ENERGY STAR TEST REPORT

ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) Eligibility Criteria Version 2.0

Applicant's name .....:	Progress Lighting
Address .....:	701 Millennium Boulevard Greenville, SC 29607
Brands.....:	Progress Lighting
Report No......:	BTR66.181.16.0012.50
Basic Model .....:	P8147-31-30K
Tested by (printed name and signature) .....:	David Zhang .....
Title .....:	**Test Engineer**
Approved by (printed name and signature) .....:	Steven Huo .....
Title .....:	**Approved Signatory**
Date of test .....:	Dec 05, 2016 to Dec 15, 2016
Date of issue .....:	Dec 15, 2016
Testing Laboratory Name .....:	BEST Test Service Shenzhen Co., Ltd.
Address .....:	1st Floor, 1st Building, Weitai Industrial Park, Yingrenshi, Shiyan, Baoan, Shenzhen, China TEL: + 86-755-28236006: FAX: + 86-755-23467087
Accreditation .....:	DLC/Lighting Facts/UL/ETL/ELI/CEC/EPA/DOE NVLAP Testing Lab Code: 200770-0
Test specification	
Standard .....:	Luminaires V2.0
Test procedure .....:	Energy Star Test Procedure
Non-standard test method .....:	No

Note:

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Product description:		
Connected Luminaire? .....:	☐Yes	☒No
Sample Quantity .....:	3 pcs	
Tested Model .....:	P8147-31-30K	
Additional Models Represented .....:	See the model list	
Note .....:	These models are all the same except for the finish color and CCT.	
Rating(s) Input Voltage (V; Hz) .....:	AC 120V, 60Hz	
Test Voltage(V; Hz).....:	AC 120V, 60Hz	
Fixture Nominal Power.....:	17.5W	
Total Lumen Output of Fixture .....:	1000 lm	
Target CCT .....:	3000K	
Allowable CCT .....:	3500K; 4000K; 5000K	
CRI(Ra) .....:	90	
Nominal Life .....:	50000Hours	
Fixture categorization .....:	☐Non-directional	☒Directional
Rated Indoor/ Outdoor Application.....:	☐Indoor	☐Outdoor ☒ Both
Lighting Technology Used .....:	☒Solid State	☐Fluorescent
Lighting Source Type	☒Inseparable LED Source	☐LED Light Engine
Directional Luminaire Type .....:	☐Portable Desk Task	☐Inseparable SSL - Other
	☐Downlight Solid State Retrofit kits	☒Downlight Surface Mount
	☐Downlight Pendant	☐Downlight Recessed
	☐Accent Light Ceiling Fan Light Kit	☐Accent Light Line-voltage
	☐Under Cabinet	☐Cove Mount
	☐Outdoor Security	☐Outdoor Post-Mounted
	☐Outdoor Porch Wall-Mount	☐Outdoor Pendent
	☐Outdoor Ceiling	☐Outdoor Close to Ceiling
Inseparable SSL - Other	☐Bath Vanity	☐Ceiling Mount
	☐Chandelier	☐Close to Ceiling Mount
	☐Decorative Pendant	☐Ceiling Fan Light Kit
	☐Linear Strip	☐Wall Sconces
	☐Wrapped Lens	☐Residential Portable Desk Task Light
	☐Portable Floor Task Light	☐Table Lamp
	☐Ventilating Fan Light	☐Floor Lamp
	☐Torchiere	☐Other
Dimmable? .....:	☒Yes	☐No
If Yes, Select Dimming Mechanism ...:	☒Continuous dimming	☐Step dimming
Dimming Range .....:	10%-100%	
Allowable Housings/Chassis.....:	N/A	
Allowable Finishes .....:	Black color; Gray color; Bronze color; White color; Nickel brushed	
Allowable Mounting type .....:	N/A	

Allowable Reflector/Trims .....:	N/A
Allowable Shade/Diffusers .....:	N/A
Allowable Product Wattage(Directional Luminaires) .....:	N/A
Number of Driver per Luminaire .....:	N/A
Number of Lighting Source per Driver:	N/A
Lighting Source Manufacture .....:	Nichia
Lighitng Source Model .....:	NFSL757GT-V1
Lighting Source Lumen Output .....:	N/A
Lighting Source is Self Ballasted or has Integrated Driver? .....:	No
ANSI-IEC Standardized Lamp Shape:	No
ANSI-IEC Designated Lamp Base Type .....:	N/A
ANSI-IEC Lamp Standard Data Sheet Number .....:	N/A
LED Driver Brand.....:	N/A
LED Driver Model Number.....	N/A
Driver Tc (ºC) During Normal Operation .....:	95℃
Allowable Driver Brand .....:	N/A
Allowable Driver Model Number .....:	N/A

Test Method Description

ANSI C78.376-2001 Specifications for the Chromaticity of Fluorescent Lamps
ANSI/NEMA/ANSLG C78.377-2011 Specifications for the Chromaticity of Solid State Lighting Products
ANSI C78.5-2003 Specifications for Performance of Self-ballasted Compact Fluorescent Lamps
ANSI/ANSLG C78.81-2010 Double-Capped Fluorescent Lamps—Dimensional and Electrical Characteristics
ANSI C78.901-2014 Single-Based Fluorescent Lamps—Dimensional and Electrical Characteristics
ANSI/ANSLG C81.61-2009 Specifications for Bases (Caps) for Electric Lamps
ANSI/ANSLG C81.62-2009 Lamp holders for Electric Lamps
ANSI C82.11-2011High-Frequency Fluorescent Lamp Ballasts
ANSI/ANSLG C82.16-2015 (anticipated) Light Emitting Diode Drivers—Methods of Measurement
ANSI C82.2-2002 Method of Measurement of Fluorescent Lamp Ballasts
ANSI C82.77-10:2014 Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
ANSI/IEEE C62.41.1-2002 IEEE Guide on the Surge Environment in Low-Voltage (1000 V and Less) AC Power Circuits
ANSI/IEEE C62.41.2-2002 IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000V and Less) AC Power Circuits
ANSI/UL 153-2002 Standard for Safety of Portable Electric Luminaires
ANSI/UL 935-2009 Standard for Safety of Fluorescent-Lamp Ballasts
ANSI/UL 1310-2010 Standard for Safety of Class 2 Power Units
ANSI/UL 1574-2004 Standard for Safety of Track Lighting Systems
ANSI/UL 1598-2008 Standard for Safety of Luminaires
ANSI/UL 1598C Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits
ANSI/UL 1598B-2010 Standard for Supplemental Requirements for Luminaire Reflector Kits for Installation on Previously Installed Fluorescent Luminaires
ANSI/UL 1993-2009 Standard for Safety of Self-Ballasted Lamps and Lamp Adapters
ANSI/UL 2108-2004 Standard for Low-Voltage Lighting Systems
ANSI/UL 8750-2009 Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products
ASTM E283-04 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
CIE Pub. No. 13.3-1995 Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. No. 15:2004 Colorimetry
EU Directive 2002/95/EC Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the Restriction of the Use of Certain Hazardous Substances In Electrical and Electronic Equipment
FCC CFR Title 47 Part 15 Radio Frequency Devices
FCC CFR Title 47 Part 18 Industrial, Scientific, and Medical Equipment
IEC 60061-1 (2012) Lamp Caps and Holders Together with Gauges for the Control of Interchangeability and Safety – Part 1: Lamp Caps
IEC 60081 Amend 4 Ed 5.0 (2010) Double-capped Fluorescent Lamps - Performance Specifications
IEC 60901 (2011) Single-capped Fluorescent Lamps - Performance Specifications
IEC 62301 ED.2.0 B:2011 Household electrical appliances - Measurement of standby power
IEC 61347-2-3-am2 ed1.0 b.2011 Amendment 2 - Lamp Control Gear - Part 2-3: Particular Requirements for A.C. Supplied Electronic Ballasts for Fluorescent Lamps
IEC 62321 Ed. 1.0 Electrotechnical Products - Determination Of Levels Of Six Regulated Substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers)
IEEE PAR1789 IEEE Recommending Practices for Modulating Current in High Brightness LEDs for Mitigating Health Risks to Viewers
IES LM-9-09 Electric and Photometric Measurements of Fluorescent Lamps
IES LM-10-96 or LM-10-XX Photometric Testing of Outdoor Fluorescent Luminaires (2015 update anticipated)
IES LM-31-95 Photometric Testing of Roadway Luminaires Using Incandescent Filament and High Intensity Discharge (HID) Lamps
IES LM-40-10 Life Testing of Fluorescent Lamps
IES LM-41-14 Approved Method for Photometric Testing of Indoor Fluorescent Luminaries
IES LM-46-04 Photometric Testing of Indoor Luminaires Using High Intensity Discharge or Incandescent Filament Lamps
IES LM-49-12 Life Testing of Incandescent Filament Lamps
IES LM-58-13 Method for Spectroradiometric Measurement Methods for Light Sources
IES LM-65-14 Life Testing of Compact Fluorescent Lamps
IES LM-66-14 Electrical and Photometric Measurements of Single-Ended Compact Fluorescent Lamps
IES LM-79-08 Electrical and Photometric Measurements of Solid-State Lighting Products
IES LM-80-08 Measuring Lumen Maintenance of LED Light Sources
IES LM-82-12 Method for the Characterization of LED Light Engines and Integrated LED Lamps for Electrical and Photometric Properties as a Function of Temperature
IES LM-84-14 Measuring Luminous Flux and Color Maintenance of LED Lamps, Light Engines, and Luminaires
IES RP-16-10 Nomenclature and Definitions for Illuminating Engineering
IES TM-21-11 Projecting Long Term Lumen Maintenance of LED Sources
IES TM-28-14 Projecting Long-Term Luminous Flux Maintenance of LED Lamps and Luminaries
NEMA LL 9-2009 Dimming of T8 Fluorescent Lighting Systems
NEMA LSD 45-2009 Recommendations for Solid State Lighting Sub-Assembly Interfaces for Luminaires
NEMA SSL 7A-2013 Phase Cut Dimming for Solid State Lighting: Basic Compatibility

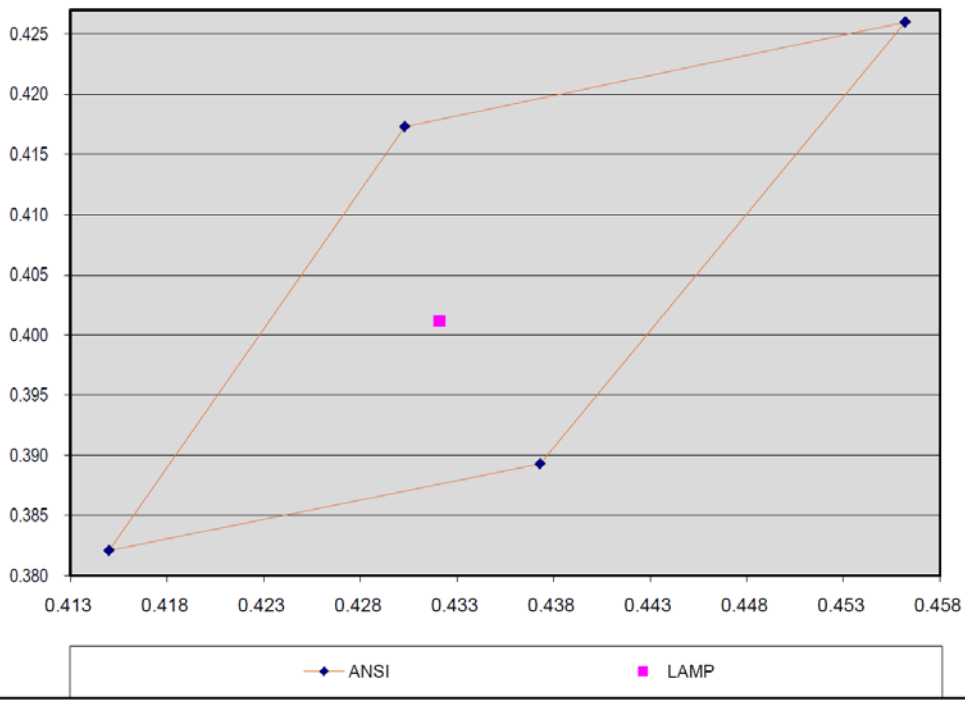
Test Data

Initial Photometric and Electrical Test Data

Sample No	Voltage (V)	Current (A)	Power (W)	Power Factor	Luminous Flux (Lumens)	Efficiency (Lumen/W)
L1	120.0	0.138	16.35	0.9885	1035.88	63.4
Sample No	Mini Light Output (Lumen)	Starting Time (mS)	Run-up Time (S)	CCT (K)	CRI (Ra)	R9
L1	575	51.8	N/A	3059	94.7	69
Sample No	x (CIE 1931)	y (CIE 1931)	u' (CIE 1976)	v' (CIE 1976)	Duv (CIE 1976)	Operating Frequency (Hz)
L1	0.4321	0.4012	0.2487	0.5195	-0.0005	120
Sample No	Audible Noise (dBA)	Transient Protection Test	Driver Replaceable	Shipped with Lighting Components	Light Source Replace ability	Standby Power (W)
L1	20.6	Survival	Yes	Yes	Exemption	0.0
Sample No	Color Angular Uniformity	Color Maintenance	Mini Dimming Level	Lumen Maintenance	Fixture Life Hours	Fixture Size (inches)
L1	0.0024	0.0019	5.9%	86.19%	50000	5
Sample No	Recessed Downlight IC	Recessed Downlight AT	Shipped with a Energystar Certificated Lamps	Air Temperature in Enclosed Fixture	ANSI Standard Lamp Base	Heads of Accent Light
L1	N/A	N/A	N/A	N/A	N/A	N/A

7-Step Chromaticity Quadrangles Test Data

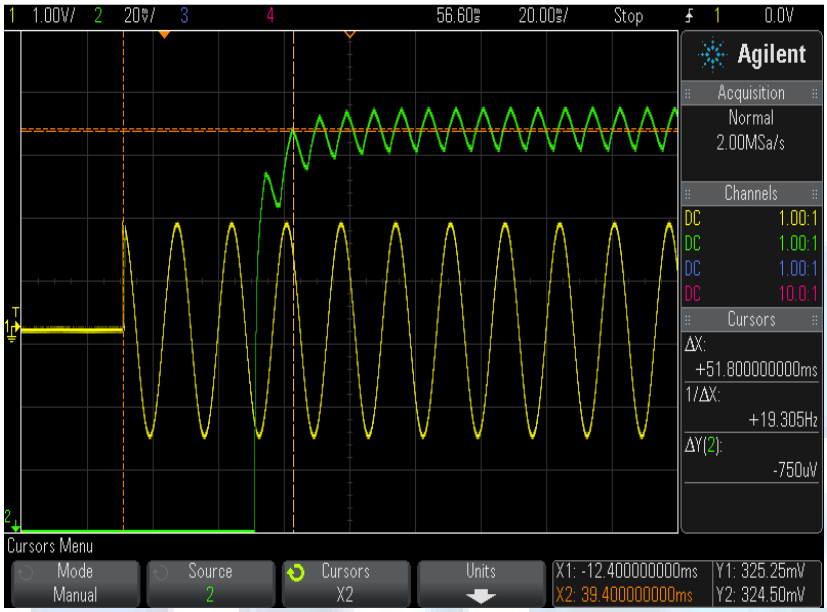
	3000K quadrangle	
	x	y
ANSI 78.377-2015	0.4562	0.4260
	0.4303	0.4173
	0.4150	0.3821
	0.4373	0.3893
	0.4562	0.4260
Center		
1	0.4321	0.4012
2		
3		
4		
5		
6		
7		
8		
9		
10		



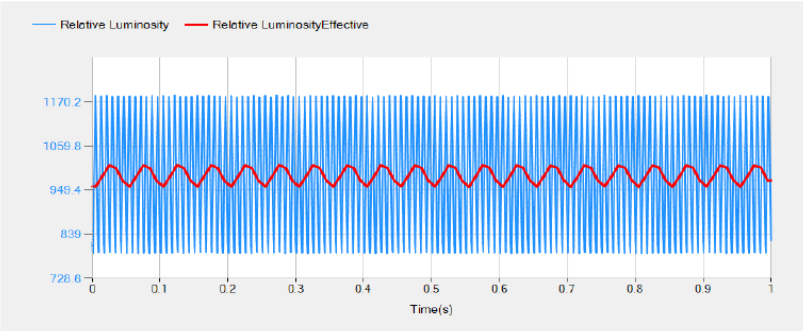
Zonal Lumen Density

Luminaire Type	Cove Mount	Under Cabinet	Downlights	SSL downlight retrofits	Accent Lights	Outdoor, Wall-, Porch-, Pendant-, and Post- Mounted Luminaires		Portable Desk Task
Zone	0-60°	0-60°	0-60°	0-60°	0-60°	0°- 85°	>90°	0-75°
Distribution	≥60%	≥60%	≥75%	≥75%	≥80%	≥95%	≤0.5%	≥60%
Result	N/A	N/A	75%	N/A	N/A	N/A	N/A	N/A

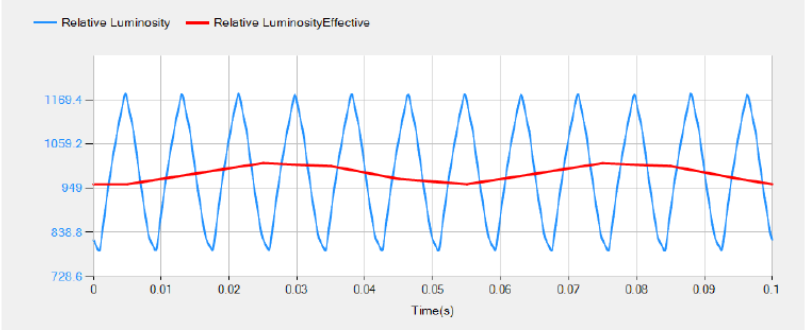
Starting Time Plots



Operating Frequency



All Wave(0～1)s



Zoom time(0～0.1)s

Color Angular Uniformity

Gamma\C	C0			C90		
	CIE u'	CIE v'	Du'v'	CIE u'	CIE v'	Du'v'
-60	0.2480	0.5184	0.0017	0.2477	0.5178	0.0022
-59	0.2480	0.5184	0.0017	0.2478	0.5178	0.0021
-58	0.2481	0.5184	0.0016	0.2478	0.5178	0.0021
-57	0.2483	0.5185	0.0014	0.2481	0.5179	0.0018
-56	0.2483	0.5185	0.0014	0.2481	0.5180	0.0018
-55	0.2484	0.5186	0.0013	0.2482	0.5180	0.0017
-54	0.2484	0.5186	0.0013	0.2482	0.5180	0.0017
-53	0.2486	0.5186	0.0011	0.2483	0.5181	0.0015
-52	0.2486	0.5187	0.0011	0.2485	0.5181	0.0014
-51	0.2487	0.5187	0.0010	0.2486	0.5182	0.0012
-50	0.2487	0.5187	0.0010	0.2486	0.5182	0.0012
-49	0.2490	0.5187	0.0007	0.2487	0.5182	0.0011
-48	0.2490	0.5188	0.0006	0.2487	0.5183	0.0011
-47	0.2490	0.5188	0.0006	0.2488	0.5183	0.0010
-46	0.2491	0.5188	0.0005	0.2491	0.5184	0.0007
-45	0.2493	0.5189	0.0003	0.2491	0.5184	0.0007
-44	0.2493	0.5189	0.0003	0.2492	0.5185	0.0005
-43	0.2493	0.5189	0.0003	0.2492	0.5185	0.0005
-42	0.2494	0.5189	0.0002	0.2493	0.5185	0.0005
-41	0.2494	0.5189	0.0002	0.2493	0.5185	0.0005
-40	0.2495	0.5190	0.0002	0.2494	0.5186	0.0003
-39	0.2497	0.5190	0.0001	0.2494	0.5186	0.0003
-38	0.2497	0.5190	0.0001	0.2497	0.5187	0.0001
-37	0.2497	0.5191	0.0002	0.2497	0.5187	0.0001
-36	0.2498	0.5191	0.0002	0.2498	0.5187	0.0001
-35	0.2498	0.5191	0.0002	0.2498	0.5188	0.0001
-34	0.2498	0.5191	0.0002	0.2499	0.5188	0.0002
-33	0.2500	0.5192	0.0005	0.2499	0.5188	0.0002
-32	0.2500	0.5192	0.0005	0.2500	0.5188	0.0003
-31	0.2501	0.5192	0.0005	0.2500	0.5189	0.0003
-30	0.2501	0.5192	0.0005	0.2500	0.5189	0.0003
-29	0.2501	0.5192	0.0005	0.2501	0.5189	0.0004
-28	0.2501	0.5192	0.0005	0.2503	0.5190	0.0007
-27	0.2501	0.5192	0.0005	0.2503	0.5190	0.0007
-26	0.2501	0.5192	0.0005	0.2504	0.5190	0.0008
-25	0.2501	0.5193	0.0006	0.2504	0.5190	0.0008
-24	0.2503	0.5193	0.0008	0.2504	0.5190	0.0008
-23	0.2503	0.5193	0.0008	0.2504	0.5190	0.0008
-22	0.2504	0.5193	0.0009	0.2504	0.5190	0.0008

-21	0.2503	0.5193	0.0008	0.2504	0.5190	0.0008
-20	0.2503	0.5193	0.0008	0.2505	0.5191	0.0009
-19	0.2504	0.5193	0.0009	0.2505	0.5191	0.0009
-18	0.2503	0.5193	0.0008	0.2505	0.5191	0.0009
-17	0.2504	0.5193	0.0009	0.2505	0.5191	0.0009
-16	0.2503	0.5193	0.0008	0.2505	0.5191	0.0009
-15	0.2504	0.5193	0.0009	0.2505	0.5191	0.0009
-14	0.2503	0.5193	0.0008	0.2505	0.5191	0.0009
-13	0.2503	0.5193	0.0008	0.2505	0.5191	0.0009
-12	0.2503	0.5193	0.0008	0.2505	0.5191	0.0009
-11	0.2504	0.5193	0.0009	0.2505	0.5191	0.0009
-10	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
-9	0.2504	0.5193	0.0009	0.2505	0.5191	0.0009
-8	0.2504	0.5193	0.0009	0.2505	0.5191	0.0009
-7	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
-6	0.2504	0.5193	0.0009	0.2505	0.5191	0.0009
-5	0.2504	0.5193	0.0009	0.2505	0.5191	0.0009
-4	0.2504	0.5193	0.0009	0.2505	0.5191	0.0009
-3	0.2504	0.5193	0.0009	0.2505	0.5191	0.0009
-2	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
-1	0.2504	0.5193	0.0009	0.2505	0.5191	0.0009
0	0.2505	0.5195	0.0010	0.2505	0.5195	0.0011
1	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
2	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
3	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
4	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
5	0.2504	0.5192	0.0008	0.2504	0.5191	0.0008
6	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
7	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
8	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
9	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
10	0.2504	0.5192	0.0008	0.2504	0.5191	0.0008
11	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
12	0.2504	0.5192	0.0008	0.2504	0.5191	0.0008
13	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
14	0.2504	0.5192	0.0008	0.2504	0.5191	0.0008
15	0.2504	0.5192	0.0008	0.2505	0.5191	0.0009
16	0.2503	0.5192	0.0007	0.2505	0.5191	0.0009
17	0.2504	0.5192	0.0008	0.2504	0.5191	0.0008
18	0.2504	0.5192	0.0008	0.2503	0.5191	0.0007
19	0.2503	0.5192	0.0007	0.2503	0.5191	0.0007
20	0.2503	0.5192	0.0007	0.2503	0.5191	0.0007
21	0.2503	0.5192	0.0007	0.2503	0.5191	0.0007

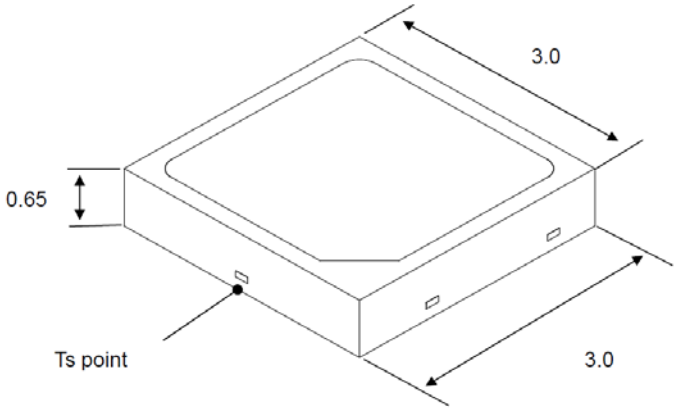
22	0.2503	0.5191	0.0007	0.2503	0.5191	0.0007
23	0.2503	0.5191	0.0007	0.2503	0.5190	0.0007
24	0.2503	0.5191	0.0007	0.2502	0.5191	0.0006
25	0.2502	0.5191	0.0006	0.2502	0.5190	0.0006
26	0.2502	0.5191	0.0006	0.2502	0.5190	0.0006
27	0.2502	0.5191	0.0006	0.2502	0.5190	0.0006
28	0.2502	0.5190	0.0006	0.2500	0.5190	0.0004
29	0.2501	0.5190	0.0005	0.2500	0.5190	0.0004
30	0.2499	0.5189	0.0003	0.2500	0.5190	0.0004
31	0.2498	0.5189	0.0002	0.2500	0.5189	0.0003
32	0.2498	0.5189	0.0002	0.2499	0.5189	0.0003
33	0.2497	0.5189	0.0001	0.2499	0.5189	0.0003
34	0.2497	0.5188	0.0001	0.2499	0.5189	0.0003
35	0.2496	0.5188	0.0001	0.2498	0.5188	0.0001
36	0.2496	0.5188	0.0001	0.2496	0.5188	0.0001
37	0.2495	0.5188	0.0002	0.2496	0.5188	0.0001
38	0.2495	0.5187	0.0003	0.2496	0.5188	0.0001
39	0.2494	0.5187	0.0003	0.2495	0.5187	0.0002
40	0.2492	0.5186	0.0005	0.2495	0.5187	0.0002
41	0.2491	0.5186	0.0006	0.2493	0.5187	0.0004
42	0.2491	0.5186	0.0006	0.2493	0.5186	0.0004
43	0.2490	0.5185	0.0008	0.2492	0.5186	0.0005
44	0.2490	0.5185	0.0008	0.2492	0.5186	0.0005
45	0.2489	0.5185	0.0008	0.2491	0.5186	0.0006
46	0.2489	0.5184	0.0009	0.2489	0.5185	0.0008
47	0.2486	0.5184	0.0012	0.2488	0.5185	0.0009
48	0.2486	0.5184	0.0012	0.2488	0.5184	0.0010
49	0.2485	0.5183	0.0013	0.2488	0.5184	0.0010
50	0.2485	0.5183	0.0013	0.2487	0.5184	0.0010
51	0.2484	0.5182	0.0014	0.2485	0.5183	0.0013
52	0.2483	0.5182	0.0015	0.2485	0.5183	0.0013
53	0.2481	0.5181	0.0017	0.2484	0.5183	0.0014
54	0.2481	0.5181	0.0017	0.2482	0.5182	0.0016
55	0.2480	0.5180	0.0019	0.2482	0.5182	0.0016
56	0.2479	0.5180	0.0020	0.2481	0.5181	0.0017
57	0.2479	0.5180	0.0020	0.2480	0.5181	0.0018
58	0.2476	0.5179	0.0023	0.2479	0.5181	0.0019
59	0.2476	0.5179	0.0023	0.2478	0.5180	0.0020
60	0.2475	0.5178	0.0024	0.2478	0.5180	0.0020

Driver TMPc/ LED Forward Current/TMP_{LED} Test Data

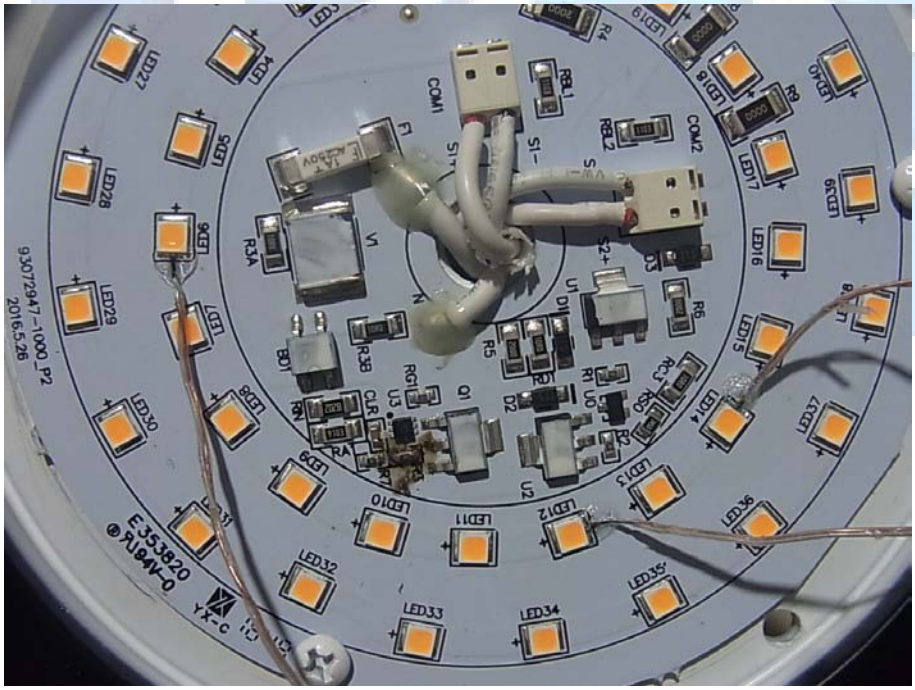
Sample No.	LED Package Manufacture	LED Package Model	In Situ TMP_{LED} (℃)	Drive Current of LED (mA)	Driver Tc (℃)	In Situ Driver TMPc (℃)
L3	Nichia	NFSL757GT-V1	68.8	98.0	95.0	58.4

Temperature Measurement Point in LM-80 Report

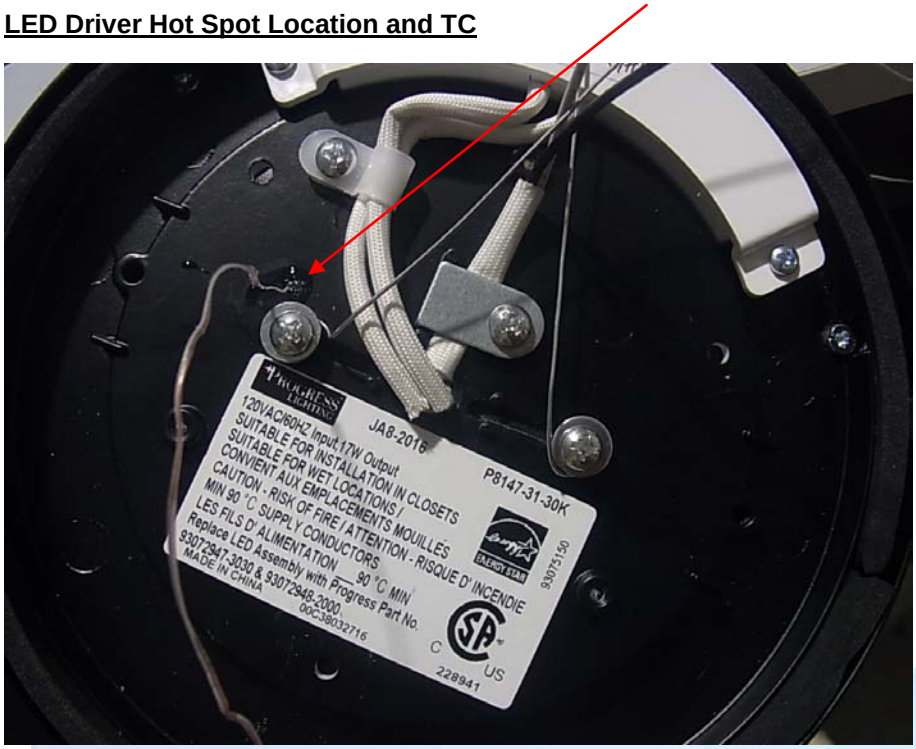
For the case temperature (T_S) measurement point, see the figure below.



In Situ LED Lighting Source Temperature Measurement Point



LED Driver Hot Spot Location and TC



In Situ LED Driver Temperature Measure Point Location

Lumen Maintenance and Lighting Source Life Test Data

TM-21 Inputs

Instructions

Yellow fields are completed by the user. Fields not used should be left blank. Cyan fields are calculated based on user entries.

First, enter a description of the LED light source tested. Then complete the fields labeled "LM-80 Testing Details". Test duration must be at least 6,000 hours. If only one case temperature data set is to be used (no interpolation), complete only "Tested case temperature 1". If the in-situ values falls between two cases temperatures, enter only those two case temperature data sets in Tested case temperature 1 and 2 in ascending temperature order.

Next, further to the right, in the corresponding box(es) for each tested case temperature, enter the test data along with the time (in hours) at which each measurement was taken. Data entered must be normalized then averaged measured data (per TM-21 sections 5.2.1 and 5.2.2).

Enter drive current, in-situ temperature data and the percentage of initial lumens to project to in the fields labeled "In-Situ Inputs".

Results can be tailored to estimate lumen maintenance at a specific time by entering a value (t) in the yellow field. A complete TM-21 report will appear on the next tab labeled "Report".

LM-80 Test Inputs

Description of LED Light Source Tested (manufacturer, model, catalog number)
Nichia, model number:NFSL757GT-V1

LM-80 Testing Details	
Total number of units tested per case temperature:	25
Number of failures:	0
Number of units measured:	25
Test duration (hours):	10000
Tested drive current (mA):	150
Tested case temperature 1 (T_c, ºC):	55
Tested case temperature 2 (T_c, ºC):	85
Tested case temperature 3 (T_c, ºC):	105

Test Data for 55ºC Case Temperature		Test Data for 85ºC Case Temperature		Test Data for 105ºC Case Temperature	
Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)
0	100.00%	0	100.00%	0	100.00%
500	99.60%	500	99.40%	500	99.00%
1000	99.50%	1000	99.20%	1000	98.70%
2000	99.30%	2000	98.80%	2000	97.80%
3000	99.50%	3000	98.70%	3000	97.60%
4000	99.40%	4000	98.60%	4000	97.10%
5000	98.90%	5000	98.10%	5000	96.20%
6000	98.80%	6000	97.90%	6000	95.30%
7000	98.70%	7000	97.70%	7000	94.40%
8000	98.30%	8000	97.30%	8000	93.60%
9000	97.90%	9000	96.80%	9000	92.60%
10000	97.70%	10000	96.50%	10000	91.90%

***In-Situ* Inputs**

Drive current for each LED package/array/module (mA):	98
In-situ case temperature (T_c, ºC):	68.8
Percentage of initial lumens to project to (e.g. for L_{70}, enter 70):	70

Results

Time (t) at which to estimate lumen maintenance (hours):	50,000
Lumen maintenance at time (t) (%):	86.19%
Reported L70 (hours):	>60000

Color Maintenance(Share data from IESNA LM-80 report)

Data Set 5 : 85 °C, 150 mA

Actual Case Temperature [T_S]	85.4 °C
Actual Ambient Temperature [T_A]	83.0 °C
Drive Current [I_F]	150 mA
Measurement Current	150 mA

NOTES:
T_S and T_A were measured during initial setup.

TABLE 5-4
Chromaticity Shift

LED No.	Chromaticity Shift Δu'v'														
	0 h	500 h	1000 h	2000 h	3000 h	4000 h	5000 h	6000 h	7000 h	8000 h	9000 h	10000 h			
1	0.0000	0.0008	0.0009	0.0009	0.0012	0.0012	0.0013	0.0014	0.0013	0.0016	0.0018	0.0019			
2	0.0000	0.0009	0.0009	0.0008	0.0010	0.0011	0.0012	0.0013	0.0013	0.0015	0.0015	0.0017			
3	0.0000	0.0008	0.0009	0.0008	0.0010	0.0011	0.0011	0.0012	0.0013	0.0014	0.0015	0.0017			
4	0.0000	0.0008	0.0009	0.0009	0.0010	0.0010	0.0010	0.0010	0.0012	0.0013	0.0014	0.0016			
5	0.0000	0.0009	0.0008	0.0009	0.0009	0.0011	0.0012	0.0012	0.0012	0.0015	0.0015	0.0018			
6	0.0000	0.0008	0.0009	0.0009	0.0009	0.0010	0.0011	0.0011	0.0011	0.0013	0.0014	0.0016			
7	0.0000	0.0008	0.0009	0.0007	0.0010	0.0010	0.0011	0.0011	0.0011	0.0014	0.0014	0.0016			
8	0.0000	0.0007	0.0008	0.0008	0.0009	0.0009	0.0010	0.0012	0.0011	0.0014	0.0014	0.0013			
9	0.0000	0.0009	0.0010	0.0009	0.0011	0.0011	0.0012	0.0014	0.0013	0.0015	0.0016	0.0017			
10	0.0000	0.0008	0.0009	0.0009	0.0011	0.0012	0.0014	0.0014	0.0014	0.0015	0.0016	0.0019			
11	0.0000	0.0009	0.0009	0.0010	0.0011	0.0011	0.0012	0.0014	0.0014	0.0016	0.0016	0.0017			
12	0.0000	0.0009	0.0008	0.0008	0.0011	0.0010	0.0012	0.0013	0.0012	0.0015	0.0015	0.0017			
13	0.0000	0.0009	0.0009	0.0009	0.0011	0.0011	0.0012	0.0013	0.0013	0.0016	0.0016	0.0017			
14	0.0000	0.0009	0.0009	0.0010	0.0011	0.0013	0.0014	0.0015	0.0015	0.0017	0.0018	0.0019			
15	0.0000	0.0009	0.0009	0.0010	0.0012	0.0011	0.0012	0.0013	0.0013	0.0016	0.0016	0.0018			
16	0.0000	0.0009	0.0008	0.0009	0.0010	0.0012	0.0012	0.0013	0.0013	0.0015	0.0016	0.0018			
17	0.0000	0.0009	0.0009	0.0009	0.0011	0.0011	0.0012	0.0014	0.0014	0.0015	0.0017	0.0018			
18	0.0000	0.0007	0.0009	0.0010	0.0010	0.0012	0.0012	0.0011	0.0012	0.0016	0.0015	0.0017			
19	0.0000	0.0009	0.0010	0.0010	0.0011	0.0013	0.0013	0.0014	0.0014	0.0016	0.0017	0.0019			
20	0.0000	0.0010	0.0010	0.0011	0.0012	0.0013	0.0014	0.0015	0.0015	0.0016	0.0017	0.0019			
21	0.0000	0.0009	0.0010	0.0009	0.0011	0.0011	0.0012	0.0014	0.0013	0.0015	0.0015	0.0017			
22	0.0000	0.0010	0.0010	0.0010	0.0012	0.0012	0.0012	0.0013	0.0014	0.0015	0.0016	0.0017			
23	0.0000	0.0009	0.0009	0.0009	0.0010	0.0011	0.0012	0.0011	0.0012	0.0014	0.0015	0.0015			
24	0.0000	0.0008	0.0009	0.0010	0.0011	0.0011	0.0012	0.0013	0.0013	0.0015	0.0015	0.0016			
25	0.0000	0.0009	0.0010	0.0011	0.0012	0.0013	0.0013	0.0014	0.0015	0.0016	0.0017	0.0018			
n	25	25	25	25	25	25	25	25	25	25	25	25			
Avg.	0.0000	0.0009	0.0009	0.0009	0.0011	0.0011	0.0012	0.0013	0.0013	0.0015	0.0016	0.0017			
Med.	0.0000	0.0009	0.0009	0.0009	0.0011	0.0011	0.0012	0.0013	0.0013	0.0015	0.0016	0.0017			
σ	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			
Min.	0.0000	0.0007	0.0008	0.0007	0.0009	0.0009	0.0010	0.0010	0.0011	0.0013	0.0014	0.0013			
Max.	0.0000	0.0010	0.0010	0.0011	0.0012	0.0013	0.0014	0.0015	0.0015	0.0017	0.0018	0.0019			

Model List

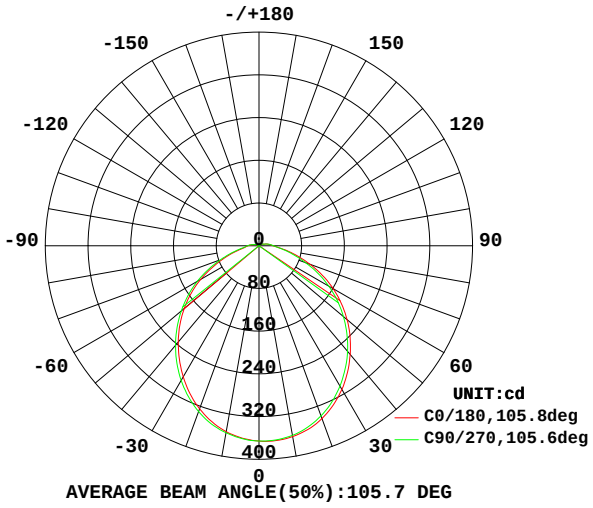
Model Number	Rated CCT	finish color	Shape
P8147-31-30K	3000K	Black color	
P8147-82-30K	3000K	Gray color	
P8147-20-30K	3000K	Bronze color	
P8147-28-30K	3000K	White color	
P8147-09-30K	3000K	Nickel brushed	
LBS5A6L30K9 WHDG	3000K	White color	
P8147-31-35K	3500K	Black color	
P8147-82-35K	3500K	Gray color	
P8147-20-35K	3500K	Bronze color	
P8147-28-35K	3500K	White color	
P8147-09-35K	3500K	Nickel brushed	
LBS5A6L35K9 WHDG	3500K	White color	
P8147-31-40K	4000K	Black color	
P8147-82-40K	4000K	Gray color	
P8147-20-40K	4000K	Gray color	
P8147-28-40K	4000K	Bronze color	
P8147-09-40K	4000K	Nickel brushed	
LBS5A6L40K9 WHDG	4000K	White color	
P8147-31-50K	5000K	Black color	
P8147-82-50K	5000K	Gray color	
P8147-20-50K	5000K	Bronze color	
P8147-28-50K	5000K	White color	
P8147-09-50K	5000K	Nickel brushed	
LBS5A6L50K9 WHDG	5000K	White color	

LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:120.1V I:0.1377A P:16.35W PF:0.9885 Lamp Flux:1035.88x1 lm		
NAME:	TYPE:P8147-31-30K	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Progress Lighting	SUR.:	PROTECTION ANGLE:

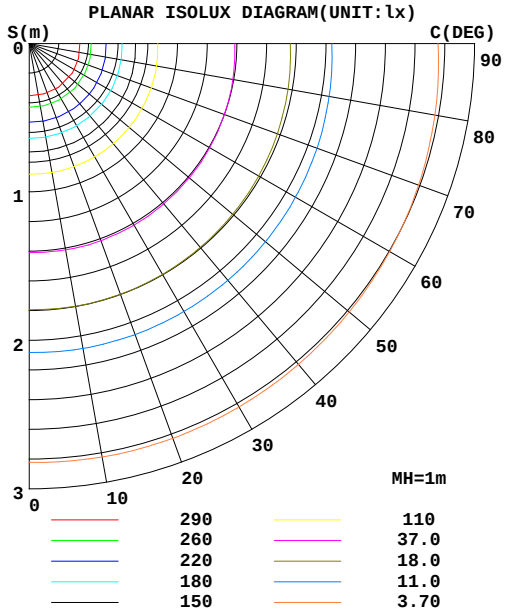
DATA OF LAMP		PHOTOMETRIC DATA Eff: 63.38 lm/W			
MODEL	P8147-31-30K	Imax(cd)	366.6	S/MH(C0/180)	1.16
NOMINAL POWER(W)	17.5	LOR(%)	100.0	S/MH(C90/270)	1.19
RATED VOLTAGE(V)	120.0	TOTAL FLUX(lm)	1035.9	η UP,DN(C0-180)	2.3,49.4
NOMINAL FLUX(lm)	1035.88	CIE CLASS	DIRECT	η UP,DN(C180-360)	2.1,46.2
LAMPS INSIDE	1	η up(%)	4.4	CIBSE SHR NOM	1.25
TEST VOLTAGE(V)	120.0	η down(%)	95.6	CIBSE SHR MAX	1.35

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



AVERAGE BEAM ANGLE(50%):105.7 DEG

PLANAR ISOLUX DIAGRAM(UNIT:lx)



C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-12-14

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.528m [K=1.0000]
Remarks:

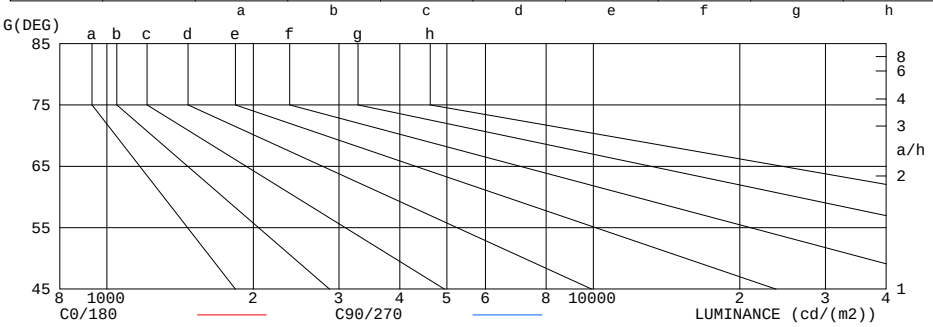
ZONAL FLUX DIAGRAM
AND LUMINANCE LIMITATION CURVES

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum
10	362.9	363.3	360.6	356.2	353.7	353.1	355.6	360.0	0- 10	34.55	34.55	3.34
20	344.6	345.0	339.1	330.6	325.1	325.1	330.6	338.8	10- 20	98.24	132.8	12.8
30	310.6	310.9	303.2	291.5	283.5	283.4	291.5	302.9	20- 30	146.2	279.0	26.9
40	265.9	266.6	258.2	244.1	235.2	234.8	243.3	257.3	30- 40	171.8	450.8	43.5
50	215.3	216.1	206.3	191.5	182.8	182.0	190.0	205.1	40- 50	173.7	624.4	60.3
60	160.3	160.0	150.5	134.6	126.3	125.6	133.7	149.9	50- 60	152.8	777.2	75
70	101.8	101.4	92.95	78.02	70.64	70.59	76.61	91.86	60- 70	112.4	889.7	85.9
80	52.94	53.01	49.48	37.47	32.97	34.94	36.88	47.77	70- 80	66.12	955.8	92.3
90	26.35	26.26	27.78	21.82	20.73	22.32	22.02	27.07	80- 90	34.50	990.3	95.6
100	17.64	17.86	18.08	13.74	12.01	12.66	13.08	17.07	90-100	21.59	1012	97.7
110	8.832	9.007	9.039	7.859	6.993	7.408	7.592	8.476	100-110	11.81	1024	98.8
120	6.041	6.079	6.332	4.601	3.403	3.597	4.407	5.973	110-120	6.767	1030	99.5
130	2.478	2.585	2.620	2.101	1.711	1.771	1.981	2.410	120-130	3.057	1034	99.8
140	1.377	1.441	1.475	1.232	1.011	1.046	1.184	1.360	130-140	1.308	1035	99.9
150	0.8699	0.8843	0.8527	0.7408	0.6327	0.6260	0.7127	0.8038	140-150	0.6322	1035	100
160	0.5567	0.5540	0.5226	0.4773	0.4167	0.4194	0.4490	0.4713	150-160	0.2865	1036	100
170	0.4044	0.4342	0.3702	0.3424	0.3089	0.3103	0.3691	0.3734	160-170	0.1197	1036	100
180	0	0	0	0.0145	0.0157	0.0176	0.0179	0.0171	170-180	0.0260	1036	100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

LUMINANCE LIMITATION CURVES

GLARE	CLASS	ILLUMINANCE (lx)							
1.15	A	2000	1000	500	<=300				
1.50	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.20	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h



LUMINANCE cd/(m2)		
G(DEG)	C0/180	C90/270
85	205525	200821
80	152445	142477
75	144705	132623
70	148816	135888
65	155267	143841
60	160290	150532
55	164064	156097
50	167499	160499
45	170703	164588

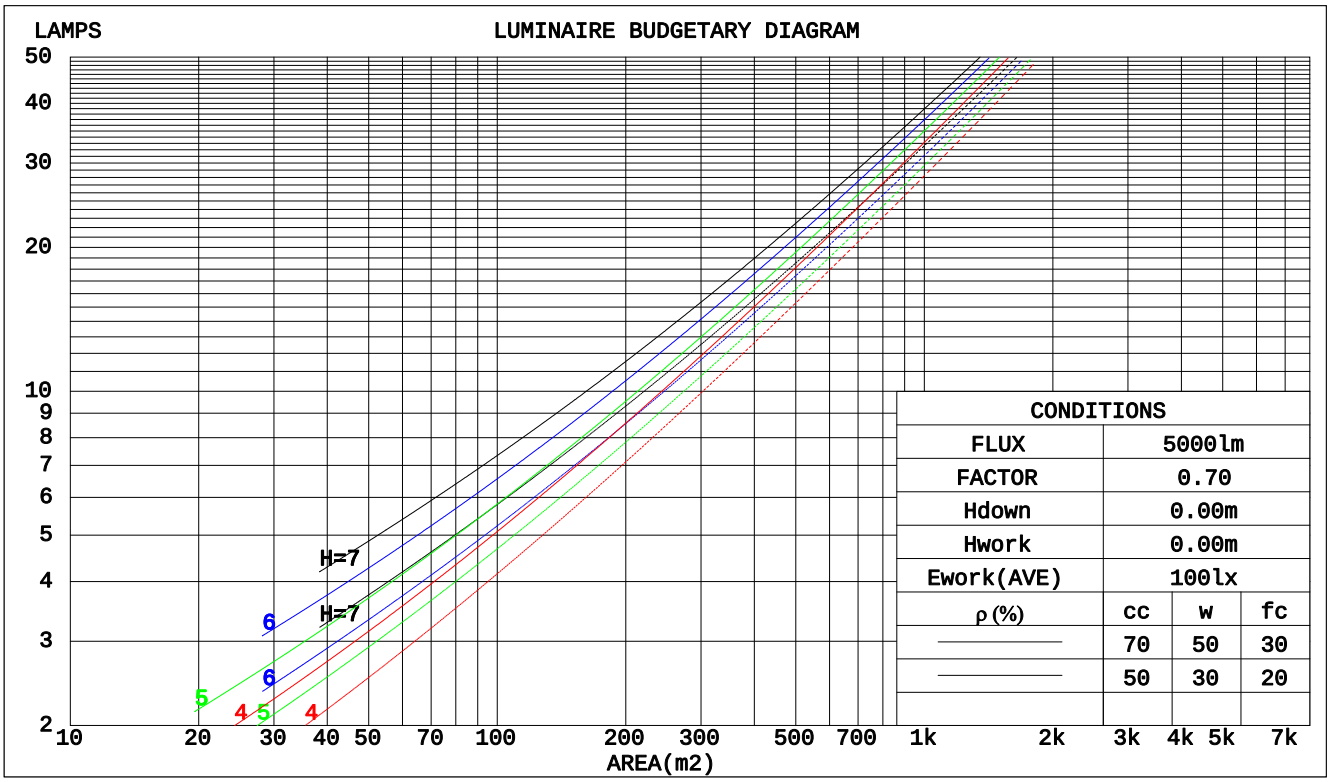
C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-12-14

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.528m [K=1.0000]
Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:120.1V I:0.1377A P:16.35W PF:0.9885 Lamp Flux:1035.88x1 lm		
NAME:	TYPE:P8147-31-30K	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Progress Lighting	SUR.:	PROTECTION ANGLE:

ρcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio			Coefficients of Utilization(CU)												
0.0	1.18	1.18	1.18	1.15	1.15	1.15	1.09	1.09	1.09	1.03	1.03	1.03	.98	.98	.98	.96
1.0	1.02	.98	.94	.00	.96	.92	.95	.91	.88	.90	.87	.85	.86	.84	.82	.79
2.0	.89	.82	.77	.87	.81	.75	.83	.77	.73	.79	.74	.71	.75	.72	.68	.66
3.0	.79	.70	.64	.77	.69	.63	.73	.67	.61	.70	.64	.60	.67	.62	.58	.56
4.0	.70	.61	.54	.68	.60	.54	.65	.58	.52	.62	.56	.51	.59	.54	.50	.48
5.0	.62	.53	.47	.61	.53	.46	.58	.51	.45	.56	.50	.45	.54	.48	.44	.41
6.0	.56	.47	.41	.55	.47	.41	.53	.45	.40	.51	.44	.39	.49	.43	.38	.36
7.0	.51	.42	.36	.50	.42	.36	.48	.41	.35	.46	.40	.35	.44	.39	.34	.32
8.0	.47	.38	.32	.46	.38	.32	.44	.37	.32	.42	.36	.31	.41	.35	.31	.29
9.0	.43	.35	.29	.42	.34	.29	.41	.33	.29	.39	.33	.28	.38	.32	.28	.26
10.0	.39	.32	.26	.39	.31	.26	.37	.31	.26	.36	.30	.26	.35	.29	.25	.24



C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-12-14

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.528m [K=1.0000]
Remarks:

WEC AND CCEC

Test:U:120.1V I:0.1377A P:16.35W PF:0.9885 Lamp Flux:1035.88x1 lm		
NAME:	TYPE:P8147-31-30K	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Progress Lighting	SUR.:	PROTECTION ANGLE:

ρcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coeffcients(WEC)									
0.0																
1.0	.318	.181	.057	.310	.177	.056	.294	.169	.054	.279	.161	.052	.266	.154	.050	
2.0	.292	.160	.049	.285	.157	.048	.271	.151	.047	.258	.145	.045	.246	.139	.044	
3.0	.268	.143	.043	.262	.140	.042	.249	.135	.041	.238	.130	.040	.227	.126	.039	
4.0	.247	.128	.038	.241	.126	.037	.230	.122	.036	.219	.118	.036	.210	.114	.035	
5.0	.228	.116	.034	.222	.114	.033	.212	.111	.033	.203	.107	.032	.195	.104	.031	
6.0	.211	.106	.030	.206	.104	.030	.197	.101	.029	.189	.098	.029	.181	.095	.028	
7.0	.196	.097	.028	.192	.096	.027	.184	.093	.027	.176	.090	.026	.169	.088	.026	
8.0	.183	.090	.025	.180	.088	.025	.172	.086	.025	.165	.084	.024	.159	.082	.024	
9.0	.172	.083	.023	.168	.082	.023	.162	.080	.023	.156	.078	.022	.150	.076	.022	
10.0	.162	.078	.022	.158	.077	.021	.152	.075	.021	.147	.073	.021	.141	.071	.020	

ρcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients(CCEC)									
0.0	.224	.224	.224	.191	.191	.191	.131	.131	.131	.075	.075	.075	.024	.024	.024	
1.0	.215	.190	.168	.184	.163	.144	.126	.112	.100	.072	.065	.058	.023	.021	.019	
2.0	.206	.166	.132	.177	.143	.114	.121	.099	.080	.070	.057	.047	.022	.019	.015	
3.0	.198	.149	.109	.170	.128	.094	.117	.089	.066	.067	.052	.039	.022	.017	.013	
4.0	.191	.135	.093	.164	.117	.081	.112	.081	.057	.065	.048	.034	.021	.016	.011	
5.0	.183	.125	.082	.157	.108	.071	.108	.076	.050	.063	.044	.030	.020	.014	.010	
6.0	.176	.117	.074	.151	.101	.065	.104	.071	.046	.061	.042	.027	.020	.014	.009	
7.0	.169	.110	.068	.146	.095	.059	.101	.067	.042	.058	.039	.025	.019	.013	.008	
8.0	.163	.104	.064	.140	.090	.056	.097	.063	.039	.056	.037	.023	.018	.012	.008	
9.0	.157	.099	.060	.135	.086	.053	.094	.060	.037	.054	.036	.022	.018	.012	.007	
10.0	.151	.095	.057	.130	.082	.050	.090	.058	.036	.053	.034	.021	.017	.011	.007	

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-12-14

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.528m [K=1.0000]
Remarks:

UGR(Unified Glare Rating) Table

Test:U:120.1V I:0.1377A P:16.35W PF:0.9885 Lamp Flux:1035.88x1 lm		
NAME:	TYPE:P8147-31-30K	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Progress Lighting	SUR.:	PROTECTION ANGLE:

ceiling/cavity	0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
walls	0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room dimensions	Viewed crosswise					Viewed endwise				
x = 2H y = 2H	30.6	32.0	30.9	32.3	32.6	30.4	31.8	30.7	32.1	32.4
3H	32.1	33.5	32.5	33.8	34.1	31.8	33.2	32.2	33.5	33.8
4H	32.8	34.1	33.2	34.4	34.7	32.4	33.7	32.8	34.0	34.4
6H	33.4	34.6	33.8	34.9	35.3	33.0	34.2	33.4	34.6	34.9
8H	33.7	34.8	34.1	35.2	35.5	33.3	34.5	33.7	34.8	35.2
12H	33.9	35.0	34.4	35.4	35.8	33.6	34.7	34.0	35.1	35.5
4H 2H	31.2	32.4	31.5	32.8	33.1	31.0	32.3	31.4	32.6	32.9
3H	32.9	34.0	33.3	34.4	34.8	32.7	33.8	33.1	34.1	34.5
4H	33.7	34.7	34.2	35.1	35.6	33.4	34.4	33.9	34.8	35.3
6H	34.5	35.4	34.9	35.8	36.3	34.2	35.1	34.6	35.5	36.0
8H	34.8	35.7	35.3	36.1	36.6	34.5	35.4	35.0	35.8	36.3
12H	35.2	36.0	35.7	36.4	36.9	34.9	35.7	35.4	36.2	36.7
8H 4H	34.0	34.8	34.5	35.3	35.8	33.8	34.6	34.2	35.1	35.5
6H	35.0	35.7	35.5	36.1	36.7	34.7	35.4	35.2	35.9	36.4
8H	35.5	36.1	36.0	36.6	37.1	35.2	35.8	35.7	36.3	36.9
12H	36.0	36.5	36.6	37.1	37.6	35.8	36.3	36.3	36.8	37.4
12H 4H	34.0	34.8	34.5	35.3	35.8	33.8	34.6	34.3	35.0	35.5
6H	35.1	35.7	35.6	36.2	36.7	34.8	35.5	35.4	36.0	36.5
8H	35.6	36.2	36.2	36.7	37.3	35.4	36.0	36.0	36.5	37.0

Variations with the observer position at spacings:		
S = 1.0H	+ 0.1 / - 0.2	+ 0.2 / - 0.2
1.5H	+ 0.2 / - 0.3	+ 0.2 / - 0.3
2.0H	+ 0.1 / - 0.3	+ 0.1 / - 0.4

CIE Pub.117 Corrected 1036 lm Total Lamp Luminous Flux.(8log(F/F0) = 0.1)

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-12-14

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.528m [K=1.0000]
Remarks:

UTILIZATION FACTORS TABLE

Test:U:120.1V I:0.1377A P:16.35W PF:0.9885 Lamp Flux:1035.88x1 lm		
NAME:	TYPE:P8147-31-30K	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Progress Lighting	SUR.:	PROTECTION ANGLE:

REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) k(RI) x RCR = 5									
k = 0.60	57	45	38	56	45	38	55	44	38	31
0.80	66	55	47	65	54	47	63	53	47	40
1.00	75	63	56	73	63	56	71	64	55	48
1.25	82	71	64	80	70	63	77	68	62	55
1.50	86	76	69	85	75	69	81	73	67	59
2.00	93	84	78	91	83	77	87	80	75	66
2.50	97	89	83	95	87	82	90	84	79	70
3.00	100	93	87	98	91	86	93	88	83	74
4.00	104	98	93	102	96	92	97	92	89	79
5.00	107	102	97	104	99	95	99	95	92	81
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004				Suspended					SHRNOM = 1.25	

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-12-14

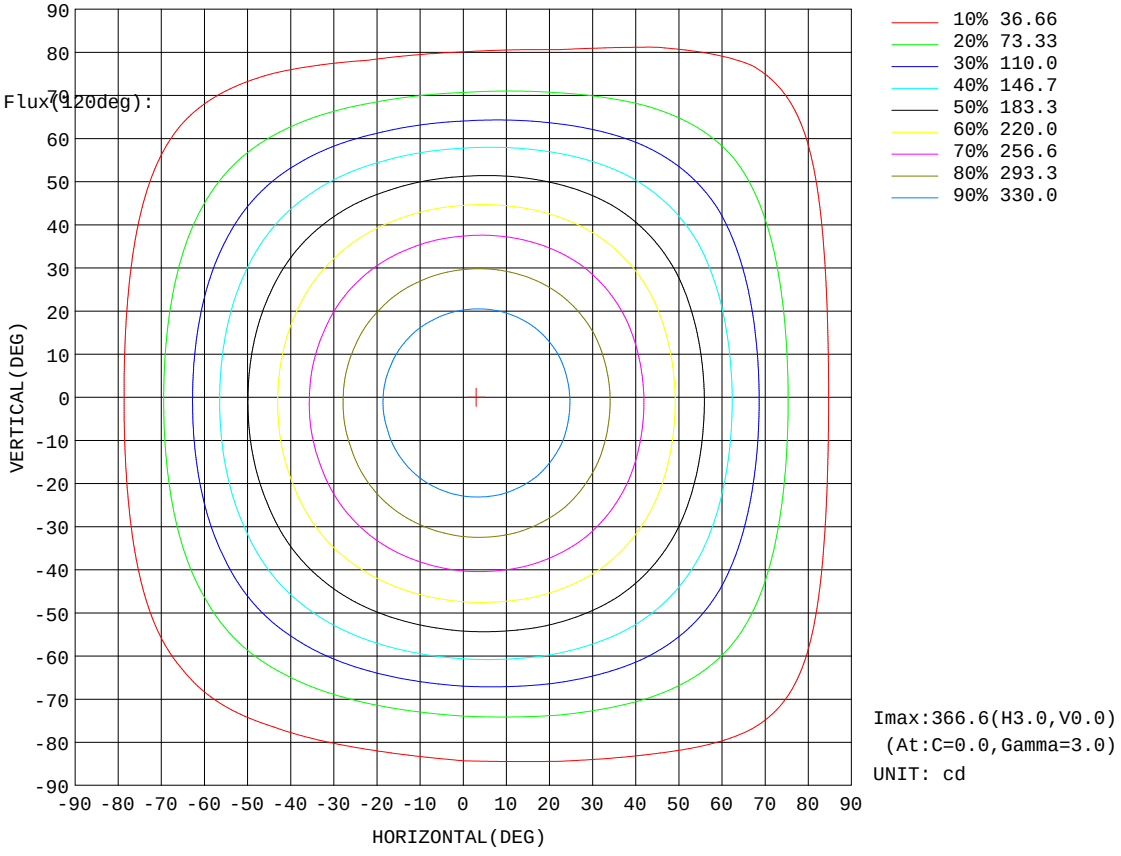
γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.528m [K=1.0000]
Remarks:

ISOCANDELA DIAGRAM

Test:U:120.1V I:0.1377A P:16.35W PF:0.9885 Lamp Flux:1035.88x1 lm		
NAME:	TYPE:P8147-31-30K	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Progress Lighting	SUR.:	PROTECTION ANGLE:

Conical surface Flux(90deg):
538.83 lm
%lum = 52.0%
%lamp = 52.0%

Conical surface Flux(120deg):
777.24 lm
%lum = 75.0%
%lamp = 75.0%



Imax:366.6(H3.0,V0.0)
(At:C=0.0,Gamma=3.0)
UNIT: cd

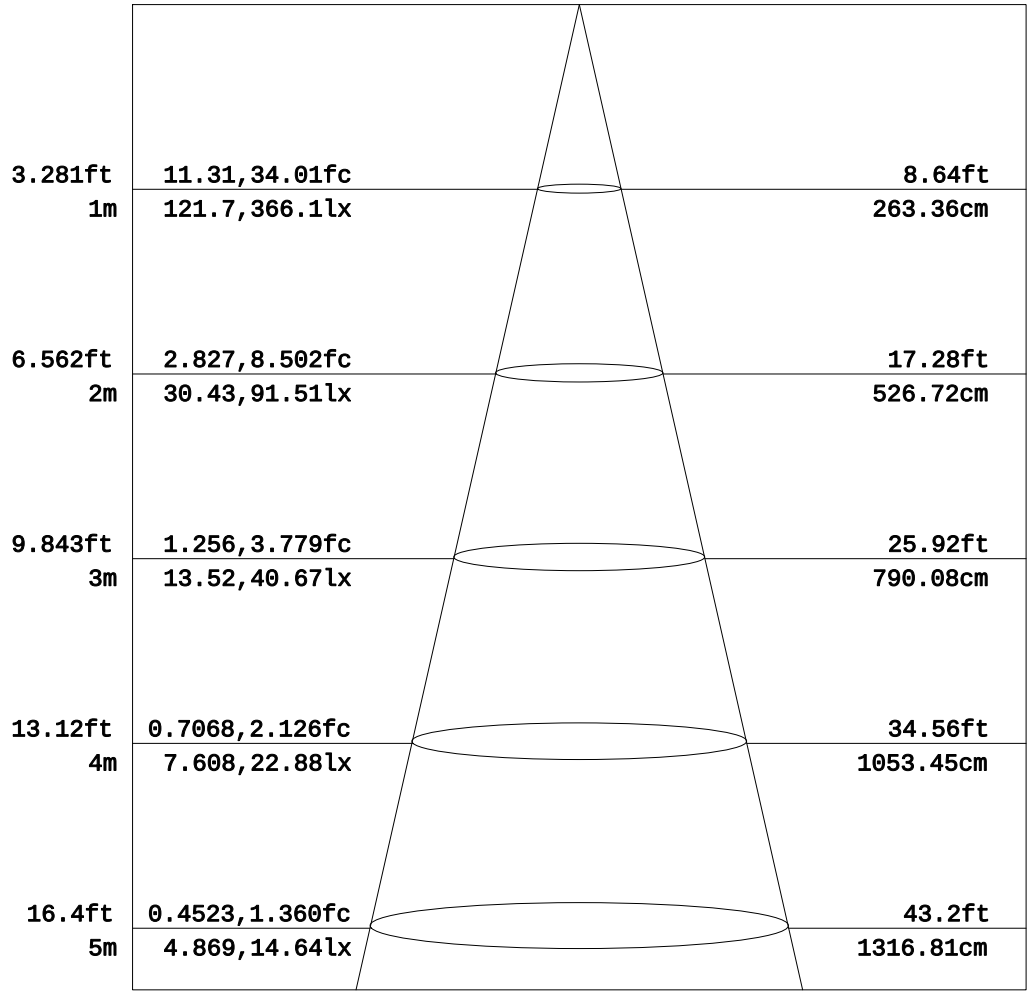
C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-12-14

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.528m [K=1.0000]
Remarks:

AAI Figure

Test:U:120.1V I:0.1377A P:16.35W PF:0.9885 Lamp Flux:1035.88x1 lm		
NAME:	TYPE:P8147-31-30K	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Progress Lighting	SUR.:	PROTECTION ANGLE:

Flux out:673.4 lm



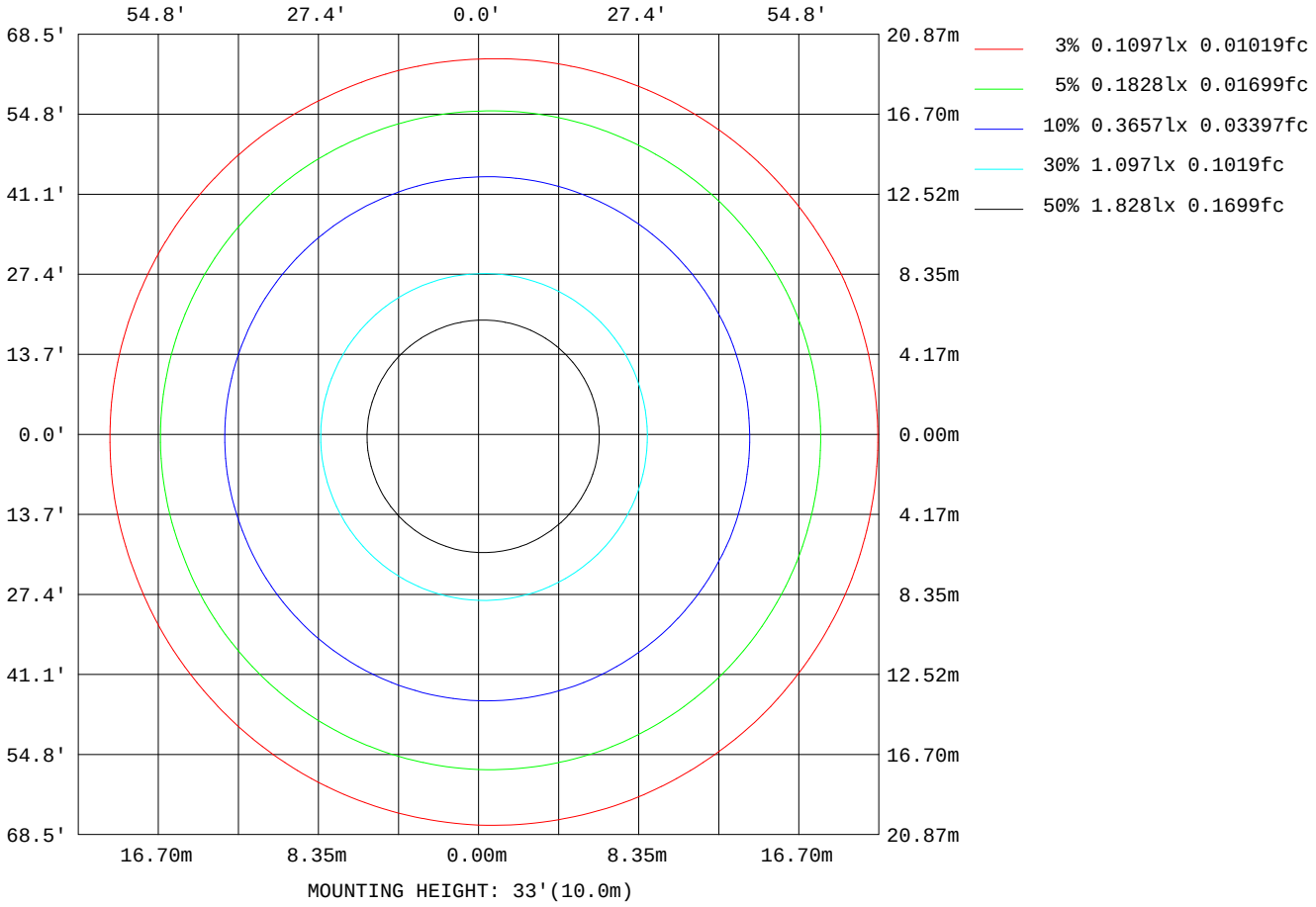
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-12-14

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.528m [K=1.0000]
Remarks:

ISOLUX DIAGRAM

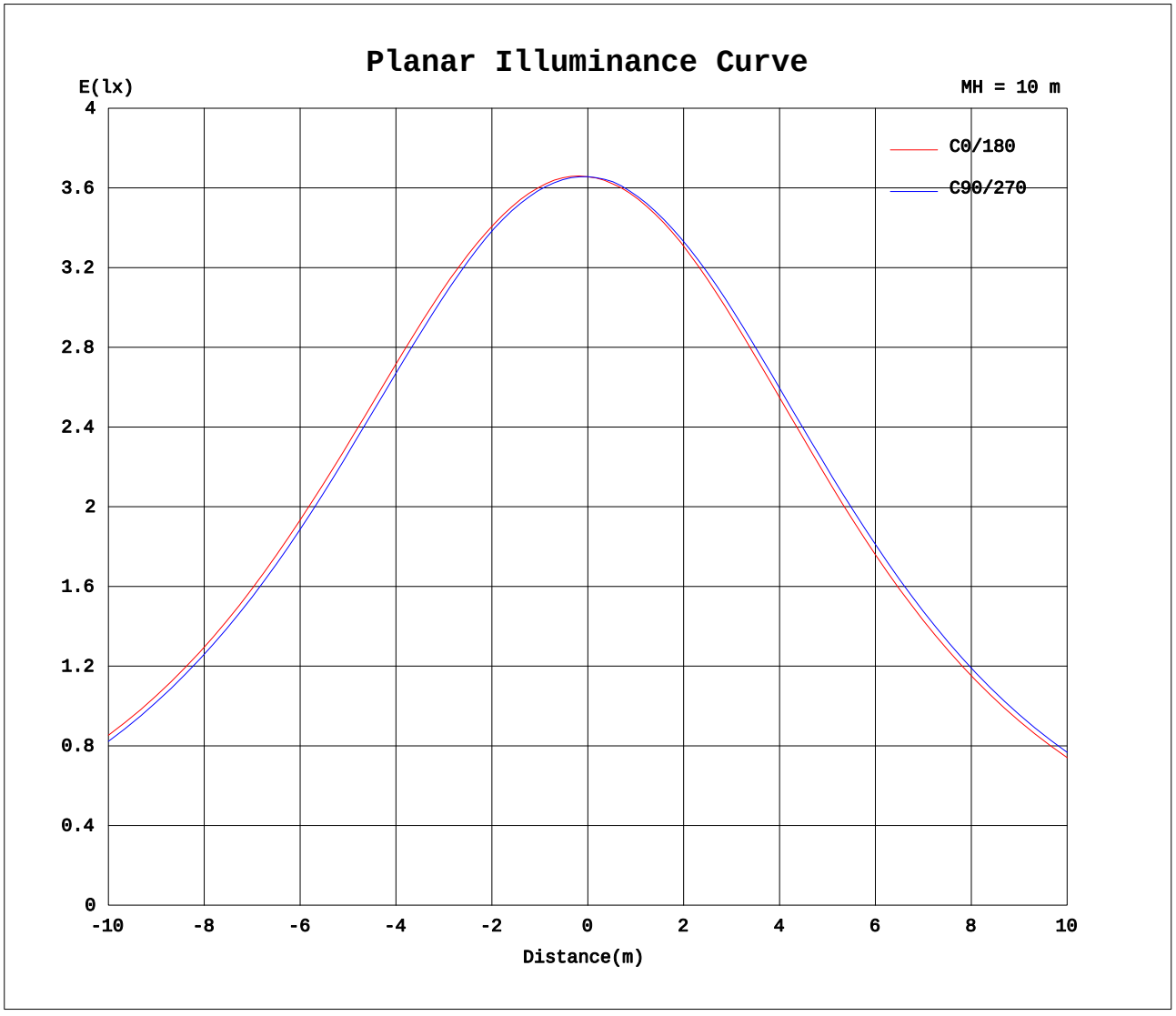
Test:U:120.1V I:0.1377A P:16.35W PF:0.9885 Lamp Flux:1035.88x1 lm		
NAME:	TYPE:P8147-31-30K	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Progress Lighting	SUR.:	PROTECTION ANGLE:



C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-12-14

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.528m [K=1.0000]
Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-12-14

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.528m [K=1.0000]
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

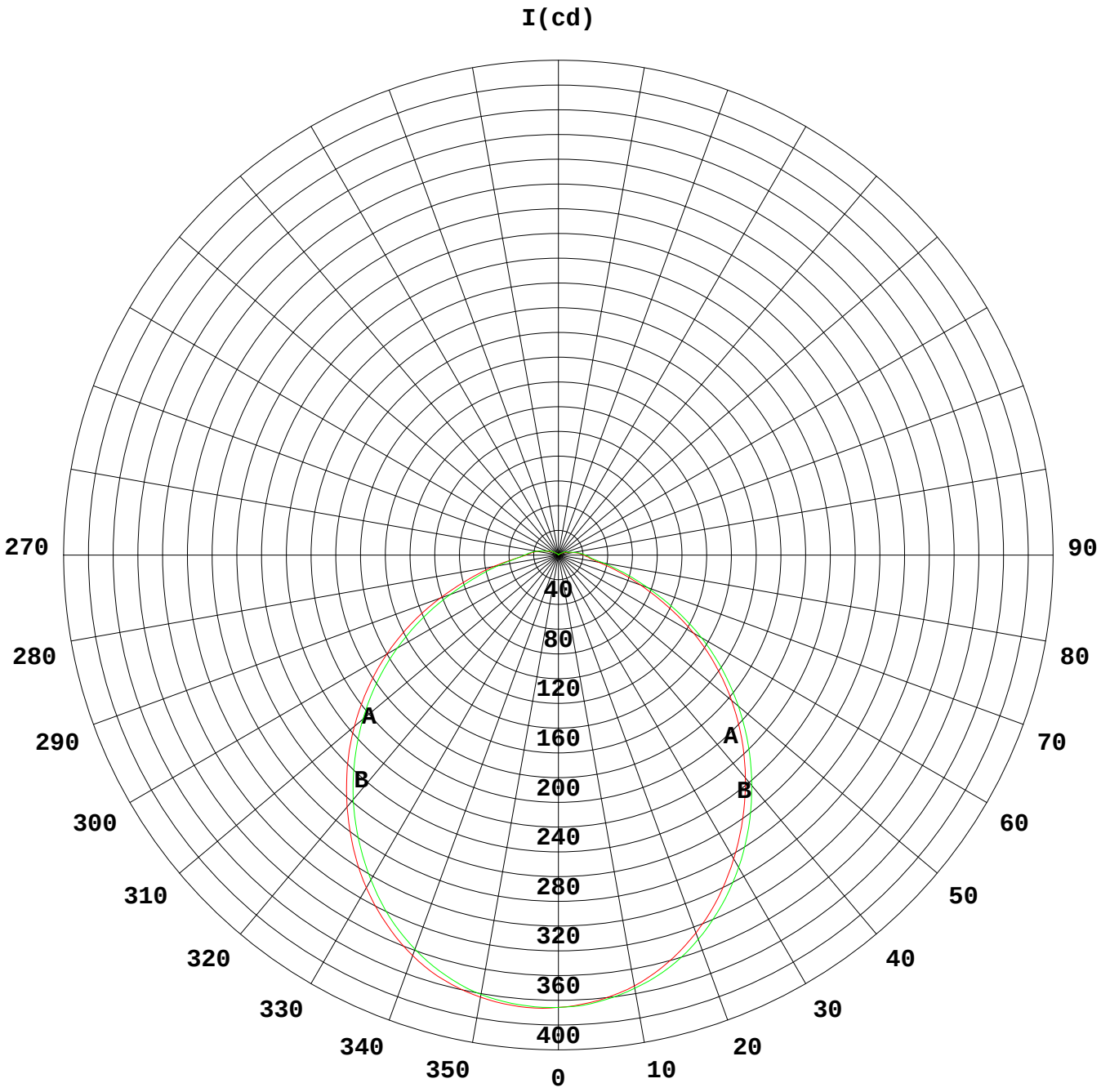
Test:U:120.1V I:0.1377A P:16.35W PF:0.9885 Lamp Flux:1035.88x1 lm		
NAME:	TYPE:P8147-31-30K	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Progress Lighting	SUR.:	PROTECTION ANGLE:

Table--1 UNIT: cd

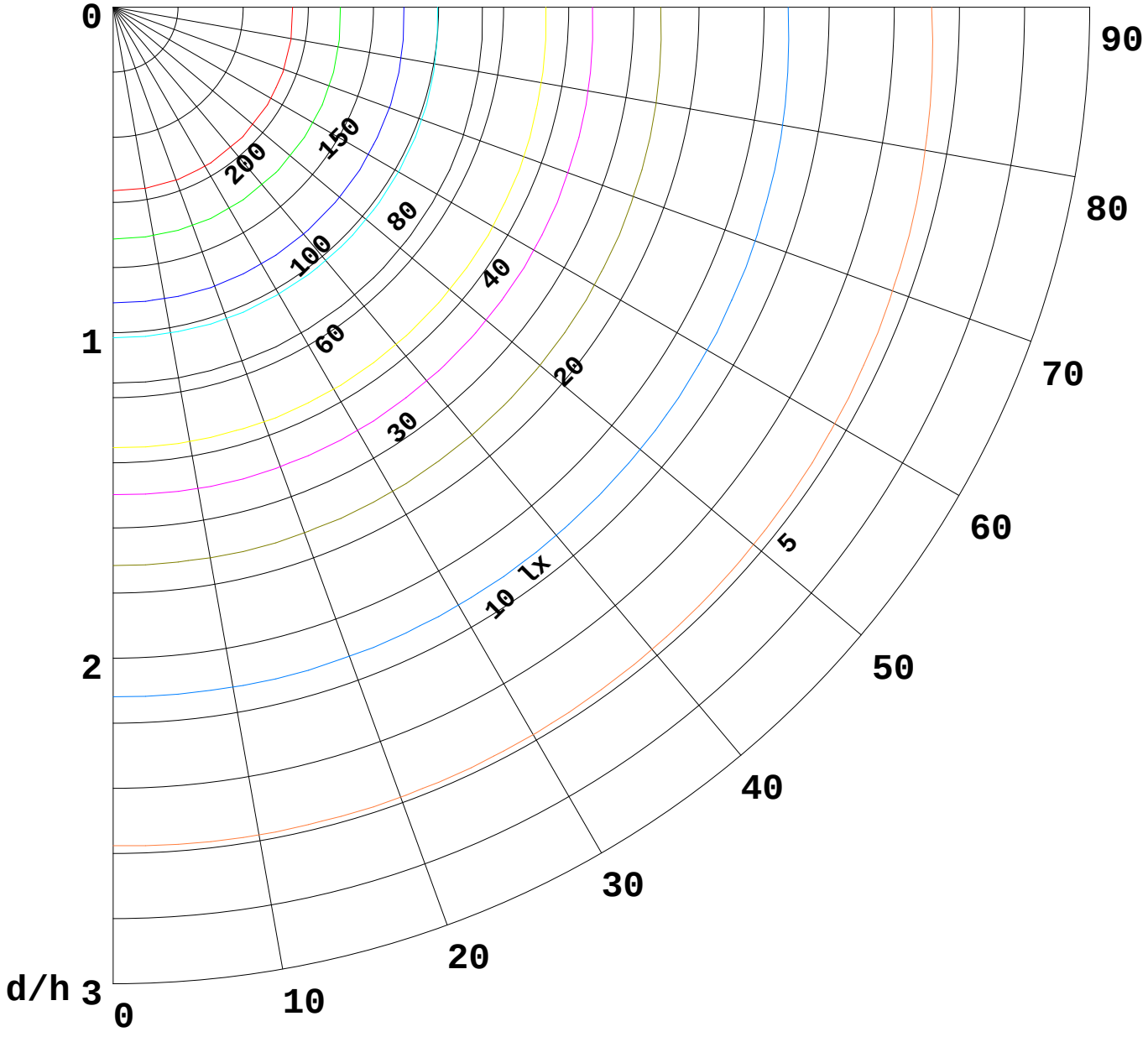
γ (DEG) \ C(DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338			
0	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366	366			
5	366	366	366	366	365	364	363	362	362	361	361	362	363	364	365	366			
10	363	363	363	362	361	358	356	355	354	353	353	354	356	358	360	362			
15	356	357	356	355	352	348	346	342	341	341	341	343	345	348	351	354			
20	345	345	345	343	339	335	331	327	325	324	325	327	331	335	339	343			
25	329	330	330	327	323	318	312	308	306	304	305	309	312	317	323	327			
30	311	312	311	308	303	297	292	286	284	282	283	287	291	297	303	308			
35	289	290	290	287	282	275	269	263	260	258	260	263	268	275	281	286			
40	266	268	267	263	258	251	244	238	235	234	235	238	243	250	257	263			
45	241	243	242	239	233	226	219	212	210	208	209	212	217	224	232	238			
50	215	217	216	212	206	199	191	185	183	181	182	185	190	197	205	212			
55	188	190	189	185	179	171	163	157	155	153	154	157	162	170	178	185			
60	160	161	160	157	151	143	135	128	126	125	126	128	134	141	150	157			
65	131	132	131	128	122	114	105	99.1	96.8	95.5	96.2	98.8	104	112	121	128			
70	102	103	101	98.2	93.0	85.4	78.0	72.4	70.6	70.0	70.6	72.3	76.6	83.5	91.9	99.2			
75	74.9	75.6	74.9	73.0	68.7	62.3	55.4	50.5	49.1	49.6	50.2	50.4	54.2	59.8	67.3	73.0			
80	52.9	53.6	53.0	52.5	49.5	43.6	37.5	34.0	33.0	34.6	34.9	33.9	36.9	40.6	47.8	52.1			
85	35.8	36.4	36.0	36.3	35.0	30.4	26.4	24.7	25.0	27.1	27.0	25.5	26.2	28.4	33.6	36.4			
90	26.3	26.2	26.3	27.0	27.8	24.1	21.8	20.9	20.7	22.3	22.3	21.3	22.0	22.8	27.1	28.1			
95	21.9	21.9	22.1	22.5	22.9	20.2	18.1	16.9	16.8	17.8	17.8	17.1	17.7	19.0	21.9	23.1			
100	17.6	17.7	17.9	18.2	18.1	15.9	13.7	12.3	12.0	12.5	12.7	12.4	13.1	14.6	17.1	18.3			
105	13.0	13.0	13.2	13.5	13.0	11.4	9.57	8.37	8.09	8.37	8.48	8.54	8.98	10.2	12.0	13.0			
110	8.83	8.87	9.01	9.11	9.04	8.42	7.86	7.25	6.99	7.38	7.41	7.33	7.59	7.91	8.48	8.90			
115	7.59	7.53	7.67	7.93	8.25	7.80	6.75	5.79	5.40	5.39	5.74	5.90	6.47	7.14	7.88	7.98			
120	6.04	6.03	6.08	6.36	6.33	5.67	4.60	3.68	3.40	3.46	3.60	3.91	4.41	5.16	5.97	6.31			
125	3.82	3.78	3.94	4.10	4.03	3.50	2.89	2.47	2.35	2.36	2.42	2.53	2.75	3.22	3.66	3.88			
130	2.48	2.51	2.58	2.66	2.62	2.39	2.10	1.83	1.71	1.73	1.77	1.86	1.98	2.19	2.41	2.53			
135	1.79	1.81	1.89	1.94	1.93	1.79	1.58	1.43	1.32	1.32	1.36	1.41	1.52	1.63	1.77	1.82			
140	1.38	1.41	1.44	1.48	1.47	1.38	1.23	1.13	1.01	1.03	1.05	1.08	1.18	1.26	1.36	1.40			
145	1.10	1.11	1.13	1.14	1.12	1.05	0.96	0.89	0.80	0.80	0.80	0.83	0.92	0.97	1.04	1.09			
150	0.87	0.90	0.88	0.88	0.85	0.80	0.74	0.69	0.63	0.62	0.63	0.65	0.71	0.75	0.80	0.85			
155	0.69	0.70	0.70	0.68	0.66	0.62	0.59	0.56	0.51	0.50	0.50	0.52	0.55	0.58	0.62	0.66			
160	0.56	0.58	0.55	0.55	0.52	0.50	0.48	0.48	0.42	0.42	0.42	0.43	0.45	0.47	0.47	0.52			
165	0.46	0.49	0.47	0.41	0.43	0.42	0.36	0.43	0.35	0.35	0.37	0.38	0.38	0.41	0.42	0.43			
170	0.40	0.41	0.43	0.35	0.37	0.35	0.34	0.34	0.31	0.31	0.31	0.33	0.37	0.38	0.37	0.37			
175	0.33	0.32	0.33	0.25	0.30	0.23	0.21	0.12	0.05	0.05	0.06	0.13	0.20	0.28	0.30	0.31			
180	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-12-14

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.528m [K=1.0000]
Remarks:


I(cd)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
40
80
120
160
200
240
280
320
360
400
A
B
A
B

1000 lm K = 1



F = 5000 lm
K = 0.7
Hcc = 0.0 m
Hfc = 0.0 m
Eave = 100 lx

	Pcc	Pw	Pfc
———	70	50	30
———	50	30	20