Designation: E1047 – 85 (Reapproved 2015)

Standard Specification for Blood Sedimentation Tube, Wintrobe, Glass, Disposable[1]

This standard is issued under the fixed designation E1047; 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 specification covers disposable blood sedimentation tubes suitable for determining sedimentation rates and the volume of packed red blood cells.

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

1.3 The following precautionary statement pertains only to the test method portion, Section 7 of this specification. *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:*[2]

E438 Specification for Glasses in Laboratory Apparatus

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *disposable, n*—in accordance with this specification and the expected product performance expressed in this standard, those tubes which are to be used one time only. Any institution or individual who reuses a disposable tube must bear full responsibility for its safety and effectiveness.

3.1.2 *Wintrobe*[3], *n*—surname of the individual responsible for the design of the reusable Wintrobe tube and the method of use for both reusable and disposable tubes.

4. Classification

4.1 This specification covers a tube that is intended to be used one time only. It is not to be confused with a reusable tube that is described in other published standards.

5. Materials

5.1 *Glass*—The tubes made to this specification shall be fabricated borosilicate glass, Type I, Class B, or from soda lime glass, Type II, in accordance with Specification E438.

6. Physical Requirements

6.1 *Design*—The tube shall be made of tubing with a minimum wall thickness of 0.6 mm. 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 fire-polished top.

6.2 *Workmanship*—The tube shall be free as possible from visible defects which detract from its serviceability. The tube shall be well annealed so there will be no ring strain evident when tested under a polariscope.

6.3 *Dimensions*—The tube shall be made of tubing with an outside diameter (O.D.) of 5.0 ± 0.5 mm and an inside diameter (I.D.) of 2.9 to 3.5 mm. The uniformity of the bore shall be ±0.15 mm throughout the tube. The tube shall be 110 to 117 mm long and have a graduated scale of 100 mm. Manufacturers have the option to place additional graduation lines on the tube to a maximum of 105 mm. Maximum overall tolerance on the total graduation scale shall be ±1.0 mm. The tube shall be legibly marked with the maker's or vendor's name or mark and possess a wide color band at the top of the tube for marking purposes.

6.4 *Graduation Scale*—The tube shall be graduated 100 to 105 ± 1.0 mm in 1 mm divisions and numbered every centimetre 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.

6.5 *Graduation Lines*—The thickness of the graduation lines may vary in uniformity but shall not exceed 0.4 mm in thickness. They shall lie at right angles to the axis of the tube with a maximum of 0.2 mm tolerance between two adjacent

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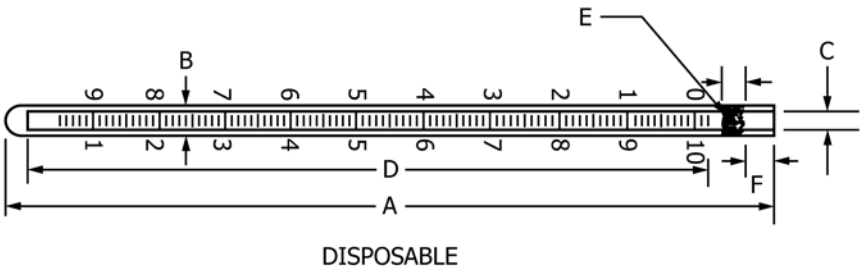
[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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



FEATURE		DIMENSIONS WITH TOLERANCES IN MILLIMETERS
A	OVERALL LENGTH	110 — 117
B	O.D.	4.5 — 5.5
C	I.D.	2.9 — 3.5
C	UNIFORMITY OF BORE (THROUGH OUT)	± 0.15
D	SCALE LENGTH	100 ± 1.0
E	COLOR CODE BAND	APPROX. 4.0 WIDE
F	LOCATION OF BAND	4.0 MIN.

FIG. 1 Wintrobe Tube

lines. Every tenth (numbered) line shall be a minimum of 5 mm. The medium (every fifth) line shall be a minimum of 3 mm. The short (intermediate) lines shall be a minimum of 2 mm.

6.6 *Resistance to Centrifugal Force*—The tube shall not chip, crack, or break when tested as specified in 7.2.

6.7 *Marking Permanency*—Inscriptions, graduation lines, and numerals may be printed on the tube in black, blue, green, or white coloring. The markings may not be of permanent nature but must possess sufficient stability to endure normal transportation and its expected one time use and meet the requirements as specified in 7.1.

7. Test Methods

7.1 *Marking Permanency Test*—Immerse tube in water for 30 s. Using a soft paper tissue, wipe the graduated portion of the wet tube lightly with ten complete strokes (five up and five down). When judged by the eye under normal room lighting the tube markings should appear as before the test with only possible fading of the printed decorations, or minor removal of markings that would not effect the tubes serviceability, or both.

7.2 *Resistance to Centrifugal Force Test*—The tube shall be filled with water to the top graduation line and placed in a centrifuge with a horizontal centrifuge head. Speed and dimensions of the centrifuge head shall be such that the inside bottom of the tube is subjected to a relative centrifugal force (RCF) not less than 2500 g. The formula for calculating relative centrifugal force is as follows:

RCF = relative centrifugal force (g)
$RCF = 00001118 \times r \times N^2$
r = rotating radius to bottom of tube (cm)
N = rotating speed (r/min)

8. Keywords

8.1 disposable; glass; tube; Wintrobe