**SECTION C**

The Meal, Ready-to-Eat (MRE) provides an operational ration for the individual.

**C-1 ITEM DESCRIPTION**

**ACR-M-023A, MEAL, READY-TO-EAT (MRE), ASSEMBLY REQUIREMENTS**

**C-2 ASSEMBLY REQUIREMENTS**

A. Components. The components are specified in Table I.

TABLE I. Components

| Component | Reference |
|---|---|
| Entrees | |
| Beef in Teriyaki Sauce with Vegetables | PCR-B-0001 |
| Black Bean and Rice Burrito | PCR-B-0002 |
| Beef Enchilada in Sauce | PCR-B-010 |
| Beefsteak, Grilled, with Mushroom Gravy | PCR-B-030 |
| Beef Patty, Grilled | PCR-B-029 |
| Beef Ravioli in Meat Sauce | PCR-B-021 |
| Beef Roast with Vegetables | PCR-B-035 |
| Beef Stew | PCR-B-020 |
| Chicken Breast Strips with Chunky Style Salsa | PCR-C-0002 |
| Chicken in Thai Style Sauce | PCR-C-0003 |
| Chicken Tetrazzini | PCR-C-018 |
| Country Captain Chicken | PCR-C-019A |
| Cheese Tortellini in Tomato Sauce | PCR-C-020 |
| Chicken, Noodles and Vegetables in Sauce | PCR-C-021 |
| Chicken Breast Fillet | PCR-C-022 |
| Chicken Breast Fillet, in Tomato Sauce, with Cavatelli | PCR-C-023 |
| Chili and Macaroni | PCR-C-027 |
| Jambalaya, with Ham and Shrimp | PCR-J-001 |
| Meat Loaf with Brown Onion Gravy | PCR-M-0001 |
| Pasta with Vegetables in Tomato Sauce | PCR-P-009 |
| Pork Rib, Boneless, Imitation Smoke Flavoring Added | PCR-P-028 |
| Spaghetti with Meat and Sauce | PCR-S-0002 |
| Turkey Breast Fillet, Chunked and Formed, Grilled in Gravy with Potatoes | PCR-T-004 |
| Vegetable Manicotti in Tomato Sauce | PCR-V-003 |
| Starches and Soups | |
| Beans, Western | PCR-B-011 |
| Clam Chowder, New England Style | PCR-C-045 |
| Minestrone Stew | PCR-M-004 |
| Noodles in Butter Flavored Sauce | PCR-N-0001 |
| Potatoes, Mashed | PCR-P-011 |
| Rice, Mexican | PCR-R-001, Type II |
| Rice, Yellow and Wild Rice Pilaf | PCR-R-001, Type III |

TABLE I. Components (cont'd)

| Component | Reference |
|---|---|
| Fruits | |
| Apple Slices in Spiced Sauce | PCR-A-0001 |
| Fruits, Applesauce, Natural | PCR-F-002A, Type I |
| Fruits, Applesauce, Raspberry | PCR-F-002A, Type VI |
| Fruits, Applesauce, Carbohydrate Enhanced | PCR-F-002A, Type VII |
| Fruits, Wet Pack, Pineapple, Peaches, Pears, or Mixed Fruit | PCR-F-002A, Type II, III, IV or V |
| Desserts | |
| Chocolate Chip Cookies, Regular, Plain, Crisp | A-A-20295, Type I, Style J, Flavor 1, Bake Type a, Class 1, Package C |
| Chocolate Mint Cookie with Chocolate Chips | A-A-20295, Type I, Style J, Flavor 8, Bake Type a, Class 1, Package C |
| Cookie(s) with Pan Coated Chocolate Disks | PCR-C-031 |
| Fig Bar | A-A-20212, Type III, Flavor F, Style a |
| Fudge Brownie with Chocolate Drops | PCR-C-007A, Type II, Flavor 1, Style C |
| Oatmeal Cookie | A-A-20295, Type I, Style I, Flavor 1, Bake Type a, Class 1, Package C |
| Oatmeal Cookie, Chocolate Covered | MIL-C-44072C, Type II |
| Pound Cake, Vanilla, Pineapple, Lemon Poppy Seed, Spice, Almond Poppy Seed, or Pumpkin | PCR-C-007A, Type I, Flavors 1, 4, 6, 7, 8 or 9, Package C |
| Shortbread Cookie, Plain | A-A-20295, Type I, Style A, Flavor 1, Class 1, Package C |
| Toaster Pastry, Apple Cinnamon | A-A-20211A, Type I, Style A, Flavor 4, Shape A, Servings 1, Class a, Package C |
| Vanilla Sugar Cream Wafer Cookie | PCR-C-046 |
| Snacks | |
| Beef Snacks, Cured | A-A-20298, Type II, Style A, Flavor 1 |
| Cheese Spread, Plain or with Jalapeno Peppers | MIL-C-595E, Type I or II |
| Chocolate Sports Bar | PCR-C-0004 |
| Crackers, Plain | MIL-C-44112D, Type I |
| Crackers, Vegetable | MIL-C-44112D, Type II |
| Jelly, Apple or Grape | A-A-20078A, Type I, Apple or Grape, Grade A |
| Noodles, Chow Mien | A-A-20112B |
| Nuts, Peanuts, Dry Roasted, Salted | A-A-20164B, Type V, Style A |
| Nut Raisin Mix | PCR-N-002, Style C |
| Preserves (Jam), Blackberry or Strawberry | A-A-20079A, Type I, Group 1, Grade A |
| Peanut Butter | A-A-20328, Style I, Class A, Texture 1, Type a, Fortification b, Package C |
| Snack Foods, Potato Sticks | A-A-20195B, Type I |
| Snack Foods, Pretzels | A-A-20195B, Type II, Style A, B, C, D or E |
| Snack Foods, Filled Pretzels, Cheddar or Nacho Cheese | A-A-20195B, Type II, Style F, Flavor 1 or 2 |
| Snack Bread, Wheat | PCR-S-009, Type I |
| Candy | |
| Pan Coated Disks; Chocolate, Fruit Flavored, Chocolate with Crisped Rice, Chocolate with Peanut Butter | A-A-20177B, Type VI, Flavor 1, 2, 3 or 4 |
| Hard Candy, Fruit Tablets | A-A-20177B, Type IV, Style A or B |

TABLE I. Components (cont'd)

| Component | Reference |
|---|---|
| Beverages | |
| Beverage Base, Powdered, Orange, Lemon-Lime, Grape or Cherry | A-A-20098B, Type II, Flavor 1, 4, 5 or 6, Fortification b, Packaging C |
| Cocoa Beverage Powder | MIL-C-3031J, Type I, Class 1 |
| Coffees, Flavored, Instant Cappuccino, Powdered, Mocha or French Vanilla | A-A-20336, Type II, Style A, Flavor 1, 2 |
| Dairyshake Powder, Fortified with Calcium and Vitamin D, Vanilla, Chocolate or Strawberry | PCR-D-002, Flavor I, II, or III |
| Other Items | |
| Barbecue Sauce | A-A-20335, Flavor I, Type B |
| Picante Sauce | A-A-20259, Type II |
| Ration Supplement, Flameless Ration Heater (FRH) | MIL-R-44398B |
| Spoon | A-A-3109, Type IV, Item 13 |

B. Accessory components. Accessory components are specified in Table II.

TABLE II. Accessory Components

| Component | Reference | Packet |
|---|---|---|
| Apple Cider, Beverage Base, Powdered | A-A-20098B, Type II, Fortification b, Flavor 12, 17 g | D |
| Candy, Vanilla Caramels or Chocolate Rolls | A-A-20177B, Type I or II | B 1/,2/ |
| Chewing Gum | A-A-20175A, Type I, Flavor 1 or 2 | All |
| Coffee, Instant | A-A-20184, Type III, Style A | A, B |
| Creamer, Non-Dairy, Dry | A-A-20043A, Package C | A, B, E |
| Hand Cleaner (towelette) | A-A-461B, Type II | All |
| Hot Sauce | A-A-20097C, Type II, 1/8 fl. oz. | A, C, E 3/ |
| Matches | A-A-59489, Type I, Class A | All |
| Red Pepper, Ground | A-A-20001 | B |
| Seasoning Blend, Salt Free | A-A-20001 | D |
| Salt | Monograph, 4 gram | All |
| Sugar | A-A-20135B, Type I, Class 1, 1/7 oz | A, B, E |
| Tea, Instant, with Sweetener and Lemon Flavor | A-A-20183A, Type I, Style B, Flavor 2, Package C, 16 g | C, D |
| Tea Bag | A-A-20033C, Type I | E 4/ |
| Toilet Tissue | A-A-59594 | All |

1/ Candy shall be procured in equal quantities and assembled in a uniform distribution.

2/ Alternatively, candy may be packaged in a heat sealable barrier material one layer of which is a minimum of 0.00025 inch thick aluminum foil.

3/ Alternatively, hot sauce may be packed loose in the meal bag.

4/ The tea bag shall be over wrapped in a heat sealable barrier material one layer of which is a minimum of 0.00025 inch thick aluminum foil.

C. Contents. The contents of each meal are specified in Table III.

| TABLE III. Contents | | |
|---|---|---|
| Menu #1<br>Beefsteak with mushrooms<br>Western beans<br>Jelly 1/<br>Crackers<br>Dairyshake 1/<br>Accessory packet B<br>Spoon<br>Flameless ration heater | Menu #2<br>Pork rib<br>Clam chowder<br>Cheese spread<br>Two wheat snack bread<br>Beverage base, powdered 1/<br>Accessory packet A<br>Spoon<br>Flameless ration heater | Menu #3<br>Beef ravioli<br>Potato sticks<br>Fudge brownie<br>Cheese spread<br>Crackers<br>Beverage base, powdered 1/<br>Accessory packet A<br>Spoon<br>Flameless ration heater |
| Menu #4<br>Country captain chicken<br>Buttered noodles<br>Toaster pastry<br>Cheese spread<br>Crackers<br>Mocha cappuccino<br>Candy 2/<br>Accessory packet A<br>Spoon<br>Flameless ration heater | Menu #5<br>Chicken breast<br>Minestrone stew<br>Pound cake 3/<br>Cheese spread, Jalapeno<br>Wheat snack bread<br>Candy 2/<br>Accessory packet D<br>Spoon<br>Flameless ration heater | Menu #6<br>Chicken in Thai sauce<br>Yellow/wild rice pilaf<br>Nut raisin mix<br>Peanut butter<br>Crackers, vegetable<br>French vanilla cappuccino<br>Accessory packet E<br>Spoon<br>Flameless ration heater |
| Menu #7<br>Chicken with salsa<br>Mexican rice<br>Shortbread cookie<br>Cheese spread, Jalapeno<br>Crackers, vegetable<br>Candy 2/<br>Accessory packet C<br>Spoon<br>Flameless ration heater | Menu #8<br>Beef patty<br>Nacho cheese pretzels<br>Cheese spread<br>Two wheat snack bread<br>Beef strip<br>Beverage base, powdered 1/<br>BBQ sauce<br>Accessory packet C<br>Spoon<br>Flameless ration heater | Menu #9<br>Beef stew<br>Jelly 1/<br>Crackers<br>Chocolate disk cookie<br>Dairyshake 1/<br>Accessory packet A<br>Spoon<br>Flameless ration heater |
| Menu #10<br>Chili and macaroni<br>Chocolate mint cookie<br>Cheese spread, Jalapeno<br>Wheat snack bread<br>Cocoa beverage powder<br>Accessory packet B<br>Spoon<br>Flameless ration heater | Menu #11 Vegetarian<br>Pasta with vegetables in tomato sauce<br>Applesauce, carbohydrate enhanced<br>Pound cake 3/<br>Peanut butter<br>Crackers<br>Hard candy 2/<br>Accessory packet D<br>Spoon<br>Flameless ration heater | Menu #12 Vegetarian<br>Black bean and rice burrito<br>Wet pack fruit 1/<br>Fudge brownie<br>Peanut butter<br>Crackers<br>Hard candy 2/<br>Picante sauce<br>Accessory packet D<br>Spoon<br>Flameless ration heater |

| TABLE III. Contents (cont'd) | | |
|---|---|---|
| Menu #13 Vegetarian<br>Cheese tortellini<br>Applesauce<br>Pound cake 3/<br>Peanut butter<br>Crackers<br>Hard candy 2/<br>Accessory packet D<br>Spoon<br>Flameless ration heater | Menu #14 Vegetarian<br>Vegetable manicotti<br>Wet pack fruit 1/<br>Pound cake 3/<br>Dry roasted peanuts<br>Peanut butter<br>Crackers<br>Accessory packet D<br>Spoon<br>Flameless ration heater | Menu #15<br>Beef enchilada<br>Mexican rice<br>Chocolate chip cookies<br>Cheese spread, Jalapeno<br>Crackers, vegetable<br>Beverage base, powdered 1/<br>Accessory packet A<br>Spoon<br>Flameless ration heater |
| Menu #16<br>Chicken with noodles<br>Raspberry applesauce<br>Fig bar<br>Cheese spread<br>Crackers, vegetable<br>Candy 2/<br>Cocoa beverage powder<br>Accessory packet A<br>Spoon<br>Flameless ration heater | Menu #17<br>Beef teriyaki<br>Chow mein noodles<br>Shortbread cookie<br>Jam 1/<br>Wheat snack bread<br>Candy 2/<br>Beverage base, powdered 1/<br>Accessory packet E<br>Spoon<br>Flameless ration heater | Menu #18<br>Turkey breast with gravy and potatoes<br>Cheddar cheese pretzels<br>Peanut butter<br>Crackers<br>Chocolate sports bar<br>Beverage base, powdered 1/<br>Accessory packet A<br>Spoon<br>Flameless ration heater |
| Menu #19<br>Beef roast with vegetables<br>Spiced apple slices<br>Oatmeal cookie<br>Cheese spread<br>Crackers<br>Cocoa beverage powder<br>Accessory packet A<br>Spoon<br>Flameless ration heater | Menu #20<br>Spaghetti with meat sauce<br>Cheese spread<br>Wheat snack bread<br>Hard candy 2/<br>Dairyshake 1/<br>Accessory packet A<br>Spoon<br>Flameless ration heater | Menu #21<br>Chicken tetrazzini<br>Chocolate covered oatmeal cookie<br>Dairyshake 1/<br>Jam 1/<br>Crackers<br>Accessory Packet B<br>Spoon<br>Flameless ration heater |
| Menu #22<br>Jambalaya<br>Pound cake 3/<br>Cheese spread, Jalapeno<br>Wheat snack bread<br>Beverage base, powdered 1/<br>Candy 2/<br>Accessory packet A<br>Spoon<br>Flameless ration heater | Menu #23<br>Chicken with cavatelli<br>Pretzels<br>Pound cake 3/<br>Peanut butter<br>Wheat snack bread<br>Beverage base, powdered 1/<br>Accessory packet A<br>Spoon<br>Flameless ration heater | Menu #24<br>Meatloaf with gravy<br>Mashed potatoes<br>Vanilla wafer cookie<br>Jelly 1/<br>Crackers<br>Cocoa beverage, powder<br>Accessory packet B<br>Spoon<br>Flameless ration heater |

1/ Flavors shall be procured in equal quantities and assembled in a uniform distribution.

2/ Chocolate disks, fruit flavored disks, chocolate disks with crisped rice and chocolate disks with peanut butter shall be procured in equal quantities and assembled in a uniform distribution within menus 4, 5, 7, 16, 17 and 22. Hard candy fruit tablets shall be procured for menus 11, 12, 13, and 20.

3/ Flavors 1, 4, 6, 7, 8 and 9 shall be procured in equal quantities and assembled in a uniform distribution. Not more than two meals in any shipping container shall contain the same flavor of cake.

**SECTION D**

**D-1 PACKAGING**

A. Components.

(1) Subassembly packet/accessory packet. The subassembly packet/accessory packet shall be a preformed packet or a form-fill-seal packet. Dimensions shall be sufficient to contain all components and be compatible with the meal bag. Seals shall be a minimum 1/8 inch wide. A tear notch or serrated edge shall be located on one or more seals. The average seal strength of the packet seals shall be not less than 3.5 pounds per inch of width and no individual specimen shall have a seal strength of less than 3.0 pounds per inch of width. As an alternative to the seal strength requirement, the filled and sealed packet 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 as specified in E,C,(5),a.

a. Subassembly packet/accessory packet A, C, D, and E. The packet shall be made from polymeric films or film combinations with adequate strength and thickness to contain and protect the components. The water vapor transmission rate (WVTR) of the film shall not exceed 6.2 gm/m$^2$/24hrs/90%rh/100°F when tested in accordance with ASTM F 372, Standard Test Method for Water Vapor Transmission Rate of Flexible Barrier Materials Using an Infrared Detection Technique; ASTM E 96, Standard Test Methods for Water Vapor Transmission of Materials or Method 3030 of FED-STD-101, Test Procedures for Packaging Materials. The exterior color of the packet shall be clear or tan.

b. Subassembly packet/accessory packet B. The preformed packet or the flat sheet form-fill-seal packet designs shall be fabricated from 0.0015 inch thick polyethylene bonded to 0.00035 inch thick aluminum foil which is bonded to 0.0005 inch thick polyester. Tray-shaped bodies and tray-shaped covers used in form-fill-seal packet designs shall be fabricated from 0.0015 inch thick polyethylene bonded to 0.0005 inch thick aluminum foil with 7 pound per ream low density polyethylene extrusions resin which is bonded to 0.00075 inch thick polyester with 10 pound per ream low density polyethylene extrusions resin. All tolerances for thickness of pouch materials shall be plus or minus 20 percent. The exterior color of the packet shall conform to number 20219, 30045, 30099, 30108, 30111, 30117, 30118, 30219, 30227, 30279, 30313, 30324, 30450 34052, 34064, 34079, 34086 or 34087 of FED-STD-595, Colors Used in Government Procurement. If candy is overwrapped in a foil-based barrier pouch, the subassembly packet/accessory packet may be constructed in accordance with D-1,A,(1),a.

(2) Time-temperature indicator (TTI) label. The TTI label shall be a 3/4 inch square, bull’s-eye type, pressure sensitive adhesive label. The TTI label shall have an activation energy (Ea) of 24–30 kcal/mole, be protected from ultraviolet radiation and have a shelf life of 1100 days at 80°F as pivot point.

(3) Meal bag. The meal bag shall be made from food grade, low density polyethylene (LDPE) tubing. Polyethylene shall have a minimum thickness of 0.010 inch. Inside dimensions of the bag shall not exceed 8-1/8 x 12-1/2 inches. The color of the bag shall conform to number 20219, 30219, 30227, 30279, 30313, 30324 or 30450 of FED-STD-595. The manufacturer’s seal shall be a minimum 1/8 inch wide, continuous, peelable seal that forms a hermetic closure. The seal shall be designed with an inverted “V” shaped peel

indicator along the seal path (see Figure 1). The seal strength of each seal shall be not less than 4 pounds per inch of width and the peelable seal shall be not greater than 10 pounds per inch of width.

B. Assembly.

(1) Subassembly packet/accessory packet assembly. One of each applicable component as described in Table II shall be inserted in a packet. For a preformed packet, contents shall be inserted in the pouch and the pouch shall be closed with a heat seal not less than 1/8 inch wide. For a form-fill-seal packet, components shall be placed in the body and the cover applied by heat sealing with a seal not less than 1/8 inch wide. The closure seal shall be free of foldover wrinkles or entrapped matter that reduces the effective seal width to less than 1/16 inch. The average seal strength of the packet seals shall be not less than 3.5 pounds per inch of width and no individual specimen shall have a seal strength of less than 3.0 pounds per inch of width. As an alternative to the seal strength requirement, 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 as specified in E,C,(5),c. The sealed accessory packets shall not show any evidence of delamination.

(2) Meal assembly. Each applicable component for each meal as described in Table III shall be inserted in a meal bag. The bag shall be closed with a heat seal not less than 1/8 inch wide. The closure seal shall have a seal strength of not less than 4 pounds per inch of width. The sealed meal bag shall not show any evidence of foreign odor.

**D-2 LABELING**

A. Subassembly packet/accessory packet. The subassembly packet/accessory packet shall be printed on one face in dark contrasting color permanent ink with ‘A’, ‘B’, ‘C’, ‘D’ or ‘E’, as applicable. Alternatively, the accessory packet letter may be embossed in the seal of non-foil accessory packets.

B. Meal bag. Each meal bag shall be printed on at least one face in dark brown ink with the information contained in Figure 1. Continuous printing is acceptable provided that the complete markings appear uninterrupted on at least one face of the bag.

**D-3 PACKING**

A. Packing. Twelve meals shall be packed in a fiberboard box. Case “A” shall contain meals 1 through 12, case “B” shall contain meals 13 through 24. The fiberboard box shall conform to RSC-L, grade V2s of ASTM D 5118/D 5118M. The box liner shall be a full inside width box liner fabricated from grade W5c fiberboard in accordance with ASTM D 5118/D 5118M, Standard Practice for Fabrication of Fiberboard Shipping Boxes; except the terminal ends of the liner shall overlap a minimum of 2 inches and no fastening of the overlap is required. The box shall be closed in accordance with closure method 2A1 of ASTM D 1974, Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes; except the gap between the outer flaps shall be not more the 3/4 inch wide. Each box shall be reinforced with two girthwise nonmetallic straps. The inside dimensions of the box shall be 16-11/16 inches in length, 9-1/8 inches in width and 10-1/4 inches in depth.

**D-4 UNITIZATION**

A. Unit loads. Forty-eight boxes shall be arranged in unit loads in accordance with type I, class B of DSCP Form 3507, Loads, Unit: Preparation of Semiperishable Subsistence Items. Each load shall have 24 “A” cases and 24 “B” cases. At least two boxes in each tier shall be oriented to display the TTI label.

**D-5 MARKING**

A. Shipping containers. Shipping containers shall be marked in accordance with DPSC Form 3556, Marking Instructions for Shipping Cases, Sacks and Palletized/Containerized Loads of Perishable and Semiperishable Subsistence and as specified in the contract with the following exceptions:

(1) Identification markings normally placed on an end of the shipping container shall read from top to bottom, left to right, when the shipping container is rotated from its upright position onto its side for palletization. The major flaps of the shipping container closure immediately to the right of the marked end of the shipping container shall bear the following marking:

Contract data and other required markings
Date of pack
Lot number
Case A or B, as applicable
U.S. GOVERNMENT PROPERTY – COMMERCIAL RESALE IS UNLAWFUL
NOTE:WATER ACTIVATED Flameless Ration heater,
NSN 8970-01-321-9153, supplied in each MRE bag

Time Temperature Indicator label shall be centrally positioned on the panel. A minimum distance (quiet zone) of 1/4 inch from the nearest identification marking shall be maintained.

(2) One side panel of shipping container shall be marked “MEAL, READY TO EAT, INDIVIDUAL” in letters not less than 1-1/4 inches high. Underneath the ration nomenclature, in letters not less than 1 inch, the shipping container shall be marked “DO NOT ROUGH HANDLE WHEN FROZEN ($0^0$F or below)”

B. Unit loads. Unit loads shall be marked in accordance with DPSC Form 3556. In addition, each unit load shall be provided with a Material Safety Data Sheet (MSDS), in accordance with MIL-R-44398. The MSDS shall be placed inside a clear plastic sleeve and securely attached to one side of the unit load with tape or pressure sensitive adhesive. A copy of the MSDS must be included with the shipping papers and a copy must also be placed in the vehicle manifest.

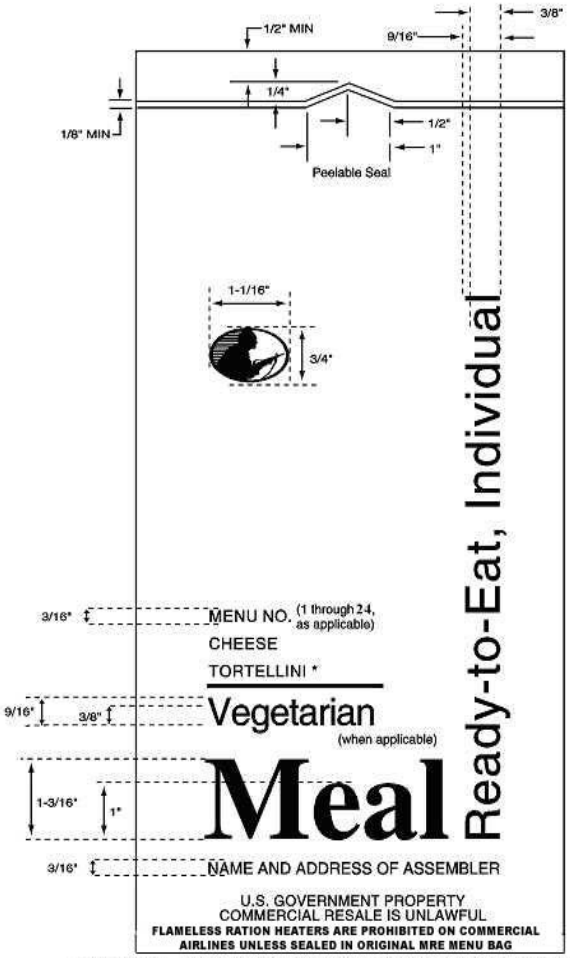


FIGURE 1. GRAPHIC DESIGN AND LETTERING HEIGHT **

* Name of applicable entree component as listed in table III component column

** A tolerance of plus or minus 1/16 inch is applicable to letter height requirements

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

C. Packaging examination.

(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 meal bag and subassembly/accessory packet material | D-1,A,(1),b and D-1,A,(3) | ASTM D 2103 1/ |
| Color of meal bag and subassembly/accessory packet | D-1,A,(1),a and b, and D-1,A,(3) | Visual evaluation and FED-STD-595, as applicable 2/ |
| Aluminum foil thickness | D-1,A,(1),b | ASTM B 479 3/ |
| Laminated material Identification and construction | D-1,A,(1),b | Laboratory evaluation |
| Water vapor transmission rate | D-1,A,(1),a | ASTM F 372, ASTM E 96 or Method 3030 of FED-STD-101 4/ |

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

2/ FED-STD-595 Colors Used in Government Procurement

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

4/ ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials

ASTM F 372 Standard Test Method for Water Vapor Transmission Rate of Flexible Barrier Materials Using an Infrared Detection Technique

FED-STD-101 Test Procedures for Packaging Materials

(2) Accessory packet examination. The filled and sealed packets shall be examined for the defects listed in Table IV. The lot size shall be expressed in packets. The sample unit shall be one packet. The inspection level shall be S-4 and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 2.5 for major defects and 4.0 for minor defects.

TABLE IV. Accessory packet defects

| Category | | Defect |
|---|---|---|
| Major | Minor | |
| 101 | | Not clean. 1/ |
| | 201 | Seal width less than 1/16 inch. 2/ |
| | 202 | Tear notch or serrations missing. |
| | 203 | Tear, hole, or open seal. |
| | 204 | Evidence of delamination, as applicable. |
| | 205 | Label missing, incorrect, or illegible. |

1/ Outer packaging shall be free from foreign matter, which is unwholesome, has the potential to cause package damage (for example, glass, metal fillings, etc.), or generally detracts from the clean appearance of the package. The following examples shall not be scored as defects for unclean:

a. Foreign matter which presents no health hazard or potential package damage and which can be readily removed by gently shaking the package or by gently brushing the package with a clean dry cloth.

b. Localized dried product which affects less than 1/8 of the total surface area of one pouch face, or an aggregate of scattered dried product which affects less than 1/4 of the total surface area of one pouch face.

2/ An effective seal is defined as any uncontaminated, fusion bonded, continuous path, minimum 1/16 inch wide, producing a hermetically sealed pouch.

(3) Accessory packet contents examination. The filled and sealed packets shall be examined for the defects listed in Table V (this examination may be performed on the preformed packets after filling and prior to sealing). The lot size shall be expressed in packets. The sample unit shall be one packet open or sealed. The inspection level shall be S-4 and the AQL, expressed in terms of defects per hundred units, shall be 1.5 for major defects and 4.0 for minor defects.

TABLE V. Accessory packet contents defects

| Category | | Defect |
|---|---|---|
| Major | Minor | |
| 101 | | Missing or crushed candy. |
| 102 | | Component not clean. 1/ |
| 103 | | Plastic shrink film missing from around screw cap of hot sauce bottle or hot sauce bottle leaking. |
| | 201 | Missing or unserviceable component (for example, tear, hole, or open seam in coffee, tea, cream substitute, sugar, salt, or hand cleaner; or crushed gum.) |

1/ Outer packaging shall be free from foreign matter, which is unwholesome, has the potential to cause package damage (for example, glass, metal filings, etc.), or generally detracts from the clean appearance of the package. The following examples shall not be scored as defects for unclean:

a. Foreign matter which presents no health hazard or potential package damage and which can be readily removed by gently shaking the package or by gently brushing the package with a clean dry cloth.

b. Localized dried product which affects less than 1/8 of the total surface area of one package face, or an aggregate of scattered dried product which affects less than 1/4 of the total surface area of one package face.

(4) Assembled meal bag examination. The filled and sealed meal bags shall be inspected for the defects listed in Table VI. The lot size shall be expressed in bags. The sample unit shall be one bag. The inspection level shall be S-4 and the AQL, expressed in terms of defects per hundred units, shall be 2.5 for major defects and 4.0 for minor defects. A minimum of 50 samples shall be examined for critical defects. The finding of any critical defect shall be cause for rejection of the lot. The inspection sample shall contain a proportionate amount of each of the meals.

TABLE VI. Assembled meal bag defects

| Category | | | Defect |
|---|---|---|---|
| Critical | Major | Minor | |
| 1 | | | Tear, hole, or puncture through carton or open carton causing a hole in the pouch or obviously wet or stained carton due to leaking pouch. 1/ |
| 2 | | | Tear, hole, or puncture in cheese spread. |
| 3 | | | Swollen cheese spread pouch, or swollen pouch or carton of thermostabilized item. |
| | 101 | | Tear or hole in carton exposing pouch to potential damage. |
| | 102 | | Menu component missing or incorrect assortment for menu package. 4/ |
| | 103 | | Not clean, the meal bag or any of the outer packaging of its contents. 2/ |
| | 104 | | Foreign odor. |
| | 105 | | Labeling missing, incorrect, or illegible. |
| | 106 | | Swollen peanut butter, jelly or jam pouch. |
| | 107 | | Tear, hole, puncture, or open seal in component packages. |
| | 108 | | Crushed or broken component. 3/ |
| | 109 | | Broken spoon. |
| | 110 | | Chocolate toffee rolls or vanilla caramels not packaged in aluminum foil barrier bag or B accessory packet. |
| | | 201 | Tear, hole, open seal, or split in meal bag. |
| | | 202 | Tear, hole, puncture, or open seal in subassembly packet/accessory packet. |
| | | 203 | Thermostabilized carton flaps open or tear or hole in carton not exposing pouch to potential damage. |
| | | 204 | Inverted "V" shaped peel indicator missing or not located as specified. |

**Comment [p1]:** Natick case ES04-071 DSCP SS-04-04237 change 01 19 May 04. Add footnote 4 to defect 102

1/ Applies to cartoned items.

2/ Outer packaging shall be free from foreign matter, which is unwholesome, has the potential to cause package damage (i.e. glass, metal filings, etc.), or generally detracts from the clean appearance of the package. The following examples shall not be scored as defects for unclean:

a. Foreign matter which presents no health hazard or potential package damage and which can be readily removed by gently shaking the package or by gently brushing the package with a clean dry cloth.

b. Localized dried product which affects less than 1/8 of the total surface area of one pouch face, or an aggregate of scattered dried product which affects less than 1/4 of the total surface area of one pouch face.

3/ For definition of crushed or broken, refer to applicable ration component document.

4/ A missing entree shall be cause for rejection of the lot.

**Comment [p2]:** Natick case ES04-071 DSCP SS-04-04237 change 01 19 May 04. Add footnote 4 to defect 102

(5) Seal testing. The pouch seals shall be tested for seal strength or internal pressure resistance as required in a, b, c, or d, as applicable.

a. Unfilled preformed subassembly packet/accessory packet pouch. The seals of the unfilled preformed pouches for the subassembly packet/accessory packet shall be tested for seal strength in accordance with ASTM F 88, Seal Strength of Flexible Barrier Materials. The lot size shall be expressed in pouches. The sample unit shall be one pouch. The inspection shall be level S-1 and the AQL, expressed in defects per hundred units, shall be 10.0. Three 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 results of the three specimens cut from that side. Any test specimen failing to meet a seal strength of 3 pounds per inch of width shall be scored as a major defect. Any average seal strength of less than 3.5 pounds per inch of width shall be cause for rejection of the lot. Alternatively, 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 14 psig pressure is reached. The 14 psig pressure shall be held constant for 30 seconds and then released. The pouches shall then be examined for separation or yield of the heat seals. Any rupture of the pouch or evidence of seal separation greater than 1/16 inch in the pouch manufacturer’s seal shall be considered a test failure. Any seal separation that reduces the effective closure seal width to less than 1/16 inch (see table IV, footnote 2/) shall be considered a test failure and shall be cause for rejection of the lot.

b. Unfilled meal bag. The seals of the unfilled meal bags shall be tested for seal strength in accordance with ASTM F 88. The lot size shall be expressed in bags. The sample unit shall be one bag. The sample size shall be the number of bags indicated by inspection level S-1. Three specimens shall be cut from the sealed end of each bag in the sample. Samples shall not be taken from the inverted “V” peel initiation. Any specimen with a seal strength less than 4 pounds per inch of width or greater than 10 pounds per inch of width shall be cause for rejection of the lot.

c. Subassembly packet/accessory packet pouch closure. The closure seals of the pouches for the subassembly packet/accessory packet 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 inspection level shall be S-1 and the AQL, expressed in defects

per hundred units, shall be 10.0. For the closure seal on preformed pouches, three adjacent specimens shall be cut from the closure seal of each pouch in the sample. For the form-fill-seal pouches, three 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 test specimen failing to meet a seal strength of 3 pounds per inch of width shall be scored as a major defect. Any average seal strength of less than 3.5 pounds per inch of width shall be cause for rejection of the lot. Alternatively, 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 14 psig pressure is reached. The 14 psig pressure shall be held constant for 30 seconds and then released. The pouches shall then be examined for separation or yield of the heat seals. Any rupture of the pouch or evidence of seal separation greater than 1/16 inch in the pouch manufacturer’s seal shall be considered a test failure. Any seal separation that reduces the effective closure seal width to less than 1/16 inch (see table IV, footnote 2/) shall be considered a test failure and shall be cause for rejection of the lot.

d. Meal bag closure. The closure seals of the meal bags shall be tested for seal strength in accordance with ASTM F 88. The lot size shall be expressed in bags. The sample unit shall be one bag. The sample size shall be the number of bags indicated by inspection level S-1. Three specimens shall be cut from the closure seal of each bag in the sample. Any specimen with a seal strength less than 4 pounds per inch of width shall be cause for rejection of the lot.

(6) Unfilled meal bag and unfilled preformed subassembly packet/accessory packet pouch seal certification. A certificate of conformance may be accepted as evidence that unfilled bags or pouches conform to the seal strength requirements specified in D-1,A,(1) and (3). When deemed necessary by the USDA, seal testing of the unfilled bags or pouches shall be as specified in E,C,(5), a and b.

D. Packing.

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

| Category | | Defect |
|---|---|---|
| Major | Minor | |
| 101 | | Marking omitted, incorrect, illegible, or improper size, location sequence or method of application. |
| 102 | | Outer flaps do not completely meet, leaving an opening greater than 3/4 inch between flap ends. |
| 103 | | Inadequate workmanship. 1/ |
| 104 | | Missing meal. 2/ |
| 105 | | Not one of each menu specified. |
| | 201 | Time-temperature indicator missing or not centrally located on panel. |
| | 202 | Time-temperature indicator 1/4 inch quiet zone not maintained. |

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.

2/ Each missing meal is a defect.

(2) Flap closure testing. The lot size shall be expressed in shipping containers. The sample unit shall be one shipping container. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 4.0. The closure of the four outer flaps of the container shall be tested separately. A 90 degree angular bar with each leg approximately 5 inches long by 3 inches wide by 1/8 inch thick shall be used to test the flap closures. Insert one leg of the angular bar full length under the center of one outer flap. Insertion shall be made through the open slot between the outer flaps. Lift the container vertically by the other leg of the bar until the container is suspended. The complete upper surface of the inserted leg shall be in contact with the inner surface of the flap during the lifting and suspension of the container. Complete separation of the adhesive bond of one or more of the outer flaps, showing no evidence of fiber tear, shall be scored as a major defect.

E. Unit load examination. The unit load shall be examined in accordance with the requirements of DSCP Form 3507. Any nonconformance shall be classified as a major defect.

**SECTION J REFERENCE DOCUMENTS**

GOVERNMENT STANDARDS

DSCP FORM

DSCP FORM 3507 - Loads, Unit: Preparation for Semiperishable Subsistence Items

DPSC FORM 3556 - Marking Instructions for Shipping Cases, Sacks and Palletized/Containerized Loads of Perishable and Semiperishable

FEDERAL STANDARD

FED-STD-101 – Test Procedures for Packaging Materials

FED-STD-595 – Colors Used in Government Procurement

NON-GOVERNMENTAL STANDARDS

AMERICAN SOCIETY FOR QUALITY CONTROL (ASQC)

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

B 479 - Standard Specification for Annealed Aluminum and Aluminum-Alloyed 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 5118/D 5118M - Standard Practice for Fabrication of Fiberboard Shipping Boxes

E 96 - Standard Test Methods for Water Vapor Transmission of Materials

F 88 - Standard Test Method for Seal Strength of Flexible Barrier Materials

F 372 - Standard Test Method for Water Vapor Transmission Rate of Flexible Barrier Materials Using an Infrared Detection Technique

**ACR-M-023A**
**15 April 2002**
**W/CHANGE 01 19 May 04**
**SUPERSEDING**
**ACR-M-023**
**25 October 2001**

AMSRD-NSC-CF-F (A. Richards/5037) 19 May 2004

TO: DSCP-HROAC (A. Lowry/7773)

SUBJECT: ES04-0071, (DSCP-SS-04-04237), Request for Technical Assistance, ACR-M-0023A, MRE Assembly Requirements.

1. Date received: 19 May 2004
   Date due: 19 May 2004
   Date replied: 19 May 2004

2. The Natick Soldier Center (NSC) has evaluated the subject case and submits the following:

Reference your message paragraph 1: Agree.
Table VI, add footnote 4 to defect 102 and add footnote 4 as follows:
4/ A missing entree shall be cause for rejection of the lot.

Reference your message paragraph 2: Do not agree. Covered by both defect 104 and 105.

3. POC for this action is Mr. Allen Richards, X5037.

DONALD A. HAMLIN
Team Leader
DoD Food Engineering Services Team

1 attachment

(ARichards)

| CF: NSC: | CF: DSCP & SVCs: | | |
|---|---|---|---|
| Aylward, A | Anthony, D | | Miller, G |
| Arcidiacono, C | Arthur, D | | Richardson, H |
| Canniff, M | Tucker, S | Salerno, L | |
| Friel, M | Ervin, C | | Spencer, B |
| Hamlin, D | Gordon, T | | |
| Hill, B | Galligan, C | | |
| Richards, A | Haldeman, E | | |
| Sherman, P | Kasa, T | | |
| Trottier, R | Malason, M | | |
| Valvano, R | | | |