## MASTER LEDtube Ultra Output for Ultra Efficiency

LED Lamps EMEA March 2015





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#### Commercial Presentation | LED Lamps

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# 1.Why Philips?

Innovation leader in linear lighting

Lighting experience

Real quality of light





Ballast compatibility

- Product range for all types of applications
- For end-users

## Innovation leader in linear lighting



Philips has a long history of ground-breaking innovation in linear fluorescent lighting technologies. LED integration delivering 200 lm/W and added integrated intelligence are the latest additions and we continue the future in lighting, today.

## Lighting expertise



Philips has a proven track record of reliable lighting in challenging and safetycritical environments. Customers value our **extensive experience** and **know-how**.





## Real quality of products

Phillips offers and guaranties the quality of their products. This is done be extensive research and careful development:

- Lifetime prediction models and real time measurement. First LEDtube ON from 2008 onwards
- Accelerate lifetime tests and reports i.e LM79 / LM80
- Due to special LED binning process and use of best phosphors to maintain right color points
- To lower the dark spots we place our LED series and parallel combined.
- **Optimized** heat sink design to keep the LED cool



# 2.Why LEDtubes?

Great potential to reduce energy Offering low initial cost and installation effort Key benefits





## **Great potential to reduce energy**

LED tubes can easily replace fluorescent TL lamps

- Lighting consumes 19 % of the global electricity supply (IEA)
- Linear fluorescent lighting accounts for a significant part of the **total electricity consumption** of lighting
- Linear LED lamps (LED tubes) are able to directly replace linear fluorescent (TL) lamps while sustaining the installed luminaire base
- Because LED tubes are more energy efficient, energy savings of 40 to 65 % can be achieved, depending on the type of installation and the application
- Efficiency measures in lighting offer one of the most attractive **financial returns**, well above initial investments and therefore generate cost reductions to the end user.

In short:

LED tubes are low hanging fruit to reduce energy!



#### Offering **low initial cost** and **installation effort** LED tubes enable a fast and efficient upgrade to LED lighting

Different LED alternatives for linear fluorescent lighting and their characteristics:

	LED Tube retrofit	Panel/Kit retrofit	New Luminaires
Installation time	Lowest	Low	High
Purchasing price	Low	Medium	High
New look	No	Yes	Yes
Energy saving in troffer-type application	Less	More	More
Energy saving in batten-type application	Same	Same	Same



## Key benefits of LEDtubes

#### **Energy efficient**

• Around 40 to 65% more efficient if compared with TL-D lamps, saving on energy costs

#### Long lasting and robust solution

- With lifetimes up to 40,000 hours (vs. 15,000 hours TL-D), reducing maintenance costs
- The performance is not affected by low(er) temperatures
- Most tubes are made of shatter-proof plastic
- Suitable for a wide range of applications

#### Simple lamp-for-lamp replacement

- Easy upgrade from current conventional TL-D fixture to LEDtubes (hassle free)
- Re-using the existing fixture without major modifications, using a similar tube form-factor

#### High quality of light

- No flickering or stroboscopic light
- High color consistency
- Instant 100% light

#### **Mercury-free**





# 3.why Philips LEDtube Ultra Output?



February 2015\_BG LS & E LEDlamps



## MASTER LEDtube Ultra Output

"The new Philips MASTER LEDtube Ultra Output is a full new product range in two lengths (1200 & 1500 mm) & 3 colors (830, 840 & 865) to suit applications that require high light output (like Office, Retail or Healthcare).

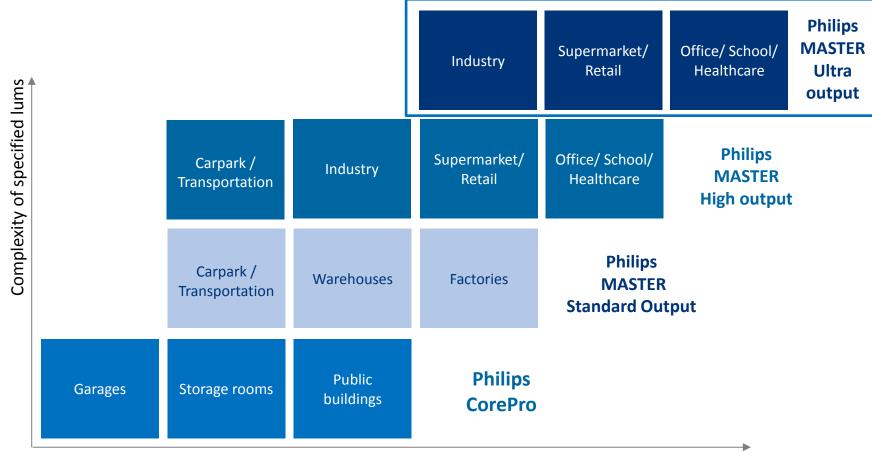
In combination with the Philips MASTER LEDtube 600 mm series this is the first LEDtube product range which is suited to target Office standards (Flux, UGR, etc.)\*

\*Final light quality besides the LEDtube also depends on application circumstances like eg. type of luminaire used and amount of daylight.



### **Key application areas for LEDtubes**

Depending on budget to invest and complexity of lums



Budget to invest



## LEDtubes increasingly fulfill customer needs

Supported by performance, compatibility and cost breakthroughs



#### Car Parks/ Back of house

- Burning hours 24/7
- Ensure visibility and feeling of safety
- Need for energy reduction and reducing maintenance costs
- Withstand cold (er) temperatures
- Light requirement: 200+ lux



#### Industry

- Burning hours : varies, max. 24/7
- Need for energy reduction and reducing maintenance costs: avoiding production loss due to up -lamping activities
- Withstand cold temperatures, vibrations
- Light requirement: 200-500+ lux



#### Transportation

- Burning hours 24/7
- Ensure visibility and feeling of safety
- Need for energy reduction and reducing maintenance costs (very important)
- Vibration resistant
- Light requirement: 200 to 500 lux



#### **Retail Shops & Hospitality**

- Burning hours 12hrs / day to 24/7
  - Enhance 'green' image of the brand
- Need for energy reduction and reducing maintenance costs
- Product enhancement on the shelf (R)
- Light requirement: 500+lux



#### **Office/School/Healthcare**

- Burning hours : usually 12 hrs / day
- Need for energy reduction and reducing maintenance costs
- High quality of light needed and compliance with ergonomic norms
- Light requirement: 500+ lux



4. Industry Standards for Ultra Output applications

## Industry Standards for Ultra Output applications

#### Two key aspects with regard to lighting industry standards

- Sufficient light
- Discomfort glare
- Requirements for these two aspects for a numerous amount of applications have been captured in official guideline EN12464-1.



#### Sufficient light

Key parameter for Indicating the amount of minimum required light Is indicated in EN12464-1 in lux (unit of illuminance per square meter).

 EN12464-1 prescribes minimum lux values, uniformity of illumination, and color rendering index, depending on the task.



#### **Discomfort glare**

 Sensation of annoyance or reflection caused by high or non-uniform brightness (eg. on computer screen).

 Amount of glare is indicated in EN 12464-1 standard by Unified Glare Rating (UGR).



• EN12464-1 prescribes minimum lux values, uniformity of illumination, and color rendering index, depending on the task

	Table	e 5.26 —	- Offices	6			1	
Ref. no.	Type of area, task or activity	Ēm Ix	UGRL -	U.	R.,	Specific requirements	I	
5.26.1	Filing, copying, etc.	300	19	0,40	80			
5.26.2	Writing, typing, reading, data processing	500	19	0,60	80	DSE-work, see 4.9.	I	
5.26.3	Technical drawing	750	16	0,70	80		Ť	
5.26.4	CAD work stations	500	19	0,60	80	DSE-work, see 4.9.	I	
5.26.5	Conference and meeting rooms	500	19	0,60	80	Lighting should be controllable.	I	
5.26.6	Reception desk	300	22	0,60	80		I	
5.26.7	Archives	200	25	0,40	80			

- For Office applications 500 lux per square meter counts as minimum value.
- Office lighting plans are typically designed at 700-800 lux.
- UGR standard for Office applications is set at max 19 UGR.

Note: no legal obligation to comply with this standard, but lower lighting levels easily give rise to complaints about eye fatigue







	<b>TL-D</b> Super80, 5240lm			TLED 3	TLED 3700lm (UO) (New)			TLED 3100lm (HO)		
	Working plane (0,75)	Ceiling	Wall	Working plane (0,75)	Ceiling	Wall	Working plane (0,75)	Ceiling	Wall	
Illuminance (Lux)	807	141	292	<b>725</b> (-10% )	133	286	607 (-25% )	112	239	
Glare (UGR)		17,1		17,8			17,2			
Energy saving	EM= (	0% / HF=20	0%	EM=65%			EM=68%			
тсо		-		2½	∕₂ - 3 years		2-2.5 years			
DIAlux	6									

Setup (DIAlux)

- C6 optics checked,
- Room size: I=24m x w=24m x h=2,8m
- # luminaires: 15
- TL-D luminaire: Philips TCS198 2x 58W C6

• TLED luminaire: Philips TBS160 2x TLED C6 (scaled from 1200mm)

• Working plane: 0,75m

.

- Light loss factor: 0,8
  - Reflection (Ceiling/Walls/Floor): 70%/50%/20%







	<b>TL-D</b> Super80, 5240lm			TLED 2	<b>500lm (</b> <sub>(New)</sub>	UO)	TLED 2100lm (HO)			
	Working plane (0,75)	Ceiling	Wall	Working plane (0,75)	Ceiling	Wall	Working plane (0,75)	Ceiling	Wall	
Illuminance (Lux)	627	110	236	586 (-7%)	108	242	492 (-22%)	91	203	
Glare (UGR)	) 16,4			17,2			16,6			
Energy saving	EM= (	0% / HF=20	)%	EM=56%			EM=56%			
тсо		-		3	3½ years			3 years		
DIAlux	-									

0

100

200

300

400

500

600

700

Setup (DIAlux)

- C6 optics checked,
- Room size: I=24m x w=24m x h=2,8m
- # luminaires: 18
- TL-D luminaire: Philips TCS198 2x 36W C6
- TLED luminaire: Philips TBS160 2x TLED C6
- Working plane: 0,75m
- Light loss factor: 0,8
   Reflection (Ceiling/Wall
  - Reflection (Ceiling/Walls/Floor): 70%/50%/20%



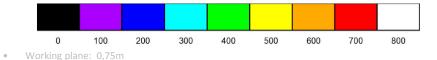
800

Ix



1100

	Supe	<b>TL-D</b> er80, 5240lr	n	TLED 1050lm (New)			
	Working plane (0,75)	Ceiling	Wall	Working plane (0,75)	Ceiling	Wall	
Illuminance (Lux)	568	100	200	569	94	110	
Glare (UGR)		15,1			18,6		
Energy saving	EM= (	0% / HF=2	0%		62%		
TCO		-		2.	5-3 years		
DIAlux							



Setup (DIAlux)

- M6 optics checked,
- Room size: I=24m x w=24m x h=2,8m
- # luminaires: 21
- Luminaire: Philips Impala TBS160 4x 600mm M6

Light loss factor: 0,8
Reflection (Ceiling/Walls/Floor): 70%/50%/20%

# Lighting requirements in Industry

 EN12464-1 prescribes minimum lux values, uniformity of illumination, and color rendering index, depending on the task

	Table 5.4 — General areas inside buildings – Store rooms, cold stores									
Ref. no.	Type of area, task or activity	Ē <sub>m</sub> Ix	UGRL	$U_{0}$	Ra	Specific requirements				
5.4.1	Store and stockrooms	100	25	0,40	60	200 lx if continuously occupied.				
5.4.2	Dispatch packing handling areas	0,60	60							
	Table 5.5 — General areas	inside l	ouilding	s – Stor	age rac	k areas				

		Ēm	UGRL	$U_{0}$	Ra	Cussifis vs muinsmants	
Ref. no.	Type of area, task or activity	lx – –		-	-	Specific requirements	
5.5.1	Gangways: unmanned	20	-	0,40	40	Illuminance at floor level.	
5.5.2	Gangways: manned	150	22	0,40	60	Illuminance at floor level.	
5.5.3	Control stations	150	22	0,60	80		
5.5.4	Storage rack face	200	-	0,40	60	Vertical illuminance, portable lighting may be used.	

- For Industry applications, there are many sub segments, each having their own specific standards (eg. fashion industry versus storage and logistic centers).
- Above a screenshot of standards in storage industry segment, where highest 300 lux counts as minimum value.
- UGR standard for Supermarket applications is set at max 25 UGR.

Note: no legal obligation to comply with this standard, but lower lighting levels easily give rise to complaints about eye fatigue.

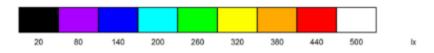


## Industry 2 x 1500 mm batten luminaire with reflector

	<b>TL-D</b> Super80, 5240lm	TLED 3700 lm (UO)	TLED 3100lm (HO)
Illuminance (Lux)	545lx	476lx (-13%)	326lx (-40%)
Glare (UGR)	24	23,2	22,6
Energy saving	EM= 0% / HF=20%	EM=65%	EM=68%
тсо	-	2 ½-3 years	2 years
DIAlux			

Setup (DIAlux)

- Room size: h=4.8m 54mx27m
- # luminaires: 85
- Luminaire: Philips TMX 204 2x 1500mm + GMX430 R
- Working plane: 0,85m
- Light loss factor: 1
- Reflection (Ceiling/Walls/Floor):







• EN12464-1 prescribes minimum lux values, uniformity of illumination, and color rendering index, depending on the task

	Table 5.27 — Retail premises										
Ref. no.	Type of area, task or activity	Ēm Ix	UGRL -	U0 -	<i>R</i> a —	Specific requirements					
5.27.1	Sales area	300	22	0,40	80						
5.27.2	Till area	500	19	0,60	80						
5.27.3	Wrapper table	500	19	0,60	80						

- For Supermarket applications 500 lux counts as minimum value.
- UGR standard for Supermarket applications is also set at max 19 UGR.

Note: no legal obligation to comply with this standard, but lower lighting levels easily give rise to complaints about eye fatigue.





	<b>TL-D</b> Super80, 5240lm	TLED 3700 lm (UO)	TLED 3100lm (HO)
Illuminance (Lux)	687lx	680lx (-1%)	567lx (-17%)
Glare (UGR)	22,5	21.1	20,6
Energy saving	EM= 0% / HF=20%	EM=65%	EM=68%
тсо	-	2 – 2.5 years	1 - 1.5 years
DIAlux			

20

105

190

275

360

445

530

Setup (DIAlux)

- Room size: I=27m x w=16.2m x h=3.5m (lamps h=3m)
- # luminaires: 85
- Luminaire: Philips TMX 204 2x 1500mm + GMX450 R
- Working plane: 0,85m
- Light loss factor: 1
- Reflection (Ceiling/Walls/Floor): 70%/50%/20%



615

700

## 5.Product specifications Philips LEDtube Ultra Output

## MASTER

## LEDtube Ultra Output range

- Full new product range in two lengths (1200 & 1500 mm) & 3 colors (830, 840 & 865) to suit applications that require high light output (like Office & Supermarkets).
- Designed in accordance to Office standards (Flux, UGR, etc.)\*

\*Please be aware that light quality besides the LEDtube also depends on application circumstances like eg. type of luminaire used and amount of daylight.

#### What's new:

- Addition to Standard and High Output range (SO & HO)
- Only EM/Mains compatible (recognizable by single ring on end-cap)
- Outstanding efficacy delivering up to 148 lm/w



Product	System Wattage	Color temp	Lumen output	Operation	CRI	12NC	EOC
	W	K	lm				
1200mm UO	20W	3000	2300	EM & Mains	83	929001148802	871869646149500
1200mm UO	20W	4000	2500	EM & Mains	83	929001148902	871869646151800
1200mm UO	20W	6500	2500	EM & Mains	83	929001149002	871869646155600
1500mm UO	25W	3000	3400	EM & Mains	83	929001149102	871869646157000
1500mm UO	25W	4000	3700	EM & Mains	83	929001149202	871869646159400
1500mm UO	25W	6500	3700	EM & Mains	83	929001149302	871869646163100



## MASTER LEDtube 600 mm range

- Upgrade of existing 600mm range
- Available in 3 colors (830, 840 & 865) and optimized to suit multi-lamp luminaires that require series compatibility (Eg. for in Office and/or Healthcare segments).
- Designed in accordance to Office standards (Flux, UGR, etc.)\*

\*Please be aware that light quality besides the LEDtube also depends on application circumstances like eg. type of luminaire used and amount of daylight.

#### What's new:

- Series compatibility
- Only EM/Mains compatible (recognizable by single ring on end-cap)



Product	System Wattage	Color temp	Lumen output	Operation	CRI	12NC	EOC
	W	K	lm				
600mm series	10W	3000	1000	EM & Mains	83	929001149502	871869646143300
600mm series	10W	4000	1050	EM & Mains	83	929001149402	871869646141900
600mm series	10W	6500	1050	EM & Mains	83	929001149602	871869646145700





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