

## Lightsource Test Report

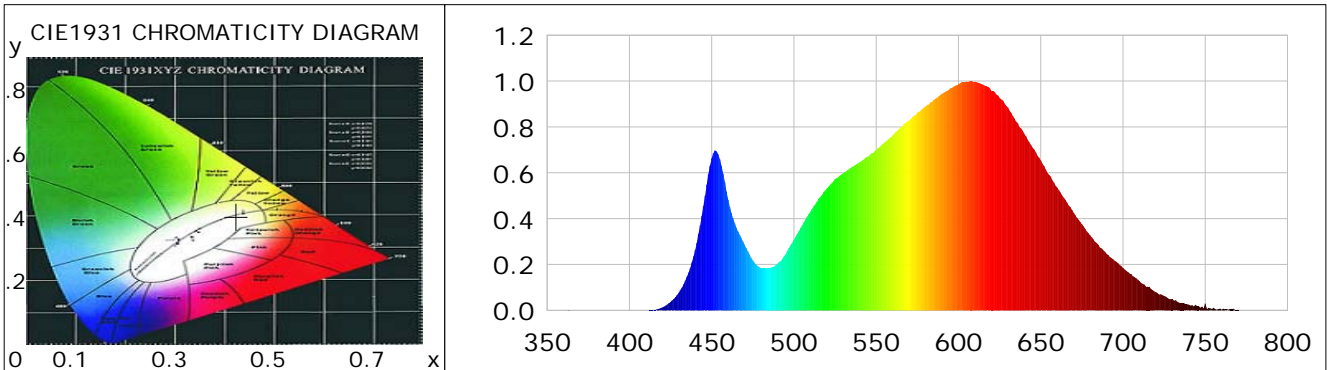
### Product Information

Product Category: LED-Röhre  
 Product Spec: LEDtube-090-10NWM-15W-RA-D-A  
 Manufacturer: METOLIGHT  
 Buyer: 6299

Product Type: LED-Röhre-PIR  
 Product Number: 1  
 Submitted Unit: 103693

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.4236$   $y=0.3990$   $u(u')=0.2441$   $v=0.3449$   $v'=0.5174$   
 CCT:  $T_c=3196K$  ( $duv=-0.00002$ ) Color Ratio:  $R=0.220$   $G=0.755$   $B=0.025$   
 Peak Wavelength: 607.7nm Half Bandwidth: 146.5nm  
 Dominant Wavelength: 582.0nm Color Purity: 0.469  
 CRI:  $R_a=84.0$ ,  $avgR(1\sim14)=78.2$ ,  $avgR(1\sim15)=78.2$  TM30:  $R_f=84$ ,  $R_g=98$   
 GAI:  $GAI\_BB\_8=95.4$ ,  $GAI\_BB\_15=103.0$ ,  $GAI\_EES=59.7$   
 R1 =83 R2 =90 R3 =95 R4 =83 R5 =82 R6 =86 R7 =86 R8 =67  
 R9 =22 R10=75 R11=81 R12=64 R13=84 R14=97 R15=78  
 Color Quality Scale:  $Q_a=83.2$ ,  $Q_f=84.1$ ,  $Q_p=85.1$ ,  $Q_g=93.8$   
 Q1 =82 Q2 =97 Q3 =79 Q4 =77 Q5 =82 Q6 =83 Q7 =83 Q8 =87  
 Q9 =96 Q10=88 Q11=86 Q12=85 Q13=85 Q14=76 Q15=78



### Photometric Parameters

Luminous Flux: 1669.0 lm Efficiency: 100.97 lm/W Radiant Power: 5.106 W  
 Total mains efficacy: 118.74 lm/W Energy Efficiency Class: E (EU 2019/2015)  
 Pupil Flux: 2169.06 Plm Pupil Lumens Per Watt: 131.22 Plm/W Pupil Factor (Kp): 1.300  
 Circopic Flux: 4010.47 lm

### Electric Parameters

Voltage: 230.80V Current: 0.0760A Power: 16.53W  
 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: 44640 (2616) CCD Integration Time: 203.05 ms

Condition: Tx:22.0°C, Ti:0.0°C, R.H.:60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-01-13 14:56:23  
 Inspector:

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WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0004	0.0115	525	0.2456	7.7947	670	0.7704	24.4491
385	0.0001	0.0023	530	0.3081	9.7794	675	0.7094	22.5148
390	0.0003	0.0097	535	0.3701	11.7468	680	0.6546	20.7736
395	0.0002	0.0059	540	0.4301	13.6506	685	0.5909	18.7544
400	0.0004	0.0113	545	0.4861	15.4259	690	0.5359	17.0078
405	0.0003	0.0085	550	0.5317	16.8751	695	0.4819	15.2949
410	0.0003	0.0087	555	0.5737	18.2066	700	0.4256	13.5061
415	0.0002	0.0050	560	0.5981	18.9830	705	0.3757	11.9237
420	0.0004	0.0136	565	0.6238	19.7969	710	0.3271	10.3815
425	0.0002	0.0059	570	0.6462	20.5070	715	0.2856	9.0639
430	0.0004	0.0125	575	0.6710	21.2950	720	0.2471	7.8405
435	0.0000	0.0014	580	0.7003	22.2247	725	0.2161	6.8581
440	0.0003	0.0082	585	0.7310	23.1988	730	0.1849	5.8687
445	0.0029	0.0933	590	0.7634	24.2263	735	0.1584	5.0286
450	0.0130	0.4116	595	0.7993	25.3658	740	0.1277	4.0517
455	0.0363	1.1532	600	0.8281	26.2818	745	0.1029	3.2644
460	0.0769	2.4401	605	0.8623	27.3676	750	0.0794	2.5190
465	0.1467	4.6548	610	0.8889	28.2118	755	0.0635	2.0143
470	0.2635	8.3637	615	0.9186	29.1523	760	0.0486	1.5440
475	0.4547	14.4313	620	0.9444	29.9732	765	0.0320	1.0163
480	0.6631	21.0432	625	0.9683	30.7306	770	0.0250	0.7948
485	0.6587	20.9033	630	0.9855	31.2770	775	0.0188	0.5962
490	0.4826	15.3172	635	0.9976	31.6586	780	0.0298	0.9461
495	0.3608	11.4506	640	0.9977	31.6616	785	0.0112	0.3543
500	0.2872	9.1145	645	0.9847	31.2521	790	0.0040	0.1281
505	0.2182	6.9258	650	0.9568	30.3647	795	0.0062	0.1973
510	0.1846	5.8571	655	0.9265	29.4045	800	0.0014	0.0447
515	0.1844	5.8507	660	0.8850	28.0873			
520	0.2037	6.4651	665	0.8234	26.1320			

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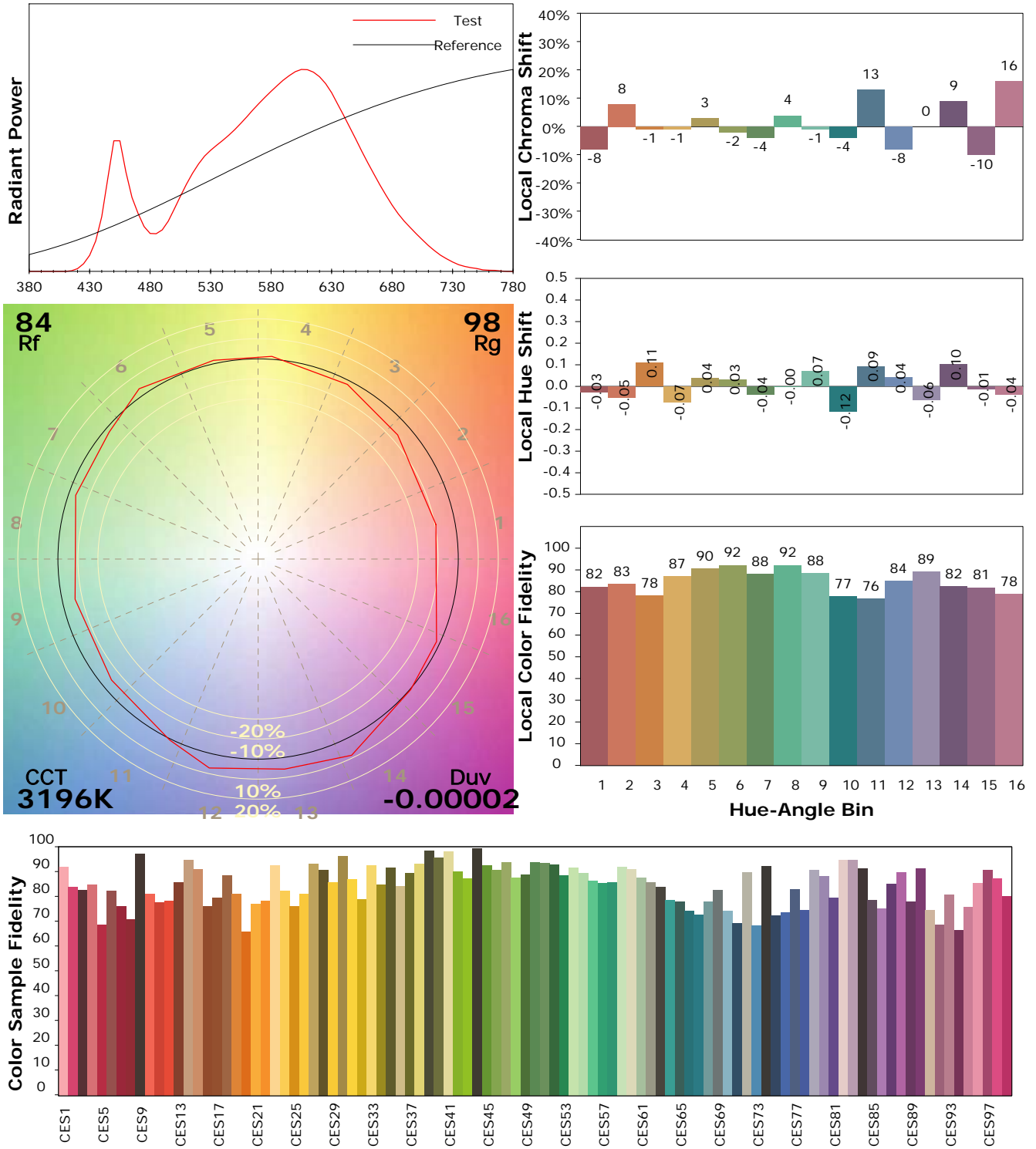
Test Device: Lisun LMS-9000B  
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## IES TM-30-18 Color Rendition Report

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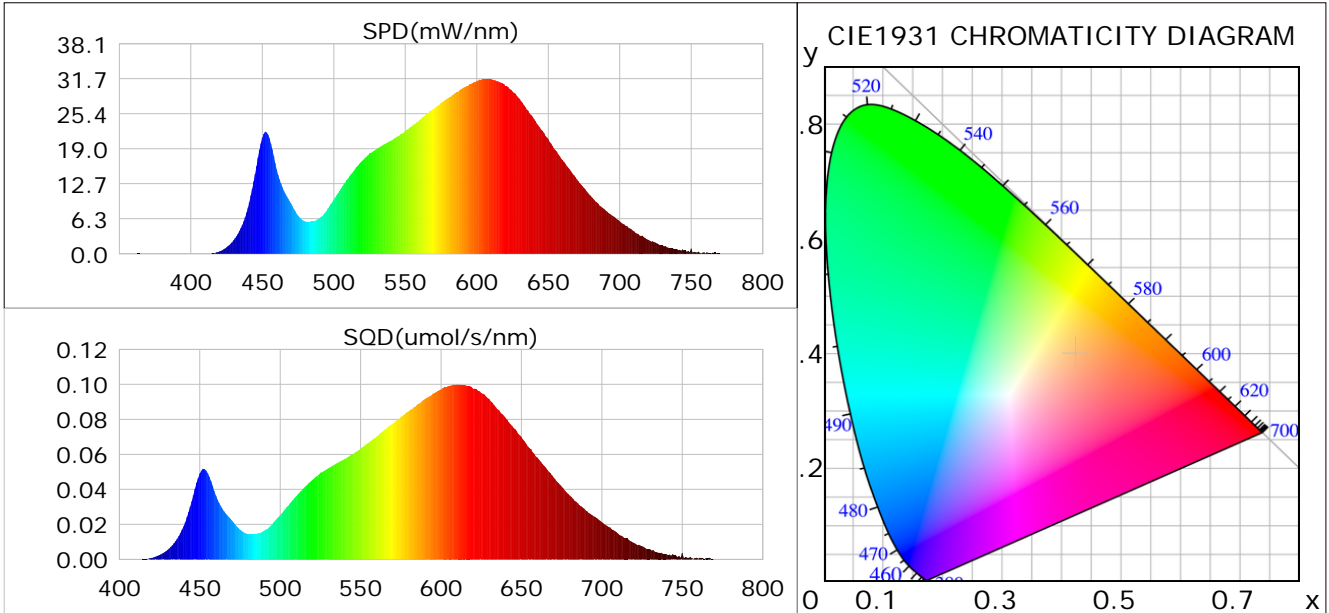
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 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
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## Plant optical param data

### CIE Colorimetric Parameters

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 Peak Wavelength: 607.7nm Half Bandwidth: 146.5nm  
 Dominant Wavelength: 582.0nm Color Purity: 0.469  
 CRI:  $R_a=84.0$



### Plant Optical Param

$ \mu_v(lm)$ : 1669.05	$Q_v(lm.s)$ : 1669.05
$ \mu_e, \dot{E}(W/nm)$ : 5.11	$Q_e(J)$ : 5.11
$ \mu_e(W)$ : 6.27	$ \mu_{fr}(W)$ : 0.16
$ \zeta_e$ : 0.38	$ \zeta_{fr}$ : 0.01
$PPE(umol/s/w)$ : 1.45	$K_{fr}$ : 0.04
$Erb\_Ratio$ : 2.72	$PPF(umol/s)$ : 24.01
$PF_{uv}(360-400)(umol/s)$ : 0.00	$PPF(400-500)(umol/s)$ : 2.86
$PPF(500-600)(umol/s)$ : 10.40	$PPF(600-700)(umol/s)$ : 10.75
$PPF_{fr}(700-800)(umol/s)$ : 0.72	$PPF.t(umol)$ : 24.01
$ \mu_{ch-A.t}(J)$ : 0.40	$ \mu_{ch-A}(W)$ : 0.40
$ \mu_{ch-B.t}(J)$ : 0.20	$ \mu_{ch-B}(W)$ : 0.20
$ \mu_b.t(J)$ : 0.93	$ \mu_b(W)$ : 0.93
$ \mu_y.t(J)$ : 2.82	$ \mu_y(W)$ : 2.82
$ \mu_r.t(J)$ : 2.58	$ \mu_r(W)$ : 2.58

### Electric Parameters

Voltage: 230.80V	Current: 0.0760A	Power: 16.53W
Power Factor: 0.9400	Frequency: 49.99Hz	

Condition:  $T_x=22.0^\circ C$ ,  $T_i=0.0^\circ C$ , R.H.: 60%  
 Test Lab:  
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