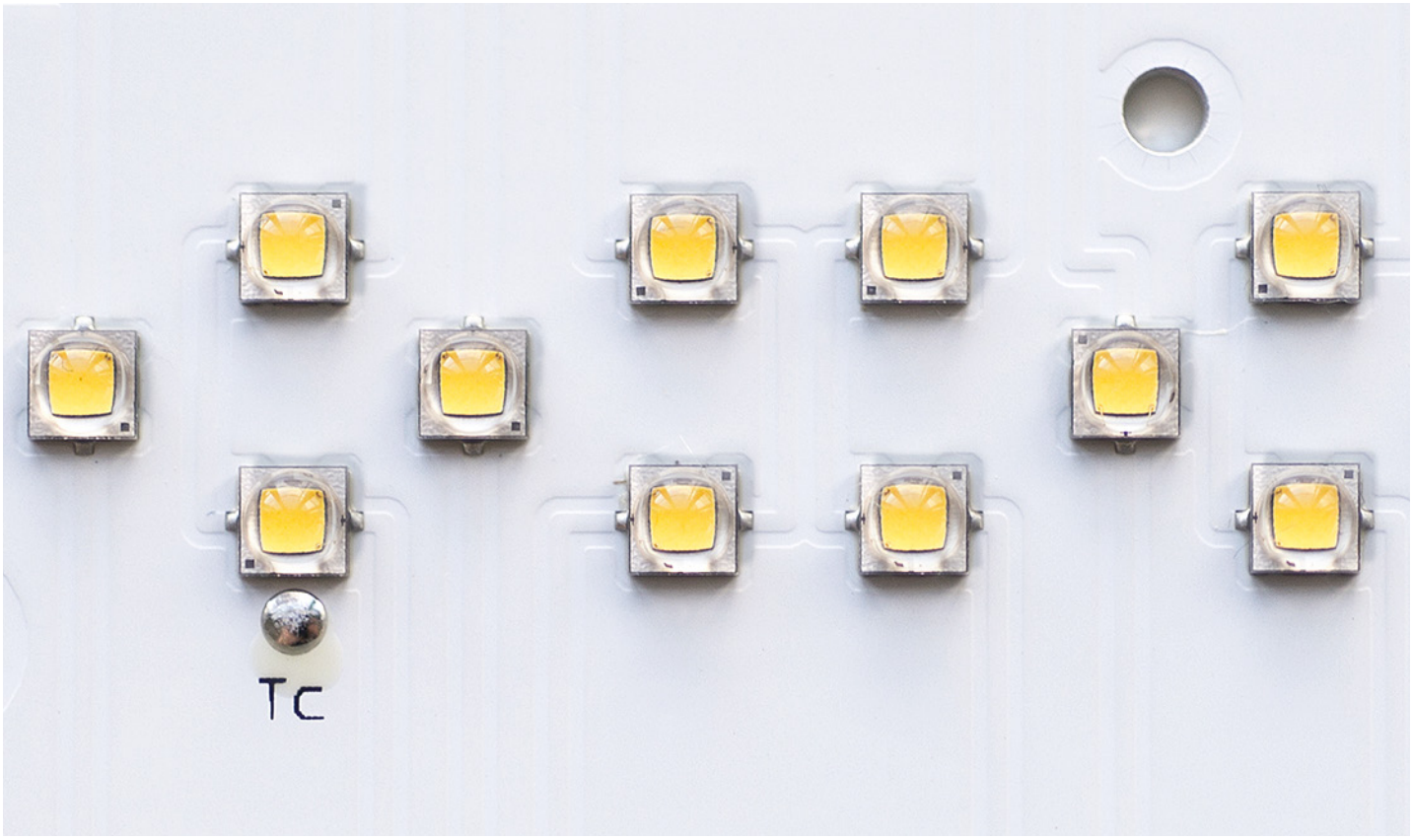
ERCO

ERCO LED
High-power LED



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

www.erco.com/led

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Unless otherwise stated, all values refer to an operating current point of 700mA and a temperature of Ts=25° (at the LED soldering point)

Technical and formal changes reserved
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ERCO

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High-power 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.erco.com/<article number>

LED

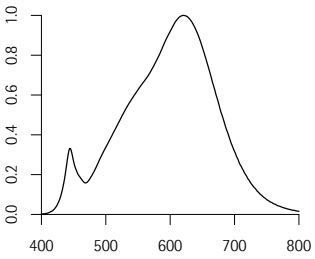
Colour temperature	2700K	3000K	3000K	3500K	4000K	4000K
Luminous efficacy (lm/W)	101	106	98	116	135	119
Colour rendering	CRI 92	CRI 92	CRI 97	CRI 92	CRI 82	CRI 92

LED module tunable white

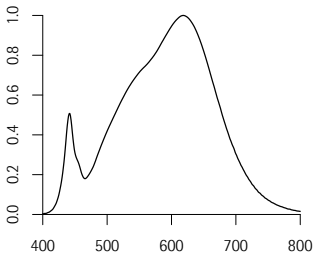
Setting	2700K/6500K
Luminous efficacy (lm/W)	101/125
Colour rendering	CRI 92

Note: all data are statistical averages.

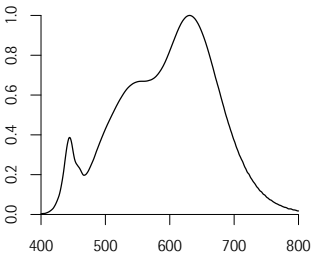
Spectra
LED



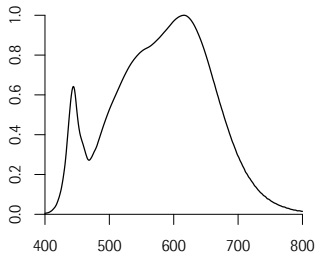
LED 2700K CRI 92



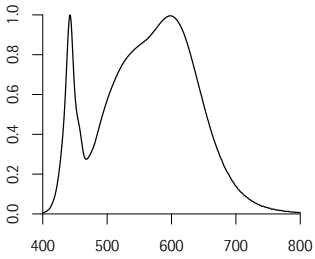
LED 3000K CRI 92



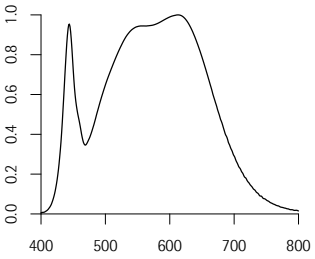
LED 3000K CRI 97



LED 3500K CRI 92

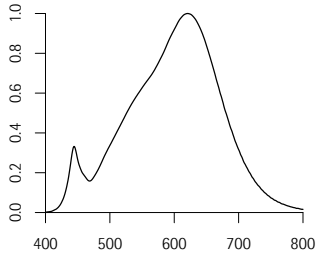


LED 4000K CRI 82

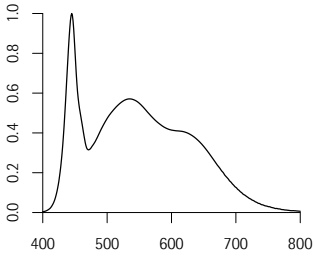


LED 4000K CRI 92

Spectra
LED module tunable white



LED module tunable white
Setting 2700K CRI 92



LED module tunable white
Setting 6500K CRI 92

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 ($E_{mel,v,D65}$) is obtained by multiplying the melanopic daylight equivalent efficiency factor MDER ($\gamma_{mel,v,D65}$) 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.erco.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=1000lx)	433lx	487lx	516lx	560lx	608lx	633lx
MR	0.478	0.537	0.569	0.618	0.671	0.699

LED module tunable white

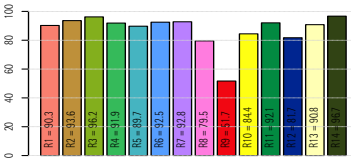
Setting	2700K/6500K
MDER	0.433/0.904
MEDI (Ev=1000lx)	433/904
MR	0.478/0.998

Colour rendering according to CRI

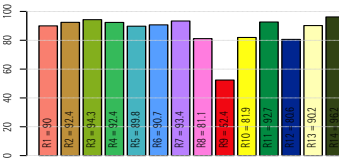
The CRI value compares the light source being tested with a reference light source, based on 8 reference colours. All ERCO High-power LEDs have very good colour rendering, ranging from CRI 82 to CRI 97 depending on the LED type.

Further information on colour rendering in Light Knowledge at www.erco.com

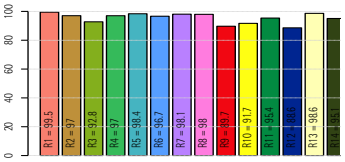
LED



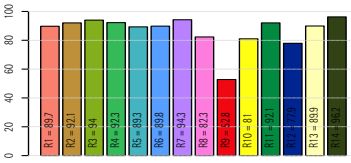
LED 2700K CRI 92



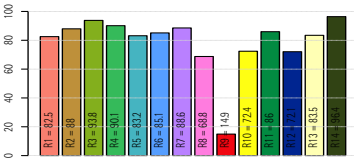
LED 3000K CRI 92



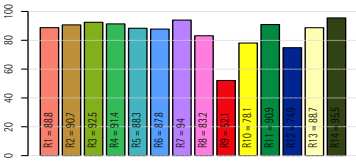
LED 3000K CRI 97



LED 3500K CRI 92

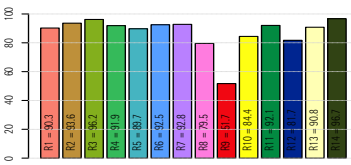


LED 4000K CRI 82

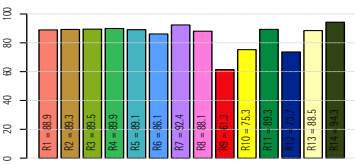


LED 4000K CRI 92

LED module tunable white



LED module tunable white
Setting 2700K CRI 92



LED tunable white
Setting 6500K CRI 92

ERCO LED
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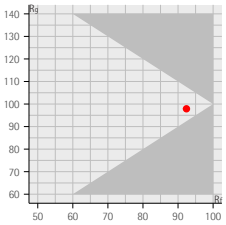
Colour rendering according to TM-30-20

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 colours, in contrast to CRI.

Further information on TM-30 at www.erco.com

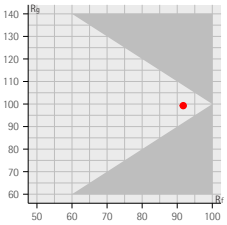
Reference
ERCO LED

LED



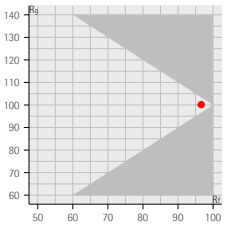
LED 2700K

R_f 92
R_g 98



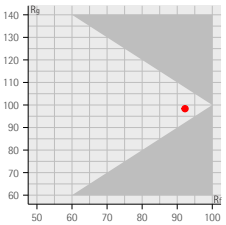
LED 3000K

R_f 92
R_g 99



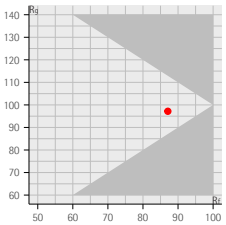
LED 3000K

R_f 97
R_g 100



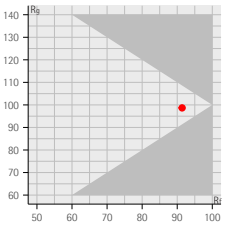
LED 3500K

R_f 92
R_g 98



LED 4000K

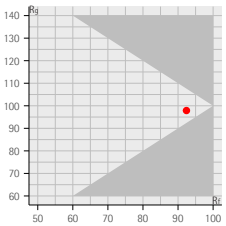
R_f 87
R_g 97



LED 4000K

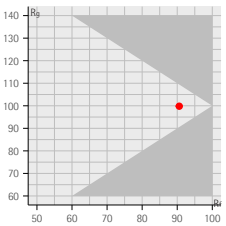
R_f 91
R_g 99

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

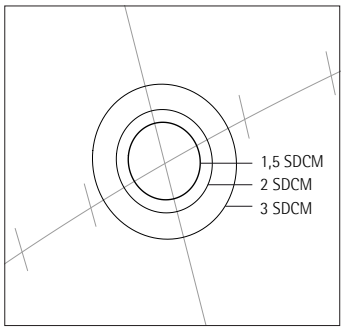
Unless otherwise stated, all values refer to an operating current point of 700mA and a temperature of Ts=25° (at the LED soldering point)

ERCO LED
High-power LED

Colour tolerance SDCM

All ERCO LED modules have a colour tolerance of 1.5 SDCM. Values < 3 are considered imperceptible colour 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 colour consistency at www.erco.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.erco.com

Light source	Relative damage factor f (mW/lm)
LED	
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
LED tunable white	
Setting	
2700K, CRI 92	0.140
6500K, CRI 92	0.261

Luminous flux maintenance

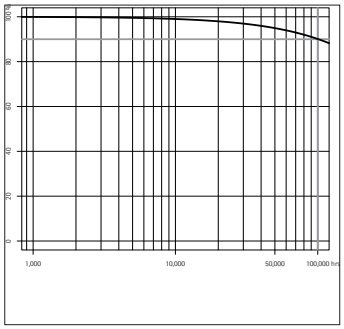
Measurement according to LM 80; projection of luminous flux maintenance according to TM-21.
The specified value is identical for all High-power LEDs used by ERCO.

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.erco.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