

PHOTOMETRIC TESTING & EVALUATION TO IES LM-79-19

Sample Tested

Pru1-STD-LED35-LO-04-NW-CW

Prepared for:

Prudential Lighting

1774 East 21st
Los Angeles, CA 90058

Technical Report Number

80164103-3 R1

April 9, 2023

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Program Description

Photometric and electrical testing of a Pru1-STD-LED35-LO-04-NW-CW Type C LED Luminaire to IES LM-79-19.

Executive Summary

Sample Tested = Pru1-STD-LED35-LO-04-NW-CW

Sample Number = 44002855

Driver = eldoLED OPTOTRONIC OTi30/120-277/1A0 DIM-1 L G2

LED Module = Lumileds 2835

Luminous Efficacy (Lumens/Watt)	Luminous Flux (Lumens)	Input Power (Watts)	Power Factor	ATHD (%)
115.28	1333.79	11.57	0.9520	13.21

Spacing Criterion (0-180°)	Spacing Criterion (90-270°)	Stabilization Time (Light & Power)
N.A.	N.A.	30

* The above results are recorded / derived from measurements made using an Integrating Sphere

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Test Sample Pictures

The following sample was submitted for evaluation:



Prudential Lighting : Pru1-STD-LED35-LO-04-NW-CW

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Test Result

The following results were measured after stabilization of the sample in the Integrating Sphere (unless otherwise stated). Stability shall be achieved when the variation (Maximum to minimum) of at least three readings of the light output and electrical power consumption, taken at a maximum of 10 minute intervals over a period of 20 minutes and divided by the last of these measurements chronologically, is less than 0.5%.

Key Photometric Results	Sample Reference
	Pru1-STD-LED35-LO-04-NW-CW
	Goniophotometer
Luminous Efficacy (Lumens/Watt)	115.00
Total Luminous Flux (Lumens)	1333.79
Stabilization Time (Light and Power)	30 minutes
Total Run Time (Goniophotometer)	60 minutes
Spacing Criteria (0°-180°)/(90°-270°)	N.A. / N.A.

Electrical Input Results:	Sample Reference
	Pru1-STD-LED35-LO-04-NW-CW
Input Power (Watts)	11.57
Input Voltage (Volts AC)	120.00
Input Current (Amps)	0.10
Input Frequency (Hertz)	60.0
Power Factor	0.9520
Total Harmonic Distortion (THD A)%	13.21

Additional Information	Sample Reference
	Pru1-STD-LED35-LO-04-NW-CW
Ambient Temperature	25
Date Tested	3/29/2023

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Photometric Test Results

Characteristics		Luminance Data (cd/sq.m)			
Total Lumens:	1333.79	Angle In Degrees	Average		
Input Wattage (W):	11.57		0°	45°	90°
Efficacy(lm/W):	115.28	45	0	69	140
Spacing Criterion (0-180°):	N.A.	55	0	156	331
Spacing Criterion (90-270°):	N.A.	65	0	481	798
Spacing Criterion (Diagonal):	N.A.	75	166	1565	1906
Luminous Length (0-180°):	4.00 ft	85	554	5245	5122
Luminous Width (90-270°):	0.10 ft				
Luminous Height:	0.03 ft				

Zonal Lumen Summary												
Zone	Lumens	%Fixt		Zone	Lumens	%Fixt		Zone	Lumens		Zone	Lumens
0-20°	0.00	0.0		60-80°	35.95	2.7		0-10°	0.00		90-100°	103.28
0-30°	0.25	0.0		70-80°	24.93	1.9		10-20°	0.00		100-110°	169.05
0-40°	1.04	0.1		80-90°	53.10	4.0		20-30°	0.25		110-120°	215.46
0-60°	7.40	0.6		90-110°	272.33	20.4		30-40°	0.79		120-130°	216.91
0-80°	43.36	3.3		90-120°	487.79	36.6		40-50°	1.82		130-140°	186.89
0-90°	96.45	7.2		90-130°	704.70	52.8		50-60°	4.55		140-150°	148.09
10-90°	96.45	7.2		90-150°	1039.67	77.9		60-70°	11.02		150-160°	108.30
20-40°	1.04	0.1		90-180°	1237.34	92.8		70-80°	24.93		160-170°	66.67
20-50°	2.85	0.2		110-180°	965.01	72.4		80-90°	53.10		170-180°	22.69
40-70°	17.39	1.3		0-180°	1333.79	100.0		0-90°	96.45		90-180°	1237.34

Coefficients of Utilization																		
Effective Floor Cavity Reflectance 0.20																		
RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	97	97	97	97	84	84	84	84	60	60	60	37	37	37	17	17	17	7
1	86	82	77	74	74	70	67	64	49	47	45	30	29	27	12	11	11	3
2	78	71	64	59	67	61	56	51	43	39	36	26	24	22	10	9	8	1
3	71	62	54	49	61	53	47	42	37	33	30	22	20	18	9	7	7	1
4	65	54	47	41	55	47	40	35	33	28	25	20	17	15	8	6	5	0
5	59	48	40	34	51	41	35	30	29	25	21	17	15	13	7	6	5	0
6	54	43	35	29	46	37	30	26	26	22	18	16	13	11	6	5	4	0
7	50	38	31	25	43	33	27	22	23	19	16	14	11	10	5	4	3	0
8	46	34	27	22	40	30	24	19	21	17	14	13	10	8	5	4	3	0
9	43	31	24	19	37	27	21	17	19	15	12	12	9	7	5	3	3	0
10	40	28	21	17	34	25	19	15	17	13	11	11	8	6	4	3	2	0

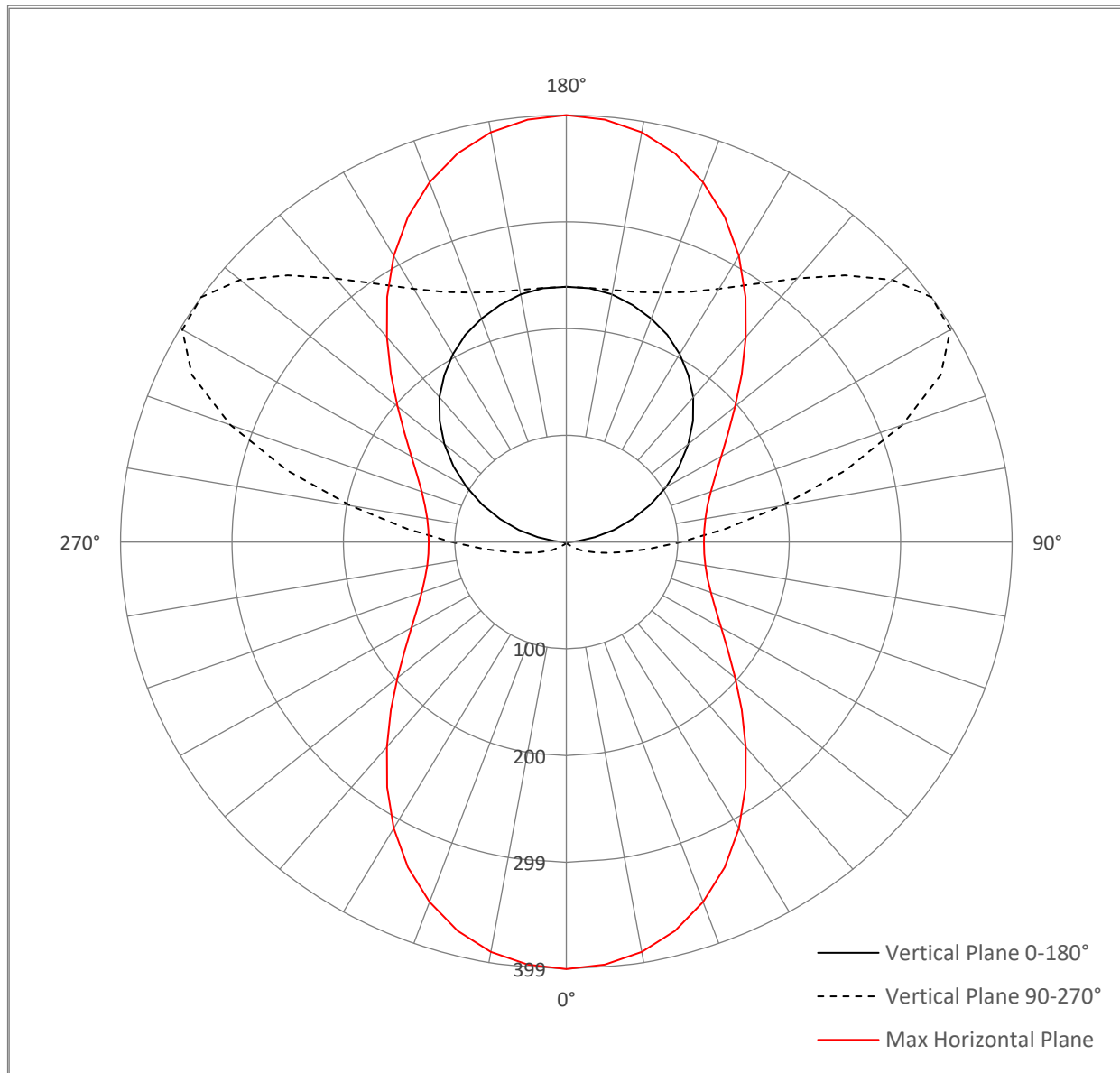
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UGR Table												
		Reflectances						Reflectances				
Ceiling Cavity		70	70	50	50	30		70	70	50	50	30
Walls		50	30	50	30	30		50	30	50	30	30
Floor Cavity		20	20	20	20	20		20	20	20	20	20
Room Size		UGR Viewed Crosswise						UGR Viewed Endwise				
X=2H	Y=2H	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
	3H	1.0	1.0	1.0	5.7	8.7	5.2	5.7	6.4	7.0	8.7	
	4H	1.0	1.0	1.0	9.6	12.6	9.1	9.6	10.4	10.9	12.6	
	6H	1.0	1.0	1.0	13.7	16.8	13.3	13.7	14.5	15.0	16.8	
	8H	1.0	1.0	1.0	15.9	19.0	15.5	15.9	16.7	17.2	19.0	
	12H	1.0	1.0	1.0	18.4	21.4	17.9	18.4	19.2	19.6	21.4	
4H	2H	1.0	1.0	1.0	1.0	1.3	1.0	1.0	1.0	1.0	1.3	
	3H	1.0	1.0	1.0	6.7	9.8	6.3	6.7	7.6	0.0	9.8	
	4H	1.0	1.0	1.0	10.9	13.9	10.4	10.9	11.7	12.1	13.9	
	6H	1.0	1.0	1.5	15.1	18.1	14.7	15.1	16.0	16.3	18.1	
	8H	1.0	1.0	1.9	17.4	20.4	17.0	17.4	18.3	18.6	20.4	
	12H	1.0	1.0	2.1	19.8	22.9	19.5	19.8	20.8	21.1	22.9	
8H	4H	5.2	5.5	8.6	11.4	14.4	11.0	11.4	12.3	12.6	14.4	
	6H	6.8	7.0	10.1	15.9	19.0	15.6	15.9	16.9	17.2	19.0	
	8H	7.3	7.6	10.6	18.4	21.4	18.1	18.4	19.4	19.6	21.4	
	12H	7.6	7.8	10.9	21.0	24.1	20.8	21.0	22.1	22.3	24.1	
12H	4H	7.4	7.7	10.8	11.4	14.4	11.0	11.4	12.3	12.6	14.4	
	6H	9.6	9.8	12.9	16.0	19.2	15.8	16.0	17.1	17.3	19.2	
	8H	10.5	10.7	13.8	18.6	21.7	18.4	18.6	19.7	19.9	21.7	

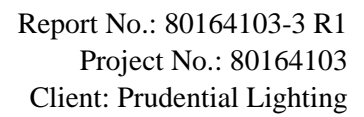
Maximum UGR = 24.1

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Polar Graph



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Vertical Angle

Horizontal Angle		Vertical Angle																																							
		0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0	100.0	105.0	110.0	115.0	120.0	125.0	130.0	135.0	140.0	145.0	150.0	155.0	160.0	165.0	170.0	175.0	180.0			
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	3	11	26	44	63	83	103	123	143	160	177	190	203	214	222	229	235	238	239			
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	4	13	27	45	65	84	104	124	143	161	177	191	204	214	223	230	235	238	239		
	10	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2	2	4	9	18	32	50	68	87	107	126	145	163	179	193	205	215	223	230	235	238	239		
	15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	3	4	8	15	26	40	56	75	93	112	131	149	166	181	194	206	216	224	230	235	238	239	
	20	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	3	5	8	14	23	35	50	66	84	102	120	138	155	170	185	197	208	217	225	230	235	238	239	
	25	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	3	5	8	14	22	33	47	62	80	97	114	131	147	163	177	190	201	211	220	226	231	236	238	239
	30	0	0	0	0	0	0	0	0	0	1	2	2	2	3	4	7	13	20	31	45	61	79	97	115	131	146	160	173	186	196	206	215	222	227	232	236	238	239		
	35	0	0	0	0	0	0	0	1	1	1	2	2	3	4	6	11	17	28	41	58	77	98	118	136	152	165	177	187	196	205	212	219	225	229	233	236	238	239		
40	0	0	0	0	0	0	0	2	1	2	2	2	3	5	9	14	23	35	51	71	94	118	142	162	178	189	197	204	209	214	219	224	228	231	234	236	238	239			
45	0	0	0	0	0	0	0	2	2	2	2	3	4	7	11	18	27	41	59	83	111	140	168	192	208	217	222	224	225	226	228	230	232	233	235	237	238	239			
50	0	0	0	0	0	0	0	1	2	2	3	4	6	8	13	21	31	46	66	93	125	160	194	222	240	249	250	247	243	239	237	236	236	236	237	238	239				
55	0	0	0	0	0	0	1	2	2	2	3	4	6	10	15	23	34	50	71	100	136	176	216	250	272	281	280	272	262	254	247	242	240	238	237	237	238	239			
60	0	0	0	0	0	0	2	2	2	2	3	5	7	11	17	25	36	52	74	104	142	187	233	274	301	312	309	297	283	269	257	249	243	240	238	238	238	239			
65	0	0	0	0	0	0	1	2	2	3	4	5	8	12	18	26	38	53	76	106	145	194	246	292	325	339	335	321	301	283	267	256	247	242	239	238	238	239			
70	0	0	0	0	0	0	1	2	2	3	4	6	9	13	19	27	38	54	76	106	146	197	253	305	343	360	358	342	319	296	276	261	251	244	240	238	238	239			
75	0	0	0	0	0	0	1	2	2	3	4	7	9	14	20	28	39	54	75	105	146	197	256	313	356	377	376	358	333	307	284	266	254	246	241	239	238	239			
80	0	0	0	0	0	0	2	2	2	3	5	7	10	14	20	28	39	54	75	104	145	197	258	317	364	388	389	371	344	315	290	270	256	247	241	239	238	239			
85	0	0	0	0	0	0	2	2	2	3	5	7	10	15	21	28	39	53	74	103	143	196	258	320	369	395	396	378	350	320	293	272	257	248	242	239	238	239			
90	0	0	0	0	0	0	1	2	2	3	5	7	10	15	21	28	39	53	74	102	143	196	259	320	370	397	399	381	353	322	295	273	258	248	242	239	238	239			

Telephone: 949-733-4300
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Version 1.4

Photometric Testing Information

The sample was evaluated for photometric and electrical characteristics using a goniophotometer, located in purpose-built, temperature and humidity-controlled, draft free environments

Luminaire Stabilization.

The results were measured after stabilization of the sample in the Goniophotometer (unless otherwise stated). Stability shall be achieved when the variation (Maximum to minimum) of at least three readings of the light output and electrical power consumption, taken at a maximum of 10-minute intervals over a period of 20 minutes and divided by the last of these measurements chronologically, is less than 0.5%.

The goniophotometer Mayer Engineering Type C is calibrated using a frosted tungsten filament FDS/DZE lamp with the following specifications:

The goniophotometer Mayer Engineering Type C is calibrated using a frosted tungsten filament FDS/DZE lamp with the following specifications:

Manufacturer: GE
Part Number: DZE
Bulb Number: 106-A
Voltage: 16.93 Volts DC reference
Calibration Current: 4.863 Amperes
Luminous Intensity: 168.8 Candelas
Calibration Date: 4/25/12 (NIST traceable)

Manufacturer: GE
Part Number: DZE
Bulb Number: 106-B
Voltage: 16.45 Volts DC reference
Calibration Current: 4.79 Amperes
Luminous Intensity: 145.3 Candelas
Calibration Date: 4/25/12(NIST traceable)

Manufacturer: GE
Part Number: DZE
Bulb Number: 106-C
Voltage: 16.57 Volts DC reference
Calibration Current: 4.829 Amperes
Luminous Intensity: 157.0 Candelas
Calibration Date: 4/25/12 (NIST traceable)

A Yokogawa WT310 Power Analyzer was used to measure all electrical characteristics of the sample.

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Equipment List: Goniophotometer Type C (Mirror 2)

Description	Manufacturer and Model Number	CSA Instrument Reference Number	Calibration Due Date
Optometer	Gigahertz Optik P9801	OPT400	N/A
Programmable DC Power Supply	Chroma Instruments 62012P-80-60	DCP300	N/A
Regulated Power Supply	Chroma Instruments 61602	AC301	N/A
Power Analyzer	Yokogawa WT310-E	POA400	6/27/2023

* All equipment is calibrated to ISO / IEC 17025-2017 guidelines.

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Testing
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