

MIL-P-223B
AMENDMENT 3
15 MAY 1973
SUPERSEDING
Int Amendment 2 (MU)
30 August 1968
AND
AMENDMENT 1
31 July 1963

MILITARY SPECIFICATION

POWDER, BLACK

This Amendment forms a part of Military Specification MIL-P-223B, dated 26 February 1962, and is approved for use by all Departments and Agencies of the Department of Defense.

2. APPLICABLE DOCUMENTS: Delete in its entirety and substitute:

"2.1 The following documents, of the issue in effect on date of invitation for bids or request for proposals, form a part of this specification to the extent specified herein:

SPECIFICATIONS

FEDERAL

RR-S-366 - Sieves; Standard for Testing Purposes
PPP-B-26 - Bag, Plastic, Polyethylene

MILITARY

MIL-G-155 - Graphite, Dry (For Use in Ammunition)
MIL-P-156 - Potassium Nitrate
JAN-C-178 - Charcoal (For Use in Munitions)
MIL-S-14929 - Sulfur Commercial Grade

STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for
Inspection by Attributes (ABC-STD-105)

FSC: 1376

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- MIL-STD-109 - Quality Assurance Terms and Definitions
- MIL-STD-129 - Marking for Shipment and Storage
- MIL-STD-286 - Propellants, Solids: Sampling, Examination and Testing
- MIL-STD-1235 - Single and Multilevel Continuous Sampling Procedures and Tables for Inspection by Attributes

FEDERAL

- FED-STD-101 - Preservation, Packaging and Packing Materials, Test Procedures
- FED-STD-406 - Plastic, Methods of Testing

DRAWINGS

U. S. ARMY MUNITIONS COMMAND

- 7548077 - Container, Metal, Packing for Black Powder, Assembly
- 7548078 - Container, Metal Packing for Black Powder, Details
- 7548321 - Drum Steel Packing for Black Powder, Assembly Details, Packing and Marking
- 7548322 - Drum Steel Packing for Black Powder, Details
- 8863394 - Primer, Percussion, M-92E1, Loading and Assembling

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

2.2 Other publications - The following document forms a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitations for bids shall apply to the extent specified herein.

CODE OF FEDERAL REGULATIONS

Title 49 - Transportation, CFR 49 Part 0-190

(The Interstate Commerce Commission Regulations are now a part of the Code of Federal Regulations, available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Orders for the above publications should cite, "49 CFR 0-190 (latest revision)")."

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Paragraph 3.1: Delete in its entirety and substitute:

"3.1 Material - The constituent materials used in the manufacture of black powder shall comply with the requirements of the following specifications:

<u>Constituent Material</u>	<u>Conforming to</u>
Graphite	MIL-G-155, Grade C (see 6.7)
Potassium Nitrate	MIL-P-156, Class 1
Charcoal	JAN-C-178, Class 1 (see 6.7)
Sulfur	MIL-S-14929"

Paragraph 3.2, Table I, Composition: Delete tolerance limits under Class 9 and substitute the following:

"74.0 plus or minus 2.0, 10.4 plus or minus 1.5, 15.6 plus or minus 1.5"

Paragraph 3.5: Delete "(not applicable to Class 7, 8 and 9)."

Paragraph 3.6: Delete "For Navy Use Only"

Add new paragraph:

"3.10 Functioning (see 6.5 and 6.6) - This test is applicable to the glazed black powder on a first article only. The glazed black powder, when loaded in a M92E1 primer, shall function 100 percent when tested as specified in 4.4.10."

Add new paragraph:

"3.11 First article testing - This specification makes provisions for first article testing. Requirements for the submission of first article samples by the contractor shall be as specified in the contract."

Paragraph 4.1: Delete in its entirety and substitute:

"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 contractor 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. Reference shall be made to MIL-STD-109 to define terms used herein.

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4.1.1 Submission of product.-At the time each completed lot of items deliverable under the contract is submitted to the Government for acceptance, the contractor shall supply the following information accompanied by a certificate which attest that the information provided is correct and applicable to the product being submitted:

- a. A statement that the lot complies with all of the quality assurance provisions specified in this specification.
- b. Drawing, specification number and date, together with identification and date of changes thereto.
- c. Certificates of analysis on all materials used directly by the contractor when such material is controlled by Government specifications shall be made available upon request by the Contracting Officer.
- d. Quantity of product in the lot.
- e. Date submitted.

The certificate shall be signed by a responsible agent of the certifying organization. The initial certificate submitted shall be substantiated by evidence of the agent's authority to bind his principal. Substantiation of the agent's authority will not be required with subsequent certificates unless, during the course of the contract, this authority is vested in another agent of the certifying organization."

Paragraphs 4.2: Delete in its entirety and substitute the following:

"4.2 First article inspection

4.2.1 Submission.-Prior to the start of regular production the contractor shall submit a first article sample (see 6.2d) to a Government approved facility as designated by the contracting officer for evaluation in accordance with the provisions of 4.2.2. The first article shall consist of 25 lbs. of Class 1 glazed black powder with instructions issued by the Contracting Officer. If the contract is for classes of glazed black powder other than Class 1 glazed black powder (Class 2 through 6), Class 1 glazed black powder still shall be submitted and made from the same process as the other classes are made. Prior to submission of the glazed black powder, the contractor shall inspect the sample in accordance with paragraphs 4.4.1 through 4.4.9 to assure that it conforms to the requirements of the contract and submit a record with the sample. Paragraph 4.4.10, Functioning Tests, will be performed by the Government. All samples submitted shall have been produced by the contractor using

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the same production processes, procedures, and equipment as will be used in fulfilling the contract. All materials, including packaging and packing, shall be obtained from the same sources of supply as will be used in regular production. The sample shall be accompanied by certificates of analysis. A first article quantity, or portion thereof, as directed by the Contracting Officer, shall also be submitted whenever there is a lapse in production for a period in excess of 90 days, or whenever a change occurs in manufacturing process, material used, specification or source of supply as to significantly affect product uniformity as determined by the Government. Prior to submission, the contractor shall inspect the sample to the degree necessary to assure that it conforms to the requirements of the contract and submit a record of this inspection with the sample. A sample containing known defects will not be submitted unless specifically authorized by the Contracting Officer.

4.2.2 Inspections to be performed.-The sample will be subjected by the Government to any or all of the examinations or tests specified in 4.4.1 through 4.4.10 of this specification.

4.2.3 Rejection.-If any sample fails to comply with any of the applicable requirements, the first article quantity shall be rejected. The Government reserves the right to terminate its inspection upon any failure of a sample to comply with any of the stated requirements."

Paragraph 4.3.2, Examination: Delete in its entirety and substitute:

"4.3.2 Examination.-Sampling plans and procedures for the following classifications of defects shall be in accordance with MIL-STD-105 (ABC-STD-105), except that inspection for critical defects shall be 100 percent. Contractor's sampling plans, if used, shall be approved by the Government and shall provide, as a minimum, the protection afforded the Government by the sampling plans in MIL-STD-105. Continuous sampling plans in accordance with MIL-STD-1235 may be used if approved by the procuring activity. Also, at the option of the procuring activity, AQL's and sampling plans may be applied to the individual characteristics listed, using an AQL of 0.40 percent for each Major defect and an AQL of 0.65 percent for each Minor defect, except where 100 percent inspection is specified.

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4.3.2.1 Container prior to sealing

Categories	Defects	Method of Inspection	Code No.
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Critical: None defined

Major: None defined

Minor: AQL 0.65 percent

201. Liner improper		Visual	01001
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4.3.2.2 Container sealed (see drawing 7548321, 7548322, 7548077 or 7548078)

Categories	Defects	Method of Inspection	Code No.
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Critical: None defined

Major: AQL 0.40 percent

101. Weight maximum		Scale	02001
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102. Improperly sealed		Visual	02002
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Minor: AQL 0.65 percent

201. Marking missing, incorrect or illegible		Visual	02003"
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Paragraph 4.3.3.1: After the last sentence, add:

"Potassium nitrate determination (see 3.2)

Major Defect Code No. 03001

Sulfur determination (see 3.2)

Major Defect Code No. 04001

Charcoal determination (see 3.2)

Major Defect Code No. 05001

Moisture content (see 3.3)

Major Defect Code No. 06001

Ash content (see 3.4)

Major Defect Code No. 07001

Specific gravity (see 3.5)

Major Defect Code No. 08001

Apparent density (see 3.6)

Major Defect Code No. 09001

Granulation (see 3.7)

Major Defect Code No. 10001

Gritty or fibrous particles (see 3.8)

Major Defect Code No. 11001

Glaze finish (see 3.9)

Major Defect Code No. 12001

Functioning (see 3.10)

Major Defect Code No. 13001"

Paragraph 4.4.1 Title: Delete "Glass" and substitute "Glaze"

Paragraph 4.4.1: Delete "dull or" and substitute "a"

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Add new paragraph:

"4.4.3.1 Alternate method for moisture.-Exactly 10 gms of bulk black powder and/or pressed pellets shall be weighed in an aluminum disposable pan liner, properly positioned, on the Ohaus Moisture Determination Balance. The infrared heat lamp that is built into the machine shall be moved directly over the powder sample; heat adjusted to the desired temperature; and time and wattage controls regulated to a setting based on a predetermined drying curve. The moisture determination shall then be read directly in either grams or percent moisture loss with the accuracy of the final percent moisture or percent moisture loss with the accuracy of the initial 10 gm sample. The pan and dried powder shall be weighed until constant weight is obtained, or until the weight between weighings does not exceed one milligram."

Add a new paragraph:

"4.4.3.2 Alternate method for moisture.-The moisture shall be determined in accordance with Method 101.4 of Standard MIL-STD-286".

Paragraph 4.4.7: Delete "(not applicable to classes 7, 8 or 9)"

Paragraph 4.4.7.1:

After "Preferred method", add "(not applicable to classes, 7, 8 or 9)"

First sentence: Delete "10 mg" and substitute "10 g"

Delete "B=density of mercury at test temperature" and substitute "B=specific gravity of mercury at test temperature"

Paragraph 4.4.7.2: After "Alternate Method", add "(not applicable to classes 7, 8 or 9)"

Add new paragraph:

"Paragraph 4.4.7.3 Specific gravity (applicable to Class 7 - Class 9).

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Use an apparatus consisting of a Fleming drying jar (see fig. 1) having a capacity of approximately 50 ml. A fritted glass disk of medium porosity is cemented to the bottom of the upper stopcock. The disk should be of the same diameter as the base of the stopcock, beveled so as to have a greater taper than the stopcock, and cemented to the stopcock by means of Canada balsam. To fill the jar, attach a piece of rubber tubing to the lower arm of the Fleming jar and immerse the other end in a beaker containing mercury at room temperature. By means of a piece of heavy rubber tubing connect the upper arm of the jar to a vacuum line and evacuate. Close the upper stopcock, remove the suction tubing, and then close the lower stopcock. Disconnect the tubing from the lower arm, and remove the mercury from this by tilting and tapping the apparatus. Open the lower stopcock so that the mercury can flow into the side arm if there is any expansion of the mercury. Weigh the jar and mercury. Attach to the lower arm a short piece of rubber tubing closed by means of a pinchcock, and allow approximately half of the mercury to drain from the jar. Using a small funnel, transfer a weighed portion of approximately 10 gm. of the sample to the jar. Replace the upper stopcock, attach suction tubing to the upper arm, open the upper stopcock, and remove the pinchcock from the rubber tubing while holding the end of the tubing under mercury in a beaker. Apply suction so that the pressure in the jar is reduced to between 100 and 120 mm. of mercury and all air replaced by mercury. Gentle tapping of the jar while the vacuum is being applied facilitates the removal of any air bubbles. When the air is replaced, which ordinarily requires approximately 10 seconds, close the upper stopcock, remove the suction tubing and then close the lower stopcock. Remove the rubber tubing and any mercury remaining in the lower arm. Open the lower stopcock and weigh the jar and contents. Calculate the specific gravity as follows:

$$\text{Specific gravity} = \frac{AB}{A + C - D}$$

where A = weight of sample taken for test
B = density of mercury at room temperature
C = weight of jar filled with mercury
D = weight of jar, powder, and mercury

Temperature	Density
150°C.....	13.559
20°C.....	13.546
25°C.....	13.534
30°C.....	13.522"

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Add a new paragraph:

"4.4.10 Functioning.--One hundred percussion primers (M92E1) shall be loaded in accordance with drawing 8863394. The loaded primer shall be placed in a static test fixture and struck by means of a spring loaded firing pin with sufficient energy to activate the element. The primer (see 6.6) shall then be observed for complete burning of the black powder. All primers must function. If any primer does not function, the first article sample shall be rejected (see 4.2.3)"

Paragraph 5.1.1, Line 1: Delete "(see 6.1.1)"

Paragraph 5.2: Delete in its entirety and substitute:

"5.2 Packing (see 6.2)

5.2.1 Level A

5.2.1.1 Bulk Powder. Bulk Black Powder shall be packed in steel drums complying with Drawings 7548321 and 7548322. The drums shall be lined with a bag made and closed as specified in 5.2.1.3. When specified, drums shall be lined with muslin liners complying with Drawing LD299212.

5.2.1.2 Cans. Black powder packaged as specified in 5.1.1 shall be packed in boxes complying with Specifications 14, 15A or 16A of Department of Transportation (DOT) Regulations CFR 49 Part 0-190.

5.2.1.3 Liners. Liners shall be made of conductive polyethylene or polyolefin sheet with a nominal thickness of .003 in. (tolerance = plus or minus 20%); surface resistivity shall not exceed 10^3 ohms per centimeter, when tested in accordance with Methods 4041 and 4052 of Standard FED-STD-406. Electrostatic bleed-off shall not exceed 2.00 seconds when tested in accordance with Method 4046 of Federal Test Method Standard 101B. Details of the liner shall comply with Type I or II, Style 1 of Specification PPP-B-26 except for the material. After filling, the top of the bag shall be twisted and the twisted portion folded back on itself; it shall be fastened with a suitable tape or tie. The bag size shall be large enough to prevent strain on the bag if the container is dropped or rolled.

5.2.2 Level C

5.2.2.1 Metal Container. Bulk Black Powder shall be packed in metal containers complying with Drawings 7548077 or 7548074. The containers shall be lined with a bag made and closed as specified in 5.2.1.3.

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5.2.2.2 Alternative Metal Container. Bulk black powder may be packed in metal kegs of 20 or 25 pounds capacity complying with DOT Specification 13. Kegs shall be lined with a bag made and closed as specified in 5.2.1.3.

5.2.2.3 Immediate Use Containers. Black Powder intended for immediate use (not more than 180 days storage) may be packaged, packed and marked by any other method approved by DOT Regulations when specifically authorized by the contracting officer. The date of pack shall be clearly marked on the shipping container. The completed pack shall provide sufficient moisture protection to insure that the moisture limit stated in 3.3 will not be exceeded if the black powder is stored up to 180 days under normal storage conditions."

Paragraph 5.3.2: Delete "ICC" and insert "DOT" in two places.

Paragraph 6.2: Add the following:

"d. Provisions for submission of first article samples"

e. Acceptance and description sheets for each lot in accordance with MIL-STD-1171"

Add new paragraphs:

"6.5 Submission of first article samples - Instructions as to the location for evaluation of the first article shall be obtained from the contracting officer. Upon receipt of such request, the contracting officer shall advise Picatinny Arsenal and instructions will be issued accordingly. All inquiries should be forwarded to: Commander, Picatinny Arsenal, ATTN: SMUPA-QA-A-P, Dover, New Jersey.

"6.6 Functioning test - Complete procedure for this test may be obtained from Commander, Picatinny Arsenal, ATTN: SMUPA-QA-A-P, Dover, New Jersey."

"6.7 In accordance with the designation of classifications, paragraph 5-222 of Defense Standardization Manual 4120.3-M,

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the following designation changes are implemented to this amendment:

"Grade I,II,III and IV" as specified in MIL-G-155 is changed to "Grade A, B, C and D" and Class a, b, c and d" as specified in JAN-C-178 is changed to "Class 1, 2, 3 and 4". In the next revision of the affected specifications, these changes will be implemented."

Add: Figure 1

CUSTODIAN:

ARMY-MU
NAVY-OS
AIR FORCE - 70

PREPARING ACTIVITY:
ARMY-MU

REVIEWING ACTIVITY:

ARMY-MU
NAVY-OS
AIR FORCE - 70

PROJECT NUMBER: 1376-O-007