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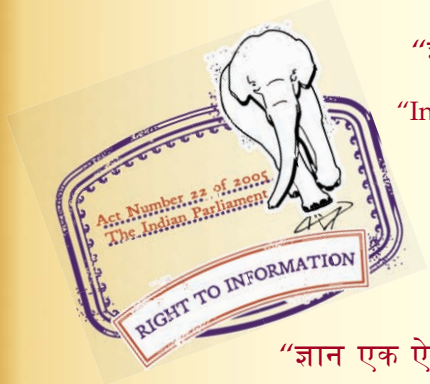
IS 404-1 (1993): Lead pipes, Part 1: For other than chemical purposes [MTD 9: Lead, Zinc, Cadmium, Tin, Antimony and their Alloys]



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"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 404 (Part 1) : 1993
(Reaffirmed 2003)

भारतीय मानक

सीसे की नलिकाएँ – विशिष्टि

भाग 1 रासायनिक के अलावा अन्य प्रयोजनों के लिए

(तीसरा पुनरीक्षण)

Indian Standard

LEAD PIPES — SPECIFICATION

PART 1 FOR OTHER THAN CHEMICAL PURPOSES

(Third Revision)

UDC 621·643·2 [669·4]

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

September 1993

Price Group 2

Lead, Zinc, Cadmium, Tin, Antimony and Their Alloys Sectional Committee, MTD 9

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Lead, Zinc, Cadmium, Tin, Antimony and Their Alloys Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first published in 1952 and subsequently revised in 1962 and 1977. In this revision the following modifications have been made:

a) Scope has been modified by deleting the requirements lead pipes for water,

b) A new clause on References has been incorporated,

c) Clauses on chemical composition and marking have been modified,

d) Requirements of drift expanding test have been included in place of flare test, and

e) Requirements of Inspection and Test certificate have been added.

This part covers the requirements of lead pipes for other than chemical purposes while the Part 2 covers the requirements of lead pipes for chemical purposes.

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

LEAD PIPES — SPECIFICATION

PART 1 FOR OTHER THAN CHEMICAL PURPOSES

(Third Revision)

1 SCOPE

1.1 This standard (Part 1) covers the requirements of lead pipes for other than chemical purposes.

1.2 The lead pipes covered in this standard are not suitable for potable water supply.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
403 : 1974	Method of chemical analysis of lead and antimonial lead (*revised*)
1387 : 1993	General requirements for the supply of metallurgical materials (*second revision*)
2335 : 1985	Methods for drift expanding test on metallic tubes (*first revision*)
8439 : 1977	Methods for sampling of lead and lead alloys

3 SUPPLY OF MATERIAL

General requirements relating to the supply of lead pipes shall be as laid down in IS 1387 : 1993.

4 FREEDOM FROM DEFECTS

The pipes shall be sound in all respect and free from laminations, flaws, pronounced extrusion marks or other harmful defects and shall, as far as possible, be circular in cross section, smooth and of uniform wall thickness throughout.

5 CHEMICAL COMPOSITION

5.1 The chemical composition of lead pipes shall meet the requirements given in Table 1.

5.2 The chemical composition shall be determined either by the methods specified in IS 403 : 1964 or any other established instrumental/chemical method. In case of dispute, the procedure specified in IS 403 : 1964 shall be the referee method.

Table 1 Chemical Composition of Lead Pipes

(*Clause* 5.1)

Constituent	Grade 1	Grade 2
	Percent	Percent
(1)	(2)	(3)
Lead, *Min*	99·80	99·25
Antimony, *Max*	0·06	0·10
Copper, *Max*	—	0 07
Tellurium, *Max*	0·005	—
Tin, *Max*	0·075	0·50
Zinc, *Max*	—	0·005
Total of all impurities, *Max*	0·20	0·75

NOTE — Other impurities do not proclude the possible presence of other unnamed elements. However, analysis shall regularly be made only for the impurities listed above. The major element shall be determined by difference between the sum of total elements analysed and 100 percent. By agreement between manufacturer and the purchaser, analysis may be required and limits established for elements not specified.

6 DIMENSIONS AND TOLERANCES

6.1 Dimensions

Depending upon the particular application, the dimensions of the pipes shall be selected from Table 2.

6.1.1 The corresponding values of mass of lead pipes in Table 2 have been given for information only.

6.2 Tolerances

6.2.1 The tolerance on the nominal internal diameter shall be + 0% and −5 %.

6.2.2 The tolerance on wall thickness shall be ± 7·5 percent except for any local increase to receive the marking as per **11**.

7 DRIFT EXPANDING TEST

When required by the purchaser, pipe shall be subjected to drift expanding test in accordance with IS 2335 : 1985 at room temperature and shall meet the requirements specified in Table 3.

Table 2 Dimensions of Lead Pipes

(*Clause* 6)

Nominal Wall Thickness (mm) →	2	3	4	6	8	10
Nominal Internal Dia (mm)	*Corresponding Nominal Mass in kg/m					
10	0·86	1·39	2·00	3·43	5·14	—
13	1·07	1·71	2·43	4·07	6·00	8·22
16	1·29	2·04	2·86	4·72	6·86	9·29
20	1·57	2·46	3·43	5·57	8·00	10·72
25	1·93	2·00	4·14	6·64	9·43	12·50
30	—	3·54	4·86	7·72	10·86	14·29
40	—	4·61	6·29	9·86	13·72	17·86
50	—	—	7·72	12·00	16·57	21·43
60	—	—	9·14	14·14	19·43	25·00
80	—	—	—	18·43	25·15	32·15
100	—	—	—	22·72	30.86	39·29
125	—	—	—	28·08	38·01	48·22

*For calculating the mass, the density of lead has been taken as 11·37 kg/dm³.

Table 3 Drift Expanding Test

(*Clause* 7)

Nominal ID mm Over	Up to and Including	Angle of Mandrel degree	Minimum Expansion in OD Percent
(1)	(2)	(3)	(4)
10	15	23	100
15	25	35	100
25	—	35	75

8 SAMPLING

8.1 Chemical Analysis

The pipes shall be grouped in lots of not more than 5 tonnes from each cast. One sample shall be selected and tested from each lot lead pipes for chemical analysis. The cuttings, which are as far as possible representative of each lot, shall be taken from the material as received for testing. The method for preparation of sample for chemical analysis shall be as per IS 8439 : 1977.

8.2 Other Tests

One sample shall be taken for each of 100 m length for all other tests.

9 RETEST

9.1 Chemical Composition

If the sample prepared under **8.1** and tested fails to meet the requirements of chemical composition specified in Table 1, two more tests shall be conducted on the same sample in order to confirm that the analysis has been done properly. If both the test results satisfy the relevant requirements, the lot shall be accepted. Should either of the retest fail, the lot represented shall be deemed as not complying with this standard.

9.2 Other Tests

If a sample selected in **8.2** fails to meet the requirement specified in **6** and **7** two more samples shall be selected from the same lot. If either of these samples fails to meet the specified requirements, the whole lot shall be rejected.

10 INSPECTION

10.1 All inspection and testing of pipes covered in this standard shall be carried out by the manufacturer unless otherwise agreed to between the manufacturer and the purchaser. The inspection requirements shall be stated in the enquiry, order and/or test schedule where applicable.

10.2 The purchaser shall notify the supplier while placing the order if it is his intention to inspect the pipes at the supplier's end. The supplier shall offer the purchaser all the necessary facilities for inspection and testing of the pipes in accordance with this standard. For this purpose the purchaser or his representative may, by prior arrangement, attend to inspect the material, to select and identify the test samples for testing and to witness the test being made.

11 MARKING

11.1 Each length of the pipes shall be legibly marked with the indication of the source of manufacture.

11.2 A metal tag shall be attached to each bundle of pipes bearing the following information:

a) Grade of lead;

b) Nominal internal diameter;

c) Nominal wall thickness; and

d) Cast number and date of manufacture.

11.3 Standard Marking

Each length of pipe may also be marked with the Standard Mark.

12 TEST CERTIFICATE

The supplier shall provide test certificate for each consignment giving information like dimensions, cast/lot number and corresponding chemical composition, etc.

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

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