Designation: ~~C925 – 09~~ C925 – 09 (Reapproved 2014)

Standard Guide for Precision Electroformed Wet Sieve Analysis of Nonplastic Ceramic Powders[1]

This standard is issued under the fixed designation C925; 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 guide covers the determination of the particle size distribution of pulverized alumina and quartz for particle sizes from 45 to 5 μm by wet sieving.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.2.1 The only exception is in the Section 5, Apparatus, 5.1 where there is no relevant SI equivalent.

1.3 *This standard does not purport to address the safety concerns 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]

E161 Specification for Precision Electroformed Sieves

3. Summary of Guide

3.1 A separate dispersed suspension of the powder is wet sieved through each sieve, using vacuum and vibration. The sieve and sample are dried and weighed.

4. Significance and Use

4.1 Both suppliers and users of pulverized ceramic powders will find this test method useful to determine particle size distributions for materials specifications, manufacturing control, development, and research.

4.2 The test method is simple, although tedious, uses inexpensive equipment, and will provide a continuous curve with data obtained with standardized woven sieves.

5. Apparatus

5.1 *Precision Electroformed Sieves ,* 3-in., mounted in brass frames, having nominal apertures of 45, 30, 20, 10, and 5 μm and a support grid having 5.7 lines per centimetre. Intermediate sizes may also be used.

5.2 *Sieving Device* (Fig. 1):

5.2.1 *Filtering Flask* (suction flask), 1-L, with side arm,

5.2.2 *Büchner Funnel* (for example, Coors No. 2),

5.2.3 *O-Ring,* 7.5-cm, rubber,

5.2.4 *Graduate,* 1-L,

5.2.5 *Rubber Stoppers,* one-hole to fit the flask and the funnel, two-hole to fit the graduate,

5.2.6 Quantity of glass tubing and rubber tubing,

5.2.7 *Metal Rod,* 15 to 20-cm, about 5 mm in diameter, and,

5.2.8 *Vacuum Source.*

[1] This guide is under the jurisdiction of ASTM Committee C21 on Ceramic Whitewares and Related Productsand is the direct responsibility of Subcommittee C21.04 on Raw 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.

***A Summary of Changes section appears at the end of this standard**

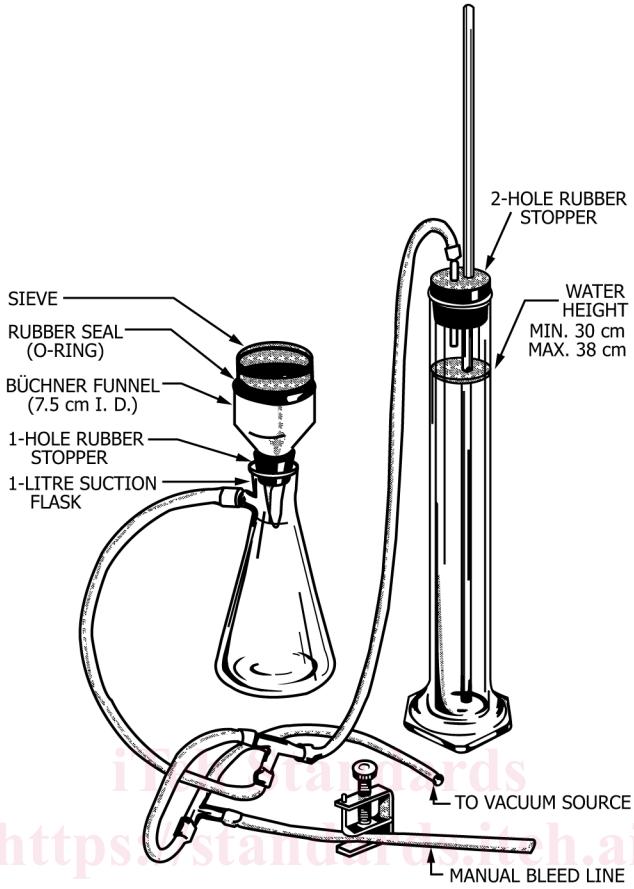

FIG. 1 Wet Sieving Apparatus

5.3 *Ultrasonic Cleaner,* required to clean all sieves below 20 µm. It should be low-powered (for example, 100 W).

5.4 *Analytical Balance,* capable of weighing up to 100 g and having at least three significant digits after the decimal.

5.5 *Drying Oven,* capable of maintaining 110 ± 5°C.

5.6 *Desiccator,* containing magnesium perchlorate or other suitable desiccant.

6. Reagents and Materials

6.1 *Water,* visually clear and particle free, not necessarily distilled, at room temperature or slightly above.

6.2 *Sieving Solution,* a dispersing media consisting of 0.1 weight % solution of sodium hexametaphosphate or sodium pyrophosphate in water.

6.3 *Drying Agents,* acetone or methyl alcohol, commercial grade.

7. Sampling

7.1 Since the amount of sample used in the determination is quite small, great care must be taken to avoid segregation. Gross samples must be cut down very carefully using splitters, rifflers, or simple cone and quartering techniques. Adjusting the portion to an exact weight must be avoided. That is, a representative portion must be extracted from the analytical sample and all of it weighed and used.

8. Preparation of Apparatus

8.1 *Cleaning of Sieves*—Use sufficient sieving solution to cover the sieve when suspended near the bottom of the ultrasonic tank. (Some organic liquids are better but create a definite explosion hazard.) Turn on the generator for about 30 s. Fine sieves may need multiple treatments. (Exposure to ultrasonic energy for periods exceeding 30 s at one time may damage the sieves.) After each cleaning carefully examine the sieve against a light, using a magnifying glass, for blockages and breaks. (Breaks can be repaired with epoxy resin.) Sieves of 20 µm and finer should be cleaned after each analysis. Rinse in clear water and dry at 110°C.

8.2 *Collector and Vacuum Control*—Assemble apparatus as shown in Fig. 1.