

[INCH-POUND]  
W-S-896F  
31 May 1999  
SUPERSEDING  
W-S-896E  
July 25, 1974

## FEDERAL SPECIFICATION

### SWITCHES, TOGGLE (TOGGLE AND LOCK), FLUSH MOUNTED (GENERAL SPECIFICATION)

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

#### 1. SCOPE

1.1 This specification covers the general requirements for flush mounted toggle and lock switches, designed for mounting in switch boxes by means of an integral strap (see 6.1).

#### 2. APPLICABLE DOCUMENTS

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

##### Federal Specifications

- W-S-896/2 - Switches, Toggle and Lock, Flush Mounted (AC).
- W-S-896/3 - Switches, Toggle, Flush Mounted (Mercury) (AC).

##### Federal Standards

- FED-STD-H28 - Screw-Thread Standards For Federal Services.

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

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

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

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data which may improve this document should be sent to: Defense Supply Center, Columbus, ATTN: DSCC-VAM, 3990 East Broad Street, Columbus, OH 43213-1199.

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2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

## AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/NCSL Z540-1 - Calibration Laboratories and Measuring and Test Equipment, General Requirements.

## INTERNATIONAL ORGANIZATIONS FOR STANDARDS (ISO)

ISO 10012-1 - Quality Assurance Requirements for Measuring Equipment - Part 1: Metrological Confirmation System for Measuring Equipment.

(Application for copies should be addressed to the American National Standards Institute (ANSI), 11 West 42nd Street, New York, NY 10036-8002.) 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.

Underwriters' Laboratories, Inc. (UL)' Standard:

UL 20 - Standard for Snap Switches.

(Application for copies should be addressed to Underwriters' Laboratories, Inc., 1285 Walt Whitman Road, Melville, NY 11747; 207 E. Ohio Street, Chicago, IL 60611; and 1655 Scott Blvd., Santa Clara, CA 95050. Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

## 3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. Except as otherwise specified herein, switches furnished under this specification shall conform to the applicable requirements of UL 20.

3.2 Qualification. The switch furnished under this specification shall be a product which is qualified for listing on the applicable qualified products list.

3.3 Materials. The materials shall be as specified in UL 20. However, when a definite material is not specified, a material shall be used which will enable the switches to meet the performance requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product.

3.3.1 Recovered materials. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

3.4 Design and construction. Switches shall be of the design, construction and physical dimensions specified (see 3.1). Switches shall be of the latest model of the manufacturer's standard commercial product and shall have been in production, marketed and in use for a minimum of 1 year preceding the application for qualification. The introduction of normal product improvement changes in this 1 year period is acceptable.

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3.4.1 Actuating member. The actuating member shall be in accordance with the following, and as specified (see 3.1):

<u>Actuating member</u>	<u>Design code</u> (see 3.6.1)
Handle (brown) .....	A
Handle (ivory) .....	B
Locking (key operated) with brown key guide .....	C
Locking (key operated) with ivory key guide .....	D
Locking (key operated) with simulated stainless steel key guide .....	E
Handle (illuminated) .....	F

3.4.2 Mounting. Switches shall be provided with an integral mounting strap. The mounting strap shall be provided with extension ears, which shall be scored so that they can be broken off when not needed.

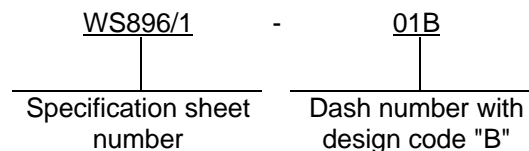
3.4.3 Terminals. Switches shall have screw or screwless type terminals. Switches with screwless type terminals shall have spring contacts which will hold the wire in place when the wire is subjected to a pull of not less than 20 pounds. Switches having a rating of 20 amperes and up shall have terminals which will receive and properly hold each of the following AWG size wires singly: No. 14, No. 12, and No. 10. Switches having a rating of less than 20 amperes shall have terminals which will receive and properly hold each of the following AWG size wires singly: No. 14 and No. 12.

3.4.4 Screw threads. Screw threads shall be in accordance with FED-STD-H28, and shall be as specified (see 3.1).

3.5 Endurance. When switches are tested as specified in 4.5.2, there shall be no electrical or mechanical failure.

3.6 Marking. Switches shall be marked in a manner which will be plainly visible after the switch has been installed (but not on removable plaster ears). Switches shall be plainly marked with W-S-896, manufacturer's name or trademark, electrical ratings, and marking to indicate when the current is "on" or "off", except for three-way, four-way, and locking (key operated) switches. Mercury switches shall be marked to indicate the required mounting position. A switch recognized as suitable for the control of tungsten-filament lamps on direct current as well as alternating current shall be identified as such by means of the letter "T". The Government part number, as specified in 3.6.1, shall be marked on each unit package.

3.6.1 Government part number. The Government part number shall consist of the specification sheet number, an assigned dash number, and a single-letter code to indicate the design of the actuating member (see 3.4.1), as shown in the following example (see 3.1 and 6.2):



NOTE: Under the Federal Specification verification program manufacturers may mark a switch with the Federal Specification mark even though there is no W-S-896 specification sheet for that switch. However, the switch must comply with all the performance requirements of W-S-896. (This allows for broader use in manufacturing of common parts on which the manufacturer may choose to place Federal Specification verification mark.)

3.6.2 Underwriters' Laboratory listing mark. Switches which have been certified by Underwriters' Laboratories shall have the listing mark on each switch and shall be plainly visible when the switch is installed.

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3.6.3 Canadian Standards Association (CSA) listing mark. Switches which have been certified by Canadian Standards Association shall have the listing mark on each switch and shall be plainly visible when the switch is installed.

3.7 Workmanship. Switches shall be processed in such a manner as to be uniform in quality and shall be free from loose terminals, cracked or displaced parts, sharp edges, burrs, chips, and other defects that will affect life, serviceability, or appearance.

#### 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.

4.1.1 Test equipment and inspection facilities. Test equipment and inspection facilities shall be of sufficient accuracy, quality and quantity to permit performance of the required inspection. The supplier shall establish calibration of inspection equipment to the satisfaction of the Government. Compliance with the requirements of ANSI/NCSL Z540-1, ISO 10012-1 or approved equivalent.

4.2 Classification of examinations and tests. The examinations and tests specified herein are classified as follows:

- a. Qualification inspection (see 4.3).
- b. Quality conformance inspection (.see 4.4).

4.3 Qualification inspection. Those switches which meet the inspection in 4.3.1 shall be considered qualified for inclusion on the qualified products list. Qualification inspection shall be performed at any laboratory acceptable to the Government (see 6.5) on sample units produced with equipment and procedures normally used in production.

4.3.1 Inspection routine. Switches shall be subjected to the inspection and test specified in UL 20, except the endurance test shall be in accordance with 3.5. Sample size, character of failures, and number of failures permitted shall be as specified by UL or CSA inspection procedures. Products which have been so certified by Underwriters' Laboratories or Canadian Standards Association shall be considered suitable for inclusion on the qualified products list.

4.3.2 Retention of qualification. The supplier shall forward to the preparing activity at 12-month intervals certification signed by a responsible official of management, attesting that the listed product(s) is still available from the listed plant, can be produced under the same conditions as originally qualified; i.e., same process, materials, construction, design, manufacturer's part number or designation; and meets the requirements of the current issue of the specification. Failure to provide the certification will be cause for removal from the qualified products list. After completion of the certification review, the qualified products list shall be reprinted to show the date of validation. DD Form 1718, Certification of Qualified Products, shall be used for obtaining certification.

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with the follow up service program of Underwriters' Laboratories, Inc. or Canadian Standards Association.

4.5 Test methods. Except as otherwise specified herein, the tests and examinations shall be in accordance with UL 20.

4.5.1 Visual examination. Switches shall be examined to verify that the materials, design and construction, physical dimensions, marking, and workmanship are in accordance with the applicable requirements (see 3.1, 3.3, 3.4, 3.6, and 3.7).

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4.5.2 Endurance (ac and mercury switches) (see 3.5). One-half of the sample group shall be operated for 50,000 cycles at a rate of 6 to 10 operations per minute with a load of tungsten filament lamps, or a load having equivalent current characteristics, and so adjusted that the normal current flow is rated current of the switch at 120 volts ac. The other one-half of the sample group shall be operated for 50,000 cycles at a rate of 18 to 24 operations per minute at full rated current and at maximum voltage ratings, with a power factor of 0.75 to 0.80.

4.6 Inspection of materials and components. In accordance with 4.1, the supplier is responsible for insuring that materials and components used were manufactured, tested, and inspected in accordance with the requirements of this specification and of referenced subsidiary specifications and standards to the extent specified, or if none, in accordance with this specification (see 3.3).

4.7 Inspection conditions. All inspections, examinations, and tests shall be performed in accordance with the applicable conditions specified in UL 20, and as specified herein.

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. 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. INFORMATION FOR GUIDANCE ONLY

(The section contains information of a general or explanatory nature which is helpful, but is not mandatory.)

6.1 Intended use. Switches, as covered by this specification, are intended for use in any electrical circuit within voltage and current limitations and at full voltage to ground except AC-DC type switches must not be used on circuits more than 125 volts to ground and the current rating should be reduced 50 percent on inductive loads.

6.2 Acquisition requirements. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Title, number, and date of the applicable specification sheet and the Government part number (see 3.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time set for opening of bids, qualified for inclusion in the applicable qualified products list whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification, in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the qualified products list is the Defense Supply Center Columbus, ATTN: DSCC-VQP, Columbus, OH 43216-5000, and information pertaining to qualification of products may be obtained from that activity.

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6.4 Supersession data. The switches formerly covered in W-S-00896d(GSA-FSS) and W-S-896c are now covered by specification sheets as shown in table I. See the applicable specification sheets for detailed information.

TABLE I. W-S-896 supersession data.

W-S-00896d (GSA-FSS) and W-S-896c descriptions (superseded)	Superseding W-S-896F specification sheet
Type I (AC/DC and "T" rated at 125/250 V)	None (use W-S-896/2 for applications not requiring a dc current)
Type II (AC only, 120 V)	W-S-896/2
Type III (AC only, 120/277 V)	W-S-896/2
Type IV (AC/DC, mercury type, 125/250 V)	None (switches no longer available)
Type IV (AC only, mercury type, 120 V)	W-S-896/3

Custodians  
Air Force-11  
Army-AT  
Navy-YD  
DLA-CC

Preparing Activity:  
DLA-CC  
  
(Project 5930-1679)

**STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL****INSTRUCTIONS**

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete block1s 4, 5, 6, and 7, and send to preparing activity.

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

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

<b>I RECOMMEND A CHANGE:</b>		<b>1. DOCUMENT NUMBER</b> MIL-PRF-	<b>2. DOCUMENT DATE (YYMMDD)</b>
<b>3. DOCUMENT TITLE</b>			
<b>4. NATURE OF CHANGE</b> (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)			
<b>5. REASON FOR RECOMMENDATION</b>			
<b>6. SUBMITTER</b>			
a. NAME (Last, First, Middle initial)		b. ORGANIZATION	
c. ADDRESS (Include Zip Code)		d. TELEPHONE (Incl Area Code) (1) Commercial (2) DSN (If applicable)	7. DATE SUBMITTED (YYYYMMDD)
<b>8. PREPARING ACTIVITY</b>			
a. NAME Defense Supply Center, Columbus ATTN: VAM		b. TELEPHONE (Include Area Code) (1) Commercial (2) DSN	
c. ADDRESS (Include Zip Code)  3990 East Broad Street Columbus, OH 43213-1199		<b>IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:</b> Defense Standardization Program Office (DLSC-LM) 8725 John J. Kingman Road, Suite 2533 Fort Belvoir, Virginia 22060-6221 Telephone (703) 767-6888 DSN 427-6888	