

## Photonics for Medical and Technical Applications. OEM Solutions for LED cold light sources.

BERLINER GLAS offers customized LED cold light source for industrial and medical<sup>1</sup> applications. We offer systems that couple the light of one or more LEDs effectively into an optical fiber and can be supplied as an assembly for integration into your device or as a stand alone unit. Customized connections to the diameter of the optical fiber can be accommodated from 0.4 mm to 8.0 mm.

BERLINER GLAS offers various solutions for the optimization of the luminous flux, the flexible tuning of the color temperature or a high color rendering.

The LED-solutions provide high energy efficiency, long lifespan and low maintenance. The assembly or the stand alone unit can be manufactured to the highest quality standards at our locations in Germany, Switzerland and China. We are an ISO 9001 and ISO 14001 certified company<sup>2</sup>.

### Applications:

- ◆ Endoscopy
- ◆ Ophthalmology
- ◆ Microscopy
- ◆ Boroscopy
- ◆ Other applications

1. The light source is not approved as a CE medical device yet.

2. From October 2011, also ISO 13485 certified.

# Example for an application with an optical fiber of $\varnothing$ 4.8 mm.

## Performance:

- ◆ Luminous Flux comparable to a 180 W Xenon cold light source.
- ◆ Very homogenous illumination.

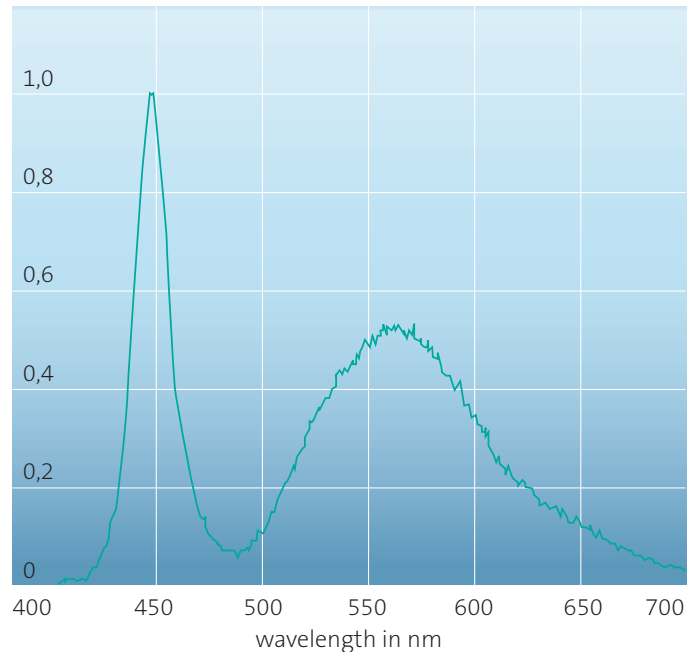
## Light coupling:

- ◆ Berliner Glas-optimized design of lenses
- ◆ Luminous flux at the entrance of a fiber with  $\varnothing$  4.8 mm:  
 $\varnothing$  fiber\_in > 1,000 lm
- ◆ Luminous flux at the end of the fiber  $\sim$  500 lm if a fiber with transmission = 50 %, NA = 0.5 is used

## Illumination Unit:

Color temperature:	CCT 5,700 K-6,000 K (typ.)
Color Rendering Index:	Ra > 70, strive for: Ra > 90
Typical luminous flux:	1,700 lm
Champion luminous flux:	> 2,000 lm
Typical operational current:	12 A < ILED < 15 A
Life cycle:	5,000 – 10,000 h

## Spectrum of the LED:



## Features in Overview:

- ◆ Customized coupling unit for fiber aperture between 0.4 - 8.0 mm
- ◆ Coupling of different colored LED for flexible tuning of color temperature and high color rendering
- ◆ Coupling in UV and IR diodes
- ◆ Customized design of electronics
- ◆ Microprocessor controlled displays with value for:
  1. LED temperature (with optional cut-off switch in case of overheating)
  2. Hour Meter
  3. Log book (Protocol)
  4. Additional customer-specific value implementable