PHILIPS

LED Modules

Fortimo LED Line High Flux

2ft 4000lm 1R LV2

Fortimo LED Line High Flux Gen 2 is designed to replace conventional lighting in high lumen and high ceiling applications such as high-bay linear 80W TL 5 fluorescent systems.

High energy efficacy and optimal thermal design enables the Fortimo LED Line High Flux Gen 2 to withstand rough application conditions while enabling excellent total cost of ownership for the end-user.

Its high lumen output of > 2,000 lm/ft and thermal capability of Tc life of 90°C for a 50,000-hour lifetime makes it the perfect fit for the most demanding applications.

Together with the wide range of available Philips Advance Xitanium LED Drivers, it offers piece of mind for both OEM and end-user, backed-up by a five-year limited system warranty.[3]

Commercial Product Name	12NC
Fortimo LED Line 2ft 4000lm 830 1R LV2	929000720513
Fortimo LED Line 2ft 4000lm 835 1R LV2	929000720613
Fortimo LED Line 2ft 4000lm 840 1R LV2	929000720713
Fortimo LED Line 2ft 4000lm 850 1R LV2	929000720813

See footnotes on last page.

Fortimo LED Line 2ft 4000lm 1R LV2

Features

- Tc life of 90°C
- High energy efficiency of up to 143 lm/W
- Variation of color temperatures (3000K, 3500K, 4000K and 5000K)
- High color rendering of CRI > 80
- High quality of light with 3 SDCM color consistency
- Lumen levels of 2,000 lm/ft and 4,000 lm/2ft
- Long lifetime – 50,000 hrs[1]
- Push-in connectors enabling easy wiring and daisy chaining
- Compliant to Zhaga footprint[2]

Benefits

- Enables LED fixture designs in thermally challenging applications of -40°C - +55°C ambient temperatures
- High energy efficacy and optimal total cost of ownership vs. conventional lighting systems
- 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 Drivers[3]

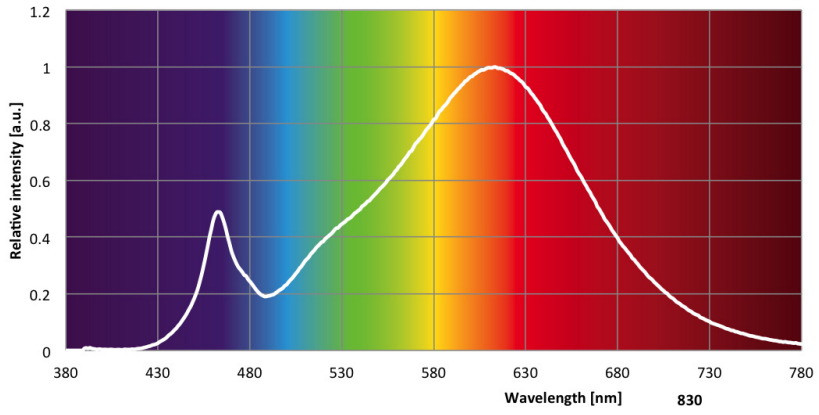
Application

- High-bay industrial lighting
- High-bay big box retail lighting
- Vapor tight high temperature applications

Optical Characteristics – Table per CCT

Fortimo LED Line 1ft 4000lm 830 1R LV2				
Parameter	**Min**	**Typ**	**Max**	**Unit**
Luminous Flux		3820		lm
Lumen Efficiency		136		lm/W
Forward Current		880	1000	mA
Forward Voltage		32.0	33.0	V
Correlated Color Temperature (CCT) Target[4]		3000		K
Color Consistency		3[5]		SDCM
CRI	80			-
Radiation Angle		120		deg

Color consistency of 3 SDCM, averaged over the module.
Tolerance for flux data is ±7.5 %.
Tolerance for efficacy data is ±10 %.



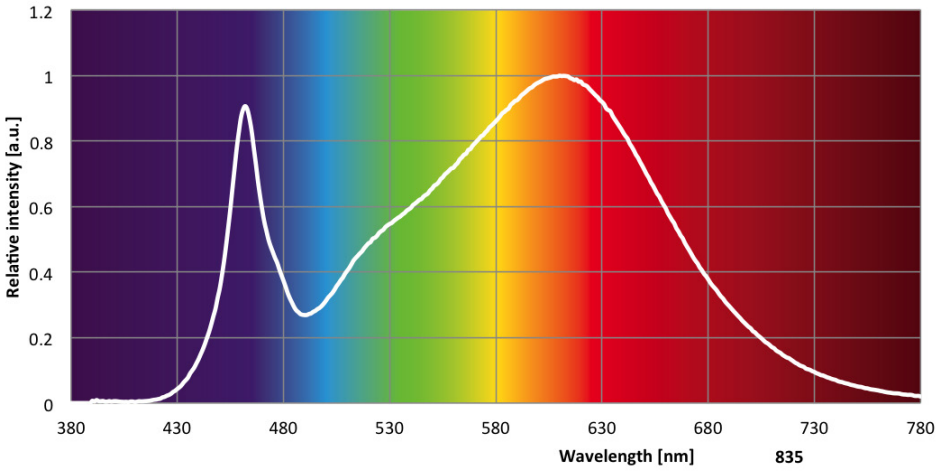
See footnotes on last page.

Fortimo LED Line 2ft 4000lm 1R LV2

Optical Characteristics – Table per CCT

Fortimo LED Line 1ft 4000lm 835 1R LV2				
Parameter	**Min**	**Typ**	**Max**	**Unit**
Luminous Flux		3900		lm
Lumen Efficiency		138		lm/W
Forward Current		880	1000	mA
Forward Voltage		32.0	33.0	V
Correlated Color Temperature (CCT) Target[4]		3500		K
Color Consistency		3[5]		SDCM
CRI	80			-
Radiation Angle		120		deg

Color consistency of 3 SDCM, averaged over the module.
Tolerance for flux data is ±7.5 %.
Tolerance for efficacy data is ±10 %.



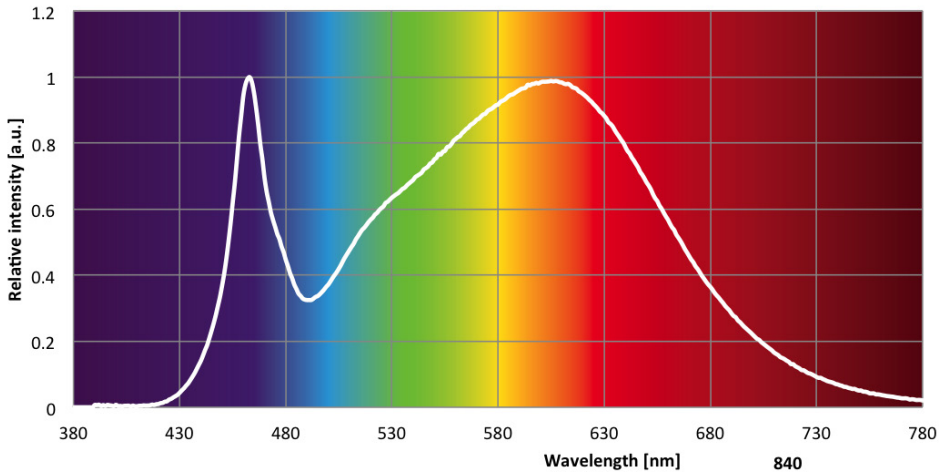
See footnotes on last page.

Fortimo LED Line 2ft 4000lm 1R LV2

Optical Characteristics – Table per CCT

Fortimo LED Line 1ft 2000lm 840 1R LV2				
Parameter	**Min**	**Typ**	**Max**	**Unit**
Luminous Flux		4000		lm
Lumen Efficiency		142		lm/W
Forward Current		880	1000	mA
Forward Voltage		32.0	33.0	V
Correlated Color Temperature (CCT) Target[4]		4000		K
Color Consistency		3[5]		SDCM
CRI	80			-
Radiation Angle		120		deg

Color consistency of 3 SDCM, averaged over the module.
Tolerance for flux data is ±7.5 %.
Tolerance for efficacy data is ±10 %.



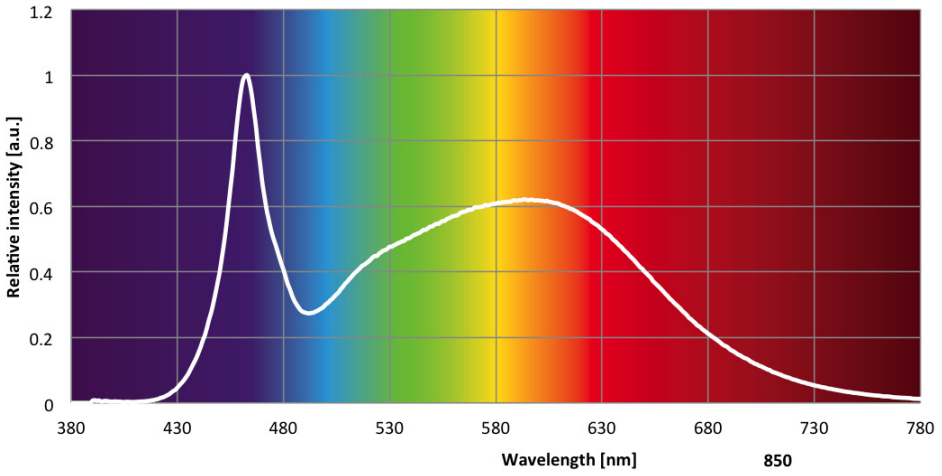
See footnotes on last page.

Fortimo LED Line 2ft 4000lm 1R LV2

Optical Characteristics – Table per CCT

Fortimo LED Line 1ft 2000lm 850 1R LV2				
Parameter	**Min**	**Typ**	**Max**	**Unit**
Luminous Flux		4020		lm
Lumen Efficiency		143		lm/W
Forward Current		880	1000	mA
Forward Voltage		32.0	33.0	V
Correlated Color Temperature (CCT) Target[4]		5000		K
Color Consistency		3[5]		SDCM
CRI	80			-
Radiation Angle		120		deg

Color consistency of 3 SDCM, averaged over the module.
Tolerance for flux data is ±7.5 %.
Tolerance for efficacy data is ±10 %.

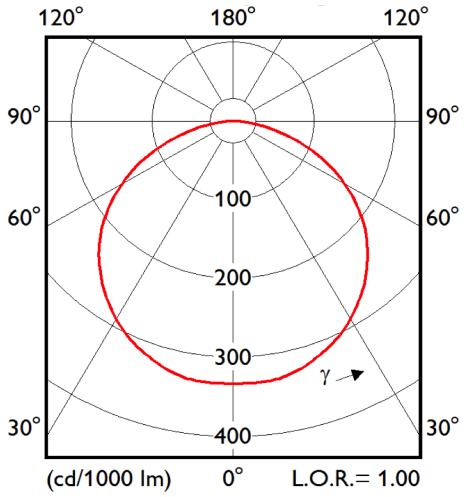


See footnotes on last page.

Fortimo LED Line 2ft 4000lm 1R LV2

Beam Shape

The Philips Fortimo LED Line High Flux Gen 2 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		880	1120	mA
Forward Voltage		32.0	33.0	V
Forward Voltage Bins		E/F		
Power Consumption		28.0	33.0	W

Note: Specifications stated at Tc nom = 55°C and I nom = 880mA

Lifetime

Parameter	Nominal[6]	Life[7]	Max[8]
Tc [°C]	55	90	100
Current [mA]	880	1000	1120

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

Note: Specifications stated while Tc< 90°C and I<1000 mA

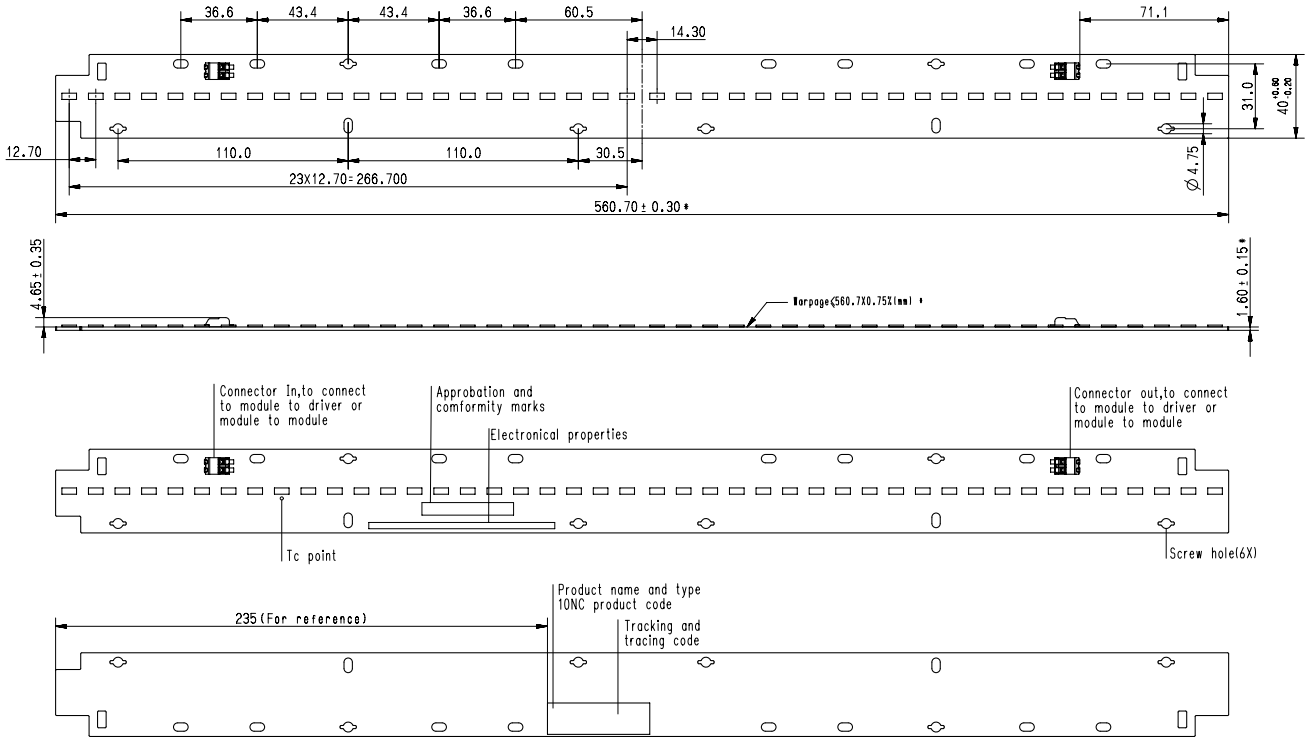
See footnotes on last page.

Fortimo LED Line 2ft 4000lm 1R LV2

Mechanical Characteristics

Parameter	Min	Typ	Max	Unit
Length	560.4	560.7	561.0	mm
Width	39.8	40.0	40.6	mm
Height Excl. Connector	1.45	1.60	1.75	mm
Height Incl. Connector	4.30	4.65	5.00	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 LED Line 2ft 4000lm 1R LV2

Abs Max Ratings

Parameter	Min	Typ	Max	Unit
Current Imax			1120	mA
Case Temperature Tc Max			100	°C
ESD (direct contact)			8	kV
ESD (air)			15	kV
Isolation Breakdown Voltage	500			Vdc
Ambient Temperature	-40		55	°C
Number of Modules per Chain			2	

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.

Fortimo LED Line 2ft 4000lm 1R LV2

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

Zhaga[2]

Designation of the ECG housing (book-1 / annex C)	BL3
Designation of the Book-7 LLE Category	L28W4 for 1ft; L28W4 for 2ft
Luminous Flux Category	C020 for 1ft; C040 for 2ft
CCT Category	3000K/3500K/4000K/5000K
CRI	80
A Plain-text-file with a Format as Defined in Book-7, Section 4.5	www.philips.com/technology/
A Greyscale iImage with a Format as Defined in Book-7, Section 4.5	
The Position of the Temperature Measurement Point Tp	same as Tc point
The Value of Tp, Max	na
The Value of Tp, Headroom	–

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

Case Temperature Tc [°C]	**Amount of Cycles**
35	40,000
40	40,000
45	40,000
50	26,000
55	26,000
60	25,000
65	25,000
70	24,000
75	21,000
80	13,000
85	8000
90	4000

See footnotes on last page.

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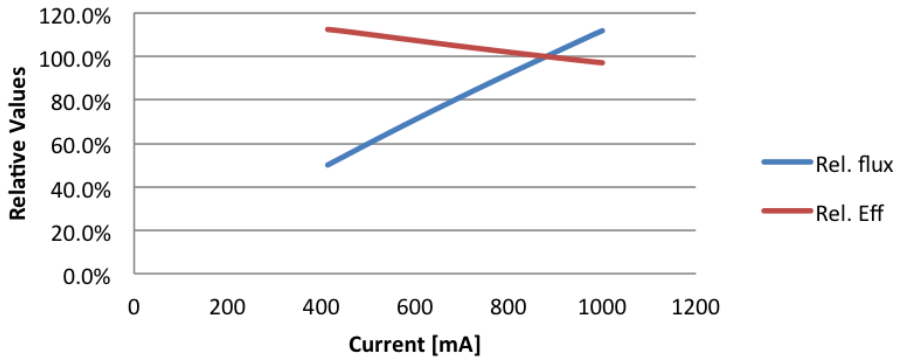
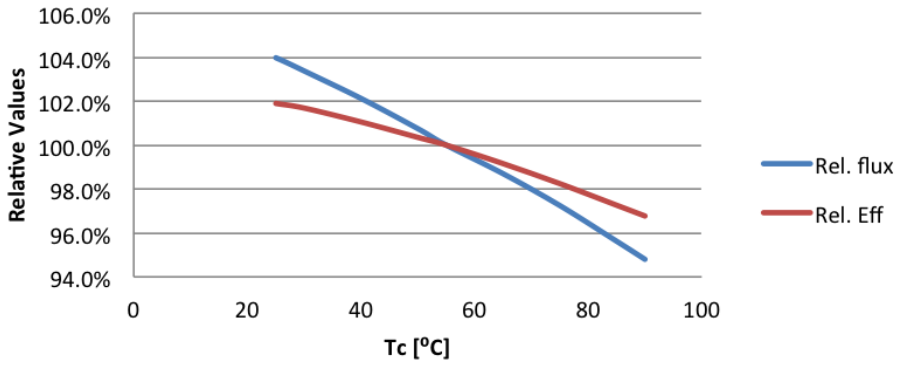
Tuning Information

Flux and Efficacy Versus Current



I [A]	Flux [%]	Efficacy [%]
414	50.0%	112.7%
501	60.0%	110.2%
592	70.0%	107.6%
685	80.0%	105.1%
781	90.0%	102.5%
880	**100.0%**	**100.0%**
980	110.0%	97.5%
1000	**111.9%**	**97.1%**

Flux and Efficacy Versus Temperature at Tc



Tc [°C]	Flux [%]	Efficacy [%]
25	104.0%	101.9%
30	103.4%	101.7%
40	102.1%	101.1%
50	100.8%	100.4%
55	**100.0%**	**100.0%**
65	98.7%	99.2%
75	97.3%	98.2%
85	95.6%	97.3%
90	**94.8%**	**96.8%**

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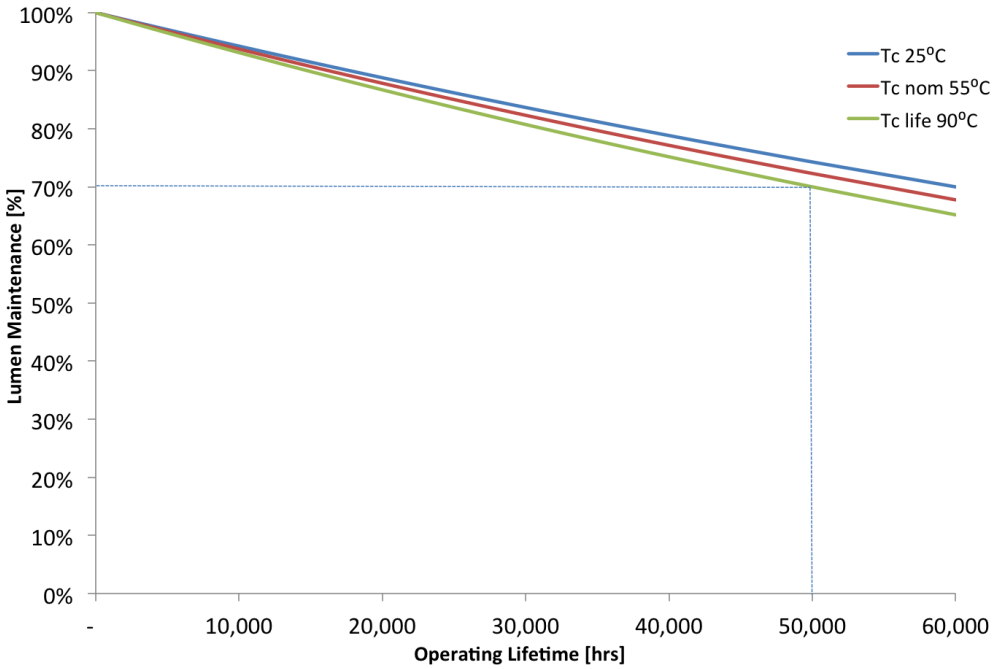
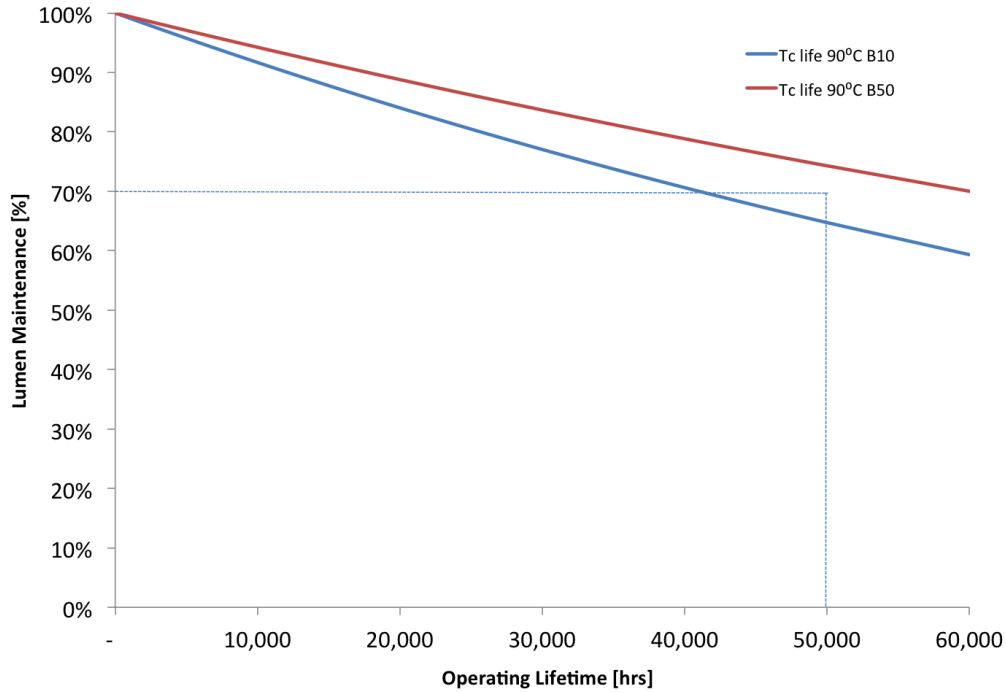
Lumen Maintenance: at I Life and Tc Life Conditions
Fortimo LED Line 1ft4000lm 1R LV2



Lumen depreciation as a function of operating hours for I-life and Tc-life.
50,000 hours proven by certified laboratory.

Lumen Maintenance at Current I Life
Fortimo LED Line 1ft 4000lm 1R LV2



Lumen depreciation as a function of operating hours for I-life and Tc-life.
50,000 hours proven by certified laboratory.

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Footnotes:

1. Average rated life is based one 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. Meets Zhaga design guidelines – not certified.
3. View limited warranty at http://www.usa.lighting.philips.com/connect/tools_literature/warranties.wpd for details and restrictions.
4. CCT for characterisation. Complies with ANSIC78.377A Specifications.
5. Note: 3 SDCM color consistency specification may not be sufficient for applications that are sensitive to color differences like wall washers, which typically require 2 SDCM.
6. Nominal value at which performance is specified.
7. Value at which lifetime is specified (max current for warranty).
8. Maximum value for safety.

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