

Specification for

# **Eyepiece and screen graticules —**

**For the determination of particle size of  
powders**

## Co-operating organizations

The Chemical Engineering Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Association of British Chemical Manufacturers*	Glass Manufacturers' Federation
Association of Consulting Engineers (Incorporated)	Institute of Petroleum
Board of Trade	Institution of Chemical Engineers*
British Chemical Plant Manufacturers' Association*	Institution of Gas Engineers
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Engineering Equipment Users' Association	Ministry of Transport
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The scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

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British Diamond Die Federation	Permanent Magnet Association
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British Hard Metal Association	Radio and Electronic Component Manufacturers' Federation
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Incorporated National Association of British and Irish Millers Ltd.	Individual firms
Institute of Physics and The Physical Society	

This British Standard, having been approved by the Chemical Engineering Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council on 4 November 1963

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# Foreword

This Standard makes reference to the following British Standard:

BS 3406, *Methods for the determination of particle size of powders — Part 4: optical microscope method.*

The present publication is a specification for the standard graticule required for the method of BS 3406-4.

BS 3406-4<sup>1)</sup> is one of a series of standards which describes methods of determining the size distribution of particles in those fractions of powders which pass through a 75 micron British Standard test sieve.<sup>2)</sup> A representative sample of the powder to be sized is dispersed and placed on a glass slide and the particles are viewed through a microscope by means of transmitted light. The areas of the magnified images of the particles are compared with the areas of reference circles of known sizes inscribed on a graticule and simultaneously visible. The relative numbers of particles in each of a series of size classes are determined.

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## Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 3 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.

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<sup>1)</sup> BS 3406, “*Methods for the determination of particle size of powders*”. Part 4, “*Optical microscope methods*.”

<sup>2)</sup> BS 410, “*Test sieves*.”

## 1 Scope

This British Standard specifies requirements for the design and construction of eyepiece and screen graticules for particle size analysis by the optical microscope method as described in BS 3406-4<sup>1)</sup>.

## 2 Construction

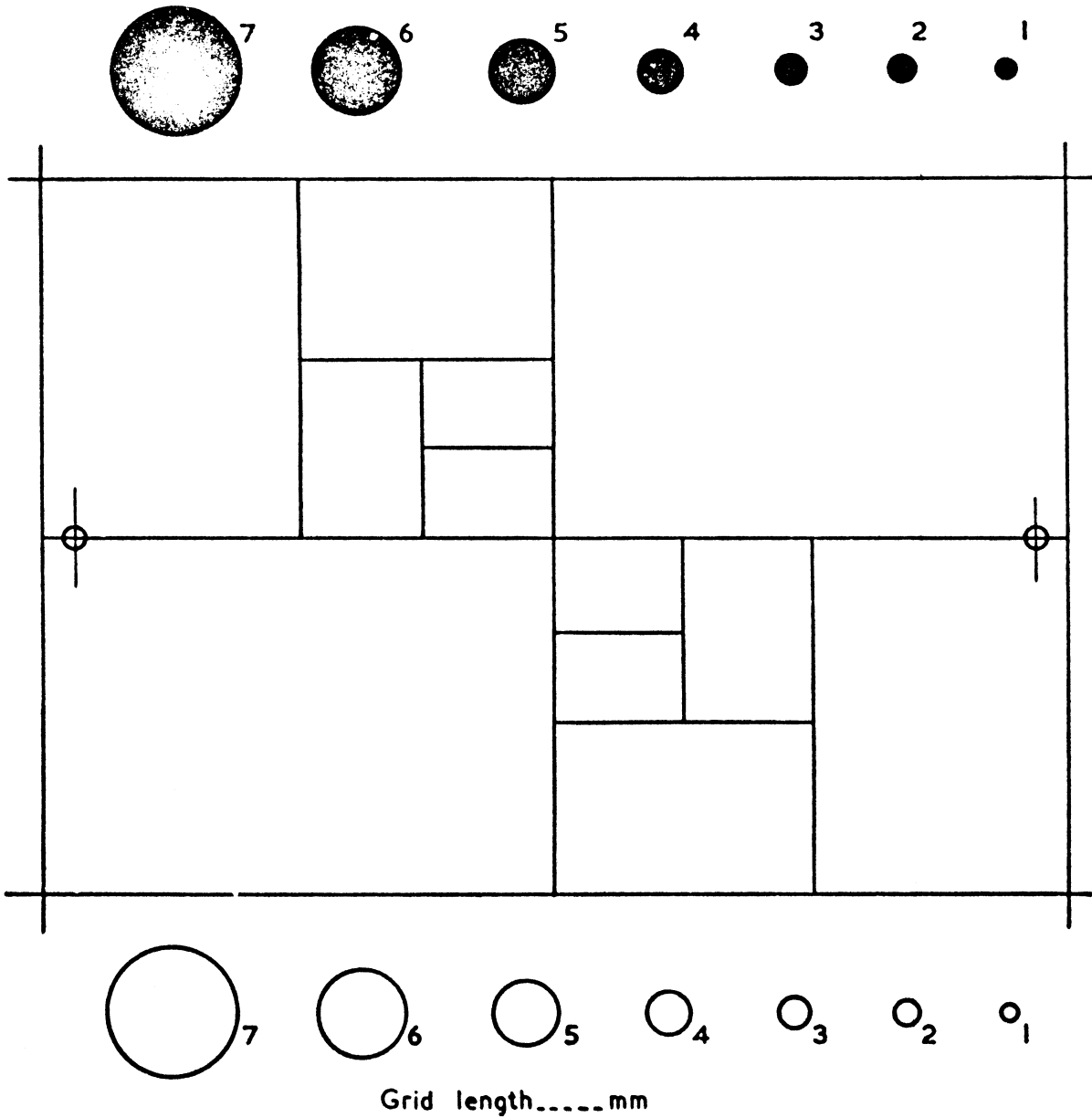
The graticule shall consist of black rulings to the pattern and dimensions specified below. In the case of screen graticules the background to the rulings shall form a diffusing screen.

## 3 Pattern of circles and rulings

The graticule shall be made to the pattern shown in the Figure which comprises:

- a rectangular grid subdivided as shown

- two calibration marks drawn across the longer axis of the grid and ringed at their intersections with that axis



**B.S.3625**

**MAKER'S  
SYMBOL**

**Standard graticule**

a set of seven open circles

a set of seven solid circles

the numbers 1 to 7 adjacent to the circles

the words GRID LENGTH followed by the actual length in millimetres of the longer dimension of the rectangular grid

the maker's name and the number of this Standard, BS 3625 (see Clause 6).

The circles and rulings shall be clear and legible on an eyepiece graticule viewed with a  $\times 10$  magnifying lens, or on a screen graticule viewed by the unaided eye.

The area containing the circles and rulings shall be free of blemishes which could interfere with the use of the graticule.

## 4 Relative dimensions of grid and circles

The relative dimensions of the grid and circles are specified in the Table. In this table the unit of length is  $\frac{1}{64}$  of the length of the rectangular grid. Tolerances on the relative dimensions are specified in the Table for a screen graticule. The same tolerances shall apply to an eyepiece graticule with the understanding that none is required to take an absolute value smaller than 5 microns.

The boundary lines of the rectangular grid shall be extended by 2 units to cross at each corner. The calibration marks on the longer axis of the grid shall be 6 units in length and shall be symmetrically placed. The sub-dividing lines of the grid shall form in the pattern shown the following areas: two each  $\frac{1}{4}$ ,  $\frac{1}{8}$ ,  $\frac{1}{16}$  and  $\frac{1}{32}$  and four each  $\frac{1}{64}$  of the total area of the grid.

The length and breadth of the grid (and of the sub-divisions) and the distance between the calibration marks shall be measured between the centres of the ruling lines. The diameters of the open circles shall be measured between the outside edges of the ruling lines.

The width of the ruling lines shall be the same within  $\pm 20$  per cent in all parts of the graticule and shall not exceed  $\frac{1}{7}$  unit (that is,  $\frac{1}{448}$ th of the grid length).

## 5 Dimensions of grid

The actual length of the longer dimension of the grid shall lie within  $\pm 2$  per cent of the value marked on the graticule.

The length of the grid of a screen graticule shall not be less than 96 mm.

**Table — Relative dimensions of standard graticule**

	Numerical value and tolerance units <sup>a</sup>
Grid length	64
Grid breadth	$45.3 \pm 0.25$
Distance between calibration marks	$60.4 \pm 0.25$
Diameter of circle	
1	$1.00 \pm 0.02$
2	$1.41 \pm 0.03$
3	$2.00 \pm 0.04$
4	$2.83 \pm 0.06$
5	$4.00 \pm 0.08$
6	$5.66 \pm 0.10$
7	$8.00 \pm 0.12$

<sup>a</sup>The unit is  $\frac{1}{64}$ th of the grid length.

## 6 Marking

Graticules manufactured in compliance with this British Standard shall be marked with the following particulars:

The name, trade mark or other means of identification of the manufacturer.

The number of this British Standard, i.e. BS 3625.

NOTE The mark BS 3625:1963 on the product is a claim by the manufacturer that it complies with the requirements of the standard.

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