



Indian Standard IS 27:2023 - Primary Lead-Specification

1. Introduction

IS 27:2023, provides specification for Primary Lead. It sets out the requirements for primary lead ingots, a product produced from smelting and refining process from ore or similar raw materials; lead derived from scrap or secondary sources is not covered.

This standards was first published in 1950 and subsequently revised in 1958, 1965, 1977 and 1992. Latest revision was carried out in 2023 keeping in view the latest developments in the lead production and refining process and addition of new grades in the standard which have international acceptance and traded on various commodity exchanges.

2. Lead Production Process

Typically Lead(Pb) production involves several key steps: (a) **Crushing**: Extracting and crushing lead ore to a manageable size, (b) **Concentration**: Using froth flotation to increase lead content by removing gangue, (c) **Roasting**: Heating ore in air to convert lead sulfide to lead oxide, (d) **Reduction Smelting**: Mixing lead oxide with coke and limestone in a furnace to produce metallic lead, with limestone forming slag to remove impurities, and (e) **Refining**: Removing impurities to achieve high-purity lead through methods such as (i) dressing, (ii) the Parkes process (for silver removal), and (iii) final electrolytic or fire refining.

3. Grades of Lead

This standard defines five grades of primary lead ingots based on minimum lead content and acceptable impurity levels for elements such as silver, iron, bismuth, and copper: (a) Pb99.90Cu (chemical copper lead), (b) Pb99.97, (c) Pb99.985, (d) Pb99.99, and (e) Pb99.995.

4. Industrial Uses of Lead Grades

Each grade is optimized for specific applications: for example, Pb99.99 is ideal for producing red lead, white lead litharge, optical glasses, accumulator plates, lead sheet, lead tubes and lead wire for the chemical industry. while Pb99.90Cu used for lead acid battery applications. Pb99.90Cu offers enhanced corrosion resistance for use in sulfuric acid environments.

5. Tests

The important tests outlined in IS 27:2023 for Primary Lead specification is (i) Freedom from Defects (ii) Shape, Size and Mass and (iii) chemical requirements.

This document also includes guidelines for marking, which ensure traceability of lead ingots. Each ingot is marked with essential information such as grade, lot number, and manufacturer details.

This standard offers a comprehensive overview of lead types based on purity, their industrial applications, and essential testing requirements.