PCR- S-023
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SECTION C

This document covers spread soup mix packaged in a flexible pouch for use by the Department of Defense as a component of operational rations.

C-1 ITEM DESCRIPTION

PCR-S-023, SPREAD SOUP MIX, PACKAGED IN A FLEXIBLE POUCH, SHELF STABLE

Types.

Type I - Spicy cheese vegetable
Type II - Cheddar potato with artificial bacon bits

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®)
Package L - Food Packet, Modular Operational Ration Enhancement (MORE)

C-2 PRODUCT REQUIREMENTS

A. Product standard. A sample shall be subjected to first article (FA) or product demonstration model inspection (PDM) as applicable, in accordance with the tests and inspections of Section E of this Product 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. The finished product shall show no evidence of heat stress (materially darkened or scorched). The finished product shall be free from foreign materials.

(2) For spread type I. The spicy cheese vegetable spread shall be golden yellow to tan color with visible red and green vegetable flakes and shall have a uniform surface sheen. The spread shall be thick and creamy (consistency not firmer than cheese spread and not less firm than butter frosting) and may have a slightly grainy and oily appearance.

(3) For spread type II. The cheddar potato with artificial bacon bits spread shall be light creamy yellow color with visible dark pink artificial bacon bits and shall have a uniform surface sheen. The spread shall be thick and creamy (consistency not firmer than peanut butter and not less firm than butter frosting) and may have a slightly grainy and slightly oily appearance.

(4) For soup types I and II. When the spread soup mix is rehydrated into a soup (according to package instructions), the soup shall be creamy and smooth with visible bits of flavor ingredients evenly dispersed.

D. Odor and flavor.

(1) General. The packaged food shall be free from foreign odors and flavors.

(2) For spread type I. The spicy cheese vegetable spread shall have a cheddar cheese, dairy and slight vegetable odor and an onion, garlic and pepper flavor with a moderate spice heat.

(3) For spread type II. The cheddar potato with artificial bacon bits spread shall have a smoky, bacon bit and cheddar cheese odor and a smoky, cheddar cheese, bacon bit and potato flavor.

E. Texture.

(1) General. The spread soup mix (after the pouch has been kneaded) shall have a smooth easily spreadable texture and moderately grainy mouth feel.

(2) For spread type I. The spicy cheese vegetable spread shall have slightly crunchy pieces of vegetables.

(3) For spread type II. The cheddar potato with artificial bacon bits spread shall have crispy, crunchy artificial bacon bits.

(4) For soup types I and II. When the spreads are rehydrated into a soup (according to package instructions), the soups shall have a smooth and creamy texture with small bits of flavor ingredients.

F. Emulsion stability. The product shall show no evidence of emulsion separation (mottling, or curdling, or oiling off) after kneading as directed on the label.

G. Net weight. The average net weight shall be not less than 1.5 ounces (42.5 grams). The net weight of an individual pouch shall be not less than 1.4 ounces (39.7 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) Sodium content. The sodium content shall not exceed 1200 mg per 100 grams.

(2) Moisture content. Moisture content shall not exceed 2.0 percent.

J. Microbiological requirements.

(1) Aerobic plate count. The aerobic plate count shall be not greater than 25,000 per gram in 4 of 5 samples and not greater than 50,000 per gram in any individual sample.

(2) Yeast and mold. The yeast and mold counts (combined) shall not exceed 100 per gram.

(3) E. coli. *The Escherichia coli* count shall have no positive tubes in the standard 3 tube most probable number (MPN) technique.

(4) Salmonella. The spread soup mix shall be *Salmonella* negative.

K. Product formulation and ingredients. The following formulations and ingredient specification are required. Ingredient suppliers and available specific ingredients may change (companies bought out, part numbers change, ingredients no longer supplied, and etc.). Any changes in ingredients or formula will need to be approved by U.S. Army Natick Soldier Research, Development and Engineering Center.

(1) Type I. Spicy cheese vegetable

Ingredient	Percent by weight
Cream powder 1/	36.775
Oil, canola 2/	27.0
Cheddar cheese powder 3/	11.0
Milk, nonfat, dry, instant	10.0
Cheese powder 4/	4.0
Lecithin, soy, liquid	3.4
Starch, dent corn, pre-gelatinized 5/	1.7
Corn syrup solids 6/	1.7
Pepper, sweet red, granules 7/	1.1
Cheese flavor 8/	0.8
Cheese flavor 9/	0.8
Gum, blend, colloid extra smooth 10/	0.6
Garlic powder	0.3
Cayenne pepper, crushed	0.3
Onion, green, minced 11/	0.3
Onion powder	0.2
TBHQ, with citric acid 12/	0.025

1/ Cream powder shall be from cream and nonfat milk, contain not less than 76 percent ± 1.5 percent fat and not more than 2.0 percent moisture. Microbiological levels shall be such that end item requirements are met for the final product.

2/ Canola oil shall be regular (not high oleic) and shall have a maximum free fatty acid content of less than or equal to 0.02 percent or Oxygen Stability Index of not less than or equal to 9 hours at 110°C. Canola oil may contain antioxidants and flow agents in approved quantities.

3/ Cheddar cheese powder shall have a maximum moisture of 4.0 percent, salt content of not more than 7.0 percent and a fat content of not less than 40 percent and not greater than 48.0 percent. The cheese powder shall be cream to pink in color and have a distinct cheddar cheese flavor. The cheddar cheese powder may contain approved quantities of anti-caking agents and other processing aid ingredients. Microbiological levels shall be such that end item requirements are met for the final product. (See C-3,A(1))

4/ Cheese powder shall have a maximum moisture of 4.0 percent, salt content not more than 8.0 percent and a fat content of not less than 29.0 percent and not more than 33.0 percent. The cheese powder shall be light orange to orange in color and a cheddar flavor.

Microbiological levels shall be such that end item requirements are met for the final product. (See C-3, A(2))

5/ Pre-gelatinized dent corn starch shall produce high viscosity in both hot and cold water. The starch shall have a maximum moisture of 8.0 percent and a pH between 6.5 to 9.25. (See C-3,A(3))

6/ Corn syrup solids shall have a 25 DE (dextrose equivalent), a maximum moisture content of 6.0 percent and pH (20 percent solution) of between 4.4 and 5.6.

7/ Sweet red bell pepper granules shall have a maximum moisture of 6.0 percent and shall have a size tolerance by weight of not more than 2 percent on a No. 10 U.S. Standard Sieve and not more than 5 percent passing through a No. 40 U.S. Standard Sieve.

8/ Cheese flavor (Natural Cheese Flavor #2400) shall be from Edlong, 225 Scott St., Elk Grove Village, IL, 60007.

9/ Cheese flavor (Natural Cheese Flavor #2662) shall be from Edlong, 225 Scott St., Elk Grove Village, IL, 60007.

10/ Gum blend (TIC Pretested® Colloid Ultrasmooth Powder) shall be from TIC Gums, Inc., 4609 Richlynn Dr., P.O. Box 369, Belcamp, MD 21017.

11/ Minced green onion shall have a maximum moisture of 6.0 percent and a size tolerance by weight of not more than 2 percent on a No. 8 U.S. Standard Sieve and not more than 5 percent passing through a No. 40 U.S. Standard Sieve.

12/ TBHQ shall be a food grade antioxidant with citric acid with a specific gravity between 0.970 and 0.990. (See C-3,A(4))

(2) Type II. Cheddar potato with artificial bacon bits

Ingredient	Percent by weight
Cream powder 1/	30.78
Oil, canola 2/	29.0
Cheddar cheese powder 3/	11.6
Milk, non-fat, dry instant	10.6
Cheese powder 4/	4.8
Bacon bits, artificial 5/	3.9
Lecithin, soy, liquid	2.9
Starch, dent corn, pre-gelatinized 6/	1.5
Corn syrup solids 7/	1.5
Potato flavor, roasted 8/	0.7
Cheese flavor 9/	0.5
Gum, blend, colloid extra smooth 10/	0.5
Bacon flavor 11/	0.4
Cheese flavor 12/	0.4
Onion powder	0.4
Bacon flavor 13/	0.2
Garlic powder	0.2
Pepper, black, ground	0.1
TBHQ, w/citric acid 14/	0.02

1/ Cream powder shall be from cream and nonfat milk, contain not less than 76 percent ± 1.5 percent fat and not more than 2.0 percent moisture. Microbiological levels shall be such that end item requirements are met for the final product.

2/ Canola oil shall be regular (not high oleic) and shall have a maximum free fatty acid content of less than or equal to 0.02 percent or Oxygen Stability Index of not less than or equal to 9 hours at 110°C. Canola oil may contain antioxidants and flow agents in approved quantities.

3/ Cheddar cheese powder shall have a maximum moisture of 4.0 percent, salt content of not more than 7.0 percent and a fat content of not less than 40 percent and not greater than 48.0 percent. The cheese powder shall be cream to pink in color and have a distinct cheddar cheese flavor. The cheddar cheese powder may contain approved quantities of anti-caking agents and other processing aid ingredients. Microbiological levels shall be such that end item requirements are met for the final product. (See C-3,A(1))

4/ Cheese powder shall have a maximum moisture of 4.0 percent, salt content not more than 8.0 percent and a fat content of not less than 29.0 percent and not more than 33.0

percent. The cheese powder shall be light orange to orange in color and a cheddar flavor. Microbiological levels shall be such that end item requirements are met for the final product. (See C-3,A(2))

5/ Artificial bacon bits shall be produced from soy beans, the bits shall be deep pink in color and shall have a bulk index of 190 to 225 cc/100g and shall have a moisture content such that end item requirements are met for the final product.

6/ Pre-gelatinized dent corn starch shall produce high viscosity in both hot and cold water. The starch shall have a maximum moisture of 8.0 percent and a pH between 6.5 to 9.25. (See C-3,A(3))

7/ Corn syrup solids shall have a 25 DE (dextrose equivalent), a maximum moisture content of 6.0 percent and pH (20 percent solution) of between 4.4 and 5.6.

8/ Roasted potato flavor (DMC #1316) shall be from David Michael & Co. Philadelphia, PA, 19154.

9/ Cheese flavor (Natural Cheese Flavor #1437) shall be from Edlong, 225 Scott St., Elk Grove Village, IL, 60007.

10/ Gum blend (TIC Pretested® Colloid Ultrasmooth Powder) shall be from TIC Gums, Inc., 4609 Richlynn Dr., P.O. Box 369, Belcamp, MD 21017.

11/ Bacon flavor (DMC #3364) shall be from David Michael & Co. Philadelphia, PA, 19154.

12 / Cheese flavor (Natural Cheese Flavor #2662) shall be from Edlong, 225 Scott St., Elk Grove Village, IL, 60007.

13/ Bacon flavor (DMC #2577) shall be from David Michael & Co. Philadelphia, PA, 19154.

14/ TBHQ shall be a food grade antioxidant with citric acid with a specific gravity between 0.970 and 0.990. (See C-3,A(4))

L. Preparation and processing. The following preparation and processes were used at U.S. Army Natick Soldier Research, Development and Engineering Center for developing and processing the spread soup mix. Industrial production may require adjustments in preparation and processing that are acceptable as long as end item requirements in Section E-5 of this Product Contract Requirements document are met.

(1) Preparation for types I and II.

(a) Blend dry ingredients (except for artificial bacon bits used in type II).

(b) Add antioxidant (TBHQ) to lecithin then mix into canola oil.

(c) Add dry ingredients to oil mixture and blend in a high shear mixer or equivalent.

(d) Mix until product is smooth, creamy and spreadable.

(e) Add artificial bacon bits into type II product and mix to distribute evenly.

(2) Continuity of preparation, processing, and packaging. The spread soup mix shall be prepared, processed, and filled into a pouch in a continuous manner with minimum delay between the various stages.

(3) Pouch filling and sealing. The spread soup mix shall be filled into a pouch, fabricated and constructed as specified in D-1,A(1), nitrogen flushed and sealed immediately after filling.

C-3 MISCELLANEOUS INFORMATION

A. Ingredients.

(1) Cheddar cheese powder #5153 from Commercial Creamery Company, 159 South Cedar St., Spokane, WA 99204 meets the requirements of C-2,K(1) 3/ and C-2,K(2) 3/ and performs satisfactorily in these products.

(2) Chez-Tone 153 Item #11343 from Kerry Inc., 100 East Grand Ave., Beloit, WI 53511 meets the requirements of C-2,K(1) 4/ and C-2,K(2) 4/ and performs satisfactorily in these products.

(3) Inscosity B656 Modified Food Starch from Grain Processing Corp., 1600 Oregon St., Muscatine, IA 52761 meets the requirements of C-2,K(1) 5/ and C-2,K(2) 6/ and performs satisfactorily in these products.

(4) Dadex 21 from Mealanders International Inc., 2770 Portland Drive, Oakville, Ontario L6H6R4 meets the requirements of C-2,K(1) 13/ and C-2,K(2) 14/ and performs satisfactorily in these products.

SECTION D

D-1 PACKAGING

A. Packaging. One and one half ounces of spread soup mix shall be filled into a pouch as described below.

(1) Pouches.

a. Pouch material. The pouches shall be fabricated from 0.002 inch thick polyolefin film laminated or extrusion coated to 0.00035 inch thick aluminum foil which is then laminated to 0.0005 inch thick polyester. The three plies shall be laminated with the polyester on the exterior of the pouch. Tolerances for thickness of plastic films shall be plus or minus 20 percent and tolerance for foil layer shall be plus or minus 10 percent. The polyolefin layer of bag material shall be suitably formulated for hot fill or post-fill processing. 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 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 pouch having maximum inside dimensions of 2-7/8 inches wide by 5-3/8 inches long. The pouch shall be 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 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 and one half ounces of spread soup mix shall be filled into the pouch, nitrogen flushed and the pouch 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 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 pouch shall show no aberration in the pouch material or heat seals. Filled and sealed pouches showing aberrations shall withstand a minimum internal pressure of 17 pounds per square inch gauge (psig) for 30 seconds to verify package integrity. Not less than 24 hours after filling, the pouches shall withstand an internal pressure of 17 psig for 30 seconds without 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.

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 type 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/USDA regulations
(7) Directions: KNEAD PACKAGE BEFORE OPENING. Use as a spread or add 3 ounces hot water and mix to make a soup.

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 Semi perishable 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 product requirements or any appearance or palatability failure, shall be cause for rejection of the lot. The approved first article or product demonstration model shall be used as the product standard for periodic review evaluations. All food components that are inspected by the USDA shall be subject to periodic review sampling and evaluation. The USDA shall select sample units during production of contracts and submit them to the following address for evaluation:

US Army Research, Development and Engineering Command
Natick Soldier 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 (5) 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 product examination 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 product requirements specified in Section C of this Product 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. The pouches shall be kneaded prior to conducting any portion of the product examination.

TABLE I. Product defects 1/ 2/

Category		Defect
Major	Minor	
101		Product not spread soup mix as specified.
102		Evidence of heat stress (materially darkened or scorched).
103		Evidence of emulsion separation (mottling or curdling or oiling off).
		Appearance
	201	Type I spicy cheese vegetable spread not golden yellow to tan color or not with visible red and green vegetable flakes or does not have a uniform surface sheen.
	202	Type II cheddar potato with artificial bacon bits spread not light creamy yellow color or not with visible dark pink artificial bacon bits or does not have a uniform surface sheen.
	203	Type I spicy cheese vegetable spread not thick or not creamy (consistency not firmer than cheese spread or less firm than butter frosting).
	204	Type II cheddar potato with artificial bacon bits spread not thick or not creamy (consistency not firmer than peanut butter or less firm than butter frosting).
	205	Types I or II soup not creamy or not smooth or not with visible bits of flavor ingredients evenly dispersed. 3/
		Odor and flavor
103		Type I spicy cheese vegetable spread does not have a cheddar cheese, dairy, and slight vegetable odor or does not have an onion, garlic and pepper flavor with a moderate spice heat.
104		Type II cheddar potato with artificial bacon bits spread does not have a smoky, bacon bit and cheddar cheese odor or does not have a smoky, cheddar cheese, bacon bit and potato flavor.

TABLE I. Product defects 1/ 2/ - Continued

Category		Defect
Major	Minor	
		Texture
105		Types I or II spread soup mix not smooth easily spreadable texture after kneading or not moderately grainy mouth feel.
106		Type I spicy cheese vegetable spread does not have slightly crunchy pieces of vegetables.
107		Type II cheddar potato with artificial bacon bits spread does not have crispy, crunchy artificial bacon bits.
108		Types I or II soup not smooth or not creamy texture or not with small bits of flavor ingredients. 3/
		Net weight
	206	Net weight of an individual pouch less than 1.4 ounces (39.7 grams). 4/

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/ Prepared according to package directions.

4/ Sample average net weight less than 1.5 ounces (42.5 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. The net weight of the filled and sealed pouches 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 the nearest 1 gram.

(3) Analytical. The samples to be analyzed for sodium and moisture 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 of AOAC International (OMA) except that for moisture a temperature of 70°C for 16 hours under a pressure of 100 mm of mercury shall be used.

Test	Method Number
Sodium	985.35
Moisture	925.09

Test results shall be reported to the nearest mg per 100 grams for sodium. Test results for moisture 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 requirements shall be cause for rejection of the lot.

(4) Microbiological testing. Five filled and sealed pouches shall be selected at random from the lot regardless of lot size. The pouched product shall be individually tested for microbiological levels in accordance with the Official Methods of Analysis (OMA) of AOAC International or the Food and Drug Administration (FDA) Bacteriological Analytical Manual (BAM). Any result not conforming to the microbiological requirements shall be cause for rejection of the lot.

Test	Method Number
Aerobic plate count	966.23, 990.12 or BAM, Ch. 3
Yeast and Mold	997.02
E. coli	966.24, 991.14, or BAM, Ch.4 sections C & F
Salmonella	967.26, 967.28, 986.35, 991.13, 996.08, 2003.09, ~~or~~ 2004.03, or 2013.09.

NOTE: The following condition applies for *Salmonella* and microbiological testing:

(a) USDA *Salmonella* and additional microbiological testing is required for each end item lot and shall be the basis for lot acceptance with respect to *Salmonella* and other microbiological testing requirements.

(5) Pouch filling and sealing. The nitrogen flush process shall be verified by the USDA on the first production lot. A Certificate of Conformance (CoC) will be provided on all future lots. If a new contract starts, then USDA will verify the nitrogen flush process again.

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.

Characteristic	Requirement paragraph	Test procedures
Thickness of films for laminated material	D-1,A(1)a	ASTM D 2103 1/
Aluminum foil thickness	D-1,A(1)a	ASTM B 479 2/
Laminated material identification an construction	D-1,A(1)a	Laboratory evaluation.
Color of laminated material	D-1,A(1)a	FED-STD-595 3/

1/ ASTM D 2103 Specification for Polyethylene Film and Sheeting

2/ ASTM B 479 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 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 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. The finding of any critical defect shall be cause for rejection of the lot.

TABLE II. Filled and sealed pouch defects 1/

Category			Defect
Critical	Major	Minor	
1			Swollen pouch.
2			Aberrations in pouch material or heat seals resulting from heat sealing or pouch fabrication that reduce the effective closure seal width to less than 1/16 inch. 2/
3			Tear or hole or open seal.
	101		Seal width less than 1/16 inch. 3/
	102		Presence of delamination. 4/
	103		Unclean pouch. 5/
	104		Pouch has foreign odor.
	105		Any impression or design on the heat seal surfaces which conceals or impairs visual detection of seal defects. 6/
	106		Not packaged as specified.
		201	Label missing or incorrect or illegible.
		202	Tear nick, 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. 3/
		204	Presence of delamination. 4/

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

2/ Aberrations in pouch material or heat seals include:

a. Major fold-over wrinkles or severe wrinkles, that extend into heat seal area and reduce effective seal width to less than 1/16 inch; or

b. Severe wrinkles in the body of the pouch along the inside edges of the heat seals. Pouches exhibiting one or more of these aberrations shall be tested in accordance with E-6,B(1)c.

3/ 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.

4/ 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.

5/ 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).

c. Water spots.

6/ 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.

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 pouch seal testing. The seals of the unfilled 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 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. 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 filled and sealed pouch. The sample size shall be the number of pouches indicated by inspection level S-1. For the closure seal on 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 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 17 psig pressure is reached. The 17 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 3/) 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.

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 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
Major	Minor	
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.

DSCP FORMS

DSCP FORM 3556	Marking Instructions for Boxes, Sacks, and Unit Loads of Perishable and Semi perishable Subsistence

FEDERAL STANDARD

FED-STD-595	Colors Used in Government Procurement

GOVERNMENT PUBLICATIONS

FOOD AND DRUG ADMINISTRATION	Bacteriological Analytical Manual (BAM) www.cfsan.fda.gov/~ebam

NON-GOVERNMENTAL STANDARDS

AMERICAN SOCIETY FOR QUALITY CONTROL (ASQC) 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 1974	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
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

AOAC INTERNATIONAL www.aoac.org

Official Methods of Analysis (OMA) of AOAC International