Medium pressure

UV lamps

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MPL general information

eta plus electronic gmbh develops and manufactures medium pressure UV lamps in the power range from 1 kW to 32 kW. Typical applications are curing of inks and varnishes; disinfection of drinking and waste water; applications in the food and beverage industries or in the disinfection of swimming pools and ballast water.

The overall success of medium pressure UV lamps is based on its exceptionally high power density. As shown in Fig.1 the Medium Pressure UV Lamp (MPL) has the highest available power density of all existing UV lamp technologies.

The higher power density enables powerful, efficient and compact UV solutions. Due to the lower number of lamps, the system complexity and maintenance costs are significantly reduced.

The lamp UV radiant power is almost independent of ambient temperatures. This enables stable operation of UV systems under even strongly varying process parameters.

When powered by our perfectly matched electronic lamp control units **ELC®** the medium pressure lamps show exceptionally high lamp service lifetime and strongly minimized dependence on switching cycles. All relevant electrical lamp parameters are precisely close loop-controlled and monitored online. This enables smart and effective in-field diagnostics.

This optimum lamp-ballast combination guarantees lowest system maintenance costs at highest reliability.

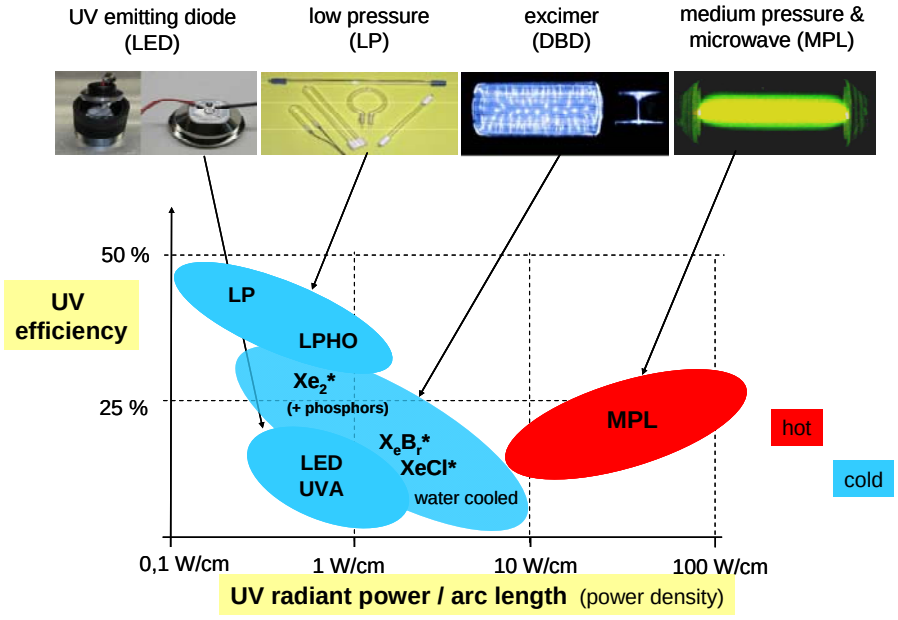


Figure 1: lamp UV efficiency over power density

MPL spectral radiant power

In contrast to most other UV sources, the MPL has a polychromatic spectral distribution ranging from 190 nm up to the IR. A typical spectral distribution for non-doped lamps is shown in Fig. 2. The far infra-red radiation is principally determined by the bulb temperature which ranges from 600 °C to max. 900 °C. All other wavelength ranges directly depend on the plasma properties such as temperature, pressure, and atomic and molecular content.

The UV radiant properties of standard mercury lamps are directly linked to the radiating characteristics of atomic mercury. The typical UV efficacy is shown in table 1.

The values shown in Fig. 3 vary strongly on operating and filling conditions and are seen as typical orders.

The radiant power of non-doped standard mercury MPL is dominated by its strong UVC emission which is mostly required in all germicidal applications.

By adding dopants such as iron, gallium or indium the spectral radiant power can be significantly varied. The emission can be tuned to the specific action spectra required for each application. Typical spectra are shown on the following pages.

The UVC, and especially the wavelength range below 230 nm, can be enhanced by tuning the quartz and plasma properties.

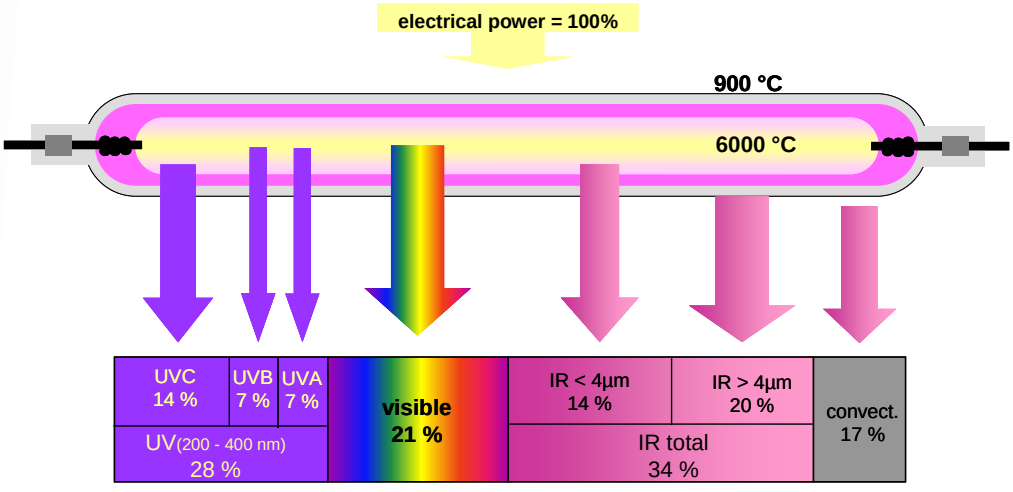


Figure 2: lamp power balance for standard mercury MPL

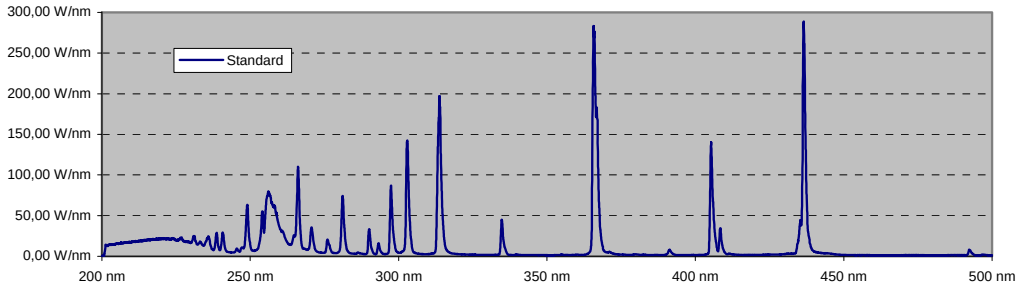
Efficacy	Standard	A (Gallium-Indium)	B (Iron)	C (Lead)
UV (200nm - 400nm)	28%	19%	35%	27%
UVV (400nm - 440nm)	6%	14%	7%	8%
UVA (315nm - 400nm)	7%	7%	20%	9%
UVB (280nm - 315nm)	7%	6%	6%	6%
UVC (200nm - 280nm)	**15%**	**6%**	**8%**	**12%**
TOC (200nm - 230nm)	5%	1%	2%	3%

Values are typical, they are strogly depending on lamp type and operating properties

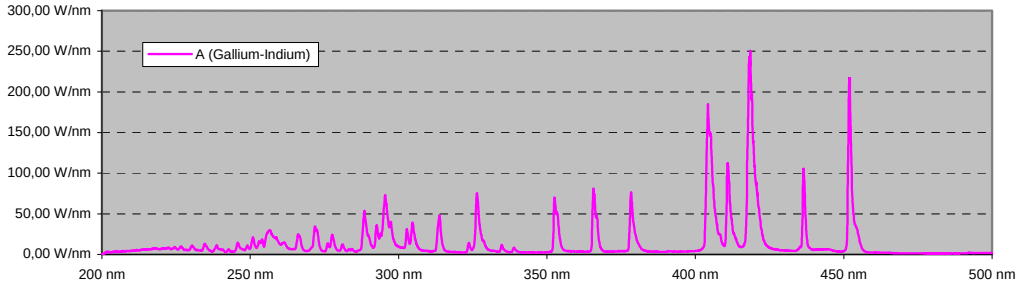
Table 1: lamp efficacy

MPL spectral radiant power

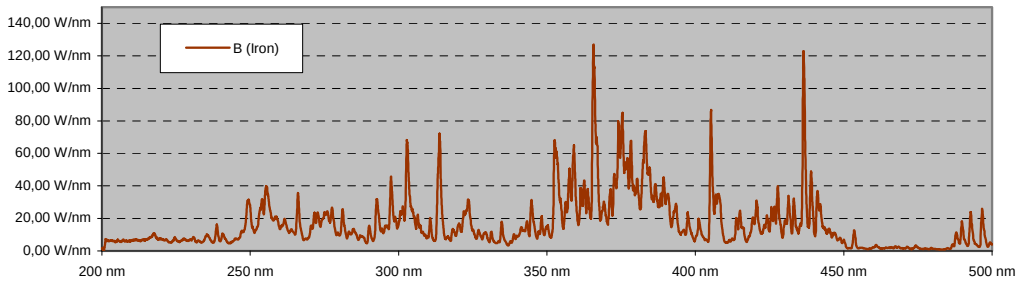
Standard Hg



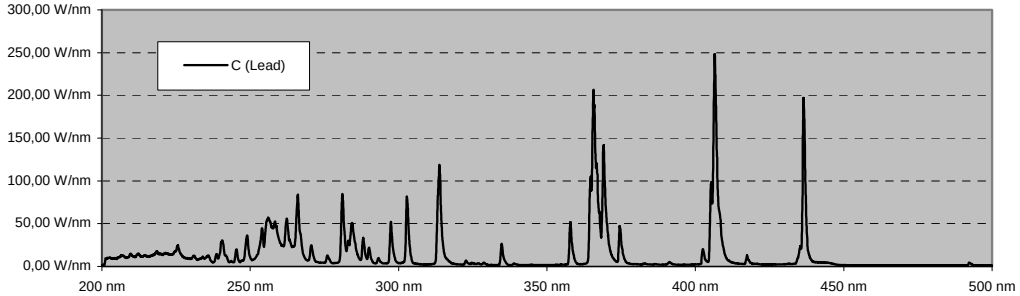
A (Gallium-Indium)



B (Iron)



C (Lead)



MP customised lamps

The key to your success lies in eta plus' lamp engineering and manufacturing know-how. We take pride in partnering you to supply the ideally engineered solution for your UV application. But we do not stop there: we remain at your service with quick and reliable after-sales support.

Our in-house lamp manufacturing is certified according to DIN EN ISO 9001:2008. Our internal quality control rejects any lamp not meeting the highest expectations; each remaining lamp is individually recorded before it is despatched.

Our customised lamp solutions provide the utmost UV efficiency coupled with the longest service lifetime for your application, thus saving on costs. Customised lamp ends not only ensure easy installation but also secure your after-market sales.

It is the expert interplay of the lamp's optical, thermal, electrical and mechanical properties which determines the perfect Medium Pressure Lamp. The table below shows the most significant parameters in producing your perfectly engineered individual solution.

Nominal power:	1 kW – 32 kW
Specific power:	40 W/cm – 300 W/cm
Arc lengths:	50 mm – 2300 mm
Bulb diameter:	16 mm – 28 mm
Quarz types:	- Standard - Ozone free (OF) - Pure Silica (PS) - Others on request
Filling / Dopants:	- Standard mercury - Gallium- indium (A) - Iron (B) - Lead (C) - Others on request
Lamp ends:	Either standard or individually customised
Electrical connection:	Wire connection or plug connection; double ended or single ended

Table 2: MPL variable characteristics