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IS 13607 (1992): Ready Mixed Paint, Finishing, General Purposes, Synthetic [CHD 20: Paints, Varnishes and Related Products]



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Indian Standard

**HEADY MIXED PAINT, FINISHING, GENERAL
PURPOSES, SYNTHETIC – SPECIFICATION**

UDC 667.633.263.3

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BUREAU OF INDIAN STANDARDS

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NEW DELHI 110002

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Price Group 2

FOREWORD

This standard 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.

With the advent of newer technology, oil based paints are no longer in vogue. As such, an ad hoc pane was set up by the Paints Sectional Committee to review the entire range of oil based paints. The Committee, based on the recommendations of ad hoc panel, decided to formulate this new standard to replace the existing fourteen oil based paint-standards (IS 117, 120, 121, 122, 123, 124 (Part 1), 124 (Part 2), 124 (Part 3), 126, 127, 128, 129, 130 and 641).

This standard is at par with the defence specifications ABSP/99/89, Specification for Paint RFU, Finishing General Service Synthetic, Semi-gloss, Brushing/Spraying, various colours.

Internationally, the determination of gloss value at 45° is becoming obsolete and 60° glossometer is being used for this purpose. Till the time Indian Paint Industry and testing laboratories switch over completely to 60° glossometer for determination of gloss value, both the values are being stipulated in this specification.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this standard.

AMENDMENT NO. 1 MAY 2003
TO
IS 13607 : 1992 READY MIXED PAINT, FINISHING,
GENERAL PURPOSES, SYNTHETIC —
SPECIFICATION

(*Page 1, clause 4.2, line 6*) — Substitute 'Pale cream (ISC No. 352), Middle stone (ISC No. 362) and Light grey (ISC No. 631)' *for* 'other colours'.

(*Page 1, clause 4.2*) — Insert the following at the end:

'NOTE — Titanium dioxide composition requirement clause is not applicable for other than above four shades.'

(*Page 4, clause C-1, line 2*) — Substitute ' $58 \pm 2^{\circ}\text{C}$ ' *for* ' 60°C '.

(CHD 20)

Reprography Unit, BIS, New Delhi, India

Indian Standard

READY MIXED PAINT, FINISHING, GENERAL PURPOSES, SYNTHETIC — SPECIFICATION

1 SCOPE

1.1 This standard prescribes requirements and methods of sampling and test for general purpose, synthetic resin based paint, in different colours, having brushing consistency.

1.2 The product is used for protection and decoration of ferrous and non-ferrous surfaces and wood.

NOTE — The normal painting system will be one coat of the finishing paint over one coat of a priming paint as per IS 2074.

2 REFERENCES

The Indian Standards listed in Annex A are the necessary adjuncts to this standard.

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 1303 : 1983 shall apply.

4 REQUIREMENTS

4.1 General

The material shall be supplied in brushing consistency and shall be suitable for application by spraying after thinning with petroleum hydrocarbon solvent, low aromatic, 140/205 grade (see IS 1745 : 1978).

4.1.1 Paints with yellow, red and green colours are not intended for application by spraying.

4.2 Composition

The paint complying with this standard shall consist of pigments adequately dispersed in vehicle based on synthetic resin. The dry pigment shall contain not less than 25 percent of Titanium Dioxide (R) in white and 15 percent in other colours. The vehicle in all cases shall essentially consist of oil modified alkyd and/or pure phenolic excluding natural resins and their derivatives.

4.3 The material shall also comply with the requirements given in Table 1.

Table 1 Requirements for RMP, Finishing, General Purpose, Synthetic

Sl No.	Characteristic	Requirement	Method of Test, Ref to	
			IS 101 (4)	Annex (5)
(1)	(2)	(3)		
i)	a) Consistency	Smooth and Uniform	(Part 1/Sec 5) : 1989	—
	b) Relative consistency (By Ford Cup No. 4 at $27 \pm 0.5^\circ\text{C}$)	80 – 120 Secs		
ii)	Drying time, <i>Max</i>		(Part 3/Sec 1) : 1986	—
	a) Surface dry	4 hours		
	b) Hard dry	12 hours		
	c) Tack free	24 hours		
iii)	a) Finish	Smooth and semi-glossy	(Part 3/Sec 4) : 1987	—
	b) Fineness of grind, <i>Max</i>	40 microns	(Part 3/Sec 5) : 1986	—
iv)	Mass in kg/10 l, <i>Min</i>	11	(Part 1/Sec 7) : 1986	—
v)	Gloss (Specular Reflection), or 60°	31 to 50 units 21 to 60 units	(Part 4/Sec 4) : 1988	—
vi)	Colour	Close match to IS colour in IS 5 as specified	(Part 4/Sec 2) : 1989	—
vii)	Volume Solids, <i>Min</i>	40	—	B
viii)	Flexibility and adhesion	No damage, detachment or cracking of the paint film	(Part 5/Sec 2) : 1988	—
ix)	Scratch hardness	Bare metal shall not be visible through the scratch	(Part 5/Sec 1) : 1988	—
x)	Stripping test	The scratch shall be free from jagged edges	17 of IS 101	—
xi)	Resistance to salt spray	No breakdown of the paint film and no corrosion of metal substrate	App. A, IS 2074	—
xii)	Presence of rosin and rosin derivatives	Absent	(Part 9/Sec 2)	—
xiii)	Lead restriction except for red, yellow and green colours	Less than 5 percent as PbO	(Part 8/Sec 5)	—
xix)	Flash point	Not below 30°C	(Part 1/Sec6) : 1986	—
xv)	Accelerated storage stability test	To pass the test	—	—
xvi)	Durability	No sign of checking, chalking, permanent blistering, spotting, flaking or brittleness and not appreciable change in colour and gloss.	—	—
	a) outdoor exposure			—
	b) salt spray test			—

5 PACKING AND MARKING

5.1 Packing

Unless otherwise agreed to between the purchaser and the supplier, the paint shall be packed in metal containers conforming to IS 1407 : 1980 and IS 2552 : 1989.

5.2 Marking

Each container shall be marked with the following:

- Name, colour and the type of the material;
- Indication of the source of manufacture;
- Volume of the material; and
- Month and year of manufacture.

6 SAMPLING

6.1 Representative samples of the paint shall be drawn as prescribed in IS 101 (Part 1/ Sec 1) : 1986.

6.2 Number of Tests

The tests shall be covered on all the characteristics of the material on individual samples.

6.3 Criteria for Conformity

The lot shall be declared as conforming to the requirements of this specification if the characteristics tests on individual sample satisfy the corresponding requirements given in this specification.

ANNEX A (Clause 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	IS No.	Title
101 (Part 1/ Sec 1) : 1986	Methods of sampling and test for paints, varnishes and related products: Part 1 Test on liquid paints (general and physical)/Sec 1 Sampling (<i>third revision</i>)	101 (Part 3/ Sec 4) : 1987	Methods of sampling and test for paints, varnishes and related products: Part 3 Tests on paint film formation Sec 4 Finish (<i>third revision</i>)
101 (Part 1/ Sec 3) : 1986	Methods of sampling and test for paints, varnishes and related products: Part 1 Test on liquid paints (general and physical)/Sec 3 Preparation of panels (<i>third revision</i>)	101 (Part 3/ Sec 5) : 1987	Methods of sampling and test for paints, varnishes and related products: Part 3 Test on paint film formation Sec 4 Fineness of grind (<i>third revision</i>)
101 (Part 1/ Sec 5) : 1989	Methods of sampling and test for paints, varnishes and related products: Part 1 Test on liquid paints (general and physical)/Sec 5 Consistency (<i>third revision</i>)	101 (Part 4/ Sec 1) : 1988	Methods of sampling and test for paints, varnishes and related products: Part 4 Optical test on paint films Sec 1 Opacity
101 (Part 1/ Sec 6) : 1986	Methods of sampling and test for paints, varnishes and related products: Part 1 Test on liquid paints (general and physical)/Sec 6 Flash point (<i>third revision</i>)	101 (Part 4/ Sec 2) : 1990	Methods of sampling and test for paints, varnishes and related products: Part 4 Optical tests on paint films Sec 2 Colour
101 (Part 1/ Sec 7) : 1986	Methods of sampling and test for paints, varnishes and related products: Part 1 Test on liquid paints (general and physical)/Sec 6 Mass per 10 litres (<i>third revision</i>)	101 (Part 4/ Sec 4) : 1988	Methods of sampling and test for paints, varnishes and related products: Part 4 Optical tests on paint films Sec 4 Gloss (<i>third revision</i>)
101 (Part 3/ Sec 1) : 1986	Methods of sampling and test for paints, varnishes and related products: Part 3 Tests on paints film formation: Sec 1 Drying time (<i>third revision</i>)	101 (Part 5/ Sec 1) : 1988	Methods of sampling and test for paints, varnishes and related products: Part 5 Mechanical test on paint films Sec 1 Hardness test (<i>third revision</i>)
		101 (Part 5/ Sec 2) : 1988	Methods of sampling and test for paints, varnishes and related products: Part 5

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
	Mechanical tests on paint films Sec 2 Flexibility and adhesion (<i>third revision</i>)	101 (Part 9/ Sec 2)	Methods of sampling and test for paints, varnishes and related products: Part 9 Tests for Lacquers and varnish Sec 2 Rosin test
101 (Part 8/ Sec 2) : 1990	Methods of sampling and test for paints, varnishes and related products: Part 8 Tests for pigments and other solids Sec 2 Pigment and non-volatile matter	1303 : 1983	Glossary of terms relating to paints (<i>second revision</i>)
		1407 : 1980	Round paint tins (<i>second revision</i>)
		2074 : 1979	Ready mixed paint, air drying, red oxide zinc chrome, prim- ing (<i>first revision</i>)
101 (Part 8/ Sec 5)	Methods of sampling and test for paints, varnishes and related products: Part 8 Tests for pigments and other solids Sec 5 Lead Restriction	2552 : 1989	Steel drums (galvanized and ungalvanized) (<i>third revision</i>)

ANNEX B

[Table 1, Sl No. (vii)]

DETERMINATION OF VOLUME SOLIDS

B-1 GENERAL

This method is intended to provide a measure of the volume of dry coating obtainable from a given volume of liquid coating. This volume is considered to be the most equitable means of comparing the coverage and the wet film thickness of the given paint.

B-2 APPARATUS

B-2.1 Analytical Balance — Sensitive to 0.1 mg.

B-2.2 Stainless Steel Disc

60 mm diameter and 0.70 mm thickness with a small hole 2 to 3 mm from the edge. A fine wire such as chromel is attached through the hole for suspending the disc in a liquid.

B 2.3 Weight Box

B-2.4 Beaker — 1 litre.

B-2.5 Mass per Litre Cup

B-2.6 Hot Air Oven — capable to maintain $105 \pm 2^\circ\text{C}$.

B-3 PROCEDURE

B-3.1 Dry the disc in an oven at 105°C for 10 minutes and cool. Weigh the disc in air. Let it be W_1 grams.

B-3.2 Suspend the disc in water and weigh again. Let it be W_2 grams.

B-3.3 Calculate the volume of the disc V as follows:

$$V = \frac{W_1 - W_2}{d}$$

where

d = is the density of the water at room temperature.

B-3.4 Determine the mass of non-volatile content of the liquid coating material by drying a known amount of paint at 105°C for 3 hours. Let it be W grams.

B-3.5 Determine the specific gravity of the paint to the nearest 0.001 g/ml by using mass per litre cup. Let it be P .

B-3.6 Dip the disc in the paint sample for 10 minutes and take out the disc. Allow the excess coating material to drain off. Blot the coating material off the bottom edge of the disc so that beads or drops do not dry on the bottom edge of the disc. Dry the disc at 105°C for 3 hours and cool. Weigh the coated disc in air. Let it be W_3 grams.

B-3.7 Suspend the coated disc in water and weigh again. Let it be W_4 grams.

B-3.8 Calculate the volume of the coated disc V_1 as follows:

$$V_1 = \frac{W_3 - W_4}{d}$$

where

d = is the density of water at room temperature.

B-3.9 Calculate the volume of the dried coating as follows:

Volume of dried coating (V_d) = $V_1 - V$

B-3.10 Calculate the volume of wet coating as follows:

$$V_w = \frac{W_3 - W_1}{W \times P}$$

where

W = grams of non-volatile matter in 1 g of wet coating.

B-3.11 Calculate the percent volume solids of the paints as follows:

$$\frac{V_1 - V}{V_s} \times 100 \quad \text{OR} \quad \frac{V_d}{V_s} \times 100$$

B-3.12 The percent volume solids of a paint is related to the covering capacity and wet film thickness in the following manner:

a) Theoretical coverage (m²/l) =

$$\frac{\text{Percent Volume Solids}}{\text{Dry film thickness (microns)}} \times 10$$

b) Wet film thickness (microns) =

$$\frac{\text{Dry film thickness (microns)}}{\text{Percent Volume Solids}} \times 100$$

ANNEX C

[Table 1, Sl No. (xv)]

METHOD FOR ACCELERATED STORAGE STABILITY TEST

C-1 PROCEDURE

The paint sample is stored in a closed container and kept at 60°C for 96 hours. After the storage, paint shall not get liver, curdle or increase in efflux time by more than 20 percent and there

shall be no evidence of seeding. The paint shall meet the drying time requirement and shall produce dry film that is uniform in appearance and free from streaking, mottling and seediness. Further, the change in gloss value from the original shall not be more than 5 units.

ANNEX D

[Table 1, Sl No. (xvi)]

DURABILITY

D-1 PREPARATION OF PANELS

D-1.1 Three mild steel panels of 150 mm × 150 mm × 0.63 mm or 150 mm × 75 mm × 0.63 mm size free from surface imperfection shall be prepared as per IS 101 (Part 1/Sec 3) : 1986.

D-1.2 The paint shall be applied by brushing in two coats at an interval of 24 hours to give a dry film mass commensurate with mass in kg/10 L as prescribed in IS 101 (Part 3/Sec 4) : 1987 and allowed to air dry for 72 hours under the conditions prescribed in IS 101 (Part 1/Sec 3) : 1986. The reverse side of the panel shall then be protected with a suitable paint.

D-2 PROCEDURE

Two panels shall then be exposed for 30 days in the open facing south at an angle of 45° to

the horizontal. After this, the panel shall be subjected to salt spray test for 96 hours. The salt solution shall comprise:

Sodium chloride	— 30 g
Anhydrous magnesium chloride	— 0.03 g (or equivalent in hydrated crystals)
Anhydrous magnesium sulphate	— 0.02 g (-do-)
Distilled water	— To make one litre.

After this test, the panels shall be washed with running water and with help of wet cotton swab and dried.

The exposed panels shall then be examined for any change/deterioration.

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