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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Blood Sedimentation Tube, Wintrobe, Glass, Reusable[1]

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1. Scope

1.1 This specification covers reusable blood sedimentation tubes suitable for determining sedimentation rates and the volume of packed red blood cells.

1.2 *This standard does not purport to address all of the safety concerns, if any, 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:*

E 438 Specification for Glasses in Laboratory Apparatus[2]

E 671 Specification for Maximum Permissible Thermal Residual Stress in Annealed Glass Laboratory Apparatus[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. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *reusable*—Capable of being used again.

3.1.2 *Wintrobe*—The surname of the individual responsible for the design of the Wintrobe tube and the method of use.[3]

4. Classification

4.1 This specification covers a tube that is intended to be used until it is no longer considered a functional device for the purpose intended.

5. Materials

5.1 *Glass*—The tubes made to this specification shall be fabricated from borosilicate glass, Type I, Class B, or soda-lime glass, Type II, in accordance with Specification E 438.

6. Dimensions and Graduations

6.1 *Dimensions*—The tube shall be made of tubing with an outside diameter (O.D.) of 7.0 to 8.0 mm with an inside diameter (I.D.) of 2.9 to 3.3 mm. The uniformity of the bore shall be ±0.1 mm throughout the tube. The tube shall be 110 to 117 mm long and have a graduated scale of 105 ± 0.25 mm from the inside bottom of the tube. The tube shall be legibly marked with the manufacturer's or vendor's name or mark and possess a frosted area for marking purposes.

6.2 *Graduation Scale*—The tube shall be graduated 105 ± 0.25 mm in 1-mm divisions and numbered every 1 cm with two sets of numerals. One set of graduation numerals shall be from 0 to 9 cm down the left side of the graduation scale and the other set of graduation numerals shall be from 1 to 10 cm up the right side of the graduation scale as shown in Fig. 1.

6.3 *Graduation Lines*—The graduation lines shall be of uniform width with a maximum width of 0.25 mm for acid-etched and filled-in lines and 0.4 mm for amber-stain, fired-in lines. They shall be at right angles to the vertical axis of the tube with a maximum of 0.2 mm tolerance between two adjacent lines. Every tenth (numbered) line shall be a minimum of 6 mm long. The medium (every fifth) line shall be a minimum of 4 mm long. The short (intermediate) lines shall be a minimum of 2.5 mm long.

7. Workmanship, Finish, and Appearance

7.1 *Design*—The tube shall be made of thick-walled glass tubing. The tube shall have a cylindrical body terminating in a round bottom on the outside and a flat bottom on the inside. The tube shall have a uniform bore and a beaded flared top.

7.2 *Workmanship*—The tube shall be free of physical defects which will impair its use. The tube shall be well annealed with no ring strain when tested as specified in 8.1. Longitudinal strain, if present, shall be faint and highly diffused. The tube shall not chip, crack, or break during centrifugation when tested as specified in 8.3.

7.3 *Marking Permanency*—Inscriptions, graduation lines and numerals shall be either etched and filled with a permanent pigment, or an amber stain fired into the glass tube. The color depth of the markings on the tube shall be adequate to permit routine functional use of the tube without creating a difficulty in setting a meniscus or reading the separation of blood cells

[1] This specification is under the jurisdiction of ASTM Committee E-41 on Laboratory Apparatus and is the direct responsibility of Subcommittee E 41.01 on Glass Apparatus.

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

[3] Wintrobe, Maxwell M., "Laboratory Evaluation of Erythrocytes," *Clinical Hematology*, Seventh Ed., 1974, pp. 109–134.