



Designation: E 877 – 93 (Reapproved 1998)

Standard Practice for Sampling and Sample Preparation of Iron Ores and Related Materials¹

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1. Scope

1.1 This practice covers procedures for mechanical sampling of iron ores and related materials in a falling stream or stopped-belt sampling and preparing the gross sample to the various test samples required for each characteristic to be measured. Included as Annexes are (1) design criteria to prevent bias, (2) statistical methods to determine quality variation and precisions of sampling and division, and (3) a method for comparing two sampling procedures for possible systematic differences.

1.2 *This standard does not purport to address all of the safety problems, 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.* Specific precautionary statements are given in Section 8.

2. Referenced Documents

2.1 ASTM Standards:

E 276 Test Method for Particle Size or Screen Analysis at No. 4 (4.75-mm) Sieve and Finer for Metal-Bearing Ores and Related Materials²

E 279 Test Method for Determination of Abrasion Resistance of Iron Ore Pellets and Sinter (Tumbler Test)²

E 389 Test Method for Particle Size or Screen Analysis at No. 4 (4.75-mm) Sieve and Coarser for Metal Bearing Ores and Related Materials³

E 882 Guide for Accountability and Quality Control in the Chemical Analysis Laboratory³

E 1072 Test Method for Low Temperature Breakdown of Iron Ores³

3. Terminology

3.1 Definitions:

¹ This practice is under the jurisdiction of ASTM Committee E-1 on Analytical Chemistry for Metals, Ores, and Related Materials and is the direct responsibility of Subcommittee E01.02 on Ores, Slags, Refractories, Cement, and Related Oxide Materials.

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² Annual Book of ASTM Standards, Vol 03.05.

³ Annual Book of ASTM Standards, Vol 03.06.

3.1.1 *bias*—an error that is consistently positive or negative.

3.1.2 *consignment*—the total quantity of iron ore to be sampled.

3.1.3 *gross sample*—the quantity of an ore consisting of all the increments taken from a consignment for any characteristic or group of characteristics; also, the composite of all these increments or subsamples each individually having been crushed or divided, or both.

3.1.4 *increment*—quantity of ore obtained by a sampling device at one time with a single operation.

3.1.5 *iron ore*—a naturally occurring material whose principal element of economic value is iron, or the products of beneficiation or processing, other than metallization of material, where iron remains or becomes the principal element of economic value.

3.1.6 *nominal size*—the opening of the screen of the standard series that would pass 95 % of a representative sample of the consignment.

3.1.7 *precision*—a measure of reproducibility of test results, using the same equipment and method, statistically derived from multiple data expressed at 95 % confidence level.

3.1.8 *quality variation* (σ_w)—a measure of the variation of a characteristic within the consignment.

3.1.9 *stratum*—quantity of an ore in routine sampling represented by one primary increment.

3.1.10 *subsample*—a quantity of an ore consisting of several increments taken from a part of the consignment; also, a composite of several increments each individually having been crushed or divided, or both.

3.1.11 *test sample*—any sample for determination of size distribution, moisture content, physical properties, or chemical composition that is prepared from each increment, each subsample, or from the gross sample in accordance with the specified method for that type of sample.

4. Summary of Practice

4.1 The precision required for the sampling and sample preparation steps are calculated based on the objectives of the testing, resulting in a sampling plan specifying the minimum weights and number of increments required for each step in the procedure. Samples are then collected, dried, blended, divided, crushed, pulverized, and ground as required by the test