


Information on Mercury-added Products

Government of Japan

In response to the request from the Minamata Convention Secretariat (under MC-4/3) for submission of any information on mercury-added products, manufacturing processes in which mercury is used and their substitutes that would be helpful in considering additional products and processes at the 5th Meeting of the Conference of the Parties, Japan hereby submits information on mercury-added products as follows.

Button zinc silver oxide batteries and button zinc air batteries	
Description:	Button zinc silver oxide batteries with a mercury content < 2%, and Button zinc air batteries with a mercury content < 2%
Alternative:	Mercury-free silver oxide batteries, mercury-free zinc air batteries
Availability:	Major battery manufacturers in Japan, the EU, the US, and the Latin American countries have already ceased the production of mercury-added button batteries by 2020 and are already marketing mercury-free silver oxide and zinc air batteries. Substitution is therefore considered to be well advanced in many countries.
Technical and economic feasibility:	<p>1. Technical feasibility The main purpose for using mercury in the past was to inhibit zinc corrosion to prevent batteries from rupturing or leaking. At present, it is possible to achieve this by using additives that inhibit hydrogen gas generation, using materials with high hydrogen gas absorption capacity and the suppression of foreign metal contamination in equipment. Hence, technology that does not use mercury has already been established.</p> <p>2. Economic feasibility Many button cell batteries are already mercury-free and hence the economic feasibility is not expected to be a problem. It is difficult to distinguish between mercury-free batteries from those using mercury, solely by appearance. If all mercury-using batteries are banned and only mercury-free batteries are left, recycling will become much easier contributing to the reduction of recycling cost.</p>
Risks and benefits:	<p>1. Risks: No specific concerns</p> <p>2. Benefits: Contribute to reduction of mercury emissions and releases</p>

Mercury-containing linear fluorescent lamps (LFLS)	
Description:	Linear fluorescent lamps for general lighting purpose (LFLS luminaires)
Alternative:	Replacement of LFLS luminaires with integrated LED luminaires. Partial replacement of LFLS with LED retrofit lamps.
Availability:	<p>The LFLS luminaires themselves are being replaced by integrated LED luminaires of the same shape. More than 75% of luminaires sales are LED luminaires. (2021) ¹</p> <p>There is no technical problem with using integrated LED luminaires. In addition, the price difference between integrated LED luminaires and conventional LFL luminaires is decreasing, and the energy savings obtained from the dimming function of integrated LED luminaires are significant. Hence, there are significant benefits to replacing conventional LFL luminaires with integrated LED luminaires. In some cases, substitution to LED retrofit lamps is also possible.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Figure 1. LFLS luminaires and integrated LED luminaires LFLS luminaires Integrated LED luminaires</p>

<p>Technical and economic feasibility:</p>	<p>1. Technical feasibility (1) Replacement with integrated LED luminaires Substitution to integrated LED luminaires has already become mainstream and is technically feasible. (2) Replacement to LED retrofit lamps Not all LED retrofit lamps can be adapted to all luminaires. To ensure safety, it is also necessary to evaluate the safety of luminaires in which LED retrofit lamps are installed. Hence, a separate combination test is considered necessary. Due to this reason, it is technically appropriate to consider replacement with integrated LED luminaires as the main alternative and to use LED retrofit lamps as a supplementary alternative.</p> <p>2. Economic feasibility Since LED-integrated luminaires are already mainstream in the market, economic feasibility can already be ensured if they are replaced based on the product life of LFL luminaires. The time schedule required for changeover to LED is equivalent to the time required for the changeover of the installed LFL luminaires. Although it will depend on the situation in each country, it may be possible to eliminate LFLs after 2027 if measures such as securing LFL inventory and promoting replacement with integrated LED luminaires can be implemented. Based on the global market share (2023 projection) of the number of installed LFL luminaires and LED production, it is expected that it will take at least 5 years to replace all the installed LFL luminaires with integrated LED luminaires or LED retrofit lamps. Accelerating the process of replacement will require increasing manufacturing capacity. However, problems such as sluggish demand after the switchover and tight supply and demand for semiconductors may lead to a risk of insufficient investment in manufacturing facilities. If a decision is made to discontinue LFLs immediately, it may make it difficult to obtain LFLs and LED luminaires when required, causing disruption to the lives of citizens. Furthermore, it is difficult to replace emergency lighting and lighting used in airplanes, etc. Hence, it is necessary to take certain considerations into account from the perspective of preventing market confusion.</p>
<p>Risks and benefits:</p>	<p>1. Risks (1) Integrated LED luminaires Risk in terms of safety will not be an issue if established safety standards are met. Even if replacement takes some time, the amount of mercury in LFLs is already minimal, and proper recycling and disposal is being carried out in Japan. As long as sound management is ensured, the impact on human health and the environment will be minimal until the switchover is fully completed.</p> <p>(2) LED retrofit lamps Although the IEC has issued a safety standard (IEC62776) for LED lamps, LED retrofit lamps may have safety implications even if they meet this standard. Therefore, an IEC Technical Report entitled "DESIGN AND APPLICATION OF LED RETROFIT LAMPS" will be published in the first half of 2023 to provide guidance to designers and manufacturers on the safety requirements to be considered and their responsibility to control the suitability of LED retrofit lamps for all applications in which the lamps to be replaced were used.³ To ensure safety, it is expected that each combination of products to be used will need to be tested in accordance with these guidelines. The lighting circuits that can be used for LED retrofit lamps vary by model, and if incompatible LED lamps are mistakenly installed, there is a risk of fire in the LED retrofit lamps or in the luminaires in which they are installed. In Japan, for example, 328 accidents occurred in the 10 years following 2009.⁴</p> <div data-bbox="516 1392 954 1671" data-label="Image"> </div> <p>Figure 2 Example of LED retrofit lamp fire accident⁴</p> <p>2. Benefits (1) Integrated LED fixture Generally, power consumption is lower than LED retrofit lamps. (2) LED retrofit lamps Replacement is easy.</p>

	<ol style="list-style-type: none">1. LEDS AND THE WORLDWIDE MARKET FOR CONNECTED LIGHTING CSIL/Nov 2021 https://www.lighting.csilmilano.com/assets/CSIL-Lighting-Reports-2022.pdf2. LEDS AND THE WORLDWIDE MARKET FOR CONNECTED LIGHTING CSIL/Nov 2022 https://www.lighting.csilmilano.com/assets/CSIL-Lighting-Reports-2022.pdf3. International Electrotechnical Commission Proposal for TR for Design and application of LED retrofit lamps https://www.iec.ch/ords/f?p=103:30:13139575929778::::FSP_ORG_ID,FSP_LANG_ID:1340,254. Consumer Affairs Agency, Government of Japan. News Release (Japanese) https://www.caa.go.jp/policies/policy/consumer_safety/release/2018/pdf/consumer_safety_release_190327_0001.pdf
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