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**Incandescent lamps — Safety
specifications — Part 1: Tungsten
filament lamps for domestic and
similar general lighting purposes**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal of revision of Japanese Industrial Standard submitted by Japan Electric Lamp Manufacturers' Association (JELMA)/ Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS C 7551-1:1999** is replaced with this Standard.

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Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

JIS C 7551 series consists of the following 3 parts under the general title "*Incandescent lamps — Safety specifications*"

Part 1: Tungsten filament lamps for domestic and similar general lighting purposes

Part 2: Tungsten halogen lamps for domestic and similar general lighting purposes

Part 3: Tungsten halogen lamps (non-vehicle)

Incandescent lamps — Safety specifications — Part 1: Tungsten filament lamps for domestic and similar general lighting purposes

Introduction

This Japanese Industrial Standard was established in 1999 based on IEC 60432-1, and has been revised since then to respond to the revision in 2005 of the said International Standard. This revised edition has been prepared based on the edition 2.1 of IEC 60432-1 published in 2005 with some modifications to the technical contents.

The portions with continuous sidelines or dotted underlines, and Annexes JA and JB are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JC.

1 Scope

This Standard specifies the safety and interchangeability requirements of tungsten filament incandescent lamps for general lighting service having :

rated wattage up to and including 200 W ;

rated voltage of 50 V to 250 V inclusive ;

bulbs of the A, B, C, G, M, P, PS, PAR or R shapes, or other bulb shapes where the lamps are intended to serve the same purpose as lamps with the foregoing bulb shapes ;

Shapes and names of bulbs are specified in JIS C 7710.

bulbs with all kinds of finishes ;

caps B15d, B22d/25×26, E12/15, E14/20, E14/25×17, E17/20, E26/25, E26/51×39.

Cap types and dimensions are specified in JIS C 7709-1.

As far as is reasonably practicable, this Standard is also applicable to lamps with bulbs and caps other than those mentioned above.

This Standard is concerned with safety criteria only and does not take into account the performance of tungsten filament lamps with respect to luminous flux, life or power consumption characteristics. Readers should refer to JIS C 7501 for such characteristics with respect to types normally used for general lighting service.

Lamps with E26/24 caps and E27 caps shall not be used with lampholders for E26 caps for general lighting.

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

IEC 60432-1 : 2005 *Incandescent lamps — Safety specifications — Part 1 : Tungsten filament lamps for domestic and similar general lighting purposes* (MOD)

The symbols which denote the degree of correspondence in the contents in the corresponding International Standard and JIS are IDT (identical), MOD (modified) and NEQ (not equivalent) according to ISO/IEC Guide 21.

2 Normative references

The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions (including amendments) of the standards indicated below shall be applied.

JIS C 0920 *Degrees of protection provided by enclosures (IP Code)*

JIS C 1302 *Insulation resistance testers*

JIS C 7551-2 *Incandescent lamps — Safety specifications — Part 2 : Tungsten halogen lamps for domestic and similar general lighting purposes*

NOTE : Corresponding International Standard : IEC 60432-2 *Incandescent lamps — Safety specifications — Part 2 : Tungsten-halogen lamps for domestic and similar general lighting purposes* (MOD)

JIS C 7709-0 *Lamp caps and holders together with gauges for the control of interchangeability and safety — Part 0 : General information*

NOTE : Corresponding International Standard : IEC 60061-4 *Lamp caps and holders together with gauges for the control of interchangeability and safety — Part 4 : Guidelines and general information* (MOD)

JIS C 7709-1 *Lamp caps and holders together with gauges for the control of interchangeability and safety Part 1 : Lamp caps*

NOTE : Corresponding International Standard : IEC 60061-1 *Lamp caps and holders together with gauges for the control of interchangeability and safety — Part 1 : Lamp caps* (MOD)

JIS C 7709-3 *Lamp caps and holders together with gauges for the control of interchangeability and safety — Part 3 : Gauges*

NOTE : Corresponding International Standard : IEC 60061-3 *Lamp caps and holders together with gauges for the control of interchangeability and safety — Part 3 : Gauges* (MOD)

JIS C 7710 *Designation method for glass bulbs of lamps*

JIS C 8302 *Edison screw lampholders*

JIS Z 8113 *Lighting vocabulary*

IEC 60061-3 *Lamp caps and holders together with gauges for the control of interchangeability and safety — Part 3 : Gauges*

- IEC 60064 *Tungsten filament lamps for domestic and similar general lighting purposes — Performance requirements*
- IEC 60360 *Standard method of measurement of lamp cap temperature rise*
- IEC 60598-1 *Luminaires — Part 1 : General requirements and tests*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions in JIS Z 8113 and the following apply.

3.1 rated voltage

voltage or voltage range specified in the relevant lamp standard or assigned by the manufacturer or responsible vendor

NOTE : If lamps are marked with a voltage range, it shall be interpreted that they are appropriate for use on any supply voltage within that range.

3.2 test voltage

rated voltage unless otherwise specified

NOTE : If lamps are marked with a voltage range, the test voltage shall be taken as the mean of the voltage range unless otherwise specified.

3.3 rated wattage

wattage specified in the relevant lamp standard or assigned by the manufacturer or responsible vendor

3.4 end of life

instant when the energized lamp ceases to emit light

3.5 cap temperature rise (Δt_s)

surface temperature rise, above ambient temperature, of a standard test lampholder fitted to the lamp's cap, when measured in accordance with the standard method described in 4.4

3.6 type test

test made on a sample for the purposes of checking compliance of the design of a type with the general safety requirements

3.7 lot test

test which decides acceptance or rejection of the products of the same type and manufacture by checking them once

3.8 batch

all the lamps of one category, identified as such, and put forward at one time for checking compliance

3.9 whole production

production of all types of lamps within the scope of this Standard manufactured during a period of 12 months and nominated by the manufacturer in a list for inclusion in the control

3.10 dichroic reflectorized lamp

reflector lamp using a mirror which reflects visible radiation and transmits infrared radiation

3.11 bowl mirror lamp

lamp with part of its bulb coated with reflecting material so as to reflect a substantial part of the light in the general direction of the lamp cap

3.12 maximum cap temperature

maximum temperature which the components in the cap area of a lamp are designed to withstand over the expected life of the lamp

4 General safety requirements

4.1 General

Lamps shall be so designed and constructed that in normal use they present no danger to the end user or surroundings.

4.2 Marking

4.2.1 The following information shall be marked on the lamps and shall be legible and durable when subjected to the test procedure in A.1 b) :

- a) the manufacturer's name, the name of responsible vendor or a trade mark or abbreviation ;
- b) the rated voltage or the rated voltage range (marked as "V" or "volts") ;
- c) the rated wattage (marked as "W" or "watts" or any equivalent marking. For lamps with 40 mm diameter bulbs or larger with a realized wattage of 9 W or less at the rated voltage 100 V to 150 V, or with a realized wattage of 14 W or less at the rated voltage 200 V to 250 V, the rated wattage need not be marked.)

4.2.2 For dichroic reflectorized lamps and bowl mirror lamps, the relevant symbol as shown in Annex B shall be marked on the minimum packaging container, such that the marking is legible from outside.

4.2.3 Lamps with operating position limitations

For lamps capped with B22d or E26 caps, such as given in the following, an appropriate marking shall be given on the minimum packaging container such that the marking is legible from outside (An example is shown in Annex B).

- a) Some 60 W chandelier (candle) lamps ;

- b) Type P round bulb lamps, etc. which can comply with the requirement of the lamp cap temperature rise only by excluding the cap-up position.

NOTE : The requirements in 4.2.2. and 4.2.3 are intended as information for the end-user of the lamp.

4.2.4 For safe use of the lamps, on the minimum packaging container, the cautionary symbols and instructions as given in Annex JA shall be indicated.

4.3 Protection against accidental contact in screw lampholders

4.3.1 E14 capped lamps

E14 capped lamps shall satisfy the following requirements :

- a) Chandelier (candle) lamps shall be fitted with caps E14/25 × 17 and tested with IEC 60061-3, gauge sheet 7006-55 ;
- b) Type P round bulb, pigmy, tubular and reflector lamps having lamp neck reference diameters of 21 mm and greater shall be fitted with caps E14/25 × 17 and tested with IEC 60061-3, gauge sheet 7006-55 ;
- c) Type P round bulb, pigmy, tubular and reflector lamps having lamp neck reference diameters between 16 mm and 21 mm shall be fitted with caps E14/20 ;
- d) Type P round bulb, pigmy, tubular and reflector lamps having lamp neck reference diameters between 14 mm and 16 mm shall be fitted with caps E14/20.

In cases c) and d) a gauge is not required, because the choice of caps guarantees the same degree of safety as in cases a) and b).

4.3.2 Other capped lamps

For other capped lamps, after the lamp has been securely inserted into the Edison screw lampholder specified in JIS C 8302, when a test finger as specified in B of 2 of table 6 in JIS C 0920 is pressed against it, the test finger shall not touch the lamp cap live part (except the projection *r* as shown in figure 1).

NOTE : The electric-shock-prevention gauge of E27 caps specified in IEC 60061-3 is not adopted in this Standard because the use of E27 caps is not permitted in Japan.

4.4 Lamp cap temperature rise

The average cap temperature rise per class of lamp manufactured in a period of 12 months shall not exceed the following :

- a) the appropriate value as specified in table 1 ; or
- b) 45 K lower than the relevant values in table 1 for lamps other than bowl mirror and reflector lamps that are fitted with B15d, B22d, or E14 caps, and having rated wattage 15W or less.

Compliance shall be checked by measurements of lamp cap temperature rise on lamps in the same class in accordance with the test procedure specified in Annex JB.

If the lamp is marked with a voltage range, the cap temperature rise shall be meas-

ured at the mean voltage provided the limits of the voltage range do not differ by more than $\pm 2.5\%$ from the mean voltage. For lamps with a wider voltage range, the measurement shall be at the design voltage decided by the manufacturer. Table 1 shows upper limits for average cap temperature rise which apply to all lamps listed by wattage, bulb and cap.

NOTE : In practice, several design features such as light centre length, mount shape and bulb finish affect cap temperature rise, but such factors are encompassed in each limit.

Table 1 Maximum allowable cap temperature rise for various lamp wattages and classes over 12 month period average

Unit : K

Group number	Wattage ^{a)} W	Bulb shape	Average cap temperature rise (Δt_s max.)					
			B15d	B22d	E12	E14	E17	E26/25
1	25, 30	A, PS, M and other shapes intended for use in the same luminaire	—	—	—	—	—	65 ^{e)}
	40		—	—	—	—	—	85 ^{e)}
	60		—	125	—	—	—	95 ^{e)}
	100		—	135	—	—	—	105 ^{e)}
	150, 200		—	135	—	—	—	100 ^{e)}
2	40	B, G (diameter ≤ 45 mm), P and other shapes intended for use in the same luminaire	135	140	—	130	—	—
	60		145	125 ^{d)}	—	140	—	—
3	15	C and other shapes intended for use in the same luminaire	—	—	90 ^{b)}	—	90 ^{b)}	90
	25		—	—	110 ^{d)}	—	110 ^{b)}	110
	40		—	—	130 ^{d)}	—	130 ^{b)}	130
	60		—	—	145 ^{d)}	—	130 ^{b), d)}	130 ^{d)}
4	25, 40	G (diameter > 45 mm)	—	—	—	—	95 ^{e)}	95 ^{e)}
	60, 100		—	—	—	—	—	95 ^{e)}
5	25	P and G (diameter ≤ 45 mm) with bowl mirror	—	—	—	—	110	110
	40		135	135	—	—	—	110
	60		135	—	—	—	—	110
6	60	A and PS with bowl mirror	—	—	—	—	—	—
	100		—	—	—	—	—	110
	150, 200		—	—	—	—	—	—
7	25	R	—	—	—	—	85	—
	40		120	120	—	120	95	95
	60		—	130	—	—	105	105
	100, 150 200		—	135	—	—	—	110
8	75	PAR shapes ^{e)}	—	—	—	—	—	85
	100		—	—	—	—	—	100
	150		—	—	—	—	—	125
9	150	PAR shapes with dichroic reflector ^{e)}	—	—	—	—	—	150
Notes	^{a)} For lamps with intermediate wattage values, the requirement of the next higher value shown applies. ^{b)} Under consideration. ^{c)} Lamps with skirted caps : E26/51 $\times$ 39. ^{d)} Some lamp classes may be limited to operation in the cap-down or cap-down-through-horizontal positions by the manufacturer. ^{e)} <u>For the maximum limits of cap temperature rise, the values in the above table shall be added by 15 K.</u>							

4.5 Resistance to torque

Caps shall be so constructed and assembled to the bulbs that they remain attached during normal operation.

4.5.1 Unused lamps

For unused lamps, the lamp cap shall not move relative to the bulb when subjected to the relevant torque value from table 2 as tested in accordance with C.1. Where the means of attachment is other than by adhesive, relative movement between bulb and cap is permitted, provided it does not exceed 10°.

4.5.2 Heat-treated lamps

For heat-treated lamps, the lamp cap shall not move relative to the bulb when subjected to the relevant torque values of table 3. In the case where the means of attachment is other than by adhesive, relative movement between bulb and cap is permitted, provided it does not exceed 10°.

Caps, capping cement or adhesive shall withstand the maximum cap temperature specified in table 4.

- a) Place the lamp in the heating oven,
- b) The temperature in the oven shall be at one of the following levels, the tolerance being 0 °C to -5 °C :
 - 1) the maximum cap temperature specified in table 4 ;
 - 2) for lamps fitted with B15d, B22d or E14 caps, the manufacturer may elect to design lamps that can withstand a maximum cap temperature of 165 °C, in which case the heating test is carried out at 165 °C, provided their rated wattage is 15 W or lower, and the lamp is not a reflector or bowl mirror type.
- c) Heat the tested lamp continuously for 1.5 times its rated life.
- d) After heating, allow the lamp to cool to room temperature.
- e) Measurement of resistance to torque of caps shall be made in accordance with C.1.

Table 2 Torque test values for unused lamps

Unit : N·m	
Cap type	Torque value
B15d	1.15
B22d/25 × 26	3.0
E12/15	0.8
E14/20, E14/25 × 17	1.15
E17/20	1.5
E26/25, E26/51 × 39	3.0

Table 3 Torque test values after heating

Unit : N·m

Cap type	Torque value
B15d	0.3
B22d/25 × 26	0.75
E12/15	0.5
E14/20, E14/25 × 17	1.0
E17/20	1.0
E26/25, E26/51 × 39	2.5

Table 4 Maximum cap temperature

Cap type	Temperature °C
B15d	210
B22d/25 × 26	210
E12/15	165
E14/20, E14/25 × 17	210
E17/20	165
E26/25	165
E26/51 × 39	Under consideration

4.6 Insulation resistance of bayonet capped lamps (B type) and other lamps having insulated skirts

Insulation resistance between the shell of the cap and the contacts of bayonet capped lamps (B type), or between the shell and the insulated skirt of skirted Edison screw capped lamps, shall be not less than 2 MΩ when measured in accordance with the procedure of A.3.

4.7 Metal parts intended to be insulated from live parts and height of side solder

Metal parts intended to be insulated from live parts shall not be or become live. Any moveable conductive material shall be placed without the use of a tool, in the most onerous position before inspection in accordance with A.4.

4.7.1 Bayonet caps (B type)

On bayonet caps (B type), any projection from the contact plate shall not come within 1 mm of metal parts intended to be insulated.

4.7.2 Edison screw caps (E type)

On E14 caps any projection from the cap shell shall not project more than 3 mm from the surface of the cap (see figure 1). The height of side solder, measured from the surface of the cap surface, shall not exceed 1.0 mm for E12 and E17 caps, and 1.5 mm for E26/25 caps (see figure 2).

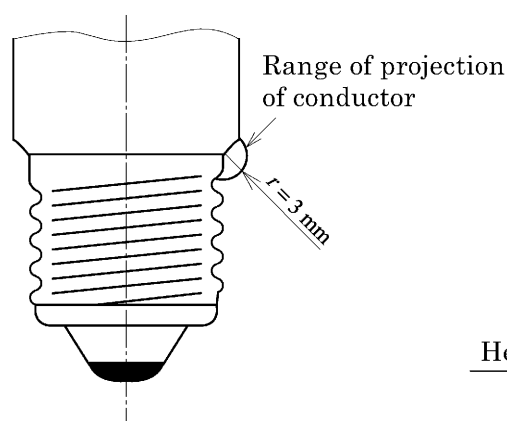


Figure 1 E14 cap

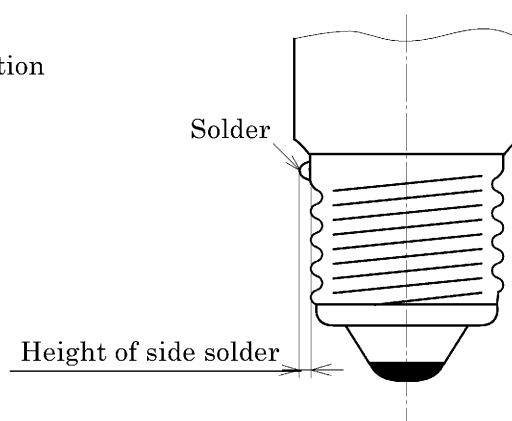


Figure 2 E12, E17, E26/25 cap

4.8 Creepage distances for B15d and B22d capped lamps

The minimum creepage distance between the metal shell of the cap and the contacts shall be in accordance with the distance given in **JIS C 7709-0**, sheet 0-3-2.

4.9 Safety at end of life

When tested under the specified conditions, lamp failure shall not be accompanied by breakage of the outer glass envelope nor its ejection from the cap. For bayonet capped lamps (B type), it is also required that there shall not be an internal short-circuit to the cap shell after the test.

The test conditions are either of the following :

- an induced-failure test in accordance with Annex D or in accordance with the alternative induced-failure test of Annex A of **JIS C 7551-2**, and
- an operation-to-failure test in accordance with Annex E.

NOTE : The induced-failure test is not applicable for lamps with rated voltages below 100 V.

4.10 Interchangeability

Interchangeability shall be ensured by the use of caps that are in accordance with **JIS C 7709-1**. Finished lamps shall satisfy the gauges for checking the dimensions controlling interchangeability in accordance with table 5. The gauges are those shown on particular standard sheets included in **JIS C 7709-3**.

Table 5 Cap dimensions to be checked and gauge

Cap	Location of cap to be checked	Gauge sheet No.
B15d		Under consideration
B22d	Diameter of the insert of the cap in the lampholder, pin position	JIS C 7709-3 3-2-1-1
	Diameter of the insert of the cap in the lampholder	JIS C 7709-3 3-2-2-1
E12	Maximum major diameter of screw thread, pitch	JIS C 7709-3 3-17-1-1
	Minimum major diameter of screw thread	JIS C 7709-3 3-17-2-1
E14	Maximum major diameter of screw thread, pitch	JIS C 7709-3 3-18-1-1
	Minimum major diameter of screw thread	JIS C 7709-3 3-18-2-1
E17	Maximum major diameter of screw thread, pitch	JIS C 7709-3 3-20-1-1
	Minimum major diameter of screw thread	JIS C 7709-3 3-20-2-1
E26	Maximum major diameter of screw thread, pitch	JIS C 7709-3 3-21-1-2
	Minimum major diameter of screw thread	JIS C 7709-3 3-21-2-1

4.11 Information for luminaire design

Refer to Annex K.

5 Test

5.1 Type test (design test, periodic test)

The type test on the following items shall be carried out on the same specimen in accordance with the procedures specified in clause 4, Annexes A, B, C, D and E, and the results shall satisfy the requirements in clause 4 :

- a) Marking
 - 1) Marking legibility
 - 2) Marking durability
 - 3) Presence of required marking
- b) Prevention of electric shock
- c) Cap temperature rise
- d) Cap resistance to torque
 - 1) Cap resistance to torque (unused lamps)
 - 2) Cap resistance to torque (after heat treatment)
- e) Insulation resistance
- f) Exposed live parts and height of side solder
 - 1) Exposed live parts
 - 2) Height of side solder
- g) Creepage distance of cap

h) Safety at end of life

i) Interchangeability

5.2 Lot test (production test)

The lot test on the following items shall be carried out on the same specimen in accordance with the procedures specified in clause 4, Annexes A, B and C, and the results shall satisfy the requirements in clause 4 :

a) Marking

1) Marking legibility

2) Marking durability

3) Presence of required marking

b) Cap resistance to torque

1) Cap resistance to torque (unused lamps)

c) Insulation resistance

d) Exposed live parts and height of side solder

1) Exposed live parts

2) Height of side solder

e) Interchangeability

5.3 Test procedures

These tests shall be carried out in order easy to implement. However, a reasonable sampling inspection plan may be determined as agreed between the parties concerned with acceptance.