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(JELMA/JSA)

**Lamps for road vehicles—
Part 2: Performance requirements**

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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 7506-2:1999** is replaced with this Standard.

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JIS C 7506 series consists of the following 3 parts under the general title "*Lamps for road vehicles*":

Part 1: Dimensional, electrical and luminous requirements

Part 2: Performance requirements

Part 3: Miniature lamps

Lamps for road vehicles—

Part 2: Performance requirements

Introduction

This Japanese Industrial Standard has been prepared based on the third edition of **IEC 60810** published in 2003, adopting the corresponding parts of the said International Standard (test conditions and a list of lamps) without modifying the technical contents, but adding **JIS** specifications (table of lamp life characteristics, table of lamp lumen maintenance, and vibration test method) that are not given in the said corresponding International Standard.

The portions given continuous sidelines or dotted underlines and Annex JA are the matters not given in the corresponding International Standard. A list of the modifications, with their respective explanations, is given in Annex JB.

1 General

1.1 Scope

This Standard specifies the replaceable filament and halogen lamps (hereafter referred to as “filament lamps”) and also discharge lamps for lighting and signaling purposes used in head lamps, fog-lamps for road vehicles. It specifies requirements and test methods for the measurement of performance characteristics such as torsion strength (cap adhesion), lamp life, lumen maintenance, resistance to vibration, bulb strength, and bulb deflection. Moreover, information on temperature limits, maximum tolerable voltage surges and maximum lamp outlines is given for the guidance of lighting and electrical equipment design.

In this Standard, the term “lamps” generically refers to both filament lamps and discharge lamps.

The performance requirements given in this Standard shall be added to those specified in **JIS C 7506-1**.

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

IEC 60810 : 2003 *Lamps for road vehicles—Performance requirements*
(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**.

1.2 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 7506-1 *Lamps for road vehicles—Part 1: Dimensional, electrical and luminous requirements*

NOTE : Corresponding International Standard: IEC 60809 *Lamps for road vehicles—Dimensional, electrical and luminous requirements* (MOD)

JIS D 1601 *Vibration testing methods for automobile parts*

JIS Z 8113 *Lighting vocabulary*

NOTE : Corresponding International Standard: IEC 60050-845 *International Electrotechnical Vocabulary. Lighting* (MOD)

JIS Z 8115 *Glossary of terms used in dependability*

1.3 Terms and definitions

For the purpose of this Standard, the terms and definitions in **JIS C 7506-1** and **JIS Z 8113** and the following apply.

1.3.1 life

total time (expressed in hours) during which a lamp has been operated before it becomes useless

For filament lamps, it is considered to be so according to one of the following criteria:

- a) the end of life is the time when the filament fails;
- b) the life of an H4 lamp is the time until either filament fails, if the lamp is tested in a switching cycle involving alternative operation of both filaments

1.3.2 characteristic life, T

constant of the Weibull distribution (see **JIS Z 8115**) indicating the time up to which 63.2 % of a number of tested lamps of the same type have ended their individual lives

1.3.3 life B3

constant of the Weibull distribution indicating the time during which 3 % of a number of the tested lamps of the same type have reached the end of their individual lives

1.3.4 lumen maintenance

ratio of the luminous flux of a lamp at a given time in its life to its initial luminous flux, the lamp being operated under specific conditions

1.3.5 initial luminous flux

luminous flux of a lamp measured after the ageing specified in Annex C of **JIS C 7506-1** or in Annex D of this Standard

1.3.6 pinch temperature limit

maximum admissible pinch temperature to ensure satisfactory lamp performance in service

1.3.7 solder temperature limit

maximum admissible solder temperature to ensure satisfactory lamp performance in service

1.3.8 maximum lamp outline

contour limiting the space to be reserved for the lamp in the relevant equipment

2 Requirements and test conditions for filament lamps

2.1 Basic function and interchangeability

Lamps shall comply with clause 2 of **JIS C 7506-1**.

2.2 Torsion strength

The cap shall be strong and firmly secured to the bulb. Compliance is checked before and after the life test by submitting the lamp to the following torque values:

The torque shall not be applied suddenly but shall be increased progressively from 0 to the specified amount. Values are based on a non-compliance level of 1 %.

2.2.1 Filament lamps with bayonet caps

- For those with 9 mm shell-diameter: 0.3 Nm
- For those with 15 mm shell-diameter: 1.5 Nm
- For those with 20 mm shell-diameter: 3.0 Nm

2.2.2 Filament lamps with screw caps

- For those with 10 mm shell-diameter: 0.8 Nm

2.3 Characteristic life T

The life T measured on a test quantity of at least 20 lamps shall be at least 96 % of the rated value, given in table 3 and table 4.

Table 3 specifies the values of life T for lamps that are given in **IEC 60809**, and table 4, for lamps not given in the said **IEC** standard. Compliance is checked by life tests as prescribed in Annex A.

2.4 Life B3

The life B3 shall not be less than the rated value given in table 3 and table 4. Compliance is checked by life tests as prescribed in Annex A.

Table 3 specifies the values of life B3 for lamps that are given in **IEC 60809**, and table 4, for lamps not given in the said **IEC** standard. The number of filament lamps failing before the require time shall not exceed the values in table 1.

Table 1 Conditions of compliance for life B3

Number of filament lamps tested	Acceptance number
23 to 35	2
36 to 48	3
49 to 60	4
61 to 74	5
75 to 92	6

2.5 Lumen maintenance

The lumen maintenance shall be not less than the rated value given in table 5 and table 6. This value is based on a non-compliance level of 10 %.

Table 5 specifies lumen maintenance values for lamps that are given in **IEC 60809**, and table 6, for lamps not given in the said **IEC** standard.

2.6 Resistance to vibration

In the event of service life being influenced by vibration, the test methods and schedules detailed in Annex B shall be used to assess the performance. The filament lamps are deemed to have satisfactorily completed the vibration test as described in Annex B, if they continue to function during and after the test. The number of filament lamps failing one of the tests shall not exceed the values in table 2 (values are based on the AQL of 4 %).

Table 2 Conditions of compliance for the vibration test

Number of filament lamps tested	Acceptance number
14 to 20	2
21 to 32	3
33 to 41	4
42 to 50	5
51 to 65	6

2.7 Glass-bulb strength

In the event of bulbs being impaired by mechanical handling for their assembly in equipment, the bulbs have to withstand the compressing strength specified in table C.1.

Table 3 Rated life values for continuous operation

Category	12 V			24 V			Data sheet No.	IEC 60809 data sheet No.
	Test voltage V	B3 life H	Tc life h	Test voltage V	B3 life h	Tc life h		
H4	13.2	350	700	28.0	180	500	C 7506-1-JIS-2120-	60809-IEC-2120-
H1	13.2	150	400	28.0	90	250	C 7506-1-JIS-2310-	60809-IEC-2310-
H3	13.2	150	400	28.0	90	250	C 7506-1-JIS-2330-	60809-IEC-2330-
P21/5W	13.5	60 ^{a)}	160 ^{a)}	28.0	60 ^{a)}	160 ^{a)}	C 7506-1-JIS-3110-^{c)}	60809-IEC-3110-
		600 ^{b)}	1 600 ^{b)}		600 ^{b)}	1 600 ^{b)}		
P21W	13.5	120	320	28.0	60	160	C 7506-1-JIS-3310-	60809-IEC-3310-
R5W	13.5	100	300	28.0	80	225	C 7506-1-JIS-3320-	60809-IEC-3320-
R10W	13.5	100	300	28.0	80	225	C 7506-1-JIS-3330-	60809-IEC-3330-
T4W	13.5	300	750	28.0	120	350	C 7506-1-JIS-3340-	60809-IEC-3340-
C5W	13.5	350	750	28.0	120	350	C 7506-1-JIS-4110-	60809-IEC-4110-
W5W	13.5	200	500	28.0	120	350	C 7506-1-JIS-4320-	60809-IEC-4320-
W16W	13.5	200	500	—	—	—	C 7506-1-JIS-4340-	60809-IEC-4340-
NOTE : The values indicated are minimum requirements. Depending on some particular customers' specifications, different values may be obtained, e.g. shorter life/higher luminous flux or longer life/lower luminous flux. This has to be negotiated between filament lamp manufacturers and their customers. Notes ^{a)} High-wattage filament. ^{b)} Low-wattage filament. ^{c)} 24 V type lamps, which are scarcely used in Japan, are not specified on data sheets in JIS C 7506-1.								

Table 4 Rated life values for continuous operation

Category	Test voltage V	B3 life h	T _c life h	Data sheet No.	IEC 60809 data sheet No.
JA12V45/45W	13.2 ^{a)}	35	100	C 7506-1-JIS-0210J-	—
	13.2 ^{b)}	75	200		
JA12V30/30W	13.0 ^{a)}	55	150	C 7506-1-JIS-0220J-	—
	13.0 ^{b)}	55	150		
A12V25/25W	13.0 ^{a)}	35	100	C 7506-1-JIS-0230J-	—
	13.0 ^{b)}	35	100		
JA12V55WP5	14.0 ^{c)}	110	300	C 7506-1-JIS-0240J-	—
JA12V35W	13.2	55	150	C 7506-1-JIS-0250J-	—
JA12V35WP6	14.0 ^{c)}	110	300	C 7506-1-JIS-0260J-	—
A12V35/5W	14.0 ^{a) c)}	55	150	C 7506-1-JIS-0310J-	—
	14.5 ^{b) c)}	180	500		
A24V25/10W	28.0 ^{a)}	90	250	C 7506-1-JIS-0320J-	—
	28.0 ^{b)}	750	2 000		
A12V35W	14.0 ^{c)}	55	150	C 7506-1-JIS-0330J-	—
A24V25W	28.0	90	250	C 7506-1-JIS-0340J-	—
A24V12W	28.0	180	500	C 7506-1-JIS-0350J-	—
A12V7.5W	13.0	280	750	C 7506-1-JIS-0360J-	—
A12V10WC	13.0	150	400	C 7506-1-JIS-0410J-	—
A12V8WC	13.0	150	400	C 7506-1-JIS-0415J-	—
A12V5WC	13.0	350	1 000	C 7506-1-JIS-0420J-	—
A12V13W	12.8	350	1 000	C 7506-1-JIS-0441J-	—
A12V10WT	13.0	150	400	C 7506-1-JIS-0450J-	—
A12V3.8W	14.0	560	1 500	C 7506-1-JIS-0460J-	—
A12V3.4W	14.0	180	500	C 7506-1-JIS-0461J-	—

NOTE : The values indicated are minimum requirements. Depending on some particular customers' specifications, different values may be obtained, e.g. shorter life/higher luminous flux or longer life/lower luminous flux. This has to be negotiated between filament lamp manufacturers and their customers.

Notes ^{a)} Main-beam filament or high-wattage filament

^{b)} Dipped-beam filament or low-wattage filament

^{c)} This is a test voltage specified for measurement of life which is set approximate to the actual conditions of vehicles and therefore different from the test voltage given in the data sheet of **JIS C 7506-1**, which is specified for measuring the initial characteristics.

Table 5 Rated lumen-maintenance values for continuous operation

Category	12 V			24 V			Data sheet No.	IEC 60809 data sheet No.
	Test voltage V	Lumen maintenance h %		Test voltage V	Lumen maintenance h %			
H4	13.2	110 ^{a)}	85	28.0	110 ^{a)}	85	C 7506-1-JIS-2120-	60809-IEC-2120-
		225 ^{b)}	85		225 ^{b)}	85		
H1	13.2	170	90	28.0	170	90	C 7506-1-JIS-2310-	60809-IEC-2310-
H3	13.2	170	90	28.0	170	90	C 7506-1-JIS-2330-	60809-IEC-2330-
P21/5W	13.5	110 ^{a)}	70	28.0	110 ^{a)}	70	C 7506-1-JIS-3110- ^{c)}	60809-IEC-3110-
		750 ^{b)}	70		750 ^{b)}	70		
P21W	13.5	110	70	28.0	110	70	C 7506-1-JIS-3310-	60809-IEC-3310-
R5W	13.5	150	70	28.0	150	70	C 7506-1-JIS-3320-	60809-IEC-3320-
R10W	13.5	150	70	28.0	150	70	C 7506-1-JIS-3330-	60809-IEC-3330-
T4W	13.5	225	70	28.0	225	70	C 7506-1-JIS-3340-	60809-IEC-3340-
C5W	13.5	225	60	28.0	225	60	C 7506-1-JIS-4110-	60809-IEC-4110-
W5W	13.5	225	60	28.0	225	60	C 7506-1-JIS-4320-	60809-IEC-4320-
W16W	13.5	375	60	—	—	—	C 7506-1-JIS-4340-	60809-IEC-4340-
NOTE : The values indicated are minimum requirements. Depending on some particular customers' specifications, different values may be obtained, e.g. shorter life/higher luminous flux or longer life/lower luminous flux. This has to be negotiated between filament lamp manufacturers and their customers.								
Notes ^{a)} Main-beam filament or high-wattage filament								
^{b)} Dipped-beam filament or low-wattage filament								
^{c)} 24 V type lamps, which are scarcely used in Japan, are not specified on data sheets in JIS C 7506-1.								

Table 6 Rated lumen-maintenance values for continuous operation

Category	Test voltage	Lumen maintenance		Data sheet No.	IEC 60809 data sheet No.
	V	h	%		
JA12V45/45W	13.2 ^{a)}	75	90	C 7506-1-JIS-0210J-	—
	13.2 ^{b)}	150	85		
JA12V30/30W	13.0 ^{a)}	115	85	C 7506-1-JIS-0220J-	—
	13.0 ^{b)}	115	80		
A12V25/25W	13.0 ^{a)}	75	70	C 7506-1-JIS-0230J-	—
	13.0 ^{b)}	75	70		
JA12V55WP5	14.0 ^{c)}	225	75	C 7506-1-JIS-0240J-	—
JA12V35W	13.2	115	75	C 7506-1-JIS-0250J-	—
JA12V35WP6	14.0 ^{c)}	225	75	C 7506-1-JIS-0260J-	—
A12V35/5W	14.0 ^{a) c)}	105	70	C 7506-1-JIS-0310J-	—
	14.5 ^{b) c)}	350	70		
A24V25/10W	28.0 ^{a)}	175	70	C 7506-1-JIS-0320J-	—
	28.0 ^{b) c)}	1 600	80		
A12V35W	14.0	105	70	C 7506-1-JIS-0330J-	—
A24V25W	28.0	175	70	C 7506-1-JIS-0340J-	—
A24V12W	28.0	375	70	C 7506-1-JIS-0350J-	—
A12V7.5W	13.0	560	70	C 7506-1-JIS-0360J-	—
A12V10WC	13.0	300	60	C 7506-1-JIS-0410J-	—
A12V8WC	13.0	300	60	C 7506-1-JIS-0415J-	—
A12V5WC	13.0	750	60	C 7506-1-JIS-0420J-	—
A12V13W	12.8	750	60	C 7506-1-JIS-0441J-	—
A12V10WT	13.0	300	60	C 7506-1-JIS-0450J-	—
A12V3.8W	—	—	—	C 7506-1-JIS-0460J-	—
A12V3.4W	—	—	—	C 7506-1-JIS-0461J-	—

NOTE : The values indicated are minimum requirements. Depending on some particular customers' specifications, different values may be obtained, e.g. shorter life/higher luminous flux or longer life/lower luminous flux. This has to be negotiated between filament lamp manufacturers and their customers.

Notes ^{a)} Main-beam filament or high-wattage filament

^{b)} Dipped-beam filament or low-wattage filament

^{c)} This is a test voltage specified for measurement of life which is set approximate to the actual conditions of vehicles and therefore different from the test voltage given in the data sheet of **JIS C 7506-1**, which is specified for measuring the initial characteristics.