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SP 1650 Supplement (1973): Standard colours for building and decorative finishes- supplement ONLY [CED 13: Building Construction Practices including Painting, Varnishing and Allied Finishing]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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SUPPLEMENT TO SP: 1650 - 1973

Reaffirmed 2000

SUPPLEMENT TO
STANDARD COLOURS
FOR
BUILDING AND DECORATIVE
FINISHES

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APPENDIX A

(*Clauses 0.1 and 2.1*)

**GLOSSARY OF COLOUR TERMS
USED FOR DECORATIVE PURPOSES IN BUILDINGS**

A-1. DEFINITIONS

A-1.1 Achromatic Sensations — Visual sensations devoid of the attribute of hue.

A-1.2 Additive Mixture — The mixture of light stimuli in such a manner that they enter the eye simultaneously or in rapid succession and are incident on the same area of the retina, or enter in the form of a mosaic which the eye cannot resolve.

A-1.3 Black

A-1.3.1 A visual sensation arising from some portion of a luminous field of extremely low luminosity.

A-1.3.2 As defined in (A-1.3.1), but applied to a secondary source which is completely absorbing at all visible wavelengths.

NOTE — The terms 'white' and 'black' are not always used in the strict sense defined above. It is usual to apply them to greys and neutrals, the luminance factor of which is nearly unity or nearly zero respectively.

A-1.4 Black Content — The subjectively estimated amount of blackness seen in the visual sensation arising from a surface colour.

A-1.5 Brightness — That colour quality, a decrease in which is associated with the residual degradation which would result from the addition of a small quantity of neutral grey to the colouring material when the strength of the mixture has been readjusted to the original strength (comparison brighter).

A-1.6 Colour

A-1.6.1 That characteristic of visual sensation which enables the observer to distinguish differences in the quality of the sensation of the kind which can be caused by differences in the spectral composition of the light.

A-1.6.2 That characteristic of the light stimulus, light source or object, which gives rise to the visual sensation in a red light, a white light, a red face, etc.

A-1.6.3 As defined in (A-1.6.1) or (A-1.6.2), but restricted to the appearance of redness, greenness, etc, as distinct from whiteness, greyness or blackness; that is chromatic colour in contra-distinction to achromatic colour.

A-1.7 Complementary Colours

A-1.7.1 Additive — Any two colours which, by additive mixture, can be made to match a specified achromatic colour.

A-1.7.2 Subtractive — Any two absorbing media which, by subtractive mixture, can be made to match a specified achromatic colour.

A-1.8 Colour Content — The subjectively estimated amount of colourfulness seen in the visual sensation arising from a surface colour. Similar to chroma.

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A-1.9 Cleaner — A difference apparently due to the presence of less black than in the original sample.

A-1.10 Cool Colours — Green or blue, or colours which exhibit a predominance of these.

A-1.11 Chromatic Sensations — Visual sensations possessing the attribute of hue.

A-1.12 Dichroism — A phenomenon in which a secondary source shows a marked change in hue with change in the observing conditions. Instances are: (a) change in colour temperature of the illuminant, (b) change in concentration of an absorbing material, (c) change in thickness of an absorbing layer, (d) change in direction of illumination or viewing, and (e) change in conditions of polarization.

A-1.13 Dullness — That colour quality, an increase in which is associated with the residual degradation which would result from the addition of a small quantity of neutral grey to the colouring material when the strength of the mixture has been readjusted to the original strength (comparison duller).

A-1.14 Deeper — A difference apparently due to the presence of less white than in the original sample.

A-1.15 Dirtier/Duller — A difference apparently due to the presence of more black than in the original sample.

A-1.16 Full Colours — Surface colours which are produced with the maximum colourfulness obtainable.

A-1.17 Grey

A-1.17.1 Any achromatic sensation of luminosity intermediate between black and white.

A-1.17.2 As defined in (A-1.17.1), but applied to a secondary source which is partially absorbing at some or all visible wavelengths but from which the reflected or transmitted light has the same colour as that of the incident light.

A-1.18 Hue — Attribute of visual sensation which has given rise to colour names, such as blue, green, yellow, red and purple.

A-1.19 Light — Radiant power (energy flux) capable of stimulating the eye to produce visual sensation.

A-1.20 Minus Colours — Colours in which only the spectral components associated with the colour named are not present to any substantial extent, for example, minus red.

A-1.21 Munsell Chroma — The estimated pure chromatic colour content of a surface colour on a scale of equal sensation intervals extending from grey (chroma = 0), as specified objectively by the samples of the Munsell Atlas (see Note).

NOTE — The Munsell system presents the closest attempt at representing the colour solid of surface colours by samples spaced at equal sensation intervals, and therefore the closest correlation with the subjective variables, which are chroma, lightness (called value) and hue.

A-1.22 Munsell Value — The estimated lightness of any surface colour on a scale of 10 equal sensation intervals extending from ideal black (value = 0) to ideal white (value = 10), as specified objectively for values from 1 to 9 in the Munsell Atlas (see Note under A-1.21).

A-1.23 Munsell Hue — The hue of a surface colour on a scale of 100 equal sensation intervals round a colour circle of constant chroma, as specified objectively by the samples of the Munsell Atlas (see Note under A-1.21).

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A-1.24 Mass Tone — The colour by reflected light of a bulk of undiluted pigment.

A-1.25 Neutral Grey — Applied to a secondary source which is equally absorbing at all visible wavelengths.

A-1.26 Primary Light Source — A body or object emitting light by virtue of a transformation of energy into radiant energy within itself.

A-1.27 Shade — A colour of the same hue and saturation but lower luminosity.

A-1.28 Shadow Series

A-1.28.1 Subjective — A series of colours of varying luminosity but constant hue and saturation.

A-1.28.2 Objective — A series of colours of varying luminance, but constant chromaticity.

A-1.29 Strength — That colour quality, an increase in which is associated with an increase in the concentration of the colouring material present, all other conditions (viewing, etc) remaining the same (comparisons stronger, weaker).

A-1.30 Stronger — A difference apparently due to the presence of more colour than in the original sample.

A-1.31 Subtractive Mixture — The mixture of absorbing media or the superposition of filters so that the composition of the light stimulus passing through the combination is determined by the simultaneous or successive absorption of parts of the spectrum by each medium present.

A-1.32 Secondary Light Source — A body or object transmitting or reflecting light falling on it from any other source, whether primary or secondary.

A-1.33 Tint — The weak colour resulting from the addition to white of a small amount of colouring matter.

A-1.34 Tinge — A trace of added colour.

A-1.35 Tone — A slight variant of a colour.

A-1.36 Undertone — The colour of a pigment when it is used in very thin layers or greatly extended with white, the hue of which may often differ from that of the mass tone.

A-1.37 Warm Colours — Red, orange or yellow, or colours which exhibit a predominance of these.

A-1.38 Weaker — A difference apparently due to the presence of less colour than in the original sample.

A-1.39 White

A-1.39.1 An achromatic sensation of relatively high luminosity.

A-1.39.2 As defined in (A-1.39.1), but applied to a secondary source which is non-absorbing at all visible wavelengths.

A-1.40 White Content — The subjectively estimated amount of whiteness seen in the visual sensation arising from a surface colour.

A-1.41 Whiter — A difference apparently due to the presence of more white than in the original sample.

APPENDIX B

(Clauses 0.1 and 6.1)

SALIENT FEATURES OF THE COLOUR RANGE
FOR BUILDING AND DECORATIVE FINISHES

B-1. NECESSITY AND DEVELOPMENT OF THE RANGE OF COLOURS

B-1.1 The range is based on BS 2660 : 1955 'Colours for building and decorative paints,' which was developed to meet most of the demands of architects and other paint users. The chief needs were to select colours and set them forth so that good combinations could be found easily and quickly and to have a range moderate in size but capable, nevertheless, of a generous variety of architectural expression. Its success lies in its being comprehensive enough to allow designers the scope of selection without feeling themselves unduly restricted, at the same time giving sufficient emphasis to the interplay of colours for creating a background suited to the particular purposes of the interior and to variations of lighting and form.

B-1.2 The following three principles prevailed in preparing the range:

- a) The whole field of possible colours was reduced to simple terms by division into categories, each of these having recognized significance in design.
- b) The range was to contain as many pleasant and harmonious combinations of colour as possible.
- c) The limitations of paint pigments and the need for reliable performance were to be accepted in the detailed choice of colour.

B-1.2.1 In the first principle, the term 'categories' means colours of a particular lightness, strength or hue. In this standard, the colours conform, for the most part, to nine different lightnesses, nine hue groups, and four categories of strength.

B-1.2.2 The second principle, namely, of selection for harmony, is partly met by the spacing of the colours into their various categories, because this helps to avoid the unpleasant or weak effects which occur when colours are neither the same nor clearly different. Nevertheless, there is room for 'smoothing' of the range by further additions of colours in due course.

B-1.3 Among the strong colours given in card 0, the 'Chroma' (*see B-2.1.3*) in the case of green-yellow, green, blue-green, blue and purple has been deliberately kept lower than for others in view of the limitations of lightfastness of the pigments used to produce them.

B-1.4 It may be noted that greys are dealt with rather liberally in view of their importance in building and decorative finishes.

B-1.5 To answer the general needs of architects and to reduce demands of special colours, it is gathered out of experience that about 100 colours would be required in the minimum. BS 2660 : 1955 has in all 101 colours displayed in its charts. The range is intended to be a self-sufficient unit and no extension of this range by 'mixing of colours' is visualized.

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B-2. THE 'MUNSELL' SYSTEM

B-2.1 In the 'Munsell' system, the colours are specified in terms of hue, value and chroma.

B-2.1.1 *Hue* distinguishes red from blue, green from yellow, etc, and is denoted by letter (for example, R for red, BG for blue-green) with prefix numbers, namely, 2.5, 7.5 or 10. If, for example, the R (red) number is greater than 5, the colour inclines to the yellow-red (YR), and if the R number is less than 5, the colour inclines to red-purple (RP), and so on round the hue circle.

B-2.1.2 *Value* is related to lightness or darkness of a colour and is quoted as ranging from 0 to 10; the low figures represent the darker colours and finally black (0), the high figures represent the light colours and finally white (10). A rough estimate of the reflectance as a percentage is given by the formula $V(V-1)$, where V is the 'value'. Thus, colours of similar values have similar reflectances.

B-2.1.3 *Chroma* is strength of colour and is based on a scale from neutral grey (-/0) towards full-strength at any given 'value' level. Steps are denoted numerically at even intervals.

B-2.2 A complete 'Munsell' reference for a colour, for example, 7.5 R 9/2, means:

- a) the hue of 7.5 R denoting a red inclined towards yellow-red,
- b) the value 9 denoting a very light colour, and
- c) the chroma 2 indicating that the strength of the colour is low.

A broad description of the colour would, therefore, be 'pale-pink'.

B-2.3 It should be noted, however, that neutral greys, having no hue or chroma, are denoted by the value figure prefixed by 'N', for example, 'N6' or 'N8'.

B-2.4 In the design of the colour range, 'Munsell' references provide the means of defining the various categories of colour required. In conjunction with the ten-card presentation, the references make the different categories of colour fully explicit. For example, the main source for wall colours for interiors is likely to be the 'greys' on card 9 or the soft colours on the left-hand side of cards 1 to 8, and it may be seen from the references that among these the range provides some vertical sequences of colours with constant 'hue' and 'chroma' but with alternatives of 'values'. The references thus help in many ways to link the choice of colours to functions.