ABET TECHNOLOGIES

Function Focused Innovation™

Sun 2000 Solar Simulators

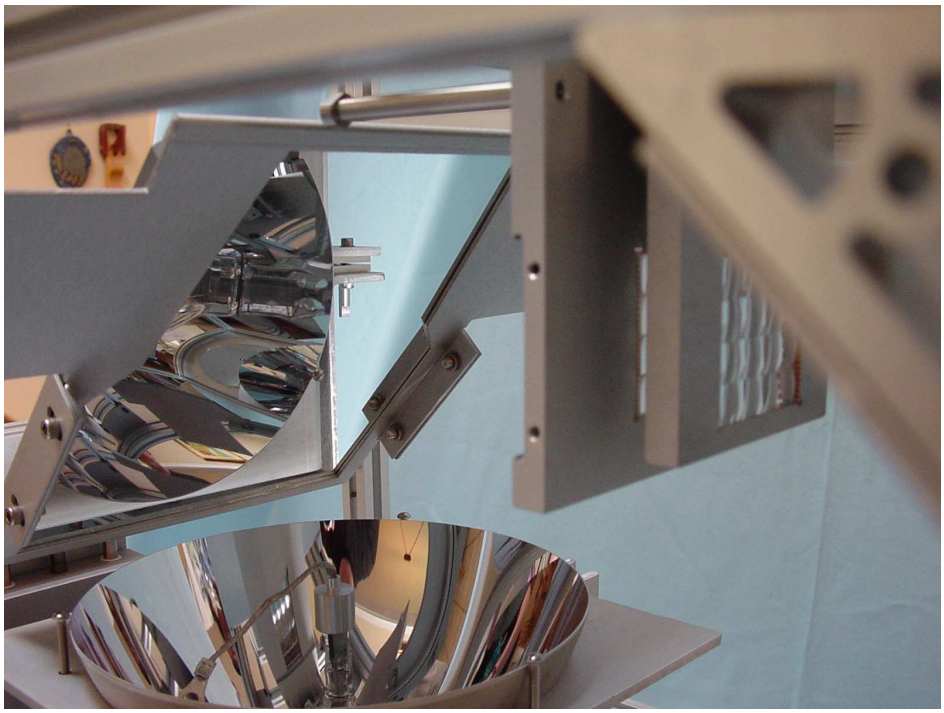
Up to 12x12 inch uniformly illuminated fields standard

High Optical Efficiency puts more photons to work

Working distances to 48 inches

Digital Shutter Timer

OEM Ready



The "optical engine" of Sun 2000 Solar Simulators

Introducing Sun 2000: The next step in Solar Simulation

Innovative

The Abet Gen II, patent pending, optical design dramatically increases the percentage of photons reaching the work plane.

Standard maintenance, lamp or filter replacement, does not require any tools. Locking indicator dials on all the system controls, located together for ease of alignment, provide for a reproducible setup. A beam imaging accessory makes alignment even faster.

All electronics are packaged in the lamp house – no clutter of high power cables to deal with.

The self-contained optics bench design of the Sun 2000 systems make OEM adaptations a breeze. Just drop it into your instrument and save on the NRE (non recurring engineering) costs.

Adaptable

Abet Technologies offers a number of spectral and field size options to match your application. The Sun 2000 family offerings range from 2x2 to 12x12 inch uniformly illuminated field versions for Photovoltaic and UV applications. The same optical train design also allows production of Hg and HgXe lamps based exposure systems.

Additional filters can be accommodated to fine tune the spectral characteristics of the source for your particular application.

A low profile optical alignment system leaves the space below the system wide open for any material positioning equipment or large samples. Unit mounting options allow from above suspension leaving space below totally free if needed.

Abet Technologies, Inc. 168 Old Gate Lane, Milford CT 06460 Tel: 203-540-9990 Fax: 203-301-0059
www.abet-technologies.com sales@abet-technologies.com

Copyright © 2007, Abet Technologies, Inc. All rights reserved.

ABET TECHNOLOGIES

Function Focused Innovation™

Compact, Integrated, Efficient, Safe, Convenient to use and maintain

The entire source, power supply, control electronics, shutter, lamp, and optical compartment are housed in a compact enclosure, approximately 13.75” deep X 23.75” high X 27.5” long (350X600X700 mm). A selection of simple bases allows positioning the various models at their design working distances. The Sun 2000 design produces a well balanced unit which is usually used free standing. It can also be suspended from above, and the base removed, for applications requiring more space around the illuminated work plane.

11044 1 kW Solar Simulator, 21x21 cm uniform field, with universal inch/metric compatible base

Gen II Optical System – more than 2x throughput improvement

The high efficiency illumination homogenizer is housed in the optical compartment which also contains a securely mounted Xe arc lamp, a light collection reflector, an electronic shutter, a condenser lens, optics cooling fan, precision optics adjusters, as well as filters, dichroics, mirrors, apertures, and attenuators needed to produce the desired spectral shape, uniformity and irradiance level.

Replacing the long life Xe arc lamp is a no tools required operation. Focusing the lamp does not expose the operator to any unsafe light levels (the exception possibly being the usual high irradiance level in the work plane).

All of the optical compartment adjustments are conveniently located on the rear of the source enclosure. They are equipped with lockable indicator dials that provide positive feedback on alignment status and assure stable operation once aligned.

Clean Cooling

Any dust or dirt particles introduced into an optical system can degrade system performance and shorten the life of critical optical components. Sun 2000 sources utilize a HEPA filtered cooling fan to extend the life of the delicate optical components.

Constant Intensity Option

Sun 2000 systems are equipped with the digital power and shutter controls. The controls also allow addition of a photofeedback option. This option incorporates a temperature stabilized light detector housed in the optical compartment which monitors the irradiance being delivered to the work plane. As the lamp or optical components age, and received signal diminishes, an electronic feedback loop automatically adjusts lamp wattage to assure a constant level of irradiation to the work plane.

Self Contained Electronics

The electronics compartment houses all the required power supplies, the electronics cooling fan, the shutter driver electronics, the digital controls and the elapsed time meter.

Having the complete source in a single enclosure assures that any EMI generated during ignition is contained inside the housing. It also eliminates the need for costly shielded cables and connectors.

Safety

Thermal interlocks shut the power supplies down in case of a fan failure to prevent damage that system overheating can cause. Door interlocks shut the lamp power down to prevent user exposure to hazardous voltage, current or radiation if the system door is accidentally opened during system operation.

Abet Technologies, Inc. 168 Old Gate Lane, Milford CT 06460 Tel: 203-540-9990 Fax: 203-301-0059
www.abet-technologies.com sales@abet-technologies.com
Copyright © 2007, Abet Technologies, Inc. All rights reserved.

ABET TECHNOLOGIES

Function Focused Innovation™

Specifications

Abet Technologies produces too many models of Sun 2000 Solar Simulators to fully describe in this summary information sheet. A typical system performance is presented below based on one of the available models:

11018 with an AM 1.5G filter

Illuminated field	6x6 inch
Maximum Irradiance (typ.)	1.3 suns
Irradiance uniformity	± 5%
ASTM 927-05	Class B
IEC 904-9	Class B
AM 1.5G spectral match	
ASTM 927-05	Class A
IEC 904-9	Class A
Temporal stability	1% RMS
ASTM 927-91	Class A
IEC 904-9	Class A
Xe Arc Lamp, ozone free	550 W
Typical life	1500 Hrs

Standards

Abet Technologies strives to meet customers' requirements for Solar Simulator performance, including standards compliance. Please let our sales department know which standard is critical to your application and if you require any certifications. Sun 2000 systems can be configured to meet the requirements of standards like ASTM 927-05 AM0 class A, IEC 904-9, JIS C 8912, COLIPA and many others.

Typical Specifications

Irradiance uniformity	± 5% or better
Working distance	8 inches

Irradiance uniformity stays well behaved for long distances, e.g. to 48 inch for a 6x6 system (Irradiance levels do fall off with distance. Please check with the factory on your requirements)

Standard systems illuminate	Horizontal surfaces
Optional straight output systems	Vertical surfaces
Electronic shutter	Included

Integrated 90 / 260 V, 50-60 Hz universal input power supply, power factor corrected, 1% RMS (typ.) light ripple (1-3 kW systems 190-260V input)
HEPA filtered cooling fan
Ozone free Xe arc lamp
Elapsed time meter
Optional built in photofeedback

Digital Controls

The digital control panel on all Abet solar simulators allows the user to set and control all functions of the instrument. Preset function allows setting of lamp operating point before it is lit. Output intensity can also be adjusted once lamp is ignited. A lockable knob prevents accidental changes to the output. Shutter exposure timing can be done with the included digital timer or with an external TTL gate input.

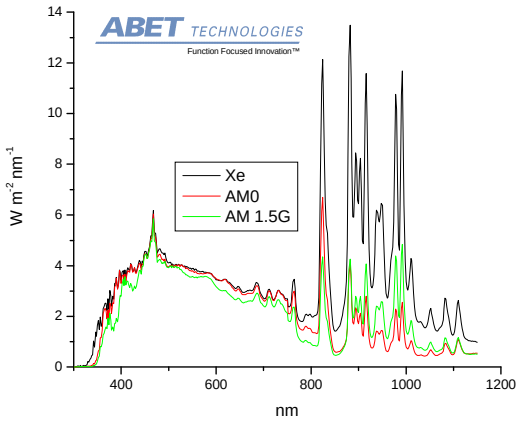
Ordering Information:

Please order the full spectrum or UV version by illuminated field size and then add any options like photofeedback, filters, spare lamps and accessories. Full spectrum systems normally ship with a borosilicate condenser lens to minimize UV exposure. UV systems ship with a UV fused silica condenser lens. If UV output is required from the full spectrum simulator fused silica condensers are used. An atmospheric absorption filter is used to provide UV edge match to the terrestrial solar spectrum.
Many other lamp power level, filter and attenuator options are available – please ask your sales representative for information on items you need to achieve the desired performance level.

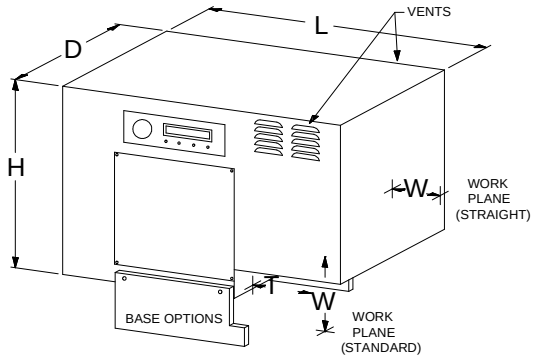
11016	Full spectrum 4x4 inch solar simulator
11018	Full spectrum 6x6 inch solar simulator
11020	Full spectrum 8x8 inch solar simulator
11016-1	UV 4x4 inch solar simulator
11018-1	UV 6x6 inch solar simulator
11044-1	UV 8.3x8.3 inch solar simulator
11054	AM0 Filter
11056	AM 1.5G Filter
11063	Atmospheric absorption filter
11058	COLIPA grade UV filter
11088	Photofeedback option
11090	Wireless control option
13021	Replacement lamp, 550 W Xe
11051	Replacement HEPA Filter

Abet Technologies, Inc. 168 Old Gate Lane, Milford CT 06460 Tel: 203-540-9990 Fax: 203-301-0059
www.abet-technologies.com sales@abet-technologies.com
Copyright © 2007, Abet Technologies, Inc. All rights reserved.

ABET TECHNOLOGIES
Function Focused Innovation™



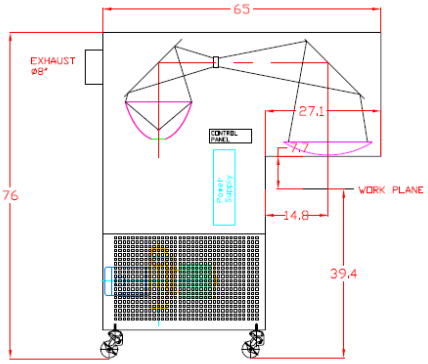
Irradiance of a 11018 full spectrum Solar Simulator, with a borosilicate glass condenser lens, with and without spectral shaping filters



Dimensional schematic of a Sun 2000 system

Typical values
Manufacturer reserves the right to modify the designs
Please consult your sales representative for specific dimensions of models you are interested in

Nominal Field size	Nominal Working distance	Working distance (closest)*	Working distance (farthest)*	Divergence full angle (typ.)	Nominal Working distance straight out	Dimensions H	D	L	W	T	Straight out L	Straight out W
Metric (mm)												
50x50	50	0	125	8.1	Consult factory	600	300	700	20	100	Consult factory	
100x100	100	0	1500	4.5	160	600	300	700	100	141	700	160
150x150	200	50	2000	3.4	200	600	300	700	200	141	760	200
210x210	200	50	2500	2.8	200	680	300	700	200	141	892	200
250x250	150	50	3000	2.3	150	840	400	750	150	225	1105	150
English (inch)												
2x2	2	0	5	8.1	Consult factory	23.6	11.8	27.6	0.8	3.9	Consult factory	
4x4	4	0	60	4.5	160.0	23.6	11.8	27.6	3.9	5.6	27.6	6.3
6x6	8	2	80	3.4	200.0	23.6	11.8	27.6	7.9	5.6	29.9	7.9
8.3x8.3	8	2	100	2.8	200.0	26.8	11.8	27.6	7.9	5.6	35.1	7.9
10x10	6	2	120	2.3	150.0	33.1	15.7	29.5	5.9	8.9	43.5	5.9



12x12 system

* Please note, maximum irradiance levels achievable at long working distances can be significantly lower than those at nominal working distances. Please consult your sales engineer with your detailed requirements prior to ordering a system.

Abet Technologies, Inc. 168 Old Gate Lane, Milford CT 06460 Tel: 203-540-9990 Fax: 203-301-0059
www.abet-technologies.com sales@abet-technologies.com
Copyright © 2007, Abet Technologies, Inc. All rights reserved.