

HELIOS® Daylight Uniform Source System



Technical Challenge

A research center needed a uniform source capable of outputting high amounts of luminance at high color temperatures. The output would be sent through a collimator to simulate sunlight for certain testing procedures. The system would be used on an optical table alongside other units, creating space constraints.

Labsphere's Solution

Our standard HELIOS system is effective in achieving the spectral output and uniformity the client requested, however; some changes had to be made for the system to be able to fit within the given space. These are its features:

- High-powered xenon light source capable of outputting over 100,000 lux at 6,000K
- QTH light source capable of outputting 50,000 lux at 3,000K
- Variable attenuators attached to each lamp for continuous adjustability
- Spectrometer with automated shutter slide
- Silicon detector with shutter slide and filter wheel, including photopic and 900 nm bandpass filters
- Custom foam port plug allows connection to additional optical elements without loss of light or marring equipment

The standard HELIOS dimensions are 14 x 28 x 23 inches, but the client needed a much thinner configuration. Labsphere was able to rearrange the components to fit into a 17 x 18 x 28 inch space, with all components contained within the frame. Despite being much smaller than a standard HELIOS system, the system still outputs the desired luminance levels and offers exceptionally high uniformity for accurate and reliable measurements.

Uniformity With Both Lamps On

Spatial Uniformity	
Uniformity	99.07%
Non-Uniformity Deviation	.25%
Angular Uniformity	
Uniformity	97.93%
Non-Uniformity Deviation	.44%

Lamp Information

Lamp Setup	Color Temperature (K)	Illuminance (lux)
QTH Lamp Only	3050	41,790
Xenon Lamp Only	6372	160,000
Both Lamps	5335	205,000

Benefits

- The client was able to integrate Labsphere's system into their testing configuration without having to work around its size
- The rear hemisphere has no port holes, creating a wide, seamless area in the back of the sphere for optimal uniformity
- The foam port plug allowed the client to attach their collimator to the sphere easily without affecting the accuracy of their data
- Broad spectral control and availability, allowing easy adjustment of spectral radiance, color temperature, and wavelength distribution with Labsphere's HELIOSense software
- Accurately tunable light sources allow the user to perform tests at any light level, up to direct sunlight