

SECTION C

This document covers fortified snack bread packaged in a flexible pouch for use by the Department of Defense as a component of operational rations.

C-1 ITEM DESCRIPTION

PCR-S-009C, SNACK BREAD, FORTIFIED, PACKAGED IN A FLEXIBLE POUCH, SHELF STABLE

Types.

- Type I – Wheat snack bread
- Type II – Plain snack bread
- Type III – Chipotle snack bread
- Type IV – Italian bread sticks
- Type V – Multigrain snack bread

Styles.

- Style A – Single pack
- Style B – Twin pack

Packages.

- 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 non-comparable 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. For Style A, the finished product shall be one intact fortified snack bread and shall be from enriched flour and shall be fortified with calcium. For Style B, the finished product shall be two intact fortified snack breads and shall be from enriched flour and shall be fortified with calcium. The product shall show no evidence of excessive heating (materially darkened or scorched). Types I-III fortified snack bread shall be flat and shall be intact. Types I-III surface shall have dock holes and may be slightly uneven. The Type IV fortified Italian bread sticks shall be flat with three uniformly spaced straight lines scored onto the surface and shall be intact. Type IV shall break with light pressure into four, smaller, uniform and rectangular bread stick pieces. For Type V, surface may be slightly uneven and shall not contain dock holes. The finished product shall be free from foreign materials.

(2) Type I. The wheat snack bread surface shall be light tan to medium tan color and shall have flecks of wheat bran. The interior crumb shall be a paler color than the surface and shall have flecks of wheat bran.

(3) Type II. The plain snack bread surface shall be a light golden to medium golden color. The interior crumb shall be an off white color.

(4) Type III. The chipotle snack bread surface shall be light tan to medium tan color with visible flecks of reddish orange and green seasoning. The interior crumb shall be a slightly paler color than the surface with visible flecks of reddish orange and green seasonings throughout.

(5) Type IV. The Italian bread sticks surface shall be light tan to medium tan color with visible flecks of reddish orange and green seasoning. The interior crumb shall be a slightly paler color than the surface with visible flecks of reddish orange and green seasonings and rosemary throughout.

(6) Type V. The multigrain snack bread shall have a light golden to medium golden brown color with a visible mixture of ground grains on surface. Surface ground grains may contain, but not limited to, rolled wheat, rye nuggets, degermed yellow corn grits, rolled oats, rye flakes, triticale flakes, parboiled brown rice, barley flakes, flaxseed, millet, defatted soy grits. Product shall be intact and free from foreign materials. The interior crumb shall be a light golden to medium golden brown color and may contain visible air cell pockets.

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

(1) Type I. The fortified wheat snack bread shall have a mild wheat odor. The fortified wheat snack bread shall have a slightly sweet, mild wheat flavor and may have a slight leavening aftertaste.

(2) Type II. The fortified plain snack bread shall have a slightly sweet odor and may have a mild chemical odor. The fortified plain snack bread shall have a bland, slightly sweet flavor and may have a slight leavening aftertaste.

(3) Type III. The fortified chipotle snack bread shall have a moderate chipotle chili spice odor and flavor with a moderate chili heat. A slight leavening aftertaste may be present.

(4) Type IV. The fortified Italian bread sticks shall have a mild Italian seasoning and rosemary odor. The fortified Italian bread sticks shall have a slightly sweet, mild wheat, mild Italian seasoning and rosemary flavor and may have a slight leavening aftertaste.

(5) Type V. The fortified multigrain snack bread shall have a mild sweet, cooked multigrain odor and flavor.

E. Texture.

(1) Types I – III. The fortified snack bread shall be moist and shall have an interior crumb with a short and biscuit-like texture.

(2) Type IV. The fortified Italian bread sticks shall be moist and shall have an interior crumb with a short and biscuit-like texture.

(3) Type V. The fortified multigrain snack bread shall be moist and tender and shall have an interior crumb with a bread-like texture.

F. Size. The fortified snack bread dimensions shall be not greater than 4-1/2 inches long and 4 inches wide and not greater than 1/2 inch thick at any single point.

G. Net weight. The net weight of an individual pouch shall be not less than 2.0 ounces (56.7 grams).

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

I. Analytical requirements.

- (1) Fat content. The fat content shall be not greater than 12.0 percent.
- (2) Moisture content. The moisture shall be not greater than 25.0 percent.
- (3) Water activity. The water activity (Aw) shall be not greater than 0.85 at 25°C.
- (4) Oxygen content. The oxygen content of the filled and sealed flexible pouch shall not exceed 0.30 percent.
- (5) Calcium content. The calcium content shall be not less than 175 milligrams (mg) and not greater than 225 mg.

C-3 MISCELLANEOUS INFORMATION

THE FOLLOWING IS INFORMATION ONLY. THIS IS NOT A MANDATORY CONTRACT REQUIREMENT.

A. Ingredients.

(1) Type I. Enriched bleached flour (niacin, reduced iron, thiamine mononitrate, riboflavin, folic acid), malted barley flour, water, partially hydrogenated soybean and/or cottonseed oils, glycerol, sugar, salt, xanthan gum, gum arabic, extracts of malted barley and corn, wheat starch, silicon dioxide, hydroxylated lecithin, soy flour, calcium sulfate, enzymes, sodium sterol lactylate, leavening (sodium bicarbonate, sodium aluminum phosphate), sorbic acid, corn syrup, hydrated monoglycerides, polysorbate 60 (processing aid), acetic and propionic acids, yeast, wheat bran. Other ingredients common to the baking industry may be used.

(2) Type II. Enriched bleached flour (bleached flour, reduced iron, niacin, thiamine mononitrate, riboflavin, folic acid), water, partially hydrogenated soybean and/or cottonseed oils, glycerol, salt, xanthan gum, gum arabic, soy flour, calcium sulfate, enzymes, sodium sterol lactylate, leavening (sodium bicarbonate, sodium aluminum phosphate), sorbic acid, extracts of malted barley and corn, wheat starch, silicon dioxide (anti-caking agent), hydroxylated lecithin (processing aid), corn syrup, hydrated monoglycerides, polysorbate 60 (processing aid), acetic and propionic acids (preservatives), yeast. Other ingredients common to the baking industry may be used.

(3) Type III. Enriched bleached wheat flour (bleached flour, malted barley flour, niacin, reduced iron, thiamine mononitrate, riboflavin, folic acid), water, partially hydrogenated soybean and cottonseed oils, chipotle seasoning (salt, chili pepper and other spices, dehydrated red bell pepper, dehydrated onion, sugar, dehydrated garlic, spice extractives and extractives of paprika), glycerol, contains 2 percent or less: wheat bran, corn syrup, yeast, sorbitan monostearate, hydrated monoglycerides, polysorbate 60, extract of malted barley and corn, wheat starch, silicon dioxide, hydroxylated lecithin, soy flour, calcium sulfate, enzymes, sodium stearyl lactylate, leavening (sodium aluminum phosphate, baking soda), xanthan gum, gum arabic, sorbic acid (preservative).

(4) Type IV. Enriched bleached flour (wheat flour, malted barley flour, niacin, reduced iron, thiamin mononitrate, riboflavin, folic acid), water, partially hydrogenated soybean oil, glycerol, sugar, wheat bran, contains 2 percent or less: corn syrup, italian seasoning (spices, salt, less than 2 percent soybean oil added as a processing aid), garlic, natural flavors, onion powder, tapioca maltodextrin, autolyzed yeast extract, enzyme modified butter and buttermilk powder (butter [cream, salt]), dry buttermilk, mono- and diglycerides), salt, tricalcium phosphate, silicon dioxide, partially hydrogenated soybean oil, leavening (baking soda, sodium aluminum phosphate), malt (malted barley flour, corn, wheat starch, silicon dioxide, lecithin), dough conditioner (soy flour, calcium sulfate, sodium stearyl lactylate, yeast, sorbitan monostearate, ascorbic acid, water and monoglycerides with propionic acid and phosphoric acid (added as preservatives) salt, potassium sorbate (preservative).

(5) Type V. Enriched bleached flour (wheat flour, malted barley flour, niacin, reduced iron, thiamin mononitrate, riboflavin, and folic acid), water, sugar, whole grain yellow corn, oat flakes, hulled barley flakes, rye chops, wheat flakes, molasses, millet, sesame seed, rolled wheat, rye nuggets, degermed yellow corn grits, rolled oats, rye flakes, tritical flakes, parboiled brown rice, flax seed, defatted soy grits, malt, glycerine, trehalose, wheat gluten, canola oil, salt, yeast, xanthan gum, DATEM 1/, soy oil, L-cysteine, potassium iodate, azodicarbonamide, monoglycerides, milk protein concentrate, nonfat dry milk, caramel color, ascorbic acid, sorbic acid.

1/ DATEM (Diacetyl Tartaric Acid Ester of monoglyceride) is an emulsifier

Note: Types I - V product supplied by Sterling Foods LLC, 1075 Arion Parkway, San Antonio, TX 78216.

SECTION D

D-1 PACKAGING

A. Packaging. For Style A, one snack bread and one intact oxygen scavenger shall be packaged in a preformed or form-fill-seal barrier pouch. For Style B, two snack breads and one intact oxygen scavenger shall be packaged in a preformed or form-fill-seal barrier pouch.

(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 in the range of 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 made by heat sealing three edges with 3/8 inch (- 1/8, + 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. The 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 D 1238, Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer and a density range of 0.918 to 0.922 g/cc in accordance with ASTM D 1505, 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 minus 20 percent and tolerance for the foil layer shall be plus or minus 10 percent. The color requirements of the exterior of the pouch 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. The 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 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:

- (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 2011 would be coded as 1045. 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 D 5118/D 5118M, Standard Practice for Fabrication of Fiberboard Shipping Boxes. The fiberboard shall conform to type CF, class D, variety SW, grade 200 of ASTM D 4727/D 4727M, Standard Specification for Corrugated and Solid Fiberboard Sheet Stock (Container Grade) and Cut Shapes. Each box shall be closed in accordance with ASTM D 1974, 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 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:

PCR-S-009C
9 September 2010
SUPERSEDING
PCR-S-009B
23 September 2009

US Army Research, Development and Engineering Command
Natick Soldier Research, Development and Engineering Center
RDNS-CFF
15 Kansas Street
Natick, MA 01760-5056

One lot shall be randomly selected during each calendar month of production. Six (6) sample units of each item produced shall be randomly selected from that one production lot. The six (6) 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 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 fortified with calcium as specified.
102		Evidence of excessive heating (materially darkened or scorched).
103		Pouch does not contain one intact oxygen scavenger. <u>4/</u>
104		Style A not a single snack bread or Style B not two snack breads.
		<u>Appearance</u>
105		Types I-III fortified snack bread not flat or not intact. <u>5/</u>
106		Type IV fortified Italian bread sticks not flat or not with three uniformly spaced straight lines scored onto the surface or not intact. <u>5/</u>
	201	Types I-III surface does not have docker holes.
	202	Type I surface not a light tan to medium tan color or does not have flecks of wheat bran.
	203	Type I interior crumb not a paler color than the surface or does not have flecks of wheat bran.
	204	Type II surface not a light golden to medium golden color.
	205	Type II interior crumb not an off white color.
	206	Type III surface not a light tan to medium tan color or not with visible flecks of reddish orange or green seasoning.
	207	Type III interior crumb not a slightly paler color than the surface or not with visible flecks of reddish orange or green seasonings throughout.

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

Category	Defect
<u>Major</u>	<u>Minor</u>
	208
	209
	210
	211
	212
	<u>Odor and flavor</u>
107	Type I not a mild wheat odor.
108	Type I not a slightly sweet, mild wheat flavor. <u>6/</u>
109	Type II not a slightly sweet odor. <u>7/</u>
110	Type II not a bland, slightly sweet flavor. <u>6/</u>
111	Type III not a moderate chipotle chili spice odor.
112	Type III not a moderate chipotle chili flavor with moderate chili heat. <u>6/</u>
113	Type IV not a mild Italian seasoning or not a rosemary odor.
114	Type IV not a slightly sweet, mild wheat, mild Italian seasoning, rosemary flavor. <u>6/</u>

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

Category		Defect
<u>Major</u>	<u>Minor</u>	
115		Type V not mild sweet, cooked multigrain odor or flavor.
		<u>Texture</u>
213		Types I-IV fortified snack bread not moist.
214		Types I-IV fortified snack bread interior crumb not a short or not a biscuit-like texture.
215		Type V not moist or not tender.
216		Type V interior crumb not a bread-like texture.
		<u>Size</u>
217		Fortified snack bread dimensions not as specified.
		<u>Net weight</u>
218		Net weight of individual pouch less than 2.0 ounces (56.7 grams).

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/ The requirement for enriched flour shall be verified by Certificate of Conformance (CoC).

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

5/ Not intact means a piece of snack bread that is missing a portion (fragment) or is broken into three pieces or more. For the Type IV Italian bread sticks, the product should not have a missing piece or fragment and the four bread sticks should not be separated.

6/ A slight leavening aftertaste may be present.

7/ May have a mild chemical odor.

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 hedonic scale to be considered acceptable.

(2) Net weight. 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 and one 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 of Analysis (OMA) of AOAC International:

<u>Test</u>	<u>Method Number</u>
Fat	920.85 <u>1/</u>
Moisture	925.45A or 985.14
Calcium	944.03 or 945.41 <u>1/</u>

Test results shall be reported to the nearest 0.1 percent. Government verification will be conducted through actual testing by a Government laboratory. Any nonconforming results shall be cause for rejection of the lot.

1/ Fat and calcium content shall be verified by the Nutrition Facts (NLEA) label and a CoC from the contractor. Product not conforming to the requirements specified in Section C of this Performance-based Contract Requirements shall be cause for rejection of the lot.

(4) Water activity (Aw) testing. Eight filled and sealed pouches shall be randomly selected from one production lot. Water activity (Aw) 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 (OMA) 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 Aw determination shall be reported to the nearest 0.01. Government verification will be conducted through actual testing by a Government laboratory. Any nonconforming result shall be cause for rejection of the lot.

(5) Oxygen content testing. Eight filled and sealed pouches shall be selected at random 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 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 CoC may be accepted as evidence that the characteristics conform to the specified requirements.

<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 D 2103 <u>1/</u>
Aluminum foil thickness	D-1,A(1)a and D-1,A(2)a	ASTM B 479 <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/ ASTM D 2103 Standard Specification for Polyethylene Film and Sheeting

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2/ ASTM B 479 Standard Specification for Annealed Aluminum and Aluminum-Alloy Foil for Flexible Barrier, Food Contact, and Other Applications

3/ FED-STD-595 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.

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.
	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 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.

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 F 88, 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 rejection of the lot.

b. Pouch closure seal testing. The closure seals of the pouches shall be tested for seal strength in accordance with ASTM F 88. 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 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. 1/
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.

SECTION J REFERENCE DOCUMENTS

Unless otherwise specified, the issues of these documents are those active on the date of the solicitation or contract.

DLA Troop Support- Subsistence FORMS

DSCP 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

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

ASTM INTERNATIONAL www.astm.org

B 479 Standard Specification for Annealed Aluminum and Aluminum-Alloy Foil for Flexible Barrier, Food Contact, and Other Applications

D 1238 Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer

D 1505 Standard Test Method for Density of Plastics by the Density-Gradient Technique

D 1974 Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes

PCR-S-009C
9 September 2010
SUPERSEDING
PCR-S-009B
23 September 2009

D 2103	Standard Specification for Polyethylene Film and Sheeting
D 4727/D 4727M	Standard Specification for Corrugated and Solid Fiberboard Sheet Stock (Container Grade) and Cut Shapes
D 5118/D 5118M	Standard Practice for Fabrication of Fiberboard Shipping Boxes
F 88	Standard Test Method for Seal Strength of Flexible Barrier Materials

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Official Methods of Analysis (OMA) of the AOAC International