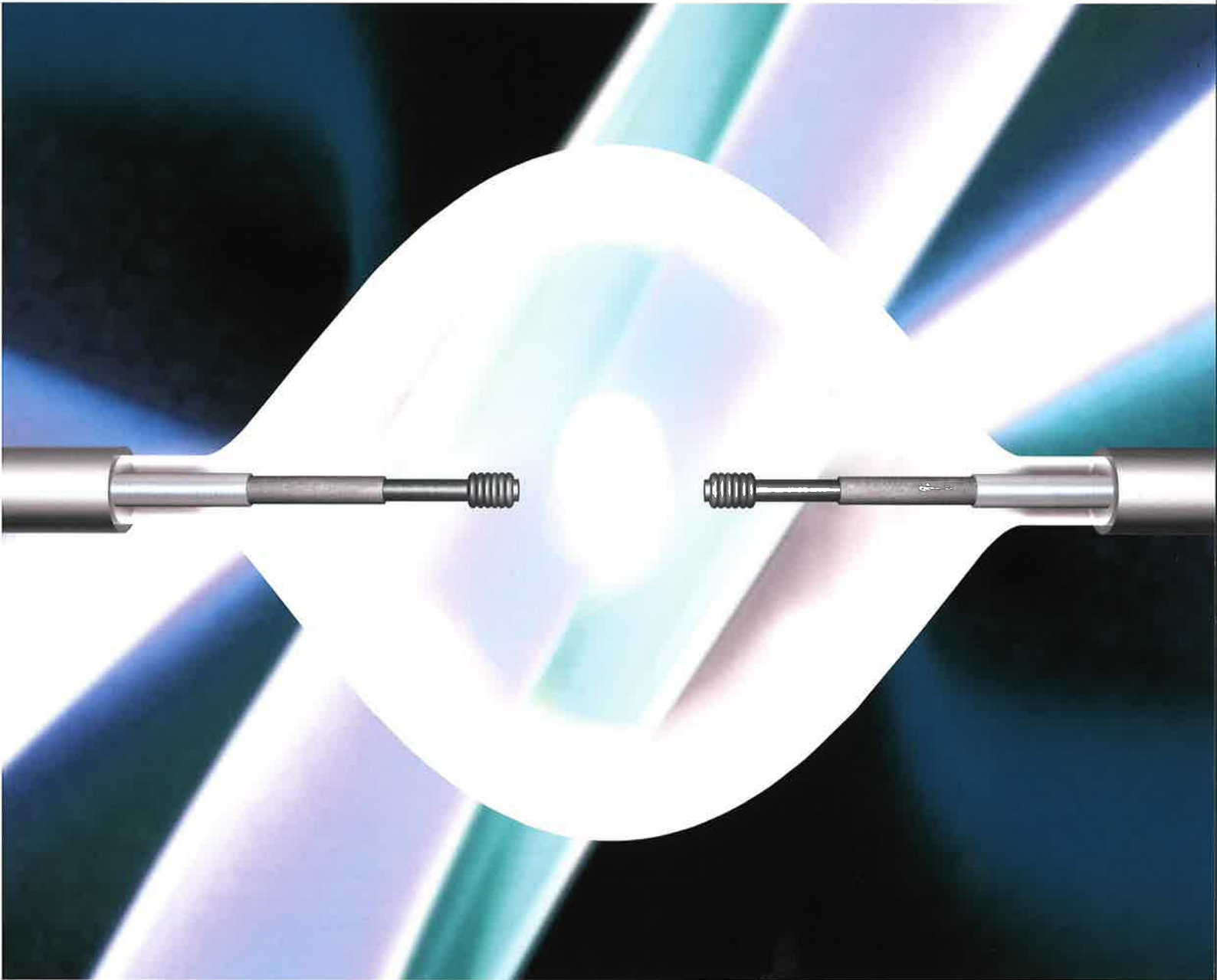


Heraeus



**Feed-through Solutions for HID Lamps
with Ceramic Arc Tubes**

Materials used as a feed-through in high intensity discharge (HID) lamps have to fulfil various requirements:

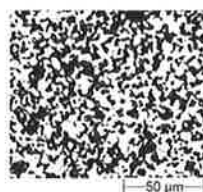
- Electrical conductivity
- Thermal resistance >1000°C
- Chemical resistance against metal halide fillings
- Ensuring gas-tight sealing for > 1000 hours
- Thermal expansion compatible to alumina (PCA)

Current HID lamp designs with ceramic arc tubes use materials with similar thermal expansion behaviour (NbZr1,

cermets) to reduce stresses within the sealing. In addition future lamp designs will become compact and downsized by functional combination of single components. For this purpose iridium is a material with outstanding chemical and thermal long-term stability that ensures all relevant specifications. Joining technology of refractory metals, cermets and other upcoming materials is of great importance. Assemblies joined by laser or friction welding must keep tight tolerances of straightness, bending and reliability. An overview of feed-through solutions is given.



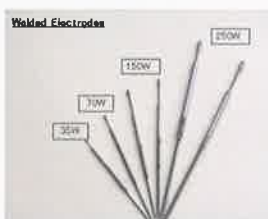
NbZr1% –
the expansion coefficient fits best



Cermets –
a composite with optimal microstructure



Electrode Assemblies –
tailor-made combination of individual features



Iridium –
most corrosion resistant precious metal



Feed-through components are decisive elements in advanced high intensity discharge (HID) lamps in terms of performance, lifetime and processability. Possible material solutions for ceramic arc tubes are niobium alloys (NbZr1), ceramic metal composites (Mo-Al₂O₃ cermet) or micro-alloyed iridium.

Various manufacturing technologies, e.g. metal extrusion, powder-metallurgical processes and hot-forming, are available within the Heraeus company. Furthermore electrode assemblies as a combination of different materials and functions joined by laser or friction welding are newly offered.

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