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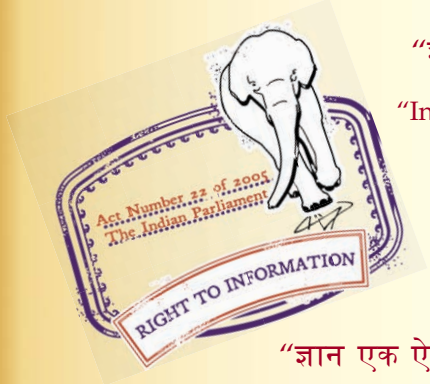
IS 2075 (2000): Ready Mixed Paint, Stoving, Red Oxide Zinc Chrome, Priming [CHD 20: Paints, Varnishes and Related Products]



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(दूसरा पुनरीक्षण)

Indian Standard

READY MIXED PAINT, STOVING, RED OXIDE ZINC CHROME, PRIMING — SPECIFICATION

(Second Revision)

ICS 87.040

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

January 2000 **Price Group 4**

FOREWORD

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

This standard was first published in 1962 amalgamating IS 135 : 1952 'Ready mixed paint, spraying, stoving, red oxide-zinc chrome, priming' and IS 136:1952 'Ready mixed paint, brushing, stoving, red oxide-zinc chrome, priming'. In the first revision in 1979 requirements for chromic anhydride and zinc oxide content in the zinc chrome content had been included. The optional requirements for spreading capacity and spreading time had been dropped. In this revision the values for wet opacity, gloss, mass per 10 litres, etc, have been quantified.

The composition of Technical Committee responsible for formulation of this standard is given in Annex E.

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 should be the same as that of specified value in this standard.

AMENDMENT NO. 1 OCTOBER 2007
TO
IS 2075 : 2000 READY MIXED PAINT, STOVING, RED OXIDE ZINC CHROME, PRIMING — SPECIFICATON

(Second Revision)

[*Page* 2, *Table* 1, *Sl No*.(xii)] — Delete.

(CHD 20)

Reprography Unit, BIS, New Delhi, India

Indian Standard

READY MIXED PAINT, STOVING, RED OXIDE ZINC CHROME, PRIMING — SPECIFICATION

(Second Revision)

1 SCOPE

1.1 This standard prescribes requirements, methods of sampling and test for the material commercially known as ready mixed paint, stoving, red oxide-zinc chrome priming.

1.1.1 The material is used for the protection of steelwork, both under marine and inland outdoor conditions.

2 REFERENCES

The Indian Standards listed in Annex A contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

3 TERMINOLOGY

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

4 CLASSES

The material shall be supplied in brushing consistency but shall be suitable for application by spraying after thinning with petroleum hydrocarbon solvent, 145/205, low aromatic grade conforming to IS 1745. The smell of the material shall not be objectionable during application.

5 REQUIREMENTS

5.1 Composition

The material shall consist of the ingredients mixed in the proportions, by mass, specified below:

a) Pigment (in accordance with **5.1.1**) — 50 ± 5 percent

b) Remainders — Vehicles solvents and driers — in suitable proportions to produce a paint satisfying the requirements of this standard

NOTE — For defence supplies, the material shall meet an additional requirement of non-volatile vehicle, *Min* 20 percent by mass.

5.1.1 The pigment used in the manufacture of the material shall consist of ingredients mixed in the proportions by mass, specified below. Zinc chromate content shall be determined as prescribed in Annex B:

a)	Zinc chrome, percent by mass, *Min* (conforming to Type 2 of IS 51) which shall correspond to chromic anhydride contents of minimum 6.88 percent by mass and 5.84 percent by mass of zinc oxide	16.0
b)	Red oxides of iron, Grade 2 and 3, conforming to IS 44, which shall correspond to red oxide (as Fe_2O_3), percent by mass, *Min;* when tested as prescribed in **6** of IS 6947 (Part 2)	50
c)	Suitable extenders	Remainder

5.1.2 The volatile vehicle shall be of such composition so as to satisfy the requirements of this specification.

5.1.3 The composition of the material shall be subject to lead restriction as defined in IS 1303 and it shall not be more than one percent, expressed as metallic lead, when tested as per IS 101 (Part 8/Sec 5).

5.2 The material shall be suitable for use with oleoresinous synthetic and nitrocellulose-based undercoats, surfacers, fillers and putties.

5.3 Freedom from Objectionable Impurities

Thinner containing chlorinated compounds and other toxic solvents shall not be used.

5.4 Compatibility with Thinner

The material shall be suitable for thinning with thinners used for synthetic paints (*see* IS 1872).

5.5 Relative Consistency

The efflux time from a Flow Cup No. 4 at (30 ± 1)°C when determined as prescribed in IS 101 (Part 1/Sec 5) shall be not less than 80 s and not more than 120 s.

5.6 Resistance to Salt Spray

Prepare a mild steel panel of 150 mm × 100 mm × 1.20 mm as prescribed in IS 101 (Part 1/Sec 3) and stove for the specified period. Keep at room temperature for 24 h

and expose it for 4 days to a baffled spray of the spray solution as per **4** of IS 101 (Part 6/Sec 1) for a period of 168 hours continuously, the paint film shall show no signs of break-down and the underlying metal shall be free from corrosion.

5.7 Resistance to Natural or Artificial Sea Water (Applicable for Marine Paints only)

When tested as prescribed in Annex C, the panel prepared from the material shall show no damage, blistering or flaking of the paint film, or underfilm corrosion.

5.8 Optional Tests

Following optional requirements, if specified by the purchaser may also be carried out:

a) Resistance to Gear/Diesel oil
b) Resistance to electrical resistivity at 750 + 250

5.9 The material shall also conform to the requirements given in Table 1 when tested according to the methods given in col 4 of the table.

6 SAMPLING

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

6.2 Criteria for Conformity

A lot shall be declared as conforming to the requirements of this standard if the test results of composite sample satisfy the requirements prescribed under 5.

7 TESTS

7.1 Tests shall be conducted as per the methods referred to in col 4 and 5 of Table 1 and in **5.6** to **5.9.**

7.2 Quality of Reagents

Unless otherwise specified, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

Table 1 Requirements for Ready Mixed Paint, Stoving, Red-Oxide, Zinc Chrome, Priming
(*Clauses* 5.9 *and* 7.1)

Sl No.	Characteristic	Requirement	Methods of Test, Ref to	
			IS 101	Annex of This Standard
(1)	(2)	(3)	(4)	(5)
i)	Baking schedule	Not more than 1 h at 150°C or 2 h at 100°C or any intermediate stoving schedule - as agreed between purchaser and supplier		
ii)	Consistency	Smooth and uniform	(Part 1/Sec 5)	—
iii)	a) Finish	Smooth, matt to egg shell gloss	(Part 3/Sec 4)	—
	b) Fineness of grind microns, *Max*	50	(Part 3/Sec 5)	—
iv)	Colour	that of red oxide	(Part 4/Sec 2)	—
v)	Mass in kg/10 1, *Min*	13.5	(Part 1/Sec 7)	—
vi)	Scratch hardness after 24 hours, after baking schedule	No scratch as to show the bare metal	(Part 5/Sec 1)	—
vii)	[1] Volume solids	40 ± 5	(Part 8/Sec 6)	—
viii)	[1] Flexibility and adhesion after 48 hours air-drying	No damage, detachment or cracking of the film	(Part 5/Sec 2)	—
ix)	[1] Protection against corrosion under conditions of condensation	No signs of corrosion	(Part 6/Sec 1)	—
x)	Flash point	Not below 30°C	(Part 1/Sec 6)	—
xi)	Accelerated storages stability	To pass the test	—	D
xii)	Water content, *Max*	0.5	(Part 2/Sec 1)	—
xiii)	Keeping properties	Not less than 12 months	(Part 6/Sec 2)	—

[1] Tests shall be carried out on stoved films after keeping for 2 h at room temperature.

8 PACKING AND MARKING

8.1 Packing

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

8.2 Marking

The containers shall be marked with the following:

a) Name of the material,

b) Volume of the material,

c) Indication of the source of manufacture,

d) Batch No. or lot No. in code or otherwise, and

e) Month and year of manufacture.

8.2.1 *BIS Certification Marking*

The product may also be marked with the Standard Mark.

8.2.1.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act,* 1986 and Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*	*IS No*	*Title*
44	Iron oxide pigments for paints *(second revision)*	(Part 5/Sec 1)	Part 5 Mechanical tests on paint films, Section 1 Hardness test *(third revision)*
51	Zinc chrome for paints (*third revision)*	Section 2	Flexibility and adhesion (*third revision)*
101	Methods of sampling and tests for paints, varnishes and related products	(Part 6/Sec 1)	Part 6 Durability tests on paint films, Section 1 Durability under conditions of condensation *(third revision)*
(Part 1/Sec 1)	Part 1 Tests on liquid paints (general and physical), Section 1 Sampling (*third revision)*	Section 2	Keeping properties (*third revision)*
(Section 3)	Preparation of panels (*third revision)*	(Part 8/Sec 5)	Part 8 Tests for pigments and other solids, Section 5 Lead restriction test (*under print*)
(Section 5)	Consistency (*third revision)*	(Section 6)	Volume solids
(Section 6)	Flash point (*third revision)*	1070	Reagent grade water (*third revision)*
(Section 7)	Mass per ten litres (*third revision)*	1303	Glossary of terms relating to paints (*second revision)*
(Part 2/Sec 1)	Part 2 Preliminary examination and preparation of samples for testing, Section 1 Water content *(third revision)*	1407	Round paint tins (*second revision)*
(Part 3/Sec 1)	Part 3 Test on paint film formation, Section 1 Drying time *(third revision)*	1745	Petroleum hydrocarbon solvents (*second revision)*
Section 4	Finish (*third revision)*	1872	Thinner for synthetic paints and varnishes for aircrafts
Section 5	Fineness of grind (*third revision)*	2552	Steel drums (galvanized and ungalvanized) (*third revision)*
(Part 4/Sec 1)	Part 4 Optical tests on paint films, Section 1 Opacity (*third revision)*	6947 (Part 2)	Methods of estimation of composite pigments in oil pastes, ready mixed paints and enamels: Part 2 Estimation of zinc chromes, ferric oxide and aluminium
Section 2	Colour (*third revision)*		
Section 4	Gloss (*third revision)*		

ANNEX B

(*Clause* 5.1.1)

DETERMINATION OF CHROMIC ANHYDRIDE AND ZINC OXIDE

B-0 OUTLINE OF THE METHOD

B-0.1 Chromic anhydride is determined by titrating the iodine liberated from potassium iodide with standard sodium thiosulphate solution. Zinc oxide is determined in the same solution by titrating the iodine subsequently liberated on addition of potassium ferricyanide, with standard sodium thiosulphate solution.

B-1 REAGENTS

B-1.1 Dilute Sulphuric Acid — approximately 7 N.

B-1.2 Potassium Iodide Solution — freshly prepared, 10 percent.

B-1.3 Standard Sodium Thiosulphate — 0.1 N.

B-1.4 Starch Solution — 0.5 percent.

B-1.5 Potassium Ferricyanide Solution

M/10, prepared in cold water, filtered rapidly and kept in a dark bottle. The solution can be suitably used for seven days if kept in dark when not in use.

B-1.6 Ammonium Bifluoride (NH_4) HF_2 — solid.

B-1.7 Sodium Hydroxide Solution — 10 percent (approx).

B-2 PROCEDURE

B-2.1 Weigh accurately about 1 g of the pigment in a 250 ml beaker and add about 100 ml of sodium hydroxide solution. Stir well by rubbing with a glass rod and boil slowly for 5 minutes over a wire gauze. Place the beaker, covered with a clock-glass on a water-bath for about half an hour. Filter over filter paper (Whatman No. 42) in a 500 ml conical flask. Wash well with hot water until the residue is free from chromate. Cool the filtrate in ice water and neutralize it with dilute sulphuric acid. Add 30 ml of dilute sulphuric acid after neutralization and cool. Then estimate chromic anhydride and zinc oxide content as given in **B-2.2, B-2.3** and **B-2.4.**

B-2.2 Transfer the solution to a 500 ml iodine flask containing 100 ml of water and 20 ml of dilute sulphuric acid. Add 30 ml of potassium iodide solution and allow to stand for 5 minutes. Titrate the liberated iodine with standard sodium thiosulphate solution after adding 5 ml of starch solution as indicator. Note the volume of sodium thiosulphate solution used in the titration V_1

B-2.3 After the titration for chromic anhydride, cool the contents of the flask at about 5°C in ice bath and add ammonia solution dropwise at controlled temperature (5 to 10°C) until the litmus paper first turns blue. (An excess of ammonia solution, more than 3 to 4 drops, should not be added as it is essential that the blue litmus should turn red with ammonium bifluoride to be added subsequently). Cool and add 2 to 3 g of ammonium bifluoride and sufficient water to make volume approximately 250 ml. (Sometime traces of iodine liberated during neutralization can be cleared by one or two drops of sodium thiosulphate solution). Add $V_1/3$ ml of potassium ferricyanide solution. Stir and allow to stand for 20 minutes at room temperature. Titrate the liberated iodine with standard thiosulphate solution. After the end point, the colour of the test solution will be bright pale greenish-yellow. Note the volume of sodium thiosulphate solution used in the second titration (V_2). If V_2 is less than 6 ml, the titration is to be repeated with the addition of $(V_2 + 2)$ ml of potassium ferricyanide solution in place of $V_1/3$ ml.

B-2.4 If V_2 is less than 2 ml, the titration is to be repeated, starting from the extracted pigment, with the addition of 5 ml of potassium ferricyanide solution.

B-3 CALCULATION

B-3.1 Chromic anhydride (CrO_3),

$$\text{percent by mass} = \frac{3.334 \times V_1 \times N}{M}$$

where

V_1 = volume, in ml, of sodium thiosulphate solution used in the first titration;

N = normality of sodium thiosulphate solution used; and

M = mass, in g, of the material taken for the titration.

B-3.2 Zinc oxide (ZnO),

$$\text{percent by mass} = \frac{12.45 \times V_2 \times N}{M}$$

where

V_2 = volume in ml of sodium thiosulphate solution used in the second titration, and

N and M have the same legend as **B-3.1.**

ANNEX C
(*Clause* 5.7)
TEST FOR RESISTANCE TO SEA WATER

C-1 APPARATUS

C-1.1 A small container capable of holding sufficient sea water for the immersion of 75 mm of the panel.

C-2 REAGENT

C-2.1 The natural sea water should be taken for not less than one foot below the surface by a method which does not contaminate from the surface layer. In areas where there is pronounced tidal action, the water should be taken near full flood and should, initially, have a salinity of not less than 30 and a *p*H of not less than 8.0.

C-2.2 If natural uncontaminated sea water is not available, a synthetic sea water to the following formulation may be used:

Sodium chloride	26.5 g
Magnesium chloride	2.4 g
Magnesium sulphate	3.3 g
Calcium chloride	1.1 g
Potassium chloride	0.73 g
Sodium bicarbonate	0.2 g
Sodium bromide	0.28 g
Water, distilled	1 000 ml

C-3 PROCEDURE

C-3.1 Prepare a panel of 150 mm × 100 mm × 1.25 mm mild steel plate as described in IS 101 (Part 1/Sec 3) and stove for the specified period. Immerse 75 mm of the panel in the reagent, for a period of seven days, at a constant temperature.

C-3.2 Reporting

At the end of the specified time of immersion remove the panel and immediately swab it vigorously with a cotton-wool swab soaked in the paint remover. Examine the panels for signs of corrosion.

ANNEX D
[*Table* 1 *Sl No.* (xi)]
METHOD FOR ACCELERATED STORAGE STABILITY TEST

D-1 Store the paint sample in a closed 500 ml container and keep at 60°C for 96 h.

D-2 The paint shall not gel, 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 requirements and shall produce dry film that is uniform in appearance and free from streaking, mottling and seediness. Further, in case of finishing paint, the change in gloss value shall not be more than 5 units from that of original value.

ANNEX E

(*Foreword*)

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(*Continued on page* 7)

(*Continued from page* 6)

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 323 01 31, 323 33 75, 323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110 002	{ 323 76 17 323 38 41
Eastern	: 1/14 C. I.T. Scheme VII M, V. I. P. Road, Kankurgachi CALCUTTA 700 054	{ 337 84 99, 337 85 61 337 86 26, 337 91 20
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