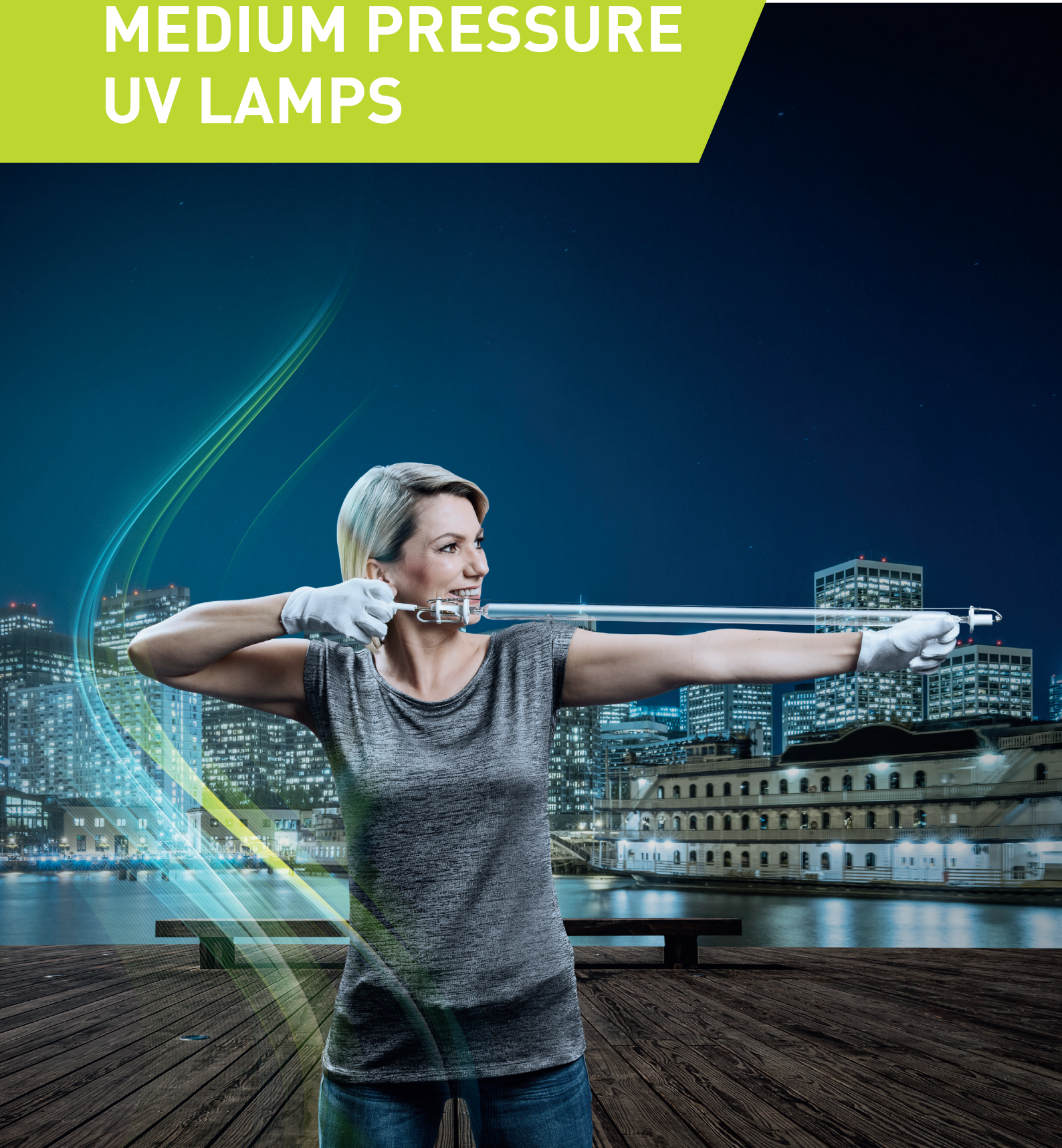




Product Flyer

MEDIUM PRESSURE UV LAMPS



MPL General Information

eta plus electronic gmbh develops and manufactures medium pressure UV lamps in the power range from 1 kW to 40 kW. Typical applications are curing of inks and varnishes; disinfection of drinking and waste water, ballast water treatment on ships, applications in the food and beverage industries or chloramin-reduction and disinfection of swimming pools.

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 even under 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.

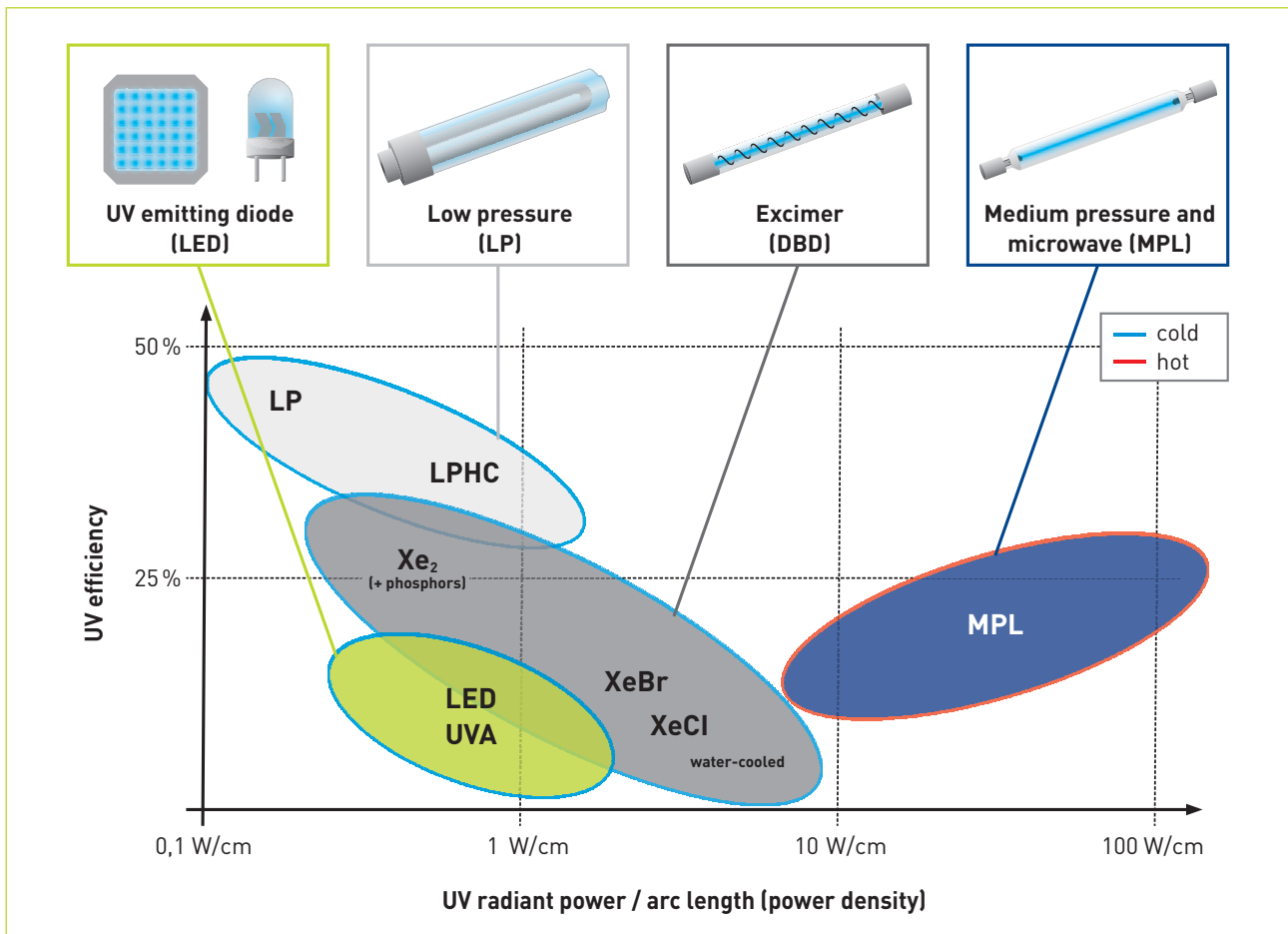


Figure 1: Lamp UV efficiency over power density

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 Infrared. A typical spectral distribution for non-doped lamps is shown in Fig. 2. The far Infrared 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 table 1 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 page, Fig. 3.

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

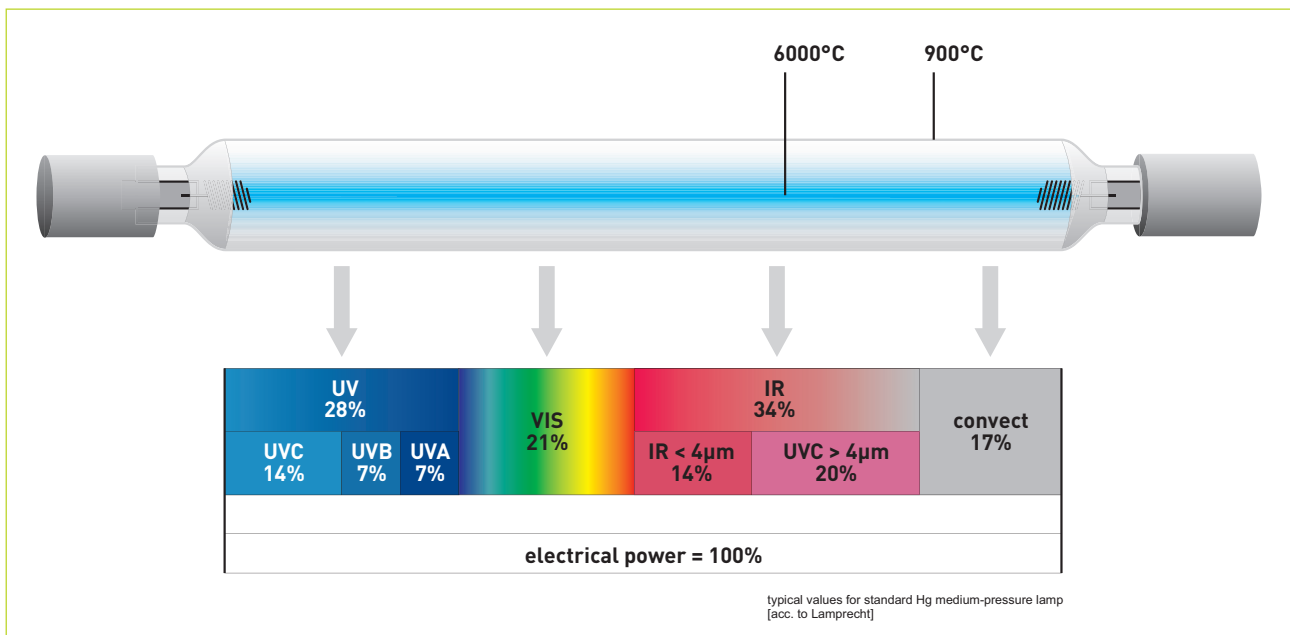


Figure 2: Lamp power balance for standard mercury MPL

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%

Table 1: Lamp efficacy

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

MPL Spectral Radiant Power

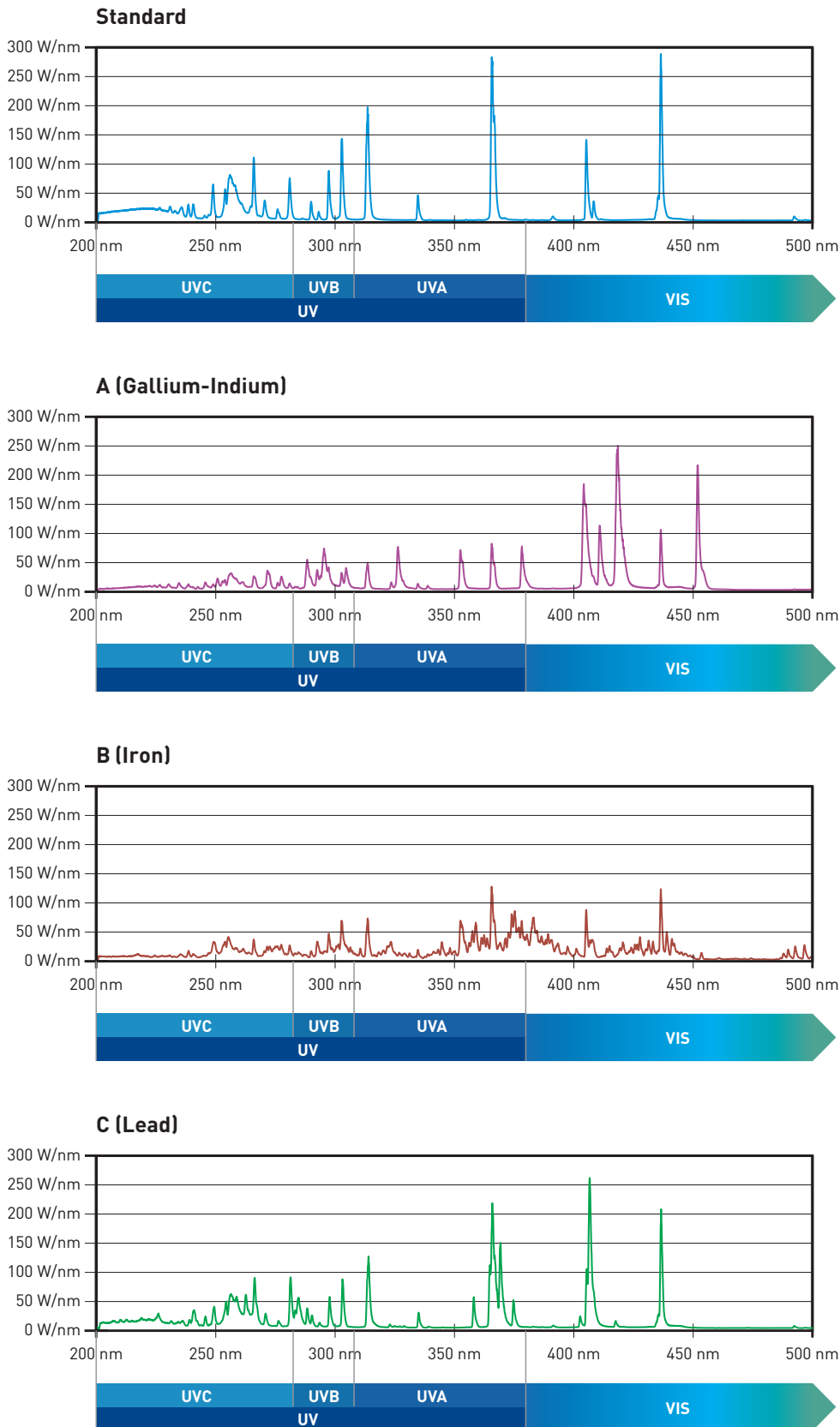


Figure 3: Typical spectra for different fillings

MPL Customised Lamps

The key to your success lies in eta plus' lamp engineering and manufacturing know-how. With our technical expertise in lamp development and manufacturing, we work in close cooperation with you to find the best technical solution for your UV application. Our in-house lamp manufacturing is certified in accordance with DIN EN ISO 9001:2015. The quality oriented process and our highly motivated team ensures highest quality standards, available on the market.

Our customised lamp solutions provide the utmost UV efficiency coupled with the longest service life-time. Customised lamp ends not only ensure easy installation but also secure your after-market sales.

The functional interaction between optical, thermal, electrical and mechanical lamp properties is decisive for the perfect medium-pressure lamp. Table 2 shows the most significant parameters in producing your perfectly engineered individual solution.

Nominal power	1 kW – 40 kW
Specific power	40 W/cm – 300 W/cm
Arc lengths	50 mm – 2300 mm
Bulb diameter	16 mm – 30 mm
Quarz types	<ul style="list-style-type: none"> ✓ standard ✓ ozone free (OF) ✓ pure silica (PS) ✓ others on request
Filling / Dopants	<ul style="list-style-type: none"> ✓ 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

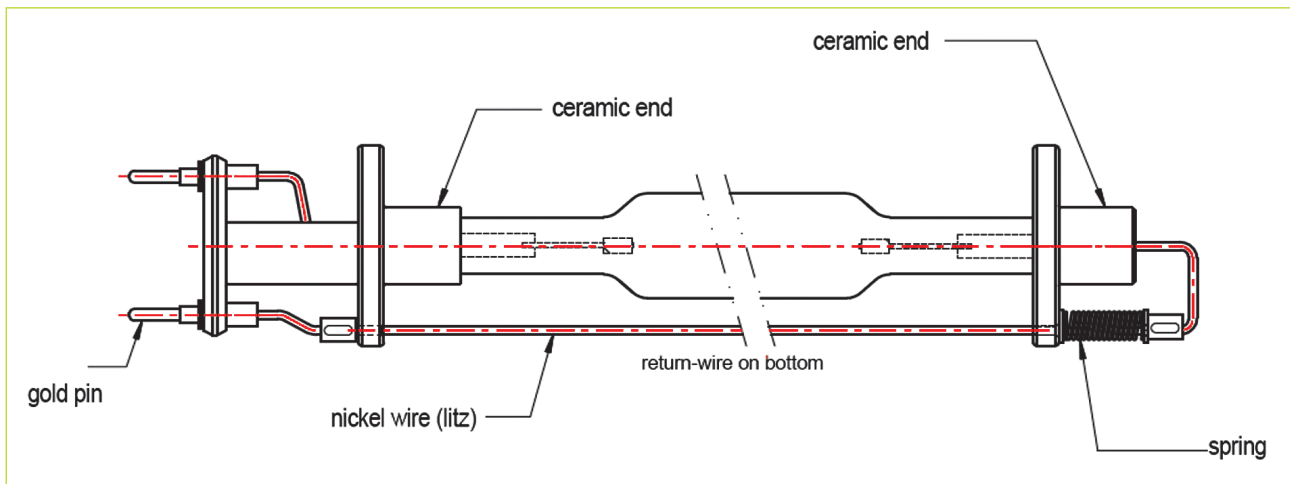


Figure 4: Customised lamp with single ended plug solution