

METRIC
MIL-P-11970C
14 October 1983
SUPERSEDING
MIL-P-11970B
23 AUGUST 1973

MILITARY SPECIFICATION

POTASSIUM PERMANGANATE, TECHNICAL (METRIC)

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers technical grade potassium permanganate.

2. APPLICABLE DOCUMENTS

2.1 Government Documents.

2.1.1 Specifications, Standards, and Handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

Federal

PPP-C-2020 Chemicals, Liquid, Dry and Paste, Packaging of

STANDARDS

Federal

FED-STD-313 - Material Safety Data Sheets, Preparation and the Submission of

Military

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

MIL-STD-129 Marking for Shipment and Storage

MIL-STD-147 Palletized Unit Loads

2.1.2 Other Government Documents, Drawings, and Publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: San Antonio ALC, Kelly AFB TX 78241, ATTN: SFRM, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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DEPARTMENT OF TRANSPORTATION - DOT 49 CFR

(Copies of specifications, standards, handbooks, drawing, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other Publications. The following document(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

AMERICAN CHEMICAL SOCIETY (ACS) SPECIFICATIONS

ACS Reagent Chemical Standards

(Application for copies should be addressed to the American Chemical Society, 1155 Sixteenth St., N.W., Washington DC 20036.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM Standards

D 3951 Commercial Packaging, Practice for

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

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

3. REQUIREMENTS

3.1 Appearance. Technical grade potassium permanganate shall be in the form of dark purple crystals, free flowing, and free from any lumps or caking.

3.2 Assay. The assay shall not be less than 97.0 percent as KMnO_4 when tested as specified in 4.4.

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.

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4.2 Classification of Inspection. Inspection shall be classified as follows:

- (a) Quality conformance inspection (see 4.3).
- (b) Inspection of preparation for delivery (see 4.5).

4.3 Quality Conformance Inspection.

4.3.1 Lot. A lot shall consist of all the potassium permanganate produced by one manufacturer, at one plant, from the same materials and under essentially the same conditions provided the operation is continuous. In the event the process is a batch operation, each batch shall constitute a lot.

4.3.2 Sampling. Sampling shall be done in accordance with MIL-STD-105. Representative samples shall be taken from each container selected and the samples divided into two approximately equal groups. A composite sample of not less than 2 kilograms and not more than 5 kilograms shall be prepared from each group. The composite samples shall be placed in separate clean, dry, metal or glass containers, sealed and marked.

4.3.3 Testing. Samples selected in accordance with 4.3.2 shall be tested as specified in 4.4. Failure of any tests by either sample shall be cause for rejection of the lot from which the samples were taken.

4.4 Tests.

4.4.1 Appearance. The potassium permanganate shall comply with paragraph 3.1.

4.4.2 Assay. A 1.580-gram sample of potassium permanganate, weighed accurately to the nearest milligram, shall be dissolved in distilled water and diluted to exactly 500 milliliters in a volumetric flask. About 0.30 grams of accurately weighed reagent grade sodium oxalate (dried at 105°C.) shall be dissolved in 250 milliliters of dilute sulfuric acid (one volume acid plus 19 volumes distilled water) which has been previously boiled and cooled. From a burette, 39 to 40 milliliters of sample solution shall be added to the oxalate solution at the rate of 25 to 35 milliliters per minute while stirring slowly. The solution shall be allowed to stand until the pink color has disappeared and the solution shall then be heated to 55° to 60°C., and the titration shall be completed by adding the sample solution until a faint pink color persists for 30 seconds. The amount of sample solution consumed shall be corrected by titrating a blank consisting of 250 milliliters of dilute sulfuric acid (one volume acid plus 19 volumes of distilled water) as used above.

$$\text{KMnO}_4 \text{ (percent by weight)} = \frac{(149.2) (100) (A)}{B}$$

where:

- A = weight of sodium oxalate, grams.
- B = ml of sample solution (corrected).

4.5 Inspection of Preparation for Delivery. The packing and marking shall be examined to determine conformance to section 5 of this document.

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4.5.1 Examination for Fill. An examination shall be made to determine the fill of the primary container. The sample unit shall be one primary container. Sampling shall be performed in accordance with MIL-STD-105. The inspection level shall be S-2 or a minimum of five sample units randomly selected from the lot. The unit quantity per container shall be not less than 0.5 percent nor more than 1.0 percent of the specified quantity. The average net contents shall not be less than the contract quantity. The AQL for uniformity of weight shall be 4.0 expressed as defects per hundred units.

4.5.2 Inspection of Packaging. An inspection of packaging shall be performed to determine compliance with specified requirements. The lot shall consist of items, packages, or shipping containers as applicable. Sampling shall be in accordance with MIL-STD-105, Level S-2, and the AQL shall be 4.0, expressed as defects per hundred units.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be Level A or Industrial (See 6.2).

5.1.1 Level A. Packaging shall be in a DOT 17C steel drum of appropriate size in accordance with PPP-C-2020, Table 1.

5.1.2 Industrial. Packaging shall be in accordance with ASTM D 3951.

5.2 Packing. No further packing is required if packaged per 5.1.

5.3 Markings. Markings shall be in accordance with MIL-STD-129.

5.4 Palletization. Palletization when required shall be in accordance with MIL-STD-147.

6. NOTES

6.1 Intended Use. Technical grade potassium permanganate is intended for use in preparing scrubbing solutions for hydrogen and carbon dioxide generators; and for treatment of water supplies for potable and industrial use.

6.2 Ordering Data. Procurements should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type and size of container required.
- (c) Level of packaging required as applicable.
- (d) Special markings, if required.
- (e) Palletization, if possible.

CUSTODIANS:

ARMY - ME
AIR FORCE - 68

PREPARING ACTIVITY:

AIR FORCE - 68
PROJECT NO. 6810-B406

REVIEW ACTIVITIES:

DLA - GS

USING ACTIVITIES:

ARMY - EL

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER
MIL-P-11970C

2. DOCUMENT TITLE

Potassium Permanganate, Technical (Metric)

3a. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

☐ VENDOR☐ USER☐ MANUFACTURER☐ OTHER (Specify): _____

b. ADDRESS (Street, City, State, ZIP Code)

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER (Last, First, MI) - Optional

b. WORK TELEPHONE NUMBER (Include Area Code) - Optional

c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional

8. DATE OF SUBMISSION (YYMMDD)