



Standard Guide for Identification 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 conditions 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:²

[E50 Practices for Apparatus, Reagents, and Safety Considerations for Chemical Analysis of Metals, Ores, and Related Materials](#)

[E135 Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials](#)

[E977 Practice for Thermoelectric Sorting of Electrically Conductive Materials](#)

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology [E135](#)

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

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

4. Significance and Use

4.1 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.

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

5. Equipment

5.1 Atomic Emission Spectroscopic or Spectrometric Equipment:

5.1.1 Bench type spectrosopes 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.

5.1.2 Mobile spectrometric equipment with a remote sampling device. Two types of such units are described in [5.1.2.1](#) and [5.1.2.2](#).

5.1.2.1 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 with an arc, spark, or plasma.

5.1.2.2 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.

(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.

5.2 X-ray Fluorescence Spectrometric Equipment:

5.2.1 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.

5.2.1.1 These units are generally programmed to produce an output that: (1) shows the designation of the alloy, (2) gives the