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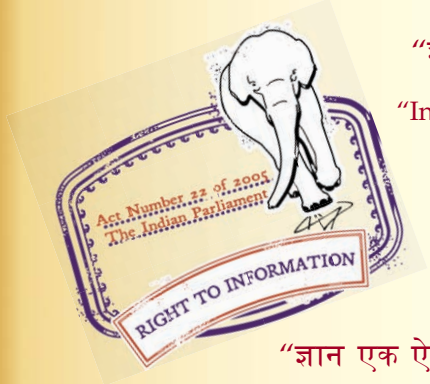
IS 168 (1993): Ready mixed paint, air drying, for general purpose [CHD 20: Paints, Varnishes and Related Products]



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"Knowledge is such a treasure which cannot be stolen"

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IS 168 : 1993
(Reaffirmed 2002)

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सामान्य प्रयोजकों के लिए तैयार मिश्रित रंग रोगन, हवा से सूखने वाले – विशिष्टि

(तीसरा पुनरीक्षण)

Indian Standard

READY MIXED PAINT, AIR DRYING, FOR GENERAL PURPOSE — SPECIFICATION

(Third Revision)

UDC 667'635'3

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

March 1993

Price Group 4

FOREWORD

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

This standard was first issued in 1950 and subsequently revised in 1965 amalgamating IS 168 : 1950 and 169 : 1950, the two specifications for the brushing and spraying types respectively of ready mixed paint, quick drying, matt, for general purposes in various colours. The second revision was issued in 1973. This revision has been taken up on the suggestion of Ministry of Defence in order to quantify the various requirements such as volume solids, gloss, fineness and mass in kg/10 litres and to bring it at par with defence specifications.

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 the specified value in this standard.

Indian Standard

READY MIXED PAINT, AIR DRYING, FOR GENERAL PURPOSE — SPECIFICATION

(Third Revision)

1 SCOPE

This standard prescribes requirements and methods of sampling and test for ready mixed paint, air-drying, for general purposes, colour as required.

1.1 The material is normally used for the protection of parts of apparatus, appliances, equipment, etc, connected with ammunition where air-drying is required.

2 REFERENCES

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

3 TERMINOLOGY

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

4 TYPES

4.1 There shall be three types of the material, namely:

a) Brushing,

b) Spraying, and

c) Dipping.

4.1.1 The type of the material required, whether brushing, spraying or dipping, shall be clearly specified by the indentor.

5 REQUIREMENTS

5.1 Composition

The material shall be of such a composition as to satisfy the requirements of this standard.

5.2 Water Content

If water is suspected to be present in the material it shall not exceed 0·5 percent when tested in accordance with IS 101 (Part 2/Sec 1) : 1988.

5.3 The minimum mass in kg/10 litres of the material, when tested in accordance with IS 101 (Part 1/Sec 7) : 1987, shall be 11·0. It shall be, however, within ±3 percent of the sample approved against this specification, if any.

5.4 Lead Restriction

When lead-restricted material is required, in addition to the requirements stipulated in **5.1** to **5.3**, it shall also be tested for restriction from lead in accordance with **28** of IS 101 : 1964.

5.4.1 When thus tested, the material shall not contain lead or lead compound or mixtures of both, calculated as lead monoxide (PbO), exceeding 5 percent by mass on separated dry mass of pigments taken for analysis.

5.5 Gloss

When tested as prescribed in IS 101 (Part 4/Sec 4) : 1988 the gloss values shall be as follows:

Glossometer	45°	60°
Flat matt	0 to 5	0 to 10
Eggshell flat	6 to 15	—
Eggshell gloss	16 to 30	11 to 20
Semigloss	31 to 50	21 to 60

5.6 Impact Resistance

The material, when intended for Defence use, shall also pass the test as prescribed in Annex B.

5.7 Durability

The material, when intended for Defence use, shall also pass the test as prescribed in Annex C.

5.8 Accelerated Storage Stability Test

When tested as per the procedure in Annex D, the change in the following requirements shall be within the range given below:

a) Increase in viscosity	Not more than 20 percent of the original value
b) Gloss	Not more than 5 units from the original value

5.9 The material shall also conform to the requirements given in Table 1.

Table 1 Requirements for Ready Mixed Paint, Air Drying, for General Purposes

(*Clauses* 5.9 *and* 8.1)

Sl No.	Characteristic	Requirement	Method of Test, Ref to IS
(1)	(2)	(3)	(4)
i)	Drying time :		101 (Part 3/Sec 1) : 1986
	a) Surface dry	Not more than 3 hours	
	b) Hard dry	Not more than 6 hours	
	c) Tack free	Not more than 18 hours	
ii)	a) Consistency	Smooth and uniform	101 (Part 1/Sec 5) : 1989
	b) Viscosity, ford Cup No. 4, Secs	60 to 120	
	NOTE — Material may be suitably thinned with Petroleum Hydrocarbon solvent (145/205) for spraying and dipping application.		
iii)	Finish	Smooth and matt/ semi-glossy	101 (Part 3/Sec 4) : 1987
iv)	Fineness of grind, *Min* microns	Matt finish 50 Semiglossy 40	101 (Part 3/Sec 5) : 1987
v)	Colour	Close match to the specified IS colour	101 (Part 4/Sec 2) : 1989
vi)	Fastness to light	To pass the test	101 (Part 4/Sec 3) : 1988
vii)	Scratch hardness	No such scratch as to show the bare metal	101 (Part 5/Sec 1) : 1988
viii)	Pressure test (18 hours after application)	To pass the test	do
ix)	Flexibility and adhesion after 48 hours air-drying	No visible damage or detachment of the film	101 (Part 5/Sec 2) : 1988
x)	Protection against corrosion under conditions of condensation	No signs of corrosion	101 (Part 6/Sec 1) : 1988
xi)	Resistance to lubricating oil, 48 h	No permanent injury to film	101 (Part 7/Sec 2) : 1990
xii)	Resistance to petroleum hydrocarbon solvent 145/ 205 (low aromatic)	No permanent injury to film	do
xiii)	Flash point, *Min*, °C	30	101 (Part 1/Sec 6) : 1987
xiv)	Keeping properties	Not less than one year	101 (Part 6/Sec 2) : 1989
xv)	Volume solids, *Min*	33	101 (Part 8/Sec 6) : 1992

6 PACKING AND MARKING

6.1 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.

6.2 Marking

The containers shall be marked with the following:

a) Name of the material and its type and gloss type;

b) Indication of the source of manufacture;

c) Volume of the material; and

d) Batch No. or Lot No., month and year of manufacture.

6.3 Other details of packing and marking shall be in accordance with the instruction given by the purchaser.

6.4 The material, when intended for Defence use, shall be packed and marked in accordance with IS 5661 : 1970.

7 SAMPLING

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

8 TESTS

8.1 Tests shall be conducted as prescribed in the methods referred to in col 4 of Table 1, and Annexes B to D.

8.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070 : 1992) shall be employed in tests.

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

8.2.1 For match against IS colours, IS 5 : 1992 shall be used.

9 CRITERIA FOR CONFORMITY

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

ANNEX A

(*Clause* 2)

IS No.	*Title*
5 : 1992	Colours for ready mixed paints and enamels (*fourth revision*)
101 : 1964	Methods of test for ready mixed paints and enamels (*second revision*)
101 (Part 1/ Sec 1) : 1988	Methods of sampling and test for paints, varnishes and related products : Part 1 Tests on liquid paints (general and physical), Section 1 Sampling (*third revision*)
101 (Part 1/ Sec 3) : 1986	Section 3 Preparation of panels (*third revision*)
101 (Part 1/ Sec 5) : 1989	Section 5 Consistency (*third revision*)
101 (Part 1/ Sec 6) : 1987	Section 6 Flash point (*third revision*)
101 (Part 1/ Sec 7) : 1987	Section 7 Mass per 10 litres (*third revision*)
101 (Part 2/ Sec 1) : 1988	Part 2 Tests on liquid paints (chemical examination), Section 1 Water content (*third revision*)
101 (Part 3/ Sec 1) : 1986	Part 3 Tests on paint film formation, Section 1 Drying time (*third revision*)
101 (Part 3/ Sec 4) : 1987	Section 4 Finish (*third revision*)
101 (Part 3/ Sec 5) : 1987	Section 5 Fineness of grind (*third revision*)
101 (Part 4/ Sec 2) : 1989	Part 4 Optical tests on paint films, Section 2 Colour (*third revision*)
101 (Part 4/ Sec 3) : 1988	Section 3 Light fastness test (*third revision*)
101 (Part 4/ Sec 4) : 1988	Section 4 Gloss (*third revision*)
101 (Part 5/ Sec 1) : 1988	Part 5 Mechanical tests on paint film, Section 1 Hardness tests (*third revision*)
101 (Part 5/ Sec 2) : 1988	Section 2 Flexibility and adhesion (*third revision*)
101 (Part 6/ Sec 1) : 1988	Part 6 Durability tests on paint films, Section 1 Resistance to humidity under condensation (*third revision*)
101 (Part 6/ Sec 2) : 1989	Section 2 Keeping properties (*third revision*)
101 (Part 7/ Sec 2) : 1990	Section 2 Resistance to liquids (*third revision*)
1070 : 1992	Reagent grade water (*third revision*)
1303 : 1983	Glossary of terms related to paints (*second revision*)
1407 : 1980	Round paint tins (*second revision*)
2552 : 1989	Steel drums (galvanized and ungalvanized) (*third revision*)
5661 : 1970	Code of practice for packing and marking of packages of paints, enamels, varnishes and allied products

ANNEX B

(*Clauses* 5.6 *and* 8.1)

TEST FOR IMPACT RESISTANCE

B-0 OUTLINE OF THE METHOD

Two painted cylinders are subjected to impact in a pendulum impact tester and the paint film examined.

B-1 APPARATUS

B-1.1 Impact Tester

Pendulum type as shown in Fig. 1. The impact tester consists of two arms of about 1 000 mm each to the ends of which steel test pieces may be attached. The arms are free to swing in a vertical plane. The test pieces are clamped in such a position that they strike at right angles with a glancing blow when the arms are released. A racket device ensures that pieces do not make contact on return swing of the arms.

B-2 PROCEDURE

B-2.1 Degrease two mild steel cylinders of diameter 40 mm, length 120 to 125 mm and mass 0·5 kg, threaded at both ends to suit the tester, with solvents. The cylinders should be free from surface imperfections, rolling and tool marks. Then rub the cylinders with No. 180 Emery paper and coat with the material by appropriate method. Allow the cylinders to dry in a horizontal position for 72 hours.

Fix the two painted cylindres in the impact tester and subject to a blow resulting from both arms of the machine being released from an inclination of at least 60° to the vertical. Remove the test pieces and examine the points of impact for loss of adhesion or removal of paint film.

B-2.1.1 The material shall be deemed to have passed the test if there is no loss of adhesion or removal of paint film.

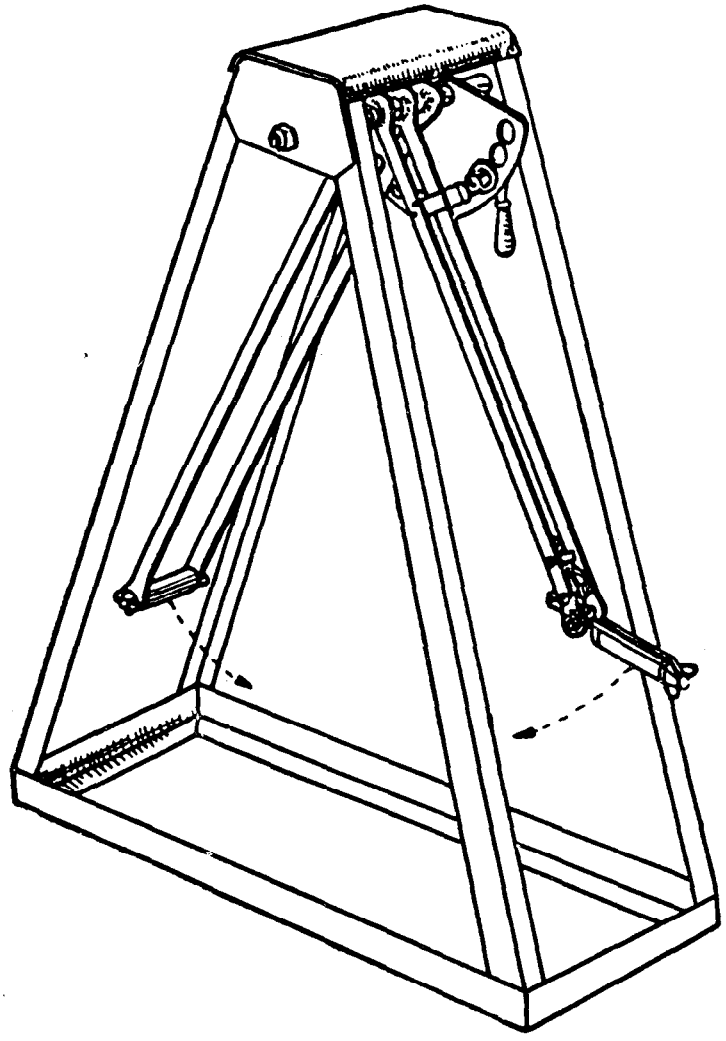

FIG. 1 IMPACT TESTER

ANNEX C

(*Clauses* 5.7 *and* 8.1)

TEST FOR DURABILITY

C-0 OUTLINE OF THE METHOD

Painted panels are subjected to accelerated weathering and salt spray tests and condition of the paint film examined.

C-1 APPARATUS

C-1.1 Accelerated Weathering Apparatus

The apparatus consists essentially of a vertical AC/DC arc, burning 13 mm uncored carbons, suspended eccentrically 20 to 22·5 cm from the centre of a cylinder container, 1·2 m in diameter. The container is fitted with a lid which is suspended over it, does not revolve with it, but can be raised or lowered. The arc is enclosed in a clean resistance glass cylinder approximately 105 cm in diameter and 15·625 cm long and the power consumption across the arc is 850 to 950 watts.

C-1.2 Salt Spray Apparatus

The apparatus illustrated diagrammatically in Fig. 2 and 3 consists essentially of a chemically inert container with a close fitting cover in which a fine mist of the spray solution is produced through an atomizer in such a way that:

a) panels supported on non-metallic supports with the test face upwards at an angle of approximately 15° to the vertical, are evenly coated with droplets of the solution.

b) the salt spray is prevented by a baffle from impinging directly on the test faces of the panel; and

c) salt solution drained from the test panels is not recirculated.

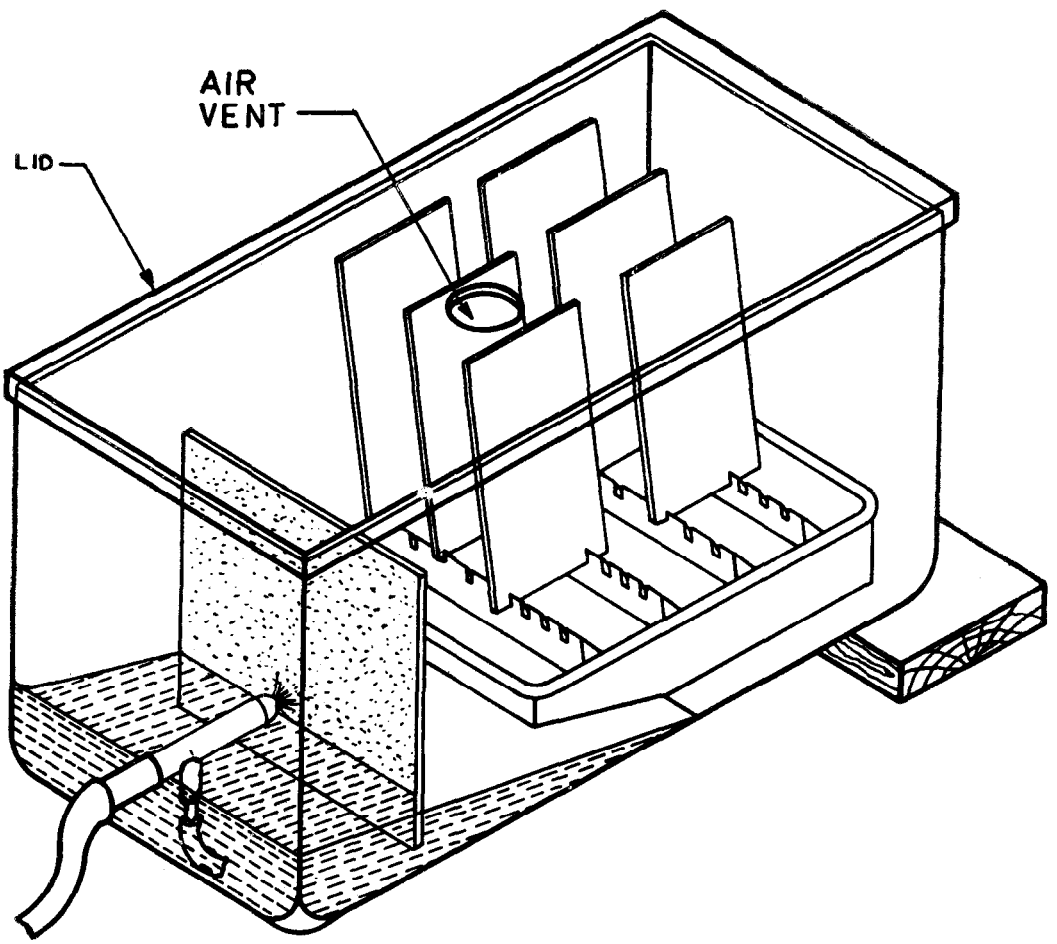

FIG. 2 SALT SPRAY APPARATUS

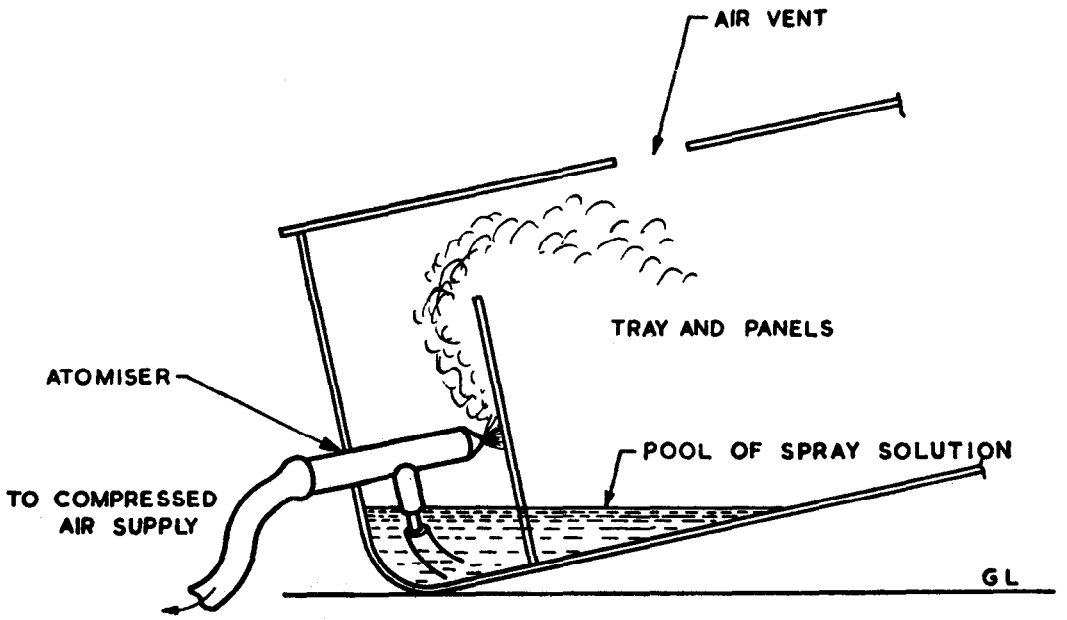

FIG. 3 PART SECTIONAL VIEW OF SALT SPRAY APPARATUS

C-2 PROCEDURE

C-2.1 Preparation of Panels

Coat mild steel panels of size 150 mm × 100 mm × 1.25 mm with the material on both sides by appropriate method to give a dry film mass commensurate with the mass in kg per 10 litres of the material. Allow the panels to air-dry under laboratory conditions for 24 hours and store at a temperature of 60 to 65°C for 1 hour. Cool the panels to room temperatures.

C-2.1.1 *Accelerated Weathering*

Place the painted panels on galleries round the circumference of the container in such a way that the painted surface of each panel is facing the beam of light. Suspended centrally in the container are three water atomizers by means of which the test panels are sprayed with distilled water, one atomizer being opposite each gallery. The container (not the lid, atomizer and arc) revolves in a horizontal plane, once every 20 minutes. Distilled water is discharged through the atomizer at a rate of approximately 5 litres per hour, with an air pressure of approximately 0·5 kg/cm^2 in such a manner that the whole of the painted surface of each panel is evenly wetted with the fine mist. The atomizers are so placed that each panel is sprayed approximately a quarter of a revolution before it comes in closest proximity to the arc.

The water from the spray in run off through a waste pipe in the bottom of the container and under no circumstances is recirculated through the atomizer. A suitable thermometer is fixed through the lid of the container diametrically opposite to the atomizer with the bulb approximately 10 cm from the side of the container, and 10 cm below the lid. Adjust the temperature of air in the range 38 to 44°C by adjusting the lid. Subject the panels to the water spray for 16 hours and note the conditions of the paint film.

C-2.1.2 *Salt Spray*

The spray solution shall have the following composition:

Salt	*Mass* (in g)
Calcium sulphate	1.3
Magnesium chloride	2.6
Magnesium sulphate	1.7
Sodium chloride	21.4
Water	To make up to 1 litre

Suspend the same panels, after the accelerated weathering test, in the cabinet and expose them for 8 hours to a baffle spray of the spray solution.

C-2.1.3 The above cycles shall commence with exposure to accelerated weathering test and shall be carried out 6 times. The painted panels, thereafter, are examined.

The painted panel shall show no signs of permanent softening/blistering/chalking/signs of corrosion. A portion of paint films removed with suitable paint remover and exposed metal surface is examined for signs of corrosion. Neglecting the stains, if any, there shall not be any pitting on the surface.

ANNEX D

(*Clauses* 5.7 *and* 8.1)

ACCELERATED STORAGE STABILITY TEST

D-1 PROCEDURE

Keep -250 ml of paint sample in a closed tin of 500 ml capacity having tight lid to avoid leakage of volatile paint thinners. Close the tin properly and keep it at 60°C for 96 hours in an electrically heated oven. Take out the sample and allow it to cool for 24 hours. The sample is then stirred well and tested for drying time, viscosity and gloss value.

The change in valves from the original values should be reported.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Additions'. Comments on this Indian Standard may be sent to BIS giving the following reference :

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