

Lightsource Test Report

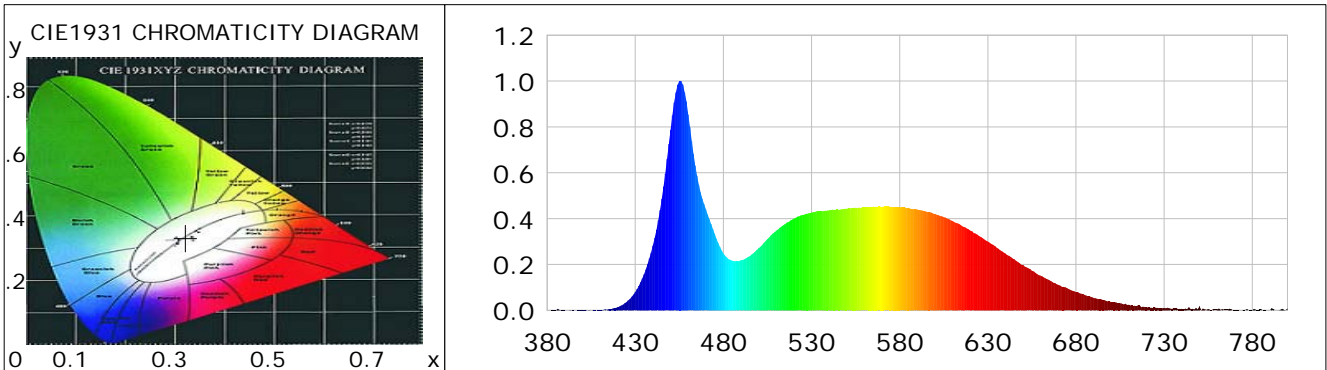
Product Infomation

Product Category: LED-Röhre
 Product Spec: LEDtube-021-5CWM-4W-DC
 Manufacturer: METOLIGHT
 Buyer: 7709

Product Type: LED-Röhre-TRF
 Product Number: 1
 Submitted Unit: 105251

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: 569.00 lm Efficiency: 130.50 lm/W Radiant Power: 1.818 W
 Total mains efficacy: 142.12 lm/W Energy Efficiency Class: D (EU 2019/2015)
 Pupil Flux: 1051.22 Plm Pupil Lumens Per Watt: 241.10 Plm/W Pupil Factor (Kp): 1.847
 Cirtopic Flux: 2414.92 lm

Electric Parameters

Voltage: 230.00V Current: 0.0190A Power: 4.36W
 Power Factor: 0.9450 Frequency: 49.99Hz

Test Infomation

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	0.0190	525	0.4166	8.0055	670	0.1113	2.1391
385	0.0011	0.0210	530	0.4270	8.2065	675	0.0969	1.8618
390	0.0009	0.0168	535	0.4315	8.2929	680	0.0796	1.5299
395	0.0008	0.0145	540	0.4367	8.3915	685	0.0669	1.2852
400	0.0011	0.0205	545	0.4403	8.4606	690	0.0544	1.0456
405	0.0006	0.0107	550	0.4435	8.5236	695	0.0459	0.8818
410	0.0027	0.0513	555	0.4478	8.6055	700	0.0347	0.6675
415	0.0057	0.1092	560	0.4487	8.6220	705	0.0311	0.5975
420	0.0143	0.2755	565	0.4519	8.6840	710	0.0247	0.4751
425	0.0359	0.6895	570	0.4523	8.6925	715	0.0213	0.4087
430	0.0802	1.5407	575	0.4520	8.6866	720	0.0144	0.2764
435	0.1571	3.0193	580	0.4497	8.6426	725	0.0124	0.2374
440	0.2822	5.4239	585	0.4466	8.5832	730	0.0110	0.2106
445	0.4869	9.3568	590	0.4399	8.4532	735	0.0080	0.1537
450	0.7872	15.1279	595	0.4314	8.2894	740	0.0064	0.1234
455	0.9991	19.1997	600	0.4205	8.0815	745	0.0061	0.1176
460	0.8549	16.4281	605	0.4066	7.8133	750	0.0176	0.3377
465	0.5877	11.2938	610	0.3900	7.4943	755	0.0059	0.1127
470	0.4416	8.4872	615	0.3703	7.1162	760	0.0044	0.0839
475	0.3342	6.4230	620	0.3484	6.6953	765	0.0039	0.0755
480	0.2484	4.7743	625	0.3240	6.2255	770	0.0017	0.0319
485	0.2165	4.1614	630	0.2997	5.7595	775	0.0024	0.0457
490	0.2186	4.2014	635	0.2735	5.2568	780	0.0015	0.0296
495	0.2367	4.5479	640	0.2476	4.7578	785	0.0046	0.0882
500	0.2717	5.2219	645	0.2228	4.2817	790	0.0009	0.0176
505	0.3108	5.9735	650	0.1976	3.7977	795	0.0010	0.0187
510	0.3482	6.6921	655	0.1730	3.3240	800	0.0093	0.1783
515	0.3767	7.2393	660	0.1509	2.8992			
520	0.3994	7.6743	665	0.1309	2.5158			

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

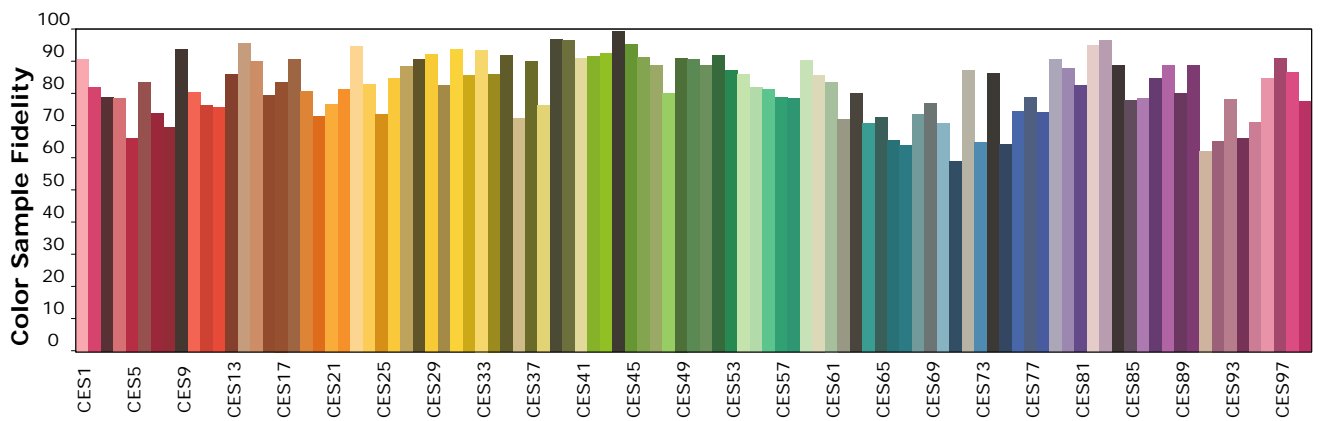
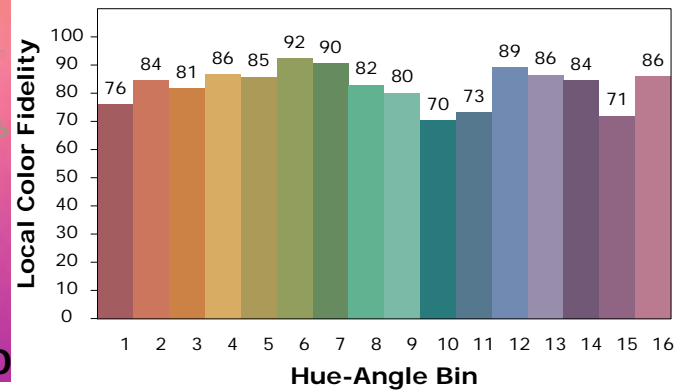
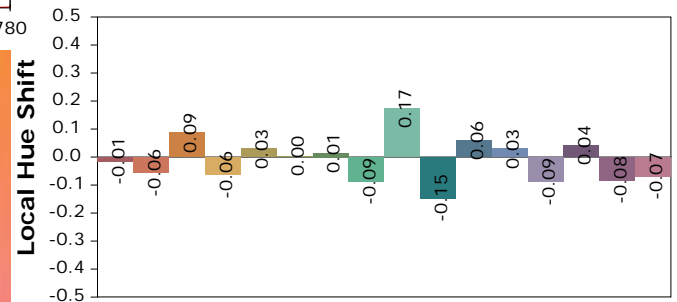
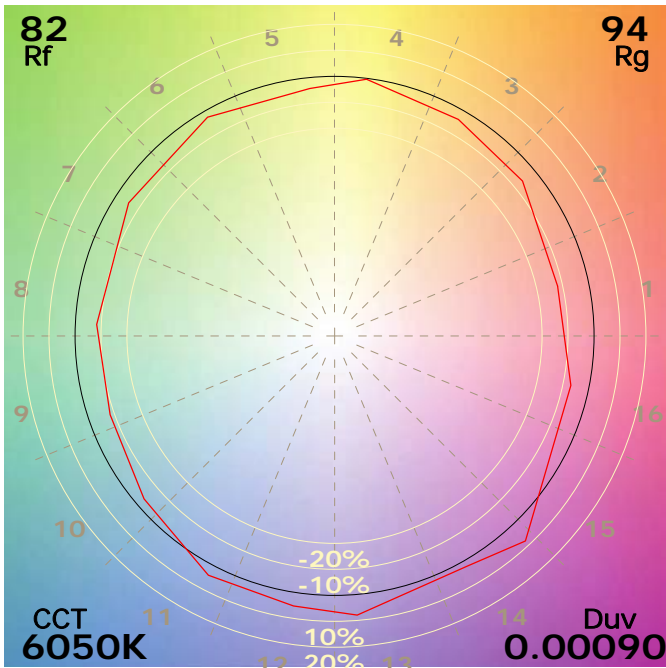
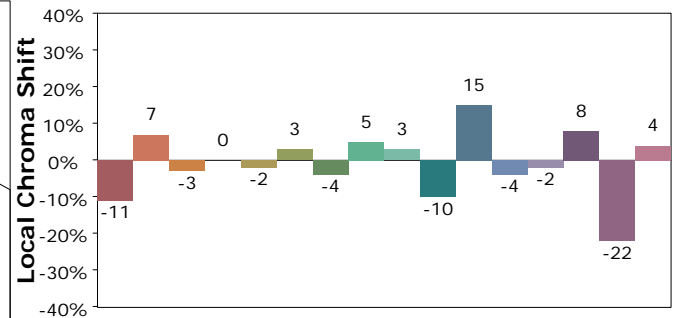
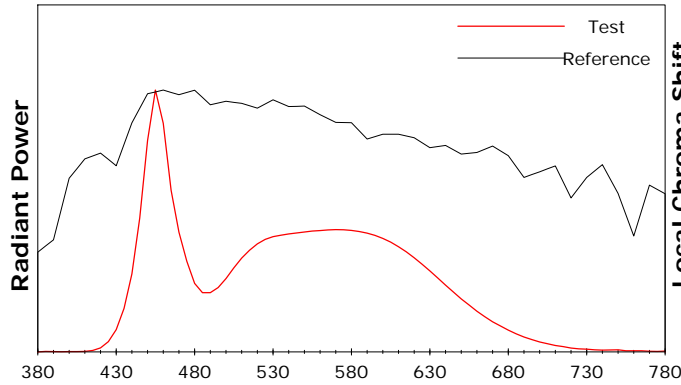
Test Device: Lisun LMS-9000B
 Test Time: 2021-03-08 10:30:20
 Inspector:

IES TM-30-18 Color Rendition Report

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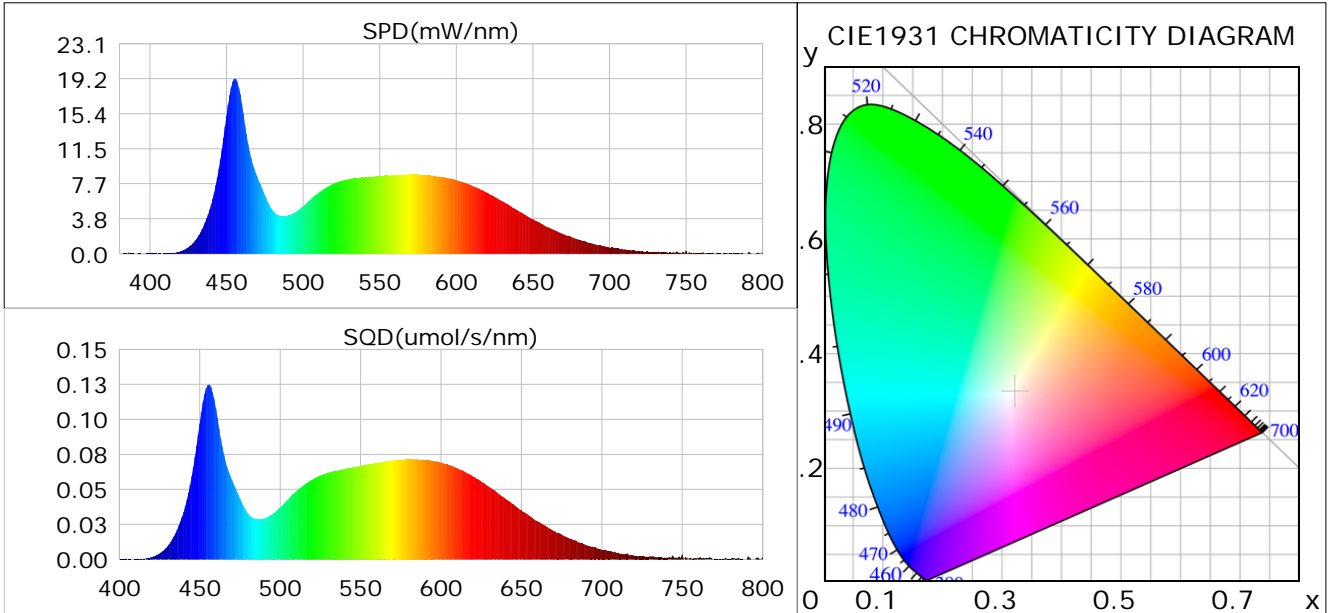
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 Operator: CRE

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

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): 569.00$	$Q_v(lm.s): 569.00$
$ \mu_e, \dot{E}(W/nm): 1.82$	$Q_e(J): 1.82$
$ \mu_e(W): 1.80$	$ \mu_{fr}(W): 0.02$
$ \zeta_e: 0.41$	$ \zeta_{fr}: 0.00$
$PPE(umol/s/w): 1.87$	$K_{fr}: 0.03$
$Erb_Ratio: 0.68$	$PPF(umol/s): 8.14$
$PF_{uv}(360-400)(umol/s): 0.00$	$PPF(400-500)(umol/s): 2.28$
$PPF(500-600)(umol/s): 3.73$	$PPF(600-700)(umol/s): 2.13$
$PPF_{fr}(700-800)(umol/s): 0.11$	$PPF.t(umol): 8.14$
$ \mu_{ch-A.t}(J): 0.14$	$ \mu_{ch-A}(W): 0.14$
$ \mu_{ch-B.t}(J): 0.11$	$ \mu_{ch-B}(W): 0.11$
$ \mu_b.t(J): 0.59$	$ \mu_b(W): 0.59$
$ \mu_y.t(J): 0.81$	$ \mu_y(W): 0.81$
$ \mu_r.t(J): 0.41$	$ \mu_r(W): 0.41$

Electric Parameters

Voltage: 230.00V	Current: 0.0190A	Power: 4.36W
Power Factor: 0.9450	Frequency: 49.99Hz	

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

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