

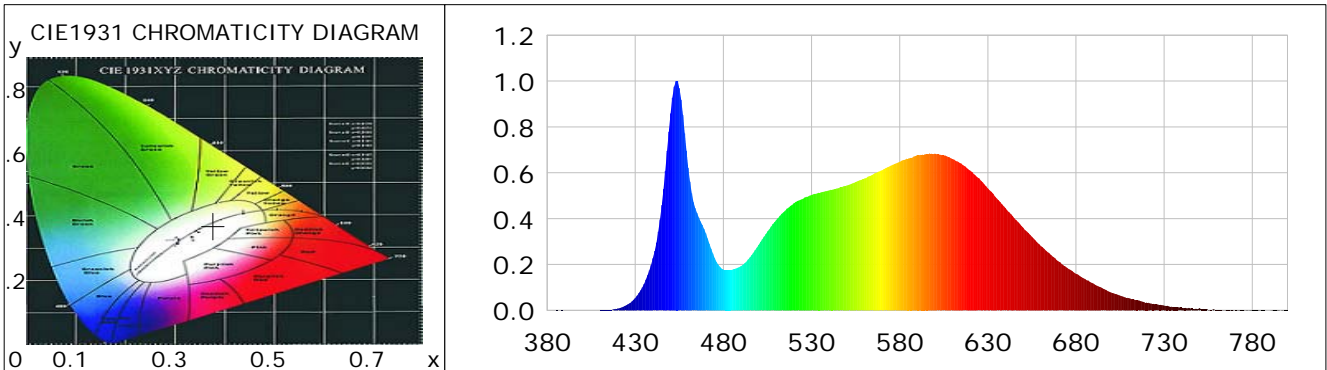
## Lightsource Test Report

### Product Information

Product Category: LED-Röhre  
 Product Type: LED-Röhre-SCE  
 Product Spec: LEDtube-060-8NWM-09W-SCE-RM-160  
 Product Number: 1  
 Manufacturer: METOLIGHT  
 Submitted Unit: 102590  
 Buyer: 6961 - 20881

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.3770$   $y=0.3700$   $u(u')=0.2255$   $v=0.3320$   $v'=0.4981$   
 CCT:  $T_c=4047K$  ( $duv=-0.00217$ ) Color Ratio:  $R=0.187$   $G=0.777$   $B=0.036$   
 Peak Wavelength: 453.5nm Half Bandwidth: 16.7nm  
 Dominant Wavelength: 580.2nm Color Purity: 0.242  
 CRI:  $R_a = 84.5$ ,  $avgR(1\sim14) = 78.1$ ,  $avgR(1\sim15) = 78.2$  TM30:  $R_f = 83$ ,  $R_g = 96$   
 GAI:  $GAI\_BB\_8=96.2$ ,  $GAI\_BB\_15=103.8$ ,  $GAI\_EES=76.6$   
 R1 =84 R2 =91 R3 =94 R4 =83 R5 =83 R6 =86 R7 =86 R8 =68  
 R9 =18 R10=76 R11=82 R12=58 R13=86 R14=97 R15=79  
 Color Quality Scale:  $Q_a = 82.6$ ,  $Q_f = 82.4$ ,  $Q_p = 83.5$ ,  $Q_g = 94.3$   
 Q1 =83 Q2 =99 Q3 =77 Q4 =73 Q5 =80 Q6 =83 Q7 =86 Q8 =89  
 Q9 =97 Q10=88 Q11=85 Q12=84 Q13=84 Q14=75 Q15=78



### Photometric Parameters

Luminous Flux: 1464.2 lm Efficiency: 155.93 lm/W Radiant Power: 4.449 W  
 Total mains efficacy: 183.38 lm/W Energy Efficiency Class: C (EU 2019/2015)  
 Pupil Flux: 2229.12 Plm Pupil Lumens Per Watt: 237.39 Plm/W Pupil Factor (Kp): 1.522  
 Cirtopic Flux: 4568.91 lm

### Electric Parameters

Voltage: 230.60V Current: 0.0430A Power: 9.39W  
 Power Factor: 0.9330 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: 44337 (1927) CCD Integration Time: 169.84 ms

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WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.0063	525	0.4864	18.0397	670	0.2143	7.9463
385	0.0007	0.0262	530	0.5032	18.6605	675	0.1853	6.8712
390	0.0003	0.0122	535	0.5138	19.0534	680	0.1598	5.9266
395	0.0003	0.0108	540	0.5230	19.3960	685	0.1372	5.0868
400	0.0007	0.0248	545	0.5324	19.7451	690	0.1162	4.3093
405	0.0002	0.0069	550	0.5447	20.1995	695	0.0959	3.5574
410	0.0008	0.0307	555	0.5598	20.7588	700	0.0781	2.8982
415	0.0026	0.0955	560	0.5752	21.3309	705	0.0645	2.3933
420	0.0080	0.2953	565	0.5938	22.0226	710	0.0532	1.9712
425	0.0224	0.8323	570	0.6108	22.6530	715	0.0446	1.6533
430	0.0544	2.0192	575	0.6316	23.4244	720	0.0338	1.2541
435	0.1152	4.2713	580	0.6483	24.0414	725	0.0272	1.0083
440	0.2271	8.4233	585	0.6621	24.5541	730	0.0216	0.8004
445	0.4592	17.0316	590	0.6773	25.1194	735	0.0152	0.5625
450	0.8589	31.8545	595	0.6814	25.2697	740	0.0125	0.4628
455	0.9694	35.9519	600	0.6835	25.3468	745	0.0081	0.3017
460	0.6224	23.0833	605	0.6764	25.0842	750	0.0095	0.3512
465	0.4250	15.7626	610	0.6600	24.4774	755	0.0042	0.1547
470	0.3364	12.4768	615	0.6404	23.7491	760	0.0029	0.1083
475	0.2288	8.4859	620	0.6101	22.6244	765	0.0030	0.1106
480	0.1780	6.6019	625	0.5754	21.3380	770	0.0012	0.0451
485	0.1773	6.5747	630	0.5314	19.7062	775	0.0022	0.0820
490	0.1927	7.1456	635	0.4886	18.1184	780	0.0015	0.0545
495	0.2304	8.5455	640	0.4459	16.5348	785	0.0009	0.0352
500	0.2858	10.5975	645	0.4017	14.8955	790	0.0001	0.0035
505	0.3443	12.7681	650	0.3602	13.3587	795	0.0033	0.1221
510	0.3945	14.6300	655	0.3207	11.8937	800	0.0019	0.0703
515	0.4346	16.1165	660	0.2809	10.4173			
520	0.4673	17.3307	665	0.2480	9.1968			

Condition: Tx: 12.3°C, Ti: 0.0°C, R.H.: 60%  
 Test Lab:  
 Operator: CRE

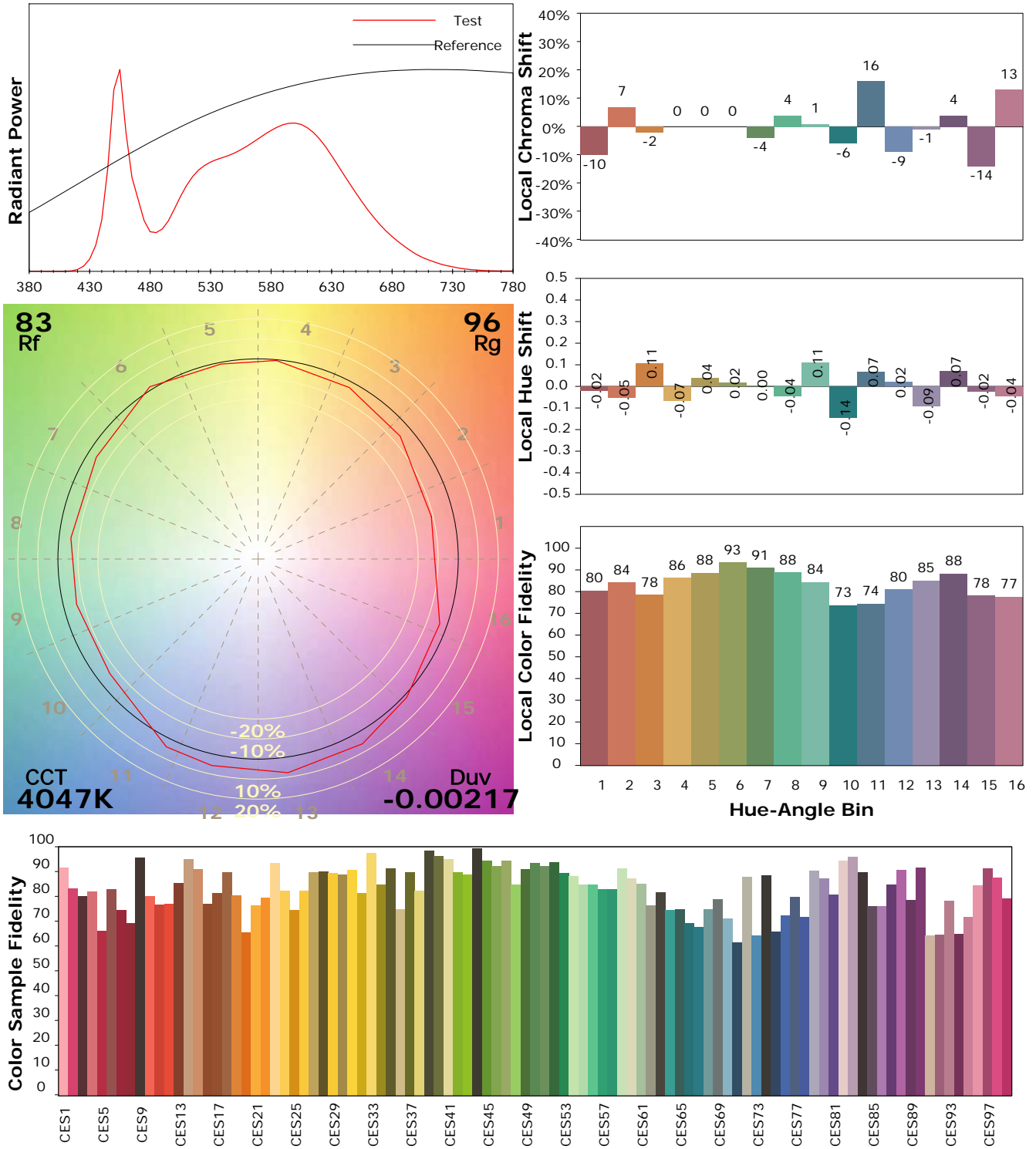
Test Device: Lisun LMS-9000B  
 Test Time: 2021-01-08 09:11:40  
 Inspector:

## IES TM-30-18 Color Rendition Report

### Product Information

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 Product Spec: LEDtube-060-8NWM-09W-SCE-RM-160  
 Manufacturer: METOLIGHT  
 Buyer: 6961 - 20881

Product Type: LED-Röhre-SCE  
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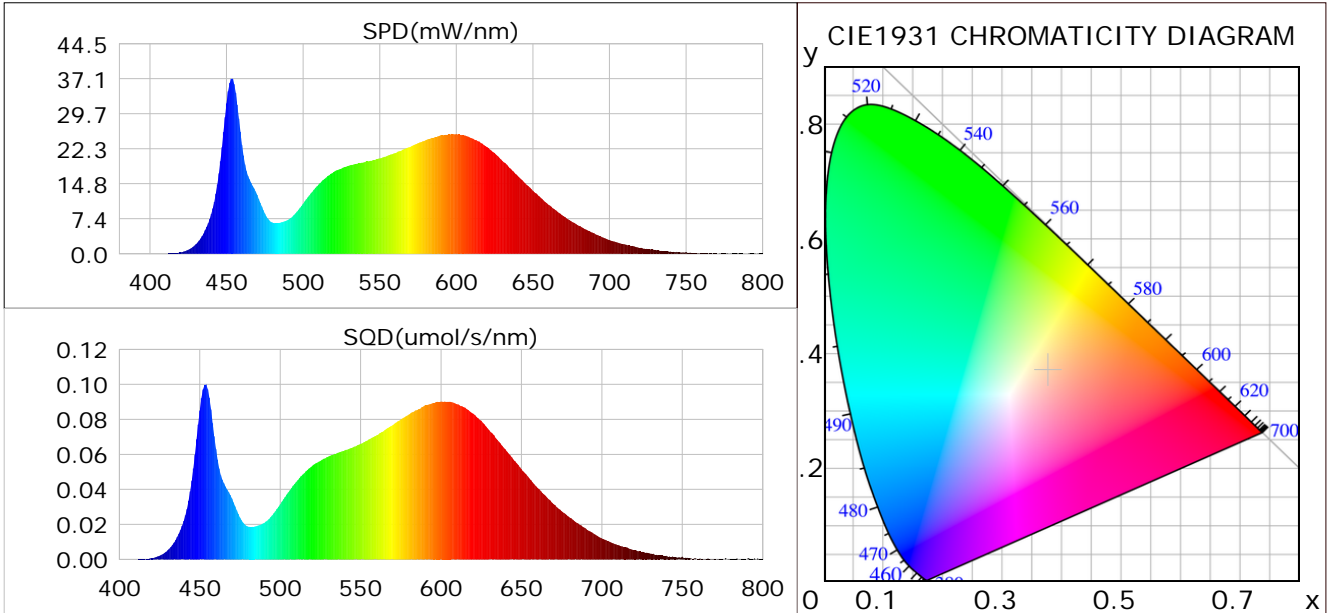
Condition: Tx: 12.3°C, Ti: 0.0°C, R.H.: 60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-01-08 09:11:40  
 Inspector:

## Plant optical param data

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.3770$   $y=0.3700$   $u(u')=0.2255$   $v=0.3320$   $v'=0.4981$   
 CCT:  $T_c=4047K$  ( $duv=-0.00217$ ) Color Ratio:  $R=0.187$   $G=0.777$   $B=0.036$   
 Peak Wavelength: 453.5nm Half Bandwidth: 16.7nm  
 Dominant Wavelength: 580.2nm Color Purity: 0.242  
 CRI:  $R_a=84.5$



### Plant Optical Param

$ \mu_v(lm): 1464.20$	$Q_v(lm.s): 1464.20$
$ \mu_e, \dot{E}(W/nm): 4.45$	$Q_e(J): 4.45$
$ \mu_e(W): 4.39$	$ \mu_{fr}(W): 0.07$
$ \zeta_e: 0.47$	$ \zeta_{fr}: 0.01$
$PPE(umol/s/w): 2.19$	$K_{fr}: 0.04$
$Erb\_Ratio: 1.42$	$PPF(umol/s): 20.52$
$PF_{uv}(360-400)(umol/s): 0.00$	$PPF(400-500)(umol/s): 3.77$
$PPF(500-600)(umol/s): 9.40$	$PPF(600-700)(umol/s): 7.35$
$PPF_r(700-800)(umol/s): 0.38$	$PPF.t(umol): 20.52$
$ \mu_{ch-A.t}(J): 0.34$	$ \mu_{ch-A}(W): 0.34$
$ \mu_{ch-B.t}(J): 0.21$	$ \mu_{ch-B}(W): 0.21$
$ \mu_b.t(J): 0.98$	$ \mu_b(W): 0.98$
$ \mu_y.t(J): 2.03$	$ \mu_y(W): 2.03$
$ \mu_r.t(J): 1.41$	$ \mu_r(W): 1.41$

### Electric Parameters

Voltage: 230.60V	Current: 0.0430A	Power: 9.39W
Power Factor: 0.9330	Frequency: 49.99Hz	

Condition:  $T_x: 12.3^\circ C$ ,  $T_i: 0.0^\circ C$ , R.H.: 60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-01-08 09:11:40  
 Inspector: