

## Lightsource Test Report

### Product Information

Product Category: LED-Röhre  
 Product Spec: LEDtube-090-8Bread-15W  
 Manufacturer: METOLIGHT  
 Buyer: 7716

Product Type: LED-Röhre-Spezial  
 Product Number: 1  
 Submitted Unit: 104309

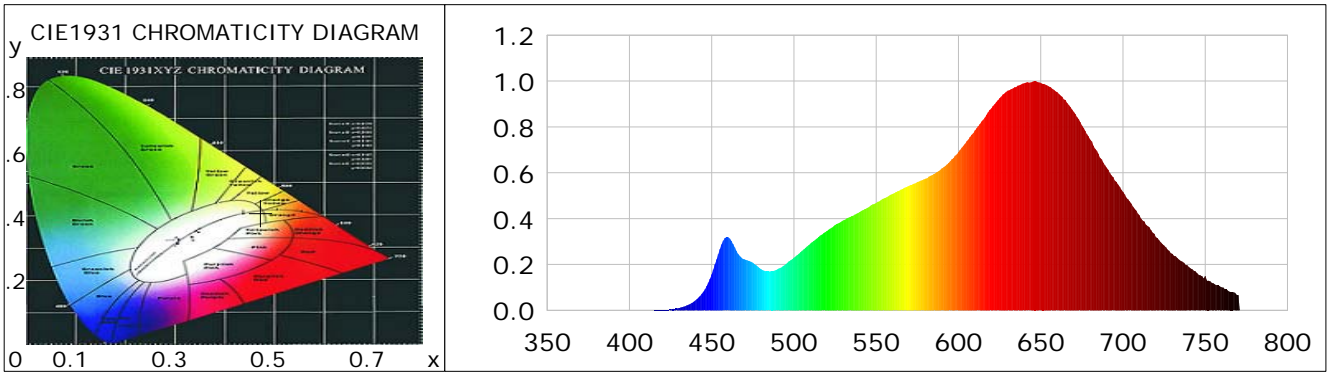
### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.4728$   $y=0.4108$   $u(u')=0.2708$   $v=0.3529$   $v'=0.5294$   
 CCT:  $T_c=2530K$  ( $duv=-0.00081$ ) Color Ratio:  $R=0.288$   $G=0.688$   $B=0.025$   
 Peak Wavelength: 646.5nm Half Bandwidth: 143.6nm  
 Dominant Wavelength: 585.4nm Color Purity: 0.652  
 CRI:  $R_a=97.7$ ,  $avgR(1\sim14)=96.9$ ,  $avgR(1\sim15)=96.9$  TM30:  $R_f=93$ ,  $R_g=100$   
 GAI:  $GAI\_BB\_8=104.4$ ,  $GAI\_BB\_15=111.6$ ,  $GAI\_EES=45.0$   

R1 =97	R2 =99	R3 =97	R4 =98	R5 =98	R6 =97	R7 =98	R8 =98
R9 =98	R10=99	R11=97	R12=85	R13=97	R14=97	R15=98	

Color Quality Scale:  $Q_a=93.3$ ,  $Q_f=95.5$ ,  $Q_p=98.7$ ,  $Q_g=97.8$   

Q1 =89	Q2 =95	Q3 =92	Q4 =91	Q5 =92	Q6 =93	Q7 =95	Q8 =95
Q9 =96	Q10=96	Q11=96	Q12=96	Q13=96	Q14=94	Q15=92	



### Photometric Parameters

Luminous Flux: 1333.8 lm Efficiency: 87.69 lm/W Radiant Power: 5.579 W  
 Total mains efficacy: 103.13 lm/W Energy Efficiency Class: F (EU 2019/2015)  
 Pupil Flux: 1594.25 Plm Pupil Lumens Per Watt: 104.82 Plm/W Pupil Factor (Kp): 1.195  
 Circopic Flux: 2844.87 lm

### Electric Parameters

Voltage: 230.50V Current: 0.0700A Power: 15.21W  
 Power Factor: 0.9400 Frequency: 49.99Hz

### Test Information

Scan Range: 350~800:1nm Photometric Method: sphere-spectroradiometer  
 Stabilization Time: 0 ms ALC.: 1.0000 Photometric Condition: Sphere diameter: 2.00m, 4PI  
 Max of Signal: 46080 (2222) CCD Integration Time: 389.87 ms

Condition:  $T_x=16.1^\circ C$ ,  $T_i=0.0^\circ C$ , R.H.: 60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-01-28 14:54:12  
 Inspector:

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WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.0086	525	0.2006	7.0113	670	0.9906	34.6294
385	0.0003	0.0110	530	0.2299	8.0356	675	0.9974	34.8649
390	0.0002	0.0075	535	0.2598	9.0800	680	0.9923	34.6865
395	0.0001	0.0035	540	0.2913	10.1820	685	0.9766	34.1381
400	0.0001	0.0041	545	0.3203	11.1955	690	0.9515	33.2624
405	0.0001	0.0046	550	0.3462	12.1010	695	0.9176	32.0770
410	0.0001	0.0025	555	0.3726	13.0234	700	0.8661	30.2750
415	0.0002	0.0062	560	0.3925	13.7210	705	0.8063	28.1852
420	0.0002	0.0065	565	0.4110	14.3671	710	0.7450	26.0408
425	0.0001	0.0021	570	0.4290	14.9973	715	0.6831	23.8803
430	0.0002	0.0055	575	0.4486	15.6806	720	0.6231	21.7800
435	0.0001	0.0021	580	0.4686	16.3820	725	0.5656	19.7727
440	0.0003	0.0092	585	0.4889	17.0911	730	0.5170	18.0738
445	0.0008	0.0264	590	0.5078	17.7503	735	0.4661	16.2928
450	0.0020	0.0686	595	0.5267	18.4101	740	0.4140	14.4724
455	0.0046	0.1610	600	0.5431	18.9856	745	0.3672	12.8366
460	0.0103	0.3593	605	0.5600	19.5751	750	0.3188	11.1435
465	0.0218	0.7617	610	0.5741	20.0691	755	0.2834	9.9062
470	0.0428	1.4950	615	0.5945	20.7816	760	0.2460	8.5996
475	0.0814	2.8465	620	0.6197	21.6608	765	0.2160	7.5508
480	0.1565	5.4697	625	0.6512	22.7637	770	0.1890	6.6064
485	0.2671	9.3373	630	0.6906	24.1411	775	0.1625	5.6787
490	0.3184	11.1293	635	0.7373	25.7735	780	0.1500	5.2444
495	0.2594	9.0683	640	0.7850	27.4422	785	0.1175	4.1090
500	0.2222	7.7668	645	0.8310	29.0477	790	0.1008	3.5241
505	0.2078	7.2648	650	0.8811	30.8011	795	0.0809	2.8276
510	0.1794	6.2725	655	0.9250	32.3338	800	0.0663	2.3190
515	0.1695	5.9262	660	0.9589	33.5194			
520	0.1792	6.2633	665	0.9741	34.0506			

Condition: Tx:16.1'C, Ti:0.0'C, R.H.:60%  
 Test Lab:  
 Operator: CRE

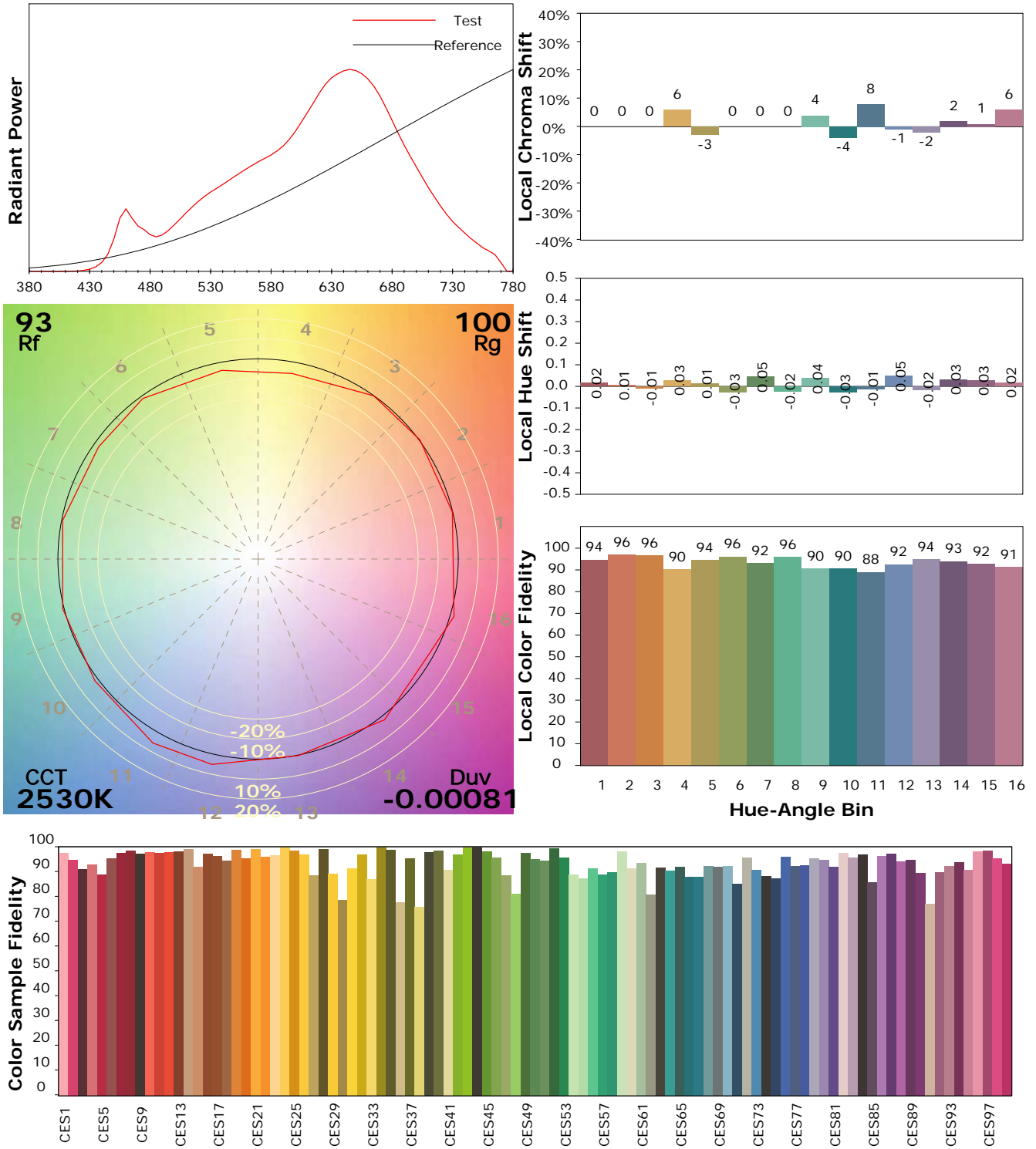
Test Device: Lisun LMS-9000B  
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 Inspector:

## IES TM-30-18 Color Rendition Report

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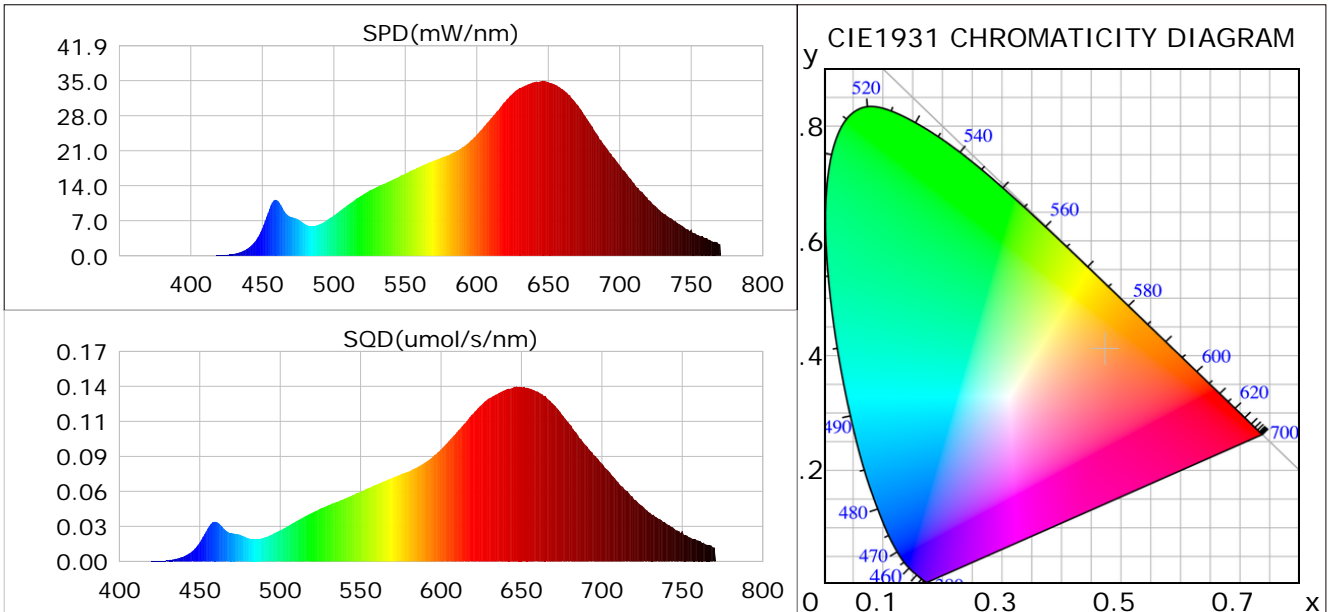
Condition: Tx: 16.1°C, Ti: 0.0°C, R.H.: 60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-01-28 14:54:12  
 Inspector:

## Plant optical param data

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.4728$   $y=0.4108$   $u(u')=0.2708$   $v=0.3529$   $v'=0.5294$   
 CCT:  $T_c=2530K$  ( $duv=-0.00081$ ) Color Ratio:  $R=0.288$   $G=0.688$   $B=0.025$   
 Peak Wavelength: 646.5nm Half Bandwidth: 143.6nm  
 Dominant Wavelength: 585.4nm Color Purity: 0.652  
 CRI:  $R_a=97.7$



### Plant Optical Param

$ \mu_v(lm): 1333.80$	$Q_v(lm.s): 1333.80$
$ \mu_e, \dot{E}(W/nm): 5.58$	$Q_e(J): 5.58$
$ \mu_e(W): 6.65$	$ \mu_{fr}(W): 0.80$
$ \zeta_e: 0.44$	$ \zeta_{fr}: 0.05$
$PPE(umol/s/w): 1.66$	$K_{fr}: 0.23$
$Erb\_Ratio: 6.83$	$PPF(umol/s): 25.20$
$PF_{uv}(360-400)(umol/s): 0.00$	$PPF(400-500)(umol/s): 1.69$
$PPF(500-600)(umol/s): 7.59$	$PPF(600-700)(umol/s): 15.92$
$PPF_r(700-800)(umol/s): 3.55$	$PPF.t(umol): 25.20$
$ \mu_{ch-A.t}(J): 0.47$	$ \mu_{ch-A}(W): 0.47$
$ \mu_{ch-B.t}(J): 0.19$	$ \mu_{ch-B}(W): 0.19$
$ \mu_b.t(J): 0.57$	$ \mu_b(W): 0.57$
$ \mu_y.t(J): 2.18$	$ \mu_y(W): 2.18$
$ \mu_r.t(J): 3.94$	$ \mu_r(W): 3.94$

### Electric Parameters

Voltage: 230.50V	Current: 0.0700A	Power: 15.21W
Power Factor: 0.9400	Frequency: 49.99Hz	

Condition:  $T_x: 16.1^\circ C$ ,  $T_i: 0.0^\circ C$ , R.H.: 60%  
 Test Lab:  
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