

LED T8 retrofit @

Left & right
Photos courtesy of
Remy Chevalier

remyc.com

Installation by:
Raymond Caddy



 **Brighten Your Home**
Green Technology Solutions For Convenience
Peace Of Mind & Energy Conservation

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The **AQUARIUM**

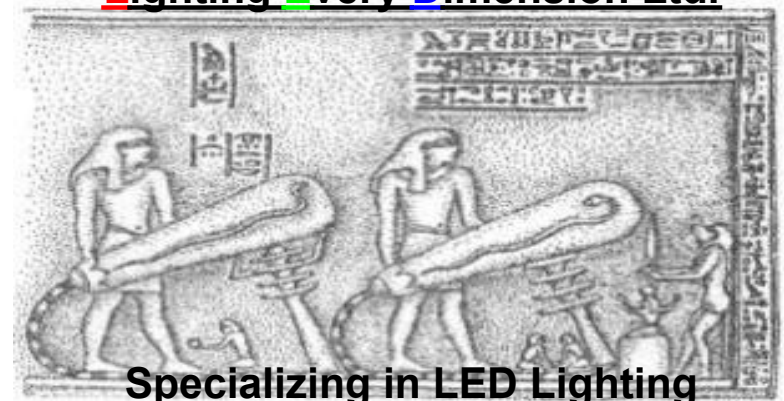
Steampunk Reading Room

10 Knight St. Norwalk, CT

Pictured above: Brian Clark Howard
Author of
Green Lighting



Lighting Every Dimension Ltd.



Specializing in LED Lighting
LightEveryDimension@gmail.com
1 845 249 5113

Why LED's?

Background

LED technology continues to develop rapidly as a general light source, and more LED light fixtures, for example T8 LED replacement tubes, have been introduced on the market.

Recently, commercially available white LEDs luminous efficacy have achieved over 90 lm/w, compared with 80-100 lm/w of existing T8 fluorescent tube.

Existing T8 fluorescent tubes work with troffers, whose efficiency ranges from only 60% to 74%. In addition to having a high efficacy, LEDs also have a longer life time, they save energy and are mercury free.



Why LED's?

Purpose

It is not always practical to replace existing T8 fluorescent's with T8 LED's. Not all T8 LED's are good replacements for conventional T8's.

This fact sheet describes a detailed comparison on the performance of T8's.

The focus lies on optical, electrical, thermal and reliability.

Introduction of G2EPS-4-T8

G2EPS-4-T8 LED tubes use LED technology to replace conventional fluorescent tubes.

They feature:

1. Patented heat sink design, good thermal management
2. Imported high quality SMD LEDs, around 85lm/w efficacy
3. Less than 4% lumen depreciation within 10,000hrs continuous burning
4. 3 years warranty
5. UL certified For USA and Canada
6. CE certified, including EMC and LVD.

The compared products (TABLE 1), are **G2EPS-4-T8** LED tube and the Philips T8 fluorescent tube and commercially available T8 LED tubes from other suppliers.

Table 1

G2EPS-4-T8 vs. Philips

Technical Comparison:	G2EPS-4-T8 4ft/ 18 watts	Philips Alto T8 4ft/ 32 watts
Physical data		
Lamp Base	G13	G13
Electrical data		
Power consumption (W)	20 ±2 watts	40±1 watts
Input Voltage (VAC)	100~240VAC	100~240VAC
Power Factor (%)	>0.95	0.97
Optical Data		
Luminous Flux (lm)	1500±100	2500±100
Illimination (lux)	360@ 3.36ft 114@ 6.56ft 58@ 9.84ft	362@ 3.36ft 119@ 6.56ft 61@ 9.84ft
Luminous Efficacy (lm/w)	85 including driver	68 including ballast
Luminaire Efficiency (%)	100% with out the need of a troffer (side reflectors)	60-74% with the use of a troffer
Color Temperature (K)	6,000~6500K	6500K
Color Rendering Index (CRI)	>80	78
Beam Angle (Degree)	120	360
Life Time	50,000-60,000	10,000-20,000

Overview

Currently, the most efficacious white LEDs can perform similarly to fluorescent tubes. However, LED efficacy doesn't tell the whole story. A quality T8 LED tube shall combine high efficacy and brand LEDs, excellent thermal management, and sophisticated optical design. Conversely, poorly-designed T8 LED tubes using even the best LEDs may be no more efficient or no longer lifetime use over existing T8 fluorescent tubes.

One of the most basic decision factors for T8 LED tube selection is longevity. However, the lighting industry has very limited direct experience with long-term performance and reliability of T8 LED replacement tubes.

In summary, T8 LED tube life is not identical to the estimated LED chip life. T8 LED tube life is also a function of the power supply, operating temperatures, thermal management, materials and electrical and material interfaces. How can T8 LED tube reliability be assessed?

Summary

- Use of high quality LEDs from brand suppliers who publish reliability data.
 - Superior heat sink design to dissipate heat, minimizing T8 LED replacement lamp temperature (for example, board, case, or solder joint temperature) as low as possible.
 - Optical specification from independent testing laboratory or manufacturer in-house testing.
 - Warranty offered by the manufacturer should be at least comparable to traditional fluorescent lamp for the application under consideration.
 - Any test data available about longer term performance of T8 LED replacement tube.

G2EPS-4-T8 vs. Common T8 LED Replacement Lamps

Common T8 LED tubes feature a linear array of 5mm DIP LEDs (suitable for indication applications, ranging from 60 to 400 LEDs per tube), with air-tight, clear, tubular plastic or glass covers as heat sink and diffuser, and integrated driver (non-isolated constant voltage type). Plastic and glass are poor heat conduction materials, this kind of design will cause heat buildup inside the tube, depreciate lumens quickly and shorten the life of T8 LED's.

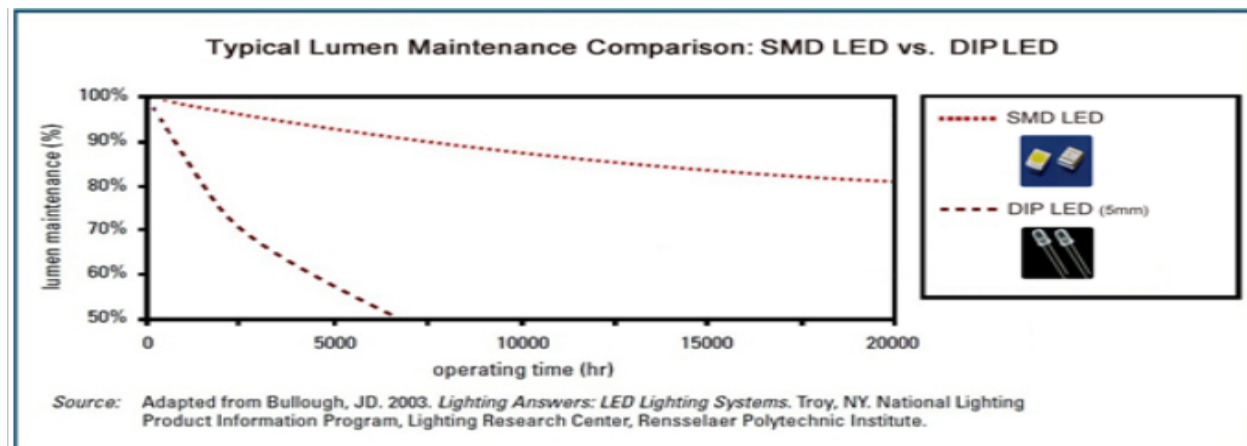
In contrast, **G2EPS-4-T8** LED replacement tube features a linear array of imported high quality SMD LEDs (ranging from 30 to 88 LEDs per tube), with patented design of aluminum housing as heat sink, stripped PC cover as diffuser and UL listed integrated driver (isolated constant current type).



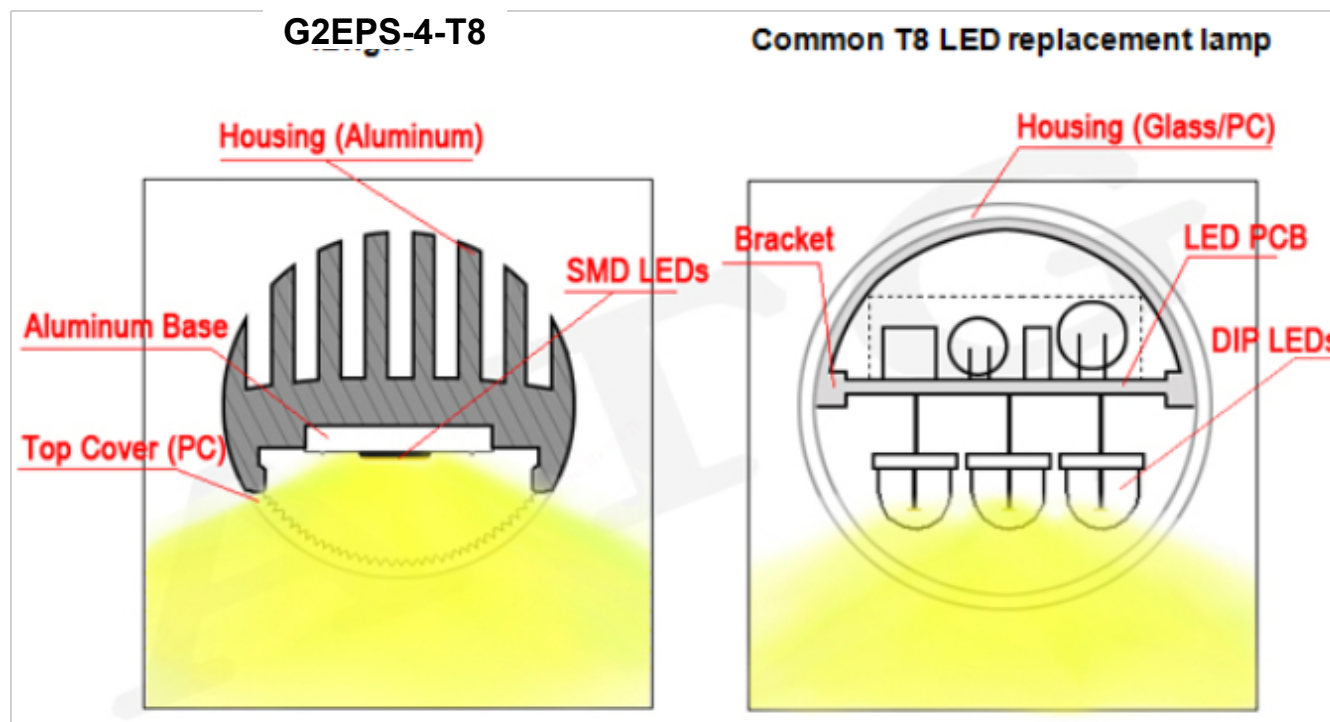
DIP LED T8 tube

G2EPS-4-T8 vs. Common T8 LED Replacement tubes

Typical Lumen Maintenance Comparison: SMD LED vs. DIP LED



Section Drawing Comparison



Project Installations

A multi-story concrete parking garage with several cars parked on the upper levels. The ground floor has an entrance and exit. A white pickup truck and a silver car are parked in the foreground. A tall building is visible in the background.

Chicago Federal Parking Garage Installation

Lighting Every Dimension Ltd.
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1,986 4ft LED T8's installed.

Fluorescent tubes- 32 watts each replaced with
G2IPS-4-T8 LED tubes 20 watts each

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Successful Projects

**G4EPS-4-
T8 installed in:
Leeuwarden,
Netherlands**

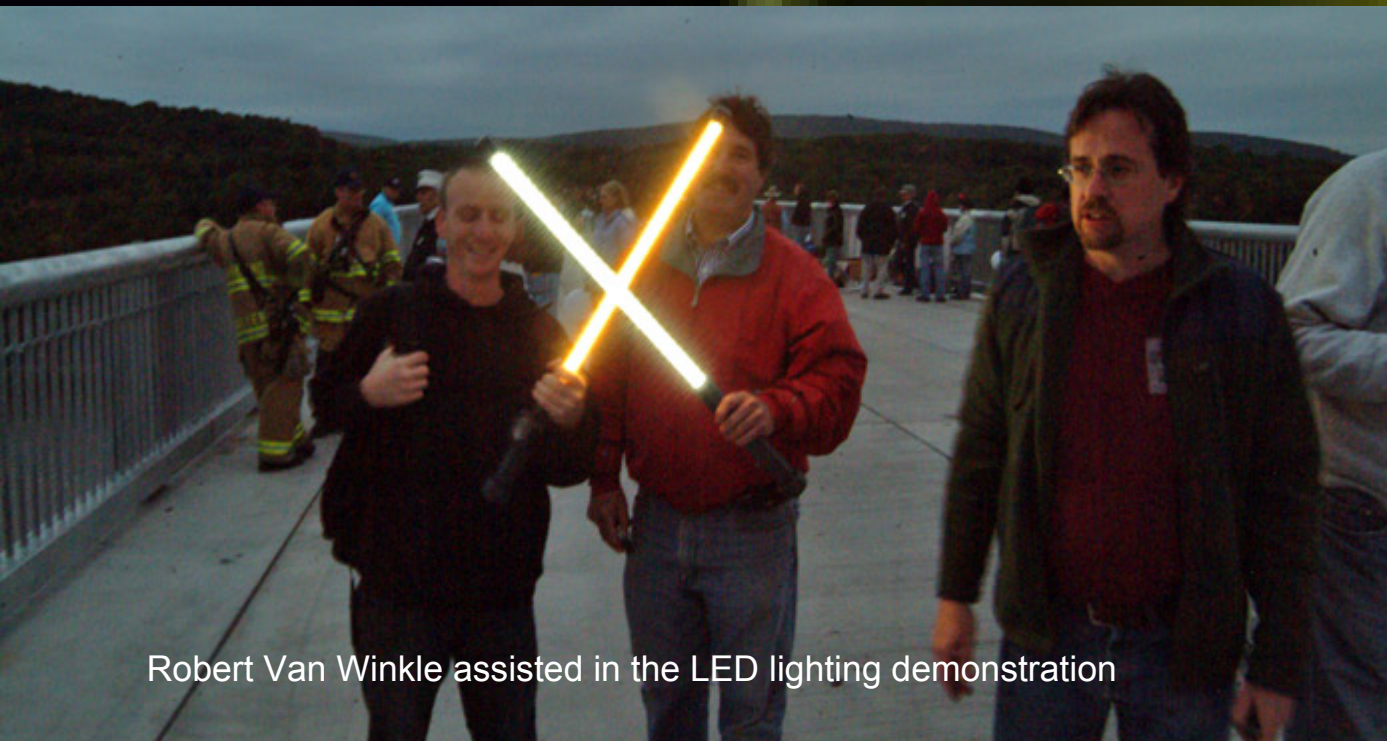


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Mid Hudson Walkway, Poughkeepsie, NY



Portable light wands designed for the opening ceremony



Robert Van Winkle assisted in the LED lighting demonstration



The Next Generation is here...

G5IPS-4-T8 and **G5EPS-4-T8** LED tube

36VDC Output internal or external driver
17±2 watts including driver

Modifying your fluorescents to LED T8's will reduce at least 44.75% on lighting costs. This percentage rate is not including labor cost/ material replacement every time a fluorescent tube or ballast stops working.



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T8 LED fluorescent replacement tubes

G5E-4-T8

Four ft replacement

Accessory Kit

- 1 36VDC External Power Supply
- 5 Wire Nuts
- 3 Screws



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Dimension:

1200 mm or 3.93 ft

Electrical Specifications

80 patented 5060 SMD LED chips
17±2 watts including driver

Operating Voltage:

Input:100~277VAC

Output voltage

Max.36VDC

Lumen :

1280±100

CRI:

>80

Beam Angle:

120 degree

Power Factor:

>95

Lumen Maintenance

>95%@1000hrs



Photo courtesy of:
Remy Chevalier
remyc.com



LED T8 Pricing

Pricing for Internal or External driven tubes are the same cost

Other T8 Custom Options: Dimming

Waterproof

Color temp adjustable (Warm white to Bright white)

Remote control

Color Changing (RGB) for theatrical events

G5IPS-4-T8

4 ft Length:
1~1,000- \$55.00
each

1,001~5,000- \$53.00
each

5,001+ \$51.00
each

Color temperature:

Warm white
2600~3200K,

Natural white
3500~4800K

Cool white 5300~7000K

Up to 50,000 hours

3 year warranty



Quality Control

All products approved by **ISO9001** quality control system, **CE**, **UL** and **CCC** approvals and standards.

Europe:

GS or **CE** Approval.



North America:

UL or **CSA** approvals under the standards **UL 1598** or **UL 48** etc.



GB7000.1 by **CCC** Approval.



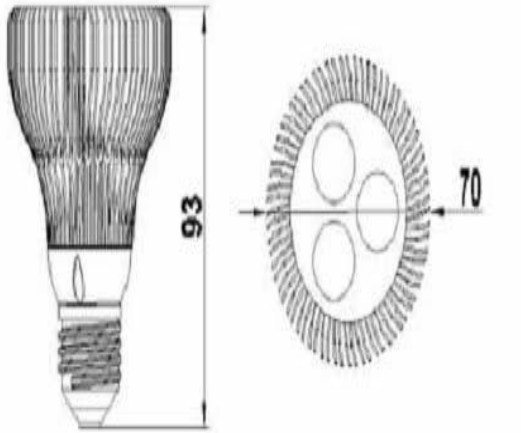
All production procedures are controlled by **ISO9000 Quality Control System**.



Effective quality management procedures include raw materials and components checking
Mid process products quality inspection
Finished products inspection
Before-shipment spot inspection.

All products undergo a minimum twelve-hour test during production process.

PAR20 LED



Unit: mm

Dimension:

D93*H70 mm E27 /E26 Base

Electrical Specifications:

3X 2 watt high power LED chips
7±0.5 Watts

Operating Voltage:

AC 85V ~ AC 265V

Lumens: Warm white 270±10% lm,

Cool white 360±10% lm

CRI: >75

Beam Angle: 30, 45, 60

Lumen Maintenance:

>95%_o@1000hrs



Color temperature:

Warm white 2600~3200K,

Natural white 3500~4800K

Cool white 5300~7000K

Up to 50,000 hours

3 year warranty

c-UL-us Listed

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PAR30 LED



Dimension:

D95*H105 mm E27 Base

Electrical Specifications:

7X 1 watt high power LED chips
9 watts including driver

Operating Voltage:

AC 85V ~ AC 265V

Lumens: 550~600 lm

CRI: >75

Beam Angle: 30, 45,
60

Lumen Maintenance:

>95%_o@1000hrs

"Green Lighting"

"Shows you how to save money and energy with:

Light-emitting diodes(LEDs)

Compact fluorescent lighting (CFL)

Solar lights

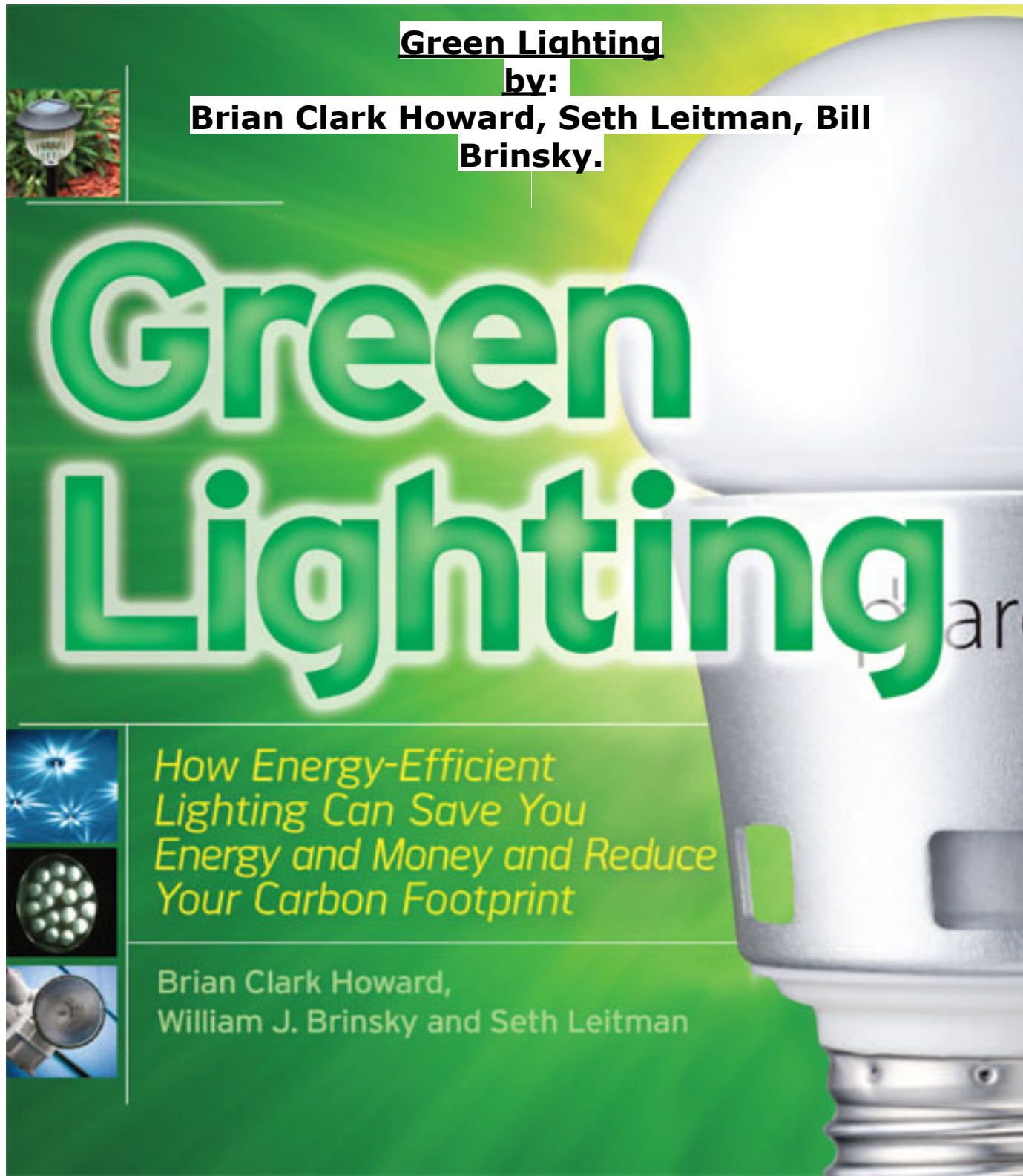
Windows

Skylights

Fixtures, controls and other bright ideas."

Quoted from Amazon.com

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Green Lighting

by:

Brian Clark Howard, Seth Leitman, Bill Brinsky.

Green Lighting

*How Energy-Efficient
Lighting Can Save You
Energy and Money and Reduce
Your Carbon Footprint*

Brian Clark Howard,
William J. Brinsky and Seth Leitman