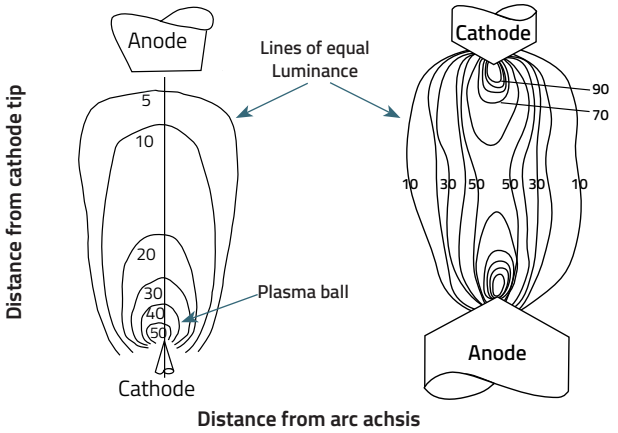
Distribution of luminance & beam uniformity

Distribution of luminance



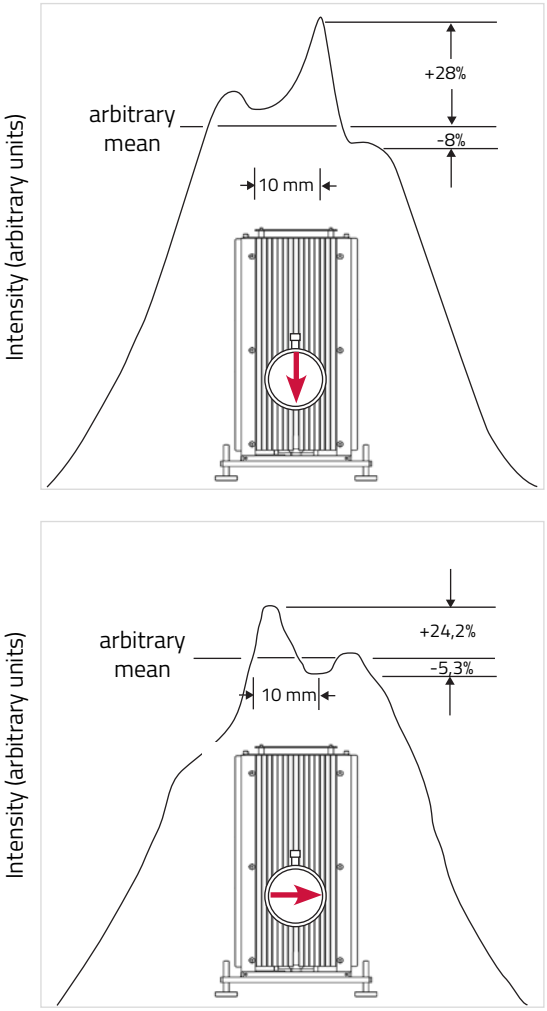
Distribution of luminance for Xe- und Hg(Xe) lamps

Distribution of luminance for Hg-Lampen

For most applications (especially in spectroscopy) the luminance or radiance is important. As shown in the figure above, Xe arc lamps have one "hot spot" at the cathode while Hg arc lamps have "hot spots" at both electrodes. These plasma balls may be imaged onto pinholes, fibers, monochromator slits or other small targets for maximum illumination (only the plasma ball, not the total area).

Beam uniformity

The figure shows that the arc of arc lamps is non-uniform and non-circular. They have intensity peaks near the electrodes. Therefore the beam of lamp housings with optics for best collimation is non-uniform and divergent. The figure below shows the collimate output of a 200 W Hg-lamp in the vertical and horizontal planes.



Collimate output of a 200 W Hg lamp, vertical and horizontal

Because of the non-uniform and non-circular beam, the divergence in one plane is not the same as that in the orthogonal plane. For most design purposes, the arc size quoted in the chapter "DC Short arc lamps, specifications"and the lens focal length give a good guide to divergence.

For low divergence beams you should consider small arc sources and if necessary, use a pinhole as interim image.

Quantum Design EUROPE

Quantum Design GmbH
Breitwieserweg 9
D-64319 Pfungstadt

Jörg Tobisch : +49 6157 80710-50
tobisch@qd-europe.com
Find your local contact at www.qd-europe.com