

## SECTION C

This document covers thermostabilized vegetables packaged in a polymeric tray for use by the Department of Defense as a component of operational rations.

### C-1 ITEM DESCRIPTION

#### **PCR-V-007, VEGETABLES, PACKAGED IN A POLYMERIC TRAY, SHELF STABLE**

##### Types.

Type I – Carrots, Glazed

Type II – Corn, Mexican Style

Type III – Green Beans, ~~Southern Style~~ Seasoned 

Type IV – Peas

### C-2 PERFORMANCE REQUIREMENTS

A. Product standard. A sample shall be subjected to first article (FA) or product demonstration model (PDM) inspection as applicable, in accordance with the tests and inspections of Section E of this Performance-based Contract Requirements (PCR) document. The approved sample shall serve as the product standard. Should the contractor at any time plan to, or actually produce the product using different raw material or process methodologies from the approved Product Standard, which result in a product non comparable to the Product Standard, the contractor shall arrange for a new or alternate FA or PDM approval. In any event, all product produced must meet all requirements of this document including Product Standard comparability.

B. Commercial sterility. The packaged food shall be processed until commercially sterile.

C. Shelf life. The packaged product shall meet the minimum shelf life requirement of 36 months at 80°F.

D. Appearance.

(1) Type I. The finished product shall be canned carrot pieces (dices or slices) in brown sugar glaze. The carrots shall be derived from frozen, Grade A carrots in accordance with the U.S. Standards for Grades of Frozen Carrots. Carrots of any type shall possess similar varietal characteristics. Carrots shall be not greater than 1-3/4 inches in diameter and

shall be not greater than 1/2 inch in thickness. The carrots shall possess a practically uniform color typical of canned glazed carrots with not more than 5 percent, by weight, of units which vary markedly from this typical color. The sauce shall be light to medium brown in color. The finished product shall be free from foreign materials.

(2) Type II. The finished product shall be canned whole kernel Mexican style corn and shall be a uniform mixture of whole kernel corn, small pieces of green and red bell peppers, onions in a sauce flavored with Mexican spices. The whole kernel corn shall be derived from frozen golden (yellow) Grade A of the U.S. Standards for Grades of Frozen Whole Kernel Corn. The corn shall possess a practically uniform color typical of canned corn with not more than 5 percent, by weight, of units which vary markedly from this typical color. The sauce shall be a light golden tan color. The finished product shall be free from foreign materials.

(3) Type III. The finished product shall be canned green beans, ~~southern style~~ seasoned. The green beans shall possess a practically uniform color typical of canned green beans with not more than 10 percent, by weight, of units which vary markedly from this typical color. The sauce shall be opaque with bits of diced onions, and red pepper ~~and bacon~~ bits uniformly distributed. The green beans shall be derived from frozen, Grade A green beans of the U.S. Standards of Frozen Green Beans and Wax Beans. The finished product shall be practically free of tough strings or stems and stem pieces and shall be free from foreign materials.

(4) Type IV. The finished product shall be canned shelled green peas in brine. The peas shall be derived from fresh U.S. No. 2 of the U.S. Standards for Grades or better. The peas shall be practically uniform in color and reasonably free of significant blemishes. The peas shall be of such size as not to pass through a 9/32 inch sieve. The canned shelled green peas shall possess a reasonably clear liquor. The finished product shall be free from foreign materials.

E. Odor and flavor.

(1) Type I. The packaged food shall have an odor and flavor of cooked glazed carrots. The sauce shall be sweet with brown sugar notes. The packaged food shall be free from foreign odors and flavors.

(2) Type II. The packaged food shall have an odor and flavor of cooked Mexican style sweet corn. The sauce shall be slightly sweet and spicy. The packaged food shall be free from foreign odors and flavors.

(3) Type III. The packaged food shall have an odor and flavor of cooked green beans, southern style seasoned. The odor and flavor of the sauce shall be mild with a hint of onion, and red pepper ~~and bacon bits~~. The packaged food shall be free from foreign odors and flavors.

(4) Type IV. The packaged food shall have an odor and flavor of cooked peas. The packaged food shall be free from foreign odors and flavors.

F. Texture. Type I shall be slightly soft to slightly firm, but not tough, fibrous or mushy. For types II, III and IV, the vegetables shall be tender to slightly firm, but not hard, tough, coarse, fibrous or mushy. For Types I, II and III the sauce shall be smooth and moderately thick.

G. Net weight. For all types, the average net weight shall be not less than 85 ounces. No individual polymeric tray shall have a net weight less than 80 ounces.

H. Drained weight. The average drained weight shall be not less than 43.0 ounces.

I. Palatability and overall appearance. The finished product shall be equal to or better than the approved product standard in palatability and overall appearance.

J. Analytical requirements.

(1) Salt content. The salt content shall be not less than 0.3 percent and not greater than 1.5 percent.

## **SECTION D**

### **D-1 PACKAGING**

A. Preservation. Product shall be filled into polymeric trays and the trays shall conform to the requirements of section 3 of MIL-PRF-32004F, Packaging of Food in Polymeric Trays. Verification testing and inspection of trays and lids shall be in accordance with Section 4 of MIL-PRF-32004F and the Quality Assurance Provisions of Section E of this Performance-based Contract Requirements document. The requirement for protective sleeves shall not apply to thermostabilized vegetables packaged in a polymeric tray.

B. Polymeric tray closure. The filled, sealed, and processed tray shall be securely closed.

## **D-2 LABELING**

A. Polymeric tray body. The polymeric tray body shall be clearly printed or stamped, in a manner that does not damage the tray, with permanent ink of any contrasting color, which is free of carcinogenic elements. One end of the polymeric tray (see figure 1 of MIL-PRF-32004F) shall be marked with the product name and number of portions. If the tray body end markings are not readily legible in low light conditions, a small, easily legible label shall be applied, but not over any existing tray markings. All other markings may be applied along the tray body side. To avoid erroneous marking of trays, the product name, lot number and filling equipment number shall be applied prior to processing. Additional tray marking may be applied before or after processing. 1/

Tray body markings shall include:

- (1) Product name. Commonly used abbreviations may be used when authorized by the inspection agency.
- (2) Tray code includes: 2/
  - Lot Number
  - Filling equipment identification number
  - Retort identification number
  - Retort cook number

1/ As an alternate method, tray body markings may be clearly printed or stamped onto the polymeric tray lid prior to processing, in a manner that does not damage the lid, with permanent ink of any contrasting color, which is free of carcinogenic elements, provided that the required markings are applied onto the tray body after processing.

2/ 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 (Example, 9 November 2006 would be coded as 6313). The Julian code shall represent the day the product was packaged into the tray and processed. Sublotting (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.

B. Polymeric tray lid. The lid shall be clearly printed or stamped, in a manner that does not cause damage. Permanent ink of any contrasting color, which is free of carcinogenic elements, shall be used. As an alternate labeling method, a pre-printed self-adhering 0.002 inch thick clear polyester label printed with indelible contrasting color ink may be used.

Note: The font tested by Natick was Microsoft Helvetica. The font used shall be similarly clear/easy to read as Helvetica. The recommended font sizes are as follows: 22 for the product name, 14 for “yield” and “to heat in water.” If an additional note is required on the label, such as “fluff before serving,” it should also be in font size 14. All other information should be in font size 9.

(1) Lid labeling shall include:

- Product name
- Ingredients
- Net weight
- Name and address of packer
- Official establishment number (for example, EST 38) or a three letter code identifying the establishment
- “Nutrition Facts” label in accordance with the Nutrition Labeling and Education Act (NLEA) and all applicable FDA/USDA regulations

(2) Lid labeling shall also show the following statements:

**YIELD:** Serves 18 portions of approximately 3/4 cup each.

**TO HEAT IN WATER:** Submerge unopened tray in boiling water. Simmer gently 25 - 30 minutes. Avoid overheating (tray shows evidence of bulging).

**WARNING:** Do not heat tray in oven.

**TO TRANSPORT AFTER HEATING:** 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.

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

### **D-3 PACKING**

A. Packing for shipment to ration assembler. Four filled, sealed, processed and sleeved polymeric trays shall be packed in a snug fitting fiberboard box conforming to style RSC-L, type CF, grade 275 of ASTM D 5118/D 5118M, Standard Practice for Fabrication of Fiberboard Shipping Boxes. The trays shall be stacked lid-to-lid. Fiberboard pads shall be placed between the trays and on the top and bottom of the stacked trays. The pad dimensions shall be not less than 1/8 inch of the full length and width inside dimensions of the box and

shall be fabricated of class domestic, grade 275 fiberboard. The box shall be closed in accordance with ASTM D 1974, Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes-

#### **D-4 UNITIZATION**

A. Unit loads. Unit loads shall be as specified in DSCP FORM 3507, Loads, Unit: Preparation of Semiperishable Subsistence Items.

#### **D-5 MARKING**

A. Shipping containers and unit loads. Marking of shipping containers and unit loads shall be as specified in DSCP FORM 3556 Marking Instructions for Boxes, Sacks and Unit Loads of Perishable and Semiperishable Subsistence.

### **SECTION E INSPECTION AND ACCEPTANCE**

The following quality assurance criteria, utilizing ANSI/ASQ Z1.4, Sampling Procedures and Tables for Inspection by Attributes, are required. Unless otherwise specified, Single Sampling Plans indicated in ANSI/ASQ Z1.4 will be utilized. When required, the manufacturer shall provide the Certificate(s) of Conformance to the appropriate inspection activity. Certificate(s) of Conformance not provided shall be cause for rejection of the lot.

#### A. Definitions.

(1) Critical defect. A critical defect is a defect that judgment and experience indicate would result in hazardous or unsafe conditions for individuals using, maintaining, or depending on the item; or a defect that judgment and experience indicate is likely to prevent the performance of the major end item, i.e., the consumption of the ration.

(2) Major defect. A major defect is a defect, other than critical, that is likely to result in failure, or to reduce materially the usability of the unit of product for its intended purpose.

(3) Minor defect. A minor defect is a defect that is not likely to reduce materially the usability of the unit of product for its intended purpose, or is a departure from established standards having little bearing on the effective use or operation of the unit.

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

(1) Product standard inspection. The first article or product demonstration model shall be inspected in accordance with the provisions of this document and evaluated for overall appearance and palatability. Any failure to conform to the performance requirements or any appearance or palatability failure shall be cause for rejection of the lot. The approved first article or product demonstration model shall be used as the product standard for periodic review evaluations. All food components that are inspected by the USDA shall be subject to periodic review sampling and evaluation. The USDA shall select sample units during production of contracts and submit them to the following address for evaluation:

US Army Research, Development and Engineering Command  
Natick Soldier Center  
AMSRD-NSC-CF-F  
15 Kansas Street  
Natick, MA 01760-5018

One lot shall be randomly selected during each calendar month of production. Two (2) sample units of each item produced shall be randomly selected from that one production lot. The two (2) sample units shall be shipped to Natick within five working days from the end of the production month and upon completion of all USDA inspection requirements. The sample units will be evaluated for the characteristics of appearance, odor, flavor, texture and overall quality.

(2) Conformance inspection. Conformance inspection shall include the examinations and the methods of inspection cited in this section.

#### **E-5 QUALITY ASSURANCE PROVISIONS (PRODUCT)**

A. Product examination. The finished product shall be examined for compliance with the performance requirements specified in Section C of this Performance-based Contract Requirements document utilizing the double sampling plans indicated in ANSI/ASQ Z1.4. The lot size shall be expressed in trays. The sample unit shall be the contents of one tray. 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. Defects and defect classifications are listed in table I below. The trays shall be heated in accordance with the heating instructions from the tray label prior to conducting any portion of the product examination. The samples for drained weight inspection shall be selected using the same sampling criteria as above.

TABLE I. Product defects 1/ 2/ 3/ 4/ 6/

Category		Defect
<u>Major</u>	<u>Minor</u>	
101		<u>General</u> Product not type as specified.
		<u>Appearance</u>
	201	Type I greater than 5 percent, by weight, not a canned carrot color.
	202	Type I not diced/sliced carrots in a brown sugar glaze.
	203	Type I sauce not light to medium brown in color.
	204	Type II greater than 5 percent, by weight, not a golden yellow canned corn color.
	205	Type II not a uniform mixture of whole kernel corn or small pieces of green or red bell peppers or onions.
	206	Type II sauce not a light golden tan color or not with small pieces of green or red bell pepper or onions
	207	Type III greater than 10 percent, by weight, not a canned green bean color.
	208	Type III not practically free of tough strings or stems or stem pieces.
	209	Type III does not have bits of diced onions or red pepper <del>or bacon</del> bits uniformly distributed.
	210	For type III, sauce not opaque or not with bits of diced onions or red pepper <del>or bacon</del> bits uniformly distributed.
	211	Type IV not practically uniform in color.
	212	For Types IV, product does not possess a reasonably clear liquor.
	213	Type IV not reasonably free of significant blemishes.



TABLE I. Product defects 1/ 2/ 3/ 4/ 6/ cont'd

Category		Defect
<u>Major</u>	<u>Minor</u>	
		<u>Odor and flavor</u>
102		Type I does not have an odor or flavor of cooked glazed carrots in a sweet sauce with brown sugar notes.
103		Type II does not have an odor or flavor of cooked Mexican Style sweet corn in a slightly sweet and spicy sauce.
104		Type III product does not have an odor or flavor of cooked green beans, <del>southern style</del> <u>seasoned</u> in a mild sauce with a hint of onion, <u>and red pepper or bacon bits.</u>
105		Type IV product does not have an odor or flavor of cooked peas.
		<u>Texture</u>
	214	Type I tough or fibrous or mushy or not slightly soft to slightly firm.
	215	Types II or III or IV, hard or tough or coarse or fibrous or mushy or not tender to slightly firm.
	216	Types I or II or III, sauce not smooth or not moderately thick.
		<u>Net weight</u>
	217	Net weight of an individual polymeric tray less than 80 ounces. <u>5/</u>

1/ Presence of any foreign materials such as, but not limited to dirt, insect parts, hair, wood, glass, metal, or mold, or any foreign odors or flavors such as, but not limited to burnt, scorched, rancid, sour, or stale shall be cause for rejection of the lot.

2/ Finished product not equal to or better than the approved product standard in palatability and overall appearance shall be cause for rejection of the lot.

3/ Failure to meet the U.S. grade requirement for any vegetable shall be cause for rejection of the lot.

4/ Type and size requirements for carrots and size requirement for peas shall be verified by Certificate of Conformance.

5/ Sample average net weight less than 85 ounces shall be cause for rejection of the lot.

6/ Sample average drained weight less than 43.0 ounces shall be cause for rejection of the lot.

B. Methods of inspection.

(1) Commercial sterility. Commercial sterility shall be verified in accordance with USDA/FSIS regulations.

(2) Shelf life. The contractor shall provide a Certificate of Conformance that the product has a 36 month shelf life when stored at 80°F. Government verification may include storage for 6 months at 100°F or 36 months at 80°F. Upon completion of either storage period, the product will be subjected to a sensory evaluation panel for appearance and palatability and must receive an overall score of 5 or higher based on a 9 point hedonic scale to be considered acceptable.

(3) Net weight. The net weight of the filled and sealed polymeric tray shall be determined by weighing each sample unit on a suitable scale tared with a representative polymeric empty tray and lid. Results shall be reported to the nearest 1 ounce.

(4) Drained weight. To determine drained weight the contents shall be poured into a flat-bottom container. A minimum of three times the polymeric tray's volume of not less than 140°F water shall be added to the container so as to cover the contents. The contents and water shall be gently agitated without breaking the vegetables. 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 vegetables. The 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 such an angle so as to assure complete drainage of all liquid from the product. Drain product for 2 minutes before determining the drained weight by subtracting the sieve tare weight from the gross weight. The drained weight shall be reported to the nearest 0.5 ounce.

(5) Analytical. The sample to be analyzed shall be a one-pound composite of three filled and sealed polymeric trays which have been selected at random from one production lot. The composite sample shall be prepared and analyzed in accordance with the following methods of the Official Methods of Analysis (OMA) of AOAC International.

<u>Test</u>	<u>Method Number</u>
Salt	971.27 or 935.47

Test results shall be reported to the nearest 0.1 percent. Verification will be conducted through actual testing by a Government laboratory. Any results not conforming to the analytical requirements shall be cause for rejection of the lot.

**E-6 QUALITY ASSURANCE PROVISIONS (PACKAGING AND PACKING MATERIALS, POLYMERIC TRAY)**

A. Packaging and labeling.

(1) Polymeric tray testing. For purposes of clarification, the polymeric tray without the lid will be referred to as the “tray” and the polymeric tray with the lid shall be referred to as the “container”. The container and container materials shall be examined for the characteristics listed in table I of MIL-PRF-32004F, Packaging of Food in Polymeric Trays. The lot size, sample unit, and inspection level criteria are provided in table II below for each of the test characteristics. Any test failure shall be classified as a major defect and shall be cause for rejection of the lot. For rough handling survivability at frozen temperature, polymeric tray survival rate shall be at least 85 percent.

TABLE II. Polymeric tray quality assurance criteria  
Prior to processing

Characteristic	Lot size expressed in	Sample unit	Inspection level
Tray configurations and dimensions	Trays	1 tray	S-1
Oxygen gas transmission rate of tray	Trays	1 tray	S-1
Oxygen gas transmission rate of lid	Yards	1/2 yard	S-1
Water vapor transmission rate of tray	Trays	1 tray	S-1
Water vapor transmission rate of lid	Yards	1/2 yard	S-1
Camouflage	Containers	1 container	S-1

After processing

Characteristic	Lot size expressed in	Sample unit	Inspection level
Processing	Trays	1 tray	S-2
Rough handling survivability	Test containers	1 container	S-2
Residual gas	Containers	1 container	S-1
Closure seal	Containers	1 container	S-1
Internal pressure	Containers	1 container	S-1
Lid opening	Containers	1 container	S-1

(2) Examination of container. The container shall be examined for the defects listed in table II of MIL-PRF-32004F and the labeling defects listed in table III below. The lot size shall be expressed in containers. The sample unit shall be one processed and labeled container. The inspection level shall be I and the AQL, expressed in terms of defects per hundred units, shall be 0.65 for major A defects, 2.5 for major B defects and 4.0 for minor

defects. Two hundred sample units shall be examined for critical defects. The finding of any critical defect shall be cause for rejection of the lot.

TABLE III. Container labeling defects

Category		Defect
<u>Major A</u>	<u>Minor</u>	
101		Polymeric tray lid or body labeling missing or incorrect or illegible.
	201	When a pre-printed self adhering label is used, the label not adhering to tray lid (for example, label raised or peeled back from edge to corner) or presence of any areas of gaps along the perimeter of the label where the label is not properly adhered.

(3) Label adhesive examination. When self-adhering labels are used, the adhesive shall be tested in accordance with ASTM D 3330/D 3330M. In lieu of testing, a Certificate of Conformance (COC) shall be provided.

B. Packing.

(1) Shipping container and marking examination. The filled and sealed shipping containers shall be examined for the defects listed in table IV 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.

TABLE IV. Shipping container and marking defects

Category		Defect
<u>Major</u>	<u>Minor</u>	
101		Marking missing or incorrect or illegible.
102		Inadequate workmanship. <u>1/</u>
	201	Arrangement or number of polymeric trays not as specified.

1/ Inadequate workmanship is defined as, but not limited to, incomplete closure of container flaps, loose strapping, inadequate stapling, improper taping, or bulged or distorted container.

C. Unitization.

(1) Unit load examination. The unit load shall be examined in accordance with the requirements of DSCP FORM 3507, Loads, Unit: Preparation of Semiperishable Subsistence Items. Any nonconformance shall be classified as a major defect.

**SECTION J REFERENCE DOCUMENTS**

U.S. STANDARDS FOR GRADES

- U.S. Standards for Grades of Frozen Carrots
- U.S. Standards for Grades of Frozen Whole Kernel Corn
- U.S. Standards for Grades of Frozen Green Beans and Wax Beans
- U.S. Standards for Grades of Fresh Shelled Peas for Canning or Freezing

DSCP FORMS

- DSCP FORM 3507      Loads, Unit: Preparation of Semiperishable Subsistence Items
- DSCP FORM 3556      Marking Instructions for Boxes, Sacks and Unit Loads of Perishable and Semiperishable Subsistence

MILITARY SPECIFICATIONS

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

GOVERNMENT PUBLICATIONS

- Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder (21 CFR Parts 1-199)

NON-GOVERNMENTAL STANDARDS

AMERICAN SOCIETY FOR QUALITY (ASQ)

- ANSI/ASQ Z1.4-2003      Sampling Procedures and Tables for Inspection by Attributes

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

**PCR-V-007**

**9 November 2006**

**W/ Change 06 18 November 2010**

D 1974-98 (2003)	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
D 3330/D 3330M-04	Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape
D 5118/D 5118M-05a	Standard Practice for Fabrication of Fiberboard Shipping Boxes

**AOAC INTERNATIONAL**

Official Methods of Analysis (OMA) of the AOAC International