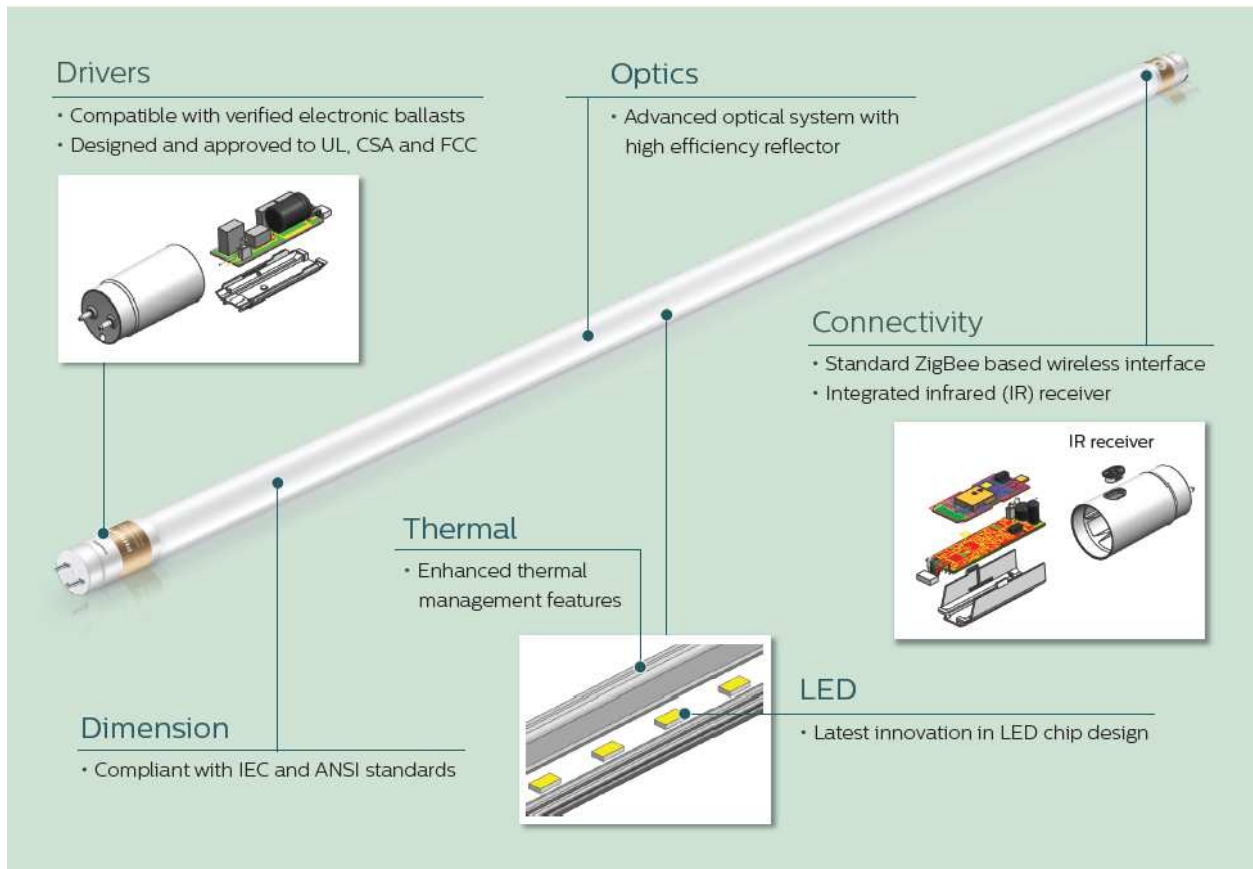




Technical Application Guide

Philips is now introducing a new line of connected LED lighting products with EasySmart technology. Philips InstantFit LED T8 with EasySmart technology is compatible with verified¹ electronic ballasts. It is the easiest way to replace fluorescent lamps with connected LED lamps without rewiring the fixture. It is true plug and play. The lamp offers standard ZigBee based connectivity that easily interoperates with various control devices. Compared with a non-connected LED solution, EasySmart technology realizes more energy savings by enabling advanced control options.





Product Features

Ballast Compatibility

- Innovative driver design that enables a “plug-and-play” LED solution
- Compatible with verified¹ electronic ballast
- Quick and easy installation

Connectivity

- ZigBee based wireless interface
- Reliable and secure wireless communication, nominal range 40 feet
- Up to 50 lamps in one network
- Easy commissioning and (re-)configuration from the floor

Control Functionality

- Automatic on/off and dimming based on occupancy detection and daylight variation
- Personal dimming and scene setting with Zigbee wireless switch
- High-end trimming to help save energy and extend lamp life

Energy Savings

- Energy savings of 50% or more* when used with advanced control such as dimming, occupancy sensing and daylight harvesting.
- DLC listed.

User comfort

- Uniform light output with advanced optical design.
- Personal light setting to enhance user comfort and productivity
- Typical CRI 82

Reliability

- Reliable operation between -20°C and +45°C ambient temperature.
- Tested to B50 L70 requirement. Lamps are rated for 50,000 hours.
- 200,000 switching cycles.

Safety

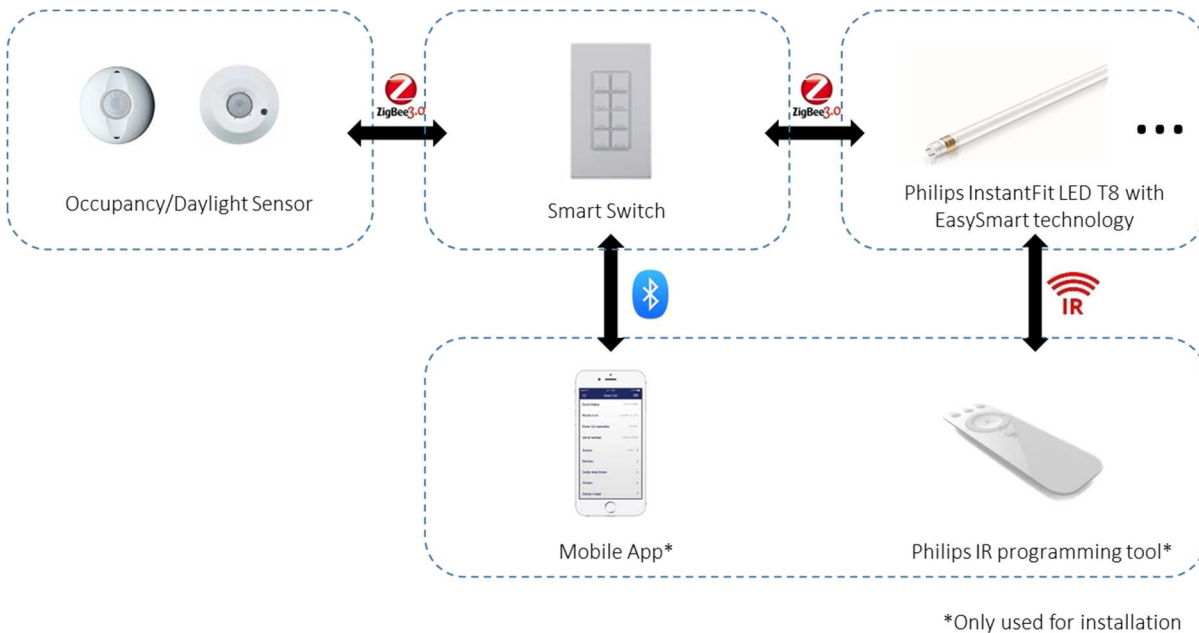
- Over voltage and over temperature protection.
- Complies with relevant UL and CSA safety requirements.
- Shatterproof polycarbonate (PC) material.

Environment

- No Mercury.
- Low Carbon Footprint.

System Overview

Communication between lamps, switch and sensors is ZigBee based.



To facilitate the installation, Philips provides an IR tool as accessory. Your control device manufacturer will provide a tool (ie: mobile app) to commission the sensor and switch.

* Philips InstantFit LED T8 with EasySmart technology uses ZigBee protocol to communicate with each other and 3rd party control devices.

* IR programming tool communicates with individual lamp via infrared.

* 50% energy savings compared to an F32T8 when dimmed at least 30% for 10% of the time product is on.

Applications



conference room



classroom



open plan office



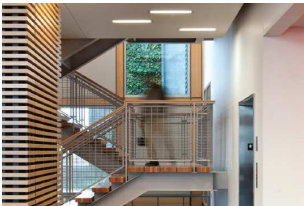
private office



common area



corridor

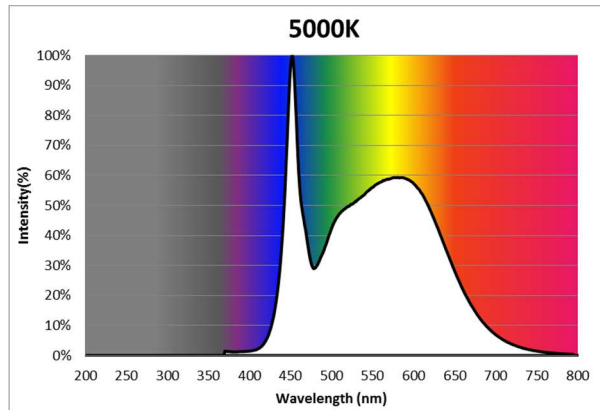
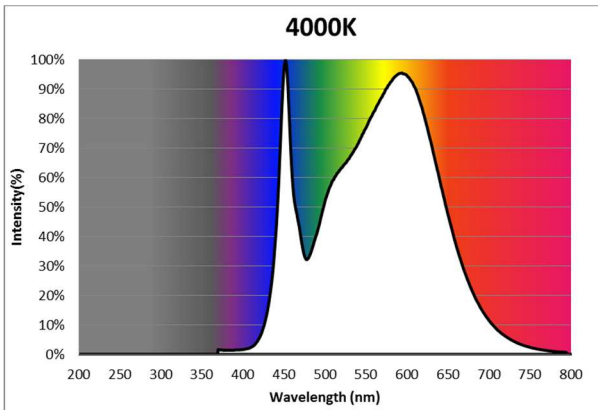
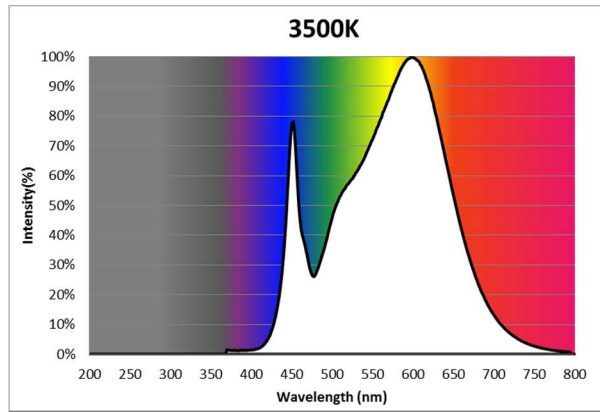
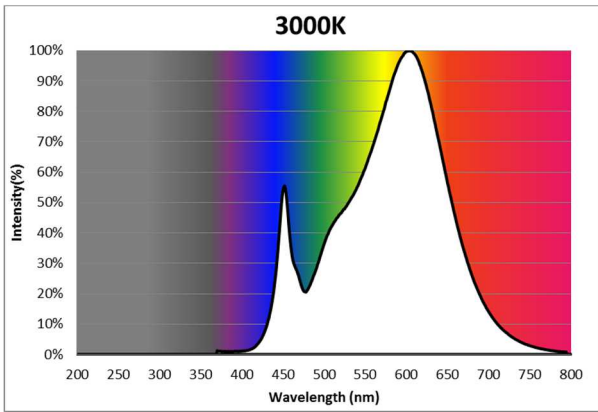


stairwell



restroom

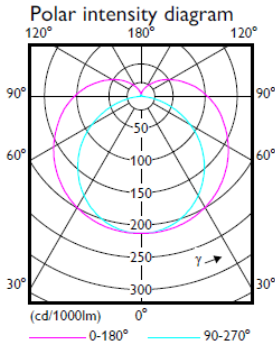
Spectral Power Distribution



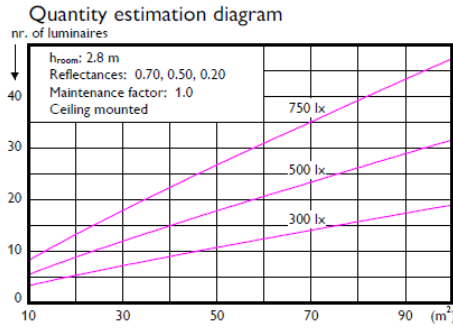
Photometric Diagrams

1 x TLED 14W 3000K 160D 9290012811

1 x 2000 lm



Light output ratio 1.00
 Service upward 0.19
 Service downward 0.81
 CIE flux code 37 65 86 81 100
 UGRcen (4Hx8H, 0.25H) 25

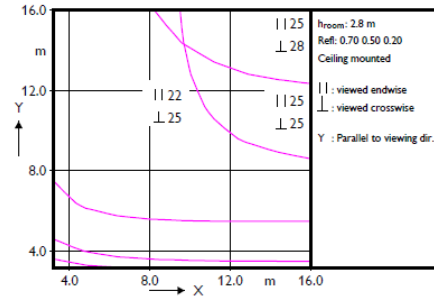


Utilisation factor table

Room Index k	Reflectances (%) for ceiling, walls and working plane (CIE)																	
	0.80	0.80	0.70	0.70	0.70	0.70	0.50	0.50	0.30	0.30	0.30	0.30	0.10	0.10	0.10	0.10	0.10	0.00
0.60	0.41	0.39	0.40	0.39	0.38	0.30	0.29	0.24	0.27	0.23	0.19							
0.80	0.51	0.48	0.49	0.47	0.46	0.38	0.36	0.31	0.34	0.29	0.25							
1.00	0.59	0.55	0.56	0.54	0.53	0.45	0.42	0.37	0.39	0.35	0.30							
1.25	0.67	0.61	0.64	0.61	0.59	0.51	0.48	0.43	0.45	0.41	0.36							
1.50	0.73	0.66	0.70	0.67	0.64	0.57	0.53	0.48	0.50	0.45	0.40							
2.00	0.82	0.74	0.78	0.75	0.71	0.65	0.61	0.56	0.57	0.53	0.47							
2.50	0.89	0.79	0.85	0.80	0.76	0.70	0.66	0.61	0.61	0.58	0.52							
3.00	0.94	0.82	0.89	0.84	0.79	0.74	0.69	0.66	0.65	0.62	0.55							
4.00	1.00	0.87	0.95	0.89	0.84	0.79	0.74	0.71	0.70	0.67	0.60							
5.00	1.04	0.90	0.99	0.92	0.87	0.83	0.78	0.75	0.73	0.70	0.63							

Ceiling mounted

UGR diagram



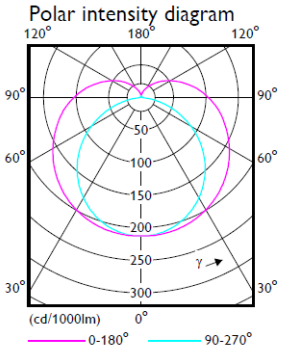
Luminance Table

Plane Cone	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	7599	7581	7657	7880	8359	9339	11372
50.0	7316	7283	7328	7506	7914	8849	11068
55.0	7056	7012	7030	7135	7458	8302	10681
60.0	6826	6790	6753	6805	7004	7704	10184
65.0	6622	6585	6507	6485	6561	7049	9537
70.0	6455	6399	6303	6220	6150	6331	8693
75.0	6347	6265	6162	6010	5782	5564	7521
80.0	6269	6195	6058	5826	5463	4761	5812
85.0	6200	6119	5959	5694	5216	4050	3289
90.0	6158	6060	5890	5602	5052	3628	1531

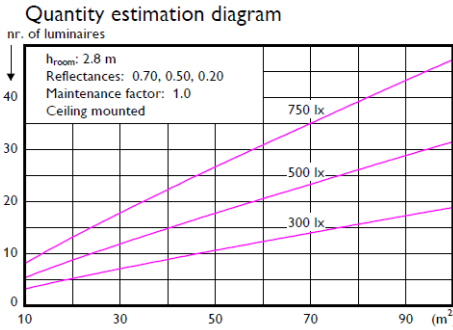
(cd/m²)

1 x TLED 14W 3500K 160D 9290012812

1 x 2000 lm



Light output ratio 1.00
 Service upward 0.19
 Service downward 0.81
 CIE flux code 37 65 86 81 100
 UGRcen (4Hx8H, 0.25H) 25

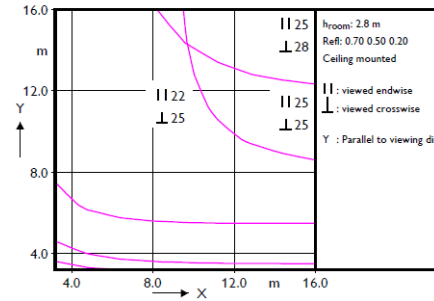


Utilisation factor table

Room Index k	Reflectances (%) for ceiling, walls and working plane (CIE)																	
	0.80	0.80	0.70	0.70	0.70	0.70	0.50	0.50	0.30	0.30	0.30	0.30	0.10	0.10	0.10	0.10	0.10	0.00
0.60	0.41	0.39	0.40	0.39	0.38	0.30	0.29	0.24	0.27	0.23	0.19							
0.80	0.51	0.48	0.49	0.47	0.46	0.38	0.36	0.31	0.34	0.29	0.25							
1.00	0.59	0.55	0.56	0.54	0.53	0.45	0.42	0.37	0.39	0.35	0.30							
1.25	0.67	0.61	0.64	0.61	0.59	0.51	0.48	0.43	0.45	0.41	0.36							
1.50	0.73	0.66	0.70	0.67	0.64	0.57	0.53	0.48	0.50	0.45	0.40							
2.00	0.82	0.74	0.78	0.75	0.71	0.65	0.61	0.56	0.57	0.53	0.47							
2.50	0.89	0.79	0.85	0.80	0.76	0.70	0.66	0.61	0.61	0.58	0.52							
3.00	0.94	0.82	0.89	0.84	0.79	0.74	0.69	0.66	0.65	0.62	0.55							
4.00	1.00	0.87	0.95	0.89	0.84	0.79	0.74	0.71	0.70	0.67	0.60							
5.00	1.04	0.90	0.99	0.92	0.87	0.83	0.78	0.75	0.73	0.70	0.63							

Ceiling mounted

UGR diagram



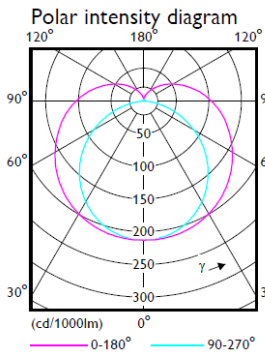
Luminance Table

Plane Cone	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	7599	7581	7657	7880	8359	9339	11372
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55.0	7056	7012	7030	7135	7458	8302	10681
60.0	6826	6790	6753	6805	7004	7704	10184
65.0	6622	6585	6507	6485	6561	7049	9537
70.0	6455	6399	6303	6220	6150	6331	8693
75.0	6347	6265	6162	6010	5782	5564	7521
80.0	6269	6195	6058	5826	5463	4761	5812
85.0	6200	6119	5959	5694	5216	4050	3289
90.0	6158	6060	5890	5602	5052	3628	1531

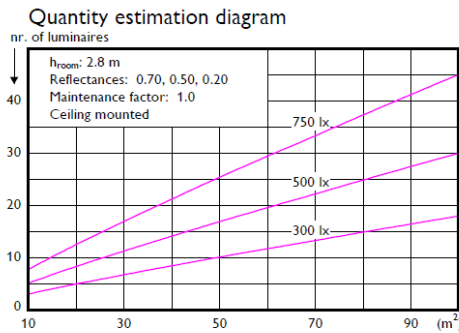
(cd/m²)

1 x TLED 14W 4000K 160D 9290012813

1 x 2100 lm



Light output ratio 1.00
 Service upward 0.19
 Service downward 0.81
 CIE flux code 37 65 86 81 100
 UGRcen (4Hx8H, 0.25H) 25

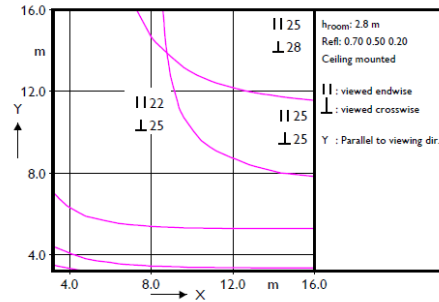


Utilisation factor table

Room Index k	Reflectances (%) for ceiling, walls and working plane (CIE)											
	0.80 0.80			0.70 0.70 0.70			0.50 0.50			0.30 0.30		
	0.80	0.50	0.10	0.50	0.50	0.10	0.30	0.10	0.10	0.30	0.10	0.10
0.60	0.41	0.39	0.40	0.39	0.38	0.30	0.29	0.24	0.27	0.23	0.19	
0.80	0.51	0.48	0.49	0.47	0.46	0.38	0.36	0.31	0.34	0.29	0.25	
1.00	0.59	0.55	0.56	0.54	0.53	0.45	0.42	0.37	0.39	0.35	0.30	
1.25	0.67	0.61	0.64	0.61	0.59	0.51	0.48	0.43	0.45	0.41	0.36	
1.50	0.73	0.66	0.70	0.67	0.64	0.57	0.53	0.48	0.50	0.45	0.40	
2.00	0.82	0.74	0.78	0.75	0.71	0.65	0.61	0.56	0.57	0.53	0.47	
2.50	0.89	0.79	0.85	0.80	0.76	0.70	0.66	0.61	0.61	0.58	0.52	
3.00	0.94	0.82	0.89	0.84	0.79	0.74	0.69	0.66	0.65	0.62	0.55	
4.00	1.00	0.87	0.95	0.89	0.84	0.79	0.74	0.71	0.70	0.67	0.60	
5.00	1.04	0.90	0.99	0.92	0.87	0.83	0.78	0.75	0.73	0.70	0.63	

Ceiling mounted

UGR diagram



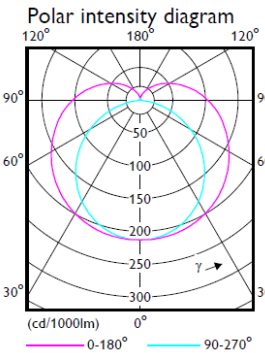
Luminance Table

Plane Cone	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	7978	7959	8040	8273	8777	9805	11940
50.0	7681	7646	7694	7881	8309	9293	11623
55.0	7409	7361	7382	7492	7833	8717	11218
60.0	7166	7129	7090	7143	7355	8092	10693
65.0	6954	6914	6832	6811	6891	7401	10013
70.0	6778	6719	6617	6529	6458	6645	9126
75.0	6666	6578	6468	6311	6071	5845	7902
80.0	6582	6503	6359	6115	5736	5005	6100
85.0	6511	6427	6259	5978	5477	4252	3451
90.0	6464	6363	6185	5886	5304	3819	1531

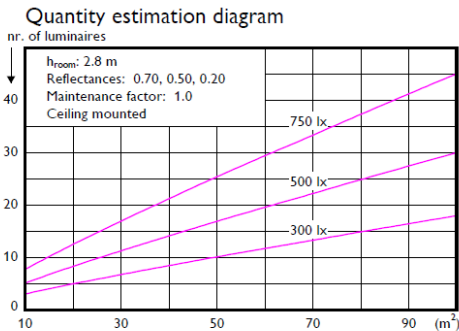
(cd/m²)

1 x TLED 14W 5000K 160D 9290012814

1 x 2100 lm



Light output ratio 1.00
 Service upward 0.19
 Service downward 0.81
 CIE flux code 37 65 86 81 100
 UGRcen (4Hx8H, 0.25H) 25

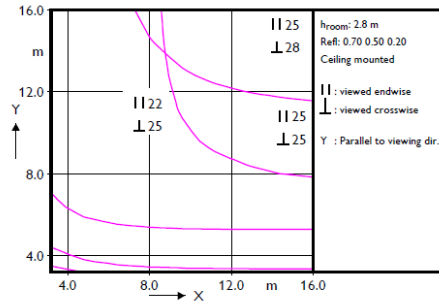


Utilisation factor table

Room Index k	Reflectances (%) for ceiling, walls and working plane (CIE)											
	0.80 0.80			0.70 0.70 0.70			0.50 0.50			0.30 0.30		
	0.80	0.50	0.10	0.50	0.50	0.10	0.30	0.10	0.10	0.30	0.10	0.10
0.60	0.41	0.39	0.40	0.39	0.38	0.30	0.29	0.24	0.27	0.23	0.19	
0.80	0.51	0.48	0.49	0.47	0.46	0.38	0.36	0.31	0.34	0.29	0.25	
1.00	0.59	0.55	0.56	0.54	0.53	0.45	0.42	0.37	0.39	0.35	0.30	
1.25	0.67	0.61	0.64	0.61	0.59	0.51	0.48	0.43	0.45	0.41	0.36	
1.50	0.73	0.66	0.70	0.67	0.64	0.57	0.53	0.48	0.50	0.45	0.40	
2.00	0.82	0.74	0.78	0.75	0.71	0.65	0.61	0.56	0.57	0.53	0.47	
2.50	0.89	0.79	0.85	0.80	0.76	0.70	0.66	0.61	0.61	0.58	0.52	
3.00	0.94	0.82	0.89	0.84	0.79	0.74	0.69	0.66	0.65	0.62	0.55	
4.00	1.00	0.87	0.95	0.89	0.84	0.79	0.74	0.71	0.70	0.67	0.60	
5.00	1.04	0.90	0.99	0.92	0.87	0.83	0.78	0.75	0.73	0.70	0.63	

Ceiling mounted

UGR diagram



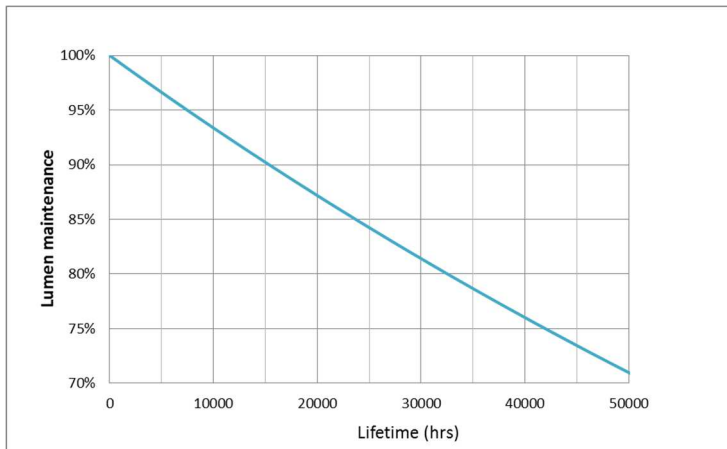
Luminance Table

Plane Cone	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	7978	7959	8040	8273	8777	9805	11940
50.0	7681	7646	7694	7881	8309	9293	11623
55.0	7409	7361	7382	7492	7833	8717	11218
60.0	7166	7129	7090	7143	7355	8092	10693
65.0	6954	6914	6832	6811	6891	7401	10013
70.0	6778	6719	6617	6529	6458	6645	9126
75.0	6666	6578	6468	6311	6071	5845	7902
80.0	6582	6503	6359	6115	5736	5005	6100
85.0	6511	6427	6259	5978	5477	4252	3451
90.0	6464	6363	6185	5886	5304	3819	1531

(cd/m²)

Lifetime and Lumen Maintenance

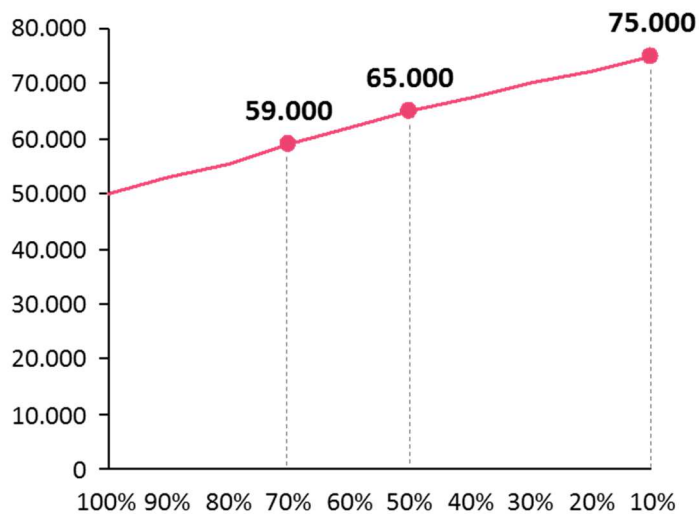
Philips InstantFit LED T8 with EasySmart technology has a lifetime of 50,000 hours. This is defined as the number of hours when 50% of a large group of identical lamps drops below 70% of its initial lumens.



Lifetime and Dimming

Dimming can help extend lifetime (ie: dimming 30% can extend lifetime by 9,000 hours)

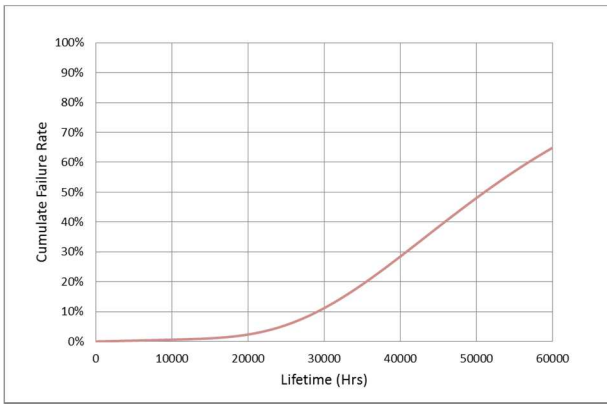
Lifetime (hrs)



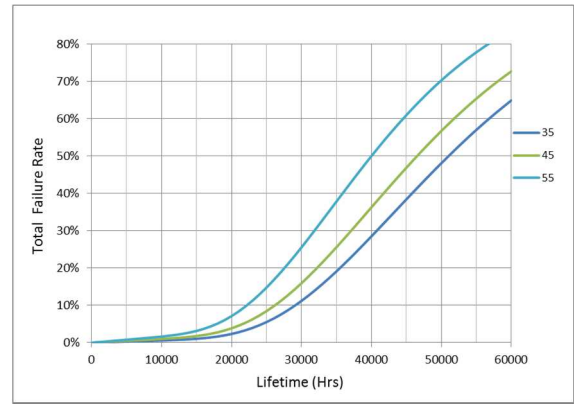
Dimming level

Lifetime and Failure Rate

Lifetime vs. Failure rate @ T_a 25°C

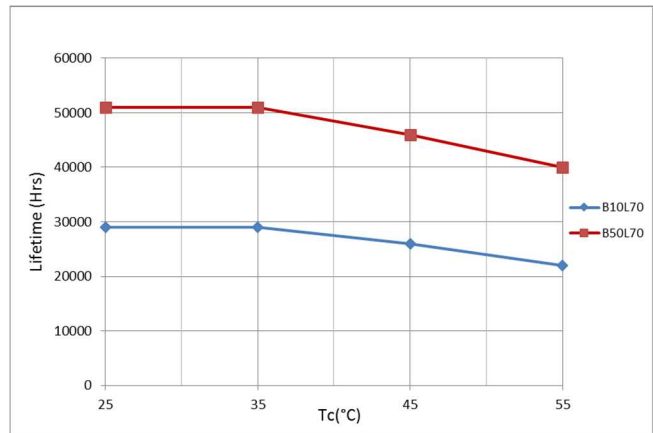
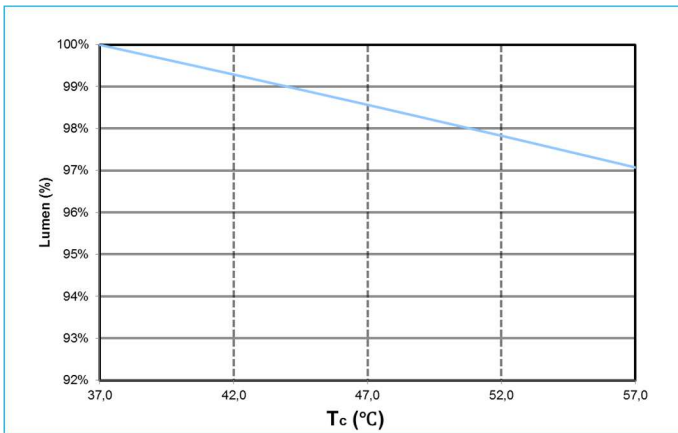


Lifetime vs. Failure Rate vs. T_{case}

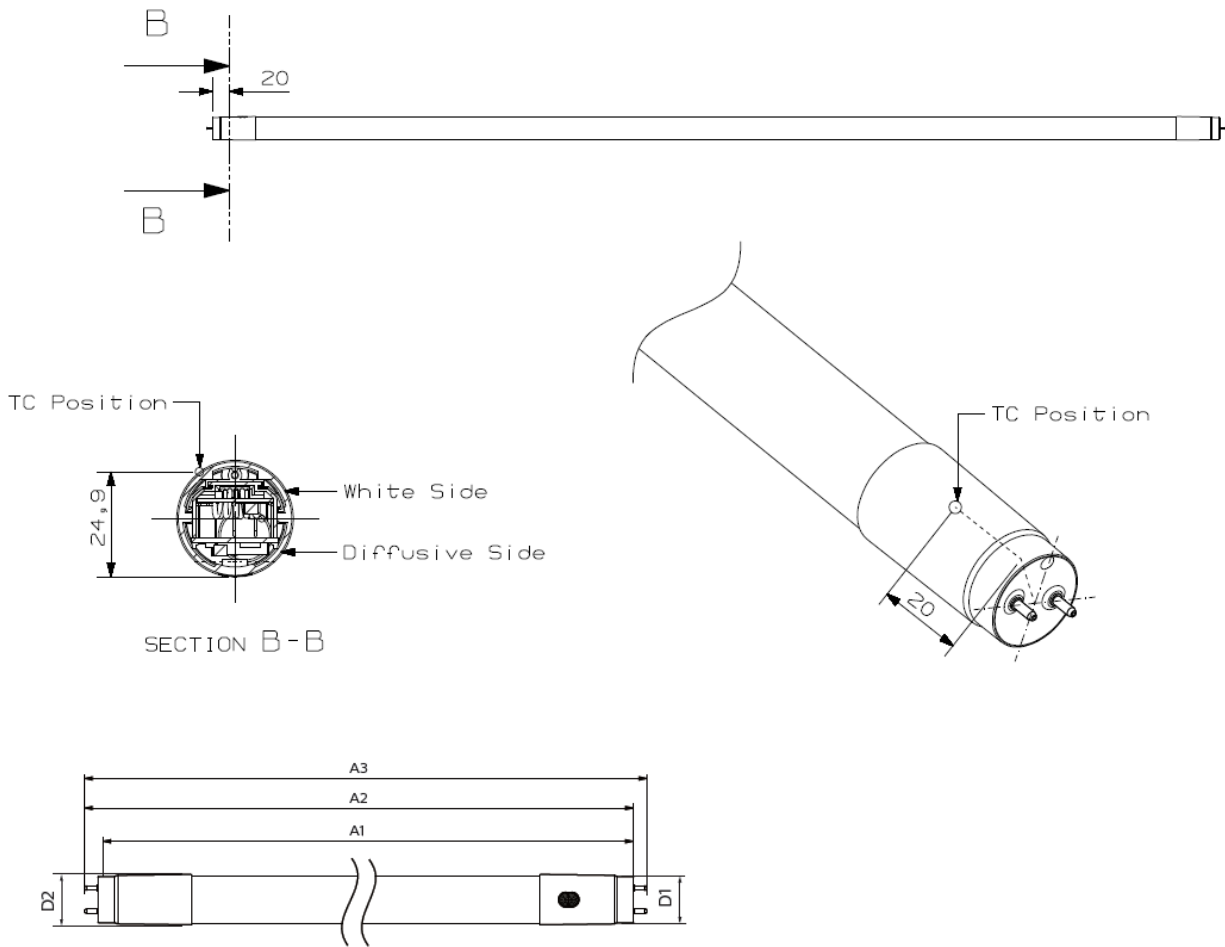


Temperature

Operating Temperature	$T_{operating}$	min -20°C	max $+45^\circ\text{C}$
Storage Temperature	$T_{storage}$	min -40°C	max $+65^\circ\text{C}$
Maximum case temperature of tube at $T_{amb}=25^\circ\text{C}$	T_{case}		$+37^\circ\text{C}$



Dimensions



Dimensions (mm)

Product	A1	A2	A3	D1	D2
14T8/48	1198.1	1205.2	1212.3	25.6	27.8

Technical Specs and Order information

Product Description	Bare Lamp Watts*	Average System Watts*	Standby Power*	Initial Lumens	Lifetime (hrs)	Cap Base	Length (in)	Bulb Type	CCT	RF Range	Product number
14T8/48-3000 IF 10/1 EasySmart	14W	16.5W	<0.5W	2000lm	50,000	G13	48	T8	3000K	40ft	929001281104
14T8/48-3500 IF 10/1 EasySmart	14W	16.5W	<0.5W	2000lm	50,000	G13	48	T8	3500K	40ft	929001281204
14T8/48-4000 IF 10/1 EasySmart	14W	16.5W	<0.5W	2100lm	50,000	G13	48	T8	4000K	40ft	929001281304
14T8/48-5000 IF 10/1 EasySmart	14W	16.5W	<0.5W	2100lm	50,000	G13	48	T8	5000K	40ft	929001281404

*test based on reference instant-start ballast

Please visit www.philips.com/EasySmart for latest information on ballast compatibility.

Accessories

Ordering Code	Product Number	Product Description
473504	929001390604	EasySmart IR Programming Tool 10/1

Control Compatibility

Philips InstantFit LED T8 with EasySmart technology now works with:

Brand	Model ID/Order Code	Product Description
Leviton	DLDNK-01W	Intellect Decora Lumina RF 1-Button multi-function BLE keypad with room controller and LED feedback functionality, 120-277VAC, 50/60Hz, White
Leviton	DLDNK-02W	Intellect Decora Lumina RF 2-Button multi-function BLE keypad with room controller and LED feedback functionality, 120-277VAC, 50/60Hz, White
Leviton	DLDNK-04W	Intellect Decora Lumina RF 4-Button multi-function BLE keypad with room controller and LED feedback functionality, 120-277VAC, 50/60Hz, White
Leviton	DLDNK-08W	Intellect Decora Lumina RF 8-Button multi-function BLE keypad with room controller and LED feedback functionality, 120-277VAC, 50/60Hz, White
Leviton	ZSC04-lxW	Lumina RF PIR Occupancy Sensor, 450 sq ft
Leviton	ZSC15-lxW	Lumina RF PIR Occupancy Sensor, 1,500 sq ft
Leviton	LURPC-00W	Lumina RF Wireless Photocell
Leviton	FREE	Neuron App

Product must be used with compatible control devices. Please visit www.philips.com/EasySmart for latest information on control compatibility.

Approbation & Certificates

Philips InstantFit LED T8 with EasySmart technology strictly follows applicable legislation and standard. The product complies with **UL**, **CSA**, **NSF** and **RoHS**.



RoHS

Product is **DLC** qualified:



Philips is a member of ZigBee Alliance. Product is **ZigBee** certified.



Application Notes

- Product is dimmable by wireless control
- Suitable for damp locations
- Reliable operation between -20°C to + 45°C ambient temperature
- Suitable to replace T8 fluorescent lamps that operate on instant-start ballasts. Please refer to www.philips.com/EasySmart for latest ballast compatibility list.
- Require use of shunted lamp holders
- Not intended for use in emergency luminaires
- Not compatible with luminaires that use a remote starter
- Modifications to the product void the limited warranty. For warranty information, please see www.philips.com/warranties
- You are required to read and understand the Quick Installation Guide and all warnings, cautions and other materials related to installation published at: www.philips.com/EasySmart before commencing installation work.

Footnotes

¹ Verified as compatible by Philips. Visit www.philips.com/EasySmart for latest ballast compatibility guide.

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