

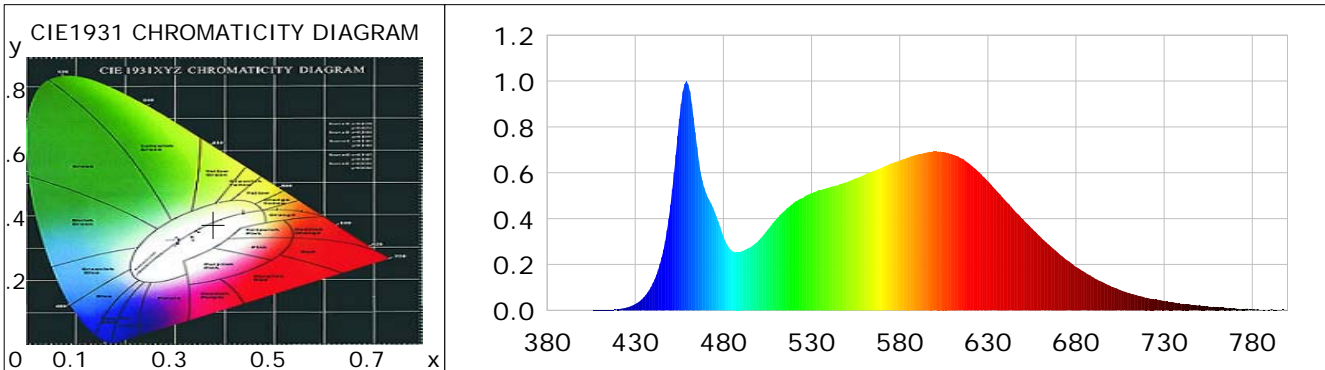
Lightsource Test Report

Product Information

Product Category: LED-Röhre	Product Type: LED-Röhre-TRF
Product Spec: Ledtube-085-5NWM-13W-TRF	Product Number: 1
Manufacturer: METOLIGHT	Submitted Unit: 104522
Buyer: 5931	

CIE Colorimetric Parameters

Chromaticity coordinates: $x=0.3771$ $y=0.3740$ $u(u')=0.2240$ $v=0.3332$ $v'=0.4998$
 CCT: $T_c=4073K$ ($duv=-0.00032$) Color Ratio: $R=0.189$ $G=0.767$ $B=0.044$
 Peak Wavelength: 459.0nm Half Bandwidth: 20.2nm
 Dominant Wavelength: 579.0nm Color Purity: 0.254
 CRI: $R_a = 86.4$, $avgR(1\sim14) = 81.3$, $avgR(1\sim15) = 81.4$ TM30: $R_f = 83$, $R_g = 92$
 GAI: $GAI_BB_8=91.6$, $GAI_BB_15=100.1$, $GAI_EES=73.3$
 R1 =87 R2 =96 R3 =96 R4 =82 R5 =85 R6 =91 R7 =85 R8 =70
 R9 =30 R10=87 R11=81 R12=60 R13=90 R14=99 R15=82
 Color Quality Scale: $Q_a = 84.4$, $Q_f = 84.7$, $Q_p = 83.2$, $Q_g = 91.8$
 Q1 =81 Q2 =95 Q3 =84 Q4 =76 Q5 =78 Q6 =80 Q7 =86 Q8 =90
 Q9 =98 Q10=94 Q11=90 Q12=88 Q13=88 Q14=79 Q15=81



Photometric Parameters

Luminous Flux: 1667.0 lm	Efficiency: 107.55 lm/W	Radiant Power: 5.206 W
Total mains efficacy: 117.12 lm/W	Energy Efficiency Class: E (EU 2019/2015)	
Pupil Flux: 2631.38 Plm	Pupil Lumens Per Watt: 169.77 Plm/W	Pupil Factor (Kp): 1.579
Cirtpopic Flux: 5583.98 lm		

Electric Parameters

Voltage: 229.90V	Current: 0.0730A	Power: 15.50W
Power Factor: 0.9210	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: 45577 (2370)	CCD Integration Time: 80.00 ms

Condition: Tx:19.8'C, Ti:0.0'C, R.H.:60%
 Test Lab:
 Operator: CRE

Test Device: Lisun LMS-9000B
 Test Time: 2021-01-22 11:50:17
 Inspector:

Lightsource Test Report

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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	0.0076	525	0.4898	20.0665	670	0.2503	10.2543
385	0.0006	0.0261	530	0.5112	20.9439	675	0.2185	8.9509
390	0.0003	0.0104	535	0.5236	21.4488	680	0.1897	7.7727
395	0.0003	0.0126	540	0.5361	21.9603	685	0.1660	6.8009
400	0.0006	0.0227	545	0.5458	22.3597	690	0.1426	5.8409
405	0.0006	0.0237	550	0.5586	22.8831	695	0.1231	5.0415
410	0.0012	0.0511	555	0.5754	23.5733	700	0.1044	4.2785
415	0.0025	0.1004	560	0.5908	24.2015	705	0.0888	3.6379
420	0.0050	0.2054	565	0.6082	24.9180	710	0.0762	3.1214
425	0.0123	0.5040	570	0.6226	25.5041	715	0.0647	2.6485
430	0.0273	1.1194	575	0.6407	26.2468	720	0.0552	2.2594
435	0.0581	2.3798	580	0.6535	26.7725	725	0.0476	1.9492
440	0.1184	4.8486	585	0.6666	27.3067	730	0.0413	1.6909
445	0.2318	9.4972	590	0.6793	27.8283	735	0.0350	1.4331
450	0.4606	18.8708	595	0.6881	28.1906	740	0.0286	1.1721
455	0.8350	34.2081	600	0.6932	28.3974	745	0.0248	1.0161
460	0.9850	40.3529	605	0.6907	28.2966	750	0.0239	0.9806
465	0.7134	29.2245	610	0.6794	27.8319	755	0.0173	0.7093
470	0.5141	21.0619	615	0.6630	27.1591	760	0.0146	0.5961
475	0.4301	17.6199	620	0.6362	26.0624	765	0.0113	0.4627
480	0.3224	13.2069	625	0.6022	24.6720	770	0.0085	0.3502
485	0.2581	10.5725	630	0.5632	23.0704	775	0.0063	0.2592
490	0.2568	10.5196	635	0.5204	21.3176	780	0.0046	0.1898
495	0.2740	11.2262	640	0.4780	19.5819	785	0.0026	0.1080
500	0.3045	12.4734	645	0.4362	17.8685	790	0.0021	0.0878
505	0.3505	14.3589	650	0.3967	16.2532	795	0.0032	0.1291
510	0.3979	16.3003	655	0.3573	14.6362	800	0.0040	0.1639
515	0.4360	17.8615	660	0.3195	13.0903			
520	0.4694	19.2318	665	0.2836	11.6192			

Condition: Tx: 19.8°C, Ti: 0.0°C, R.H.: 60%
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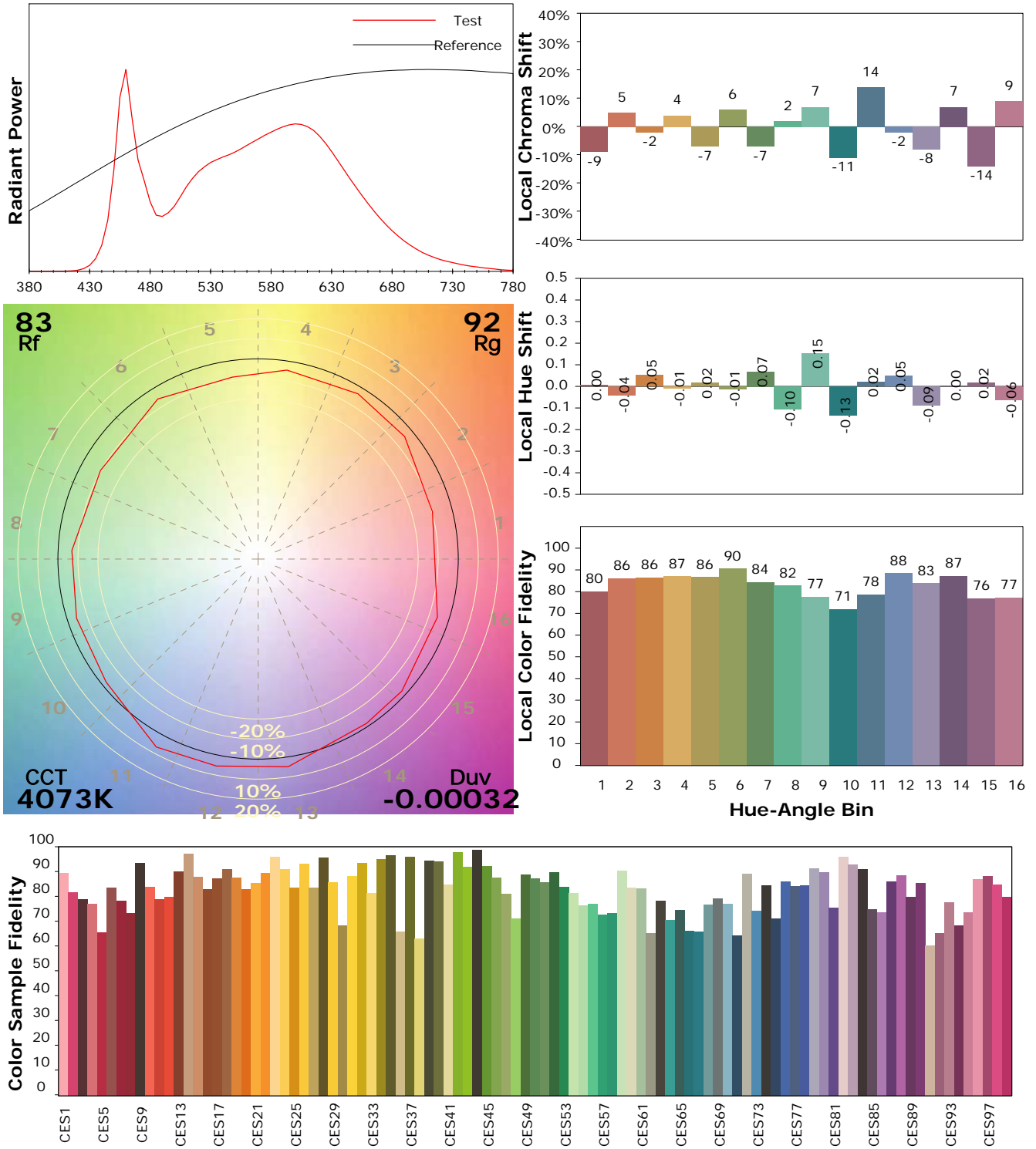
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IES TM-30-18 Color Rendition Report

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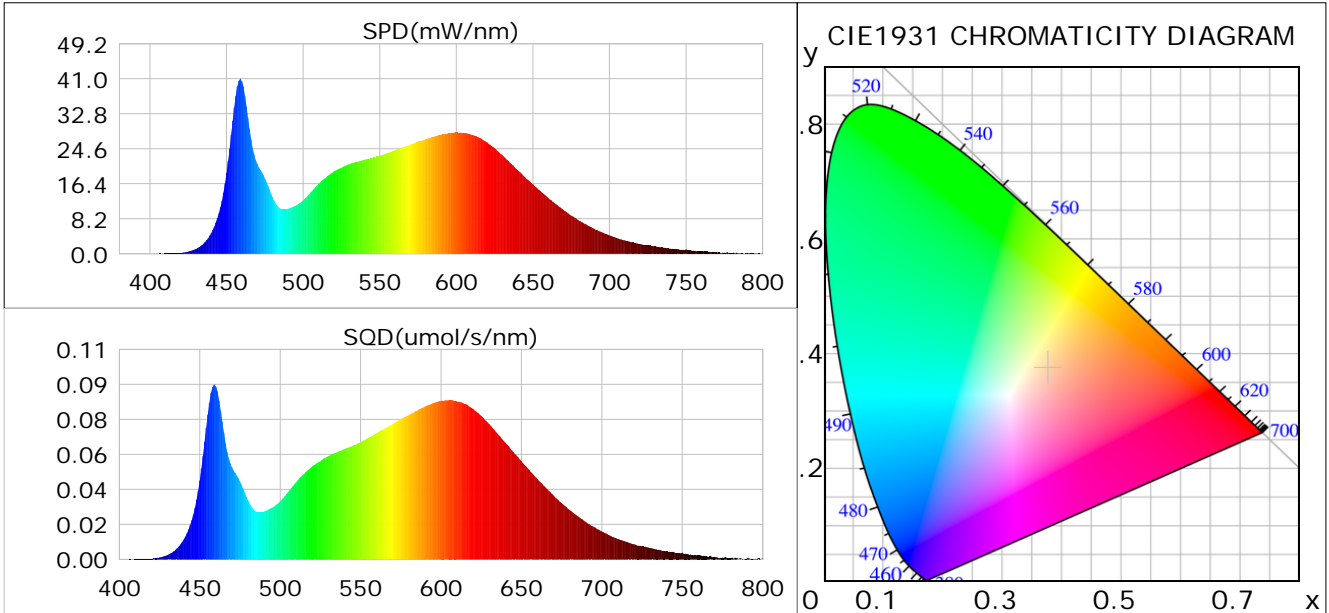
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Plant optical param data

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 CRI: $R_a=86.4$



Plant Optical Param

$ \mu_v(lm): 1667.00$	$Q_v(lm.s): 1667.00$
$ \mu_e, \dot{E}(W/nm): 5.21$	$Q_e(J): 5.21$
$ \mu_e(W): 5.09$	$ \mu_{fr}(W): 0.13$
$ \zeta_e: 0.33$	$ \zeta_{fr}: 0.01$
$PPE(umol/s/w): 1.54$	$K_{fr}: 0.05$
$Erb_Ratio: 1.42$	$PPF(umol/s): 23.87$
$PF_{uv}(360-400)(umol/s): 0.00$	$PPF(400-500)(umol/s): 4.54$
$PPF(500-600)(umol/s): 10.55$	$PPF(600-700)(umol/s): 8.78$
$PPF_r(700-800)(umol/s): 0.74$	$PPF.t(umol): 23.87$
$ \mu_{ch-A.t}(J): 0.38$	$ \mu_{ch-A}(W): 0.38$
$ \mu_{ch-B.t}(J): 0.26$	$ \mu_{ch-B}(W): 0.26$
$ \mu_b.t(J): 1.17$	$ \mu_b(W): 1.17$
$ \mu_y.t(J): 2.28$	$ \mu_y(W): 2.28$
$ \mu_r.t(J): 1.68$	$ \mu_r(W): 1.68$

Electric Parameters

Voltage: 229.90V	Current: 0.0730A	Power: 15.50W
Power Factor: 0.9210	Frequency: 49.99Hz	

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