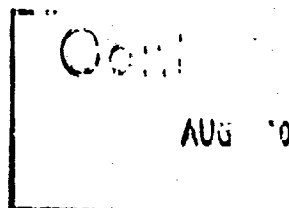


BRITISH STANDARD 4727 : Part 4 : Group 02 : 1971

**GLOSSARY OF
ELECTROTECHNICAL, POWER,
TELECOMMUNICATION,
ELECTRONICS, LIGHTING AND
COLOUR TERMS**

**PART 4. TERMS PARTICULAR TO
LIGHTING AND COLOUR**

Group 02. Vision and colour terminology



BRITISH STANDARDS INSTITUTION

Gr 7

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Incorporating amendment issued December 1972 (AMD 1042)

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The Institution desires to call attention to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

A complete list of British Standards, numbering over 5000, fully indexed and with a note of the contents of each, will be found in the British Standards Yearbook. The BS Yearbook may be consulted in many public libraries and similar institutions.

This Standard makes reference to the following British Standards:

BS 950. Artificial daylight for the assessment of colour.

Part 1. Illuminant for colour matching and colour appraisal.

Part 2. Viewing conditions for reproduction in the graphic arts.

BS 1853. Tubular fluorescent lamps for general lighting service.

British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.

The following BSI references relate to the work on this standard:
Committee reference LOE/2 Draft for comment 69/33919

CO-OPERATING ORGANIZATIONS

The Illumination 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 Public Lighting Engineers
British Glass Industry Research Association
British Railways Board
Council of British Manufacturers of Petroleum Equipment
Department of Employment and Productivity
*Department of the Environment
Department of the Environment, Building Research Station
Department of Trade and Industry
Electricity Council, the Central Electricity Generating Board and the Area Boards in England and Wales

Engineering Equipment Users Association
Glass Manufacturers' Federation
*Illuminating Engineering Society
Institution of Electrical Engineers
Institution of Municipal Engineers
*Lighting Industry Federation Ltd.
London Transport Executive
Ministry of Defence, Navy Department
*National Physical Laboratory—Department of Trade and Industry
Royal Institute of British Architects
Society of British Gas Industries
Society of Glass Technology

The Government departments and 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:

British Colour Council
Institute of Physics and the Physical Society
National Illumination Committee of Great Britain
P.I.R.A.

Society of Dyers and Colourists
Trinity House Lighthouse Service
Colour Group of Great Britain
The British Optical Association

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GUIDE TO THE GLOSSARY

Part 1. Terms common to power, telecommunications and electronics**Group 01. Fundamental concepts****Group 02. General technological terminology****Group 03. Relay terminology****Group 04. Measurement terminology****Group . Semiconductor terminology*****Group . Electronic tube terminology*****Group . Magnetism terminology*****Group . Radiological terminology*****Group . Radio interference terminology*****Group . Integrated electronic circuit terminology****Titles to any further groups will be added in due course.***Part 2. Terms particular to power engineering****Group 01. General power terminology****Group 02. Static converter terminology****Group 03. Rotating machinery terminology****Group 04. Transformer terminology*****Group 05. Voltage fluctuation terminology*****Group . Power switchgear terminology*****Group . Power systems terminology*****Group . Systems operation terminology*****Group . Traction terminology*****Group . Tariffs terminology****Titles to any further groups will be added in due course.*

* Not yet published, as at 16 September, 1971.

Part 3. Terms particular to telecommunications and electronics**Group 01. General telecommunication and electronics terminology****Group 02. Telephony terminology****Group 03. Telegraphy, including facsimile, terminology****Group 04. Broadcasting, radio and television terminology****Group 05. Propagation and media terminology****Group 06. Radiolocation and navigation terminology****Group 07. Radiocommunication terminology***Titles to any further groups will be added in due course.***Part 4. Terms particular to lighting and colour****Group 01. Radiation and photometry terminology****Group 02. Vision and colour terminology****Group 03. Lighting technology terminology***

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BRITISH STANDARD GLOSSARY OF ELECTROTECHNICAL, POWER, TELECOMMUNICATION, ELECTRONICS, LIGHTING AND COLOUR TERMS

Part 4. Terms Particular to Lighting and Colour Group 02. Vision and colour terminology

FOREWORD

This Group of Part 4 of this British Standard Glossary, prepared under the authority of the Illumination Industry Standards Committee, contains terms and definitions relating to vision and colour and supersedes BS 1611*, Section 2, Group 2A and Group 2B; Section 3; Section 5; and parts of Section 1; Section 2, Group 2C and Group 2D; and Section 6. The terms and definitions are in close agreement with those of Group 45 of the third edition of the International Electrotechnical Vocabulary, prepared jointly by the Commission Internationale d'Eclairage (CIE) and the International Electrotechnical Commission (IEC).

In this new glossary a number of significant changes have been introduced. It has been decided to combine into one glossary the subjects previously covered by BS 1611, BS 204†, BS 205‡ and BS 233§ glossaries. The glossary is divided into four main Parts, each of which is subdivided into groups. Each group will comprise the terms and definitions used in a particular branch of electrical engineering and will be issued individually as soon as it is completed. This arrangement makes it possible to add new groups, or revise existing groups, at any time without affecting the remainder of the glossary.

The four main Parts of the glossary are as follows:

Part 1. Terms common to power, telecommunications and electronics.

Part 2. Terms particular to power engineering.

Part 3. Terms particular to telecommunications and electronics.

Part 4. Terms particular to lighting and colour.

As groups of terms within the new framework are published, the corresponding parts of the British Standard glossaries mentioned above will be withdrawn. Ultimately the new glossary will replace these standards completely and they will then be withdrawn.

Fundamental and general terms common to power, telecommunications and electronics, respectively form the first two groups of Part 1. General terms particular to Part 2 and Part 3 similarly form the first groups of their respective Parts. The specialist groups contain only the terms and definitions relating to their subject.

As far as has been practicable all terms and definitions established in current usage and falling within the scope of this glossary have been included. Experience has shown that it is rarely possible to replace, or even to modify, a well established term no matter what the logical or aesthetic shortcomings of that term may be. Current usage has therefore been accepted as the authority for terms and their meanings except where there has been a very good reason for doing otherwise, as, for example, where terms have been considered to be fundamentally wrong, ambiguous, superfluous or in need of standardization. Where two or more synonymous terms are in use those which are deprecated are omitted from the body of the text but are entered in the alphabetical index with a cross reference to the standard term. In cases where it was felt that the time was not yet right to deprecate a synonym, preferred terms

* BS 1611, 'Glossary of colour terms used in science and industry'.

† BS 204, 'Glossary of terms used in telecommunication (including radio) and electronics'.

‡ BS 205, 'Glossary of terms used in electrical engineering'.

§ BS 233, 'Glossary of terms used in illumination and photometry'.

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are given first and other terms are printed in less prominent type to indicate the intention to deprecate them in the course of time. Where synonyms are considered of equal value they are shown in the same type.

Where terms are used with somewhat different meanings in different branches of electrical engineering, appropriate definitions are given in the groups of the glossary corresponding to these branches. Such a definition, when taken out of the context of its group, should always be quoted with a preamble indicating its proper context.

It is to be noted that the given definition of a term represents the generally accepted meaning of that term. Under no circumstances should it be regarded as taking the place of a specification.

An effort has been made to arrange the terms in a logical order proceeding from the general to the specific and from the whole to the part and placing allied terms in proximity within a subsection or section of the group. Each term has assigned to it a Part number (one digit) and a Group number of two digits followed by a space and four digits, the first digit of which represents the section, the second digit the subsection and the last two digits the place within the subsection.

A general view of the arrangement of the group in the glossary can be obtained from the Guide to the Glossary. An alphabetical index of the terms of the group is provided at the end to facilitate reference to particular terms. For simplicity, only the last four digits of a term's number are quoted in the index. It is recommended that the user of any group of the glossary should consider the group in association with the groups covering general or fundamental terms within the Part for Parts 2 and 3, and also together with Groups 01 and 02 of Part 1.

In this glossary round brackets () enclose words or phrases which are not part of the term or definition and can be omitted without affecting the meaning. Square brackets [] enclose words or phrases which may replace a preceding part of an expression. The limiting sign [indicates, if necessary, how many of the preceding words are replaced.

NOTE. The titles of the British Standards referred to in this Standard are listed on Page 2.

402 1 THE EYE AND VISION, COLOUR RENDERING

No.	Term	Definition
402 11	<i>The eye and vision</i>	
402 1101	visual system; visual organ	The group of structures comprising the eye, the optic nerve and certain parts of the brain, which transforms the light stimulus into a complex of nerve excitations, whose subjective correlate is visual perception.
402 1102	eye	Part of the visual system, in which an optical image of the external world is produced and transformed into nerve excitations.
402 1103	pupil	Variable aperture in the iris, through which the rays producing the image enter the eye.
402 1104	retina	Structure at the back of the eye which is sensitive to light stimuli and composed of the photoreceptors (cones and rods) and the nerve cells which transmit to the optic nerve the response of the receptor elements.
402 1105	cones	Retinal receptor elements primarily concerned with perception of light and colour stimuli when the eye is adapted to light (see 402 1111).
402 1106	rods	Retinal receptor elements primarily concerned with perception of light stimuli when the eye is adapted to darkness (see 402 1112).
402 1107	yellow spot; macula lutea	Central part of the retina, generally containing a yellow pigment.
402 1108	fovea; fovea centralis	Central part of the yellow spot, thinner and depressed, containing almost exclusively cones and forming the site of most distinct vision. NOTE 1. It corresponds to a region of the external field about 0.03 rad (2°) in diameter. NOTE 2. The term foveola distinguishes the innermost region of the fovea and is limited to a diameter of about 0.003 rad (0.3°).
402 1109	adaptation	1. The process by which the properties of the visual system are modified according to the luminances or the colour stimuli presented to it. 2. The final state of the process. In particular, the terms 'light adaptation' and 'dark adaptation' are used, according as the luminance of the significant

No.	Term	Definition
		part of the visual field is of at least several candelas per square metre, or less than some hundredths of a candela per square metre (see also 402 1111 and 402 1112).
402 1110	vision; visual perception	The appreciation of differences in the external world, resulting from the sensory impressions produced by radiation entering the eye.
402 1111	photopic vision	Vision by the normal eye when it is adapted to levels of luminance of at least several candelas per square metre. NOTE. The cone receptors of the retina are the principal active elements under these conditions and the spectrum appears coloured.
402 1112	scotopic vision	Vision by the normal eye when it is adapted to levels of luminance below some hundredths of a candela per square metre. NOTE. The rod receptors in the retina are the principal active elements under these conditions. The spectrum appears uncoloured and the maximum spectral luminous efficiency is shifted to a shorter wavelength than in photopic vision. (See 402 1115.)
402 1113	mesopic vision	Vision intermediate between photopic and scotopic vision.
402 1114	spectral luminous efficiency for an individual observer	For a monochromatic radiation of wavelength λ . Ratio of the radiant flux at wave length λ_m to that at wavelength λ , such that both radiations produce equally intense luminous sensations as perceived by the individual observer under specified photometric conditions. NOTE. The spectral luminous efficiency for the CIE standard photometric observer, for photopic vision and for scotopic vision, is defined in 401 2003.
402 1115	Purkinje phenomenon	Reduction in the luminosity of a red light relative to that of a blue light when the luminances are reduced in the same proportion without changing the respective spectral distributions. NOTE. In passing from photopic to scotopic vision, the spectral luminous efficiencies change, the wavelength of maximum efficiency being displaced towards the shorter wavelengths.
402 1116	Bezold-Brücke phenomenon	Change in the hue of the (perceived) colour with change in luminance level within the range of photopic vision.
402 1117	Stiles-Crawford effect	Variation of the luminosity of a light stimulus with position of entry of the light pencil through the pupil.
402 1118	troland	Unit used for expressing the magnitude of the external light stimulus applied through the pupil. When the eye is viewing a surface of uniform luminance, the number of trolands is equal to the product of the area in square millimetres of the limiting pupil, natural or artificial, and the luminance of the surface in candelas per square metre. NOTE. In computing retinal illuminance, absorption and reflection losses and the dimensions of the particular eye under consideration must be taken into account. An allowance must also be made for the Stiles-Crawford effect if any part of the bundle of rays passes through the pupil in an area significantly separated from its centre. This allowance for the Stiles-Crawford effect may be expressed by a generally lower number of 'reduced trolands', computed by multiplying the number of trolands by appropriate factors which reach, for example, the value of 0.5 for a pupil of 50 mm ² area (8 mm diameter). If all these corrections are negligible, 1 troland produces a retinal illuminance of approximately 2×10^{-8} lm/m ² .
402 1119	sensation	Element of the mental content of a sense impression which cannot be analysed further.
402 1120	speed of sensation of light stimulus	Reciprocal of the time interval between the onset of a light stimulus and onset of the visual sensation it produces. NOTE. The time interval referred to is also known as the 'latency time'.

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No.	Term	Definition
402 1121	perception	Complex effect in the field of consciousness derived from sense impressions supplemented by the memory. Visual perceptions, in particular, contribute towards the formation of our concepts of the existence, form and position of objects.
402 1122	speed of perception	Reciprocal of the time interval between the instant at which an object is presented and its perception.
402 1123	speed of perception of form	Reciprocal of the time interval between the instant at which an object is presented and the perception of its form.
402 1124	speed of contrast perception	Reciprocal of the time interval between the instant at which a contrast is presented and the instant at which it is perceived.
402 1125	light	(See 401 1105.)
402 1126	colour	1. (<i>Perceived</i>) <i>colour</i>. Aspect of visual perception by which an observer may distinguish between two fields of view of the same size, shape and structure, such as may be caused by differences in the spectral composition of the radiation concerned in the observation. 2. (<i>Psychophysical</i>) <i>colour</i>. Characteristic of a visible radiation by which an observer may distinguish differences between two fields of view of the same size, shape and structure, such as may be caused by differences in the spectral composition of the radiation concerned in the observation. NOTE 1. Psychophysical colour is specified by the tristimulus values of the radiation entering the eye (see 402 2013). NOTE 2. The adjectives 'perceived' and 'psychophysical' shown in parentheses are necessary only when the context does not clearly indicate whether the terms are used in the subjective or objective sense.
402 1127	(perceived) chromatic colour	Perceived colour possessing a hue. NOTE 1. In everyday speech the word 'colour' is often used in this sense in contradistinction to white, black, or grey. The adjective 'coloured' usually refers to chromatic colour. NOTE 2. For hue, see 402 1142.
402 1128	(psychophysical) chromatic colour	Psychophysical colour of greater than zero excitation purity and hence possessing a dominant or complementary wavelength. NOTE. See also 402 2026.
402 1129	(perceived) achromatic colour	Perceived colour devoid of hue.
402 1130	(psychophysical) achromatic colour	Psychophysical colour of zero purity (see 402 2029).
402 1131	unrelated (perceived) colour	Colour perceived to belong to an area with completely dark surroundings. NOTE. The colour appears self-luminous.
402 1132	related (perceived) colour	Colour perceived to belong to an area or object in relation to other perceived colours in the visual field.
402 1133	surface colour; non-self-luminous (perceived) colour	Colour perceived to belong to a non-self-luminous object. NOTE 1. The term 'surface colour' is preferred whenever the colour is perceived to belong to the surface of a non-self-luminous object. NOTE 2. 'Surface colour' is also used to refer to psychophysical colour pertaining to the surface of a non-self-luminous object.