



Philips MASTER LEDtube 1200mm & 1500mm Technical Application Guide



PHILIPS



MASTER LEDtube is a reliable value-for-money LED lamp out of Philips lighting portfolio, incorporates frontier LED chips and other advanced technologies. It also helps generate more than 55% energy saving and significant maintenance cost reduction by comparing to fluorescent lamps. It also helps generate natural and comfortable lighting effect, and to build up green and environment friendly image for our customers.

Product Features

Highly Reliable

- Ultra Output for Ultra efficiency --> designed to comply with key industry standards like UGR and Lux levels
- Reliable operation between -20 °C to 45 °C ambient temperature
- Rated average life of 50,000 hours (tested to F50 L70 requirement)
- 200,000 switching cycles

Highly Comfortable

- CRI 83
- Advanced optical design ensures a uniform light output and superior optical efficiency

Perfect Fit

- 100% comply with IEC requirement on T8 dimension, fitting into fluorescent luminaire perfectly

Highly Energy Efficient

- Energy savings of more than 55%*
- Efficacy up to 156lm/W to get A++ energy label in EU

Highly Safe

- Protection circuit inside ensuring people's safety in case of mis-use, complying with IEC safety requirements
- Pass 4KV high-pot test, insulation & safety guaranteed
- Pass 1KV surge test (vs. IEC standard 500V), avoiding the damage caused by input voltage fluctuation and lightning strike

Highly Environmental Friendly

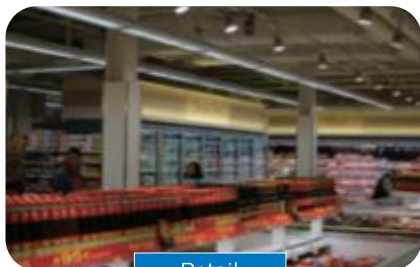
- No mercury
- No breakage and pollution risk

Rotatable end-cap

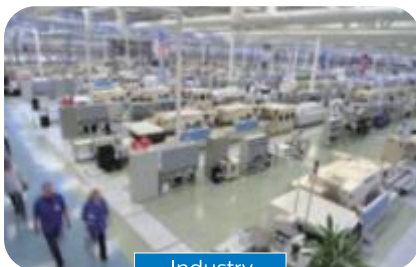
- To ensure maximum compatibility with existing luminaires, directional LEDtubes often need to be adjusted towards where light is needed most. That's why Philips MASTER products have this feature. It allows the LEDtube to be easily rotated up to 90 degrees, giving you the freedom to direct the light to best effect.

* Based on comparison between Philips 18W & 25W MASTER LEDtube and Philips TLD standard 36W (40~44W system power consumption) & 58W

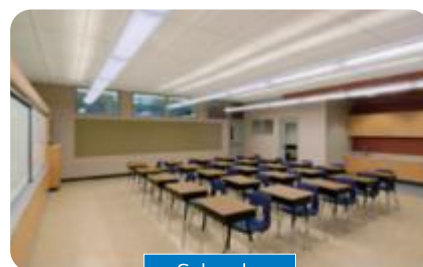
Application



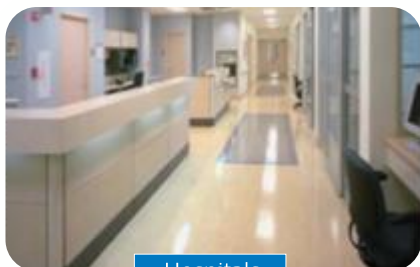
Retail



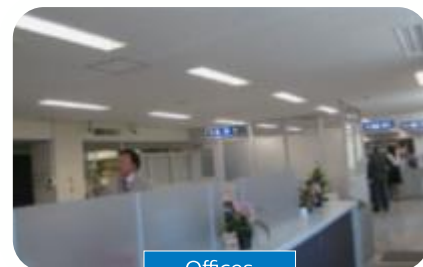
Industry



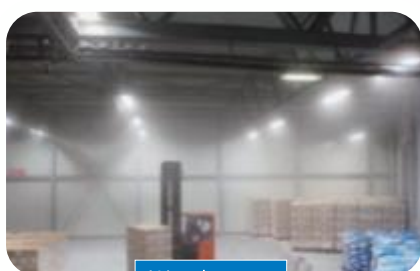
Schools



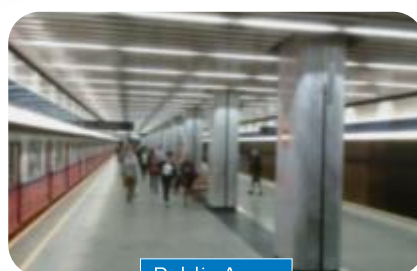
Hospitals



Offices



Warehouses

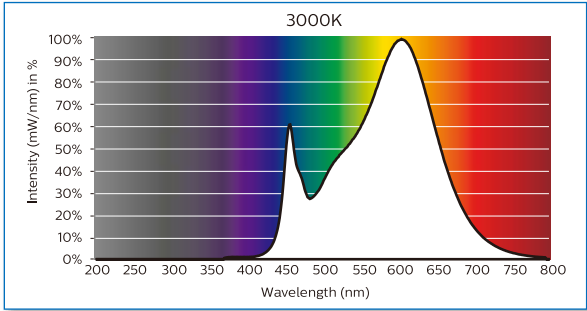


Public Areas

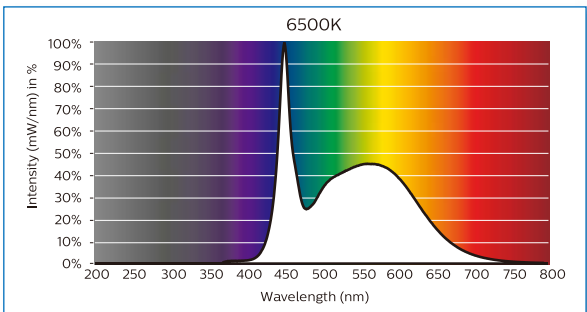
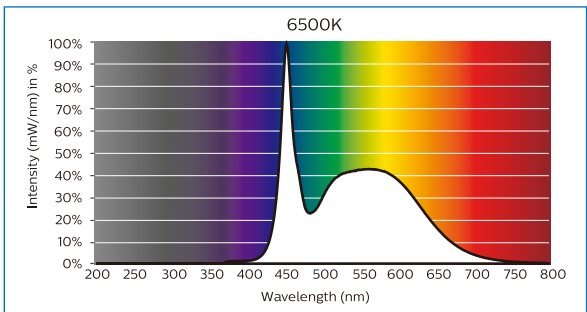
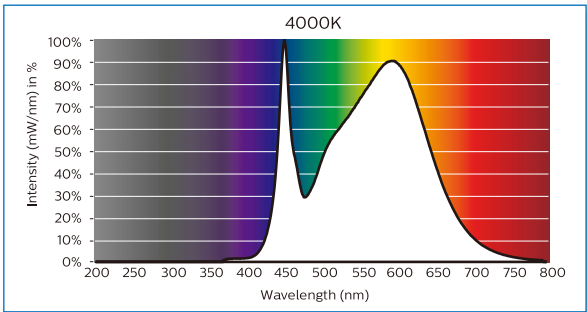
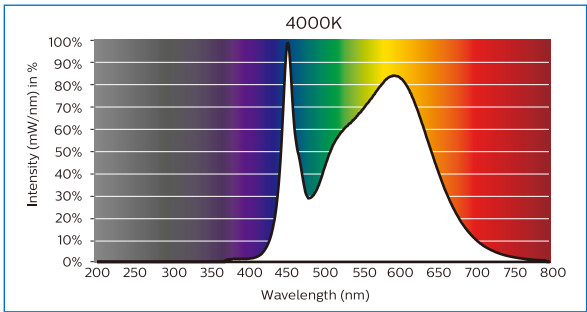
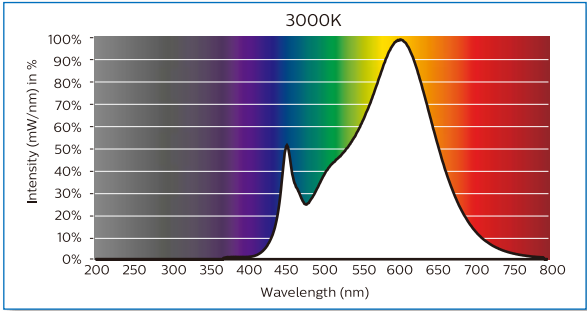
Spectral Power Distribution

Light may be precisely characterized by giving the power of the light at each wavelength in the visible spectrum. The resulting spectralpower distribution (SPD) shows that the MASTER LEDtube 1200 & 1500 mm Ultra Output contains the visible light only. No harm from UV and IR.

1200 mm 16W



1500 mm 24W

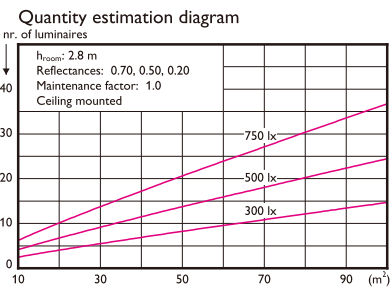
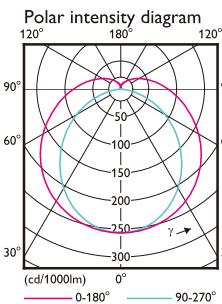


Photometric Diagrams

The Photometric diagram depicting the top down mounted lighting fixtures in a specific area and a numerical grid of the maintained lighting levels that the fixture will produce in that specific area. Pictures below show the photometric diagrams of a typical Philips Master LEDtube's application.

1 x TLED 16W 3000K 160D

1 x 2300 lm



Utilisation factor table

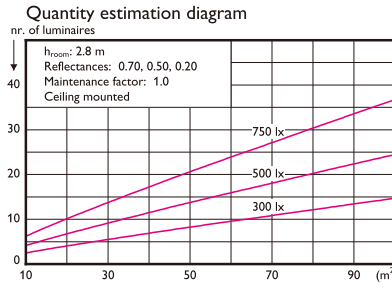
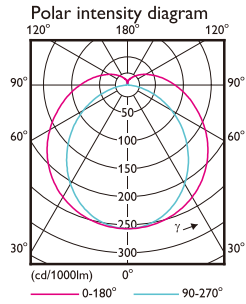
Room Index k	Reflectances (%) for ceiling, walls and working plane (CIE)															
	0.80	0.80	0.70	0.70	0.70	0.70	0.50	0.50	0.30	0.30	0.30	0.10	0.10	0.10	0.10	0.00
0.60	0.43	0.41	0.41	0.40	0.40	0.32	0.31	0.26	0.29	0.25	0.22					
0.80	0.53	0.50	0.51	0.49	0.48	0.40	0.38	0.33	0.36	0.32	0.28					
1.00	0.61	0.57	0.59	0.57	0.55	0.47	0.45	0.40	0.43	0.38	0.34					
1.25	0.69	0.63	0.66	0.64	0.61	0.54	0.51	0.46	0.49	0.44	0.40					
1.50	0.75	0.68	0.72	0.69	0.66	0.59	0.56	0.51	0.53	0.49	0.44					
2.00	0.85	0.76	0.81	0.77	0.73	0.67	0.64	0.59	0.60	0.57	0.51					
2.50	0.91	0.81	0.87	0.82	0.78	0.73	0.69	0.65	0.65	0.62	0.56					
3.00	0.96	0.84	0.92	0.86	0.82	0.77	0.73	0.69	0.69	0.66	0.60					
4.00	1.02	0.89	0.97	0.91	0.86	0.82	0.77	0.74	0.73	0.71	0.65					
5.00	1.06	0.91	1.01	0.95	0.89	0.85	0.81	0.78	0.76	0.74	0.68					

Ceiling mounted

Luminance Table

Plane Cone	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	10512	10213	10255	10659	11519	12993	15438
50.0	9893	9551	9552	9920	10718	12171	14731
55.0	9302	8920	8883	9212	9918	11299	13930
60.0	8724	8312	8244	8543	9127	10389	13027
65.0	8181	7743	7647	7915	8347	9431	11985
70.0	7686	7228	7110	7356	7605	8442	10770
75.0	7236	6786	6657	6898	6927	7427	9286
80.0	6888	6401	6259	6495	6380	6343	7173
85.0	6560	6056	5904	6140	5719	5343	6203
90.0	6286	5771	5620	5882	5481	5141	5786

(cd/m²)



Utilisation factor table

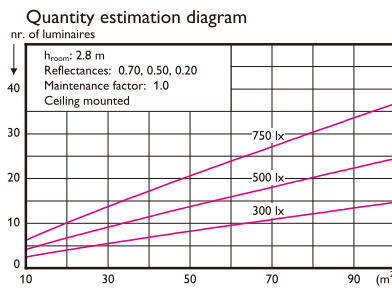
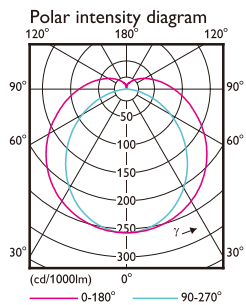
Room Index k	Reflectances (%) for ceiling, walls and working plane (CIE)											
	0.80	0.80	0.70	0.70	0.70	0.70	0.50	0.50	0.30	0.30	0.00	0.00
	0.30	0.10	0.30	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.00
0.60	0.43	0.41	0.41	0.40	0.40	0.32	0.31	0.26	0.29	0.25	0.22	
0.80	0.53	0.50	0.51	0.49	0.48	0.40	0.38	0.33	0.36	0.32	0.28	
1.00	0.61	0.57	0.59	0.57	0.55	0.47	0.45	0.40	0.43	0.38	0.34	
1.25	0.69	0.63	0.66	0.64	0.61	0.54	0.51	0.46	0.49	0.44	0.40	
1.50	0.75	0.68	0.72	0.69	0.66	0.59	0.56	0.51	0.53	0.49	0.44	
2.00	0.85	0.76	0.81	0.77	0.73	0.67	0.64	0.59	0.60	0.57	0.51	
2.50	0.91	0.81	0.87	0.82	0.78	0.73	0.69	0.65	0.65	0.62	0.56	
3.00	0.96	0.84	0.92	0.86	0.82	0.77	0.73	0.69	0.69	0.66	0.60	
4.00	1.02	0.89	0.97	0.91	0.86	0.82	0.77	0.74	0.73	0.71	0.65	
5.00	1.06	0.91	1.01	0.95	0.89	0.85	0.81	0.78	0.76	0.74	0.68	

Ceiling mounted

Luminance Table

Plane Cane	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	10512	10213	10255	10659	11519	12993	15428
50.0	9893	9551	9552	9920	10718	12171	14731
55.0	9302	8920	8883	9212	9918	11299	13930
60.0	8724	8312	8244	8543	9127	10389	13027
65.0	8181	7743	7647	7915	8347	9431	11985
70.0	7686	7228	7110	7356	7605	8442	10770
75.0	7256	6786	6657	6898	6927	7427	9266
80.0	6888	6401	6259	6495	6280	6343	7175
85.0	6560	6056	5904	6140	5719	5343	4205
90.0	6286	5771	5620	5882	5481	5141	1786

(cd/m²)



Utilisation factor table

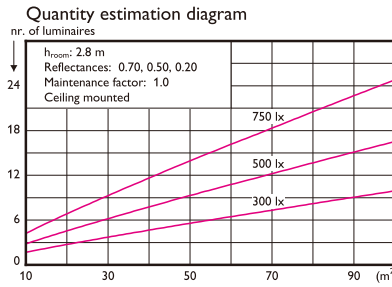
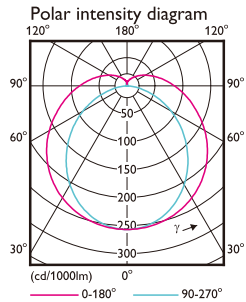
Room Index k	Reflectances (%) for ceiling, walls and working plane (CIE)											
	0.80	0.80	0.70	0.70	0.70	0.70	0.50	0.50	0.30	0.30	0.00	0.00
	0.30	0.10	0.30	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.00
0.60	0.43	0.41	0.41	0.40	0.40	0.32	0.31	0.26	0.29	0.25	0.22	
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1.25	0.69	0.63	0.66	0.64	0.61	0.54	0.51	0.46	0.49	0.44	0.40	
1.50	0.75	0.68	0.72	0.69	0.66	0.59	0.56	0.51	0.53	0.49	0.44	
2.00	0.85	0.76	0.81	0.77	0.73	0.67	0.64	0.59	0.60	0.57	0.51	
2.50	0.91	0.81	0.87	0.82	0.78	0.73	0.69	0.65	0.65	0.62	0.56	
3.00	0.96	0.84	0.92	0.86	0.82	0.77	0.73	0.69	0.69	0.66	0.60	
4.00	1.02	0.89	0.97	0.91	0.86	0.82	0.77	0.74	0.73	0.71	0.65	
5.00	1.06	0.91	1.01	0.95	0.89	0.85	0.81	0.78	0.76	0.74	0.68	

Ceiling mounted

Luminance Table

Plane Cane	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	10512	10213	10255	10659	11519	12993	15428
50.0	9893	9551	9552	9920	10718	12171	14731
55.0	9302	8920	8883	9212	9918	11299	13930
60.0	8724	8312	8244	8543	9127	10389	13027
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85.0	6560	6056	5904	6140	5719	5343	4205
90.0	6286	5771	5620	5882	5481	5141	1786

(cd/m²)



Utilisation factor table

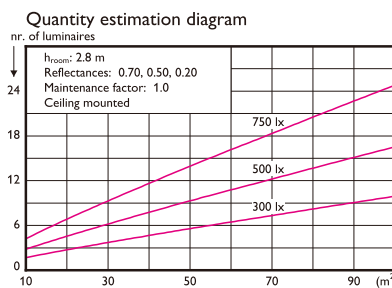
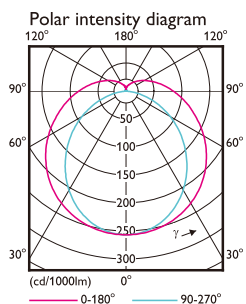
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	0.80	0.80	0.70	0.70	0.70	0.70	0.50	0.50	0.30	0.30	0.00	0.00
	0.30	0.10	0.30	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.00
0.60	0.43	0.41	0.41	0.40	0.40	0.32	0.31	0.26	0.29	0.25	0.22	
0.80	0.53	0.50	0.51	0.49	0.48	0.40	0.38	0.33	0.36	0.32	0.28	
1.00	0.61	0.57	0.59	0.57	0.55	0.47	0.45	0.40	0.43	0.38	0.34	
1.25	0.69	0.63	0.66	0.64	0.61	0.54	0.51	0.46	0.49	0.44	0.40	
1.50	0.75	0.68	0.72	0.69	0.66	0.59	0.56	0.51	0.53	0.49	0.44	
2.00	0.85	0.76	0.81	0.77	0.73	0.67	0.64	0.59	0.60	0.57	0.51	
2.50	0.91	0.81	0.87	0.82	0.78	0.73	0.69	0.65	0.65	0.62	0.56	
3.00	0.96	0.84	0.92	0.86	0.82	0.77	0.73	0.69	0.69	0.66	0.60	
4.00	1.02	0.89	0.97	0.91	0.86	0.82	0.77	0.74	0.73	0.71	0.65	
5.00	1.06	0.91	1.01	0.95	0.89	0.85	0.81	0.78	0.76	0.74	0.68	

Ceiling mounted

Luminance Table

Plane Cane	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	12445	12099	12157	12644	13675	15439	18352
50.0	11714	11315	11325	11769	12727	14467	17534
55.0	11013	10568	10533	10933	11782	13441	16602
60.0	10329	9850	9778	10142	10848	12367	15545
65.0	9686	9175	9070	9398	9924	11233	14322
70.0	9099	8565	8434	8737	9046	10065	12906
75.0	8593	8043	7898	8194	8243	8863	11146
80.0	8155	7586	7427	7717	7477	7583	8692
85.0	7767	7179	7008	7302	6819	6407	5201
90.0	7443	6841	6671	6994	6538	6181	2551

(cd/m²)



Utilisation factor table

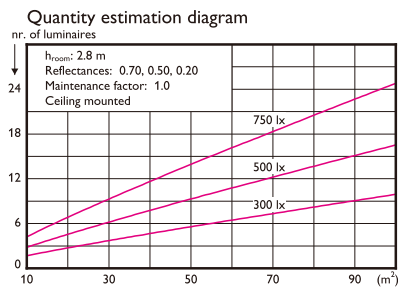
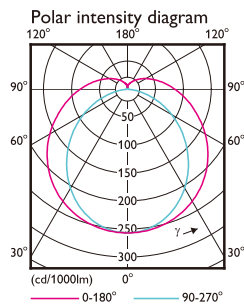
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	0.30	0.10	0.30	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.00
0.60	0.43	0.41	0.41	0.40	0.40	0.32	0.31	0.26	0.29	0.25	0.22	
0.80	0.53	0.50	0.51	0.49	0.48	0.40	0.38	0.33	0.36	0.32	0.28	
1.00	0.61	0.57	0.59	0.57	0.55	0.47	0.45	0.40	0.43	0.38	0.34	
1.25	0.69	0.63	0.66	0.64	0.61	0.54	0.51	0.46	0.49	0.44	0.40	
1.50	0.75	0.68	0.72	0.69	0.66	0.59	0.56	0.51	0.53	0.49	0.44	
2.00	0.85	0.76	0.81	0.77	0.73	0.67	0.64	0.59	0.60	0.57	0.51	
2.50	0.91	0.81	0.87	0.82	0.78	0.73	0.69	0.65	0.65	0.62	0.56	
3.00	0.96	0.84	0.92	0.86	0.82	0.77	0.73	0.69	0.69	0.66	0.60	
4.00	1.02	0.89	0.97	0.91	0.86	0.82	0.77	0.74	0.73	0.71	0.65	
5.00	1.06	0.91	1.01	0.95	0.89	0.85	0.81	0.78	0.76	0.74	0.68	

Ceiling mounted

Luminance Table

Plane Cane	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	12445	12099	12157	12644	13675	15439	18352
50.0	11714	11315	11325	11769	12727	14467	17534
55.0	11013	10568	10533	10933	11782	13441	16602
60.0	10329	9850	9778	10142	10848	12367	15545
65.0	9686	9175	9070	9398	9924	11233	14322
70.0	9099	8565	8434	8737	9046	10065	12906
75.0	8593	8043	7898	8194	8243	8863	11146
80.0	8155	7586	7427	7717	7477	7583	8692
85.0	7767	7179	7008	7302	6819	6407	5201
90.0	7443	6841	6671	6994	6538	6181	2551

(cd/m²)



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	0.00	0.00
0.60	0.43	0.41	0.41	0.40	0.40	0.32	0.31	0.26	0.29	0.25	0.22	0.20	0.18	0.16	0.14	0.12
0.80	0.53	0.50	0.51	0.49	0.48	0.40	0.38	0.33	0.36	0.32	0.28	0.26	0.23	0.21	0.19	0.17
1.00	0.61	0.57	0.59	0.57	0.55	0.47	0.45	0.40	0.43	0.38	0.34	0.32	0.28	0.26	0.24	0.22
1.25	0.69	0.63	0.66	0.64	0.61	0.54	0.51	0.46	0.49	0.44	0.40	0.38	0.34	0.32	0.30	0.28
1.50	0.75	0.68	0.72	0.69	0.66	0.59	0.56	0.51	0.53	0.49	0.44	0.42	0.38	0.36	0.34	0.32
2.00	0.85	0.76	0.81	0.77	0.73	0.67	0.64	0.59	0.60	0.57	0.51	0.49	0.45	0.43	0.41	0.39
2.50	0.91	0.81	0.87	0.82	0.78	0.73	0.69	0.65	0.65	0.62	0.56	0.54	0.50	0.48	0.46	0.44
3.00	0.96	0.84	0.92	0.86	0.82	0.77	0.73	0.69	0.69	0.66	0.60	0.58	0.54	0.52	0.50	0.48
4.00	1.02	0.89	0.97	0.91	0.86	0.82	0.77	0.74	0.73	0.71	0.65	0.63	0.59	0.57	0.55	0.53
5.00	1.06	0.91	1.01	0.95	0.89	0.85	0.81	0.78	0.76	0.74	0.68	0.66	0.62	0.60	0.58	0.56

Ceiling mounted

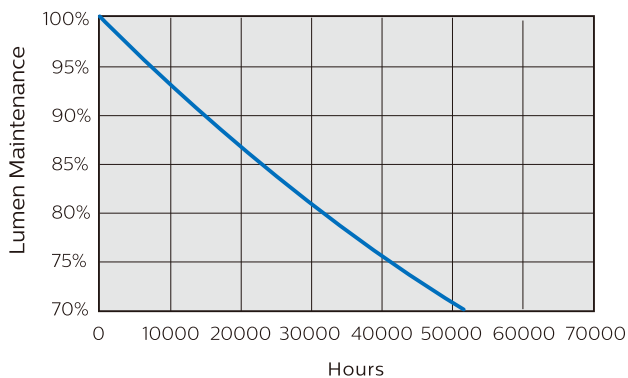
Luminance Table

Plane	0.0	15.0	30.0	45.0	60.0	75.0	90.0
Cone							
45.0	12445	12099	12157	12644	13675	15439	18352
50.0	11714	11315	11325	11769	12727	14467	17534
55.0	11013	10588	10533	10933	11782	13441	16602
60.0	10329	9850	9778	10142	10848	12367	15545
65.0	9686	9175	9070	9398	9924	11233	14322
70.0	9099	8565	8434	8737	9046	10065	12906
75.0	8593	8043	7898	8194	8243	8863	11146
80.0	8155	7586	7427	7717	7477	7583	8692
85.0	7767	7179	7008	7302	6819	6407	5201
90.0	7443	6841	6671	6994	6538	6181	2551

(cd/m²)

Lifetime and Lumen Maintenance

1200mm 16W/ 1500mm 24W



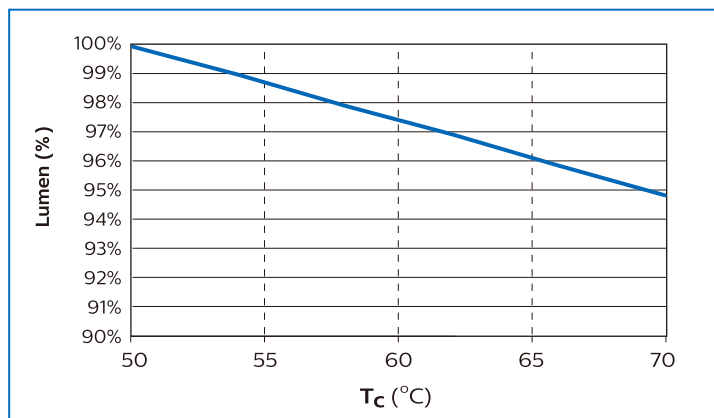
Philips MASTER LEDtube has a lifetime of 50,000 hours, defined as the number of hours when 50% of a large group of identical lamps below 70% of its initial lumen (F50L70).

Temperature

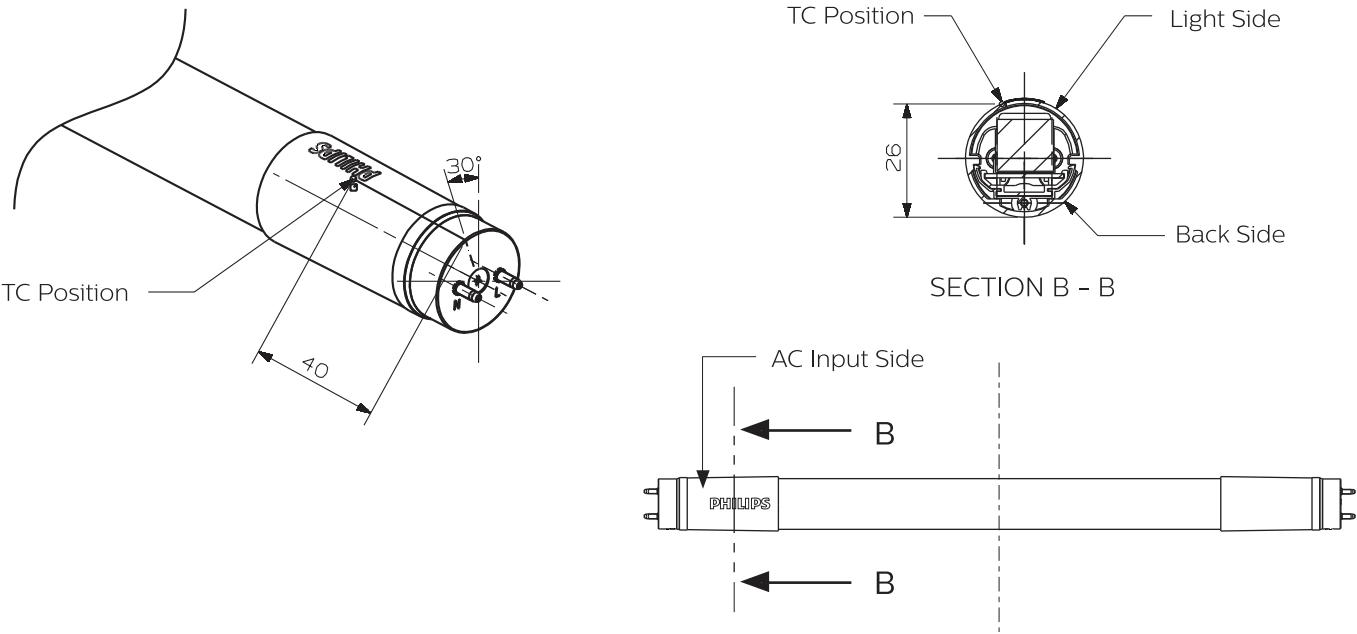
MASTER LEDtube's excellent thermal design ensures low temperature during operating, which brings reliable and stable product performance throughout life time.

Operating temperature	T operating	min -20°C	max +45°C
Storage temperature	T storage	min -40°C	max +65°C
Maximum case temperature of tube at Tamb =25°C	T case		+50°C (1200 mm)
Maximum case temperature of tube at Tamb = 25°C	T case		+50°C (1500 mm)

1200mm 16W/ 1500mm 24W



1200mm_18W/ 1500mm_25W (Dimension:mm)



Approbation & Certificates

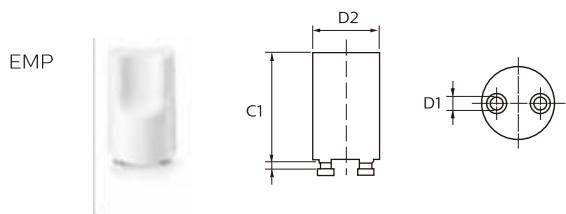
Philips MASTER LEDtube is designed by strictly following applicable legislation and international standard. The product complies with **CE, KEMA, TUV, RoHS** and **REACH**.



Technical specification

10NC	Product Description	Lamp Wattage	Equivalent Fluorescent Wattage	Voltage	Cap	Length	Beam angle	Lifetime	Lumen output (Typical)	Color Temp	CRI
		(W)	(W)	(V)		(mm)	(°)	(hrs)	(lm)	(K)	(Typical)*
9290012978	MAS LEDtube 1200mm UO 16W 830 T8	16	36	220-240	G13	1200	160	50,000	2300	3000	83
9290012979	MAS LEDtube 1200mm UO 16W 840 T8	16	36	220-240	G13	1200	160	50,000	2500	4000	83
9290012980	MAS LEDtube 1200mm UO 16W 865 T8	16	36	220-240	G13	1200	160	50,000	2500	6500	83
9290012981	MAS LEDtube 1500mm UO 24W 830 T8	24	58	220-240	G13	1500	160	50,000	3400	3000	83
9290012982	MAS LEDtube 1500mm UO 24W 840 T8	24	58	220-240	G13	1500	160	50,000	3700	4000	83
9290012983	MAS LEDtube 1500mm UO 24W 865 T8	24	58	220-240	G13	1500	160	50,000	3700	6500	83

* Minimum CRI is 80

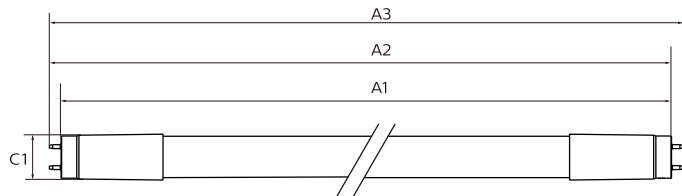


Accessories

MASTER LEDtube

Protector EMP

871829172930300

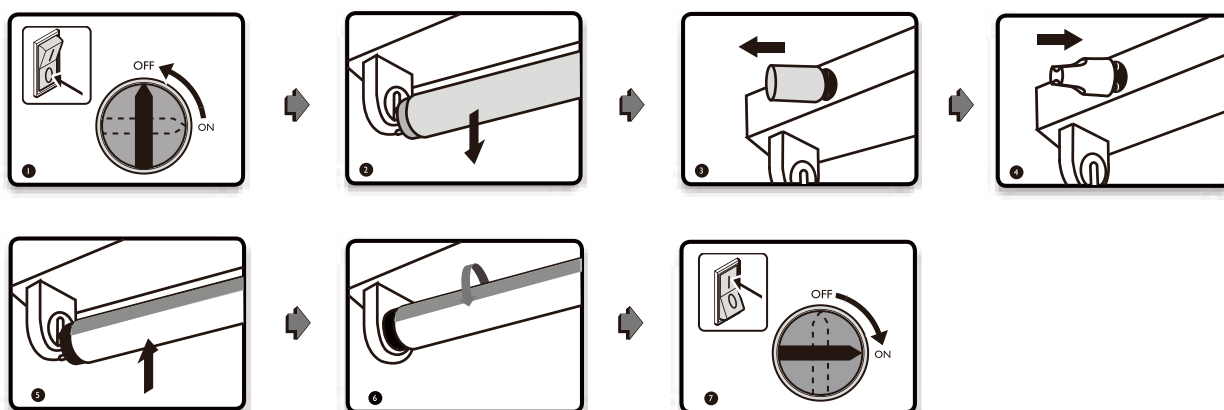


Dimensions (mm)

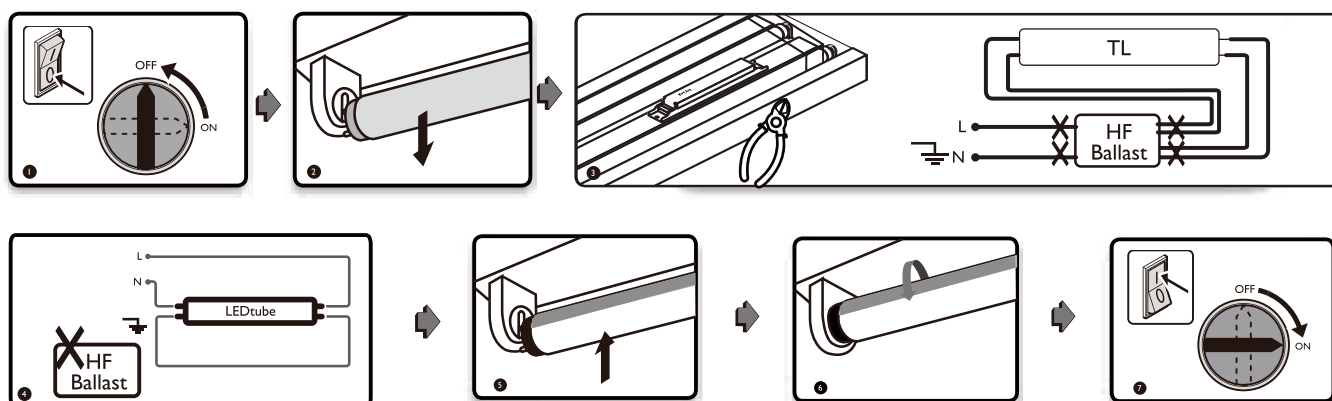
Product	A1	A2	A3	C1	D1	D2
1200mm	1198	1205	1212	27.8	-	-
1500mm	1499	1506	1513	27.8	-	-
EMP	-	-	-	34.5	3	21.5

Installation Guide

• EM ballast based system



• HF ballast based system



Note: for twin lamp series configuration and more detailed information please visit:
www.philips.com/led-product-info

Maximum amount of Master LED tube connected on one circuit breaker

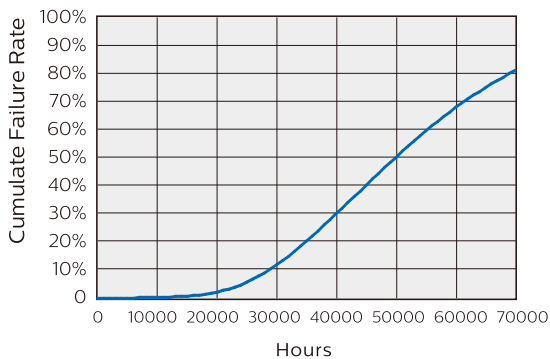
MCB B Type	Wiring Type	Master TLED	
		1200 mm	1500 mm
16A	Mains	110	93
	EM	110	93
	EM + Comp. Cap.	14	15
10A	Mains	68	58
	EM	68	58
	EM + Comp. Cap.	8	9

Parallel Power factor compensation capacitors are expected not to cause any problems with LED tubes, but larger Parallel Power factor compensation capacitors to correct inductive reactive power load are recommended to be removed

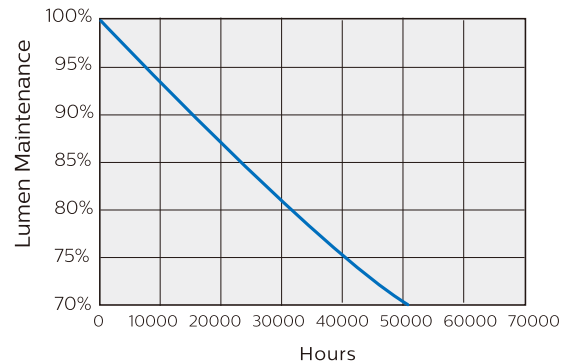
OEM Guideline

1200mm / 1500mm

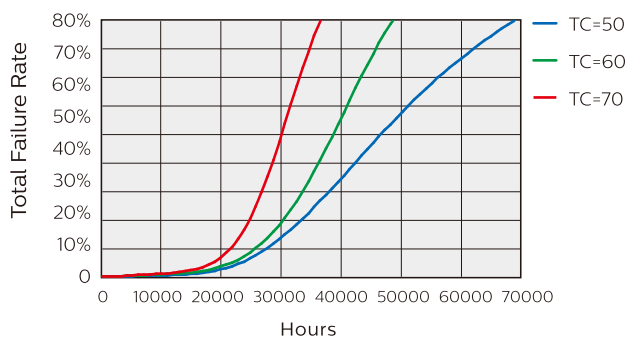
Lifetime Curve



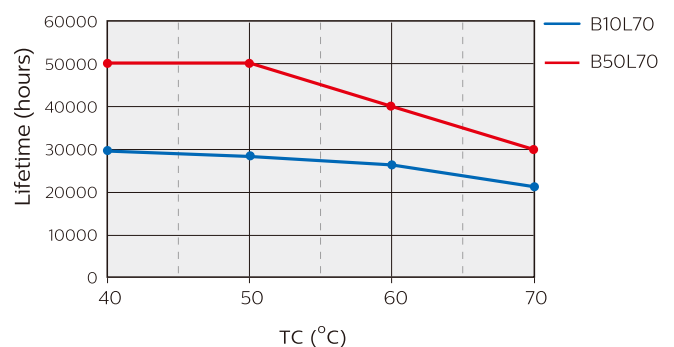
Lifetime and Lumen Maintenance



Failure Rate vs.
Lifetime vs. Tcase



Lifetime vs. Tcase



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01/2017

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