XENON™ S-2300

Dual-Stage Sintering System

Advanced Energy Management for Leading-Edge Materials Research

The XENON S-2300 dual-stage system is a breakthrough in materials research, providing unprecedented control of high-energy Pulsed Light for the most challenging sintering, curing, and annealing applications.

Materials researchers are using Pulsed Light to explore innovative applications in printed electronics, bio sensors, OPV, semiconductor films, and other developing research areas. These applications can pose special challenges, especially where heat can damage the substrate, or where thick or multiple layers make uniform curing difficult.

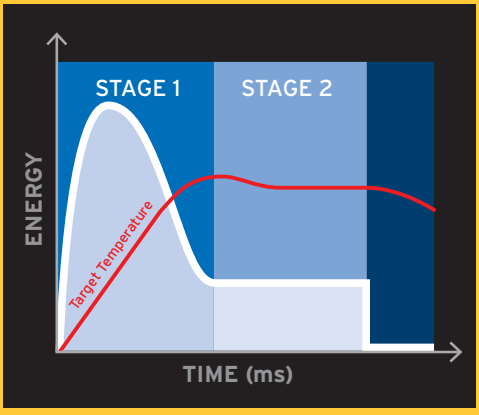
The XENON S-2300 was designed to meet these challenges with a patent-pending technology that gives materials researchers the ability to manage the energy delivered using a dual-stage pulse profile (see sidebar). With the intuitive touch-screen interface, researchers can quickly and easily program up to 40 pulse sequences for unprecedented control over the profile and total Pulsed Light energy delivered to the target area. Energy levels for each stage can be set independently and the system can adjust the pulse duration and amplitude automatically, if desired. The ability to quickly establish a wide range of energy exposure profiles supports studies of advanced materials such as nanoparticles and semiconductor thin films.

SYSTEM HIGHLIGHTS

- Unique pulse control that has two independent high-energy stages implemented in a single pulse.
- User flexibility to set energy or pulse width and amplitude
- Touch-screen user interface with pulse display, recipe storage and recall
- Ability to create up to 40 pulse sequences, each with its own dual-stage profile for flexibility in control of target thermal attributes
- Scalable software technology for Lab-to-fab capability

How Dual-Stage Pulse Control Works

XENON's patent-pending dual-stage technology is a breakthrough in materials research, giving users a new level of control over the waveform and characteristics of Pulsed Light energy. Researchers are able to set two pulse stages to operate simultaneously under independent control. Materials can be brought to a controlled high temperature using one pulse stage, and then held at that level long enough to complete the cure using the second pulse stage, all while controlling energy delivery to avoid damage to materials. As a result, XENON's dual-stage technology enables development in new and challenging applications in materials research.



A dual-stage profile where the pulse and duration are independently controlled. The red plot shows the intended thermal characteristics on target.

Advanced Software for Advanced Control

The S-2300's industrial touch-screen controller puts the power of dual-stage technology at the researcher's fingertips. Users can easily set pulse parameters and monitor the system operation in real-time. In addition, parameters can be saved and recalled when iniating new testing.

- Choose the desired energy levels and let the software adjust the way optical energy is delivered to the target
- View pulse profile and optical energy dose delivered by flash lamp
- Recipe storage and recall allows users to speed their process development as well as set the foundation for future software transfer to online, roll-to-roll applications

Enabling a New Generation of Challenging Applications

The XENON S-2300 is specifically designed to address emerging applications that materials researchers are investigating across a range of industries.

Display

In recent years, the development of new flexible displays has been directed at reducing manufacturing cost, material waste and processing time. High-energy exposure, using Pulsed Light from UV to near IR, achieves rapid curing with high uniformity and reliable production. Materials experience low heat during the curing process thus eliminating thermal damage to substrates.

Semiconductor Thin Film

The search for low-cost growth techniques and processing methods for semiconductor thin films is an area of increasing interest, especially in photovoltaics. Pulsed Light systems are applied to create localized heating in under 1ms, allowing films to be processed under atmospheric conditions, avoiding the need for inert or vacuum environments.[1]

Printed Electronics

Used for sintering nano inks, including copper, on flexible, heat-sensitive substrates. The ink is initially brought to a sintering temperature using one stage and then held at a constant temperature for a longer period to complete the cure using the second stage.

Configure a system for your research needs

XENON offers a range of lamps, housings, and other system elements, allowing researchers to tailor the S-2300 system to your specific requirements. In addition, our engineers will work with you to develop a customized lamp assembly that meets your unique research challenge.

Part of the XENON family of Pulsed Light solutions

XENON has pioneered Pulsed Light for more than 50 years, and has helped drive many applications from the laboratory to online production, in industries ranging from packaging and medical devices, to the latest advances in optical storage and printed electronics.

For more information on the XENON S-2300, visit www.xenoncorp.com or contact one of our sales representatives.

[1] *Dharmadasa, R.; Lavery, B.; Dharmadasa, I. M.; Druffel, T., Intense pulsed light treatment of cadmium telluride nanoparticle-based thin films. ACS Appl Mater Interfaces 2014, 6, (7), 5034-40.*

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