

Lightsource Test Report

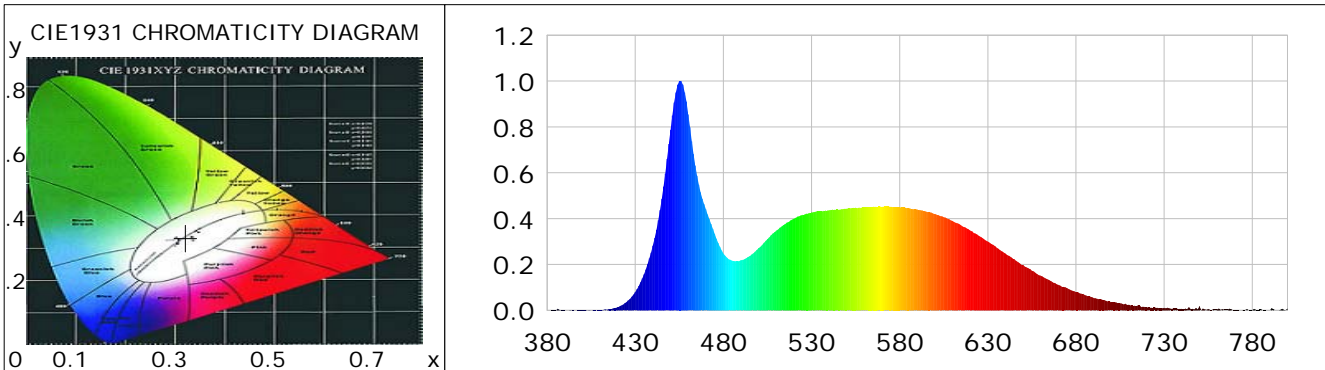
Product Information

Product Category: LED-Röhre
 Product Spec: LEDtube-145-5CWM-21W-TRF
 Manufacturer: METOLIGHT
 Buyer: 7709

Product Type: LED-Röhre-TRF
 Product Number: 1
 Submitted Unit: 104527

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: 2578.2 lm Efficiency: 116.61 lm/W Radiant Power: 8.239 W
 Total mains efficacy: 126.99 lm/W Energy Efficiency Class: E (EU 2019/2015)
 Pupil Flux: 4763.17 Plm Pupil Lumens Per Watt: 215.43 Plm/W Pupil Factor (Kp): 1.847
 Circopic Flux: 10942.24 lm

Electric Parameters

Voltage: 229.90V Current: 0.1020A Power: 22.11W
 Power Factor: 0.9400 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	0.0859	525	0.4166	36.2740	670	0.1113	9.6924
385	0.0011	0.0953	530	0.4270	37.1844	675	0.0969	8.4360
390	0.0009	0.0759	535	0.4315	37.5759	680	0.0796	6.9322
395	0.0008	0.0655	540	0.4367	38.0226	685	0.0669	5.8236
400	0.0011	0.0930	545	0.4403	38.3358	690	0.0544	4.7377
405	0.0006	0.0483	550	0.4435	38.6215	695	0.0459	3.9953
410	0.0027	0.2323	555	0.4478	38.9925	700	0.0347	3.0246
415	0.0057	0.4949	560	0.4487	39.0671	705	0.0311	2.7073
420	0.0143	1.2484	565	0.4519	39.3482	710	0.0247	2.1529
425	0.0359	3.1243	570	0.4523	39.3864	715	0.0213	1.8521
430	0.0802	6.9812	575	0.4520	39.3600	720	0.0144	1.2523
435	0.1571	13.6810	580	0.4497	39.1604	725	0.0124	1.0757
440	0.2822	24.5763	585	0.4466	38.8915	730	0.0110	0.9542
445	0.4869	42.3967	590	0.4399	38.3022	735	0.0080	0.6965
450	0.7872	68.5462	595	0.4314	37.5600	740	0.0064	0.5590
455	0.9991	86.9960	600	0.4205	36.6183	745	0.0061	0.5331
460	0.8549	74.4374	605	0.4066	35.4031	750	0.0176	1.5302
465	0.5877	51.1736	610	0.3900	33.9573	755	0.0059	0.5109
470	0.4416	38.4563	615	0.3703	32.2441	760	0.0044	0.3803
475	0.3342	29.1033	620	0.3484	30.3371	765	0.0039	0.3423
480	0.2484	21.6328	625	0.3240	28.2084	770	0.0017	0.1443
485	0.2165	18.8557	630	0.2997	26.0971	775	0.0024	0.2069
490	0.2186	19.0369	635	0.2735	23.8191	780	0.0015	0.1340
495	0.2367	20.6068	640	0.2476	21.5580	785	0.0046	0.3998
500	0.2717	23.6610	645	0.2228	19.4010	790	0.0009	0.0799
505	0.3108	27.0667	650	0.1976	17.2076	795	0.0010	0.0848
510	0.3482	30.3225	655	0.1730	15.0612	800	0.0093	0.8078
515	0.3767	32.8022	660	0.1509	13.1365			
520	0.3994	34.7732	665	0.1309	11.3993			

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

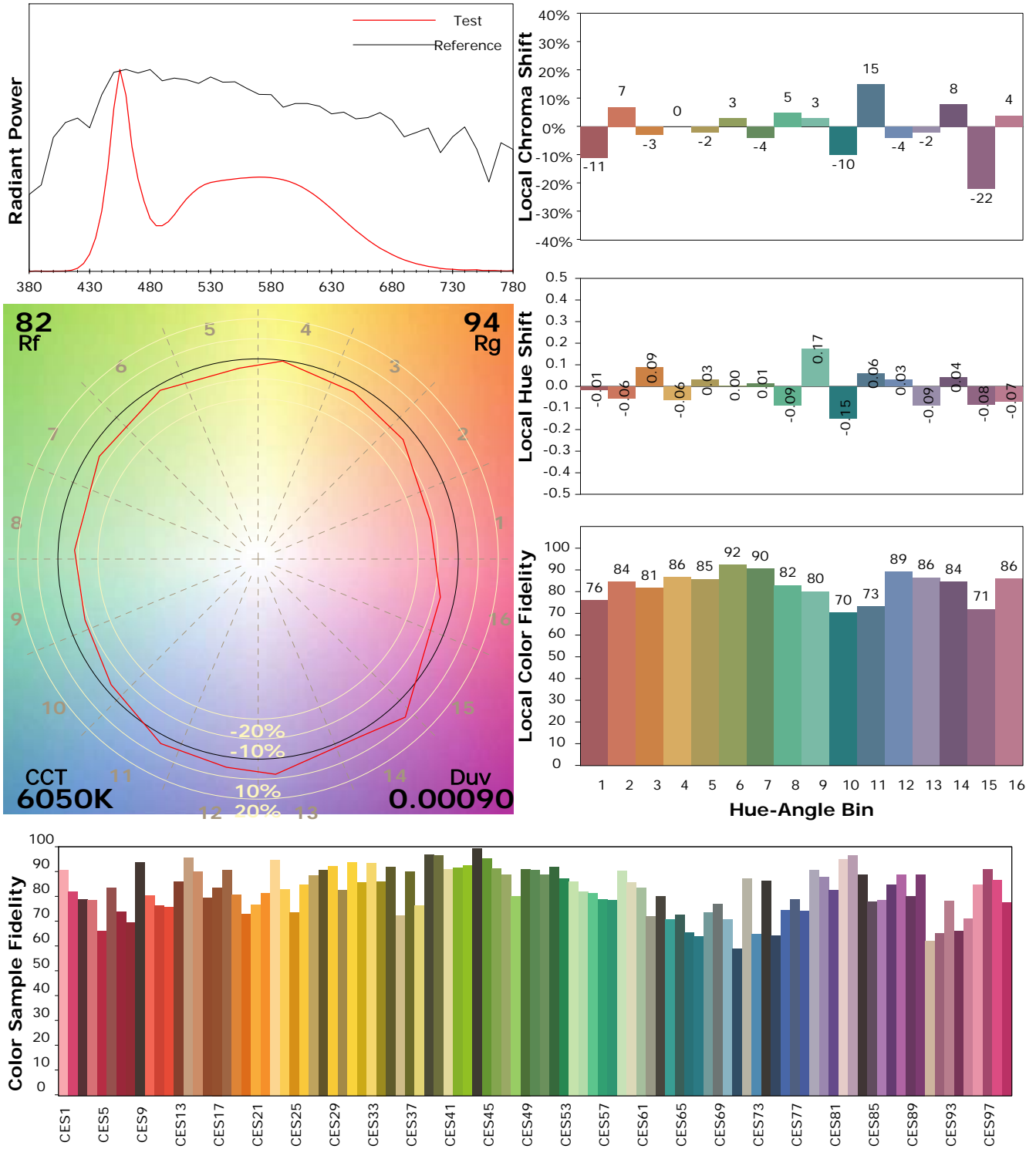
Test Device: Lisun LMS-9000B
 Test Time: 2021-03-08 10:30:20
 Inspector:

IES TM-30-18 Color Rendition Report

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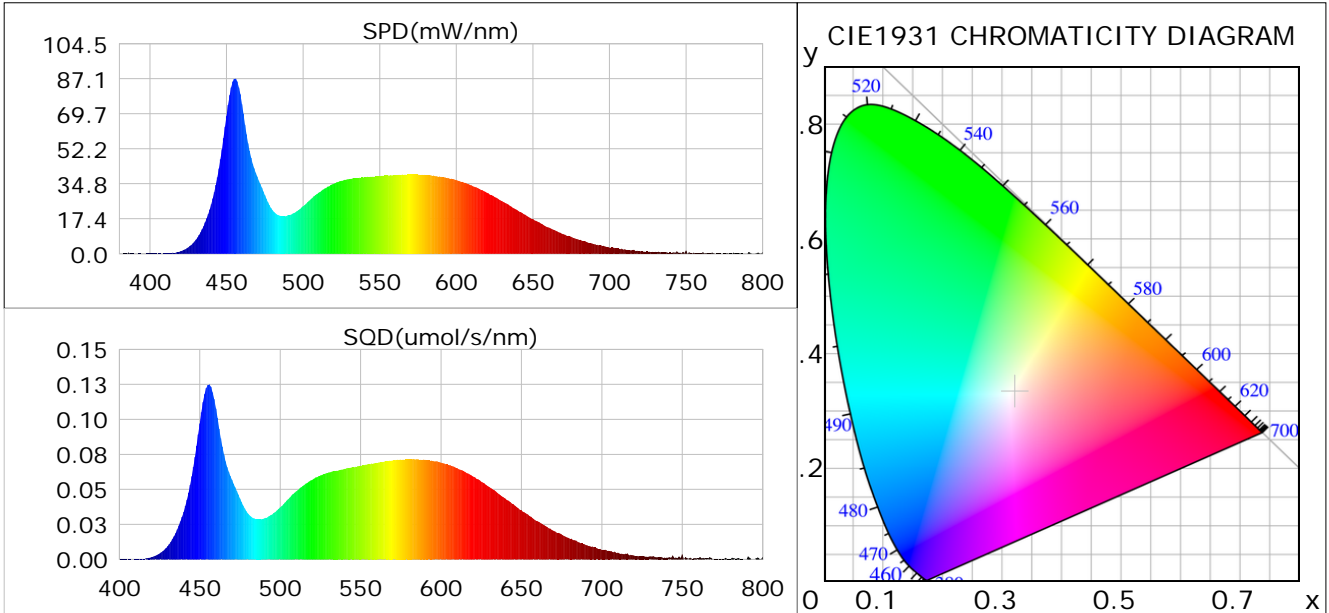
Condition: Tx:0.0°C, Ti:0.0°C, R.H.: 60%
 Test Lab:
 Operator: CRE

Test Device: Lisun LMS-9000B
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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): 2578.20$	$Q_v(lm.s): 2578.20$
$ \mu_e, \dot{E}(W/nm): 8.24$	$Q_e(J): 8.24$
$ \mu_e(W): 8.16$	$ \mu_{fr}(W): 0.08$
$ \zeta_e: 0.37$	$ \zeta_{fr}: 0.00$
$PPE(umol/s/w): 1.67$	$K_{fr}: 0.02$
$Erb_Ratio: 0.68$	$PPF(umol/s): 36.89$
$PF_{uv}(360-400)(umol/s): 0.01$	$PPF(400-500)(umol/s): 10.33$
$PPF(500-600)(umol/s): 16.92$	$PPF(600-700)(umol/s): 9.64$
$PPF_r(700-800)(umol/s): 0.50$	$PPF.t(umol): 36.89$
$ \mu_{ch-A.t}(J): 0.65$	$ \mu_{ch-A}(W): 0.65$
$ \mu_{ch-B.t}(J): 0.49$	$ \mu_{ch-B}(W): 0.49$
$ \mu_b.t(J): 2.68$	$ \mu_b(W): 2.68$
$ \mu_y.t(J): 3.69$	$ \mu_y(W): 3.69$
$ \mu_r.t(J): 1.86$	$ \mu_r(W): 1.86$

Electric Parameters

Voltage: 229.90V	Current: 0.1020A	Power: 22.11W
Power Factor: 0.9400	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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