



Report No.: UTU2503014E-C

LM-79-08 Test Report

For

RAB Lighting Inc.

(Brand Name:RAB Lighting)

408 W 14th St, New York, NY 10014 United States
Xiao Xiang,15921313292,Gary.Xiao@rablighting.com

Outdoor Pole/Arm-Mounted Area and Roadway Luminaires

Model name(s): AL22-300[blank, SF, WM, UNV][blank, W]
[blank, /PIR, /MVS, /LCBS, /LCBS/MVS]

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Winnie Wu

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Date: 2024-03-26

Review By:

Jason Luo

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Report Format Number BL-FM-SA-012

1.1 Product Information:

Organization Name	RAB Lighting Inc.	
Brand Name	RAB Lighting	
Model Number	AL22-300[blank, SF, WM, UNV][blank, W][blank, /PIR, /MVS, /LCBS, /LCBS/MVS]	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	300W(Power adjustable)	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,4000K, 5000K (Color tunable)	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-2880RC35005A1 L128-5780RC35005A1	
Sample Number	UTU2503014E-C1	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo



1.2 Test Specifications:

Date of Receipt	2024-03-10
Date of Test	2024-03-12
Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2019 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	BL-QP-033

1.3 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Goniophotometer far field detector $f1' = 1.42\%$, Test distance: 14.14m

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm. Use 2m diameter integrated sphere (94-98% coating reflectance) and 4π geometry.

Self-absorption:

AST-S-GE12-300WBT3/T4/T5DA1-abcdWfg:1.2433

3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2024-03-12	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	AL22-300 (Setting at 3000K T3)	Operation time(min)	110

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTU250301	120.0	60	2.566	306.04	0.994	7.92
4E-C1	277.0	60	1.136	297.41	0.945	9.81
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

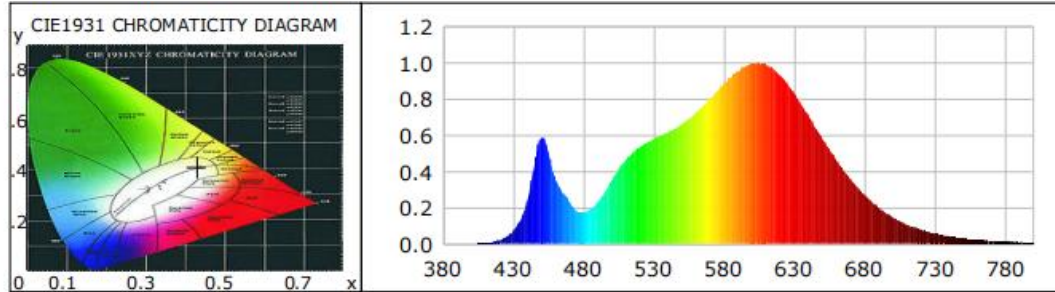
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	9
Frequency (Hz)	60	R2	89	R10	75
CCT (K)	3179	R3	97	R11	82
Duv	0.0033	R4	83	R12	65
Chromaticity (x, y)	x=0.429 y=0.4092	R5	81	R13	83
Chromaticity (u', v')	u'=0.2433 v'=0.5222	R6	87	R14	98
Color Rendering Index (CRI)	83	R7	86	R15	73
R9	9	R8	62	--	--
Rf	86	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-11				

Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	44084.8	44162.5	>=10000(-10%)
Luminous Efficacy (lm/W)	144.05	148.49	Premium: >= 120(-3%)
Most worst Luminous/Highest	144.05		
Zonal lumens in the 0-90° zone (%)	100	--	Category 1: >=100(-1) Category 2: >=85(-3)
Zonal lumens in the 80-90°zone (%)	3.1	--	<=10(+3)
Beam Angle (°)	117.4	--	--
Center Beam Candle Power (cd)	9784	--	--

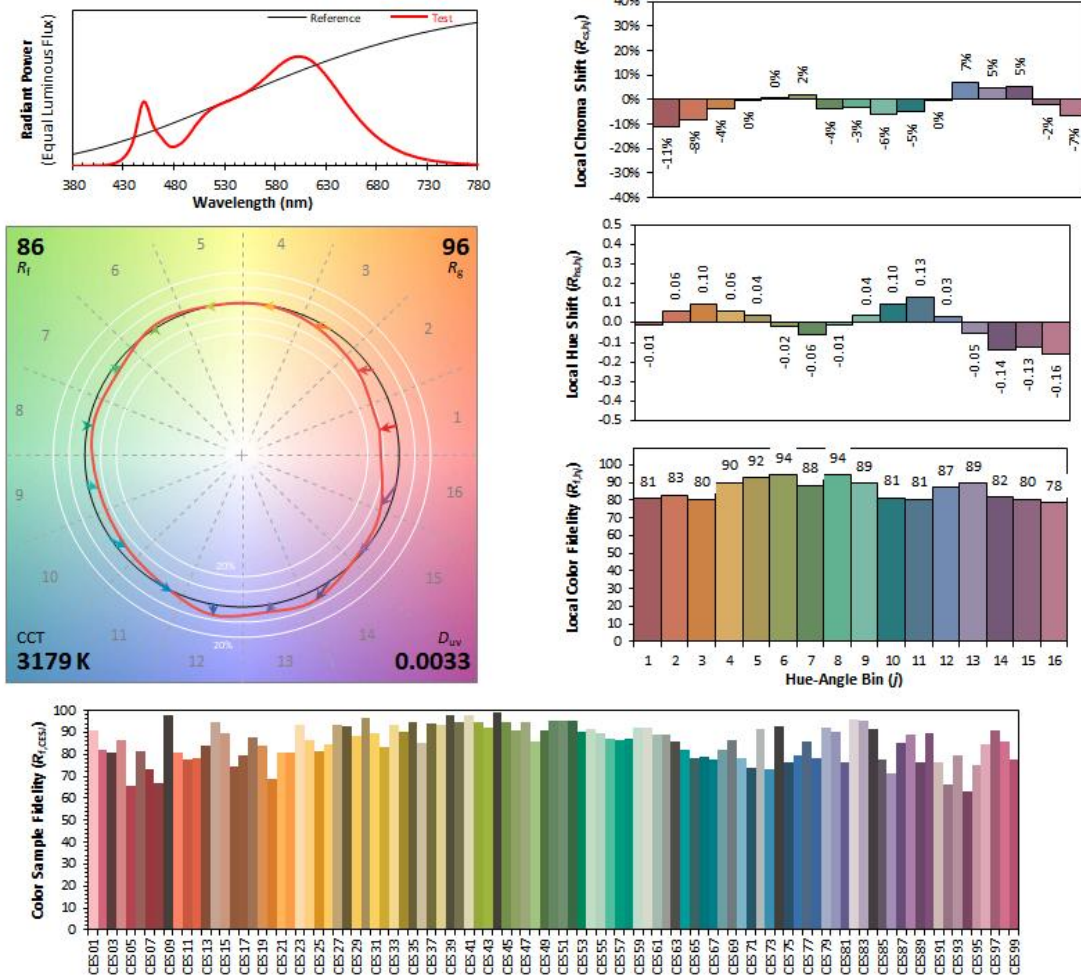
Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0012	0.9723	535	0.5602	455.9477	690	0.3526	286.9550
385	0.0005	0.4458	540	0.5790	471.2345	695	0.3088	251.2935
390	0.0004	0.3210	545	0.5992	487.6207	700	0.2670	217.3343
395	0.0004	0.3420	550	0.6185	503.3816	705	0.2311	188.0410
400	0.0010	0.8215	555	0.6398	520.6800	710	0.1992	162.1468
405	0.0017	1.4123	560	0.6641	540.5009	715	0.1708	139.0192
410	0.0043	3.4969	565	0.6925	563.6277	720	0.1466	119.3360
415	0.0094	7.6223	570	0.7273	591.8971	725	0.1248	101.5615
420	0.0198	16.1481	575	0.7629	620.8739	730	0.1060	86.2655
425	0.0391	31.8161	580	0.8028	653.3405	735	0.0909	73.9388
430	0.0732	59.5531	585	0.8441	686.9544	740	0.0774	63.0148
435	0.1318	107.3048	590	0.8869	721.8192	745	0.0665	54.1255
440	0.2396	195.0109	595	0.9246	752.4908	750	0.0561	45.6567
445	0.4395	357.6485	600	0.9586	780.1862	755	0.0489	39.8067
450	0.5872	477.8924	605	0.9833	800.2724	760	0.0405	32.9811
455	0.5024	408.8377	610	0.9973	811.6514	765	0.0349	28.3695
460	0.3576	291.0611	615	0.9994	813.3742	770	0.0300	24.3801
465	0.2878	234.2123	620	0.9890	804.8934	775	0.0258	21.0326
470	0.2298	187.0566	625	0.9664	786.4807	780	0.0214	17.4060
475	0.1828	148.7384	630	0.9281	755.3556	785	0.0192	15.5931
480	0.1742	141.7396	635	0.8833	718.9062	790	0.0155	12.6315
485	0.1935	157.5115	640	0.8286	674.3934	795	0.0130	10.5673
490	0.2309	187.9396	645	0.7691	625.9384	800	0.0116	9.4145
495	0.2868	233.3985	650	0.7071	575.4709			
500	0.3528	287.1048	655	0.6404	521.1989			
505	0.4122	335.4476	660	0.5771	469.6489			
510	0.4649	378.3224	665	0.5157	419.7040			
515	0.5054	411.3292	670	0.4587	373.3091			
520	0.5361	436.3336	675	0.4035	328.3920			
525	0.5602	455.9477	680	0.3526	286.9550			
530	0.5790	471.2345	685	0.3088	251.2935			

TM30

ANSI/IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.4290
 y 0.4092
 u' 0.2433
 v' 0.5222

CIE 13.3-1995
(CRI)
 R_a 83
 R_g 9

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

Zonal Lumen Tabulation

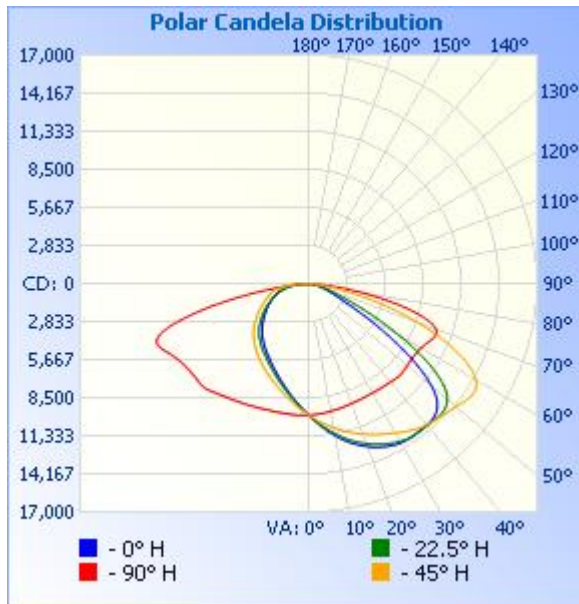
Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	8,296.0	18.8%	18.8%
0-40	14,534.5	33%	33%
0-60	30,200.1	68.5%	68.5%
60-90	13,882.5	31.5%	31.5%
70-100	6,687.5	15.2%	15.2%
90-120	0	0%	0%
0-90	44,082.7	100%	100%
90-180	0	0%	0%
0-180	44,082.7	100%	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	935.2	2.1%	90-100	0	0%
10-20	2,786.4	6.3%	100-110	0	0%
20-30	4,574.5	10.4%	110-120	0	0%
30-40	6,238.5	14.2%	120-130	0	0%
40-50	7,633.8	17.3%	130-140	0	0%
50-60	8,031.8	18.2%	140-150	0	0%
60-70	7,195.0	16.3%	150-160	0	0%
70-80	5,304.5	12.0%	160-170	0	0%
80-90	1,383.0	3.1%	170-180	0	0%

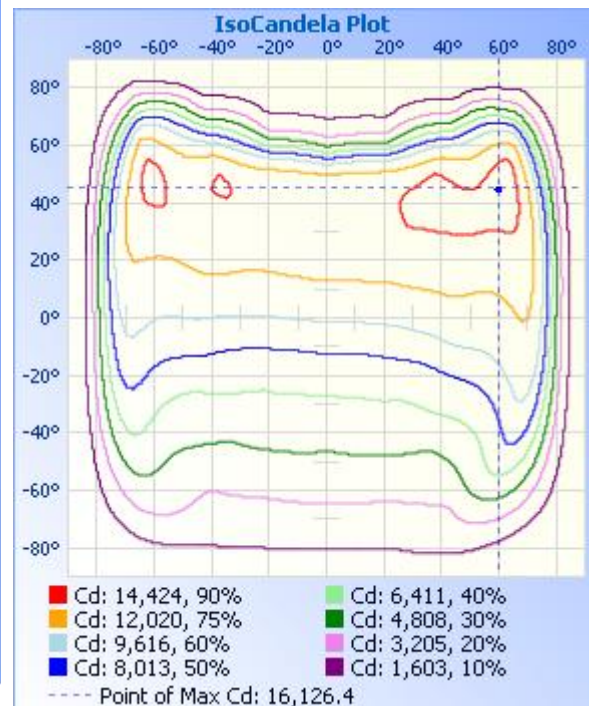
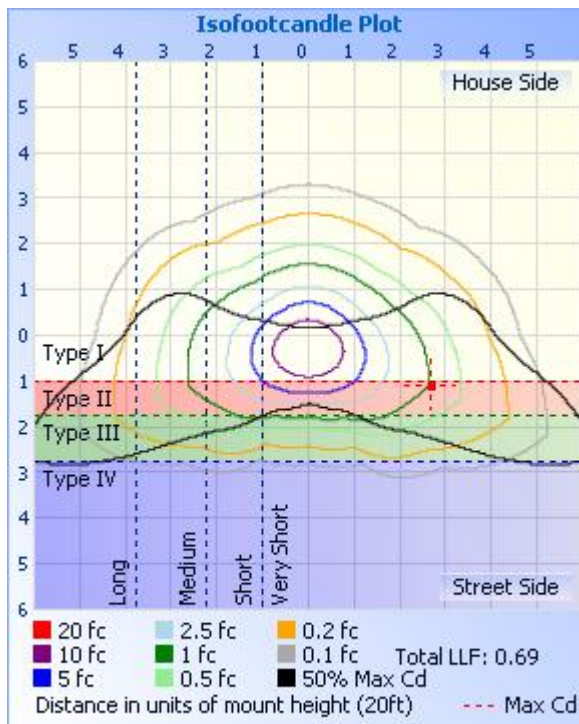
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	33.9 fc	44.3 ft	123.2 ft
34.0ft	8.46 fc	88.6 ft	246.5 ft
51.0ft	3.76 fc	132.9 ft	369.7 ft
68.0ft	2.12 fc	177.2 ft	493.0 ft
85.0ft	1.35 fc	221.5 ft	616.2 ft
102.0ft	0.94 fc	265.7 ft	739.5 ft

■ Vert. Spread: 105.0°
■ Horiz. Spread: 149.2°



Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	9784	9784	9784	9784	9784	9784	9784	9784	9784	9784	9784	9784	9784	9784	9784	9784	9784
1	9955	9936	9895	9840	9776	9712	9658	9627	9621	9634	9671	9727	9792	9854	9907	9944	9955
2	10124	10091	10010	9896	9765	9636	9533	9471	9455	9485	9559	9669	9799	9928	10033	10104	10124
3	10301	10244	10121	9948	9753	9566	9411	9320	9296	9340	9449	9612	9805	10000	10158	10268	10301
4	10472	10403	10236	10001	9740	9492	9292	9172	9139	9194	9336	9552	9810	10071	10284	10428	10472
5	10647	10558	10347	10053	9727	9419	9170	9026	8985	9054	9227	9493	9814	10142	10409	10594	10647
6	10820	10716	10457	10104	9711	9343	9051	8881	8836	8913	9118	9434	9818	10214	10537	10754	10820
7	10993	10872	10573	10156	9693	9269	8935	8738	8687	8776	9009	9376	9819	10283	10663	10916	10993
8	11163	11030	10681	10207	9675	9194	8816	8598	8544	8640	8901	9316	9822	10353	10787	11074	11163
9	11332	11183	10790	10258	9656	9117	8697	8462	8401	8508	8792	9259	9821	10423	10913	11233	11332
10	11500	11335	10895	10309	9636	9042	8583	8327	8261	8382	8687	9198	9825	10499	11038	11391	11500
11	11661	11483	11001	10355	9617	8969	8472	8200	8129	8257	8582	9141	9825	10569	11165	11549	11661
12	11822	11633	11108	10402	9599	8891	8360	8069	7994	8133	8479	9082	9827	10638	11290	11705	11822
13	11975	11779	11214	10451	9581	8816	8253	7945	7868	8009	8381	9023	9832	10709	11413	11852	11975
14	12123	11921	11319	10497	9561	8739	8144	7821	7742	7889	8282	8965	9840	10780	11535	11993	12123
15	12264	12057	11425	10545	9544	8664	8037	7699	7620	7774	8186	8909	9849	10857	11652	12128	12264
16	12403	12188	11529	10593	9527	8594	7933	7579	7502	7659	8093	8855	9859	10935	11774	12263	12403
17	12536	12315	11632	10644	9511	8522	7830	7465	7382	7548	8001	8806	9870	11016	11896	12401	12536
18	12660	12434	11730	10694	9497	8450	7729	7353	7268	7435	7908	8750	9884	11094	12012	12537	12660
19	12782	12550	11827	10747	9482	8378	7631	7245	7156	7330	7818	8701	9901	11178	12126	12662	12782
20	12899	12663	11925	10799	9469	8310	7537	7144	7049	7227	7731	8653	9920	11267	12240	12782	12899
21	13012	12778	12020	10854	9458	8243	7444	7041	6941	7128	7643	8605	9942	11360	12358	12895	13012
22	13111	12888	12109	10909	9449	8176	7350	6938	6836	7028	7558	8560	9963	11453	12470	13002	13111
23	13208	12989	12192	10969	9441	8114	7258	6839	6735	6936	7478	8514	9985	11540	12575	13102	13208
24	13298	13082	12288	11030	9434	8049	7165	6739	6637	6841	7398	8468	10013	11637	12682	13201	13298
25	13385	13174	12382	11093	9429	7986	7081	6645	6542	6752	7316	8424	10039	11733	12795	13303	13385
26	13462	13258	12468	11159	9425	7923	6994	6553	6447	6662	7236	8382	10070	11824	12908	13397	13462
27	13533	13341	12560	11228	9423	7860	6912	6464	6357	6577	7159	8342	10097	11924	13022	13482	13533
28	13597	13421	12649	11299	9421	7800	6828	6379	6269	6493	7086	8303	10130	12027	13131	13574	13597

29	13642	13489	12742	11373	9419	7741	6745	6297	6184	6413	7007	8261	10165	12133	13248	13659	13642
30	13682	13560	12838	11449	9424	7682	6663	6216	6100	6336	6931	8219	10196	12240	13361	13728	13682
31	13715	13622	12932	11526	9425	7622	6579	6137	6019	6258	6856	8178	10229	12355	13479	13776	13715
32	13731	13674	13026	11604	9428	7568	6496	6063	5942	6186	6782	8138	10272	12469	13595	13820	13731
33	13743	13709	13132	11686	9431	7508	6418	5989	5864	6113	6707	8097	10313	12583	13712	13853	13743
34	13743	13729	13232	11770	9438	7451	6336	5916	5789	6042	6630	8058	10351	12700	13827	13882	13743
35	13740	13746	13327	11860	9449	7397	6259	5847	5712	5971	6559	8019	10389	12818	13945	13898	13740
36	13727	13758	13418	11951	9461	7340	6178	5780	5633	5904	6479	7984	10427	12948	14048	13916	13727
37	13719	13761	13504	12053	9472	7283	6099	5712	5555	5833	6405	7953	10483	13082	14145	13931	13719
38	13717	13764	13578	12162	9491	7226	6019	5642	5477	5760	6329	7922	10540	13224	14223	13948	13717
39	13715	13768	13647	12276	9507	7170	5940	5571	5394	5687	6251	7892	10595	13371	14291	13964	13715
40	13723	13781	13707	12383	9529	7119	5858	5502	5315	5614	6174	7864	10646	13513	14368	13983	13723
41	13721	13791	13761	12500	9552	7065	5779	5426	5235	5540	6095	7844	10713	13655	14423	14006	13721
42	13694	13799	13805	12628	9572	7015	5697	5351	5151	5463	6014	7825	10784	13795	14471	14028	13694
43	13643	13819	13855	12746	9600	6963	5612	5272	5067	5388	5936	7799	10854	13912	14526	14045	13643
44	13576	13838	13903	12840	9621	6910	5527	5192	4983	5305	5859	7766	10912	13993	14569	14055	13576
45	13456	13840	13947	12916	9624	6849	5443	5103	4892	5217	5781	7727	10957	14064	14619	14049	13456
46	13298	13817	13993	12975	9626	6784	5359	5013	4804	5128	5700	7673	10981	14103	14679	14018	13298
47	13097	13784	14052	13016	9609	6711	5273	4924	4714	5040	5615	7614	10982	14131	14741	13952	13097
48	12832	13728	14117	13052	9590	6634	5190	4829	4625	4948	5529	7548	10975	14149	14813	13848	12832
49	12477	13624	14191	13076	9569	6551	5099	4730	4535	4848	5434	7480	10960	14185	14880	13696	12477
50	12020	13474	14260	13098	9546	6464	5007	4629	4443	4751	5338	7414	10957	14217	14976	13472	12020
51	11478	13260	14352	13132	9531	6376	4916	4529	4354	4651	5238	7345	10954	14242	15056	13167	11478
52	10863	12968	14447	13167	9514	6290	4817	4426	4261	4549	5137	7285	10959	14273	15131	12779	10863
53	10177	12595	14536	13203	9501	6205	4718	4325	4168	4451	5036	7226	10969	14317	15188	12296	10177
54	9433	12136	14619	13241	9502	6126	4617	4222	4078	4350	4932	7173	10972	14372	15233	11727	9433
55	8624	11590	14682	13291	9497	6044	4513	4121	3988	4248	4830	7124	11001	14420	15241	11074	8624
56	7805	10975	14725	13358	9508	5962	4407	4020	3900	4144	4728	7086	11038	14482	15217	10340	7805
57	6991	10297	14730	13429	9525	5885	4300	3918	3811	4041	4627	7053	11081	14556	15138	9555	6991
58	6212	9557	14684	13513	9548	5813	4196	3817	3725	3934	4524	7025	11129	14637	14986	8734	6212
59	5479	8790	14573	13611	9581	5740	4089	3715	3638	3827	4420	7012	11189	14727	14764	7898	5479

60	4793	8001	14389	13720	9632	5672	3981	3613	3551	3722	4319	7003	11259	14823	14468	7054	4793
61	4198	7200	14129	13843	9690	5607	3875	3514	3466	3617	4217	7010	11335	14927	14089	6245	4198
62	3675	6429	13789	13975	9750	5541	3771	3414	3382	3508	4117	7027	11436	15054	13626	5495	3675
63	3234	5676	13357	14117	9826	5487	3664	3315	3296	3404	4018	7062	11554	15191	13107	4808	3234
64	2864	4991	12859	14275	9916	5435	3557	3217	3213	3298	3919	7113	11680	15333	12519	4197	2864
65	2542	4364	12304	14452	9997	5390	3453	3121	3131	3192	3822	7174	11812	15484	11857	3648	2542
66	2282	3793	11698	14655	10085	5349	3344	3025	3046	3087	3724	7255	11943	15640	11143	3182	2282
67	2086	3301	11060	14864	10157	5310	3239	2928	2960	2982	3628	7341	12059	15804	10369	2784	2086
68	1890	2883	10376	15091	10202	5272	3134	2833	2876	2879	3534	7420	12134	15943	9560	2454	1890
69	1695	2527	9677	15312	10196	5237	3031	2737	2790	2776	3445	7474	12128	16058	8731	2214	1695
70	1545	2273	8942	15495	10117	5204	2927	2636	2705	2673	3357	7469	12005	16126	7885	1975	1545
71	1414	2018	8180	15583	9946	5166	2822	2537	2621	2570	3273	7382	11746	16104	7089	1736	1414
72	1293	1764	7411	15549	9657	5087	2720	2436	2537	2466	3189	7194	11316	15978	6316	1555	1293
73	1182	1575	6646	15385	9256	5007	2619	2340	2451	2363	3106	6897	10736	15731	5596	1398	1182
74	1078	1408	5889	15104	8755	4928	2521	2244	2365	2260	3025	6502	10007	15331	4908	1257	1078
75	982	1262	5149	14730	8145	4766	2421	2146	2273	2157	2944	6046	9188	14786	4251	1129	982
76	891	1131	4419	14271	7455	4546	2319	2049	2174	2057	2861	5530	8295	14057	3624	1016	891
77	802	1014	3726	13675	6701	4296	2212	1953	2065	1952	2770	5015	7325	13098	3025	909	802
78	720	903	3077	12885	5910	4007	2099	1852	1939	1848	2667	4499	6340	11969	2500	814	720
79	641	805	2513	11919	5119	3686	1979	1748	1800	1744	2546	3952	5341	10616	2115	723	641
80	566	712	2113	10706	4329	3338	1846	1639	1649	1644	2406	3408	4400	9049	1731	640	566
81	494	628	1713	9300	3573	2965	1694	1531	1492	1543	2244	2833	3505	7385	1346	563	494
82	423	549	1314	7788	2875	2566	1540	1419	1328	1435	2067	2283	2717	5799	1080	490	423
83	356	475	1041	6271	2235	2151	1394	1293	1158	1315	1864	1804	2194	4391	857	419	356
84	290	403	811	4814	1676	1743	1247	1152	987	1180	1629	1388	1676	3181	660	351	290
85	231	331	611	3509	1169	1306	1081	1005	816	1032	1377	1020	1158	2231	494	284	231
86	173	263	446	2424	861	897	887	838	656	876	1097	741	820	1636	350	222	173
87	115	202	297	1727	553	629	644	645	495	624	767	461	539	1041	232	159	115
88	65	140	208	1030	246	361	402	453	335	371	436	185	321	446	145	96	65
89	23	78	119	333	92	98	162	261	191	118	105	51	221	300	58	39	23
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
151	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
154	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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179	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

BUG Rating

Lum. Classification System (LCS)

<u>LCS Zone</u>	<u>Lumens</u>	<u>%Lamp</u>	<u>%Lum</u>
FL (0-30)	4940.4	11.2	11.2
FM (30-60)	14721.7	33.4	33.4
FH (60-80)	7984.4	18.1	18.1
FVH (80-90)	757.0	1.7	1.7
BL (0-30)	3355.4	7.6	7.6
BM (30-60)	7186.1	16.3	16.3
BH (60-80)	4513.9	10.2	10.2
BVH(80-90)	625.8	1.4	1.4
UL (90-100)	0.0	0.0	0.0
UH (100-180)	0.0	0.0	0.0
Total	44084.7	99.9	100.0
BUG Rating	B4-U0-G5		

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2024-03-12	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	AL22-300 (Setting at 3000K T4)	Operation time(min)	110

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTU250301	120.0	60	2.437	290.72	0.994	8.61
4E-C1	277.0	60	1.077	281.95	0.945	9.59
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

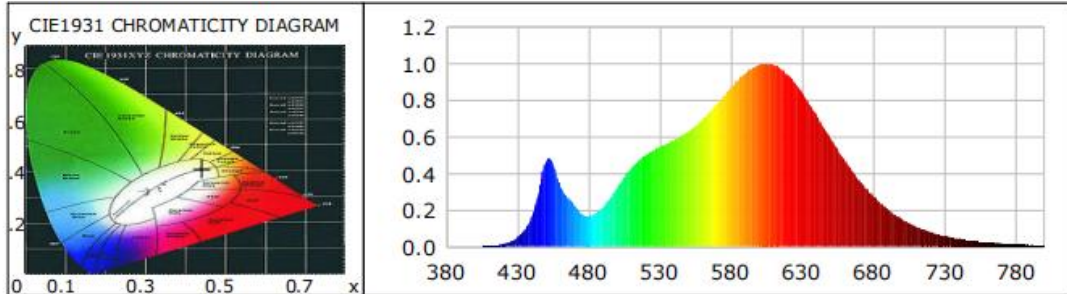
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	8
Frequency (Hz)	60	R2	90	R10	77
CCT (K)	3031	R3	98	R11	82
Duv	0.0041	R4	82	R12	66
Chromaticity (x, y)	x=0.4408 y=0.4159	R5	81	R13	83
Chromaticity (u', v')	u'=0.248 v'=0.5265	R6	88	R14	99
Color Rendering Index (CRI)	83	R7	85	R15	73
R9	8	R8	61	--	--
Rf	86	--	--	--	--
Rg	94	--	--	--	--
Rcs,h1(%)	-11				

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	45855.3	45513.6	>=10000(-10%)
Luminous Efficacy (lm/W)	157.73	161.42	Premium: >= 120(-3%)
Most worst Luminous/Highest Watts	156.55		
Zonal lumens in the 0-90° zone (%)	100	--	Category 1: >=100(-1) Category 2: >=85(-3)
Zonal lumens in the 80-90°zone (%)	5.4	--	<=10(+3)
Beam Angle (°)	141.0	--	--
Center Beam Candle Power (cd)	8677	--	--

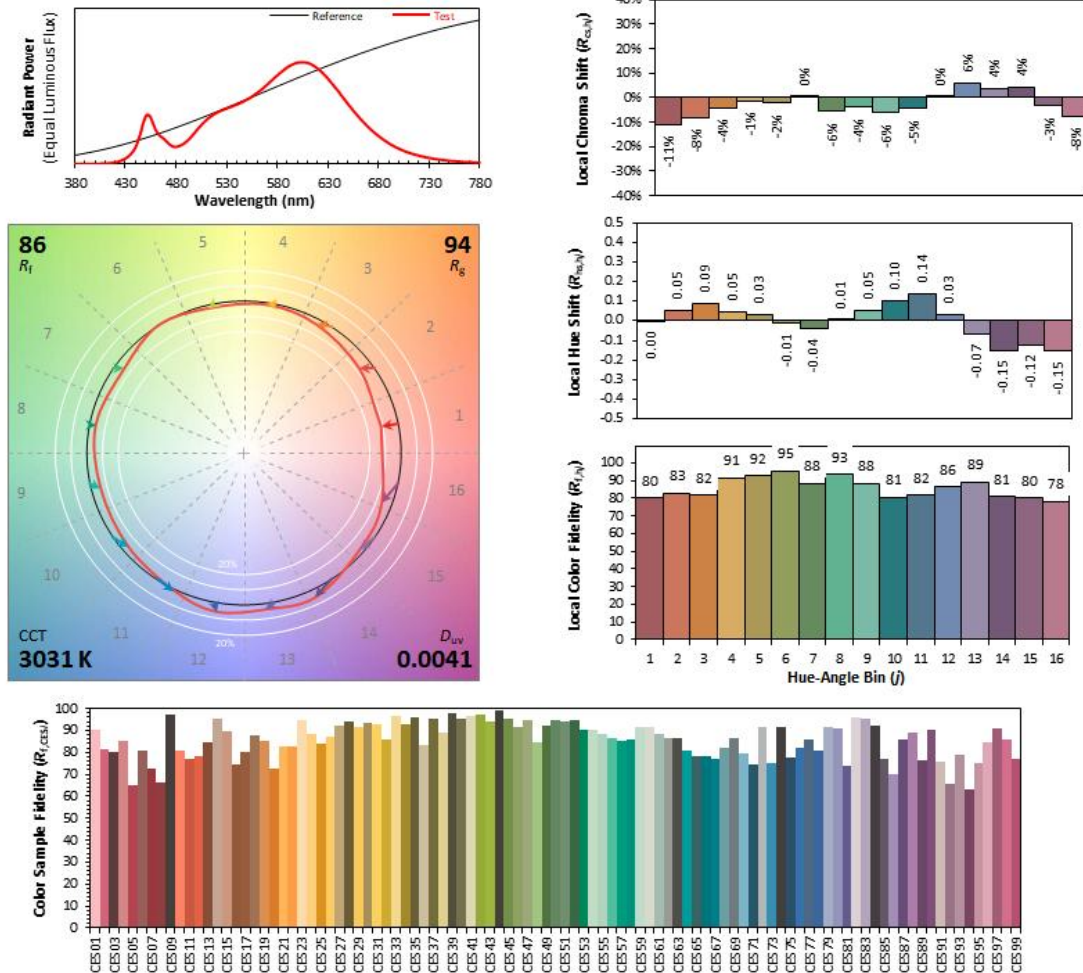
Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0005	0.4091	535	0.5248	445.7085	690	0.3616	307.1003
385	0.0005	0.4207	540	0.5440	462.0492	695	0.3151	267.5936
390	0.0002	0.2123	545	0.5637	478.7569	700	0.2741	232.7486
395	0.0006	0.5238	550	0.5829	495.0524	705	0.2370	201.2548
400	0.0006	0.4992	555	0.6057	514.4323	710	0.2039	173.1724
405	0.0014	1.1873	560	0.6312	536.0675	715	0.1750	148.6267
410	0.0031	2.6062	565	0.6609	561.2545	720	0.1495	126.9967
415	0.0071	6.0593	570	0.6966	591.6184	725	0.1277	108.4158
420	0.0147	12.5269	575	0.7350	624.2553	730	0.1092	92.7412
425	0.0282	23.9113	580	0.7781	660.8493	735	0.0940	79.8465
430	0.0526	44.6312	585	0.8247	700.3623	740	0.0802	68.0951
435	0.0928	78.7896	590	0.8690	738.0307	745	0.0681	57.8218
440	0.1635	138.8410	595	0.9110	773.6813	750	0.0577	49.0344
445	0.3041	258.2769	600	0.9495	806.3771	755	0.0491	41.6791
450	0.4658	395.5668	605	0.9765	829.2810	760	0.0422	35.8219
455	0.4537	385.3181	610	0.9953	845.2923	765	0.0360	30.5606
460	0.3327	282.5568	615	0.9994	848.7453	770	0.0306	26.0017
465	0.2694	228.7555	620	0.9944	844.5248	775	0.0263	22.3611
470	0.2266	192.4838	625	0.9708	824.4640	780	0.0228	19.3983
475	0.1812	153.9055	630	0.9372	795.9523	785	0.0185	15.6952
480	0.1675	142.2707	635	0.8927	758.1274	790	0.0164	13.9204
485	0.1841	156.3354	640	0.8391	712.6684	795	0.0140	11.8535
490	0.2161	183.4964	645	0.7791	661.6369	800	0.0116	9.8494
495	0.2648	224.9231	650	0.7181	609.8318			
500	0.3246	275.7144	655	0.6509	552.7807			
505	0.3817	324.1301	660	0.5875	498.9397			
510	0.4310	366.0601	665	0.5252	446.0416			
515	0.4702	399.3337	670	0.4669	396.5462			
520	0.5004	425.0146	675	0.4132	350.9224			
525	0.5248	445.7085	680	0.3616	307.1003			
530	0.5440	462.0492	685	0.3151	267.5936			

TM30

ANSI/IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4408	CIE 13.3-1995 (CRI) R_a 83 R_g 8
y	0.4159	
u'	0.2480	
v'	0.5265	

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

Zonal Lumen Tabulation

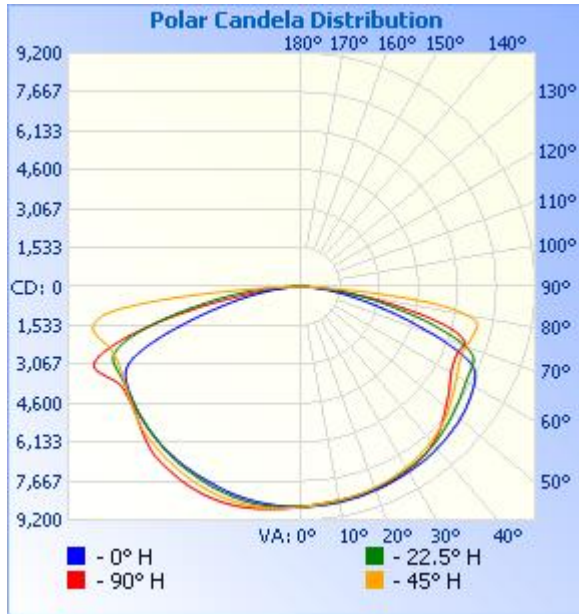
Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	7,263.9	17.1%	17.1%
0-40	12,563.7	29.6%	29.6%
0-60	25,903.8	61.1%	61.1%
60-90	16,474.1	38.9%	38.9%
70-100	8,969.1	21.2%	21.2%
90-120	0	0%	0%
0-90	42,377.9	100%	100%
90-180	0	0%	0%
0-180	42,377.9	100%	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	828.5	2.0%	90-100	0	0%
10-20	2,457.7	5.8%	100-110	0	0%
20-30	3,977.8	9.4%	110-120	0	0%
30-40	5,299.7	12.5%	120-130	0	0%
40-50	6,332.9	14.9%	130-140	0	0%
50-60	7,007.3	16.5%	140-150	0	0%
60-70	7,505.0	17.7%	150-160	0	0%
70-80	6,671.5	15.7%	160-170	0	0%
80-90	2,297.6	5.4%	170-180	0	0%

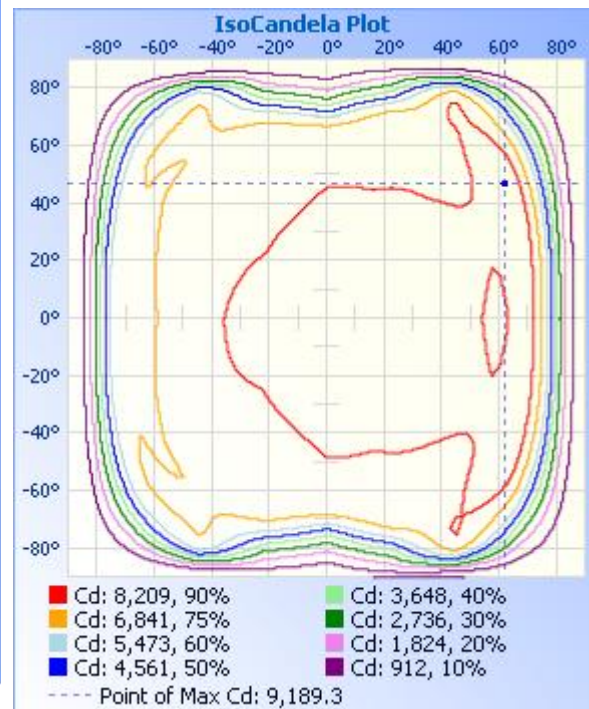
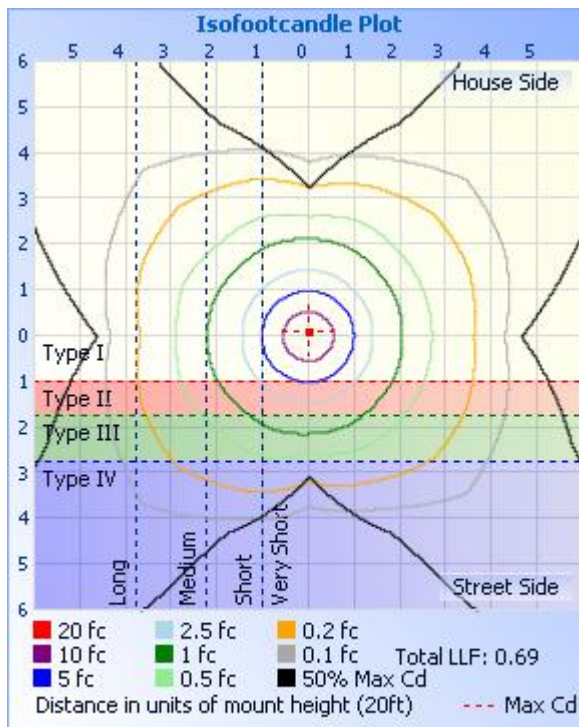
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	30.0 fc	107.5 ft	119.6 ft
34.0ft	7.51 fc	215.1 ft	239.3 ft
51.0ft	3.34 fc	322.6 ft	358.9 ft
68.0ft	1.88 fc	430.1 ft	478.5 ft
85.0ft	1.20 fc	537.6 ft	598.1 ft
102.0ft	0.83 fc	645.2 ft	717.8 ft

■ Vert. Spread: 144.9°
■ Horiz. Spread: 148.3°



Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677
1	8673	8666	8664	8657	8658	8658	8663	8669	8679	8686	8695	8697	8697	8691	8686	8680	8673
2	8668	8655	8646	8640	8643	8642	8651	8664	8681	8698	8712	8718	8716	8709	8699	8685	8668
3	8664	8645	8632	8623	8626	8626	8639	8659	8682	8707	8730	8739	8739	8730	8708	8687	8664
4	8660	8635	8616	8606	8609	8612	8629	8653	8684	8716	8745	8759	8759	8747	8718	8691	8660
5	8655	8624	8602	8591	8594	8598	8618	8646	8682	8727	8763	8781	8781	8762	8729	8693	8655
6	8649	8614	8591	8578	8582	8586	8606	8639	8681	8735	8778	8806	8801	8779	8741	8695	8649
7	8643	8605	8577	8563	8572	8573	8597	8631	8679	8739	8794	8827	8824	8796	8749	8694	8643
8	8639	8595	8565	8554	8562	8562	8586	8621	8675	8745	8807	8848	8848	8815	8759	8694	8639
9	8632	8584	8554	8544	8555	8554	8576	8613	8673	8750	8818	8868	8866	8832	8767	8694	8632
10	8626	8574	8544	8535	8549	8547	8567	8605	8669	8753	8830	8887	8889	8846	8776	8691	8626
11	8616	8563	8535	8524	8544	8538	8559	8596	8664	8754	8838	8907	8912	8861	8782	8691	8616
12	8608	8552	8525	8516	8536	8532	8549	8588	8659	8754	8847	8924	8932	8876	8787	8686	8608
13	8597	8543	8516	8509	8535	8528	8538	8580	8654	8753	8859	8939	8953	8891	8792	8683	8597
14	8591	8531	8507	8502	8531	8523	8531	8570	8644	8749	8865	8952	8975	8904	8792	8677	8591
15	8584	8520	8496	8495	8526	8520	8519	8560	8636	8742	8868	8967	8990	8917	8793	8669	8584
16	8576	8505	8485	8489	8521	8515	8510	8548	8626	8735	8870	8980	9007	8929	8792	8659	8576
17	8564	8493	8472	8483	8517	8507	8502	8533	8617	8722	8873	8995	9021	8940	8790	8650	8564
18	8550	8480	8460	8477	8511	8502	8492	8521	8610	8712	8874	9006	9034	8949	8785	8637	8550
19	8540	8471	8445	8466	8503	8494	8480	8509	8601	8699	8869	9016	9043	8953	8782	8625	8540
20	8531	8458	8430	8456	8497	8485	8467	8495	8588	8687	8865	9022	9052	8958	8777	8609	8531
21	8522	8448	8415	8441	8486	8479	8453	8478	8574	8677	8861	9027	9054	8962	8772	8597	8522
22	8517	8436	8397	8430	8478	8472	8438	8466	8557	8665	8855	9029	9057	8965	8765	8584	8517
23	8505	8419	8381	8419	8470	8469	8421	8448	8542	8654	8846	9028	9057	8968	8757	8571	8505
24	8497	8405	8365	8406	8460	8460	8406	8430	8530	8641	8836	9028	9057	8966	8749	8559	8497
25	8483	8389	8345	8389	8454	8448	8387	8414	8520	8623	8824	9027	9056	8965	8738	8543	8483
26	8471	8379	8328	8371	8442	8433	8366	8398	8509	8606	8813	9026	9051	8963	8728	8528	8471
27	8464	8362	8303	8352	8432	8418	8345	8383	8497	8589	8807	9019	9044	8958	8717	8517	8464
28	8455	8346	8280	8332	8418	8404	8321	8372	8491	8577	8795	9011	9038	8952	8704	8505	8455



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29	8444	8334	8253	8312	8399	8389	8298	8361	8483	8566	8778	9006	9028	8945	8688	8496	8444
30	8434	8318	8229	8290	8379	8371	8274	8347	8473	8548	8765	8997	9016	8934	8671	8487	8434
31	8425	8302	8208	8268	8351	8350	8253	8336	8464	8531	8750	8985	9005	8924	8656	8474	8425
32	8413	8286	8185	8242	8325	8324	8230	8323	8456	8522	8734	8970	8992	8912	8645	8459	8413
33	8402	8272	8156	8214	8300	8303	8204	8308	8447	8508	8717	8956	8974	8901	8630	8443	8402
34	8395	8254	8132	8181	8274	8275	8184	8288	8434	8494	8702	8939	8952	8889	8617	8428	8395
35	8391	8236	8107	8152	8241	8247	8157	8272	8417	8477	8679	8919	8933	8878	8605	8421	8391
36	8378	8212	8075	8121	8212	8216	8132	8254	8403	8462	8658	8904	8916	8865	8587	8408	8378
37	8361	8187	8047	8089	8182	8185	8101	8233	8389	8446	8643	8890	8902	8851	8568	8387	8361
38	8347	8162	8019	8057	8148	8150	8073	8212	8379	8424	8630	8873	8882	8834	8552	8376	8347
39	8330	8134	7987	8024	8105	8116	8037	8189	8366	8406	8611	8859	8863	8818	8537	8361	8330
40	8313	8103	7955	7990	8058	8081	8004	8163	8352	8383	8590	8846	8845	8812	8522	8338	8313
41	8294	8076	7918	7953	8016	8042	7967	8134	8342	8363	8569	8836	8822	8803	8503	8319	8294
42	8283	8045	7889	7918	7965	8003	7935	8109	8325	8343	8547	8820	8786	8791	8485	8303	8283
43	8273	8014	7855	7879	7906	7967	7895	8078	8306	8318	8524	8797	8745	8775	8464	8285	8273
44	8251	7984	7815	7839	7843	7923	7853	8053	8285	8293	8510	8774	8697	8752	8446	8268	8251
45	8231	7953	7781	7789	7777	7868	7819	8018	8270	8276	8494	8742	8643	8719	8428	8250	8231
46	8215	7918	7740	7736	7700	7816	7781	7990	8260	8254	8476	8702	8588	8687	8414	8227	8215
47	8192	7889	7700	7680	7629	7759	7744	7960	8240	8229	8455	8658	8536	8651	8391	8211	8192
48	8180	7858	7647	7629	7560	7702	7702	7930	8221	8207	8428	8615	8475	8612	8362	8195	8180
49	8165	7823	7600	7572	7495	7641	7647	7896	8205	8185	8392	8575	8419	8578	8330	8181	8165
50	8143	7793	7548	7515	7421	7582	7595	7863	8172	8164	8357	8534	8363	8538	8289	8160	8143
51	8119	7761	7498	7456	7355	7525	7547	7840	8161	8142	8314	8497	8312	8500	8251	8140	8119
52	8095	7728	7449	7396	7293	7469	7492	7805	8146	8123	8276	8456	8270	8469	8213	8119	8095
53	8075	7697	7404	7346	7228	7411	7439	7768	8118	8097	8233	8418	8228	8437	8176	8096	8075
54	8044	7666	7351	7290	7170	7353	7387	7733	8096	8074	8191	8387	8194	8409	8131	8078	8044
55	8008	7633	7300	7232	7106	7293	7343	7708	8059	8049	8153	8363	8164	8379	8097	8058	8008
56	7981	7600	7250	7189	7034	7238	7292	7676	8032	8034	8116	8341	8136	8359	8057	8037	7981
57	7946	7570	7204	7137	6973	7185	7240	7655	8000	8017	8082	8322	8118	8342	8024	8026	7946
58	7914	7538	7152	7092	6909	7136	7189	7628	7978	7997	8048	8310	8104	8336	7990	8007	7914
59	7875	7512	7110	7042	6849	7080	7143	7601	7955	7981	8008	8307	8098	8329	7954	7989	7875



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60	7842	7484	7067	7003	6801	7033	7095	7580	7921	7968	7978	8308	8090	8327	7919	7977	7842
61	7804	7465	7025	6964	6758	6985	7053	7567	7883	7954	7944	8316	8111	8338	7884	7971	7804
62	7753	7448	6988	6925	6735	6946	7010	7548	7846	7951	7914	8323	8156	8360	7857	7974	7753
63	7689	7440	6947	6891	6714	6910	6976	7541	7796	7951	7891	8352	8223	8390	7843	7978	7689
64	7600	7430	6914	6869	6694	6877	6938	7534	7718	7954	7865	8391	8315	8437	7822	7991	7600
65	7457	7425	6888	6855	6679	6851	6910	7537	7618	7962	7849	8443	8434	8507	7804	8017	7457
66	7229	7412	6874	6841	6674	6838	6885	7534	7451	7978	7835	8529	8549	8590	7798	8053	7229
67	6904	7377	6858	6824	6681	6826	6877	7526	7223	7987	7831	8622	8663	8704	7805	8087	6904
68	6474	7285	6856	6813	6717	6811	6865	7492	6882	7995	7828	8735	8752	8833	7812	8112	6474
69	6031	7116	6872	6809	6762	6806	6870	7404	6495	7966	7834	8872	8769	8977	7837	8083	6031
70	5567	6861	6896	6816	6796	6818	6880	7265	6060	7891	7853	8992	8678	9115	7869	7972	5567
71	5053	6562	6925	6838	6793	6851	6910	7048	5588	7731	7886	9082	8450	9189	7921	7774	5053
72	4589	6151	6960	6871	6711	6910	6948	6757	5058	7512	7928	9114	8115	9189	7992	7497	4589
73	4135	5733	6992	6902	6511	6961	6985	6400	4589	7214	7989	9032	7643	9074	8081	7097	4135
74	3723	5314	7025	6902	6219	6978	7011	5952	4146	6854	8067	8790	7122	8782	8201	6634	3723
75	3290	4840	7040	6829	5829	6917	7034	5512	3738	6399	8168	8454	6510	8386	8313	6164	3290
76	2927	4358	7073	6666	5333	6798	7046	5050	3347	5926	8264	8007	5890	7885	8418	5623	2927
77	2589	3885	7098	6403	4793	6529	7053	4592	2961	5449	8343	7495	5228	7309	8512	5074	2589
78	2268	3470	7087	6038	4169	6154	7046	4096	2626	4954	8397	6854	4509	6671	8557	4543	2268
79	1970	3074	6989	5520	3613	5678	6999	3676	2315	4476	8383	6215	3875	5926	8480	4067	1970
80	1676	2713	6723	4987	3083	5132	6876	3278	2033	3981	8288	5548	3251	5228	8280	3595	1676
81	1424	2312	6318	4407	2520	4485	6658	2904	1738	3559	8135	4862	2657	4514	7945	3188	1424
82	1198	1960	5768	3687	2028	3829	6297	2488	1493	3148	7831	4092	2177	3746	7338	2751	1198
83	964	1671	5010	3050	1603	3150	5772	2130	1256	2759	7287	3385	1731	3041	6486	2362	964
84	763	1378	3905	2458	1221	2511	4850	1811	1036	2362	6323	2669	1357	2390	5343	2017	763
85	580	1103	2798	1834	850	1832	3704	1521	832	2014	5068	2018	1052	1807	3965	1647	580
86	410	839	1717	1235	502	1255	2630	1245	634	1673	3625	1463	743	1251	2529	1290	410
87	234	497	683	644	246	752	1537	951	462	1358	2266	986	503	821	1423	877	234
88	93	160	157	174	59	269	562	591	276	962	1202	583	298	441	620	417	93
89	25	35	47	42	28	40	87	233	90	446	441	254	138	177	169	59	25
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178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

BUG Rating

Lum. Classification System (LCS)

<u>LCS Zone</u>	<u>Lumens</u>	<u>%Lamp</u>	<u>%Lum</u>
FL (0-30)	4471.9	9.8	9.8
FM (30-60)	12742.9	27.8	27.8
FH (60-80)	7921.0	17.3	17.3
FVH (80-90)	971.7	2.1	2.1
BL (0-30)	3674.1	8.0	8.0
BM (30-60)	8895.9	19.4	19.4
BH (60-80)	6302.6	13.7	13.7
BVH(80-90)	875.2	1.9	1.9
UL (90-100)	0.0	0.0	0.0
UH (100-180)	0.0	0.0	0.0
Total	45855.3	100.0	100.0
BUG Rating	B5-U0-G5		

2.3 Electrical, Photometric and Chromaticity Measurements
(Refer to Work Instruction BL-QP-033)

Test date	2024-03-12	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	AL22-300 (Setting at 3000K T5)	Operation time(min)	110

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTU250301	120.0	60	2.522	300.87	0.994	8.56
4E-C1	277.0	60	1.111	291.06	0.946	9.63
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

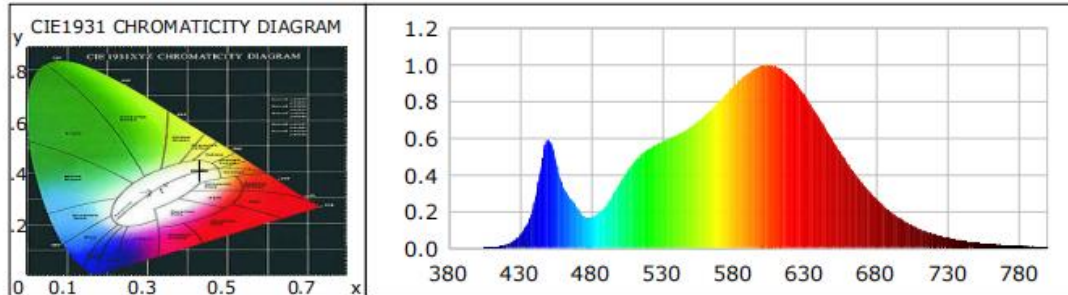
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	9
Frequency (Hz)	60	R2	89	R10	75
CCT (K)	3174	R3	97	R11	83
Duv	0.0035	R4	83	R12	65
Chromaticity (x, y)	x=0.4297 y=0.4101	R5	81	R13	83
Chromaticity (u', v')	u'=0.2434 v'=0.5226	R6	87	R14	98
Color Rendering Index (CRI)	83	R7	86	R15	73
R9	9	R8	62	--	--
Rf	86	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-11				

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	42378.8	42192.2	>=10000(-10%)
Luminous Efficacy (lm/W)	140.85	144.96	Premium: >= 120(-3%)
Most worst Luminous/Highest Watts	140.23		
Zonal lumens in the 0-90° zone (%)	100	--	Category 1: >=100(-1) Category 2: >=85(-3)
Zonal lumens in the 80-90°zone (%)	5.4	--	<=10(+3)
Beam Angle (°)	150.7	--	--
Center Beam Candle Power (cd)	8677	--	--

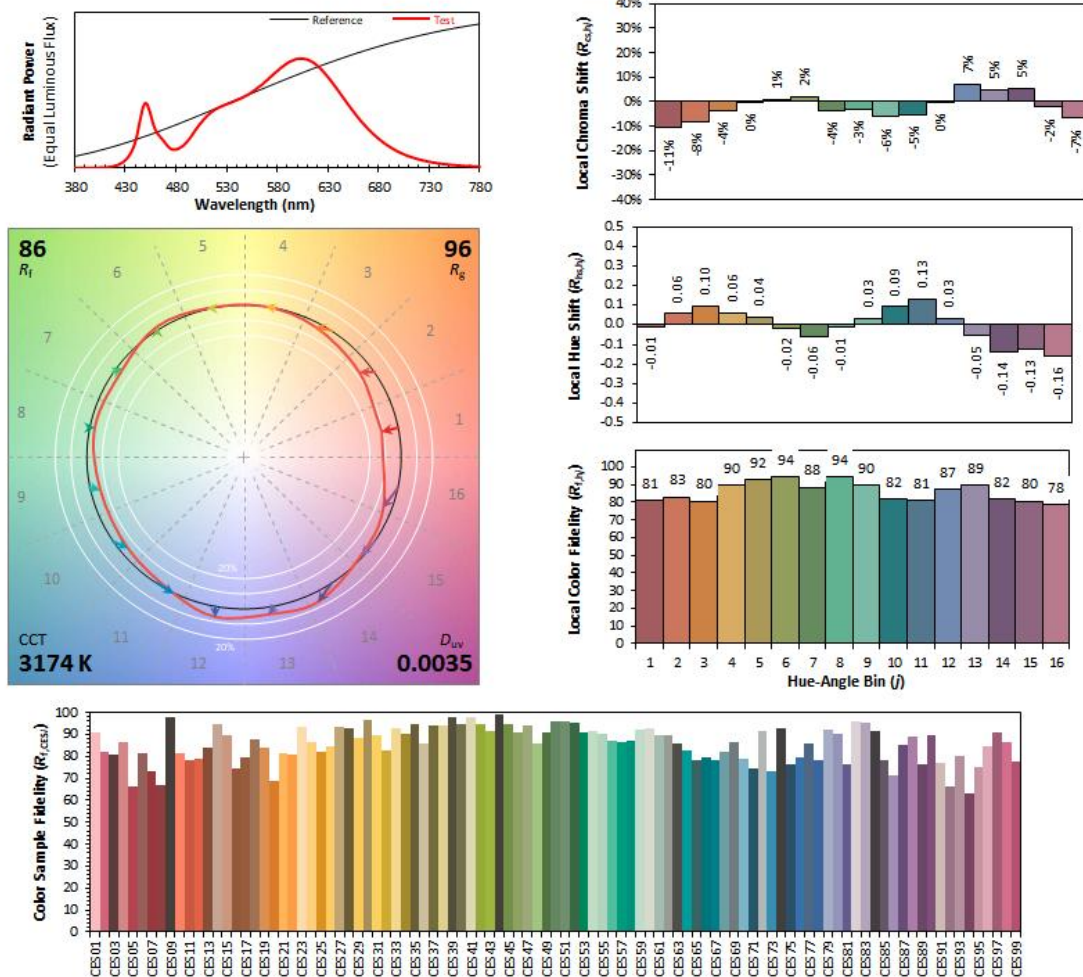
Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0011	0.9257	535	0.5627	464.1089	690	0.3531	291.2465
385	0.0005	0.3850	540	0.5815	479.5589	695	0.3082	254.1546
390	0.0004	0.3170	545	0.5999	494.7423	700	0.2679	220.9620
395	0.0006	0.5168	550	0.6187	510.3056	705	0.2310	190.5347
400	0.0007	0.5743	555	0.6390	527.0203	710	0.1997	164.7395
405	0.0015	1.2097	560	0.6637	547.4054	715	0.1703	140.4865
410	0.0035	2.8902	565	0.6917	570.4878	720	0.1459	120.3694
415	0.0088	7.2257	570	0.7272	599.7306	725	0.1248	102.9506
420	0.0182	15.0274	575	0.7616	628.1595	730	0.1058	87.2683
425	0.0372	30.6398	580	0.8010	660.6268	735	0.0897	73.9991
430	0.0704	58.0549	585	0.8436	695.7613	740	0.0765	63.1305
435	0.1310	108.0303	590	0.8847	729.6689	745	0.0657	54.2100
440	0.2462	203.0548	595	0.9234	761.5756	750	0.0554	45.6805
445	0.4576	377.3660	600	0.9589	790.8479	755	0.0466	38.3997
450	0.5925	488.6660	605	0.9807	808.8364	760	0.0404	33.3136
455	0.4839	399.0947	610	0.9967	822.0690	765	0.0344	28.4018
460	0.3407	280.9531	615	0.9976	822.7516	770	0.0293	24.2033
465	0.2767	228.1928	620	0.9901	816.6041	775	0.0249	20.5256
470	0.2187	180.3713	625	0.9656	796.4150	780	0.0210	17.3313
475	0.1731	142.7953	630	0.9317	768.4200	785	0.0178	14.7217
480	0.1681	138.6415	635	0.8861	730.8501	790	0.0158	13.0216
485	0.1897	156.4765	640	0.8315	685.7534	795	0.0129	10.6158
490	0.2290	188.8511	645	0.7716	636.4097	800	0.0108	8.9212
495	0.2882	237.6931	650	0.7085	584.3437			
500	0.3551	292.8973	655	0.6439	531.0458			
505	0.4163	343.3319	660	0.5790	477.5175			
510	0.4687	386.5621	665	0.5179	427.1174			
515	0.5083	419.1935	670	0.4590	378.5492			
520	0.5394	444.8717	675	0.4038	333.0377			
525	0.5627	464.1089	680	0.3531	291.2465			
530	0.5815	479.5589	685	0.3082	254.1546			

TM30

ANSI/IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.4297
 y 0.4101
 z' 0.2434
 v' 0.5226

CIE 13.3-1995
(CRI)

R_a 83
 R_g 9

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

Zonal Lumen Tabulation

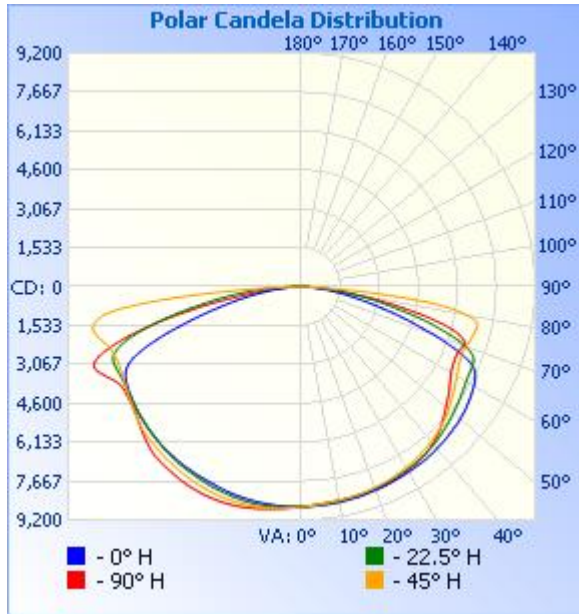
Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	7,263.9	17.1%	17.1%
0-40	12,563.7	29.6%	29.6%
0-60	25,903.8	61.1%	61.1%
60-90	16,474.1	38.9%	38.9%
70-100	8,969.1	21.2%	21.2%
90-120	0	0%	0%
0-90	42,377.9	100%	100%
90-180	0	0%	0%
0-180	42,377.9	100%	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	828.5	2.0%	90-100	0	0%
10-20	2,457.7	5.8%	100-110	0	0%
20-30	3,977.8	9.4%	110-120	0	0%
30-40	5,299.7	12.5%	120-130	0	0%
40-50	6,332.9	14.9%	130-140	0	0%
50-60	7,007.3	16.5%	140-150	0	0%
60-70	7,505.0	17.7%	150-160	0	0%
70-80	6,671.5	15.7%	160-170	0	0%
80-90	2,297.6	5.4%	170-180	0	0%

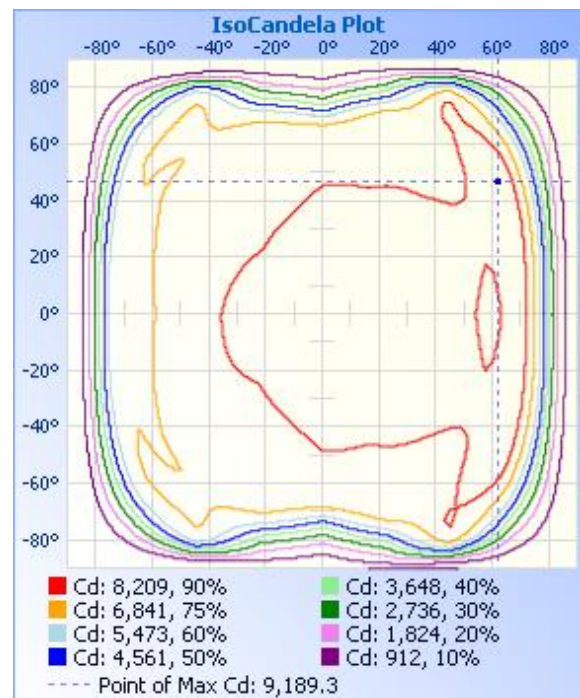
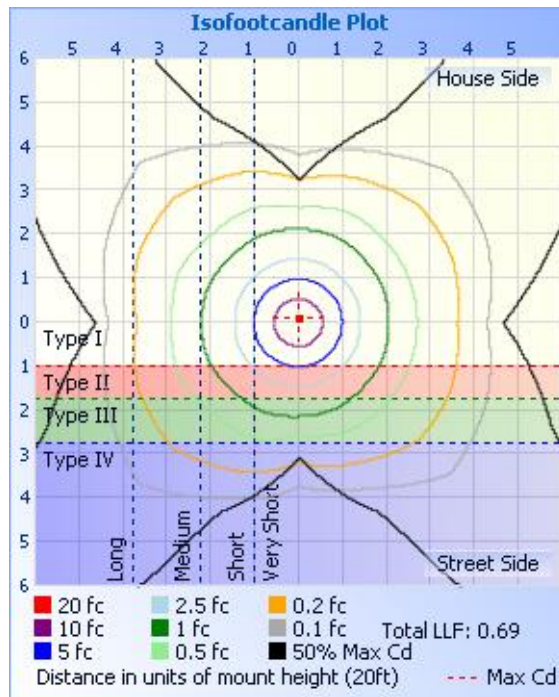
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	30.0 fc	107.5 ft	119.6 ft
34.0ft	7.51 fc	215.1 ft	239.3 ft
51.0ft	3.34 fc	322.6 ft	358.9 ft
68.0ft	1.88 fc	430.1 ft	478.5 ft
85.0ft	1.20 fc	537.6 ft	598.1 ft
102.0ft	0.83 fc	645.2 ft	717.8 ft

■ Vert. Spread: 144.9°
■ Horiz. Spread: 148.3°



Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677	8677
1	8673	8666	8664	8657	8658	8658	8663	8669	8679	8686	8695	8697	8697	8691	8686	8680	8673
2	8668	8655	8646	8640	8643	8642	8651	8664	8681	8698	8712	8718	8716	8709	8699	8685	8668
3	8664	8645	8632	8623	8626	8626	8639	8659	8682	8707	8730	8739	8739	8730	8708	8687	8664
4	8660	8635	8616	8606	8609	8612	8629	8653	8684	8716	8745	8759	8759	8747	8718	8691	8660
5	8655	8624	8602	8591	8594	8598	8618	8646	8682	8727	8763	8781	8781	8762	8729	8693	8655
6	8649	8614	8591	8578	8582	8586	8606	8639	8681	8735	8778	8806	8801	8779	8741	8695	8649
7	8643	8605	8577	8563	8572	8573	8597	8631	8679	8739	8794	8827	8824	8796	8749	8694	8643
8	8639	8595	8565	8554	8562	8562	8586	8621	8675	8745	8807	8848	8848	8815	8759	8694	8639
9	8632	8584	8554	8544	8555	8554	8576	8613	8673	8750	8818	8868	8866	8832	8767	8694	8632
10	8626	8574	8544	8535	8549	8547	8567	8605	8669	8753	8830	8887	8889	8846	8776	8691	8626
11	8616	8563	8535	8524	8544	8538	8559	8596	8664	8754	8838	8907	8912	8861	8782	8691	8616
12	8608	8552	8525	8516	8536	8532	8549	8588	8659	8754	8847	8924	8932	8876	8787	8686	8608
13	8597	8543	8516	8509	8535	8528	8538	8580	8654	8753	8859	8939	8953	8891	8792	8683	8597
14	8591	8531	8507	8502	8531	8523	8531	8570	8644	8749	8865	8952	8975	8904	8792	8677	8591
15	8584	8520	8496	8495	8526	8520	8519	8560	8636	8742	8868	8967	8990	8917	8793	8669	8584
16	8576	8505	8485	8489	8521	8515	8510	8548	8626	8735	8870	8980	9007	8929	8792	8659	8576
17	8564	8493	8472	8483	8517	8507	8502	8533	8617	8722	8873	8995	9021	8940	8790	8650	8564
18	8550	8480	8460	8477	8511	8502	8492	8521	8610	8712	8874	9006	9034	8949	8785	8637	8550
19	8540	8471	8445	8466	8503	8494	8480	8509	8601	8699	8869	9016	9043	8953	8782	8625	8540
20	8531	8458	8430	8456	8497	8485	8467	8495	8588	8687	8865	9022	9052	8958	8777	8609	8531
21	8522	8448	8415	8441	8486	8479	8453	8478	8574	8677	8861	9027	9054	8962	8772	8597	8522
22	8517	8436	8397	8430	8478	8472	8438	8466	8557	8665	8855	9029	9057	8965	8765	8584	8517
23	8505	8419	8381	8419	8470	8469	8421	8448	8542	8654	8846	9028	9057	8968	8757	8571	8505
24	8497	8405	8365	8406	8460	8460	8406	8430	8530	8641	8836	9028	9057	8966	8749	8559	8497
25	8483	8389	8345	8389	8454	8448	8387	8414	8520	8623	8824	9027	9056	8965	8738	8543	8483
26	8471	8379	8328	8371	8442	8433	8366	8398	8509	8606	8813	9026	9051	8963	8728	8528	8471

27	8464	8362	8303	8352	8432	8418	8345	8383	8497	8589	8807	9019	9044	8958	8717	8517	8464
28	8455	8346	8280	8332	8418	8404	8321	8372	8491	8577	8795	9011	9038	8952	8704	8505	8455
29	8444	8334	8253	8312	8399	8389	8298	8361	8483	8566	8778	9006	9028	8945	8688	8496	8444
30	8434	8318	8229	8290	8379	8371	8274	8347	8473	8548	8765	8997	9016	8934	8671	8487	8434
31	8425	8302	8208	8268	8351	8350	8253	8336	8464	8531	8750	8985	9005	8924	8656	8474	8425
32	8413	8286	8185	8242	8325	8324	8230	8323	8456	8522	8734	8970	8992	8912	8645	8459	8413
33	8402	8272	8156	8214	8300	8303	8204	8308	8447	8508	8717	8956	8974	8901	8630	8443	8402
34	8395	8254	8132	8181	8274	8275	8184	8288	8434	8494	8702	8939	8952	8889	8617	8428	8395
35	8391	8236	8107	8152	8241	8247	8157	8272	8417	8477	8679	8919	8933	8878	8605	8421	8391
36	8378	8212	8075	8121	8212	8216	8132	8254	8403	8462	8658	8904	8916	8865	8587	8408	8378
37	8361	8187	8047	8089	8182	8185	8101	8233	8389	8446	8643	8890	8902	8851	8568	8387	8361
38	8347	8162	8019	8057	8148	8150	8073	8212	8379	8424	8630	8873	8882	8834	8552	8376	8347
39	8330	8134	7987	8024	8105	8116	8037	8189	8366	8406	8611	8859	8863	8818	8537	8361	8330
40	8313	8103	7955	7990	8058	8081	8004	8163	8352	8383	8590	8846	8845	8812	8522	8338	8313
41	8294	8076	7918	7953	8016	8042	7967	8134	8342	8363	8569	8836	8822	8803	8503	8319	8294
42	8283	8045	7889	7918	7965	8003	7935	8109	8325	8343	8547	8820	8786	8791	8485	8303	8283
43	8273	8014	7855	7879	7906	7967	7895	8078	8306	8318	8524	8797	8745	8775	8464	8285	8273
44	8251	7984	7815	7839	7843	7923	7853	8053	8285	8293	8510	8774	8697	8752	8446	8268	8251
45	8231	7953	7781	7789	7777	7868	7819	8018	8270	8276	8494	8742	8643	8719	8428	8250	8231
46	8215	7918	7740	7736	7700	7816	7781	7990	8260	8254	8476	8702	8588	8687	8414	8227	8215
47	8192	7889	7700	7680	7629	7759	7744	7960	8240	8229	8455	8658	8536	8651	8391	8211	8192
48	8180	7858	7647	7629	7560	7702	7702	7930	8221	8207	8428	8615	8475	8612	8362	8195	8180
49	8165	7823	7600	7572	7495	7641	7647	7896	8205	8185	8392	8575	8419	8578	8330	8181	8165
50	8143	7793	7548	7515	7421	7582	7595	7863	8172	8164	8357	8534	8363	8538	8289	8160	8143
51	8119	7761	7498	7456	7355	7525	7547	7840	8161	8142	8314	8497	8312	8500	8251	8140	8119
52	8095	7728	7449	7396	7293	7469	7492	7805	8146	8123	8276	8456	8270	8469	8213	8119	8095
53	8075	7697	7404	7346	7228	7411	7439	7768	8118	8097	8233	8418	8228	8437	8176	8096	8075
54	8044	7666	7351	7290	7170	7353	7387	7733	8096	8074	8191	8387	8194	8409	8131	8078	8044
55	8008	7633	7300	7232	7106	7293	7343	7708	8059	8049	8153	8363	8164	8379	8097	8058	8008
56	7981	7600	7250	7189	7034	7238	7292	7676	8032	8034	8116	8341	8136	8359	8057	8037	7981
57	7946	7570	7204	7137	6973	7185	7240	7655	8000	8017	8082	8322	8118	8342	8024	8026	7946

58	7914	7538	7152	7092	6909	7136	7189	7628	7978	7997	8048	8310	8104	8336	7990	8007	7914
59	7875	7512	7110	7042	6849	7080	7143	7601	7955	7981	8008	8307	8098	8329	7954	7989	7875
60	7842	7484	7067	7003	6801	7033	7095	7580	7921	7968	7978	8308	8090	8327	7919	7977	7842
61	7804	7465	7025	6964	6758	6985	7053	7567	7883	7954	7944	8316	8111	8338	7884	7971	7804
62	7753	7448	6988	6925	6735	6946	7010	7548	7846	7951	7914	8323	8156	8360	7857	7974	7753
63	7689	7440	6947	6891	6714	6910	6976	7541	7796	7951	7891	8352	8223	8390	7843	7978	7689
64	7600	7430	6914	6869	6694	6877	6938	7534	7718	7954	7865	8391	8315	8437	7822	7991	7600
65	7457	7425	6888	6855	6679	6851	6910	7537	7618	7962	7849	8443	8434	8507	7804	8017	7457
66	7229	7412	6874	6841	6674	6838	6885	7534	7451	7978	7835	8529	8549	8590	7798	8053	7229
67	6904	7377	6858	6824	6681	6826	6877	7526	7223	7987	7831	8622	8663	8704	7805	8087	6904
68	6474	7285	6856	6813	6717	6811	6865	7492	6882	7995	7828	8735	8752	8833	7812	8112	6474
69	6031	7116	6872	6809	6762	6806	6870	7404	6495	7966	7834	8872	8769	8977	7837	8083	6031
70	5567	6861	6896	6816	6796	6818	6880	7265	6060	7891	7853	8992	8678	9115	7869	7972	5567
71	5053	6562	6925	6838	6793	6851	6910	7048	5588	7731	7886	9082	8450	9189	7921	7774	5053
72	4589	6151	6960	6871	6711	6910	6948	6757	5058	7512	7928	9114	8115	9189	7992	7497	4589
73	4135	5733	6992	6902	6511	6961	6985	6400	4589	7214	7989	9032	7643	9074	8081	7097	4135
74	3723	5314	7025	6902	6219	6978	7011	5952	4146	6854	8067	8790	7122	8782	8201	6634	3723
75	3290	4840	7040	6829	5829	6917	7034	5512	3738	6399	8168	8454	6510	8386	8313	6164	3290
76	2927	4358	7073	6666	5333	6798	7046	5050	3347	5926	8264	8007	5890	7885	8418	5623	2927
77	2589	3885	7098	6403	4793	6529	7053	4592	2961	5449	8343	7495	5228	7309	8512	5074	2589
78	2268	3470	7087	6038	4169	6154	7046	4096	2626	4954	8397	6854	4509	6671	8557	4543	2268
79	1970	3074	6989	5520	3613	5678	6999	3676	2315	4476	8383	6215	3875	5926	8480	4067	1970
80	1676	2713	6723	4987	3083	5132	6876	3278	2033	3981	8288	5548	3251	5228	8280	3595	1676
81	1424	2312	6318	4407	2520	4485	6658	2904	1738	3559	8135	4862	2657	4514	7945	3188	1424
82	1198	1960	5768	3687	2028	3829	6297	2488	1493	3148	7831	4092	2177	3746	7338	2751	1198
83	964	1671	5010	3050	1603	3150	5772	2130	1256	2759	7287	3385	1731	3041	6486	2362	964
84	763	1378	3905	2458	1221	2511	4850	1811	1036	2362	6323	2669	1357	2390	5343	2017	763
85	580	1103	2798	1834	850	1832	3704	1521	832	2014	5068	2018	1052	1807	3965	1647	580
86	410	839	1717	1235	502	1255	2630	1245	634	1673	3625	1463	743	1251	2529	1290	410
87	234	497	683	644	246	752	1537	951	462	1358	2266	986	503	821	1423	877	234
88	93	160	157	174	59	269	562	591	276	962	1202	583	298	441	620	417	93

89	25	35	47	42	28	40	87	233	90	446	441	254	138	177	169	59	25
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
146	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

151	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
154	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
173	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

BUG Rating

Lum. Classification System (LCS)

<u>LCS Zone</u>	<u>Lumens</u>	<u>%Lamp</u>	<u>%Lum</u>
FL (0-30)	3622.6	8.5	8.5
FM (30-60)	9298.0	21.9	21.9
FH (60-80)	7034.1	16.6	16.6
FVH (80-90)	1061.8	2.5	2.5
BL (0-30)	3641.2	8.6	8.6
BM (30-60)	9345.0	22.1	22.1
BH (60-80)	7140.7	16.8	16.8
BVH (80-90)	1235.3	2.9	2.9
UL (90-100)	0.0	0.0	0.0
UH (100-180)	0.0	0.0	0.0
Total	42378.7	99.9	100.0
BUG Rating	B5-U0-G5		

2.4 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2024-03-12	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	AL22-300 (Setting at 4000K T5)	Operation time(min)	110

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTU250301	120.0	60	2.422	289.14	0.995	8.42
4E-C1	277.0	60	1.067	279.59	0.946	9.71
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

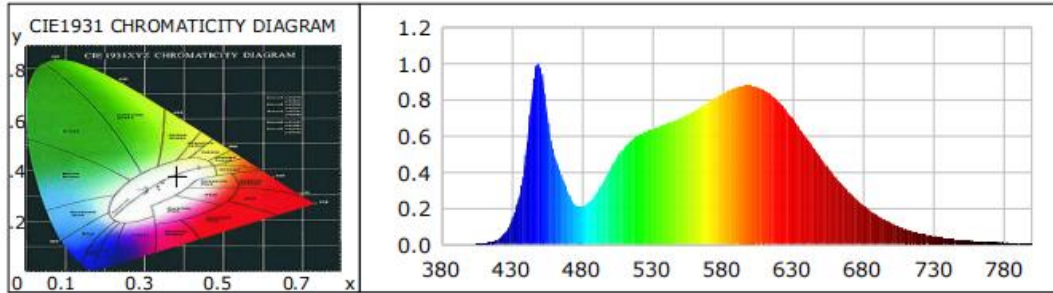
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	15
Frequency (Hz)	60	R2	89	R10	74
CCT (K)	3926	R3	94	R11	84
Duv	0.0002	R4	84	R12	63
Chromaticity (x, y)	x=0.384 y=0.3794	R5	83	R13	84
Chromaticity (u', v')	u'=0.2264 v'=0.5033	R6	85	R14	96
Color Rendering Index (CRI)	84	R7	87	R15	77
R9	15	R8	67	--	--
Rf	85	--	--	--	--
Rg	98	--	--	--	--
Rcs,h1(%)	-11				

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	44967.1	44552.7	>=10000(-10%)
Luminous Efficacy (lm/W)	155.52	159.35	Premium: >= 120(-3%)
Most worst Luminous/Highest Watts	154.09		

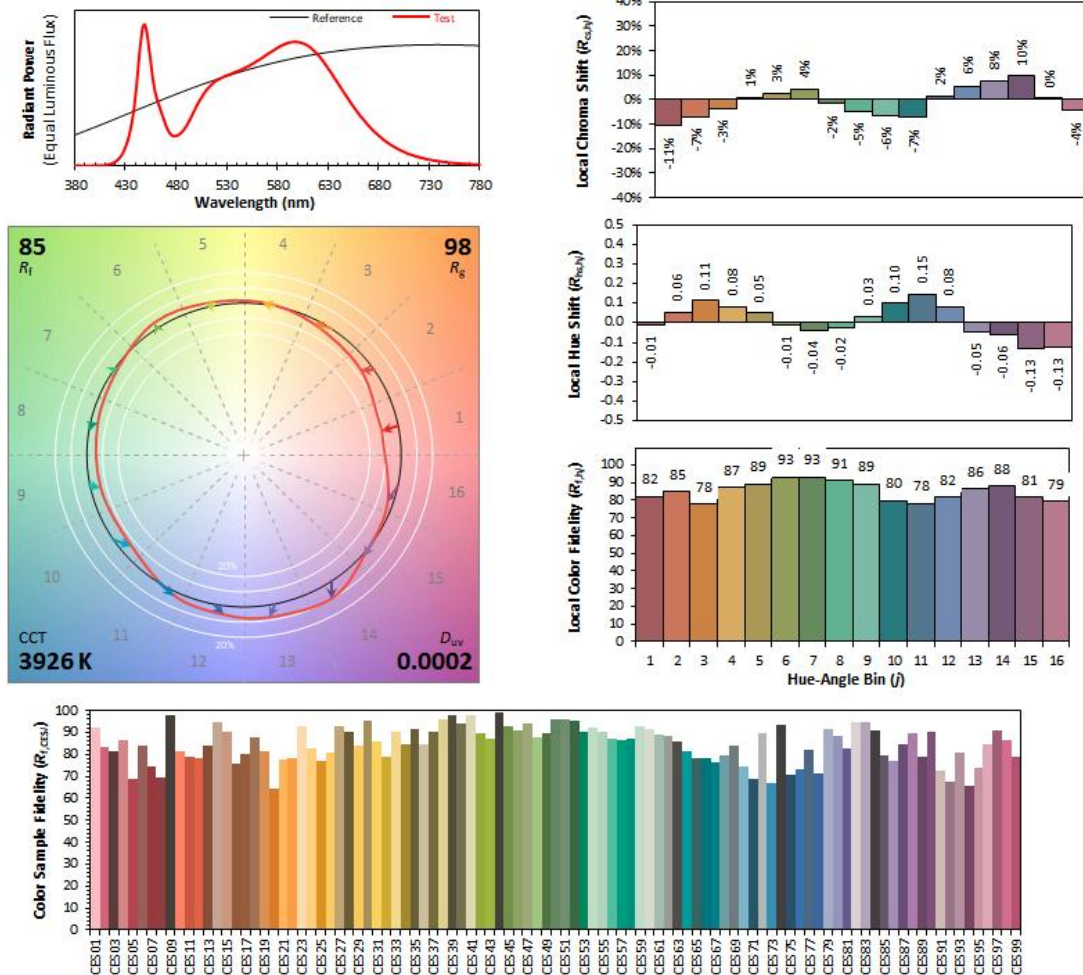
Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.2186	535	0.6228	549.3034	690	0.2862	252.4192
385	0.0006	0.5550	540	0.6382	562.8362	695	0.2495	220.0058
390	0.0008	0.6723	545	0.6529	575.8450	700	0.2157	190.2629
395	0.0005	0.4463	550	0.6682	589.3000	705	0.1857	163.7623
400	0.0009	0.8093	555	0.6815	601.0578	710	0.1600	141.0705
405	0.0017	1.5382	560	0.6995	616.9474	715	0.1370	120.8564
410	0.0049	4.3267	565	0.7189	634.0603	720	0.1168	103.0378
415	0.0125	11.0300	570	0.7419	654.3456	725	0.0999	88.1276
420	0.0283	24.9229	575	0.7639	673.6960	730	0.0831	73.2780
425	0.0621	54.7630	580	0.7872	694.2945	735	0.0717	63.1959
430	0.1307	115.3079	585	0.8108	715.0879	740	0.0619	54.5929
435	0.2566	226.3038	590	0.8323	734.0462	745	0.0525	46.2783
440	0.4974	438.6313	595	0.8527	751.9866	750	0.0445	39.2517
445	0.8699	767.1892	600	0.8684	765.9106	755	0.0377	33.2096
450	0.9846	868.3057	605	0.8762	772.7479	760	0.0312	27.5000
455	0.7345	647.7724	610	0.8768	773.2707	765	0.0282	24.8549
460	0.5043	444.7894	615	0.8676	765.1402	770	0.0230	20.2561
465	0.3896	343.6083	620	0.8531	752.3993	775	0.0202	17.8161
470	0.2859	252.1228	625	0.8233	726.0590	780	0.0170	15.0032
475	0.2210	194.9451	630	0.7872	694.2171	785	0.0151	13.3084
480	0.2121	187.0432	635	0.7438	655.9975	790	0.0116	10.2175
485	0.2340	206.3669	640	0.6921	610.3896	795	0.0108	9.5251
490	0.2799	246.8163	645	0.6397	564.1435	800	0.0084	7.4408
495	0.3452	304.4064	650	0.5843	515.2873			
500	0.4179	368.5655	655	0.5285	466.0670			
505	0.4816	424.7391	660	0.4758	419.6006			
510	0.5358	472.5611	665	0.4218	372.0220			
515	0.5744	506.5961	670	0.3734	329.3025			
520	0.6029	531.6823	675	0.3282	289.4177			
525	0.6228	549.3034	680	0.2862	252.4192			
530	0.6382	562.8362	685	0.2495	220.0058			

TM30

ANSI/IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.3840
 y 0.3794
 z' 0.2264
 v' 0.5033

CIE 13.3-1995
(CRI)
 R_a 84
 R_g 15

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

2.5 Electrical, Photometric and Chromaticity Measurements
(Refer to Work Instruction BL-QP-033)

Test date	2024-03-12	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	AL22-300 (Setting at 5000K T5)	Operation time(min)	110

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTU250301	120.0	60	2.491	296.85	0.993	8.42
4E-C1	277.0	60	1.097	287.41	0.946	9.48
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

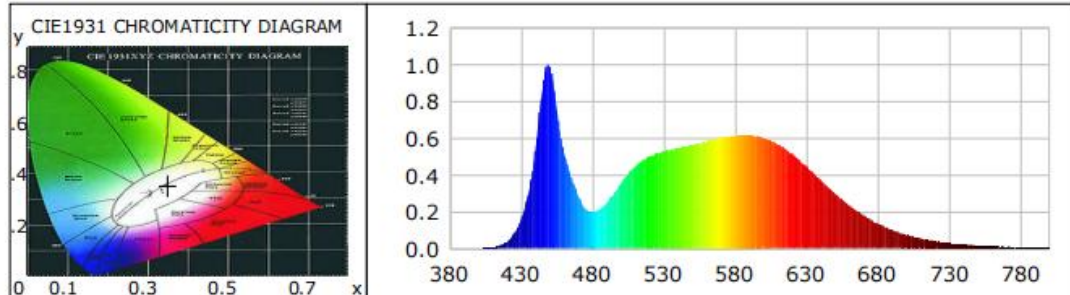
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	13
Frequency (Hz)	60	R2	87	R10	70
CCT (K)	4853	R3	91	R11	83
Duv	0.0002	R4	84	R12	58
Chromaticity (x, y)	x=0.3494 y=0.3554	R5	82	R13	83
Chromaticity (u', v')	u'=0.2129 v'=0.4871	R6	82	R14	95
Color Rendering Index (CRI)	83	R7	88	R15	77
R9	13	R8	69	--	--
Rf	83	--	--	--	--
Rg	98	--	--	--	--
Rcs,h1(%)	-12				

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	43651.8	43493.8	>=10000(-10%)
Luminous Efficacy (lm/W)	147.05	151.33	Premium: >= 120(-3%)
Most worst Luminous/Highest Watts	146.52		

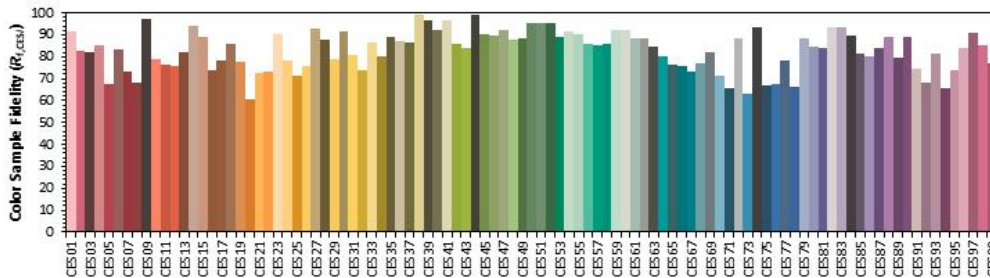
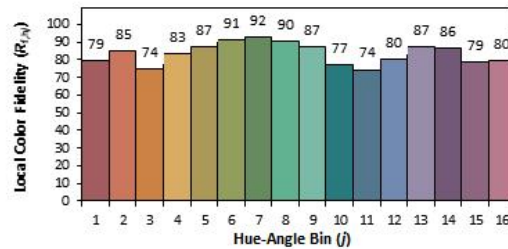
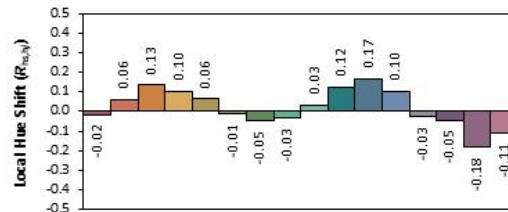
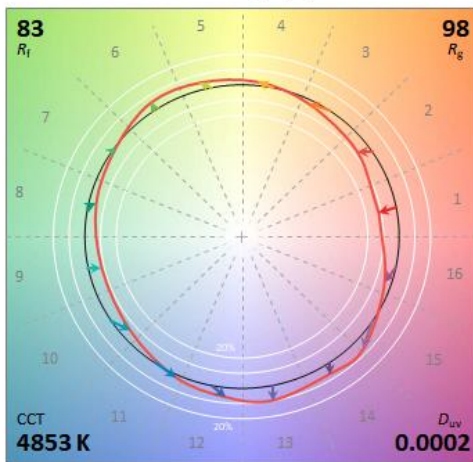
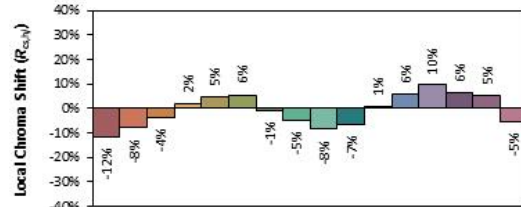
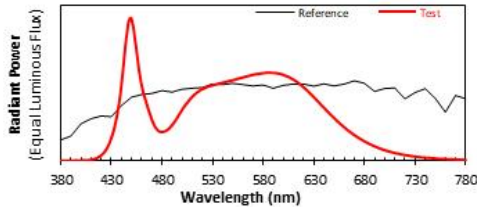
Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0011	1.2241	535	0.5174	580.4277	690	0.1792	201.0911
385	0.0006	0.6787	540	0.5274	591.7380	695	0.1559	174.9181
390	0.0003	0.3498	545	0.5379	603.4986	700	0.1351	151.5186
395	0.0006	0.6488	550	0.5457	612.2768	705	0.1171	131.3380
400	0.0009	1.0055	555	0.5548	622.4457	710	0.1011	113.4179
405	0.0027	3.0376	560	0.5636	632.2991	715	0.0856	96.0914
410	0.0068	7.5986	565	0.5730	642.8527	720	0.0734	82.3412
415	0.0160	17.9999	570	0.5833	654.3630	725	0.0635	71.2513
420	0.0368	41.2607	575	0.5928	665.0368	730	0.0536	60.1340
425	0.0796	89.3408	580	0.6001	673.2044	735	0.0456	51.1438
430	0.1583	177.6298	585	0.6070	680.9589	740	0.0390	43.7417
435	0.2968	333.0070	590	0.6127	687.4404	745	0.0339	38.0246
440	0.5353	600.5690	595	0.6162	691.3192	750	0.0290	32.5333
445	0.8760	982.8343	600	0.6153	690.3205	755	0.0240	26.8778
450	0.9881	1108.5631	605	0.6098	684.0994	760	0.0212	23.8400
455	0.7587	851.2130	610	0.6003	673.4926	765	0.0178	19.9700
460	0.5245	588.4205	615	0.5868	658.2837	770	0.0149	16.6779
465	0.3938	441.7861	620	0.5674	636.5569	775	0.0124	13.9431
470	0.2860	320.9157	625	0.5428	608.9317	780	0.0109	12.2749
475	0.2182	244.7709	630	0.5137	576.3299	785	0.0085	9.4835
480	0.2007	225.1909	635	0.4809	539.4925	790	0.0075	8.3650
485	0.2142	240.2688	640	0.4438	497.9354	795	0.0072	8.0293
490	0.2490	279.3989	645	0.4078	457.5444	800	0.0057	6.4330
495	0.3001	336.7225	650	0.3713	416.5385			
500	0.3578	401.4249	655	0.3332	373.7717			
505	0.4065	456.0073	660	0.2993	335.7342			
510	0.4492	503.9296	665	0.2654	297.7170			
515	0.4799	538.3944	670	0.2337	262.1531			
520	0.5013	562.3611	675	0.2047	229.6498			
525	0.5174	580.4277	680	0.1792	201.0911			
530	0.5274	591.7380	685	0.1559	174.9181			

TM30

ANSI/IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.3494
 y 0.3554
 u' 0.2129
 v' 0.4871

CIE 13.3-1995 (CRI)
 R_a 83
 R_g 13

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

3. Test Equipment

Equipment Name	Model No.	Serial No.	Calibration Date
Goniophotometric System	GPM-3000	DYHXF120001	2025-01-08
AC Power Source	CHP-500C	DYBWD010159	2025-01-02
Standard Lamp*	24V/150W	DYJYR040040	2025-01-14
Standard Lamp**	24V/100W	DYBWR030014	2025-01-14
Digital Power Meter	WT500	DYDWQ20010	2025-01-02
Integral Sphere (2M)	2M	DYJCE120067	2025-01-08
Digital Power Meter	WT500	DYDWQ200006	2025-01-02
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2025-01-08

* Reference standard lamp (150W incandescent directional lamp) calibrated by Guangzhou Institute of Measurement and Testing Technology.

** Reference standard lamp (100W incandescent omni-directional lamp) calibrated by Guangzhou Institute of Measurement and Testing Technology.

Expand Uncertainty:

Photometric Measurement (Sphere): 2.02%, k=2

Chromaticity Measurement(Sphere):24.8K, k=2

Photometric Measurement(Goniophotometer):2.88%, k=2

***** END OF REPORT *****