PKG & QAP
A-A-20098C
17 August 2004
SUPERSEDING
31 January 2000

SECTION C

This document covers beverage bases packaged in flexible pouches for use by the Department of Defense as a component of operational rations.

C-1 ITEM DESCRIPTION

PACKAGING REQUIREMENTS AND QUALITY ASSURANCE PROVISIONS FOR CID A-A-20098C, BEVERAGE BASES, POWDERED

Type, flavors, fortification and packages.

Type.

Type II – Sweetened with nutritive sweetener

Flavors.

Flavor 1 – Orange
Flavor 2 – Lemon
Flavor 3 – Lime
Flavor 4 – Lemon-lime
Flavor 5 – Grape
Flavor 6 – Cherry
Flavor 10 – Tropical punch
Flavor 12 – Apple cider

Fortification.

Fortification b – Fortified with ascorbic acid
Fortification c – Fortified with vitamin pre-mix
Fortification d – Fortified with ascorbic acid and maltodextrin

Packages.

Package A –	Meal, Cold Weather (MCW)
Package B –	Food Packet, Long Range Patrol (LRP)
Package C –	Meal, Ready-To-Eat (MRE)
Package E –	Unitized Group Ration (UGR) – Heat & Serve
Package I –	Unitized Group Ration – B

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 the Packaging Requirements and Quality Assurance Provisions. 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 arrange for a new or alternate FA or PDM 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. Palatability and overall appearance. The finished product shall be equal to or better than the approved product standard in palatability and overall appearance.

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

E. Net weight.

(1) For flavors 1 through 6, flavor 10, and flavor 12, fortification b and d, package A, B, or C. When specified, the net weight shall be not less than 34 grams or not less than 17 grams, as applicable.

(2) For flavor 1, fortification c, package A or B. The net weight shall be not less than 50 grams.

F. Nutrient content.

(1) Fortification b. The ascorbic acid content shall be not less than 20 milligrams per serving.

(2) Fortification c. The packaged product per 50 grams serving shall contain not less than the following amounts:

Ascorbic acid	80 milligrams
Vitamin D	6.5 micrograms
Pantothenic acid	2.4 milligrams
Vitamin E	2.0 milligrams
Riboflavin	0.6 milligram
Niacin	0.6 milligram
Thiamin	0.4 milligram
Vitamin B_6	0.25 milligram

(3) Fortification d. The packaged product per serving shall contain not less than the following amounts:

Ascorbic acid	Not less than 45 milligrams per serving
Maltodextrin	Not less than 40 milligrams per serving

G. Moisture content. For all types specified, the moisture content procedures and testing shall be in accordance with A-A-20098C.

SECTION D

D-1 PACKAGING

A. Packaging. When specified, for flavors 1 through 6 and flavor 12, fortification b, package A, B, or C, 17 grams or 34 grams, as applicable, of beverage base shall be filled into a preformed pouch as described below. When specified, flavor 1, fortification c, package A or B, 50 grams of beverage base shall be filled into a preformed pouch as described below. When specified, for flavors 1 through 6 and flavor 10, fortification d, package A, B, or C, 34 grams of beverage base shall be filled into a preformed pouch as described below.

(1) Preformed pouches.

a. Pouch material. The preformed pouch shall be fabricated from 0.002 inch thick ionomer or polyethylene film laminated or extrusion coated to 0.00035 inch thick aluminum foil which is then laminated to 0.0005 inch thick polyester. The three plies shall be laminated with the polyester on the exterior of the pouch. All tolerances for thickness of pouch material shall be plus or minus 20 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. For package A (MCW), the complete exterior surface of the pouch shall be colored white overall with a color in the range of 37778 through 37886 of FED-STD-595, Colors Used in Government Procurement. For package B (LRP) and package C (MRE), 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.

b. Pouch construction. The pouch shall be a flat style preformed pouch. For 17 grams of product, the pouch shall have maximum inside dimensions of 3 inches by 4 inches. For 34 grams or 50 grams of product, the pouch shall have maximum inside dimensions of 3-7/8 inches by 4-3/4 inches. The pouch shall be made by heat sealing three edges with 3/8 inch (-1/8 inch, +3/16 inch) wide seals. The heat seals shall be made in a manner that will assure hermetic seals. A tear notch shall be provided on one outside edge or two opposite outside edges of the pouch 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. As specified in D-1,A, product shall be filled into the pouch. 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 sealed pouch shall not leak when tested in accordance with E-6, B,(1).

B. Apple cider envelope packaging. When specified for flavor 12, fortification b, package A, B, or C, not less than 17 grams or not less than 34 grams, as applicable shall be filled into an envelope having maximum outside dimensions of 4-7/8 inches long by 3-7/16 inches wide. The envelope shall be made from a heat sealable barrier material, one layer of which is a minimum of 0.00035 inch thick aluminum foil. All four edges of the envelope shall be heat-sealed with seals not less than 1/8 inch wide. The sealed envelope shall not leak when tested in accordance with E-6,B.(1). There shall be no crushed, misshapen or unclean envelopes.

D-2 LABELING

A. Pouches. Each pouch shall be clearly printed or stamped, in a manner that does not conceal or impair visual examination of heat seals or damage the pouch, with permanent black ink or other, dark, contrasting color which is free of carcinogenic elements. Pre-printed information, information printed prior to sealing or information printed by non-contact type printing equipment may be located anywhere on the pouch (in one complete print). Information printed subsequent to sealing by contact type printing equipment may be located anywhere on the pouch, except the closure seal area. The label shall contain the following information:

(1) Name and flavor of product (letters not less than 1/8 inch high)
(2) Directions for use:
For a 17 gram pouch: Add 1/4 canteen cup (6 ounces) of water to contents and stir. Allow water just chemically purified to stand 30 minutes before adding beverage powder.
For a 34 gram or 50 gram pouch: Add 1/2 canteen cup (12 ounces) of water to contents and stir. Allow water just chemically purified to stand 30 minutes before adding beverage powder.
(3) Date 1/
(4) Net Weight
(5) Contractor's name and address
(6) "Nutrition Facts" label in accordance with the Nutrition Labeling and Education Act (NLEA) and all applicable FDA/USDA 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, 17 August 2004 would be coded as 4230. The Julian day code shall represent the day the product was packaged into the pouch.

D-3 PACKING

A. Packing for shipment to ration assembler. Not more than 40 pounds of pouched product shall be packed in a fiberboard shipping container constructed in accordance with style RSC-L, class domestic, variety SW, grade 200 of ASTM D5118/D5118M-95 (2001), Standard Practice for Fabrication of Fiberboard Shipping Boxes. Each container shall be securely closed in accordance with ASTM D1974-98, Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes.

D-4 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/ASQC Z1.4-1993, Sampling Procedures and Tables for Inspection by Attributes, are required. Unless otherwise specified, Single Sampling Plans indicated in ANSI/ASQC Z1.4-1993 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:

US Army Research, Development and Engineering Command
Natick Soldier Center
AMSRD-NSC-CF-F
15 Kansas Street
Natick, MA 01760-5018

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 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 performance requirements specified in A-A-20098C and Section C of the Packaging Requirements and Quality Assurance Provisions document utilizing the double sampling plans indicated in ANSI/ASQC Z1.4 - 1993. 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/

Category		Defect
Major	Minor	
		Dehydrated product
101		Product not type specified.
	201	Net weight of an individual pouch less than 17 grams or less than 34 grams or less than 50 grams, as applicable.
	202	Beverage base not free flowing, not uniformly blended, or not a homogenous mixture.
	203	Presence of hard lumps. 3/
		Rehydrated product 4/
		Appearance
102		Appearance or color not of the applicable type II flavor specified.
103		Beverage not sediment free.
		Odor and flavor
104		Odor or flavor not of the applicable type II flavor specified.

1/ Presence of any foreign materials such as but not limited to, dirt, insect parts, hair, wood, glass, metal, or mold or the presence of any foreign odors or flavors such as, but not limited to burnt, scorched, rancid, sour, or stale 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 is not applicable to dehydrated product.

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

4/ Prior to conducting the rehydrated product examination, the beverage base shall be reconstituted per label instructions. Product that does not fully dissolve within 2 minutes with constant stirring 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 3 year shelf life when stored at 80^0F. Government verification may include storage for 6 months at 100^0F or 36 months at 80^0F. 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 pouches or envelopes shall be determined by weighing each sample on a suitable scale tared with a representative empty pouch or envelope. Results shall be reported to the nearest 0.1 gram.

(3) Nutrient content. The sample to be analyzed shall be a composite of the product from eight filled and sealed pouches or envelopes which have been selected at random from the lot. The composited sample shall be prepared and analyzed for vitamin C in accordance with the following methods of the Official Methods of Analysis of AOAC International:

Test	Method Number
Vitamin C	984.26

For products with fortification c, use the same composited sample, the USDA shall select at random one of the following vitamins to test, except for vitamin D and pantothenic acid, which shall be verified by a producer's certificate of analysis. The vitamins not tested shall be verified by a producer's certificate of analysis.

Test	Method Number
Vitamin E	992.03
Thiamin	986.27
Riboflavin	985.31
Niacin	985.34
Vitamin B_6	985.32

Test results shall be reported to the nearest milligram or microgram for vitamins, as applicable. Any nonconforming result shall be cause for rejection of the lot.

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

A. Packaging.

(1) Pouch material certification. Material listed below may be accepted on the basis of a contractor's certification of conformance to the indicated requirements. In addition, compliance to the requirements for inside pouch dimensions and dimensions of manufacturer's seals may be verified by certificate of conformance.

Requirement	Requirement paragraph	Test procedure
Thickness of films for laminated material	D-1,A,(1),a	As specified in ASTM D2103-03 1/
Aluminum foil thickness	D-1,A,(1),a	As specified in ASTM B479-00 2/
Laminated material identification and construction	D-1,A,(1),a	Laboratory evaluation
Color of laminated material	D-1,A,(1),a	Visual evaluation by FED-STD-595 3/

1/ ASTM D2103-03 Standard Specification for Polyethylene Film and Sheeting

2/ ASTM B479-00 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 certification of conformance may be accepted as evidence that unfilled pouches conform to the requirements specified in D-1,A,(1) a and b.

(3) Envelope material certification. Conformance to thickness of envelope laminate foil and polyethylene components and basis weight of paper component requirements shall be determined by certificate of conformance.

(4) 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
Major	Minor	
101		Tear, hole, or open seal.
102		Seal width less than 1/16 inch. 2/
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		Leakage. 6/
	201	Label missing, incorrect, or illegible.
	202	Tear notch missing or does not facilitate opening.
	203	Seal width less than 1/8 inch but greater than 1/16 inch.
	204	Presence of delamination. 3/

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).

c. Water spots.

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/ Examine envelope after removal from leakage test apparatus.

B. Methods of Inspection.

(1) Leakage test. The filled and sealed envelopes shall be tested by placing them in a dry desiccator, or similar apparatus, and subjecting them to a vacuum of 26 inches of mercury (atmospheric pressure is 29.9 inches of mercury) for 30 seconds. Any envelope that does not swell to form a tightly distended package having at least one distorted edge during the test shall be recorded as a leaker. After vacuum testing, the envelopes shall be visually inspected for evidence of delamination and for seal separation. Any leakage, any delamination, or any seal separation of more than 1/16 inch from the product edge of any seal shall be recorded as a major defect.

C. Packing.

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

Category		Defect
Major	Minor	
101		Marking omitted, incorrect, illegible, or improper size, location sequence or method of application.
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

DSCP 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)

ANSI/ASQCZ1.4-1993 Sampling Procedures and Tables for Inspection by Attributes

ASTM International

B479-00 Standard Specification for Annealed Aluminum and Aluminum-Alloy Foil for Flexible Barrier, Food Contact, and Other Applications

D1238-04	Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
D1505-03	Standard Test Method for Density of Plastics by the Density-Gradient Technique
D1974-98	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
D2103-03	Standard Specification for Polyethylene Film and Sheeting
D5118/D5118 M-95 (2001)	Standard Practice for Fabrication of Fiberboard Shipping Boxes

AOAC INTERNATIONAL Official Methods of Analysis of the AOAC International (OMA)