

PHILIPS

LED Modules

Fortimo LED Strip

24in 2200lm 1R LV3



Fortimo LED strip systems are ideal for use in narrow width luminaire designs for architectural applications that are not practical or affordable with fluorescent lighting. This Fortimo LED strip product offers best-in-class module of up to 163 lm/W and flux packages.

The Fortimo LED strip 24in 2200lm LV3 systems are a superb choice for use in luminaires for long linear runs in increments of 2 feet in offices, banks, schools, public buildings and healthcare applications.

Commercial Product Name	12NC
Fortimo LED Strip 24in 2200lm 830 1R LV3	929000757713
Fortimo LED Strip 24in 2200lm 835 1R LV3	929000757813
Fortimo LED Strip 24in 2200lm 840 1R LV3	929000757913
Fortimo LED Strip 24in 2200lm 850 1R LV3	929000758013
Fortimo LED Strip 24in 2200lm 930 1R LV3	929000758113
Fortimo LED Strip 24in 2200lm 935 1R LV3	929000758213
Fortimo LED Strip 24in 2200lm 940 1R LV3	929000758313

Fortimo LED Strip 24in 2200lm 1R LV3

Features

- High LED module efficiency of up to 163 lm/W
- Narrow width (20mm)
- Light output range per module up to 2800 lm
- High CRI options and 3 SDCM color consistency
- Optimized length of 603 mm (23.75in) for linear run fixtures and "seamless" LED lighting
- Variation of color temperatures (3000K, 3500K, 4000K and 5000K)
- Push-in connectors enabling easy wiring
- Zhaga-compliant screw mounting pattern

Benefits

- High energy efficiency and long lifetime¹ allows state-of-the-art luminaire design
- Slim width and optimized length enables optimized luminaire design and new form factors
- High color rendering and excellent color consistency bring linear LED lighting to the next level for quality of light
- 5-year limited system warranty with Philips Advance Xitanium LED drivers²

Applications

- Office
- Healthcare
- Retail

Optical Characteristics – Table per CCT

Fortimo LED Strip 24in 2200lm 830 1R LV3

Parameter	Min	Typ	Unit
Luminous Flux		2120	Lm
Lumen Efficiency		155	Lm/W
Forward Current		400	mA
Correlated Color Temperature (CCT) Target		3000	K
CRI	80		-
Radiation Angle		120	deg

Parameter at I_{life}	Typ	Unit
Luminous Flux	2714	Lm
Lumen Efficiency	146	Lm/W
Forward Current	530	mA

Nominal temperature for performance specification: $T_c = 45^\circ\text{C}$.

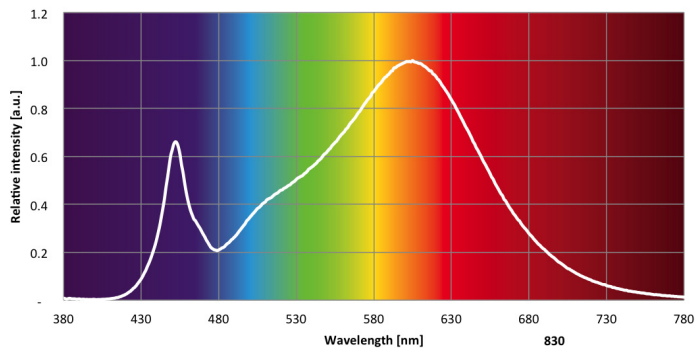
Max performance values at I_{life} .

Color consistency of 3 SDCM, averaged over the module.

Tolerance for flux data is $\pm 7.5\%$.

Tolerance for efficacy data is $\pm 10\%$.

Measurements tolerance $\pm 2.5\%$ on flux, $\pm 5\%$ on efficacy, 0.005 on x,y, ± 2 on CRI.



1. Average rated life is based on engineering data testing and probability analysis. The hours are at the B50, L70 point – 50,000 hours life with 70% lumen maintenance at T_c point.
2. View limited warranty at <http://www.usa.lighting.philips.com/support/support/warranty> for details and restrictions.

Fortimo LED Strip 24in 2200lm 1R LV3

Optical Characteristics – Table per CCT

Fortimo LED Strip 24in 2200lm 835 1R LV3

Parameter	Min	Typ	Unit
Luminous Flux		2120	Lm
Lumen Efficiency		155	Lm/W
Forward Current		400	mA
Correlated Color Temperature (CCT) Target		3500	K
CRI	80		-
Radiation Angle		120	deg

Parameter at I_{life}	Typ	Unit
Luminous Flux	2671	Lm
Lumen Efficiency	146	Lm/W
Forward Current	530	mA

Nominal temperature for performance specification: $T_c = 45^\circ\text{C}$.

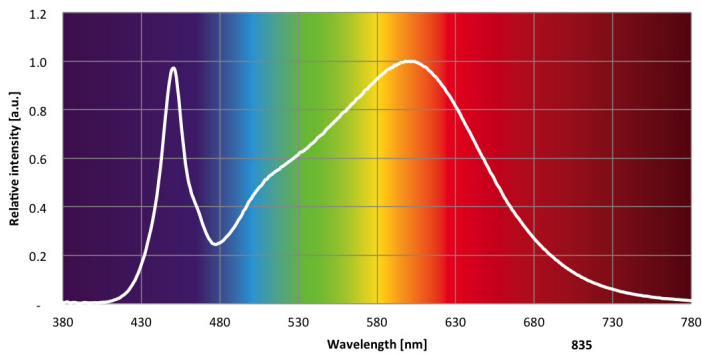
Max performance values at I_{life} .

Color consistency of 3 SDCM, averaged over the module.

Tolerance for flux data is $\pm 7.5\%$.

Tolerance for efficacy data is $\pm 10\%$.

Measurements tolerance $\pm 2.5\%$ on flux, $\pm 5\%$ on efficacy, 0.005 on x,y, ± 2 on CRI.



Fortimo LED Strip 24in 2200lm 1R LV3

Optical Characteristics – Table per CCT

Fortimo LED Strip 24in 2200lm 840 1R LV3

Parameter	Min	Typ	Unit
Luminous Flux		2200	Lm
Lumen Efficiency		161	Lm/W
Forward Current		400	mA
Correlated Color Temperature (CCT) Target		4000	K
CRI	80		-
Radiation Angle		120	deg

Parameter at I_{life}	Typ	Unit
Luminous Flux	2772	Lm
Lumen Efficiency	150	Lm/W
Forward Current	530	mA

Nominal temperature for performance specification: $T_c = 45^\circ\text{C}$.

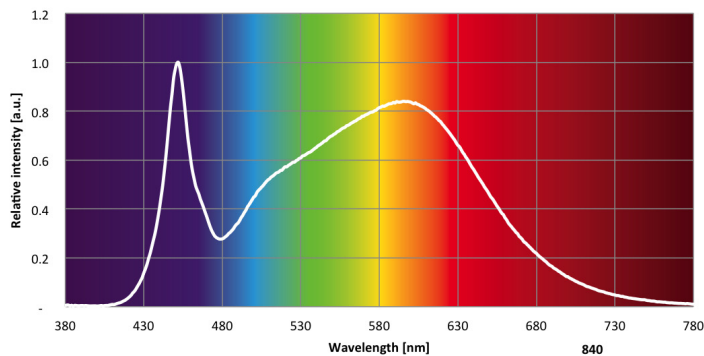
Max performance values at I_{life} .

Color consistency of 3 SDCM, averaged over the module.

Tolerance for flux data is $\pm 7.5\%$.

Tolerance for efficacy data is $\pm 10\%$.

Measurements tolerance $\pm 2.5\%$ on flux, $\pm 5\%$ on efficacy, 0.005 on x,y, ± 2 on CRI.



Fortimo LED Strip 24in 2200lm 1R LV3

Optical Characteristics – Table per CCT

Fortimo LED Strip 24in 2200lm 850 1R LV3

Parameter	Min	Typ	Unit
Luminous Flux		2240	Lm
Lumen Efficiency		164	Lm/W
Forward Current		400	mA
Correlated Color Temperature (CCT) Target		5000	K
CRI	80		-
Radiation Angle		120	deg

Parameter at I_{life}	Typ	Unit
Luminous Flux	2822	Lm
Lumen Efficiency	153	Lm/W
Forward Current	530	mA

Nominal temperature for performance specification: $T_c = 45^\circ\text{C}$.

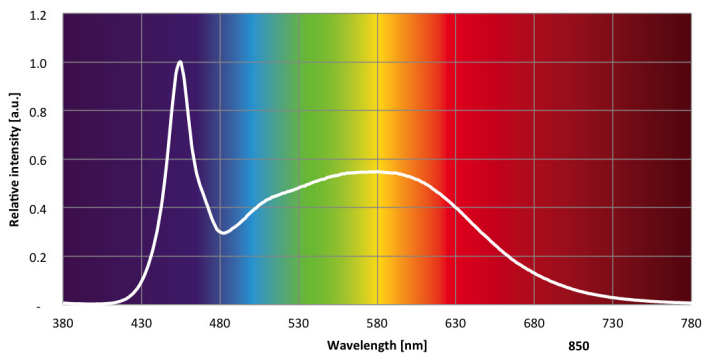
Max performance values at I_{life} .

Color consistency of 3 SDCM, averaged over the module.

Tolerance for flux data is $\pm 7.5\%$.

Tolerance for efficacy data is $\pm 10\%$.

Measurements tolerance $\pm 2.5\%$ on flux, $\pm 5\%$ on efficacy, 0.005 on x,y, ± 2 on CRI.



Fortimo LED Strip 24in 2200lm 1R LV3

Optical Characteristics – Table per CCT

Fortimo LED Strip 24in 2200lm 930 1R LV3

Parameter	Min	Typ	Unit
Luminous Flux		1730	Lm
Lumen Efficiency		128	Lm/W
Forward Current		400	mA
Correlated Color Temperature (CCT) Target		3000	K
CRI	90		-
Radiation Angle		120	deg

Parameter at I_{life}	Typ	Unit
Luminous Flux	2200	Lm
Lumen Efficiency	121	Lm/W
Forward Current	530	mA

Nominal temperature for performance specification: $T_c = 45^\circ\text{C}$.

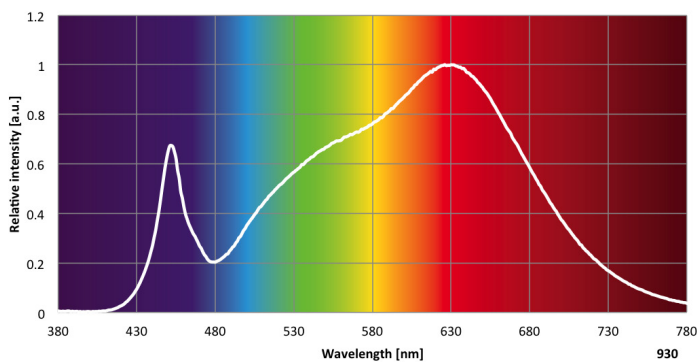
Max performance values at I_{life} .

Color consistency of 3 SDCM, averaged over the module.

Tolerance for flux data is $\pm 7.5\%$.

Tolerance for efficacy data is $\pm 10\%$.

Measurements tolerance $\pm 2.5\%$ on flux, $\pm 5\%$ on efficacy, 0.005 on x,y, ± 2 on CRI.



Fortimo LED Strip 24in 2200lm 1R LV3

Optical Characteristics – Table per CCT

Fortimo LED Strip 24in 2200lm 935 1R LV3

Parameter	Min	Typ	Unit
Luminous Flux		1840	Lm
Lumen Efficiency		135	Lm/W
Forward Current		400	mA
Correlated Color Temperature (CCT) Target		3500	K
CRI	90		-
Radiation Angle		120	deg

Parameter at I_{life}	Typ	Unit
Luminous Flux	2290	Lm
Lumen Efficiency	123	Lm/W
Forward Current	530	mA

Nominal temperature for performance specification: $T_c = 45^\circ\text{C}$.

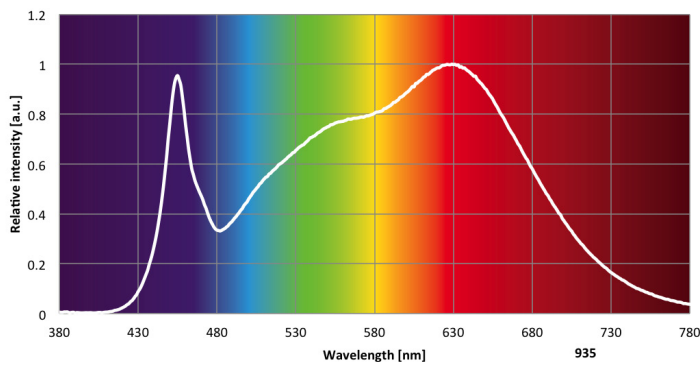
Max performance values at I_{life} .

Color consistency of 3 SDCM, averaged over the module.

Tolerance for flux data is $\pm 7.5\%$.

Tolerance for efficacy data is $\pm 10\%$.

Measurements tolerance $\pm 2.5\%$ on flux, $\pm 5\%$ on efficacy, 0.005 on x,y, ± 2 on CRI.



Fortimo LED Strip 24in 2200lm 1R LV3

Optical Characteristics – Table per CCT

Fortimo LED Strip 24in 2200lm 940 1R LV3

Parameter	Min	Typ	Unit
Luminous Flux		1900	Lm
Lumen Efficiency		139	Lm/W
Forward Current		400	mA
Correlated Color Temperature (CCT) Target		4000	K
CRI	90		-
Radiation Angle		120	deg

Parameter at I_{life}	Typ	Unit
Luminous Flux	2340	Lm
Lumen Efficiency	126	Lm/W
Forward Current	530	mA

Nominal temperature for performance specification: $T_c = 45^\circ\text{C}$.

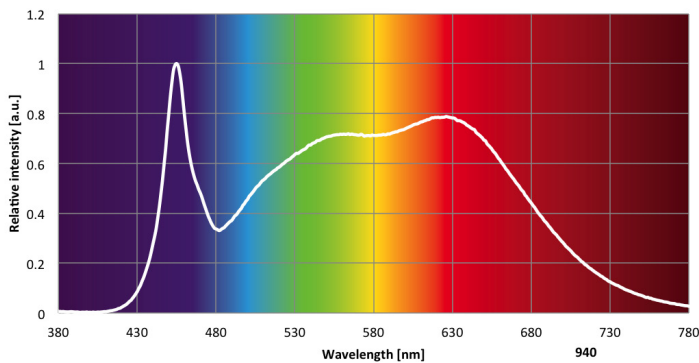
Max performance values at I_{life} .

Color consistency of 3 SDCM, averaged over the module.

Tolerance for flux data is $\pm 7.5\%$.

Tolerance for efficacy data is $\pm 10\%$.

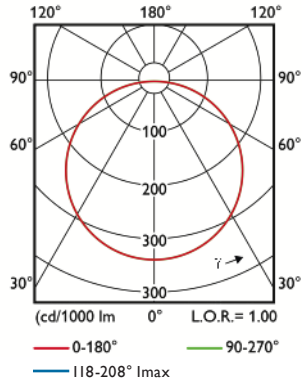
Measurements tolerance $\pm 2.5\%$ on flux, $\pm 5\%$ on efficacy, 0.005 on x,y, ± 2 on CRI.



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Beam Shape

The Philips Fortimo LED strip generates a Lambertian beam shape, which is a pragmatic starting point for OEMs wishing to design secondary optics.



Electrical Characteristics

Parameter	Min	Typ	Max	Unit
Nominal Current		400		mA
Forward Voltage	32.6	34.2	35.3	V
Power Consumption	13.0	13.7	14.1	W

Note: Specifications stated at T_c nom = 45 °C and I nom = 400 mA.

Lifetime

Parameter	Nominal *	Life**	Max***
T _c [°C]	45	70	80
Current [mA]	400	530	600

* Nominal value at which performance is specified

** Value at which lifetime is specified (max current for warranty)

*** Maximum value for safety

Parameter	Min	Typ	Max	Units
Δu'v' at 6000 Hours			0.007	—

Note: Specifications stated while T_c < 65°C and I < 520 mA.

Abs Max Ratings

Parameter	Min	Typ	Max	Unit
Current I _{max}			600	mA
Case Temperature T _c Max			80	°C
ESD (Direct Contact)			8	kV
ESD (Air)			15	kV
Isolation Breakdown Voltage	500			V _{dc}
Ambient Temperature	-20			°C
Number of Modules per Chain			3	

Fortimo LED Strip 24in 2200lm 1R LV3

Wiring

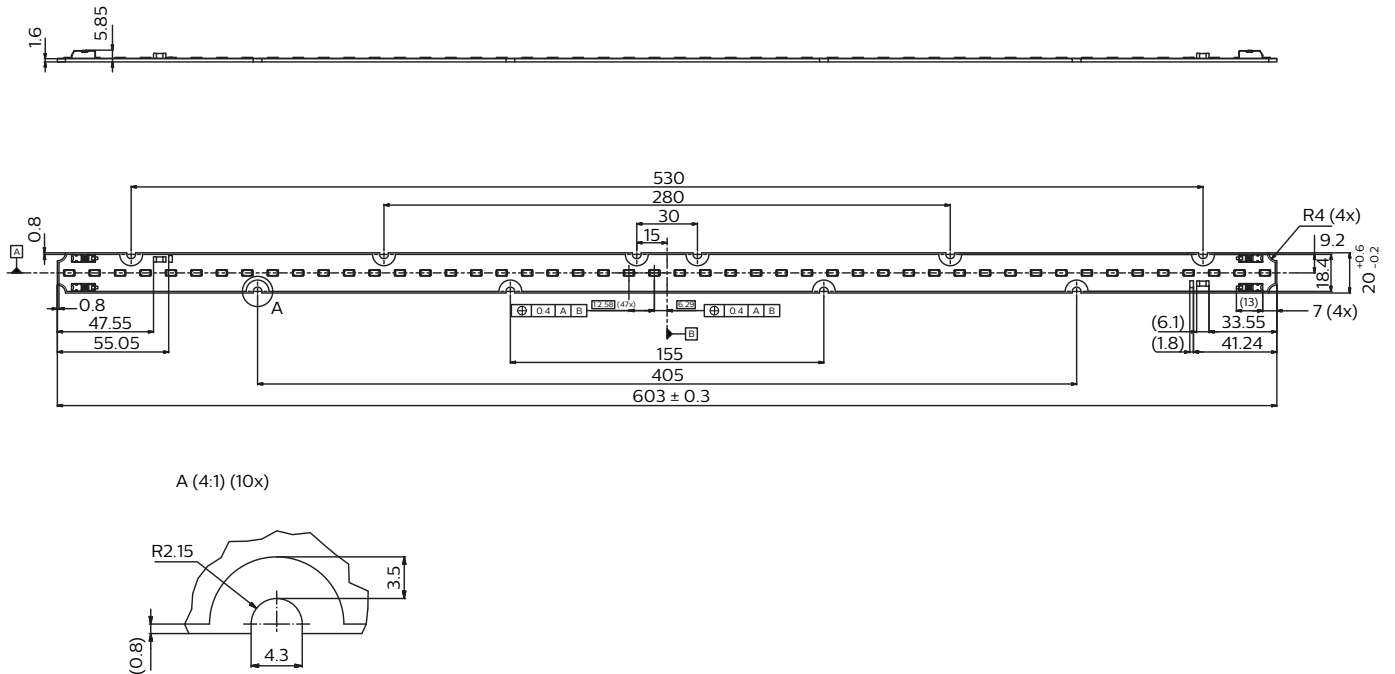
Specification Item	Value	Unit	Condition
Input Wire Cross-Section	0.2...0.8	mm ²	Solid
	18...24	AWG	
	0.45...0.7	mm ²	Stranded
	20...22	AWG	
Input Wire Strip Length	7.5...8.5	mm	

Note: Connector suited for robot wiring.

Mechanical Characteristics

Parameter	Min	Typ	Max	Unit
Length	602.7	603.0	603.3	mm
Width	19.8	20	20.6	mm
Height Excl. Connector	1.45	1.60	1.75	mm
Height Incl. Connector	3.85	4.2	4.55	mm
Warpage (IPC-TM-650)			4.2	mm

Note: Bow & Twist of the PCB after production tested and released according IPC-TM-650 2.4.22.



Fortimo LED Strip 24in 2200lm 1R LV3

Application Information

Compliance and Approval

UL8750 (UL recognized)

Environmental

RoHS / REACH

Application Information

IP Rating	No IP rating
Overheating Protection	No protection
Luminaire Class	UL Class 2 / Class II or Class III

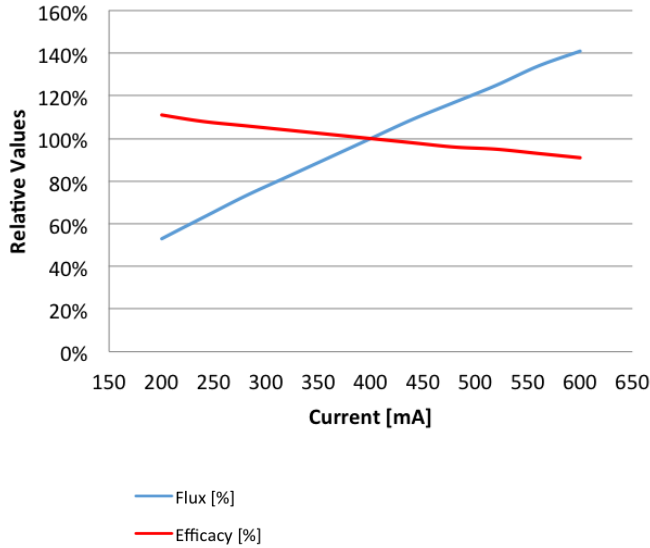
Warranted Number of Full Thermal Product Cycles @ 25°C Ambient Temperature

Case Temperature Tc [°C]	Amount of Cycles
35	
40	
45	>30,000
50	
55	>30,000
60	
65	30,000
70	27,000
75	20,000
80	15,000
85	
90	
95	

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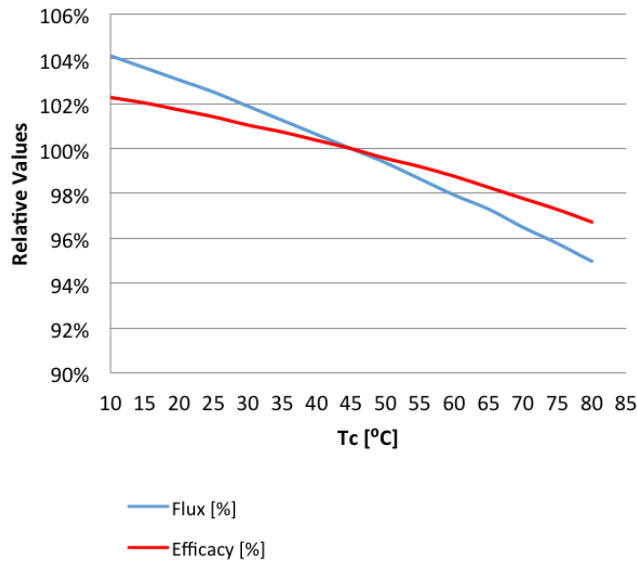
Tuning Information

Flux and Efficacy Vs. Current (at Nominal Temperature)



I [A]	Rel flux	Rel efficacy
200	53%	111%
240	63%	108%
280	73%	106%
320	82%	104%
360	91%	102%
400	100%	100%
440	109%	98%
480	117%	96%
520	125%	95%
560	134%	93%
600	141%	91%

Flux and Efficacy Vs. Tc



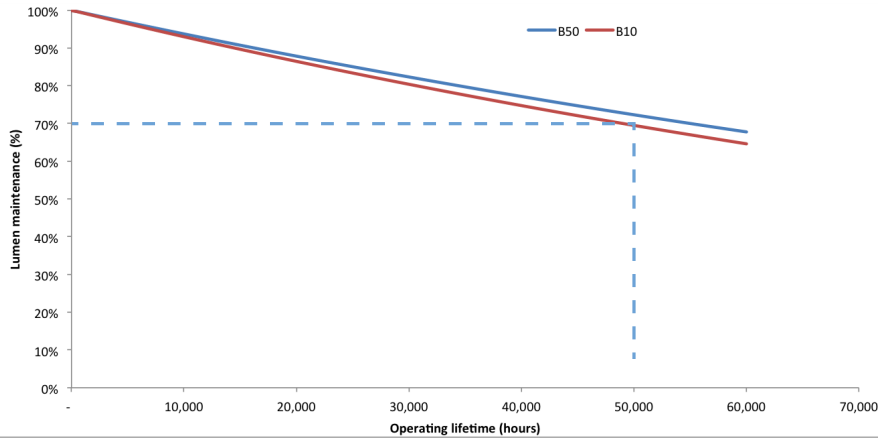
Tc [°C]	Rel flux	Rel efficacy
80	95%	97%
75	96%	97%
70	96%	98%
65	97%	98%
60	98%	99%
55	99%	99%
50	99%	100%
45	100%	100%
40	101%	100%
35	101%	101%
30	102%	101%
25	103%	101%
20	103%	102%
15	104%	102%
10	104%	102%
5	105%	103%
0	105%	103%

Fortimo LED Strip 24in 2200lm 1R LV3

Lumen Maintenance

Lumen Maintenance: at I Life and Tc Life Conditions

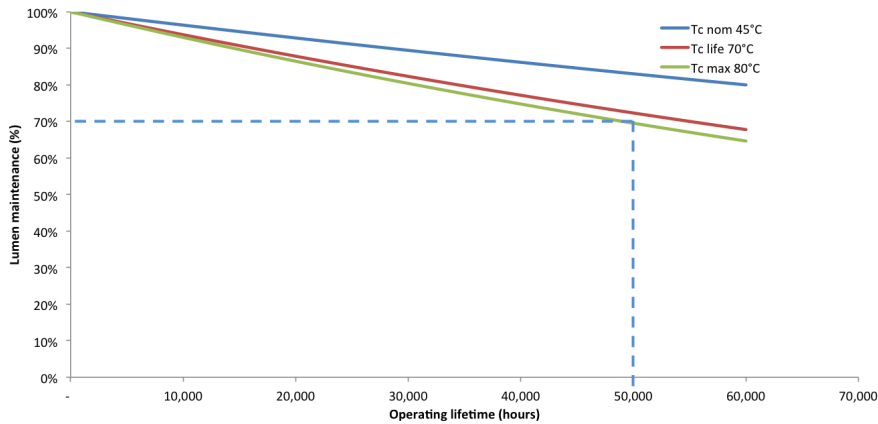
Fortimo LED Strip 24in 2200lm 1R LV3



Lumen depreciation as a function of operating hours for I-life and Tc-life.
36,000 hours proven by certified laboratory.

Lumen Maintenance (B50): at Current I Life

Fortimo LED Strip 24in 2200lm 1R LV3



Lumen depreciation as a function of operating hours at different Tc values and I-life.
36,000 hours proven by certified laboratory.

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