

SECTION C

This document covers pasteurized, uncooked, dehydrated egg mix packaged in a Boil-In-Bag (BIB) then overpacked in a barrier pouch for use by the Department of Defense as a component of operational rations.

C-1 ITEM DESCRIPTION

PCR-E-017A, EGG MIX, PASTEURIZED, UNCOOKED, DEHYDRATED, PACKAGED IN A BOIL-IN-BAG (BIB)

Classes.

Class 1 - Small opening fitment and cap (for Boil-In-Bag module in the Unitized Group Ration - Express™ (UGR-E™))

Class 2 - Large opening fitment and cap

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 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, overpacked in a barrier pouch, shall meet the minimum shelf life requirement of 36 months at 80°F.

C. Dehydrated product.

(1) Appearance. The product shall be uncooked, dehydrated egg mix. The egg mix shall be a free flowing homogenous mixture. The egg mix shall be light yellow in color and free of scorched particles. The egg mix shall be free from foreign materials.

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(2) Odor. The packaged food shall have an odor of butter-flavored egg mix. The egg mix shall be free from foreign odors.

(3) Texture. The product shall have no lumps that cannot be broken apart under light finger pressure.

D. Net weight. The average net weight shall be not less than 500 grams (17.6 ounces). The net weight of an individual BIB shall be not less than 475 grams (16.8 ounces).

E. Rehydrated and cooked product. The product shall rehydrate readily in accordance with label instructions and shall show complete water penetration within five minutes. The rehydrated egg mix shall be cooked. Cooking shall be by placing the package of rehydrated egg mix in boiling water, or by pouring egg mix onto a grill, or cooking with a heater module.

(1) Appearance. The rehydrated and cooked product shall have the appearance of cooked scrambled eggs. The eggs shall be light yellow in color with no color foreign to the product.

(2) Odor and flavor. The rehydrated and cooked product shall have an odor and flavor of cooked scrambled eggs with butter. The eggs shall be free from scorched odors and flavors. The eggs shall be free from foreign odors and flavors.

(3) Texture. The rehydrated and cooked product shall be moist and tender and shall have a texture of cooked scrambled eggs.

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

G. Analytical requirements.

(1) Protein content. The protein content shall be not less than 36.0 percent.

(2) Salt content. The salt content shall be not less than 0.5 and not greater than 1.0 percent.

(3) Moisture content. The moisture content shall be not greater than 2.0 percent.

(4) Oxygen content. The oxygen content of the headspace gas in the barrier pouch shall not exceed 2.0 percent.

H. Microbiological requirements.

(1) Aerobic plate count. The aerobic plate count shall not exceed 25,000 colony forming units (CFU) per gram.

(2) E. coli count. The *E. coli* count shall be less than 3 per gram using MPN (most probable number) techniques or less than 10 CFU per gram.

(3) Salmonella. The *Salmonella* test shall be negative in 25 grams.

I. Ingredients.

(1) Eggs. The egg components shall be produced under USDA inspection in compliance with the Egg Products Inspection Act. The liquid egg mix, prior to dehydration, shall contain a minimum of 80 percent eggs.

(2) Nonfat dry milk. When used, the U.S. Extra Grade Nonfat Dry Milk shall be produced in a facility in compliance with the provisions of the General Specifications for Approved Plants and Standards for Grades of Dairy Products and listed in the Publication Dairy Plants Surveyed and Approved for USDA Grading Service.

(3) Dry buttermilk. When used, the dry buttermilk shall be U.S. Extra Grade Dry Buttermilk and Dry Buttermilk Product.

(4) Additional ingredients. Additional ingredients such as salt, citric acid, butter flavor, carrageenan, starch, water, and flavors may be used.

J. Processing.

(1) Pasteurization. The liquid egg mix shall be pasteurized in accordance with USDA FSIS Egg Products Inspection Regulations (9 CFR Part 590). The pasteurized egg mix shall be held at 40°F or below for not more than 72 hours prior to drying or freezing. Note: Frozen eggs may be stored up to six months prior to freeze drying if held at 0°F or below.

(2) Dehydration. The product shall be dehydrated utilizing pressures and temperatures so that the end product meets the requirements and is produced according to USDA FSIS Egg Products Inspection Regulations (9 CFR Part 590).

K. BIB filling and sealing. The product shall be packaged into the BIB and then into the barrier pouch within 96 hours from drying. If the product cannot be packaged within 96 hours, then the remaining product shall be adequately protected from moisture and oxygen by either holding under a nitrogen atmosphere with 2.0 percent or less oxygen, or under a vacuum of at least 27 inches of mercury (27 Hg). If vacuum is used, it shall be broken with nitrogen. Product may be held for a period not to exceed 30 days prior to packaging into BIBs.

SECTION D

D-1 PACKAGING

A. Packaging. Five hundred grams (17.6 ounces) of product shall be packaged in a preformed BIB as described below. The BIB shall be used as a rehydrating bag and may be used as the cooking vessel for the product. Note that the terms BIB, bag, and pouch are used interchangeably.

(1) BIB.

a. BIB material. The preformed BIB shall be fabricated from 0.0020 inch thick LLDPE/EVOH/LLDPE laminated or extrusion coated to 0.0006 inch thick biaxially oriented nylon (BON) which is then bonded with 0.0020 inch thick polyethylene. All tolerances for thickness of bag material shall be plus or minus 20 percent. Alternative materials shall be acceptable if all performance requirements are met. The material shall show no evidence of delamination, degradation, or foreign odor when heat sealed or fabricated into BIBs. The material shall be suitably formulated for food packaging and shall not impart an odor or flavor to the product. The material shall be clear or translucent so the water level is visible through the BIB.

b. BIB construction. The BIB shall be a flat style preformed bag having inside dimensions of 11-3/4 inches by 15-3/8 inches ($\pm 1/8$ inch). The bag shall be made by heat sealing three edges with 3/8 inch (-1/8, +3/16 inch) wide seals. The 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.

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A heat seal, minimum 4 inches long, shall be placed in the center of the bag to create a partial left/right division in the BIB. The BIB shall show no material degradation and shall not damage the product when the rehydrated product in the BIB is placed in boiling water for 2 hours when tested in accordance with E-6,B(3).

c. Fitment and cap. The Class 1 (for UGR-E™) small plastic threaded fitment shall be compatible with the rehydration pouch. The fitment shall have a minimum 3/4 inch opening. The fitment shall have an inner pre-cut covering to accommodate the spout of the rehydration pouch. The Class 2 large plastic threaded fitment shall have a minimum opening of 1-1/2 inch. The Class 1 or 2 cap, as applicable, shall thread onto the neck to provide a liquid barrier.

d. Venting. The BIB shall be fitted with a one-way air venting system which allows air to escape and does not allow water to enter the BIB.

e. BIB filling and sealing. Product shall be inserted into the BIB and the filled BIB shall be sealed with a minimum 1/8 inch wide heat seal. 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.

(2) Barrier pouch. One BIB (for the BIB module) and oxygen scavenger(s) or three BIB(s) and oxygen scavenger(s) shall be placed in a barrier pouch having maximum outside dimensions of 18 by 18 inches. The pouch shall be made from a heat sealable barrier material. Note that material conforming to MIL-PRF-131 has been used. All four edges of the pouch shall be heat-sealed with seals not less than 1/8 inch wide. The BIB(s) and oxygen scavengers shall not be entrapped in the heat seals. The side, bottom and closure 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.

(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.

(4) Paperboard carton. One barrier pouch with three Class 2 BIBs shall be packed in a paperboard carton. The carton shall be style RSC, tray or telescoping design. The paperboard shall be minimum 0.028 inch thick and shall have a minimum basis weight of 100 pounds per square feet. The paperboard may be coated. The paperboard may be bleached. The use of materials composed of the highest percentage of recovered materials practicable is encouraged. The outside dimensions of the carton shall not exceed 12-1/2 by 11-1/2 by 4-1/2 inches.

D-2 LABELING

A. BIB. Each BIB shall be correctly and legibly labeled. Printing ink shall be permanent black ink or other dark contrasting color which is free of carcinogenic elements. A carcinogenic-free pre-printed self-adhering clear polyester label printed with indelible contrasting ink may also be used. The label shall contain the following information:

- (1) Name of product (letters not less than 1/4 inch high)
- (2) Ingredients
- (3) Date 1/
- (4) Net weight
- (5) Contractor's name and address
- (6) USDA plant number
- (7) "Nutrition Facts" label in accordance with the Nutrition Labeling and Education Act (NLEA) and all applicable FDA regulations

NOTE: There shall be a black line, minimum 1/16 inch thick, indicating the fill level.

1/ Each BIB 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 BIB.

The following instructions shall be printed on the BIB:

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YIELD: Serves 18 portions of approximately 1/2 cup each.

PREPARATION: Shake BIB to settle contents. Open cap. Support BIB on flat surface. Add about 56 ounces (7 cups) of potable water to fill line. Replace cap. Shake BIB until contents are rehydrated. Knead if necessary. If level of egg mix is below fill line, add more water.

WARNING: Do not heat BIB in oven.

Rehydrated egg mix should be used within one hour unless refrigerated for use within 24 hours. Do not use rehydrated egg mix in uncooked salad dressings or other recipes that do not require cooking.

COOKING

IN WATER: Place rehydrated closed BIB in boiling water. Simmer gently 35 minutes or until egg appears fully cooked. Avoid overcooking (BIB may show evidence of bulging).

ON GRILL: Use as a rehydrated egg mix and cook fully.

BIB HEATER MODULE: Follow instructions on module.

TO TRANSPORT AFTER HEATING: Insert BIB into an insulated food container or empty cooked eggs into an insulated food container to protect during transport.

CAUTION: Use care when opening as pressure may have been generated within the BIB.

TO OPEN: Cut bottom of BIB with clean knife.

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

B. Barrier pouch. Each barrier pouch shall be correctly and legibly labeled. Printing ink shall be permanent black ink or other dark contrasting color. The label shall contain the following information:

- (1) Name of product (letters not less than 1/4 inch high)
- (2) Contents
- (3) Date 1/
- (4) Contractor's name and address

In addition, the label shall contain the following warnings:

DO NOT OPEN WITH KNIFE
USE IMMEDIATELY
DO NOT STORE BOIL-IN-BAG

1/ Each barrier 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 BIB.

C. Paperboard carton. Each carton shall be correctly and legibly labeled. Printing ink shall be permanent black ink or other, dark, contrasting color. The label shall contain the following information:

- (1) Name of product (letters not less than 1/4 inch high)
- (2) Contents
- (3) Date 1/
- (4) Contractor's name and address

1/ Each carton 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 BIB.

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

D-4 UNITIZATION

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

D-5 MARKING

A. Shipping containers and unit loads. Shipping containers and unit loads 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:

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(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. The sample unit shall be one paperboard carton or barrier pouch containing BIBs of egg mix. Two (2) sample units of each item produced shall be randomly selected from that one production lot. The two (2) sample units shall be shipped to Natick within five working days from the end of the production month and upon completion of all USDA inspection requirements. The sample units will be evaluated for the characteristics of appearance, odor, flavor, texture and overall quality.

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

E-5 QUALITY ASSURANCE PROVISIONS (PRODUCT)

A. Product examination. The finished product shall be examined for compliance with the performance requirements specified in Section C of this Product Contract Requirements document utilizing the double sampling plans indicated in ANSI/ASQ Z1.4. The lot size shall be expressed in BIBs. The sample unit shall be the contents of one BIB. 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 6.5 for minor defects. Defects and defect classifications are listed in table I.

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

Category	Defect
<u>Major</u>	<u>Minor</u>
101	Product not uncooked, dehydrated egg mix.
102	Not class specified.
	<u>Dehydrated product</u>
	<u>Appearance</u>
201	Egg mix not a free flowing homogenous mixture.
202	Egg mix not light yellow in color.
203	Egg mix not free of scorched particles.
	<u>Odor</u>
103	Packaged food does not have an odor of butter-flavored egg mix.
	<u>Texture</u>
204	Presence of hard lumps. <u>5/</u>
	<u>Net weight</u>
205	Net weight of an individual BIB less than 475 grams (16.8 ounces). <u>6/</u>
	<u>Rehydrated and cooked product</u> <u>7/</u>
	<u>Appearance</u>
206	Product does not rehydrate readily or does not show complete water penetration within five minutes.
104	Not cooked scrambled eggs appearance.
207	Eggs not light yellow in color.

TABLE I. Product defects 1/ 2/ 3/ 4/ - Continued

Category		Defect
<u>Major</u>	<u>Minor</u>	
		<u>Odor and flavor</u>
105		Rehydrated and cooked product does not have an odor or flavor of cooked scrambled eggs with butter.
	208	Eggs have a scorched odor or flavor.
		<u>Texture</u>
	209	Cooked product not moist or not tender.
	210	Texture not cooked scrambled eggs.

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 or foreign color shall be cause for rejection of the lot. Foreign flavor is not applicable to dehydrated product.

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. Palatability not applicable to dehydrated product.

3/ When used, the producer shall provide a USDA Grade Certificate for the nonfat dry milk and the dry buttermilk.

4/ The percent egg in the liquid egg mix shall be verified by Certificate of Conformance (CoC).

5/ Lumps that do not fall apart under light pressure between fingers shall be scored as a defect.

6/ Sample average net weight less than 500 grams (17.6 ounces) shall be cause for rejection of the lot.

7/ Prepare egg mix in accordance with BIB directions.

B. Methods of inspection.

(1) Shelf life. The contractor shall provide a Certificate of Conformance (CoC) 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 BIB shall be determined by weighing each sample unit on a suitable scale tared with a representative empty BIB. Results shall be reported to the nearest 1 gram or to the nearest 0.1 ounce.

(3) Analytical. The sample to be analyzed shall be a one-pound composite of dehydrated egg mix from three filled and sealed BIBs that have been selected at random from the lot. The composite sample shall be prepared and analyzed in accordance with the following Official Methods of Analysis (OMA) of AOAC International.

<u>Test</u>	<u>Method Number</u>
Protein	988.05, 992.15
Salt	935.47
Moisture	927.05, 985.14

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.

(4) Microbiological testing. Five filled and sealed BIBs shall be selected at random from the lot regardless of lot size. The 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.

<u>Test</u>	<u>Method Number</u>
Aerobic Plate Count	966.23, 990.12
<i>E. coli</i>	966.24, 991.14 or BAM Ch. 4 sections C & F
<i>Salmonella</i>	967.26, 967.28, 986.35, 991.13, 994.04, 996.08, 2000.06 (b), 2003.09, 2004.03

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

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

A. Packaging. Note that the terms BIB, bag, and pouch are used interchangeably.

(1) BIB and barrier pouch material certification. The BIB and barrier 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)	ASTM D 2103 <u>1/</u>
Laminated material identification and construction	D-1,A(1)a and D-1,A(2)	Laboratory evaluation.
Color of BIB material	D-1,A(1)a	Fill the BIB with minimum 8 oz. of water. The water level in the BIB shall be easily discernible through the BIB material. Inability to discern the water level shall constitute a test failure.

1/ ASTM D 2103 Standard Specification for Polyethylene Film and Sheeting

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

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(3) Filled and sealed BIB examination. The filled and sealed BIBs shall be examined for the defects listed in table II. The lot size shall be expressed in BIBs. The sample unit shall be one BIB. 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 BIB 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 BIB. <u>4/</u>
105		BIB has foreign odor.
106		Any impression or design on the heat seal surfaces which conceals or impairs visual detection of seal defects. <u>5/</u>
	201	Label missing or incorrect or illegible.
	202	Seal width less than 1/8 inch but greater than or equal to 1/16 inch.
	203	Presence of delamination. <u>3/</u>
	204	Center heat seal not in center of bag.
	205	Center heat seal not minimum four inches long.
107		Venting system missing or not functional.
108		Class 1 fitment not compatible with rehydration pouch.
109		Class 1 fitment opening less than 3/4-inch.
110		Class 2 fitment not as specified.

TABLE II. Filled and sealed BIB defects 1/ - Continued

Category		Defect
<u>Major</u>	<u>Minor</u>	
111		Class 2 fitment opening less than 1-1/2 inch.
112		Cap missing or does not fit or does not provide a liquid barrier.
	206	Fill line missing or incorrect.
	207	When self-adhering label is used, label not adhered to BIB (for example, label raised or peeled back or presence of gaps along perimeter).

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 inner barrier film 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

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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 that 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.

(4) Filled and sealed barrier pouch examination. The filled and sealed barrier pouches shall be examined for the defects listed in table III. The lot size shall be expressed in pouches. The sample unit shall be one pouch. The inspection level shall be 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 III. <u>Filled and sealed barrier pouch defects</u> 1/	
Category	Defect
<u>Major</u>	<u>Minor</u>
101	Tear or hole or open seal.
102	Seal width less than 1/16 inch. 2/

TABLE III. Filled and sealed barrier pouch defects 1/ - Continued

Category	Defect
<u>Major</u>	<u>Minor</u>
103	Presence of delamination. 3/
104	Unclean pouch. 4/
105	Pouch has foreign odor.
106	Any impression or design on the heat seal surfaces which conceals or impairs visual detection of seal defects. 5/
107	Pouch does not contain one intact oxygen scavenger. 6/
	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. 3/
108	Not 1 or not 3 BIBs in barrier pouch, as applicable.
109	BIB or oxygen scavenger entrapped in heat seal of barrier pouch.

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 inner barrier film 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

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

B. Methods of inspection.

(1) Seal testing. The BIB and barrier 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 BIB and barrier 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 for rejection of the lot.

b. Pouch closure seal testing. The closure seals of the BIB and barrier pouch 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. 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 (for barrier pouch). The internal pressure resistance shall be determined by pressurizing the barrier 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

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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. Any test failure shall be classified as a major defect and shall be cause for rejection of the lot.

(2) Label adhesive examination. When self-adhering labels are used, the adhesive shall be tested in accordance with ASTM D 3330/D 3330M, Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape. In lieu of testing, a CoC shall be provided.

(3) BIB in boiling water test. Rehydrated egg mix in BIBs shall be tested for durability in boiling water. The lot size shall be expressed in BIBs. The inspection level shall be S-2. The rehydrated BIBs shall be placed in boiling water for two hours. After removal from the boiling water, the BIBs shall be inspected. Any delamination or degradation of the BIB or damage to the product shall be classified as a major defect and shall be cause for rejection of the lot.

(4) 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 96 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.

C. Paperboard carton. When applicable, the filled and closed paperboard cartons shall be examined for the defects listed in table IV. The lot size shall be expressed in paperboard boxes. The sample unit shall be one carton fully packed. The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units, shall be 4.0 for major defects and 10.0 for total defects.

TABLE IV. Paperboard carton and label defects

Category	Defect
<u>Major</u>	<u>Minor</u>
101	Labeling missing or incorrect or illegible.
102	Inadequate workmanship. 1/
201	Does not contain one filled and sealed barrier pouch.

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

D. Packing.

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

E. Unitization.

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

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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 DSCP FORMS

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

GOVERNMENT PUBLICATIONS

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

FDA Bacteriological Analytical Manual (BAM), 8th Edition

Inspection of Eggs and Egg Products (Egg Products Inspection Act) (9 CFR Part 590)

General Specifications for Approved Plants and Standards for Grades of Dairy Products (7 CFR Part 58)

Dairy plants surveyed and approved for USDA grading service (7 CFR Part 58)

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-131	Barrier Materials, Watervaporproof, Greaseproof, Flexible, Heat-Sealable
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(Copies of these documents are available from <http://assist.daps.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Ave, Building 4D, Philadelphia, PA 19111-5094.)

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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

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

D 2103 Specification for Polyethylene Film and Sheeting

D 3330/D 3330M Standard Test Method for Peel Adhesion of Pressure-
Sensitive Tape

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 the AOAC International