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Indian Standard

SPECIFICATION FOR FARM DRAINAGE ASBESTOS CEMENT PIPES

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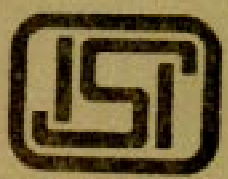

INDIAN STANDARDS INSTITUTION
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Indian Standard

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Farm Drainage Tiles Sectional Committee, AFDC 47

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0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 17 November 1980, after the draft finalized by the Farm Drainage Tiles Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Different types of asbestos cement pipes have been in use in this country for about four decades and considerable experience is available in regard to their use as water supply pressure mains and building pipes, gutters and fittings for conveying rain water and sullage from the buildings to the drainage and sewerage system. Standards for asbestos cement pressure pipes (IS : 1592-1970*) and asbestos cement pipes and fittings for sewerage and drainage (IS : 6908-1975†) and asbestos cement building pipes, gutters and fittings (IS : 1626-1960‡) have already been published. A need has also been felt for an Indian Standard on asbestos cement pipes for farm drainage purposes and this standard has been prepared to cover such pipes.

0.3 In preparation of this standard assistance has been derived from C 508-76 Specification for asbestos-cement perforated underdrain pipe issued by American Society for Testing and Materials, USA.

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.

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*Specification for asbestos cement pressure pipes (*first revision*).

†Specification for asbestos cement pipes and fittings for sewerage and drainage.

‡Specification for asbestos cement building pipes, gutters and fittings (spigot and socket type).

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

1. SCOPE

1.1 This standard specifies material, classification, sizes and other requirements for farm drainage asbestos cement pipes.

NOTE — The pipes covered in this standard are non-pressure pipes.

2. TYPE

2.1 For the purpose of this standard, the asbestos pipes shall be of the following two types:

a) Plain, and

b) Perforated.

3. CLASSIFICATION

3.1 For the purpose of this standard, the pipes based on their crushing strength (*see* **7.1**) shall be of the following three classes:

a) Light duty,

b) Medium duty, and

c) Heavy duty.

4. MATERIAL

4.1 The pipes shall be made from close and homogeneous mixture of following ingredients:

a) Clean asbestos fibre,

b) Ordinary or rapid hardening Portland cement conforming to IS : 269-1976* or Portland blast furnace slag cement conforming to IS : 455-1976† or Portland pozzolana cement conforming to IS : 1489-1976‡, and

c) Water.

4.1.1 The mixture shall be free from any organic fibre or any material, liable to cause deterioration in the quality of pipes. In case of auto-claved pipes siliceous filler may also be used.

NOTE — When the pipes are intended for conveyance of particularly aggressive residual water or to be laid in particularly aggressive grounds, the nature of these water and grounds shall be specified to the manufacturer by the purchaser, who may suggest appropriate material or treatment.

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*Specification for ordinary and low heat Portland cement (*third revision*).
†Specification for Portland slag cement (*third revision*).
‡Specification for Portland-pozzolana cement (*second revision*).

5. DIMENSIONS AND TOLERANCES

5.1 The nominal size (inside diameter) shall be 80, 100, 125, 150, 200, 250 and 300 mm.

5.1.1 The average inside diameter of the pipe shall be not less than nominal by 6·4 mm or 1·5 percent, whichever is greater.

5.2 The thickness of the pipe shall be such that pipes shall meet the load requirement of specified class.

5.2.1 The permissible lower deviations for various declared thicknesses shall be as follows:

a) Up to 10 mm — 1·5 mm

b) Over 10 mm and up to 20 mm — 2·0 mm

c) Over 20 mm — 2·5 mm

NOTE — Upper deviations are free.

5.3 The ends of the pipes shall be square with their longitudinal axis so that when placed in a straight line in the trench no opening in end contact shall exceed 3 mm.

5.4 The nominal length of the pipe shall be not less than 250 mm.

5.4.1 The tolerance on the declared nominal length shall be $\pm$ 3 percent.

6. PERFORATION REQUIREMENTS

6.0 Unless otherwise specified by the purchaser, the perforation requirements shall be as given in **6.1** and **6.1.1.**

6.1 Perforations shall be circular holes, 6·0 $\pm$ 1 5 mm in diameter arranged in rows parallel to the axis of the pipe. Perforations shall be approximately 75 mm centre to centre, along the rows. Rows shall be arranged in two equal groups on either side of the vertical centre line of the pipe, and the total number of rows shall be as given below:

Nominal Size of Pipe, mm	*Rows of Perforations*
(1)	(2)
80	4
100	4
125	4
150	4
200	4
250	6
300	6

6.1.1 The lowermost rows of perforations in each group shall be separated by an arc of 90° and the uppermost rows of perforations in each group shall be separated by an arc of 160°. The spacing of rows between these limits shall be uniform. Holes may appear at the ends of short and random lengths.

7. PHYSICAL AND CHEMICAL REQUIREMENT

7.1 When tested in accordance with the method given in **A-1** of IS : 8967 (Part I)-1978*, the crushing strength of the pipe shall be in accordance with Table 1 for respective classes and sizes.

TABLE 1 CRUSHING STRENGTH OF PIPES

Sl No.	Nominal Size (mm)	Minimum Crushing Strength, kN/m					
		Light-Duty Pipes		Medium-Duty Pipes		Heavy-Duty Pipes	
		Average of 5 tiles	Individuals	Average of 5 tiles	Individual	Average of 5 tiles	Individual
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	80	11·7	9·9	16·0	14·4	20·4	18·4
ii)	100	11·7	9·9	16·0	14·4	20·4	18·4
iii)	125	11·7	9·9	16·0	14·4	20·4	18·4
iv)	150	11·7	9·9	16·0	14·4	20·4	18·4
v)	200	11 7	9·9	16·0	14 4	21·8	19·7
vi)	250	11·7	9·9	16·0	14·4	22·6	20·4
vii)	300	11·7	9·9	16·0	14·4	24·8	22·3

7.2 When tested in accordance with the method given in **5** of IS : 5913-1970†, the material of the pipe shall be such that the amount of acetic acid neutralized shall not exceed 0·115 g/cm^2.

NOTE — This is an optional requirement.

8. WORKMANSHIP AND FINISH

8.1 The pipe shall be seamless, compact and homogeneous. The internal surface shall be regular and smooth. The ends of the pipe shall also be smooth.

8.2 At the option of the purchaser, the pipes may be coated internally and/or externally with a suitable coating.

*Specification for farm drainage clay tiles: Part I Tiles with open joints.
†Methods of tests for asbestos cement products.

9. MARKING AND PACKING

9.1 Marking — The pipes shall be marked in a suitable manner with the following information:

a) Manufacturer's name or identification mark,

b) Size,

c) Length, and

d) Class.

9.1.1 Each pipe may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI 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 ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

9.2 Packing — The pipes may be packed for safe handling as agreed to between the purchaser and the supplier.

10. SAMPLING

10.0 If the purchaser requires the manufacturer to carry out any of the tests specified in this standard in his or his representative's presence, the number and type of tests shall be stated in his enquiry and order. Such acceptance tests shall be carried out before delivery. Where a short length has to be cut from pipes in order to comply with the test requirements, such shortened pipes shall be accepted in that respect by the purchaser as standard lengths subject to the total length of the pipes supplied being not less than the total length ordered.

10.1 Sampling of the pipe for carrying out these tests shall be done in accordance with IS : 7639-1975*. Each inspection lot shall include only items of the same nominal size and of the same class.

*Methods of sampling of asbestos cement products.