

## European Solar and Energy Storage Solutions

# Xenon lamp solar power generation



## Overview

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What are xenon arc lamps?

Xenon arc lamps are the most commonly used light sources among conventional solar simulators , , . Since there are intensity and spectral component differences between natural sunlight and artificial light, xenon arc lamps are modified using filters to obtain the natural sunlight spectrum .

Why are xenon lamps so efficient?

Xenon lamps are also known for their high luminous efficiency or the amount of visible light produced per unit of electric power. This efficiency stems from the high radiance of xenon in the visible spectrum and the lamp's ability to convert a large proportion of electrical energy into light rather than heat.

Which xenon arc lamp is used in a solar simulator?

By checking lamp models used in solar simulators ( Fig. 9 ), the Philips brand was found to be used twice with the same input power of 2 kW e. The simulator used a metal halide lamp (HPI-T) whereas the second had a tungsten halogen lamp (6994Z). Therefore, a Philips xenon arc lamp with an input power of 2 kW e was selected for comparison (LTIX).

What is the output of a xenon lamp?

The output of a pure xenon short-arc lamp offers intensity of light ranging from 20,000 to 500,000 cd/cm<sup>2</sup> and a color temperature of about 6200K. Though even in a high-pressure lamp, there are some very strong emission lines in the near infrared, roughly in the region from 850–900 nm.

How does a Xe lamp generate light?

Xe lamps, specifically Xenon short-arc lamps, have two distinct varieties: pure xenon, which contains only xenon gas, and xenon-mercury, which contains xenon gas and a small amount of mercury metal. The light generation mechanism in both types is based on the xenon gas being ionized, creating an

electric arc.

What are the two types of xenon short-arc lamps?

Xenon short-arc lamps come in two types: pure xenon, which contain only xenon gas, and xenon-mercury, which contain xenon gas and a small amount of mercury metal. A steady-state solar simulator typically uses a Xe short-arc lamp as the light source due to its high color temperature of 6500K, which is close to the Sun's spectrum (5500K).

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### The structure of the xenon lamp , Download Scientific ...

Concentrating solar power (CSP) is a fast-growing solar power generation technology that is expected to play an important role in the energy transition [9][10] [11]. Among all the CSP technologies

### Tunable high-flux solar simulator with enhanced uniformity for

The light core is a sphere with a diameter of 2 mm, which accounts for 70% of the emitted light power of the xenon lamp. The light cone is a cone with a bottom diameter of 5.5 ...



### Comparisons of IV Curves between Xenon Lamp-Based ...

The solar simulator designation AAA gives the highest rating of A to all three: spectral match, uniformity and stability. In this application, the Xenon lamp-based Oriel Sol3A Class AAA and ...

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The simulation results show that when a xenon lamp with a rated power of 6 kW is used as the light source, the single-lamp solar simulator

composed of a free-form condenser can produce a spot with an average irradiance of 274.4 kW/m ...



## Light Sources and Irradiance Spectrum of LED solar simulator for

Light sources of solar simulator including halogen lamps and xenon lamps have been adapted to LED as a result of lamp technology. Y. Tsuno, K. Kamisako, and K. Kurokawa, "New ...

## Light source selection for a solar simulator for thermal applications

A xenon arc lamp has a more stable spectrum as well as a brighter point source, allowing the generation of a high intensity collimated light beam. However, this lamp type has ...



## Indoor photovoltaics awaken the world's first solar cells

J-V curves of the solar cells were obtained using an AM1.5G solar simulator (Newport, USA) equipped with a Keithley 2420 source meter and 450-W xenon lamp (OSRAM) in air at room temperature. Light intensity was ...

## Light source selection for a solar simulator for thermal applications

Light sources used for solar simulators in thermal applications are reviewed. o Lamp types are discussed (argon arc, metal halide, tungsten halogen lamp and xenon arc). o ...



## Development of high flux solar simulators for solar thermal research

The application and design of solar simulators falls into two main classifications, non-concentrating uniformly distributed light used in the testing of photovoltaic (PV) cells and ...

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