

Specification for

Haemocytometer and particle counting chambers

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The organizations marked with an asterisk in the above list, together with the following, were directly represented on the Technical Committee entrusted with the preparation of this British Standard:

- Association of Clinical Pathologists
- British Committee for Standards in Haematology
- British Society for Haematology
- Glass Manufacturers' Federation
- Institute of Medical Laboratory Sciences
- Medical Research Council
- Medical Sterile Products Association
- Ministry of Agriculture, Fisheries and Food
- Public Health Laboratory Service
- Royal College of Pathologists

This British Standard, having been prepared under the direction of the Laboratory Apparatus Standards Committee, was published under the authority of the Board of BSI and comes into effect on 30 July 1982

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Foreword

This British Standard was first published in 1937, revised in 1953, and again in 1963 when the scope was extended to chambers with four rulings. BS 748:1963 is now withdrawn.

The four-ruling chamber is suitable for leucocyte counts, but not for red-cell counts, because of drying out of the sample in the fourth and possibly also the third ruled area during counting of the first and second areas.

In the UK the Improved Neubauer counting chamber has to some extent replaced the Neubauer chamber, for it has been found that confusion can arise in the use of the latter which can lead to errors. However, the Neubauer chamber is still manufactured and has been retained in the present edition.

Haemocytometer dilution pipettes have been omitted from the present edition because experience has shown that they are difficult to calibrate, easily broken, and in practice better accuracy is obtainable by a tube dilution technique using a capillary pipette and a measured volume of diluent.

The tolerances on dimensions specified in this British Standard provide for the highest degree of accuracy which is considered to be attainable in manufacture without unduly increasing the cost of production. Nevertheless, it is important to note that errors as large as $\pm 7\%$ on a blood count could occur if, by chance, all the tolerances permitted by this standard for different parts of the apparatus were cumulative. Therefore, for work where greater accuracy than this is required, it is advisable to determine the accuracy of the apparatus by direct measurement of its dimensions, or by other suitable method.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8 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.

1 Scope

This British Standard specifies haemocytometer counting chambers with one, two or four rulings and two types of ruling suitable for counting red blood cells, leucocytes and platelets in suitable dilutions of blood.

2 Types of chamber

The counting chamber shall consist of a recess in a glass slide bridged by a cover-glass. The base of the recess shall bear either one, two or four rulings of one of the types specified in clause 8.

The general design of the glass slides is shown diagrammatically in Figure 1, Figure 2 and Figure 3.

3 Size of slide

The glass slides shall conform to the dimensions given in Table 1 and shall be designated "thick" or "thin" according to thickness. The upper edges of the slides shall be bevelled as shown in Figure 1, Figure 2 and Figure 3. The lower surface of the slide may, if required, be concave immediately below the ruled area or areas so as to minimize the danger of the surface becoming scratched.

Table 1 — Dimensions of slides

Type of chamber	Length	Breadth	Thickness	
			Thin slides	Thick slides
	mm	mm	mm	mm
One ruling	75.0 ± 1.0	25.0 ± 1.0	2.0 ± 0.2	5.25 ± 0.75
Two ruling	75.0 ± 1.0	32.0 ± 1.0	2.0 ± 0.2	5.25 ± 0.75
Four ruling	75.0 ± 1.0	32.0 ± 1.0	2.0 ± 0.2	5.25 ± 0.75

4 Transverse grooves

Slides with one or two rulings shall have two transverse grooves parallel to the shorter edges as shown in Figure 1 and Figure 2. Slides with four rulings shall have three such transverse grooves, as shown in Figure 3. The edges where the sides of each groove meets the surface of the slide shall be slightly bevelled. The width of each groove, measured on the surface of the slide to the outside edges of the bevels, shall be 2.0 ± 0.5 mm.

The grooves shall be symmetrically disposed about the middle of the slide.

The plane surface of the slide between the bevels of adjacent grooves shall measure 6.5 ± 0.5 mm.

The depth of each groove, measured from the surface of the slide, shall be not greater than 0.5 mm for a thin slide and shall be 1.5 ± 0.5 mm for a thick slide.

5 Longitudinal groove

Slides with two or four rulings shall have a longitudinal groove of semi-circular cross section connecting the centres of the transverse grooves as shown in Figure 2 and Figure 3. The width of this groove, measured on the surface of the slide, shall be 3.0 ± 0.5 mm.

6 Flatness of upper surface of slide

The areas of the slide in contact with the cover glass (see clause 9) shall be parts of the same surface which shall be flat to within 0.001 mm.

The ruled areas between the grooves shall be flat and parallel to the plane of the two outer areas, to within 0.001 mm.

NOTE 0.001 mm corresponds to about 3.5 interference fringes if the surface is tested by reference to an optical flat using green light from a mercury vapour lamp.

7 Depth of chamber

The mean depth of the areas between the grooves below the plane of the two outer areas for all chambers specified in this standard shall be 0.100 ± 0.001 mm, with the exception of the Modified Fuchs-Rosenthal rulings with one-ruling or two-ruling chambers in which the depth shall be 0.200 ± 0.001 mm.

8 Rulings

8.1 Position. The rulings shall occupy the positions marked R in Figure 1, Figure 2 and Figure 3 and shall be centrally placed between the transverse grooves subject to a tolerance of ± 0.4 mm.

8.2 Type. The ruling shall be one of the following types.

Neubauer. This ruling is shown in Figure 4. Each of the nine large squares into which the ruling is divided has sides 1 mm in length. The central square ABCD of Figure 4, shown on a larger scale in Figure 5, is subdivided into sixteen squares, such as abcd, each of which in turn contains 16 squares having sides 0.05 mm in length. Variations are permissible in the ruling of the four corner squares around the central one, but if a ruling of these squares different from that shown in Figure 4 is required details shall be specified by the purchaser. Mirror images of the ruling shown in Figure 4 are permissible.