

GGG-C-746G

July 26, 1979

SUPERSEDING

Fed. Spec. GGG-C-746F

April 11, 1974

FEDERAL SPECIFICATION

CUTLERY, GALLEY AND KITCHEN (CLEAVER, FORKS, KNIVES, SPATULAS, STEEL AND SERVER)

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers cutlery items for galley and kitchen use.

1.2 Classification. Cutlery furnished in accordance with this specification shall be of the following types, sizes, and grades, as specified (see 6.2).

Type I - Cleaver, meat, butchers, 8-inch (204 mm) blade
Grade A - SAE 1095 high carbon steel

Type II - Fork, food preparation, cooks
Grade A - SAE 1095 high carbon steel
Grade B - Analysis I high carbon steel

Type III - Knife, boning, 6-inch (152 mm) blade
Grade A - SAE 1095 high carbon steel
Grade D - Stainless steel

Type IV - Knife cooks: forged
Size 1 - 12-inch (305 mm) blade
Grade A - SAE 1095 high carbon steel
Size 2 - 10-inch (254 mm) blade
Grade A - SAE 1095 high carbon steel
Grade B - Analysis I high carbon steel

Type V - Knife, paring, 3-1/2 inch (89 mm) blade
Grade A - SAE 1095 high carbon steel
Grade B - Analysis I high carbon steel
Grade D - Stainless steel

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- Type VI - Knife, slicing, 12-inch (305 mm) blade
 - Grade A - SAE 1095 high carbon steel
 - Grade D - Stainless steel
- Type VII - Knife, steak, scimitar, 10-inch (254 mm) blade
 - Grade A - SAE 1095 high carbon steel
 - Grade D - Stainless steel
- Type VIII - Knife, steak, scimitar, 12-inch (305 mm) blade
 - Grade A - SAE 1095 high carbon steel
- Type IX - Knife, grapefruit, 3-1/2 inch (89 mm) blade
 - Grade D - Stainless steel
- Type X - Spatula, metal, without offset
 - Size 1 - 8-inch (204 mm) blade
 - Grade A - SAE 1095 high carbon steel
 - Grade D - Stainless steel
 - Size 2 - 10-inch (254 mm) blade
 - Grade A - SAE 1095 high carbon steel
- TYPE XI - Spatula, metal, 14-inch (356 mm) blade
 - Grade A - SAE 1095 high carbon steel
 - Grade B - Analysis I high carbon steel
- Type XII - Butchers' steel, smooth, 10-inch (254 mm) blade
 - Grade C - Analysis II high carbon steel
- Type XIV - Knife, butchers', 8-inch (204 mm) blade
 - Grade B - Analysis I high carbon steel
- Type XV - Knife, butchers', 10-inch (254 mm) blade
 - Grade B - Analysis I high carbon steel
- Type XVI - Knife, butchers', 14-inch (356 mm) blade
 - Grade B - Analysis I high carbon steel
 - Grade D - Stainless steel
- Type XVII - Knife, slicing, 12-inch (305 mm) blade (scalloped)
 - Grade A - SAE 1095 high carbon steel
- Type XVIII - Spatula, metal, with offset, 8-inch (204 mm) blade
 - Grade D - Stainless steel
- Type XIX - Knife, slicing, 6-inch (152 mm) blade
 - Grade B - Analysis I high carbon steel
- Type XX - Knife, cooks', stamped, 10-inch (254 mm) blade
 - Grade D - Stainless steel
- Type XXI - Server, pie and cake
 - Grade D - Stainless steel

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2. APPLICABLE DOCUMENTS

2.1 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 Specifications:

L-P-394	- Plastic Molding Material, Polypropylene Injection and Extrusion.
QQ-S-700	- Steel Sheet and Strip, Medium and High Carbon.
QQ-W-321	- Wire, Copper Alloy.
PPP-B-566	- Boxes, Folding, Paperboard.
PPP-B-636	- Boxes, Shipping, Fiberboard.
PPP-B-665	- Boxes, Paperboard, Metal Edged and Components.
PPP-B-676	- Boxes, Setup.
PPP-P-291	- Paperboard, Wrapping and Cushioning.
PPP-T-45	- Tape, Gummed, Paper, Reinforced and Plain, for Sealing and Securing.

Federal Standards:

FED-STD-123	- Marking for Shipment (Civil Agencies).
FED-STD-151	- Metals; Test Methods.
FED-STD-406/GEN	- Plastics: Methods of testing.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other Federal specifications required by activities outside the Federal Government for bidding purposes are available without charge from General Services Administration Business Service Centers in Boston, New York, Philadelphia, Washington, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Houston, Denver, San Francisco, Los Angeles and Seattle, WA.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

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Military Specifications:

- MIL-P-116 - Preservation-Packaging, Methods of.
- MIL-B-117 - Bag, Sleeve and Tubing - Interior Packaging.
- MIL-B-121 - Barrier Material, Greaseproofed, Waterproofed, Flexible.

Military Standards:

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.

(Copies of specifications and standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

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:

American Society for Testing and Materials (ASTM) Standards

- A 276 - Stainless and Heat-Resisting Steel Bars and Shapes
- D 785 - Rockwell Hardness of Plastics and Electrical Insulating Materials
- D 1324 - Modified Wood
- E 18 - Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
- E 380 - Standard for Metric Practice

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

National Sanitation Foundation (NSF)

Basic Criteria C-2 Special Equipment and Devices

Listing of Food Service Equipment

(Application for copies should be addressed to the National Sanitation Foundation, P. O. Box 1468, Ann Arbor, MI 48106.)

National Motor Freight Traffic Association, Inc., Agent

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Associations, Inc., Traffic Department, 1616 P Street, N.W., Washington, DC 20036.)

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Uniform Freight Classification Committee, Agent

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

3. REQUIREMENTS

3.1 Standard product. The items listed in 1.2 shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's current standard commercial product.

3.2 NSF compliance. Prior to approval of first shipment, the contractor shall submit to the contracting officer or his authorized representative satisfactory evidence that the items he proposes to furnish under this specification meet the applicable requirements of NSF Standard No. C-2. Satisfactory evidence of this compliance shall be any of the following:

(1) A listing in the current edition of the NSF "Listing of Food Service Equipment" and display of the NSF seal on the finished item, or

(2) A certification issued by NSF under this special one-time contract evaluation/certification service, or

(3) A certified test report from a recognized independent testing laboratory acceptable to the medical department of the service for which the items are being procured, indicating that the cutlery has been tested and conforms to NSF No. C-2.

3.3 Materials and components. Materials and components shall be as specified herein. Materials not definitely specified shall be of the quality normally used by the manufacturer in his standard commercial cutlery provided the completed item complies with all provisions of this specification (see 6.4).

3.3.1 Steel.3.3.1.1 High carbon steel.

3.3.1.1.1 High carbon, Analysis I or II. High carbon steel shall comply with Analysis I, chromium vanadium steel, or Analysis II, electric furnace process steel.

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TABLE I. Analysis I and II high carbon steel, chemical composition

Elements	Analysis I		Analysis II	
	Chromium-Vanadium Alloy Steel		Electric Furnace Process	
	Min. %	Max. %	Min. %	Max. %
Carbon	1.00	1.10	1.20	1.35
Manganese	0.20	0.40	0.25	0.50
Silicon	0.15	0.30	-	0.35
Sulfur	-	0.025	-	0.05
Phosphorus	-	0.025	-	0.05
Chromium	0.40	0.60	-	-
Vanadium	0.15	0.25	-	-

3.3.1.1.2 SAE 1095 steel. SAE 1095 steel shall comply with QQ-S-700.

3.3.1.2 Stainless steel. Stainless steel shall comply with one of the highly hardenable stainless steels suitable for forging such as class 420, 440A, 440B, or 440C of ASTM A 276.

3.3.2 Brass. As specified herein, brass for rivets shall conform to alloy No. 260 of QQ-W-321.

3.3.3 Compressed modified wood. Compressed modified wood shall be in accordance with ASTM D 1324. Resin-impregnated wood (phenol formaldehyde resin or equivalent) shall be for the primary purpose of modifying physical properties through densification and improvement of dimensional stability.

3.3.4 Plastic moulding compound. The plastic compound shall be phenol formaldehyde moulding compound or fabricated laminated sheet stock, or polypropylene conforming to L-P-394. Polycarbonate plastic or polyallamer plastic are also acceptable.

3.3.5 Rivets. Rivets shall be of the compression (tube and blank type), or slotted head type. Rivets shall be fabricated of brass as specified in 3.3.2 or carbon steel as specified in 3.3.1 or nickel silver. Rivet heads shall be not less than 1/4 inch (6 mm) diameter.

3.4 Design and construction.

3.4.1 Handles. The handle shall be fabricated from material specified in 3.3.3 and 3.3.4, be smooth with end of handle toward tip of blade, beveled, to prevent buildup of food or meat. The fit between the handle and tang shall be close and uniform at all points. The space between handle and tang shall not exceed 0.004 inch (0.10 mm) at any point on slotted and two-piece handles.

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3.4.1.1 Types I through XI and types XIV through XXI. Handles shall be two-piece or solid slotted construction of the materials specified in 3.3.3, or one-piece moulded construction of material specified in 3.3.4 (as specified in 6.2). Two-piece handles shall be attached to the tangs by not less than three rivets specified in 3.3.5. Slotted solid handles shall be attached to the tangs by not less than two rivets specified in 3.3.5. Compressed modified wood handles and moulded plastic handles shall be attached to the tangs in accordance with the manufacturer's standard commercial practice.

3.4.1.2 Type XII. The handle of the butcher's steel shall be one solid piece of material specified in 3.3.3 or 3.3.4 (as specified in 6.2). The handles shall be fastened to the tang in accordance with the manufacturer's standard commercial practice.

3.4.2 Tangs.

3.4.2.1 For blades, less than 6 inches (152 mm) long. Tangs shall extend the full length of the two-piece handles, and not less than 2 inches (51 mm) into the slotted handles with the end of the tang flush with the bottom of the slot.

3.4.2.2 For blades, 6 inches (152 mm) or greater in length. Tangs shall extend the full length of the two-piece handles. Tangs shall extend not less than 2-1/2 inches (64 mm) into the slotted handles with the end of the tang flush with the bottom of the slot or may extend not less than three-quarters the width and one-half the length of the handle, and shall fit flush with the top of the handle.

3.4.3 Type I - Cleaver, meat, butchers', 8-inch (204 mm) blade. The meat cleaver shall conform to figure 1. The weight of the finished cleaver shall be 2-1/2 pounds (1.13 kg), plus or minus 6 ounces (170 g). The handle shall conform to 3.4.1.1. The blade and tang shall be fabricated in one piece of SAE 1095 steel conforming to 3.3.1.1.2, except that the sulphur or phosphorous content shall not exceed 0.04 percent. The blade shall be ground from the back towards the edge for a distance of 7/16 inch (11 mm) plus or minus 1/16 inch (1.6 mm) from the cutting edge. The blade shall have a Rockwell "C" hardness between 50 and 56 inclusive in the area measured from cutting edge to a minimum of 1 inch (25 mm) back from the cutting edge.

3.4.4 Type II - Fork, food preparation, cooks'. The cooks' fork shall conform to figure 2. The handle shall conform to 3.4.1.1. The tines, shank, and tang shall be fabricated in one piece from materials conforming to 3.3.1.1.2 or 3.3.1.2. The cross section of the tines at their base, shall be not less than 5/32 inch (4 mm) thick by 11/32 inch (8.7 mm) wide. Tines shall taper uniformly on the surface at right angles to the face of the fork, from a section 1-1/2 inches (38 mm) plus or minus 1/2 inch (13 mm) above the point to the point. The shank shall be either oval or round and the tang shall be flat. Tines shall have a Rockwell "C" hardness between 39 and 50, inclusive.

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3.4.5 Type III - Knife, boning, 6-inch (152 mm) blade. The boning knife shall conform to figure 3. The handle shall conform to 3.4.1.1. The blade and tang shall be fabricated from materials conforming to 3.3.1.1.2 or 3.3.1.2. The blade shall be uniformly machine ground in accordance with the manufacturer's commercial practice; lengthwise on a uniform taper and uniformly tapered from the back towards the edge, with a thickness of not more than 0.030 inch (0.8 mm) at a line paralleling the contour of the blade, measured 1/8 inch (3.2 mm) back from the cutting edge. From this point the blade shall be roll ground with a symmetrical reduction in thickness to zero producing a fine smooth sharp edge. This edge shall apply to the full length of the blade except the 1/2 inch (13 mm) next to handle and at the point end of the blade where it meets the taper of the back (see figure 3). The blade shall have a Rockwell "C" hardness between 53 and 58, inclusive.

3.4.6 Type IV - Knife cooks', forged, 10-inch (254 mm) and 12-inch (305 mm) blade. The 12-inch (305 mm) forged cooks' knife shall conform to figure 4. The 10-inch (254 mm) forged cooks' knife shall conform to figure 4 except for blade length. The handles shall conform to 3.4.1.1. The blade, bolster, and tang shall be fabricated from materials conforming to 3.3.1.1.1 (Analysis I) and 3.3.1.1.2. The blade shall be uniformly machine ground in accordance with the manufacturer's commercial practice; lengthwise on a uniform taper and uniformly tapered from the back toward the edge with a thickness of not more than 0.025 inch (0.6 mm) at a line paralleling the contour of the blade, measured 1/8 inch (3.2 mm) back from the cutting edge. From this point the blade shall be roll ground with a symmetrical reduction to zero producing a fine smooth sharp edge. The grinding shall apply to the first 9 inches (229 mm) of the blade length for the 12 inch (305 mm) blade and to the first 7-1/2 inches (191 mm) for the blade length for the 10 inch (254 mm) blade. The 3 inches (76 mm) of the 12 inch (305 mm) and the 2-1/2 inch (64 mm) of the 10 inch (254 mm) blade next to the bolster shall have a heavier section blending with the other (see figure 4). The blade shall have a Rockwell "C" hardness between 53 and 58, inclusive.

3.4.7 Type V - Knife, paring, 3-1/2 inch (89 mm) blade. The 3-1/2 inch (89 mm) paring knife shall conform to figure 5. The handle shall conform to 3.4.1.1. The blade and tang shall be fabricated from stainless steel conforming to 3.3.1.2 or carbon steel conforming to 3.3.1.1.1 (Analysis I) or 3.3.1.1.2. The blade shall be uniformly machine ground in accordance with the manufacturers' commercial practice; lengthwise on a uniform taper and uniformly tapered from the back toward the edge with a thickness of not more than 0.020 inch (0.5 mm) at a line paralleling the contour of the blade measured 1/8 inch (3.2 mm) back from the cutting edge. From this point the blade shall be roll ground with a symmetrical reduction in thickness to zero producing a fine smooth sharp edge. This edge shall apply to the full length of the blade except the 1/2 inch (13 mm) next to the handle and at the point end of the blade where the point meets the taper of the back (see figure 5). The blade shall have a Rockwell "C" hardness between 53 and 58, inclusive.

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3.4.8 Type VI - Knife, slicing, 12-inch (305 mm) blade. The slicing knife shall conform to figure 6. The handle shall conform to 3.4.1.1. The blade and tang shall be fabricated from materials conforming to 3.3.1.1.2 and 3.3.1.2. The blade shall be uniformly machine ground in accordance with manufacturer's commercial practice; lengthwise on a uniform taper and uniformly tapered from the back toward the edge with a thickness of not more than 0.025 inch (0.6 mm) at a line paralleling the contour of the blade measured 1/8 inch (3.2 mm) back from the cutting edge. From this point the blade shall be roll ground with a symmetrical reduction in thickness to zero producing a fine smooth sharp edge. This edge should apply to the full length of the blade except the 1/2 inch (13 mm) next to the handle and at the point end of the blade where it meets the taper of the back (see figure 6). The blade shall have a Rockwell "C" hardness between 53 and 58, inclusive.

3.4.9 Types VII and VIII - Knives, steak, scimitar, 10-inch (254 mm) and 12-inch (305 mm) blades. The scimitar steak knives shall conform to figures 7 and 8. The handles shall conform to 3.4.1.1. The blade and tang shall be fabricated from materials conforming to 3.3.1.1.2 or 3.3.1.2. The blade shall be uniformly machine ground in accordance with the manufacturer's commercial practice; lengthwise on a uniform taper and uniformly tapered from the back towards the edge with a thickness of not more than 0.030 inch (0.8 mm) at a line paralleling the contour of the blade measured 1/8 inch (3.2 mm) back from the cutting edge. From this point the blade shall be roll ground with a symmetrical reduction in thickness to zero producing a fine smooth sharp edge. This edge shall apply to the full length of the blade except the 1/2 inch (13 mm) next to handle and at the point end of the blade where it meets the taper of the back. The blade shall have a Rockwell "C" hardness between 53 and 58, inclusive.

3.4.10 Type IX - Knife, grapefruit, 3-1/2 inch (89 mm) blade. The grapefruit knife shall conform to figure 9. The handle shall conform to 3.4.1.1. The blade and tang shall be fabricated in one piece from stainless steel specified in 3.3.1.2. The blade shall be curved and both edges serrated. The blade shall have a Rockwell "C" hardness between 53 and 58, inclusive.

3.4.11 Types X and XI - Spatulas, 8-inch (204 mm) and 14-inch (356 mm) blades. The spatulas shall conform to figures 10 and 11. The handles shall conform to 3.4.1.1. The blade and tang shall be fabricated from materials conforming to 3.3.1.1.1 (Analysis I), 3.3.1.1.2 or 3.3.1.2. The blade shall be uniformly ground in accordance with the manufacturer's commercial practice from the point near the handle where the spatula attains its maximum width to the end of the blade. The blade shall have a spring temper and a Rockwell "C" hardness between 44 and 58, inclusive.

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3.4.12 Type XII - Butchers' steel, smooth, 10-inch (254 mm) blade. The butchers' steel shall conform to figure 12, and shall have a guard, a screw eye, swivel, and may have a ferrule. The handle shall conform to 3.4.1.2. The design shall be of the half-tang type with the blade and tang fabricated in one-piece from steel conforming to Analysis II specified in 3.3.1.1.1. The blade shall be uniformly ground in accordance with the manufacturer's commercial practice. The blade shall be magnetized and the surface shall have an abrasive finish, the scratches of which shall be not coarser than those resulting from a 200-mesh abrasive. The blade shall have a Rockwell "C" hardness between 63 and 66, inclusive.

3.4.13 Types XIV, XV, and XVI - Knives, butchers' 8-inch (204 mm), 10-inch (254 mm) and 14-inch (256 mm) blades. The butchers' knives shall conform to figure 14. The handles shall conform to 3.4.1.1. The blade and tang shall be fabricated from materials conforming to 3.3.1.1.1 (Analysis I) or 3.3.1.2. The blade shall be uniformly machine ground in accordance with the manufacturer's commercial practice; lengthwise on a uniform taper and uniformly tapered from the back towards the edge with a thickness of not more than 0.030 inch (0.8 mm) at a line paralleling the contour of the blade measured 1/8 inch (3.2 mm) back from the cutting edge. From this point the blade shall be roll ground with a symmetrical reduction in thickness to zero producing a fine smooth sharp edge. This edge should apply to the full length of the blade except the 1/2 inch (13 mm) next to handle and at the point end of the blade where it meets the taper of the back (see figure 10). The blade shall have a Rockwell "C" hardness between 53 and 58, inclusive.

3.4.14 Type XVII - Knife, slicing, 12-inch (305 mm) blade (scalloped). The scalloped slicing knife shall conform to figure 15. The handle shall conform to 3.4.1.1. The blade and tang shall be fabricated from materials conforming to 3.3.1.1.2. The blade shall be uniformly machine ground in accordance with the manufacturers' commercial practice; lengthwise on a uniform taper and uniformly tapered from the back toward the edge, with a thickness of not more than 0.025 inch (0.6 mm) at a line paralleling the contour of the blade, measured 1/8 inch (3.2 mm) back from the cutting edge. From this point the blade shall be roll ground with a symmetrical reduction in thickness to zero producing a fine smooth sharp edge. This edge should apply to the full length of the blade except the 1/2 inch (13 mm) next to the handle. At least 90 percent of the cutting edge shall be scalloped. The blade shall be not less than 3 nor more than 8 scallops to the inch (25 mm). The blade shall have a Rockwell "C" hardness between 53 and 58, inclusive.

3.4.15 Type XVIII - Spatula, offset, 8-inch (204 mm) blade. The offset spatula shall conform to figure 16. The handle shall conform to 3.4.1.1. The blade and tang shall be fabricated from stainless steel specified in 3.3.1.2 (grade D). The blade shall be uniformly ground in accordance with the manufacturer's commercial practice from the point near the handle where the spatula attains its maximum width to the end of the blade. The blade shall have a Rockwell "C" hardness between 44 and 56, inclusive.

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3.4.16 Type XIX - Knife, slicing, 6-inch (152 mm) blade. The slicing knife shall conform to figure 17. The handle shall conform to 3.4.1.1. The blade and tang shall be fabricated from steel specified in 3.3.1.1 (Analysis I). The blade shall be uniformly machine ground in accordance with the manufacturer's commercial practice; lengthwise on a uniform taper and uniformly tapered from the back toward the edge with a thickness of not more than 0.025 inch (0.6 mm) at a line paralleling the contour of the blade measured 1/8 inch (3.2 mm) back from the cutting edge. From this point the blade shall be roll ground with a symmetrical reduction in thickness to zero producing a fine smooth sharp edge. This edge should apply to the full length of the blade except the 1/2 inch (13 mm) next to the handle and at the point end of the blade where it meets the taper of the back (see figure 17). The blade shall have a Rockwell "C" hardness between 53 and 58, inclusive.

3.4.17 Type XX - Knife, cooks', stamped, 10-inch (254 mm) blade. The 10-inch (254 mm) stamped cooks' knife shall conform to figure 18. The handle shall conform to 3.4.1.1. The blade and tang shall be fabricated from materials conforming to 3.3.1.2 (grade D). The blade shall be uniformly machine ground in accordance with the manufacturer's commercial practice; lengthwise on a uniform taper and uniformly tapered from the back toward the edge with a thickness of not more than 0.030 inch (0.8 mm) at a line paralleling the contour of the blade, measured 1/8 inch (3.2 mm) back from the cutting edge. From this point the blade shall be roll ground with a symmetrical reduction in thickness to zero producing a fine smooth sharp edge. This edge should apply to the full length of the blade except the 1/2 inch (13 mm) next to handle and at the point end of the blade where it meets the taper of the back (see figure 18). The blade shall have a Rockwell "C" hardness between 53 and 58, inclusive.

3.4.18 Type XXI - Server pie and cake. The design of the pie and cake server shall conform to figure 19. The handle shall conform to 3.4.1.1. The blade and tang shall be formed from one piece of stainless steel specified in 3.3.1.2. The blade shall have a Rockwell "C" hardness between 42 and 47, inclusive.

3.5 Mechanical characteristics.

3.5.1 Rockwell hardness.

3.5.1.1 Blades and forks. Rockwell hardness values for blades and forks specified shall be determined in accordance with 4.4.1.1.

3.5.1.2 Handles. Rockwell hardness values for handles specified herein shall be determined in accordance with 4.4.1.2.

3.6 Performance requirements.

3.6.1 Bend tests.

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3.6.1.1 Knives and spatulas. Except for the grapefruit knife, all knives and spatulas shall be capable of withstanding the test specified in 4.4.2.1 without showing any visible indication of permanent deformation or breaking.

3.6.1.2 Forks. Forks shall be capable of withstanding the test specified in 4.4.2.2 without showing any visible indication of permanent deformation. The tines shall be capable of returning to within 1/8 inch (3 mm) of their original position when tested as specified in 4.4.2.2.

3.6.2 Handle tests.

3.6.2.1 Resin treated laminated compressed wood or thermo setting plastic moulding compound handles. Knife, fork, spatula, cleaver, or server handles shall not warp, loosen, split, chip, or change appearance when tested as specified in 4.4.3.1.

3.6.2.2 Butchers' steels. Handles of butchers' steels shall not move, become loose, or show visual indication of permanent deformation when tested as specified in 4.4.3.2.

3.6.2.3 Moulded plastic handles. Moulded plastic handles and blades shall not separate or be deformed when subjected to the pull test specified in 4.4.3.3.

3.6.3 Cutting test.

3.6.3.1 All knives (except grapefruit knife). All knives, except the grapefruit knife shall be well sharpened and capable of finely cutting all quarters of one raw cabbage without the use of excessive hand pressure or strokes (see 4.4.4.1).

3.6.3.2 Grapefruit knife. The grapefruit knife shall be well sharpened and capable of easily cutting grapefruit sections between the membrane partitions of both halves of one grapefruit (see 4.4.4.2).

3.7 Finish.

3.7.1 Blades. Before assembly, all blades and exposed portions of tangs shall be polished to a mirror finish or an abrasive matte finish with scratches not coarser than those resulting from a 200 mesh abrasive and cleaned with a suitable solvent. Swagging shall be optional based on the manufacturer's standard commercial practice.

3.7.2 Handles. The handles for all items shall be buffed and finished in accordance with the manufacturer's standard commercial practice.

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3.8 Workmanship. Finished cutlery items shall be clean and free from any defect which may affect appearance or serviceability. Except for specified cutting edges, there shall be no other sharp edges, projections, corners, or burrs which may cause personal injury. Handles shall be shaped or contoured in accordance with the manufacturer's commercial practice to provide a comfortable and positive grip. Handle and tang shall fit flush and all corners and edges of handles, except ends, shall be rounded. Rivets shall completely fill the holes in the tangs and handles and shall be securely set to prevent handle looseness, with the heads flush with the handle, not out of round and free from nicks, cracks or slivers.

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 as specified herein. Except as otherwise specified in the contract or 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 assure supplies and services conform to prescribed requirements.

4.2 Quality conformance inspection. Sampling for inspection shall be in accordance with the provisions set forth in MIL-STD-105, unless otherwise indicated hereinafter.

4.2.1 Component and material inspection. In accordance with 4.1 above, components and materials shall be inspected in accordance with all the requirements of referenced specifications, drawings and standards unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.2.1.1 Steel. Steel for blades and tangs specified in table I shall be tested for chemical content in accordance with Method 111 and 112 of FED-STD-151. Failure to meet the requirements shall be cause for rejection.

4.2.2 End item inspection. The inspection lot shall be all cutlery items of the same type, size, and grade offered for inspection at one time.

4.2.2.1 Visual examination. The cutlery items shall be examined for the defects in table II. The inspection level shall be level II with an acceptable quality level (AQL) of 2.5 for major defects and 6.5 for total defects expressed in terms of defects per hundred units.

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TABLE II. Classification of defects

Examine	Defect	Classification	
		Major	Minor
Finish	Any component not finished as specified	X	
	Area of rust or corrosion	X	
	Any component surface containing embedded foreign material	X	
	Any component surface rough, misaligned or containing cracks, tears, nicks, burrs, dents, or otherwise defective	X	
	Any component surface not clean		X
Construction and workmanship	Any component not of specified design	X	
	Component missing	X	
	Burrs, sharp corners, or projections, which may cause injury	X	
	Any component bent, misshapen, deformed, distorted, or otherwise defective	X	
	Blade cutting edge not uniformly ground and sharpened to a keen edge	X	
	Cutting edge broken in any place or contains nicks, burrs, etc.	X	
	Blades loose in handle	X	
	Tang does not extend into handle or fit flush as specified	X	
	Rivets not neatly set		X
	Components of two-piece handle not of same material		X

4.2.2.2 Dimensional examination. The cutlery items shall be examined for compliance with dimensions and weight specified. Any dimension or weight not within the specification tolerance shall be a defect. The inspection level shall be S-2 and the AQL shall be 2.5 defects per hundred units.

4.2.2.3 End item testing. The end item shall be tested in accordance with 4.3. The inspection level shall be S-2 and the AQL shall be 2.5 defects per hundred units.

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4.2.3 Packaging inspection. An examination shall be made to determine that preservation, packing, and marking as required by section 5 are complied with. Defects shall be as indicated in table III. The sample unit shall be one shipping container packaged. The lot shall be the number of containers offered for inspection at one time. The inspection level shall be S-2 with an AQL of 2.5 defects, expressed in terms of defects per hundred units.

TABLE III. Packaging defects

<u>Examine</u>	<u>Defect</u>
Markings (exterior and interior)	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application
Preservation	Missing or improperly applied
Materials	Any component missing, damaged, or otherwise defective
Contents (exterior and interior)	Number per container is more or less than required

4.3 Certificate of examination. Certificate of compliance, certified test reports, approval labels or listing marks for codes and standards, as applicable, that are submitted as proof of compliance with the specification requirements shall be examined and validated.

4.4 Test methods.

4.4.1 Hardness.

4.4.1.1 Blades and forks. Blades and forks shall be tested for compliance with Rockwell hardness requirements as specified in ASTM E-18. Hardness readings shall be determined at a minimum of three locations; point, center, and shoulder. Any hardness reading not within specified limits shall be considered non-compliance.

4.4.1.2 Handles. Handles shall be tested for compliance with Rockwell hardness requirements as specified in ASTM D-785. Resin treated laminated compressed wood shall have a Rockwell "M" hardness ranging from 45 to 55. Thermo setting plastic moulding compound shall have a Rockwell "M" hardness ranging from 85 to 110. Any hardness reading not within specified limits shall be considered non-compliance.

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4.4.2 Bend tests.

4.4.2.1 Knives and spatulas. Knives and spatulas (except grapefruit knives) shall be tested for conformance with 3.6.1.1 by securing the handle in the jaws of a bench vise with the point in a vertical position and moving the point each side of the perpendicular as follows:

Type III, boning knife -- 10° arc (total 20°).

Type IV, forged, cooks' knives; type V, paring knife, and types VI, XVII, and XIX, slicing knives, type XXI server -- 30° arc (total 60°).

Types VII and VIII, steak scimitar knives; types XIV, XV, and XVI, butchers' knives; and type XX, stamped cooks' knives -- 20° arc (total 40°).

Types X, XI and XVIII, spatulas -- 60° arc (total 120°).

The test shall be repeated with the blade secure in the jaws of the vise, half-way between the point and the handle; and, the end of the handle moved through the same arc.

Visible indication of any permanent deformation shall be considered non-compliance.

4.4.2.2 Forks. Forks shall be tested as follows for compliance with 3.6.1.2

(a) The tines shall be secured in the jaws of a vise (parallel to the jaws) for a distance of not less than 1-1/2 inches (38 mm) with the handle in a vertical position. The end of the handle shall be moved through an arc of 5° each side of the perpendicular (total 10°). Visual indication of any permanent deformation shall be considered noncompliance.

(b) The tines shall be inserted in the jaws of a vise (perpendicular to the jaws) for a distance of approximately 3/4 inch (19 mm) and the jaws tightened until the tines meet. Failure of the tines to return to within 1/8 inch (3.2 mm) of their original position, after removal of the fork from the vise, shall be considered noncompliance.

4.4.3 Handle tests.

4.4.3.1 Resin treated laminated compressed wood or thermo setting plastic moulding compound handles. Knife, fork, spatula, and cleaver samples with resin treated laminated compressed wood or thermo setting plastic moulding compound handles shall be tested for compliance with 3.6.2.1 as specified in procedure V, Method 6011 of FED-STD-406, for one test cycle with cold box maintained at minus 40° + 3.6°F (-40° + 2°C). Any indication of loosening, warping, splitting, chipping, or change of appearance of the handles shall be considered noncompliance.

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4.4.3.2 Butchers' steel handles only. The samples of butchers' steels shall be tested for compliance with 3.6.2.2 by securing the blade in a bench vise in a horizontal position with the handle projecting at least 2 inches (51 mm) beyond the jaws of the vise; and then grasping the handle in one hand and subjecting it to the maximum torsional stress possible without bracing or otherwise increasing the leverage so applied. Any indication of handle movement, loosening, or deformation shall be considered noncompliance.

4.4.3.3 Moulded plastic handle. Knives shall be tested to determine that the moulded plastic handle is securely fastened to the tang in conformance with 3.6.2.3. The blade shall be held in a vise or clamp and a pull force of 100 pounds (45 kg) shall be applied to the moulded handle. Any indication of handle movement, loosening, or deformation shall be considered noncompliance.

4.4.4 Cutting test.

4.4.4.1 All knives (except grapefruit knife). Place a raw cabbage, minimum diameter of 6 inches (152 mm), on a suitable slicing board. Slice the cabbage in four quarters. Place one cabbage quarter on one cut surface and finely slice the cabbage. Repeat for all quarters. Each knife shall meet the requirements of 3.6.3.1. If excessive hand pressure is required it shall be considered noncompliance.

4.4.4.2 Grapefruit knife. Place a large grapefruit on a slicing board and cut in half with a type XIX slicing knife. With the cut grapefruit surface facing up, slice the grapefruit sections between the membrane partitions. Repeat for the second half. The grapefruit knife shall meet the requirements of 3.6.3.2. If excessive hand pressure is required it shall be considered noncompliance.

5. PACKAGING

5.1 Preservation. Preservation shall be level A or Commercial as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Preservative. All blade surfaces, except stainless steel, shall be cleaned in accordance with process C-1, thoroughly dried, and coated with type P-14 preservative in accordance with MIL-P-116.

5.1.1.2 Unit packing. The surface of each cutlery item, preserved as specified in 5.1.1.1, shall be wrapped in barrier material conforming to type II, grade A, class 2 of MIL-B-121 and the wrap secured with tape conforming to type III, grade A of PPP-T-45, or each item shall be placed in a bag conforming to type II or III, class C of MIL-B-117 and the bag sealed. In addition, knife and meat cleaver blades, including stainless steel blades that do not require preservative, shall be wrapped with paperboard conforming to PPP-P-291 and the wrap secured.

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5.1.1.3 Intermediate packing. Cutlery items of one type, size and grade only, unit packed as specified in 5.1.1.2, shall be intermediately packed in the quantities specified in table IV in snug-fitting boxes conforming to variety 2, style III or VIII, type G, class 1 of PPP-B-566, class 2, style A of PPP-B-665 or type I or IV, variety 2, class A, style 1 of PPP-B-676. Closure shall be in accordance with the applicable box specification.

TABLE IV. Number of cutlery items per intermediate pack and shipping container

Type	Number of cutlery items per intermediate container	Number of cutlery items per shipping container
I	2	18
II	6	72
III	6	72
IV	6	72
V	12	144
VI	6	72
VII	6	60
VIII	6	60
IX	12	144
X	6	144
XI	6	72
XII	6	24
XIV	6	60
XV	6	60
XVI	6	60
XVII	6	72
XVIII	6	144
XIX	6	72
XX	6	72
XXI	6	120

5.1.2 Commercial. The cutlery items shall be preserved and intermediately packed in the quantities specified in table IV to afford adequate protection against corrosion, deterioration, and damage during shipment from the supply source to the first receiving activity. The blade of each knife shall be protected with a close-fitting sheath made of a folding grade of paperboard ranging in caliper from 0.014 to 0.020 inch (0.36 to 0.51 mm) or plastic. The sheath shall be of sufficient length to extend at least 0.0625 inch (1.59 mm) beyond the end of the blade. In addition, meat cleaver blades and butcher steels shall be wrapped or placed in a paper envelope or sleeve. The supplier may use his standard practice when it meets these requirements.

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5.2 Packing. Packing shall be level A, B, or Commercial, as specified (see 6.2).

5.2.1 Level A packing. Cutlery items of one type, size and grade only, preserved as specified in 5.1, shall be packed in the quantities specified in table IV in a snug-fitting fiberboard shipping container conforming to style RSC, V3s of PPP-B-636. Each shipping container shall be closed in accordance with method III, waterproofed in accordance with method V, and reinforced as specified in the appendix of PPP-B-636.

5.2.2 Level B packing. Cutlery items of one type, size and grade only, preserved as specified in 5.1, shall be packed in the quantities specified in table IV in a snug-fitting shipping container conforming to style RSC, type CF, variety SW, or type SF, class domestic of PPP-B-636. Each shipping container shall be closed in accordance with method II as specified in the appendix of PPP-B-636.

5.2.2.1 Weather-resistant containers. When specified (see 6.2), the shipping container shall be V3c, V3s, or V4s, fabricated in accordance with PPP-B-636 and closed in accordance with method III as specified in the appendix of PPP-B-636.

5.2.3 Level C packing. Cutlery items, preserved as specified in 5.1, shall be packed in a manner to insure carrier acceptance and safe delivery at destination at the lowest transportation rate for such supplies. Containers shall be in accordance with Uniform Freight Classification or National Motor Freight Classification, as applicable.

5.3 Marking. Marking shall be in accordance with 5.3.1 or 5.3.2 as specified (see 6.2).

5.3.1 Civil agencies. In addition to any special marking required by the contract, intermediate packs and shipping containers shall be marked in accordance with FED-STD-123.

5.3.2 Military activities. In addition to any special marking required by the contract, intermediate packs and shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The cutlery items covered by this specification are intended for use by galley and kitchen personnel in the preparation and serving of food.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

- (a) Title, number, and date of this specification.
- (b) Type, size, and grade of cutlery to be furnished (see 1.2).
- (c) Type of handle required (see 3.4.1.1 and 3.4.1.2).
- (d) Selection of the applicable levels of preservation and packing (see 5.1 and 5.2).
- (e) When weather-resistant grade fiberboard shipping containers are required for level B packing (see 5.2.2.1).
- (f) Type marking required (see 5.3).

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6.3 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of the specification (see 3.3).

6.4 Supersession data. Type XX, 12-inch cook's knife deleted from supply system.

6.5 Metric equivalents. Metric equivalents, indicated in parentheses throughout this document, are based on practices, conversion factors, and symbols specified in ASTM E 380 Standard for Metric Practice, and are for information only. In each instance, the value stated in US customary units shall be controlling.

Custodians:

Army - GL
Navy - SA
Air Force - 99

Review activities:

Army - MD
Navy - MS, YD

User activity:

Navy - CG, MC

Preparing activity:

Army - GL

Civil Agency Coordinating Activities:

GSA - FSS
VA - DMS

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Orders for this publication are to be placed with the General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein.