

PHILIPS

LED Modules

Fortimo LML SE

1ft 700lm 1R LV1



Fortimo LED LML Slim Efficiency systems are designed to replace conventional lighting in both fixed and dimmable luminaires. Slim board design enables compact fixture design and creates a high degree of design freedom. The Fortimo LED LML Slim Efficiency enables the use of a wide variety of optics, resulting in beams ranging from batwing to tight beam distribution, making it the better choice for the illumination of vertical surfaces.

Commercial Product Name	12NC
Fortimo LML SE 1ft 700lm 830 1R LV G1	9290 009 17308
Fortimo LML SE 1ft 700lm 835 1R LV G1	9290 009 17408
Fortimo LML SE 1ft 700lm 840 1R LV G1	9290 009 17508
Fortimo LML SE 1ft 700lm 850 1R LV G1	9290 009 17608

Fortimo LML SE 1ft 700lm 1R LV1

Features

- High energy efficiency of up to 141 lm/W
- Variation of color temperatures (3000K, 3500K, 4000K, and 5000K)
- Lumen levels of 700 lm/ft and 1,400 lm/2ft
- High quality white light
- Long lifetime – 50,000 hrs¹
- Push-in connectors enabling easy wiring

Benefits

- Enables most economic and flexible fixture design
- High degree of design freedom allowing slim and compact fixture design
- Flexible system design due to pairing with Philips Advance Xitanium window drivers with SimpleSet technology
- 5-year limited system warranty with Philips Advance Xitanium LED Drivers²

Application

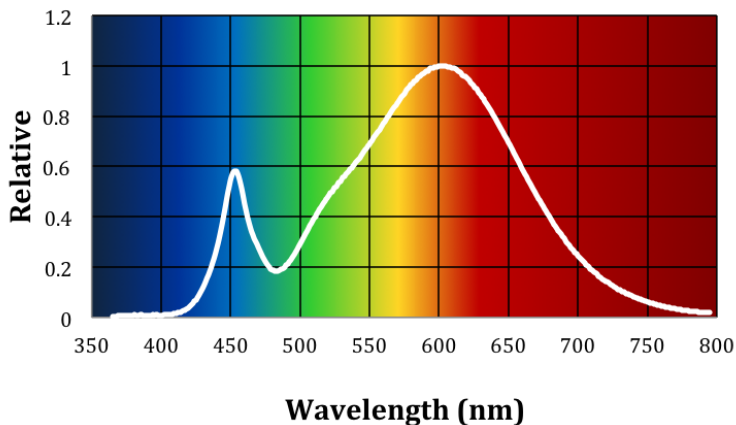
- Office
- Industry
- Retail

Optical Characteristics – Table per CCT

Fortimo LML SE 1ft 700lm 830 1R LV G1				
Parameter	Min	Typ	Max	Unit
Luminous Flux		650		lm
Lumen Efficiency		127		lm/W
Forward Current		140		mA
Forward Voltage	35.4	36.6	38.0	V
Correlated Color Temperature (CCT) Target ³		3000		K
Color Consistency		3.5 ⁴		SDCM
CRI	80			-
Radiation Angle		120		deg

Color consistency of 3.5 SDCM, averaged over the module.
Tolerance for flux data is $\pm 7.5\%$.
Tolerance for efficacy data is $\pm 10\%$.

Spectrum



See footnotes on last page.

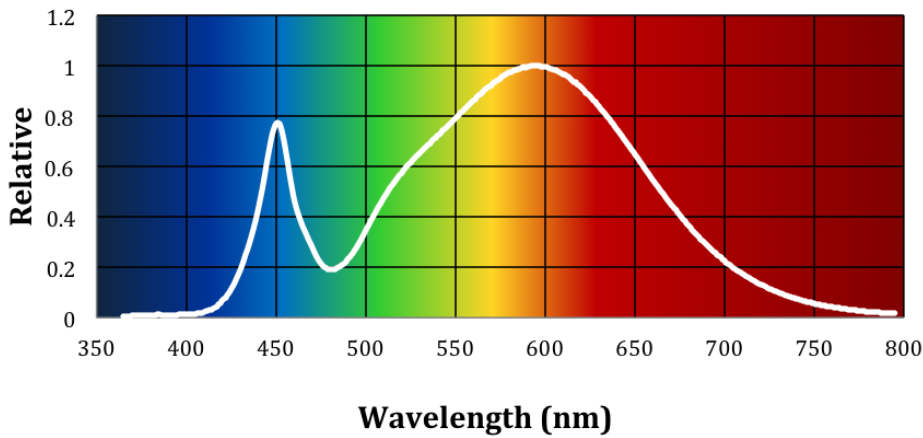
Fortimo LML SE 1ft 700lm 1R LV1

Optical Characteristics – Table per CCT

Fortimo LML SE 1ft 700lm 835 1R LV G1				
Parameter	Min	Typ	Max	Unit
Luminous Flux		670		lm
Lumen Efficiency		131		lm/W
Forward Current		140		mA
Forward Voltage	35.4	36.6	38.0	V
Correlated Color Temperature (CCT) Target ³		3500		K
Color Consistency		3.5 ⁴		SDCM
CRI	80			-
Radiation Angle		120		deg

Tolerance for flux data is $\pm 7.5\%$.
Tolerance for efficacy data is $\pm 10\%$.

Spectrum



See footnotes on last page.

Fortimo LML SE 1ft 700lm 1R LV1

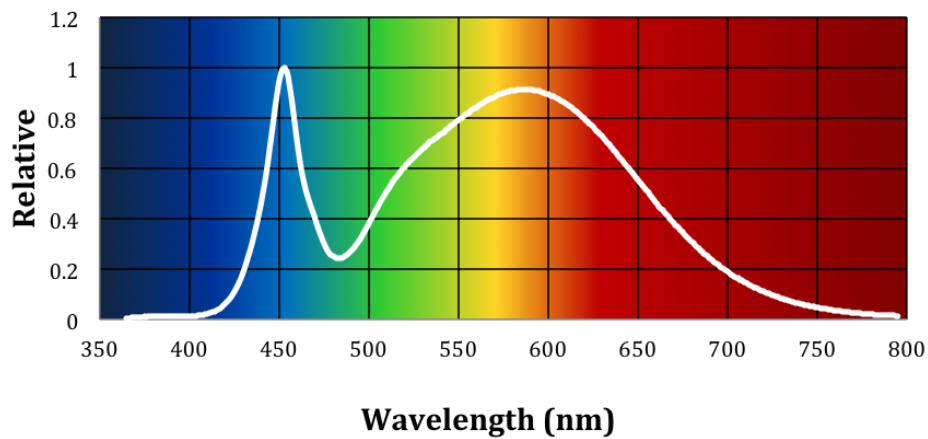
Optical Characteristics – Table per CCT

Fortimo LML SE 1ft 700lm 840 1R LV G1

Parameter	Min	Typ	Max	Unit
Luminous Flux		700		lm
Lumen Efficiency		137		lm/W
Forward Current		140		mA
Forward Voltage	35.4	36.6	38.0	V
Correlated Color Temperature (CCT) Target ³		4000		K
Color Consistency		3.5 ⁴		SDCM
CRI	80			-
Radiation Angle		120		deg

Tolerance for flux data is ±7.5 %.
Tolerance for efficacy data is ±10 %.

Spectrum



See footnotes on last page.

Fortimo LML SE 1ft 700lm 1R LV1

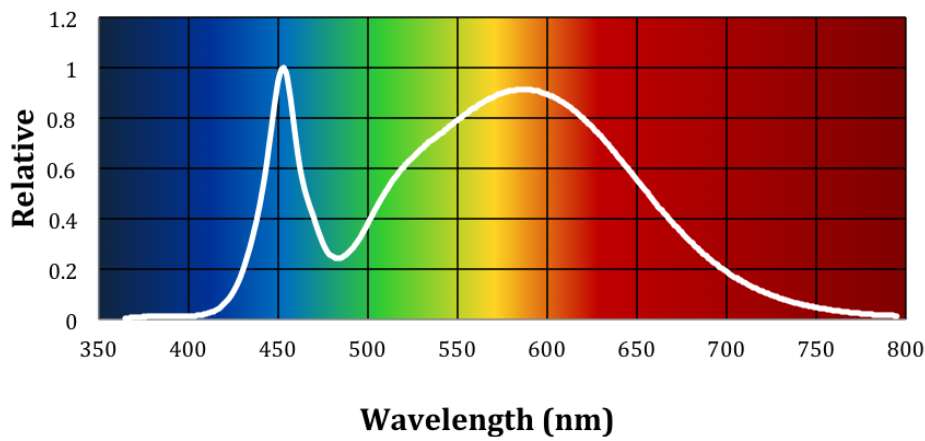
Optical Characteristics – Table per CCT

Fortimo LML SE 1ft 700lm 850 1R LV G1

Parameter	Min	Typ	Max	Unit
Luminous Flux		730		lm
Lumen Efficiency		141		lm/W
Forward Current		140		mA
Forward Voltage	35.4	36.6	38.0	V
Correlated Color Temperature (CCT) Target ³		5000		K
Color Consistency		3.5 ⁴		SDCM
CRI	80			-
Radiation Angle		120		deg

Tolerance for flux data is ±7.5 %.
Tolerance for efficacy data is ±10 %.

Spectrum

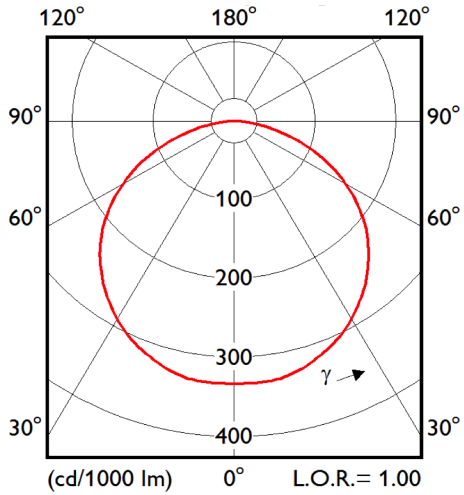


See footnotes on last page.

Fortimo LML SE 1ft 700lm 1R LV1

Beam Shape

The Philips Fortimo LML SE 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		140	180	mA
Forward Voltage	35.4	36.6	38.0	V
Forward Voltage Bins		E/F		
Power Consumption	4.9	5.1	5.3	W

Note: Specifications stated at Tc nom = 45°C and I nom = 140 mA

Lifetime

Parameter	Nominal ¹¹	Life ¹²	Max ¹³
Tc [°C]	45	65	80
Current [mA]	140	160	180

Parameter	Min	Typ	Max	Unit
Δu'v' at 6000 hours)			0.007	-

Note: Specifications stated while Tc < 65°C and I < 160 mA

11. Nominal value at which performance is specified

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

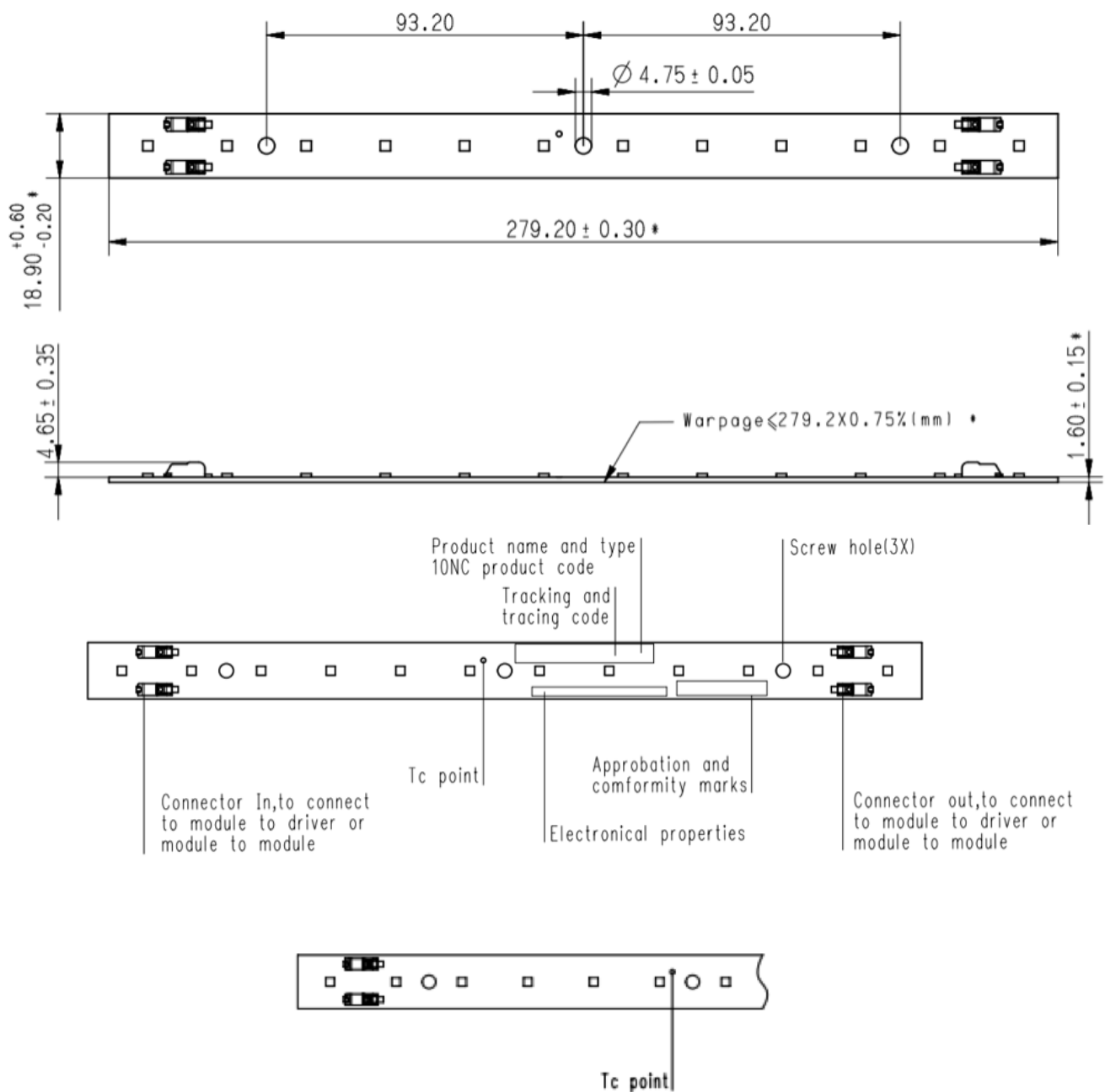
13. Maximum value for safety

Fortimo LML SE 1ft 700lm 1R LV1

Mechanical Characteristics

Parameter	Min	Typ	Max	Unit
Length	278.9	279.2	279.5	mm
Width	18.7	18.9	19.5	mm
Height Excl. Connector	1.45	1.60	1.75	mm
Height Incl. Connector	5.65	6.00	6.35	mm
Warpage (IPC-TM-650)			2.1	mm

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



Fortimo LML SE 1ft 700lm 1R LV1

Abs Max Ratings

Parameter	Min	Typ	Max	Unit
Current I _{max}			180	mA
Case temperature T _c max			80	°C
ESD (direct contact)			4	kV
ESD (air)			8	kV
Isolation breakdown voltage	500			Vdc
Ambient temperature	-20			°C
Number of Modules per Chain			8	

Wiring

Specification item	Value	Unit	Condition
Input Wire Cross-section	0.2...0.75	mm ²	solid and fine stranded
	18...24	AWG	
Input Wire Strip Length	6..7	mm	

Note: Connector suited for robot wiring.

Application Information

Compliance and Approval

IEC / EN 62031, IEC / EN 62471, IEC / TR 62778, 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

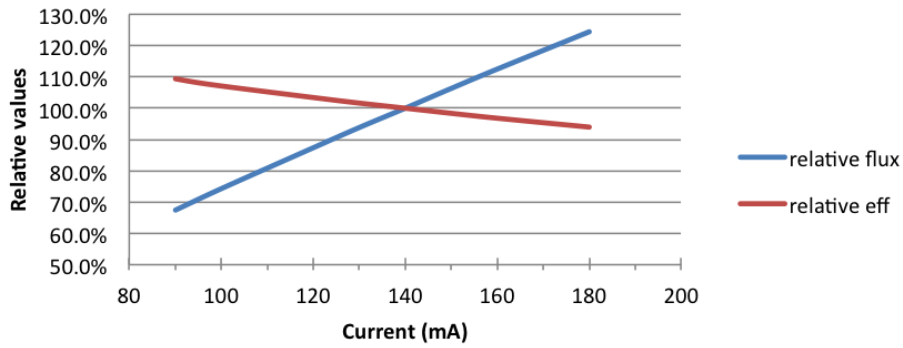
Warranted number of full thermal product cycles @ 25°C ambient temperature

Case Temperature T _c [°C]	Amount of Cycles
35	40,000
40	33,300
45	33,300
50	33,300
55	29,000
60	20,830
65	16,666

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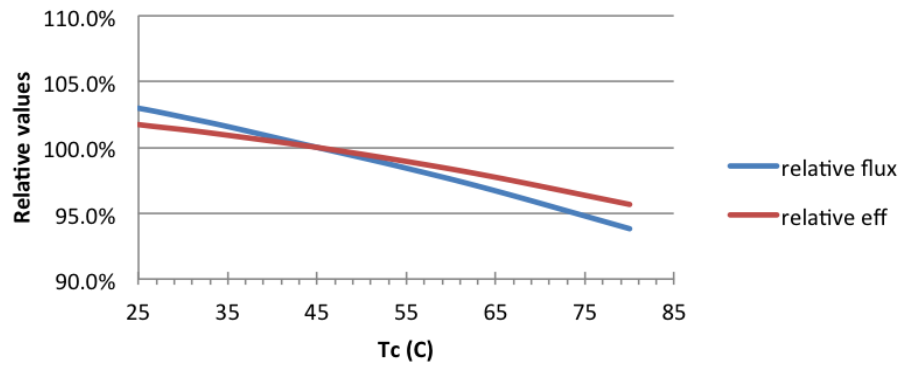
Tuning Information

Flux and Efficacy Versus Current



I [A]	Flux [%]	Efficacy [%]
90	67.4%	109.2%
100	74.3%	107.1%
120	87.4%	103.4%
130	93.8%	101.6%
140	100.0%	100.0%
150	106.3%	98.4%
160	112.5%	96.8%
180	124.4%	94.0%

Flux and Efficacy Versus Temperature at Tc

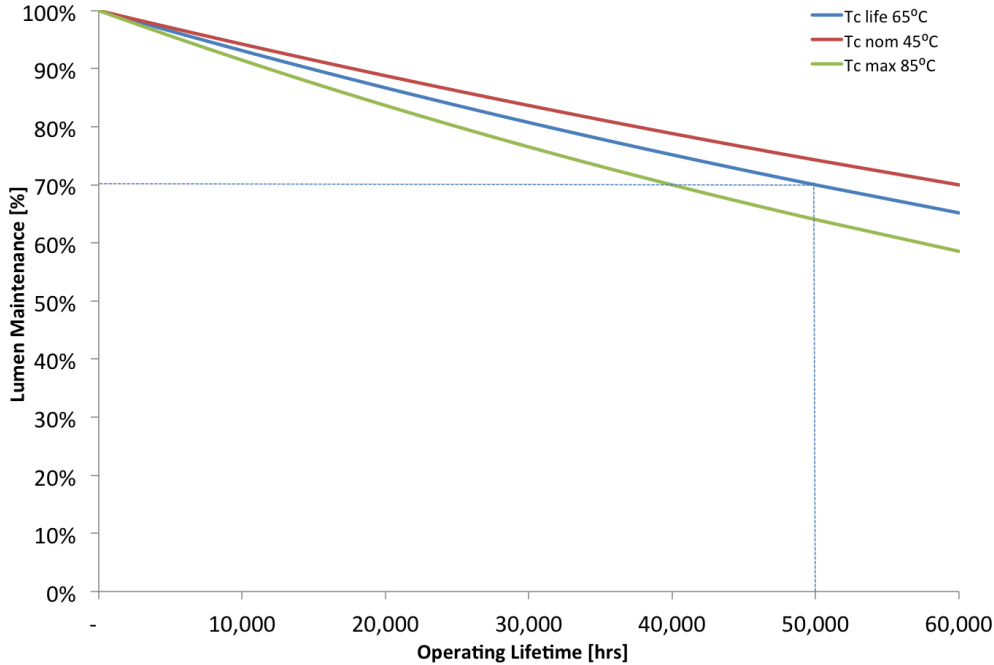


Tc [°C]	Flux [%]	Efficacy [%]
25	103.0%	101.7%
30	102.3%	101.3%
35	101.6%	100.9%
45	100.0%	100.0%
55	98.4%	98.9%
65	96.7%	97.7%
80	93.8%	95.7%

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Lumen Maintenance: at I Life and Tc Life Conditions

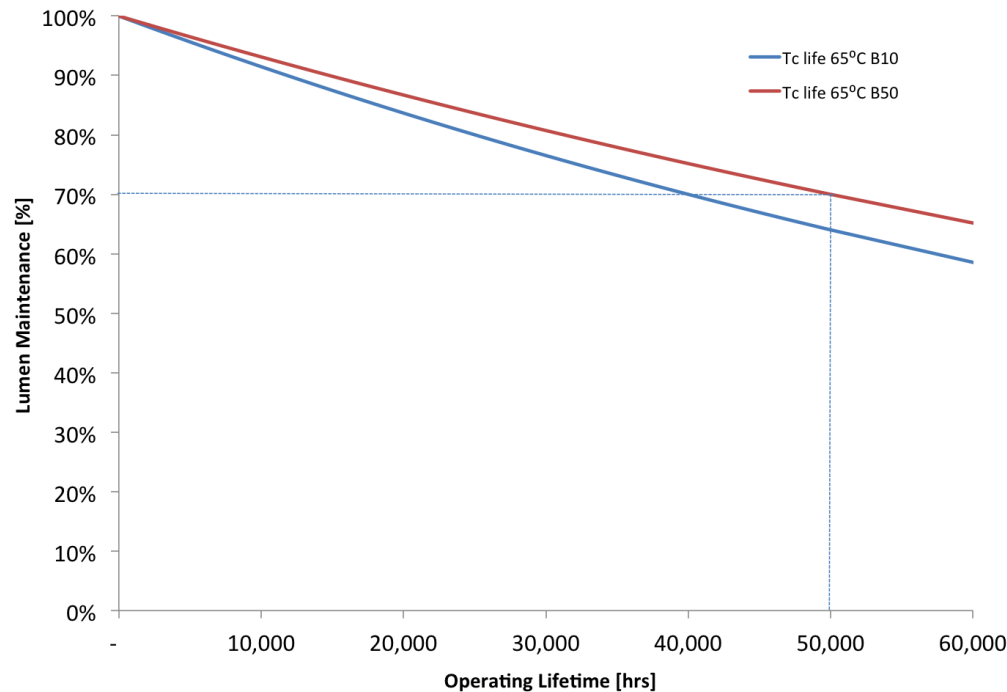
Fortimo LML SE 1ft 700lm 1R LV G1



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

Lumen Maintenance at Current I Life

Fortimo LML SE 1ft 700lm 1R LV G1



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

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Footnotes:

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 Tc point.
2. View limited warranty at http://www.usa.lighting.philips.com/connect/tools_literature/warranties.wpd for details and restrictions.
3. CCT for characterisation. Complies with ANSIC78.377A Specifications.
4. Note: 3.5 SDCM color consistency specification may not be sufficient for applications that are sensitive to color differences like wall washers, which typically require 2 SDCM.

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