IS : 2547 (Part II) - 1976
(Reaffirmed 1997)

Indian Standard

SPECIFICATION FOR GYPSUM BUILDING PLASTERS

PART II PREMIXED LIGHTWEIGHT PLASTERS

(First Revision)

First Reprint FEBRUARY 1999

UDC 691.55 : 691.311

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

Gr 2 *April* 1977

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PART II PREMIXED LIGHTWEIGHT PLASTERS

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0. FOREWORD

0.1 This Indian Standard (Part II) (First Revision) was adopted by the Indian Standards Institution on 22 December 1976, after the draft finalized by the Gypsum Building Materials Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Gypsum is a well known building material. It has been extensively used in various countries. Premixed lightweight plasters essentially consists of gypsum plaster and lightweight aggregate which are characterized by low density, high thermal insulation and sound absorption properties and can be readily used for building purposes.

0.3 In the formulation of this standard, due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country. This has been met by basing the standard on BS 1191 : Part 2 : 1973 ' Specification for gypsum building plasters. Part 2 Premixed lightweight plasters ', published by the British Standards Institution.

0.4 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*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part II) specifies requirements for premixed lightweight plaster consisting essentially of gypsum plaster and lightweight aggregate used in general building operations.

*Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definition shall apply.

2.1 Lightweight Plaster — A plaster consisting of suitable lightweight aggregates and retarded hemihydrate gypsum plasters complying with IS : 2547 (Part I)-1976*. Other additives may be incorporated to impart desired properties.

3. CLASSIFICATION

3.1 Premixed lightweight plaster may be divided into the following types:

Type A Undercoat plasters:

a) Browning plaster,
b) Metal lathing plaster,
c) Bonding plaster

Type B Final coat plaster — finish plaster.

4. PHYSICAL AND CHEMICAL REQUIREMENTS OF PLASTERS

4.1 The physical and chemical requirements of the plasters shall be as given in Table 1.

5. SAMPLING

5.1 Lot — In any consignment, all the packages of the gypsum plaster of the same class and type and from the same batch of manufacture shall be grouped together to constitute a lot.

5.1.1 Samples shall be selected and tested separately from each lot to determine its conformity or otherwise to the requirements of the specification.

5.2 The number of packages to be selected for the sample from a lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 2.

5.2.1 The packages for the sample shall be selected at random from the lot and in order to ensure the randomness of selection the procedures given in IS : 4905-1968† may be adopted.

5.3 Number of Tests

5.3.1 The contents of each package in the sample shall be thoroughly homogenized by mixing separately and sufficient quantity of gypsum plaster shall then be drawn from each package separately for carrying out the tests

*Specification for gypsum building plaster; Part I Excluding premixed lightweight plasters.

†Methods for random sampling.

TABLE 1 PROPERTIES OF DIFFERENT TYPES OF PLASTERS

(*Clause* 4.1)

Sl No.	Particulars	Undercoat Plasters (Type A)			Final Coat Plaster (Type B), Finish Plaster	Method of Test, Ref to
		Browning Plaster	Metal Lathing Plaster	Bonding Plaster		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Sum of soluble sodium and magnesium salt contents, expressed as percentages of sodium oxide (Na_2O), and magnesium oxide (MgO) by mass, *Max*	0·25	0·25	No upper limit	0·25	Appendix A
ii)	Dry bulk density, *Max*, kg/m³	640	770	770	—	IS : 2542 (Part I)-1964*
iii)	Dry set density, *Max*, kg/m³	850	1 040	1 040	—	,,
iv)	Compressive strength, *Min*, N/mm²	0·93	1·0	1·0	—	,,
v)	Free lime content, by percent, mass, *Min*,	—	2½	—	—	Appendix B
vi)	Mechanical resistance	—	—	—	Diameter of the indentation shall not be less than 4 mm and not more than 5·5 mm.	IS : 2542 (Part I)-1964*

*Method of test for gypsum plaster, concrete and products: Part I Plaster and concrete.

TABLE 2 NUMBER OF PACKAGES TO BE SELECTED FOR THE SAMPLE

(*Clause* 5.2)

Lot Size (No. of Packages in the Lot)	Sample Size (No. of Packages to be Selected for the Sample)
(1)	(2)
Up to 100	3
101 ,, 150	4
151 ,, 300	5
301 ,, 500	7
501 and above	10

for compressive strength and free lime content. These samples of gypsum plaster drawn from each package shall be kept separately and tested individually for each of the tests mentioned above. The samples should be placed immediately in clean, dry, airtight containers for delivering to the laboratory.

5.3.2 The test for the remaining requirements shall be carried out on a composite sample prepared by thoroughly mixing equal quantities of gypsum plaster taken from each of the packages selected in the sample.

5.4 Criteria for Conformity — A lot shall be considered as conforming to the requirements of this standard if the conditions mentioned in **5.4.1** and **5.4.2** are satisfied.

5.4.1 For test results on compressive strength and free lime content, the average ($\bar{X}$) and the range (R) shall be calculated. From the corresponding average and range value for each characteristic the value of the expressions $\bar{X} \pm 0{\cdot}4\,R$ shall be calculated. The value of the expression $\bar{X} - 0{\cdot}4\,R$ as calculated above should be greater than or equal to the minimum limits specified, and the value of the expression $\bar{X} + 0{\cdot}4\,R$ shall be less than or equal to the maximum limit specified.

5.4.2 All the test results for remaining requirements tested on the composite sample shall satisfy the corresponding specification requirements.

6. MARKING

6.1 The vendor shall show clearly on each package of plaster name of the manufacturer, the type to which the plaster belongs, the date of manufacture and the net mass. In addition, it shall be clearly indicated whether the plaster is to be used as an undercoat or final coat.

6.1.1 The product may also be marked with Standard mark.

6.2 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 details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

APPENDIX A

(*Table* 1)

DETERMINATION OF SOLUBLE MAGNESIUM OXIDE AND SODIUM OXIDE CONTENT IN GYPSUM BUILDING PLASTER

A-1. PREPARATION OF THE SAMPLE SOLUTION

A-1.1 Weigh 25 g of sample into a 400-ml beaker and add 250 ml of water. Stir thoroughly and let stand for 30 minutes at room temperature. Stir again and filter immediately through a Buchner funnel, which contains a well-seated retentive filter paper, into a 500-ml filtering flask using slight vacuum. Without washing, transfer the insoluble matter and the paper to the original beaker and rinse the funnel with 150 ml of water into the beaker containing the insoluble matter. Stir thoroughly and let stand 30 min at room temperature. Stir and filter, as above, using a fresh filter paper. Again return the insoluble matter and the paper to the original beaker. Wash the funnel with 100 ml of water into the beaker containing the insoluble matter. Stir thoroughly and let stand for 30 minutes at room temperature. Stir and filter as above. Quantitatively transfer the filtrate to a suitable beaker. Acidify the filtrate with 5 ml of concentrated hydrochloric acid (r. d. 1·19). Stir until cloudiness disappears. Evaporate the solution to about 400 ml. Cool to room temperature and transfer quantitatively to a 500-ml volumetric flask. Dilute to 500 ml.

A-1.2 Determination of Soluble MgO — Determination of soluble magnesium oxide is specified in **12** of IS : 1760-1962* except that 200 ml of sample solution is taken and calcium precipitated according to **9.3** of IS : 1760-1962* and the filtrate from calcium estimation is used for the determination of magnesium. The calculations may be modified as:

$$\text{Magnesium oxide (MgO), percent} = \frac{A \times 0{\cdot}1291 \times 2{\cdot}5 \times 100}{B}$$

where

A = mass in g of oxinate, and

B = mass in g of the sample.

A-1.3 Determination of Soluble Sodium Salt as Sodium Oxide — The estimation of soluble sodium oxide is done as specified in **4.11** of IS : 4032-1968† except that 50 ml of the sample solution is taken in a 100-ml

*Methods of chemical analysis of limestone, dolomite and allied materials.

†Method of chemical analysis of hydraulic cement.

flask. To this is added 9 ml of 63 000 ppm calcium oxide solution and the volume made up to 100 ml. The calculation for the sodium oxide may be modified as:

$$\text{Sodium oxide } (Na_2O), \text{ percent} = \frac{A}{W \times 10}$$

where

A = parts per million of sodium oxide in the solution, and

W = mass in g of the sample.

APPENDIX B

(Table 1)

DETERMINATION OF FREE LIME

Suspend 5 g of the sample in approximately 100 ml of distilled water. Add several drops of phenolphthalein indicator solution (0·5 percent in 50 percent aqueous ethanol) and titrate with 0·50 N hydrochloric acid until the pink colour of the indicator just disappears. Continue the titration until the pink colour does not return after standing for two to three minutes.

With 5 g sample, 1 ml 0·50 N acid ≡ 0·37 percent $Ca(OH)_2$.

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Printed at New India Printing Press, Khurja, India