



Standard Terminology Relating to Sieve Analysis¹

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INTRODUCTION

Particle size distribution analysis through the use of standard testing sieves has been a commonly adopted method of verifying compliance with desired process particle specifications for many decades. As an adjunct to that function, greater emphasis is being placed on inter- and intralaboratory correlation of all particle measurement systems, testing sieves included.

To ensure a better understanding of the comparison of testing results from sieve analysis-based particle measurement systems, terminology common to the process must be documented and defined so that both the recipient and generator of the data are in full agreement as to the meaning of the data. Every effort has been made to ensure accuracy, precision, and clarity for the terms included in this terminology. For Committee E-29, this is an on-going process with new terms being developed for future inclusion. Suggestions and comments for additions, corrections, and revisions are welcomed.

1. Scope

1.1 This terminology defines terms used in the description and procedure of analysis of the size of particulate materials through sieve analysis with standard testing sieves. The terms relate directly to the equipment used in the analysis, the physical forms of the material to be sieved may take on before, during, or after analysis, and selected descriptive data reduction and analysis formats.

1.2 Committee E-29 on Particle Size Measurement feels that it is essential to include terms and definitions explicit to the scope, regardless of whether the terms appear in existing ASTM standards. Terms that are in common usage and appear in common-language dictionaries are generally not included.

2. Referenced Documents

2.1 ISO Standard:

ISO 2395 Test Sieves and Test Sieving—Vocabulary.²

3. Significance and Use

3.1 This terminology contains terms used in the description and procedure of analysis of the size of particulate materials through sieve analysis with standard testing sieves and is applicable to the work of many ASTM technical committees.

For a composite listing of published ASTM standards using standard testing sieves, Refer to ASTM STP 447B³

3.2 While some of the terms appearing in this terminology may also be used in the description, procedure, and end products of production screening (either on a batch-fed or continuous basis), it is the intent of this terminology to present the definitions and usage of terms strictly in the context of sieve analysis using standard testing sieves.

4. Terminology

4.1 Definitions:

agglomerate, *n*—two or more particles adhering together.

aperture size, *n*—the dimension defining an opening in a sieving medium.

bulk density, *n*—the mass per unit volume of a material, including voids inherent in the material as tested.

cumulative oversize distribution graph, *n*—a graph obtained by plotting the total (cumulative) percentage by the mass retained on each of a set of sieves versus the corresponding aperture sizes.

cumulative undersize distribution graph, *n*—a graph obtained by plotting the total (cumulative) percentage by the mass passing each of a set of sieves versus the corresponding aperture sizes.

matched test sieve, *n*—a test sieve that reproduces the results of a master test sieve within defined limits for a designated material.

¹ This terminology is under the jurisdiction of ASTM Committee E-29 on Particle Size Measurement and is the direct responsibility of Subcommittee E29.01 on Sieves, Sieving Methods, and Screening Media.

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² Available from American National Standards Institute, 11 West 42nd St., 13th Floor, New York, NY 10036.

³ *Manual on Testing Sieving Methods ASTM 447 B*, ASTM, 1985.

median particle size, *n*—the particle size at which half the distribution (by mass, volume, number, etc.) is larger than and half smaller than the stated size.

mesh, *n*—*in a piece of woven wire cloth*, the nominal number of apertures or fraction thereof per in.

near size particle, *n*—a particle of a size approximately equal to the aperture size of the sieve. **ISO/DIS 2395**

nominal mesh size, *n*—the designated dimension of the openings of a sieve.

open area, *n*—the ratio of the total area of the apertures to the total functional area of the screening media, expressed as a percentage.

particle size distribution, *n*—*in sieve analysis*, the percentages, by mass or number, of all fractions into which various sizes of particles are classified.

representative sample, *n*—a sample taken from a quantity of material that exhibits the characteristics of the original material from which it was taken.

sample, *n*—a portion, or part, of a quantity of material.

sieve, *n*—a plate, sheet, or woven wire cloth, or other device, with regularly spaced apertures of uniform size, mounted in a suitable frame or holder, for use in separating material according to size. The terms sieve and screen can be used interchangeably.

sieve analysis, *n*—the act of obtaining a particle size distribution using sieves.

test sample, *n*—a quantity suitable for use directly in a selected testing device.

test sieve, *n*—a sieve that meets all of the minimum requirements of ASTM Committee E-11.

5. Keywords

5.1 particle measurement; particle size; particles; particulate; screen; screening; sieve; sieve analysis; standard testing sieve

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