

PHOTOMETRIC TESTING & EVALUATION TO IES LM-79-19

Sample Tested

Pru1-STD-LED35-HO-04-NW-CW

Prepared for:

Prudential Lighting

1774 East 21st
Los Angeles, CA 90058

Technical Report Number

80150237-8

December 2, 2022

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Program Description

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

Executive Summary

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

Sample Number = 44002765-3

Driver = OSRAM OPTOTRONIC OTi48/120-277/2A0 DIM-1L-G2

Luminous Efficacy (Lumens/Watt)	Luminous Flux (Lumens)	Input Power (Watts)	Power Factor	ATHD
93.21	3436.50	36.87	0.9755	9.59%

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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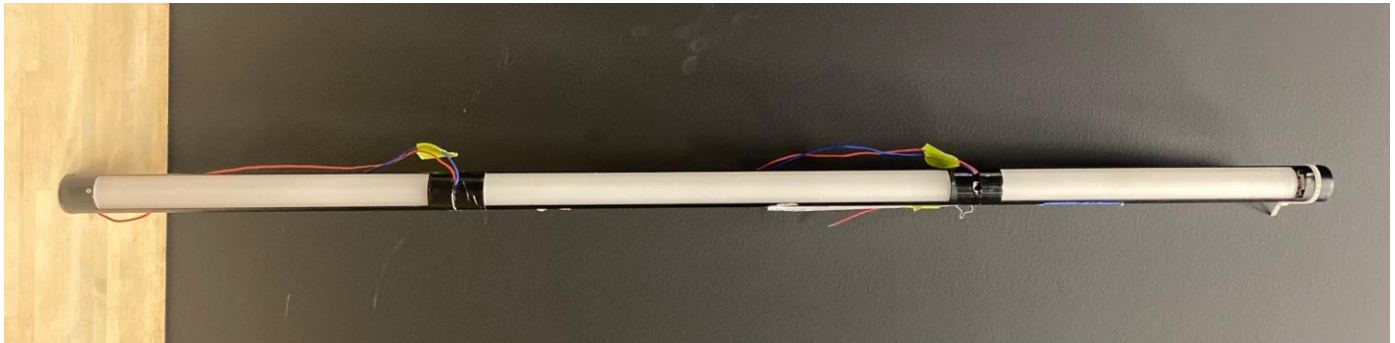
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Test Sample Pictures

The following sample was submitted for evaluation:



Prudential Lighting : Pru1-STD-LED35-HO-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-HO-04-NW-CW
	Goniophotometer
Luminous Efficacy (Lumens/Watt)	93.00
Total Luminous Flux (Lumens)	3436.5
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-HO-04-NW-CW
Input Power (Watts)	36.87
Input Voltage (Volts AC)	119.96
Input Current (Amps)	0.32
Input Frequency (Hertz)	60.0
Power Factor	0.9755
Total Harmonic Distortion (THD A)%	9.59

Additional Information	Sample Reference
	Pru1-STD-LED35-HO-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:	3436.50	Angle In	Average		
Input Wattage (W):	36.87	Degrees	0°	45°	90°
Efficacy(lm/W):	93.21	45	0	62	242
Spacing Criterion (0-180°):	N.A.	55	0	255	962
Spacing Criterion (90-270°):	N.A.	65	0	1091	2492
Spacing Criterion (Diagonal):	N.A.	75	0	3417	5991
Luminous Length (0-180°):	3.83 ft	85	817	9843	13753
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°	102.15	3.0		0-10°	0.00		90-100°	239.34
0-30°	0.00	0.0		70-80°	71.19	2.1		10-20°	0.00		100-110°	360.80
0-40°	0.19	0.0		80-90°	138.79	4.0		20-30°	0.00		110-120°	463.56
0-60°	13.64	0.4		90-110°	600.14	17.5		30-40°	0.19		120-130°	517.81
0-80°	115.79	3.4		90-120°	1063.70	31.0		40-50°	2.49		130-140°	510.46
0-90°	254.58	7.4		90-130°	1581.51	46.0		50-60°	10.96		140-150°	448.20
10-90°	254.58	7.4		90-150°	2540.17	73.9		60-70°	30.96		150-160°	347.53
20-40°	0.19	0.0		90-180°	3181.92	92.6		70-80°	71.19		160-170°	219.33
20-50°	2.68	0.1		110-180°	2581.79	75.1		80-90°	138.79		170-180°	74.89
40-70°	44.41	1.3		0-180°	3436.50	100.0		0-90°	254.58		90-180°	3181.92

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	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	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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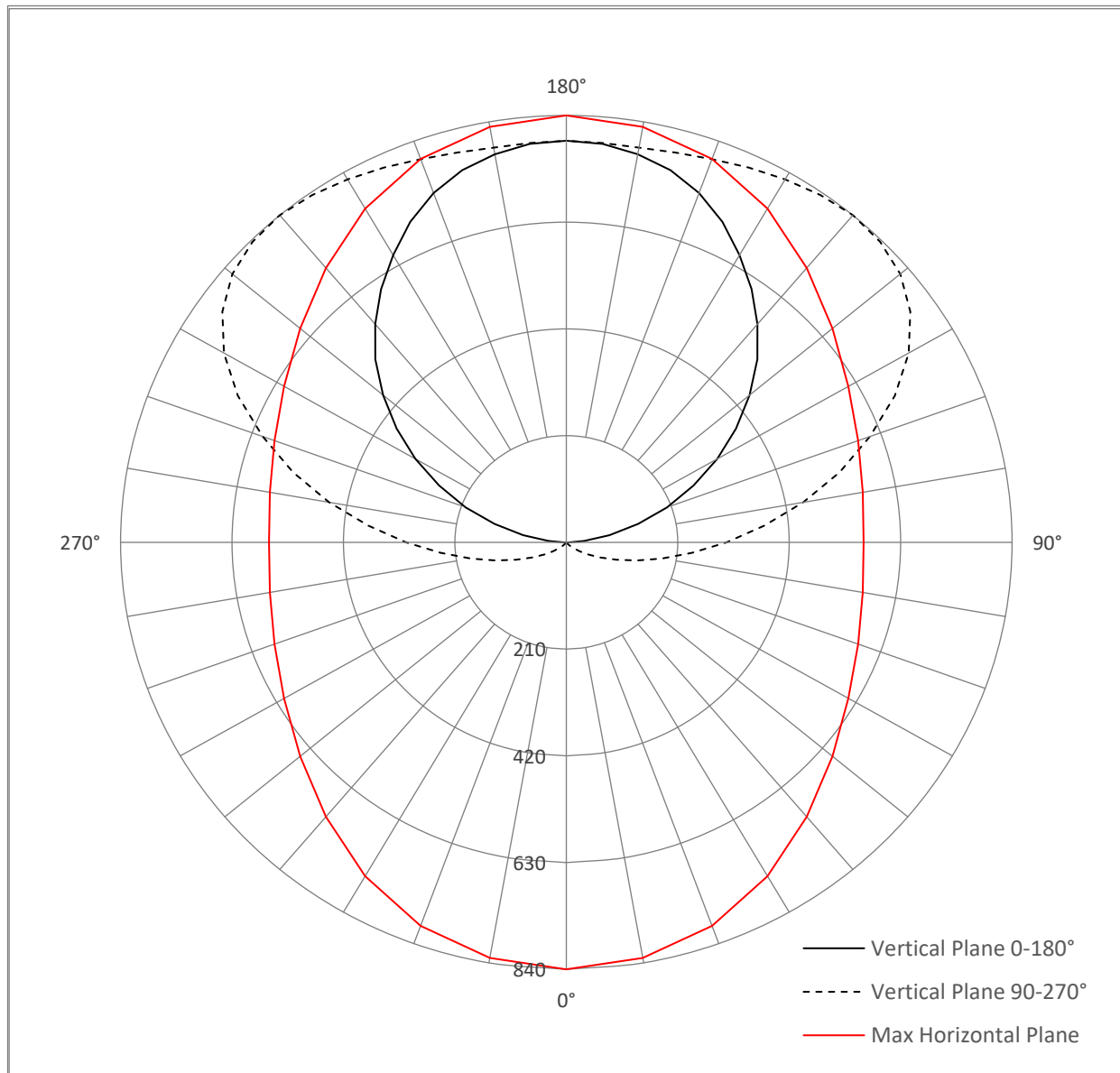
UGR Table												
		Reflectances						Reflectances				
Ceiling Cavity		70	70	50	50	30		70	70	50	50	30
Walls		50	30	50	30	30		50	30	50	30	30
Floor Cavity		20	20	20	20	20		20	20	20	20	20
Room Size		UGR Viewed Crosswise						UGR Viewed Endwise				
X=2H	Y=2H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	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	2	2	2	2	2	3	4	34	82	140	202	265	328	390	451	509	560	608	653	696	732	758	775	787	790
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	3	10	39	86	144	206	268	330	393	453	512	563	611	654	697	732	759	774	787	790
	10	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	3	8	22	53	98	154	213	275	337	399	458	518	567	614	658	699	734	760	775	787	790
	15	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	3	8	18	38	71	115	169	227	288	349	411	469	527	574	619	660	700	735	760	775	787	790
	20	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	3	8	16	33	57	92	137	190	248	307	367	426	483	540	585	628	667	704	738	761	775	786	790
	25	0	0	0	0	0	0	0	0	0	0	0	2	2	2	3	8	16	29	50	79	116	163	215	272	331	390	448	504	552	599	639	677	711	743	764	776	786	790
	30	0	0	0	0	0	0	0	0	0	2	2	2	2	3	7	15	26	44	69	102	142	190	243	301	359	418	473	529	572	614	653	687	719	747	764	776	785	790
	35	0	0	0	0	0	0	0	0	0	2	2	2	3	6	13	23	38	61	90	126	170	220	275	333	391	448	503	549	595	633	669	700	729	753	767	776	785	790
	40	0	0	0	0	0	0	0	0	0	2	2	2	4	10	19	32	51	78	111	151	199	252	308	368	426	483	536	578	619	655	687	716	741	760	771	778	785	790
	45	0	0	0	0	0	0	0	0	0	2	2	3	7	15	27	43	66	95	132	176	227	283	343	404	465	523	566	609	646	678	707	731	753	767	774	780	786	790
	50	0	0	0	0	0	0	0	0	0	2	2	5	11	21	34	52	79	112	152	201	255	315	378	443	505	554	602	642	677	705	728	748	763	772	777	782	786	790
	55	0	0	0	0	0	0	0	2	2	3	7	15	26	42	62	92	128	172	223	282	346	413	480	539	590	637	677	708	732	750	765	773	778	781	783	786	790	
	60	0	0	0	0	0	0	0	2	2	4	9	18	31	49	71	104	142	189	244	306	374	444	513	569	625	673	711	739	758	772	780	783	783	783	783	786	790	
	65	0	0	0	0	0	0	0	2	2	5	12	22	36	55	80	114	155	204	261	327	397	471	539	602	660	708	743	768	783	790	793	792	789	786	786	787	790	
	70	0	0	0	0	0	0	2	2	3	6	14	25	40	60	87	123	165	216	276	344	418	495	562	631	691	738	772	793	803	805	803	798	793	789	787	787	790	
	75	0	0	0	0	0	0	2	2	3	7	16	27	43	64	93	129	173	226	288	357	434	514	583	655	716	762	794	811	819	818	812	805	797	791	787	787	790	
	80	0	0	0	0	0	0	2	2	3	8	17	29	46	67	97	134	179	233	296	367	445	524	599	671	732	779	810	826	831	827	819	810	800	793	788	788	790	
	85	0	0	0	0	0	0	2	2	4	9	18	31	47	69	99	137	182	237	300	373	452	531	607	680	742	789	819	834	837	833	823	813	803	794	788	788	790	
90	0	0	0	0	0	0	2	2	4	9	18	31	48	70	100	138	183	238	302	375	454	533	609	683	745	792	822	836	840	834	825	814	803	794	789	789	790		

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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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