

## Heraeus Reflective Coating (HRC®) for Lamp Materials

### ■ Properties

Diffusive reflection from the UV to the IR range, highly thermal stable, high chemical purity and extended lifetime

### ■ Applications

Integrated diffuse reflector, heat shield



Many industries rely on light emitting systems in production processes. In most systems the light is needed only at one side of the lamp requiring a reflector to make the system more efficient. HRC® is an innovative reflector consisting of a pure silica material, which is well suited for the most stringent light reflector applications.

Applications for various UV light sources are numerous. For instance, UV light is used to disinfect water, clean air, cure adhesives, dry ink as well as to clean surfaces. The industrial branches using UV light are as widely spread as the applications, ranging from, restaurants, and food processing over printing to semiconductor production.

The infrared (IR) region of the light spectrum is used in rapid heating applications. IR lamps provide the heat necessary to dry lacquer, for diffusion or chemical reaction processes and to form plastic, to name a few.

Many applications rely on a homogeneous energy distribution across a defined area. To that end, lamps use various reflectors to improve the radiation characteristics. Heraeus Reflective Coating (HRC®) is a unique kind of reflector for a number of reasons.

a) It is a coating made of pure silica. Therefore, it has all the thermal and chemical properties of quartz glass.

b) Additionally, its special microstructure (open porosity) results in a high diffuse reflectivity over a very broad range of the electromagnetic spectrum. The directional reflection properties are close to an ideal diffuse reflector (Lambertian reflector).

c) In lamp applications its typical thickness ranges from 0.5 mm to 1.5 mm. The thickness is a parameter to manipulate performance.

Compared with metal reflectors, HRC® has a superior thermal resistance, assuring that no metallic components are within the vicinity of the lamp or the process itself.

In addition to exceptional thermal resistance, the HRC® pure silica composition allows for greater exposure to harsh chemicals resulting in an extended lifetime even in most challenging atmospheres.

Tubes with HRC® bring the reflector to the application directly from the start. In addition to the physical advantages, this saves time during manufacturing of the complete system.

The combination of high reflectivity, chemical compatibility and high temperature resistance makes HRC superior to competing metal type coatings, mirrors and external reflectors.

## Typical trace elements (ppm by weight)

Element	Al	Ca	Cr	Cu	Fe	K	Li	Mg	Mn	Na	Ti	Zr
HRC®	8	0.2	< 0.1	< 0.05	< 0.7	0.1	0.05	< 0.05	< 0.05	0.1	0.5	0.3

## Thermal Characteristics (typical values)

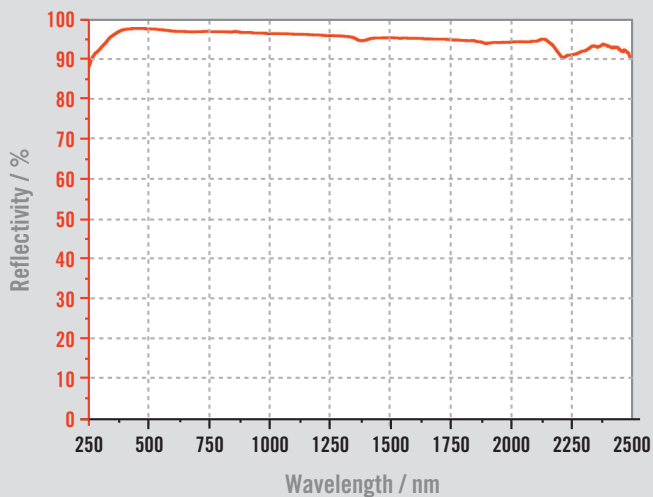
Typical process temperatures:

Long term < 1100°C

Short term < 1300°C

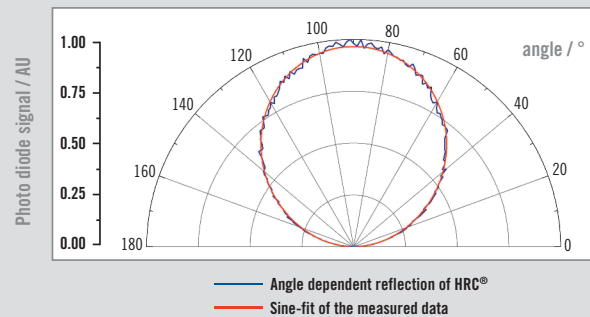
Thermal conductivity:  $\lambda_{(20^{\circ}\text{C}-170^{\circ}\text{C})} = 0.72 \text{ W/(m}\cdot\text{K)} \pm 10\%$

## Absolute reflectivity of HRC®



## Typical directional reflection characteristics

(An ideal Lambertian reflection shows a sinusoidal characteristic)



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