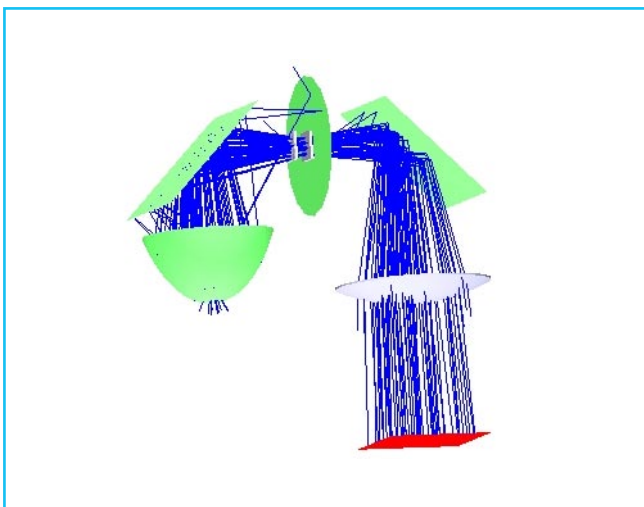


- Highly uniform, large, collimated beam
- High intensity UV output with little VIS and IR
- Choice of dichroic mirrors for wavelength selection
- Shutter control of exposure time

These efficient mercury arc illuminators produce an intense, uniform, collimated beam of ultraviolet or visible radiation. Efficiency comes from the ellipsoidal reflector which collects 70% of the flux emitted from the lamp, and the proprietary low loss optical integrator, which provides a repeatable uniform light beam. The illuminator shutter provides exposure time control.

This complete line of illuminators can provide uniform beams from 50 x 50 up to 250 x 250 mm², and are available with lamp powers of 350, 500, 1000 or 1600 watts.



Features

With all the light sources we sell, it can be difficult to determine the differences and decide which is the best system for a given application. Choose one of these illuminators if you need high intensity uniform and collimated UV radiation.

The performance of collimation and beam uniformity is a critical point in photolithography.

These systems are most often used for:

- Photolithography
- Flood exposure for
 - Presensitization
 - Photostabilization
 - Conformable mask imaging
- UV Photobiology
- UV Testing

System Components

Each Source is made up of three components: the illuminator housing with ignitor, lamp and power supply.

Illuminator Housing

Fig. 1 shows the beam path of the housing. An efficient ellipsoidal reflector collects up to 70% of the lamp output and directs it to a NUV or DUV dichroic reflector for spectral selection. The optical integrator scrambles the light and produces many diverging beams. These diverging beams overlap at the collimating lens to produce a uniform, collimated beam at the work plane. An electronic splitblade shutter lets you time exposures. An ignitor, required to send the high voltage ignition pulses to the arc lamp, is positioned close to the lamp to reduce the pathlength to pulse must travel; this facilitates ignition and reduces EMI. The housing is also equipped with an interlock system for the safety of the operator. A temperature controlled fan provides air cooling to ensure optimum lamp, optics and housing temperature.

Lamp

The lamp is a 350 W Hg, 500 W Hg, 500 W Hg(Xe), 1000 W Hg(Xe) or 1600 W Hg(Xe) short arc lamp, depending upon the source you choose.

Ignitor

All sources contain a high voltage ignitor, necessary to ignite mercury(xenon) arc lamps. This ignition system applies a high voltage (30 kV) pulsed discharge across the lamp electrodes. It is mounted inside the lamp housing, which minimizes the cable length the pulse must travel. The result is superior lamp start reliability with greatly reduced EMI.



Power Supply

High wattage lamps demand a reliable power supply. Our Power Supplies are dependable and long-lived, and offer many convenient features for lamp operation, including RS 232 and optional IEEE-488 (GPIB) computer interfaces for remote lamp control and monitoring.

Lamp ignition is safe and easy. Simply connect the two high voltage cables to the lamp housing and plug in the power cord, and you're ready to ignite the lamp. The power supply's contribution to output stability is significant. The output of these new power supplies change by less than 0,03% even for large swings in the line voltage. Light ripple is an impressive <1% r.m.s.

The lamp itself and the lamp housing also contribute to the output stability of the source. Arc lamps suffer from arc fluctuations due to convection currents inside the lamp and arc migration on the electrodes as well as overall aging. To minimize signal changes beyond the power supply's control, we recommend that you use the Light Intensity Controller. It compensates for short term arc wander and ensures long term stable performance.

Shutter

This solenoid actuated, split blade shutter is built for reliability under the heavy heat load. The mean cycles before failure is in excess of a million operations.

Neither the Stand Alone Digital Timer, nor the Light Intensity and Timer System drive the shutter. They provide TTL output for the driver, which is a part of the shutter system.

Specifications	
Lamp Type:	DC Hg(Xe) or Hg short arc
Power:	350, 500, 1000, 1600 W
Lamp Lifetime:	400 - 1000 hours depending on lamp type
Beam Size:	50 x 50 mm ² up to 250 x 250 mm ² (see table on next page)
Collimation:	1,4 - 6,6° depending on beam size and lamp (see table on next page)
Beam Uniformity:	± 5%
Output Intensity:	see table on next page
Light Ripple:	<1% r.m.s., typ.
Power Requirements:	Housing: 95-264 VAC; 3 A max Power Supply: 500 W: 95-264 VAC; 8 A 1000 W: 95-264 VAC; 15 A 1600 W: 190-264 VAC; 12 A

Output Spectra

The primary Source is a mercury lamp. Fig. 2 shows a typical output spectrum for the 500 W mercury lamp. Each illuminator includes a dichroic mirror which reflects the desired wavelengths and passes most of the infrared. The final output spectrum then closely resembles the mercury lamp spectrum multiplied by the reflectance of the dichroic mirror (Fig. 3).

We offer three wavelength ranges:

- 350 - 450 nm, designed to expose most of the available photosensitive materials
- 260 - 320 nm, for polymer cross linking and novel resist materials
- 220 - 260 nm, for deep ultraviolet studies

You can change the dichroic mirror to change your spectral output. A fully reflective mirror is available to special order.

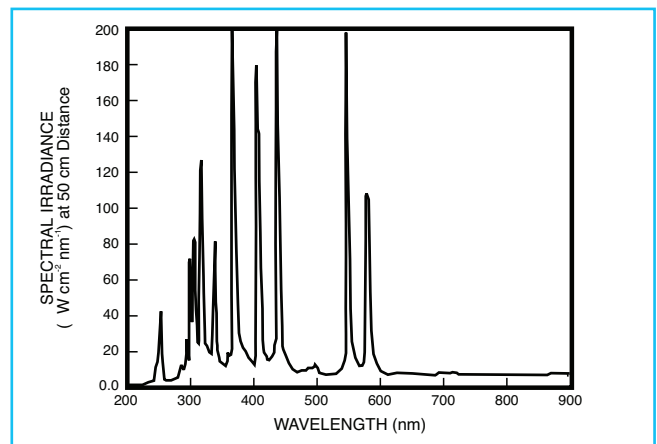


Fig 2 Typical Output of a 500 W Hg Lamp (in Air)

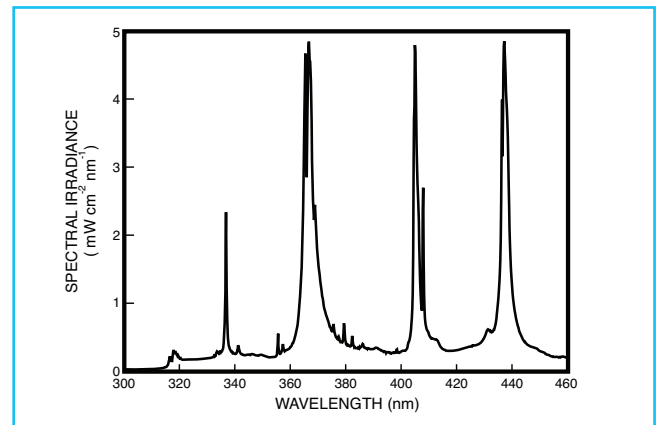
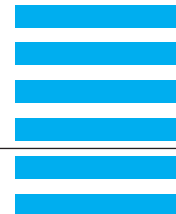


Fig 3 Output of a lamp in Illuminator Housing modified by a 350 - 450 nm dichroic

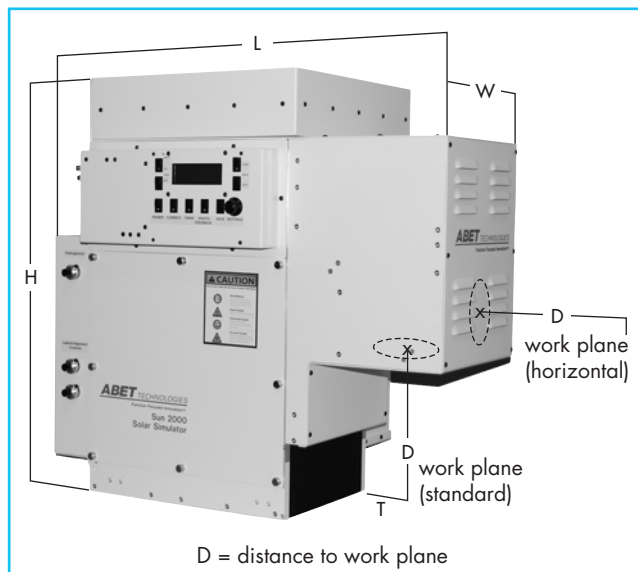
Photoresist Exposure Sources



Ordering Information

All sources include an illuminator housing, ignitor, power supply and necessary cables. Order the lamp separately. For source model numbers see the table below.

Lamps	
200 W Hg arc lamp	LSB620
500 W Hg(Xe) arc lamp (deep UV)	LSB740
1000 W Hg(Xe) arc lamp, ozone free	LSB751
1000 W Hg(Xe) arc lamp, UV enhanced	LSB750



	H	W	T	Standard		Horizontal	
				L	D	L	D
50 x 50 mm ²	513	321	100	283	20	upon request	
100 x 100 mm ²	513	321	141	762	100	762	160
150 x 150 mm ²	513	321	141	762	200	822	200
200 x 200 mm ²	513	321	141	762	200	954	200

Dimensions in mm

Specifications and typ. output

Lamp Type	Beam Size (mm ²)	Collimation Angle (± Degrees)	Working Distance (mm)	Spectral Region					
				220 - 260 nm		260 - 320 nm		350 - 450 nm	
				Typical Output (W m ⁻²)		Typical Output (W m ⁻²)		Typical Output (W m ⁻²)	
200 W Hg	50 x 50	4,6	50					2500	LS0210
	100 x 100	2,6	80					750	LS0211
	150 x 150	1,8	100					360	LS0212
	200 x 200	1,4	140					200	LS0213
500 W Hg(Xe)	50 x 50	4,6	50		LS0220		LS0230		
	100 x 100	2,6	80		LS0221		LS0231		
	150 x 150	1,8	100		LS0222		LS0232		
	200 x 200	1,4	140		LS0223		LS0233		
1000 W Hg(Xe)	50 x 50	6,6	50		LS0240		LS0250		LS0260
	100 x 100	3,8	80		LS0241		LS0251		LS0261
	150 x 150	2,5	100		LS0242		LS0252		LS0262
	200 x 200	2,0	140		LS0243		LS0253		LS0263
	250 x 250	1,6	180		LS0244		LS0254		LS0264

Note: These figures are nominal. They are based on integrated spectral radiometric measurements of similar sources. These do not necessarily correspond with measurements by various broadband instruments with varying spectral response.

Beam Uniformity: ±5% over the specified area. This is measured at a plane at the recommended working distance from the collimating lens. Uniformity will degrade somewhat at other distances.