IS 13008 : 1990
(Reaffirmed 2001)
Edition 1.1
(1997-09)

भारतीय मानक

उपली ऐस्बेस्टास सीमेंट की सपाट चद्दरें — विशिष्टि

Indian Standard

SHALLOW CORRUGATED ASBESTOS CEMENT SHEETS — SPECIFICATION

(Incorporating Amendment No. 1)

UDC 691.328.5 - 417.2

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

Price Group 2

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Cement and Concrete Sectional Committee had been approved by the Civil Engineering Division Council.

The Bureau of Indian Standards has formulated a number of Indian standards on asbestos cement products. Of late asbestos cement corrugated sheets with shallow corrugation are also finding their use in this country. Therefore, it is felt necessary to bring out a specification for this product. This specification covers the dimensional requirements, physical and mechanical characteristics of asbestos cement corrugated sheets with shallow corrugations. Requirements for standard corrugated and semi-corrugated sheets are covered in IS 459 : 1970 'Unreinforced corrugated and semi-corrugated asbestos cement sheets (*second revision*)'. Guidance regarding laying and fixing of such sheets is given in IS 3007 (Part 1) : 1964 'Code of practice for laying of asbestos cement sheets : Part 1 Corrugated sheets'.

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. In the formulation of this standard, assistance has been derived from ISO 393/1-1983 Asbestos cement products — Part 1 Corrugated sheets and fittings for roofing and cladding.

The composition of the technical committee responsible for formulation of this standard is given in Annex B.

This edition 1.1 incorporates Amendment No. 1 (September 1997). Side bar indicates modification of the text as the result of incorporation of the amendment.

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

SHALLOW CORRUGATED ASBESTOS CEMENT SHEETS — SPECIFICATION

1 SCOPE

1.1 This standard covers the requirements for materials, dimensions and tests for shallow corrugated asbestos cement sheets.

2 REFERENCES

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

3 COMPOSITION

3.1 The products shall be composed of an inert aggregate consisting of clean asbestos fibre, including suitable other fibres, cemented together either by 33 grade ordinary Portland cement conforming to IS 269 : 1989 or 43 grade ordinary Portland cement conforming to IS 8112 : 1989 or 53 grade ordinary Portland cement conforming to IS 12269 : 1987 or Portland slag cement conforming to IS 455 : 1989 or Portland pozzolana cement conforming to IS 1489 (Part 1) : 1991 or IS 1489 (Part 2) : 1991. Pozzolanic materials, pigments and fillers which are compatible with asbestos cement may be added.

NOTE — In case of Portland pozzolana cement, further addition of pozzolanic materials shall not be permitted.

4 COLOURING MATTER

4.1 The sheets may be left in their natural colour or colouring matter may be added in the composition. Pigments which are embodied in asbestos cement for colouring purposes shall be of permanent colour and shall conform to the relevant Indian Standards. For guidance in ascertaining the colour and staining power of the pigment, IS 5913 : 1989 may be referred to.

5 DIMENSIONS AND TOLERANCES

5.1 The sheets shall conform to the dimensions and tolerances given in Table 1 and Fig. 1.

5.1.1 For the purpose of measuring the thickness, a dial thickness gauge having an anvil shown in Fig. 2 shall be used. Thickness measurement shall be made along the width at each end of the sheet. Measure at least three corrugation at each end of the sheet excluding side laps. Thickness shall be measured at a distance not less than 20 mm from the edge. Each individual measurement shall be not less than the minimum value specified in Table 1.

5.1.2 The depth of corrugation shall be measured with the help of a depth gauge as follows :

Select three complete corrugations on a sheet. On each of them take three measurements regularly spaced over the length of the sheet with a micrometer.

Calculate for each corrugation, the arithmetic mean of the three measurements which shall be in accordance with Table 1.

Table 1 Dimensions and Tolerances of Shallow Corrugated Sheets

(*Clauses* 5.1, 5.1.2 *and* 5.1.3)

All dimensions in millimetres.

Sl No.	Characteristic	Nominal Dimension	Tolerance
i)	Depth of corrugation, *D*	20	± 2.0
ii)	Pitch of corrugation, *P*	75	± 1.5
iii)	Overall width, *B*	1 015	+ 10 – 5
iv)	Nominal thickness, *T*	4.2	+ Free – 0.2
v)	Length of sheet, *A*	1 500 1 750 2 000 2 250	± 10

NOTE — By mutual agreement between the purchaser and the manufacturer, the sheets may be supplied in lengths and widths other than those specified in the table.

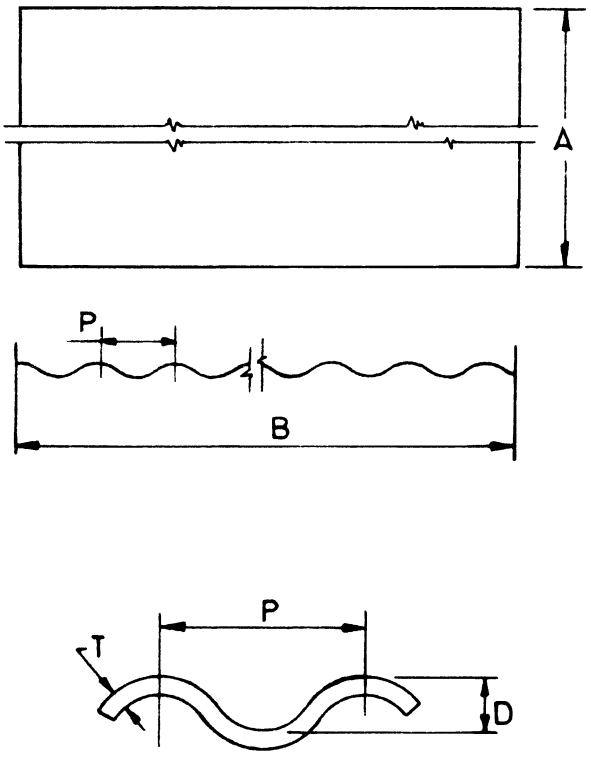

FIG. 1 SHALLOW CORRUGATED SHEETS

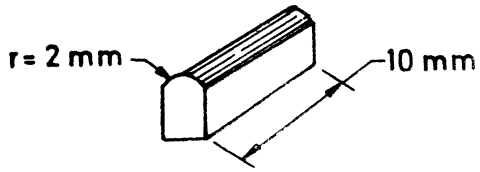

FIG. 2 ANVIL FOR MEASURING THICKNESS

5.1.3 The pitch of corrugation shall be measured as follows:

The total length over any six consecutive pitches shall be measured and the length measured over these six pitches shall not vary from six times the pitch specified in Table 1 by the tolerance given.

6 PHYSICAL AND MECHANICAL PROPERTIES

6.1 Load Bearing Capacity

The load bearing capacity of shallow corrugated sheets shall be not less than 1.8 Newton per millimeter width of the specimen when tested according to the method described in IS 5913 : 1989.

6.2 Impermeability

The specimen shall not show during 24 hours of test any formation of drops of water except traces of moisture on the lower surface when tested according to the method described in IS 5913 : 1989.

7 FINISH

7.1 The finished product, when delivered, shall have a rectangular shape, smooth surface on the weathering side, a good appearance and shall be free from visible defects. The corrugations shall be true and regular. The edges of the sheets shall be straight and clean.

8 SAMPLING

8.1 The sampling, inspection and acceptance shall be in accordance with IS 7639 : 1975. Unless otherwise agreed to between the manufacturer and the purchaser, the maximum and minimum inspection lots shall be as follows:

a) 8 000 and 400 sheets respectively, for lengths less than or equal to 1 500 mm; and

b) 3 000 and 200 sheets respectively, for lengths exceeding 1 500 mm

9 INSPECTION AND MANUFACTURER'S CERTIFICATE

9.1 The purchaser or his representative shall have access at all reasonable times to the manufacturer's stock area for the purpose of inspecting the materials and products, and selecting and testing the sheets, which shall be so conducted as not to interfere unnecessarily with the loading in the carriers.

9.2 The manufacturer shall, upon request, furnish the purchaser or his representative with a certificate that the finished products comply with this specification in all respects.

10 TESTING FACILITIES

10.1 The manufacturer shall, in all cases and at his own expense, supply labour and appliances for such tests as may be carried out in his premises in accordance with this specification.

11 MARKING

11.1 Each sheet shall be legibly and indelibly stamped or marked by any suitable method with the following information:

a) Manufacturer's name or trade-mark,

b) Year and date of manufacture, and

c) Pictorial warning sign as given in IS 12081 (Part 2) : 1987.

11.2 Each sheet may also be marked with the Standard Mark.

12 SAFETY RULES SHEET

12.1 All delivery of shallow corrugated asbestos cement sheets by the manufacturer shall be accompanied by safety rules sheets as given in IS 11769 (Part 1) : 1987.

ANNEX A

(*Clause* 2.1)

LIST OF INDIAN STANDARDS

IS No.	*Title*
269 : 1989	33 Grade Ordinary Portland cement (*fourth revision*)
455 : 1989	Specification for Portland slag cement (*fourth revision*)
1489 (Part 1) : 1991	Specification for Portland-pozzolana cement : Part 1 Flyash based (*third revision*)
1489 (Part 2) : 1991	Specification for Portland-pozzolana cement : Part 2 Calcined clay based (*third revision*)
5913 : 1989	Methods of test for asbestos cement products (*first revision*)
7639 : 1975	Methods of sampling of asbestos cement products
8112 : 1989	Specification for 43 grade ordinary Portland cement (*first revision*)
11769 (Part 1) : 1987	Guideline for safe use of products containing asbestos : Part 1 Asbestos cement products
12081 (Part 2) : 1987	Recommendations for pictorial warning signs and precautionary notices for asbestos and products containing asbestos : Part 2 Asbestos and its products
12269 : 1987	Specification for 53 grade Ordinary Portland cement

ANNEX B

(*Foreword*)

COMPOSITION OF THE TECHNICAL COMMITTEE

Cement and Concrete Sectional Committee, CED 2

Chairman	*Representing*
DR H. C. VISVESVARAYA	In personal capacity (*University of Roorkee, Roorkee 247667*)
Members	
SHRI H. BHATTACHARYA	Orissa Cement Limited, New Delhi
DR A. K. CHATTERJEE	The Associated Cement Companies Ltd, Bombay
SHRI S. H. SUBRAMANIAN (*Alternate*)	
CHIEF ENGINEER (DESIGNS)	Central Public Works Department, New Delhi
SUPERINTENDING ENGINEER (S & S) (*Alternate*)	
CHIEF ENGINEER, NAVAGAM DAM	Sardar Sarovar Narmada Nigam Ltd, Gandhinagar
SUPERINTENDING ENGINEER QCC (*Alternate*)	
CHIEF ENGINEER (RESEARCH-*cum*-DIRECTOR)	Irrigation and Power Research Institute, Amritsar
RESEARCH OFFICER (CONCRETE TECHNOLOGY) (*Alternate*)	
DIRECTOR	A. P. Engineering Research Laboratories, Hyderabad
JOINT DIRECTOR (*Alternate*)	
DIRECTOR (CMDD) (N & W)	Central Water Commission, New Delhi
DEPUTY DIRECTOR (CMDD) (NW & S) (*Alternate*)	
SHRI K. H. GANGWAL	Hyderabad Industries Ltd, Hyderabad
SHRI V. PATTABHI (*Alternate*)	
SHRI V. K. GHANEKAR	Structural Engineering Research Centre (CSIR), Ghaziabad
SHRI S. GOPINATH	The India Cements Ltd, Madras
SHRI R. TAMILAKARAN (*Alternate*)	
SHRI S. K. GUHA THAKURTA	Gannon Dunkerley & Co Ltd, Bombay
SHRI S. P. SANKARANARAYANAN (*Alternate*)	
DR IRSHAD MASOOD	Central Building Research Institute (CSIR), Roorkee
JOINT DIRECTOR STANDARDS (B & S) (CB-I)	Research, Designs & Standards Organization (Ministry of Railways), Lucknow
JOINT DIRECTOR STANDARDS (B & S) (CB-II) (*Alternate*)	
SHRI N. G. JOSHI	Indian Hume Pipes Co Ltd, Bombay
SHRI P. D. KELKAR (*Alternate*)	
SHRI D. K. KANUNGO	National Test House, Calcutta
SHRI B. R. MEENA (*Alternate*)	
SHRI R. L. KAPOOR	Ministry of Transport, Department of Surface Transport (Roads Wing), New Delhi
SHRI R. K. SAXENA (*Alternate*)	
SHRI P. KRISHNAMURTHY	Larsen and Toubro Limited, Bombay
SHRI S. CHAKRAVARTHY (*Alternate*)	
SHRI G. K. MAJUMDAR	Hospital Services Consultancy Corporation (India) Ltd, New Delhi
SHRI S. O. RANGARI (*Alternate*)	
SHRI P. N. MEHTA	Geological Survey of India, Calcutta
SHRI J. S. SANGANERIA (*Alternate*)	
MEMBER-SECRETARY	Central Board of Irrigation and Power, New Delhi
DIRECTOR (CIVIL) (*Alternate*)	

Members	*Representing*
DR A. K. MULLICK	National Council for Cement and Building Materials, New Delhi
DR S. C. AHLUWALIA (*Alternate*)	
SHRI NIRMAL SIGH	Development Commissioner for Cement Industry (Ministry of Industry)
SHRI S. S. MIGLANI (*Alternate*)	
SHRI R. C. PARATE	Engineer-in-Chief's Branch, Army Headquarters
LT-COL R. K. SINGH (*Alternate*)	
SHRI H. S. PASRICHA	Hindustan Prefab Ltd, New Delhi
SHRI Y. R. PHULL	Central Road Research Institute (CSIR), New Delhi
SHRI S. S. SEEHRA (*Alternate*)	
SHRI Y. R. PHULL	Indian Roads Congress, New Delhi
SHRI K. B. THANDEVAN (*Alternate*)	
SHRI G. RAMDAS	Directorate General of Supplies and Disposals, New Delhi
DR M. RAMAIH	Structural Engineering Research Centre (CSIR), Madras
DR A. G. MADHAVA RAO (*Alternate*)	
REPRESENTATIVE	Builders Association of India, Bombay
SHRI A. U. RIJHSINGHANI	Cement Corporation of India, New Delhi
SHRI C. S. SHARMA (*Alternate*)	
SHRI J. SEN GUPTA	National Buildings Organization, New Delhi
SHRI A. K. LAL (*Alternate*)	
SHRI T. N. SUBBA RAO	Gammon India Limited, Bombay
SHRI S. A. REDDI (*Alternate*)	
SUPERINTENDING ENGINEER (DESIGNS)	Public Works Department, Government of Tamil Nadu
EXECUTIVE ENGINEER (S. M. R. DIVISION) (*Alternate*)	
SHBI S. B. SURI	Central Soil and Materials Research Station, New Delhi
SHRI N. CHANDRASEKARAN (*Alternate*)	
DR H. C. VISVESVARAYA	Institution of Engineers (India), Calcutta
SHRI D. C. CHATTURVEDI (*Alternate*)	
SHRI G. RAMAN, Director (Civ Engg)	Director General, BIS (*Ex-officio Member*)

Secretary
SHRI N. C. BANDYOPADHYAY
Joint Director (Civ Engg), BIS

Fibre Reinforced Cement Products Subcommittee, CED 2 : 3

Convener

DR C. RAJKUMAR	National Council for Cement and Building Materials, New Delhi

Members

SHRI S. K. BANERJEE	National Test House, Calcutta
SHRI N. G. BASAK	Directorate General of Technical Development, New Delhi
SHRI P. K. JAIN (*Alternate*)	
SHRI S. N. BASU	Directorate General of Supplies and Disposals
SHRI T. N. UBOVEJA (*Alternate*)	
SHRI S. R. BHANDARI	Shree Digvijay Cement Co Ltd, Bombay
SHRI D. N. SINGH (*Alternate*)	
SHRI S. GANAPATHY	Ramco Industries Ltd, Madras
SHRI S. S. GOENKA	Sarbamangala Industries, Calcutta
SHRI I. P. GOENKA (*Alternate*)	
SHRI MOTWANI GURBUX	All India Small Scale A.C. Pressures Pipe Manufacturer's Association, Hyderabad
SHRI H. R. OZA (*Alternate*)	
SHRI SRINIVASAN N. IYER	Everest Building Products Ltd, Bombay
DR V. G. UPADHYAYA (*Alternate*)	
JOINT DIRECTOR STANDARDS (B & S)/CB-I	Research, Designs & Standards Organization, Lucknow
JOINT DIRECTOR STANDARDS (B & S)/CB-II (*Alternate*)	
SHRI P. S. KALANI	Kalani Asbestos Cement Pvt Ltd, Indore
SHRI SAURABH KALANI (*Alternate*)	
DR KALYAN DAS	Central Building Research Institute (CSIR), Roorkee
SHRI K. D. DHARIYAL (*Alternate*)	
LT-COL KAMLESH PRAKASH	Engineer-in-Chief's Branch, Army Headquarters
LT-COL A. K. BANGIA (*Alternate*)	
SHRI P. N MEHTA	Geological Survey of India, Calcutta
SHRI V. K. KASLIWAL (*Alternate*)	
SHRI V. PATTABHI	Hyderabad Industries Ltd, Hyderabad
SHRI A. K. GUPTA (*Alternate*)	
DR N. RAGHAVENDRA	National Council for Cement and Building Materials, New Delhi
SHRI RAJ KUMAR	Development Commissioner, Small Scale Industries, New Delhi
SHRI S. C. KUMAR (*Alternate*)	
SHRI J. SEN GUPTA	National Buildings Organization, New Delhi
SUPTD. SURVEYOR OF WORKS (CZ)	Central Public Works Department, New Delhi
SURVEYOR OF WORKS (CZ) (*Alternate*)	
SHRI S. A. SWAMY	Municipal Corporation, Delhi

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.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

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 Catalogue' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc : No. CED 02 (4524)

Amendments Issued Since Publication

Amend No.	Date of Issue
Amd. No. 1	September 1997

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002.
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 110002	323 76 17 323 38 41
Eastern	: 1/14 C. I. T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700054	337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43 60 20 25
Southern	: C. I. T. Campus, IV Cross Road, CHENNAI 600113	235 02 16, 235 04 42 235 15 19, 235 23 15
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	832 92 95, 832 78 58 832 78 91, 832 78 92

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISHAKHAPATNAM.