

# 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: LES9027DIM010UNVVN/ADR8CC**

<b>Report Type:</b>	Electrical and Photometric tests including: Input Current, Power, Power Factor, Luminous Flux, Luminous Efficacy, CRI, CCT, Chromaticity Coordinate, Spectral Power Distribution
<b>Test Engineer:</b>	Joker Gu
<b>Report Number:</b>	RKS180131080-10-7-M1
<b>Test Date:</b>	2018-03-12
<b>Report Date:</b>	2020-09-04
<b>Reviewed By:</b>	Seven Xia/EE Engineer
<b>Revised Note:</b>	The previous report RKS180131080-10-7 is replaced by this report on 2020-09-04
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Kunshan). No.248 Chenghu Road, Kunshan, Jiangsu province, China. Tel: +86-0512-86175000 Fax: +86-0512-88934268
<b>Test Facility:</b>	Test facility was located at No.248 Chenghu Road, Kunshan, Jiangsu province, China.
<b>Accreditation:</b>	The IAS Accreditation Number TL-749.

## 1. Product Description

### General Information:

One sample was received on 2018-02-05 and used for testing.

Model Tested: LES9027DIM010UNVVN/ADR8CC  
Manufacturer: GREEN CREATIVE LTD  
Brand Name: GREEN CREATIVE  
Product Designation: LED Recessed Downlight  
Aging Time Before Test: 0hour(For New Products)

### Rated Values:

Rated Voltage/Frequency: 120-277VAC, 50/60Hz  
Rated Power: 12.5W  
Nominal CCT: 2700K  
Nominal Lumen Output: 940lm

## 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-30-15: 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	2018-01-24	2019-01-24
Power Meter	INVENTFINE	WT500	GSJWQ20009	2017-03-23	2018-03-22
Spectral photometer	INVENTFINE	CMS-3S	GSGSE100017	2018-01-24	2019-01-24
AC Power Supply	INVENTFINE	CHP500	JWJSD010071	2017-03-23	2018-03-22
Standard Light Source	INVENTFINE	N/A	JWWCR020106	2018-01-24	2019-01-24
Thermal Meter	KEJIAN	TA298	N/A	2017-11-14	2018-11-14
DC Power Supply	INVENTFINE	WL3005	JWWCP020069	2017-03-23	2018-03-22

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.

$4\pi$  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  $U=2.6\%$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is  $U=24\text{K}$  ( $K=2$ ), 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  $U=0.16\%$  of rdg, AC Voltage  $U=0.18\%$  of rdg, Power  $U=0.14\%$  ( $K=2$ ), at the 95% confidence level.

### Fidelity Index and Gamut Index Calculation

The  $R_i$ ,  $R_g$  was calculated according to IES TM-30-15 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**

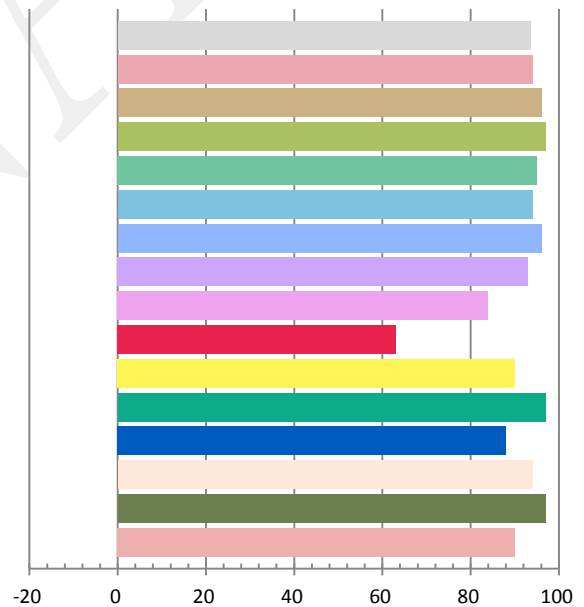
### Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.1039	12.4	0.9948	1145.7	92.4

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
4.030	2733	0.00133	0.4595	0.4141	0.2607	0.5286

### Color Rendering Index

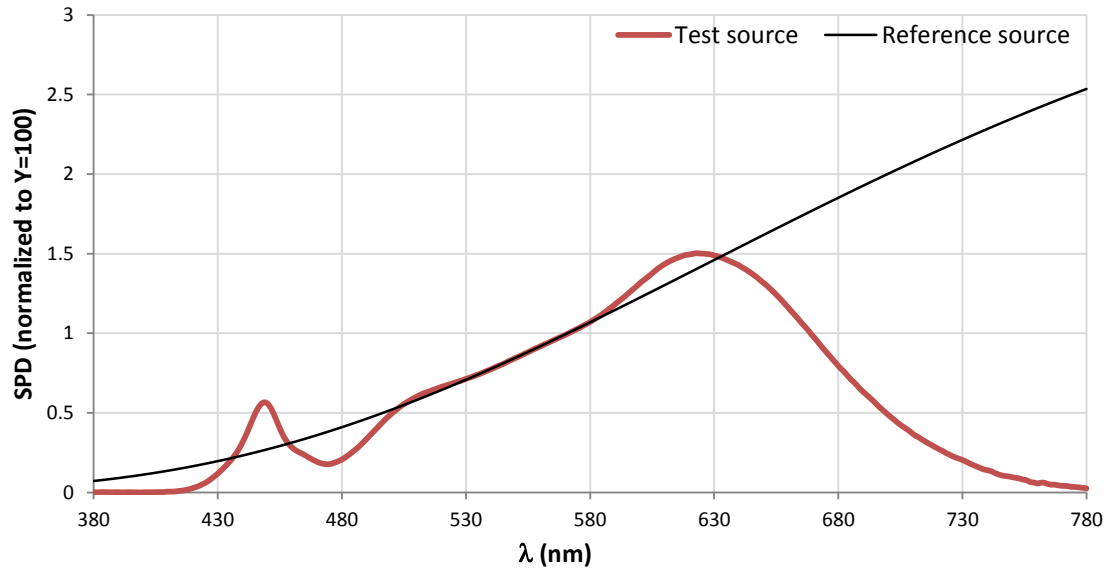
<b>Ra</b> <b>93.6</b>			
<b>R1</b> 94	<b>R2</b> 96	<b>R3</b> 97	<b>R4</b> 95
<b>R5</b> 94	<b>R6</b> 96	<b>R7</b> 93	<b>R8</b> 84
<b>R9</b> 63	<b>R10</b> 90	<b>R11</b> 97	<b>R12</b> 88
<b>R13</b> 94	<b>R14</b> 97	<b>R15</b> 90	



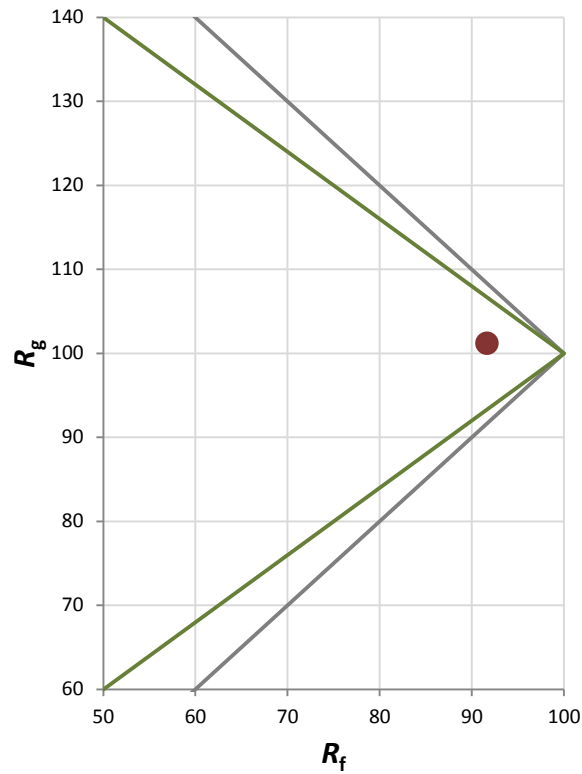
### Fidelity Index and Gamut Index

Fidelity Index $R_f$	92
Gamut Index $R_g$	101

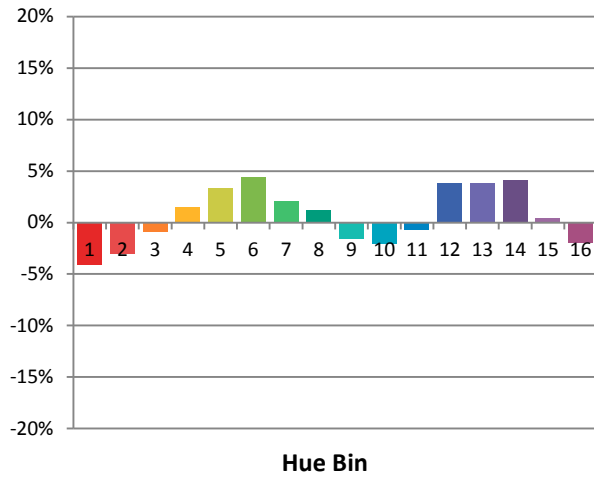
### Spectral Power Distribution Comparison



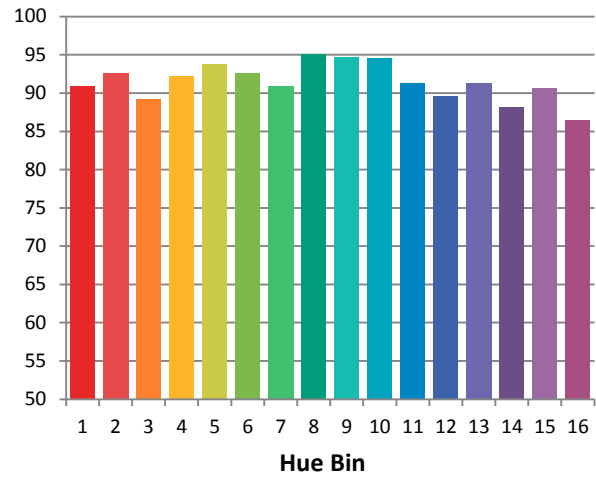
### Plot of $R_g$ versus $R_f$



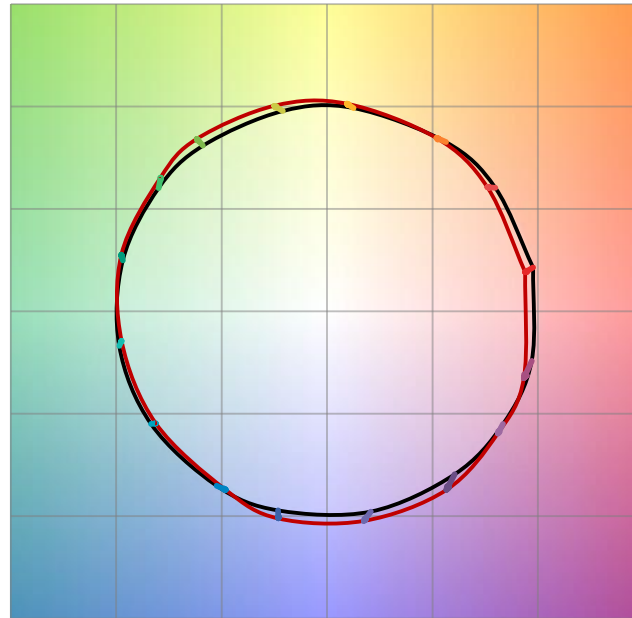
Chroma Shift by Hue



$R_f$  by Hue

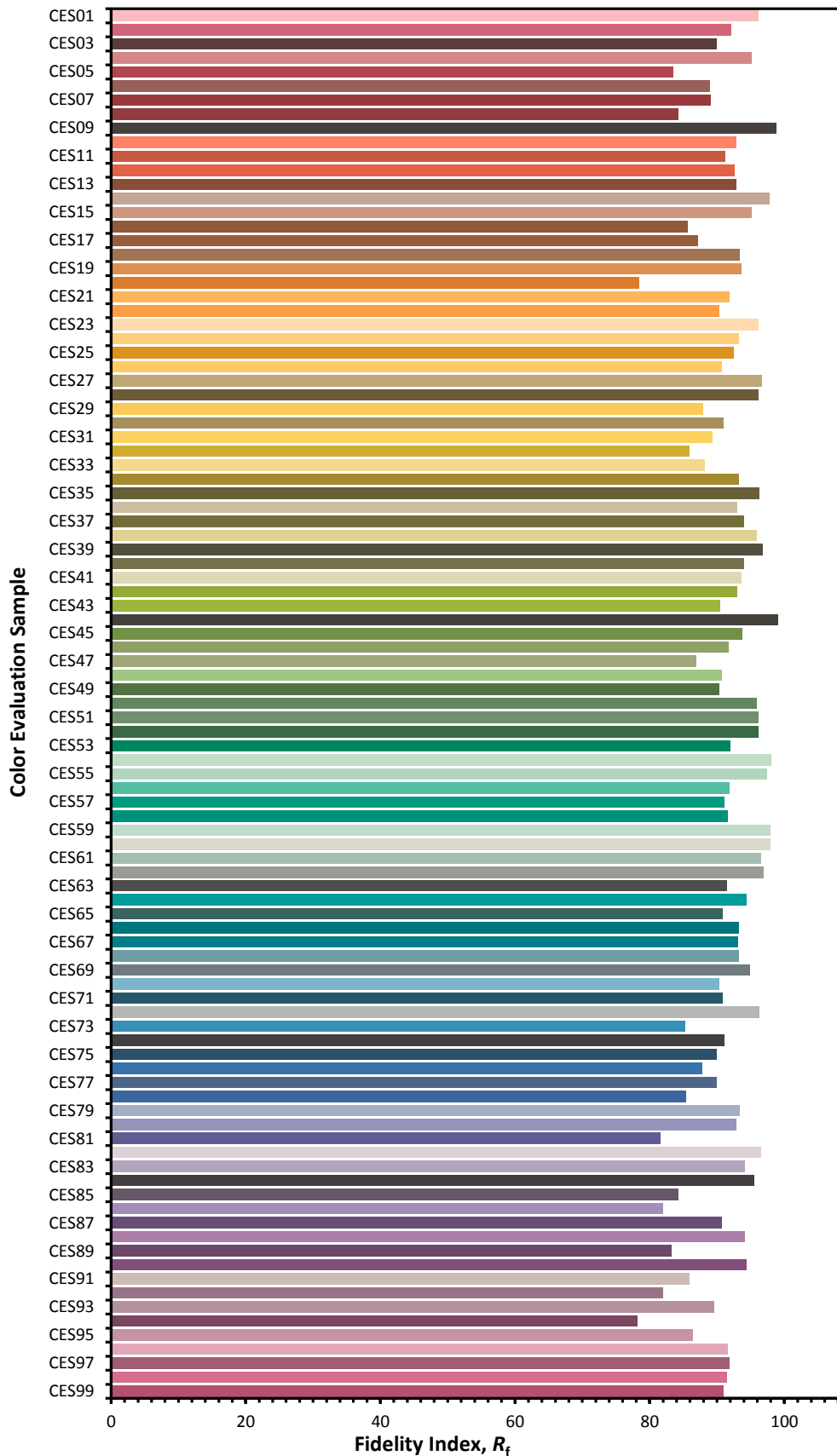


Color Vector Graphic

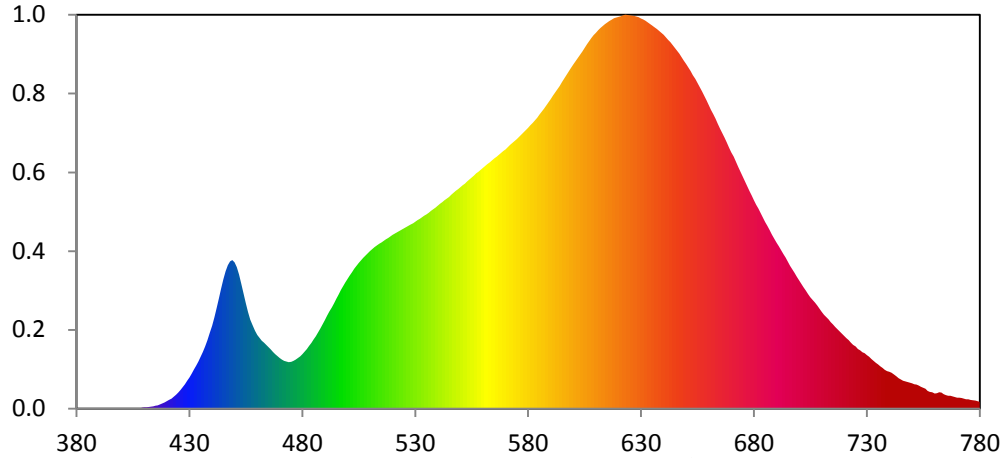


— Refenerce Illuminat — Test Source

### Color Fidelity by CES Sample



### Relative Spectral Power Distribution

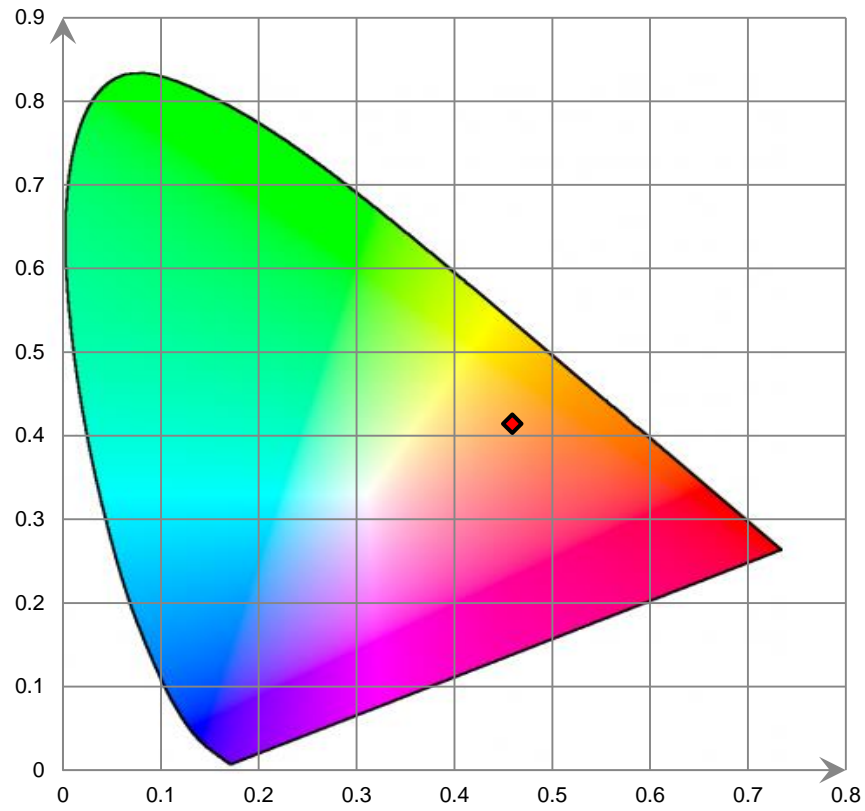


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.970E-02	421	5.485E-01	462	4.349E+00	503	8.944E+00	544	1.344E+01
381	2.860E-02	422	6.371E-01	463	4.214E+00	504	9.138E+00	545	1.355E+01
382	2.120E-02	423	7.613E-01	464	4.083E+00	505	9.311E+00	546	1.368E+01
383	3.440E-02	424	8.876E-01	465	3.939E+00	506	9.483E+00	547	1.382E+01
384	4.620E-02	425	1.020E+00	466	3.784E+00	507	9.645E+00	548	1.394E+01
385	3.280E-02	426	1.182E+00	467	3.633E+00	508	9.797E+00	549	1.406E+01
386	2.730E-02	427	1.366E+00	468	3.488E+00	509	9.942E+00	550	1.417E+01
387	2.640E-02	428	1.563E+00	469	3.352E+00	510	1.008E+01	551	1.429E+01
388	2.160E-02	429	1.773E+00	470	3.228E+00	511	1.022E+01	552	1.441E+01
389	3.050E-02	430	1.993E+00	471	3.126E+00	512	1.034E+01	553	1.454E+01
390	3.000E-02	431	2.233E+00	472	3.051E+00	513	1.046E+01	554	1.467E+01
391	1.490E-02	432	2.489E+00	473	3.000E+00	514	1.055E+01	555	1.478E+01
392	1.160E-02	433	2.750E+00	474	2.978E+00	515	1.063E+01	556	1.492E+01
393	1.860E-02	434	3.018E+00	475	2.986E+00	516	1.073E+01	557	1.505E+01
394	2.490E-02	435	3.311E+00	476	3.045E+00	517	1.084E+01	558	1.517E+01
395	2.550E-02	436	3.630E+00	477	3.134E+00	518	1.093E+01	559	1.528E+01
396	1.820E-02	437	3.973E+00	478	3.228E+00	519	1.102E+01	560	1.541E+01
397	1.150E-02	438	4.357E+00	479	3.347E+00	520	1.112E+01	561	1.553E+01
398	6.400E-03	439	4.802E+00	480	3.480E+00	521	1.120E+01	562	1.565E+01
399	3.400E-03	440	5.300E+00	481	3.637E+00	522	1.128E+01	563	1.576E+01
400	1.530E-02	441	5.846E+00	482	3.814E+00	523	1.136E+01	564	1.589E+01
401	2.040E-02	442	6.433E+00	483	4.009E+00	524	1.145E+01	565	1.602E+01
402	2.270E-02	443	7.054E+00	484	4.206E+00	525	1.153E+01	566	1.613E+01
403	2.320E-02	444	7.680E+00	485	4.419E+00	526	1.162E+01	567	1.625E+01
404	2.700E-02	445	8.267E+00	486	4.633E+00	527	1.170E+01	568	1.637E+01
405	3.190E-02	446	8.779E+00	487	4.867E+00	528	1.178E+01	569	1.649E+01
406	3.660E-02	447	9.183E+00	488	5.123E+00	529	1.187E+01	570	1.660E+01
407	4.100E-02	448	9.434E+00	489	5.385E+00	530	1.197E+01	571	1.673E+01
408	3.810E-02	449	9.503E+00	490	5.654E+00	531	1.206E+01	572	1.687E+01
409	6.470E-02	450	9.370E+00	491	5.930E+00	532	1.215E+01	573	1.700E+01
410	8.360E-02	451	9.046E+00	492	6.209E+00	533	1.225E+01	574	1.713E+01
411	8.600E-02	452	8.575E+00	493	6.479E+00	534	1.235E+01	575	1.726E+01
412	9.290E-02	453	7.997E+00	494	6.745E+00	535	1.244E+01	576	1.739E+01
413	1.125E-01	454	7.374E+00	495	7.019E+00	536	1.254E+01	577	1.754E+01
414	1.437E-01	455	6.753E+00	496	7.298E+00	537	1.265E+01	578	1.768E+01
415	1.765E-01	456	6.181E+00	497	7.570E+00	538	1.276E+01	579	1.781E+01
416	2.067E-01	457	5.695E+00	498	7.829E+00	539	1.287E+01	580	1.796E+01
417	2.541E-01	458	5.301E+00	499	8.070E+00	540	1.298E+01	581	1.813E+01
418	3.188E-01	459	4.980E+00	500	8.300E+00	541	1.310E+01	582	1.829E+01
419	3.856E-01	460	4.718E+00	501	8.516E+00	542	1.322E+01	583	1.845E+01
420	4.636E-01	461	4.515E+00	502	8.725E+00	543	1.333E+01	584	1.862E+01

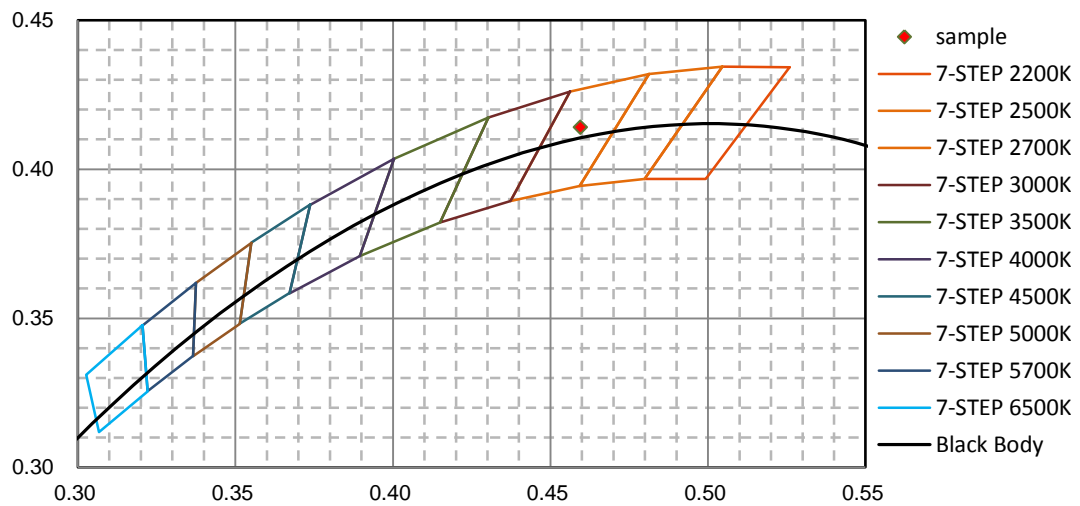


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.882E+01	626	2.516E+01	667	1.735E+01	708	6.598E+00	749	1.667E+00
586	1.901E+01	627	2.513E+01	668	1.704E+01	709	6.397E+00	750	1.619E+00
587	1.921E+01	628	2.511E+01	669	1.672E+01	710	6.193E+00	751	1.561E+00
588	1.941E+01	629	2.505E+01	670	1.642E+01	711	6.003E+00	752	1.529E+00
589	1.960E+01	630	2.498E+01	671	1.611E+01	712	5.866E+00	753	1.470E+00
590	1.982E+01	631	2.491E+01	672	1.579E+01	713	5.707E+00	754	1.385E+00
591	2.003E+01	632	2.483E+01	673	1.547E+01	714	5.530E+00	755	1.330E+00
592	2.024E+01	633	2.473E+01	674	1.516E+01	715	5.382E+00	756	1.278E+00
593	2.045E+01	634	2.463E+01	675	1.485E+01	716	5.222E+00	757	1.133E+00
594	2.065E+01	635	2.453E+01	676	1.455E+01	717	5.080E+00	758	1.067E+00
595	2.089E+01	636	2.441E+01	677	1.424E+01	718	4.930E+00	759	1.036E+00
596	2.112E+01	637	2.429E+01	678	1.394E+01	719	4.783E+00	760	9.574E-01
597	2.135E+01	638	2.417E+01	679	1.365E+01	720	4.648E+00	761	9.920E-01
598	2.157E+01	639	2.406E+01	680	1.335E+01	721	4.500E+00	762	1.036E+00
599	2.179E+01	640	2.393E+01	681	1.306E+01	722	4.383E+00	763	1.020E+00
600	2.203E+01	641	2.376E+01	682	1.281E+01	723	4.218E+00	764	9.255E-01
601	2.225E+01	642	2.361E+01	683	1.253E+01	724	4.080E+00	765	8.592E-01
602	2.245E+01	643	2.346E+01	684	1.222E+01	725	3.964E+00	766	8.151E-01
603	2.266E+01	644	2.328E+01	685	1.194E+01	726	3.816E+00	767	8.209E-01
604	2.287E+01	645	2.310E+01	686	1.169E+01	727	3.717E+00	768	7.804E-01
605	2.309E+01	646	2.291E+01	687	1.143E+01	728	3.614E+00	769	7.384E-01
606	2.331E+01	647	2.271E+01	688	1.114E+01	729	3.532E+00	770	7.000E-01
607	2.352E+01	648	2.249E+01	689	1.086E+01	730	3.419E+00	771	6.876E-01
608	2.372E+01	649	2.227E+01	690	1.061E+01	731	3.311E+00	772	6.802E-01
609	2.390E+01	650	2.206E+01	691	1.038E+01	732	3.178E+00	773	6.391E-01
610	2.406E+01	651	2.184E+01	692	1.014E+01	733	3.044E+00	774	5.858E-01
611	2.422E+01	652	2.160E+01	693	9.905E+00	734	2.935E+00	775	5.848E-01
612	2.435E+01	653	2.136E+01	694	9.675E+00	735	2.817E+00	776	5.589E-01
613	2.447E+01	654	2.110E+01	695	9.408E+00	736	2.709E+00	777	5.373E-01
614	2.460E+01	655	2.084E+01	696	9.141E+00	737	2.602E+00	778	5.009E-01
615	2.470E+01	656	2.058E+01	697	8.901E+00	738	2.484E+00	779	4.731E-01
616	2.480E+01	657	2.030E+01	698	8.678E+00	739	2.402E+00	780	4.222E-01
617	2.490E+01	658	2.001E+01	699	8.436E+00	740	2.352E+00		
618	2.499E+01	659	1.973E+01	700	8.204E+00	741	2.284E+00		
619	2.504E+01	660	1.943E+01	701	7.989E+00	742	2.197E+00		
620	2.508E+01	661	1.912E+01	702	7.764E+00	743	2.064E+00		
621	2.513E+01	662	1.884E+01	703	7.556E+00	744	1.955E+00		
622	2.518E+01	663	1.856E+01	704	7.332E+00	745	1.858E+00		
623	2.521E+01	664	1.824E+01	705	7.137E+00	746	1.784E+00		
624	2.519E+01	665	1.793E+01	706	6.953E+00	747	1.747E+00		
625	2.518E+01	666	1.764E+01	707	6.772E+00	748	1.707E+00		

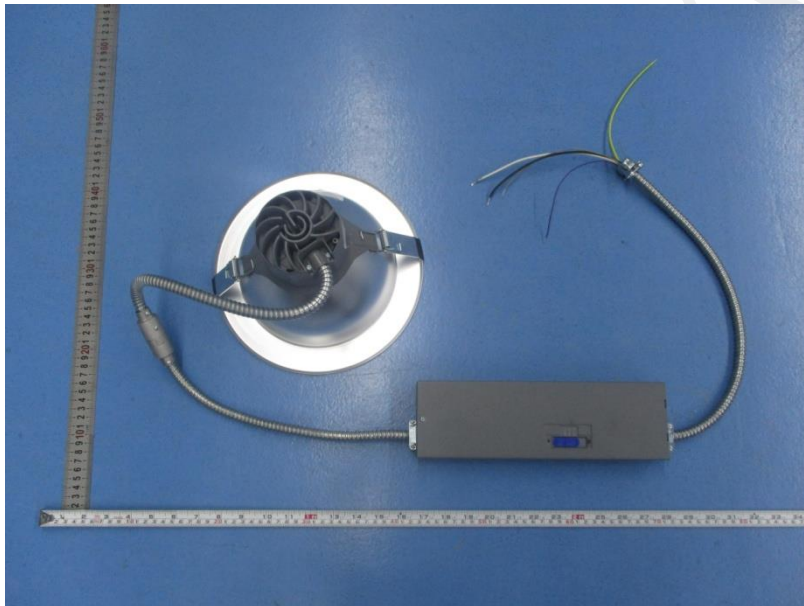
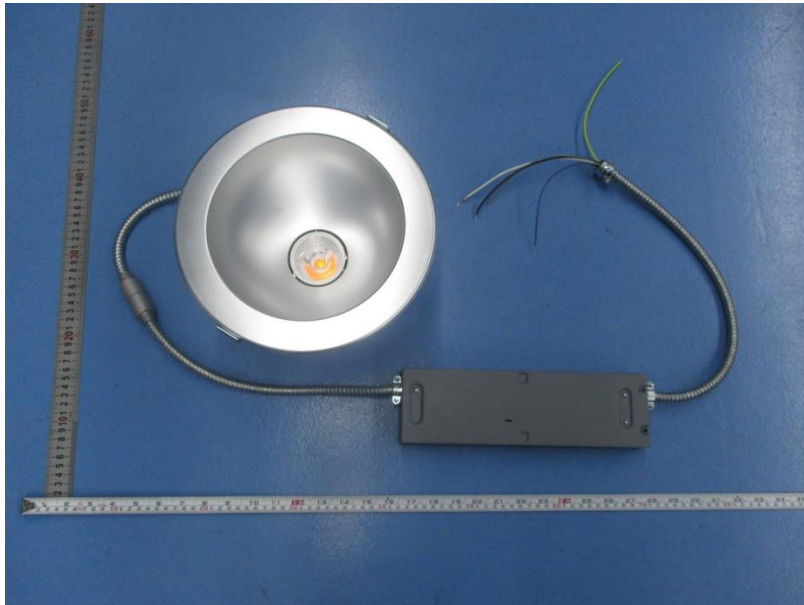
CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



## 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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