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AMERICAN SOCIETY FOR TESTING AND MATERIALS
100 Barr Harbor Dr., West Conshohocken, PA 19428
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Standard Specification for Glass Serological Pipets (General Purpose and Kahn)[1]

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1. Scope

1.1 This specification covers glass serological pipets, used in measuring volumes of liquids.

2. Referenced Documents

2.1 *ASTM Standards:*

E 438 Specification for Glasses in Laboratory Apparatus[2]
E 542 Practice for Calibration of Volumetric Ware[2]
E 671 Specification for Maximum Permissible Thermal Residual Stress in Annealed Glass Laboratory Apparatus[2]
E 694 Specification for Volumetric Ware[2]
E 920 Specification for Commercially Packaged Laboratory Apparatus[2]
E 921 Specification for Export Packaged Laboratory Apparatus[2]
E 1133 Practice for Performance Testing of Packaged Laboratory Apparatus for United States Government Procurements[2]
E 1157 Specification for Sampling and Testing of Reusable Laboratory Glassware[2]

3. Classification

3.1 *Style and Capacity*—Pipets covered by this specification shall be of the following styles and capacities:

3.1.1 *Style I*—General purpose top end.
3.1.2 *Style II*—Cotton plugging top end.
3.1.3 *Style III*—Cotton plugging top end, large tip opening.
3.1.4 *Capacities* (mL)—0.1; 0.1 (Kahn); 0.2; 0.2 (Kahn); 0.25 (Kahn); 0.5; 0.60 (Kahn); 1.0; 2.0; 5.0; 10.0; and 25.0.

4. General Requirements

4.1 *Borosilicate Glass*—Borosilicate glass for pipets shall conform to the glass requirements of Type 1, Class A or B of Specification E 438.

4.2 *Calibration*—Pipets shall be calibrated in accordance with Practice E 542 to deliver (*TD*) the intended capacity of distilled water at 20°C when the last drop is blown out, except the 0.25 mL Kahn pipet; this Kahn pipet shall have a clear ungraduated space of not less than 63 mm between the lowermost graduation mark and the tip of the pipet. The pipet shall be filled about 10 mm above the capacity line. Remove any water on the outside of the tip by a downward wipe with filter paper. Next, place the tip in contact with the wetted wall of a beaker and slowly lower the meniscus to the capacity line. Do not remove any water remaining on the tip at this time. Delivery of the contents into a receiving vessel is made with the tip in contact with the wall of the vessel. When the water has ceased to flow, the water remaining in the tip is then blown out with one firm puff with the tip in contact with the wall of the vessel, if possible. No after-drainage period is allowed. Capacity tolerances shall be within the limits given in Table 1.

4.3 *Annealing*—The maximum residual thermal stress shall be such as to conform to Specification E 671, except that tempered tips or tempered tops, or both, may be supplied at the option of the manufacturer. The tempered tip, when examined in index oil that matches the refractive index of the glass being used, shall have a temper between 75 and 220 nm.

5. Design

5.1 *Shape*—The pipets shall be straight and of one-piece construction. Any cross section of a pipet taken in a plane perpendicular to the longitudinal axis shall be circular.

5.2 *Delivery Tips*—Delivery tips shall be made with a gradual taper of 15 to 30 mm for capacities up to 5 mL inclusive, and 20 to 35 mm for 10 and 25 mL capacity pipets. The end of the tip shall be perpendicular to the longitudinal axis of the pipet. Sudden constriction at the orifice shall not be acceptable. The outside edge of the tip shall be bevelled slightly at the end, and the bevel shall be ground or firepolished.

5.3 *Zero Graduation Line Position*—The distance from the top end to the top graduation of all pipets (except for 0.5 mL and Kahn pipets) shall be not less than 100 mm nor more than 150 mm from the zero graduation line; for 0.5 mL and Kahn pipets this distance shall be not less than 90 mm nor more than 150 mm.

5.4 *Dimensions and Outflow Times*—The limiting dimensions and outflow times shall be as shown in Table 1. Outflow times shall be determined on unplugged pipets using distilled water at 25 ± 5°C and by means of a stopwatch. Outflow time shall be determined by the unrestricted outflow of the water from the zero mark until the water has ceased to flow.

[1] This specification is under the jurisdiction of ASTM Committee E-41 on Laboratory Apparatus and is the direct responsibility of Subcommittee E41.01 on Glass and Plastic Apparatus.

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[2] *Annual Book of ASTM Standards*, Vol 14.02.