

Lightsource Test Report

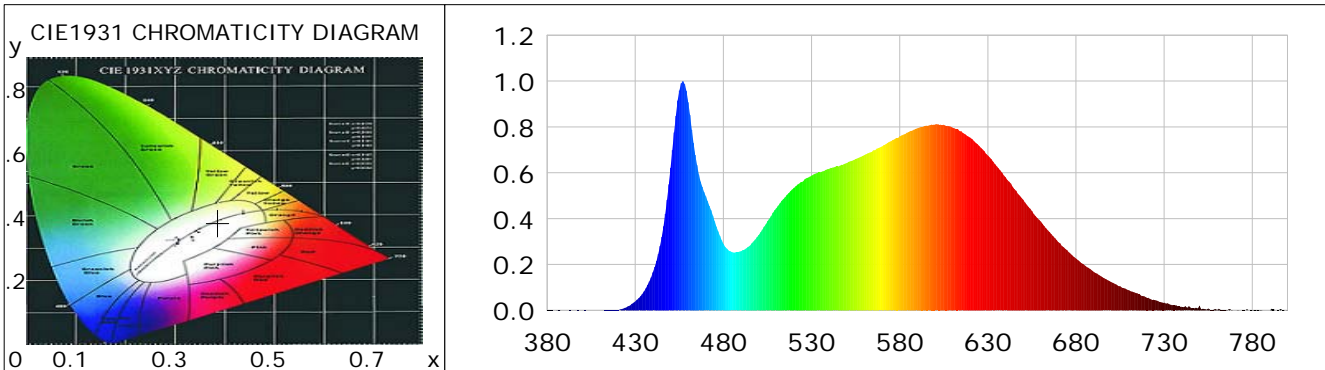
Product Information

Product Category: LED-Röhre
 Product Spec: LEDtube-060-8NWM-09W-TRF
 Manufacturer: METOLIGHT
 Buyer: 6852

Product Type: LED-Röhre TRF
 Product Number: 1
 Submitted Unit: 102262

CIE Colorimetric Parameters

Chromaticity coordinates: $x=0.3863$ $y=0.3798$ $u(u')=0.2278$ $v=0.3359$ $v'=0.5038$
 CCT: $T_c=3867K$ ($duv=-0.00025$) Color Ratio: $R=0.194$ $G=0.767$ $B=0.038$
 Peak Wavelength: 456.9nm Half Bandwidth: 21.6nm
 Dominant Wavelength: 579.7nm Color Purity: 0.299
 CRI: $R_a = 86.3$, $avgR(1\sim14) = 80.7$, $avgR(1\sim15) = 80.8$ TM30: $R_f = 84$, $R_g = 94$
 GAI: $GAI_BB_8=93.0$, $GAI_BB_15=101.5$, $GAI_EES=71.3$
 R1 =86 R2 =94 R3 =96 R4 =83 R5 =85 R6 =90 R7 =86 R8 =70
 R9 =28 R10=82 R11=82 R12=60 R13=89 R14=98 R15=81
 Color Quality Scale: $Q_a = 84.7$, $Q_f = 84.9$, $Q_p = 84.2$, $Q_g = 93.0$
 Q1 =83 Q2 =97 Q3 =82 Q4 =76 Q5 =80 Q6 =83 Q7 =87 Q8 =90
 Q9 =98 Q10=92 Q11=89 Q12=88 Q13=87 Q14=79 Q15=81



Photometric Parameters

Luminous Flux: 1365.6 lm Efficiency: 135.21 lm/W Radiant Power: 4.201 W
 Total mains efficacy: 159.00 lm/W Energy Efficiency Class: D (EU 2019/2015)
 Pupil Flux: 2064.70 Plm Pupil Lumens Per Watt: 204.43 Plm/W Pupil Factor (Kp): 1.512
 Circopic Flux: 4243.37 lm

Electric Parameters

Voltage: 231.10V Current: 0.0500A Power: 10.10W
 Power Factor: 0.8700 Frequency: 49.99Hz

Test Information

Scan Range: 380~800:1nm Photometric Method: sphere-spectroradiometer
 Stabilization Time: 0 ms ALC.: 1.0000 Photometric Condition: Sphere diameter: 2.00m, 4PI
 Max of Signal: 46501 (2494) CCD Integration Time: 287.60 ms

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WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0019	0.0542	525	0.5615	16.3818	670	0.2978	8.6894
385	0.0014	0.0402	530	0.5878	17.1479	675	0.2622	7.6496
390	0.0006	0.0163	535	0.6021	17.5662	680	0.2264	6.6041
395	0.0001	0.0031	540	0.6174	18.0123	685	0.1958	5.7116
400	0.0005	0.0145	545	0.6273	18.3026	690	0.1681	4.9032
405	0.0001	0.0036	550	0.6426	18.7468	695	0.1444	4.2122
410	0.0002	0.0070	555	0.6602	19.2623	700	0.1235	3.6019
415	0.0012	0.0353	560	0.6775	19.7643	705	0.1049	3.0604
420	0.0032	0.0939	565	0.6978	20.3578	710	0.0877	2.5593
425	0.0130	0.3807	570	0.7151	20.8641	715	0.0739	2.1560
430	0.0389	1.1336	575	0.7373	21.5104	720	0.0557	1.6254
435	0.0827	2.4129	580	0.7592	22.1486	725	0.0440	1.2843
440	0.1657	4.8354	585	0.7772	22.6755	730	0.0338	0.9867
445	0.3210	9.3636	590	0.7941	23.1664	735	0.0224	0.6536
450	0.6218	18.1412	595	0.8056	23.5026	740	0.0157	0.4576
455	0.9590	27.9778	600	0.8105	23.6462	745	0.0113	0.3306
460	0.9082	26.4955	605	0.8096	23.6195	750	0.0201	0.5851
465	0.6335	18.4817	610	0.7969	23.2492	755	0.0077	0.2250
470	0.4976	14.5165	615	0.7805	22.7708	760	0.0024	0.0700
475	0.3884	11.3306	620	0.7538	21.9930	765	0.0016	0.0458
480	0.2908	8.4848	625	0.7175	20.9319	770	0.0004	0.0127
485	0.2538	7.4045	630	0.6756	19.7092	775	0.0019	0.0547
490	0.2576	7.5156	635	0.6286	18.3403	780	0.0023	0.0665
495	0.2820	8.2275	640	0.5804	16.9325	785	0.0040	0.1178
500	0.3287	9.5893	645	0.5296	15.4521	790	0.0013	0.0386
505	0.3892	11.3543	650	0.4830	14.0924	795	0.0016	0.0471
510	0.4454	12.9940	655	0.4329	12.6289	800	0.0036	0.1062
515	0.4937	14.4035	660	0.3878	11.3130			
520	0.5345	15.5945	665	0.3419	9.9759			

Condition: Tx:20.0°C, Ti:0.0°C, R.H.:60%
 Test Lab:
 Operator: CRE

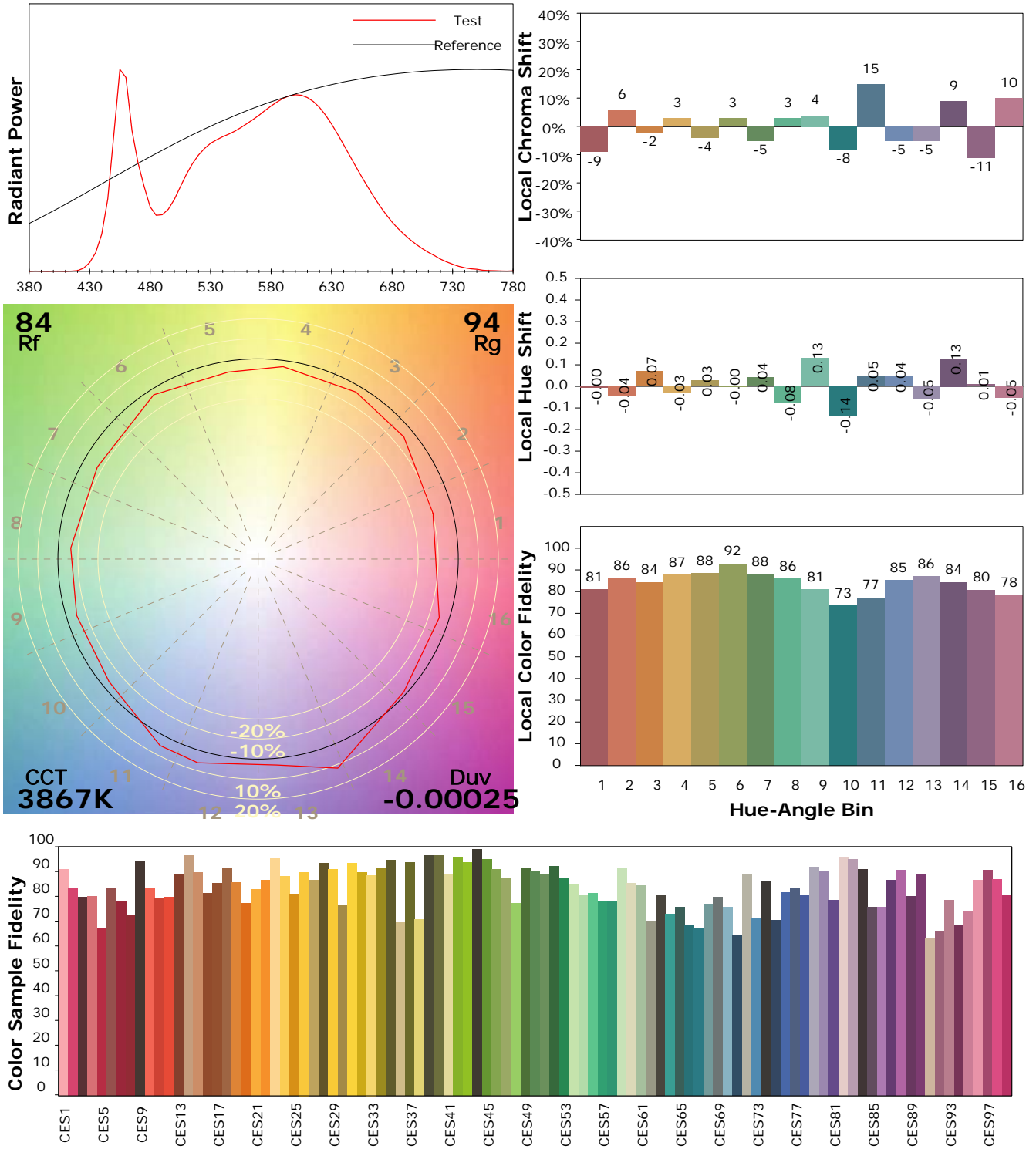
Test Device: Lisun LMS-9000B
 Test Time: 2021-01-06 10:49:42
 Inspector:

IES TM-30-18 Color Rendition Report

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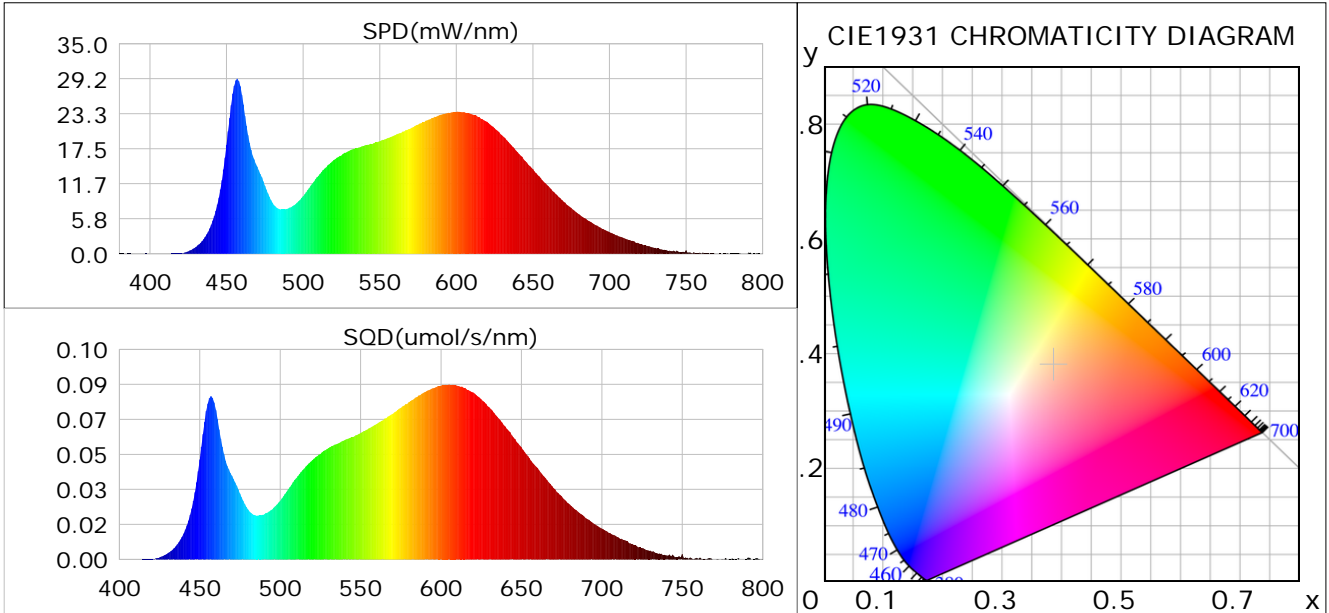
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Test Device: Lisun LMS-9000B
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Plant optical param data

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 Dominant Wavelength: 579.7nm Color Purity: 0.299
 CRI: $R_a=86.3$



Plant Optical Param

$ \mu_v(lm): 1365.60$	$Q_v(lm.s): 1365.60$
$ \mu_e, \dot{E}(W/nm): 4.20$	$Q_e(J): 4.20$
$ \mu_e(W): 4.12$	$ \mu_{fr}(W): 0.08$
$ \zeta_e: 0.41$	$ \zeta_{fr}: 0.01$
$PPE(umol/s/w): 1.93$	$K_{fr}: 0.05$
$Erb_Ratio: 1.62$	$PPF(umol/s): 19.45$
$PF_{uv}(360-400)(umol/s): 0.00$	$PPF(400-500)(umol/s): 3.35$
$PPF(500-600)(umol/s): 8.65$	$PPF(600-700)(umol/s): 7.46$
$PPF_{fr}(700-800)(umol/s): 0.47$	$PPF.t(umol): 19.45$
$ \mu_{ch-A.t}(J): 0.31$	$ \mu_{ch-A}(W): 0.31$
$ \mu_{ch-B.t}(J): 0.20$	$ \mu_{ch-B}(W): 0.20$
$ \mu_b.t(J): 0.86$	$ \mu_b(W): 0.86$
$ \mu_y.t(J): 1.87$	$ \mu_y(W): 1.87$
$ \mu_r.t(J): 1.42$	$ \mu_r(W): 1.42$

Electric Parameters

Voltage: 231.10V	Current: 0.0500A	Power: 10.10W
Power Factor: 0.8700	Frequency: 49.99Hz	

Condition: $T_x: 20.0^\circ C$, $T_i: 0.0^\circ C$, R.H.: 60%
 Test Lab:
 Operator: CRE

Test Device: Lisun LMS-9000B
 Test Time: 2021-01-06 10:49:22
 Inspector: