

CONTRACT TECHNICAL REQUIREMENT  
DATE: JANUARY 11, 2000

INCH-POUND

MIL-P-44241B \*  
28 November 1990  
SUPERSEDING  
MIL-P-44241A  
14 October 1988

## MILITARY SPECIFICATION

### POTATOES, SWEET, GLAZED, THERMOSTABILIZED, TRAY PACK

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

#### 1. SCOPE

1.1 Scope. This specification covers glazed sweet potatoes, thermostabilized in tray pack cans or polymeric trays for use by the Department of Defense as a component of operational rations.

1.2 Classification. The packaging shall be of the following styles as specified (see 6.1):

Style a – Tray Pack Can

Style b – Polymeric tray

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.1).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5018 by using the Standardization Document Improvement Proposal (DD Form 1426 appearing at the end of this document or by letter.

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SPECIFICATIONS

MILITARY

MIL-L-1497 - Labeling of Metal Cans for Subsistence Items

DSCP FORM 3507 - Loads, Unit: Preparation of Semiperishable Subsistence Items

MIL-C-44340 - Can, Tray Pack

MIL-PRF-32004 - Packaging of Food in Polymeric Trays

STANDARDS

MILITARY

MIL-STD-900 - Bacterial Standards for Starches, Flours, Cereals, Alimentary Pastes, Dry Milks and Sugars Used in the Preparation of Thermostabilized Foods for the Armed Forces

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094).

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues shall be those cited in the solicitation.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

National Primary Drinking Water Regulations

(Copies are available from the Office of Drinking Water, Environmental Protection Agency, WH550D, 401 M Street, S.W., Washington, DC 20460).

U.S. DEPARTMENT OF AGRICULTURE (USDA)

U.S. Standards for Condition of Food Containers

(Copies are available from the Chairperson, Condition of Container Committee, Agricultural Marketing Service, U.S. Department of Agriculture, Room 2506, South Building, P.O. Box 96456, Washington, DC 20090-6456).

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U.S. Standards for Grades of Canned Sweet Potatoes

U.S. Standards for Grades of Frozen Concentrated Orange Juice

(Copies are available from the Chief, Processed Products Branch, Fruit and Vegetable Division, Agriculture Marketing Service, US Department of Agriculture, P.O. Box 96456, Washington, DC 20090-6456.)

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS), U.S. FOOD AND DRUG ADMINISTRATION (FDA)

Federal Food, Drug, and Cosmetic Act and Regulations Promulgated Thereunder  
(21 CFR Parts 1-199)

U.S. Standards of Identity for Margarine

(Copies are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001).

DEFENSE SUPPLY CENTER PHILADELPHIA (DSCP)

DSCP Form 3556 Marking Instructions for Shipping Cases, Sacks and Palletized/  
Containerized Loads of Perishable and Semiperishable Subsistence

DSCP FORM 3507, Loads Unit: Preparation of Semiperishable Subsistence Items  
(Copies are available from the Commander, Defense Supply Center Philadelphia  
ATTN: DSCP-HSL, 700 Robbins Avenue, Bldg 6, Philadelphia, Pa 19111-5092)

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.1).

AMERICAN ASSOCIATION OF CEREAL CHEMISTS (AACC)

Approved Methods of the American Association of Cereal Chemists

(Application for copies should be addressed to the American Association of Cereal Chemists, 3340 Pilot Knob Road, St. Paul, MN 55121).

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AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 3330 - Peel Adhesion of Pressure-Sensitive Tape

D 1974 - Methods of Closing, Sealing, and Reinforcing Fiberboard Shipping Containers

D 5118 - Fabrication of Fiberboard Shipping Boxes

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, Pa 19428-2959)

AOAC INTERNATIONAL

Official Methods of Analysis of the AOAC International

(Application for copies should be addressed to the AOAC International 2200, Wilson Boulevard, Suite 400, Arlington, VA 22201-3301).

NATIONAL ACADEMY OF SCIENCES

Food Chemicals Codex

(Application for copies should be addressed to the National Academy Press, 2101 Constitution Avenue, N.W., Washington, DC 20418).

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services).

AMERICAN SOCIETY FOR QUALITY CONTROL

ANSI/ASQC Z1.4-1993 Sampling Procedures and tables for Inspection by Attributes

(Application for copies should be addressed to the ASQC, 611 East Wisconsin Avenue, Milwaukee, WI 53201-3005.)

2.3 Order of precedence. In the event of conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

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3.1 First Article. When specified (see 6.1), a sample shall be subjected to first article inspection (see 6.2) in accordance with 4.4.

3.2 Ingredients. All ingredients shall be clean, sound, wholesome, and free from foreign material, evidence of rodent or insect infestation, extraneous material, off-odors, off-flavors, and off-colors.

3.2.1 Potatoes, sweet, fresh. Fresh sweet potatoes shall be a soft-flesh type that is freshly dug (uncured), firm, well colored (see 6.5), free from freezing injury, internal discoloration and damage and of a variety suitable for canning. If freshly dug sweet potatoes are not available, properly cured and stored sweet potatoes may be used provided the cured sweet potatoes are mature, firm, well colored (see 6.5), and free from chilling or freezing injury or internal discoloration and damage and have been stored at 55° to 60°F and 85 to 90 percent relative humidity for not more than 4 months.

3.2.2 Water. Water used for formulation and washing shall conform to the National Primary Drinking Water Regulations.

3.2.3 Sugar, light brown. The brown sugar shall be partially refined cane or beet sugar. The sugar shall be light brown in color and shall possess a sweet, molasses-like flavor. The sugar shall comply with MIL-STD-900.

3.2.4 Margarine. Margarine shall be of vegetable origin only and shall conform to the FDA Standards of Identity for Margarine (21 CFR 166.110) and shall possess a fine and pleasing flavor. The body shall be smooth, firm, and homogenous. The margarine shall possess a uniform medium yellow color and may be salted or unsalted.

3.2.5 Starch, waxy maize, modified. Starch shall be white, odorless, finely pulverized, modified waxy maize food starch for use in thermostabilized foods. The modified starch shall demonstrate initial viscosity development in the temperature range of 140°F to 170°F and be fully hydrated at common retort temperatures. The starch shall resist breakdown at low pH, under shear stress and conditions of cold storage. The starch shall be bland with essentially no cereal or starch taste.

3.2.6 Juice, orange, concentrated, frozen. Frozen concentrated orange juice shall be U.S. Grade A of the U.S. Standards for Grades of Orange Juice.

3.2.7 Salt. Salt shall be noniodized, white, refined sodium chloride with or without anticaking agents and shall comply with the purity standards for sodium chloride of the Food Chemicals Codex.

3.3 Preparation and processing. Processing shall be on a continuous basis.

3.3.1 Sweet potato preparation. The sweet potatoes shall be washed thoroughly and sorted to remove foreign material and diseased or otherwise damaged potatoes. The sweet potatoes shall be peeled, snapped, scrubbed, and trimmed to remove parts not suitable for canning. Peeling may be accomplished by mechanical abrasion, steam peeling, lye peeling, or a combination of these methods. After trimming, the potatoes shall be mechanically diced with dicer settings of approximately 1-1/4 by 3/4 by 1/2 inches. The peeled and cut sweet potatoes shall be blanched sufficiently to prevent discoloration and to remove excess air. The blanched sweet potatoes shall be immediately cooled to the initial temperature of the cooling water and thoroughly drained. The cooled drained sweet potatoes shall be handled in a manner to prevent discoloration and filled into the tray pack cans or polymeric tray within 4 hours after blanching.

3.3.2 Syrup preparation. The syrup shall be formulated as follows:

<u>Ingredients</u>	<u>Percent by Weight</u>
Water	47.4
Sugar, light brown	37.0
Margarine	7.0
Starch, waxy maize, modified <u>1/</u>	4.4
Orange juice concentrate	3.0
Salt <u>2/</u>	1.2

1/ The total amount of starch in the syrup formula may be adjusted, if necessary, to ensure compliance with the finished product viscosity requirements (see 3.6i).

2/ The total amount of salt in the formula shall be adjusted, if necessary to produce a product that complies with the finished product salt requirement (see 3.6h).

NOTE: The following syrup preparation procedures were used in the development of this product. Alternate procedures may be used provided finished product requirements are met. (When alternate procedures are used, the time and temperature requirements specified for the prepared syrup are still applicable).

Approximately 80 percent of the water shall be combined with the brown sugar, margarine, orange juice, and salt in the processing vessel and heated to approximately 140° to 145°F. A starch slurry shall be prepared using the remaining water and the starch. The starch slurry shall be added slowly with constant agitation to the sugar mixture and the final mixture heated to 200° to 205°F and held for approximately 5 minutes at this temperature. Prior to filling, the volume of

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the final mixture shall be adjusted with water to compensate for evaporation loss during preparation. Each batch of prepared syrup shall be completely filled into the tray pack cans or polymeric trays within one hour following syrup preparation.

3.4 Tray pack or polymeric tray filling and sealing. Each tray pack can (see 5.1.1) or polymeric tray (see 5.1.2) shall be filled with product to conform to the finished product requirements and to the following requirements.

a. The temperature of the syrup at time of filling shall be in the temperature range of 150° to 180°F.

b. For style a, immediately after filling, each can shall be sealed in accordance with the can manufactures guidelines/requirements and 21 CFR, Part 113, Subpart D, or CFR 9, Part 318, Subpart G, as applicable (see 4.5.5), and under a vacuum established by a processing authority and specified in the scheduled process so as to ensure compliance with finished product requirement (see 3.6n). For style b, immediately after filling, each polymeric tray shall be hermetically sealed so as to ensure compliance with the requirements specified in MIL-PRF-32004 (see 4.5.5.1).

c. The filled and sealed tray pack cans or polymeric trays shall be in the retort process within 2 hours after sealing.

3.5 Tray pack thermoprocessing (style a only). The filled and sealed tray pack cans shall be thermostabilized by retorting until a sterilization value ( $F_0$ ) of not less than 6 has been achieved. The filled and sealed thermoprocessed tray pack cans shall show no evidence of can swelling when tested for commercial sterility as specified in 4.5.3.4.

3.5.1 Polymeric tray processing (style b only). The filled and sealed polymeric trays shall be processed until commercially sterile (see 4.5.3.4).

3.6 Finished product requirements. Unless otherwise specified, finished product for style a and style b shall comply with the following requirements:

a. There shall be no foreign material such as, but not limited to, dirt, insect parts, hair, wood, glass, or metal.

b. There shall be no foreign odor or flavor such as, but not limited to, burnt, scorched, stale, sour, rancid, musty or moldy.

c. There shall be no color foreign to the product.

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d. For style a, no individual can shall contain less than 56 ounces of drained weight of product. For style b, no individual tray shall contain less than 50 ounces of drained weight of product.

e. For style a, the average drained weight shall be not less than 58.0 ounces. For style b, the average drained weight shall be not less than 52.0 ounces.

f. For style a, the average net weight shall be not less than 106 ounces. For style b, the average net weight shall be not less than 94 ounces.

g. For style a, no individual can shall contain less than 104 ounces. For style b, no individual polymeric tray shall contain less than 92 ounces of product.

h. The salt content of the finished product shall be not greater than 1.2 percent nor less than 0.5 percent.

i. The viscosity of the syrup shall be not less than 7.5 cm per 10 seconds nor greater than 18.5 cm per 10 seconds when determined by a Bostwick consistometer (see 4.5.3.5).

j. The syrup shall not be lumpy.

k. The syrup shall be translucent and tan-yellow in color.

l. The sweet potatoes shall meet the requirements of U.S. Grade A, golden, pieces, cuts, or cut canned sweet potatoes of the U.S. Standards for Grades of Canned Sweet Potatoes.

m. Product shall show no evidence of excessive heating (materially darkened or scorched).

n. For style a only, filled, sealed, and retorted cans shall show evidence of proper vacuum as determined by concavity of the can lid (see 4.5.6).

o. For style b only, the packaged food shall meet the minimum shelf life requirement of 18 months at 80<sup>0</sup>F or 36 months at 80<sup>0</sup>F (see 4.5.3.6).

p. For style b only, the filled, sealed, and processed polymeric tray shall show evidence of proper residual gas volume and internal pressure (see 4.5.6.1).

3.6.1 Palatability. The finished product shall be equal to or better than the approved preproduction sample (see 6.1) in palatability and overall appearance.

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3.7 Plant qualification. The product shall be prepared, processed, and packaged in establishments meeting the requirements of Title 21, Code of Federal Regulations, Part 110, "Current Good Manufacturing Practice in Manufacturing, Packing or Holding Human Food," and the plant sanitation requirements of the appropriate Government inspection agency.

3.8 Federal Food, Drug, and Cosmetic Act. All deliveries shall conform in every respect to the provisions of the Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Contractor's responsibility. Inspection and acceptance by the USDA shall not relieve the contractor of obligation and responsibility to deliver a product complying with all requirements of this specification. The contractor shall ensure product compliance prior to submitting the product to the USDA for any inspection.

4.2 Inspection and certification. Product acceptability shall be determined by the USDA. The USDA will determine the degree of inspection and supervision necessary to ensure compliance with the requirements of this specification.

4.3 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.4)
- b. Quality conformance inspection (see 4.5)

4.4 First article inspection. When a first article is required (see 6.1), it shall be inspected in accordance with the quality assurance provisions of this specification and evaluated for overall appearance and palatability. Any failure to conform to the quality assurance provisions of this specification or any appearance or palatability failure shall be cause for rejection of the first article.

4.5 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with ANSI/ASQC Z1.4-1993.

4.5.1 Component and material examination. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

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4.5.1.1 Ingredient and component examination. Conformance of ingredients and components to identity, condition, and other requirements specified in 3.2 shall be certified by the ingredient supplier or ingredient manufacturer, and compliance shall be verified by examination of pertinent labels, markings, US Grade Certificates, certificates of analyses, or other such valid documents acceptable to the inspection agency. If necessary, each ingredient shall be examined organoleptically or inspected according to generally recognized test methods, such as the standard methods described in the Official Methods of Analysis of the AOAC International and in the Approved Methods of the American Association of Cereal Chemists, to determine conformance to the requirements. Any nonconformance to an identity, condition, or other requirement shall be cause for rejection of the ingredient or component lot or of any involved product.

4.5.2 In-process examination. In-process examination shall be performed to determine conformance to the preparation, processing, can interior coating, filling, sealing, and packing requirements. Any nonconformance revealed by actual examination or by review of records of time, temperature, and formulation, or of other valid documents shall be cause for rejection of the involved product.

4.5.3 Tray pack can or polymeric tray inspection. The USDA reserves the right to separate the inspection lot into smaller inspection lots.

4.5.3.1 Net weight inspection. Randomly select 30 filled and sealed tray pack cans or 30 filled and sealed polymeric trays from the inspection lot and weigh separately. Subtract the average tare weight (determined by randomly selecting and weighing 30 of the empty tray pack cans and lids or 30 filled and sealed polymeric trays and lids used in preparing the product and dividing the total weight by 30) from the weight of each tray pack or polymeric tray in the sample. The results shall be reported to the nearest 1 ounce. For style a, if the average net weight is less than 106 ounces or if the net weight of any individual can is less than 104 ounces, the lot shall be rejected. For style b, if the average net weight is less than 94 ounces or if the net weight of any individual polymeric tray is less than 92 ounces, the lot shall be rejected.

4.5.3.2 Double sampling plan for product examination. The finished product shall be examined for the defects listed in table I utilizing the double sampling plans indicated in ANSI/ASQC Z1.4-1993. The lot size shall be expressed in tray pack cans or polymeric trays. The sample unit shall be one filled and sealed tray pack can or one filled and sealed polymeric tray. The sample cans or polymeric trays shall be heated in accordance with heating instructions on the label. The inspection level shall be S-3 and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 4.0 for major defects and 6.5 for minor defects.

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TABLE I. Product defects 1/ 2/ 3/

Category	Defect
<u>Major</u>	
101	For style a, drained weight of sweet potatoes in a can is less than 56.0 ounces. For style b, drained weight of sweet potatoes in a polymeric tray is less than 50.0. <u>4/</u> <u>5/</u>
102	Syrup is not tan - yellow in color
103	Syrup is lumpy
104	Syrup is not translucent
105	Product shows evidence of excessive heating (materially darkened or scorched)

1/ The presence of any foreign material (for example, dirt, insect parts, hair, wood, glass, metal), foreign odor or flavor (for example, burnt, scorched, moldy, rancid, sour, stale), or foreign color shall be cause for rejection of the lot.

2/ Product not equal to or better than the approved preproduction sample (see 6.1) in palatability and overall appearance shall be cause for rejection of the lot (see 3.6.1).

3/ The product not meeting grade shall be cause for rejection of the lot.

4/ To determine drained weight, the free liquid in the can or polymeric tray shall be poured off and the remaining contents shall be poured into a flat-bottom container. A minimum of three times the tray pack can's or polymeric tray's volume of 180°F to 190°F water shall be added to the container so as to cover the contents. The contents and water shall be agitated so as to remove syrup without breaking up the sweet potato pieces. The contents shall then be poured into a U.S. Standard 1/4 inch sieve in a manner that will distribute the product over the sieve without breaking the sweet potato pieces. Sieve area shall be such that the distributed product does not completely cover all the openings of the sieve. The sieve shall be tilted at approximately a 45° angle and allowed to drain for 2 minutes before determining the drained weight. Determine the drained weight by subtracting the sieve tare weight from the gross weight. The drained weight shall be reported to the nearest 0.1 ounce.

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5/ For style a, the lot shall be rejected if the sample average drained weight of sweet potatoes is less than 58.0 ounces. For style b, the lot shall be rejected if the sample average drained weight of sweet potatoes is less than 52.0 ounces.

4.5.3.3 Fat and salt content testing. Three filled and sealed tray pack cans or three filled and sealed polymeric trays shall be selected at random from the lot. The product shall be tested for salt content in accordance with the Official Methods of Analysis of AOAC, method 935.47. Preparation of the samples shall be as follows: The cans or polymeric trays shall be opened and the entire contents of each can or polymeric tray shall be separately blended in a Waring blender or equivalent. The test results shall be reported to the nearest 0.1 percent. Any result failing to conform to the salt requirement in 3.6 shall be classified as a major defect and shall be cause for rejection of the lot.

4.5.3.4 Commercial sterility. The sample size shall be one filled, sealed, and thermoprocessed tray pack can or polymeric tray selected from each process batch in the lot. Incubate the sample cans or trays at  $95^{\circ}\text{F} \pm 5^{\circ}\text{F}$  for 10 days unless otherwise specified by the inspection agency. Any evidence of swelling or microbial activity following incubation shall be cause for rejection of the lot.

4.5.3.5 Viscosity testing. The strained free liquid collected from each of the cans or polymeric trays in the first sample of cans or polymeric trays selected for drained weight inspection (see 4.5.3.2 and 5/ to Table I) shall be individually tested for viscosity as follows (see 6.4).

Instrument: Bostwick Consistometer	or	Catalog Number: 15-347-50
Catalog Number: 23270-004		Fisher Scientific
VWR Scientific Company		585 Alpha Drive
P.O. Box 7900		Pittsburgh, PA 15238
San Francisco, CA 94120		

Method:

- a. Level the instrument.
- b. Bring syrup to  $100^{\circ}\text{F} \pm 1^{\circ}\text{F}$  in a water bath in a covered container.
- c. Stir syrup thoroughly before filling the Bostwick cavity.
- d. Scrape syrup evenly across upper edge of cavity.
- e. Release syrup and time syrup flow to the nearest 1 second and distance traveled to the nearest 0.1 cm.

The lot shall be rejected if the Bostwick viscosity value of the syrup from any can or polymeric tray in the sample is less than 7.5 cm per 10 seconds or greater than 18.5 cm per 10 seconds.

4.5.3.6 Shelf life (style b only).

4.5.3.6.1 Shelf Life (18 months). Compliance with requirement shall be determined by incubation for 18 months at 80<sup>0</sup>F. Following the incubation period, the contractor shall perform an organoleptic test comparing the incubated samples to the control product. An acceptable product would receive a score of 5 or higher based on a hedonic scale. Contractor shall provide a certificate of conformance.

4.5.3.6.2 Shelf Life (36 months). Compliance with requirement shall be determined by incubation for 1 month at 120<sup>0</sup>F or 6 months at 100<sup>0</sup>F or 36 months at 80<sup>0</sup>F. Following the incubation period, the contractor shall perform an organoleptic test comparing the incubated samples to the control product. An acceptable product would receive a score of 5 or higher based on a hedonic scale. Contractor shall provide a certificate of conformance.

4.5.4 Can condition examination (style a only). Examination of filled and sealed tray pack cans shall be in accordance with the United States Standards for Condition of Food Containers, except that inspection for labeling shall be in accordance with 4.5.4.1. In addition, scratches, scuffs, or abrasions that occur on the outside coating as a result of the filling, sealing, and thermoprocessing of the tray cans shall not be scored as a defect.

4.5.4.1 Can label examination (style a only). Labels shall be examined for defects in accordance with MIL-L-1497 (see 5.4) except, for self-adhering labels, the following additional defects shall apply:

Major: Label torn or scratched so as to obliterate any of the markings.

Minor: Air bubbles under label.

Label not properly adhered to can, for example, label raised or peeled back from edges or corners.

4.5.4.2 Label adhesive examination (style a only). When self-adhering labels are used, the adhesive shall be tested in accordance with ASTM D 3330.

4.5.4.3 Polymeric tray condition examination (style b only). Examination of filled and sealed polymeric trays shall be in accordance with table II of MIL-PRF-32004.

4.5.4.3.1 Polymeric tray label examination (style b only). Labels shall be examined in accordance with the Quality Assurance Provisions and Packaging Requirements for MIL-PRF-32004.

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4.5.5 Can closure examination (style a only). Can closure shall be examined visually and by teardowns in accordance with the can manufacturer's guidelines/requirements and 21 CFR, Part 113, Subpart D, or 9 CFR, Part 318, Subpart G, as applicable. Any nonconformance based on observation of can seam teardowns or of record of can seam teardowns shall be classified as a major defect and shall be cause for rejection of any involved product.

4.5.5.1 Polymeric tray closure examination (style b only). Polymeric tray closure shall be examined in accordance with table II of MIL-PRF-32004.

4.5.6 Vacuum examination (style a only). Cans shall be allowed to cool to  $75^0 \pm 5^0\text{F}$ , held for at least 24 hours after sealing, and then examined for vacuum retention. To examine, lay a straight edge in the center of the lid along the length of the tray pack. Both ends of the straight edge shall touch the lid at the inside edge of the double seam. There shall be a visible gap between the straight edge and the lid for the entire distance of the label panel. Using a shorter edge, the same procedure shall be used across the width, in the center of the tray pack can. One measurement shall be made when examining a ribbed lid; lay the straight edge between the two center ribs along the length of the can. The inspection lot shall include only tray packs produced in a single shift on a single sealing machine. The sample size shall be 50 cans. Any nonconformance shall be classified as a major defect and shall be for rejection of the lot.

4.5.6.1 Polymeric tray testing (style b only). Polymeric trays shall be tested for conformance to residual gas volume and internal pressure requirements in accordance with MIL-PRF-32004.

4.5.7 Shipping container examination (style a and style b). The filled and sealed shipping containers shall be examined for the defects listed below. The lot size shall be expressed in shipping containers. The sample unit shall be one shipping container fully packed. The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units, shall be 4.0 for major defects and 10.0 for total defects.

Major: National stock number, item description, contract number,  
or date of pack markings missing, incorrect, or illegible.  
Reinforced with other than nonmetallic strapping or tape.  
For style a only, Dimensions of pads not as specified.  
For style a only, Interior packing with fiberboard liner or pads not as specified.  
For style b only, protective sleeve missing

Minor: Other required markings missing, incorrect, or illegible.  
Arrangement or number of cans or polymeric trays not as specified.

4.5.8 Unit load inspection (style a only). Inspection of unit loads shall be in accordance with the quality assurance provisions of DSCP FORM 3507.

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4.5.8.1 Unit load inspection (style b only). The unit loads shall be examined in accordance with the Quality Assurance Provisions and Packaging Requirements for MIL-PRF-32004.

### 5. PACKAGING

5.1 Preservation. The product shall be preserved in accordance with Level A.

5.1.1 Level A (style a only). One hundred and four ounces of product shall be filled into a tray pack can conforming to MIL-C-44340 and sealed and thermoprocessed as specified in 3.4 and 3.5.

5.1.2 Level A (style b only). Ninety-four ounces of food product shall be filled into a polymeric tray conforming to MIL-PRF-32004 and sealed and processed as specified in 3.4 and 3.5.1

5.2 Packing (style a only). The product shall be packed in accordance with Level A, B, or C as specified (see 6.1).

5.2.1 Level A packing. Four cans of product, preserved as specified in 5.1, shall be packed in a snug-fitting fiberboard box, constructed and closed in accordance with style RSC-L or HSC-L with an HSC full depth cover, grade V2s of ASTM D 5118. The cans shall be packed flat, four in depth within the box, with the first two cans placed with the lids together and the next two cans with the lids together. The inside of each box shall be provided with a box liner and five fiberboard pads fabricated of grade V3c fiberboard. The height of the box liner shall be equal to the full inside depth of the box (+0 inch, -1/8 inch). Flute direction of the box liner shall be vertical. The pads shall be placed between the cans and on the top and bottom of the stacked cans. The pad dimensions shall be not less than 1/8 inch of the full length and width dimensions of the box. Each box shall be reinforced with nonmetallic strapping or pressure-sensitive adhesive filament-reinforced tape in accordance with the appendix of ASTM D 1974. Shipping containers shall be arranged in unit loads in accordance with DSCP FORM 3507 for the type and class of load specified (see 6.1), except that the unit load shall consist of 48 boxes with 12 boxes per course and four courses per load with all courses having the same pattern. Boxes may be stacked by interlocking and reversing each tier, or by columnar stacking with paperboard or fiberboard sheets placed between each tier. When unit loads are strapped, strapping shall be limited to nonmetallic strapping, except for type II, class F loads.

5.2.2 Level B packing. Four cans of product, preserved as specified in 5.1, shall be packed as specified in 5.2.1, except the box shall be constructed of grade V3c, V3s, or V4s fiberboard.

5.2.3 Level C packing. Four cans of product, preserved as specified in 5.1, shall be packed in a snug-fitting fiberboard box, constructed and closed in accordance with style RSC-L, class domestic, grade 275 of ASTM D 5118. The cans shall be packed flat, four in depth within the

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box with the first two cans placed with the lids together and the next two cans with the lids together. The inside of each box shall be provided with a box liner and five fiberboard pads. The height of the box liner shall be equal to the full inside depth of the box (+0 inch, -1/8 inch). Flute direction of the box liner shall be vertical. The pads shall be placed between the cans and on the top and bottom of the stacked cans. The pad dimensions shall be not less than 1/8 inch of the full length and width dimensions of the box and shall be fabricated of class, domestic, grade 175 fiberboard.

5.2.4 Polymeric tray packing for shipment to ration assembler (style b only). Packing for shipment to ration assembler shall be in accordance with the Quality Assurance Provisions and Packaging Requirements for MIL-PRF-32004.

5.3 Unit loading (style a only). When specified (see 6.1), the product, packed as specified in 5.2.2 or 5.2.3, shall be arranged in unit loads in accordance with DSCP FORM 3507 for the type and class of load specified except that the unit load shall consist of 48 boxes with 12 boxes per course and four courses per load with all courses having the same pattern. Boxes may be stacked by interlocking and reversing each tier, or by columnar stacking with paperboard or fiberboard sheets placed between each tier. When unit loads are strapped, strapping shall be limited to nonmetallic strapping, except for type II, class F loads.

5.3.1 Unit loading (style b only). Unit loads shall be in accordance with the Quality Assurance Provisions and Packaging Requirements for MIL-PRF-32004.

5.4 Labeling (style a only). Each tray pack can shall be labeled in accordance with MIL-L-1497 and with the following:

- Official establishment number (for example, EST 38) or a three digit letter code identifying the establishment.
- Lot number 1/
- Production shift number 1/
- Retort identification number 1/
- Retort cook number 1/

1/ The lot number shall be expressed as a four digit Julian code. The first digit shall indicate the year of production and the next three digits shall indicate the day of the year (for example, November 29, 1993, would be coded as 3333). The Julian code shall represent the day the product was packaged and processed. Sub-lotting (when used) shall be represented by an alpha character immediately following the four digit Julian code. Following the four digit Julian code and the alpha character (when used), the other required code information shall be printed in the sequence as listed above.

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In addition, the name of the product shall be made, stamping is permitted, on one 1001 by 200 side of the can. The labeling shall be legible when examined as specified in 4.5.4.1 after preparation of product in accordance with heating instructions. Paper labels are not permitted. In addition, cans shall show the following statements:

TO HEAT IN WATER: Submerge unopened can in boiling water. Simmer gently 40 to 45 minutes. Avoid overheating (can shows evidence of bulging).

CAUTION: Use care when opening as pressure may have been generated within the can.

TO HEAT IN OVEN: Either punch several holes in lid of can or open in usual manner leaving the loose lid in place. Place in a 350<sup>0</sup>F oven 30 to 40 minutes.

WARNING: Do not place unopened can in oven. This may cause the can to burst.

YIELD: Serves 18 portions of 1/2 cup each.

As an alternate labeling method, a preprinted, self-adhering, 0.002 inch thick, clear polyester label printed with indelible black ink may be used. Self-adhering labels shall be applied after retorting. Pressure-sensitive adhesive shall require no preparation prior to application. Labels shall tack quickly and adhere without curling or breaking. The adhesive shall have a minimum adhesion of 60 ounces per inch width when examined as specified in 4.5.4.2. When self-adhering labels are used, the tray pack cans shall be labeled with the Julian code and a product code prior to retorting

5.4.1 Labeling (style b only). Each polymeric tray shall be labeled in accordance with the Quality Assurance Provisions and packaging Requirements for MIL-PRF-32004.

The tray lid shall show the following statements:

TO HEAT IN WATER: Submerge unopened tray in boiling water. Simmer gently 40 - 45 minutes. Avoid overheating (tray shows evidence of bulging).

WARNING: Do not heat tray in oven.

TO TRANSPORT AFTER HEATING: Insert tray back into protective sleeve to protect during transport. If sleeve is unavailable, stack trays lid-to-lid with fiberboard pads in between.

CAUTION: Use care when opening as pressure may have been generated within the tray.

TO OPEN: Using a clean knife, cut the lidding around the inside perimeter of the tray seals.

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SUGGESTION: Cut lid along 3 sides and fold over uncut portion. Fold back to keep unused portions protected.

YIELD: Serves 18 portions of approximately 2/3 cup each.

5.5 Marking (style a only).

5.5.1 Shipping containers. In addition to any special marking required by the contract or purchase order, shipping containers shall be marked in accordance with DSCP Form 3556.

5.5.2 Unit loads. Unit loads shall be marked in accordance with DSCP Form 3556. In addition, the following precautionary marking in capital letters larger than other markings shall be included:

CAUTION: DO NOT STACK PALLETS IN TRANSIT OR MORE THAN TWO HIGH IN STORAGE, UNLESS PALLET RACKS ARE USED.

5.6. Marking (style b only). Marking of shipping containers and unit loads shall be in accordance with the Quality Assurance Provisions and Packaging Requirements for MIL-PRF-32004.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory).

6.1 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- c. When a first article is required (see 3.1, 4.4, and 6.2).
- d. Provisions for approved preproduction samples (see 3.6.1 and 6.2).
- e. Level of packing required (see 5.2).
- f. Type and class of unit load when unit loading is required (see 5.2.1 and 5.3).
- g. Style required (see 1.2).

6.2 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of Federal Acquisition Regulations (FAR) 52.209-4. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of

first article and the number of units to be furnished. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.3 Appropriate level of pack. Based on the conditions known or expected to be encountered during shipment, handling, and storage of the specific item being procured, the procuring activity should select the appropriate level of pack in accordance with the criteria established in AR 700-15/NAVSUPINST 4030.28/AFR 71-6/MCO 4030.33A/DLAR 4145.7.

6.4 Alternate viscosity testing method. The contracting officer may authorize an alternative contractor recommended method of viscosity testing if the alternative method is approved by the U.S. Army Natick Research, Development and Engineering Center.

6.5 Definition of fairly well colored. "Fairly well colored" means that sweet potatoes of the white-fleshed varieties shall be no lighter in color than a light straw color, and that yellow or orange flesh varieties shall be no lighter in color than a light salmon-orange color.

6.6 Subject term (key word) listing.

- Canned foods
- Combat field feeding
- Operational rations
- Shelf stable
- Vegetables

6.7 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:

- Army - GL
- Navy - SA
- Air Force - 50

Preparing activity:

- Army - GL
- (Project 8940-0719)

Review activities:

- Army - MD, QM
- Navy - MC
- DLA - SS

Notes:

1. 5-18-99 Changes made to addresses and DSCP FORM 3507.