

## Lightsource Test Report

### Product Information

Product Category: LED-Röhre  
 Product Spec: LEDtube-090-8Veg-15WM  
 Manufacturer: METOLIGHT  
 Buyer: 7116

Product Type: LED-Röhre-Spezial  
 Product Number: 1  
 Submitted Unit: 105181

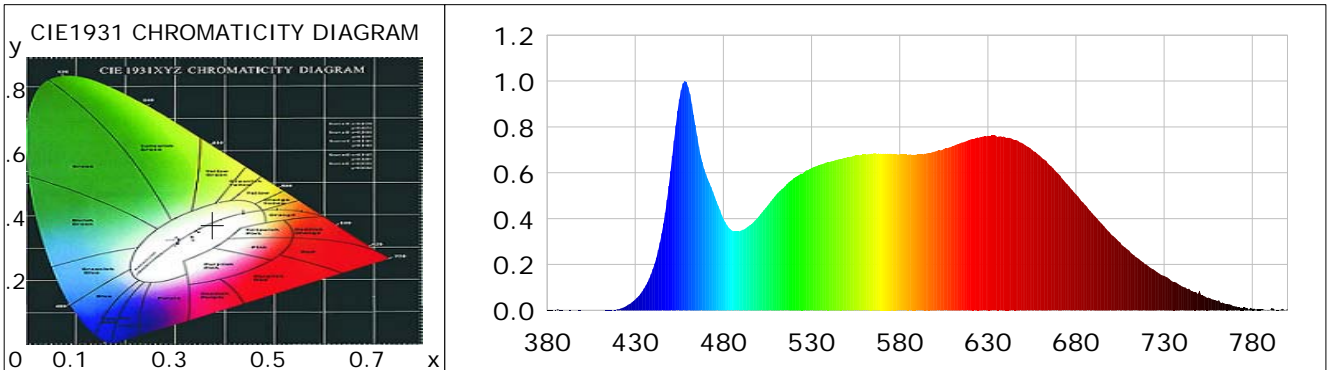
### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.3757$   $y=0.3732$   $u(u')=0.2234$   $v=0.3329$   $v'=0.4993$   
 CCT:  $T_c=4108K$  ( $duv=-0.00025$ ) Color Ratio:  $R=0.198$   $G=0.755$   $B=0.047$   
 Peak Wavelength: 458.2nm Half Bandwidth: 26.5nm  
 Dominant Wavelength: 578.8nm Color Purity: 0.248  
 CRI:  $R_a=95.5$ ,  $avgR(1\sim14)=93.5$ ,  $avgR(1\sim15)=93.6$  TM30:  $R_f=89$ ,  $R_g=97$   
 GAI:  $GAI\_BB\_8=98.0$ ,  $GAI\_BB\_15=104.9$ ,  $GAI\_EES=79.0$   

R1 =97	R2 =99	R3 =97	R4 =93	R5 =94	R6 =95	R7 =95	R8 =94
R9 =93	R10=95	R11=93	R12=67	R13=99	R14=98	R15=95	

Color Quality Scale:  $Q_a=92.2$ ,  $Q_f=91.8$ ,  $Q_p=92.1$ ,  $Q_g=98.2$   

Q1 =90	Q2 =97	Q3 =89	Q4 =84	Q5 =86	Q6 =89	Q7 =95	Q8 =97
Q9 =98	Q10=97	Q11=96	Q12=97	Q13=98	Q14=98	Q15=95	



### Photometric Parameters

Luminous Flux: 1389.9 lm	Efficiency: 92.60 lm/W	Radiant Power: 5.049 W
Total mains efficacy: 108.90 lm/W	Energy Efficiency Class: F (EU 2019/2015)	
Pupil Flux: 2259.87 Plm	Pupil Lumens Per Watt: 150.56 Plm/W	Pupil Factor (Kp): 1.626
Cirtopic Flux: 4841.94 lm		

### Electric Parameters

Voltage: 230.60V	Current: 0.0690A	Power: 15.01W
Power Factor: 0.9370	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: 46804 (2480)	CCD Integration Time: 260.70 ms

Condition:  $T_x=19.6^{\circ}C$ ,  $T_i=0.0^{\circ}C$ , R.H.:60%  
 Test Lab:  
 Operator: CRE

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

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WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0008	0.0231	525	0.5968	17.6572	670	0.5957	17.6265
385	0.0016	0.0473	530	0.6206	18.3614	675	0.5507	16.2936
390	0.0006	0.0168	535	0.6353	18.7960	680	0.5059	14.9673
395	0.0005	0.0144	540	0.6469	19.1416	685	0.4602	13.6153
400	0.0006	0.0169	545	0.6577	19.4602	690	0.4157	12.2986
405	0.0001	0.0043	550	0.6673	19.7440	695	0.3735	11.0510
410	0.0009	0.0264	555	0.6762	20.0072	700	0.3308	9.7863
415	0.0013	0.0390	560	0.6805	20.1337	705	0.2960	8.7588
420	0.0045	0.1336	565	0.6843	20.2466	710	0.2616	7.7396
425	0.0192	0.5674	570	0.6824	20.1900	715	0.2280	6.7462
430	0.0473	1.4009	575	0.6831	20.2100	720	0.1994	5.8995
435	0.0952	2.8175	580	0.6809	20.1462	725	0.1726	5.1082
440	0.1797	5.3173	585	0.6792	20.0962	730	0.1503	4.4472
445	0.3361	9.9444	590	0.6801	20.1236	735	0.1246	3.6856
450	0.6073	17.9671	595	0.6840	20.2392	740	0.1053	3.1148
455	0.9205	27.2353	600	0.6926	20.4912	745	0.0870	2.5753
460	0.9734	28.8013	605	0.7038	20.8239	750	0.0849	2.5120
465	0.7611	22.5187	610	0.7163	21.1933	755	0.0560	1.6574
470	0.5952	17.6106	615	0.7311	21.6314	760	0.0409	1.2087
475	0.4967	14.6970	620	0.7447	22.0324	765	0.0274	0.8105
480	0.3999	11.8334	625	0.7536	22.2979	770	0.0177	0.5238
485	0.3473	10.2757	630	0.7614	22.5287	775	0.0121	0.3592
490	0.3477	10.2876	635	0.7586	22.4456	780	0.0076	0.2260
495	0.3707	10.9680	640	0.7539	22.3047	785	0.0053	0.1556
500	0.4091	12.1031	645	0.7430	21.9824	790	0.0008	0.0241
505	0.4565	13.5059	650	0.7270	21.5105	795	0.0010	0.0285
510	0.5049	14.9388	655	0.7003	20.7189	800	0.0069	0.2030
515	0.5415	16.0209	660	0.6705	19.8387			
520	0.5767	17.0623	665	0.6332	18.7353			

Condition: Tx: 19.6°C, Ti: 0.0°C, R.H.: 60%  
 Test Lab:  
 Operator: CRE

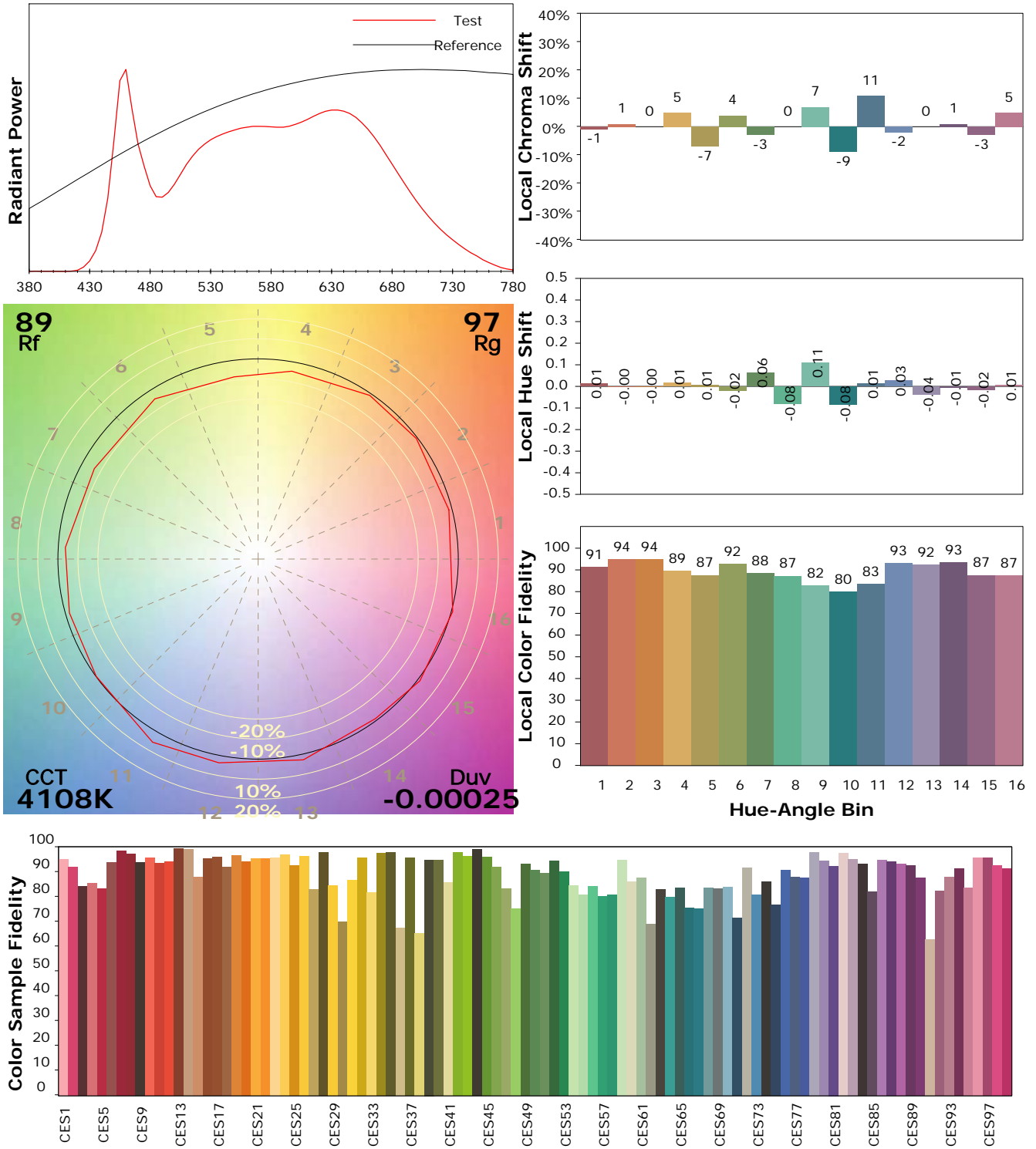
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## IES TM-30-18 Color Rendition Report

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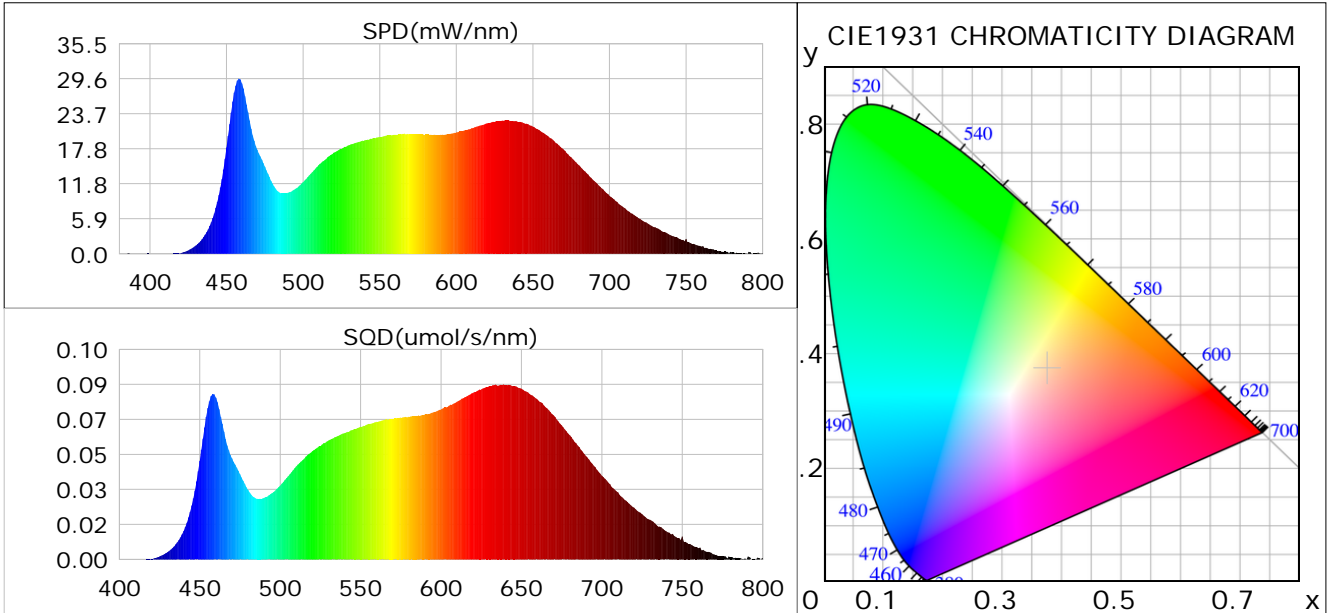
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 Test Lab:  
 Operator: CRE

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

## Plant optical param data

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 Peak Wavelength: 458.2nm Half Bandwidth: 26.5nm  
 Dominant Wavelength: 578.8nm Color Purity: 0.248  
 CRI:  $R_a=95.5$



### Plant Optical Param

$ \mu_v(lm): 1389.90$	$Q_v(lm.s): 1389.90$
$ \mu_e, \dot{E}(W/nm): 5.05$	$Q_e(J): 5.05$
$ \mu_e(W): 4.76$	$ \mu_{fr}(W): 0.31$
$ \zeta_e: 0.32$	$ \zeta_{fr}: 0.02$
$PPE(umol/s/w): 1.51$	$K_{fr}: 0.12$
$Erb\_Ratio: 1.90$	$PPF(umol/s): 22.73$
$PF_{uv}(360-400)(umol/s): 0.00$	$PPF(400-500)(umol/s): 3.89$
$PPF(500-600)(umol/s): 8.63$	$PPF(600-700)(umol/s): 10.20$
$PPF_{fr}(700-800)(umol/s): 1.79$	$PPF.t(umol): 22.73$
$ \mu_{ch-A.t}(J): 0.40$	$ \mu_{ch-A}(W): 0.40$
$ \mu_{ch-B.t}(J): 0.23$	$ \mu_{ch-B}(W): 0.23$
$ \mu_b.t(J): 1.00$	$ \mu_b(W): 1.00$
$ \mu_y.t(J): 1.88$	$ \mu_y(W): 1.88$
$ \mu_r.t(J): 1.91$	$ \mu_r(W): 1.91$

### Electric Parameters

Voltage: 230.60V	Current: 0.0690A	Power: 15.01W
Power Factor: 0.9370	Frequency: 49.99Hz	

Condition:  $T_x: 19.6^\circ C$ ,  $T_i: 0.0^\circ C$ , R.H.: 60%  
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