Size Measurement of Dry, Granular Drilling Fluid Particulates

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1 Scope

This report is intended to serve as a guide for the selection of appropriate techniques to determine the particle size distribution (PSD) of relatively large dry solid additives for drilling fluids, especially lost circulation materials (LCMs). Detailed procedures for the utilization of any specific PSD method are not included. The technician should refer to and be guided by the measurement equipment manufacturer's instructions. The particulates range in size from approximately one micron to as much as several millimeters in diameter, and are considered "granular" in shape, i.e. relatively isometric (of similar length, width, and height). The recommendations in this technical report generally are not applicable to the measurement of the PSD of nonisometric (high aspect ratio) materials such as fibers or flakes.

2 Terms, Definitions, and Abbreviations

2.1 General Terms

2.1.1
anisometric
Having two or more axes that are significantly different from each other.

NOTE The opposite is "isometric"; see 2.1.6.

2.1.2
aspect ratio
A numeric expression of the relative length, width, and height (or thickness) of a particle as a ratio.

NOTE 1 Aspect ratio provides information on the shape of a particulate.

NOTE 2 The preferred format of the expression is with the largest axis in the primary position, the second-largest axis in the secondary position, and the smallest axis in the third (last) position. (example: 3.5 : 2.5 : 1) An alternative format for the aspect ratio is a value equivalent to the largest axis divided by the smallest axis (example: 3.5, only one number is provided).

2.1.3
axes
axis (singular)
The three principal measured dimensions of a discrete particle, measured orthogonally (at 90-degree angles) from one another, commonly known as length, width, and height.

2.1.4
differential plot
In a particle size distribution, a chart showing the percentile of a population (by count, mass, or volume) of particles within defined size ranges.

NOTE This is usually displayed as a linear or semi-log histogram plot of % versus size.

2.1.5
granule
granular (adjective)
A particle that has axial dimensions (i.e. aspect ratio) that are near to isometric.

NOTE Distinguished from flake or fibrous materials in that they do not have significantly flattened or elongated dimensions.

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