



Designation: E 2294 – 03

Standard Practice for Proof Silver Corrections in Metal Bearing Ores, Concentrates and Related Materials by Fire Assay Gravimetry¹

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1. Scope

1.1 This standard practice covers the determination of fire assay correction for silver, utilizing proof silver, for ores, concentrates and related metallurgical materials.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* (See Method E 1335, Practices E 50, Guide E 882, and ISO Guide 35).

2. Referenced Documents

2.1 ASTM Standards:

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance With Specifications²

E 50 Standard Practices for Apparatus, Reagents, and Safety Precautions for Chemical Analysis of Metals³

E 135 Standard Terminology relating to Analytical Chemistry for Metals, Ores, and Related Materials²

E 882 Guide for Accountability and Quality Control in the Chemical Analysis of Metals²

E 1335 Test Methods for Determination of Gold in Bullion by Cupellation²

2.2 Other Documents

ISO Guide 35: 1989, Certification of Reference Materials—General and Statistical Principles

ISO 10378:1994, Copper Sulfide Concentrates—Determination of Gold and Silver Contents—Fire Assay Gravimetric and Atomic Absorption Spectrometric Method
Bugbee, Edward, Textbook of Fire Assaying⁴

¹ This practice is under the jurisdiction of ASTM Committee E01 on Analytical Chemistry for Metals, Ores and Related Materials and is the direct responsibility of Subcommittee E01.02 on Ores, Concentrates, and Related Metallurgical Materials.

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² *Annual Book of ASTM Standards*, Vol 14.02.

³ *Annual Book of ASTM Standards*, Vol 03.05.

⁴ Bugbee, E. E., *A Textbook of Fire Assaying*, John Wiley and Sons, Inc., Third Ed., 1946.

Smith, E.A., *The Sampling and Assay of Precious Metals*⁵

3. Terminology

3.1 *Definitions*—For definitions of terms used in this Practice, refer to Terminology E 135.

4. Summary of Practice

4.1 In the process of fire assay, silver losses occur. Proof silver is carried through the assay fusion and cupellation procedures to determine losses that can provide the fire assay silver correction values, (see Method E 1335, Method ISO 10378, Bugbee, , Smith).

5. Significance and Use

5.1 This practice is primarily intended to be used for the correction of silver loss in the fire assay process. Silver assays are determined by fire assay for the purpose of metallurgical exchange between seller and buyer.

5.2 It is assumed that all who use this practice will be trained analysts capable of performing skillfully and safely. It is expected that work will be performed in a properly equipped laboratory under appropriate quality control practices such as those described in Guide E 882.

6. Apparatus

6.1 *Analytical balance*—Capable of weighing to 0.001 mg

6.2 *Assay furnace*—Capable of temperatures up to 1100 °C, accurate to ± 5 °C

6.3 *Hammer*—Blacksmith type

6.4 *Hammering block*—Flat Steel plate

7. Reagents and Materials

7.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society where

⁵ Smith, E. A., *The Sampling and Assay of the Precious Metals*, Charles Griffin and Co., Ltd., Second Ed., 1947.