Designation: E1046 – 85 (Reapproved 2021)

Standard Specification for Glass Westergren Tube, Disposable[1]

This standard is issued under the fixed designation E1046; 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 a disposable tube used for measuring the erythrocyte sedimentation rate, ESR (the suspension stability of red cells in diluted, anti-coagulated human blood).

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 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

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 resuses a disposable tube must bear full responsibility for its safety and effectiveness.

3.1.2 *Westergren*[3], *n*—surname of the individual responsible for the design of the reusable Westergren 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. The tubes shall be of the following types:

4.1.1 *Type I*—standard Westergren tube to be used in conventional racks only, and

4.1.2 *Type II*—self-zeroing tubes to be used with racks designed with convenient disposable tube features.

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 E438.

6. Physical Requirements

6.1 *Design, Type I and II*—The Westergren tube shall be made of one-piece construction from tubing that is straight and of uniform bore. The ends of the tube shall be cut at right angles to the axis of the tube and fire polished.

6.1.1 *Type II only*—Each tube shall have an absorbant cotton plug inserted in the tube with the bottom edge of the plug aligned with the 0 mm calibration line. The alignment of the plug to the calibration line should not vary by more than 1 mL. The plug must be capable of supporting a 200 mm vertical column of water when the plug has been thoroughly soaked.

NOTE 1—With possible printing scale variation *and* cotton plug alignment to the calibration line variation, the bottom of the cotton plug is to be located 200 ± 1 mm from the bottom of the tube.

6.2 *Workmanship*—The tube shall be free as possible from visible defects which would detract from its appearance or impair its serviceability when viewed by the human eye under normal room lighting. Self-zeroing tubes are to be used with racks designed with convenient disposable tube features.

6.3 *Dimensions*—Dimensions and tolerances shall be in accordance with Fig. 1. The uniformity of the bore shall be ±0.15 mm throughout the tube. The tube shall have an inscribed graduated scale extending over the lower 200 ± 1.0 mm of the tube. The marker's or vendor's name or mark shall be inscribed on the tube in a selected location. Inscription of the word "Westergren" on the tube is optional. Type II tubes may be made of varied lengths from 230 to 243 mm long with the selected length within this range confined to a ±1 mm tolerance.

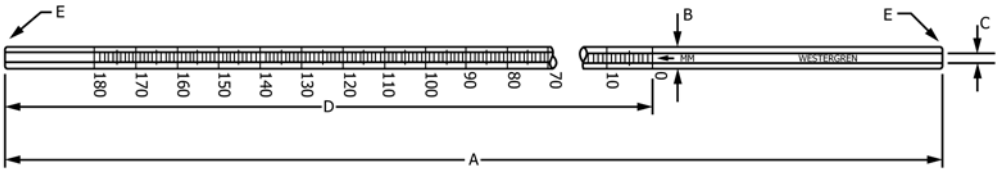
6.4 *Graduation Lines*—Thickness of graduation lines may vary in uniformity but shall not exceed 0.4 mm in thickness.

[1] This specification is under the jurisdiction of ASTM Committee E41 on Laboratory Apparatus and is the direct responsibility of Subcommittee E41.01 on Laboratory Ware and Supplies.

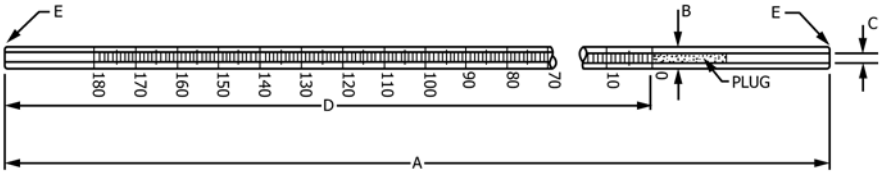
Current edition approved Jan. 1, 2021. Published February 2021. Originally approved in 1985. Last previous edition approved in 2015 as E1046 – 85(2015). DOI: 10.1520/E1046-85R21.

[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] Westergren, A., "Studies of the Suspension Stability of the Blood in Pilmonary Tuberculosis," *Acta Medica Scandinavia*, 54, 1920–1921, pp. 247–282.



TYPE 1.



TYPE 2.

	FEATURE	DIMENSIONS WITH TOLERANCES IN MILLIMETERS TYPE 1	TYPE 2
A	OVERALL LENGTH	300. ± 1.5	230. – 243.
B	O.D.	4.8 – 5.2	4.8 – 6.0
C	I.D.	2.0 – 3.0	2.0 – 3.0
D	SCALE LENGTH	200. ± 1.0	200. ± 1.0
E	FIREPOLISH	BOTH ENDS	BOTH ENDS

FIG. 1

They shall lie at right angles to the axis of the tube with a maximum tolerance between two adjacent markings of 0.25 mm. Maximum tolerance for the total 200 mm scale shall not exceed 1.0 mm.

6.5 *Graduation Line Numbering*—The tube shall be graduated in millimetres with a scale of 200 mm from the tip of the tube. The tube shall be numbered every 10 or 20 graduation lines starting with a numerical zero (0) and downward to a maximum value of 180 or 190 mm. The numerical markings shall appear at the right side of the graduated scale when held vertically with the scale facing the viewer.

7. Keywords

7.1 disposable; glass; tube; Westergren