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INCH-POUND

MIL-F-44434(GL)
17 January 1992

MILITARY SPECIFICATION

FLASHLIGHT, LIGHTWEIGHT

This specification is approved for use by Natick Research, Development, and Engineering Center, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers a lightweight flashlight (to be powered by two "AA" batteries) which will provide red or white light by means of an integral, movable, red filter.

1.2 Classification. The flashlights shall be the following types as specified (see 6.2).

Type I - Flashlight without batteries
Type II - Flashlight with batteries

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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 issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5019 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 6230

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SPECIFICATIONS

FEDERAL

PPP-B-566 - Boxes, Folding, Paperboard
PPP-B-636 - Boxes, Shipping, Fiberboard

MILITARY

MIL-B-18/7 - Battery, Dry, BA-27
MIL-P-116 - Preservation, Methods of
MIL-L-35078 - Loads, Unit: Preparation of Semiperishable Subsistence Items; Clothing, Personal Equipment and Equipage; General Specification For

STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129 - Marking for Shipment and Storage
MIL-STD-147 - Palletized Unit Loads
MIL-STD-731 - Quality of Wood Members for Containers and Pallets

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

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 SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 2000 - Standards Classification System for Elastomeric Materials for Automotive Application
D 3951 - Standard Practice for Commercial Packaging

(Application for copies should be addressed to the American Society for Testing and Materials, 1919 Race Street, Philadelphia, PA 19103-1187.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

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2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, 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 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.3) in accordance with 4.3.

3.2 Material. The material shall be specified herein. However, when a material is not specified, a material shall be used which will enable the flashlight to conform to the performance requirements of this specification.

3.2.1 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.

3.3 Components. The flashlight components shall consist of a lamp head, battery housing, pocket clip, red filter, lamp, spare lamp, lanyard ring, and switch.

3.4 Construction. The flashlight shall be so constructed that no parts will work loose in service. The flashlight shall be built to withstand the strains, jars, vibrations, and other conditions incident to shipping, storage, installation, and service.

3.4.1 Battery housing. The battery housing shall be fabricated of anodized aluminum and shall be designed to house two size "AA" batteries and to prevent inserted batteries from damaging the base of the lamp, reflector, or any internal part which could render the flashlight unserviceable when impact tested as specified in 4.4.2. The flashlight and battery housing shall be so designed that the batteries can be easily replaced without the use of tools.

3.4.2 Lamp head. The lamp head shall include the lamp socket, reflector, red filter, lamp housing, and lamp. The head shall be so designed that the lamp can be easily replaced without the use of tools. The lamp head shall be capable of providing at least 20 foot-candles of illumination when tested as specified in 4.4.2 without filter. The lamp shall have a minimum life of 10 hours of continuous operation and shall not become loose or displaced during rough handling when impact tested as specified in 4.4.2.

3.5 Holder for spare lamp. Each flashlight shall be furnished with a spare lamp. The spare lamp shall be mounted in a holder within the flashlight in such a manner so as to be accessible and shall not become loose or displaced when impact tested as specified in 4.4.2.

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3.6 Gaskets. Gasket shall be provided on all flashlights, where necessary, to prevent the entrance of moisture into the interior of the flashlight or into the switch contacts. Gaskets shall be fabricated from rubber or synthetic rubber composition conforming to ASTM D2000, grades 3AA510B13C12F17, 3AA610B13C12F17, or 3AA710B13C12F17.

3.7 Red filter. The flashlight shall include an integral red filter which can be moved into place over the lamp and moved away from the lamp without the use of tools and without any assembly or disassembly of the flashlight. When the filter is in place over the lamp, it shall permit at least 6 percent of the light emitted by the lamp to leave the flashlight. A detent or other approved means shall be provided to ensure positive positioning of the filter.

3.8 Switch. The switch shall be a "push on-push off" switch mounted on the side of the flashlight. The flashlight shall be able to be held and operated with one hand. The switch shall be designed so that it cannot accidently be operated or snagged on other clothing or equipment. The switch shall not have internal electrical leakage when tested as specified in 4.4.2. The switch shall be capable of operating for a minimum of 1000 off-on cycles when endurance tested as specified in 4.4.2. The switch shall be guarded to protect it from damage when impact tested as specified in 4.4.2. The flashlight shall not go off when shaken vigorously while the switch is in the "ON" position during the operation test in 4.2.2.

3.9 Lanyard ring. The ring shall be of one piece construction and shall be fastened so that it cannot be readily detached by hand. The ring shall seat firmly to and recess in the flashlight when not in use. The ring shall not fail when strength tested as specified in 4.4.2.

3.10 Pocket clip. The pocket clip shall maintain adequate pressure against the housing to ensure retention of the flashlight in pockets made of lightweight material when the pockets are inverted.

3.11 Batteries (for type II). The batteries shall be size "AA" and shall conform to MIL-B-18/7.

3.12 Weight. The weight of the flashlight without batteries shall not exceed 0.2 pounds.

3.13 Size. The size of the flashlight shall not exceed 5.0 cubic inches. The maximum dimensions shall be as follows: width--1.5 inches; length--6.5 inches; depth--1.5 inches.

3.14 Heat and humidity resistance. The flashlight shall be capable of withstanding heat and humidity when tested as specified in 4.4.2.

3.15 Color. The color of the battery housing, lamp head, switch, lanyard ring, and clip shall be black.

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3.16 Workmanship. The finished flashlight shall not contain defects, rough edges, blemishes, or other disfigurations which could affect serviceability or appearance. External surfaces shall be free of burrs, sharp edges, and corners. Soldering, welding, brazing, painting, and wiring shall be thorough. Parts shall be properly aligned and assembly screws and bolts shall be tight. The flashlight shall be thoroughly cleaned, and loose, spattered, or excess solder, metal chips, and other foreign material removed during and after final assembly.

4. QUALITY ASSURANCE PROVISIONS

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

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. 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.

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

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

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

4.3 First article inspection. When a first article is required (see 3.1 and 6.2), it shall be examined for the defects listed in 4.4.1 and shall be tested for the characteristics specified in 4.4.2.

4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

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

4.4.1.1 End item visual examination. The flashlights shall be examined for defects listed in table I. The lot size shall be expressed in flashlights. The sample unit shall be one flashlight. The inspection level shall be S-3 and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 4.0 for major defects and 6.5 for total (major and minor combined) defects.

TABLE I. End item visual defects

Examine	Defect	Classification Major	Minor
Components	Flashlight not furnished with all parts specified (see 3.3)	101	
Battery housing	Not as specified (see 3.4.1)	102	
Lamp head	Not as specified (see 3.4.2)	103	
Spare lamp	No holder for spare lamp (see 3.5)	104	
Gaskets	Not as specified (see 3.6)	105	
Red filter	Not as specified (see 3.7)	106	
Switch	Not as specified (see 3.8)	107	
Lanyard ring	Not as specified (see 3.9)	108	
Pocket clip	Not as specified (see 3.10)	109	
Battery	Not as specified (see 3.11), (type II only)	110	
Weight	Weight greater than specified (see 3.12)	111	
Size	Dimensions greater than specified (see 3.13)	112	
Color	Not as specified (see 3.15)	113	
Workmanship	Not as specified (see 3.16)		201

4.4.2 End item testing. The end items shall be tested for the characteristics indicated in table II. The lot size shall be expressed in units of flashlights. The sample unit shall be one flashlight. Any test failure shall be cause for rejection of the lot. The sample size shall be as follows:

Lot size	Sample size (units)
800 or less	4
801 up to and including 22,000	6
22,001 and over	10

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TABLE II. End item tests

Characteristic	Requirement paragraph	Test Method
Impact	3.4.1, 3.4.2, 3.5, 3.8	4.4.2.7
Lamp life	3.4.2	4.4.2.4
Illumination	3.4.2	4.4.2.5
Filter	3.7	4.4.2.6
Switch leakage	3.8	4.4.2.1
Operation	3.8	4.4.2.2
Switch endurance	3.8	4.4.2.3
Lanyard ring	3.9	4.4.2.9
Heat and humidity	3.14	4.4.2.8

4.4.2.1 Switch leakage test. With the lamp and reflector removed, insert batteries into the flashlight. Connect a voltmeter (Simpson model 260 series or equal) across the switch and battery or the switch and battery contacts, as appropriate, in such a way as to read the battery voltage through the switch. With the switch in the "OFF" position, read the voltage. Any distinguishable deflection of the meter hand, when the meter is set in the voltage range nearest the battery voltage, shall constitute failure of this test.

4.4.2.2 Operation test. Insert batteries into the flashlight and operate the switch five times in each of the two positions (see 3.8). Shake the flashlight vigorously when switch is in the "ON" position. Nonconformance to 3.4.2 and 3.8 shall constitute failure of this test.

4.4.2.3 Switch endurance test. The contact switch mechanism of the flashlight shall be tested by operating the switch for 1000 continuous cycles at 15 to 20 cycles per minute. A cycle shall consist of movements from "OFF" position to "ON" position and back to "OFF" position. The switch shall be operated under normal electrical load conditions, and the lamp and batteries shall be replaced as often as required to insure that the switch mechanism is operating under normal load throughout the 1000 cycles. Burning out of bulbs and batteries during the test shall not constitute failure of this test. Failure of the switch to complete cycles shall constitute failure of this test.

4.4.2.4 Lamp life test. The flashlight shall be subjected to a lamp life test with a fresh lamp, the flashlight shall be turned to the "ON" position. Batteries shall be replaced as often as required. Failure of batteries during the test shall not constitute failure of the test. Nonconformance to the continuous operation requirement in 3.4.2 shall constitute failure of this test.

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4.4.2.5 Illumination test. The flashlight without filter shall be subjected to a photometric test. The flashlight with fresh batteries must provide 20 foot-candles. Nonconformance will constitute failure of this test.

4.4.2.6 Filter test. The flashlight shall be subjected to a photometric test with the red filter over the lamp. Nonconformance to 3.7 will constitute failure of this test.

4.4.2.7 Impact test. The flashlight, complete with batteries and lamp, shall be dropped in free fall onto a wooden floor from height of 36 inches. The flashlight shall be dropped once on the side of the case and once on the end opposite the lamp. At the end of this test, the flashlight shall be examined. There shall be no failures of the flashlight, except for the lamp, which would interfere with its proper operation.

4.4.2.8 Heat and humidity test. The flashlight shall be placed on a horizontal surface and subjected to dry heat at 120°F ± 5°F for 16 hours, followed by an 85 ± 5 percent relative humidity at 110°F ± 2°F for 6 hours. The flashlight shall then be compared with untested flashlights for dimensional stability, crazing of surface, and then operated in the "ON" and "OFF" positions. Any evidence of defects or nonconformance to 4.4.2.1 and 4.4.2.2 shall constitute failure of this test.

4.4.2.9 Lanyard ring test. A 10-pound weight shall be suspended from the ring for a period of 30 minutes with the flashlight held in a vertical position (with batteries installed). Any separation or sign of damage shall constitute failure of this test.

4.4.3 Packaging examination. The fully packaged end items shall be examined for the defects listed below. The lot size shall be expressed in units of shipping containers. The sample unit shall be one shipping container fully packaged. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred unit, shall be 2.5.

Examine	Defect
Preservation	Preservation not as specified Mixed types in same unit pack
Marking	Omitted; incorrect, illegible; of improper size, location, sequence or method of application
Materials	Any component missing, damaged or not as specified
Workmanship	Inadequate application of components, such as: incomplete sealing or closure of flap, improper taping, loose strapping, or inadequate stapling Bulged or distorted container

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Content	Number per container is more or less than specified

4.4.4 Palletization examination. The fully packaged and palletized end items shall be examined for defects listed below. The lot size shall be expressed in units of palletized unit loads. The sample unit shall be one palletized unit load, fully packaged. The inspection level shall be S-1 and the AQL, expressed in terms of defects per hundred units, shall be 6.5.

Examine	Defect
Finished dimensions	Length, width, or height exceeds specified maximum requirement
Palletization	Pallet pattern not as specified Load not bonded as specified
Weight	Exceeds maximum load limits
Marking	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application

5. PACKAGING

5.1 Preservation. Preservation shall be Level A or commercial, as specified (see 6.2).

5.1.1 Level A. Each flashlight shall be preserved in accordance with MIL-P-116, method IC-1. The flashlight shall be unit packaged in a container conforming to PPP-B-566.

5.1.2 Commercial. Flashlights shall be preserved in accordance with ASTM D 3951.

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

5.2.1 Level A packing. One-hundred flashlights, of one type only, preserved as specified in 5.1, shall be nested one in length, ten in width, and ten in depth in a fiberboard shipping container conforming to style RSC-L, grade V2s of PPP-B-636. A corrugated fiberboard pad shall be placed between each layer of flashlights. Inside dimension of each shipping container shall be approximately 11-1/2 inches in length, 6-1/4 inches in width, and 11-1/2 inches in depth. Each box shall be closed, waterproofed, and reinforced in accordance with the appendix of PPP-B-636. Boxes shall be arranged in unit loads in accordance with MIL-L-35078 for the type and class of load specified (see 6.2). Strapping shall be limited to nonmetallic strapping, except for type II, class F loads.

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5.2.2 Level B packing. One-hundred flashlights, of one type only, preserved as specified in 5.1, shall be nested one in length, ten in width, and ten in depth in a fiberboard shipping container conforming to style RSC-L, type CF (variety SW), or SF, class domestic, grade 275 of PPP-B-636. Inside dimensions of each shipping container shall approximate 11-1/2 inches in length, 6-1/4 inches in width, and 11-1/2 inches in depth. Each box shall be closed in accordance with method II as specified in the appendix of PPP-B-636.

5.2.2.1 Weather-resistant shipping container. When specified (see 6.2), the shipping container shall be a grade V3c, V3s, or 4Vs fiberboard box fabricated in accordance with PPP-B-636 and closed in accordance with the appendix of PPP-B-636.

5.2.3 Commercial packing. Flashlights preserved as specified in 5.1, shall be packed in accordance with ASTM D 3951.

5.3 Palletization. When specified (see 6.2), flashlights packed as specified in 5.2.2 or 5.2.3, shall be palletized on a 4-way entry pallet in accordance with load type Ia of MIL-STD-147. Pallet types shall be type I (4-way entry), type IV, or type V in accordance with MIL-STD-147. Pallets shall be fabricated from wood groups, I, II, III, or IV of MIL-STD-731. Each prepared load shall be bonded with straps in accordance with bonding means C and D or film bonding means F or G. Pallet pattern shall be number 105 in accordance with the appendix of MIL-STD-147.

5.4 Marking. In addition to any special marking required by the contract or purchase order, unit packs, shipping containers, and unit loads shall be marked in accordance with MIL-STD-129 or ASTM D 3951, as applicable.

6. NOTES

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

6.1 Intended use. The flashlight is intended for use by the dismounted combat soldier to enable him to read a map, navigate, and signal during periods of limited visibility.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, date of this specification.
b. Type required (see 1.2).
c. Date of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
d. When a first article is required (see 3.1, 4.3 and 6.3).
e. Levels of packing (see 5.2).

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f. Type and class of unit load required (see 5.2.1).
g. When weather-resistant grade fiberboard shipping containers are required for level B packing (see 5.2.2.1).
h. When palletization is required (see 5.3).

6.3 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209-4. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.4 Part or Identifying Number (PIN). The PINs to be used for items covered by this specification are formed as follows:

M 00000-1

- Type
- Specification number
- Military specification

6.5 Subject term (key word) listing.

AA
Battery
Map
Pocket

Custodian:

Army - GL

Review activity:

DLA - GS

Preparing activity:

Army - GL

(Project 6230-A318)

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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 revisi letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

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

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE (YYMMDD)
	MIL-F-44434(GL)	1992 January 17

3. DOCUMENT TITLE

FLASHLIGHT, LIGHTWEIGHT

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

5. REASON FOR RECOMMENDATION

6. SUBMITTER

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

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE (Include Area Code) (1) Commercial	(2) AUTOVON/DSN
U.S. Army Natick RD&E Center	508-651-4532	256-4532
c. ADDRESS (Include Zip Code) Commander, U.S. Army Natick RD&E Center ATTN: STRNC-IRT Natick, MA 01760-5019	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	

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