

U. S. Department of Commerce  
 Frederick B. Dent  
 Secretary

National Bureau of Standards  
 Harold W. Roberts, Director

# National Bureau of Standards

## Certificate of Analysis

### Standard Reference Material 1170a

#### Selenium-Bearing Steel

This standard is in the form of disks 31 mm (1 1/4 in) in diameter and 6.3 mm (1/4 in) thick, primarily for use in x-ray spectrometric analysis.<sup>a/</sup>

<u>Element</u>	<u>Certified</u>	<u>Percent by Weight</u>
Selenium .....	.....	0.25 <sup>b/</sup>
	<u>Not Certified<sup>c/</sup></u>	
Carbon .....	.....	(.052)
Manganese .....	.....	(.738)
Phosphorus .....	.....	(.129)
Sulfur .....	.....	(.013)
Silicon .....	.....	(.654)
Copper .....	.....	(.199)
Nickel .....	.....	(8.89)
Chromium .....	.....	(17.42)
Vanadium .....	.....	(0.058)
Molybdenum .....	.....	(.248)
Cobalt .....	.....	(.096)

<sup>a/</sup> SRM 1170 was a selenium-bearing, low-alloy steel certified for C, Mn, P, S, Si, and Se. SRM 1170a is a selenium-bearing stainless steel and is the core material remaining after chipping to form the chemical SRM 339. Only Se is certified, although chemical information on the other elements appearing on the certificate for SRM 339 is included.

<sup>b/</sup> Homogeneity testing for Se was performed by x-ray fluorescence analysis (R. L. Myklebust.) Longitudinal variability was observed to be from 0.240 to 0.257%; no significant transverse variability was observed. Metallographic examination also was performed for Se (C. H. Brady) and no significant differences were observed in the transverse direction.

<sup>c/</sup> Based on experience, small but significant differences have been observed between the material in chip form certified for chemical analysis and the remaining core material in solid form. Particularly is this true for elements not in solid solution with the matrix. The figures reported for elements other than selenium, therefore, are not certified but they are expected to serve an important role in guidance for additional information on the composition.

Washington, D. C. 20234  
 February 2, 1974

J. Paul Cali, Chief  
 Office of Standard Reference Materials

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Material for this standard was prepared by the Carpenter Technology Corporation, Reading, Pa.

Intended Use - This SRM is for application in x-ray spectrometric 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 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 ensure the surface analyzed represents the metal. The surface preparation for x-ray analysis may require wet finishing with a fine grit paper - even preferable would be a metallographic polish with one micrometer diamond finish.

The technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference Material were coordinated by R. E. Michaelis.

#### LIST OF ANALYSTS

For completeness, the analysts for SRM 339 are given below.

1. B. B. Bendigo and J. I. Shultz, Division of Analytical Chemistry, National Bureau of Standards.
2. M. J. Noll and A. L. Sloan, Carpenter Steel Co., Reading, Pa.
3. W. M. Gross and R. E. Hanson, General Dynamics-Convair, San Diego, Calif.
4. R. W. Bley, Inland Steel Co., East Chicago, Ind.
5. M. D. Cooper, A. H. Jones, R. E. Kohn, W. R. Lee, R. B. Loranger, and H. E. Vergosen, General Motors Corp. Research Laboratories, Warren, Mich.
6. A. C. Hale and D. R. Burrier, Copperweld Steel Co., Warren, Ohio.