



# Mercury-Free Projector

## Background

### Increased use of mercury-free solid state light sources

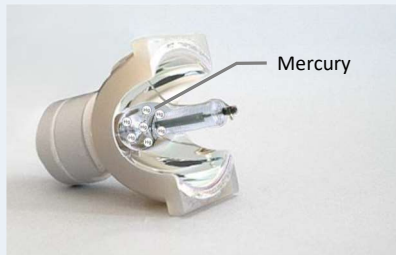
Super-high pressure mercury lamps that are used in projectors are not subject to phase out by 2020 under the Minamata Convention on Mercury. However, manufacturers are increasingly employing "solid state light sources" that use lasers or LEDs as diodes instead of mercury in Japan. "The Basic Policy on Promoting Green Procurement", stipulated by the Ministry of the Environment in February 2019, clearly stated that "a solid state light source should be used for light source lamps as much as possible. Therefore, domestic demand for mercury-free projectors is expected to increase in Japan.

## Overview of Technology

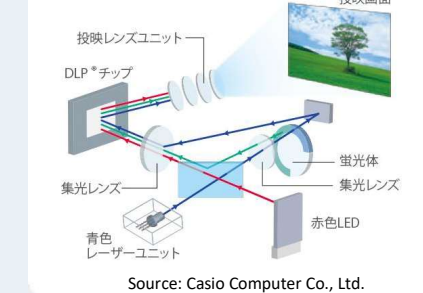
### Laser and LED Hybrid Light Source Technology

In 2010, Japanese manufacturers successfully developed a mercury-free projector that combines lasers and LEDs as a light source, as an alternative to super-high pressure mercury lamps. At that time, mercury-free projectors with a brightness less than 2,000 Lumens already existed, but it was the first time for a projector greater than 2,000 Lumens, which is used in the average meeting room and classroom.

Super-high pressure mercury lamp



Mercury-free projector Optical engine image

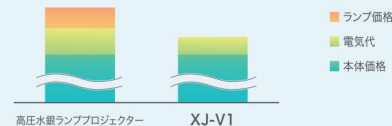


Source: Casio Computer Co., Ltd.

The optical engine that combines a high intensity blue laser with red LED enables a bright projection light with little electricity consumption compared to super-high pressure mercury lamps or other solid state light source methods. This is due to its optimization of optic blocks and superior energy-efficient technology that creates a high projection effect. In addition, another advantage is that product size can be downsized because of its flexible design layout and high-density mounting technology.

The laser and LED hybrid light source method has a higher initial purchase cost compared to super-high pressure mercury lamp methods, however taking into consideration electricity costs and lamp replacement costs, the cost over the longer term (TCO; Total Cost of Ownership) is lower.

5年間使用した際のTCO比較\*



\* 1日5時間、年間200日使用した場合  
当社従来(高圧水銀ランプ)機種に比べて、2019年6月現在、当社調べ。

## Benefits of converting to a laser and LED hybrid light source

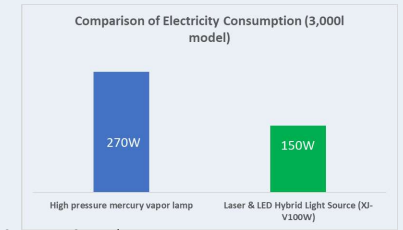
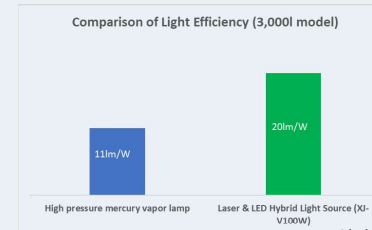
The following benefits can be obtained by shifting from super-high pressure mercury lamps.

### 1. Reduction of environmental impact

Energy consumption is about 40% less than a super-high pressure mercury lamp, so electricity cost and CO<sub>2</sub> emissions will decrease. In addition, while the average lifespan of a super-high pressure mercury lamp is about 3,000 to 6,000 hours, the laser and LED hybrid light source has a longer lifespan of about 20,000 hours, meaning the elimination of the need to dispose of or replace the lamp.

### 2. Increased usability

The laser and LED hybrid light source has a high energy-to-light conversion, which has the benefit of enabling the downsizing of the light source itself. Therefore, downsizing of the device itself is also possible, leading to benefits such as portability, and lessening the workload during installation. Moreover, maximum brightness is achieved instantly during use, meaning preparation time is short, and it can be turned on and off often, contributing to the increase in usability. It can also project in any direction for 360 degrees, increasing the opportunities to utilize the projector.



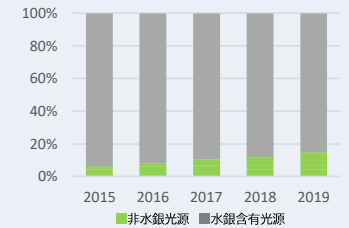
Data provided by: Casio Computer Co., Ltd.

## Applicability to Other Countries

### Global trend of projector light sources

In 2015, global sales volume of mercury-free projectors was only 7% of the total projector sales volume. However, global awareness of the mercury problem has increased due to the entry into force of the Minamata Convention in 2017, and because of technological innovation such as smaller product size and higher brightness, currently 15% of global total projector sales are mercury-free projectors.

The laser and LED hybrid light source projector made in Japan is currently being used in over 70 countries worldwide.



Source: Futuresource (based on total projector sales volume)

## References

Editing \* publication



November 2020

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