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SUPERSEDING
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(See 6.4)

FEDERAL SPECIFICATION

SODIUM PHOSPHATE, TRIBASIC, ANHYDROUS; DODECARYDRATE; AND MONOHYDRATE; TECHNICAL

This specification was approved by the Assistant Administrator, Office of Federal Supply and Services, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers three types and one grade of tribasic sodium phosphate suitable for various washing, cleaning, and scouring processes (see 6.1).

1.2 Classification.

1.2.1 Types. The tribasic sodium phosphate covered by this specification shall be of the following types as specified (see 6.2).

- I - Anhydrous (Na_3PO_4).
- II - Dodecahydrate ($\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$).
- III - Monohydrate ($\text{Na}_3\text{PO}_4 \cdot \text{H}_2\text{O}$).

2. APPLICABLE DOCUMENTS

2.1 The following documents, 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:

- PPP-B-566 - Boxes, Folding, Paperboard.
- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.
- PPP-B-636 - Boxes, Shipping, Fiberboard.
- PPP-D-723 - Drums, Fiber.
- PPP-B-1055 - Barrier Material, Waterproofed, Flexible.

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Federal Standards:

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

FED-STD-536 - Soap and Soap-Products (Including Synthetic Detergents); Sampling and Testing.

(Activities outside the Federal Government may obtain copies of Federal specifications, standards, and commercial item descriptions as outlined under General Information in the Index of Federal Specifications, Standards and Commercial Item Descriptions. The Index, which includes cumulative bimonthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

(Single copies of this specification, other Federal specifications and standards required by activities outside the Federal Government for bidding purposes are available without charge from General Services Administration Business Service Centers in Boston, MA; New York, NY; Philadelphia, PA; Washington, DC; Atlanta, GA; Chicago, IL; Kansas City, MO; Fort Worth, TX; Houston, TX; Denver, CO; San Francisco, CA; Los Angeles, CA; and Seattle, WA.

(Federal Government activities may obtain copies of Federal standardization documents and the Index of Federal Specifications, Standards and Commercial Item Descriptions from established distribution points in their agencies.)

Military Specifications:

MIL-L-10547 - Liners, Case and Sheet, Overwrap; Water-Vaporproof or Waterproof, Flexible.

Military Standards:

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.

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

Federal Regulation:

DEPARTMENT OF TRANSPORTATION (DOT)
Code of Federal Regulations (CFR)
CFR 49, Parts 100-199 - Hazardous Material Regulations

(The Code of Federal Regulations (CPR) and the Federal Register (FR) are for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. When indicated, reprints of certain regulations may be obtained from the Federal agency responsible for issuance thereof.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply:

ASTM

- D 501 - Standard Methods of Sampling and Chemical Analysis of Alkaline Detergents, Methods of (R 1977).
(DoD adopted)
- D 3951 - Standard Practice for Commercial Packaging.
(DoD adopted)

(Application for copies should be addressed to the ASTM, 1916 Race Street, Philadelphia, PA 19103.)

3. REQUIREMENTS

3.1 Composition. The material, as received, shall conform to the chemical and physical characteristics of table I when tested as specified in 4.3.2.

TABLE I. Chemical and physical characteristics.

Characteristic	Type I		Type II		Type III	
	Minimum percent	Maximum percent	Minimum percent	Maximum percent	Minimum percent	Maximum percent
Sodium phosphate, tribasic: Calculated as Na_3PO_4 , from P_2O_5 Calculated as $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$ from P_2O_5 Calculated as $\text{Na}_3\text{PO}_4 \cdot \text{H}_2\text{O}$, from P_2O_5	97.0	----				
Total alkalinity to methyl orange, as Na_2O	36.0	40.0	16.0	19.0	32.0	37.0
Phosphates as phosphoric anhydride P_2O_5	39.5	----	18.1	----	36.0	----
Matter insoluble in water	----	0.1	----	0.1	----	0.1
Particle size: Matter retained on:						
U.S. No. 20 sieve (powder)	----	1.0			----	None
U.S. No. 100 sieve (powder)	----	10.0			----	10.0
U.S. No. 10 sieve (granular)	----	5.0			----	5.0
U.S. No. 100 sieve (granular)	80.0	----			40.0	----
U.S. No. 10 sieve (all forms)			None	None		
U.S. No. 100 sieve (all forms)			90.0	----		

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3.2 Form.

3.2.1 Type I. The tribasic sodium phosphate shall be powder or granular in form, as specified (see 6.2).

3.2.2 Type II. The tribasic sodium phosphate shall be granular, flake or crystalline in form, as specified (see 6.2).

3.2.3 Type III. The tribasic sodium phosphate shall be powder or granular in form, as specified (see 6.2).

3.3 Labeling. Each unit container shall be durably and legibly marked with the following information:

"Avoid prolonged or repeated contact with skin.
Avoid prolonged or repeated breathing of dust."

3.4 Net content. The average net content per unit container shall be not less than specified.

3.5 Workmanship. The finished product shall be white, uniform, free flowing, and free from foreign matter.

3.6 Material safety data sheets. The contracting activity shall be provided a material safety data sheet (MSDS) at the time of contract award. The MSDS is form OSHA-20 found as part of FED-STD-313. The MSDS shall be included with each shipment of the material covered by this specification.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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.

4.1.1 Certificate of compliance. When certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

4.2 Inspection. Sampling for inspection shall be performed in accordance with MIL-STD-105, except where otherwise indicated. For purposes of sampling, an inspection lot for examination and tests shall consist of all units of the same type prepared in a single run and submitted for inspection at one time.

4.2.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected and tested in accordance with all the requirements of referenced specifications, drawings, and standards unless otherwise excluded, amended, modified or qualified in this specification or applicable purchase documents.

4.3 Inspection of the end item.

4.3.1 Examination of the end item. The end item shall be examined for defects as specified in 4.3.1.1 through 4.3.1.4 at the inspection levels and acceptable quality levels (AQLs) set forth in 4.3.1.5. The lot size, for purposes of determining the sample size in accordance with MIL-STD-105, shall be expressed in unit containers of tribasic sodium phosphate for examination in 4.3.1.1, 4.3.1.2, 4.3.1.3, and in units of shipping containers for examination in 4.3.1.4.

4.3.1.1 Examination of the unit container. The sample unit for this examination shall be one filled unit container. This examination does not apply when the unit container is the shipping container.

Examine	Defect
Construction	Not as specified.
Closure	Not as specified. Incomplete; leaks. Seam open or damaged container.
Markings (label or printing)	Not clear, illegible, omitted, incorrect, or incomplete. Does not contain labeling information specified in 3.3.

4.3.1.2 Examination of contents of the unit container for form and workmanship. The sample unit for this examination shall be the contents of one filled unit container.

Examine	Defect
Form	Not powder, granular, flake, or crystalline, as required.
Workmanship	Not white. Not uniform. Not free flowing; presence of caking or lumping. Presence of foreign matter.

4.3.1.3 Examination for average net content. The sample unit for this examination shall be one filled unit container. Weigh the contents of each filled unit container examined in 4.3.1.2.

Examine	Defect
Average net content	The average net content per container is less than specified.

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4.3.1.4 Examination of preparation for delivery. An examination shall be made to determine that packaging, packing, count, and markings comply with this specification. The sample unit for this examination shall be one shipping container, fully packed, selected just prior to the closing operation. Shipping containers, fully prepared for delivery, shall be examined for closure defects.

Examine	Defect
Packing	Not in accordance with contract requirements. Any leakage of contents. Liner material (as applicable) omitted, damaged, not specified type, or not sealed. Any nonconforming, missing, damaged, or defective component. Container not as specified, badly dented, crushed.
Marking (interior or exterior, as applicable)	Illegible, incorrect, incomplete, omitted; not in accordance with requirements.

4.3.1.5 Inspection levels and AQLs for examinations. The inspection levels and AQLs expressed in defects per 100 unit containers in 4.3.1.1, 4.3.1.2 and 4.3.1.3, and per 100 shipping containers in 4.3.1.4 shall be as follows:

Examination paragraph	Inspection levels	AQLs
4.3.1.1	I	2.5
4.3.1.2	S-2	2.5
4.3.1.3	S-2	---
4.3.1.4	S-2	2.5

4.3.2 Testing of the end item. The methods of testing specified in table II shall be followed for each lot. The lot size shall be expressed in pounds of sodium phosphate. The sample unit for testing shall be a one pound composite selected in equal portions in accordance with the sample size, as follows from samples throughout the lot and thoroughly mixed to yield the composite sample. The composite sample shall be placed in individual clean, dry, glass, or metal containers and sealed. Care shall be exercised to prevent the loss of absorption of moisture during the sampling, weighing, and storage. The lot shall be unacceptable if the composite sample fails to meet any test requirement specified. All test reports shall contain the individual values utilized in expressing the final results.

Lot size (pounds)	Sample size
800 or less	2
801 up to and including 22,000	3
22,001 or more	5

TABLE II. Instructions for testing of the end item.

Characteristic	Specification reference		Requirements applicable to	Number determinations per unit	Results reported as
	Requirement	Test method	Comp. unit		
Sodium phosphate, tribasic	Table I	ASTM D 501			
Total alkalinity to methyl orange, as Na ₂ O	Table I	ASTM D 501	X	2	Average of 2 determinations to nearest 0.1 percent
Phosphates as phosphoric anhydrid, P ₂ O ₅	Table I	ASTM D 501	X	2	Average of 2 determinations to nearest 0.1 percent
Matter insoluble in water	Table I	ASTM D 501	X	2	Average of 2 determinations to nearest 0.1 percent
Sieve tests	Table I	<u>1/2101</u>	X	2	Average of 2 determinations to nearest 0.1 percent

1/ Test shall be performed in accordance with FED-STD-536.

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5. PACKAGING

5.1 Preservation. Preservation shall be level A, C or commercial, as specified (see 6.2).

5.1.1 Level A. Sodium phosphate shall be packaged in 1-pound (453 grams), 4-pound (1812 grams) or 100-pound (45.36 kilograms) quantities, as specified (see 6.2). When specified (see 6.2), sodium phosphate, type II, shall be packaged in 25-pound (11.34 kilograms) quantities.

5.1.1.1 One and 4-pound quantities. One or 4-pounds of sodium phosphate shall be packaged in siftproof sealed, end-folding paperboard boxes in accordance with style I, type A, class a or b, variety 2 of PPP-B-566. Closures shall be in accordance with the appendix to PPP-B-566.

5.1.1.2 Twenty-five and 100-pound quantities. Twenty-five and 100-pound quantities of sodium phosphate shall be packed in drums as specified for the level of packing required in 5.2. Drums shall be provided with a polyethylene bag or liner having a minimum thickness of 3 mils. Closure of the bag or liner shall be by heat sealing or plastic coated metal twist tie.

5.1.2 Level C. Sodium phosphate in the quantity specified (see 6.2) shall be packaged in accordance with Department of Transportation (DOT) regulations and any other applicable regulatory requirements in a manner that will preserve the chemical and physical characteristics of the product in containers that will retain integrity from the supply source to the first receiving activity for immediate use.

5.1.3 Commercial. Sodium phosphate in the quantity specified (see 6.2) shall be packaged in accordance with ASTM D 3951 in siftproof water resistant containers complying with DOT or other regulatory requirements.

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

5.2.1 Level A.

5.2.1.1 One and 4-pound quantities. Forty-eight 1-pound boxes or twenty 4-pound boxes of sodium phosphate packaged as specified in 5.1, shall be packed in wood, or wood cleated plywood boxes in accordance with class 2 of PPP-B-621 or PPP-B-601 overseas type respectively. When specified (see 6.2) boxes shall be provided with case liners in accordance with PPP-B-1055 and fabricated in accordance with MIL-L-10547. All joints and seams of the case liner shall be sealed in accordance with the appendix of MIL-L-10547. Box closure and reinforcement shall be in accordance with PPP-B-601 or PPP-B-621 or appendix thereto.

5.2.1.2 Twenty-five and 100-pound quantities. Each 25- and 100-pound quantities of sodium phosphate packaged as specified in 5.1, shall be packed in metal or plywood drums in accordance with DOT 17C, 22A, 22B or 22C respectively. Closure shall be as specified for the applicable drum.

5.2.2 Level B.

5.2.2.1 One and 4-pound quantities. Forty-eight 1-pound boxes or twenty 4-pound boxes of sodium phosphate, packaged as specified in 5.1, shall be packed in a snug-fitting fiberboard container in accordance with class weather resistant, grade V3c or V3s, style RSC of PPP-B-636. Closure waterproofing and reinforcement shall be in accordance with method V of the appendix to PPP-B-636.

5.2.2.2 Twenty-five and 100-pound quantities. Each 25- and 100-pound quantities packaged as specified in 5.1 shall be packed in a fiber drum in accordance with type III of PPP-D-723. Drum closure shall be in accordance with the appendix of PPP-D-723.

5.2.3 Level C. Sodium phosphate in the quantity and packaged as specified in 5.1 shall be packed in containers as specified in 5.2.2 except that the containers may be of the domestic type, class or grade.

5.2.4 Commercial or industrial. Sodium phosphate in the quantity and packaged as specified in 5.1 shall be packed in accordance with ASTM D 3951.

5.3 Palletization. When specified (see 6.2) sodium phosphate packed in accordance with 5.2 shall be palletized in accordance with MIL-STD-147. Pallet load types I and Ia are recommended for wood and fiberboard boxes, load types XIIa, XIIb or XIII are recommended for drums.

5.4 Marking. In addition to any special marking required (see 3.3 and 6.2) level A, B and C unit, shipping containers and palletized unit loads shall be marked in accordance with MIL-STD-129. Commercial or industrial unit, shipping containers and palletized unit loads shall be marked in accordance with ASTM D 3951, the requirements of 3.3 and the contract or order (see 6.2).

5.6 Material safety data sheet. A copy of the material safety data sheet (Form OSHA-20) shall be attached to the shipping document for each destination (see 3.6).

6. NOTES

6.1 Intended use. Tribasic sodium phosphate covered by this specification is intended for washing, cleaning, and scouring with or without soap when a fairly strong alkaline material is required. Protection of the hands is recommended.

6.1.1 Military use. Items acquired under this specification for military use are to be limited to the variety shown on the applicable military standard or military supply standard. Personnel of the military departments are requested to refer to these documents for guidance.

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

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- (a) Title, number and date of this specification.
- (b) Type required (see 1.2.1).
- (c) Form required (see 3.2).
- (d) Selection of the applicable levels of packaging and packing (see 5.1 and 5.2).
- (e) Quantity of the product desired per package (see 5.1.1, 5.1.2 and 5.1.3).
- (f) When case liners are required (see 5.2.1.1).
- (g) When palletization is required (see 5.3).

6.3 International standardization agreement. Certain provisions of this specification are the subject of international standardization agreement ABCA-NAVSTAG 6E. When amendment, revision or cancellation of this specification is proposed which affects or violates the international agreement concerned, the preparing activity will inform GSA so that appropriate reconciliation action may be taken through international standardization channels.

6.4 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

MILITARY INTERESTS:

CIVIL AGENCY COORDINATING ACTIVITIES:

Custodians

FSS

GPO

Army - GL

NBS

Navy - SH

OSS

Air Force - 68

Review Activities

Preparing activity:

Army - MD, MI

Navy - SH

(Project 6810-B400)

User Activities

Army - AR

Navy - MC