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(JELMA/JSA)

**Self-ballasted fluorescent lamps for
general lighting services—
Part 2: Performance specifications**

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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 for 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 7620-2:2004** 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 or utility model right. 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 or utility model right.

JIS C 7620 series consists of the following 2 parts under the general title “*Self-ballasted fluorescent lamps for general lighting services*”:

Part 1: Safety specifications;

Part 2: Performance specifications.

Self-ballasted fluorescent lamps for general lighting services— Part 2: Performance specifications

Introduction

This Japanese Industrial Standard has been prepared based on Edition 1.2 of **IEC 60969** [consolidated version consisting of the first edition (1988), Amendment 1 (1991) and Amendment 2 (2000)] published in 2001, with some modifications of the technical contents so as to reflect the actualities in Japan.

The portions given continuous sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with explanations is given in Annex JF. Annexes JA to JE contain matters that are not given in the corresponding International Standard.

1 Scope

This Standard specifies the performance requirements, together with the test methods and conditions, required to show compliance of self-ballasted fluorescent lamps with integrated means for controlling starting and stable operation, intended for domestic and similar general lighting purposes, having:

- an electronic ballast;
- a rated wattage: up to 60 W;
- a rated input voltage: a.c. (50 Hz or 60 Hz), 100 V to 250 V;
- cap: E-type, B-type and GX53.

NOTE 1 These performance requirements are additional to the requirements in **JIS C 7620-1**.

NOTE 2 The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows:

IEC 60969:2001 *Self-ballasted lamps for general lighting services—Performance requirements* (MOD)

The symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

1A Normative references

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

JIS C 1102-2 *Direct acting indicating analogue electrical measuring instruments and their accessories Part 2: Special requirements for ammeters and voltmeters*

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|--------------|---|
| JIS C 1102-3 | <i>Direct acting indicating analogue electrical measuring instruments and their accessories Part 3: Special requirements for wattmeters and varmeters</i> |
| JIS C 7620-1 | <i>Self-ballasted fluorescent lamps for general lighting service—Part 1: Safety specifications</i> |
| JIS C 7709-1 | <i>Lamp caps and holders together with gauges for the control of interchangeability and safety Part 1: Lamp caps</i> |
| JIS Z 8113 | <i>Lighting vocabulary</i> |
| JIS Z 8724 | <i>Methods of colour measurement—Light-source colour</i> |
| JIS Z 8726 | <i>Method of specifying colour rendering properties of light sources</i> |
| JIS Z 9015-1 | <i>Sampling procedures for inspection by attributes—Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection</i> |
| JIS Z 9112 | <i>Classification of fluorescent lamps by chromaticity and colour rendering property</i> |
| IEC 60410 | <i>Sampling plans and procedures for inspection by attributes</i> |

2 Terms and definitions

For the purpose of this Standard, the terms and definitions given in JIS Z 8113 and JIS Z 9112 and the following apply.

2.1 self-ballasted fluorescent lamp

a unit which can not be dismantled without being permanently damaged, provided with a lamp cap and incorporating an arc tube and any additional elements necessary for starting and stable operation of the arc tube

2.1A electronic ballast type

a starting system of lamp having a built-in device which consists of semiconductor elements including ballast elements for the purpose of starting one or more discharge lamps under a.c. power employing a d.c. or a.c. power as the supply

2.2 type

a division of lamps of the same group, that are identical in optical characteristics and light source colour

2.2A group

a division of lamps with the same cap, that are identical in the electric characteristics, dimensions and starting method

2.3 rated voltage

the voltage or voltage range marked by the manufacturer or the responsible vendor

NOTE : For the purpose of this Standard, “the manufacturer or the responsible vendor” is a manufacturer engaged in manufacturing the products in Japan or a dealer (wholesale, etc.) engaged in importing the products,

who are similar to a “notifying supplier” as defined in the Electrical Appliance and Material Safety Act.

2.4 test voltage

the voltage applied to the lamp in tests

2.5 rated wattage

the wattage marked by the manufacturer or the responsible vendor

2.6 rated frequency

the frequency marked by the manufacturer or the responsible vendor

2.7 rated luminous flux

the initial value of flux, with the lamp operated under the specified conditions, marked on the lamp or declared as such by the manufacturer or responsible vendor

2.8 lumen maintenance

the luminous flux, with the lamp operated under the specified conditions, at a given time in the life of a lamp divided by the initial value of the luminous flux of the lamp and expressed as a percentage of the initial luminous flux

2.9 initial values

the starting characteristic of a lamp before ageing and the photometric and electrical characteristics of the lamp at the end of the 100 h operation

2.10 life of an individual lamp

the total operating time of a lamp, that is operated under the specified conditions, up to the instant when the lamp no longer operates or when the total luminous flux has decreased to 60 % of the initial value, whichever is the shorter

2.11 life to 50 % failures

the length of time during which 50 % of the tested lamps reach their individual lives when a life test is operated under the specified conditions

2.12 rated life

the life declared based on the average value of lives of the lamps of the same type manufactured over a long period of time

2.13 colour

(Deleted, since the definition is given in **JIS Z 9112** and need not be given here)

2.14 rated colour

(Deleted, since the term is not used)

2.15 starting time

the time needed, after the supply voltage is switched on, for the lamp to start fully and remain alight

2.16 run-up time

the time needed, after the supply voltage is switched on, for the lamp to reach 80 % of its final luminous flux

2.17 stabilization time

the burning time of the lamp required to obtain stable operating electrical and photometric characteristics

2.18 type test

a test or series of tests made on a type test sample for the purpose of checking compliance of the design of a given product with the requirements of the relevant standard

2.19 type test sample

a sample consisting of one or more similar units submitted by the manufacturer or responsible vendor for the purpose of the type test

2.19A nominal wattage

a number by which lamps interchangeable in their size and characteristics are denoted

2.19B design test

a test performed in the event where a major modification is to be made in the design of the lamp, such as the structure or used material

2.19C acceptance test

a special test performed upon request made by the vendor to the manufacturer

2A General requirements

The self-ballasted fluorescent lamps in compliance with this Standard shall comply with the requirements of **JIS C 7620-1**.

Lamps shall be so designed that their performances are normal and they are reliable under normal service. In general this is accomplished by satisfying all the requirements given in this Standard.

The requirements and tolerances specified by this Standard are used for the tests of type test samples submitted by the manufacturer. When the products are manufactured in the same process as the samples accepted by the inspection, the products are expected to satisfy the standard within the tolerances given by the Standard. However, in individual level, some non-conforming products may be generated since production can not be perfectly uniform. As for guidance of sampling method and inspection procedure according to the characteristics of the lamp, see Annex JE and JIS Z 9015-1 or IEC 60410.

2B Cap

The dimensions of caps in complete lamps shall comply with **JIS C 7709-1**.

3 Dimensions

The dimensions of a lamp shall comply with the value specified in the relevant lamp data sheet (see **11C.3**).

4 Test conditions

Test conditions for testing electrical and photometric characteristics shall be as given in Annex A, and those for lumen maintenance and life shall be as given in Annex JB.

5 Starting and run-up

The lamp shall start completely within the starting time specified in the relevant lamp data sheet (see **11C.3**) and shall run up within the specified run-up time. The procedures for testing are given in Annex JA.

6 Lamp wattage

The initial wattage dissipated by the lamp shall not exceed 115 % of the value specified in the relevant lamp data sheet (see **11C.3**) and of the rated wattage declared by the manufacturer or responsible vendor. The procedures for testing are given in Annex A.

6A Lamp current

The initial value of the lamp current shall comply with the value specified in the relevant lamp data sheet (see **11C.3**). The procedures for testing are given in Annex A.

7 Total luminous flux

The individual initial value of total luminous flux of the lamp shall be not less than 90 % of the rated luminous flux. The procedures for testing are given in Annex A.

8 Light source colour

The individual value of light source colour shall comply with the specification for chromaticity co-ordinates stated in **JIS Z 9112**. The procedures for testing are given in Annex A or **JIS Z 8724**.

NOTE : The ambient temperature of the lamp, when this test is performed, may be $25\text{ °C} \pm 3\text{ °C}$.

8A Colour rendering property

The individual value of colour rendering property shall not be below the minimum value of colour rendering index of tri-phosphor radiation type stated in **JIS Z 9112** by exceeding 2, and the said index declared by the manufacturer or responsible vendor by exceeding 5. The procedures for testing are given in Annex A and **JIS Z 8724**, and the evaluation method is given in **JIS Z 8726**.

NOTE : The ambient temperature of the lamp, when this test is performed, may be $25\text{ °C} \pm 3\text{ °C}$.

9 Lumen maintenance

The individual value of lumen maintenance of the lamp shall be not less than 92 % ¹⁾ of the value specified in the relevant lamp data sheet (see **11C.3**) and of the value declared by the manufacturer or responsible vendor. The procedures for testing are given in Annex JB.

Note ¹⁾ The judgment value for the lumen maintenance of self-ballasted fluorescent lamps is under consideration (92 %).

10 Rated life

For the rated life of a self-ballasted fluorescent lamp, a value lower than the average life measured under the conditions given in Annex JB, deemed to be appropriate with considerations of dispersion over individual products or other matters, shall be selected. The rated life is stated in the relevant lamp data sheet (see **11C.3**).

10A Markings

10A.1 Marking on products

Self-ballasted fluorescent lamps shall be marked with the following information.

- a) Name of manufacturer or the name of responsible vendor, or their trade mark.
- b) Rated input voltage or voltage range (marked “V” or “volts”)
- c) Rated lamp wattage (marked “W” or “watts”)
- d) Rated frequency (marked in “Hz”)
- e) Type
- f) Supplementary information for clarifying identification in electric characteristics and optical characteristics of self-ballasted fluorescent lamp.

10A.2 Marking on packaging

Packages of lamps shall be marked with total luminous flux. The luminous flux may be marked on the lamp itself. The unit used shall be lumen (lm).

The following information shall be marked on the package or in the instruction manual.

- a) Rated input current
- b) Type
- c) Supplementary information required for the users to exchange lamps

NOTE : The nominal wattage or the rated power consumption of alternative incandescent lamps permitted by the manufacturer or the responsible vendor. The nominal wattage should be indicated with “type” attached after the symbol, as in “10 type”.

- d) Supplementary information for clarifying identification in electric characteristics and optical characteristics

11 Harmonics

(Under consideration)

11A Information for design of luminaires

See Annex JC.

11B Type and group

See Annex JD.

Annex A (normative)

Method of measuring electrical and optical characteristics

A.1 General

Electrical and optical characteristics shall be measured under the draught-free atmosphere at an ambient temperature of $25\text{ °C} \pm 1\text{ °C}$ and relative humidity of 65 % maximum, with the cap in a base-up position. The optical characteristics shall be measured in accordance with the recommendation of CIE (Commission Internationale de l'Eclairage).

The preparatory burning time for stabilization of electrical and optical characteristics before measurement shall be at least 120 min.

In such a case that the lamp burned on a preparatory burning stand is transferred to the measuring stand, further stabilizing time is necessary for the lamp. In this procedure, the interruption of power supply should not to exceed 60 s. The additional stabilizing time shall be at least 3 min.

A.2 Test voltage

The test voltage shall be stable within $\pm 0.5\%$ of the value specified in the relevant data sheet (see **11C.3**) during stabilization, this tolerance being reduced to $\pm 0.2\%$ at the moment of measurements.

The frequency variation of the test voltage shall be within $\pm 0.5\%$ of the rated frequency specified in the relevant data sheet (see **11C.3**).

The total harmonic content of the test voltage shall not exceed 3 % of the fundamental wave. The harmonic content is defined as the r.m.s. summation (%) of the individual harmonic contents using the fundamental as 100 %.

NOTE : Clause **A.2** of the corresponding International Standard contains specification of the test method for starting and run-up, which is, in this Standard, given in Annex JA.

A.3 Electrical and photometric instruments

The electrical and photometric instruments used for a test shall ensure the accuracy required by the test. Especially, the electrical characteristics shall be measured by using the instruments of accuracy class 0.5 or better specified in **JIS C 1102-2** or **JIS C 1102-3**, or the instruments at least equivalent thereto in accuracy.

NOTE : Clause **A.4** of the corresponding International Standard contains specification of the test method for lumen maintenance and lamp life, which is, in this Standard, given in Annex JB.

Annex JA (normative)

Method for starting and run-up test

JA.1 Starting test

JA.1.1 Test method

The starting and run-up tests shall be carried out at all the ambient temperatures specified in the starting characteristics clause of the lamp data sheet (see **11C.3**).

In the starting test, the metallic components and metallic wires shall be located as far away from the lamp as possible. Prior to the test, the lamp shall be left to stand without burning for at least 24 h. After further standing at an ambient temperature of 20 °C to 27 °C, immediately before the test, the lamp shall be left to stand for at least 2 h under an ambient temperature as given in the relevant lamp data sheet (see **11C.3**) and a relative humidity not exceeding 65 %.

NOTE : At least 2 h standing immediately before the test may be included in the 24 h standing, without burning, prior to the test.

JA.1.2 Test voltage

The starting test voltage for starting test shall be as specified in the relevant lamp data sheet (see **11C.3**).

JA.2 Run-up test

JA.2.1 Test method

The run-up tests shall be carried out with the cap in a base-up position, under draught-free atmosphere at an ambient temperature of 25 °C ± 1 °C and a relative humidity of 65 % maximum.

In the run-up test, the lamp shall be operated for 100 h at an ambient temperature of 15 °C to 50 °C, and then left to stand without burning for 24 h ± 3 h. After further standing at an ambient temperature of 20 °C to 27 °C, the lamp shall be left to stand for at least 2 h in an environment of ambient temperature 25 °C ± 1 °C and relative humidity of 65 % or under.

NOTE : At least 2 h standing immediately before the test may be included in the 24 h standing, without burning, prior to the test.

JA.2.2 Test voltage

The run-up test voltage shall be the rated input voltage as specified in the relevant lamp data sheet (see **11C.3**).

Annex JB (normative)

Method for lumen maintenance and life tests

The total luminous flux shall be measured at instants specified in lumen maintenance of the lamp data sheet within the life of the self-ballasted fluorescent lamp or at suitable instants for clarifying damping properties to any rated life under the conditions specified in Annex A.

During the life test, the self-ballasted fluorescent lamp shall be operated as follows:

- a) Excessive draught shall be avoided and the lamp shall not be subjected to extreme vibration and shocks.
- b) The lamp shall be operated in a vertical base-up position, unless otherwise specified by the manufacturer or responsible vendor.
- c) The lamp shall be switched off for 15 min in every burning of 2 h and 45 min.
- d) The supply voltage shall be within $\pm 2\%$ from the rated input voltage.

NOTE : It is preferable that the lamp is operated at an ambient temperature of 15 °C to 50 °C.