LightLab INTERNATIONAL ALLENTOWN LLC

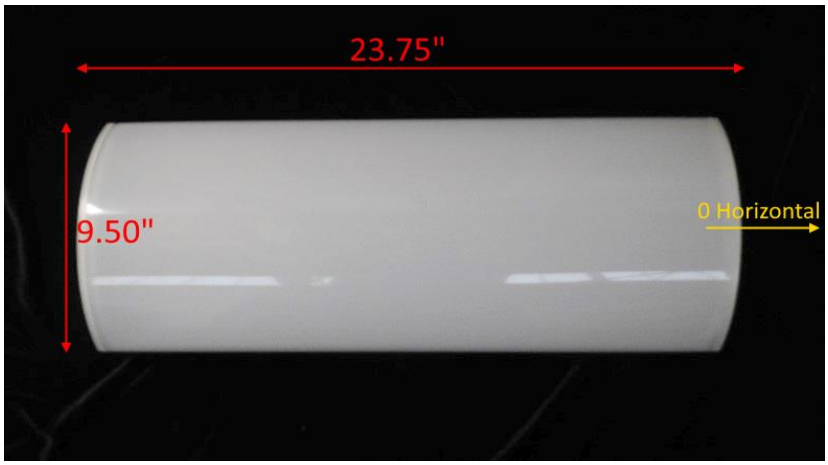
NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA002469-005

Indoor Distribution Photometry Test Report

Catalog Number: LWRAPA2-25PCS 20W Setting 4000K
Surface mounted, formed white painted steel housing, white painted steel reflector, translucent white linear ribbed plastic enclosure.
240 white LEDs, 120 CW LEDs and 120 WW LEDs on 2 boards
One PLC025S0550US-DEGAR LED driver



Prepared For:
Topaz Lighting, A Southwire Company
925 Waverly Avenue
Holtsville, NY 11742, USA

Performance Summary					
Input Voltage	120.0	Vac	Luminous Flux	2796.7	Lumens
Input Current	0.1732	A	Total Efficacy	135.7	Lm/W
Input Power	20.61	W	Downward Flux	2685.0	Lumens
Frequency	60.00	Hz	Downward Flux	96.0	% of Total
Power Factor	0.992				
Current THD	9.7	%			

This test report was issued by LightLab International Allentown, LLC without alterations or erasures.

Test date: 08/21/2024
Report date: 09/03/2024

Signed: Michael L. Grather Digitally signed by Michael L. Grather Date: 2024.09.04 14:03:41 -04'00'

North America (issuing laboratory)
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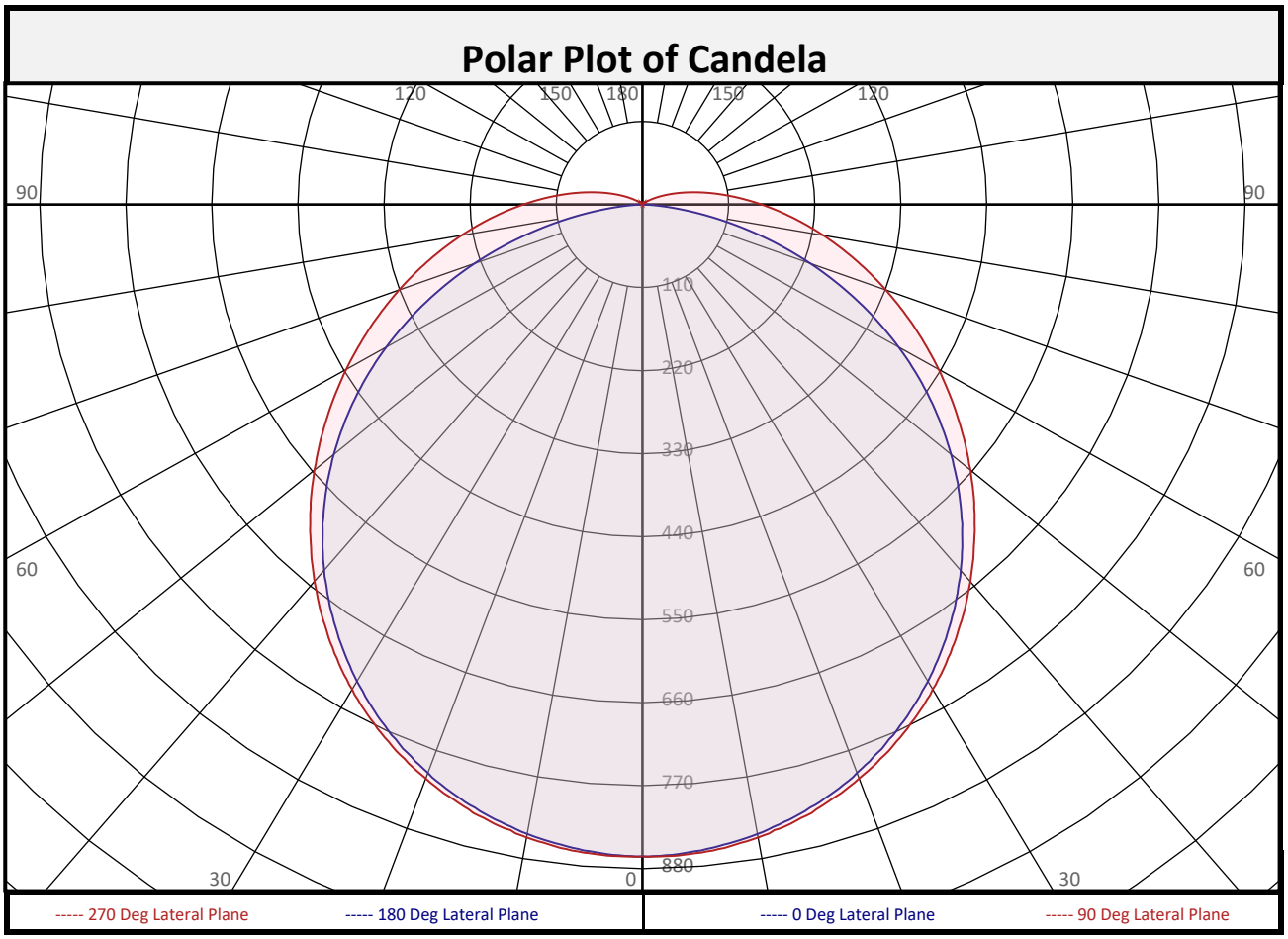

Zonal Flux Summary

Zone (Deg Vert)	Flux (Lumens)	Percent of Total	Zone (Deg Vert)	Flux (Lumens)	Percent of Total	Zone (Deg Vert)	Flux (Lumens)	Percent of Total
0-10	81.8	2.9%	90-100	67.4	2.4%	0-20	316.3	11.3%
10-20	234.5	8.4%	100-110	29.6	1.1%	0-30	672.9	24.1%
20-30	356.6	12.8%	110-120	10.4	0.4%	0-40	1105	39.5%
30-40	432.5	15.5%	120-130	2.8	0.1%	0-60	1977	70.7%
40-50	453.1	16.2%	130-140	0.9	0.0%	0-80	2551	91.2%
50-60	418.6	15.0%	140-150	0.5	0.0%	10-90	2603	93.1%
60-70	339.1	12.1%	150-160	0.1	0.0%	20-50	1242	44.4%
70-80	234.6	8.4%	160-170	0.0	0.0%	40-90	1580	56.5%
80-90	134.3	4.8%	170-180	0.0	0.0%	60-90	707.9	25.3%
0-90	2685	96.0%	90-180	111.7	4.0%	0-180	2797	100.0%

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Luminous Intensity (Candela) Table

Vertical (Gamma) Angles - Data was acquired in 0.5° increments, 2.5° increments shown.	Lateral (C-Plane) Angles									
		0	22.5	45	67.5	90	112.5	135	157.5	180
	0	864	864	864	864	864	864	864	864	864
	2.5	863	863	863	864	864	864	863	863	863
	5	859	859	860	861	862	861	860	859	859
	7.5	854	854	855	857	858	857	855	854	854
	10	847	848	849	851	852	851	849	848	847
	12.5	838	839	840	843	844	843	840	839	838
	15	827	829	831	833	835	833	831	829	827
	17.5	816	817	819	822	822	822	819	817	816
	20	801	803	806	809	809	809	806	803	801
	22.5	786	787	790	793	795	793	790	787	786
	25	769	770	774	778	779	778	774	770	769
	27.5	750	751	755	760	761	760	755	751	750
	30	730	731	735	740	742	740	735	731	730
	32.5	707	709	714	720	722	720	714	709	707
	35	684	686	691	697	699	697	691	686	684
	37.5	659	661	667	673	676	673	667	661	659
	40	633	635	641	648	652	648	641	635	633
	42.5	605	608	614	623	626	623	614	608	605
	45	576	579	586	596	600	596	586	579	576
	47.5	547	549	557	569	574	569	557	549	547
	50	515	518	527	541	547	541	527	518	515
	52.5	482	485	497	512	520	512	497	485	482
	55	448	452	466	484	492	484	466	452	448
	57.5	414	418	435	456	464	456	435	418	414
	60	378	383	403	427	437	427	403	383	378
	62.5	341	348	372	399	410	399	372	348	341
	65	304	313	342	371	383	371	342	313	304
	67.5	266	277	312	344	356	344	312	277	266
	70	228	242	282	317	331	317	282	242	228
	72.5	190	208	254	291	306	291	254	208	190
	75	152	176	226	266	281	266	226	176	152
	77.5	116	145	201	242	257	242	201	145	116
	80	81	117	176	219	235	219	176	117	81
	82.5	50	92	153	197	213	197	153	92	50
	85	24	70	132	176	191	176	132	70	24
	87.5	6	52	112	156	171	156	112	52	6
	90	0	37	94	137	152	137	94	37	0

16 lateral half-planes of data were acquired, 22.5 degree increments shown.

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Luminous Intensity (Candela) Table

Vertical (Gamma) Angles - Data was acquired in 0.5° increments, 2.5° increments shown.	Lateral (C-Plane) Angles									
		0	22.5	45	67.5	90	112.5	135	157.5	180
	90	0	37	94	137	152	137	94	37	0
	92.5	0	25	78	119	135	119	78	25	0
	95	0	17	64	103	118	103	64	17	0
	97.5	0	10	52	88	102	88	52	10	0
	100	0	6	41	75	88	75	41	6	0
	102.5	0	3	32	62	75	62	32	3	0
	105	0	2	24	52	63	52	24	2	0
	107.5	0	0	18	42	52	42	18	0	0
	110	0	0	13	33	42	33	13	0	0
	112.5	0	0	9	26	34	26	9	0	0
	115	0	0	7	20	27	20	7	0	0
	117.5	0	0	4	15	21	15	4	0	0
	120	0	0	3	11	16	11	3	0	0
	122.5	0	0	2	8	12	8	2	0	0
	125	0	0	2	6	8	6	2	0	0
	127.5	0	0	2	4	6	4	2	0	0
	130	0	0	2	3	4	3	2	0	0
	132.5	0	0	1	2	3	2	1	0	0
	135	0	0	1	2	2	2	1	0	0
	137.5	0	0	1	2	2	2	1	0	0
	140	0	0	1	2	2	2	1	0	0
	142.5	0	0	1	2	2	2	1	0	0
	145	0	0	1	1	2	1	1	0	0
	147.5	0	0	1	1	1	1	1	0	0
	150	0	0	1	0	2	0	1	0	0
	152.5	0	0	0	0	1	0	0	0	0
	155	0	0	0	0	0	0	0	0	0
	157.5	0	0	0	0	0	0	0	0	0
	160	0	0	0	0	0	0	0	0	0
	162.5	0	0	0	0	0	0	0	0	0
	165	0	0	0	0	0	0	0	0	0
	167.5	0	0	0	0	0	0	0	0	0
	170	0	0	0	0	0	0	0	0	0
	172.5	0	0	0	0	0	0	0	0	0
	175	0	0	0	0	0	0	0	0	0
	177.5	0	0	0	0	0	0	0	0	0
	180	0	0	0	0	0	0	0	0	0

16 lateral half-planes of data were acquired, 22.5 degree increments shown.

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Coefficients of Utilization/Room Utilization - Zonal Cavity Method

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
RCR																						
0	118	118	118	118		115	115	115	115		109	109	109		103	103	103		98	98	98	96
1	106	101	96	92		103	98	94	90		93	90	86		89	86	83		84	82	80	77
2	96	87	80	74		93	85	78	72		81	75	70		77	72	68		73	69	66	63
3	87	76	68	61		84	74	66	60		71	64	58		67	62	57		64	59	55	53
4	80	67	58	51		77	66	57	50		63	55	49		60	53	48		57	52	47	45
5	73	60	51	44		71	59	50	43		56	48	42		54	47	42		51	45	41	39
6	68	54	45	38		65	53	44	38		50	43	37		48	42	36		46	40	36	34
7	63	49	40	34		61	48	39	33		46	38	33		44	37	32		42	36	32	30
8	58	44	36	30		56	44	35	30		42	34	29		40	34	29		39	33	28	26
9	54	41	32	27		53	40	32	27		39	31	26		37	31	26		36	30	26	24
10	51	38	30	24		50	37	29	24		36	29	24		34	28	23		33	27	23	21

For absolute test reports, RUs are expressed as a percentage of total lumen output. For relative test reports, CUs are expressed as a percentage of total lamp output. Calculations were based on published IES procedures, and are based on the zonal cavity method. Basic assumptions: 1) Room surfaces are lambertian reflectors. 2) Incident flux on each surface is uniformly distributed. 3) The room is spectrally neutral. When luminaires are not evenly distributed throughout the room, or do not exhibit lateral symmetry, CU values may differ from actual performance.

Circle of Light Plot

Height(ft)	Illuminance at Nadir (fc)	Ground-level distance to half-of-nadir illuminance (ft) 0-180 deg	90-270 deg
6.0	24.0	7.53	7.66
8.0	13.5	10.04	10.21
10.0	8.6	12.55	12.77
12.0	6.0	15.07	15.32
14.0	4.4	17.58	17.87
16.0	3.4	20.09	20.43

Spacing Criterion

0 deg:	1.3
90 deg:	1.3
180 deg:	1.3
270 deg:	1.3

Average Luminance (cd/m^2)

	0 deg Plane	45 deg Plane	90 deg Plane
0	5934	5934	5934
45	5598	4728	4522
55	5370	4318	4167
65	4942	3858	3842
75	4041	3407	3586
85	1870	3108	3501

Beam and Field Angle

0-180 Degree Plane

Beam Angle: 112.4°

Field Angle: 159.2°

90-270 Degree Plane

Beam Angle: 120.9°

Field Angle: 200.5°

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UGR Table - Corrected

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	16.0	17.7	16.5	18.0	18.5	17.1	18.7	17.6	19.1	19.5
	3H	17.6	19.0	18.0	19.5	19.9	19.4	20.8	19.8	21.2	21.7
	4H	18.1	19.5	18.5	19.9	20.4	20.4	21.8	20.9	22.2	22.7
	6H	18.4	19.6	18.8	20.1	20.6	21.4	22.7	21.9	23.2	23.6
	8H	18.4	19.6	18.9	20.1	20.6	21.9	23.2	22.4	23.6	24.1
	12H	18.4	19.6	18.9	20.0	20.6	22.4	23.6	22.9	24.1	24.6
4H	2H	16.8	18.1	17.2	18.6	19.0	17.6	19.0	18.1	19.4	19.9
	3H	18.5	19.7	19.0	20.2	20.7	20.1	21.3	20.5	21.7	22.2
	4H	19.1	20.2	19.6	20.7	21.2	21.3	22.4	21.8	22.8	23.4
	6H	19.5	20.5	20.0	21.0	21.5	22.5	23.4	23.0	23.9	24.5
	8H	19.6	20.5	20.1	21.0	21.5	23.1	24.0	23.6	24.5	25.0
	12H	19.6	20.4	20.2	21.0	21.5	23.7	24.5	24.2	25.0	25.6
8H	4H	19.6	20.5	20.1	21.0	21.6	21.5	22.4	22.0	22.9	23.5
	6H	20.2	20.9	20.7	21.5	22.0	22.9	23.6	23.4	24.2	24.8
	8H	20.3	21.0	20.9	21.6	22.2	23.6	24.3	24.2	24.9	25.4
	12H	20.4	21.0	21.0	21.6	22.2	24.4	25.0	25.0	25.6	26.2
12H	4H	19.8	20.6	20.3	21.1	21.7	21.5	22.3	22.1	22.9	23.4
	6H	20.4	21.1	21.0	21.6	22.2	23.0	23.6	23.5	24.2	24.8
	8H	20.6	21.2	21.2	21.8	22.4	23.7	24.3	24.3	24.9	25.5

Maximum UGR = 26.2

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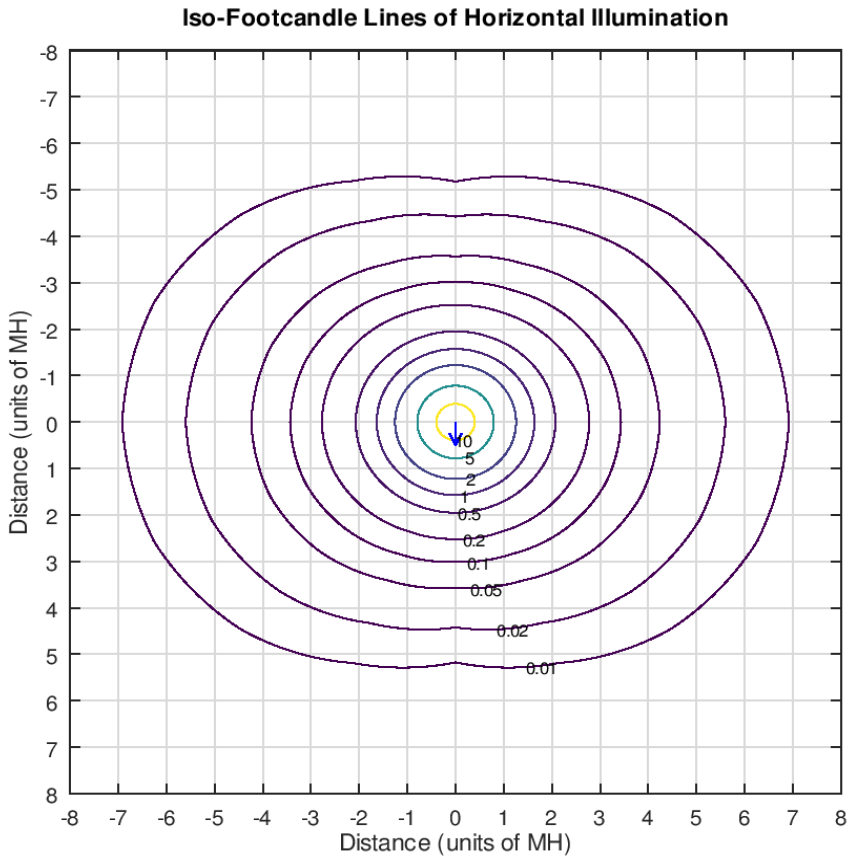
Iso-Illuminance Plot



The isofootcandle values shown in the plot above are based on a mounting height of h = 8.0 feet. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of footcandles. The values expressed are based on the direct light from a single unit without the contribution of room reflections.

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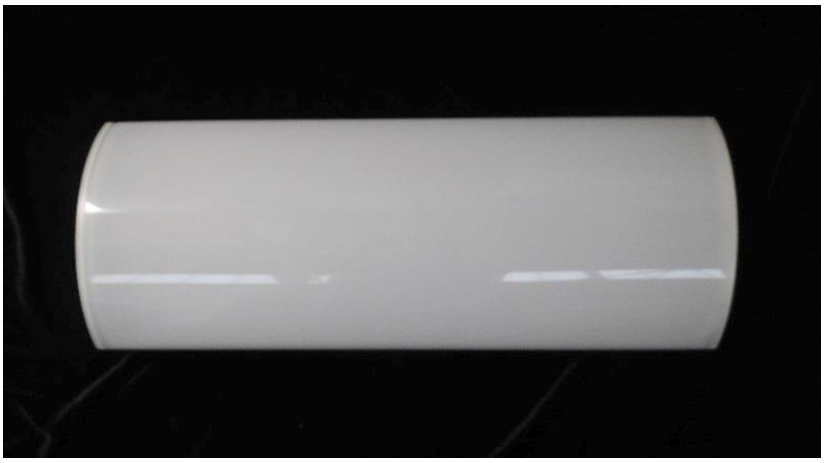
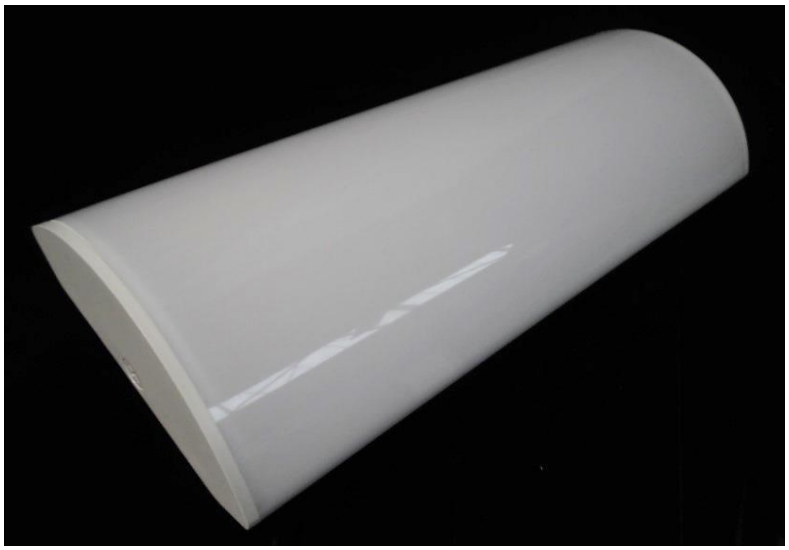
Additional Pictures of Test Subject





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Test Distance	9.5 m
Ambient Temperature	25.1 °C

Notes

The laboratory has not participated in the selection of samples to be tested. All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.

Tested in accordance with the applicable sections of IES LM-79-19. Format of reports and angular increments based on IES LM-41-20 and LM-46-20.

The luminous intensity values, and other derived quantities, contained in this report are based on the absolute data, as measured.

Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

This report is free of erasures and corrections.

Photometric intensity values are reported using the CIE C-Gamma coordinate system as defined in CIE publication number 121.

This report may contain data that are not covered by the NVLAP accreditation. Quantities marked with ‡ are not covered.

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the Federal Government.