

## Lightsource Test Report

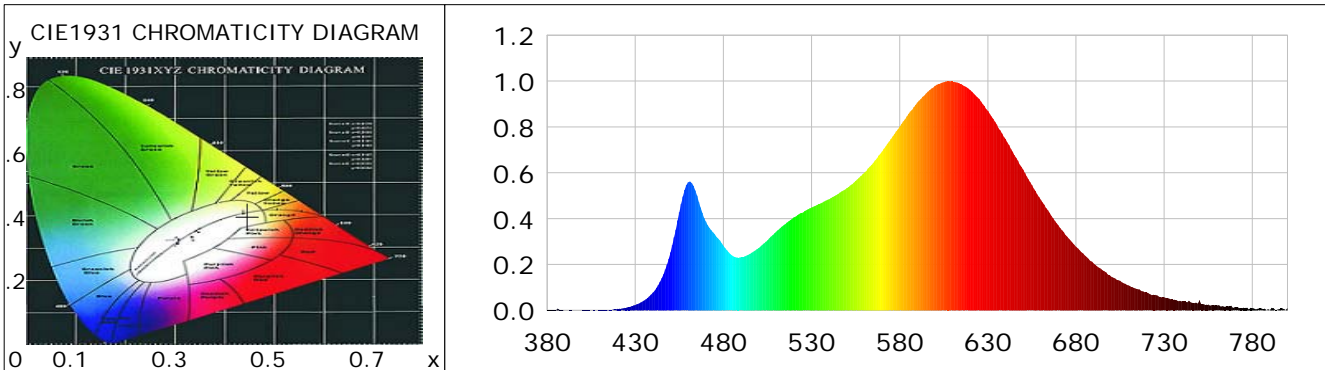
### Product Information

Product Category: LED-Röhren  
 Product Spec: LEDtube-028-5WWM-5W-DC  
 Manufacturer: METOLIGHT  
 Buyer: 7709

Product Type: LED-Röhren-TRF  
 Product Number: 1  
 Submitted Unit: 105256

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.4461$   $y=0.3996$   $u(u')=0.2585$   $v=0.3473$   $v'=0.5210$   
 CCT:  $T_c=2815K$  ( $duv=-0.00289$ ) Color Ratio:  $R=0.250$   $G=0.720$   $B=0.030$   
 Peak Wavelength: 607.9nm Half Bandwidth: 115.1nm  
 Dominant Wavelength: 584.7nm Color Purity: 0.538  
 CRI:  $R_a=84.5$ ,  $avgR(1\sim14)=80.9$ ,  $avgR(1\sim15)=80.7$  TM30:  $R_f=84$ ,  $R_g=93$   
 GAI:  $GAI\_BB\_8=100.2$ ,  $GAI\_BB\_15=109.4$ ,  $GAI\_EES=52.2$   
 R1 =86 R2 =97 R3 =91 R4 =82 R5 =87 R6 =95 R7 =79 R8 =60  
 R9 =19 R10=93 R11=82 R12=78 R13=89 R14=96 R15=78  
 Color Quality Scale:  $Q_a=83.8$ ,  $Q_f=85.5$ ,  $Q_p=86.1$ ,  $Q_g=91.2$   
 Q1 =79 Q2 =92 Q3 =88 Q4 =81 Q5 =81 Q6 =83 Q7 =86 Q8 =87  
 Q9 =94 Q10=93 Q11=89 Q12=85 Q13=84 Q14=76 Q15=77



### Photometric Parameters

Luminous Flux: 673.60 lm Efficiency: 127.58 lm/W Radiant Power: 2.107 W  
 Total mains efficacy: 138.93 lm/W Energy Efficiency Class: D (EU 2019/2015)  
 Pupil Flux: 852.20 Plm Pupil Lumens Per Watt: 161.40 Plm/W Pupil Factor (Kp): 1.265  
 Circopic Flux: 1606.12 lm

### Electric Parameters

Voltage: 230.00V Current: 0.0230A Power: 5.28W  
 Power Factor: 0.7420 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: 46543 (2677) CCD Integration Time: 319.39 ms

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WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0014	0.0210	525	0.4265	6.2806	670	0.3709	5.4628
385	0.0014	0.0210	530	0.4487	6.6078	675	0.3216	4.7360
390	0.0006	0.0094	535	0.4663	6.8673	680	0.2774	4.0845
395	0.0003	0.0039	540	0.4851	7.1441	685	0.2393	3.5240
400	0.0008	0.0123	545	0.5073	7.4704	690	0.2044	3.0103
405	0.0002	0.0034	550	0.5333	7.8542	695	0.1751	2.5782
410	0.0013	0.0190	555	0.5644	8.3117	700	0.1471	2.1667
415	0.0030	0.0441	560	0.6007	8.8469	705	0.1286	1.8931
420	0.0064	0.0937	565	0.6435	9.4768	710	0.1086	1.5995
425	0.0117	0.1727	570	0.6928	10.2032	715	0.0927	1.3657
430	0.0233	0.3427	575	0.7475	11.0080	720	0.0785	1.1556
435	0.0429	0.6319	580	0.8019	11.8096	725	0.0673	0.9911
440	0.0774	1.1394	585	0.8571	12.6218	730	0.0566	0.8333
445	0.1408	2.0728	590	0.9063	13.3467	735	0.0470	0.6919
450	0.2529	3.7243	595	0.9463	13.9351	740	0.0389	0.5736
455	0.4282	6.3059	600	0.9791	14.4189	745	0.0350	0.5162
460	0.5588	8.2286	605	0.9948	14.6501	750	0.0434	0.6386
465	0.5006	7.3725	610	0.9983	14.7020	755	0.0256	0.3776
470	0.3875	5.7066	615	0.9867	14.5305	760	0.0211	0.3105
475	0.3323	4.8944	620	0.9612	14.1550	765	0.0172	0.2530
480	0.2827	4.1634	625	0.9226	13.5864	770	0.0133	0.1966
485	0.2393	3.5245	630	0.8703	12.8165	775	0.0117	0.1729
490	0.2311	3.4036	635	0.8110	11.9435	780	0.0101	0.1481
495	0.2459	3.6217	640	0.7476	11.0099	785	0.0088	0.1296
500	0.2721	4.0068	645	0.6777	9.9800	790	0.0017	0.0243
505	0.3057	4.5017	650	0.6140	9.0422	795	0.0043	0.0635
510	0.3439	5.0646	655	0.5463	8.0448	800	0.0110	0.1621
515	0.3761	5.5383	660	0.4830	7.1124			
520	0.4059	5.9781	665	0.4252	6.2622			

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

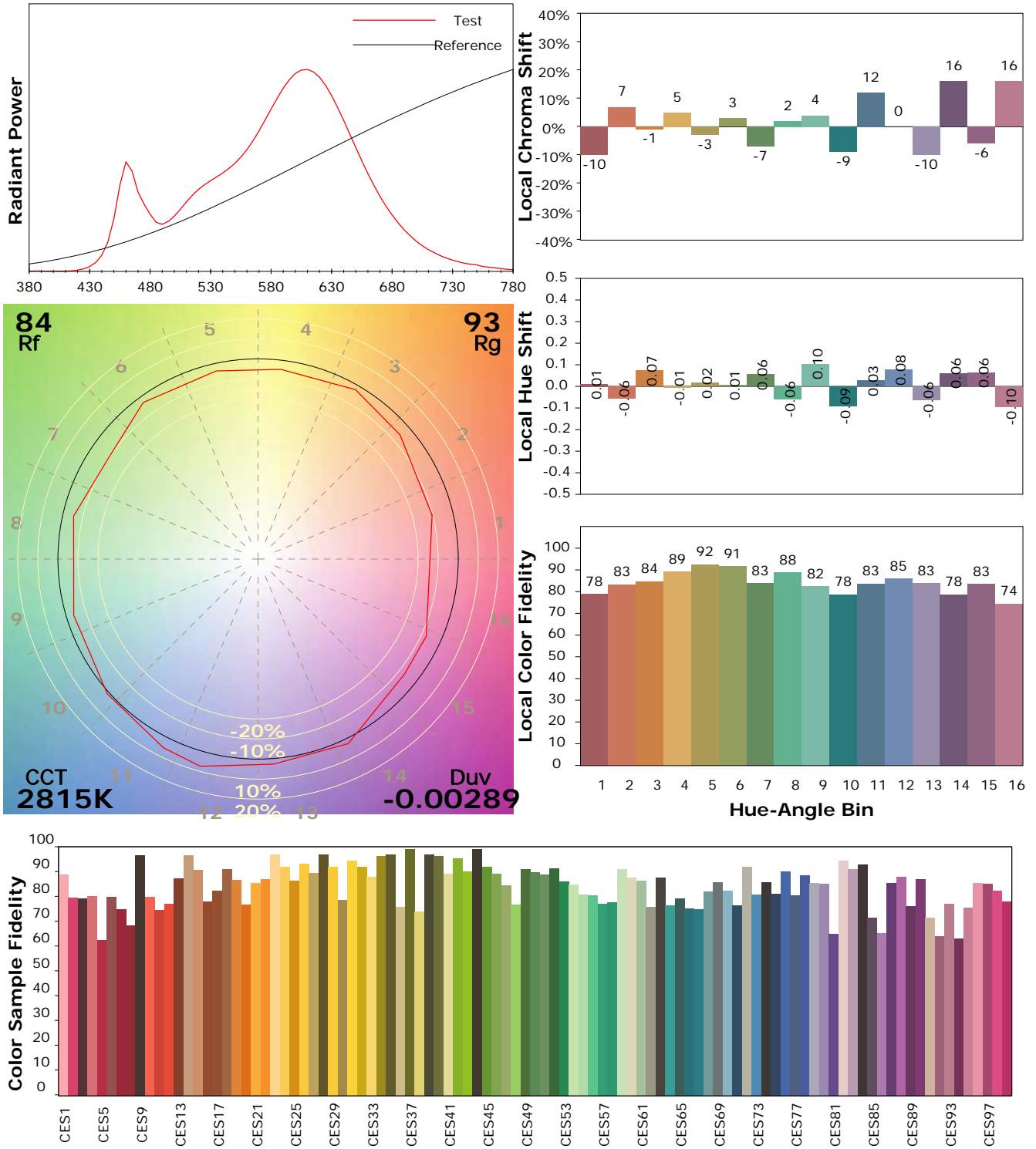
Test Device: Lisun LMS-9000B  
 Test Time: 2021-03-03 15:25:26  
 Inspector:

## IES TM-30-18 Color Rendition Report

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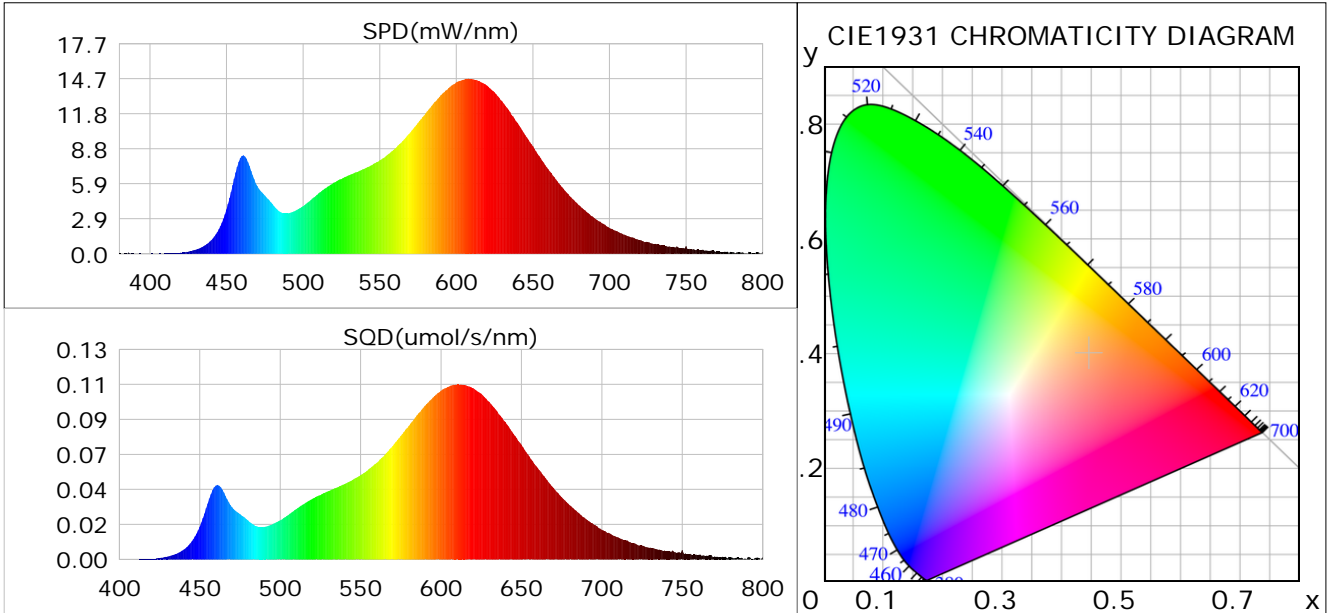
Condition: Tx:0.0°C, Ti:0.0°C, R.H.: 60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-03-03 15:25:26  
 Inspector:

## Plant optical param data

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.4461$   $y=0.3996$   $u(u')=0.2585$   $v=0.3473$   $v'=0.5210$   
 CCT:  $T_c=2815K$  ( $duv=-0.00289$ ) Color Ratio:  $R=0.250$   $G=0.720$   $B=0.030$   
 Peak Wavelength: 607.9nm Half Bandwidth: 115.1nm  
 Dominant Wavelength: 584.7nm Color Purity: 0.538  
 CRI:  $R_a=84.5$



### Plant Optical Param

$ \mu_v(lm): 673.60$	$Q_v(lm.s): 673.60$
$ \mu_e, \dot{E}(W/nm): 2.11$	$Q_e(J): 2.11$
$ \mu_e(W): 2.05$	$ \mu_{fr}(W): 0.07$
$ \zeta_e: 0.39$	$ \zeta_{fr}: 0.01$
$PPE(umol/s/w): 1.88$	$K_{fr}: 0.07$
$Erb\_Ratio: 3.08$	$PPF(umol/s): 9.93$
$PF_{uv}(360-400)(umol/s): 0.00$	$PPF(400-500)(umol/s): 1.13$
$PPF(500-600)(umol/s): 4.05$	$PPF(600-700)(umol/s): 4.74$
$PPF_r(700-800)(umol/s): 0.38$	$PPF.t(umol): 9.93$
$ \mu_{ch-A.t}(J): 0.16$	$ \mu_{ch-A}(W): 0.16$
$ \mu_{ch-B.t}(J): 0.09$	$ \mu_{ch-B}(W): 0.09$
$ \mu_b.t(J): 0.29$	$ \mu_b(W): 0.29$
$ \mu_y.t(J): 0.87$	$ \mu_y(W): 0.87$
$ \mu_r.t(J): 0.91$	$ \mu_r(W): 0.91$

### Electric Parameters

Voltage: 230.00V	Current: 0.0230A	Power: 5.28W
Power Factor: 0.7420	Frequency: 49.99Hz	

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

Test Device: Lisun LMS-9000B  
 Test Time: 2021-03-03 15:25:26  
 Inspector: