



# National Institute of Standards & Technology

## Certificate of Analysis

### Standard Reference Material C2415

#### Battery Lead

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

This Standard Reference Material (SRM) is intended for use as a composition standard for optical emission spectrometric methods of analysis. It is in the form of a disk 50 mm (2 in.) in diameter and 16 mm (5/8 in.) thick.

<u>Element</u>	<u>Certified Value<sup>1</sup></u> <u>Percent by Weight</u>	<u>Estimated<sup>2</sup></u> <u>Uncertainty</u>
Antimony	2.95	0.04
Arsenic	0.20	.01
Bismuth	.054	.004
Cadmium	.002	.001
Copper	.095	.005
Iron	< .001	--
Manganese	< .001	--
Nickel	< .001	--
Selenium	< .001	--
Silver	.002	.001
Sulfur	.0026	.0007
Tellurium	.0045	.0005
Tin	.33	.01
Zinc	< .001	--

<sup>1</sup> 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.

<sup>2</sup> 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.

**Use:** The smaller diameter surface (containing the cast indentation) is the surface intended for analytical use. A fresh surface should be prepared by lathe turning for each use of the SRM.

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 W.P. Reed and P.A. Lundberg.

Gaithersburg, MD 20899  
March 25, 1991

William P. Reed, Chief  
Standard Reference Materials Program

(over)

PLANNING, PREPARATION, TESTING ANALYSIS:

The material for this SRM was provided and prepared by the East Penn Manufacturing Co. Inc., Lyon Station, Pennsylvania.

Extensive homogeneity testing by J.A. Norris and L.E. Creasy was performed at NIST, Inorganic Analytical Research Division.

Cooperative analyses for certification were performed in the following laboratories:

- C&D Power Systems, Inc., Plymouth Meeting, Pennsylvania, M. Kresz.
- Doe Run Co., Herculaneum, Missouri, F.J. Szydlowski.
- Doe Run Co., Resource Recycling Division, Buick Facility, Boss, Missouri, B. Cash.
- East Penn Manufacturing Co. Inc., Lyon Station, Pennsylvania, K.M. Smith.
- Exide Corporation, Reading, Pennsylvania, C.R. Clair and L. Lindermuth.
- Johnson Controls, Inc., Milwaukee, Wisconsin, D.A. Wynn.
- Quemetco Corporation, RSR, Indianapolis, Indiana, K.R. Centrella.
- RSR Corporation, Dallas, Texas, D.P. Carter.
- Southern Spectrographic Laboratories, Irving, Texas, C. Myers.

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

Element	Concentration, Percent by Weight
Aluminum	(<0.0003)
Calcium	(<0.001)