)

This material is available in solid form primarily for application in optical emission and x-ray spectrometric methods of analysis. A companion material, SRM 132b, is available in chip form primarily for use in checking chemical methods of analysis.

<u>Element</u>	<u>Percent by Weight</u>
Carbon.....	0.84
Manganese.....	.34
Phosphorus.....	.01 <sub>3</sub>
Sulfur.....	.005
Silicon.....	.18
Copper.....	.08 <sub>7</sub>
Nickel.....	.23
Chromium.....	4.35
Vanadium.....	1.83
Molybdenum.....	4.8 <sub>7</sub>
Tungsten.....	6.2 <sub>8</sub>
Cobalt.....	0.028

SIZE AND METALLURGICAL CONDITION: Annealed disks, 32 mm (1 1/4in) in diameter and 19 mm (3/4in) thick.

PROVISIONAL CERTIFICATION: The value listed for an element is the present best estimate of the "true" value based on the results of the analytical program. The value listed is not expected to deviate from the "true" value by more than + 1 in the last significant figure reported; for a subscript figure the deviation is not expected to be more than + 5. Based on the results of homogeneity testing, maximum variations within and among samples are estimated to be less than the uncertainty figures given above.

The overall direction and coordination of the technical measurements leading to certification were performed under the direction of O. Menis and J. I. Shultz.

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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  
November 7, 1972

J. Paul Cali, Chief  
Office of Standard Reference Materials

PLANNING, PREPARATION, TESTING, ANALYSIS: For many metal SRM's, it is desirable to make the material available in the form of chips primarily for chemical methods of analysis, and solids primarily for optical emission and x-ray spectrochemical methods of analysis. Prior to the preparation of SRM 132b (chip form) plans were also made to provide this material as SRM 1157 (solid form).

The material for this standard was vacuum melted and cast at the Carpenter Technology Corporation, Reading, Pa. Selected sections were rolled to rounds approximately 130 mm (5 1/4in) in diameter. At NBS these were lathe cut to a diameter of about 85 mm (3 1/4in) to provide chips for SRM 132b. The remaining cores were processed at Carpenter Technology Corporation to the final solid size by rolling, annealing, and centerless grinding.

Homogeneity testing was performed at NBS by J. L. Weber, Jr., and was found to be satisfactory.

Analyses for this Provisional Certificate of Analysis were performed by the NBS Analytical Chemistry Division; Carpenter Technology Corporation, Reading, Pa.; Ledoux and Company, Teaneck, N. J.; and Bethlehem Steel Corporation, Baltimore, Md.