

JIS

JAPANESE INDUSTRIAL STANDARD

Hand lanterns

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Hand lanterns

C 8104-1991

1. Scope

This Japanese Industrial Standard specifies dry battery hand lanterns and rechargeable battery hand lanterns of the following types:

Battery lanterns, high-power lights, emergency signal lights for automobiles, household lights, and pocket lights.

Remarks: The following Standards are cited in this Standard:

JIS C 1302-Insulation Resistance Testers (Battery Operated)

JIS C 3306-Polyvinyl Chloride Insulated Flexible Cords

JIS C 7508-Bulbs for Flashlight

JIS C 7709-Lamp Caps and Holders

JIS C 8303-Plugs and Receptacles for Domestic and Similar General Use

JIS C 8358-Appliance Couplers for Domestic and Similar Use

JIS C 8501-Manganese Dry Cells and Batteries

JIS C 8705-Sealed Nickel-Cadmium Cylindrical Rechargeable Single Cells

JIS D 0204-Method of High and Low Temperature Test for Automobile Parts

JIS D 1601-Vibration Testing Methods for Automobile Parts

JIS H 8610-Electroplated Coatings of Zinc on Iron and Steel

JIS H 8617-Electroplated Coatings of Nickel and Chromium

JIS K 2240-Liquefied Petroleum Gases

JIS Z 9104-General Rules of Coloured Light for Safety

2. Definitions

For the purposes of this Standard, the following principal definitions apply:

- (1) hand lantern A portable lighting device composed of an electric lamp, battery and container.
- (2) dry battery hand lantern A hand lantern which uses a dry cell (or cells) as the battery.

- (3) rechargeable hand lantern A hand lantern which uses a nickel-cadmium rechargeable cell (or cells) as the battery, and is equipped with a charger as a built-in or an external accessory.
- (4) dry battery electric flashlight A hand lantern with a tubular case, which uses two or more cells of type R 20 P or R 14 P, connected in series.
- (5) rechargeable electric flashlight A rechargeable hand lantern in which the power consumption of the electric lamp is 0.6 W or more but less than 2 W.
- (6) dry battery high-power light A dry battery hand lantern of focused-beam type, which uses four or more cells of type R 20 P or R 14 P. In this category, however, the lights which can be used as emergency signalling lights for automobiles (hereafter referred to as the "dry battery high-power combination lights") are also included.
- (7) rechargeable high-power light A rechargeable hand lantern in which the power consumption of the electric lamp is 2 W or over. In this category, however, the lights which can be used as an emergency signalling light for automobiles (hereafter referred to as the "rechargeable high-power combination light") are also included.
- (8) emergency signalling light for automobile A hand lantern which also has a red-light emitting portion to be used as an emergency signalling device that is required to be equipped in an automobile. In this category combination lights which can be used for automobile inspection too are included.
- (9) dry battery household light A dry battery hand lantern which uses two or more cells of type R 20 P or R 14 P, has a fixture for mounting on a wooden plate or the like and is operated when it is drawn out from the fitting for use.
- (10) rechargeable household light A rechargeable hand lantern which is automatically operated when the power failure occurs while charging is done.
- (11) dry battery pocket light A small-sized dry battery hand lantern which uses cell (or cells) of type R 6 P.
- (12) rechargeable pocket light A rechargeable hand lantern in which the power consumption of the electric lamp is less than 0.6 W.
- (13) focused-beam type A type of lantern, in which the light beam can be focused when in use.
- (14) non-focused-beam type A type of lantern other than the focused-beam type.
- (15) function For dry battery hand lanterns, the term means such a state that the lantern complies with the requirement of 4.7, permits replacement of the electric lamp and the battery, permits closing and opening of the switch, and is capable of carrying out lighting. For rechargeable hand lanterns, the term means such a state that the lantern complies with the requirements of 4.7 and 4.8, permits correct charging of the battery and replacement of the electric lamp, and is capable of carrying out lighting.

3. Classification (power supplies and types), applicable batteries, applicable electric lamps and input voltages

The classification (power supply and type), applicable batteries, applicable electric lamps and input voltages shall be as given in Tables 1 and 2.

Table 1. Classification of dry battery hand lantern, applicable battery and applicable lamp

Classification		Applicable battery and number of batteries in service	Rated voltage of applicable lamp v			
Classification by power supply	Type					
Dry battery type	Flashlight	Focused-beam type	Type R 20 P × 3 Type R 20 P × 2 Type R 14 P × 3 Type R 14 P × 2	3.8 2.5 3.8 2.5		
		Non-focused-beam type	Type R 20 P × 3 Type R 20 P × 2 Type R 14 P × 3 Type R 14 P × 2	3.8 2.5 3.8 2.5		
			High-power light		Type R 20 P × 6 Type R 20 P × 4 Type R 14 P × 6 Type R 14 P × 4	7.2 4.8 7.2 4.8
			Emergency signalling light for automobile		Type R 20 P × 3 Type R 20 P × 2 Type R 14 P × 3 Type R 14 P × 2	3.8 2.5 3.8 2.5
			Household light		Type R 20 P × 3 Type R 20 P × 2 Type R 14 P × 3 Type R 14 P × 2	3.8 2.5 3.8 2.5
		Pocket light		Type R 6 P × 2 Type R 6 P × 1	2.2 1.1	

Remarks 1. Type designations of applicable batteries are based on JIS C 8501.

Present type designation	Traditional type designation
R 20 P	SUM-1
R 14 P	SUM-2
R 6 P	SUM-3

2. "Rated voltages of applicable electric lamps" mean the rated voltages of electric lamps for hand lanterns.

Table 2. Classification of rechargeable hand lanterns, input voltage and applicable lamp

Classification		Input voltage	Power consumption of applicable lamp
Classification by power supply	Type		
Rechargeable type	Flashlight	AC 100 V	0.6 W or more but less than 2.0 W
	High-power light		2.0 W or more
	Pocket light		Less than 0.6 W
	Household light		—

Remarks: The current when the characteristic of the lamp is almost stabilized by applying the rated d.c. voltage to the lamp is measured, and the power consumption of the applicable lamp is calculated by the following formula (1).

$$P = E \cdot I \dots\dots\dots (1)$$

where, P : power consumption (W)

E : rated voltage (V)

I : current (A)

4. Performances

4.1 Switch mechanism The switch mechanism shall comply with the following requirements:

- (1) In the case of dry battery hand lanterns, the switch mechanism shall show no defects such as poor electrical connection or loosening when tested as specified in 6.2 (1).
- (2) In the case of rechargeable hand lanterns, the switch mechanism shall show no defects such as poor electrical connection or loosening when tested as specified in 6.2 (2).

4.2 Beam focusing When the focused-beam type, flashlight is tested as specified in 6.3, the beam shall be so concentrated that its profile will not extend beyond a circle the effective diameter of which is five times that of the reflector.

4.3 Mechanical strength The mechanical strength shall comply with the following requirements:

- (1) Free fall impact test When tested as specified in Table 6, the electric lanterns shall comply with the following requirements:

(1.1) Dry battery hand lantern

- (1.1.1) When a dry battery hand lantern is subjected to the free fall impact test of type I given in Table 6 once, it shall exhibit no malfunction, nor shall it become unusable except for the breakage of electric lamp or the failure of lamp filament.
- (1.1.2) For emergency signalling lights for automobiles and household lights, in dry battery lanterns, five specimens shall be subjected to the free fall impact test of type III in addition to the free fall impact test of type I given in Table 6. No more than one specimen shall exhibit breakage of electric lamp, nor the failure of lamp filament except such changes as filament inclination that are not detrimental to the lighting function of the lamp.

(1.2) Rechargeable battery hand lantern

- (1.2.1) When subjected once to the free fall impact test of type II given in Table 6, the rechargeable battery hand lanterns shall comply with the following requirements.
- (a) Live parts shall not be exposed. This requirement, however, does not apply to those live parts that can not be touched by the test finger shown in Attached Fig. 1.
- (b) They shall exhibit no malfunction, nor shall they become unusable except the breakage of lamp or the failure of lamp filament.
- (1.2.2) For rechargeable high-power combination lights and household lights, in rechargeable hand lanterns, five specimens shall be subjected to the free fall impact test of type III in addition to the free fall impact test of type II specified in Table 6. No more than one specimen shall exhibit breakage of lamp, nor the failure of lamp filament except such changes as filament inclination that are not detrimental to the lighting function of the lamp.
- (2) Steel ball drop test When the test is carried out as specified in 6.4 (2), no breakage that may cause danger of electric shock, fire, etc. shall occur.
- (3) Polyamide sphere impact test When the test is carried out as specified in 6.4 (3), no flaws, cracks, or other abnormalities that may cause danger of electric shock, fire, etc. shall occur.

4.4 Luminous intensity of red-light emitting portion When the test is carried out according to 6.5, the luminous intensity of red-light emitting portion of emergency signalling lights for automobiles, dry battery high-power combination lights, and rechargeable high-power combination lights shall be 1.0 cd or higher.

4.5 Resistance to vibration When tested according to 6.6, emergency signalling lights for automobiles, dry battery high-power combination lights, and rechargeable high-power combination lights shall exhibit no malfunction, nor shall they become unusable.

4.6 Resistance to heat When tested according to 6.7, emergency signalling lights for automobiles, dry battery high-power combination lights, and rechargeable high-power combination lights shall exhibit no malfunction, nor shall they become unusable.

4.7 Insulation resistance When the test is carried out according to 6.8, the insulation resistance shall be 1 M Ω or over.

4.8 Dielectric withstand voltage Rechargeable battery hand lanterns shall withstand the test voltage when tested as specified in 6.9.

4.9 Input power consumption When the test is carried out according to 6.10, the input power consumption of rechargeable battery hand lanterns shall be 125 % of the marked value or lower for lanterns with marked power input of 10 W or lower, and (100 ± 25) % of the marked value for lanterns with marked power input of over 10 W up to and including 30 W. When a rechargeable battery hand lantern which employs a charger as an external accessory is tested according to 6.10 (2), the input consumption shall be 125 % of the marked value or lower for lanterns with marked input capacity of 20 VA or lower, and (100 ± 20) % of the marked value for lanterns with marked input capacity of over 20 VA up to and including 30 VA.

4.10 Temperature rise When the test is carried out according to 6.11, the temperature rise of the rechargeable hand lantern, shall not exceed the relevant value given in Table 3.

Table 3. Temperature rise of rechargeable type

Unit: °C

	Position of measurement	Temperature rise
Rectifier element	Gerumanium	30
	Selenium	45
	Silicon	105
Winding	Class A insulation	70
	Class E insulation	85
Enclosure	Metal, ceramic and glass	25
	Others	40

Remarks: Reference ambient temperature is 30°C.

4.11 Resistance to moisture of insulation Rechargeable hand lanterns, when tested according to 6.12, shall exhibit an insulation resistance of 0.3 M Ω or more.

4.12 Charging capacity Rechargeable hand lanterns shall comply with the following requirements:

- (1) The charging capacity, when the test is carried out according to 6.13 (1), shall be not less than 80 % of the nominal capacity of the battery.
- (2) The charging capacity after charge and discharge cycles, when the test is carried out according to 6.13 (2), shall be not less than 50 % of the nominal capacity of the battery. Further, no part of the hand lantern tested shall exhibit any abnormalities.

4.13 Overcharging Rechargeable hand lanterns, when tested according to 6.14, shall comply with the requirements of 4.12 (1), and, in addition, they shall be usable, without practical trouble.

4.14 Bending of cord joint Rechargeable hand lanterns equipped with an electric cord, when tested as specified in 6.15, shall exhibit no short circuit between the cord conductors, nor rate of broken component wires of more than 20 %.

4.15 Appliance plug Rechargeable hand lanterns which are equipped with an appliance plug, when tested as specified in 6.16, shall maintain a retention force of 5 to 60 N, exhibit no abnormalities of insulating materials or conductive metallic parts, and present perfect electrical continuity.

4.16 Blade for connection with power supply Rechargeable hand lanterns which have blade terminals equipped in the body or in the charger for the purpose of connection to the power supply, shall comply with the following requirements:

- (1) When the test is carried out as specified in 6.17 (1) the remaining force against pressure of blade terminals for connection to the power supply shall be such that the blade terminals can not be recessed or exhibit other abnormalities.
- (2) When the test is carried out as specified in 6.17 (2), the operation of putting the blade terminals in and out of the body, shall cause no abnormalities and shall ensure complete electrical continuity.

4.17 Abnormal temperature rise Rechargeable hand lanterns, when tested as specified in 6.18, shall comply with the following requirements:

- (1) Neither flame nor melted insulating filler shall come out from the body.
- (2) The surface temperature of wooden base with which the specimen is in contact (excluding the cord) shall not exceed 150°C (under the reference ambient temperature of 30°C).
- (3) The insulation resistance between any live part and any dead metallic part accessible by a man shall be not less than 1 M Ω .