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Standard Specification for Modern Pewter Alloys¹

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1. Scope

1.1 This specification covers three alloy types, made from tin, antimony, and copper, used in the fabrication of pewter articles by casting, spinning, drawing, or forming. The metal may be supplied in the form of bars, ingots, rolled sheet, and circles.

1.2 Pewter alloy shall be defined as having a composition within the range from 90 to 98 % tin, 1 to 8 % antimony, and 0.25 to 3 % copper. Compositions are given in [Table 1](#).

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to become familiar with all hazards including those identified in the appropriate Material Safety Data Sheet (MSDS) for this product/material as provided by the manufacturer, to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

[E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications](#)

[E51 Method for Spectrographic Analysis of Tin Alloys by the Powder Technique \(Withdrawn 1983\)](#)³

[E57 Methods for Chemical Analysis of White Metal Bearing Alloys \(Withdrawn 1986\)](#)³

[E88 Practice for Sampling Nonferrous Metals and Alloys in Cast Form for Determination of Chemical Composition](#)

¹ This specification is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.02 on Refined Lead, Tin, Antimony, and Their Alloys.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

3. Classification

3.1 The hardness and workability of pewter varies with the amount of antimony and copper alloyed with the tin. Casting alloys generally contain less copper and a slightly higher tin content than sheet alloys. The composition for castings (Type 1) and sheet (Type 2) are shown in [Table 1](#), but individual fabricators may choose compositions in the range given for each type. A special-purpose alloy (Type 3), high in tin, is used for articles requiring a softer metal. All types must conform to the impurity limits shown in [Table 1](#).

3.2 The following applies to all specified limits in this standard: For purposes of determining conformance with these specifications an observed value or a calculated value shall be rounded "to the nearest unit" in the last right-hand place of figures used in expressing the limiting value, in accordance with the rounding method of Practice [E29](#).

4. Ordering Information

4.1 Orders for material under this specification should include the following:

4.1.1 Quantity,

4.1.2 Form—bars, sheet, or circles,

4.1.3 Type and composition ([Table 1](#)),

4.1.4 Size (sheet—thickness, width and length; circles—thickness and diameter), and

4.1.5 Marking.

5. Materials and Manufacture

5.1 The manufacturer shall use care to have each shipment of each form as uniform in quality and composition as possible and of a commercially satisfactory appearance.

6. Chemical Composition

6.1 The material shall conform to the requirements as to chemical composition specified in [Table 1](#). Nominal compositions, agreed upon by the manufacturer and purchaser, may be prescribed under this specification.

7. Dimensions, Mass, and Permissible Variations

7.1 Sheet pewter is commercially available in thicknesses from 0.031 to 0.064 ± 0.002 in. (0.79 to 1.63 mm) ([Table 2](#)). Thinner sheet down to a thickness of 0.010 in. (0.25 mm) can be supplied to special order. Sheet can be supplied in widths up to 2 ft (0.6 m) and lengths up to 4 ft (1.2 m).

**TABLE 1 Chemical Requirements**

Element	Composition, -wt%		
	Type 1 Casting Alloy ^A	Type 2 Sheet Alloy ^B	Type 3 Special Purpose Alloys
UNS Number	L13911	L13912	L13963
Tin	90–93	90–93	95–98
Antimony	6–8	5–7.5	1.0–3.0
Copper	0.25–2.0	1.5–3.0	1.0–2.0
Lead, max	0.05	0.05	0.05
Arsenic, max	0.05	0.05	0.05
Iron, max	0.015	0.015	0.015
Zinc, max	0.005	0.005	0.005

^A Nominal Type 1 alloy composition: 92 Sn, 7.5 Sb, and 0.5 Cu.

^B Nominal Type 2 alloy composition: 91 Sn, 7 Sb, and 2 Cu.

7.2 Circles are available in diameters from 2 to 20 in. (50.8 to 508 mm) and in thicknesses from 0.031 to 0.064 ± 0.002 in. (Table 2).

7.3 Bars or ingots are nominally 5 lb (2.27 kg) in mass.

8. Workmanship, Finish, and Appearance

8.1 Surface defects in bars or ingots are of no importance. Surface defects in sheet pewter or circles may be a cause for rejection if the defects (pits or dents) cannot be removed to the total satisfaction of the purchaser by polishing. Rejection of an entire shipment should be made only if the surface defects are present on a substantial percentage of the shipment.

9. Sampling

9.1 Unless otherwise agreed upon by the manufacturer and the purchaser, heat (ladle) analyses furnished by the manufacturer shall be accepted as defining the composition of the material furnished.

9.2 If samples for check analyses are desired, they shall be so specified by the purchaser at the time of placement of the order.

9.3 Check analyses samples shall consist of three bars or ingots selected to represent a shipment of less than 1000 lb (454 kg) and five bars or ingots to represent a shipment of over 1000 lb (454 kg). The bars shall be selected at random, preferably under such conditions that every piece in the lot is accessible for selection (for example, while shipment is being loaded or unloaded). A saw cut shall be made entirely through the piece on its long axis and the saw chips collected. Sawings thoroughly mixed and split into three parts shall constitute the samples for chemical analysis (Practice E88).

9.4 For sheet, circles, and discs, a sample shall consist of clippings from not more than 2 % of the shipment. The minimum mass of sample shall be 250 g.

10. Chemical Analysis

10.1 In case of dispute, the chemical analysis shall be made in accordance with Methods E57 and E51.

11. Rejection and Rehearing

11.1 Material that fails to conform to the requirements of this specification may be rejected. Rejection should be reported to the producer or supplier promptly and in writing. In case of dissatisfaction with the results of the test, the producer or supplier may make claim for a rehearing.

12. Product Marking

12.1 At the option of the purchaser, the manufacturer's identifying mark shall be cast or stamped on each bar. The numerical designation of the type shall be either cast on each bar for identification or marked on the container. Sheet metal shall be marked on the container as to type, for identification purposes.

13. Keywords

13.1 bar; ingot; pewter; rolled sheet; tin–antimony–copper alloys