

SECTION C

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

C-1 ITEM DESCRIPTION

ACR-M-027, MEAL, READY-TO-EAT (MRE), ASSEMBLY REQUIREMENTS

C-2 ASSEMBLY REQUIREMENTS

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

TABLE I. Components

<u>Component</u>	<u>Reference</u>
<u>Entrees</u>	
Beef Enchilada in Sauce	PCR-B-010
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
Cheese Omelet with Vegetables	PCR-C-054
Cheese Tortellini in Tomato Sauce	PCR-C-020
Chicken Breast Fillet with Rib Meat, Seasoned	PCR-C-022
Chicken Breast Fillet, in Tomato Sauce, with Cavatelli	PCR-C-023
Chicken Breast Strips with Chunky Salsa	PCR-C-0002
Chicken Fajita	PCR-C-055
Chicken, Noodles and Vegetables, in Sauce	PCR-C-021
Chicken and Dumplings	PCR-C-067
Chili and Macaroni	PCR-C-027
Chili with Beans	PCR-C-062
Meatballs in Marinara Sauce	PCR-M-015
Meatloaf with Brown Onion Gravy	PCR-M-0001
Penne with Vegetarian Sausage Crumbles in Spicy Tomato Sauce	PCR-P-036
Pork Rib, Boneless, Imitation, Smoke Flavoring	PCR-P-028
Sloppy Joe Filling	PCR-S-013

TABLE I. Components (cont'd)

Component	Reference
Spaghetti with Meat and Sauce	PCR-S-0002
Tuna, Flexible Pouch, Chunk, White (Albacore), Water Packed, Regular Salt/Sodium Level	A-A-20155C , Type B, Form I, Color b, Packing Media 1, Salt/Sodium Level (a)
Vegetable Manicotti in Tomato Sauce	PCR-V-003
Veggie Burger in Barbecue Sauce	PCR-V-004
<u>Starches and Soups</u>	
Clam Chowder, New England Style	PCR-C-045
Cornbread Stuffing	PCR-C-066
Hash Browns with Bacon	PCR-H-012
Macaroni and Cheese, Mexican Style	PCR-M-009
Mexican Style Corn	PCR-M-013
Potatoes, Mashed	PCR-P-011
Refried Beans	PCR-R-007
Rice	PCR-R-001A
Mexican Rice	Type II
Fried Rice	Type IV
Snack Bread, Wheat	PCR-S-009 , Type I
Tortillas	PCR-T-008
<u>Fruits</u>	
Apple Pieces in Spiced Sauce	PCR-A-001A
Cobbler, Cherry Blueberry	PCR-C-058 , Flavor I
Fruits, Osmotically Dried	A-A-20299A
Sliced Cranberries, Not Fortified	Type VII, Fortification a
Raisins, Not Fortified	Type IX, Fortification a
Fruits, Wet Pack	PCR-F-002B
Applesauce, with Raspberry Puree	Type VI
Applesauce, Carbohydrate Enhanced	Type VII
Applesauce, with Mango and Peach Puree	Type VIII
Pineapple	Type II
Pears	Type IV
Mixed Fruit	Type V

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TABLE I. Components (cont'd)

Component	Reference
<u>Desserts and Snacks</u>	
Beef Snacks, Cured, Kippered Beef Strips, Smoked	A-A-20298A , Type II, Style A, Fl. 1
Cookies, Shortbread	A-A-20295B , Type I, Style A, Flavor 1, Class 1
Cookies, Fig Bar	A-A-20295B , Type I, Style P, Bake type b, Class 1
Cookies	A-A-20295B , Type I, Bake Type a
Oatmeal	Style I, Flavor 1
Chocolate Chip	Style J, Flavor 1
Kreamsicle	Style K
Toffee Crunch	Style L
White Chocolate Raspberry	Style Q
Cookies with Pan Coated Chocolate Disks	PCR-C-031
Cakes and Brownies, and Muffin Tops, Fudge Brownie with Chocolate Drops	PCR-C-007C , Type II, Flavor 1
Cakes and Brownies, and Muffin Tops, Pound Cake, Vanilla, Lemon Poppy Seed, Spice, Almond Poppy Seed, Carrot or Marble	PCR-C-007C , Type I Flavors 1, 6, 7, 8, 10 or 11
Cakes, Brownies and Muffin Tops; Chocolate Banana Nut Muffin Top	PCR-C-007C , Type III, Flavor 1
Cheese Spread, Cheddar; Fortified, Plain, with Jalapeno Peppers, or with Bacon	PCR-C-039 , Type I, II, or III
Chocolate Sports Bar, Chocolate with Chocolate Coat	PCR-C-0004A , Flavor II
Crackers, Fortified, Plain or Vegetable	PCR-C-037 , Type I or II
Fruit Butter, Regular, Apple	A-A-20348 , Type I, Flavor A
FIRST STRIKE™ Bar, Chocolate or Apple-Cinnamon	PCR-F-001 Flavor I or II
Jelly, Fruit, Standardized Single, Apple or Grape, Regular	A-A-20078B , Type I, Style 1, Kind A or L
Nuts, Shelled, Roasted	A-A-20164C
Peanuts, Virginia Type or Runner Type, Dry Roasted, Salted	Type V, Style A
Almonds, Smoke Flavored (Unblanched), Salted	Type IX, Style A
Nut Raisin Mix, Regular, or with Pan Coated Chocolate Disks	PCR-N-002A , Type I or II

TABLE I. Components (cont'd)

Component	Reference
Peanut Butter and Peanut Spread, Regular, Stabilized, Fortified	A-A-20328A , Class A, Type a, Fortification b
Peanut Butter, Smooth	Style I, Texture 1
Peanut Butter, Chunky/Crunchy	Style I, Texture 3
Peanut Spread, Smooth, Chocolate	Style II, Texture 1, Flavor 2
Preserves (Jam), Single Fruit, Regular, Blackberry or Strawberry	A-A-20079B , Type I, Group I, Style, 1, Flavor A or R
Ranger Bar, Caramel Apple	PCR-R-008 , Flavor II
Scone, Cinnamon	PCR-S-014 , Flavor I
Snack Foods	A-A-20195C
Potato Sticks	Type I
Pretzels, Bavarian, Rod, Stick, Twist, Nugget	Type II, Style A, B, C, D, or E
Filled Pretzels, Cheddar Cheese or Nacho Cheese	Type II, Style F, Flavor 1 or 2
Baked Snack Cracker, Cheddar Cheese	Type V, Flavor 1
Toaster Pastry, Regular, Shelf Stable, Not fortified, Rectangular, Single serving	A-A-20211A , Type I, Style A, Class 1, Flavor a, Fort. b,
Unfrosted Strawberry	Shape i, Servings a
Frosted Brown Sugar Cinnamon	Type I, Style B, Class 1, Flavor c, Fort. b, Shape i, Servings a
 <u>Candy</u>	
Candy and Chocolate Confections	A-A-20177C
Toffee Rolls, Chocolate Flavored <u>1</u> /	Type II
Candy and Chocolate Confections, Pan Coated Candy	A-A-20177C , Type VI
Chocolate, Plain, Disks	Shape A, Flavor 1
Peanut Butter, Plain	Shape A, Flavor 5
Chocolate with Peanuts, Oval/Round	Shape B, Flavor 1
Candy and Chocolate Convection, Pan Coated Candy	A-A-20177C , Type VI
Fruit Flavored, Disks	Shape A
Berry	Flavor 2
Tropical	Flavor 2
Cinnamon	Flavor 6

TABLE I. Components (cont'd)

Component	Reference
<u>Beverages</u>	
Beverage Base, Powdered, with Nutritive Sweetener Fortified with Ascorbic Acid and Maltodextrin; Orange, Lemon-Lime or Tropical Punch	A-A-20098C , Type II, Flavor 1, 4 or 10, Fortification d
Beverage Base, Powdered, with Non-nutritive Sweetener, Lemonade or Raspberry, Non-fortified	A-A-20098C , Type III, Flavors 8 or 13, Fortification a
Beverage Powder, Carbohydrate Electrolyte, Flat Pouch, Fruit Punch, Grape, Lemon-Lime or Orange	PCR-B-013A , Flavors I, II, III or IV Design A
Cocoa Beverage Powder, Fortified, Flat Interlocking Closure Pouch	PCR-C-041 , Design B
Cocoa Beverage Powder, Sugar Sweetened, Without Marshmallows, Chocolate Hazelnut, Flat Interlocking Closure Pouch	A-A-20189A , Type I, Style B, Flavor F, Design B
Drink Mixes, Coffee (Unflavored and Flavored), Flavored Instant Cappuccino, Regular, French Vanilla or Mocha, Flat Interlocking Closure Pouch	A-A-20336A , Type V, Style A, Flavors 1 or 2, Design B
Dairyshake Powder, Fortified with Calcium and Vitamin D, Vanilla, Chocolate or Strawberry, Flat Interlocking Closure Pouch	PCR-D-002 , Flavors I, II or III, Design B
<u>Other Items</u>	
Bag, Hot Beverage	MIL-PRF-32176
Barbecue Sauce, Plain/Regular, Without Fruit Purees	A-A-20335 , Flavor I, Type B
Fork, Knife and Spoon, Picnic (Plastic), High Impact Spoon, MRE, 7-inch (Brown)	A-A-3109B , Type IV, Item 13
Hot Sauce, 1/8 fl. oz.	A-A-20097E
Extra Hot 4x	Type II
Green	Type III
Ketchup, Flavored, Jalapeno, Medium	A-A-20346 , Flavor V, Style B, Packaging Type 5
Mayonnaise, Salad Dressing and Tartar Sauce	A-A-20140C
Mayonnaise, Fat Free	Type I, Style C
Picante Sauce, Medium	A-A-20259A , Type II
Ration Supplement, Flameless Ration Heater (FRH)	MIL-R-44398B
Steak Sauce, Regular	A-A-20092B , Flavor 1

TABLE I. Components (cont'd)

Component	Reference
Spices and Spice Blends	A-A-20001A
Red Pepper, Ground	Type I, Class Z, Form 1
Seasoning Blend, Salt Free, with Herbs and Citrus	Type II, Class D, Blend (1)
Barbecue Seasoning	Type II, Class E
Pizza Seasoning	Type II, Class M

1/ These items, if commercially packaged, shall be overwrapped in a barrier pouch as cited in the Packaging Requirements and Quality Assurance Provisions (PKG&QAP) for A-A-20177C.

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

TABLE II. Accessory Components

Component	Reference	Pack
Chewing Gum, Reg, Tablet, Sugar Free, Peppermint or Cinnamon	A-A-20175B , Type I, Size B, Class 2, Flavor a or c	All
Hand Cleaner (towelette), Unscented, Water Based	A-A-461B , Type II	All
Matches, Safety	A-A-59489A , Type I, Class B	All
Salt, Table, Iodized, 4 g.	NaCl Monograph	All
Toilet Tissue, Institutional	A-A-59594 , Style II, Type A, Sheet size b	All
Coffee, Instant, Freeze dried, Reg.	A-A-20184B , Type III, Style A	A
Creamer, Non-Dairy, Dry	A-A-20043B	A
Sugar, 1/7 oz.	A-A-20135C , Type I, Style A	A
Tea, Instant, Regular, Sweetened, Lemon Flavor, 16 g.	A-A-20183B , Type I, Style B, Flavor 2	B
Beverage Base, Powder, Sweet, Ascorbic acid, Apple Cider, 17 g	A-A-20098C , Type II, Fortification b, Flavor 12	C

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

TABLE III. Contents

<u>Menu #1</u>	<u>Menu #2</u>	<u>Menu #3</u>
Chili with beans	Pork rib	Beef ravioli
Mexican style corn	Clam chowder	Wet pack fruit <u>1/</u>
Jam <u>1/</u>	Cheese spread, plain	Fudge brownie
Crackers, plain	2 Wheat snack bread	Cheese spread, Jalapeno
Candy III <u>2/</u>	Pound cake <u>3/</u>	Crackers, vegetable
Dairyshake <u>1/</u>	Beverage, carbo electro <u>1/</u>	Beef snacks
Red pepper	Barbecue sauce	Beverage, carb fortified <u>1/</u>
Accessory packet A	Accessory packet A	Hot sauce
Spoon	Spoon	Accessory packet A
Flameless ration heater	Flameless ration heater	Spoon
Hot beverage bag	Hot beverage bag	Flameless ration heater
		Hot beverage bag

<u>Menu #4</u>	<u>Menu #5</u>	<u>Menu #6</u>
Cheese and veggie omelet	Chicken breast	Chicken with noodles
Hash browns with bacon	Cornbread stuffing	Cheese spread, plain
Toaster pastry <u>1/</u>	Caramel apple ranger bar	Crackers, plain
Apple butter	Cheese spread, Jalapeno	Chocolate covered sports bar
Crackers, plain	Wheat snack bread	Candy II <u>2/</u>
Cinnamon scone	Candy II <u>2/</u>	Cocoa beverage
Beverage, sugar free <u>1/</u>	Cappuccino, Fr. Van.	Hot sauce
Hot sauce	Jalapeno ketchup	Accessory packet A
Accessory packet C	Accessory packet B	Spoon
Spoon	Spoon	Flameless ration heater
Flameless ration heater	Flameless ration heater	Hot beverage bag
Hot beverage bag	Hot beverage bag	

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<u>Menu #7</u> Chicken with salsa Mexican rice Shortbread cookies Cheese spread, Jalapeno Crackers, vegetable Candy II <u>2/</u> Cappuccino, Mocha Hot sauce, green Accessory packet B Spoon Flameless ration heater Hot beverage bag	<u>Menu #8</u> Beef patty Mexican mac & cheese Cheese spread with bacon 2 Wheat snack bread Nacho cheese pretzels Beverage, carb fortified <u>1/</u> BBQ sauce Hot sauce Accessory packet B Spoon Flameless ration heater Hot beverage bag	<u>Menu #9</u> Beef stew Cheese spread, plain Crackers, plain FIRST STRIKE™ bar <u>1/</u> Dairyshake <u>1/</u> Hot sauce Accessory packet A Spoon Flameless ration heater Hot beverage bag
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<u>Menu #10</u> Tuna Tortillas Cookies <u>4/</u> Pretzels Dairyshake <u>1/</u> Candy II <u>2/</u> Mayonnaise Seasoning blend Accessory packet C Spoon	<u>Menu #11 Vegetarian</u> Vegetable manicotti Wet pack fruit <u>1/</u> Pound cake <u>3/</u> Peanut butter, plain Crackers, plain Cocoa, hazelnut Hot sauce Accessory packet B Spoon Flameless ration heater Hot beverage bag	<u>Menu #12 Vegetarian</u> Veggie burger with BBQ Dried fruit <u>1/</u> Chocolate banana muffin top 2 Wheat snack bread Potato sticks Beverage, carbo electro <u>1/</u> Hot sauce Accessory packet B Spoon Flameless ration heater Hot beverage bag
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<u>Menu #13 Vegetarian</u> Cheese tortellini Spiced apples FIRST STRIKE™ bar <u>1/</u> Peanut butter, chunky Crackers, plain Candy II <u>2/</u> Beverage, sugar free <u>1/</u> Seasoning blend Accessory packet C Spoon Flameless ration heater Hot beverage bag	<u>Menu #14 Vegetarian</u> Spicy penne pasta Dried fruit <u>1/</u> Pound cake <u>3/</u> Peanut butter, plain Crackers, plain Beverage, carb fortified <u>1/</u> Seasoning blend Accessory packet C Spoon Flameless ration heater Hot beverage bag	<u>Menu #15</u> Beef enchilada Refried beans Cookies <u>4/</u> Cheese spread, Jalapeno Crackers, vegetable Beverage, carb fortified <u>1/</u> Picante sauce Red pepper Accessory packet A Spoon Flameless ration heater Hot beverage bag
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<u>Menu # 16</u> Chicken fajita Fried rice Cheese spread, plain Tortillas Nut raisin mix Cappuccino, Fr. Van. Seasoning blend Accessory packet C Spoon Flameless ration heater Hot beverage bag	<u>Menu #17</u> Sloppy Joe Cheddar snack cracker Shortbread cookies Cheese spread, Jalapeno Tortillas Beverage, carbo electro <u>1/</u> Hot sauce Accessory packet A Spoon Flameless ration heater Hot beverage bag	<u>Menu #18</u> Meatballs in marinara sauce Cheddar cheese, plain 2 Wheat snack bread Nuts <u>1/</u> Cheddar cheese pretzels Beverage, carb fortified <u>1/</u> Pizza seasoning Accessory packet A Spoon Flameless ration heater Hot beverage bag
<u>Menu #19</u> Beef roast with vegetables Dried fruit <u>1/</u> Pound cake <u>3/</u> Chocolate peanut spread Crackers, plain Beverage, carb fortified <u>1/</u> Steak sauce Accessory packet A Spoon Flameless ration heater Hot beverage bag	<u>Menu #20</u> Spaghetti with meat sauce Cherry blueberry cobbler Cheese spread, plain Potato sticks Wheat snack bread Beverage, carbo electro <u>1/</u> Hot sauce, green Accessory packet A Spoon Flameless ration heater Hot beverage bag	<u>Menu #21</u> Chili and macaroni Wet pack fruit <u>1/</u> Cookies <u>4/</u> Cheese spread, Jalapeno Wheat snack bread Candy III <u>2/</u> Beverage, sugar free <u>1/</u> Red pepper Accessory packet C Spoon Flameless ration heater Hot beverage bag
<u>Menu #22</u> Chicken and dumplings Pound cake <u>3/</u> Jelly <u>1/</u> Wheat snack bread Dairyshake <u>1/</u> Hot sauce Accessory packet A Spoon Flameless ration heater Hot beverage bag	<u>Menu #23</u> Chicken with cavatelli Fig bar Raisin nut mix/chocolate Cheese spread with bacon Wheat snack bread Beverage, carb fortified <u>1/</u> Red pepper Accessory packet A Spoon Flameless ration heater Hot beverage bag	<u>Menu #24</u> Meatloaf with gravy Mashed potatoes Cookies <u>4/</u> Jelly <u>1/</u> Crackers, plain Candy I <u>2/</u> Cocoa beverage BBQ seasoning Accessory packet B Spoon Flameless ration heater Hot beverage bag

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1/ Flavors shall be procured in equal quantities and assembled in a uniform distribution. Wet pack fruit (Menus 3, 11 and 21) shall include raspberry applesauce, carbo enhanced applesauce, mango/peach applesauce, pineapple, pears, and mixed fruit. Nuts (Menu 18) shall include dry roasted peanuts and smoked almonds. Dairyshakes (Menus 1, 9, 10 and 22) shall include vanilla, chocolate and strawberry. Jams (Menu 1) shall include blackberry and strawberry. Jelly (Menus 22 and 24) shall include apple and grape. Beverages with nutritive sweetener (Menus 3, 8, 14, 15, 18, 19 and 23) shall include orange, lemon-lime and fruit punch. Beverages with carbohydrate electrolyte (Menus 2, 12, 17 and 20) shall include fruit punch, grape, lemon-lime and orange. Beverages with non-nutritive sweetener (Menus 4, 13 and 21) shall include lemonade and raspberry. Dried fruit (Menu 12, 14 and 19) shall include cranberries and raisins. FIRST STRIKE™ bar (Menus 9 and 13) shall include chocolate and apple-cinnamon.

2/ Candy I (Menu 24): chocolate toffee rolls, Candy II (Menus 5, 6, 7, 10 and 13): plain, chocolate with peanut, and peanut butter pan coated disks and Candy III (Menus 1 and 21): tropical and berry fruit disks and red hot cinnamon disks; shall be procured in equal quantities and assembled in a uniform distribution. Candy I, if commercially packaged, shall be overwrapped in a barrier pouch as cited in A-A-20177C PKG & QAP.

3/ Pound cakes, Flavors 1, 6, 7, 8, 10 and 11, shall be procured in equal quantities and assembled in a uniform distribution in Menus 2, 11, 14, 19 and 22. Not more than two meals in any shipping container shall contain the same flavor of cake.

4/ Cookies; Type I; Style I, Flavor 1; Style J, Flavor 1; Style K; Style L; Style Q and PCR-C-031 shall be procured in equal quantities and assembled in a uniform distribution within Menus 10, 15, 21 and 24.

SECTION D

D-1 PACKAGING

A. Components.

(1) Subassembly packet/accessory packet. The subassembly/accessory packet shall be a preformed packet or a form-fill-seal packet. Dimensions shall be sufficient to contain all components. Seals shall be a minimum 1/8 inch wide. A tear nick, 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

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inch when tested for internal pressure resistance as specified in E,C,(5),a. 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 $6.2 \text{ gm/m}^2/24\text{hrs}/90\%\text{rh}/100^\circ\text{F}$ 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.

(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 or tubing made from a blend of food grade, low density polyethylene (LDPE) and linear-low density polyethylene (LLDPE). Additives may be used in order to improve sealability, peelability, tear resistance or other attributes provided all additives are food grade and are certified by the FDA as approved for food contact. 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, Colors Used in Government Procurement. One 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 the peelable seal shall be not less than 4 pounds per inch of width and shall be not greater than 10 pounds per inch of width.

Comment [NSC1]: Natick case ES07-121 (DSCP-SS-07-46267) change 04 15 Aug 07. Addition of performance requirement to allow use of new materials for MRE meal bag.

B. Assembly.

(1) Subassembly/accessory packet assembly. One of each applicable component as described in Table II shall be inserted in a packet. If a subassembly is used, additional components may also be inserted in the 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.

(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 an average seal strength of not less than 4 pounds per inch of width with no individual specimen test result less than 3 pounds per inch of width. The sealed meal bag shall not show any evidence of foreign odor.

D-2 LABELING

A. Subassembly/accessory packet. The subassembly/accessory packet shall be labeled on one face in permanent dark contrasting color ink with 'A', 'B' or 'C', as applicable. Alternatively, the packet letter may be embossed in the seal of the packet.

B. Meal bag. Each meal bag shall be correctly and legibly labeled on at least one face with permanent ink or other dark contrasting color with the information contained in Figure 1.

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 of ASTM D 5118/D 5118M, Standard Practice for Fabrication of Fiberboard Shipping Boxes and grade V2s of ASTM D 4727/D 4727M Standard Specification for Corrugated and Solid Fiberboard Sheet Stock (Container Grade) and Cut Shapes, except the requirements for dry burst strength shall be minimum 425 psi, the requirement for wet burst strength shall be minimum 250 psi and the laminated board thickness shall be 0.069 inches. [The U.S. Army Research, Development & Engineering Command, Natick Soldier Center has found that solid fiberboard shipping container material consisting of two outer facings of 90# wet strength linerboard and an inner ply of 69# linerboard meets the performance criteria of this specification.] The box liner shall be a full inside width box liner fabricated from grade W5c fiberboard in accordance with ASTM D 5118/D 5118M, 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 than 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 C 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 DSCP FORM 3556, Marking Instructions for Boxes, Sacks and Unit 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°F or below)".

B. Unit loads. Unit loads shall be marked in accordance with DSCP 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 packaged and attached to one side of the unit load. A copy of the MSDS must be included with the shipping papers and a copy must also be placed in the vehicle manifest.

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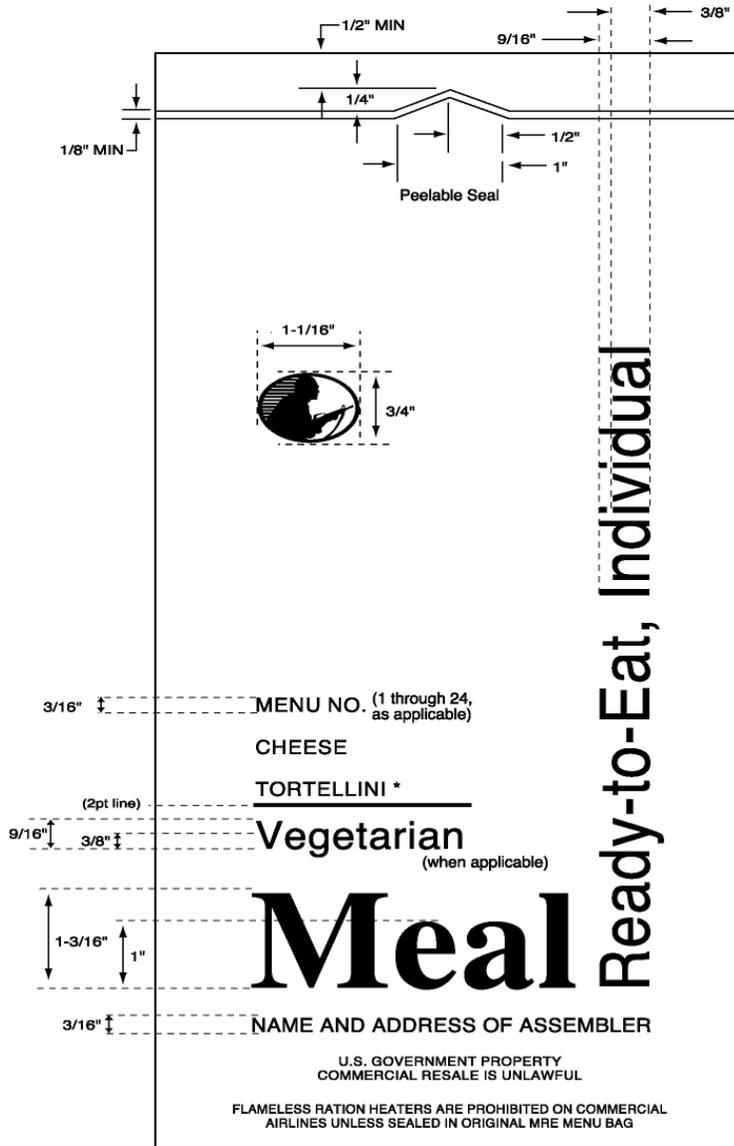


FIGURE 1. GRAPHIC DESIGN AND LETTERING HEIGHT **

* 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, Sampling Procedures and Tables for Inspection by Attributes, are required. Unless otherwise specified, single sampling plans indicated in ANSI/ASQC 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. 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.

<u>Requirement</u>	<u>Requirement para</u>	<u>Test procedure</u>
Thickness of meal bag	D-1,A,(3)	ASTM D 2103 <u>1/</u>
Color of meal bag and subassembly/accessory packet	D-1,A,(1) and D-1,A,(3)	Visual evaluation and FED-STD-595, as applicable <u>2/</u>
Water vapor transmission rate	D-1,A,(1)	ASTM F 372, ASTM E 96 or Method 3030, FED-STD-101 <u>3/</u>

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

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

3/ 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) Subassembly/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. Subassembly/accessory packet defects

Category		Defect
<u>Major</u>	<u>Minor</u>	
	101	Not clean. <u>1/</u>
	201	Seal width less than 1/16 inch. <u>2/</u>
	202	Tear notch or serrations missing.
	203	Tear or hole or open seal.
	204	Label missing or incorrect or illegible.
	205	Pouch not sealed on four sides.

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) Subassembly/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. Subassembly/accessory packet contents defects

Category	Defect
<u>Major</u>	<u>Minor</u>
101	Component not clean. <u>1/</u>
201	Missing or unserviceable component.
202	Plastic shrink film missing from around screw cap of hot sauce bottle or hot sauce bottle leaking, as applicable.

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

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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
<u>Critical</u>	<u>Major</u>	<u>Minor</u>	
1			Tear or hole or puncture through carton or open carton causing a hole in the pouch or obviously wet or stained carton due to leaking pouch. <u>1/</u>
2			Tear or hole or puncture in cheese spread.
3			Swollen cheese spread pouch, or swollen pouch or carton of thermostabilized item.
4			Tear or hole or puncture in uncartoned thermostabilized pouch.
	101		Tear or hole in carton exposing pouch to potential damage.
	102		Menu component missing or incorrect assortment for menu. <u>4/</u>
	103		Meal bag not clean or outer packaging of its contents not clean. <u>2/</u>
	104		Foreign odor.
	105		Labeling missing or incorrect or illegible.
	106		Swollen peanut butter, jelly or jam pouch.
	107		Tear or hole or puncture or open seal in component packages.
	108		Crushed or broken component. <u>3/</u>
	109		Broken spoon.
	110		Chocolate toffee rolls or toffee with walnuts not packaged in barrier pouch.

TABLE VI. Assembled meal bag defects (cont'd)

Category			Defect
<u>Critical</u>	<u>Major</u>	<u>Minor</u>	
		201	Tear or hole or open seal or split in meal bag.
		202	Tear or hole or puncture or open seal in subassembly/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.
		205	Plastic shrink film missing from around screw cap of hot sauce bottle or hot sauce bottle leaking, as applicable.

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 entrée shall be cause for rejection of the lot.

(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.

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a. Unfilled preformed subassembly/accessory packet pouch. The seals of the unfilled preformed pouches for the subassembly/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. Any test failure shall be a major defect 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 a major defect and shall be cause for rejection of the lot.

c. Subassembly/accessory packet pouch closure. The closure seals of the pouches for the subassembly/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

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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. Any test failure shall be a major defect 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. The average seal strength shall be calculated by averaging the three test specimens cut from that seal (the sample unit). Any test specimen result less than 3 pounds per inch of width shall be cause for rejection of the lot. Any average seal strength of less than 4 pounds per inch of width shall be cause for rejection of the lot.

(6) Unfilled meal bag and unfilled preformed subassembly/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
<u>Major</u>	<u>Minor</u>	
101		Marking missing or incorrect or illegible.
102		Outer flaps do not completely meet, leaving an opening greater than 3/4 inch between flap ends.
103		Inadequate workmanship. <u>1/</u>
104		Missing meal. <u>2/</u>
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

DSCP FORMS

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

MILITARY SPECIFICATIONS

MIL-PRF-32176	Bag, Hot Beverage
MIL-R-44398B	Ration Supplement, Flameless Ration Heater (FRH)

FEDERAL STANDARDS

FED-STD-101	Test Procedures for Packaging Materials
FED-STD-595	Colors Used in Government Procurement

NON-GOVERNMENTAL STANDARDS

AMERICAN SOCIETY FOR QUALITY (ASQ)
ANSI/ASQCZ1.4-2003 Sampling Procedures and Tables for Inspection by Attributes

ASTM INTERNATIONAL

D 1974-98 (2003)	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
D 2103-05	Standard Specification for Polyethylene Film and Sheeting
D 4727/D 4727M-05	Standard Specification for Corrugated and Solid Fiberboard Sheet Stock (Container Grade) and Cut Shape
D 5118/D 5118M-05a	Standard Practice for Fabrication of Fiberboard Shipping Boxes
E 96/E 96M-05	Standard Test Methods for Water Vapor Transmission of Materials
F 88-06	Standard Test Method for Seal Strength of Flexible Barrier Materials

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F 372-99 (2003)

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

For DSCP Website Posting

AMSRD-NSC-CF-F

15 August 2007

TO: DSCP-FTRE

SUBJECT: ES07-121; DSCP-SS-07-46267, Technical Inquiry, SOPAKCO, Request to review High Strength Meal Bag, ACR-M-027, MEAL, READY-TO-EAT (MRE), ASSEMBLY REQUIREMENTS.

1. Natick received a request to modify ACR-M-027 for the MRE meal bag to reflect the current technology in polymers. SOPAKCO performed extensive testing on these meal bags and the results were easier loading with superior seal strength and puncture resistance which will result in reduced waste due to less production failures.

2. Subject case has been reviewed and it has been determined that a more performance oriented requirement will be undertaken and implemented at a later date that will take into account all of the specific performance characteristics of the MRE meal bag. As an expedient to permit new materials to be used in the construction of MRE meal bags, Natick submits the following change to ACR-M-027 for all current, pending and future procurements until the document is formally amended or revised:

a. Section D-1, para "(3) Meal bag. After "(LDPE) tubing", insert "or tubing made from a blend of food grade, low density polyethylene (LDPE) and linear-low density polyethylene (LLDPE). Additives may be used in order to improve sealability, peelability, tear resistance or other attributes provided all additives are food grade and are certified by the FDA as approved for food contact."

3. Please see the highlighted change in the attached document.