



Designation: E 1916 – 97

Standard Guide for Identification and/or Segregation of Mixed Lots of Metals¹

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1. Scope

1.1 This guide covers the identification or segregation, or both, of mixed metal lots under plant condition using trained plant personnel.

1.2 The identification is not intended to have the accuracy and reliability of procedures performed in a laboratory using laboratory equipment under optimum conditions, and performed by trained chemists or technicians. The identification is not intended to establish whether a given piece or lot of metal meets specifications.

1.3 Segregation of certain metal combinations is not always possible with procedures provided in this guide and can be subject to errors.

1.4 *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.*

2. Referenced Documents

2.1 ASTM Standards:

E 50 Practices for Apparatus, Reagents, and Safety Precautions for Chemical Analysis of Metals²

E 977 Practice for Thermoelectric Sorting of Electrically Conductive Materials³

2.2 Other ASTM Documents and Publications:

STP 98 Symposium for Rapid Identification of Metal, June 28, 1949

3. Significance and Use

3.1 Equipment and procedures described in this guide are comparative methods and are intended for identification or segregation, or both, of pieces or lots of metals that were mixed or lost their identity during certain manufacturing operations. It is presumed that all pieces or lots of metal have been previously checked and did meet applicable specifications.

3.2 The equipment and procedures described in this guide may also be suitable for identifying or segregating, or both, scrap metals.

4. Equipment

4.1 Optical Emission Spectroscopic or Spectrometric Equipment:

4.1.1 Bench type spectrometers generally with two sample tables and a split viewing field where the spectrum of the unknown piece can be visually and directly compared to that of a piece of identified metal.

4.1.2 Mobile spectrometric equipment with a remote sampling device. Two types of such units are described in 4.1.2.1 and 4.1.2.2.

4.1.2.1 Units where the particles removed by an arc or spark in the remote sampling device are conveyed to the main unit in a stream of inert gas and analyzed in the unit in a conventional way with an arc, spark, or plasma.

4.1.2.2 Units where the light generated from the arc or spark at the remote sampling device is conveyed to the main unit with fiberoptics, where it is analyzed in the conventional way.

(a) These units generally are programmed to produce an output that: (1) shows the designation of the alloy, (2) gives the approximate elemental composition of the alloy, or (3) gives a “go” or “no-go” indication based on parameters programmed by the operator.

(b) These units require careful calibration and depend on the quality and range of the reference materials used for the calibration.

4.2 X-ray Fluorescence Spectrometric Equipment:

4.2.1 The portable and mobile units are supplied with a source of radiation that can be an X-ray tube or radioactive isotopes, generally a mixture of two or more isotopes to provide a larger spectrum coverage.

4.2.1.1 These units are generally programmed to produce an output that: (1) shows the designation of the alloy, (2) gives the approximate elemental composition of the alloy, or (3) gives a “go” or “no-go” indication based on parameters programmed by the operator (see 4.1.2.2(b)).

4.3 Miscellaneous Sorting Instruments:

4.3.1 All instruments based on comparative methods require careful calibration with appropriate reference materials.

¹ This guide is under the jurisdiction of ASTM Committee E-1 on Analytical Chemistry of Metals, Ores and Related Materials and is the direct responsibility of Subcommittee E01.20 on Fundamental Practices and Measurement Traceability.

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² *Annual Book of ASTM Standards*, Vol 03.05.

³ *Annual Book of ASTM Standards*, Vol 03.03.