

Xenon flash lamp modules

High Stability, Long Life, High Intensity Pulsed Light Source Support Solutions to the 2020 SO_x Regulation Problem Faced by the Maritime Shipping Industry

Hamamatsu Photonics offers xenon flash lamp modules that deliver high stability and long life, yet provide high output power covering a broad spectrum of light from the UV to infrared region. These xenon flash lamp modules have been used in wide-ranging applications and fields such as environmental monitoring, including atmospheric and water quality analysis, medical research and treatment such as blood analysis, and industrial uses such as product inspection.

Now, applications of xenon flash lamp modules are expanding even further to include the maritime shipping industry.

SO_x (sulphur oxides)
emission regulations (general sea area)

3.5 %

→

0.5 %

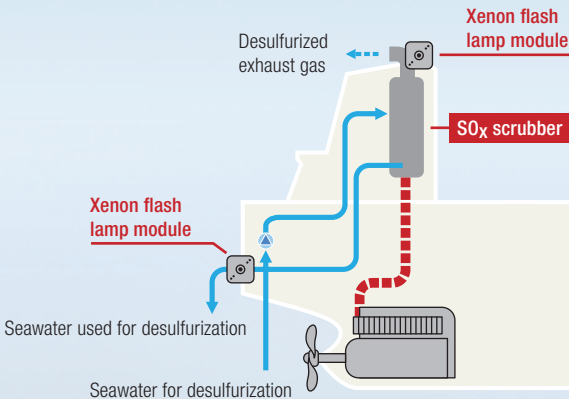
2012

2020

SO_x scrubbers for washing away SO_x with seawater are the key to dealing with the SO_x regulations that will become tougher in 2020

The maritime shipping industry has been promoting the reduction of SO_x (sulphur oxides) emissions mainly in areas where maritime traffic is concentrated such as the oceans near Europe and North American coasts. In 2020, the global regulations to reduce SO_x emissions will be set forth according to the International Convention for the Prevention of Pollution from Ships (MARPOL) that will strengthen and expand the regulations to include general sea areas in addition to the currently designated sea areas. To cope with these new regulations an exhaust gas cleaning system called the “SO_x scrubber” is being installed on ships.

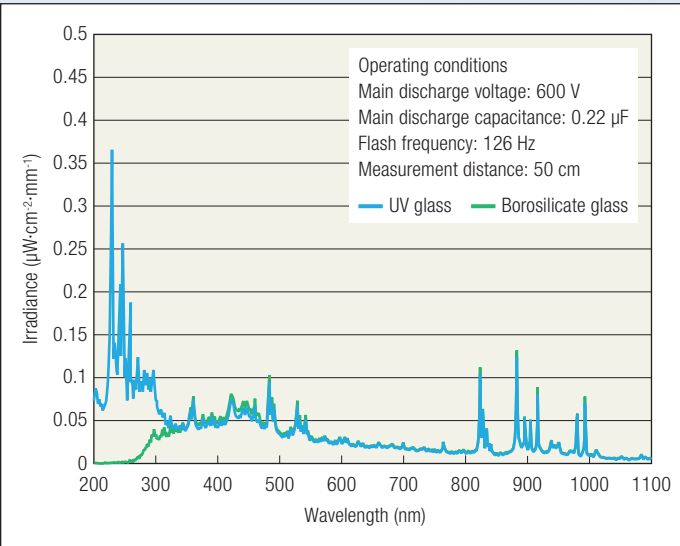
A SO_x scrubber, as the name implies, is a system that scrubs out or washes away SO_x in exhaust gas by using seawater. Installing this system along the exhaust gas path helps reduce the amount of SO_x emitted from ship engines and allows ship owners to continuously use their existing ship engines and fuels that might exceed the upper sulphur concentration limit if not improved. This method proves very effective in reducing SO_x emissions quickly, cheaply and in a short time period, so is likely to become the future mainstream approach. When using a SO_x scrubber, it is essential to keep monitoring exhaust gas as well as wastewater used for cleaning to ensure that the SO_x concentration is not higher than the specified level. The monitor devices for this purpose require a light source and Hamamatsu Photonics manufactures xenon flash lamp modules to meet that need.



Excellent luminous efficiency and instantaneously high optical output support measurements of even low pollutant concentrations in exhaust gas and wastewater

Currently, one technique called the “fluorometer method” for monitoring residual SO_x discharged from scrubbers is becoming the mainstream that determines the concentration of pollutants called PAHs (polycyclic aromatic hydrocarbons) by measuring their fluorescence. In this method, PAHs in exhaust gas and wastewater constantly discharged from a scrubber are excited by light to generate fluorescence. Xenon flash lamps were selected as a light source ideal for efficiently exciting PAHs. Our xenon flash lamps are designed to instantaneously emit highly intense light over a broad wavelength range from 160 nm to 7,500 nm. This allows measuring even low-concentration PAHs in exhaust gas and wastewater. We also provide compact lamp modules integrated with a power supply and trigger socket that easily install into equipment.

Spectral distribution (5 W xenon flash lamp module L9455 series)

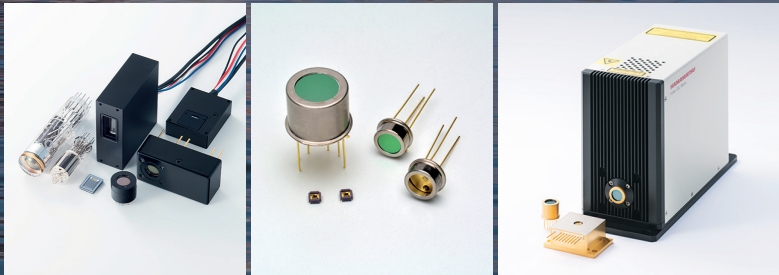


Responding to diverse analysis needs with our wide variety of light emitting and sensing technologies

Besides SO_x emission reduction described above, the maritime shipping industry is engaged in various environmental protection activities such as reducing NO_x emissions and deterring environmental pollution caused by ballast water. A wide variety of optical sensing technologies are applied to support those technologies. At Hamamatsu Photonics we have a wide ranging product lineup including light detectors such as photomultiplier tubes and InAsSb (indium arsenide antimonide) photovoltaic detectors and light sources such as xenon flash lamps and quantum cascade lasers (QCLs).

Bringing together our know-how from manufacturing electron tubes and discharge control technology to deliver the high stability and long service life needed to withstand long ocean cruises

There are even more reasons why our xenon flash lamps are selected for SO_x scrubber monitors used on ships. In modern maritime transport, containers are transshipped from one port to another to streamline transportation so it often takes more than a whole year for a ship to return to its home port. This makes it essential that the SO_x scrubber work both correctly and non-stop while the ship is at sea. These conditions mean that the SO_x scrubber and peripheral devices must have high stability and long service life and also be maintenance-free. Our xenon flash lamps are highly rated for their high stability and long service life achieved by electron tube manufacturing knowledge and discharge control technology we have accumulated since our company was first founded. We will further extend these characteristics and continue to develop even more compact and cost-saving products.



Photomultiplier tubes InAsSb photovoltaic detectors Quantum cascade lasers

