

## **SECTION C**

This document covers shelf stable mini loaves and muffins, packaged in a polymeric tray for use by the Department of Defense as a component of operational rations.

### **C-1 ITEM DESCRIPTION**

#### **PCR-M-018, MINI LOAVES AND MUFFINS, PACKAGED IN A POLYMERIC TRAY, SHELF STABLE**

##### Types and flavors.

##### Type I – Mini Loaves

- Flavor 1 - Brownie
- Flavor 2 - Lemon with white icing
- Flavor 3 - Cornbread

##### Type II – Muffins

- Flavor 1 - Chocolate

### **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 noncomparable to the product standard, the contractor shall submit a replacement FA or PDM for approval. In any event, all product produced must meet all requirements of this document including product standard comparability.

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

##### C. Appearance.

(1) General. The finished product shall be fully baked, intact individual serving size mini loaves and muffins. The product shall show no evidence of excessive baking (materially darkened or scorched). There shall be no evidence of compression streaks when broken by hand. The interior crumb may have air pockets distributed throughout. The finished product shall be free from foreign materials.

(2) Type I. The rectangular mini loaves shall be not less than 3 inches long by 1-2/5 inches wide.

a. Flavor 1. Not less than 17 brownie mini loaves shall be arranged in a polymeric tray. The brownie mini loaves shall have a medium to dark brown exterior and interior crumb color.

b. Flavor 2. Not less than 15 lemon mini loaves shall be arranged in a polymeric tray. The lemon mini loaves shall have a light to medium golden yellow exterior color. The lemon mini loaves shall have an off-white to pale yellow interior crumb color. The icing shall be white, smooth and glossy. The icing shall be packaged separately.

c. Flavor 3. Not less than 15 cornbread mini loaves shall be arranged in a polymeric tray. The cornbread mini loaves shall have a golden yellow to tan exterior color. The cornbread mini loaves shall have a light to medium yellow interior crumb color with an irregular crumb appearance. The cornbread height, measured at its highest point, shall be not less than 1-1/4 inch.

(3) Type II.

a. Flavor 1. Not less than 18 intact chocolate muffins shall be arranged in a polymeric tray. The chocolate muffins shall have a medium to dark brown exterior and interior crumb color.

D. Odor and flavor. The packaged food shall be free from foreign odors and flavors.

(1) Type I.

a. Flavor 1. The packaged food shall have a sweet, mild chocolate odor and flavor.

b. Flavor 2. The packaged food shall have a sweet, lemon odor and flavor. The white icing shall have a sweet odor and flavor.

c. Flavor 3. The packaged food shall have a slightly sweet, mild corn odor and flavor.

(2) Type II.

a. Flavor 1. The packaged food shall have a sweet, chocolate odor and flavor.

E. Texture.

(1) Type I.

a. Flavor 1. The brownie mini loaves shall be dense, moist and firm.

b. Flavor 2. The lemon mini loaves shall be slightly dense and tender with a fine grain crumb. The icing shall be easily spreadable and smooth.

c. Flavor 3. The cornbread mini loaves shall be dense, tender and moist with a coarse grain crumb.

(2) Type II.

a. Flavor 1. The chocolate muffins shall be tender and moist.

F. Net weight.

(1) Type I.

a. Flavor 1. The average net weight shall be not less than 36.0 ounces (1020 grams). The net weight of an individual polymeric tray shall be not less than 35.0 ounces (992 grams).

b. Flavor 2. The average net weight, without icing, shall be not less than 29.0 ounces (822 grams). The net weight of an individual polymeric tray, without icing, shall be not less than 28.0 ounces (793 grams). The average net weight of icing shall be not less than 6.0 ounces (170 grams).

c. Flavor 3. The average net weight shall be not less than 36.0 ounces (1020 grams). The net weight of an individual polymeric tray shall be not less than 35.0 ounces (992 grams).

(2) Type II.

a. Flavor 1. The average net weight shall be not less than 25.0 ounces (708 grams). The net weight of an individual polymeric tray shall be not less than 24.0 ounces (680 grams).

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

H. Analytical requirements.

(1) Fat.

a. Type I, flavor 1 and Type II, flavor 1. The fat content shall be not less than 15.0 percent.

b. Type I, flavor 2 and Type I, flavor 3. The fat content shall be not less than 12.0 percent.

(2) Water activity. The water activity ( $a_w$ ) for type I, flavor 1 and type I, flavor 2 (without icing) and type II, flavor 1 packaged product shall be not greater than 0.89. The water activity of type 1, flavor 3 shall be not greater than 0.85.

(3) Oxygen. The oxygen content of the filled and sealed polymeric tray shall not exceed 0.30 percent.

**SECTION D**

**D-1 PACKAGING**

A. Preservation. Product as specified plus the appropriate number of oxygen scavengers and ovenable tray insert, if applicable, shall be filled and sealed into polymeric trays within 4 hours of baking and the trays shall conform to the requirements of section 3 of MIL-PRF-32004, Packaging of Food in Polymeric Trays, Type II Oven-baked products. Government verification testing and inspection of trays, lids, and fiberboard pads shall be in accordance with section 4 of MIL-PRF-32004 and the Quality Assurance Provisions of Section E of this Performance-based Contract Requirements document. The requirement for protective sleeves shall not apply to Type II Oven-baked products.

B. Component. For type I, flavor 2, one pouch containing icing shall be provided for each polymeric tray of product. The following materials and processing requirements are for icing in a pouch prior to packaging with the product:

(1) Icing pouch.

a. Material and construction. The preformed pouch shall be fabricated from material suitably formulated for food packaging and shall be in compliance with all applicable Food and Drug Administration (FDA) and United States Department of Agriculture (USDA) regulations. The material shall show no evidence of delamination, degradation, or foreign odor when heat-sealed or fabricated into pouches. The material shall not impart an odor or flavor to the product after filling and sealing. The pouch shall be made by heat sealing three edges with 3/8 inch (-1/8 inch, +3/16 inch) wide seals. The heat seals shall be made in a manner that will assure hermetic seals. The side and bottom seals shall

have an average seal strength of not less than 6 pounds per inch of width and no individual specimen shall have a seal strength of less than 5 pounds per inch of width when tested as specified in E-6,B(1). Alternatively, the filled and sealed pouch shall exhibit no rupture or seal separation greater than 1/16 inch or seal separation that reduces the manufacturer's seals to less than 1/16 inch when tested as specified in E-6,C(1)b. A tear notch shall be present in one or both side seals to facilitate opening.

b. Filling and sealing. Six ounces of icing shall be filled into the pouch and the filled pouch shall be heat sealed. The closure seal shall be free of foldover wrinkles or entrapped matter that reduces the effective closure seal width to less than 1/16 inch. Seals shall be free of impression or design on the seal surface that would conceal or impair visual detection of seal defects. The average seal strength shall be not less than 6 pounds per inch of width and no individual specimen shall have a seal strength of less than 5 pounds per inch of width when tested as specified in E-6,C(1)b. Alternatively, the filled and sealed pouch shall exhibit no rupture or seal separation greater than 1/16 inch or seal separation that reduces the effective closure seal width to less than 1/16 inch when tested as specified in E-6,C(1)c. Residual headspace in the filled and sealed pouch shall be minimized to facilitate packing.

c. Pouch size. The filled and sealed pouch shall be a size that fits within the void created between the tray lid material and fiberboard pad added during packing.

C. Oxygen scavenger. The oxygen scavenger shall be constructed of materials that are safe for direct food contact. The oxygen scavenger shall be in compliance with all applicable FDA regulations.

D. Ovenable tray insert. The ovenable tray insert (if utilized) shall be constructed of materials that are safe for direct food contact. The ovenable tray insert shall be in compliance with all applicable FDA and USDA regulations.

## **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-32004) 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. The marking of trays with the product name and lot number shall be applied at the time of tray scaling. 1/

Tray body markings shall include:

- (1) Product name. Commonly used abbreviations may be used.

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(2) Tray code includes: 2/

Lot number

1/ As an alternate method, tray body markings may be clearly printed or stamped onto the polymeric tray lid at the time of tray sealing, 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 prior to packing for shipment to ration assembler.

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, 14 February 2050 would be coded as 0045). The Julian code shall represent the day the product was packaged into the tray and the tray sealed. 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 DEVCOM Soldier Center 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, it should also be in font size 14. All other information should be in font size 9.

(1) Lid labeling shall include:

Product name and flavor

Ingredients

Net weight

Name and address of packer

“Nutrition Facts” label in accordance with the Nutrition Labeling and Education Act (NLEA) and all applicable FDA regulations

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

a. For Type I, flavor 1:

**YIELD:** Serves 17 portions, individual mini loaves.

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

**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.

b. For Type I, flavor 2:

**YIELD:** Serves 15 portions, individual mini loaves.

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

**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.

**ICING:** Icing is packaged in a separate pouch. Knead icing packet. Spread icing evenly on the surface of the lemon loaves using a spatula or knife.

c. For Type I, flavor 3:

**YIELD:** Serves 15 portions, individual mini loaves.

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

**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. For Type II, flavor 1:

**YIELD:** Serves 18 portions, individual muffins.

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

**CAUTION:** Use care when opening as pressure may have been generated within pouch or tray.

**TO OPEN:** Open pouch at tear notch and cut tray lid with a clean knife.

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

C. Icing pouch (for Type I, flavor 2). Each pouch shall be clearly printed or stamped, in a manner that does not damage the pouch. Permanent black ink or other contrasting color which is free of carcinogenic elements shall be used. The information may be located anywhere on the pouch (in one complete print).

(1) Icing labeling shall include:

Product name

Ingredients

Date 1/

Net weight

Name and address of manufacturer

1/ Each pouch shall have the date of pack noted by using a four-digit code beginning with the final digit of the current year followed by the three-digit Julian code. For example, 14 February 2050 would be coded as 0045. The Julian code shall represent the day the product was packaged into the pouch.

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

Knead pouch to soften icing.

Apply icing in accordance with tray label instructions.

**CAREFULLY PEEL POUCH AWAY FROM TRAY LID PRIOR TO  
SERVING**

### **D-3 PACKING**

A. Packing. Four filled and sealed polymeric trays shall be packed with fiberboard pads in a fiberboard shipping container constructed in accordance with style RSC-L of ASTM



D5118/D5118M, Standard Practice for Fabrication of Fiberboard Shipping Boxes. The fiberboard shall conform to type CF, class D, variety SW, minimum burst grade 200 or ECT 32 of ASTM D4727/D4727M, Standard Specification for Corrugated and Solid Fiberboard Sheet Stock (Container Grade) and Cut Shapes. Type II Oven-baked product trays shall be stacked with lids oriented upright. 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 D, minimum burst grade 200 fiberboard. Each box shall be closed in accordance with ASTM D1974/D1974M, Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes.

B. Packing of icing pouches (for Type I, flavor 2). In addition to the packing requirements in D-3,A, the following shall apply for all flavors that require an additional pouch of icing. One filled and sealed icing pouch shall be provided for each polymeric tray of specified product. The filled and sealed icing pouch shall be placed between the polymeric tray lid and fiberboard pad and secured to the tray lid using a food grade, peelable adhesive or alternate method of attachment. The icing pouch shall peel away easily from the tray lid.

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

A. Unit loads. Unit loads shall be as specified in accordance with DLA Troop Support Form 3507, Loads, Unit: Preparation of Semiperishable Subsistence Items.

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

A. Shipping containers and unit loads. Shipping containers and unit loads shall be marked in accordance with DLA Troop Support Form 3556, Marking Instructions for Boxes, Sacks, and Unit Loads of Perishable and Semiperishable Subsistence.

#### **D-6 MISCELLANEOUS INFORMATION**

THE FOLLOWING IS INFORMATION ONLY TO PROVIDE THE BENEFIT OF PAST GOVERNMENT EXPERIENCE. THIS IS NOT A MANDATORY CONTRACT REQUIREMENT.

A. Icing pouch material. It has been found that a pouch with minimum inside dimensions of 8-3/4 inches in length by 6-5/8 inches in width and fabricated from a 3-ply laminate constructed of, from inside to outside, 0.002 inch thick linear low density polyethylene, extrusion coated or laminated to 0.00035 inch thick aluminum foil, and extrusion coated or laminated to 0.0006 inch thick biaxially oriented nylon, meets the performance requirements of this document.

## **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 appearance, odor, flavor, and texture. Any failure to conform to the performance requirements or any appearance or palatability failure shall be cause for rejection of the lot.

(2) Periodic review evaluation. 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:

COMBAT CAPABILITIES DEVELOPMENT COMMAND (DEVCOM) SOLDIER CENTER  
FCDD-SCD-SCR  
10 GENERAL GREENE AVENUE  
NATICK, MA 01760-5000

One lot shall be randomly selected during each calendar month of production or as otherwise specified in the contract. Two (2) sample units shall be randomly selected from that one production lot. The two (2) sample units shall be shipped to DEVCOM Soldier Center within

five (5) working days from the end of the production month from which they are randomly selected and upon completion of all USDA inspection requirements. The sample units will be evaluated for overall quality against the current first article or product demonstration model.

(3) Conformance inspection. Conformance inspection shall include the examinations/tests 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, and the contents of the associated icing pouch, as applicable. 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. The filled and sealed polymeric trays shall be brought to room temperature (65°F to 75°F).

TABLE I. Product defects 1/ 2/ 3/

Category		Defect
<u>Major</u>	<u>Minor</u>	<u>General</u>
101		Product not type or not flavor as specified.
102		Product not individual serving size.
103		Evidence of excessive baking (materially darkened or scorched).
104		Product not fully baked.
	201	Evidence of compression streaks. <u>4/</u>
105		Polymeric tray does not contain intact oxygen scavenger(s). <u>5/</u>
106		Tear or hole or open seal in oxygen scavenger.
	202	Product not intact. <u>6/</u>
	203	Product dimensions or height not as specified. <u>7/</u>
	204	Evidence of delamination by ovenable tray insert (if utilized).

TABLE I. Product defects 1/ 2/ 3/ - Continued

Category		Defect
<u>Major</u>	<u>Minor</u>	
		<u>Type I – Mini loaves</u>
		<u>Flavor 1- Brownie</u>
107		Less than 17 mini loaves arranged in a polymeric tray.
	205	Mini loaves not a medium to dark brown exterior or interior crumb color.
108		Flavor 1 packaged food not sweet or not a mild chocolate odor or flavor.
	206	Mini loaves texture not dense or not moist or not firm.
		<u>Flavor 2 - Lemon</u>
109		Less than 15 mini loaves arranged in a polymeric tray.
	207	Mini loaves not a light to medium golden yellow exterior color.
	208	Mini loaves not an off-white to pale yellow interior crumb color.
	209	Icing not white or not smooth or not glossy.
110		Flavor 2 packaged food not sweet or not a lemon odor or flavor.
111		White icing not a sweet odor or flavor.
	210	Icing pouch missing.
	211	Icing pouch leaking.
	212	Icing pouch not secured to tray lid.
	213	Icing pouch does not peel away easily from tray lid.
	214	Mini loaves texture not slightly dense or not tender or not a fine grain crumb.
	215	Icing texture not easily spreadable or not smooth.

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Category		Defect
<u>Major</u>	<u>Minor</u>	
		<u>Flavor 3 - Cornbread</u>
112		Less than 15 mini loaves arranged in a polymeric tray.
	216	Mini loaves not a golden yellow to tan exterior color.
	217	Mini loaves not a light to medium yellow interior crumb color or not with an irregular crumb appearance.
113		Flavor 3 packaged food not a slightly sweet or not a mild corn odor or flavor.
	218	Mini loaves texture not dense or not tender or not moist or not with a coarse grain crumb.
		<u>Type II – Muffins</u>
		<u>Flavor 1 - Chocolate</u>
114		Less than 18 muffins arranged in a polymeric tray.
	219	Muffins not a medium to dark brown exterior or interior crumb color.
115		Flavor 1 packaged food not a sweet or not a chocolate odor or flavor.
	220	Muffins texture not tender or not moist.
		<u>Net weight</u>
	221	Type I, flavor 1, net weight of an individual polymeric tray less than 35.0 ounces (992 grams). <u>8/</u>
	222	Type I, flavor 2, net weight of an individual polymeric tray, without icing, less than 28.0 ounces (793 grams). <u>9/</u>
	223	Type I, flavor 3, net weight of an individual polymeric tray less than 35.0 ounces (992 grams). <u>10/</u>
	224	Type II, flavor 1, net weight of an individual polymeric tray less than 24.0 ounces (680 grams). <u>11/</u>

225 Type I, flavor 2, net weight of icing pouch less than 6.0 ounces (170 grams).

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1/ Presence of any foreign materials such as, but not limited to dirt, insect parts, hair, glass, wood, or metal, or any foreign odors or flavors such as, but not limited to burnt, scorched, rancid, sour, stale, musty or moldy 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/ As applicable, bisect mini loaves or muffins vertically in the center with a sharp knife to inspect for defects.

4/ When broken by hand.

5/ Construction of the oxygen scavenger and compliance with FDA regulations will be verified by Certificate of Conformance (CoC).

6/ Not intact is defined as any mini loaf or muffin separated into two or more distinct pieces. Crumbs shall not be considered as not intact.

7/ As applicable, mini loaves or muffin heights, excluding icings, shall be measured at the highest point along the vertical cut.

8/ Type I, flavor 1, sample average net weight less than 36 ounces (1020 grams) shall be cause for rejection of the lot.

9/ Type I, flavor 2, sample average net weight, without icing, less than 29 ounces (822 grams) shall be cause for rejection of the lot.

10/ Type I, flavor 3, sample average net weight less than 36 ounce (1020 grams) shall be cause for rejection of the lot.

11/ Type II, flavor 1, sample average net weight less than 25 ounces (708 grams) shall be cause for rejection of the lot.

B. Methods of inspection.

(1) 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 quality scale to be considered acceptable.

(2) Net weight.

a. Type I and Type II. 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 empty tray, ovenable tray insert (if utilized), appropriate number of oxygen scavengers, and lid. Results shall be reported to the nearest 1 ounce or to the nearest 1 gram.

b. Icing (for Type I, flavor 2). The net weight of the filled and sealed pouch shall be determined by weighing each sample unit on a suitable scale tared with a representative empty pouch. Results shall be reported to the nearest 0.1 ounce or to the nearest 1 gram.

(3) Analytical. The sample to be analyzed shall be a one-pound composite of three filled and sealed polymeric trays that have been selected at random from one production lot. The sample to be analyzed shall not include the icing. 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>
Fat	922.06, 991.36, 2008.06 or AACC 30-10
Moisture	925.45A or 2008.06

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

(4) Water activity. Eight filled and sealed polymeric trays shall be selected at random from one production lot regardless of lot size. Water activity ( $a_w$ ) shall be determined not less than 4 days but not more than 14 days after baking to allow moisture equilibration in the product. The product shall be individually tested for water activity in accordance with the Official Methods of Analysis of the AOAC method 978.18, using an electric hygrometer system self-temperature controlled at 25°C or an equivalent instrument. The sample unit shall be a specimen from the center of the product. The results of each  $a_w$  determination shall be reported to the nearest 0.01. Any nonconforming result shall be cause for rejection of the lot. For type I, flavor 2 the samples to be tested shall not include the icing.

(5) Oxygen testing. Eight filled and sealed polymeric trays shall be randomly selected from one production lot and individually tested for oxygen content. Testing shall be accomplished after the filled and sealed polymeric trays have been allowed to equilibrate at room temperature for not less than 72 hours from the time of sealing. Test results shall be reported to the nearest 0.01 percent. Any individual result not conforming to the oxygen content requirement specified in Section C of this Performance-based Contract Requirements document shall be classified as a major defect and shall be cause for rejection of the lot.

## **E-6 QUALITY ASSURANCE PROVISIONS (PACKAGING AND PACKING MATERIALS)**

### **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 tray, container and packaging materials, as applicable, in accordance with the lot size, sample unit, and inspection level criteria shall be examined for the performance characteristics listed in table I of MIL-PRF-32004, Packaging of Food in Polymeric Trays. Any test failure shall be classified as a major defect and shall be cause for rejection of the lot.

(2) Examination of container. The container shall be examined for the defects listed in table II of MIL-PRF-32004. 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~~ **Fifty** sample units shall be examined for critical defects. The finding of any critical defect shall be cause for rejection of the lot. The labeling defects are listed in table II as follows:

TABLE II. 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 D3330/D3330M, Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape. In lieu of testing, a CoC shall be provided.

### **B. Component.** Inspection for icing pouch shall be as follows:

(1) Unfilled preformed icing pouch certification. A CoC may be accepted as evidence that unfilled pouches conform to the requirements specified in D-1,B(1)a. When deemed necessary by the USDA, testing of the unfilled preformed pouches for seal strength shall be as specified in E-6,C(1)a.



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(2) Filled and sealed icing pouch examination. The filled and sealed pouches shall be examined for the defects listed in table III. The lot size shall be expressed in pouches. The sample unit shall be one pouch. 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 6.5 for minor defects.

TABLE III. Filled and sealed icing pouch defects 1/

Category		Defect
<u>Major</u>	<u>Minor</u>	
101		Tear or hole or open seal.
102		Seal width less than 1/16 inch. <u>2/</u>
103		Presence of delamination. <u>3/</u>
104		Unclean pouch. <u>4/</u>
105		Pouch has foreign odor.
106		Any impression or design on the heat seal surfaces which conceals or impairs visual detection of seal defects. <u>5/</u>
	201	Label missing or incorrect or illegible.
	202	Tear nick or notch or serrations missing or does not facilitate opening.
	203	Seal width less than 1/8 inch but greater than or equal to 1/16 inch. <u>2/</u>
	204	Presence of delamination. <u>3/</u>

1/ Any evidence of rodent or insect infestation shall be cause for rejection of the lot.

2/ The effective closure seal is defined as any uncontaminated, fusion bonded, continuous path, minimum 1/16 inch wide, from side seal to side seal that produces a hermetically sealed pouch.

3/ Delamination defect classification:

Major - Delamination of the outer ply in the pouch seal area that can be propagated to expose aluminum foil at the food product edge of the pouch after manual flexing of the delaminated area. To flex, the delaminated area shall be held between the thumb and forefinger of each hand with both thumbs and forefingers touching each other. The delaminated area shall then be rapidly flexed 10 times by rotating both hands in alternating

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clockwise-counterclockwise directions. Care shall be exercised when flexing delaminated areas near the tear notches to avoid tearing the pouch material. After flexing, the separated outer ply shall be grasped between thumb and forefinger and gently lifted toward the food product edge of the seal or if the separated area is too small to be held between thumb and forefinger, a number two stylus shall be inserted into the delaminated area and a gentle lifting force applied against the outer ply. If separation of the outer ply can be made to extend to the product edge of the seal with no discernible resistance to the gentle lifting, the delamination shall be classified as a major defect. Additionally, spot delamination of the outer ply in the body of the pouch that is able to be propagated beyond its initial borders is also a major defect. To determine if the laminated area is a defect, use the following procedure: Mark the outside edges of the delaminated area using a bold permanent marking pen. Open the pouch and remove the contents. Cut the pouch transversely not closer than 1/4 inch ( $\pm 1/16$  inch) from the delaminated area. The pouch shall be flexed in the area in question using the procedure described above. Any propagation of the delaminated area, as evidenced by the delaminated area exceeding the limits of the outlined borders, shall be classified as a major defect.

Minor - Delamination of the outer ply in the pouch seal area is acceptable and shall not be classified as a minor defect unless it extends to within 1/16 inch of the food product edge of the seal. All other minor outer ply delamination in the pouch seal area or isolated spots of delamination in the body of the pouch that do not propagate when flexed as described above shall be classified as minor defects.

4/ Outer packaging shall be free from foreign matter which is unwholesome, has the potential to cause pouch damage (for example, glass, metal filings) or generally detracts from the clean appearance of the pouch. The following examples shall not be classified as defects for unclean:

a. Foreign matter which presents no health hazard or potential pouch damage and which can be readily removed by gently shaking the package or by gently brushing the pouch with a clean dry cloth.

b. Dried product which affects less than 1/8 of the total surface area of one pouch face (localized and aggregate).

5/ If doubt exists as to whether or not the sealing equipment leaves an impression or design on the closure seal surface that could conceal or impair visual detection of seal defects, samples shall be furnished to the contracting officer for a determination as to acceptability.

C. Methods of inspection.

(1) Seal testing (for Type I, flavor 2). The icing pouch seals shall be tested for seal strength as required in a, b or c, as applicable.

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a. Unfilled preformed icing pouch seal testing. The seals of the unfilled preformed pouch shall be tested for seal strength in accordance with ASTM F88/F88M, Standard Test Method for Seal Strength of Flexible Barrier Materials. The lot size shall be expressed in pouches. The sample unit shall be one unfilled pouch. The sample size shall be the number of pouches indicated by inspection level S-1. Three adjacent specimens shall be cut from each of the three sealed sides of each pouch in the sample. The average seal strength of any side shall be calculated by averaging the three specimens cut from that side. Any average seal strength of less than 6 pounds per inch of width or any test specimen with a seal strength of less than 5 pounds per inch of width shall be classified as a major defect and shall be cause for rejection of the lot.

b. Icing pouch closure seal testing. The closure seals of the pouches shall be tested for seal strength in accordance with ASTM F88/F88M. The lot size shall be expressed in pouches. The sample unit shall be one pouch. The sample size shall be the number of pouches indicated by inspection level S-1. For the closure seal on preformed pouches, three adjacent specimens shall be cut from the closure seal of each pouch in the sample. The average seal strength shall be calculated by averaging the three specimens cut from the closure. Any average seal strength of less than 6 pounds per inch of width or any test specimen with a seal strength of less than 5 pounds per inch of width shall be classified as a major defect and shall be cause for rejection of the lot.

c. Internal pressure test. The internal pressure resistance shall be determined by pressurizing the pouches while they are restrained between two rigid plates. The lot size shall be expressed in pouches. The sample unit shall be one pouch. The sample size shall be the number of pouches indicated by inspection level S-1. If a three seal tester (one that pressurizes the pouch through an open end) is used, the closure seal shall be cut off for testing the side and bottom seals of the pouch. For testing the closure seal, the bottom seal shall be cut off. The pouches shall be emptied prior to testing. If a four-seal tester (designed to pressurize filled pouches by use of a hypodermic needle through the pouch wall) is used, all four seals can be tested simultaneously. The distance between rigid restraining plates on the four-seal tester shall be equal to the thickness of the product +1/16 inch. Pressure shall be applied at the approximate uniform rate of 1 pound per square inch gage (psig) per second until 14 psig pressure is reached. The 14 psig pressure shall be held constant for 30 seconds and then released. The pouches shall then be examined for separation or yield of the heat seals. Any rupture of the pouch or evidence of seal separation greater than 1/16 inch in the pouch manufacturer's seal shall be considered a test failure. Any seal separation that reduces the effective closure seal width to less than 1/16 inch (see table III, footnote 2/) shall be considered a test failure. Any test failure shall be classified as a major defect and shall be cause for rejection of the lot.

**D. Packing.**

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

#### E. Unitization.

(1) Unit load examination. The unit load shall be examined in accordance with DLA Troop Support Form 3507, Loads, Unit: Preparation of Semiperishable Subsistence Items. Any nonconformance shall be classified as a major defect.

## **SECTION J REFERENCE DOCUMENTS**

Unless otherwise specified, the applicable version of these documents is that which is active on the date of the solicitation or contract.

### DLA Troop Support Forms

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

### DEPARTMENT OF DEFENSE SPECIFICATION

MIL-PRF-32004 Packaging of Food in Polymeric Trays

### GOVERNMENT PUBLICATIONS

Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder (21 CFR Parts 1 - 199) and (9 CFR Parts 1 - 391)

### NON-GOVERNMENTAL STANDARDS

AMERICAN SOCIETY FOR QUALITY (ASQ) [www.asq.org](http://www.asq.org)

ANSI/ASQ Z1.4 Sampling Procedures and Tables for Inspection by Attributes  
ASTM INTERNATIONAL [www.astm.org](http://www.astm.org)

D1974/D1974M Standard Practice for Methods of Closing, Sealing, and  
Reinforcing Fiberboard Boxes

D3330/D3330M Standard Test Method for Peel Adhesion of Pressure-  
Sensitive Tape

D4727/D4727M Standard Specification for Corrugated and Solid Fiberboard  
Sheet Stock (Container Grade) and Cut Shapes

D5118/D5118M Standard Practice for Fabrication of Fiberboard Shipping  
Boxes

F88/F88M Standard Test Method for Seal Strength of Flexible Barrier  
Materials

AOAC INTERNATIONAL [www.aoac.org](http://www.aoac.org)

Official Methods of Analysis (OMA) of AOAC International

AMERICAN ASSOCIATION OF CEREAL CHEMISTS (AACC) [www.aaccnet.org](http://www.aaccnet.org)

Approved Methods of the American Association of Cereal Chemists

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