

LEDs COPY THE SUN

The SINUS-70 is the ideal solar simulator for research. Its nearly perfect simulation of the sun's spectrum enables highly accurate and precise simulation of the sun spectrum for e.g. solar cell efficiency measurement or experiments in life and material science. The intelligent LED-based light source is what makes this exceptional accuracy possible. LED's present the new benchmark:

FEATURES

- Light engine with multiple LEDs
- Wide spectral range from 350 nm up to 1100 nm or 1260 nm.
- Wide range of exposure times, from flashes up to continuous illumination
- All LEDs can be separately tuned for user defined spectra
- Unique special optical lens system for perfect color mixing
- Reference intensity sensor in combination with fast feedback loop for automatic intensity correction
- Active cooling of all LEDs for perfect stability and long lifespan
- Optional water cooling for long exposure times
- Exceeds class AAA (IEC 60904-9, JIS C8912, ASTM E 927-10) criteria for spectral match, non-uniformity and temporal stability
- Allows storage of user defined spectra
- Intuitive user interface
- Typical LED lifespan of 20,000 hrs and more

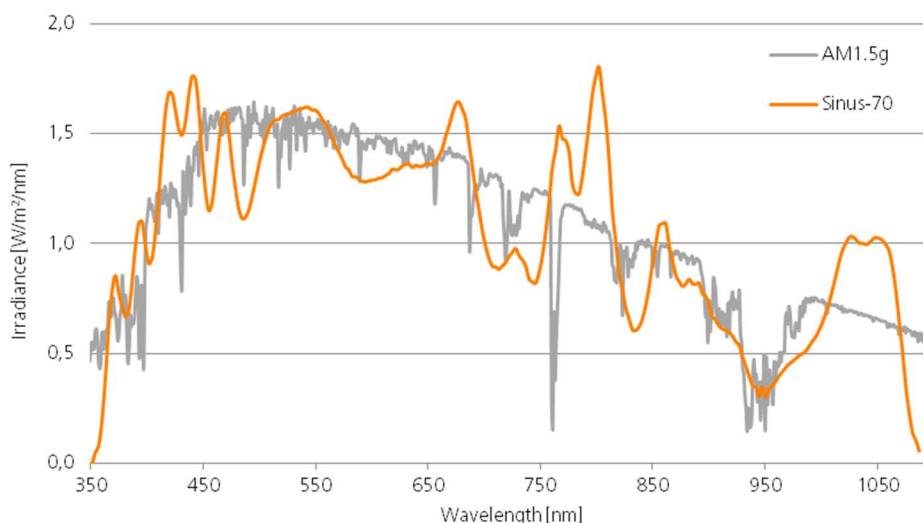
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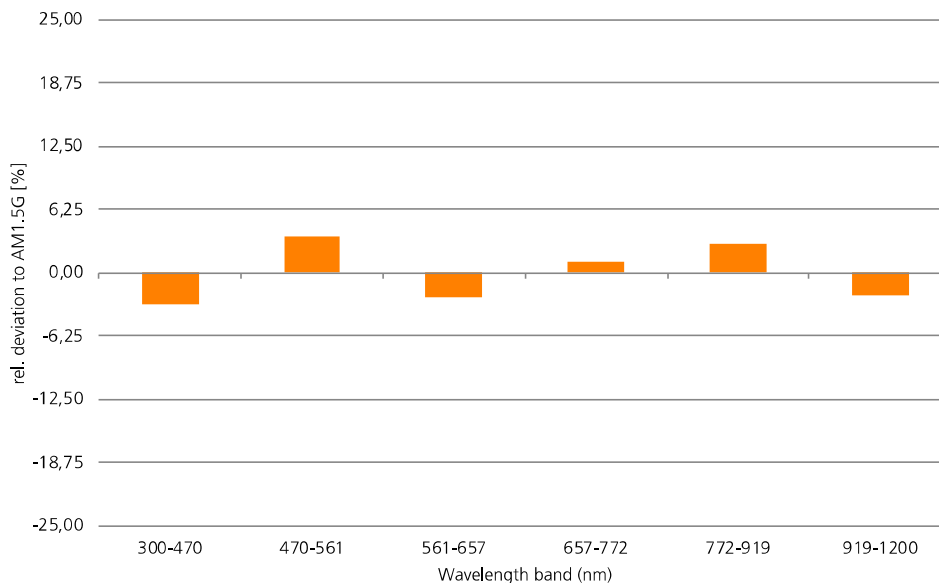
CLASSIFICATION

	SINUS-70		Class AAA requirements (IEC 60904-9)
Spectral Match	Class A++	0.95 - 1.05	0.75 - 1.25
Non-uniformity (2.5 x 2.5 cm ²)	Class A+	< 1%	2%
Non-uniformity (5.1 x 5.1 cm ²)	Class A	< 1.8%	2%
Long term instability (LTI) flash length < 0.5 s	Class A++	< 0.5%	2%
Long term instability (LTI) flash length > 0.5 s	Class A+	< 0.6%	2%

Validity of classification: WPVS cell ISE021/030-2014, 1 sun, AM1.5G, 250 ms, 5.1x5.1 cm², 33.5cm distance between light engine and test plane

SPECTRAL QUALITY


Typical spectrum of LED solar simulator SINUS-70



Typical spectral match.

PRODUCT FEATURES

Light source	Multiple individually controlled sets of LEDs with different peak wavelengths
Spectral range	Modular system allows flexible spectral range from 350 nm up to 1,100 nm or 1,260 nm (IR-booster)
Intensity range	From 0.1 up to 1 sun at class A
Spectrum	Various preset spectra like AM1.5. User can easily define other spectra including illumination by single LEDs or a combination of various LEDs
Irradiance time	From 10 ms up to continuous illumination (continuous illumination requires water-cooling of LEDs)
Special optical lens system	The multi-level special optical lens system ensures that all LEDs/colors are perfectly mixed so that each spot in the test plane is illuminated with identical spectrum
Feedback system	Monitor cell and spectrometer measure intensity and spectrum during each single measurement multiple times. Adjustments, if necessary, are made on-the-fly within 2 ms.
Active cooling	A special temperature cooling unit ensures that all LEDs are run at perfect operating temperature. In consequence, intensity and spectrum are perfectly stable for highly accurate measurements. For long exposure times and high repetition rate or continuous light water cooling is recommended for best stability and life span.
Test area	51 mm x 51 mm
Distance light engine - sample	33.5 cm is designated operating distance, rack allows easy height adjustment if e.g. sample thickness varies.
Light engine orientation	Rack allows flexible head orientation for sunny side up, sunny side down and various other angles.
System control	Software runs on conventional Windows PC or laptop. GUI can be controlled via touch screen or mouse and keyboard. Connection to SINUS-70 via USB. Remote control via TCP/IP/labVIEW routine possible.
Calibration	Factory calibrated.
Recipe management	User can save different settings each with different spectral composition and intensity.

PRODUCT REQUIREMENTS

Power	270 W @ 1 sun, 110VAC or 230VAC, 50/60Hz, 1 phase
Environment	Non-condensing ambient humidity with relative humidity less than 80%.
Chiller	Required for long flash times. 350W, 4l/minute, 0.5-1bar

SCOPE OF DELIVERY

Light engine (LxDxH 330x180x270 mm³, 24.5 kg incl. rack)
 Vertical stand (LxDxH 560x600x980 mm³)
 Controller incl. power supply (LxDxH 172x460x462mm³, 9 kg)
 Software

Specifications subject to technical changes

CONTACT

WAVELABS Solar Metrology Systems GmbH | Spinnereistraße 7 | 04179 Leipzig | Germany | sales@wavelabs.de | www.wavelabs.de

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