

**PCR-C-007F**

**3 July 2013**

**W/Change 01 4 Apr 19 ES19-019 (DSCP-SS-19-00752)**

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## **SECTION C**

This document covers cakes, brownies, muffin tops and filled cakes in a flexible pouch for use by the Department of Defense as a component of operational rations.

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

#### **PCR-C-007F, CAKES, BROWNIES, MUFFIN TOPS AND FILLED CAKES, PACKAGED IN A FLEXIBLE POUCH, SHELF STABLE**

##### Types and flavors.

Type I – Pound cakes

- Flavor 1 – Vanilla
- Flavor 6 – Lemon poppy seed
- Flavor 7 – Spice
- Flavor 10 – Carrot
- Flavor 11 – Marble
- Flavor 12 – Applesauce

Type II – Brownies

- Flavor 1 – Fudge with chocolate drops
- Flavor 2 – Dark chocolate fudge with chocolate drops

Type III – Muffin tops

- Flavor 1 – Chocolate banana nut
- Flavor 2 – Maple

Type IV – Filled pound cakes

- Flavor 1 – Chocolate with chocolate filling

##### Styles.

- Style 1 – Regular
- Style 2 – *Trans* fat free

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Packages.

- Package A – Meal, Cold Weather (MCW)
- Package B – Food Packet, Long Range Patrol (LRP)
- Package C – Meal, Ready-to-Eat™ (MRE™)
- Package J – First Strike Ration® (FSR™)

**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 intact. The product shall show no signs of excessive heating (materially darkened or scorched). The product surface may have slightly browned edges. The product shall have a uniform cell (crumb) structure and shall show no evidence of compression streaks. The finished product shall be free from foreign materials.

(2) Type I.

a. Flavor 1. The vanilla pound cake shall have a light tan surface and a pale, off-white crumb.

b. Flavor 6. The lemon poppy seed pound cake shall have a light golden surface and a yellow crumb with poppy seeds distributed throughout.

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c. Flavor 7. The spice pound cake shall have a medium beige surface and a light beige crumb and may have flecks of spices.

d. Flavor 10. The carrot pound cake shall have a medium brown to golden brown surface and a medium golden brown crumb with small pieces of orange carrot distributed throughout.

e. Flavor 11. The marble pound cake shall have a light golden brown to dark brown swirled surface and crumb.

f. Flavor 12. The applesauce pound cake shall have a golden brown surface and a light to medium beige crumb with dark tan apple pieces distributed throughout.

(3) Type II.

a. Flavor 1. The fudge brownie with chocolate drops shall have a medium to dark brown surface and crumb and shall have chocolate drops distributed throughout.

b. Flavor 2. The dark chocolate fudge brownie with chocolate drops shall have a dark brown surface and crumb and shall have chocolate drops distributed throughout.

(4) Type III.

a. Flavor 1. The chocolate banana nut muffin top shall be round and shall have a dark brown surface and crumb containing off-white to pale yellow banana flavored drops and walnut pieces distributed throughout.

b. Flavor 2. The maple muffin top shall be round and shall have a light to medium golden brown surface and a pale yellow crumb. Muffin top may have pale yellow maple flecks on the surface. The crumb may contain air structure pockets.

(5) Type IV, flavor 1. The chocolate filled pound cake with chocolate filling shall have a dark brown surface and crumb. The chocolate filling shall be a dark brown color. The pound cake shall not have any filling leaking through the cake portion of the product.

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

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(1) Type I.

a. Flavor 1. The vanilla pound cake shall have a sweet vanilla odor and flavor.

b. Flavor 6. The lemon poppy seed pound cake shall have a sweet, mild lemon and poppy seed odor and flavor.

c. Flavor 7. The spice pound cake shall have a sweet spice odor and flavor.

d. Flavor 10. The carrot pound cake shall have a sweet, caramelized spiced odor and flavor with cinnamon, nutmeg, and cloves.

e. Flavor 11. The marble pound cake shall have a semi-sweet chocolate and sweet vanilla odor and flavor.

f. Flavor 12. The applesauce pound cake shall have a sweet cooked apple and brown spice odor and flavor.

(2) Type II.

a. Flavor 1. The fudge brownie with chocolate drops shall have a sweet chocolate odor and flavor.

b. Flavor 2. The dark chocolate fudge brownie with chocolate drops shall have a sweet dark chocolate odor and a sweet, slightly bitter dark chocolate flavor.

(3) Type III.

a. Flavor 1. The chocolate banana nut muffin top shall have a sweet, mild cocoa with banana and walnut odor and flavor.

b. Flavor 2. The maple muffin top shall have a sweet, maple odor and flavor.

(4) Type IV, flavor 1. The chocolate pound cake shall have a sweet, mild chocolate odor and flavor. The chocolate filling shall have a sweet, mild chocolate odor and flavor.

E. Texture.

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(1) Type I.

a. Flavors 1, 7, and 11. The vanilla, spice, and marble pound cakes shall have a dense, firm, tender, moist, fine grain crumb texture.

b. Flavor 6. The lemon poppy seed pound cake shall have a dense, firm, tender, moist, fine grain crumb texture with slightly crunchy poppy seeds.

c. Flavor 10. The carrot pound cake shall have a dense, firm, tender, moist, fine grain crumb texture with pieces of soft carrot.

d. Flavor 12. The applesauce pound cake shall have a dense, firm, tender, moist, fine grain crumb texture with pieces of soft apple.

(2) Type II, flavors 1 and 2. The fudge brownie with chocolate drops and dark chocolate fudge brownie with chocolate drops shall have a very dense, firm, moist texture with chocolate drops.

(3) Type III.

a. Flavor 1. The chocolate banana nut muffin top shall have a tender, moist, fine grain crumb texture with slightly firm banana drops and firm walnuts.

b. Flavor 2. The maple muffin top shall have a tender, moist, fine grain crumb texture. Maple flecks may be slightly crunchy.

(4) Type IV, flavor 1. The chocolate pound cake with chocolate filling shall have a dense, firm, tender, moist, fine grain crumb texture with a thick, smooth pudding-like filling. The filling shall not be excessively thin or runny.

F. Percent filling. For type IV, the percent filling by weight shall be not less than 20.0 percent.

G. Dimensions. Types I and IV pound cakes and type II brownies shall be not greater than 4-3/4 inches long and 3-1/4 inches in width **for rectangular product or not greater than 4-1/4**

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**inches in diameter for round product.** Type III muffin tops shall be not greater than 4-1/4 inches in diameter.

H. Net weight.

(1) Type I. The average net weight of type I pound cakes shall be not less than 2.5 ounces (71 grams). The net weight of an individual pouch shall be not less than 2.3 ounces (65 grams).

(2) Type II. The average net weight of type II brownies shall be not less than 3.0 ounces (85 grams). The net weight of an individual pouch shall be not less than 2.6 ounces (74 grams).

(3) Type III. The average net weight of type III muffin tops shall be not less than 2.2 ounces (62 grams). The net weight of an individual pouch shall be not less than 2.0 ounces (57 grams).

(4) Type IV. The average net weight of type IV filled pound cakes shall be not less than 3.0 ounces (85 grams). The net weight of an individual pouch shall be not less than 2.6 ounces (74 grams).

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) Fat.

- a. For types I, II, and III, the fat content shall be not less than 18.0 percent.
- b. For type IV, the fat content shall be not less than 12.0 percent.
- c. For style 2, the *trans* fat content shall be not greater than 0 grams per serving.

(2) Moisture.

- a. The moisture content for type I pound cakes shall be not less than 13.0 percent.

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b. The moisture content for type II brownies shall be not less than 15.0 percent.

c. The moisture content for type III, flavor 1 chocolate banana nut muffin tops shall be not less than 10.0 percent. The moisture content for type III, flavor 2 maple muffin tops shall be not less than 13.0 percent.

d. The moisture content for type IV filled pound cake shall be not less than 20.0 percent.

(3) Water activity. The water activity ( $a_w$ ) shall be not greater than 0.85.

(4) Oxygen. The oxygen content of the filled and sealed pouch shall not exceed 0.30 percent.

## **SECTION D**

### **D-1 PACKAGING**

A. Packaging. One unit of product and one oxygen scavenger shall be packaged in a preformed or form-fill-seal barrier pouch as described below.

(1) Preformed pouches.

a. Pouch material. The preformed pouch shall be fabricated from 0.002 inch thick ionomer or polyethylene film laminated or extrusion coated to 0.00035 inch thick aluminum foil which is then laminated to 0.0005 inch thick polyester. Tolerances for thickness of plastic films shall be plus or minus 20 percent and tolerance for the foil layer shall be plus or minus 10 percent. The material shall show no evidence of delamination, degradation, or foreign odor when heat sealed or fabricated into pouches. The material shall be suitably formulated for food packaging and shall not impart an odor or flavor to the product. The complete exterior surface of the pouch shall be uniformly colored and shall conform to number 20219, 30219, 30227, 30279, 30313, 30324, or 30450 of FED-STD-595, Colors Used in Government Procurement.

b. Pouch construction. The pouch shall be a flat style preformed pouch having maximum inside dimensions of 5-1/2 inches wide by 6-3/4 inches long. The pouch shall be

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made by heat sealing three edges with 3/8 inch (-1/8 inch, +3/16 inch) wide 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. 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 for internal pressure resistance. A tear nick, notch or serrations shall be provided to facilitate opening of the filled and sealed pouch. A 1/8 inch wide lip may be incorporated at the open end of the pouch.

c. Pouch filling and sealing. One unit of product and one oxygen scavenger shall be inserted into the pouch. The filled pouch shall be 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. 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 for internal pressure resistance.

(2) Horizontal form-fill-seal pouches.

a. Pouch material. The horizontal form-fill-seal pouch shall consist of a formed tray-shaped body with a flat sheet, heat sealable cover or a tray-shaped body with a tray-shaped heat sealable cover. The tray-shaped body and the tray-shaped cover shall be fabricated from a 3-ply flexible laminate barrier material consisting of, from outside to inside, 0.0009 inch thick oriented polypropylene bonded to 0.0007 inch thick aluminum foil with 10 pounds per ream pigmented polyethylene or adhesive and bonding the opposite side of the aluminum foil to 0.003 inch thick ionomer or a blend of not less than 50 percent linear low density polyethylene and polyethylene. The linear low density polyethylene portion of the blend shall be the copolymer of ethylene and octene-1 having a melt index range of 0.8 to 1.2 g/10 minutes in accordance with ASTM D1238, Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer and a density range of 0.918 to 0.922 g/cc in accordance with ASTM D1505, Standard Test Method for Density of Plastics by Density-Gradient Technique. Alternatively, 0.0005 inch thick polyester may be used in place of the oriented polypropylene as the outer ply of the laminate. The flat sheet cover shall be made of the same 3-ply laminate as specified for the tray-shaped body except the aluminum foil thickness may be 0.00035 inch. Tolerances for thickness of plastic films shall be plus or



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minus 20 percent and tolerance for the foil layer shall be plus or minus 10 percent. The color requirements of the exterior (oriented polypropylene or polyester side) of the laminate shall be as specified in D-1,A(1)a. The material shall show no evidence of delamination, degradation, or foreign odor when heat sealed or fabricated into pouches. The material shall be suitably formulated for food packaging and shall not impart any odor or flavor to the product.

b. Pouch construction. The tray-shaped body and the tray-shaped cover shall be formed by drawing the flexible laminate material into an appropriately shaped cavity. The flat cover shall be in the form of a flat sheet of the barrier material taken from roll stock. One unit of product and one oxygen scavenger shall be placed into the tray-shaped body of the pouch. Pouch closure shall be effected by heat sealing together the cover and body along the entire pouch perimeter. The closure seal width shall be a minimum of 1/8 inch. The closure seal 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. 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 for internal pressure resistance. The maximum outside dimensions of the sealed pouch shall be 6 inches wide by 6 inches long. A tear nick, notch or serrations shall be provided to facilitate opening of the filled and sealed pouch. The sealed pouch shall not show any evidence of material degradation, aluminum stress cracking, delamination or foreign odor. Heat seals shall be free of 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.

(3) Oxygen scavenger. The oxygen scavenger shall be constructed of materials that are safe for direct and indirect food contact, and shall be suitable for use with edible products. The oxygen scavenger shall be in compliance with all applicable FDA regulations.

## **D-2 LABELING**

A. Pouches. Each pouch shall be correctly and legibly labeled. Printing ink shall be permanent black ink or other dark contrasting color which is free of carcinogenic elements. The label shall contain the following information:

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- (1) Name and flavor of product (letters not less than 1/8 inch high)
- (2) Ingredients
- (3) Date 1/
- (4) Net weight
- (5) Name and address of packer
- (6) "Nutrition Facts" label in accordance with the Nutrition Labeling and Education Act (NLEA) and all applicable FDA regulations

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 day code. For example, 14 February 2014 would be coded as 4045. The Julian day code shall represent the day the product was packaged into the pouch.

### **D-3 PACKING**

A. Packing. Not more than 40 pounds of product shall be packed in a fiberboard shipping box 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, burst grade 200 or ECT grade 32 of ASTM D4727/D4727M, Standard Specification for Corrugated and Solid Fiberboard Sheet Stock (Container Grade) and Cut Shapes. Each box shall be closed in accordance with ASTM D1974/D1974M, Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes.

### **D-5 MARKING**

A. Shipping containers. Shipping containers shall be marked in accordance with DLA Troop Support 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) or Conformance not provided shall be cause for rejection of the lot.

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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:

DEPARTMENT OF THE ARMY  
FCDD-SCC-EMR  
COMBAT CAPABILITIES DEVELOPMENT COMMAND-SOLDIER CENTER  
15 GENERAL GREENE AVENUE  
NATICK, MA 01760-5056

One lot shall be randomly selected during each calendar month of production or as otherwise specified in the contract. Three (3) sample units shall be randomly selected from that one production lot. The three (3) sample units shall be shipped to Natick within five (5) working

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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 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 pouches. The sample unit shall be the contents of one pouch. The inspection level shall be S-3 and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 1.5 for major defects and 4.0 for minor defects. Defects and defect classifications are listed in table I.

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 or not style as specified.
102		Evidence of excessive heating (materially darkened or scorched).
103		Pouch does not contain one intact oxygen scavenger. <u>4/</u>
	201	Product not intact.
	202	Product does not have a uniform cell (crumb) structure.
	203	Evidence of compression streaks.
	204	Product not dimensions as specified.
	205	Net weight of any individual type I pound cake less than 2.3 ounces (65 grams). <u>5/</u>

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

Category		Defect
<u>Major</u>	<u>Minor</u>	
	206	Net weight of any individual type II brownie less than 2.6 ounces (74 grams). <u>6/</u>
	207	Net weight of any individual type III muffin top less than 2.0 ounces (57 grams). <u>7/</u>
	208	Net weight of any individual type IV filled pound cake less than 2.6 ounces (74 grams). <u>8/</u>
		<u>Type I – Pound cakes</u>
		<u>Flavor 1 – Vanilla</u>
104		Pound cake not a sweet vanilla odor or flavor.
	209	Pound cake does not have a light tan surface or does not have a pale, off-white crumb.
	210	Pound cake texture not dense or not firm or not tender or not moist or not fine grain crumb.
		<u>Flavor 6 – Lemon poppy seed</u>
105		Pound cake not a sweet, mild lemon and poppy seed odor or flavor.
	211	Pound cake does not have a light golden surface or does not have a yellow crumb with poppy seeds distributed throughout.
	212	Pound cake texture not dense or not firm or not tender or not moist or not fine grain crumb or not with slightly crunchy poppy seeds.
		<u>Flavor 7 – Spice</u>
106		Pound cake not a sweet spice odor or flavor.
	213	Pound cake does not have a medium beige surface or does not have a light beige crumb.

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

Category		Defect
<u>Major</u>	<u>Minor</u>	
	214	Pound cake texture not dense or not firm or not tender or not moist or not fine grain crumb.
107		<u>Flavor 10 – Carrot</u> Pound cake not a sweet, caramelized spiced odor or flavor with cinnamon, nutmeg, and cloves.
	215	Pound cake does not have a medium brown to golden brown surface or does not have a medium golden brown crumb with small pieces of orange carrot distributed throughout.
	216	Pound cake texture not dense or not firm or not tender or not moist or not fine grain crumb or not with pieces of soft carrot.
108		<u>Flavor 11 – Marble</u> Pound cake not a semi-sweet chocolate and sweet vanilla odor or flavor.
	217	Pound cake does not have a light golden brown to dark brown swirled surface and crumb.
	218	Pound cake texture not dense or not firm or not tender or not moist or not fine grain crumb.
109		<u>Flavor 12 – Applesauce</u> Pound cake not a sweet cooked apple and brown spice odor or flavor.
	219	Pound cake does not have a golden brown surface or does not have a light to medium beige crumb with dark tan apple pieces distributed throughout.
	220	Pound cake texture not dense or not firm or not tender or not moist or not fine grain crumb or not with pieces of soft apple.

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

Category		Defect
<u>Major</u>	<u>Minor</u>	
		<u>Type II – Brownies</u>
		<u>Flavor 1 – Fudge with chocolate drops</u>
110		Brownie not a sweet chocolate odor or flavor.
	221	Brownie does not have a medium to dark brown surface and crumb with chocolate drops distributed throughout.
	222	Brownie texture not very dense or not firm or not moist or not with chocolate drops.
		<u>Flavor 2 – Dark chocolate fudge with chocolate drops</u>
111		Brownie not a sweet dark chocolate odor or not a sweet, slightly bitter, dark chocolate flavor.
	223	Brownie does not have a dark brown surface and crumb with chocolate drops distributed throughout.
	224	Brownie texture not very dense or not firm or not moist or not with chocolate drops.
		<u>Type III – Muffin tops</u>
		<u>Flavor 1 – Chocolate banana nut</u>
112		Muffin top not a sweet, mild cocoa with banana and walnut odor or flavor.
	225	Muffin top not round or does not have a dark brown surface and crumb containing off-white to pale yellow banana flavored drops and walnut pieces distributed throughout.
	226	Muffin top texture not tender or not moist or not fine grain crumb or not with slightly firm banana drops or not with firm walnuts.

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

Category		Defect
<u>Major</u>	<u>Minor</u>	
113		<u>Flavor 2 – Maple</u> Muffin top not a sweet, maple odor or flavor.
	227	Muffin top not round or does not have a light to medium golden brown surface or does not have a pale yellow crumb.
	228	Muffin top texture not tender or not moist or not fine grain crumb.
		<u>Type IV – Filled pound cakes 9/</u>
114		<u>Flavor 1 – Chocolate with chocolate filling</u> Filled pound cake not a sweet, mild chocolate odor or flavor.
115		Chocolate filling not a sweet, mild chocolate odor or flavor.
	229	Filled pound cake does not have a dark brown surface and crumb.
	230	Chocolate filling not a dark brown color.
	231	Cake portion of the product not free of filling leakage.
	232	Filled pound cake texture not dense or not firm or not tender or not moist or not fine grain crumb.
	233	Filled pound cake does not have a thick, smooth, pudding-like filling, or filling is excessively thin or runny.

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.



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3/ For style 2, the *trans* fat content shall be verified by the NLEA “Nutrition Facts” label. Product not conforming to the *trans* fat content as specified in Section C of this document shall be cause for rejection of the lot.

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

5/ Type I, sample average net weight less than 2.5 ounces (71 grams) shall be cause for rejection of the lot.

6/ Type II, sample average net weight less than 3.0 ounces (85 grams) shall be cause for rejection of the lot.

7/ Type III, sample average net weight less than 2.2 ounces (62 grams) shall be cause for rejection of the lot.

8/ Type IV, sample average net weight less than 3.0 ounces (85 grams) shall be cause for rejection of the lot.

9/ For type IV, the percent filling shall be verified by CoC.

**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. The net weight shall be determined by weighing each sample unit on a suitable scale tared with a representative empty pouch and an oxygen scavenger. 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 composite of eight filled and sealed pouches which have been selected at random from the lot. The composite sample shall be prepared and analyzed in accordance with the following methods of the Official Methods

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of Analysis (OMA) of AOAC International or approved methods of the American Association of Cereal Chemists (AACC):

<u>Test</u>	<u>Method Number</u>
Fat	922.06, 991.36 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 ( $a_w$ ) testing. Eight filled and sealed pouches shall be randomly selected from one production lot and tested for  $a_w$  in accordance with the latest edition of the Official Methods of Analysis (OMA) of AOAC International, method 978.18, using an electric hygrometer system self temperature controlled (at 25°C) or an equivalent instrument. Water activity shall be determined not less than 4 days but not more than 14 days after baking to allow moisture equilibration in the product. The sample unit shall be a specimen from the center of the product. Test results shall be reported to the nearest 0.01  $a_w$ . Government verification will be conducted through actual testing by a Government laboratory. Any nonconforming  $a_w$  result shall be cause for rejection of the lot.

(5) Oxygen content testing. Eight filled and sealed pouches shall be randomly selected from one production lot and individually tested for oxygen content. Testing shall be accomplished after the filled and sealed pouches have been allowed to equilibrate at room temperature for not less than 48 hours from the time of sealing. Test results shall be reported to the nearest 0.01 percent. Government verification will be conducted through actual testing by a Government laboratory. Any individual result not conforming to the oxygen content requirement 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.**

(1) Pouch material certification. The pouch material shall be tested for these characteristics. A Certificate of Conformance (CoC) may be accepted as evidence that the characteristics conform to the specified requirements.

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<u>Characteristic</u>	<u>Requirement paragraph</u>	<u>Test procedure</u>
Thickness of films for laminated material	D-1,A(1)a and D-1,A(2)a	ASTM D2103 <u>1/</u>
Aluminum foil thickness	D-1,A(1)a and D-1,A(2)a	ASTM B479 <u>2/</u>
Laminated material identification and construction	D-1,A(1)a and D-1,A(2)a	Laboratory evaluation
Color of laminated material	D-1,A(1)a and D-1,A(2)a	FED-STD-595 <u>3/</u>

1/ Standard Specification for Polyethylene Film and Sheeting

2/ Standard Specification for Annealed Aluminum and Aluminum-Alloy Foil for Flexible Barrier, Food Contact, and Other Applications

3/ Colors Used in Government Procurement

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

(3) Filled and sealed pouch examination. The filled and sealed pouches shall be examined for the defects listed in table II. The lot size shall be expressed in pouches. The sample unit shall be one pouch. The inspection level shall be I and the AQL, expressed in terms of defects per hundred units, shall be 0.65 for major defects and 2.5 for minor defects.

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TABLE II. Filled and sealed 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>
107		Not packaged as specified.
108		Presence of stress cracks in the aluminum foil. <u>6/ 7/</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:

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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 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 - 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.

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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.

6/ Applicable to form-fill-seal pouches only.

7/ The initial examination shall be a visual examination of the closed package. Any suspected visual evidence of stress cracks in the aluminum foil (streaks, breaks, or other disruptions in the laminated film) shall be verified by the following physical examination. To examine for stress cracks, the inside surface of both tray-shaped bodies shall be placed over a light source and the outside surface observed for the passage of light. Observation of light through the pouch material in the form of a curved or straight line greater than 2 mm in length shall be evidence of the presence of stress cracks. Observation of light through the pouch material in the form of a curved or straight line 2 mm in length or smaller or of a single pinpoint shall be considered a pinhole. Observation of ten or more pinholes per pouch shall be evidence of material degradation.

#### B. Methods of Inspection.

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

a. Unfilled preformed 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 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.

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b. 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. For form-fill-seal pouches, three adjacent specimens shall be cut from each side and each end of each pouch in the sample. The average seal strength of any side, end or closure shall be calculated by averaging the three specimens cut from that side, end or 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 II, footnote 2/) shall be considered a test failure and shall be classified as a major defect and shall be cause for rejection of the lot.

C. Packing.

(1) Shipping container and marking examination. The filled and sealed shipping containers shall be examined for the defects listed in table III. The lot size shall be expressed in shipping containers. The sample unit shall be one shipping container fully packed. The

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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 III. 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	More than 40 pounds of product.

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.



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## **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 Form

Form 3556                      Marking Instructions for Boxes, Sacks, and Unit Loads of  
Perishable and Semiperishable Subsistence

### FEDERAL STANDARD

FED-STD-595      Colors Used in Government Procurement

### 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)

B479                                      Standard Specification for Annealed Aluminum and  
Aluminum-Alloy Foil for Flexible Barrier, Food  
Contact, and Other Applications

D1238                                      Standard Test Method for Melt Flow Rates of  
Thermoplastics by Extrusion Plastometer

D1505                                      Standard Test Method for Density of Plastics by the  
Density-Gradient Technique

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

D2103                                      Standard Specification for Polyethylene Film and  
Sheeting

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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)

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.)