

平成 31 年 3 月 27 日

## machine translation

Use LED lighting correctly.

-Using it on a light fixture that shouldn't be used can cause smoke, fire, etc. ! -

<sup>1</sup> LED (light emitting diode) lighting has become widely used in recent years as a replacement for conventional lighting such as fluorescent lamps because of its energy-saving and long life. There are several options for replacing conventional lighting with LED lighting, such as replacing the lighting fixtures themselves or replacing only the lamps with LED lamps. Some luminaires may require you to replace them yourself. In some cases, not only can they be done, but they also need to be replaced.

In this situation, LED lamps can be installed in conventional lighting fixtures where they should not be used. The Consumer Affairs Agency has received information about accidents, including smoke emission.

LED lamps may look the same as conventional lighting lamps in terms of shape and terminal ferrules, but their internal Since they are designed differently, some combinations of conventional lighting fixtures and LED lamps can lead to accidents such as smoking and burning.

Conventional lighting fixtures that have been used for a long period of time may also deteriorate over time, making them more prone to breakdowns and problems if they are used continuously. Even if you replace only the lamps with longer-lasting LED lights, you may not be able to continue using them.

If you decide to replace your existing lighting with new LED lights, make sure you understand the precautions you need to take when using LED lights and use them correctly and safely. It is also important to regularly inspect your lighting fixtures as they can deteriorate over time. In particular, it is important to check the following points

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<sup>1</sup> In this document, both the light source (lamp) and the fixture (lighting equipment) are referred to as "illumination" in the context of this document. (Figure 1)

- (1) When switching from conventional lighting fixtures to LED lamps without replacing them, make sure that they can be used with the LED lamp warning label.
- (2) Periodically inspect the lighting fixtures to make sure they are safe for use as they can deteriorate over time and cause accidents. Generally speaking, lighting fixtures are more likely to break down after 10 years.<sup>2</sup> ます<sup>2</sup>。You can find the year on the label of the light fixture. Also, check to see if your lamp or light fixture is subject to a recall.

## 1 What is LED lighting?

LEDs are a type of semiconductor that converts electric current into light. Unlike conventional lighting that utilizes incandescent and electrical discharge phenomena, LEDs emit light by converting electrical energy directly into light (Figure 1), and are highly efficient and require little power to light up. LED is used for various applications, such as video for large displays and LCD backlighting, and LED lighting is used for lighting.

① 燃 焼	物体が燃えることによる発光 ⇒ろうそく、松明など
② 白 熱	物体が高温に熱せられることによる発光 ⇒白熱電球(電球、ハロゲン電球など)
③ 放 電	気体放電による発光 ⇒蛍光ランプ、HIDランプ
④ LED	電気を直接光に変換することによる発光 ⇒電球形LEDランプ

Figure 1: List of main principles<sup>3</sup> for

<sup>2</sup> JIS C 8105-1「照明器具-第1部：安全性要求事項通則解説」解説図9に基づき一般社団法人日本照明工業会が作成したものを引用。

LED lighting for general household use can be roughly divided into two types: one is a light source (lamp) and the other is a fixture (luminaire), and the other is an integrated type in which the LED lamp is built into the fixture and the light source cannot be replaced (Figure 2). In addition, many LED lamps are sold with the same size and shape as conventional lamps such as incandescent and fluorescent lamps, have the same base metal and can be installed in the same way as conventional lighting fixtures (Figure 3).



Figure 2: Types of LED lighting for general household use <sup>4</sup>

<sup>3</sup> 日本照明工業会発行「電球形 LED ランプガイドブック」から引用。 <https://www.jlma.or.jp/led/guide/>

<sup>4</sup> 日本照明工業会「住まいの照明 省エネ B00K」から引用。

	器具部	ランプ(光源)部	
LED 照明	LED 一体形器具(LEDシーリングライトなど)		
	ランプ交換形 LED 照明器具	電球形	LED 電球(電球形 LED ランプ)
		蛍光灯形	直管 LED ランプ 環形 LED ランプ など
従来の照明	電球用照明器具	電球	白熱電球 ハロゲン電球 など
		蛍光灯用照明器具	蛍光灯 (放電ランプ)

Figure 3: Relationship between main LED lighting for homes and conventional lighting

Since March 2011, LED lighting has become increasingly popular as energy conservation awareness increased in the wake of the Great East Japan Earthquake, and now almost all lighting fixtures sold to the public are LED.

Since LEDs use direct current to light up, it is necessary to convert the AC power supplied to households into direct current. The control unit responsible

for converting the current may be built into the LED lamp or external to it.

### Accident information

The Accident Information Data Bank of the Consumer Affairs Agency received 328 cases of LED lighting accidents from September 2009 to March 10, 2019 (Figure 4 and Figure 5).

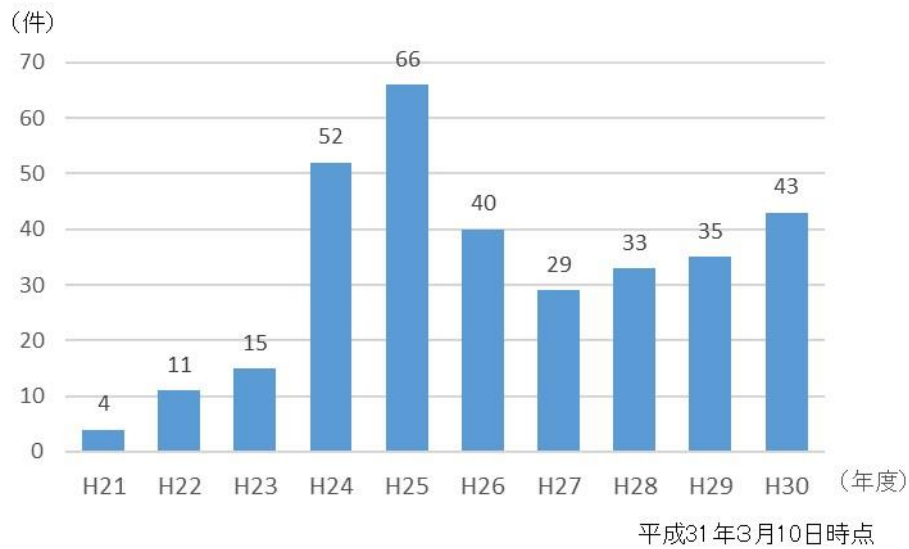


図4. LED照明 事故年度別の推移

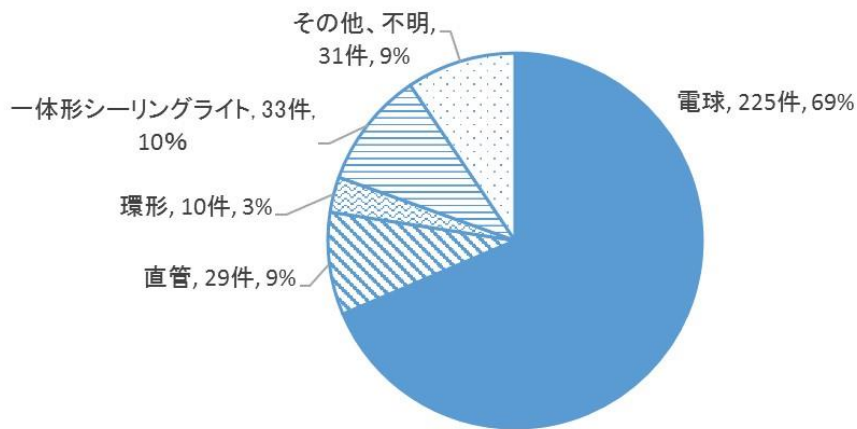


Figure 5: LED Lighting Accident Breakdown by Type (FY2009 to FY2008)

### 3. Accident cases

#### [Case 1]

The LED bulb I installed in my bathroom a year ago flickered slowly and repeatedly, so I removed the sealed shade and found

that the insulating cover and the base of the cover were separated from the insulating cover, with only the leads hanging off. I was told by the manufacturer that the bulb was not intended for bathroom use only.

(Date of receipt: June 2014)

[Case 2]

While using a light fixture purchased more than 20 years ago after replacing the original LED bulbs at a home improvement store, one of the six bulbs ignited and broke.

(Accident date: December 2016; receipt date: December 2016)

[Case 3]

I replaced 10 straight LED lamps with an existing fluorescent light fixture, and four of the lamps went out in one year. A few minutes ago I heard a bang and a strange smell. Is it OK?

(Date of receipt: April, 2018)

[Case 4]

We had a downlight in the hallway of our house, which we replaced with an LED bulb two years ago after confirming at the dealership that it was usable, and about two weeks ago, the bulb was glowing strangely, so we turned off the light and tried to remove it, but the glass part was broken and burned black. When I checked the product in question on the website, I found an "X" on the "Insulating Material Installation Fixtures Compatible" column. It is unclear if the downlights in the house have insulation installed.

(Received date: June, 2018)

[Case 5]

Chandelier installed 25 years ago; replaced with LED bulbs 6 years ago; noticed a week ago that the glass part of the bulb had a blackish discoloration and multiple cracks at the base. Is there a safety issue?

(Received Jan. 31, 2019)

[Case 6]

A few years ago, we installed a ring-shaped LED lamp in a conventional fluorescent light fixture in our living room. The day before yesterday, the lamp suddenly went out with a beeping sound and the room was filled with a strange smell as if it had burned. When I looked at the ceiling light fixture, I found that a few centimeters away from the socket of the LED lamp had been burnt black for about 15cm, the tube had melted and made a hole, and the base inside was black and charcoal-like. The base inside was blackened and charred. The lighting fixture side was also partially charred.

(Accident date: February, 2019; receipt date: February, 2019)

#### 4. advice on how to prevent accidents

(1) If you are switching to LED lamps without replacing a conventional light fixture, check the LED lamp warning label or other information to see if it can be used in that fixture.

LED lamps emit light using a different principle than conventional lamps, and the design of the inside of the lamp is very different. Even though they may be the same size and shape, have the same plugs, and are designed to be mounted in the same way as conventional lamps, some combinations may not work with conventional lighting fixtures. If you are switching from conventional lamps to LED lamps without replacing the conventional lighting fixtures in your home, do not select a product based on shape, size, or brightness alone, but look at the function and type of the lighting fixtures and carefully read the warning labels on the LED lamps to see if the combination can be used or not. Make sure you check before you buy. If you have a question or point that you do not understand, check with the dealer or manufacturer.

Even when purchasing online, check the information posted on the website, and if you have any questions, contact the seller and make sure that you can contact them if you have any problems.

LED bulbs (LED lamps)

LED bulbs are the same size and shape as traditional bulbs such as incandescent bulbs, have the same base diameter, and in many cases can be mounted and used in the same way as traditional lighting fixtures. However, there are certain combinations of luminaires that can be installed but are not suitable for use, and continued use can result in damage to the luminaires or lamp, smoke, or other accidents.

Incompatible LED bulbs will not work with the following types of lighting fixtures. When replacing a light fixture, make sure that the LED bulb is suitable for your application before purchasing and using it.

i. The lighting fixtures are dimmable (adjustable brightness)

If a light fixture has a dimming function that allows you to adjust the brightness of the light with a knob on the switch, using an unsupported LED light bulb can damage the internal circuitry, causing damage and smoking.

(Figure 6).



Figure 6: Examples of dimmer types and warning signs

ii. Lighting fixtures that are compatible with heat-insulating fixtures  
Use LED bulbs that are compatible with insulation installation fixtures if you see the following S marks on the frames of downlighters embedded in the ceiling or other fixtures. If you use non-compliant LED bulbs, you will not be able to use LED electric

This can cause problems such as shortening the life of the ball (Figure 7).



図 7. 断熱材施工器具対応のタイプの例<sup>3</sup>

### iii. Others

LED bulbs may not be available for lighting fixtures with motion or brightness sensors, garden lights, approach lights and other outdoor lighting fixtures. In addition, LED electric Since the bulb contains circuits and devices unique to LED bulbs, such as a control unit, it is often heavier than conventional bulbs, and the total weight of the bulb must be taken into consideration when mounting a number of bulbs in a lighting fixture such as a chandelier, otherwise it may cause the light to fall. For more information, please contact your dealer, installer or manufacturer.

#### (2) Straight tube or ring-shaped LED lamps

Straight LED lamps and circular LED lamps are shaped like conventional straight tube and circular fluorescent lamps, respectively (Figure 8), and some of them have the same terminals and plugs as conventional fluorescent lamps and can

<sup>3</sup> 日本照明工業会「住まいの照明 省エネ BOOK」から引用。



be attached to conventional lighting fixtures in the same way.



Fig. 8. Example of a straight tube or ring-shaped LED lamp

In addition to the various types of straight LED lamps with different power supply systems, as mentioned above, there are various types of fluorescent lamp fixtures with different lighting systems, such as rapid-start, glow starter, and inverter types, depending on the type of built-in ballast that is used to maintain the current in the fluorescent lamps at an appropriate value.

Therefore, when installing straight LED lamps or circular LED lamps in fluorescent lighting fixtures, depending on the combination of the LED lamp power supply system and the fluorescent lighting fixture lighting system, there is a possibility that the electronic components inside may be overheated, causing smoke and fire (see Figure 1).

(9).



Fig. 9. Example of damage to a straight tube LED lamp

If you'd like to replace a fluorescent light fixture in your home with an LED light fixture, consider replacing the entire fixture with an LED light fixture, rather than just the lamp. If you want to replace only the LED lamps without replacing the luminaires, be sure to check the type of fluorescent lighting fixtures you are using, and then check with the store or the manufacturer for the types of LED lamps that can be used,

whether or not wiring is necessary, how to replace the lamps, and whether or not compensation is offered.

You should make your decision based on your

<参考>

Government Internet TV: "Beware of the wrong connection of the straight tube LED lamp! <https://nettv.gov-online.go.jp/prg/prg7625.html>

Japan Lighting Manufacturers Association, Inc. "Cautions on Replacing LED Lamps with Straight Tube Lamps"

[https://www.jlma.or.jp/anzen/chui/pdf/JLMAP2013\\_changeLEDLamp.pdf](https://www.jlma.or.jp/anzen/chui/pdf/JLMAP2013_changeLEDLamp.pdf)

(2) Old lighting fixtures can cause accidents due to deterioration over time.

and check them regularly.

Although LEDs have a long lifespan, lighting fixtures, whether conventional or LED lighting, deteriorate over time, so if a problem such as a lamp not turning on is encountered, it is likely to be due to the deterioration of the fixture itself, not the life of the lamp. Generally, after 10 years, lighting fixtures tend to fail or malfunction more often due to deterioration (Figure 10).

It is important to understand that you may not be able to continue using the fixtures even if you replace them with LED lamps that have a longer lifespan. If you notice any abnormalities such as abnormal noise or flickering, check the age of the fixtures and if they have been used for a long period of time, consider replacing them with new fixtures instead of just replacing the lamps.

Also, there are cases where the lighting fixtures in your rental apartment have been in use for a long time before you moved in. Check the age of the light fixture and if you notice any abnormalities such as unusual noises or

smoke while using it, stop using it and report it to the landlord or management company.

Also, to prevent accidents, check your lighting fixtures once a year using the safety check



sheet (see Figure 11).

Fig. 10. Example of degraded ballast in a fluorescent light fixture

Also, check the Consumer Affairs Agency Recall Information Site to see if the lighting fixtures or lamps you are using are subject to a recall. Continued use may lead to accidents such as smoke, fire, or damage.

Be especially careful when buying a used product.

5. request to lighting-related organizations and industry organizations related to LED sales

The Japan Lighting Manufacturers Association (JLA) has been promoting LED

We are working to raise awareness of the proper use of lighting.



## 安全チェックシート（住宅用照明器具）

愛情点検

●安全のために1年に1回は点検をおすすめいたします。

●下欄の安全点検項目について点検し、該当する場合は点検結果欄に✓印を記入し、処置手順に従ってください。

安全点検項目	点検年月	点検結果					処置手順
		／	／	／	／	／	
1. スイッチを入れても、時々点灯しないときがある。							✓印がある場合は危険な状態になっています。事故防止のためすぐに使用を中止し、新しい器具にお取り替えください。
2. プラグ、コード、又は本体を動かすと点滅する。							
3. プラグ、コードなどが異常に熱い。							
4. こげかい臭いがする。							
5. 点灯時にブレーカが動作することがある。							
6. コード、ソケット及び配線部に傷み、ひび割れ、又は変形がある。							
1. 購入後、10年以上経過している。							✓印がある場合は危険な状態になることがあります。事故防止のためすぐに使用を中止し、新しい器具にお取り替え、又は継続的に点検してください。
2. 点灯するまで時間がかかる。 (蛍光灯器具の場合はランプを交換して確認)							
3. カバー、パネルなどに変色、変形、ひび割れなどがある。							
4. 塗装面にふくれ又はひび割れがある、もしくはさびが出ている。							
5. 器具取付け部に変形、ガタツキ、ゆるみなどがある。							
6. 極端に明るさが低下している。							
7. ちらつきが頻繁に生じる。							
1. ランプの端部が極端に黒化している。(LED 照明器具を除く)							✓印のものは新しいものにお取り替えください。
2. グロースタータ(点灯管)が点滅を繰り返す。(LED 照明器具を除く)							

チェック欄が足りない場合はコピーしてお使いください。

上記点検項目以外でも不具合があれば、ご購入した販売店・工事店・メーカーなどの専門家にご相談ください。

Fig. 11: Safety check sheet

The Consumer Affairs Agency, in cooperation with the Japan Lighting Industry Association and other related organizations, is calling on the industry associations of consumer electronics retail stores and home centers where LED lamps and LED lighting fixtures are sold to help consumers who wish to replace them with LED lights to understand the correct way to replace them and how to use them.

In addition to the above, the committee requested that more efforts be made to promote awareness of the replacement and use of lighting fixtures. <Links to related sites: z Japan Lighting Manufacturers Association

<https://www.jlma.or.jp/index.htm>

Ministry of the Environment's COOL CHOICE LIGHT FUTURE PLAN Cautions in Replacing LED Lamps

<http://ondankataisaku.env.go.jp/coolchoice/akar i/check/index.html>

Consumer Affairs Agency recall information website <http://www.recall.go.jp/>

<Consumer Affairs Agency, Consumer  
Safety Division, Kato and  
Sotozono

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<https://www.caa.go.jp/>