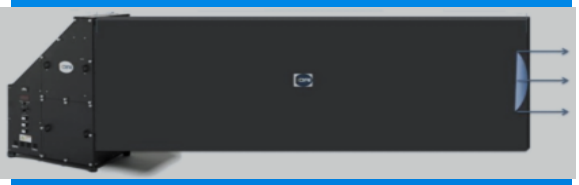
Trisol ™ 100mm x 100mm , Class ABA, AM1.5G and AM0, ±0.25° Collimation Angle Solar Simulator



High Performance for Space Applications

KEY FEATURES

- **Beam Size: 100mm x 100mm**
- **Long Lens Housing ~3m**
- **Various AM1.5G and AM0 Spectrum Options**
  - **280 – 1800nm,**
  - **300 – 1800nm**
  - **Any Custom Spectrum**
- **Meets JIS, IE C, ASTM Standards**
- **Perfect for Research & Development**
- **Multiple configurations:**
  - **Downward**
  - **Horizontal**
  - **Upward Beams**

- www.oainet.com
- sales@oainet.com

OAI's *Trisol*™ Class ABA, 100mm x 100mm, ±0.25° Collimation Angle Solar Simulator is designed with engineering technology perfected over a long history of our company since 1973.

OAI's builds these custom Solar Simulators using a special 1500W Xe short arc lamp housing. The ±0.25° Collimation Angle Solar Simulators have single 100mm x 100mm beam size. The system is designed with lens housing that has a length of 3 meters and a ±0.25° collimation angle to simulate the Sun in laboratory conditions for doing various experiments pertaining to space applications. The samples can be placed anywhere outside the beam after it leaves the lens housing.

This simulator applies special Class A+ AM0 and AM1.5G filters to provide Sun Spectrum with ranges from 280 – 1800nm, 300 – 1800nm or any other Custom Spectrum matched to the Sun's spectrum in space. There are dual filter holders which fit both Air Mass and Neutral Density (ND) filters together. OAI's Solar Simulator is certified to ASTM E927-05, IEC 60904-9 2007, and JIS C 8912 standards for Class AAA performance.

The intensity of the ±0.25° Collimation Angle Solar Simulator can be controlled to provide uniform beam up to 1.2Suns. These solar simulators also come in various beam configurations, to provide vertically downward, horizontal, or upward beam directions.

OAI's Class ABA, 100mm x 100mm, ±0.25° Collimation Angle Solar Simulator can be integrated with OAI's or other OEM IV Testing Systems to **provide current-voltage characteristics** of various solar cells in space. This special solar simulator can also be used to expose different samples while modeling Sun Light in space under laboratory conditions.

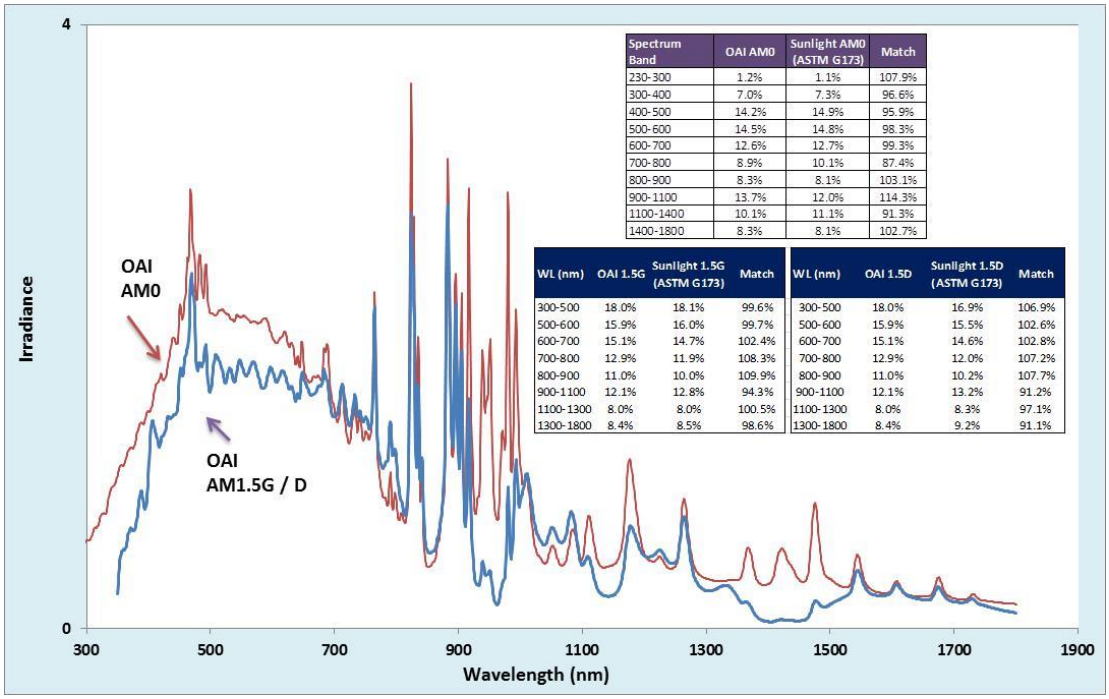
OAI Model #	±0.25° Collimation Angle Solar Simulator
Special	Constant Current and Intensity
Spectral Type	AM 1.5G and D, AM0
Spectrum Range Options	280 - 1800nm 300 - 1800nm
Beam Direction Configuration Options	1. Horizontal 2. Downward 3. Upward
Illumination Area	100mm x 100mm
Collimated angle	Half angle: <±0.25°
Typical Power Output	100mW/cm^2 (1Sun)
Spatial Uniformity	≤5% (Class B)
Temporal (ST)	<0.5% STI & <2.0% LTI (Class A)
Spectral Match	≤±15% (Class A+)
Working Distance	Anywhere outside the beam
Lamp Power	1500W
Power Requirements	120VAC - 220VAC/15A

Class ABA Performance and Certification:

OAI's Solar Simulators are manufactured and certified by OAI's engineering staff. All Solar Simulators go through a rigorous calibration procedure that includes testing of the lamp housing, mirrors and filters. Each system is then fine-tuned to achieve a Class AAA or ABA certification. A typical final test report contains the following set of data.

1. Class A+ AM0 and AM1.5G Sun Spectrum:

OAI provides spectrum match in various resolutions within ≤±15%.. The graph below shows the typical AM0 and AM1.5G spectrum curves and spectrums matches tabulated in various bands.



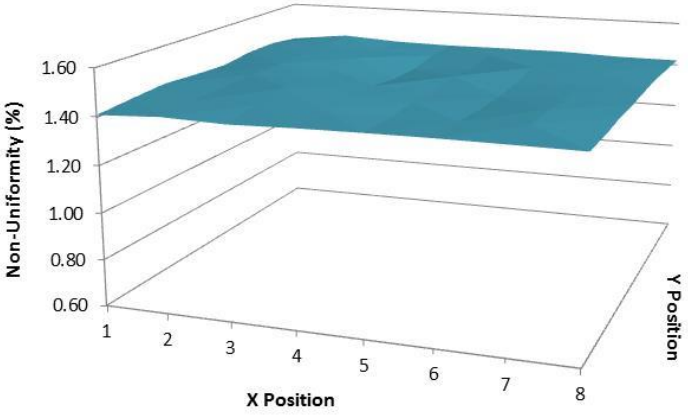
Spectrum Band	OAI AM0	Sunlight AM0 (ASTM G173)	Match
230-300	1.2%	1.1%	107.9%
300-400	7.0%	7.3%	96.6%
400-500	14.2%	14.9%	95.9%
500-600	14.5%	14.8%	98.3%
600-700	12.6%	12.7%	99.3%
700-800	8.9%	10.1%	87.4%
800-900	8.3%	8.1%	103.1%
900-1100	13.7%	12.0%	114.3%
1100-1400	10.1%	11.1%	91.3%
1400-1800	8.3%	8.1%	102.7%

WL (nm)	OAI 1.5G	Sunlight 1.5G (ASTM G173)	Match
300-500	18.0%	18.1%	99.6%
500-600	15.9%	16.0%	99.7%
600-700	15.1%	14.7%	102.4%
700-800	12.9%	11.9%	108.3%
800-900	11.0%	10.0%	109.9%
900-1100	12.1%	12.8%	94.3%
1100-1300	8.0%	8.0%	100.5%
1300-1800	8.4%	8.5%	98.6%

WL (nm)	OAI 1.5D	Sunlight 1.5D (ASTM G173)	Match
300-500	18.0%	16.9%	106.9%
500-600	15.9%	15.5%	102.6%
600-700	15.1%	14.6%	102.8%
700-800	12.9%	12.0%	107.2%
800-900	11.0%	10.2%	107.7%
900-1100	12.1%	13.2%	91.2%
1100-1300	8.0%	8.3%	97.1%
1300-1800	8.4%	9.2%	91.1%

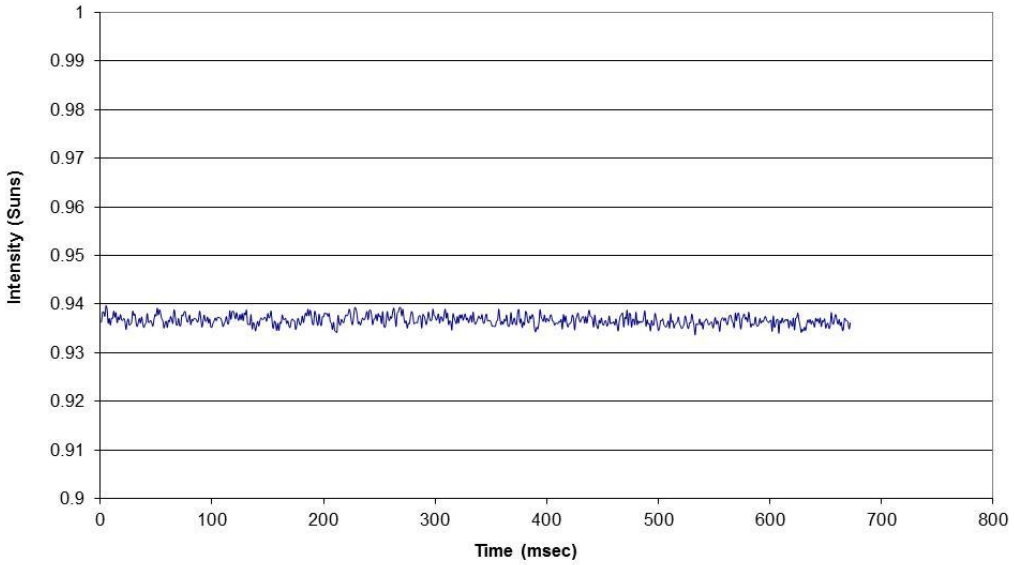
2. Irradiance Uniformity:

The Class A Spectral Spatial Uniformity Map of Irradiance for a typical 100mm x 100mm system is given in the chart below. With long working distances and integrated light homogenizers, the *Trisol* <±0.25° Collimation Angle Solar Simulator provides ≤5% Class B (or best effort ≤5% Class) spatial uniformity over the entire working area.



3. Temporal Instability:

The Class A temporal instability of OAI's typical 100mm x 100mm Solar Simulator system is shown in the graph to the right. The data is taken at 100ms time intervals. For accurate and repeatable solar cell performance measurements, lamp fluctuations from reading to reading should not cause data instability. Per the IEC 60904-9-2007 requirement as well as ASTM and JIS specifications, the measured data fluctuation for the short-term instability is within 0.5% and the long-term instability is <2% per the specifications for Class A.



About OAI

For over 47 years, OAI has been a leader in the generation, control, and measurement of light. Supplying advanced precision equipment for both R&D and production, OAI has gained a worldwide reputation in the PV/SOLAR, MEMS, Semiconductor, Microfluidics, MicroTAS, and Flat Panel industries. The company offers a broad portfolio of field-proven products that include: solar simulators, IV testers, solar power meters, calibrated reference cells, outdoor panel IV tracer, UV exposure systems, UV light sources, mask aligners, nano imprint modules, UV Measurement Instruments and numerous custom-engineered solutions. OAI's products deliver exceptional performance, high versatility and outstanding reliability. Based on a proven platform of modularized subsystems, many of these advanced tools can be custom configured to meet your specific requirements. With thousands of systems and instruments in use around the world, OAI prides itself on highly responsive customer service and superior engineering support.

464 S Hillview Drive• Milpitas, CA 95035 USA
Phone (408) 232-0600 • Toll free (800) 843-8259 • **sales@oainet.com**
www.oainet.com