

Cosine Response Diffusers



For the measurement of spectral irradiance, Bentham understand the necessity of input optics with correct angular response and high throughput.

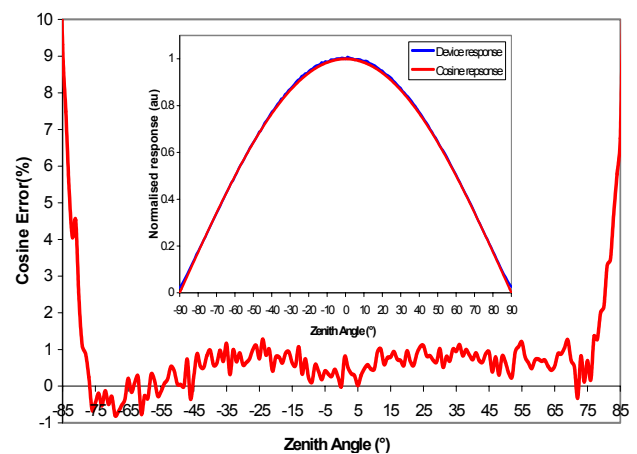
The Bentham family of diffusers includes a range of calibrated devices with near perfect match to the cosine response and high throughput. Variants are available for use with Bentham fibre bundles, monochromator entrance slits and now with SMA adaptor for use with third party devices.

D6 / D7



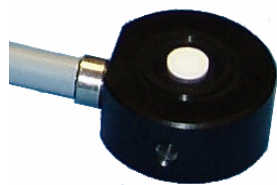
The D6 and D7 diffuser are PTFE-based in line devices, for use over the spectral range 200-600nm (D6) and 200-1100nm (D7). The D6 offers greatest throughput in the UV.

The cosine response error, f_2' of these devices is typically around 0.75% with a maximum error below 1%.



Example cosine response of calibrated D6 diffuser

D6-H / D7-H



The D6-H and D7-H variants are intended for those applications where, for space or other considerations, it is desirable to couple light perpendicular to the optical axis. They exhibit negligible loss in throughput or reduction in cosine response.

Environmentally protected



Where measurements are performed out-of-doors, it is important to pay great attention to contamination of the input optic.

To protect the diffuser a quartz dome may be fitted. This is always accompanied by a dry-air re-circulation system to prevent condensation on the dome.

The quartz dome has a slight impact upon the resultant cosine response of the device, typically around 1.5%.



IS75-ENV

SMA connectorised



Whilst there is a great selection of compact array-based spectroradiometers in the market, there is a lack of good diffusers for use with them.

All Bentham diffuser variants can be supplied with SMA connector for use with such devices. Typically the cosine error of such devices is around 1.5%.



Cosine Response Diffusers

Model	Spectral Range of use (nm)	Typical f_2' calibrated (%)	Max. f_2' calibrated (%)	Notes
D6	200-600	0.75	1.0	In-line
D6-H	200-600	0.75	1.0	Horizontal
D6-ENV	200-600	1.5	2.0	Quartz dome
D6-SMA	200-600	1.5	2.0	SMA
D6-SMA-ENV	200-600	1.5	2.0	Dome & SMA
D7	200-1100	0.75	1.0	In-line
D7-H	200-1100	0.75	1.0	Horizontal
D7-ENV	200-1100	1.5	2.0	Quartz dome
D7-SMA	200-1100	1.5	2.0	SMA
D7-SMA-ENV	200-1100	1.5	2.0	Dome & SMA

Integrating spheres (200nm-3000nm)

To cover extended wavelength ranges from the UV into the infra red, one migrates from the use of diffusers to integrating spheres designed to achieve good cosine response. Bentham offers a range of integrating spheres including the D8 which can be fibre coupled or slit mounted and the IS75-Env with quartz dome.



D8 Fibre coupled sphere

Solar Measurement Accessories



Rotating Shadow Band

- For measurement of diffuse solar irradiance
- Algorithm determines solar position
- Possible to calibrate in situ

CL6 Standard of Spectral Irradiance

- 150W quartz halogen lamp standard
- Enclosed housing– no need of dark room or alignment
- Supplied with diffuser adaptor
- Calibration traceable to NPL UK



Solar Tracker & Direct Solar Accessory

- For measurement of direct solar radiance
- Algorithm determines solar position
- Tracker angular accuracy 0.1°
- weatherproofed to IP66



Dry Air Pump

- Eliminates condensation in environmentally sealed diffuser
- Easy to replace drying crystal cartridges
- Can be used with multiple devices in series