

QQ-L-171e

October 10, 1966

SUPERSEDING

Int. Fed. Spec. QQ-L-00171d (NAVY-Ships)

December 10, 1962 and

Fed. Spec. QQ-L-171c

May 27, 1957

FEDERAL SPECIFICATION

LEAD PIG

This specification was approved by the Commissioner, Federal Supply Services, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 **Scope.** This specification covers lead pigs of the composition specified in 3.3 (see 6.1).

1.2 **Classification.**

1.2.1 *Forms, shapes, and grades.* The pigs shall be furnished in commercial standard forms and shapes, in the following grades, as specified (see 3.3 and 6.2).

Grade A.

Grade B.

Grade C.

2. APPLICABLE DOCUMENTS

2.1 **Specifications and standards.** The following specifications and standards, of the issues in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

Federal Specifications:

NN-P-71—Pallets, Material Handling, Wood, Double Faced, Stringer Construction.

QQ-S-781—Steel, Strapping, Flat.

Federal Standard:

Fed. Test Method Std. No. 151—Metals; Test Methods.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S.

Government Printing Office, Washington, D.C. 20402.

(Single copies of this specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge at the General Services Administration Regional Offices in Boston, New York, Washington, D.C., Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, and Seattle, Wash.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Standards:

MIL-STD-105—Sampling Procedures and Tables for Inspection by Attributes.

MIL-STD-129—Marking for Shipment and Storage.

(Copies of Military Specifications and Standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 **Other publication.** The following document forms a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Society for Testing and Materials (ASTM) Publication:

B 29—Specification for Pig Lead.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa., 19103.)

3. REQUIREMENTS

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3.1 Material. The lead pigs shall be made from ore or other material by processes of reduction and refining. For grades A and B, reclaimed lead obtained by recovery of metallic lead and its alloys by the simple reclaiming process of melting, drossing, and casting is acceptable under this specification if chemical composition requirements are within the limits specified herein. Grade C lead pig shall be either primary or secondary lead produced from ore or other materials by electrolytic or pyrometallurgical reduction and refining processes which preclude the presence of unusual deleterious elements. The pyrometallurgical processes shall include at least the following steps:

- (1) Softening (antimony removal).
- (2) Desilverizing (where required).
- (3) Decopperizing and adjustment of copper content.
- (4) Desulphurizing.

Reclaimed lead is not acceptable for grade C.

3.2 Surface condition. The pigs shall be clean and reasonably free from adhering foreign matter.

3.3 Chemical composition.

3.3.1 Lead pigs shall conform to the chemical composition specified in table I.

TABLE I. *Chemical composition*

* Element	Grade A percent	Grade B percent	Grade C, percent maximum
Lead.....	1 99.90	1 95.0	1 99.90
Antimony, tin and arsenic (total).....	-----	-----	0.002
Iron.....	-----	-----	.002
Bismuth.....	-----	-----	.025
Zinc.....	-----	-----	.001
Copper.....	-----	-----	² .040 to .080
Silver.....	-----	-----	.020

¹ Minimum by difference. Grades A and C — maximum total other elements 0.10 percent, grade B — maximum total other elements 5.0 percent.

² Range.

³ For grade C, no element other than those specified shall exceed 0.001 percent maximum as determined by a normal spectrographic analysis,

except for 0.006 percent maximum for nickel and 0.002 percent maximum for cadmium.

3.3.2 The contractor shall furnish an analysis of each melt showing the percentage of each of the elements specified in 3.3.1.

3.4 Identification marking. Each pig shall have the following information cast or stamped thereon in legible characters: The Federal Specification symbol, grade, the manufacturer's name or brand, and melt or cast number.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.2 Inspection lot.

4.2.1 For inspection purposes, a lot shall consist of all lead pigs of the same grade produced by one manufacturer and offered for delivery at one time, but shall not exceed one carload.

4.2.2 For Grade C lead, a lot for chemical analysis shall also be limited to the lead pig produced by one manufacturing or smelting heat. In this case, a lot that cannot be identified by heat shall be cause for rejection.

4.3 Sampling for examination and tests.

4.3.1 Sampling for visual examination. A random sample of lead pig shall be selected from each lot offered for delivery and examined for visual characteristics in accordance with MIL-STD-105 at inspection level I. The acceptable quality level (AQL) shall be 2.5 percent defective (see 4.4.1).

4.3.2 Chemical analysis. One pig shall be taken by the inspector to represent each ton of lead in the lot and the pig or pigs thus taken sampled by any one of the methods specified herein. Except when the spectrographic analysis is to be made on a solid sample (see 4.3.2.5), not less than 600 grams from each lot shall be forwarded to a laboratory for analysis (see 4.4.2).

4.3.2.1 Sawing. The pigs shall be sawed completely through in the center, at each end of largest cross section, and at points midway between ends and center. The sawings shall be mixed thoroughly, quartered, and samples for analysis taken from the mixed materials. Sawings shall be free from all extraneous material and shall be treated with a strong magnet in order to remove iron introduced from the saw blade. See ASTM B 29 for details on sampling.

4.3.2.2 Drilling. The pigs shall be drilled preferably with a 1/2-inch drill at least half-way through from two opposite sides. In drilling, the holes are spaced along a diagonal line from one corner of the pig to the other. If several pigs are used, the holes may be drilled in each of the several pigs of a group so that holes represent consecutive positions on the diagonal of a single pig. The drillings may be clipped and mixed and samples for analysis drawn from mixed material; or they may be melted in a clean crucible and either granulated by pouring into distilled water and drying thoroughly, or cast into thin slabs which shall be sawed through completely in several places and sawings treated as specified in 4.3.2.1. See ASTM B 29 for details on sampling.

4.3.2.3 Kettle (classes A and C). Unless otherwise agreed upon by the procuring activity and the contractor, the pigs or portions of lot selected shall be melted in a clean kettle. The melt shall be made at as low a temperature as possible, preferably not over 685°F., in order to prevent excessive drossing, and the molten bath shall be stirred immediately prior to sampling. While stirring, a sample in a preheated ladle may be taken and cast into thin sample bars ap-

proximately 8 inches in length, 1-1/4 inches in width, and 3/8 inch in thickness. From the bar so cast, saw cuts shall be made 1/2 inch apart alternately from each side, halfway across the slab. No cut shall be made closer than 1 inch to either end of the slab. The sample shall be treated with a strong magnet to remove iron.

4.3.2.4 When mutually agreed upon between the procuring activity and the contractor, ladle test ingots obtained during pouring of the metal shall be used as samples and treated as specified in 4.3.2.1, 4.3.2.2, and 4.3.2.3. One ladle test ingot shall be taken at the beginning of the pouring of a lot and one near the end of pouring as indicated by the inspector.

4.3.2.5 Spectrographic analysis. Samples for spectrographic analysis shall be obtained by pouring metal representative of the heat or melt into a permanent mold in the presence of the inspector or at the time castings are poured. The mold shall be so designed that the samples obtained will be truly representative of the heat or melt and satisfactory for use by the laboratory at which the spectrographic analysis is to be performed.

4.4 Examination and tests.

4.4.1 Visual examination. Each of the sample lead pigs, selected in accordance with 4.3.1, shall be visually examined to verify compliance with the requirements of this specification regarding surface condition and identification marking (see 3.2 and 3.4).

4.4.2 Chemical analysis. Chemical analysis shall be made on each sample, selected in accordance with 4.3.2, by wet chemical or spectrographic methods (method 111 or 112 of Fed. Test Method Std. No. 151, to determine conformance with 3.3. In case of dispute, chemical analysis by wet chemical methods shall be basis for acceptance of chemical composition and spectrographic analysis the basis for the acceptance of other impurity elements as specified in table I, note³.

4.5 Rejected lots. Any lead pig in the sam-

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ple containing one or more defects shall be cause for rejection, and if the number of defective lead pigs in any sample exceeds the acceptance number for that sample, it shall be cause for rejection of the lot represented by the sample. Rejected lots may be offered again for inspection provided the contractor has repaired or removed all nonconforming lead pigs. Samples shall again be selected from such resubmitted lots and examined to verify compliance with this specification.

5. PREPARATION FOR DELIVERY

5.1 Packing. Packing shall be level A, B, or C, as specified (see 6.2).

5.1.1 Level A. Lead pig shall be packed on pallets conforming to type III of NN-P 71. The stringer ends shall be bevelled. The load shall be adequately tension tied to the pallet with class B, 1-1/4 by 0.035 inch coated metal strapping conforming to QQ-S-781. Full length, nominal 1 by 4 inch lumber shall be placed under the strapping at the top of the load. The gross weight shall not exceed 2,240 pounds.

5.1.2 Level B. Lead pig shall be packed in bundles stacked in a manner to facilitate handling with forklift vehicles. Such bundles shall be adequately tension bound with 1-1/4 inch by 0.035 inch coated metal strapping conforming to QQ-S-781. The gross weight shall not exceed 2,240 pounds.

5.1.3 Level C. Lead pig, separated by grade, shall be packed to insure carrier acceptance and safe delivery at destination at lowest rates in containers complying with the rules and regulations applicable to the mode of transportation.

5.2 Marking.

5.2.1 Military agencies. In addition to any special marking required by the contract or order, loose pigs and palletized loads shall be marked in accordance with MIL-STD-129.

5.2.2 Civil agencies. In addition to any spe-

cial marking required by the contract or order, loose pigs and palletized loads shall be marked in accordance with Fed. Std. No. 123.

6. NOTES

6.1 Intended use.

6.1.1 Grade A. Grade A lead pig is intended for foundry use.

6.1.2 Grade B. Grade B lead pig is intended for uses such as weights and ballast.

6.1.3 Grade C. Grade C lead pig is intended for structural uses where high purity lead is required and for chemical use.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

- (a) Title, number, and date of this specification.
- (b) Grade of lead pig required (see 1.2).
- (c) Selection of applicable level of packing required (see 5.1).
- (d) Marking required (see 5.2).

MILITARY CUSTODIANS:

Army—MR
Navy—SH
Air Force—69

Review activities:

Army—MR, MU, WC
Navy—SH, WP, YD
Air Force—69

User activities:

Army—MO
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Preparing activity:

Navy—SH

Review/user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current Federal Supply Classification Listing of DOD Standardization Documents.

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