

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
80150237-7

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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 = 44002765-3

Driver = OSRAM OPTOTRONIC OTi20/120-277/700 DIM-1LG2

Luminous Efficacy (Lumens/Watt)	Luminous Flux (Lumens)	Input Power (Watts)	Power Factor	ATHD
93.60	1088.53	11.63	0.9835	8.31%

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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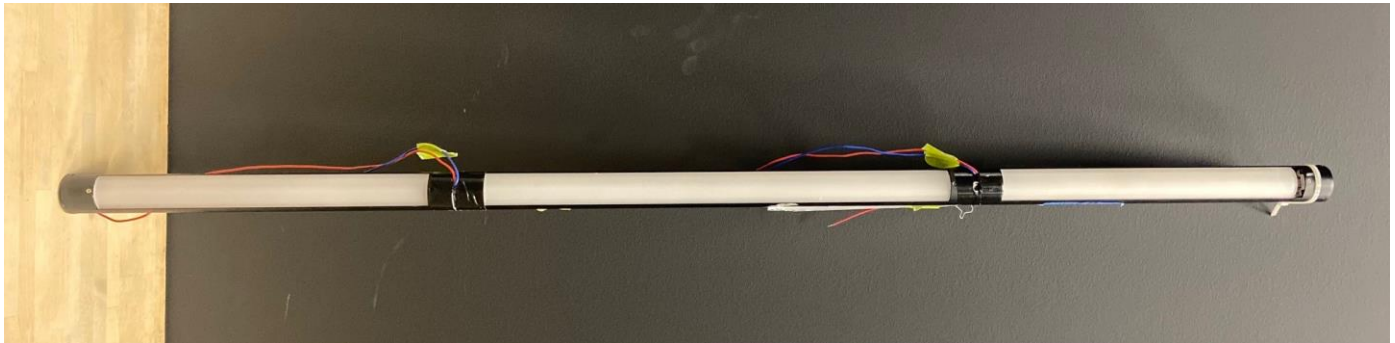
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Test Sample Pictures

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)	94.00
Total Luminous Flux (Lumens)	1088.53
Stabilization Time (Light and Power)	30 minutes
Total Run Time (Integrating Sphere)	85 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)	11.63
Input Voltage (Volts AC)	119.98
Input Current (Amps)	0.10
Input Frequency (Hertz)	60.0
Power Factor	0.9835
Total Harmonic Distortion (THD A)%	8.31

Additional Information	Sample Reference
	Pru1-STD-LED35-LO-04-NW-CW
Ambient Temperature	25.2
Date Tested	11/29/2022

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Photometric Test Results

Characteristics		Luminance Data (cd/sq.m)			
Total Lumens:	1088.53	Angle In	Average		
Input Wattage (W):	11.63	Degrees	0°	45°	90°
Efficacy(lm/W):	93.60	45	0	0	94
Spacing Criterion (0-180°):	N.A.	55	0	105	309
Spacing Criterion (90-270°):	N.A.	65	0	371	805
Spacing Criterion (Diagonal):	N.A.	75	0	1098	1862
Luminous Length (0-180°):	3.83 ft	85	0	3130	4306
Luminous Width (90-270°):	0.10 ft				
Luminous Height:	0.04 ft				

Zonal Lumen Summary												
Zone	Lumens	%Fixt		Zone	Lumens	%Fixt		Zone	Lumens		Zone	Lumens
0-20°	0.00	0.0		60-80°	32.64	3.0		0-10°	0.00		90-100°	75.91
0-30°	0.00	0.0		70-80°	22.57	2.1		10-20°	0.00		100-110°	114.82
0-40°	0.00	0.0		80-90°	43.86	4.0		20-30°	0.00		110-120°	148.06
0-60°	4.35	0.4		90-110°	190.74	17.5		30-40°	0.00		120-130°	164.82
0-80°	36.99	3.4		90-120°	338.80	31.1		40-50°	0.76		130-140°	161.70
0-90°	80.85	7.4		90-130°	503.62	46.3		50-60°	3.58		140-150°	141.32
10-90°	80.85	7.4		90-150°	806.64	74.1		60-70°	10.08		150-160°	109.00
20-40°	0.00	0.0		90-180°	1007.67	92.6		70-80°	22.57		160-170°	68.61
20-50°	0.76	0.1		110-180°	816.94	75.1		80-90°	43.86		170-180°	23.42
40-70°	14.42	1.3		0-180°	1088.53	100.0		0-90°	80.85		90-180°	1007.67

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	73	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	48	61	53	47	42	37	33	30	22	20	18	9	7	6	1
4	65	54	46	40	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	5	4	0
6	54	43	35	29	46	37	30	26	26	21	18	16	13	11	6	5	4	0
7	50	38	31	25	43	33	27	22	23	19	16	14	11	9	5	4	3	0
8	46	34	27	22	40	30	23	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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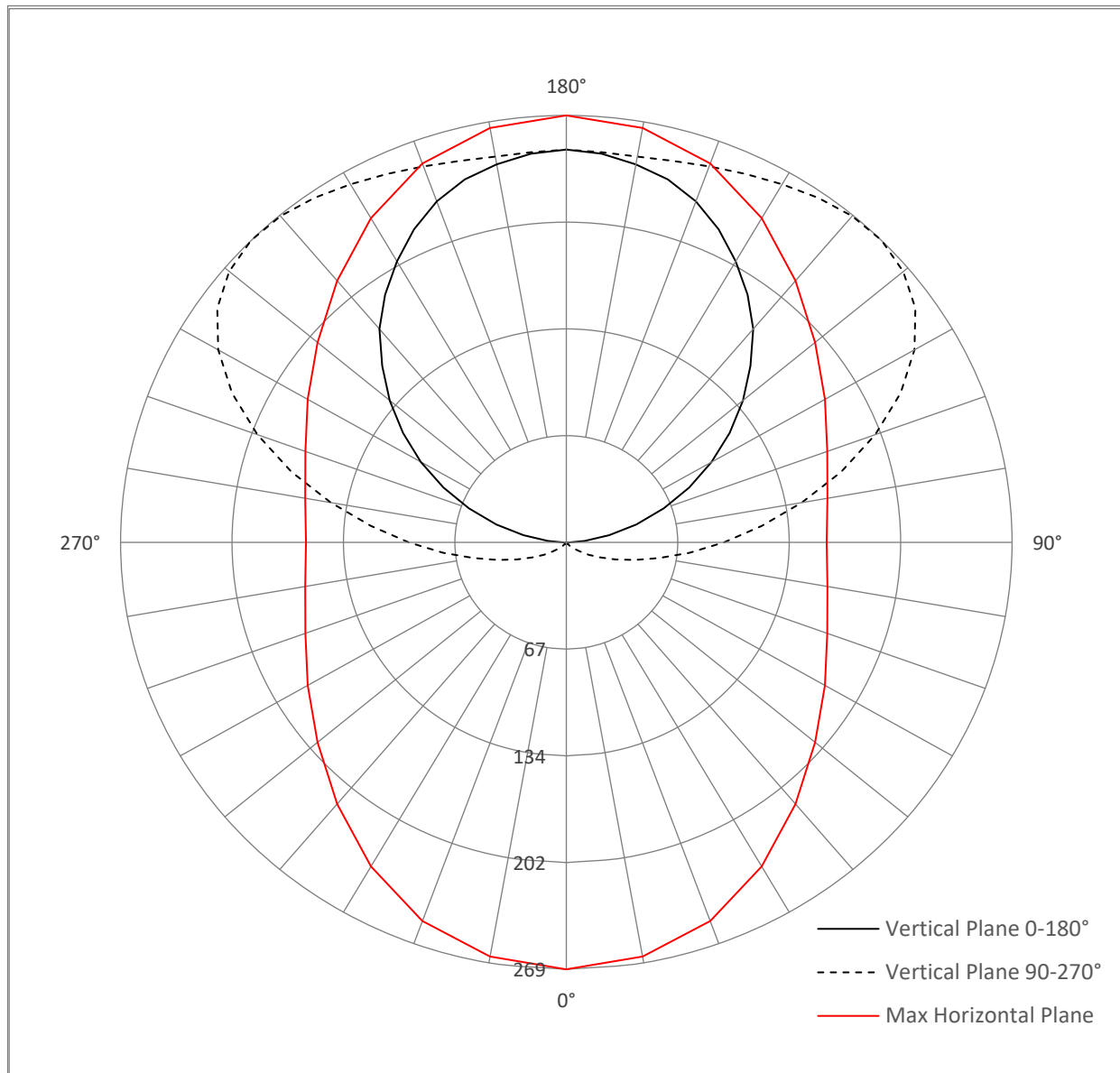
UGR Table												
		Reflectances						Reflectances				
Ceiling Cavity		70	70	50	50	30		70	70	50	50	30
Walls		50	30	50	30	30		50	30	50	30	30
Floor Cavity		20	20	20	20	20		20	20	20	20	20
Room Size		UGR Viewed Crosswise						UGR Viewed Endwise				
X=2H	Y=2H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	3H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	4H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	6H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	8H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	12H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4H	2H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	3H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	4H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	6H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	8H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	12H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8H	4H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	6H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	8H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	12H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12H	4H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	6H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	8H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Maximum UGR =

Unable to calculate UGR - No candela in offending zones

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Polar Graph



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Candela Tabulation

		Vertical Angle																																					
Horizontal Angle		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	11	26	44	62	82	101	120	139	157	175	190	204	217	229	237	242	246	247
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	4	13	27	45	64	83	102	121	140	158	176	192	205	218	229	237	242	246	247
	10	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	3	8	17	31	48	66	85	104	123	142	160	178	193	206	219	229	237	242	246	247
	15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	3	6	12	23	36	53	71	89	108	127	145	163	180	194	207	219	230	238	242	246	247
	20	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	3	6	11	18	29	43	59	77	95	114	132	150	168	184	197	209	220	231	238	242	246	247
	25	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	3	6	10	16	25	37	51	67	85	103	121	139	156	174	188	201	212	223	233	239	243	246	247
	30	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3	5	9	14	22	32	45	60	77	94	112	130	147	164	180	193	205	215	225	234	239	242	246	247
	35	0	0	0	0	0	0	0	0	1	1	1	2	2	5	8	13	20	28	40	54	69	87	105	123	140	157	173	188	199	210	220	228	236	240	243	245	247	
	40	0	0	0	0	0	0	0	0	1	1	1	2	4	7	11	17	25	35	48	63	80	98	116	134	152	169	183	196	207	216	225	232	238	241	243	246	247	
	45	0	0	0	0	0	0	0	0	1	1	2	3	5	9	14	21	30	42	56	72	90	109	128	147	165	181	194	205	214	223	230	236	240	242	244	246	247	
	50	0	0	0	0	0	0	0	0	1	1	2	4	7	11	17	25	36	48	64	81	100	120	141	160	178	193	205	215	223	230	235	239	242	243	244	246	247	
	55	0	0	0	0	0	0	0	0	1	2	3	5	9	14	20	29	40	54	71	89	110	132	153	173	190	205	216	225	232	237	241	243	244	244	245	246	247	
	60	0	0	0	0	0	0	1	1	1	2	4	6	10	16	23	33	45	60	77	97	119	142	164	184	202	217	228	236	241	244	245	246	245	245	245	246	247	
	65	0	0	0	0	0	0	1	1	1	2	4	7	12	18	26	36	49	64	83	104	126	150	174	195	214	228	239	246	249	250	249	248	247	246	246	246	247	
	70	0	0	0	0	0	0	1	1	2	3	5	8	13	19	28	38	52	68	87	109	133	158	183	205	224	239	248	254	256	255	253	251	249	247	246	246	247	
	75	0	0	0	0	0	0	1	1	2	3	5	9	14	21	29	40	54	71	91	113	138	164	190	213	232	247	256	260	261	259	256	253	250	248	246	246	247	
	80	0	0	0	0	0	0	1	1	2	3	6	9	15	22	31	42	56	73	93	116	141	169	195	218	238	252	261	265	265	262	258	254	251	248	246	246	247	
	85	0	0	0	0	0	0	1	1	2	3	6	10	15	22	31	43	57	74	94	118	144	171	197	221	241	256	264	268	267	264	260	255	252	248	247	247	247	
90	0	0	0	0	0	0	1	1	2	3	6	10	16	23	32	43	57	74	95	118	144	172	198	222	242	257	265	269	268	265	260	256	252	249	247	247	247		

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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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