~~Designation:B 749–03~~ Designation: B749 – 03 (Reapproved 2009)

Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products[1]

This standard is issued under the fixed designation B749; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers lead sheet, strip, and plate of various alloys intended for use in chemical plants, sound attenuation, roofing, vibration dampening, flashing and weather stripping, waterproofing, and radiation shielding.

~~1.2The values stated in inch-pound units are to be regarded as the standard.~~

1.2 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.

1.3 *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]

B29 Specification for Refined Lead

E8 Test Methods for Tension Testing of Metallic Materials

E10 Test Method for Brinell Hardness of Metallic Materials

E18 ~~Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials~~[3] Test Methods for Rockwell Hardness of Metallic Materials

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E37 Test Methods for Chemical Analysis of Pig Lead

E87 Methods for Chemical Analysis of Lead, Tin, Antimony, and Their Alloys (Photometric Methods)[3]

E112 Test Methods for Determining Average Grain Size

3. Terminology ~~Definitions~~

~~3.1~~

3.1 *Definitions:*

3.1.1 *lot, n*—shall consist of all the lead sheet, strip, or plate of the same alloy produced by one manufacturer and offered for delivery at one time for sampling and inspection from one manufacturing or smelting heat.

~~3.2~~

3.1.2 *plate, n*—any product over 0.187 in. (4.75 mm) in thickness and over 10 in. (254 mm) in width.

~~3.3~~

3.1.3 *sheet, n*—products 0.187 in. (4.75 mm) and under in thickness and 24 in. (610 mm) or more in width.

~~3.4~~

3.1.4 *strip, n*—any product 0.187 in. (4.75 mm) and under in thickness and less than 24 in. (610 mm) in width.

4. Ordering Information

4.1 Orders for material to this specification shall include the following information:

---

[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.~~

~~Current edition approved, June 10, 2003. Published July 2003. Originally approved in 1985. Last previous edition approved in 1997 as B 749-97.~~on Refined Lead, Tin, Antimony, and Their Alloys.

Current edition approved, Oct. 1, 2009. Published October 2009. Originally approved in 1985. Last previous edition approved in 2003 as B749 - 03. DOI: 10.1520/B0749-03R09.

[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* ~~, Vol 02.04.~~volume information, refer to the standard's Document Summary page on the ASTM website.

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

4.1.1 Alloy (chemical composition) with variations specified.
4.1.2 Type (strip, sheet, or plate).
4.1.3 Condition including mechanical properties where applicable.
4.1.4 Dimensions.
4.1.5 Number of Pieces.
4.1.6 *Certification*—State if certification is required.
4.1.7 *Sampling*—Type of sampling required and whether samples product (check) analysis shall be furnished.
4.1.8 *Inspection Requirements*—If purchaser wishes to witness tests or inspection of material at the place of manufacture, the purchase order must so state indicating which tests or inspections are to be witnessed.
4.1.9 *Optional Requirements*:
4.1.9.1 *Strip and Sheet*—Whether to be furnished in coils or in cut straight lengths.
4.1.9.2 *Sheet and Plate*—Whether to be furnished in specially flattened condition.
4.1.9.3 *Wrought Products*—Minimum reduction required.

5. Materials and Manufacture

5.1 The lead sheet, strip, or plate shall be manufactured by rolling or extruding the product from a lead work piece of chemical composition specified in Table 1 or other specified composition. The work piece may be prepared by conventional casting into a mold or by continuous casting. Lead sheet or strip may also be produced by direct continuous casting to the desired thickness.

6. Chemical Composition

6.1 Lead sheet, strip, and plate shall conform to the chemical composition limits specified in the purchase order. The appropriate ASTM or UNS alloy may be designated where applicable. Table 1 lists the chemical requirements of several grades of lead for information purposes.

NOTE 1—Soft lead sheet, strip, and plate is generally produced from Specification ~~B 29~~B29 grade copper-bearing lead.

6.2 If a product (check) analysis is performed by the purchaser, the material shall conform to the product analysis variation in chemical composition specified in the purchase agreement or in the applicable alloy specification.

7. Mechanical Properties

7.1 The material shall conform to the mechanical properties specified in the purchase order by way of testing (see Section 12).

8. Dimensions, Mass, and Permissible Variations

8.1 *Thickness*:

TABLE 1 Chemical Requirements[A,B]

Grade	Composition (Weight Percent)			
	Low Bismuth Low Silver Pure Lead, max[C]	Refined Pure Lead, max[D]	Pure Lead, max	Chemical-Copper Lead[E]
Sb	0.0005	0.0005	0.001	0.001 max
As	0.0005	0.0005	0.001	0.001 max
Sn	0.0005	0.0005	0.001	0.001 max
Sb As and Sn	. . .	. . .	0.002	0.002 max
Cu	0.0010	0.0010	0.0015	0.040–0.080
Ag	0.0010	0.0075	0.010	0.020 max
Bi	0.0015	0.025	0.05	0.025 max
Zn	0.0005	0.001	0.001	0.001 max
Te	0.0001	0.0001	. . .	. . .
Ni	0.0002	0.0002	0.0005	0.002 max
Fe	0.0002	0.001	0.001	0.002 max
Lead (min) by difference	99.995	99.97	99.94	99.90
UNS Number	L50006	L50021	L50049	L51121

[A] The following applies to all specified limits in Table 1: For the purpose of determining conformance with this specification, an observed value obtained from the analysis shall be rounded off "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 ~~E 29.~~ E29.

[B] By agreement between the purchaser and the supplier, analyses may be required and limits established for elements or compounds not specified in Table 1.

[C] This grade is intended for chemical applications where low silver and low bismuth contents are required.

[D] This grade is intended for lead acid battery applications.

[E] This grade is intended for applications requiring corrosion protection and formability.