

ARC SOURCES - EXAMPLES OF APPLICATIONS

Xenon, Mercury, Mercury-Xenon

Because of their high luminance and small arc size, Xenon and Mercury high-pressure lamps are particularly suitable as light sources for:

Illumination of monochromator slits

The small size of the arc plus a matching optical system makes it possible to bring the light through the narrow slits of a monochromator and fill the first mirror of the instrument to optimise the light throughput.

Illumination of cuvettes

Here the use of arc lamps at the focal point of an elliptical reflector can prove advantageous. This arrangement is very effective to illuminate cuvettes with a high light power.

Projection

The high light output small spot size and the high colour temperature of about 6000 K results in an intense white light which gives excellent colour reproduction.

Infra red experiments

By simply replacing the Xenon or Mercury lamps with Halogen lamps or a CESIWID Glowbar, experiments can be undertaken down to the far infra red.

UV light

Because Mercury and Xenon lamps emit up to 10% of their light in the 200 nm to 400 nm range they are particularly suitable in research as UV light sources for fluorescence spectroscopy, testing and ageing of materials and as sun simulators. They are also used in medicine for dermatological and other applications.

Deuterium lamps

Deuterium arc lamps are low pressure lamps. A gas fill pressure of a few mbars produces a continuous spectrum from 190nm to 400nm. The small luminous spot dimensions, high luminance and spectral characteristics of Deuterium arc lamps make them particularly suitable as light sources for fluorospectrophotometers - and also as UV standard light sources.

REQUIREMENTS OF LAMP HOUSES AND POWER SUPPLIES

The operation of high pressure arc lamps demands special attention to the construction of the light source.

MECHANICS

During operation Xenon and Xenon-mercury lamps operate at a very high pressure (60 - 80 bars). Therefore the lamp housing must be constructed to meet the following criteria: The lamp housing must be constructed such that it can withstand a possible explosion. Temperature changes in the lamp housing must not alter the alignment of the lamp housing optics and arc lamp. The lamp must be allowed to expand freely during operation as it heats up. The location of the lamp must be adjustable during operation. The cooling of the lamp must be arranged such that the arc is not disturbed, and also that the lamp electrode temperature does not exceed 230 C. Lamp changing should be a simple operation.

ELECTRONICS

The switching on of a Xenon high pressure lamp is done in three stages: First a high frequency voltage of 20-40 KV gives the spark flash between the electrodes of the lamp. Immediately a voltage of 60-90 V is developed at the electrodes, in order to build up a stable arc light. After that the voltage drops to that of the operational value of the lamp. Xenon high pressure lamps operate at 20-30 V depending upon the model and the lamps output, against which Mercury high pressure lamps start at 10-15 V and after the heating up phase, require a voltage of 35-40 V. Low power lamps i.e. XBO 75 require a power regulation, higher power lamps need a current regulation. In order to obtain a stable arc and to guarantee the lifetime of the lamp, the ripple current must be as small as possible.

Lamp housings and power supplies from MÜLLER ELEKTRONIK-OPTIK comply with these demands and guarantee trouble-free operation of the Xenon and Mercury high pressure lamps.