



Designation: E389 – 13

Standard Test Method for Particle Size or Screen Analysis at No. 4 (4.75-mm) Sieve and Coarser for Metal-Bearing Ores and Related Materials¹

This standard is issued under the fixed designation E389; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the determination of the size distribution by screen analysis of metal-bearing ores and related materials at No. 4 (4.75-mm) sieve and coarser.

1.2 The values stated in inch-pound units are to be regarded as standard. The SI values given in parentheses are provided for information only and are not considered standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility 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

[E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves](#)

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

[E276 Test Method for Particle Size or Screen Analysis at No. 4 \(4.75-mm\) Sieve and Finer for Metal-Bearing Ores and Related Materials](#)

[E882 Guide for Accountability and Quality Control in the Chemical Analysis Laboratory](#)

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms in this test method, refer to Terminology [E135](#).

3.1.2 *nominal topsize*—the sieve designating the upper limit or topsize shall be that sieve of the series with the smallest

openings upon which is cumulatively retained a total of less than 5 % of the sample. This defined topsize is not to be confused with the size of the largest particle in the lot.

4. Summary of Test Method

4.1 The sample is passed through a bank of standard sieves by agitation. The screening technique described in this procedure may be used on any solid particles that can be dried so that sieve blinding does not occur.

5. Significance and Use

5.1 This test method is intended to be used for compliance with compositional specifications for particle size distribution. It is assumed that all who use this procedure will be trained analysts capable of performing common laboratory practices skillfully and safely. It is expected that work will be performed in a properly equipped laboratory and that proper waste disposal procedures will be followed. Follow appropriate quality control practices such as those described in Guide [E882](#).

6. Apparatus and Materials

6.1 *U.S. Standard Sieves*, conforming to the requirements of Specification [E11](#).

6.2 *Sieve Shaker*, mechanical or manual.

6.3 *Drying Oven*, of approximate size and capable of maintaining a uniform temperature at $110\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

6.4 *Sample Splitter or Riffle*, with openings not less than three times the size of the nominal topsize.

6.5 *Scales and Weights*, of adequate accuracy.

6.6 *Pans*, for holding samples.

6.7 *Brushes*, for cleaning sieves and pans.

7. Sample Preparation

7.1 If necessary, reduce the sample by means of a sample splitter or riffle, or by the alternate-shovel method. Dry at $110\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ to constant mass. Constant mass is obtained when an additional hour drying at $110\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ does not cause a change greater than 0.05 % mass. Record mass.

NOTE 1—The size of the sample is very important in sieve analysis

¹ This test method 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 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.