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भारतीय मानक

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(तीसरा पुनरीक्षण)

Indian Standard

LEAD SHEETS AND STRIPS — SPECIFICATION

PART 1 FOR CHEMICAL PURPOSES

(*Third Revision*)

UDC 669.47 - 41 [661]

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NEW DELHI 110002

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Price Group 1

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

FOREWORD

This Indian Standard (Part 1) (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 1961 and 1977. In this revision the following modifications have been made:

- a) A new clause on references has been incorporated,
- b) Clauses on chemical composition and marking have been modified, and
- c) Requirements of inspection and test certificate have been added.

This part covers the requirements of lead sheet and strip for chemical purposes, while part 2 covers the requirements of lead sheet and strip for other than 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 SHEETS AND STRIPS — SPECIFICATION****PART 1 FOR CHEMICAL PURPOSES***(Third Revision)***1 SCOPE**

This standard (Part 1) covers the requirements for the lead sheets and strips for chemical purposes.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

<i>IS No.</i>	<i>Title</i>
403 : 1964	Method of chemical analysis of lead and antimonial lead (<i>revised</i>)
1387 : 1967	General requirements for the supply of metallurgical materials (<i>first revision</i>)
8439 : 1977	Methods for sampling of lead and lead alloys.

3 SUPPLY OF MATERIAL

General requirements relating to the supply of lead sheets and strips shall be as laid down in IS 1387 : 1967.

4 CHEMICAL COMPOSITION

4.1 The lead sheets and strips shall conform to the chemical composition as given in Table 1.

4.2 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.

5 FREEDOM FROM DEFECTS

The lead sheets and strips shall be sound, free from inclusions, laminations and other harmful defects.

6 SIZES

The thickness and tolerances of sheets and strips shall be as given in Table 2.

Table 1 Chemical Composition of Lead Sheets and Strips

(Clause 4.1)

(Percentage are maximum unless specified otherwise)		
Constituents	Lead Alloy Percent	Pure Lead Percent
Tellurium	0.04 to 0.06	—
Copper	0.05 to 0.07	0.003
Antimony	0.002	0.002
Bismuth	0.005	0.005
Iron	0.003	0.003
Silver	0.002	0.002
Zinc	0.002	0.002
Arsenic	0.002	0.002
Total Impurities	—	0.01
Lead	Remainder	99.99 Min

NOTE — Other impurities do not preclude the possible presence of other unnamed elements. However, analysis shall regularly be made only for the impurities listed in the table. 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.

7 TESTS FOR THICKNESS

7.1 Sheets and strips with specified thickness shall be tested by measuring the thickness of the sample drawn in accordance with 8 at not less than four points across the rolled width at equally spaced intervals and then taking an average.

7.1.1 The lead is very soft material and the measurement of thickness by micrometer may present difficulty. As an interim measure, when required by the purchaser, compliance with the thickness tolerance may be checked by measurement of weight. Take a 300 × 300 mm square from the position in the sheet or strip as indicated by the purchaser and weigh it. The weight shall not vary from that specified in 6 (corrected after multiplying by a factor of 0.09) by more than ± 5 percent.

IS 405 (Part 1) : 1992**Table 2 Thickness and Tolerance of Lead Sheets/Strips***(Clause 6)*

Nominal Thickness	Tolerances on Nominal Thickness	Corresponding Nominal Weight per Unit Area
mm	Percent	kg/m ²
0.5	±10	5.7
0.8	do	9.0
1.0	do	11.3
1.6	do	18.1
2.0	do	22.7
2.5	do	28.3
3.2	do	36.2
3.5	±7.5	39.7
4.0	do	45.4
4.5	do	51.0
5.0	do	56.7
5.5	do	62.1
6.0	do	68.0
7.0	do	79.1
8.0	do	90.7
9.0	do	102.0
10.0	±5	113.0
12.0	do	136.0
14.0	do	159.0
16.0	do	181.0

NOTE — Width of strip shall not be less than 75 mm.

8 SAMPLING

One check sample for chemical analysis and another for the test for thickness shall be taken from each lot of 2 500 kg or fraction thereof. The method for preparation of sample for chemical analysis shall be as per IS 8439 : 1977.

9 RETEST**9.1 Chemical Composition**

If the sample prepared under 8 and tested fails to meet the requirements of chemical composition specified under 4 (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 Thickness

If a sample selected for testing fails to meet the specified requirement of thickness, 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 sheets/strips 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 when placing the order if it is his intention to inspect sheets/strips at the supplier's end. The supplier shall offer the purchaser all the necessary facilities for inspection and testing of sheets/strips in accordance with this standard. For this purpose the purchaser or his representative may, be prior arrangement, attend to inspect sheets/strips, to select and identify the test samples for testing and to witness the testing.

11 MARKING

11.1 The following details shall be suitably marked on each package of sheets/strips:

- cast/lot number;
- type of lead;
- thickness in mm; and
- indication of the source of manufacture.

11.2 Standard Marking

The sheets/strips may also be marked with the standard Mark.

12 TEST CERTIFICATE

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

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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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