

LED STREETLIGHT LUMINAIRE, 70 WATT



1. Scope

This material standard covers the requirements for 70 watt, end-mount, outdoor type, light-emitting-diode (LED) streetlight luminaires. LED luminaires are also known as solid state luminaires.

This material standard applies to Seattle City Light Stock Number 013078.

2. Application

70 watt LED streetlight luminaires are mounted on 2-inch nominal pipe size (NPS) tenons on poles to provide light to residential neighborhoods.

A 70 watt, LED streetlight consumes approximately 40 percent less energy than a conventional 100 watt high-intensity discharge (HID) luminaire.

LED life is greater than 50,000 hours. LED streetlight luminaire is 100 percent mercury- and lead-free.

3. Industry Standards

LED streetlight luminaires shall meet the applicable requirements of the following industry standards:

ANSI/NEMA/ANSLG C78.377-2008 - Specifications for the Chromaticity of Solid State Lighting (SSL) Products

IES LM-79-08 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

IES LM-80-08 - Approved Method: Measuring Lumen Maintenance of LED Lighting Sources

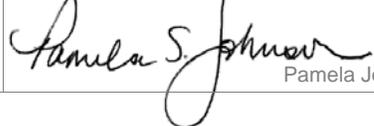
IEEE C62.41.2-2002 – IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits

IESNA TM-15-07 (revised) - Luminaire Classification System for Outdoor Luminaires

IESNA TM-15-07, Addendum A - Backlight, Uplight, and Glare (BUG) Ratings

IEC 60529 - Degrees of protection provided by enclosures (IP Code), consolidated edition

UL 1598 – Luminaires; UL

<i>standards coordinator</i>	<i>standards manager</i>	<i>unit director</i>
 John Shipek	 John Shipek	 Pamela Johnson

MATERIAL STANDARD

LED Streetlight Luminaire, 70 Watt

standard number: **5723.51**

superseding: new
 effective date: June 11, 2010
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4. Requirements

4.1 Luminaire Performance

Operating temperature, range	
C	-20 to +50
F	-4 to +122
Correlated Color Temperature (CCT), nominal, °K, per ANSI/NEMA/ANSLG C78.377	
	4000 ±300
Color rendering index (CRI), minimum	
	70
Lumen depreciation of LED light sources per IES LM-80	
	LED module(s)/ array(s) shall deliver at least 70% of initial lumens (L ₇₀), when installed for a minimum of 50,000 hours
Light distribution per IES Handbook, chapter 22	
	Type II Medium
Backlight, Uplight and Glare (BUG) rating per IESNA TM-15, Addendum A	
	B1, U1, G1
Uplight per IESNA TM-15	
	UL & UH = 0 (full cutoff)
Luminaire efficacy, type II distribution, lumens/watt, minimum, per IES LM-79, Section 11.0	
	55
Off-state power consumption, W, maximum	
	0.5
On-state power consumption, excluding control device, watt, maximum	
	75
Luminous flux distribution at median driver current, lumens, minimum	
	3900

4.2 Power Supply/Driver

Power supply driver shall be dimmer compatible.

Input voltage, functional range, 60 Hz, Vac	
	120 to 277
Power factor, minimum	
	0.90
Driver output current, mA, range	
	300 - 725
Transient protection	
	10 kV
Interference	
	FCC 47 CFR part 15/18, Class A

4.3 Construction

Luminaire housing shall be cast aluminum.

Luminaire housing shall allow tool-less entry.

Luminaire housing shall be provided with level bubble to facilitate installation.

Luminaire housing finish shall be powder-coated gray.

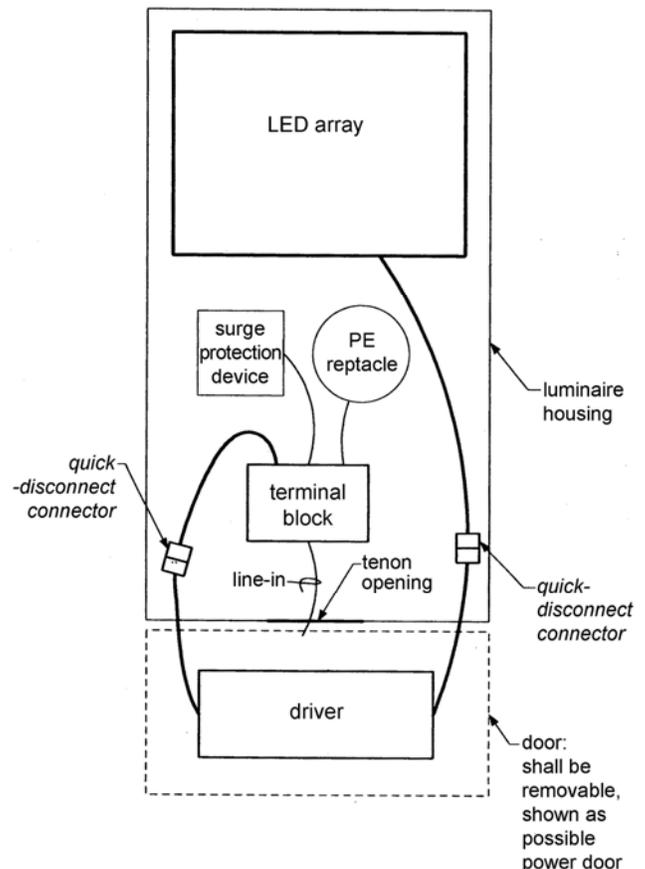
Luminaire shall be designed to mount on a schedule 40, 2-inch nominal pipe size (NPS) tenon with ±5 degrees of tilt.

Power supply/driver shall be field replaceable by means of quick-disconnect connectors and easy access mounting hardware.

Luminaire external housing shall have a minimum rating of IP65 as specified in IEC 60529, with the ability to shed water from inside the housing (i.e. weep holes).

Luminaire circuitry shall include *quick connect/disconnects* to allow easy separation and removal of driver and power door. Refer to Figure 4.3

Figure 4.3, Locations of Quick Disconnect Connectors



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page: 3 of 4**4. Requirements****4.3 Construction, continued**

The luminaire optical chamber shall have a minimum rating of IP66 as specified in IEC 60529.

Luminaire cooling system shall consist of a passive heat sink with no fans, pumps, or liquids.

Luminaire shall be designed and constructed to accept a standard plug type, locking, three-pole, three-wire, streetlight photocontrol.

All fasteners shall be stainless steel.

All polycarbonate components shall be UV stabilized.

A three-pole terminal block capable of accepting #14 to #10 AWG wire shall be mounted to the housing inside the electrical compartment.

Luminaire shall be provided with capability for optional backlight control.

Complete assembly weight shall not exceed 45 lbs.

4.4 Certification and Listing

Power supply/driver shall be UL recognized for dry and damp locations.

All other electrical components shall be UL listed or recognized for wet locations.

5. Testing

Test data that establishes compliance with the requirements of UL 1598 and the other industry standards listed in Section 3 of this material standard shall be provided upon request.

6. Product Approval

Manufacturers interested in having their luminaire(s) approved for purchase by Seattle City Light must participate in the stepped process summarized below. Contact Streetlight Engineering for the details.

- Review fixture test reports
- Computer modeling of fixture light distribution
- Laboratory testing of sample fixture
- Field trial of sample fixture(s)
- Field trial review and evaluation

Manufacturers are encouraged to plan accordingly. The approval process can take up to six months to complete.

7. Design Changes

Manufacturer shall inform Seattle City Light in writing of all design changes that could affect the product's understood or published capabilities.

8. Marking**8.1 Nameplate**

An easily-viewable nameplate shall be permanently affixed to the inside each luminaire housing.

Nameplate shall contain the following information:

- manufacturer's name
- manufacturer's catalog number
- date of manufacture (month and year)
- plant location
- input power consumption
- driver output current
- IEC IP Rating
- correlated color temperature (CCT)
- IES light distribution type
- IESNA TM-15 BUG ratings
- serial number

A similar nameplate shall be permanently affixed to the exterior underside of each luminaire housing.

8.2 Barcode

A barcode label shall be as provided as specified in the purchase order.

8.3 Identification

All UL listed components shall be labeled or recognized as such.

9. Packaging

Luminaires shall be individually package to prevent damage during shipping, inside storage, and casual handling prior to installation.

Each package shall be legibly marked with:

- Manufacturer's name
- Manufacturer's catalog number
- Product description
- Date of manufacture (month and year)
- Seattle City Light's Stock Number
- Seattle City Light's Purchase Order Number

10. Issuance

EA

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11. Approved Manufacturers

Manufacturer: BetaLED

Catalog Number: STR-LWY-2M-HT-04-C-UL-SV-R-43K

where:

- STR** = product
- LWY** = family
- 2M** = IESNA type II medium distribution
- HT** = horizontal tenon mount
- 04** = forty LEDs
- C** = LED series
- UL** = voltage, universal 120-277 Vac
- SV** = housing color, silver
- R** = NEMA photocell receptacle
- 43K** = color temperature, 4300 K

Buy American provision of the ARRA compliant: yes

Manufacturer: Leotek

Catalog Number: GC1-40C-MV-NW-2M-GY-530mA

where:

- GC1** = LED streetlight
- 40C** = forty type C LEDs
- MV** = voltage, 120-277 Vac
- NW** = nominal color temperature, 4000 K
- 2M** = light distribution, type 2 medium
- GY** = finish, gray
- 530mA** = fixed drive current, 530 mA

Buy American Provision of the ARRA compliant: no

12. References

Buy American Provision, American Recovery and Reinvestment Act (ARRA); US Congress

CN-031310, LED Street Lighting, Leotek bulletin, GCA1 Series; Leotek

IESNA Lighting Handbook; Chapter 22,9th edition; Roadway Lighting; IESNA

IESNA Lighting Ready Reference, A Compendium of Materials from the IESNA Lighting Handbook; 9th Edition, RR-03 Fourth Edition; IESNA

Marsten, Vicki; SCL engineer and subject matter expert for 5723.51; (vicki.marsten@seattle.gov)

OLP-2858, bulletin, LED Roadway; GE Lighting System, Inc.; 1/10

Shipek, John; SCL Standards Engineer, subject matter expert and originator of 5723.51; (john.shipek@seattle.gov)

Smalley, Edward; SCL engineer and subject matter expert for 5723.51; (edward.smalley@seattle.gov)

Standard Specifications, Section 9-31.1(2)-Luminaires; City of Seattle

STR-LWY-2M-HT, LEDway Streetlight - Type II Medium, BetaLED bulletin; BetaLED; revision 02/15/10

UL 1012 - Power Units Other Than Class 2; UL

UL 1310 - Class 2 Power Units; UL

UL 2108 - Low Voltage Lighting Systems; UL

UL 8750 - Light-Emitting Diode (LED) Light Sources for Use in Lighting Products; UL