

Specification for

Westergren tubes and support for the measurement of erythrocyte sedimentation rate

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- Association of Clinical Pathologists
- British Laboratory Ware Association
- British Society for Haematology
- Department of Health and Social Security
- Institute of Medical Laboratory Sciences
- Medical Research Council
- Medical Sterile Products Association
- Ministry of Agriculture, Fisheries and Food
- Royal College of Pathologists
- Society of Glass Technology

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Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
Section 1. General	
1 Scope	1
2 Marking	1
3 Inscriptions	1
Section 2. Single-use Westergren tubes	
4 Construction	2
5 Graduation and figuring	2
6 Inscriptions	2
7 Labelling	2
Section 3. Re-usable Westergren tubes	
8 Construction	4
9 Graduation and figuring	4
10 Inscriptions	4
11 Labelling	4
Section 4. Support for Westergren tubes	
12 Construction	6
13 Graduation and figuring	6
14 Inscriptions	6
Appendix A Measurement of the erythrocyte sedimentation rate by the Westergren method	7
Appendix B Test for rigidity of a Westergren tube	7
Appendix C Test for contamination and interfering substances	8
Appendix D Test for straightness of a Westergren tube	8
Figure 1 — A single-use Westergren tube illustrated diagrammatically	3
Figure 2 — A re-usable Westergren tube illustrated diagrammatically	5
Figure 3 — Apparatus for testing rigidity of Westergren tubes	8
Figure 4 — Apparatus for testing straightness of Westergren tubes	9
Table 1 — Essential dimensions of a single-use Westergren tube	2
Table 2 — Dimensions of a re-usable Westergren tube	4
Table 3 — Erythrocyte sedimentation rate (Westergren) in Britain (mm/1st h)	7
Publications referred to	Inside back cover

Foreword

This revision of BS 2554 has been prepared under the direction of the Laboratory Apparatus Standards Committee. It was first published in 1954 and revised in 1968. This revision of BS 2554 supersedes the 1968 edition which is withdrawn.

The measurement of the erythrocyte sedimentation rate (ESR), that is the suspension stability of red blood cells, is a routine test in the investigation and management of certain diseases. As several factors may affect the rate, it is important to standardize the apparatus and procedure as far as possible. If it is not possible to obtain sufficient blood for this procedure, for example from babies, a micro-method may be adopted, with a 100 mm or 200 mm column of blood in a tube of much narrower bore; this method may give variable results when replicate measurements are made on aliquot portions of the same sample of blood, and it is particularly inaccurate when the packed cell volume is more than about 0.4 L/L. A third method, the Wintrobe method, was formerly used extensively in the USA and to some extent in Britain with the tube being the same as that used for estimating the packed red cell volume. The Wintrobe tube is now specified in BS 4316 for estimating packed red cell volume alone.

Since 1968 the development of new methods of establishing and maintaining a 200 mm column of blood has led to the introduction of disposable plastics and modified glass tubes for the measurement of the ESR by the Westergren method; these have largely replaced the tube specified in the 1968 edition of BS 2554. The present specification standardizes the features which are essential to the Westergren method, whether a single-use or re-usable tube is used. The re-usable tubes are the same as those specified in the 1968 edition.

The accuracy of results is greatly influenced by various technical factors to which it is essential to pay strict attention. Details are given in Appendix A of the recommended technique against which any modifications, found convenient for routine purposes, should be standardized.

The principal differences between BS 2554:1968 and this edition are:

- a) that requirements for single-use tubes are included;
- b) that requirements for supports are included;
- c) that subjective requirements for the material have been replaced by objective requirements.

CAUTION. This British Standard calls for the use of procedures which may be injurious to health if adequate precautions are not taken. Venepuncture, the setting-up of an ESR test, and the handling of a Westergren tube after completion of the test may all cause contamination to the operator with blood, and this may cause infection of the operator. This British Standard refers only to the technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

1 Scope

This British Standard specifies requirements for single-use and re-usable tubes for measuring the erythrocyte sedimentation rate (ESR) by the Westergren method, and for a support to hold tubes during the performance of the test.

A procedure for measuring the erythrocyte sedimentation rate by the Westergren method is given in Appendix A.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Marking

2.1 Graduation lines

2.1.1 Graduation lines shall be clean and of uniform thickness not greater than 0.3 mm.

2.1.2 Graduation lines shall lie in planes at right angles to the axis of each tube, and shall be without irregularity in their spacing.

2.2 Scale

2.2.1 A scale, graduated in millimetres, shall run downwards for at least 150 mm from a zero mark situated 200 mm above the lower end of each tube.

2.2.2 There shall be a distance of 1 mm between the centres of adjacent graduation lines.

2.2.3 The lengths of graduation lines shall be varied so as to distinguish clearly every tenth line and every intermediate fifth line as follows.

- a) The length of the short lines shall be not less than 10 % and not more than 20 % of the circumference of the tube.
- b) The length of the medium lines shall be approximately 1.5 times the length of the short lines. They shall extend symmetrically at each end beyond the ends of the short lines.
- c) The length of the long lines shall be approximately twice the length of the short lines. They shall extend symmetrically at each end beyond the ends of the short and medium lines.

2.3 Figuring of graduation lines

2.3.1 Every tenth (long) graduation line shall be figured.

2.3.2 Figures shall be at least 2 mm high and shall be placed immediately above the long line and not more than 1 mm to the right of the adjacent short graduation lines.

3 Inscriptions

The following inscriptions shall be marked on the tube and/or on the support:

- a) the symbol “mm” above “0” on the scale;
- b) the temperature “ 20 ± 3 °C”;
- c) the maker’s and/or vendor’s mark or name;
- d) the number and date of this British Standard, i.e. BS 2554:1987¹⁾.

The inscriptions shall be positioned so that they are visible to the operator when the tube is put in the support for which it is intended.

¹⁾ Marking BS 2554:1987 on or in relation to a product is a claim by the manufacturer that the product has been manufactured to the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer’s responsibility. Enquiries as to the availability of third party certification should be addressed to the appropriate certification body.