

# Certificate of Analysis

## Standard Reference Material 1170<sup>1</sup>

### Selenium-Bearing Steel

	<i>Percent</i>
Carbon -----	0.089
Manganese -----	.79
Phosphorus -----	.109
Sulfur -----	.207
Silicon -----	.163
Selenium <sup>2</sup> -----	.29 <sub>3</sub>

<sup>1</sup> Size—Samples are 1¼ in. in diameter and ¾ in. thick.

<sup>2</sup> Homogeneity—Selenium was observed to vary from one end to the other longitudinally along the rod. The observed variation was about 0.005 percent selenium in either direction. No significant variation was observed for the cross section. The homogeneity was investigated by metallographic examination, by optical emission and by x-ray spectrochemical analysis (D. M. Bouchette) at the National Bureau of Standards.

Material for the standard was prepared at the Applied Research Laboratories of the United States Steel Corporation, and supplied to NBS in the form of rods 1½ in. in diameter. These rods were lathe cut at NBS to 1¼ in. in diameter.

Intended Use—The sample is for application in optical emission and x-ray spectroscopic analysis. Metallographic examination shows a difference in structure for the transverse section as compared to the longitudinal (rolling direction) section. It is recommended that for both the standard sample and unknown samples, the analyses be performed on the transverse cross section. Because the selenium is present as soft particles in a relatively hard steel matrix, care must be taken to insure the surface analyzed represents the metal. In optical emission analysis the usual surface preparation will suffice, although a longer preburn may be necessary. The surface preparation for x-ray analysis is more critical, and may require wet-finishing with a fine-grit paper.

Chemical analyses were made on millings cut from the cross section of the rods by J. R. Baldwin, R. K. Bell, D. A. Becker, E. Anderson, and G. W. Smith, Division of Analytical Chemistry, Institute for Materials Research, National Bureau of Standards; United States Steel Corporation Laboratories; W. F. Smith, Aliquippa Works Division, Jones and Laughlin Steel Corporation; and D. P. Robertson, Weirton Steel Company, Weirton, West Virginia.