

MIL-C-40638D

30 April 1973

SUPERSEDING

MIL-C-40638C

21 June 1971

MILITARY SPECIFICATION

CANDLES, ECCLESIASTICAL (AND TAPER, CANDLELIGHTER)

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

1. SCOPE

1.1 Scope. This specification covers two types of ecclesiastical candles for use in religious services and one type of candlelighter taper (see 6.1).

1.2 Classification. The items furnished under this specification shall be of the following types and sizes, as specified (see 6.2).

Type I - Altar candles.

Size 1 - Chapel ones - 8 hours burning time.

Size 2 - Chapel fours - 4 hours burning time.

Size 3 - Chapel eights - 1 hour burning time.

Type II - Votive candles.

Size 1 - 10 hours burning time.

Size 3 - 7 days burning time.

Type III - Candlelighter taper.

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:

FSC 9925

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SPECIFICATIONS

FEDERAL

- PPP-B-566 - Boxes, Folding, Paperboard.
- PPP-B-636 - Boxes, Shipping, Fiberboard.
- PPP-B-676 - Boxes, Setup.

MILITARY

- MIL-C-43467 - Candle Burner, and Candle Lighter and Snuffer.

STANDARDS

FEDERAL

- FED-STD-595 - Colors.

MILITARY

- 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 suppliers 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:

National Motor Freight Traffic Association, Inc., Agent

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Associations, Inc., Tariff Order Section, 1616 P Street, N.W., Washington, D.C. 20036.)

Uniform Classification Committee, Agent

Uniform Freight Classification

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

3. REQUIREMENTS

3.1 Material.

- * 3.1.1 Types I, II, and III. The manufacturer is given wide latitude in the component materials provided the candles and candle-lighter taper conform to the requirements of this specification. In addition, the type II, size 3 votive candle shall be inclosed in a transparent, water-white, heat-resistant glass with a bottle type opening. Type I, sizes 2 and 3 candles shall be furnished with a self-fitting fluted base.

3.2 Dimensions.3.2.1 Type I, size 1 (straight sided).

Diameter - 1-1/4 inches (\pm 1/32 inch).
Length* - 24-1/4 inches (\pm 1/4 inch).

*Length is measured from the base to shoulder.

3.2.2 Type I, size 2 (straight sided with self-fitting fluted base).

Diameter - 7/8 inch (\pm 1/32 inch).
Length* - 12-7/16 inches (\pm 1/2 inch).

The top diameter of the fluted base shall be 31/32 inch \pm 1/32 inch and the bottom diameter of the fluted base shall be 27/32 inch \pm 1/32 inch.

*Length is measured from the base to shoulder.

3.2.3 Type I, size 3 (straight sided with self-fitting fluted base).

Diameter - 7/8 inch (\pm 1/32 inch).
Length* - 7-1/2 inches (\pm 1/2 inch).

The top diameter of the fluted base shall be 31/32 inch \pm 1/32 inch and the bottom diameter of the fluted base shall be 27-3/2 inch \pm 1/32 inch.

*Length is measured from the base to shoulder.

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3.2.4 Type II, size 1 (tapered).

Top diameter	-	1-3/4 inches (+ 1/32 inch).
Base diameter	-	1-1/2 inches (+ 1/32 inch).
Height	-	1-3/4 inches (+ 1/32 inch).

3.2.5 Type II, size 3 (straight sided or tapered).

Height of glass inclosure (base of top of glass)	-	9-1/4 inches (plus 1/2 inch minus 3/4 inch).
Height of candle	-	Shoulder of candle shall be recessed not less than 3/4 inch from top of glass inclosure.
Diameter (candle plus glass inclosure)	-	2-3/4 inches (+ 1/2 inch)*; with a taper from top to 1-1/2 inches above base no greater than 1/8 inch, when applicable.

3.2.6 Type III.

Diameter - 1/8 inch (+ 1/32 inch).
 Length - 16 to 18 inches. In addition, the length of the taper submitted by the manufacturer shall be uniform, defined here as a length not varying more than $\pm 1/4$ inch per designation per lot.

3.3 Wick. The wick of each candle shall be of satisfactory quality to insure proper burning. The wick shall be properly centered along the entire length of the candle and shall be consumed by the flame of the candle without the necessity for trimming.

* 3.4 Burning quality. The candles shall burn uniformly with an even flame and shall remain lighted throughout the required time (see 3.4.1). The flame shall consume the candle and wick without dripping in still air without noticeable smoking, without excessive wax accumulation along the shaft of the candle or objectionable odor when tested as specified in 4.3.7 and 4.4.1. Type I, size 2 and 3 candles shall be burned with candle burners (followers)(see 6.3) and shall not drip or bend. The candle burners shall remain upright and not tilt during the burning period.

* 3.4.1 Burning time. The candles shall remain lighted for the specified time, as follows:

Type I, Size 1 - Eight hours
 Type I, Size 2 - Four hours
 Type I, Size 3 - One hour
 Type II, Size 1 - Ten hours
 Type II, Size 3 - Seven days

3.5 Deflection. The candle shall not show a deflection of more than 2 angular degrees when tested as specified in 4.4.2.

3.6 Color. The candles shall be uniformly white in color, and no darker than chip number 37886 of FED-STD-595.

3.7 Odor. The candles shall be free of unpleasant odor (acrid) during burning and non-burning.

3.8 Performance (type III only). The taper shall burn dripless when held in any position or angle from vertical to horizontal. The taper shall be consumed fully without unraveling, excessive smoking or objectionable odor.

3.9 Workmanship.

3.9.1 Candles. The candles shall be cylindrical with a tapered wick-end, and shall be clean, uniform, smoothly finished, free from fractures and distortions, not fused together, and the quality shall conform to the levels established herein.

3.9.2 Tapers. The candlelighter tapers shall have a smooth, uniform and clean appearance throughout, without any of the wax coated wick being exposed to the outer surface. The taper shall be fringed 1/2 inch from one end to permit ease in the initial lighting. The quality shall conform to the levels established herein.

4. QUALITY ASSURANCE PROVISIONS

- * 4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier 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.

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* 4.1.1 Certificates of compliance. Where certificates of compliance are submitted the Government reserves the right to check test the item to determine the validity of the certification.

4.2 Quality conformance inspection. Sampling for inspection shall be in accordance with MIL-STD-105, except where otherwise indicated. For purposes of sampling, an inspection lot shall consist of all materials of the same type, class, and size and manufactured under essentially the same conditions, at essentially the same time and submitted for inspection at one time.

4.2.1 Component and material inspection. In accordance with 4.1 above, components and materials shall be tested 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 documents.

4.3 Inspection of the end item.

4.3.1 Examination of the end item. The end item shall be examined for the defects in the applicable sub-paragraphs at the inspection levels and the acceptable quality levels (AQL's) set forth in 4.3.7. The lot size shall be expressed in unit packages filled with the same type and size of material for the examinations in 4.3.2, 4.3.3 and 4.3.4, and in units of shipping containers for the examinations in 4.3.5.

4.3.2 Examination of type I and II for defects in workmanship, wick, odor, color and stamping. The sample unit for this examination shall be one candle. No more than two candles shall be drawn from any one unit package.

<u>Examine</u>	<u>Defect</u>
Workmanship	Not cylindrical with a tapered wick-end. Not self-fitting fluted base (type I, sizes 2 and 3 only). Not clean (contains dirt or foreign matter). Not uniform. Not smoothly finished. Fractures (breaks). Distortions (warped, sags, runs).
Inclosures (type II, size 3 only)	Not transparent, water-white glass. Glass cracked, sharp or uneven edge at top. Opening not bottle type.

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<u>Examine</u>	<u>Defect</u>
Wick	Missing or not centered in candle. Visible along the shaft of the candle, not visible at bottom of candle. Does not extend entire length of candle and beyond the tip.
Odor	Unpleasant odor (non-burning).
Color	Not uniformly white; darker than color chip number 37886.

4.3.3 Examination of type III for defects in workmanship. The sample unit shall be ten candlelighter tapers. Not more than five tapers shall be drawn from an interior package.

<u>Examine</u>	<u>Defect</u>
Workmanship	Not smooth and uniform in appearance. Not clean (contains dirt or foreign matter). Wick visible on outer surface of wax. Not fringed 1/2 inch from one end.

- * 4.3.4 Examination of the end item for defects in dimensions. The sample unit shall be one candle for types I and II and ten candlelighter tapers for type III. Any dimension which varies from the dimension specified in 3.2 by more than the allowable tolerance shall be classified as a defect.
- * 4.3.5 Examination of preparation for delivery requirements. An examination shall be made to determine that the packaging, packing, and marking complies with the section 5 requirements. The sample unit shall be one shipping container, fully packed, selected just prior to the closing operation. Defects shall be scored in accordance with the list below. Defects of closure listed below shall be examined on shipping containers fully prepared for delivery. The lot size shall be the number of shipping containers in the end item inspection lot.

<u>Examine</u>	<u>Defect</u>
Packaging (as applicable)	Number of candles or tapers per interior package not as specified. Not level specified. Packaging material not as specified. Closure not completed or as specified.

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<u>Examine</u>	<u>Defect</u>
Packaging (as applicable) (cont'd)	Separator paper missing, not interleaved between the candles, as specified (for types I and II only). Two or more candles fused together (for type I and II only).
Packing (as applicable)	Not level specified. Number of candles or tapers per shipping container not as specified. Box liner, top and bottom pads, or slotted partition omitted when specified. Container not as specified. Closures not accomplished by specified or required methods or materials.
Markings (exterior and interior)	Omitted, illegible, incorrect, incomplete or not in accordance with contract requirements.

- * 4.3.6 Inspection levels and acceptable quality levels (AQL's) for examinations. The inspection levels, for determining the sample size, and the acceptable quality levels (AQL's), expressed in defects per hundred units, shall be as follows:

<u>Examination paragraph</u>	<u>Inspection level</u>	<u>AQL</u>
4.3.2	I	4.0
4.3.3	I	4.0
4.3.4	S-2	4.0
4.3.5	S-2	4.0

- * 4.3.7 Testing of the end item. The candles, types I and II only, shall be tested for the characteristics specified in 3.3, 3.4, 3.5 and 3.7 for each lot. The taper (type III) shall be tested for the characteristics specified in 3.8 for each lot. The sample unit shall be six type I candles, three type II candles or five candlelighter tapers. No more than one sample unit shall be withdrawn from any one shipping container, when practicable. The sample size shall be as listed below. The lot shall be the number of candles in the end item inspection lot. The lot shall be unacceptable if there is any failure to meet any specified requirement applicable to the individual test unit. All test reports shall contain the individual values utilized in expressing the final result.

<u>Lot size (candle or tapers, as applicable)</u>	<u>Sample size</u>
800 or less	2
801 up to and including 22,000	3
22,001 or more	5

4.4 Test procedures.

4.4.1 Burning quality. The burning qualities of the candles (see 3.3, 3.4, and 3.7) and the tapers (see 3.8) shall be determined at an ambient temperature of 68° to 80°F. under conditions free from drafts. Ignite six type I candles or three type II candles as applicable, and burn for the required time. Type I size 2 and 3 candles shall be burned with candle burners (followers) conforming to item 1 of MIL-C-43467 (see 6.3) in place. The candles shall be observed for even burning, odor, smoking, dripping, wax accumulation along the shaft and wick consumption. The type I, size 2 and 3 candles shall also be observed for tilting of the burner and dripping. When applicable, ignite five candlelighter tapers and burn until fifty percent of each taper has been consumed. The candlelighter tapers shall be observed for dripping when held in any position or angle from vertical to horizontal, for consumption without unraveling, excessive smoking or objectionable odor. Failure of any one candle or candlelighter taper to meet any of these characteristics shall be cause for rejection of the lot.

4.4.2 Deflection (see 3.5).

4.4.2.1 Apparatus.

4.4.2.1.1 Deflection tester. The deflection tester shall consist of an accurate protractor chart marked off at each 10 degrees, with the first 10 degrees subdivided into 10 equal parts. A suitable clamp arrangement shall be used to hold the candle and protractor chart (see figure 1). The protractor chart shall be in a vertical position.

4.4.2.1.2 Constant temperature cabinet. The constant temperature cabinet shall be large enough to hold the deflection tester assembly and shall be capable of maintaining a temperature of $38^{\circ} \pm 1.0^{\circ}\text{C}$ ($100.4^{\circ} \pm 1.8^{\circ}\text{F}$) throughout the cabinet continuously for 24 hours.

4.4.2.2 Procedure. The candle shall be placed in the deflection tester with the length of the candle (excluding tip) 5.5 inches above the top of the clamp. The candle shall be at an angle of 5 degrees from the vertical and so placed that an angular deflection of the specimen can be accurately noted on the protractor chart. The assembly shall be placed in a constant temperature cabinet

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maintained at $38^{\circ} \pm 1.0^{\circ}\text{C}$ ($100.4^{\circ} \pm 1.8^{\circ}\text{F}$). Allow to remain at this temperature for 24 hours with periodic observations for possible failure. Record angular deflection. The angular deflection shall be considered the increase from the initial 5 degree position.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A or C, as specified (see 6.2).

- * 5.1.1 Level A. Candles of one type and size, or tapers shall be packaged in quantities specified in table I in a snug-fitting folding or setup paperboard box conforming to variety 1, style III or VIII, type G, class I of PPP-B-566 or type I, variety 1, class A, style 4 of PPP-B-676, respectively. The candles, except type III (tapers), shall be interleaved or individually wrapped with material that is compatible with the candles in such a manner as to prevent the candles from coming in contact with each other. Closure of the box shall be in accordance with the appendix of the applicable box specification.

TABLE I. Quantities of candles or tapers per interior package and shipping container

	Type I			Type II		Type III
	size 1	size 2	size 3	size 1	size 3	
Quantity per interior package	6	24	48	36	-	500
Quantity per shipping container	54	216	432	288	12	6000

5.1.2 Level C. The candles and tapers shall be packaged to afford adequate protection against physical damage during shipment from the supply source to the first receiving activity. The supplier may use his standard practice when it meets this requirement.

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

- * 5.2.1 Level A. Candles and tapers, packaged as specified in 5.1, shall be packed in quantities specified in table I in a snug-fitting fiberboard shipping container conforming to style RSC, or RSC-L (as applicable) grade V2s of PPP-B-636. Each shipping container packed with type II, size 3 candles shall be provided with a taped box liner, full size top and bottom pads, and slotted partitions fabricated from fiberboard conforming to grade W6c of

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PPP-B-636. The liner and partitions shall be full-height, less the thicknesses of the top and bottom pads. The partitions shall be fabricated in such a manner as to provide a snug-fitting cell for each candle. 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. Candles and tapers, packaged as specified in 5.1, shall be packed in quantities specified in table I in a snug-fitting fiberboard shipping container conforming to style RSC, or RSC-L (as applicable) type CF, (variety SW) or SF, class domestic, grade 275 of PPP-B-636. Each shipping container packed with type II, size 3 candles shall be provided with a taped box liner, full size top and bottom pads, and slotted partitions as specified in 5.2.1 except the fiberboard shall conform to type CF (variety SW), class domestic, grade 200 of PPP-B-636. Each shipping container shall be closed in accordance with method II as specified in the appendix of the container specification.

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

- * 5.2.3 Level C. Candles and tapers, packaged 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 Rules or National Motor Freight Classification Rules, as applicable.

5.3 Marking. In addition to any special marking required by the contract or order, interior packages and shipping containers shall be marked in accordance with MIL-STD-129. In addition, candles (type I and II only) shall include the following legend:

CANDLES - FRAGILE

STORE IN A COOL PLACE

6. NOTES

6.1 Intended use. The type I (altar candles) are intended for use in religious services. Type I, size 3 and type II, size 1 candles are intended to be used as components of chaplains' kits. Type II, size 3 (votive candle) is used as a sanctuary candle. Type III (candlelighter taper) is used to light the candles.

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6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type and size required (see 1.2).
- (c) Selection of the applicable levels of packaging and packing (see 5.1 and 5.2).
- (d) When weather-resistant grade fiberboard shipping containers are required for level B packing (see 5.2.2.1).

* 6.3 Candle burner. The candle burners ("follower") may be obtained from the Triangle Metal Spinning Company 12-33A Broadway Street, Long Island, New York 11106 (see 3.4 and 4.4.1).

6.4 Marginal code identification. The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and suppliers are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:

Army - GL
Navy - PE
Air Force - 28

Preparing activity:

Army - GL
Project No. 9925-0217

Review activities:

Armed Forces Chaplain Board
DSA-GS

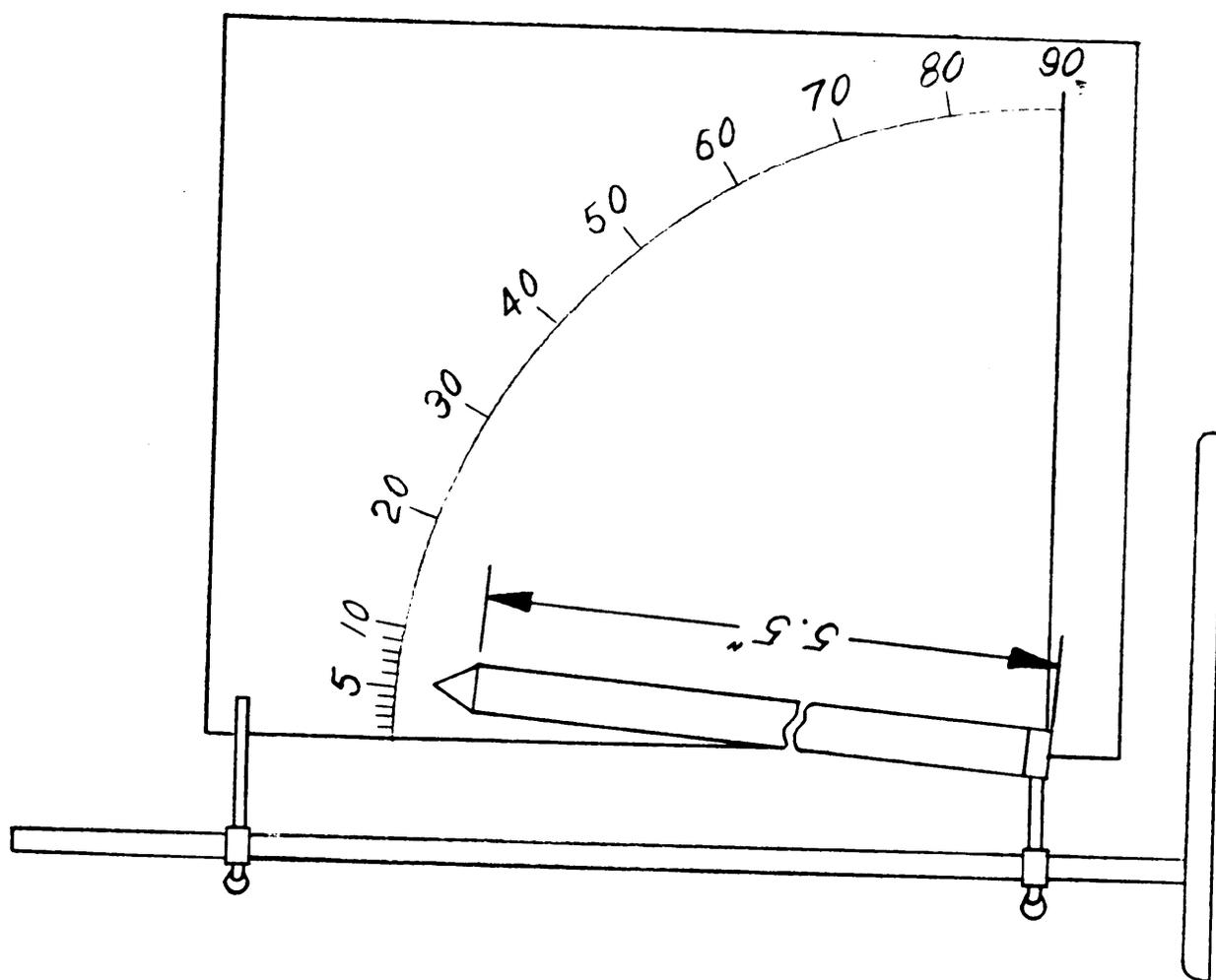


FIGURE 1. DEFLECTION TESTER

