

Lightsource Test Report

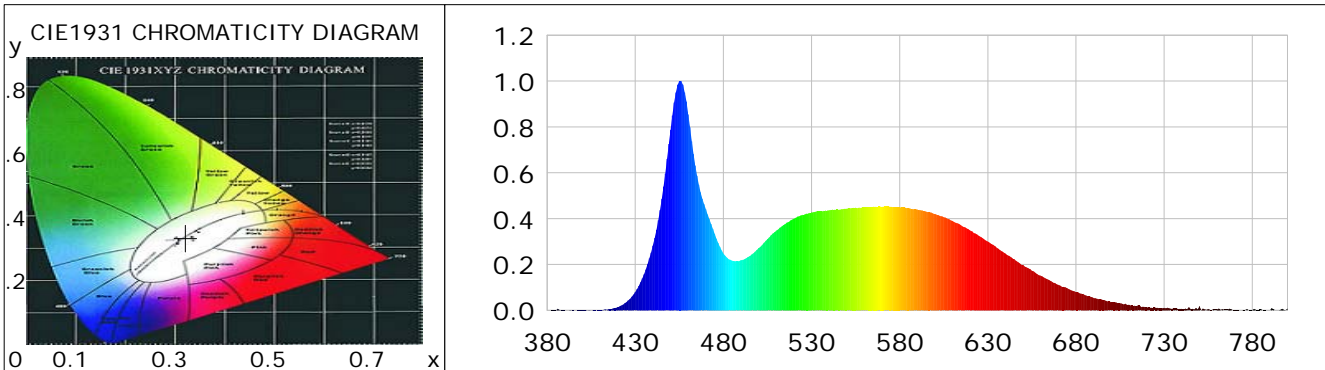
Product Information

Product Category: LED-Röhre
 Product Spec: LEDtube-085-5CWM-13W-TRF
 Manufacturer: METOLIGHT
 Buyer: 7709

Product Type: LED-Röhre-TRF
 Product Number: 1
 Submitted Unit: 104523

CIE Colorimetric Parameters

Chromaticity coordinates: $x=0.3211$ $y=0.3326$ $u(u')=0.2023$ $v=0.3143$ $v'=0.4714$
 CCT: $T_c=6050K$ ($duv=0.00090$) Color Ratio: $R=0.145$ $G=0.799$ $B=0.056$
 Peak Wavelength: 455.6nm Half Bandwidth: 22.3nm
 Dominant Wavelength: 490.9nm Color Purity: 0.042
 CRI: $R_a=84.9$, $avgR(1\sim14)=78.4$, $avgR(1\sim15)=78.6$ TM30: $R_f=82$, $R_g=94$
 GAI: $GAI_BB_8=92.2$, $GAI_BB_15=98.1$, $GAI_EES=87.9$
 R1 =84 R2 =91 R3 =93 R4 =83 R5 =84 R6 =85 R7 =88 R8 =72
 R9 =20 R10=77 R11=82 R12=57 R13=87 R14=96 R15=81
 Color Quality Scale: $Q_a=81.2$, $Q_f=81.1$, $Q_p=81.6$, $Q_g=92.1$
 Q1 =83 Q2 =99 Q3 =77 Q4 =69 Q5 =76 Q6 =79 Q7 =86 Q8 =90
 Q9 =96 Q10=87 Q11=82 Q12=82 Q13=83 Q14=74 Q15=78



Photometric Parameters

Luminous Flux: 1578.2 lm Efficiency: 114.20 lm/W Radiant Power: 5.043 W
 Total mains efficacy: 124.36 lm/W Energy Efficiency Class: E (EU 2019/2015)
 Pupil Flux: 2915.69 Plm Pupil Lumens Per Watt: 210.98 Plm/W Pupil Factor (Kp): 1.847
 Circopic Flux: 6698.10 lm

Electric Parameters

Voltage: 230.00V Current: 0.0600A Power: 13.82W
 Power Factor: 0.9200 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: 46459 (2542) CCD Integration Time: 395.67 ms

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WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0010	0.0526	525	0.4166	22.2045	670	0.1113	5.9331
385	0.0011	0.0584	530	0.4270	22.7618	675	0.0969	5.1640
390	0.0009	0.0465	535	0.4315	23.0014	680	0.0796	4.2434
395	0.0008	0.0401	540	0.4367	23.2748	685	0.0669	3.5648
400	0.0011	0.0569	545	0.4403	23.4666	690	0.0544	2.9001
405	0.0006	0.0296	550	0.4435	23.6414	695	0.0459	2.4457
410	0.0027	0.1422	555	0.4478	23.8686	700	0.0347	1.8515
415	0.0057	0.3029	560	0.4487	23.9142	705	0.0311	1.6572
420	0.0143	0.7642	565	0.4519	24.0863	710	0.0247	1.3179
425	0.0359	1.9125	570	0.4523	24.1097	715	0.0213	1.1337
430	0.0802	4.2734	575	0.4520	24.0935	720	0.0144	0.7666
435	0.1571	8.3746	580	0.4497	23.9713	725	0.0124	0.6585
440	0.2822	15.0439	585	0.4466	23.8067	730	0.0110	0.5841
445	0.4869	25.9524	590	0.4399	23.4460	735	0.0080	0.4263
450	0.7872	41.9594	595	0.4314	22.9917	740	0.0064	0.3422
455	0.9991	53.2531	600	0.4205	22.4152	745	0.0061	0.3263
460	0.8549	45.5655	605	0.4066	21.6714	750	0.0176	0.9367
465	0.5877	31.3250	610	0.3900	20.7864	755	0.0059	0.3127
470	0.4416	23.5403	615	0.3703	19.7376	760	0.0044	0.2328
475	0.3342	17.8151	620	0.3484	18.5703	765	0.0039	0.2095
480	0.2484	13.2421	625	0.3240	17.2673	770	0.0017	0.0884
485	0.2165	11.5422	630	0.2997	15.9749	775	0.0024	0.1266
490	0.2186	11.6531	635	0.2735	14.5805	780	0.0015	0.0820
495	0.2367	12.6141	640	0.2476	13.1964	785	0.0046	0.2447
500	0.2717	14.4837	645	0.2228	11.8760	790	0.0009	0.0489
505	0.3108	16.5684	650	0.1976	10.5334	795	0.0010	0.0519
510	0.3482	18.5614	655	0.1730	9.2194	800	0.0093	0.4945
515	0.3767	20.0793	660	0.1509	8.0413			
520	0.3994	21.2858	665	0.1309	6.9779			

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

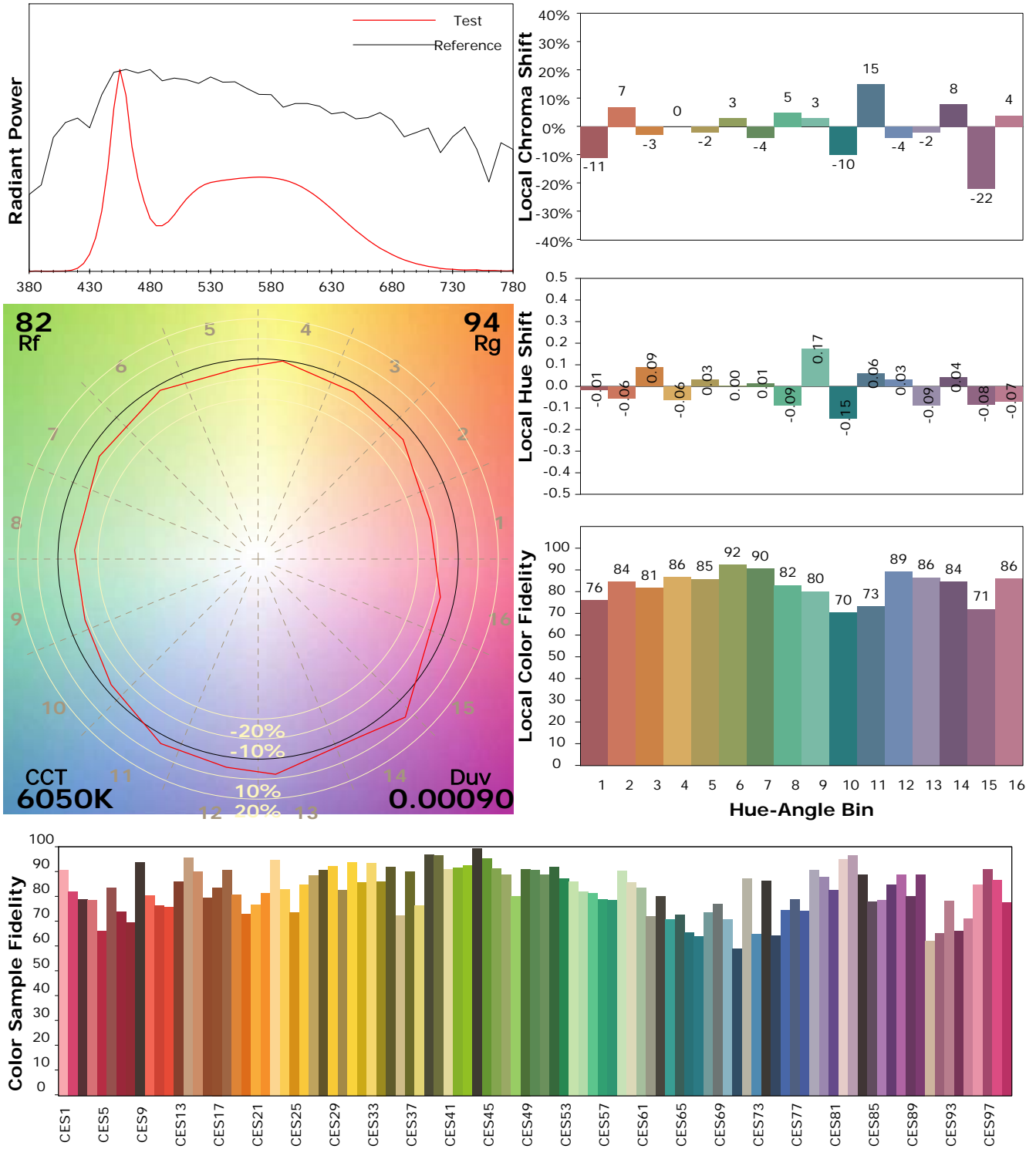
Test Device: Lisun LMS-9000B
 Test Time: 2021-03-08 10:30:20
 Inspector:

I ES TM-30-18 Color Rendition Report

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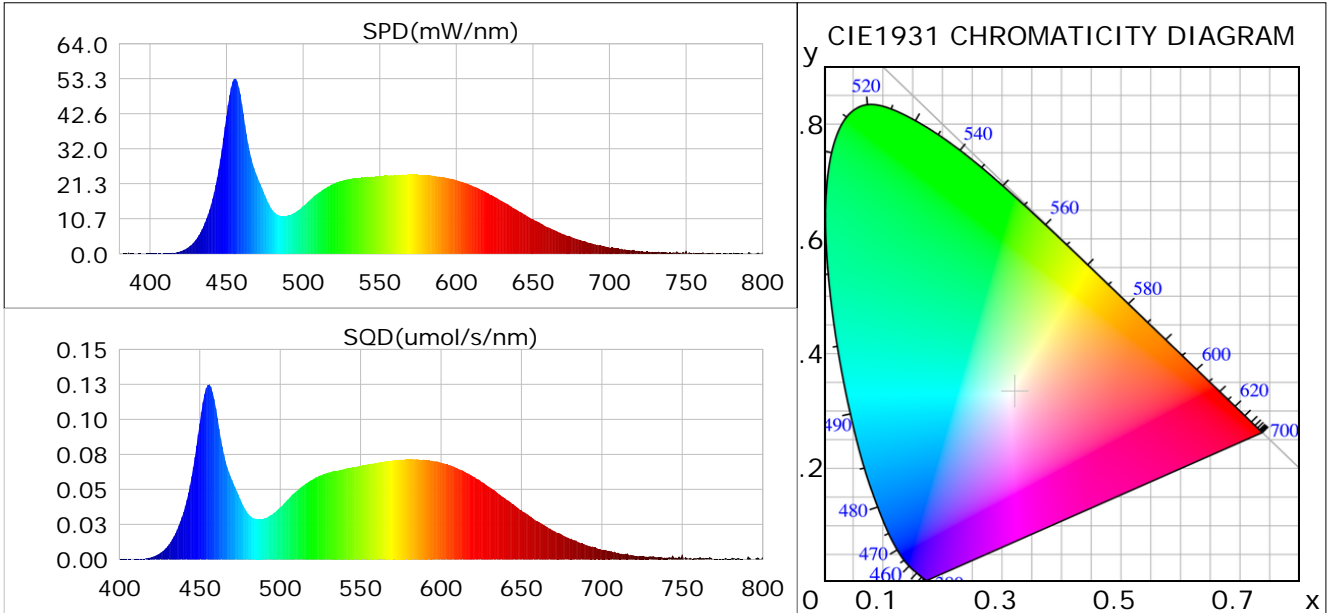
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Plant optical param data

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 Dominant Wavelength: 490.9nm Color Purity: 0.042
 CRI: $R_a=84.9$



Plant Optical Param

$ \mu_v(lm): 1578.20$	$Q_v(lm.s): 1578.20$
$ \mu_e, \dot{E}(W/nm): 5.04$	$Q_e(J): 5.04$
$ \mu_e(W): 5.00$	$ \mu_{fr}(W): 0.05$
$ \zeta_e: 0.36$	$ \zeta_{fr}: 0.00$
$PPE(umol/s/w): 1.63$	$K_{fr}: 0.02$
$Erb_Ratio: 0.68$	$PPF(umol/s): 22.58$
$PF_{uv}(360-400)(umol/s): 0.01$	$PPF(400-500)(umol/s): 6.32$
$PPF(500-600)(umol/s): 10.36$	$PPF(600-700)(umol/s): 5.90$
$PPF_r(700-800)(umol/s): 0.30$	$PPF.t(umol): 22.58$
$ \mu_{ch-A.t}(J): 0.40$	$ \mu_{ch-A}(W): 0.40$
$ \mu_{ch-B.t}(J): 0.30$	$ \mu_{ch-B}(W): 0.30$
$ \mu_b.t(J): 1.64$	$ \mu_b(W): 1.64$
$ \mu_y.t(J): 2.26$	$ \mu_y(W): 2.26$
$ \mu_r.t(J): 1.14$	$ \mu_r(W): 1.14$

Electric Parameters

Voltage: 230.00V	Current: 0.0600A	Power: 13.82W
Power Factor: 0.9200	Frequency: 49.99Hz	

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

Test Device: Lisun LMS-9000B
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