INCH-POUND

MIL-DTL-20277K
1 May 2014
SUPERSEDING
MIL-DTL-20277J
20 September 2007

DETAIL SPECIFICATION

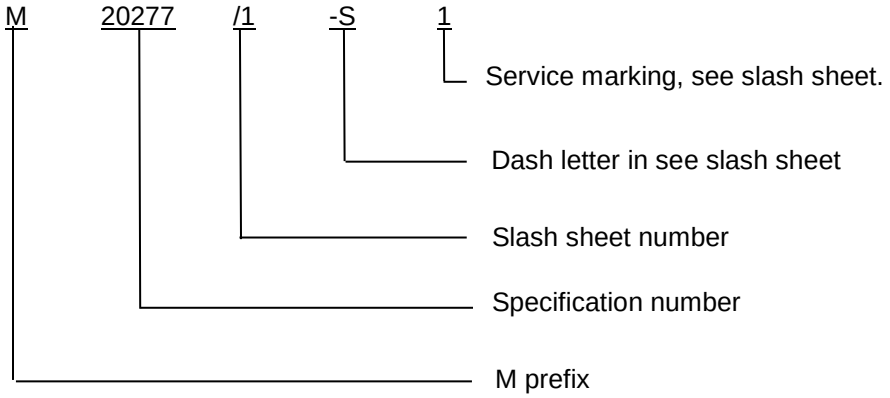
KNIFE, COMBAT; AND SHEATH, GENERAL SPECIFICATION FOR

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 requirements for a knife combat; and sheath.

1.2 Part or Identifying Number (PIN). The definitive specification PIN will be formatted to identify each item covered by this specification. The PIN format will consist of the letter M, specification number, a slash sheet number a dash and a letter for knife and sheath and a number for service marking as follows:



2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 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 sections 3 and 4of this specification, whether or not they are listed.

Comments, suggestions, or questions on this document should be addressed to: DLA Land and Maritime, Attn: VAI, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to FluidFlow@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil.

AMSC N/A FSC 1095

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issue of these documents are those cited in the solicitation or contract.

FEDERAL STANDARD

FED-STD-595/37038	-	Miscellaneous, Lusterless

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL-16232	-	Phosphate Coating, Heavy, Manganese or Zinc Base
MIL-DTL-20277/1	-	Knife, Combat
MIL-DTL-20277/2	-	Sheath, For Combat Knife
MIL-DTL-32068	-	Leather, Cattlehide, Strap, Vegetable Tanned

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-130	-	Identification Marking of U.S. Military Property
MIL-STD-889	-	Dissimilar Metals

(Copies of these documents are available online at http:// quicksearch.dla.mil.)

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 these documents are those cited in the solicitation or contract.

ASTM INTERNATIONAL

ASTM A29/A29M	-	Standard Specification for Steel Bars, Carbon and Alloy, Hot-Wrought, General Requirements for
ASTM E18	-	Standard Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E112	-	Standard Test Methods for Determining Average Grain Size

(Copies of these documents are available online at http://www.astm.org.)

SAE INTERNATIONAL

SAE AIR4127	-	Steel: Chemical Composition and Hardenability
SAE-AMS-H-6875	-	Heat Treatment of Steel Raw Materials

(Copies of these documents are available online at http://www.sae.org.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), 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 Specifications sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between the requirements of this specification and the specification sheet, the later shall govern.

3.2 First article. When specified (see 6.2), a sample, shall be subjected to first article inspection in accordance with 4.5.

3.3 Materials. Materials shall be as identified herein or as approved by the acquiring activity. However, when a specific material is not specified, a material shall be used which will enable the combat knife and sheath to meet the performance requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guarantee of acceptance of the finished product.

3.3.1 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.3.2 Hazardous substances. The use of hazardous substances, toxic chemicals, or ozone depleting chemicals shall be avoided, whenever feasible.

3.3.3 Other materials. Materials not otherwise specified shall be in accordance with applicable specifications and to the requirements specified herein. All materials that are not specifically described shall be of the highest quality and suitable for the purpose intended.

3.3.4 Leather tanning. Leather shall be vegetable tanned in accordance with MIL-DTL-32068. Color fastness not applicable.

3.3.4.1 Sheath leather. The leather used on the sheath shall be in accordance with MIL-DTL-32068, type II, class 1.

3.3.4.2 Combat knife handle. Combat knife handle shall be leather in accordance with MIL-DTL-32068, type I through IV, class1.

3.3.5 Fungus proof materials. All leather components shall be treated with a fungicidal agent in accordance with MIL-DTL-32068 to render the material fungus-resistant, see 4.7.6.

3.3.6 Handle strap. The handle strap shall be closeable with combat knife inserted and shall restrain the combat knife handle from movement, see MIL-DTL-20277/2.

3.3.7 Blade and tang material. Steel in accordance with ASTM A29/A29M, type 1095.

3.3.8 Pin, butt plate, and guard material. Steel in accordance with ASTM A29/A29M, type 1018 or 1020.

3.3.9 Blade hardening. The finished blade shall be hardened and tempered in accordance with SAE-AMS-H-6875. The hardness of the steel shall be tested in accordance with 4.7.2. The Rockwell hardness range shall be from C55 to C58. There shall be a hardness transition zone from the heel of the blade to .75 inch (19.05 mm) onto the tang, having a Rockwell hardness of C35 to C45 at the midpoint. The remainder of the tang shall have a maximum Rockwell hardness of C30. After hardening the blade shall have a fracture grain size no courser than 8 when tested in accordance with ASTM E112.

3.3.10 Blade finish. Steel combat knife components shall be phosphate coated in accordance with MIL-DTL-16232, type Z, class 2, after deburring, marking, and prior to assembly. The blade shall meet the color requirements of 3.5.

3.3.11 Guard, butt plate and pin. The guard, butt plate and pin shall be steel in accordance with SAE AIR4127 type SAE 1018 or 1020.

3.3.12 Dissimilar metals. Dissimilar metals shall not be used. Dissimilar metals are specified in MIL-STD-889.

3.4 Design and construction.

3.4.1 Combat knife construction. The combat knife design and construction shall be in accordance with MIL-DTL-20277/1.

3.4.2 Sheath construction. Sheath design and construction shall be in accordance with MIL-DTL-20277/2.

3.5 Color. The color of all components shall be black in accordance with FED-STD-595/37038.

3.6 Performance.

3.6.1 Visual examination. The combat knife assembly shall be in accordance with MIL-DTL-20277/1 and MIL-DTL-20277/2 when visually examined as specified in 4.7.1.

3.6.2 Holding of the knife by strap. When tested in accordance with 4.7.3, the knife shall not move out of the position by more than .25 inch (6.35 mm).

3.6.3 Cutting. When tested in accordance with 4.7.4 the blade shall show no undue wear, such as turning over, nicking or breaking of any part of the cutting edge.

3.6.4 Flexibility. When tested in accordance with 4.7.5, the blade shall not break or fail to return to the original shape when bent through an angle of 9°.

3.7 Identification of product. The combat knife shall be identified by a permanently indent stamp with letters in accordance with MIL-STD-130.

3.8 Workmanship. Combat knives and sheaths shall be of high and uniform quality. The combat knife shall be free of sharp burrs and the sheath shall be free of sharp burrs or edges which may injure the hand of the user or adversely effect performance, reliability, and durability. The appearance shall be of the highest commercial practice for this type item (see 4.7.1). The knives and sheaths shall be examined for the following defects in table I.

TABLE I. Workmanship defects.

Examination	Requirement paragraph
Metal components	
Scratches, cracks, burrs, dents, pit marks or cuts	3.8
Metal surfaces shall be free of cracks, laps, and seams	3.8
Phosphate or preservative coating missing or wrong color	3.3.10
Contractor does not have documentation available for identification of material, material finishes or treatment	3.3.3
Surface unclean or containing embedded foreign matter	3.8
Knife blade: Blood groove not as specified Point broken or not ground smooth Cutting edges of blade not uniformly honed to a keen edge Cutting edge contains nicks or burrs Back edge of blade not ground to the tip Contour lines not clearly defined Marking - missing, illegible, or not as specified	3.4.1
Knife handle: Any component loose, handle not integral with blade Leather portion not smooth, not grooved or not colored to match Butt pin not peened or not ground smooth Tang protruding from butt plate surface Guard not at right angles to the blade Guard edges not flush with blade heel Color wrong including cut edges that improperly colored or color not matching	3.4.1 and 3.5
Leather	
Open briar, scratches or scars: Single scratch longer than 2 inches Any scratch wider than .0625 inch (1.59 mm) Three or more short scratches.	3.8
Slaughter cuts: Cut longer than .50 inch (12.7 mm) Cut deeper than .25 inch (6.35 mm) Cut wider than .0156 inch (.397 mm) All other slaughter cuts	3.8
Flaky leather: Two or more adjacent folds or wrinkles, each wider than .0625 inch (1.59 mm)	3.8
Pitted - six pits anywhere or four pits within .25 inch (6.35 mm)	3.8
Bronzing	3.8
Fat wrinkles and heel scratches conspicuous at a distance of 4 feet (1.22 m)	3.8
Sheath components and assembly	3.4.2
Flesh sides of the leather on the outer side of the sheath	3.8
Skived end of back inadequately attached	3.8
Color wrong including cut edges that improperly colored or color not matching	3.5

TABLE I. Workmanship defects - Continued.

Examination	Requirement paragraph
Filler welt missing, improperly tapered or misaligned outer edge	3.8
Sewing of sheath: Needle marks on leather Thread breaks, run-offs, incorrect type of stitch Incorrect thread color Stitches missing loose seam Stitches per inch not within specified range	3.8
Strap holding not attached as required	3.4.2
Snap fastener: Improper functioning Loose, improperly clinched, cutting into leather Any sharp burrs or metal slivers Not centered on strap	3.8
Riveting: Insecurely set (such as pulling away from leather) Improperly clinched, cutting of leather or stitches Improperly located or inverted (clinched on outside) Any sharp burrs or metal silvers	3.8

4. VERIFICATION

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

a. First article inspection (see 4.5).

b. Conformance inspection (see 4.6).

4.2 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in 4.7.

4.3 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality and quantity to permit performance of the required inspection shall be used.

4.4 Responsibility for compliance. All items shall meet all requirements of sections 3 and 4. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.4.1 Lot records. Manufacturers shall keep lot records for 3 years minimum. Manufacturers shall monitor for compliance to the prescribed procedures, and observe that satisfactory manufacturing conditions and records on lots are maintained for these knife and sheath assemblies. The records, including as a minimum, an attributes summary of all quality conformance inspections conducted on each lot, shall be available to review by customers at all times.

4.4.1.1 Leather test records. Manufacturer shall have lot records from the tanning facility. These test reports shall contain as a minimum reports for chromic oxide level (between 1 and 5 percent), acidity pH (3.3 minimum, 5.0 maximum), presence of lead salts (0 -none), and fungicidal agent used.

4.5 First article inspection. First article inspection shall be performed at a laboratory acceptable to the procuring activity on sample units produced with equipment and procedures used in production.

4.5.1 Samples for first article. Samples for first article shall be representative of the products proposed to be furnished to this specification. Sampling for knifes and sheaths shall be in accordance with 4.5.5.

4.5.2 First article inspection routine. All samples shall be subjected to first article testing in table II. The test sequence shall be determined by the manufacturer unless otherwise specified.

TABLE II. First article inspection.

Inspection	Requirement	Test method
Visual inspection	3.6.1, 3.7, and 3.8	4.7.1
Blade hardening	3.3.9	4.7.2
Grain size	3.3.9	---
Holding of the knife by strap	3.6.2	4.7.3
Cutting	3.6.3	4.7.4
Flexibility	3.6.4	4.7.5
Fungicide	3.3.5	4.7.6

4.5.3 Waivers or deviations to specification requirements. All waivers or deviations to specification requirements shall be coordinated through the preparing activity; Defense Supply Center, Columbus, Attn: VAI, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to FluidFlow@dla.mil.

4.5.4 Failures. All samples shall meet all of the contract requirements. Failure of a sample unit to pass any inspection or test in table I shall be cause for rejection of the entire lot and refusal to grant first article approval.

4.5.5 First article samples. Unless otherwise specified, after award of the contract or order, the manufacturer shall forward 2 knives with sheaths. The samples shall be representative of the construction, workmanship, components, and materials to be used during production. When a manufacturer is in continuous production of the knives and sheaths from one contract to another, submission of additional first article samples for a new contract may be waived at the discretion of the acquiring activity (see 6.2).

4.5.5.1 First article information. Upon completion of first article inspection, the Government activity responsible for conducting the inspection program (see 6.2), shall report the results of the inspection, with appropriate recommendation, to the contracting officer. Approval of the first article samples or the waiving of first article inspection does not preclude the requirements for performing individual, or sampling and periodic inspections.

4.5.5.2 Disposition of samples. First article samples shall be furnished to the Government as directed by the contracting officer (see 6.2).

4.6 Conformance inspection. For manufacturers that have successfully passed first article inspections and are continuously producing knifes and sheaths to this specification, on going inspections shall consist of individual inspections (see table III) and periodic inspections (see table II). If first article is waived due to prior successful first article inspection, the individual inspections and periodic inspections shall be the manufactures in house inspection procedures.

4.6.1 Individual inspection. Individual inspection shall consist of the inspections specified in table III in the order shown. Individual inspections shall be implemented on a continual basis throughout the production of knife and sheath assemblies.

TABLE III. Individual inspections.

Inspections	Requirement paragraph	Inspection paragraph	Number of samples
Visual inspection	3.6.1, 3.7, and 3.8	4.7.1	100% 1/

1/ Dimensional inspections may be the manufacturers in house sampling plan.

4.6.2 Individual inspections. Individual inspection tests specified in table II shall be performed on a production lot basis.

4.6.2.1 Nonconformance individual inspections. If one or more defects are found in the inspection lot, then the production lot shall be screened for that particular defect and defects removed. An inspection lot shall be selected from the production lot and all individual tests (see table II) shall be performed. If one or more defects are found in the second inspection lot, the production lot shall be rejected and shall not be supplied to this specification. Test data of part performance shall be made available to the contracting agency upon request.

4.6.3 Periodic inspection. Periodic inspections shall consist of the inspections specified in table I and shall be made on test samples, every 3 years, which have been subjected to and passed the individual inspections (see table II). Visual inspection does not need to be repeated.

4.6.4 Periodic inspection samples.

4.6.4.1 Lot. A lot shall consist of knifes and sheaths manufactured under essentially the same conditions and submitted for inspection at substantially the same time.

4.6.4.2 Lot samples. For each lot of five hundred knife and sheath assemblies or fraction thereof produced, four knifes and sheaths shall be fabricated using the manufacturers standard production processes and procedures.

4.6.5 Non conformance sampling and periodic inspections. In the event a failure should occur during sampling or periodic inspection tests, specified in table I, then the production lot shall be screened for that particular defect and defects removed. An inspection lot shall be selected from the production lot and all sampling and periodic tests shall be performed. If one or more defects are found in the second inspection lot, the production lot shall be rejected and shall not be supplied to this specification. Test data of part performance shall be made available to the contracting agency upon request.

4.7 Test methods.

4.7.1 Visual examination. Continuous examination shall be performed to assure compliance with the following requirements:

a. Design, construction and physical dimensions (see 3.4).
b. Specification sheets (see 3.4.1 and 3.4.2).
c. Color (see 3.5).
d. Marking (see 3.7).
e. Workmanship (see 3.8).

4.7.2 Hardness (see 3.3.9). The blade when hardened in accordance with 3.3.9, the Rockwell hardness of the steel shall be determined as specified in ASTM E18, hardness scale C. The following details shall apply:

a. The hardness of the blade shall be determined at the heel, center and point not less than .25 inch (6.35 mm) from the cutting edge.
b. The hardness of the tang in the transition area shall be determined in the center on the opposite side to the marking.
c. Three hardness determinations shall be made on the remaining portion of the tang evenly distributed along its length.

4.7.3 Holding of the knife by strap (see 3.6.2). The effectiveness of the strap in holding the knife in the sheath shall meet the requirements of 3.6.2. The following details shall apply:

a. With the strap snapped shut over the handle of the sheathed knife, grasp the sheath near the tip end without pinching the blade; raise the arm overhead with the knife butt in the uppermost, then suddenly swing the arm downward through an arc in a rapid motion, stopping suddenly at the bottom of the arc.
b. The guard of the knife shall not have moved away from the sheath at the completion of this hurl.

4.7.4 Cutting (see 3.6.3). The knife shall meet the requirements of 3.6.3 when the keenness of the blade is tested by cutting at least ten shavings, not less than .0625 inch (1.59 mm) thick, from a strip of oak or other wood of similar hardness. The following details shall apply:

a. The blade shall enter into the wood at an angle of not less than 30° and all portions of the cutting edge shall be capable of producing a clean cut without undue effort.
b. After ten shavings have been cut, the blade, shall have no defects in the cutting edge.

4.7.5 Flexibility (see 3.6.4). The knife shall meet the requirements of 3.6.4 when tested for flexibility. The following details shall apply:

a. The tip of the blade shall be secured by inserting the tip into a contoured metal fixture to a depth of 1.5 inches (38 mm) from the point.
b. Pressure shall be of such magnitude that it shall cause bending of the blade through an angle of 9°.
c. The blade shall not break during the bending and when the pressure is removed, the blade shall return to the original shape with no deformation.

4.7.6 Fungicide (see 3.3.5). When tested in accordance with MIL-DTL-32068 the amount of thiocyanomethylthio benzothiazole, Ortho-phenyl phenol or diiodomethyl para tolysulfone shall be in accordance with MIL-DTL-32068.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of material is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Service or Defense Agency, or within the Military Service's System Commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use. The knives and sheaths described by this military specification are military unique because they have been proven in previous battles and wars. In addition improvements have been added by the various warriors and by the USMC requests.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. PIN (see 1.2).
c. Quantity required.
d. Whether first article inspection is waived (see 6.3).
e. Lot records if required (see 4.4.1).
f. Name and address of the first article inspection test facility to which first article samples (if required see 4.5.5) are to be forwarded and the name and address of the Government activity responsible for conducting the first article inspection program (see 4.5.5.1 and 6.3).
g. Packaging requirements (see 5.1).

6.3 First article. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first article samples. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.3.1 Defense Logistics Agency (DLA) waiver of first article test. A waiver of a first article testing will only be considered by DLA when the contractor has delivered the same item within the last three years, has no unfavorable quality history, has not changed processes, or changed any subcontractors. DLA will not accept first article testing results outside the stated requirements.

6.4 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmental Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals and additional information is available on their website at http://www.epa.gov/osw/hazard/wastemin/priority.htm. Included in the list of 31 priority chemicals are cadmium, lead, and mercury. Use of these materials should be minimized or eliminated unless needed to meet the requirements specified herein (see Section 3).

TABLE IV. EPA top seventeen hazardous materials.

Benzene	Dichloromethane	Tetrachloroethylene
Cadmium and Compounds	Lead and Compounds	Toluene
Carbon Tetrachloride	Mercury and Compounds	1,1,1 - Trichoroethane
Chloroform	Methyl Ethyl Ketone	Trichloroethylene
Chromium and Compounds	Methyl Isobutyl Ketone	Xylenes
Cyanide and Compounds	Nickel and Compounds	

6.5 Subject term (key word) listing.

Blade
Butt plate
Diiodomethyl para Tolysulfone
Fungicidal
Grip
Guard
Ortho-phenyl phenol
Thiocyanomethylthio Benzothiazole
Vegetable tanned

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

CONCLUDING MATERIAL

Custodians:
Army - AR
Navy - SH
Air Force - 99
DLA - CC

Preparing activity:
DLA - CC

(Project 1095-2013-002)

Review activities:
Army - CR4, GL
Navy - CG, MC, SA

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.dla.mil.