

W-L-101H  
~~December 6, 1977~~  
~~SUPERSEDING~~  
W-L-101F  
July 31, 1959 and  
W-L-00101G (GSA-FSS)  
January 15, 1969

# FEDERAL SPECIFICATION

## LAMP, INCANDESCENT (ELECTRIC, LARGE TUNGSTEN-FILAMENT) (GENERAL SPECIFICATION)

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. All lamps covered by this specification are large tungsten-filament incandescent electric lamps. "Large" lamp designation, broadly, lamps regularly fitted with other than miniature bases.

1.2 Classification. The incandescent lamps shall be classified in accordance with each class sheet, i.e. W-L-101/1.

### 2. APPLICABLE DOCUMENTS

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

#### Military Standard:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.

(Copies of Military 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 National Standards Institute (ANSI), Inc. Standard:

E78.100 - Electric Lamps.

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

#### 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 F Street, N.W., Washington, DC 20036.)

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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, IL 60606.)

3. REQUIREMENTS

3.1 Quality control and production. The manufacturer shall have a documented quality control system, approved by the Government. Complete and accurate records of the inspections performed in accordance with this system shall be made available to the Government for a period of at least 2 years.

3.2 Qualification. Lamps furnished under this specification shall be a product which has been tested in accordance with the qualification tests described in section 4 of this specification and has been listed on or approved for listing on the applicable Federal Qualified Products List.

3.3 Average life. The lamps furnished under this specification shall give an average life to burn out, of not less than the average life specified in the detailed specification as modified by table I. A minus tolerance as listed in table I shall be applicable. Failures due to handling shall be neglected in calculating the test results.

3.4 Lumens per watt (efficacy) initial. Lamps furnished under this specification shall have an initial efficacy of not less than the value specified in the detailed specification when tested in accordance with 4.4.2.

3.5 Lumens per watt (efficacy) maintenance. Lamps furnished under this specification shall have an average efficacy at 70 percent of required life of not less than the value specified in the detailed specification as modified by 4.4.2 when tested in accordance with 4.4.2.

3.6 Watts. Lamps furnished under this specification shall have an initial wattage consumption within the tolerance specified in the detailed specification when tested in accordance with 4.4.3.

3.7 Base. When a specific base material is required it shall be specified in the detailed specification.

3.8 Dimensions. The dimensions of the lamps furnished under this specification shall be in accordance with the applicable ANSI standard. Where an ANSI Standard does not exist for a particular lamp type, the manufacturer's established tolerances shall be used for inspection.

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.

4.2 Qualification tests. Qualification tests shall consist of all tests specified in 4.4.

4.2.1 Place of qualification test. Qualification tests shall be conducted at a Government or a commercial laboratory designated by the Mechanical and Electrical Division, Federal Supply Service, General Services Administration.

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**4.2.2 Sample size for qualification.** The sample size for qualification shall be as indicated below:

<u>Lamp wattage</u>	<u>Sample size (No. of individual lamps)</u>
15	30
25	30
40	30
50	30
60	30
75	30
100	30
150	30
200	30
300	10
500	10
750	5
1000	5
1500	5

**4.3 Test conditions.** Unless otherwise specified in the detailed specification, all lamps shall be tested at specified test voltage. The AC supply voltage shall be such that the r.m.s. summation of harmonic components shall not exceed 3 percent of the fundamental. For photometry the supply may be either DC or AC, and the voltage during test shall be maintained within  $\pm 1/4$  percent of the specified voltage. For life testing, the voltage shall be maintained within  $\pm 1/2$  percent of the specified voltage.

#### **4.4 Tests.**

**4.4.1 Life test.** Lamps shall be tested for compliance with 3.3. Unless otherwise specified the lamps shall be operated on a 60-cycle voltage meeting the tests of 4.3. The lamps shall be shut off once each day for not less than 20 minutes. The life of each lamp is the number of burning hours to failure.

TABLE I. Life test tolerances

Sample size	Allowable percent variation from required life	Sample size	Allowable percent variation from required life	Sample size	Allowable percent variation from required life
250 and above	5	24-20	12	9	19
249-100	6	19-13	13	8	20
99-55	7	17-16	14	7	21
54-45	8	15-14	15	6	23
44-35	9	13-12	16	5	25
34-30	10	11	17	-	-
29-25	11	10	18	-	-

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**4.4.2 Measurement of lumens per watt (efficacy).** The efficacy test shall be conducted under the test conditions specified in 4.3. The tests shall be conducted after lamp seasoning and also at 70 percent of the specified required life. Unless otherwise specified the lamp burning position shall be base up. No more than 20 percent of the test lamps shall fall below the specified initial lumens per watt by more than the allowable tolerance or the lamps shall fail to qualify. If the average lumens per watt at 70 percent of required life of the then burning lamps falls below the value specified in the detailed specification by more than the tolerances specified in table II, the lamp shall fail to qualify.

TABLE II. Maintenance tolerances

Number of lamps tested	Allowable percent variation
100 and above	1
99-25	2
24-10	3
9-5	4

**4.4.3 Measurements of watts.** The test conditions of 4.4.2 apply. The test shall be conducted after lamp seasoning. No more than 20 percent of the test lamps shall depart from the watts specified in the detailed specification by more than the allowed tolerance or the lamps shall fail to qualify.

**4.4.4 Dimensions.** The lamps shall be measured to determine compliance with paragraph 3.8.

**4.4.4.1 Below 500 watts.** The sample size shall consist of 13 lamps for 500 watts and less. Four or more deviations from required dimensions shall fail to qualify.

**4.4.4.2 Above 500 watts.** The sample size shall consist of 8 lamps for 500 watts or more. Three or more deviations from required dimensions shall fail to qualify.

#### **4.5 Acceptance inspection.**

**4.5.1 Sampling for acceptance inspection.** Unless otherwise specified, sampling shall be performed in accordance with the provisions set forth in MIL-STD-105.

**4.5.2 Inspection lot.** Inspection lot shall consist of lamps of one designation and size, from an identifiable production period, from one manufacturer, and one plant, submitted for acceptance.

**4.5.3 In-process inspection.** Inspections shall be performed throughout the manufacturing process to assure that lamps produced meet the requirements of this specification.

**4.5.4 Tests.** Each month during the contract, while the lamps are in the process of manufacture, lamps shall be tested for initial lumens per watt and watts consumed (see 4.4.2, 4.4.3 and 6.2). The minimum sample size for each specified lamp shall be 8 lamps and the acceptance number for each test shall be 2. If larger sample sizes are used, an AQL of 10.0 percent defective per test shall apply. In case of test failure, the contractor shall suspend offering lamps of the same designation until corrective measures, as necessary, have been taken, and another sample of at least 13 lamps has been tested and passed, with an AQL of 10.0 percent defective used for acceptance. Sample lamps for the initial efficacy and wattage test shall not be tested earlier than 4 hours from the time of manufacture.

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4.5.5 Dimension. Dimensions not in accordance with ANSI Standard C78 shall be considered a defect. The inspection level shall be S-3 and the acceptance quality level (AQL), 6.5 percent defective.

4.5.6 Visual examination. Examination for visual defects shall be in accordance with table III below. Inspection level S-4 shall apply, and the AQL shall be 4.0 percent defective units major and 6.5 percent defective minor.

TABLE III. Examination of end item

Minor defects	Major defects
Minor defects are those which mar the appearance of the lamps or are otherwise incompatible with good workmanship or good service.	Major defects are those which render lamps inoperative or which would cause them unquestionable to give poor service.

4.5.7 Inspection of preparation for delivery. An inspection shall be made to determine compliance with the requirements of section 3. Defects shall be scored in accordance with table IV. The sample unit shall be one shipping container fully prepared for delivery. The lot size shall be the number of shipping containers offered for acceptance at one time. The inspection level shall be S-4 with an AQL of 4.0 defects per hundred units.

TABLE IV. Classification of defects

Examine	Defects
Marking	Omitted, incorrect, illegible.
Materials	Packaging materials not as specified, missing, damaged, or non-serviceable.
Workmanship	Containers inadequately closed and secured, poor application of internal packaging and packing material, distorted intermediate packages.

## 5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A or Commercial as specified (see 6.1).

5.1.1 Level A. The lamps, of one type only, shall be cushioned and separated from one another and packaged in individually or in multiples of 2, 4 or 8. Unless otherwise specified, not more than 24 lamps shall be repackaged in intermediate fiberboard boxes. The boxes shall be secured to prevent accidental opening.

5.1.2 Commercial. Lamps, of one type only, shall be preserved and packaged in accordance with normal commercial practice. The complete package shall be designed to protect the item against damage during shipments, handling and storage.

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

5.2.1 Level A. Lamps, packaged as specified in 5.1.1, shall be packed in corrugated fiberboard boxes made from weather proof fiberboard with a bursting test strength of not less than 275 lbs. per square inch. The box flaps shall be secured with water resistant adhesive applied to the entire area of contact between the flaps or with 3-inch wide water resistant tape applied to the full length of the center seams and extending over the ends not less than 3 inches. Alternatively wireboard, cleated plywood or nailed wood boxes shall be acceptable shipping containers when lined with a waterproof barrier material. The barrier material shall be sealed at the edges with waterproof tape or adhesive.

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5.2.2 Commercial. Lamps, packaged as specified in 5.1.2, shall be packed in fiberboard boxes to insure safe delivery at destination, to provide for safe redistribution by the initial receiving activity, and shall be acceptable by common carrier under National Motor Freight Classification or Uniform Freight Classification.

5.3 Marking. Unless otherwise specified (see 6.1), marking shall be in accordance with 5.3.1, 5.3.2, and 5.3.3.

5.3.1 Unit packages. Each unit package shall be plainly marked to indicate the name of the article, the watt size, and the quantity contained therein.

5.3.2 Intermediate packages. The intermediate packages shall be marked with the following, arranged in this order shown:

- (a) National stock number.
- (b) Item name and watt size.
- (c) Quantity therein.

5.3.2 Shipping container. Each shipping container shall be marked in an upper right hand corner on one side panel and one end panel with the following, arranged in the order shown:

- (a) National stock number.
- (b) Item name and watt size.
- (c) Quantity therein.
- (d) Contractor's name and address (and manufacturer's name and address, if different).
- (e) Contract and purchase or delivery order number.
- (f) Gross weight and cubic displacement (to the nearest .1 of a cubic foot).

In addition, shipping containers shall be marked with appropriate exterior caution markings.

5.4 Unitization. When shipment to Government depots are full car or truckload, the shipping containers shall be unitized to facilitate handling in accordance with normal commercial practice. The unitized load shall not exceed 2,500 lbs. in weight, 63 inches in height, 56 inches in length, and 45 inches in width.

## 6. NOTES

6.1 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) Title, number, and date of the applicable detailed specification.
- (c) Base; if special base is required (see 3.7).
- (d) Ruggedness; if required (see 3.9).
- (e) Responsibility for inspection (see 4.1).
- (f) Voltage supply for life test if other than specified (see 4.4.1).
- (g) Lamp burning position if other than specified (see 4.4.2).
- (h) Sampling if other than specified (see 4.5.1).
- (i) Specified packaging level (see 5.1).
- (j) Specified packing level (see 5.2).
- (k) Marking required (see 5.3).
- (l) Unitization required (see 5.4).

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6.2 For acceptance inspection, test results for lamps with inside frosted bulbs will be accepted as indicative of the performance of the same designation lamp with a clear bulb. The reverse shall also be true.

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA-FSS  
Commerce - NBS

PREPARING ACTIVITY:

GSA-FSS

MILITARY INTEREST:

Custodian  
Navy-SH  
Air Force-85

Orders for this publication are to be placed with 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. Price 60 cents each.



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3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Include Area Code)	
b. ADDRESS (Street, City, State, ZIP Code)		<input type="checkbox"/> VENDOR	
		<input type="checkbox"/> USER	
		<input type="checkbox"/> MANUFACTURER	
		<input type="checkbox"/> OTHER (Specify):	
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a. Paragraph Number and Wording:			
b. Recommended Wording:			
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7a. NAME OF SUBMITTER (Last, First, MI) - Optional		7b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
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