

PURE BRIGHT LIGHTING LLC



LED retrofits!

Retrofit your existing
Fluorescent Lights in
Seconds

No Electrician Needed!

These LED T12 Tubes replace fluorescent tube lights *without any changes* to your existing fixture or ballast. Retrofits in seconds and produces 60% in energy savings.

4'T12 Specification Guide



LED T12 Retrofit Product Description

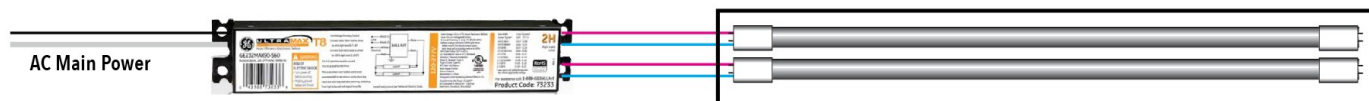
Illumination Performance: With a 320° illumination angle, the design allows more up light, providing a more uniform light output. This lamp delivers (2,645) lumens of full spectrum LED light at 80 CRI while achieving 115 lumens per watt at the fixture level.

Color Availability: The Pure Bright T12 LED tube lights are available in three color temperatures: 3000K, 4000K, and 5000K.

Ballast Compatibility: Our tube light work with all electronic T12 ballasts, rapid-start, programmed-start and instant-start ballasts.

Dimming: Dimmable with dimming ballasts, enabling daylight harvesting and profile dimming based on dimming controls.

Pure Bright Performance Table



The existing T8 electronic ballast stays in place. To retrofit, replace the fluorescent bulb with the Pure Bright LED tubes. Your existing ballast acts as the driver.

Retrofits existing T12 fluorescent tube lights. No electrical alterations needed.
Efficacy: 115.85 LPW at fixture level
Lamp Delivered Light Output: 2,645 lumens per 4' LED tube light
Target System Delivered Light Output (2 lamps): 5,290 lumens
Input Power: 23 Watts @ 1.0 ballast factor / 20.2 Watts @ 0.88 ballast factor / 17.9 Watts @ 0.78 ballast factor
CRI: 80 Down Flux of Lamp: 78.3% Up Flux of Lamp: 21.71% Output Flux Ratio: in \square Solid Angle : 50.21%
Installation: Installs into existing linear fluorescent luminaire and operates on existing ballast. Ballasts serves as LED driver.
CIE Type: Semi-direct lighting. 78/22 flux direction designed to fill luminaire with illumination to provide even lighting.
CCT: 3000K, 4000K, and 5000K
Input Voltage: 120-277 VAC: determined by existing fluorescent ballast
Lifetime: Designed to last a minimum of 50,000 hours
Warranty: 5 years
Location: Suitable for damp or dry locations. Mounting: Linear fluorescent fixtures
Controls: Dimmable (ballast dependent) enabling daylight harvesting and profiling.

Ordering Information

Example: PBT12-DL5004EFX-U

PBT12	DL50	04	EF	X	U
Product	Color Temperature	Length	T12 Ballast Type	Control	Options
Pure Bright LED T12	DL50= Day Light 5000K NW40= Neutral White 4000K WW30=Warm White 3000K	04 4 foot Special order lengths available upon request.	EF Electronic fluorescent All 120-277V T12 electronic ballasts including Programmed start, Rapid start, Instant Start, etc.	X Dimmable base on dimmable ballast	U Frosted lens

Pure Bright T5 LED Tube Dimensions

Overall Length	47.27" (1212 mm)
Tube Length (without pin)	46.72" (1198 mm)
Tube Diameter	1.02" (26 mm)
Pin Distance	0.51" (13 mm)
Pin Diameter	0.09" (2.3 mm)
Pin Height	2.87" (7.3 mm)

Ballast Driver Electronic Characteristics

AC Input Range	90~264/277 VAC; 0.3~ 0.15A/ 47~63Hz
Power Factor	Determined by ballast
Total Harmonic Distortion	<20%, determined by ballast
Efficiency	BF:1.0=115.8 5 LPW
Operation Temperature	-20°C ~+50°C, Tc: 90°C
Storage Temperature	-20°C ~+85°C

Smart Driver Technology: Works With All T12 Ballast Types

The Pure Bright Smart Driver Technology has been in development for over five years. With UL Listed approval-the most rigorous NRTL requirements-there is no requirement to first compare ballast models for in-field installations. Lower testing approvals require installers to open ballast compartments, and to replace ballasts with those listed on UL-required installation instructions.

Construction and Materials

The lightweight aluminum heat sink efficiently draws heat away from the LED diodes. Lens materials are recognized and certified by Underwriters Laboratories (UL) to flammability specification UL-94 V-0. Pure Bright has been successfully tested on active oil tankers running 24/7 for over 42,500 hours (references available) under severe vibration conditions, with units installed in the boiler rooms operational at an average temperature of 117°F without failure.

Optical System

320° wrap-around lens design places 22% of the illumination above the horizontal plane, and 78% below. This semi-direct designation enables full illumination of the fixture and ensures optimal lighting distribution.

Spectral Performance

Pure Bright LED Tubes provide significant improvements of illumination quality over fluorescent tubes. Shown at right is the distribution of 4000K bulbs.

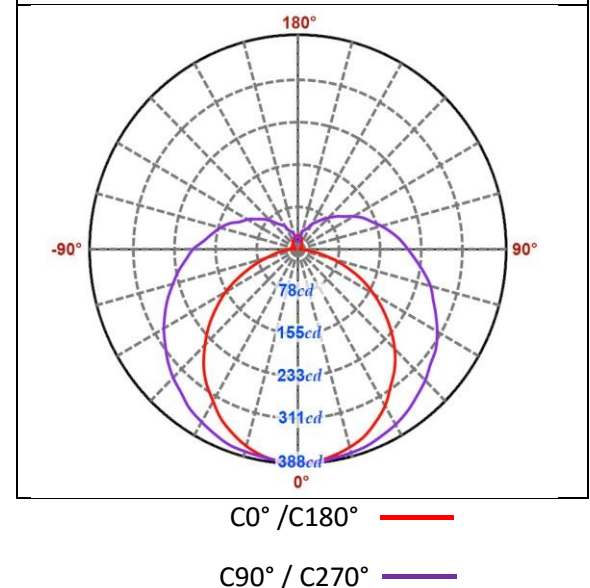
Controls

Full dimmable (ballast dependent).

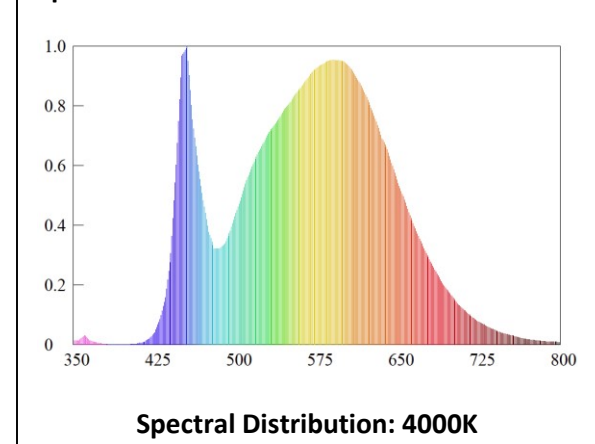
C90 Zonal Lumen Distribution

Zone	Lumens	% Lamp
0-30°	423	16.0%
0-40°	704	26.6%
0-60°	1328	50.2%
0-90°	2,071	78.3%
90-120°	391	14.8%
90-130°	463	17.5%
90-150°	542	20.5%
90-180°	574	21.7%
0-180°	2,645	100.0%
Up/Down flux rate= 21.7% : 78.3%		
CIE Type: Semi-direct Lamp		

Light Distribution Curve (Units in Candella: cd)



Spectroradiometric Parameters



As Local Building Codes: Pure Bright Plastics Fire Safety Rating: UL 94-V-0

Fire codes, life safety and model building codes include numerous requirements that products and materials meet specified minimum flammability ratings. By ensuring that building materials meet hourly fire resistance ratings and don't exceed flame spread and smoke developed ratings, occupant safety is optimized. Failure to meet these minimum standards increases the chance of fire and smoke spread, and increased dangers for building occupants.

The Pure Bright T8 LED tube lens materials are recognized and certified by Underwriters Laboratories to flammability specification UL 94-V-0 under yellow card listing. The UL 94 Standard provides a method for rating the ignition characteristics of plastic materials. The UL 94 "V" indicates a vertical burn test that is used widely for plastic materials that are used mostly in electrical devices. In this test-five vertically mounted samples are exposed to two successive ten-second bottom ignitions for a 3/4" 50W tirrel burner flame ignition source. Flame resistance is then classified according to:

- 1) The time for the flame to self-extinguish, and
- 2) The duration of the afterglow

To achieve a V rating (e.g. V-2, V-1, or V-0) the test samples, placed vertically with the test flame impinging on the bottom of the sample, must extinguish within specified times, not burning to the top clamp or dripping molten material which ignites a cotton indicator.

The V-0 rating of our lens polymer is the highest rating under the UL 94-V test which means that:

- a) The extinguishment time (for each samples) was 0-10 seconds
- b) The afterglow time was 0-30 seconds per sample
- c) There are no flaming drips

As a manufacturer, we take extra steps to ensure that use of our products in your facilities meet or exceed state and local building codes. We offer to work with you on your upcoming projects, and to ensure that you provide the safety your occupants deserve.

EXAMPLE, New York City

Building Codes¹ state that plastics in a lighting fixture must meet a Flame Spread Index within ASTM E 84 standards; defined by an ignition test of 7 seconds in duration. Since the UL 94-V-0 testing (two 10 second ignitions with an open flame) exceeds this, UL 94-V-0 more than meets New York City's requirement. (Reference: Section BC 2606.7.5: PLASTIC, Electrical Lighting Fixtures)