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Indian Standard

COLOURS FOR READY MIXED PAINTS AND ENAMELS

(Fourth Revision)

(Incorporating Amendment No. 1)

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BUREAU OF INDIAN STANDARDS
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Price Group 6

Paints (Other than Industrial Paints) and Allied Products Sectional Committee, CHD 020

F O R E W O R D

This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Paints (Other than Industrial Paints) and Allied Products Sectional Committee had been approved by the Chemical Division Council.

This standard was first published in 1949 and since then it has been revised three times in 1955, 1961 (and also reprinted in 1969), and 1978 (also printed in 1984). Through the use of the reprinted version of the standard for over five years colour fading was noticed in some shades. The concerned Sectional Committee, therefore, decided to prescribe 'Munsell' values in terms of hue, lightness value graduations (value) and chroma according to the calibrated scales of the 'Munsell' colour Atlas as records of the original colour values of individual shades for reference. Accordingly, approximate 'Munsell' references and Colourimetric values for all colours are given in Table 1. The Colourimetric values expressed in terms of Trichromatic System are also given in Table 1. An explanation of the 'Munsell' system of colour references and glossary of colour terms is given in Annex A.

In the third revision an additional colour shade 'scamic', Indian Standard Colour (ISC) No. 294 in semi-gloss was included with the specific approval of the Ministry of Defence, Government of India. The title of the standard was modified to include the word 'enamels'. The name of the shade ISC No. 415 was changed from 'Imperial Brown' to 'India Brown' and ISC No. 633 from 'RAF Blue-Grey' to 'AF Blue-Grey'.

In this revision, four new colours, namely, Phirozi (ISC No. 176) and Satin Blue (ISC No. 177). Bus Green (ISC No. 299) and Steel Grey (ISC No. 698) have been added in Blue, Green and Grey colour groups respectively. Tri chromatic values determined on spectro photometer have also been included in this revision for each colour shades. Consequently definition of relevant terms have also been added in Annex A.

In the preparation of this revised standard substantial assistance has been made available in measurement and checking of colour values by Indian Institute of Chemical Technology, Hyderabad and active collaboration of the Panel of referees comprising experts from National Test House, Calcutta; Indian Institute of Chemical Technology, Hyderabad; Ministry of Defence (DGQA), Kanpur; Indian Paints Association, Calcutta; Shalimar Paints, Calcutta; Berger Paints, Calcutta; and Jenson and Nicholson, Calcutta in matchings of colour shades, which are thankfully acknowledged. Assistance has also been derived from BS 381 C : 1988 'Colours for identification, coding and special purposes' and BS 1611 : 1953 'Glossary of colour terms used in science and industry' issued by the British Standards Institution.

This edition 5.1 incorporates Amendment No. 1 (September 1995). Side bar indicates modification of the text as the result of incorporation of the amendment.

Indian Standard

COLOURS FOR READY MIXED PAINTS AND ENAMELS

(Fourth Revision)

1 SCOPE

1.1 This standard covers 104 colours for ready mixed paints and enamels grouped under Blue; Green; Yellow, Cream and Buff; Brown and Pink; Red and Orange; Grey; and Violet.

2 TERMINOLOGY

2.1 For the purpose of this standard, the definitions of colour terms given in Annex A of this standard shall apply.

3 NUMBERING SYSTEM

3.1 Three digit numbers have been given to the colours, of which the first digit indicates the group of colours according to the seven broad colour divisions mentioned in **1.1**, each group having a range of numbers allotted, namely :

Blue	...	...	...	100-199
Green	...	...	...	200-299
Yellow, Cream and Buff	...	...	...	300-399
Brown and Pink	...	...	...	400-499
Red and Orange	...	...	...	500-599
Grey	...	...	...	600-699
Voilet	...	...	...	700-799

3.1.1 Whenever new colours are required to be added in the above ranges, these will be assigned numbers which do not overlap the existing numbers.

4 'MUNSELL' REFERENCES AND COLOURIMETRIC VALUES

4.1 Approximate 'Munsell' references for each colour are given in Table 1 quoted by the respective reference number. The Indian Standard Colour (ISC) number shall always be used for identifying a colour, and 'Munsell' references are given for guidance and as an aid in comparing individual properties in terms of hue, value and chroma. The colourimetric values (chromaticity co-ordinates and luminance factor) expressed in terms of the trichromatic system for colourimetry, which constitute a permanent record of the standard colours obtained from spectrophotometric measurements are also given in Table 1 for guidance. The 'Munsell' system of colours is briefly explained in Annex A.

ANNEX A

(*Foreword*, *Clauses* 2.1 *and* 4.1)

GLOSSARY OF COLOUR TERMS AND THE 'MUNSELL' SYSTEM

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 arc 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 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.

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 condition 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 Colour — 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 sample 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, a specified objectively by the samples of the 'Munsell' Atlas (*see* Note under **A-1.21**).

A-1.24 Masstone — 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 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 Tings — 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 masstone.

A-1.37 Warm Colour — 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.

A-2 THE 'MUNSELL' SYSTEM

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

A-2.1.1 ***Hue*** — It 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.

A.2.1.2 ***Value*** — It 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 reflectance.

A-2.1.3 ***Chroma*** — Attribute of a visual sensation which permits a judgement to be made in the amount of pure chromatic colour present, irrespective of the amount of a chromatic colour.

It 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.

A-2.1.4 ***Chromaticity Coordinates*** — Ratio of each of the three tristimulus values to their sum. It indicates the colour quality of the sample and recommended symbols are x,y and z in the CIE 1931 standard colourmetric system and x10, y10 and z10 in the CIE 1964 supplementary colourmetric system.

$$x = \frac{X}{X+Y+Z} \qquad x_{10} = \frac{X_{10}}{X_{10}+Y_{10}+Z_{10}}$$

$$y = \frac{Y}{X+Y+Z} \qquad y_{10} = \frac{Y_{10}}{X_{10}+Y_{10}+Z_{10}}$$

$$z = \frac{Z}{X+Y+Z} \qquad z_{10} = \frac{Z_{10}}{X_{10}+Y_{10}+Z_{10}}$$

X, Y and Z are the tristimulus values in the CIE 1931 Standard Colourimetric System and X10, Y10 and Z10 in the CIE 1964 Supplementary Colourimetric System.

$$x + y + z = 1 \quad \text{and } x\,10 + y\,10 + z10 = 1$$

A-2.1.5 ***Tristimulus Value*** — Amounts of the three reference or matching stimuli required to give a match with the colour stimulus considered, in a given trichromatic system.

The symbols recommended for the tristimulus values are X, Y and Z in the CIE 1931 standard colourimetric system and X_{10}, Y_{10} and Z_{10} in the CIE 1964 standard colourimetric system.

A-2.1.6 ***Luminance Value*** — The emission by matter of electromagnetic radiation which for certain wavelengths or restricted regions of the spectrum is in excess of that due to the thermal radiation from the material at the same temperature is defined as Luminance.

The ratio of the luminance of a body while illuminated and observed under certain conditions to that of perfect defuser under the same conditions.

A-2.1.7 ***Method of Determination of Chromaticity Coordinates*** — The value of reflectance is measured for the sample over a circular area of 20 mm in dia over a wavelength range of 400 to 700 mm at 20 mm interval. The Macbeth "Uptimatch" colour matching system is used for determining the reflectance values.

A-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'.

A-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'.

A-2.4 In the design of the colour range, 'Munsell' references provide the means of defining the various categories of colour required.

Table 1 Approximate 'Munsell' References and Colourimetric Values

(*Foreword* and *Clause* 4.1)

Sl No.	Indian Standard Colour (ISC) No.	Name of Colour Shade	Chromaticity Coordinates		Luminance Value	Approximate Munsell Value	
			X	Y		Hue	Value/Chroma
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	101	Sky Blue	0.2917	0.3512	34.47	2.5 BG	6.5/3.0
2.	102	Turquoise Blue	0.2605	0.3368	23.23	7.5 BG	4.5/10.0
3.	103	Peacock Blue	0.2474	0.3105	12.47	5.0 B	3.5/5.0
4.	104	Azure Blue	0.2308	0.2514	9.36	5.0 PB	2.75/8.0
5.	105	Oxford Blue	0.2548	0.2641	6.18	7.5 PB	2.0/5.0
6.	106	Navy Blue	0.2949	0.3068	5.05	7.5 PB	1.00/4.0
7.	108	Aircraft Blue	0.2242	0.2335	8.56	7.5 PB	2.50/7.0
8.	166	French Blue	0.2189	0.2371	12.88	5.0 PB	3.00/12.0
9.	169	Traffic Blue	0.2365	0.2845	11.75	10.0 B	3.50/8.0
10.	174	Oriental Blue	0.2447	0.3243	25.30	2.5 B	5.50/7.0
11.	176	Phirozi	0.1953	0.2515	20.96	10.0 B	6.00/13.0
12.	177	Satin Blue	0.2666	0.3089	56.87	7.5 B	9.00/6.0
13.	216	Eau-de-Nil	0.3409	0.3961	43.07	7.5 GY	7.50/3.5
14.	217	Sea Green	0.3518	0.4255	31.53	7.5 GY	6.50/7.0
15.	218	Grass Green	0.3383	0.4338	17.83	7.5 GY	4.50/8.0
16.	219	Sage Green	0.3525	0.4008	17.99	5.0 GY	4.00/6.0
17.	220	Olive Green	0.3360	0.3848	9.11	5.0 GY	3.00/6.0
18.	221	Brilliant Green	0.3191	0.4326	13.55	10.0 GY	3.50/8.0
19.	222	Light Bronze Green	0.3651	0.4059	14.07	2.5 GY	4.00/6.0
20.	223	Middle Bronze Green	0.3327	0.3706	8.57	2.5 GY	3.00/4.0
21.	224	Deep Bronze Green	0.3212	0.3553	7.06	2.5 GY	2.00/4.0
22.	225	Light Brunswick Green	0.3189	0.4149	11.25	10.0 GY	4.00/6.0
23.	226	Middle Brunwsick Green	0.2985	0.3723	8.14	5.0 G	2.50/4.0
24.	227	Deep Brunswick Green	0.2990	0.3558	6.87	10.0 GY	2.00/4.0
25.	267	Traffic Green	0.2961	0.3802	10.76	2.5 G	3.00/5.0
26.	275	Opaline Green	0.3134	0.3875	36.62	2.5 G	6.50/5.0
27.	276	Lincoln Green	0.3145	0.3855	8.80	2.5 G	3.00/5.0
28.	277	Cypress Green	0.3277	0.3989	10.17	10.0 GY	3.00/4.0
29.	278	Light Olive Green	0.3537	0.4041	23.24	5.0 GY	5.50/4.0
30	279	Steel Furniture Green	0.3314	0.3510	7.88	10.0 Y	2.50/2.0

Table 1 — (*Continued*)

Sl No.	Indian Standard Colour (ISC) No.	Name of Colour Shade	Chromaticity Coordinates		Luminance Value	Approximate Munsell Value	
			X	Y		Hue	Value/Chroma
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
31.	280	Verdigris Green	0.2908	0.3928	25.43	5.0 G	5.50/6.0
32.	281	Apple Green	0.3217	0.3984	30.46	10.0 GY	5.75/6.0
33.	282	Forest Green	0.3083	0.3820	11.71	10.0 GY	2.50/4.0
34.	283	Aircraft Grey Green	0.3258	0.3725	21.31	10.0 GY	5.00/3.0
35.	284	India Green	0.2918	0.3944	11.64	2.5 G	4.00/5.0
36.	294	Scamic	0.3279	0.3555	9.72	2.5 GY	3.50/2.0
37.	298	Olive Drab	0.3364	0.3639	8.48	10.0 Y	2.50/2.0
38.	299	Bus Green	0.2626	0.4017	10.22	10.0 Y	4.00/9.0
39.	309	Canary Yellow	0.4506	0.4643	62.46	5.0 Y	8.75/14.0
40.	352	Pale Cream	0.3865	0.3964	59.81	5.0 Y	8.50/5.0
41.	353	Deep Cream	0.4140	0.4133	63.53	2.5 Y	9.00/10.0
42.	354	Primrose	0.4265	0.4287	51.33	5.0 Y	8.25/9.0
43.	355	Lemon	0.4735	0.4544	51.07	2.5 Y	8.50/13.0
44.	356	Golden Yellow	0.4855	0.4379	47.46	10.0 YR	8.00/14.0
45.	358	Light Buff	0.4193	0.2994	45.36	10.0 YR	9.00/8.00
46.	359	Middle Buff	0.4306	0.4062	35.32	10.0 YR	7.00/8.5
47.	360	Deep Buff	0.4253	0.3918	27.39	7.5 YR	6.00/7.0
48.	361	Light Stone	0.3861	0.3827	38.53	10.0 YR	6.50/5.0
49.	362	Middle Stone	0.4192	0.3922	25.16	10.0 YR	5.50/7.0
50.	363	Dark Stone	0.4170	0.3886	21.08	10.0 YR	5.00/7.0
51.	364	Portland Stone	0.3596	0.3752	53.76	5.0 Y	8.50/3.0
52.	365	Vellum	0.3477	0.3665	60.46	7.5 Y	8.75/3.0
53.	368	Traffic Yellow	0.4991	0.4078	34.12	5.0 YR	6.50/12.0
54.	384	Light Straw	0.3663	0.3788	54.91	5.0 Y	8.50/5.0
55.	385	Light Biscuit	0.3825	0.3895	63.56	2.5 Y	8.75/5.0
56.	386	Champagne	0.3828	0.3849	55.32	2.5 Y	8.25/4.5
57.	387	Sunshine	0.3709	0.3807	49.31	2.5 Y	7.50/3.0
58.	388	Beige	0.3719	0.3764	47.74	2.5 Y	7.50/6.0
59.	397	Jasmine Yellow	0.4116	0.4307	64.12	5.0 Y	9.50/10.0
60.	410	Light Brown	0.4263	0.3896	18.14	7.5 YR	4.50/6.0
61.	411	Middle Brown	0.3983	0.3693	11.17	7.5 YR	3.00/4.0
62.	412	Dark Brown	0.3712	0.3467	7.86	5.0 YR	2.00/4.0
63.	413	Nut Brown	0.3396	0.3404	6.93	5.0 YR	2.50/2.0
64.	414	Golden Brown	0.4505	0.3865	16.63	5.0 YR	5.00/7.0
65.	415	India Brown	0.3939	0.3578	9.94	5.0 YR	2.50/6.0
66.	439	Orange Brown	0.4199	0.3563	11.38	7.5 R	3.00/8.0
67.	442	Light Salmon Pink	0.3902	0.3777	57.77	7.5 YR	9.00/5.0
68.	443	Salmon Pink	0.3960	0.3596	34.48	2.5 YR	6.50/7.0

Table 1 — (*Concluded*)

Sl No.	Indian Standard Colour (ISC) No.	Name of Colour Shade	Chromaticity Coordinates		Luminance Value	Approximate Munsell Value	
			X	Y		Hue	Value/Chroma
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
69.	444	Terra Cotta	0.4360	0.3457	14.24	7.5 R	4.00/8.0
70	445	Venetian Red	0.4219	0.3450	10.77	7.5 R	3.00/6.0
71.	446	Red Oxide	0.4054	0.3415	9.74	7.5 R	3.00/4.5
72.	448	Deep Indian Red	0.3786	0.3317	7.61	7.5 R	2.50/4.0
73.	449	Light Purple Brown	0.3622	0.3292	6.88	7.5 R	2.75/3.0
74.	451	Chocolate	0.3315	0.3340	6.13	5.0 R	1.00/2.0
75.	473	Gulf Red	0.4020	0.3352	8.21	7.5 R	2.50/6.0
76.	489	Leaf Brown	0.4089	0.3625	13.10	2.0 YR	3.00/6.0
77.	490	Beech Brown	0.3719	0.3483	8.69	2.5 R	2.75/6.00
78.	499	Service Brown	0.3520	0.3513	8.10	10.0 YR	2.50/4.0
79.	536	Fire Red	0.3585	0.3464	17.69	7.5 R	4.50/13.0
80.	537	Signal Red	0.5252	0.3351	14.95	7.5 R	5.00/16.0
81.	538	Post Office Red	0.4973	0.3269	10.88	5.0 R	4.00/14.0
82.	540	Crimson	0.4067	0.3232	7.32	5.0 R	3.00/7.0
83.	541	Maroon	0.3400	0.3242	5.85	7.5 R	1.50/3.0
84.	557	Light Orange	0.5096	0.3860	27.19	2.5 YR	5.00/13.0
85.	570	Traffic Red	0.4877	0.3531	15.13	10.0 R	3.50/10.0
86.	574	Indian Saffron	0.5029	0.3539	23.01	7.5 R	6.00/12.0
87.	591	Deep Orange	0.5092	0.3640	21.72	7.5 R	6.00/12.0
88.	592	International Orange	0.5308	0.3538	19.69	7.5 R	4.50/14.0
89.	628	Silver Grey	0.3389	0.3664	31.60	2.5 GY	6.00/1.5
90.	629	Quaker Grey	0.3429	0.3644	26.51	10.0 Y	5.50/2.0
91.	630	French Grey	0.3263	0.3547	32.69	5.0 GY	6.50/1.5
92.	631	Light Grey	0.3098	0.3413	31.28	5.0 G	5.50/1.5
93.	632	Dark Admiralty Grey	0.2994	0.3224	15.75	10.0 B	4.00/1.5
94.	633	AF Blue-Grey	0.2963	0.3191	8.06	10.0 B	2.50/2.5
95.	634	Slate	0.3252	0.3549	15.23	5.0 GY	4.00/1.5
96.	635	Lead	0.3104	0.3405	10.00	2.5 G	3.00/1.0
97.	671	Middle Graphite	0.3036	0.3246	10.08	10.0 B	3.75/1.5
98.	692	Smoke Grey	0.2756	0.3085	25.14	10.0 B	5.50/4.0
99.	693	Aircraft Grey	0.3089	0.3343	23.95	10.0 BG	5.50/1.0
100.	694	Dove Grey	0.3128	0.3379	25.82	5.0 BG	5.50/1.5
101.	695	Dark Blue-Grey	0.3060	0.3259	6.17	10.0 B	2.50/1.5
102.	697	Light Admiralty Grey	0.2987	0.3377	47.95	10.0 BG	7.00/3.0
103.	698	Steel Grey	0.3088	0.3292	7.67	10.0 BG	2.50/1.5
104.	796	Dark Violet	0.2981	0.2579	9.90	7.5 P	3.00/7.0

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