



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

Berliner Glas offers a customized LED cold light source for industrial and for medical<sup>1</sup> applications. The system couples LED light effectively into an optical fiber and can be supplied as an assembly for integration into your system or as a stand alone unit. The color temperature can be adjusted to customers needs.

The LED is 50 % more efficient than halogen light sources and exceeds the light output of a comparable 150 W halogen light source. The light produces a similar color temperature as xenon light sources and provides a long life cycle and low maintenance illumination source.

The OEM sub-assembly or the stand alone unit can be manufactured to the highest quality at our German site or Chinese subsidiary. We are an ISO 9001 and ISO 14001 certified company<sup>2</sup>.

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

2. From October 2010, also ISO 13485 certified.

### Applications:

- ◆ Medical endoscopy
- ◆ Microscopy
- ◆ Boroscopy
- ◆ Other technical applications

# Features of the LED cold light source.

## Performance:

- Light output: currently up to 900 lumens at the fiber input within the acceptance angle of the optical fiber (with selected LEDs).

## Coupling:

- Berliner Glas-optimized design of lenses (not plastic)
- Luminous flux at the entrance of a fiber with  $D = 4.8 \text{ mm}$ :  
 $O| \text{ fiber\_in} > 900 \text{ lm}$
- (Effective light output when using an optical fiber with a smaller diameter is less, data available on request)
- Luminous flux at the fiber-dependent release of unused fiber:  
 $O| \text{ fiber\_out} = \text{TFAS} * O| \text{ fiber\_in}$
- Typical:  $\text{TFAS} > 50 \%$  of (we recommend for applications without autoclavability fluid filled fiber with transmission values greater than 80 %)
- Optics replaced by temperature-resistant PEEK plastic, heat conduction to the decoupled coupling piece, thereby even after a long operation time no heating at the coupling point

## Connected load:

- Line voltage: 110 - 240 V
- Power input:  $P < 80 \text{ W}$
- Internal supply voltage:  $U = 12 \text{ V}$

## Upon request we offer more features:

- Custom coupling unit for other fiber diameters
- Additional coupling of other colors to adjust the color temperature
- Another lamp integrated as a substitute
- Microprocessor controlled displays with values for:
  - LED temperature (with optional cut-off switch in case of overheating)
  - Hour Meter
  - Log book (Protocol)
  - Additional customer-specific values implementable

## Illumination Unit:

Color temperature:	CCT 5700 K-6000 K (typ.)
Color Rendering Index:	$Ra > 70$ , angestrebt: $Ra > 90$
Maximum luminous flux:	$\Phi_{\text{LED}} = 1800 \text{ lm}$ (Championdata: $> 2000 \text{ lm}$ )
Minimum luminous flux of the lamp used:	$\Phi_{\text{min}} = 1600 \text{ lm}$
Typical operational current:	$12 \text{ A} < \text{ILED} < 15 \text{ A}$
Life cycle:	5,000 – 10,000 h
Cooling:	Fan, $U = 12 \text{ V}$ , radiator block* with transverse heat transfer to the housing side, noise about 30 dB

\* Additionally, active cooling with Peltier elements currently in testing, about 10% efficiency and longer life cycle is expected (earnings in late April).

## Spectrum of the LED:

