

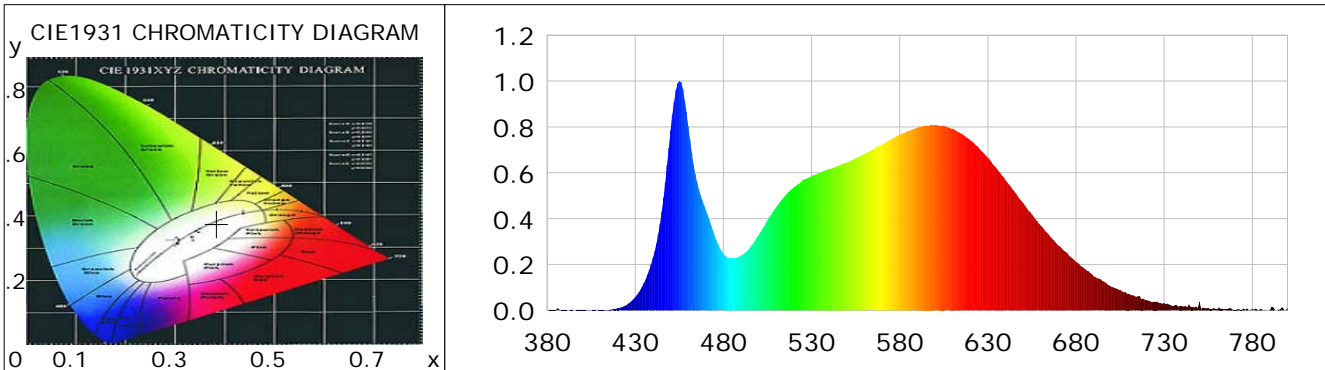
Lightsource Test Report

Product Information

Product Category: LED-Röhren
 Product Spec: LEDtube-028-5NWM-5W-DC
 Manufacturer: METOLIGHT
 Buyer: 7709
 Product Type: LED-Röhren-TRF
 Product Number: 1
 Submitted Unit: 105255

CIE Colorimetric Parameters

Chromaticity coordinates: $x=0.3841$ $y=0.3764$ $u(u')=0.2276$ $v=0.3347$ $v'=0.5020$
 CCT: $T_c=3900K$ ($duv=-0.00119$) Color Ratio: $R=0.192$ $G=0.772$ $B=0.036$
 Peak Wavelength: 455.1nm Half Bandwidth: 21.0nm
 Dominant Wavelength: 580.1nm Color Purity: 0.282
 CRI: $R_a=85.4$, $avgR(1\sim14)=79.5$, $avgR(1\sim15)=79.5$ TM30: $R_f=84$, $R_g=95$
 GAI: $GAI_BB_8=94.9$, $GAI_BB_15=102.9$, $GAI_EES=73.3$
 R1 =85 R2 =92 R3 =95 R4 =83 R5 =84 R6 =88 R7 =87 R8 =69
 R9 =24 R10=79 R11=82 R12=60 R13=87 R14=97 R15=80
 Color Quality Scale: $Q_a=83.8$, $Q_f=83.8$, $Q_p=84.1$, $Q_g=93.9$
 Q1 =84 Q2 =98 Q3 =79 Q4 =75 Q5 =80 Q6 =83 Q7 =87 Q8 =89
 Q9 =98 Q10=90 Q11=86 Q12=86 Q13=86 Q14=77 Q15=80



Photometric Parameters

Luminous Flux: 686.92 lm Efficiency: 125.12 lm/W Radiant Power: 2.102 W
 Total mains efficacy: 136.26 lm/W Energy Efficiency Class: D (EU 2019/2015)
 Pupil Flux: 1032.37 Plm Pupil Lumens Per Watt: 188.05 Plm/W Pupil Factor (Kp): 1.503
 Circopic Flux: 2106.13 lm

Electric Parameters

Voltage: 230.00V Current: 0.0240A Power: 5.49W
 Power Factor: 0.7690 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: 45869 (2859) CCD Integration Time: 501.65 ms

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

Test Device: Lisun LMS-9000B
 Test Time: 2021-08-26 09:41:28
 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	0.0123	525	0.5685	8.3505	670	0.2829	4.1551
385	0.0017	0.0256	530	0.5852	8.5951	675	0.2503	3.6763
390	0.0018	0.0258	535	0.6014	8.8333	680	0.2118	3.1117
395	0.0001	0.0021	540	0.6165	9.0552	685	0.1806	2.6526
400	0.0018	0.0261	545	0.6305	9.2610	690	0.1483	2.1783
405	0.0003	0.0042	550	0.6449	9.4723	695	0.1275	1.8728
410	0.0014	0.0210	555	0.6632	9.7408	700	0.1032	1.5162
415	0.0033	0.0488	560	0.6816	10.0118	705	0.0898	1.3194
420	0.0096	0.1408	565	0.7028	10.3235	710	0.0733	1.0761
425	0.0223	0.3281	570	0.7237	10.6305	715	0.0610	0.8954
430	0.0579	0.8500	575	0.7472	10.9753	720	0.0445	0.6541
435	0.1198	1.7592	580	0.7659	11.2496	725	0.0383	0.5633
440	0.2269	3.3326	585	0.7837	11.5109	730	0.0319	0.4692
445	0.4310	6.3305	590	0.7961	11.6936	735	0.0176	0.2583
450	0.7846	11.5250	595	0.8052	11.8270	740	0.0189	0.2774
455	1.0000	14.6883	600	0.8064	11.8444	745	0.0150	0.2196
460	0.8039	11.8073	605	0.8035	11.8026	750	0.0374	0.5487
465	0.5601	8.2271	610	0.7927	11.6441	755	0.0111	0.1627
470	0.4373	6.4232	615	0.7703	11.3148	760	0.0043	0.0636
475	0.3262	4.7916	620	0.7426	10.9078	765	0.0044	0.0647
480	0.2475	3.6347	625	0.7064	10.3763	770	0.0024	0.0358
485	0.2262	3.3225	630	0.6651	9.7698	775	0.0071	0.1049
490	0.2394	3.5169	635	0.6178	9.0738	780	0.0051	0.0749
495	0.2728	4.0071	640	0.5675	8.3352	785	0.0069	0.1012
500	0.3290	4.8325	645	0.5192	7.6258	790	0.0021	0.0311
505	0.3926	5.7663	650	0.4671	6.8608	795	0.0018	0.0266
510	0.4513	6.6290	655	0.4175	6.1324	800	0.0126	0.1854
515	0.4995	7.3372	660	0.3698	5.4319			
520	0.5363	7.8769	665	0.3247	4.7696			

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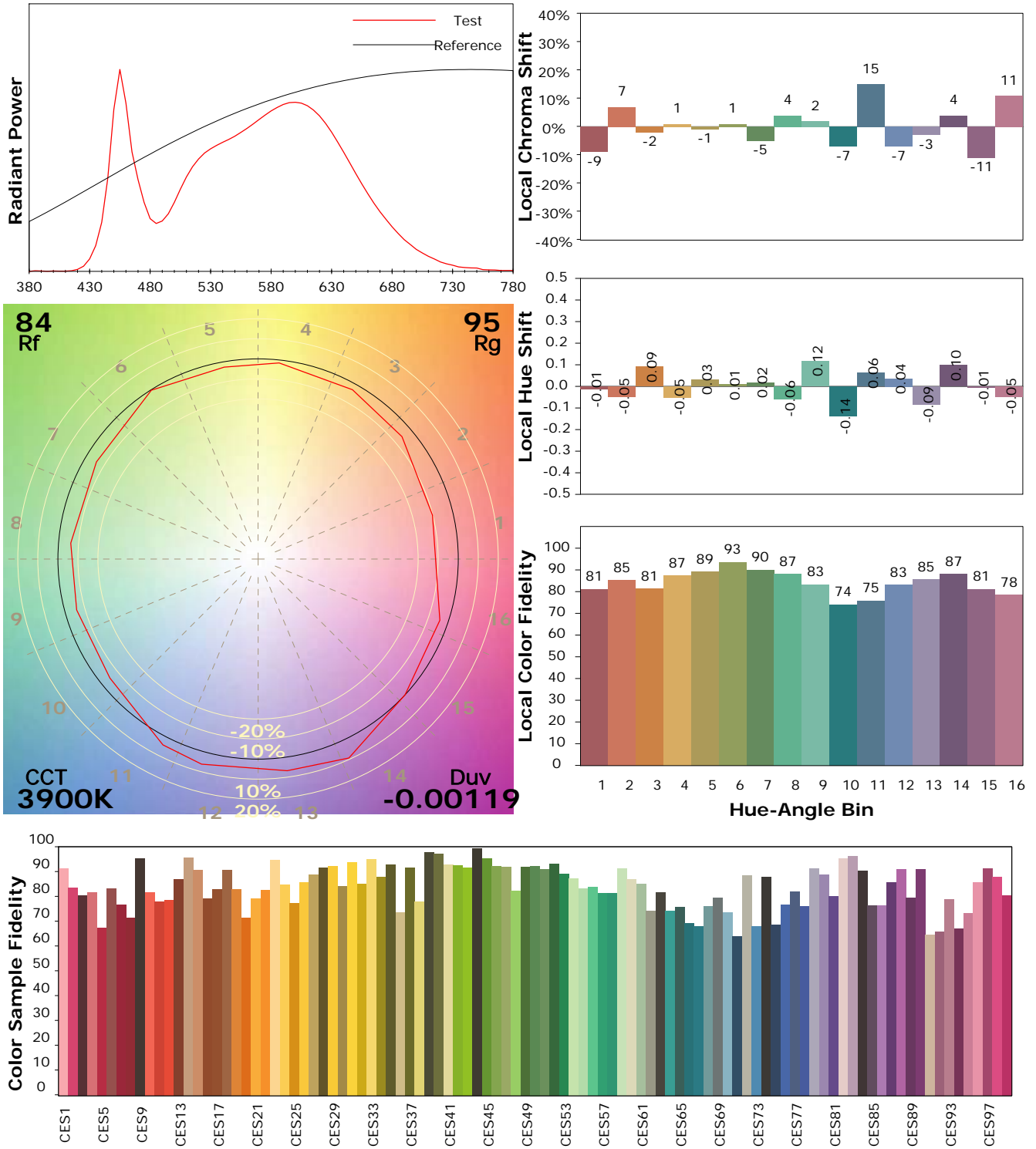
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I ES TM-30-18 Color Rendition Report

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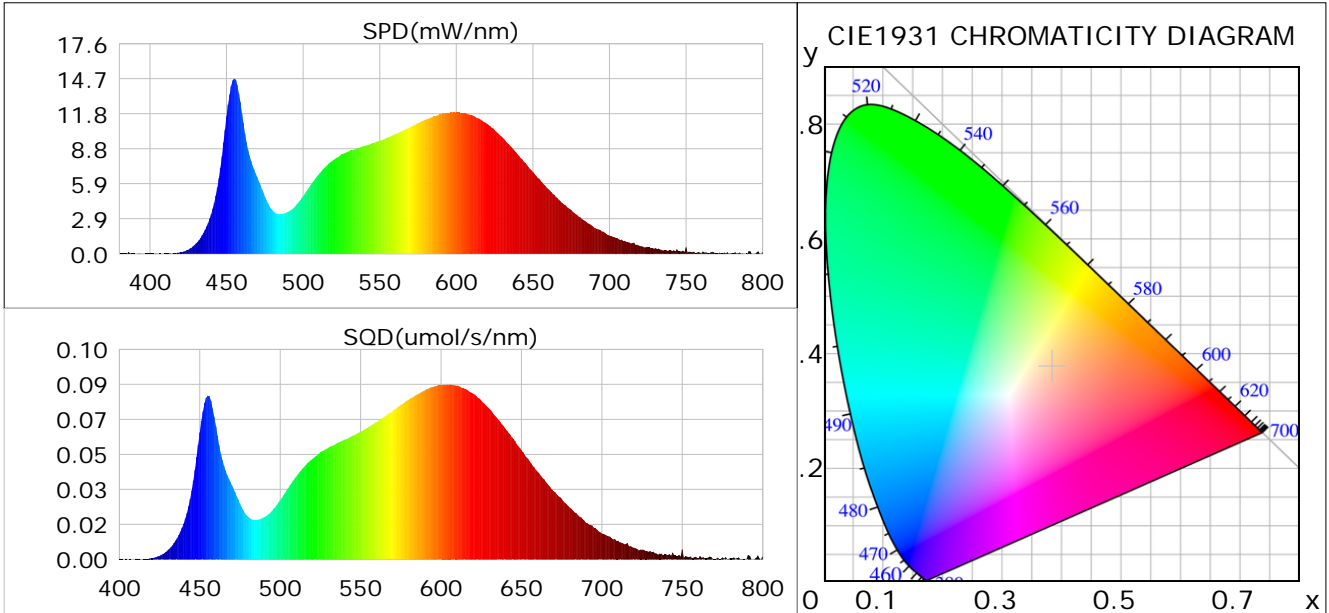
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Plant optical param data

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 Dominant Wavelength: 580.1nm Color Purity: 0.282
 CRI: $R_a=85.4$



Plant Optical Param

$ \mu_v(lm): 686.92$	$Q_v(lm.s): 686.92$
$ \mu_e, \dot{E}(W/nm): 2.10$	$Q_e(J): 2.10$
$ \mu_e(W): 2.07$	$ \mu_{fr}(W): 0.04$
$ \zeta_e: 0.38$	$ \zeta_{fr}: 0.01$
$PPE(umol/s/w): 1.77$	$K_{fr}: 0.04$
$Erb_Ratio: 1.57$	$PPF(umol/s): 9.72$
$PF_{uv}(360-400)(umol/s): 0.00$	$PPF(400-500)(umol/s): 1.69$
$PPF(500-600)(umol/s): 4.37$	$PPF(600-700)(umol/s): 3.65$
$PPF_{fr}(700-800)(umol/s): 0.22$	$PPF.t(umol): 9.72$
$ \mu_{ch-A.t}(J): 0.16$	$ \mu_{ch-A}(W): 0.16$
$ \mu_{ch-B.t}(J): 0.10$	$ \mu_{ch-B}(W): 0.10$
$ \mu_b.t(J): 0.44$	$ \mu_b(W): 0.44$
$ \mu_y.t(J): 0.95$	$ \mu_y(W): 0.95$
$ \mu_r.t(J): 0.70$	$ \mu_r(W): 0.70$

Electric Parameters

Voltage: 230.00V	Current: 0.0240A	Power: 5.49W
Power Factor: 0.7690	Frequency: 49.99Hz	

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