



TL-749



IES LM-79-08

MEASUREMENT AND TEST REPORT

For

GREEN CREATIVE LTD

Room 3603, Level 36, Tower 1, Enterprise Square Five, 38 Wang Chiu Road, Kowloon Bay, KL, Hong Kong

Test Model: LEL9027KDIM120VVN/ADS6BL

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Test Engineer:	Joker Gu
Report Number:	RKSB200812011-10-6
Test Date:	2020-08-27 to 2020-08-29
Report Date:	2020-09-07
Reviewed By:	Seven Xia/EE Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan). No.248 Chenghu Road, Kunshan, Jiangsu province, China. Tel: +86-0512-86175000 Fax:+86-0512-88934268
Accreditation:	The IAS Accreditation Number TL-749.

1. Product Description

General Information:

One sample was received on 2020-08-12 and used for testing.

Model Tested:	LEL9027KDIM120VVN/ADS6BL
Manufacturer:	GREEN CREATIVE LTD
Brand Name:	GREEN CREATIVE
Product Designation:	LED Recessed Downlight
Burning Time Before Test:	0hour(For New Products)

Rated Values:

Rated Voltage/Frequency:	120VAC 60Hz
Rated Power:	60W
Nominal CCT:	2700K
Nominal Lumen Output:	3790 lm

2. Standards Used

- IES LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products
- ANSI C82.77-10-2014: Harmonic Emission Limits – Related Power Quality Requirements for Lighting Equipment
- IES TM-30-18: IES Method for Evaluating Light Source Color Rendition

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Integrating Sphere	INVENTFINE	Dia 1.5m	JWWCV090112	2020-01-22	2021-01-21
Power Meter	INVENTFINE	WT500	GSJWQ20009	2020-04-02	2021-04-01
Spectral photometer	INVENTFINE	CMS-3S	GSGSE100017	2020-01-22	2021-01-21
AC Power Supply	INVENTFINE	CHP500	JWJSD010071	2020-04-02	2021-04-01
Standard Light Source	INVENTFINE	N/A	JWWCR020104	2019-11-19	2020-11-18
Thermal Meter	KEJIAN	TA298	N/A	2019-12-02	2020-12-01
DC Power Supply	INVENTFINE	WL3005	JWWCP020069	2019-12-20	2020-12-19
AC Power Supply	INVENTFINE	CHP-5KVA	900511765	2020-04-02	2021-04-01
DC Power Supply	INVENTFINE	WL3010	JWDMP030001	2019-12-20	2020-12-19
Power Meter	INVENTFINE	WT500	GSDSQ200007	2020-04-02	2021-04-01
Goniophotometer	INVENTFINE	GPM-1900	YWGCF120001	2020-01-22	2021-01-21
Wireless Weather Station	ZHONGXING	KG218	N/A	2019-12-02	2020-12-01
Standard Light Source	INVENTFINE	N/A	JWBYR040008	2020-03-19	2021-03-18

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

4. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C}\pm 1^{\circ}\text{C}$ during measurement. And relative humidity is less than 65%.

Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, Spectroradiometer, and integrating sphere. The integrating sphere system is calibrated by standard spectrum light source before measurement.

4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

The uncertainty of the light output (luminous flux) measurements is $U_{ref}=2.61\%$ ($k=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=34\text{K}$ ($k=2$), at the 95% confidence level. The uncertainty of the CRI is $U=2.5(k=2)$, at the 95% confidence level.

The uncertainty of power meter AC current $U_{ref}=0.48\%$ of rdg, AC Voltage $U_{ref}=0.25\%$ of rdg, Power $U_{ref}=0.44\%$, ($k=2$), at the 95% confidence level.

Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The vertical angle (γ) test intervals were set no more than 1 degree while data for 5 degree intervals is reported. The horizontal angle (C plane) test intervals were set no more than 22.5 degree.

The uncertainty of the luminous flux is $U_{ref}=2.6\%$ ($k=2$), at the 95% confidence level.

Fidelity Index and Gamut Index Calculation

The R_i , R_g was calculated according to IES TM-30-18 by using calculation tools. The calculation was based on the measured SPD from 380nm to 780nm with 1nm intervals. All the colors in this report is for reference only.

5. Test Result

[Integrating Sphere System]

Total operating time for integrating sphere test: **1.0 hour**

Test orientation: **Downward**

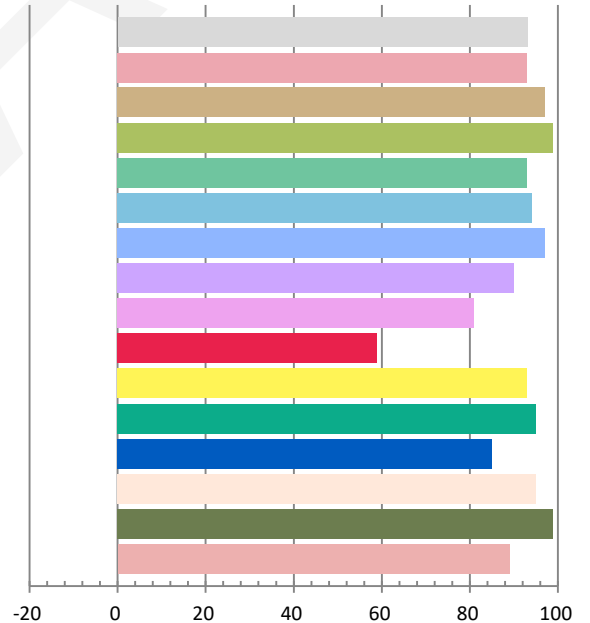
Photometric and Electrical Measurement Result

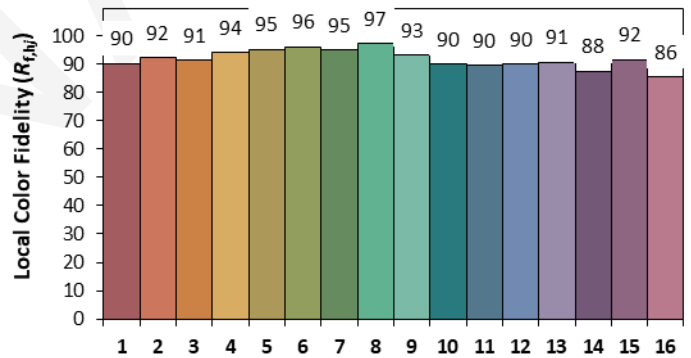
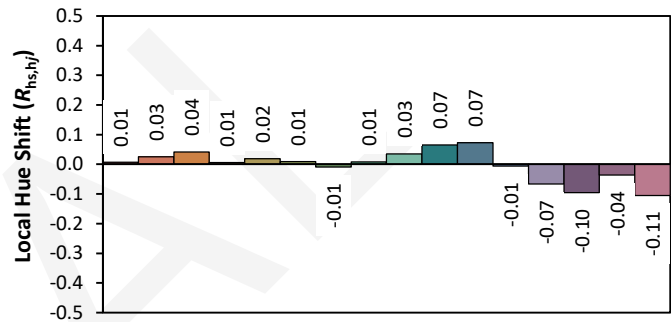
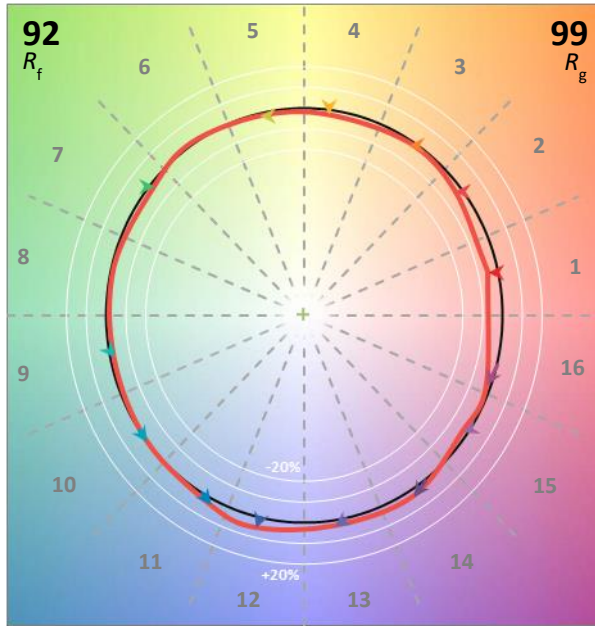
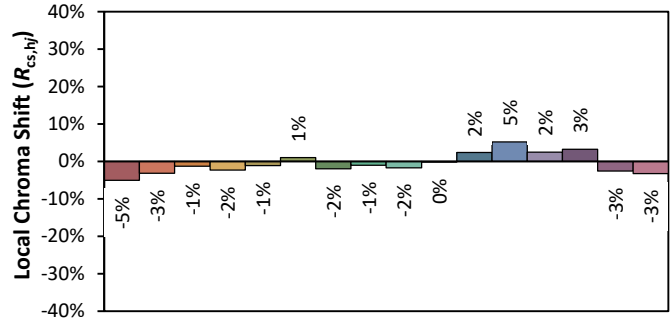
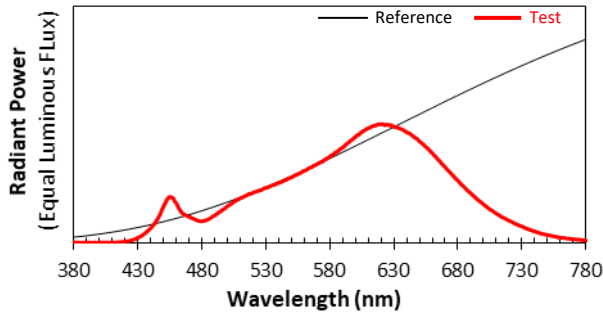
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.01	60	0.5041	60.07	0.9929	3894.74	64.84

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
13.691	2693	-0.00032	0.4599	0.4097	0.2629	0.5270

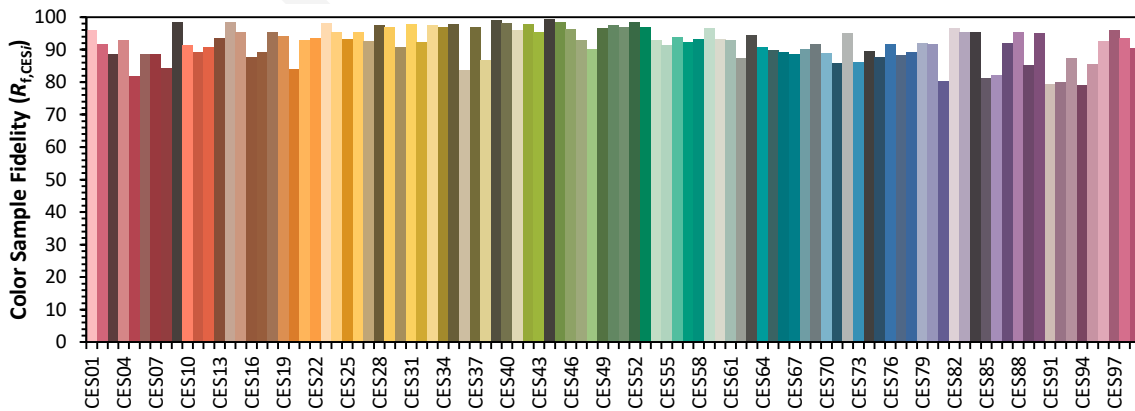
Color Rendering Index

Ra			
93.1			
R1	R2	R3	R4
93	97	99	93
R5	R6	R7	R8
94	97	90	81
R9	R10	R11	R12
59	93	95	85
R13	R14	R15	
95	99	89	

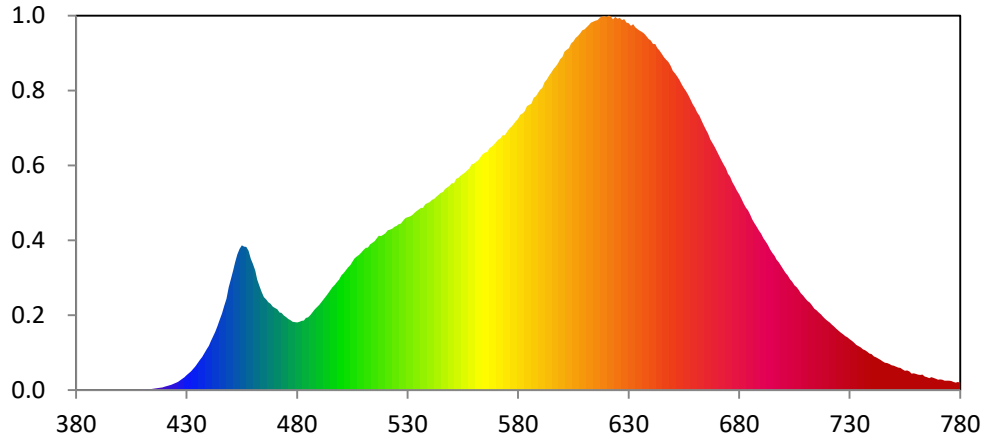




Hue-Angle Bin (j)



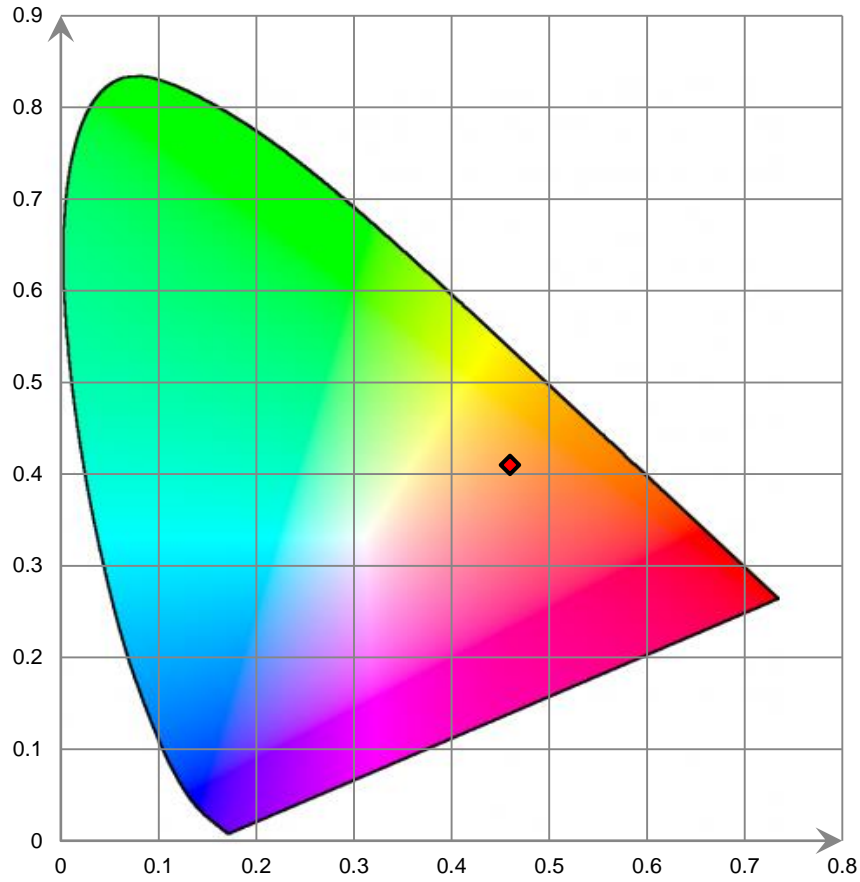
Relative Spectral Power Distribution



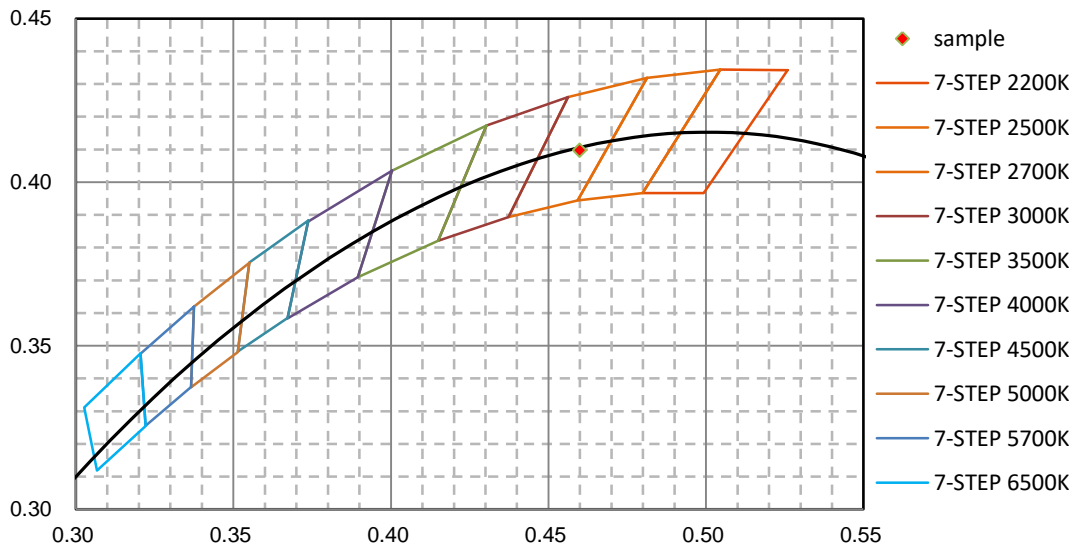
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.150E-02	421	9.103E-01	462	2.535E+01	503	2.816E+01	544	4.488E+01
381	4.180E-02	422	1.013E+00	463	2.395E+01	504	2.869E+01	545	4.530E+01
382	7.400E-03	423	1.161E+00	464	2.252E+01	505	2.944E+01	546	4.550E+01
383	2.440E-02	424	1.414E+00	465	2.134E+01	506	3.021E+01	547	4.619E+01
384	9.900E-02	425	1.646E+00	466	2.082E+01	507	3.066E+01	548	4.657E+01
385	1.700E-02	426	1.869E+00	467	2.017E+01	508	3.104E+01	549	4.696E+01
386	1.400E-03	427	2.226E+00	468	1.977E+01	509	3.155E+01	550	4.752E+01
387	4.970E-02	428	2.567E+00	469	1.915E+01	510	3.211E+01	551	4.752E+01
388	1.060E-02	429	2.947E+00	470	1.886E+01	511	3.263E+01	552	4.854E+01
389	1.530E-02	430	3.396E+00	471	1.858E+01	512	3.275E+01	553	4.873E+01
390	8.480E-02	431	3.844E+00	472	1.779E+01	513	3.344E+01	554	4.928E+01
391	1.650E-02	432	4.283E+00	473	1.771E+01	514	3.384E+01	555	4.967E+01
392	1.040E-02	433	4.892E+00	474	1.718E+01	515	3.420E+01	556	5.005E+01
393	2.210E-02	434	5.458E+00	475	1.678E+01	516	3.480E+01	557	5.055E+01
394	1.400E-03	435	6.157E+00	476	1.636E+01	517	3.545E+01	558	5.088E+01
395	4.750E-02	436	6.899E+00	477	1.606E+01	518	3.538E+01	559	5.182E+01
396	2.140E-02	437	7.599E+00	478	1.565E+01	519	3.566E+01	560	5.197E+01
397	2.730E-02	438	8.465E+00	479	1.561E+01	520	3.605E+01	561	5.243E+01
398	6.800E-03	439	9.318E+00	480	1.552E+01	521	3.670E+01	562	5.283E+01
399	6.100E-03	440	1.013E+01	481	1.566E+01	522	3.687E+01	563	5.358E+01
400	2.100E-03	441	1.120E+01	482	1.590E+01	523	3.705E+01	564	5.423E+01
401	6.710E-02	442	1.226E+01	483	1.596E+01	524	3.751E+01	565	5.456E+01
402	3.890E-02	443	1.336E+01	484	1.653E+01	525	3.770E+01	566	5.473E+01
403	3.070E-02	444	1.469E+01	485	1.669E+01	526	3.811E+01	567	5.559E+01
404	7.700E-02	445	1.616E+01	486	1.725E+01	527	3.827E+01	568	5.591E+01
405	4.850E-02	446	1.762E+01	487	1.788E+01	528	3.890E+01	569	5.631E+01
406	1.690E-02	447	1.934E+01	488	1.851E+01	529	3.949E+01	570	5.693E+01
407	8.940E-02	448	2.100E+01	489	1.908E+01	530	3.973E+01	571	5.754E+01
408	5.130E-02	449	2.365E+01	490	1.956E+01	531	3.985E+01	572	5.777E+01
409	9.450E-02	450	2.549E+01	491	2.021E+01	532	4.015E+01	573	5.851E+01
410	2.049E-01	451	2.755E+01	492	2.089E+01	533	4.069E+01	574	5.850E+01
411	2.091E-01	452	2.934E+01	493	2.158E+01	534	4.111E+01	575	5.937E+01
412	9.380E-02	453	3.122E+01	494	2.216E+01	535	4.150E+01	576	6.010E+01
413	1.097E-01	454	3.245E+01	495	2.289E+01	536	4.182E+01	577	6.056E+01
414	2.612E-01	455	3.325E+01	496	2.359E+01	537	4.188E+01	578	6.123E+01
415	3.001E-01	456	3.298E+01	497	2.413E+01	538	4.266E+01	579	6.176E+01
416	4.087E-01	457	3.285E+01	498	2.481E+01	539	4.298E+01	580	6.228E+01
417	4.446E-01	458	3.199E+01	499	2.542E+01	540	4.318E+01	581	6.324E+01
418	5.485E-01	459	3.013E+01	500	2.630E+01	541	4.366E+01	582	6.354E+01
419	6.303E-01	460	2.891E+01	501	2.685E+01	542	4.388E+01	583	6.406E+01
420	7.445E-01	461	2.741E+01	502	2.753E+01	543	4.441E+01	584	6.523E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	6.556E+01	626	8.554E+01	667	5.755E+01	708	2.223E+01	749	5.668E+00
586	6.584E+01	627	8.501E+01	668	5.672E+01	709	2.170E+01	750	5.596E+00
587	6.712E+01	628	8.526E+01	669	5.583E+01	710	2.103E+01	751	5.409E+00
588	6.752E+01	629	8.444E+01	670	5.480E+01	711	2.047E+01	752	5.186E+00
589	6.834E+01	630	8.425E+01	671	5.378E+01	712	2.008E+01	753	5.058E+00
590	6.898E+01	631	8.368E+01	672	5.276E+01	713	1.940E+01	754	4.749E+00
591	6.944E+01	632	8.404E+01	673	5.177E+01	714	1.871E+01	755	4.429E+00
592	7.072E+01	633	8.336E+01	674	5.092E+01	715	1.832E+01	756	4.476E+00
593	7.130E+01	634	8.296E+01	675	4.969E+01	716	1.783E+01	757	4.270E+00
594	7.220E+01	635	8.257E+01	676	4.896E+01	717	1.740E+01	758	3.792E+00
595	7.292E+01	636	8.229E+01	677	4.773E+01	718	1.688E+01	759	3.810E+00
596	7.377E+01	637	8.194E+01	678	4.683E+01	719	1.635E+01	760	3.720E+00
597	7.437E+01	638	8.133E+01	679	4.578E+01	720	1.590E+01	761	3.538E+00
598	7.505E+01	639	8.066E+01	680	4.503E+01	721	1.554E+01	762	3.465E+00
599	7.606E+01	640	8.032E+01	681	4.399E+01	722	1.505E+01	763	3.514E+00
600	7.652E+01	641	7.952E+01	682	4.289E+01	723	1.457E+01	764	3.127E+00
601	7.773E+01	642	7.950E+01	683	4.191E+01	724	1.405E+01	765	2.985E+00
602	7.819E+01	643	7.861E+01	684	4.123E+01	725	1.363E+01	766	2.752E+00
603	7.851E+01	644	7.802E+01	685	4.023E+01	726	1.316E+01	767	2.959E+00
604	7.962E+01	645	7.730E+01	686	3.918E+01	727	1.281E+01	768	2.786E+00
605	8.009E+01	646	7.647E+01	687	3.830E+01	728	1.239E+01	769	2.613E+00
606	8.092E+01	647	7.587E+01	688	3.749E+01	729	1.214E+01	770	2.382E+00
607	8.134E+01	648	7.539E+01	689	3.661E+01	730	1.169E+01	771	2.437E+00
608	8.191E+01	649	7.452E+01	690	3.587E+01	731	1.131E+01	772	2.373E+00
609	8.266E+01	650	7.335E+01	691	3.490E+01	732	1.088E+01	773	2.149E+00
610	8.291E+01	651	7.271E+01	692	3.410E+01	733	1.037E+01	774	2.158E+00
611	8.333E+01	652	7.199E+01	693	3.329E+01	734	1.012E+01	775	2.115E+00
612	8.387E+01	653	7.120E+01	694	3.231E+01	735	9.782E+00	776	2.038E+00
613	8.446E+01	654	7.030E+01	695	3.152E+01	736	9.368E+00	777	1.843E+00
614	8.461E+01	655	6.941E+01	696	3.079E+01	737	9.145E+00	778	1.679E+00
615	8.485E+01	656	6.871E+01	697	2.996E+01	738	8.737E+00	779	1.865E+00
616	8.499E+01	657	6.779E+01	698	2.932E+01	739	8.374E+00	780	1.633E+00
617	8.557E+01	658	6.675E+01	699	2.855E+01	740	8.216E+00		
618	8.582E+01	659	6.566E+01	700	2.776E+01	741	7.748E+00		
619	8.592E+01	660	6.489E+01	701	2.695E+01	742	7.530E+00		
620	8.575E+01	661	6.376E+01	702	2.633E+01	743	7.228E+00		
621	8.604E+01	662	6.300E+01	703	2.543E+01	744	6.903E+00		
622	8.578E+01	663	6.185E+01	704	2.484E+01	745	6.560E+00		
623	8.514E+01	664	6.074E+01	705	2.408E+01	746	6.284E+00		
624	8.571E+01	665	5.986E+01	706	2.359E+01	747	6.197E+00		
625	8.534E+01	666	5.888E+01	707	2.300E+01	748	5.944E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

Total operating time for luminous intensity distribution: **1.0hour**

Test orientation: **Downward**

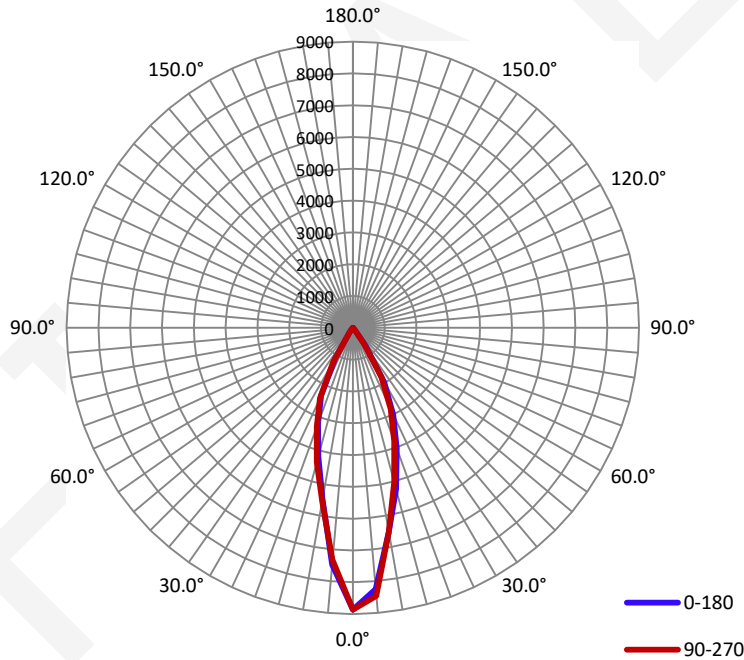
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.5030	60.1	0.9960

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	I _{max} (cd)	S/MH(C0/180)	S/MH(C90/270)
3899.8	64.94	8862.3	0.51	0.51

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50%I _{max}):	32.4	32.8	32.2	33.3	32.7
Field Angle(10%I _{max}):	65.5	75.9	65.5	76.0	70.7

Luminous Intensity (cd) Distribution Data

C \ y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	8862	8862	8862	8862	8862	8862	8862	8862
5.0°	8247	8396	8464	8511	8464	8345	8202	8034
10.0°	6524	6680	6725	6660	6522	6340	6052	5853
15.0°	5248	5295	5281	5163	5021	4826	4609	4393
20.0°	4033	4086	4129	4051	3798	3727	3592	3355
25.0°	3015	3050	3144	2996	2812	2734	2754	2455
30.0°	1981	2164	2199	2061	1787	1925	1933	1637
35.0°	699	1060	1455	990	597	890	1311	541
40.0°	127	214	869	194	129	174	566	119
45.0°	46	82	213	75	42	74	114	47
50.0°	0	15	58	9	0	0	29	0
55.0°	0	0	0	0	0	0	0	0
60.0°	0	0	0	0	0	0	0	0
65.0°	0	0	0	0	0	0	0	0
70.0°	0	0	0	0	0	0	0	0
75.0°	0	0	0	0	0	0	0	0
80.0°	0	0	0	0	0	0	0	0
85.0°	0	0	0	0	0	0	0	0
90.0°	0	0	0	0	0	0	0	0
95.0°	0	0	0	0	0	0	0	0
100.0°	0	0	0	0	0	0	0	0
105.0°	0	0	0	0	0	0	0	0
110.0°	0	0	0	0	0	0	0	0
115.0°	0	0	0	0	0	0	0	0
120.0°	0	0	0	0	0	0	0	0
125.0°	0	0	0	0	0	0	0	0
130.0°	0	0	0	0	0	0	0	0
135.0°	0	0	0	0	0	0	0	0
140.0°	0	0	0	0	0	0	0	0
145.0°	0	0	0	0	0	0	0	0
150.0°	0	0	0	0	0	0	0	0
155.0°	0	0	0	0	0	0	0	0
160.0°	0	0	0	0	0	0	0	0
165.0°	0	0	0	0	0	0	0	0
170.0°	0	0	0	0	0	0	0	0
175.0°	0	0	0	0	0	0	0	0
180.0°	0	0	0	0	0	0	0	0

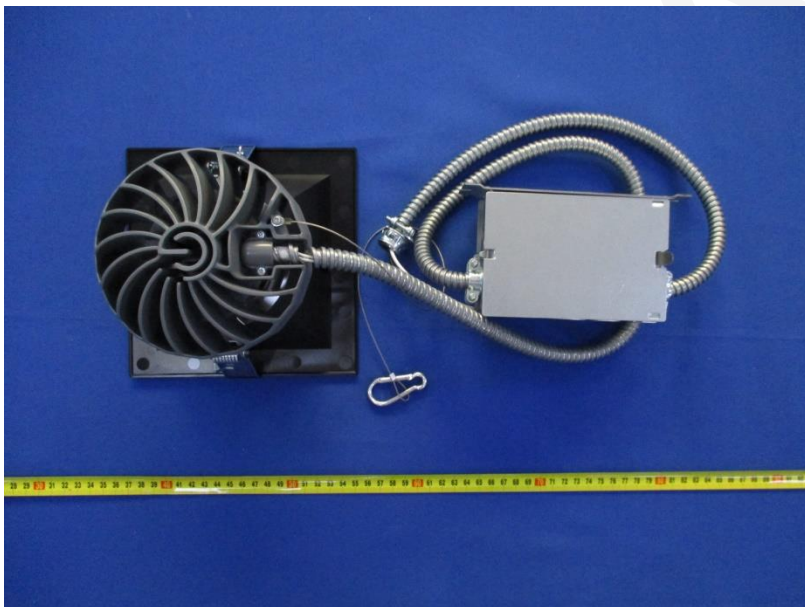
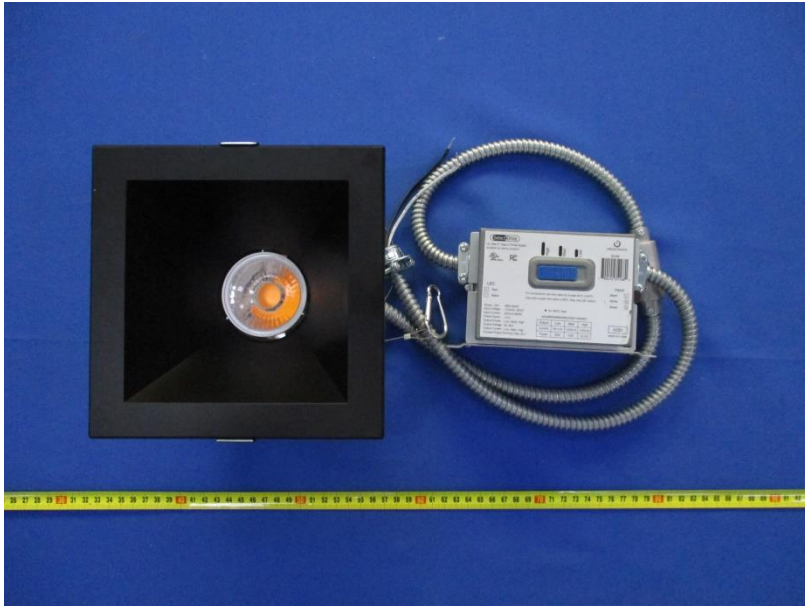
Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	8862	8862	8862	8862	8862	8862	8862	8862
5.0°	7476	7299	7164	7201	7320	7420	7580	7841
10.0°	5466	5329	5344	5404	5544	5863	6108	6279
15.0°	4198	4172	4226	4274	4372	4637	5005	5181
20.0°	3197	3255	3319	3308	3309	3548	3833	4012
25.0°	2340	2338	2494	2345	2441	2598	2895	2894
30.0°	1097	1488	1755	1549	1248	1708	2051	2024
35.0°	210	456	1047	463	224	584	1344	941
40.0°	76	108	248	113	89	133	617	177
45.0°	12	43	72	38	25	53	124	65
50.0°	0	0	13	0	0	0	38	0
55.0°	0	0	0	0	0	0	0	0
60.0°	0	0	0	0	0	0	0	0
65.0°	0	0	0	0	0	0	0	0
70.0°	0	0	0	0	0	0	0	0
75.0°	0	0	0	0	0	0	0	0
80.0°	0	0	0	0	0	0	0	0
85.0°	0	0	0	0	0	0	0	0
90.0°	0	0	0	0	0	0	0	0
95.0°	0	0	0	0	0	0	0	0
100.0°	0	0	0	0	0	0	0	0
105.0°	0	0	0	0	0	0	0	0
110.0°	0	0	0	0	0	0	0	0
115.0°	0	0	0	0	0	0	0	0
120.0°	0	0	0	0	0	0	0	0
125.0°	0	0	0	0	0	0	0	0
130.0°	0	0	0	0	0	0	0	0
135.0°	0	0	0	0	0	0	0	0
140.0°	0	0	0	0	0	0	0	0
145.0°	0	0	0	0	0	0	0	0
150.0°	0	0	0	0	0	0	0	0
155.0°	0	0	0	0	0	0	0	0
160.0°	0	0	0	0	0	0	0	0
165.0°	0	0	0	0	0	0	0	0
170.0°	0	0	0	0	0	0	0	0
175.0°	0	0	0	0	0	0	0	0
180.0°	0	0	0	0	0	0	0	0

Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	200.1	5.13	0-5	200.1	5.13
5-10	497.8	12.77	0-10	697.9	17.90
10-15	639.9	16.41	0-15	1337.8	34.30
15-20	692.5	17.76	0-20	2030.3	52.06
20-25	667.7	17.12	0-25	2698.0	69.18
25-30	568.7	14.58	0-30	3266.7	83.77
30-35	381.2	9.77	0-35	3647.9	93.54
35-40	174.8	4.48	0-40	3822.6	98.02
40-45	58.7	1.51	0-45	3881.4	99.53
45-50	16.2	0.42	0-50	3897.6	99.94
50-55	2.2	0.06	0-55	3899.8	100.00
55-60	0.0	0.00	0-60	3899.8	100.00
60-65	0.0	0.00	0-65	3899.8	100.00
65-70	0.0	0.00	0-70	3899.8	100.00
70-75	0.0	0.00	0-75	3899.8	100.00
75-80	0.0	0.00	0-80	3899.8	100.00
80-85	0.0	0.00	0-85	3899.8	100.00
85-90	0.0	0.00	0-90	3899.8	100.00
90-95	0.0	0.00	0-95	3899.8	100.00
95-100	0.0	0.00	0-100	3899.8	100.00
100-105	0.0	0.00	0-105	3899.8	100.00
105-110	0.0	0.00	0-110	3899.8	100.00
110-115	0.0	0.00	0-115	3899.8	100.00
115-120	0.0	0.00	0-120	3899.8	100.00
120-125	0.0	0.00	0-125	3899.8	100.00
125-130	0.0	0.00	0-130	3899.8	100.00
130-135	0.0	0.00	0-135	3899.8	100.00
135-140	0.0	0.00	0-140	3899.8	100.00
140-145	0.0	0.00	0-145	3899.8	100.00
145-150	0.0	0.00	0-150	3899.8	100.00
150-155	0.0	0.00	0-155	3899.8	100.00
155-160	0.0	0.00	0-160	3899.8	100.00
160-165	0.0	0.00	0-165	3899.8	100.00
165-170	0.0	0.00	0-170	3899.8	100.00
170-175	0.0	0.00	0-175	3899.8	100.00
175-180	0.0	0.00	0-180	3899.8	100.00

6. Product Photo



Directions

1. The information marked "superscript #" is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
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*****END OF REPORT*****