

**SECTION C**

This document covers dehydrated cooked shrimp packaged in a No. 10 metal can for use by the Department of Defense as a component of operational rations.

**C-1 ITEM DESCRIPTION**

**PCR-S-024, SHRIMP, DEHYDRATED, COOKED, PACKAGED IN A No. 10 METAL CAN, SHELF STABLE**

**C-2 PERFORMANCE REQUIREMENTS**

A. Product standard. A sample shall be subjected to first article (FA) or product demonstration model (PDM) inspection as applicable, in accordance with the tests and inspections of Section E of this Performance-based Contract Requirements (PCR) document. The approved sample shall serve as the product standard. Should the contractor at any time plan to, or actually produce the product using different raw material or process methodologies from the approved product standard, which result in a product non comparable to the product standard, the contractor shall submit a replacement FA or PDM for approval. In any event, all product produced must meet all requirements of this document including product standard comparability.

B. Shelf life. The packaged food shall meet the minimum shelf life requirement of 36 months at 80°F.

C. General. The raw shrimp shall be from the U.S. Department of Commerce (USDC) Grade A of the U.S. Standards for Grades of Fresh and Frozen Shrimp. The type and style shall be either Type (1) Chilled, fresh or Type (3) Frozen individually; Style (1) Raw or Style (3) Cooked. Market form shall be peeled, deveined, round, tail off (all shell removed, with all segments slit or pierced) for either Type or Style. Raw shrimp shall be cooked before dehydrating. Raw shrimp shall be 36 to 42 shrimp per pound, cooked shrimp shall be 41-60 shrimp per pound. Raw shrimp shall not be tempered or thawed more than once before freezing the cooked shrimp for placement in the dehydrator. Raw shrimp shall not be stored frozen more than 120 days. Cooked frozen shrimp shall not be thawed and refrozen before placement in the dehydrator. Cooked frozen shrimp shall not be held more than 30 days before the start of dehydration.

D. Dehydrated product.

(1) Appearance. The finished product shall be dehydrated cooked shrimp. There shall be no evidence of faulty dehydration procedures such as glazed areas more than 1/4 inch (6.4

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mm) in any dimension on more than two shrimp per can. The product shall show no evidence of incomplete dehydration such as wet or soft spots. The dehydrated product shall be a light orange-pink color. There shall be no more than 0.75 ounces of shrimp fragments or broken or damaged shrimp per can. The packaged food shall be free from foreign materials.

(2) Odor. The packaged food shall have a dehydrated cooked shrimp odor. The packaged food shall be free from foreign odors.

E. Net weight. The average net weight shall be not less than 11.00 ounces (312 grams). The net weight of an individual can shall be not less than 10.75 ounces (305 grams).

F. Rehydrated product.

(1) General. The rehydrated shrimp shall have no unrehydrated spots larger than 1/4 inch (6.4 mm) in two dimensions perpendicular to each other.

(2) Odor and flavor. The rehydrated shrimp shall have a cooked shrimp odor and flavor. The product shall be free from excessive or strong iodoform-like odor and flavor. The rehydrated shrimp shall be free from foreign odors and flavors.

(3) Texture. The rehydrated shrimp shall have a tender and slightly fibrous texture.

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

H. Analytical requirements.

(1) Moisture content. The moisture content of the dehydrated product shall not exceed 2.0 percent.

(2) Oxygen content. The oxygen content of the headspace gas in the metal can shall not exceed 2.0 percent.

I. Microbiological requirements.

(1) Aerobic plate count. The aerobic plate count shall be not greater than 50,000 per gram in four of five samples and not greater than 75,000 per gram in any individual sample.

(2) E. coli count. *Escherichia coli* shall have less than 10 Colony Forming Units (CFU) per gram or less than 3 Most Probable Number (MPN) per gram, where findings indicate zero colonies (CFU) per plate or zero tube producing gas for MPN.

(3) Salmonella. The *Salmonella* test shall be negative for each of five cans tested per production lot.

(4) Listeria monocytogenes. *Listeria monocytogenes* shall be negative.

## **SECTION D**

### **D-1 PACKAGING**

A. Packaging. The dehydrated product shall be packaged in a No. 10 metal can under an atmosphere of nitrogen so that the oxygen content of the gases in the filled and sealed container shall not exceed 2.0 percent when tested within 24 hours of packing. The can shall not leak.

### **D-2 LABELING**

A. Metal cans. The metal cans shall be labeled in accordance with DLA Troop Support Form 2997, Labeling of Metal Cans for Subsistence. In addition, the following information and directions for use shall appear on one end of the can:

- (1) SHRIMP, DEHYDRATED, COOKED
- (2) Net weight
- (3) Name and address of processor
- (4) Date of packaging (day-month-year)
- (5) Lot No. (concurrent with dehydration load)
- (6) THIS PRODUCT IS GAS PACKED
- (7) Directions for use:

Rehydrate the shrimp as soon as can is opened. Add the entire contents of can to 3 quarts of water 90°F-100°F and stir. Soak for 20 minutes. Drain and chill in covered container. Handle and use like fresh cooked shrimp.

NOTE: One pound dehydrated cooked product equals about 3-1/2 pounds of cooked, peeled, deveined shrimp. Each portion is 8 to 10 shrimp. For 100 portions use 4 No. 10 cans.

### **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 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-4 UNITIZATION**

A. Unit loads. Unit loads shall be arranged in accordance with DLA Troop Support 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 DLA Troop Support Form 3556, Marking Instructions for Boxes, Sacks, and Unit Loads of Perishable and Semiperishable Subsistence.

### **SECTION E INSPECTION AND ACCEPTANCE**

The following quality assurance criteria, utilizing ANSI/ASQ Z1.4, Sampling Procedures and Tables for Inspection by Attributes, are required. Unless otherwise specified, single sampling plans indicated in ANSI/ASQ Z1.4 will be utilized. When required, the manufacturer shall provide the Certificate(s) of Conformance to the appropriate inspection activity. Certificate(s) 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 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 United States Department of Commerce (USDC) shall be subject to periodic review sampling and evaluation. The USDC 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. 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 USDC inspection requirements. The sample units will be evaluated for the characteristics of appearance, odor, flavor, texture and overall quality.

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

**E-5 QUALITY ASSURANCE PROVISIONS (PRODUCT)**

A. Product examination. The finished product shall be examined for compliance with the performance requirements specified in Section C of this Performance-based Contract Requirements document utilizing the double sampling plans indicated in ANSI/ASQ Z1.4. The lot size shall be expressed in cans. The sample unit shall be the contents of one can. 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/

<u>Category</u>		<u>Defect</u>
<u>Major</u>	<u>Minor</u>	
		<u>Dehydrated product</u>
101		Product not dehydrated cooked shrimp.
102		More than two shrimp containing glazed areas more than 1/4 inch (6.4 mm) in any dimension. <u>5/</u>
103		Evidence of incomplete dehydration. <u>6/</u>
	201	Product not a light orange-pink color.
	202	Packaged food does not have a dehydrated cooked shrimp odor.
104		More than 0.75 ounces of shrimp fragments or broken shrimp or damaged shrimp.
		<u>Net weight</u>
	203	Net weight of an individual can less than 10.75 ounces (305 grams). <u>7/</u>
		<u>Rehydrated product 8/</u>
105		Rehydrated shrimp have unrehydrated spots larger than 1/4 inch (6.4 mm) in two dimensions perpendicular to each other.
		<u>Odor and flavor</u>
106		Rehydrated shrimp does not have a cooked shrimp odor or flavor.
107		Product has an excessive or strong iodoform-like odor or flavor. <u>9/</u>
		<u>Texture</u>
	204	Rehydrated shrimp not tender or not slightly fibrous.

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,

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rancid, sour, stale, musty or moldy shall be cause for rejection of the lot. Foreign flavor 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/ The shrimp shall be USDC Certified Grade A raw or cooked. Product not accompanied by a USDC certificate shall be cause for rejection of the lot.

4/ Requirements for Type (1) Style (1) and Type (3) Style (3) shrimp processing, the market form, and count per pound shall be verified by a Certificate of Conformance (CoC).

5/ Evidence of faulty dehydration.

6/ Presence of wet or soft spots.

7/ Sample average net weight less than 11.00 ounces (312 grams) shall be cause for rejection of the lot.

8/ The dehydrated shrimp shall be rehydrated in an excess of 90°F to 100°F water, stirred, allowed to soak for 20 minutes, drained, and held in a covered container at 40°F for 4 to 8 hours.

9/ Iodoform odors and flavors in shrimp are caused by what the shrimp were feeding on before harvesting. Iodoform can be an unpleasant sharp odor. Freeze dehydrated shrimp is a process intensive product that requires careful handling and can be prone to off odor development if improperly handled or exposed to too much oxygen. If the inspector is uncertain if the product can be classified 'excessive or strong' then the product can be sent to Natick for sensory testing. The sensory testing will evaluate the intensity of the odor and for the flavor iodoform attribute and also determine acceptability in accordance with the Codex Committee on Fish and Fishery Products.

**B. Methods of inspection.**

(1) Shelf life. The contractor shall provide a Certificate of Conformance that the product has a 36 month shelf life when stored at 80°F. Government verification may include storage for 6 months at 100°F or 36 months at 80°F. Upon completion of either storage period, the product will be subjected to a sensory evaluation panel for appearance and palatability and must receive an overall score of 5 or higher based on a 9 point hedonic scale to be considered acceptable.

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(2) Net weight. The net weight of the filled and sealed can shall be determined by weighing each sample unit on a suitable scale tared with a representative empty can and lid. Results shall be reported to the nearest 0.01 ounce or to the nearest 1 gram.

(3) Moisture content testing. The sample to be analyzed shall be a one-pound composite of three filled and sealed cans that have been selected at random from one production lot. The composite sample shall be tested for moisture content in accordance with the Official Methods of Analysis of the AOAC method 950.46A (except that the temperature-time cycle for moisture analysis shall be modified by using a temperature of 70°C for 16 hours at a pressure of not more than 100 mm of mercury). Test results shall be reported to the nearest 0.1 percent. Any result not conforming to the requirements specified in Section C of this Performance-based Contract Requirements document shall be cause for rejection of the lot.

(4) Oxygen content testing. Eight filled and sealed cans shall be randomly selected from one production lot and individually tested for oxygen content. Testing shall be accomplished after the filled and sealed cans have been allowed to equilibrate at room temperature for not more than 24 hours from the time of sealing. Test results shall be reported to the nearest 0.1 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 of rejection of the lot.

(5) Microbiological testing. Five samples 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, 992.30, <del>989.10, 2005.15,</del> 991.14 or BAM Ch. 4 sections C & F
<i>Salmonella</i>	967.26, 967.28, 986.35, 991.13, 996.08, 2003.09, or 2004.03
<i>Listeria monocytogenes</i>	<del>990.06,</del> 999.06, 995.22, 997.03, or FDA's BAM, Sections C, D, E, Ch 10

**Comment [RDNS-CFF1]:** ES13-047 (DSCP-SS-13-01018), 27 Sep 13, p. 8, E-5, B(5)  
Microbiological testing, after "992.30," delete "989.10, 2005.15"

**Comment [RDNS-CFF2]:** ES13-047 (DSCP-SS-13-01018), 27 Sep 13, p. 8, E-5, B(5)  
Microbiological testing, delete "990.06" insert "999.06,"

(6) Can leakage examination. Cans shall be inspected for leakage. The sample unit shall be one filled and sealed can. The lot size shall be expressed in cans. The sealed cans



shall be examined for leakage by submerging the can in water contained in a vacuum desiccator, Mead Tester, or equivalent device, and drawing a vacuum of 10 inches of mercury (atmospheric pressure 29.9 inches of Hg) for at least 30 seconds. A leak is indicted by a steady progression of bubbles and is a major defect. Isolated bubbles caused by air entrapped in the double seam are not considered signs of leakage. The inspection level shall be S-2 and the AQL, expressed as defects per hundred units, shall be 1.5.

**E-6 QUALITY ASSURANCE PROVISIONS (PACKAGING AND PACKING MATERIALS, No. 10 METAL CAN)**

A. Packaging.

(1) Can condition examination. Examination of filled and sealed cans shall be in accordance with the United States Standards for Condition of Food Containers. In addition, scratches, scuffs or abrasions that occur on the outside coating as a result of the filling, sealing, and processing of the cans shall not be scored as a defect.

(2) Can closure examination. Can closures shall be examined visually and by teardowns in accordance with the can manufacturer's requirement and 21 CFR, Part 113, Subpart D, or 9 CFR, Part 318, Subpart G, as applicable. Any nonconformance based on observation of can seam teardowns or on record of can seam teardowns shall be classified as a major defect and shall be cause for rejection of any involved product.

B. Labeling.

(1) Can labeling examination. The can labeling shall be examined in accordance with the requirements of DLA Troop Support Form 2997, Labeling of Metal Cans for Subsistence. Any nonconformance shall be classified 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 II. 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 II. Shipping container and marking defects

Category		Defect
<u>Major</u>	<u>Minor</u>	
101		Marking omitted 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.

D. Unitization.

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

**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 Forms

Form 2997	Labeling of Metal Cans for Subsistence
Form 3507	Loads, Unit: Preparation of Semiperishable Subsistence Item
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)

U.S. Standards for Condition of Food Containers

U.S. DEPARTMENT OF COMMERCE, SEAFOOD INSPECTION

<http://www.seafood.nmfs.noaa.gov/>

FOOD AND DRUG ADMINISTRATION Bacteriological Analytical Manual (BAM)  
<http://www.fda.gov/Food/ScienceResearch/LaboratoryMethods/BacteriologicalAnalyticalManualBAM/default.htm>

U.S. STANDARDS FOR GRADES

U.S. Standards for Grades of Fresh and Frozen Shrimp

NON-GOVERNMENTAL STANDARDS

AMERICAN SOCIETY FOR QUALITY (ASQ) [www.asq.org](http://www.asq.org)

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

ASTM INTERNATIONAL [www.astm.org](http://www.astm.org)

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- D1974 Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
- D 4727/D 4727M Standard Specification for Corrugated and Solid Fiberboard Sheet Stock (Container Grade) and Cut Shape
- D 5118/D 5118M Standard Practice for Fabrication of Fiberboard Shipping Boxes

AOAC INTERNATIONAL [www.aoac.org](http://www.aoac.org)

Official Methods of Analysis (OMA) of AOAC International

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## For DLA Troop Support Website Posting

RDNS-CFF

27 September 2013

TO: DLA Troop Support – Subsistence DSCP-FTRE

SUBJECT: ES13-047 (DSCP-SS-13-01018); Specification update; PCR-S-024 Shrimp, Dehydrated, Cooked, Packaged in a No. 10 Metal Can, Shelf Stable; Update microbiological tests for E. coli and Listeria monocytogenes

1. DLA completed a review of the testing requirements in subject document and found methods that are out of date, wrong, or allow for tests which cannot determine the applicable requirement. DLA submitted their findings to USDA for review. The USDA S&T laboratory has reviewed the microbiological testing requirements for E. coli and Listeria monocytogenes in subject document and concurs with DLA's recommended changes.

2. Natick submits the following changes to subject document for all current, pending, and future procurements until the document is formally amended or revised:

(1) Paragraph E-5, B(5), Microbiological testing.  
Reference: E. coli: after "992.30," delete "989.10, 2005.15"

(2) Paragraph E-5, B(5), Microbiological testing.  
Reference: Listeria monocytogenes: delete "990.06," insert "999.06,"

3. Attached is Change 01, PCR-S-024, Shrimp, Dehydrated, Cooked, Packaged in a No. 10 Metal Can, Shelf Stable dated 27 September 2013, with the changes highlighted.