

MIL-L-18618A(OS)  
5 January 1976  
SUPERSEDING  
MIL-L-18618(NOrd)  
2 June 1955

MILITARY SPECIFICATION

LEAD CARBONATE, BASIC, DRY  
(FOR ORDNANCE USE)

*This specification is approved for use by all departments and agencies of  
the Department of Defense.*

1. SCOPE

1.1 Scope. This specification covers basic lead carbonate for use in propellant powders.

2. APPLICABLE DOCUMENTS

\*2.1 The following documents of the issues in effect on date of invitation for bids or request for proposals form a part of this specification to the extent specified herein. In the event of conflict between this specification and other documents referenced herein, requirements of this specification shall apply.

SPECIFICATIONS

Military

MIL-P-17449 Powder, Propellant, Cordite N

STANDARDS

Military

MIL-STD-129 Marking of Shipment and Storage

(Copies of specifications and standards required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

FSC 6810

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\*2.2 Other publications. The following documents form a part of this specification to the extent specified herein. In the event of conflict between this specification and other documents referenced herein, the requirements of this specification shall apply.

American Society for Testing and Materials (ASTM)

D 185	Coarse Particles in Pigments, Pastes, and Paints, Test for
D 280	Hygroscopic Moisture and Other Matter Volatile Under the Test Conditions in Pigments, Test for
D 301	Soluble Nitrocellulose, Test for
D 1301	Chemical Analysis of White Lead Pigments, Standard Methods for

(Copies are obtainable from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103.)

3. REQUIREMENTS

3.1 Material. The material shall be a high-grade basic carbonate white lead and shall contain no more than traces of impurities incident to well controlled manufacture of this material.

3.1.1 Chemical composition. The material shall conform to the following chemical requirements:

<u>Requirements</u>	<u>Minimum</u>	<u>Maximum</u>
Impurities	-	0.5%
Lead carbonate	62%	69%
Total lead (calculated as Pb)	80%	-
Moisture	-	0.7%

3.1.2 Physical properties. All primary samples shall conform to the following physical requirements:

<u>Requirements</u>	<u>Minimum</u>	<u>Maximum</u>
Average particle size	-	5 microns
Percent coarse particles	-	0.5%

3.1.3 pH value. When tested as specified in 4.3.2, all primary samples shall have a pH value between 5.5 and 7.0.

3.1.4 Compatibility test. When tested as specified in 4.3.4, the stability end point for the control shall not differ by more than 10 minutes from the stability end point for any of the primary samples of basic lead carbonate mixed with propellant.

#### 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 in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by 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 supplies and services conform to prescribed requirements.

#### 4.2 Sampling.

4.2.1 Lot. A lot shall consist of 5,000 pounds or less of material manufactured as part of one batch or under uniform process conditions.

4.2.2 Samples. A minimum of five containers in the lot shall be selected in a random manner so as to be representative of the lot. From each selected container, a primary sample of 1-1/2 pounds shall be removed by means of a scoop. Each sample shall then be subdivided into 3 subsamples of 8 ounces each. The first and second subsamples from each container shall be placed in separate rubber stoppered bottles and labeled to show the name of the material, manufacturer, plant, contract or order number, lot number, and the identification of the container from which it was taken. The remaining 8-ounce subsamples shall be thoroughly mixed together and separated into 2 approximately equal composite samples. Each composite sample shall be placed in a rubber

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stoppered bottle and labeled to show the name of the material, manufacturer, plant, contract or order number, number of pounds in the lot, and lot number. The five bottles containing the first subsamples from each container and one bottle of the composite sample shall be forwarded to the Commanding Officer, Naval Ordnance Station, Indian Head, Md., for analysis. Each of the forwarded primary samples shall be for use in testing conformity to the requirements for physical properties, pH, and compatibility. The forwarded composite sample shall be for use in the chemical analysis. The remaining five bottles containing the second subsamples from each container and the other bottle containing the composite sample shall be retained for possible future use in case any of the samples tested should fail to meet the requirements of this specification.

#### 4.3 Test procedures.

\*4.3.1 Chemical composition. Analysis for chemical composition shall be carried out on the composite sample in accordance with the following.

\*4.3.1.1 Insoluble impurities. Insoluble impurities shall be determined in accordance with ASTM D 1301.

\*4.3.1.2 Total lead. Total lead shall be determined in accordance with ASTM D 1301, using the factor 0.641 for converting lead chromate to lead.

\*4.3.1.3 Lead carbonate. Lead carbonate shall be determined in accordance with ASTM D 1301, using the evolution method for determining CO<sub>2</sub>.

\*4.3.1.4 Moisture. Moisture shall be determined in accordance with ASTM D 280.

4.3.2 pH value. Prepare a quantity of carbon dioxide-free water by boiling distilled water in a 1-liter flask for 15 minutes. Close the flask with an "Ascarite" (or similar CO<sub>2</sub> absorbent material) guard tube and cool to 25° C. Check the pH of the water at 25° ± 1° C to determine that its value lies between 6.0 and 7.0. Transfer 10 ± 0.01 grams of a primary sample of the basic lead carbonate to a 250-milliliter (ml) flask equipped with a ground-glass stopper. Add 100 ml of the prepared water, stopper the flask, and shake for 1 minute. Allow the flask and contents

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to stand for 1 hour, with occasional swirling, at  $25^{\circ} \pm 1^{\circ}$  C. Allow the sample to settle. Decant a portion of the supernatant liquid. Determine the pH of the liquid at  $25^{\circ} \pm 1^{\circ}$  C by means of a calibrated potentiometer equipped with a glass electrode and a saturated calomel reference electrode. Repeat or concurrently perform this procedure for each primary sample submitted as representative of the lot.

#### 4.3.3 Physical properties.

4.3.3.1 Average particle size. The average particle size shall be determined separately on each primary sample using the Fisher Sub-Sieve Sizer. A sample of  $6.14 \pm 0.01$  grams (approximately 1 ml by volume) shall be used. All operations shall be performed in accordance with the instructions supplied with the instrument.

\*4.3.3.2 Percent coarse particles. Each primary sample shall be tested as described in ASTM D 185, using a No. 325 U. S. Standard sieve.

\*4.3.4 Compatibility test. Each primary sample shall be tested separately, but the tests can be run concurrently with a single control standard if facilities permit. A ground sample of Cordite N propellant powder, which has met the requirements of MIL-P-17449 shall be mixed thoroughly with 10 percent of its weight of the primary sample. This mixture shall then be subjected to the stability test described in ASTM D 301, using a temperature of  $120^{\circ}$  C instead of  $134.5^{\circ}$  C. A control sample of the Cordite N propellant powder mixed thoroughly with 10 percent of its weight of the standard lead carbonate (Lot IH STD 1 previously tested at the Naval Ordnance Station, Indian Head, Md., and found satisfactory for propellant use), shall be tested at the same time.

### 5. PREPARATION FOR DELIVERY

5.1 Packaging. Unless otherwise specified in the contract or purchase order, basic lead carbonate shall be packaged in 50-pound containers conforming to standard commercial practice for the pigment "basic carbonate white lead."

5.2 Marking. Unless otherwise specified, each container shall be plainly marked with the following information completed:

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Material \_\_\_\_\_  
 Specification \_\_\_\_\_  
 Stock No. \_\_\_\_\_  
 Quantity \_\_\_\_\_  
 Contractor \_\_\_\_\_  
 Manufacturer \_\_\_\_\_  
 Contract No. \_\_\_\_\_  
 Gross Weight \_\_\_\_\_  
 Date \_\_\_\_\_  
 Lot No. \_\_\_\_\_

In addition to the foregoing, shipments shall be marked in accordance with the requirements of MIL-STD-129.

#### 6. NOTES

\*6.1 Ordering data. Procurement documents should specify the title, number, and date of this specification.

6.2 Material. Under 3.1, the material is described chemically as basic lead carbonate with a lead carbonate content of 62 to 69 percent. The remainder (other than impurities and moisture) is generally all lead hydroxide or various proportions of lead hydroxide and anhydrous lead oxide combined in the compound. Thus, the material "basic lead carbonate" covered by this specification is high grade commercial "white lead" with a lead carbonate content and ratio of lead carbonate to lead hydroxide complying with the requirements of 3.1.

6.3 Compatibility test. The compatibility test described in 4.3.4 is intended to determine whether any undesirable interaction occurs between the material and the propellant powder. Previous tests have indicated that high grade commercial pigment "basic carbonate white lead" will readily pass this test. Prime manufacturers are advised that compatibility tests will be conducted at Government laboratories. Information regarding testing of samples for conformance to the compatibility requirement prior to submission of bids may be obtained from the Commanding Officer, Naval Ordnance Station, Indian Head, Md. 20640.

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\*6.4 The margins of this specification are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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