

## Lightsource Test Report

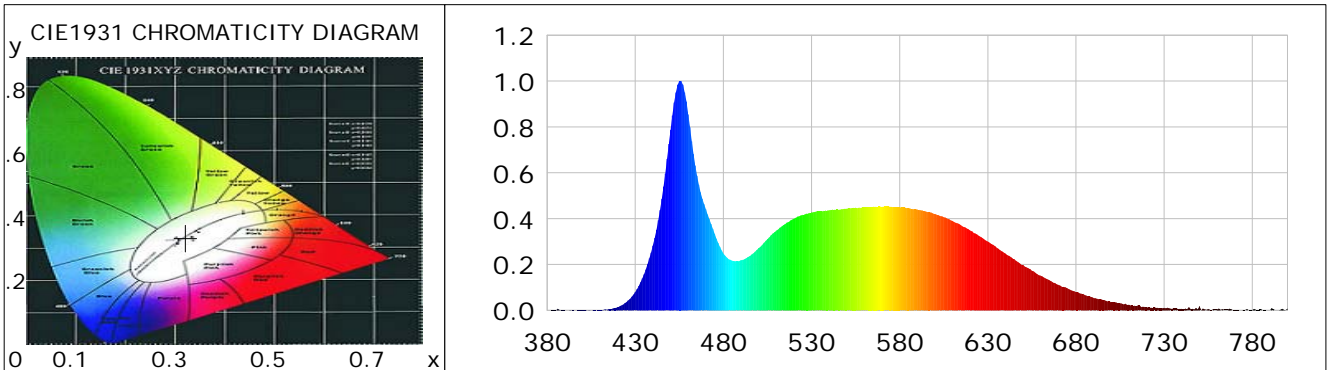
### Product Information

Product Category: LED-Röhre  
 Product Spec: LEDtube-115-5CWM-18W-TRF  
 Manufacturer: METOLIGHT  
 Buyer: 5931

Product Type: LED-Röhre-TRF  
 Product Number: 1  
 Submitted Unit: 104525

### 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: 2278.2 lm Efficiency: 119.22 lm/W Radiant Power: 7.280 W  
 Total mains efficacy: 129.83 lm/W Energy Efficiency Class: E (EU 2019/2015)  
 Pupil Flux: 4208.93 Plm Pupil Lumens Per Watt: 220.25 Plm/W Pupil Factor (Kp): 1.847  
 Circopic Flux: 9669.00 lm

### Electric Parameters

Voltage: 229.90V Current: 0.0890A Power: 19.11W  
 Power Factor: 0.9340 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

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:

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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	0.0759	525	0.4166	32.0531	670	0.1113	8.5646
385	0.0011	0.0842	530	0.4270	32.8577	675	0.0969	7.4544
390	0.0009	0.0671	535	0.4315	33.2035	680	0.0796	6.1256
395	0.0008	0.0579	540	0.4367	33.5982	685	0.0669	5.1460
400	0.0011	0.0822	545	0.4403	33.8750	690	0.0544	4.1864
405	0.0006	0.0427	550	0.4435	34.1275	695	0.0459	3.5304
410	0.0027	0.2053	555	0.4478	34.4553	700	0.0347	2.6727
415	0.0057	0.4373	560	0.4487	34.5212	705	0.0311	2.3923
420	0.0143	1.1031	565	0.4519	34.7696	710	0.0247	1.9024
425	0.0359	2.7607	570	0.4523	34.8034	715	0.0213	1.6366
430	0.0802	6.1689	575	0.4520	34.7801	720	0.0144	1.1066
435	0.1571	12.0890	580	0.4497	34.6037	725	0.0124	0.9506
440	0.2822	21.7166	585	0.4466	34.3661	730	0.0110	0.8432
445	0.4869	37.4634	590	0.4399	33.8454	735	0.0080	0.6155
450	0.7872	60.5702	595	0.4314	33.1895	740	0.0064	0.4939
455	0.9991	76.8731	600	0.4205	32.3573	745	0.0061	0.4710
460	0.8549	65.7758	605	0.4066	31.2836	750	0.0176	1.3522
465	0.5877	45.2190	610	0.3900	30.0061	755	0.0059	0.4514
470	0.4416	33.9815	615	0.3703	28.4921	760	0.0044	0.3360
475	0.3342	25.7168	620	0.3484	26.8071	765	0.0039	0.3024
480	0.2484	19.1156	625	0.3240	24.9261	770	0.0017	0.1275
485	0.2165	16.6617	630	0.2997	23.0604	775	0.0024	0.1828
490	0.2186	16.8218	635	0.2735	21.0475	780	0.0015	0.1184
495	0.2367	18.2090	640	0.2476	19.0495	785	0.0046	0.3532
500	0.2717	20.9078	645	0.2228	17.1435	790	0.0009	0.0706
505	0.3108	23.9172	650	0.1976	15.2054	795	0.0010	0.0749
510	0.3482	26.7942	655	0.1730	13.3087	800	0.0093	0.7138
515	0.3767	28.9853	660	0.1509	11.6079			
520	0.3994	30.7270	665	0.1309	10.0729			

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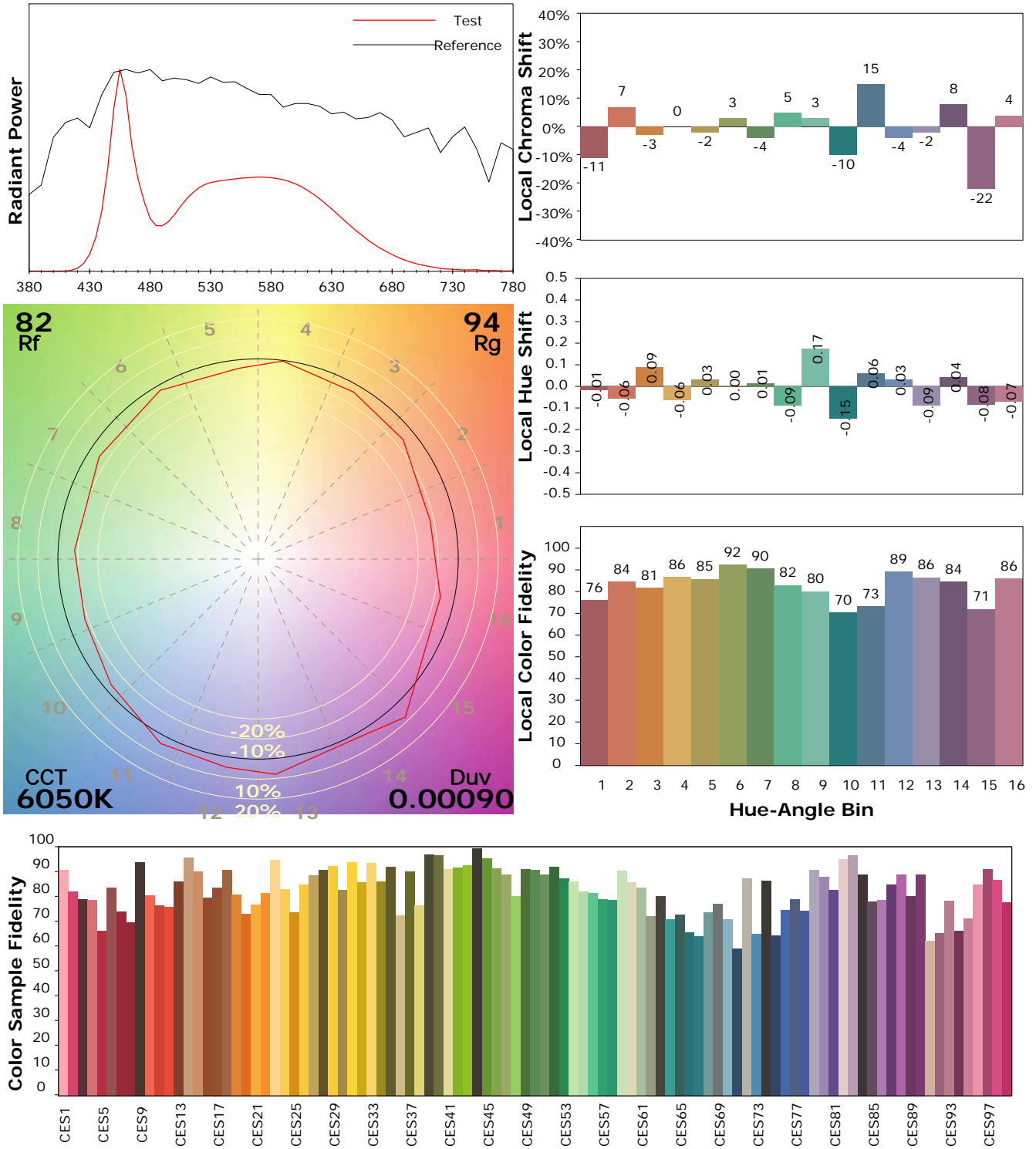
Test Device: Lisun LMS-9000B  
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 Inspector:

## IES TM-30-18 Color Rendition Report

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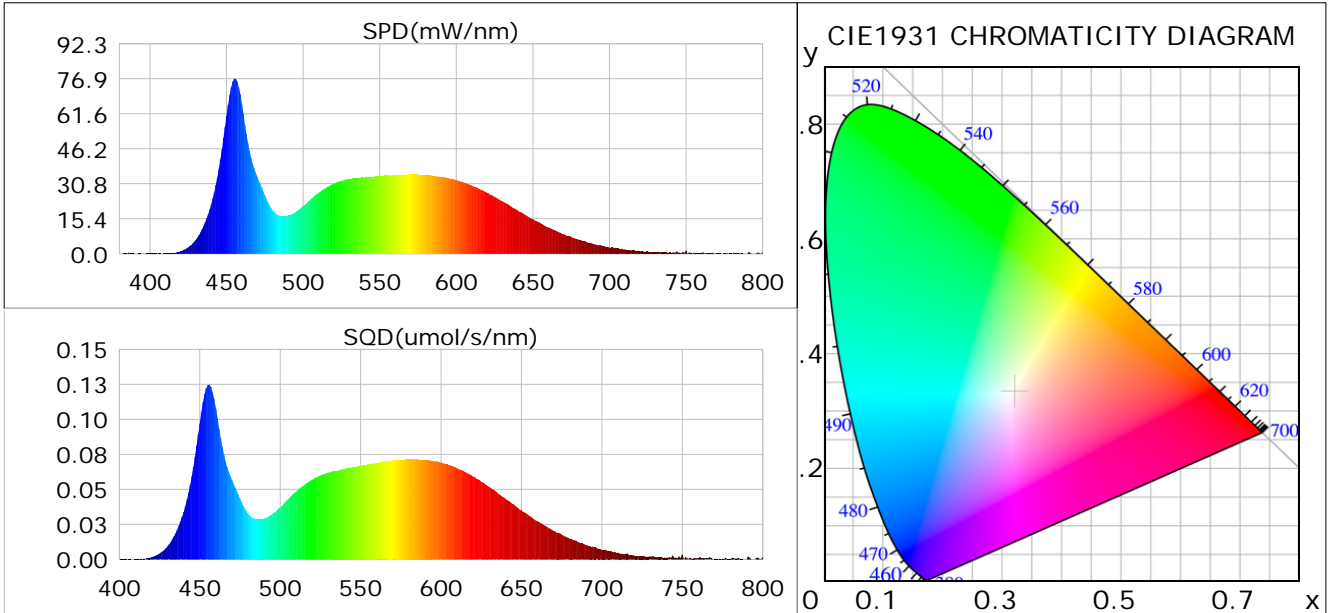
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## Plant optical param data

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 Peak Wavelength: 455.6nm Half Bandwidth: 22.3nm  
 Dominant Wavelength: 490.9nm Color Purity: 0.042  
 CRI:  $R_a=84.9$



### Plant Optical Param

$ \mu_v(lm): 2278.20$	$Q_v(lm.s): 2278.20$
$ \mu_e, \dot{E}(W/nm): 7.28$	$Q_e(J): 7.28$
$ \mu_e(W): 7.21$	$ \mu_{fr}(W): 0.07$
$ \zeta_e: 0.38$	$ \zeta_{fr}: 0.00$
$PPE(umol/s/w): 1.71$	$K_{fr}: 0.02$
$Erb\_Ratio: 0.68$	$PPF(umol/s): 32.60$
$PF_{uv}(360-400)(umol/s): 0.01$	$PPF(400-500)(umol/s): 9.13$
$PPF(500-600)(umol/s): 14.95$	$PPF(600-700)(umol/s): 8.51$
$PPF_r(700-800)(umol/s): 0.44$	$PPF.t(umol): 32.60$
$ \mu_{ch-A.t}(J): 0.57$	$ \mu_{ch-A}(W): 0.57$
$ \mu_{ch-B.t}(J): 0.43$	$ \mu_{ch-B}(W): 0.43$
$ \mu_b.t(J): 2.37$	$ \mu_b(W): 2.37$
$ \mu_y.t(J): 3.26$	$ \mu_y(W): 3.26$
$ \mu_r.t(J): 1.64$	$ \mu_r(W): 1.64$

### Electric Parameters

Voltage: 229.90V	Current: 0.0890A	Power: 19.11W
Power Factor: 0.9340	Frequency: 49.99Hz	

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