

KS

KOREAN INDUSTRIAL STANDARD

Ball Lamps

KS C 7526-1989

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1. Scope

This Korean Industrial Standard specifies ball type white lamps, white lamp with thin film, and colourless clear lamps (hereinafter referred to as the "lamps").

2. Definitions

For the purpose of this Standard, in addition to the definitions specified in KS C 8008, the following principal definitions apply :

(1) rated voltage

The voltage marked on a bulb.

(2) rated wattage

The power consumption marked on a bulb.

(3) initial light flux

The total light flux at the rated voltage after aging.

(4) rated initial light flux

The initial light flux as the reference for use.

(5) lumen maintenance

The percent ratio of the total luminous flux after operating for a definite time to the initial luminous flux.

(6) life

The operating time until the filament burns out or the operating time specified by the lumen maintenance, whichever is the shorter.

(7) rated life

The life expressed officially based on the average value of life on lamps of the same kind produced in a long period.

Normative References :

- KS B 5203 Vernier Callipers
- KS C 7613 Methods of Luminance Measurements
- KS C 7702 Lamp Caps and Holders
- KS C 7708 General Rules of Testing Method for Lamps
- KS C 8008 Glossary of Lighting Terms
- KS D 5201 Copper and Copper Alloy-Sheets, Plates and Strips
- KS D 5542 Tungsten Wires for Lighting and Electronic Equipments
- KS D 5603 Dumet Wires

(8) luminance ratio

The ratio of the luminance at a specified position to the maximum luminance.

3. Classification

Lamps are classified and expressed by the type designation as given in Attached Tables 1 to 3.

The type designation shall be formed in the following order :

Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
Symbol denoting ball lamp	Symbol denoting inner treatment of glass bulb	Symbol denoting rated voltage	Symbol denoting the rated wattage	Symbol denoting diameter of bulb	Symbol denoting cap
G	W : white or white thin film coated C : clear without colour	100V 110V 220V	25W 40W 60W 100W 38W 57W 95W	50 70 80 95	No marking : lamps using E 26/25 cap E 17 : lamps using E 17/20 cap

4. Performance

4.1 Cap Adhesive Strength

When the test specified in 9.2.3 is carried out, the lamp with E 26 base shall bear 3 Nm twisting moment, and the lamp with E 17 base shall bear 1.5Nm twisting moment.

4.2 Cap Temperature Rise

The temperature rise of cap shall not exceed 110°C when the test specified in 9.2.4 is carried out.

4.3 Luminance Ratio

When a white lamp or white thin film coated lamp subjected to the test specified in 9.2.5, the luminance ratio shall not exceed 5.

4.4 Initial Characteristics

The initial characteristics are tested as specified in 9.2.6, the initial luminous flux shall be not less than 90% of the rated initial luminous flux given in Attached Tables 1 to 2 for white and white thin film coated bulbs, and not less than 93% of the rated initial luminous flux given in Attached Table 3 for other lamps. The wattage shall not exceed the maximum wattage given in Attached Tables 1 to 3.

4.5 Life

When the test specified in 9.2.7 is carried out according to the provision of 11.2, the individual life shall be not less than 60% of the rated life specified in Attached Tables 1 to 3. The luminous flux maintenance ratio shall be not less than the appropriate

value in Attached Tables 1 to 3.

5. Construction

The construction shall comply with the following requirements :

- (1) In a gas-filled double-coiled lamp, a proper fuse shall be inserted in either of the lead-in wires for safety.
- (2) The connections between the lead-in wire and filament, and between the lead-in wire and cap shall be firm.
- (3) Filament shall be located in the center of bulb.
- (4) Bonding between a cap and a bulb shall be sure.

6. Dimension

The dimensions shall be as specified in Attached Tables 1. to 3.

7. Appearance

There shall be no bubbles, cuts, etc. which are detrimental to service in bulbs.

8. Materials

The materials shall comply with the following requirements :

- (1) The filament shall be the tungsten wire specified in KS D 5542.
- (2) The lead-in wire shall be a material of good quality with high conductivity and the part sealed in glass shall be the dumet wire specified in KS D 5603.
- (3) The painting material for painted bulbs shall be heat resistant.
- (4) The conductive part of cap shall be the copper alloy specified in KS D 5201 or appropriate metals, and the insulation part shall be of glass or some other suitable materials.
- (5) The bonding material for cap and bulb shall bear the temperature of at least 160°C.

9. Tests

9.1 Test Conditions

The test condition shall be as given below unless otherwise specified.

However, the ambient condition in life test is an exception.

(1) Operating Condition

In the normal position (the cap being upwards) without influence of vibration.



(2) Test Power Supply

Substantial sinusoidal a.c. at having a frequency of 60Hz, or d.c. power supply.

(3) Ambient Conditions

Temperature $20 \pm 15^{\circ}\text{C}$

Humidity $65 \pm 20\%$

9.2 Testing Procedure

9.2.1 Dimensional Test

The dimensions shall be measured by the vernier callipers specified in KS B 5203, or a measuring instrument or jig at least equivalent shall be used. But the dimensions of cap shall be measured by a limit gauge.

9.2.2 Appearance Test

The appearance (including construction and markings), shall be visually checked.

9.2.3 Cap Bonding Strength Test

The cap bonding strength shall be tested after aging in such a way that the appropriate twisting moment is imposed between the cap and the bulb gradually.

9.2.4 Cap Temperature Rise Test

Cap temperature rise shall be measured after aging as specified in Appendix 1.

9.2.5 Luminance Ratio Test

The luminance ratio shall be measured after aging as specified in Appendix 2.

9.2.6 Initial Characteristics Test

In the initial characteristics test, the total luminous flux (initial luminous flux) and the wattage at the rated voltage shall be measured after aging.

Remark The measurement should be made based on KS C 7708.

9.2.7 Life Test

To measure the life, the time until the filament burns out while operating the lamp at the rated voltage shall be measured.

During this operating test, the lumen maintenance shall be measured when the lighting has been continued for 1250h.

If the voltage and the life coefficient have been agreed between the parties concerned with acceptance, the said voltage may be used for operation.

Appropriate test voltage is 130% rated voltage for vacuum lamp, and 120% rated voltage for gas-filled lamp.

Remarks 1. The fluctuation of the operating voltage shall be within $\pm 1\%$. In addition, the voltage shall be recorded with a voltage recorder.

2. Equivalent life to rated voltage, where the correlation between test voltage and life is set up, shall be calculated by the following

formula (The same method shall be applied hereafter in this standard) ;

$$L_1 = L_2 \left(\frac{V_2}{V_1} \right)^n$$

where L_1 : Life at rated voltage

L_2 : Life at test voltage of overvoltage

V_1 : Rated voltage

V_2 : Average voltage at the time of overvoltage test

n : 13 for vacuum lamp, 14 for gas-filled lamp

10. Inspection

In the type inspection, one and the same specimen shall be tested by the methods of 9. for the following items :

- (1) Dimension
- (2) Construction, appearance and marking
- (3) Cap bonding strength
- (4) Cap temperature rise
- (5) Luminance ratio
- (6) Initial characteristics
- (7) Life

11. Inspection, Sample Size and Acceptance Criteria

The inspection, sample size and acceptance criteria shall be established based on the following :

11.1 Dimensions, Construction, Appearance, Marking, Cap Bonding Strength, Cap Temperature Rise, Luminance Ratio

Dimensions, construction, appearance, marking, cap bonding strength, cap temperature rise, luminance ratio and initial characteristics shall be inspected on lamps of the same type, and the sampling size, acceptance number and quality criteria shall be as shown in the Table 1.



Table 1

Inspection items	Sample size (<i>n</i>)	Acceptance number (<i>c</i>)	Quality criterion
Dimension	10	0	Compliance with 6
Construction, marking, appearance	10	0	Compliance with 5., 7. and 13.
Cap bonding strength	10	0	Compliance with 4.1
Cap temperature rise	3	0	Compliance with 4.2
Luminance ratio	15	1	Compliance with 4.3
Initial characteristics	15	1	Compliance with 4.4

11.2 Life

The life shall be inspected on the lamps sampled randomly from those having passed the initial characteristics test. The sample size shall be 12, and the acceptance number shall be one. The individual life and lumen maintenance shall be calculated and meet the requirement of 4.5.

If the lumen maintenance does not satisfy the provision of Attached Tables 1 to 3, the filament shall be considered as having burned out in 1190h.

12. Designation of Products

The designation of products shall be based on the name and the type.

Example : Ball lamp GW 100V 60W 95

13. Marking

The following matters shall be marked on each lamp at a conspicuous place in an indelible way :

- (1) Type designation (items other than rated voltage, rated wattage may be omitted)
- (2) Manufacturer's name or abbreviation