

INCH-POUND

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## PERFORMANCE SPECIFICATION

### PACKAGING OF FOOD IN FLEXIBLE POUCHES

This specification is approved for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

1.1 Scope. This specification covers the performance criteria for packaging materials and the packaging of food in flexible pouches to include the filling and hermetic sealing of the pouches, the thermal processing of the filled and sealed pouches for commercial sterility, and the unit packing of the pouches into cartons.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army Soldier and Biological Chemical Command, Natick Soldier Center, ATTN: AMSSB-RCF-F(N), Natick, MA 01760-5018 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 89GP

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1.2 Classification. Packaging and thermal processing of product shall be of the following types and classes, as specified (see 6.1).

1.2.1 Types. The packaging types and styles are as follows:

Type I - Single Serving Pouch (SSP)

Style 1 – Rectangular pouch (Figure 1)

Style 2 – Shaped pouch with side spout (Figure 4)

Style 3 – Shaped pouch with center spout (Figure 5)

Type II - Institutional Size Pouch (ISP)

1.2.2 Classes. The classes are as follows:

Class 1 - For meat, poultry, and fish with sauce and gravy

Class 2 - For vegetables with sauces

Class 3 - For fish, meat and poultry in loaf, slice, or solid form

Class 4 - For fruit

## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in section 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in section 4 of this specification, whether or not they are listed.

2.2 Government documents, drawings and publications.

2.2.1 Specifications, standards and handbooks. None.

2.2.2 Other government documents. The following other Government documents drawings and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

### U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Federal Food, Drug and Cosmetic Act and regulations (21 Code of Federal Regulations (CFR), Parts 170-189)

(Copies of this document are available from [www.access.gpo.gov/nara](http://www.access.gpo.gov/nara) or Superintendent of

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Documents, ATTN: New Orders, P.O. Box 371954, Pittsburgh, PA 15250-7954.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.1).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 999-01 – Methods for Vibration Testing of Shipping Containers

D1974-98 (2003) – Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes

D 3985-05 - Oxygen Gas Transmission Rate Through Plastic Film and Sheeting Using a Coulometric Sensor

D 5118/D 5118M-05 – Standard Practice for Fabrication of Fiberboard Shipping Boxes

D 5276-98(2004) – Test Method for Drop Test of Loaded Containers by Free Fall

F 372-99 (2003) - Standard Test Method for Water Vapor Transmission of Flexible Barrier Materials Using an Infrared Detection Technique

(Application for copies should be addressed to the ASTM-International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

#### 3.1 Performance characteristics.

##### 3.1.1 Pouch material.

3.1.1.1 Fabrication. The pouch material shall be capable of being fabricated into pouches as specified in 3.1.2. The material used for the pouch shall be safe for use with food by reference to, and in accordance with 21 CFR, Part 170-189, applicable material safety datasheets, or other recognized health standards and regulations.

3.1.1.2 Oxygen transmission rate. The oxygen transmission rate (O<sub>2</sub>TR) of the material shall not exceed 0.06 cc/m<sup>2</sup>/24 hrs/atm.

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3.1.1.3 Water vapor transmission rate. The water vapor transmission Rate (WVTR) of the material shall not exceed 0.01 gm/m<sup>2</sup>/24 hrs.

3.1.1.4 Thermal processing. The material when fabricated into pouches shall be capable of withstanding the thermal process specified in 3.1.5. If the material used is a multi-layered laminate, it shall show no evidence of delamination after thermal processing when examined in accordance with 4.2.

3.1.1.5 Environmental conditions.

3.1.1.5.1 Low temperature (Type I). After thermal processing, the filled and sealed Single Serve Pouch (SSP) pouch shall withstand pouch abuse at 28°F with a survival rate of 75 percent when tested in accordance with 4.3.4.1.

3.1.1.5.2 High temperature (Type I). After thermal processing, the filled and sealed SSP pouch shall withstand pouch abuse at 160°F with a survival rate of 100 percent when tested in accordance with 4.3.4.2.

3.1.1.5.3 Standard temperature (Type II). After thermal processing, the filled and sealed Institutional Size pouch (ISP) shall withstand pouch abuse at 72°F with a survival rate of 100 percent when tested in accordance with 4.3.4.3.

3.1.1.5.4 Frozen temperature (Type II). After thermal processing, the filled and sealed ISP shall withstand pouch abuse at -20°F with a survival rate of 75 percent when tested in accordance with 4.3.4.4.

3.1.1.6 Camouflage. The color of outside surfaces of the SSP pouch, after thermal processing, shall contribute to field camouflage. For ISP, commercial pouches are acceptable.

3.1.1.7 Directional tear. The pouch material shall be modified (in one or more layers) to provide a straight tear along the lengthwise axis of the pouch when tested in accordance with 4.3.10.

3.1.2 Pouch configurations and dimensions. Pouch configurations and dimensions for 5 and 8 ounce SSP pouches shall be as specified in figure 1, figure 4 or figure 5 as specified, (see 6.1). Pouch configuration and dimensions for the ISP shall be as specified in figure 3 (see 6.1).

3.1.3 Pouch filling.

3.1.3.1 Eight ounce pouch. Products requiring an average net weight of 8 ounces or less but more than 5 ounces shall be filled into an 8 ounce size pouch. Placeable products may be filled into an 8 ounce pouch.

3.1.3.2 Five ounce pouch. Products requiring an average net weight of 5 ounces or less shall

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be filled into a 5 ounce size pouch.

3.1.3.3 Institutional size pouch. Products requiring an average net weight ranging from 48 to 104 ounces shall be filled into an ISP.

3.1.4 Pouch sealing.

3.1.4.1 Residual gas. Residual gas volume in the filled and sealed SSP pouches shall not exceed 10 cubic centimeters (cc) in pouches packed with Class 4 products, nor shall the residual gas volume exceed 20 cc in SSP pouches packed with Class 1, Class 2, or Class 3 products, when tested in accordance with 4.3.6. Residual gas volume in the filled and sealed ISPs shall not exceed 250 cc when tested in accordance with 4.3.6.

3.1.4.2 Closure seal. The closure seal width shall be a minimum 2.5 mm. The closure seal shall be free of impression or design on the seal surface that would conceal or impair visual detection of seal defects. The closure seal shall be free of wrinkles, occluded matter, or evidence of entrapped moisture or grease that reduces the closure seal width to less than 1/16 inch at any location along its continuous path when examined in accordance with 4.2.

3.1.4.3 Internal pressure. The pouches shall be filled and hermetically sealed such that after thermal processing, the pouches shall withstand the applicable pressure for 30 seconds when tested in accordance with 4.3.7.

3.1.5 Thermal processing. Filled and sealed pouches shall be thermally processed as specified in the applicable food product document.

3.1.5.1 Commercial sterility. Thermally processed pouches shall be free of swelling or microbial activity when tested in accordance with 4.3.8.

3.1.5.2 Pouch defects. Filled and sealed thermally processed pouches shall be free of damage (tears, cuts, holes, or if a multi-layer laminate is used, abrasions through one or more layers in the pouch material, or leakage through any heat seal) when examined in accordance with 4.2.

3.1.6 Carton design.

3.1.6.1 Carton design for 8 ounce size pouches (Type I). The SSP carton, when closed and sealed, shall completely enclose the pouch to prevent physical damage and entry of foreign matter when examined in accordance with 4.2.1. Not applicable for Type I, Styles 2 or 3 pouches.

3.1.6.2 Carton design for 5 ounce size pouches (Type I). The SSP carton, when closed and sealed, shall completely enclose pouch to prevent physical damage and entry of foreign matter when examined in accordance with 4.2.1. Not applicable for Type I, Styles 2 or 3 pouches.

3.1.6.3 Carton color. The color of all inside and outside SSP and ISP carton surfaces shall be natural kraft, tan or dull gray.

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3.1.6.4 Carton dimensions (Type I). The inside length and width dimensions of the SSP carton shall be equal to the outside length and width dimensions of the pouch. The carton depth shall be 5/8 inch ( $\pm$  1/16 inch).

3.1.6.5 Carton design (Type II). The ISP carton, when closed and sealed, shall enclose pouch to prevent physical damage when examined in accordance with 4.2.1.

3.1.6.6 Carton dimensions (Type II). The outside length, width and height of the ISP carton shall not exceed 12-13/16 x 10-3/4 x 2-1/8 inches.

3.1.7 Unit packing of pouches in cartons.

3.1.7.1 Pouch in carton (Type I). Each SSP carton shall contain one flat, fully extended pouch.

3.1.7.2 Carton closure (Type I). Each SSP carton shall be securely closed. The closure shall have a bond strength greater than the fiber tear of the paperboard when examined in accordance with 4.3.9.

3.1.7.3 Pouch in carton (Type II). Each ISP carton shall contain one pouch. One end of ISP may be folded to accommodate fitting the pouch into the carton.

3.1.7.4 Carton closure (Type II). The top and bottom faces of the carton shall be compressed and the ends taped.

3.1.7.5 Carton label (Type II). A label with the following instructions shall be printed, stamped, or otherwise applied onto the carton, in a manner that does not damage the carton, with permanent ink of any contrasting color. Type size of the label shall be no smaller than shown below (printed on 8-1/2" x 11" paper), but can be larger.

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**ATTENTION!**

**PROTECTIVE CARTON-DO NOT THROW AWAY**

**SAVE AND RE-USE TO PROTECT  
POUCH FROM DAMAGE**

**To Avoid Damaging Pouch:**

- 1. Keep Pouch in Carton Until Ready to Heat, Then Remove.**
- 2. Insert Pouch Back Into Carton After Heating.**
- 3. Always Use Cartons When Transporting  
Pouches in Insulated Food Containers.**
- 4. If Cartons Are Unavailable, Stack Pouches  
With Fiberboard Pads in Between.**

In addition, the product name shall be correctly and legibly labeled on the carton.

4. VERIFICATION

4.1 Conformance inspection. Conformance inspection shall include the examinations of 4.2 and 4.2.1, and the tests of 4.1.1, and 4.3.1 through 4.3.9.

4.1.1 Pouch material testing. The pouch material shall be tested for the performance characteristics listed in table I.

TABLE I. Pouch material tests

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Characteristic <u>1/</u>	Requirement paragraph	Test method
Oxygen transmission rate	3.1.1.2	4.3.1
Water vapor transmission rate	3.1.1.3	4.3.2
Thermal processing	3.1.1.4	4.3.3
Low temperature (Type I)	3.1.1.5.1	4.3.4.1
High temperature (Type I)	3.1.1.5.2	4.3.4.2
Standard temperature (Type II)	3.1.1.5.3	4.3.4.3
Frozen temperature (Type II)	3.1.1.5.4	4.3.4.4
Camouflage (Type I)	3.1.1.6	4.3.5
Residual gas	3.1.4.1	4.3.6
Internal pressure	3.1.4.3	4.3.7
Directional tear	3.1.1.7	4.3.10

1/ In lieu of testing, determination of compliance to O<sub>2</sub>TR, WVTR, environmental conditions, and camouflage requirements may be ascertained by examination of records, invoices, or other valid documents. In addition, compliance to the requirements for outside pouch dimensions and dimensions of manufacturer's seals may be verified by certificate of conformance.

4.2 Examination of pouch. After thermal processing, the pouches shall be visually examined for compliance with the requirements specified in 3.1.1, 3.1.2, 3.1.3, 3.1.4, and 3.1.5. Defects and defect classifications are listed in table II.

TABLE II. Filled, sealed and thermal processed pouch defects

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Category				Defect
<u>Critical</u>	<u>Major A</u>	<u>Major B</u>	<u>Minor</u>	
1				Swollen pouch.
2				Tear, cut, hole, or if a multi-layered laminate is used, abrasion through one or more layers in the pouch material or leakage through any heat seal.
3				Foldover wrinkle extending into the seal such that the closure seal is reduced to less than 1/16 inch.
4				Presence of entrapped matter (for example, product, moisture, grease, etc.) that reduces the closure seal to less than 1/16 inch.
5				Presence of delamination when a multi-layered laminate is used. <u>1/</u>
	101			Unclean pouch. <u>2/</u>
	102			Any impression or design on the heat seal surfaces which conceals or impairs visual detection of seal defects. <u>3/</u>
	103			Less than 3/16 inch between inside edge of tear notch and inside edge of seal.
	104			Closure seal not located as specified.
	105			Pouch labeling is missing or incorrect or illegible.
		151		Presence of delamination when a multi-layered laminate is used. <u>1/</u>
		152		Closure seal width not as specified.
			201	Presence of delamination when a multi-layered laminate is used. <u>1/</u>
			202	Tear notches missing or not as specified.

TABLE II. Filled, sealed and thermal processed pouch defects (cont'd)

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Category				Defect
Critical	Major A	Major B	Minor	
			203	Tear notches not located as specified.
			204	Depth of tear notches not as specified.
			205	Color of SSP does not contribute to field camouflage.

1/ Delamination defect classification:

Critical - Evidence of outer ply delamination such that the adjacent ply in the pouch body is exposed or evidence of two ply delamination such that the food contactant layer is exposed.

Major B - Delamination of the outer ply in the pouch seal area that can be propagated to expose the adjacent ply at the food product edge of the pouch after manual flexing of the delaminated area. To flex, the delaminated area shall be held between the thumb and forefinger of each hand with both thumbs and forefingers touching each other. The delaminated area shall then be rapidly flexed 10 times by rotating both hands in alternating clockwise-counter clockwise directions. Care shall be exercised when flexing delaminated areas near the tear notches to avoid tearing the pouch material. After flexing, the separated outer ply shall be grasped between thumb and forefinger and gently lifted toward the food product edge of the seal or if the separated area is too small to be held between thumb and forefinger, a number two stylus shall be inserted into the delaminated area and a gentle lifting force applied against the outer ply. If separation of the outer ply can be made to extend to the product edge of the seal with no discernible resistance to the gentle lifting, the delamination shall be scored as a Major B defect. Additionally, spot delamination of the outer ply in the body of the pouch that is able to be propagated beyond its initial borders is also a Major B defect. To determine if the delaminated area is a defect, use the following procedure: Mark the outside edges of the delaminated area using a bold permanent marking open. Open the pouch and remove the contents. Cut the pouch transversely not closer than 1/4 inch (plus or minus 1/16 inch) from the delaminated area. The pouch shall be flexed in the area in question using the procedure described above. Any propagation of the delaminated area, as evidenced by the delaminated area exceeding the limits of the outlined borders, shall be scored as a Major B defect.

Minor - Minor delamination of the outer ply in the pouch seal area is acceptable and shall not be classified as a minor defect unless it extends to within 1/16 inch of the food product edge of the seal. All other minor outer ply delamination in the pouch seal area or isolated spots of delamination in the body of the pouch that do not propagate when flexed as described above shall be classified as minor.

2/ Scale or dust on the outside of pouches caused by retort water may be removed by washing. The following examples shall not be scored as defects for unclean:

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a. Water spots.

b. On SSP, two or less specks of dried product each of which measure 1/8 inch by 1/8 inch or equivalent area, or less. On ISP, ten or less specks of dried product each of which measure 1/8 inch by 1/8 inch or equivalent area, or less.

c. Any foreign matter which presents no health hazard or no potential pouch damage and which readily falls off when pouch is lifted and shaken lightly.

d. Very thin film of grease, oil, or product residue which is discernible to touch, but not readily discernible by visual examinations.

e. Thin strips or drops of adhesive.

3/ If doubt exists as to whether or not the sealing equipment leaves an impression or design on the heat seal surfaces that could conceal or impair visual detection of seal defects, samples shall be furnished to the contracting officer for a determination as to acceptability.

4.2.1 Examination of pouch and carton assembly. The pouch and carton assembly shall be examined for compliance with the requirements specified in 3.1.6 and 3.1.7. Defects and defect classifications are listed in table III.

TABLE III. Pouch and carton assembly 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.
	101		Tear or hole in carton exposing pouch to potential damage.
	102		Outer flaps of carton not closed.
	103		Carton not clean.
	104		Type I pouch body not in a flat, fully extended position in SSP carton.

TABLE III. Pouch and carton assembly defects (cont'd)

Category			Defect
Critical	Major	Minor	

105	Carton labeling is missing, incorrect or illegible.
106	Bond strength in SSP carton closure is not greater than fiber strength of paperboard of carton.
107	Type II pouch does not fit into the ISP carton. <u>1/</u>
201	Tear or hole in carton not exposing pouch to potential damage.
202	Color of carton not as specified.
203	Outer flaps of SSP carton not closed to within 1/2 inch of either end.
204	The ISP carton not closed as specified.

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1/ Pouches with a folded end shall not be scored as a defect.

#### 4.3 Tests.

4.3.1 Oxygen transmission rate. The oxygen transmission rate of the material shall be determined in accordance with ASTM D 3985, at 73°F and 50 % RH.

4.3.2 Water vapor transmission rate. The water vapor transmission rate of the material shall be determined in accordance with ASTM F 372, at 100°F and 90 % RH.

4.3.3 Thermal processing. Testing for thermal processing of the material shall be as follows: Material shall be formed into SSP or ISP in accordance with figure 1, 3, 4, or 5 as applicable. Pouches shall be filled with five or eight, or 48 ounces of water, as applicable, sealed and exposed to the same thermal processing conditions as required for filled and sealed pouches by the food product document. Following thermal processing, pouches shall be examined visually. Any pouch material defect as a result of thermal processing shall be considered a test failure.

#### 4.3.4 Environmental conditions.

4.3.4.1 Low temperature (Type I). Fill the SSP pouches with water, seal and thermal process as in 3.1.5. After thermal processing, unit pack in paperboard cartons. Condition the unit packs in an atmosphere uniformly maintained at 28°F ± 2°F for a period of 48 hours. During exposure, position the unit packs to allow free circulation of air around each pack. Conduct a pouch abuse test while still in the frozen state using the test apparatus shown in figure 2. For eight ounce unit packs, the drop height shall be 40 inches; for five ounce unit packs, the drop height shall be 64 inches. Drop each unit pack twice, once on each end. Recondition tested unit packs to ambient temperature for at least 24 hours, remove pouches from cartons and examine visually. Any

pouch leakage shall be considered a test failure.

4.3.4.2 High temperature (Type I). Fill the SSP pouches with water, seal and thermal process as in 3.1.5. After thermal processing, unit pack in paperboard cartons. Condition the unit packs in an atmosphere uniformly maintained at  $160^{\circ}\text{F} \pm 2^{\circ}\text{F}$  for a period of 48 hours. During exposure, position the unit packs to allow free circulation of air around each pack. Conduct a pouch abuse test using the test apparatus shown in figure 2. For eight ounce unit packs, the drop height shall be 40 inches; for five ounce unit packs, the drop height shall be 64 inches. Drop each unit pack twice, once on each end. Recondition tested unit packs to ambient temperature for at least 24 hours, remove pouches from cartons and examine visually. Any pouch leakage shall be considered a test failure.

4.3.4.3 Standard temperature (Type II). Each pouch, filled with either water or a representative food product, processed as specified in the applicable food document shall be inserted into the carton as specified in 3.1.7. Four filled, sealed and thermal processed ISP pouches shall be packed in a fiberboard box conforming to style RSC-L, type CF, grade 275 of ASTM D 5118. The box shall be closed in accordance with ASTM D 1974. Condition the box of four ISPs in an atmosphere uniformly maintained at  $72^{\circ}\text{F} \pm 2^{\circ}\text{F}$  for a period of 48 hours. Conduct a drop test in accordance with ASTM D 5276, Ten Drop Cycle at a height of 21 inches. Immediately after completion of the drop test, conduct a vibration test (on the same box of four ISPs) in accordance with ASTM D 999, at 268 RPM (4.5 Hz) for a period of one hour. Remove ISPs from the box and examine visually. Any cracked, split or leaking ISP at any location, or tear, hole, or puncture through the carton causing a hole in the ISP; or wet or stained carton due to one or more leaking ISPs; or any evidence of food product leakage from ISP shall be considered a test failure.

4.3.4.4 Frozen temperature (Type II). Prepare the box of four ISPs as specified in 4.3.4.3, but condition in an atmosphere uniformly maintained at  $-20^{\circ}\text{F} \pm 2^{\circ}\text{F}$  for a period of 48 hours. While still in frozen state, conduct drop and vibration tests as specified in 4.3.4.3. Remove ISPs from the box and allow to fully thaw prior to visual examination. Any cracked, split or leaking ISP at any location, or tear, hole, or puncture through the carton causing a hole in the ISP; or wet or stained carton due to one or more leaking ISPs; or any evidence of food product leakage from ISP shall be considered a test failure.

4.3.5 Camouflage (Type I). External visible color of the outside surfaces of the SSP pouch material after thermal processing shall conform to the range of the government approved and standardized color swatches. Standardized swatch samples have been provided to and are on file with each contractor, each material supplier, USDA, Natick, and DSCP. Visibly match the outside surface of the pouch material to the range of colors of the standardized color swatch samples.

4.3.6 Residual gas volume test. The samples for test shall be opened under  $75^{\circ}\text{F} \pm 5^{\circ}\text{F}$  water and the gases shall be collected by water displacement in a graduated cylinder or other calibrated tube. The volume of the gases shall be reported to the nearest 0.1 cubic centimeter (cc) for SSP. Any residual gas volume exceeding 20 cc in SSP pouches filled with Class 1, Class 2, or Class 3 products shall be considered a test failure. Any residual gas volume exceeding 10 cc in SSP pouches filled with Class 4 products shall be considered a test failure. The volume of the gases

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shall be reported to the nearest 1 cc for ISP. Any residual gas volume exceeding 250 cc in ISP pouches shall be considered a test failure.

4.3.7 Internal pressure test. Internal pressure resistance shall be determined by pressurizing the pouches while they are restrained between two rigid plates. The plates shall be 1/2 inch  $\pm$  1/16 inch apart or 1 inch  $\pm$  1/16 inch apart for MRE, or 2 inches  $\pm$  1/16 inch apart for ISP. 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 of 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. For SSP, the pressure shall be 20 psig for the 1/2 inch plate distance and 12 psig for the 1 inch plate distance. For ISP, the pressure shall be 20 psig for the 2 inch plate distance. Pressure shall be applied gradually until pressure set point is reached. The pressure set point 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 II) shall be considered a test failure.

4.3.8 Commercial sterility test. Incubate filled, sealed and thermally processed pouches as follows:

- a. Classes 1, 2, and 3: Incubate at 95°F  $\pm$  5°F for 10 days, unless otherwise specified by the inspection agency.
- b. Class 4: Incubate at 80°F  $\pm$  5°F for 10 days.

Any evidence of swelling or microbial activity following incubation shall be considered a test failure.

4.3.9 Carton closure bond strength. Compliance with required bond strength in carton closure shall be verified by visually examining flaps for evidence of fiber tear after opening. Absence of fiber tear shall be considered a test failure.

4.3.10 Directional tear test. Using thumb and forefinger of each hand the pouch shall be gripped on each side of the tear notch opening at one end of the pouch. Twisting the two sides of the tear notch away from the notch center the pouch shall be torn open along the axis of the adjacent lengthwise side seal, (if pouch opening cannot be initiated on the initial attempt, the test shall be performed using the notch at the opposite end of the pouch). If the path of the resultant pouch tear line reduces the width of the remaining opened pouch to less than ~~4~~ **3-1/2** inches when measured from the outside edge of the opposite side seal to the lowest point along the tear line, it shall be considered a test failure.

Comment [C1]: Natick case ES09-139, change 07, 17 Jul 09, to update test parameters.

## 5. PACKAGING

This section is not applicable to this specification.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification.
- b. Type, style, and class required (see 1.2).
- c. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.3).
- d. Pouch sizes for SSP (see 3.1.2 and figure 1).
- e. Pouch size for ISP (see 3.1.2 and figure 3).

6.2 Pouch material.

6.2.1 Type I pouch material. The U.S. Army Soldier Biological and Chemical Command (SBCCOM), Natick Soldier Center (NSC) has found that for preformed SSP pouches, a material structure consisting of, from inside to outside, 0.003 to 0.004 inch thick polyolefin, 0.00035 to 0.0007 inch thick aluminum foil, 0.0006 inch thick biaxially oriented polyamide-type 6, and 0.0005 inch thick polyester meets the performance criteria of this specification. Alternatively, the aluminum foil layer and the biaxially oriented polyamide layer may be in either order. For the formed, tray-shaped body of a horizontal form-fill-seal (HFFS) SSP pouch, it has been found that a material structure consisting of, from inside to outside, 0.003 to 0.004 inch thick polyolefin, 0.0006 inch thick biaxially oriented polyamide-type 6, 0.0015 to 0.00175 inch thick aluminum foil and 0.0010-0.0014 inch thick oriented polypropylene meets the performance criteria of this specification. For the lidding material for the HFFS SSP pouch, it has been found that a material structure consisting of, from inside to outside 0.003 to 0.004 inch thick polyolefin, 0.00035 to 0.0007 inch thick aluminum foil and 0.0005 to 0.00075 inch thick polyester meets the performance criteria of this specification. The above values and ranges expressed for the thickness of thin gauge plastic films and aluminum foil are nominal values. A plus or minus 20% tolerance is typical for thin gauge plastic film thickness measurements and a plus or minus 10% tolerance is typical for aluminum foil thickness measurements.

6.2.2 Type II pouch material. The U.S. Army Soldier Biological and Chemical Command (SBCCOM), Natick Soldier Center (NSC) has found that for preformed ISP pouches, a material 5-layer structure consisting of, from inside to outside, 0.004 inch thick polyolefin, 0.00098 inch thick biaxially oriented polyamide, 0.00035 inch thick aluminum foil, 0.00059 inch thick biaxially oriented polyamide, and 0.00047 inch thick polyester meets the performance criteria of this specification. The above values and ranges expressed for the thickness of thin gauge plastic films and aluminum foil are nominal values. A plus or minus 20% tolerance is typical for thin

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gauge plastic film thickness measurements and a plus or minus 10% tolerance is typical for aluminum foil thickness measurements.

6.3 Carton design and material.

6.3.1 Type I Carton design and material. The SSCOM (NRDEC) has found that a SSP carton design and material conforming to variety I, style I, type A, class a or style XIV, group I or II of PPP-B-566, Boxes, Folding, Paperboard, except that the carton may be made of 16-point bending chips, kraft lined chips or unbleached solid sulfate paperboard or of 17-point low density kraft paperboard having a minimum basis weight for the bending chips and the kraft lined chipboard of 60 pounds per 1000 square feet, a minimum basis weight for the unbleached solid sulfate board of 55 pounds per 1000 square feet or a minimum basis weight for the low density kraft paperboard of 48 pounds per square feet meets the performance criteria of this specification. The use of materials composed of the highest percentage of recovered materials practicable is encouraged by the Resource Conservation and Recovery Act of 1976.

6.3.2 Type II Carton design and material. It has been found that a ISP carton constructed of grade 275 fiberboard in accordance with ASTM D 5118, oriented with flutes parallel to the carton width, jointed and hot melt glued along either the vertical length or bottom face of the carton, and then ends closed and compressed and securely taped across the open ends of the carton at their midpoints meets the performance criteria of this specification.

6.4 Technical information. Specific technical inquiries may be addressed to the Commander, U.S. Army Soldier Systems Biological Chemical Command, Natick Soldier Center, ATTN: AMSSB-RCF-F(N), 15 Kansas Street, Natick, MA 01760-5018.

6.5 Subject term (key word) listing.

Meal, Ready-to-Eat  
MRE  
Operational rations  
Institutional Size Pouch (ISP)

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodians:

Preparing activity:

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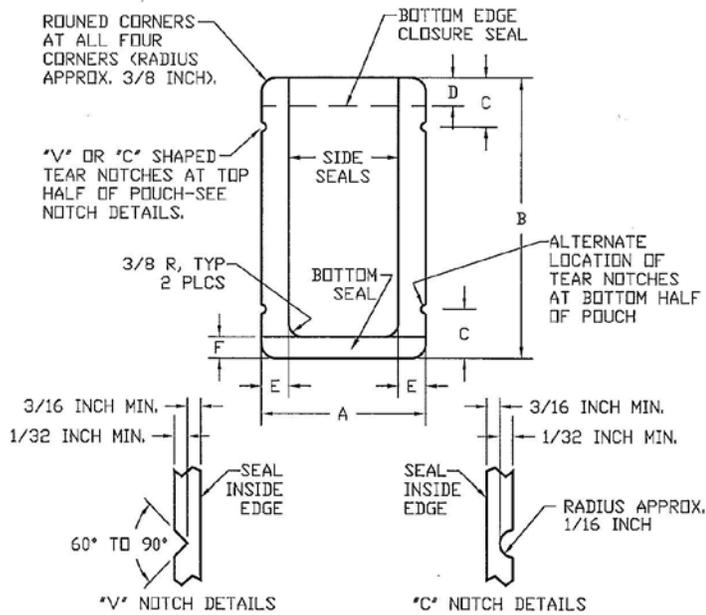
Army - GL  
Navy - SA  
Air Force - 35

Army - GL  
(Project 89GP-A003)

Review activities:

Army - MD, QM  
Navy - MC  
DLA - SS

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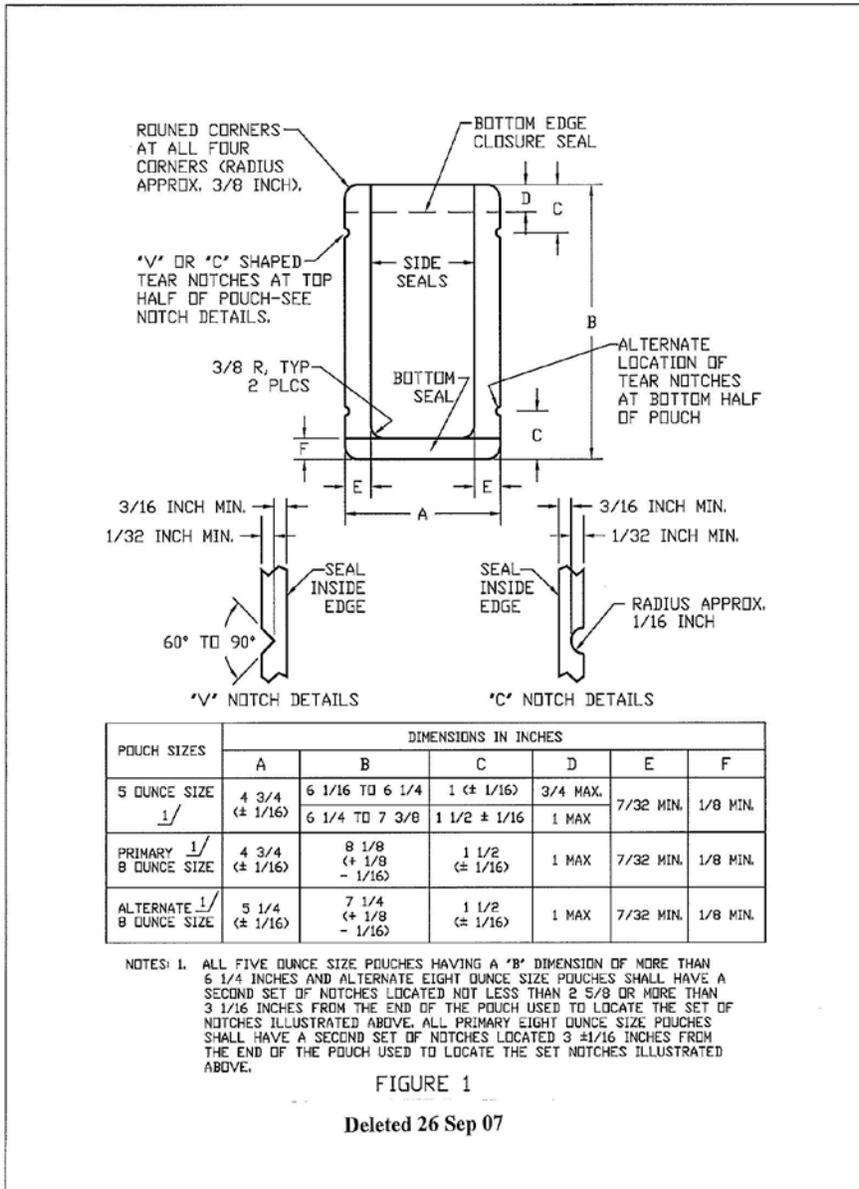


POUCH SIZES	DIMENSIONS IN INCHES					
	A	B	C	D	E	F
5 OUNCE SIZE $\frac{1}{2}$	4 $\frac{3}{4}$ (+ $\frac{1}{16}$ - $\frac{1}{8}$ )	6 $\frac{1}{16}$ TO 6 $\frac{1}{4}$	1 ( $\pm$ $\frac{1}{16}$ )	$\frac{3}{4}$ MAX.	7/32 MIN.	1/8 MIN.
		6 $\frac{1}{4}$ TO 7 $\frac{3}{8}$	1 $\frac{1}{2} \pm \frac{1}{16}$	1 MAX.		
PRIMARY $\frac{1}{8}$ OUNCE SIZE	4 $\frac{3}{4}$ (+ $\frac{1}{16}$ - $\frac{1}{8}$ )	8 $\frac{1}{8}$ (+ $\frac{1}{8}$ - $\frac{1}{16}$ )	1 $\frac{1}{2}$ ( $\pm$ $\frac{1}{16}$ )	1 MAX.	7/32 MIN.	1/8 MIN.
ALTERNATE $\frac{1}{8}$ OUNCE SIZE	5 $\frac{1}{4}$ ( $\pm$ $\frac{1}{16}$ )	7 $\frac{1}{4}$ (+ $\frac{1}{8}$ - $\frac{1}{16}$ )	1 $\frac{1}{2}$ ( $\pm$ $\frac{1}{16}$ )	1 MAX.	7/32 MIN.	1/8 MIN.

NOTES: 1. ALL FIVE OUNCE SIZE POUCHES HAVING A "B" DIMENSION OF MORE THAN 6 1/4 INCHES AND ALTERNATE EIGHT OUNCE SIZE POUCHES SHALL HAVE A SECOND SET OF NOTCHES LOCATED NOT LESS THAN 2 5/8 OR MORE THAN 3 1/16 INCHES FROM THE END OF THE POUCH USED TO LOCATE THE SET OF NOTCHES ILLUSTRATED ABOVE. ALL PRIMARY EIGHT OUNCE SIZE POUCHES SHALL HAVE A SECOND SET OF NOTCHES LOCATED 3  $\pm$  1/16 INCHES FROM THE END OF THE POUCH USED TO LOCATE THE SET NOTCHES ILLUSTRATED ABOVE.

FIGURE 1  
 Revised 26 Sep 07

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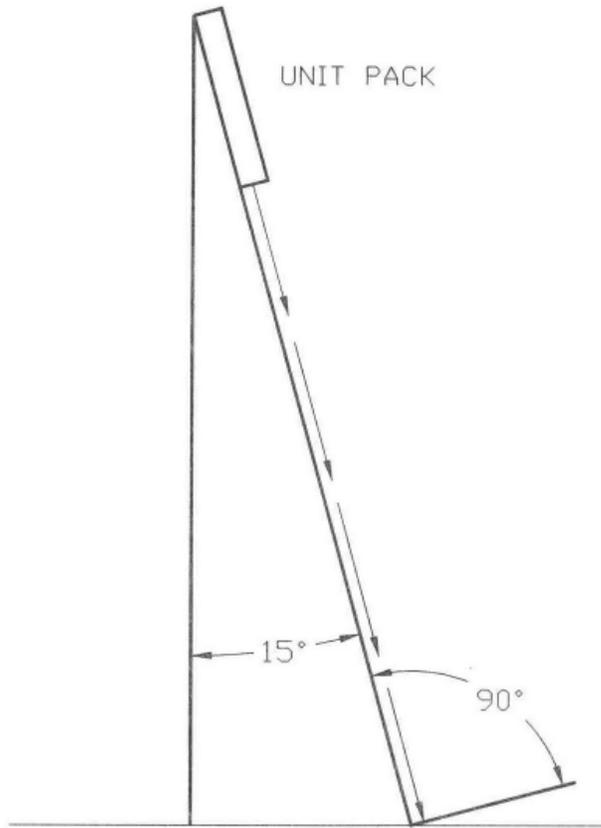


FIGURE 2  
POUCH ABUSE TEST APPARATUS

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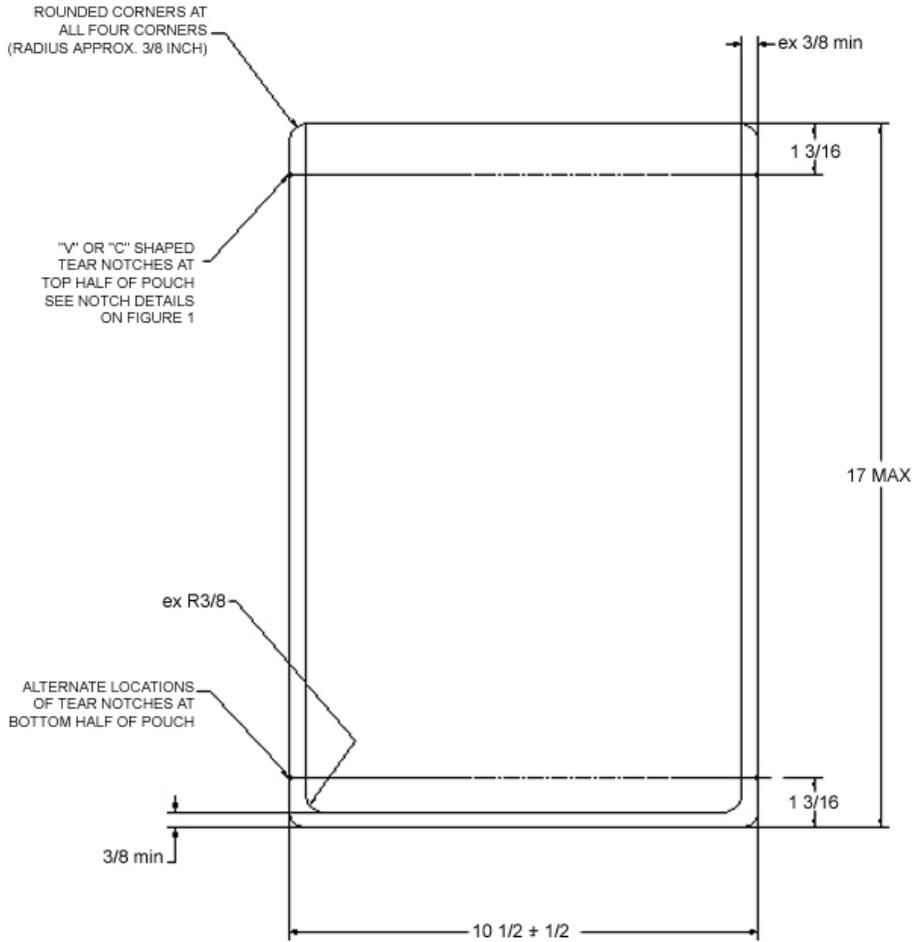
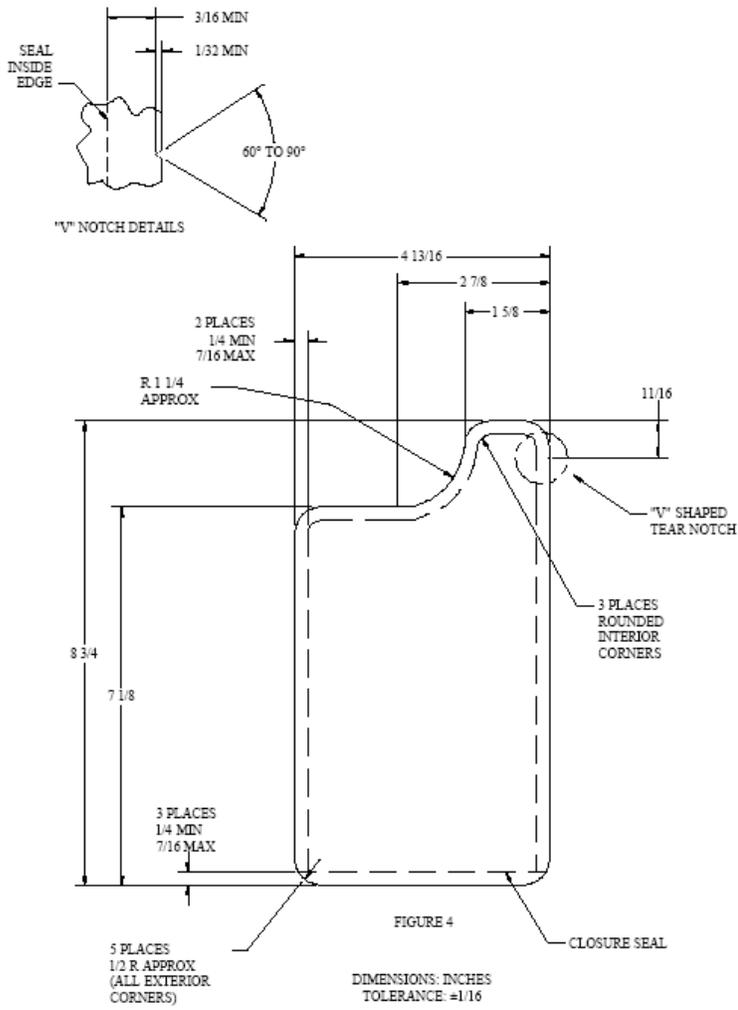
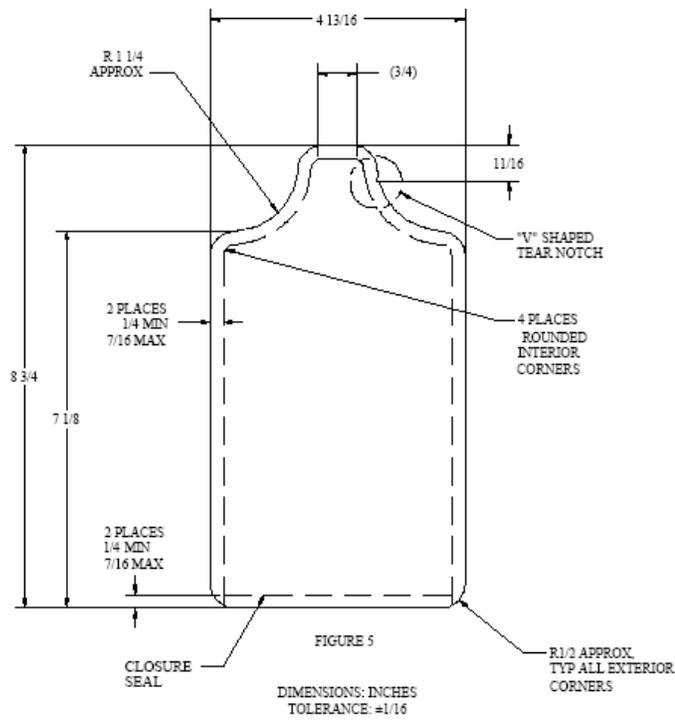
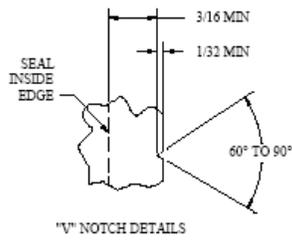


FIGURE 3. Institutional Size Pouch  
(Not actual size)

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Draft change to MIL-PRF-44093F tear notch location and notch detail to incorporate directional tear characteristics.

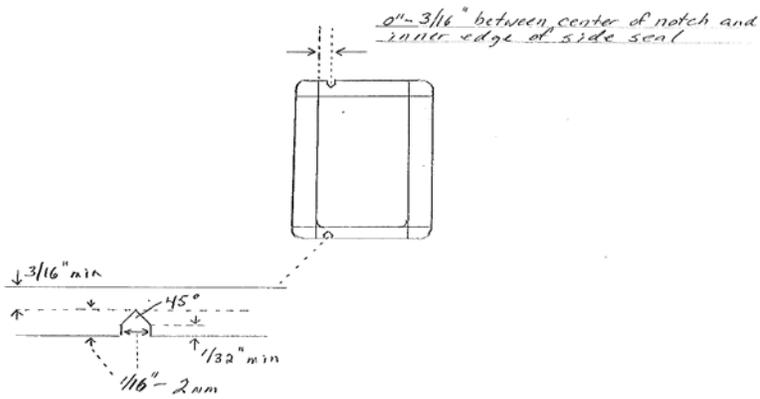


FIGURE 6. Directional Tear Pouch

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<b>STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL</b>		
<b>INSTRUCTIONS</b>		
1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given. 2. The submitter of this form must complete blocks 4, 5, 6, and 7, and send to preparing activity. 3. The preparing activity must provide a reply within 30 days from receipt of the form.		
<b>NOTE:</b> This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.		
<b>I RECOMMEND A CHANGE:</b>	<b>1. DOCUMENT NUMBER</b> MIL-PRF-44073F	<b>2. DOCUMENT DATE (YYYYMMDD)</b> 2001 09 04
<b>3. DOCUMENT TITLE</b>		
PACKAGING OF FOOD IN FLEXIBLE POUCHES		
<b>4. NATURE OF CHANGE</b> ( <i>Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.</i> )		
<b>5. REASON FOR RECOMMENDATION</b>		
<b>6. SUBMITTER</b>		
a. NAME ( <i>Last, First, Middle Initial</i> )	b. ORGANIZATION	
c. ADDRESS ( <i>Include ZIP code</i> )	d. TELEPHONE ( <i>Include Area Code</i> ) (1) Commercial  (2) DSN ( <i>If applicable</i> )	<b>7. DATE SUBMITTED</b> (YYYYMMDD)
<b>8. PREPARING ACTIVITY</b>		
a. NAME US Army Soldier & Biological Chemical Command Natick Soldier Center	b. TELEPHONE (Include Area Code) (1) Commercial 508-233-5907 (2) DSN 256-5907	
c. ADDRESS ( <i>Include ZIP code</i> ) US Army Soldier & Biological Chemical Command Natick Soldier Center Attn: AMSSB-RCF-FN 15 Kansas Street Natick, MA 01760-5018	<b>IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:</b> Defense Standardization Program Office (DLSC-LM) 8725 John J. Kingman Road, Suite 2533 Fort Belvoir, Virginia 22060-6221 Telephone (703) 767-6888 DSN 427-6888	

DD FORM 1426, FEB 1999 (EG)

PREVIOUS EDITION IS OBSOLETE

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## For DSCP Website Posting

RDNS-CFF

17 July 2009

TO: DSCP-FTSA

SUBJECT: ES09-139; Change parameters for the directional tear test, MIL-PRF-44073F, Packaging of Food in Flexible Pouches

1. As a result of tests conducted and measurements taken during in-house evaluation and the test results submitted by Meal, Ready-to-Eat™ (MRE™) retort suppliers, a change in the parameters is provided to cite 3-1/2 inches as the minimum flap during the directional tear test.
2. Natick submits the following change to the subject document for all current, pending and future procurements until the document is formally amended or revised:  

Paragraph 4.3.10, line 6. Delete “4” and insert “3-1/2”.
3. Attached is MIL-PRF-44073F, Change 07 with changes highlighted.