

PHOTOMETRIC TESTING & EVALUATION TO IES LM-79-19

Sample Tested

Pru1-STD-LED35-MO-04-SAL-NU

Prepared for:

Prudential Lighting1774 East 21st
Los Angeles, CA 90058**Technical Report Number**

801502237-2

December 1, 2022

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Program Description

Photometric and electrical testing of a Pru1-STD-LED35-MO-04-SAL-NU Type C LED Luminaire to IES LM-79-19.

Executive Summary

Sample Tested = Pru1-STD-LED35-MO-04-SAL-NU

Sample Number = 44002765-3

Driver = OSRAM OPTOTRONIC OTI 20W UNV 700C 1DIM DIM-1 J10

Luminous Efficacy (Lumens/Watt)	Luminous Flux (Lumens)	Input Power (Watts)	Power Factor	ATHD
90.49	1701.23	18.80	0.9899	6.47%

Spacing Criterion (0-180°)	Spacing Criterion (90-270°)	Stabilization Time (Light & Power)
1.2	1.3	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-MO-04-SAL-NU

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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-MO-04-SAL-NU
	Goniophotometer
Luminous Efficacy (Lumens/Watt)	90.00
Total Luminous Flux (Lumens)	1701.23
Stabilization Time (Light and Power)	30 minutes
Total Run Time (Integrating Sphere)	85 minutes
Spacing Criteria (0°-180°)/(90°-270°)	1.2 / 1.28

Electrical Input Results:	Sample Reference
	Pru1-STD-LED35-MO-04-SAL-NU
Input Power (Watts)	18.8
Input Voltage (Volts AC)	120.10
Input Current (Amps)	0.16
Input Frequency (Hertz)	60.0
Power Factor	0.9899
Total Harmonic Distortion (THD A)%	6.47

Additional Information	Sample Reference
	Pru1-STD-LED35-MO-04-SAL-NU
Ambient Temperature	24
Date Tested	11/22/2022

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Photometric Test Results

Characteristics		Luminance Data (cd/sq.m)			
Total Lumens:	1701.23	Angle In Degrees	Average		
Input Wattage (W):	18.8		0°	45°	90°
Efficacy(lm/W):	90.49	45	11767	10624	10877
Spacing Criterion (0-180°):	1.2	55	10670	9614	10141
Spacing Criterion (90-270°):	1.28	65	9431	8684	9484
Spacing Criterion (Diagonal):	1.36	75	7869	7941	9063
Luminous Length (0-180°):	4.00 ft	85	5500	7828	9190
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°	193.68	11.4		60-80°	340.53	20.0		0-10°	50.33		90-100°	53.02
0-30°	408.82	24.0		70-80°	143.26	8.4		10-20°	143.35		100-110°	28.23
0-40°	664.65	39.1		80-90°	91.47	5.4		20-30°	215.14		110-120°	13.03
0-60°	1168.98	68.7		90-110°	81.25	4.8		30-40°	255.82		120-130°	4.74
0-80°	1509.51	88.7		90-120°	94.28	5.5		40-50°	263.37		130-140°	1.18
0-90°	1600.98	94.1		90-130°	99.02	5.8		50-60°	240.97		140-150°	0.05
10-90°	1550.65	91.1		90-150°	100.25	5.9		60-70°	197.27		150-160°	0.00
20-40°	470.96	27.7		90-180°	100.25	5.9		70-80°	143.26		160-170°	0.00
20-50°	734.34	43.2		110-180°	19.00	1.1		80-90°	91.47		170-180°	0.00
40-70°	701.61	41.2		0-180°	1701.23	100.0		0-90°	1600.98		90-180°	100.25

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	118	118	118	118	114	114	114	114	108	108	108	102	102	102	97	97	97	94
1	106	100	95	91	102	97	93	89	92	88	85	87	84	81	82	80	78	75
2	96	87	79	73	92	84	77	72	80	74	69	75	71	67	72	68	64	62
3	87	76	67	60	84	74	66	59	70	63	57	66	61	56	63	58	54	52
4	80	67	58	51	77	65	57	50	62	55	49	59	53	47	56	51	46	44
5	73	60	50	44	70	58	50	43	55	48	42	53	46	41	50	45	40	38
6	67	54	45	38	65	52	44	38	50	42	37	48	41	36	46	40	35	33
7	63	49	40	34	60	48	39	33	46	38	33	44	37	32	42	36	31	29
8	58	44	36	30	56	43	35	30	42	34	29	40	33	28	38	32	28	26
9	54	41	32	27	53	40	32	27	38	31	26	37	30	26	35	30	25	23
10	51	38	30	24	49	37	29	24	35	29	24	34	28	23	33	27	23	21

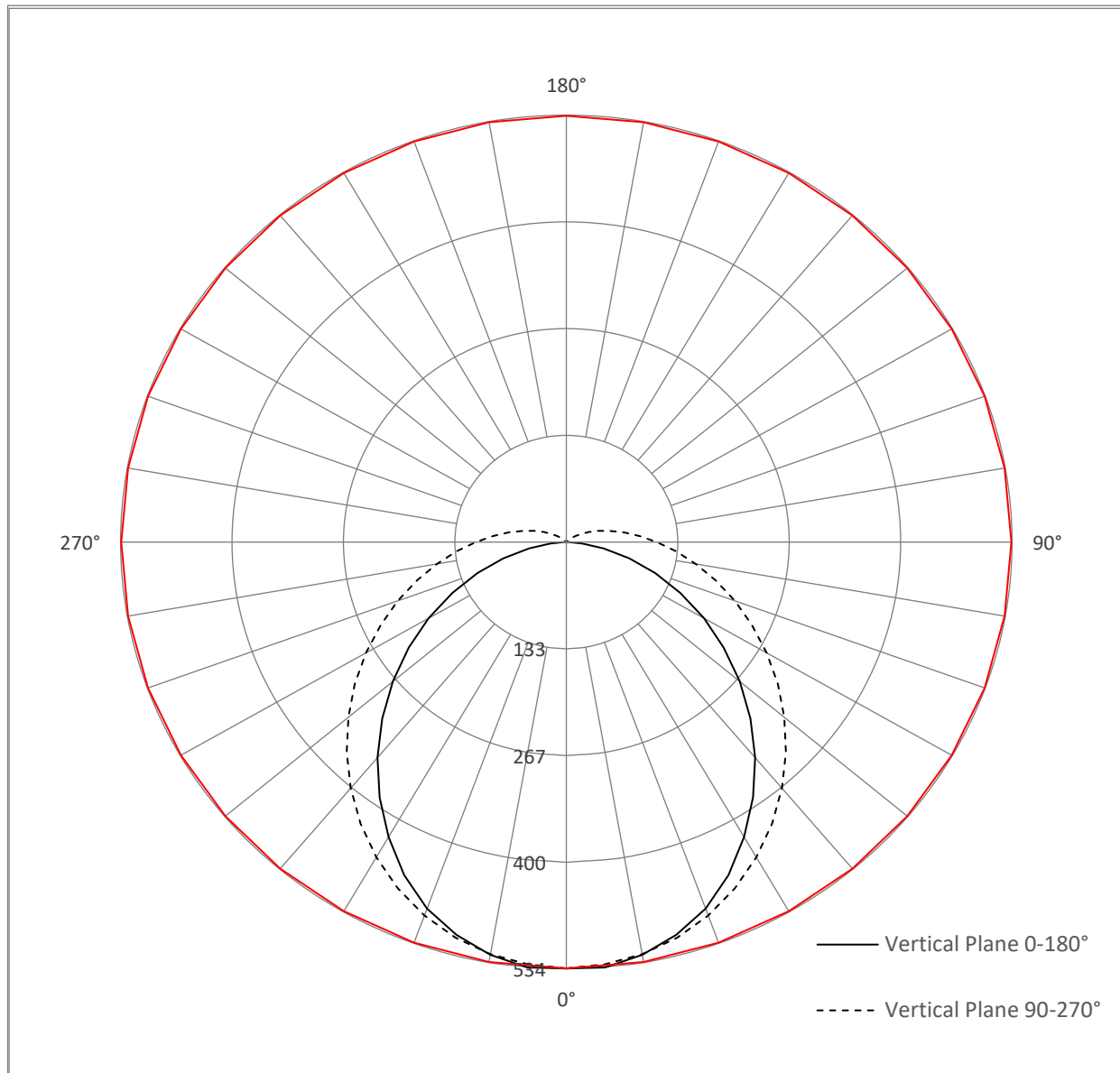
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UGR Table												
		Reflectances						Reflectances				
Ceiling Cavity		70	70	50	50	30		70	70	50	50	30
Walls		50	30	50	30	30		50	30	50	30	30
Floor Cavity		20	20	20	20	20		20	20	20	20	20
Room Size		UGR Viewed Crosswise						UGR Viewed Endwise				
X=2H	Y=2H	17.9	19.5	20.4	22.2	23.1	20.7	22.2	21.1	22.6	23.1	
	3H	19.3	20.7	21.7	24.6	25.5	23.2	24.6	23.6	25.0	25.5	
	4H	19.8	21.1	22.1	25.7	26.7	24.4	25.7	24.9	26.2	26.7	
	6H	20.0	21.3	22.3	26.9	27.9	25.7	26.9	26.2	27.4	27.9	
	8H	20.1	21.3	22.3	27.5	28.6	26.3	27.5	26.9	28.0	28.6	
	12H	20.1	21.3	22.4	28.2	29.3	27.1	28.2	27.6	28.7	29.3	
4H	2H	18.9	20.2	21.2	22.4	23.3	21.0	22.4	21.5	22.8	23.3	
	3H	20.6	21.7	22.7	24.9	26.0	23.8	24.9	24.3	0.0	26.0	
	4H	21.2	22.2	23.3	26.2	27.3	25.2	26.2	25.7	26.7	27.3	
	6H	21.5	22.5	23.6	27.6	28.7	26.7	27.6	27.2	28.1	28.7	
	8H	21.6	22.5	23.6	28.3	29.5	27.5	28.3	28.0	28.9	29.5	
	12H	21.7	22.5	23.6	29.1	30.3	28.3	29.1	28.9	29.7	30.3	
8H	4H	21.9	22.8	24.0	26.2	27.4	25.4	26.2	25.9	26.8	27.4	
	6H	22.5	23.3	24.5	27.8	29.0	27.0	27.8	27.6	28.4	29.0	
	8H	22.7	23.4	24.6	28.6	29.9	28.0	28.6	28.6	29.2	29.9	
	12H	22.9	23.4	24.7	29.6	30.9	29.1	29.6	29.6	30.2	30.9	
12H	4H	22.2	23.0	24.1	26.2	27.3	25.4	26.2	25.9	26.7	27.3	
	6H	22.9	23.6	24.8	27.8	29.0	27.1	27.8	27.7	28.3	29.0	
	8H	23.2	23.8	25.1	28.7	29.9	28.1	28.7	28.7	29.3	29.9	

Maximum UGR =

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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	533	534	524	508	488	459	426	390	352	312	271	230	190	151	113	78	46	19	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	5	533	532	522	506	486	458	425	389	351	311	270	230	190	151	114	79	47	21	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10	533	532	522	507	486	459	426	390	353	313	272	231	191	153	116	82	52	27	12	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	15	533	531	522	506	486	459	426	390	353	314	274	234	194	156	120	87	58	35	18	9	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	20	533	531	521	506	486	460	427	392	355	317	277	237	199	162	127	94	66	43	26	15	8	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	25	533	531	521	506	487	461	429	395	358	321	282	242	204	168	134	102	75	52	34	22	13	7	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
	30	533	530	521	506	486	462	432	397	362	325	287	248	211	175	141	111	84	61	43	29	19	11	7	4	2	0	0	0	0	0	0	0	0	0	0	0	0	
	35	533	529	520	506	487	463	435	401	366	330	293	255	218	183	150	120	93	71	52	36	25	16	10	6	3	0	0	0	0	0	0	0	0	0	0	0	0	
	40	533	529	521	507	488	465	438	405	371	335	298	262	226	191	159	129	103	80	60	44	31	21	14	8	5	3	0	0	0	0	0	0	0	0	0	0	0	
	45	533	529	521	508	489	467	441	410	375	340	305	269	234	200	168	138	112	88	68	51	37	26	18	11	7	4	2	0	0	0	0	0	0	0	0	0	0	
	50	533	529	521	508	490	468	443	414	381	346	311	276	242	208	177	147	120	97	76	58	43	31	22	14	9	5	3	0	0	0	0	0	0	0	0	0	0	
	55	533	529	521	509	491	470	445	417	386	353	318	283	249	216	185	156	129	105	83	65	49	36	26	17	11	6	4	2	0	0	0	0	0	0	0	0	0	
	60	533	529	522	509	492	472	447	420	390	358	325	291	256	223	192	163	136	111	90	71	54	41	29	20	13	8	4	3	0	0	0	0	0	0	0	0	0	
	65	533	529	522	510	493	473	449	422	393	362	330	297	263	231	199	170	143	118	95	76	59	45	32	23	15	9	5	3	0	0	0	0	0	0	0	0	0	
	70	533	529	522	510	494	474	451	424	396	365	333	301	268	236	205	175	148	123	100	80	63	48	35	25	17	11	6	3	2	0	0	0	0	0	0	0	0	
	75	533	529	522	511	495	475	452	426	398	368	337	304	272	240	209	179	152	127	104	84	66	51	38	27	19	12	7	4	2	0	0	0	0	0	0	0	0	
	80	533	530	523	511	496	476	454	428	400	370	339	307	274	243	212	183	155	130	107	86	68	52	39	29	20	13	7	4	2	0	0	0	0	0	0	0	0	
	85	533	530	523	512	496	477	455	429	401	371	340	308	276	245	214	185	157	131	108	87	69	54	40	29	20	13	8	4	2	0	0	0	0	0	0	0	0	
90	533	530	523	512	497	478	455	430	402	372	341	309	277	245	215	185	157	132	109	88	70	54	41	29	20	13	8	4	2	0	0	0	0	0	0	0	0		

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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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