

Safety signs and colours —

Part 2: Specification for colorimetric and photometric properties of materials

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Cooperating organizations

The Personal Safety Equipment Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations.

- British Footwear Manufacturers' Federation
- British Rubber Manufacturers' Association
- British Safety Council
- British Steel Industry*
- Cement Makers' Federation
- Chemical Industries Association*
- Council of Ironfoundry Associations
- Department of Industry, National Engineering Laboratory
- Electricity Supply Industry in England and Wales*
- Engineering Employers' Federation*
- Engineering Equipment Users' Association
- Federation of Civil Engineering Contractors
- Glass Manufacturers' Federation
- Health and Safety Executive*
- Industrial Safety (Protective Equipment) Manufacturers' Association*
- Institute of British Foundrymen
- Institution of Civil Engineers
- Institution of Industrial Safety Officers
- Institution of Production Engineers
- Iron and Steel Trades Confederation
- Light Metal Traders Organization
- Medical Research Council
- Ministry of Agriculture, Fisheries and Food
- National Coal Board*
- National Joint Council for the Building Industry (Operatives Side)
- National Radiological Protection Board
- Royal Society for the Prevention of Accidents*
- Trades Union Congress

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:

- British Non-ferrous Metals Federation
- British Sign Association
- Chartered Institution of Building Services
- Chief and Assistant Chief Fire Officers' Association
- Department of Health and Social Security
- Institution of Fire Engineers
- Ministry of Defence
- Paintmakers Association of Great Britain Ltd.
- Individual expert

This British Standard, having been prepared under the direction of the Personal Safety Equipment Standards Committee, was published under the authority of the Executive Board and comes into effect on 29 August 1980

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Foreword

This revision of BS 5378 has been prepared under the direction of the Personal Safety Equipment Standards Committee and consists of three Parts, which may be purchased separately. BS 5378:1976 has been withdrawn.

Over many years, widely different codes and systems of safety signs have been developed.

This British Standard specifies a system for giving health or safety information that keeps the use of words to a minimum. The need for such a system has arisen due to the increase in international trade and travel and the development of work forces that do not share a common language.

Attention is drawn to the fact that education and training is an essential part of any system for giving health or safety information.

BS 5378 was originally published in 1976 and was based upon the draft international standard ISO/DIS 3864 issued by the International Organization for Standardization (ISO). Since publication of that draft, the EEC has issued a Directive (77/576/EEC) "Council Directive of 25 July 1977 on the Approximation of the Laws, Regulations and Administrative Provisions of the Member States relating to the provision of safety signs at places of work".

The Directive is based upon the ISO work.

The international standard, ISO 3864, was published in 1984 and covers the same subject matter as Parts 1 and 2 of BS 5378, but it is not identical with them. Attention is drawn in this Part of BS 5378 to the main differences between the publications.

BS 5378-1, which deals with basic principles and gives examples of safety signs, is in line with the EEC Directive (77/576/EEC) and was prepared in anticipation of the preparation of the Safety Signs Regulations 1980 (SI 1980 No. 1471).

BS 5378-3 has been produced to cover additional requirements.

This Part of BS 5378 gives guidance on preferred sizes of signs in Appendix A and specifies the colorimetric and photometric properties of materials. These are not specific requirements of the EEC Directive, but are recommendations supplementary to it. ISO 3864-1984 includes requirements for colorimetric and photometric properties which, for blue colours, are more restrictive than the requirements of this Part of BS 5378. The technical committee responsible for the preparation of this British Standard, and for monitoring the ISO work, did not agree with the restriction imposed on blue colours in ISO 3864-1984 but the ISO limits have been indicated, for information, in this standard.

The colour areas for all other ordinary surface colours, retroreflecting surface colours and fluorescent red and orange-red are identical with those specified in ISO 3864-1984.

This Part of BS 5378 allows photoluminescent white to be used as an alternative to ordinary white or retroreflecting white. The colour area for photoluminescent white under normal illumination is specified, but the performance characteristics of this material upon removal of normal illumination are not specified.

NOTE BS 5378-1 is called up in the Safety Signs Regulations 1980 (SI 1980 No. 1471).

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 9 and a back cover.

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1 Scope

This Part of this British Standard specifies the colorimetric and photometric properties of materials and gives the preferred sizes for safety signs complying with the requirements of Part 1.

2 References

The titles of the standards publications referred to in this Part of this standard are listed on page 9.

3 Definitions

For the purposes of this Part of this standard the following definitions apply.

3.1

colour boundary

a (straight) line in the CIE chromaticity diagram (CIE 45-15-200¹⁾) separating the area of the permitted colours from that of the non-permitted colours

3.2

luminance factor

(at a point on the surface of a non-self-radiating body, in a given direction, under specified conditions of illumination.) Ratio of the luminance of the body to that of a perfect reflecting diffuser identically illuminated (CIE 45-20-200¹⁾)

3.3

coefficient of retroreflection (R^1)

(of a plane retroreflecting surface). The quotient obtained by dividing the luminous intensity (I) of the retroreflecting material in the direction of observation, by the product of the illuminance ($E_{\perp}$) at the retroreflecting surface on a plane perpendicular to the direction of the incident light and its area (A)

$$R^1 = \frac{I}{E_{\perp} \times A}$$

3.4

ordinary colour

a colour that is neither retroreflecting nor fluorescent

4 Colorimetric and photometric properties of the materials

4.1 Conditions

The physical requirements with which the materials comply shall be primarily related to daytime colour.

Colour measurements shall be made as specified in CIE Publication No. 15²⁾ (reference **E.1.3.1**).

NOTE For the colorimetric measurements, the material is considered to be illuminated by daylight as represented by the Standard Illuminant D₆₅ (CIE 45-15-145³⁾) at an angle of 45° with the normal to the surface and the observation is made in the direction of the normal (45/0 geometry).

The coefficient of retroreflection shall be measured in accordance with CIE Publication No. 7, 1960 volume D, pages 566 to 571⁴⁾ using Standard Illuminant A, under the condition that the entrance and observation angles are in the same plane.

¹⁾ CIE (Commission Internationale de l'Eclairage) Vocabulary Publication No. 17, 1970, "International lighting vocabulary". CIE publications may be obtained from the National Illumination Committee of Great Britain, c/o The Library, Thorn Lighting Ltd., Great Cambridge Road, Enfield, Middlesex EN1 1UL. Tel. 01-363 5353.

²⁾ CIE (Commission Internationale de l'Eclairage) Publication No. 15, 1971, "Colorimetry".

³⁾ CIE (Commission Internationale de l'Eclairage) Publication No. 17, 1970, "International lighting vocabulary".

⁴⁾ CIE (Commission Internationale de l'Eclairage) Publication No. 7, 1960, volume D, "Proceedings 14th session, Brussels".