

This document contains a summary of the technical data for the High-power LEDs used at ERCO.

[www.erco.com/led](http://www.erco.com/led)

Technical data  
(overview)

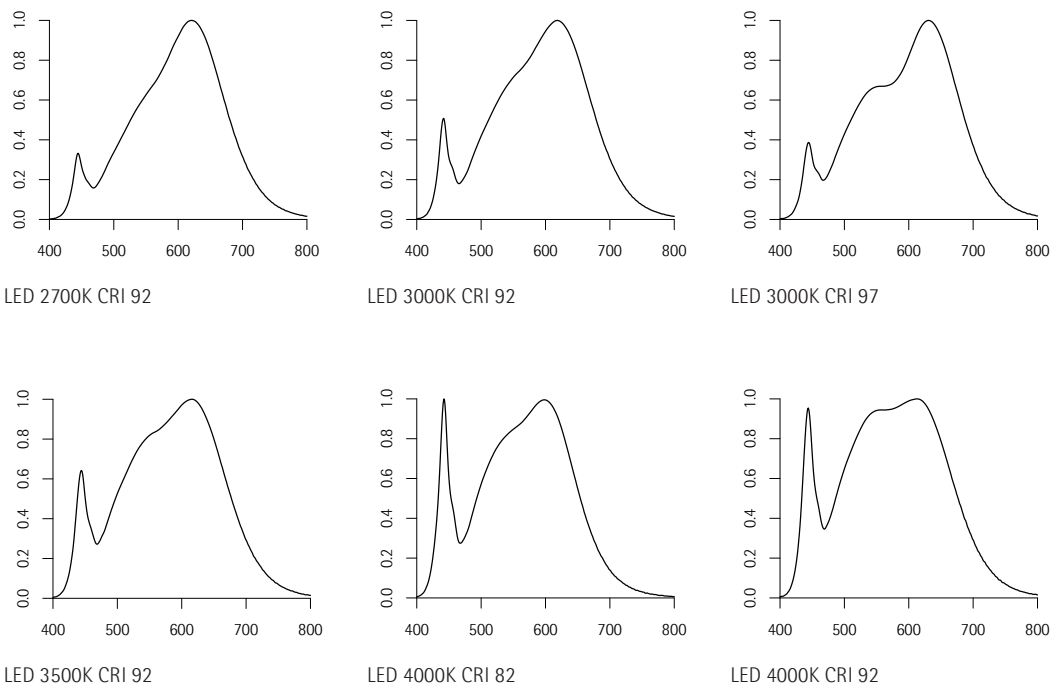
General technical data on the High-power LEDs used at ERCO can be found below. Detailed data on a specific luminaire can be found on the product data sheet of the luminaire.

Specific information on a luminaire can be found at [www.ercos.com/<article number>](http://www.ercos.com/<article number>)

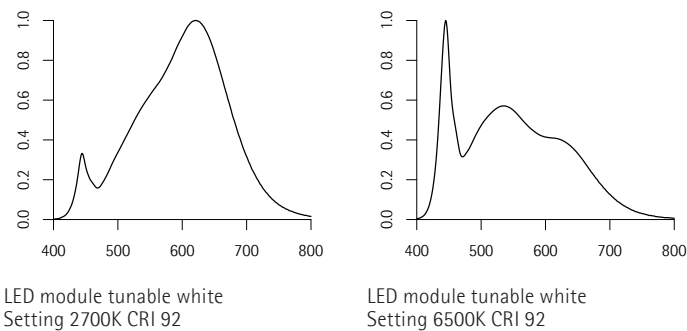
LED						
Color temperature	2700K	3000K	3000K	3500K	4000K	4000K
Luminous efficacy (lm/W)	101	106	98	116	135	119
Color rendering	CRI 92	CRI 92	CRI 97	CRI 92	CRI 82	CRI 92
LED module tunable white						
Setting	2700K/6500K					
Luminous efficacy (lm/W)	101/125					
Color rendering	CRI 92					

Note: all data are statistical averages.

Spectra  
LED



Spectra  
LED module tunable white



# ERCO LED

## High-power LED

### Melanopic efficacy ratios

The melanopic effect of light can be calculated from photometric quantities by means of efficacy ratios. The ratios are the same for all LEDs of a certain design and can be taken from the table below. The melanopic equivalent daylight illuminance MEDI ( $E_{\text{mel},\text{D65}}$ ) is obtained by multiplying the melanopic daylight equivalent efficiency factor MDER ( $\gamma_{\text{mel},\text{D65}}$ ) by the visual illuminance  $E_v$ . In addition to the MEDI and the MDER, the melanopic efficacy ratio of visible radiation (MR) is also listed. This ratio, which is no longer used according to current standards, is used to calculate the EML (also no longer used). Nevertheless, these specifications are still used in practice.

For further information on the melanopic light effect, see the Light Knowledge at [www.ercos.com](http://www.ercos.com).

LED	2700K CRI 92	3000K CRI 92	3000K CRI 97	3500K CRI 92	4000K CRI 82	4000K CRI 92
MDER	0.433	0.487	0.516	0.560	0.608	0.633
MEDI (at $E_v=1000\text{lx}$ )	433lx	487lx	516lx	560lx	608lx	633lx
MR	0.478	0.537	0.569	0.618	0.671	0.699

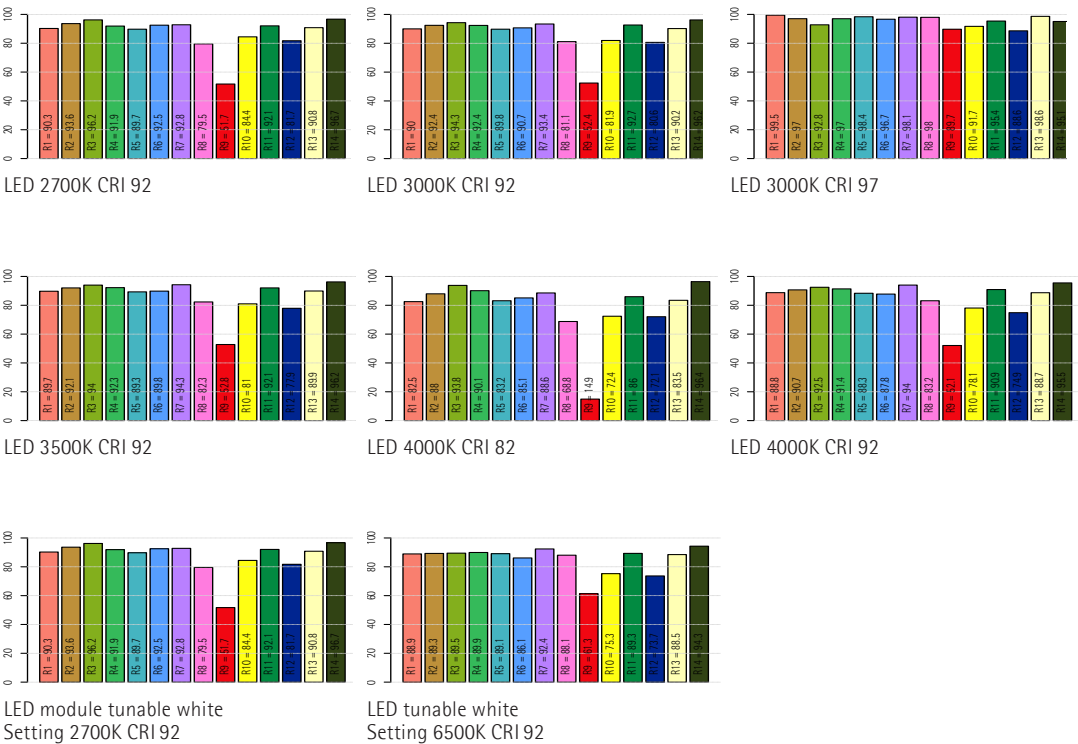
LED module tunable white	2700K/6500K
Setting	2700K/6500K
MDER	0.433/0.904
MEDI ( $E_v=1000\text{lx}$ )	433/904
MR	0.478/0.998

### Color rendering according to CRI

The CRI value compares the light source being tested with a reference light source, based on 8 reference colors. All ERCO High-power LEDs have very good color rendering, ranging from CRI 82 to CRI 97 depending on the LED type.

Further information on color rendering in Light Knowledge at [www.ercos.com](http://www.ercos.com)

### LED



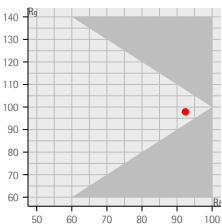
Color rendering  
according to TM-30-20

As an alternative to the CRI method, TM-30 defines the values  $R_f$  (fidelity) and  $R_g$  (gamut).  $R_f$  is based on 99 reference colors, in contrast to CRI.

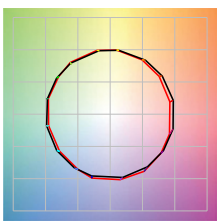
Further information on TM-30 at [www.erco.com](http://www.erco.com)

— Reference  
— ERCO LED

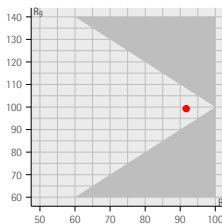
LED



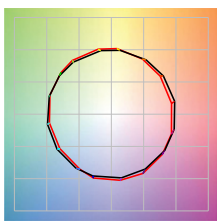
LED 2700K



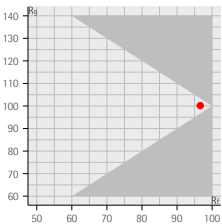
$R_f$  92  
 $R_g$  98



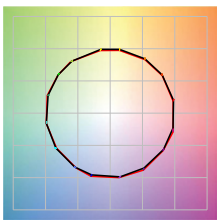
LED 3000K



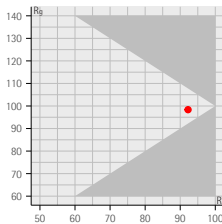
$R_f$  92  
 $R_g$  99



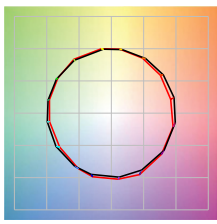
LED 3000K



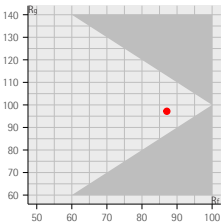
$R_f$  97  
 $R_g$  100



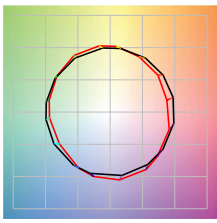
LED 3500K



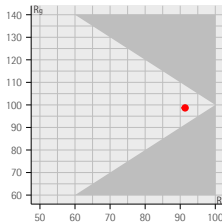
$R_f$  92  
 $R_g$  98



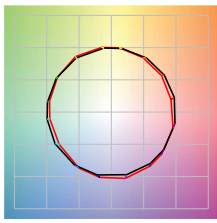
LED 4000K



$R_f$  87  
 $R_g$  97

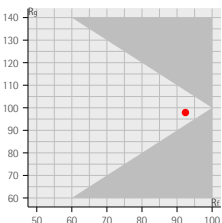


LED 4000K

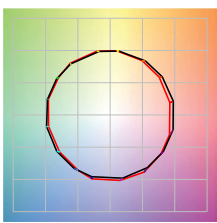


$R_f$  91  
 $R_g$  99

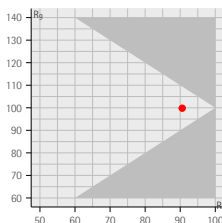
LED module tunable white



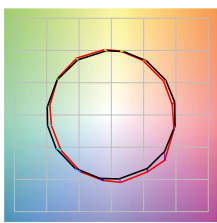
LED module tunable white  
Setting 2700K



$R_f$  91  
 $R_g$  99



LED module tunable white  
Setting 6500K

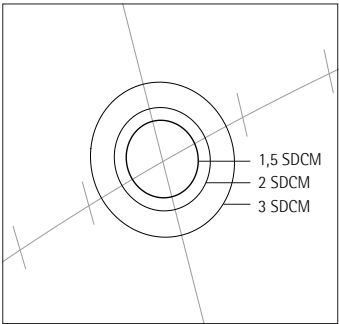


$R_f$  91  
 $R_g$  100

Color tolerance SDCM

All ERCO LED modules have a color tolerance of 1.5 SDCM. Values < 3 are considered imperceptible color differences. The exact values for each luminaire can be found in the luminaire data sheet and the LED module data sheet compliant to EPREL.

Further information on color consistency at [www.ercos.com](http://www.ercos.com)



Damage factor

The relative damage factor is used to evaluate suitable light sources for conservation requirements, for example in museums.

Further information on the damage factor at [www.ercos.com](http://www.ercos.com)

Light source	Relative damage factor f (mW/lm)
<b>LED</b>	
LED 2700K, CRI 92	0.140
LED 3000K, CRI 92	0.154
LED 3000K, CRI 97	0.155
LED 3500K, CRI 92	0.168
LED 4000K, CRI 82	0.186
LED 4000K, CRI 92	0.187
<b>LED tunable white</b>	
Setting	
2700K, CRI 92	0.140
6500K, CRI 92	0.261



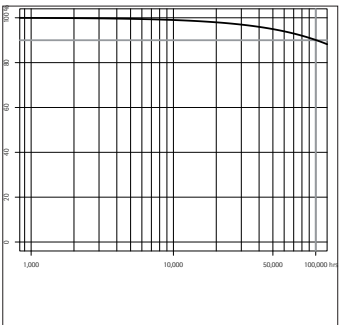
Luminous flux maintenance

Measurement according to LM 80; projection of luminous flux maintenance according to TM-21. The specified value is identical for all High-power LEDs used by ERCO.

The L-value describes what percentage of the original luminous flux an LED still emits after the specified time.

The B-value indicates what percentage of the LEDs fall below the L-value at the end of the specified period.

Further information on luminous flux maintenance at [www.ercos.com](http://www.ercos.com)



Luminous flux maintenance	L90/B10 ≤50,000h
(LED manufacturer specification)	L90/B50 ≤100,000h

Projection of luminous flux maintenance after 100,000 hours according to TM-21

Failure rate

The failure rate of LEDs used by ERCO is 0.1% ≤50,000h