INCH-POUND

L-F-560G
November 17, 1995
SUPERSEDING
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December 31, 1990

FEDERAL SPECIFICATION

FORK, KNIFE, AND SPOON, PICNIC (PLASTIC)

The General Services Administration has authorized the use of this federal specification, by all federal agencies

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements of disposable plastic flatware.

1.2 Classification. The plastic flatware shall be of the following types and items, as specified (see 6.2).

Type III - Heavy duty

Item 5	-	Fork, picnic (white)
Item 5a	-	Fork, picnic (green)
Item 5b	-	Fork picnic (tan/sand)
Item 6	-	Knife, picnic (white)
Item 6a	-	Knife, picnic (green)
Item 6b	-	Knife, picnic (tan/sand)
Item 7	-	Spoon, tea, picnic (white)
Item 7a	-	Spoon, tea, picnic (green)
Item 7b	-	Spoon, tea, picnic (tan/sand)
Item 8	-	Spoon, bouillon, picnic (white)

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 Natick Research, Development and Engineering Center, ATTN: SSCNC-WEF, Natick, MA 01760-5018 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 7340

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

Type IV - High impact

Item 9 - Spoon, picnic (tan/sand)
Item 10 - Knife, picnic (tan/sand)
Item 11 - Fork, picnic (tan/sand)
Item 12 - Flatware set, consisting of one fork, knife, and spoon (tan/sand)
Item 13 - Spoon, MRE, 7-inch (brown)

2. APPLICABLE DOCUMENTS

2.1 Government documents. Unless otherwise specified, the following documents of the issue in effect on date of invitation for bids or request for proposal form a part of this specification to the extent specified herein.

Federal Standard

FED-STD-595 - Colors Used in Government Procurement

(Activities outside the Federal Government may obtain copies of federal specifications, standards, and commercial item descriptions as specified in the General Information section of the Index of Federal Specifications, Standards, and Commercial Item Descriptions. The Index is for sale on a subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001.)

(Single copies of this specification, and other federal specifications and commercial item descriptions required by activities outside the Federal Government for bidding purposes, are available without charge from the General Services Administration, Federal Supply Service Bureau, Specification Section, Suite 8100, 470 L'Enfant Plaza, SW, Washington, DC 20407.)

(Federal Government activities may obtain copies of federal standardization documents and the index of Federal Specifications, Standards, and Commercial Item Descriptions from established distribution points in their agencies.)

Drawings

U.S. Army Natick Research, Development and Engineering Center

4-1-169 - Impact Machine, Spoon, Picnic, Plastic
5-13-4655 - Spoon, Plastic, 7-inch
8-2-39 - Fork, Picnic, Plastic
8-2-38 - Knife, Picnic, Plastic
8-2-15 - Spoon, Picnic, Plastic

(Copies of drawings are available from the U.S. Army Natick Research, Development and Engineering Center, ATTN: SSCNC-WEF, Natick, MA 01760-5018)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

Laws and Regulations

21 CFR 177 - Subpart B - Indirect Food Additives: Polymers

(The Code of Federal Regulation (CFR) and the Federal Register (FR) are for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001. When indicated, reprints of certain regulations may be obtained from the Federal agency responsible for the issuance thereof.)

American National Standards Institute (ANSI)/
American Society of Quality Control (ASQC)

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

(Application for copies should be addressed to the American Society for Quality Control, 611 E. Wisconsin Avenue, Milwaukee, WI 53202-4606.)

American Society for Testing and Materials (ASTM) Standards

D 256 - Determining the Pendulum Impact Resistance of Notched Specimens of Plastics
D 648 - Deflection Temperature of Plastics Under Flexural Load
D 4549 - Polystyrene Molding and Extrusion Materials (PS)

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

(Technical society and technical association documents are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

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

3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.3.

3.2 Material. All materials used in the manufacture of forks, knives, and spoons shall conform to Subpart B of title 21, CFR 177. Utensils made from polystyrene shall conform to Section 177.1640, and those made from polypropylene shall conform to Section 177.1520 of the above referenced code. Biodegradable materials can be used. Color shall be as specified in 3.7. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.

3.2.1 Type III items. The molding material for this type item shall be modified polystyrene, opaque of alternatively shall conform to PS112 of ASTM D 4549. Polypropolene may be used as an alternative material.

3.2.2 Type IV items. The molding material for this type item shall be modified polystyrene and opaque.

3.2.2.1 Impact strength. The molding material for the type IV items shall have an Izod impact strength of not less than 0.75 foot-pounds per inch of notch when tested as specified in 4.4.1.1.

3.2.2.2 Heat distortion. The molding material for the type IV items shall have a minimum heat distortion temperature of not less than 185°F when tested as specified in 4.4.1.1.

3.3 Design. The design for the type III items shall be the contractors own and shall be such as to conform to the requirements specified herein. Prior to beginning productions, approval of the design for the type III items shall be obtained from the contracting officer. The design of the type IV items shall conform to the design shown on Drawings 8-2-15, 8-2-38, 8-2-39 and 5-13-4655. Type IV, item 12 shall be procurable only as a set.

3.3.1 Knife serrations. The type III knife shall be serrated for a minimum length of 2-1/4 inches. The serrations shall be well defined and shall contact the horizontal surface when the longitudinal knife axis is approximately 30 degrees (± 5 degrees) to the horizontal surface.

3.3.2 Length and weight (type III items only). The type III items shall conform to the requirements of table I for length and weight. The test for weight shall be as specified in 4.4.4.

TABLE I. Length and weight of type III items (minimum)

Item	Length (inches)	Polystyrene Ave. Wt. of 50 pcs (grams)	Polypropylene Ave. Wt.of 50 pcs (grams)
Fork	6-1/8 (+1/4; -0)	6.4	3.1
Knife	6-1/2 (+1/2; -0)	6.0	3.2
Spoon, tea	5-3/4 (+1/4; -0)	5.0	2.8
Spoon, bouillon	5-1/2 (+1/2; -0)	5.5	3.0

3.3.3 Dimensions and weights (type IV items only). The type IV fork, knife, and spoon shall conform to the applicable drawings, respectively. Determination of all dimensional requirements shall be based on the first article inspection of forks, knives, spoons or sets, as applicable, produced from the supplier's molds (see 4.3). The minimum average weight of 50 pieces shall be as follows: forks, 4.0 grams; knives, 3.6 grams; teaspoons, 4.2 grams; and for the MRE spoons, 6.5 grams. Testing shall be as specified in 4.4.4

3.3.4 Flexibility (all type III items; and type IV, item 13 only).

3.3.4.1 Type III, fork, knife, and spoons. When tested as specified in 4.4.4, the items shall not break, nor deflect greater than the values indicated:

Fork----------no more than 7/8 inch
Knife----------no more than 1-1/2 inches
Spoons, tea--------no more than 1 inch
Spoons, bouillon---no more than 1 inch

3.3.4.1.1 Fork tine: The fork tine shall not break or deflect sufficiently to allow the test weight to slip off the tine when tested as specified in 4.4.4.

3.3.4.2 Type IV, item 13, spoon MRE. When tested as specified in 4.4.4, the spoon shall not break, nor deflect greater than 1/2 inch using a 3-1/4 inch beam length. An additional deflection test using a 4-1/4 inch beam length shall not break, nor deflect greater than 1 inch.

3.4 Heat distortion (type III items only). The fork, knife, and spoons shall show no change in shape when tested as specified in 4.4.4.

3.5 Impact strength (type IV spoon). The type IV spoon shall sustain no damage when tested as specified in 4.4.4. Discoloration of the spoon due to stressing from impact shall not be considered as damage.

3.6 Odor and taste. The forks, knives, and spoons shall be free from any objectionable odor at temperatures up to 185° ± 2°F and objectionable taste at temperatures between 80° to 90°F when tested as specified in 4.4.4.

3.7 Color. For type III items 5, 6, 7, and 8, the color shall not be darker than white, color no. 27875 of FED-STD-595. For type III items 5a, 6a, and 7a, the flatware color shall be green, and approximate any of the following color numbers of FED-STD-595: 34373, 34449, 34504, or 34558. For type III items 5b, 6b, and 7b, the flatware color shall be tan/sand, and approximate any of the following color Nos.: 20450, 22563, or 23531 of FED-STD-595. For type IV, items 9 thru 12, the color shall be tan/sand not darker than color No. 13690 of FED-STD-595, unless otherwise specified (see 6.2). The color for type IV, item 13 shall be brown and approximate color No. 20122 of FED-STD-595.

3.8 Marking for identification. The manufacturer's name or trade name or trademark readily identifiable with the manufacturer shall appear on all type III items. When specified (see 6.2), for type IV items, the manufacturer's trade name or trademark readily identifiable with the manufacturer shall be printed on each utensil packet or alternatively molded on the underside of the utensil handle.

3.9 Workmanship. The flatware shall have a smooth, uniform, continuous finish, shall be clean, and free from any scratch, crack, chip, blister, glow-mark, weld line, sink mark, flash, sharp edge distortion, oil spot, grease or imbedded foreign material. Minor color swirls or flow marks do not constitute a defect.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the government. The government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure that supplies and services conform to prescribed requirements.

4.1.1 Certificates of compliance. When certificates of compliance are submitted, the Government reserves the right to inspect such items to determine the validity of the certification.

4.2 Classification of inspection. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.3).
b. Quality conformance inspection (see 4.4).

4.3 First article inspection. When a first article is required (see 3.1 and 6.2), it shall be examined for the defects specified in 4.4.2 and 4.4.3 and tested for the characteristics specified in 4.4.4. In addition, a first article for type IV shall be examined for conformance to the dimensions shown on Drawings 8-2-15, 8-2-38, 8-2-39 and 5-13-4655. The presence of any defect, any dimension not within specified limits, or failure of any test shall be cause for rejection of the first article.

4.3.1 Process approval. When a first article is not required (see 6.2), or each time a new production setup is made, material, mold, or process changed, the measurements specified in 4.3 shall be made on the first units produced under the revised production conditions. Whenever nonconformance is noted, correction shall be made to the items affected, the lot in progress, and to the operation. Items which cannot be corrected shall be removed from production.

4.4 Quality conformance inspection. Conformance inspection shall include the examinations of 4.4.2, 4.4.3, and the tests of 4.4.4. Unless otherwise specified, sampling for inspection shall be performed in accordance with ANSI/ASQC Z1.4.

4.4.1 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.4.1.1 Testing of the molding material (type IV items only). The molding material for type IV items shall be tested for the characteristics listed in table II. The lot size shall be expressed in units of one hundred pounds of molding material. The sample unit shall be one pound of resin. The inspection level shall be S-1. Two test samples shall be molded from each sample unit of molding material, (one for each characteristic shown in table II). The dimensions of the molded samples shall be as follows:

a. For impact strength - 1-1/2 by 1/2 by 1/2 inches
b. For heat distortion - 5 by 1/2 by 1/2 inches

TABLE II. Molding material (for type IV) tests

Characteristic	Requirement paragraph	Test method	Number of determinations per sample unit	Results reported to nearest
Impact strength	3.2.2.1	ASTM 256 1/	1	0.01 foot pound
Heat distortion	3.2.2.2	ASTM 648 1/	1	5°F

1/ In lieu of testing, a contractor's certificate of compliance showing that the material complies with the specified requirements, will be acceptable.

4.4.2 End item visual examination. The end items shall be examined for the defects listed in Table III. The lot size shall be expressed in units of like items, forks, knives, spoons or sets, as applicable. The sample unit shall be one fork, knife, spoon or set, as applicable. Unless otherwise specified in the contract or purchase order, the inspection level shall be S-1 and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 4.0.

TABLE III. End item visual defects

Examine	Defect
Design	Not in accordance with the applicable drawings, or approved design, as applicable Serrations not well defined, or not minimum length specified
Appearance	Any scratch, crack, or chip Presence of any dirt, grease, or oil spot Color not as specified
Workmanship	Any blister, flow mark, weld line, sink mark, flash, sharp edge, distortion, or imbedded foreign material Gate cutoff on type IV, item 13 (spoon MRE), not smooth, or protrudes more than 1/32-inch
Marking	Not as specified

4.4.3 End item dimensional examination. The type III end items shall be examined for conformance to the length requirement as specified in 3.3.2. The type IV end items shall be examined for the dimensions as indicated by NOTE "1" on the applicable drawing. The lot size shall be expressed in units of like items, forks, knives, spoons or sets, as applicable. The sample unit shall be one fork, knife, spoon or set, as applicable. Unless otherwise specified in the contract or purchase order, the inspection level shall be S-1 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.

4.4.4 End item testing. The end items shall be tested for the applicable characteristics in Table IV. The lot size shall be expressed in units of like items, forks, knives, spoons or sets, as applicable. The sample unit for testing shall be one fork, knife, spoon or set, as

applicable, except for the weight test, where the sample unit shall be 50 for that specific item. Unless otherwise specified in the contract or purchase order, the inspection level shall be S-1 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.

TABLE IV. End item testing

Characteristic	Requirement paragraph	Test method	Results report as
Weight	3.3.2 and 3.3.3	4.5.1	Pass or fail
Flexibility:			
Fork tine (type III)	3.3.4.1.1	4.5.2.2	Pass or fail
Fork (type III)	3.3.4.1	4.5.2.3	Pass or fail
Knife (type III)	3.3.4.1	4.5.2.4	Pass or fail
Spoon (type III)	3.3.4.1	4.5.2.5	Pass or fail
Spoon MRE (Type IV, item 13)	3.3.4.2	4.5.2.5	Pass or fail
Heat distortion (type III items only)	3.4	4.5.3	Pass or fail
Impact strength (type IV spoon only)	3.5	4.5.4	Pass or fail
Odor and taste	3.6	4.5.5	Pass or fail

4.4.5 Statictical process control An approved statistical process control plan and system may be used in lieu of the end item visual examination, end item dimensional examination, and end item testing.

4.5 Methods of inspections.

4.5.1 Weight test. Weigh fifty forks, knives, or spoons on a balance and report the average weight of the fifty utensils. If the average weight of the fifty utensils is less than that required in 3.3.2 or 3.3.3, it shall be reported as a failure.

4.5.2 Flexibility tests (type III and type IV, item 13).

4.5.2.1 Suggested apparatus. The suggested apparatus is equivalent to a laboratory stand with a base, upright and a drill press vise attached to the top of the upright. The base and upright should be at right angles to each other. Any suitable height gauge may be used for recording the readings before and after loading of the fork, knife or spoon.

4.5.2.2 Fork tine. Insert the handle of a finished fork into the vise jaws of the apparatus until 3 inches protrude from the jaws to the tip end of the tines. The fork shall have the concave surface facing up. Using a 1 pound weight, attach a small loop of 0.010-inch wire to the weight for applying the load. Apply the load at a point 1/4 inch from the end of each tine. The wire loop shall not fall off due to excessive deflection nor shall the tine break off under this load (see 3.3.4.1.1).

4.5.2.3 Fork. Insert the handle of a finished fork into the vise jaws of the apparatus so that 2 inches of the fork protrudes from the vise jaws to the base of the tines. The fork shall have the concave surface facing up. Using a triangular file, slightly notch the edges of the fork where the tines begin. Apply the 1-pound load smoothly to the point where the base of the tines begin. Deflection greater than that specified in 3.3.4.1 constitutes failure of this test.

4.5.2.4 Knife. Insert the handle of a finished knife into the vise jaws so that the knife protrudes 4 inches from the vise jaws to the end of the cutting end. The flat surface of the knife shall be horizontal. Using a triangular file, notch the knife blade at a point 3-1/2 inches from the vise jaws. Apply the 1-pound load and measure the deflection at the point the load is applied. Deflection greater than that specified in 3.3.4.1 constitutes failure of this test.

4.5.2.5 Spoon. At the center of a finished spoon bowl, notch the edge of the bowl with a triangular file. Insert the spoon in the vise jaws so that the distance from the vise jaw to the notches is 3-1/4 inches. The concave surface shall face up. Apply the 1 pound load and measure the deflection at the point the load is applied. Deflection greater than that specified in 3.3.4.1 or 3.3.4.1.1 constitutes failure of the test. As an additional test for the MRE spoon (item 13), testing shall be performed as previously specified above, except that the distance from the vise jaws to the notches shall be 4-1/4 inches, and the deflection measurement shall be taken between 30 and 45 seconds after the load is applied. Deflection greater than that specified in 3.3.4.2 for either test shall constitute failure of this test.

4.5.3 Heat distortion test (type III). A hole shall be drilled through the handle, near the end of the fork, knife, or spoon to be tested. The fork, knife, or spoon shall be suspended from the top of a 1000 mL beaker containing enough distilled water, maintained at 185° ± 2°F, so that the test specimen shall be completely immersed in the distilled water, and in such a manner that no part of the specimen comes in contact with the beaker. After 15 minutes remove the test specimen from the water. Any change in shape shall be considered a test failure.

4.5.4 Impact strength test for type IV spoon.

4.5.4.1 Apparatus. The apparatus for this test shall be as shown on Drawing 4-1-169. The test weight shall be 1.00 ± 0.03 pound and shall be made of metal.

4.5.4.2 Conditioning. The finished spoon shall be conditioned at 73° ± 10°F and 50 ± 4 percent relative humidity for 48 hours prior to test.

4.5.4.3 Procedure. The conditioned spoon shall be laid on the hardwood base of the stand with the convex side of the bowl facing upward. The spoon shall be secured to the base in the middle of the handle area by the spring clip as shown on Drawing 4-1-169, or by any other suitable method which provides sufficient pressure to prevent movement of the spoon during the test. The weight guide tube shall be centered over the bowl area so that the test weight strikes the highest point of the bowl. The bottom of the weight guide tube shall be approximately 1 inch above the bowl. The test weight shall be dropped onto the highest point of the bowl from a height of 12 inches. The spoon shall then be removed from the apparatus and examined to determine conformance with 3.5. Any nonconformance shall be considered a test failure.

4.5.5 Odor and taste test. A finished fork, knife, or spoon shall be immersed in distilled water at 185° ± 2°F for 15 minutes. At the expiration of this time, the fork, knife, or spoon shall be removed and tested for odor. The fork, knife, or spoon, as applicable, shall then be re-immersed in distilled water at 80° to 90°F for 15 minutes. At the expiration of this time, the fork, knife, or spoon, as applicable, shall be removed and evaluated for taste by placing it in the mouth in simulation of actual eating operation as required in 3.6. The presence of any objectionable odor or taste shall be considered a test failure.

5. PACKAGING

5.1 Preservation, packing, palletization and marking. Preservation, packing, palletization, and marking shall be as specified in the contract or purchase order (see 6.2).

6. NOTES

(INFORMATION FOR GUIDANCE ONLY)

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

6.1 Intended use. The forks, knives, and spoons are intended for use as disposable utensils.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number and date of this specification.
b. Type and item required (see 1.2).
c. When a first article is required (see 3.1).
d. Color required for type IV, items 9 thru 12 (if other than tan/sand) (see 3.7).

e. When the manufacturer's name or trademark is required for type IV utensil packets (see 3.8).
f. Whether the first article shall be waived (see 4.3.1).
g. Packaging requirements (see 5.1)
h. When alternative construction of handle tip for type IV items is authorized (see Drawings 8-2-15, 8-2-38, 8-2-39, and 6.3).

6.3 Handle tip construction. The primary construction for the type IV items shown on Drawings 8-2-15, 8-2-38 and 8-2-39 provide for a blunt handle tip design. This design is required when the items are packed in Meal-Ready-to-Eat (MRE) rations so that the tips will not penetrate through the sealed package. The alternate construction provides a pointed handle tip design which SHOULD NOT be packed in MRE rations.

6.4 Subject term (key word) listing.

Disposable tableware
Plastic tableware
Utensils

6.5 Changes from the previous issue. Asterisks (or vertical lines) are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

MILITARY INTERESTS:

Custodians

Army - GL
Navy - SA
Air Force - 99

Review Activities

Army - MD, QM-1
Navy - MS
Air Force - 35, 84
DLA - SS

User Activities

Navy - MC, CG

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA - FSS
VA - OSS

PREPARING ACTIVITY:

Army - GL

(Project 7340-0096)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

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.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: 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.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE (YYMMDD)
	L-F-560G	95-11-17

3. DOCUMENT TITLE

Fork, Knife, and Spoon, Picnic (Plastic)

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE (Include Area Code) (1) Commercial	(2) AUTOVON /DSN
U.S. Army Natick RD&E Center	(508) 233-5175	256- 5175
c. ADDRESS (Include Zip Code) Commander, U.S. Army Natick RD&E Center ATTN: SSCNC-WEF Natick, MA 01760-5018	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	