



# CCD Spectroradiometer Integrating Sphere Compact System for LED (LPCE-3) Brochure

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**Leader in Lighting & Electrical Test Instruments**

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## CONTENT TABLE

Name	Model	Remark	Page
CCD Spectroradiometer	LMS-7000VIS	350nm~950nm	-----2
Optical Fiber	CFO-1.5M	Option is CFO-1.5MY for two integrating spheres	-----3
Digital DC Power Supply	DC3005S	30V/5A. Option is DC3010S or DC6005S	-----3
Digital Power Meter	LS2008R	Option is LS2012 or LS2050B	-----4
AC Power Source	LSP-500VAS	Option is LPS-1KVAS	-----4
Big Integrating Sphere with Cabinet	IS-1.5MA-CASE	Option is Dia 1.75m or 2m	-----5
Small Integrating Sphere	IS-0.3M	Option is Dia 0.5m	-----5
Standard Lamp Source	SLS-50W	24V/50W to calibrate big integrating sphere	-----6
Auxiliary Lamp Test Set	RLS-50W	To correct lumen due to the self absorption issue	-----6
Standard Lamp Source	SLS-10W	12V/10W to calibrate for small integrating sphere	-----6
<b>LM-79 LED Colorimetric, Photometric and Electrical Test Report</b>			

Note the following: If you need to test the single LED or LED Chip, you should choose the items which marked by **Blue**

## 1、 CCD Spectroradiometer (LMS-7000VIS)

The LMS-7000 work with LISUN A molding integrating sphere to be an ALL-IN-ONE system to test single LED and LED luminaires photometric, colorimetric and electrical parameters. The test speed is quick and test results are very accuracy. It is fully meet CIE127-1997, IES LM-79-08 and IES LM-80-08. The LMS-7000 is a cost-efficient CCD Spectroradiometer which was widely used by the LED manufactory.

The LMS-7000 is quick and high accuracy testing. It has been certificated by the third CNAS lab, the test results can be traced to NIM and NIST.



### Specifications:

- Spectral Resolution:  $\pm 0.2\text{nm}$
- Reproducibility:  $\pm 0.5\text{nm}$
- Accuracy of Chromaticity Coordinate ( $\Delta x$ ,  $\Delta y$ ):  $\pm 0.003$
- Correlated Color Temperature CCT: 1,500K~25,000K, CCT Accuracy:  $\pm 0.5\%$
- High spectral resolution, High sensitivity and excellent reliability
- Spectrum sensor: SMA905 optical fiber
- Communicate PC via USB, the software can be run-in Win7, Win8 and Win10

LMS-7000UV	LMS-7000UV-VIS	LMS-7000VIS	LMS-7000VIS-NIR	LMS-7000UV-VIS-NIR
200~400nm	200~800nm	350~950nm	350~1050nm	200~1050nm

## 2、 Optical Fiber (CFO-1.5M)



CFO-1.5M is 1.5m length optical fiber used to connect the spectroradiometer and integrating sphere. CFO-1.5MY is Y type optical fiber which can connect with two integrating spheres at the same time.

## 3、 Digital DC Power Supply (DC3005S)



The DC Series Power Supplies are with high stability and high accuracy. The voltage and current can be adjustable and simple operation. They are suitable to supply DC Power for the standard lamps.

### Specifications:

- Output voltage range: 0.005~30.00V
- Output current range: 0.005~5.000A
- Digital control for Constant Current output or Constant Voltage output
- Communicate with PC via software, the Voltage & Current set by the software and Power Output can be remote controlled.

## 4、 Digital Power Meter (LS2008R)



- Measure Voltage, Current, Power and Power Factor (AC model).
- Voltage range: 10~600V; Current range: 0.005~20A
- Accuracy:  $\pm (0.4\% \text{reading} + 0.1\% \text{range} + 1 \text{digit})$
- Communicate with PC via software

Model	Measure	Remark
LS2008R	AC Parameters: U, I, P, PF	Digital Tube display
LS2012	U(AC&DC), I(AC&DC), P(AC&DC), Power Factor PF(AC)	Digital Tube display
LS2050B	U(AC&DC), I(AC&DC), P(AC&DC), Power Factor PF(AC), Displacement Factor DF(AC) and Total 0-50 Harmonic in IEC/CSA	Test Accuracy is Class 0.5 with LCD touch screen display, it has special Software can be run in Win7, Win8 or Win10

## 5、 AC Power Source (LSP-500VAS)



- AC-DC-AC frequency conversion technology, Controlled & tested by 16 bits MCU
- Protection for over hot, thundering voltage and current
- Total voltage distortion:  $\leq 0.6\%$ ; Voltage stability:  $\leq 0.1\%/30 \text{min}$
- Load adjust rate:  $\leq 0.1\%$ ; Frequency stability:  $\leq 0.05\%/30 \text{min}$
- Output voltage range: AC 0.0~300.0V, Output Frequency Range: 45~70Hz, 100Hz, 200Hz and 400Hz
- Power output: LSP-500VAS: 0~150V is 4.2A and 150~300V is 2.1A. LSP-1KVAS: 0~150V is 8.4A and 150~300V is 4.2A.

- Input Power: 220V and 50/60Hz
- Communicate with PC via software, the Voltage & Current set by the software and Power Output can be remote controlled.

## 6、 Integrating Sphere with Cabinet (IS-1.5MA-CASE)

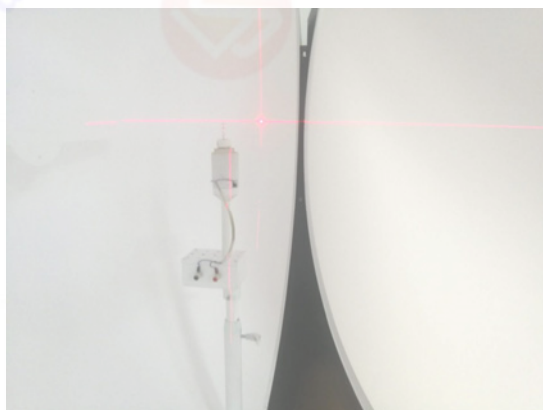
Due to the LED luminaries such as LED street luminaries developed, to do 4π geometry testing, it is hard to be hold in the traditional integrating sphere design. To solve this problem, LISUN design a new kind of sphere.



A Molding Integrating Sphere VS the traditional Integrating Sphere

LISUN new Integrating sphere has the following advantages:

- The hold base can bear max 20kg, it can test all kinds of luminaires and light source such as E27/E40, all tubes such as T5/T8/T12 and all kinds of luminaries
- The hold base can be installed in the ceiling or down, height can be adjustable
- The test hold base has four power cables connect to the outside Power Supply and max is 5KW
- Build-in Cross laser system which help to install the standard lamp and testing lamp in the center of the integrating sphere



Build-in Cross Laser System

**Specification:**

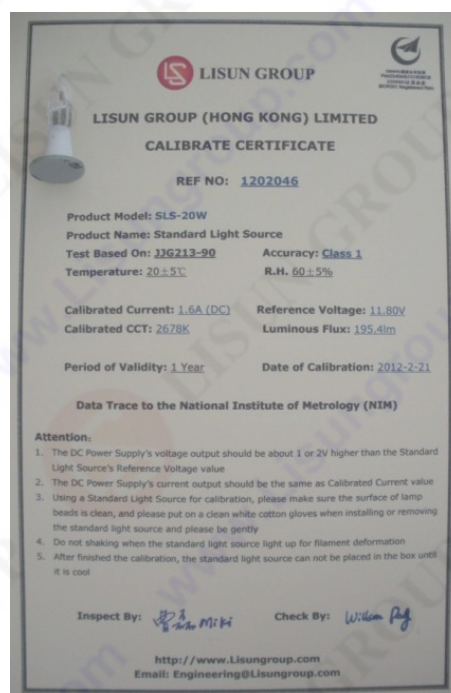
- Diameter: 0.3m, 0.5m, 1.0m, 1.5m, 1.75m, 2.0m, 2.5m and 3.0m
- The painting of integrating spheres is according to CIE Pub.No.84(1989)
- BaSO4 coating:  $\rho(\lambda) \geq 0.96(450\text{nm} \sim 800\text{nm})$  and  $\rho(\lambda) \geq 0.92(380\text{nm} \sim 450\text{nm})$
- Fine diffuse reflection: Reflectance  $\rho \approx 0.8$  and accuracy of  $\rho(\lambda) < 1.5\%$
- IS-1.5MA-CASE (1.5m), IS-1.75MA-CASE (1.75m) and IS-2.0MA-CASE (2m) integrating sphere has built-in cabinet inside to combine all of the instruments.

**P.S. The big sphere already includes the Auxiliary lamp position which allowed to work with the auxiliary lamp to do self-absorption revise, and also include the cross laser system to help install the lamp in the sphere.**

**7、 Standard Lamp Source**

OSRAM Standard Lamp to calibrate the spectrum and luminous flux with Lisun Lab certification. The data can be traced NIM. The Standard Lamp Source is used to calibrate the integrating sphere system. The different size of Integrating Sphere should choose the right power of standard lamp source

Integrating Sphere Size	Standard Lamp Source
0.3m/0.5m	SLS-10W
1m/1.5m/1.75m	SLS-50W
2m/2.5m/3m	SLS-100W



**8、 Auxiliary Lamp (RLS-50W)**

Due to the luminaires material has self-absorption, the test flux will be a bit difference than the original flux when test the luminaires in the integrating sphere, according to CIE request, it is necessary use an Auxiliary lamp to do flux self-absorption revise.

**The next pages are LPCE-3 Test Report.**

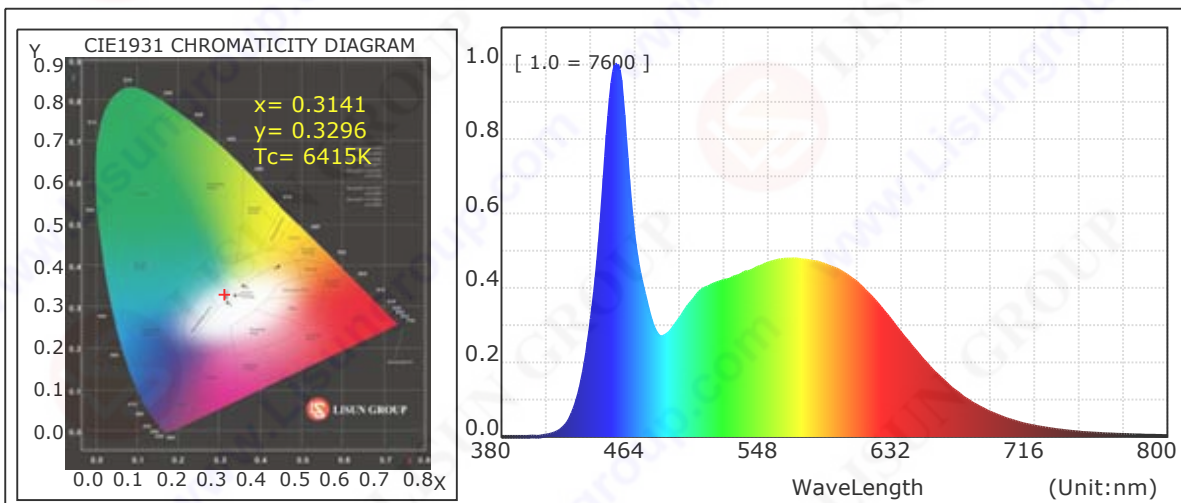
## Lightsource Test Report

### Product Information

Product Number:	Product Type:
Product Category: Bulb	Product Spec:
Manufacturer: PHILIP	Buyer:
Submitted Unit:	

### CIE Colorimetric Parameters

Chromatic Coordinate:  $x=0.3141$   $y=0.3296$   $u(u')=0.1986$   $v=0.3126$   $v'=0.4689$   
 CCT: 6415K Color Ratio: R=15.052 G=43.993 B=41.807  
 Peak WaveLength: 452.6nm Half WaveLength: 24.0nm  
 Domaint Wave: 489.2nm Color Purity: 6.754%  
 Color Render Index: Ra=83.8 TM30: Rf= 79.1, Rg= 100.0  
 R1=82 R2=90 R3=93 R4=82 R5=82 R6=83 R7=89 R8=70  
 R9=10 R10=74 R11=81 R12=54 R13=85 R14=97 R15=77  
 Color Quality Scale: Qa=81.8, Qf=81.9, Qp=81.7, Qg=91.2  
 Q1=84 Q2=99 Q3=79 Q4=72 Q5=78 Q6=81 Q7=85 Q8=89  
 Q9=97 Q10=90 Q11=84 Q12=83 Q13=82 Q14=72 Q15=77



### Photometric Parameters

Luminous Flux: 555.60lm	Efficiency: 83.17lm/W	Radiant Power: 1.802W
$\eta_{TM}$ : 83.18	Energy Efficiency Class: G(EU2019/2020)	
PAR: 1.777W	PPF: 7.960 $\mu$ mol/s	R/B: 0.6
Photons1: 2.069 $\mu$ mol/s(400~500nm)	Photons2: 1.944 $\mu$ mol/s(600~700nm)	

### Electric Parameters

Voltage: 220.50V	Current: 0.036A	Power: 6.68W
Power Factor: 0.8440	Frequency: 49.99Hz	

### Test Information

Scan Range: 380~800: 1nm	Photometric Method: sphere-spectroradiometer
Stabilization Time: 1min	Photometric Condition: Sphere:1.5 Geometry:4n
Max of Signal: 7600	CCD Integration Time: 36

Environment: Tx:25.1°C Ti:24.5°C RH:60%  
 Test Lab: Lisun Lab  
 Operator: Jacky

Test Device: Lisun LMS-7000  
 Test Time: 2020/12/31 14:01:22  
 Inspector:





WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0000	0.0000	525	0.4242	5.2012	670	0.1096	1.3436
385	0.0000	0.0000	530	0.4327	5.3049	675	0.0953	1.1681
390	0.0000	0.0000	535	0.4434	5.4369	680	0.0827	1.0145
395	0.0000	0.0000	540	0.4504	5.5227	685	0.0716	0.8781
400	0.0006	0.0069	545	0.4597	5.6363	690	0.0619	0.7590
405	0.0010	0.0120	550	0.4681	5.7399	695	0.0531	0.6513
410	0.0049	0.0598	555	0.4738	5.8093	700	0.0455	0.5575
415	0.0119	0.1455	560	0.4764	5.8417	705	0.0389	0.4770
420	0.0283	0.3472	565	0.4774	5.8529	710	0.0329	0.4039
425	0.0639	0.7840	570	0.4739	5.8099	715	0.0288	0.3530
430	0.1333	1.6341	575	0.4710	5.7749	720	0.0247	0.3025
435	0.2543	3.1179	580	0.4680	5.7378	725	0.0213	0.2613
440	0.4286	5.2552	585	0.4598	5.6380	730	0.0180	0.2210
445	0.6946	8.5159	590	0.4519	5.5407	735	0.0155	0.1898
450	0.9511	11.6608	595	0.4410	5.4069	740	0.0133	0.1633
455	0.9583	11.7499	600	0.4266	5.2302	745	0.0111	0.1366
460	0.6918	8.4820	605	0.4097	5.0232	750	0.0097	0.1190
465	0.4878	5.9806	610	0.3889	4.7682	755	0.0083	0.1013
470	0.3844	4.7126	615	0.3666	4.4945	760	0.0069	0.0849
475	0.3027	3.7115	620	0.3418	4.1902	765	0.0061	0.0748
480	0.2681	3.2875	625	0.3157	3.8704	770	0.0053	0.0647
485	0.2763	3.3877	630	0.2877	3.5280	775	0.0046	0.0563
490	0.3020	3.7033	635	0.2611	3.2015	780	0.0038	0.0471
495	0.3333	4.0860	640	0.2354	2.8860	785	0.0034	0.0411
500	0.3617	4.4351	645	0.2096	2.5697	790	0.0028	0.0344
505	0.3884	4.7619	650	0.1866	2.2873	795	0.0026	0.0315
510	0.4020	4.9283	655	0.1649	2.0220	800	0.0024	0.0292
515	0.4115	5.0455	660	0.1451	1.7794			
520	0.4191	5.1380	665	0.1258	1.5420			