

## Lightsource Test Report

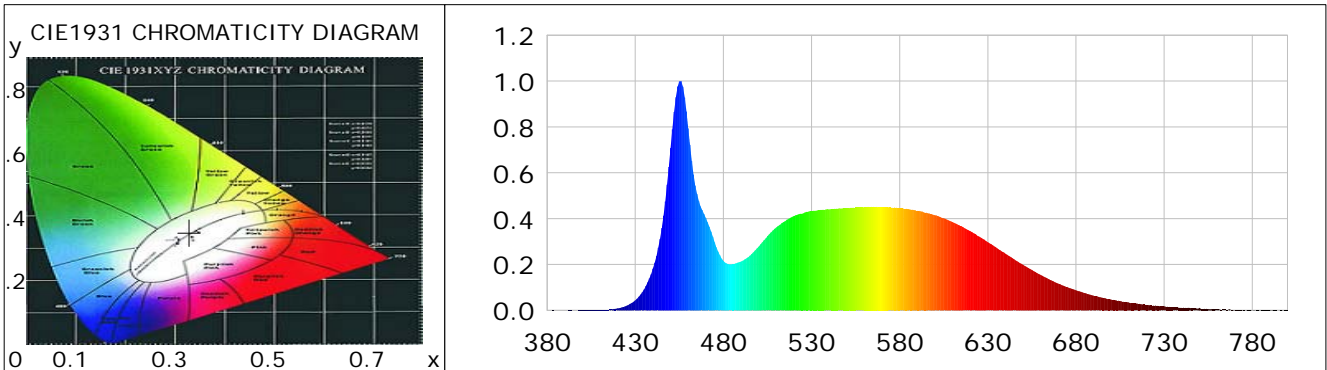
### Product Information

Product Category: LED-Röhre  
 Product Spec: LEDtube-150-8CWM-24W-TRF-RM  
 Manufacturer: METOLIGHT  
 Buyer: 6961

Product Type: LED-Röhre-TRF  
 Product Number: 1  
 Submitted Unit: 102346

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.3285$   $y=0.3497$   $u(u')=0.2009$   $v=0.3209$   $v'=0.4813$   
 CCT:  $T_c=5668K$  ( $duv=0.00613$ ) Color Ratio:  $R=0.144$   $G=0.804$   $B=0.052$   
 Peak Wavelength: 455.6nm Half Bandwidth: 17.9nm  
 Dominant Wavelength: 536.7nm Color Purity: 0.037  
 CRI:  $R_a=83.2$ ,  $avgR(1\sim14)=75.9$ ,  $avgR(1\sim15)=75.9$  TM30:  $R_f=82$ ,  $R_g=92$   
 GAI:  $GAI\_BB\_8=87.9$ ,  $GAI\_BB\_15=94.9$ ,  $GAI\_EES=81.8$   
 R1 =81 R2 =90 R3 =94 R4 =80 R5 =81 R6 =84 R7 =87 R8 =68  
 R9 =9 R10=74 R11=79 R12=53 R13=84 R14=97 R15=76  
 Color Quality Scale:  $Q_a=81.5$ ,  $Q_f=81.8$ ,  $Q_p=80.5$ ,  $Q_g=90.3$   
 Q1 =81 Q2 =98 Q3 =79 Q4 =72 Q5 =76 Q6 =79 Q7 =84 Q8 =89  
 Q9 =97 Q10=89 Q11=85 Q12=84 Q13=84 Q14=72 Q15=76



### Photometric Parameters

Luminous Flux: 3341.2 lm Efficiency: 144.52 lm/W Radiant Power: 10.388 W  
 Total mains efficacy: 169.95 lm/W Energy Efficiency Class: C (EU 2019/2015)  
 Pupil Flux: 6020.48 Plm Pupil Lumens Per Watt: 260.40 Plm/W Pupil Factor (Kp): 1.802  
 Circopic Flux: 13535.72 lm

### Electric Parameters

Voltage: 230.00V Current: 0.1000A Power: 23.12W  
 Power Factor: 0.9560 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: 45305 (2401) CCD Integration Time: 62.79 ms

Condition:  $T_x=20.6^{\circ}C$ ,  $T_i=0.0^{\circ}C$ , R.H.: 60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2020-11-16 13:23:11  
 Inspector:

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WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0000	0.0026	525	0.4227	47.7315	670	0.1166	13.1705
385	0.0005	0.0549	530	0.4329	48.8902	675	0.1020	11.5175
390	0.0006	0.0649	535	0.4379	49.4452	680	0.0879	9.9260
395	0.0003	0.0364	540	0.4402	49.7099	685	0.0758	8.5646
400	0.0010	0.1142	545	0.4436	50.0885	690	0.0637	7.1886
405	0.0010	0.1097	550	0.4455	50.3135	695	0.0549	6.2041
410	0.0019	0.2179	555	0.4484	50.6331	700	0.0472	5.3319
415	0.0040	0.4560	560	0.4503	50.8471	705	0.0406	4.5896
420	0.0088	0.9976	565	0.4512	50.9538	710	0.0342	3.8669
425	0.0201	2.2743	570	0.4497	50.7835	715	0.0289	3.2689
430	0.0438	4.9486	575	0.4488	50.6819	720	0.0235	2.6580
435	0.0912	10.3016	580	0.4460	50.3701	725	0.0212	2.3910
440	0.1820	20.5524	585	0.4418	49.8915	730	0.0180	2.0295
445	0.3594	40.5895	590	0.4342	49.0328	735	0.0137	1.5512
450	0.7081	79.9575	595	0.4262	48.1269	740	0.0109	1.2287
455	0.9985	112.7591	600	0.4150	46.8624	745	0.0099	1.1150
460	0.7940	89.6635	605	0.4018	45.3707	750	0.0110	1.2413
465	0.5078	57.3395	610	0.3850	43.4712	755	0.0061	0.6842
470	0.4033	45.5427	615	0.3674	41.4848	760	0.0044	0.4914
475	0.2971	33.5455	620	0.3460	39.0678	765	0.0037	0.4127
480	0.2164	24.4354	625	0.3223	36.4015	770	0.0021	0.2334
485	0.2015	22.7543	630	0.2971	33.5534	775	0.0011	0.1271
490	0.2133	24.0864	635	0.2724	30.7646	780	0.0013	0.1469
495	0.2381	26.8900	640	0.2468	27.8726	785	0.0009	0.1003
500	0.2784	31.4343	645	0.2225	25.1234	790	0.0015	0.1665
505	0.3243	36.6259	650	0.1985	22.4135	795	0.0002	0.0227
510	0.3621	40.8854	655	0.1766	19.9412	800	0.0019	0.2123
515	0.3891	43.9448	660	0.1548	17.4811			
520	0.4114	46.4626	665	0.1342	15.1597			

Condition: Tx:20.6'C, Ti:0.0'C, R.H.:60%  
 Test Lab:  
 Operator: CRE

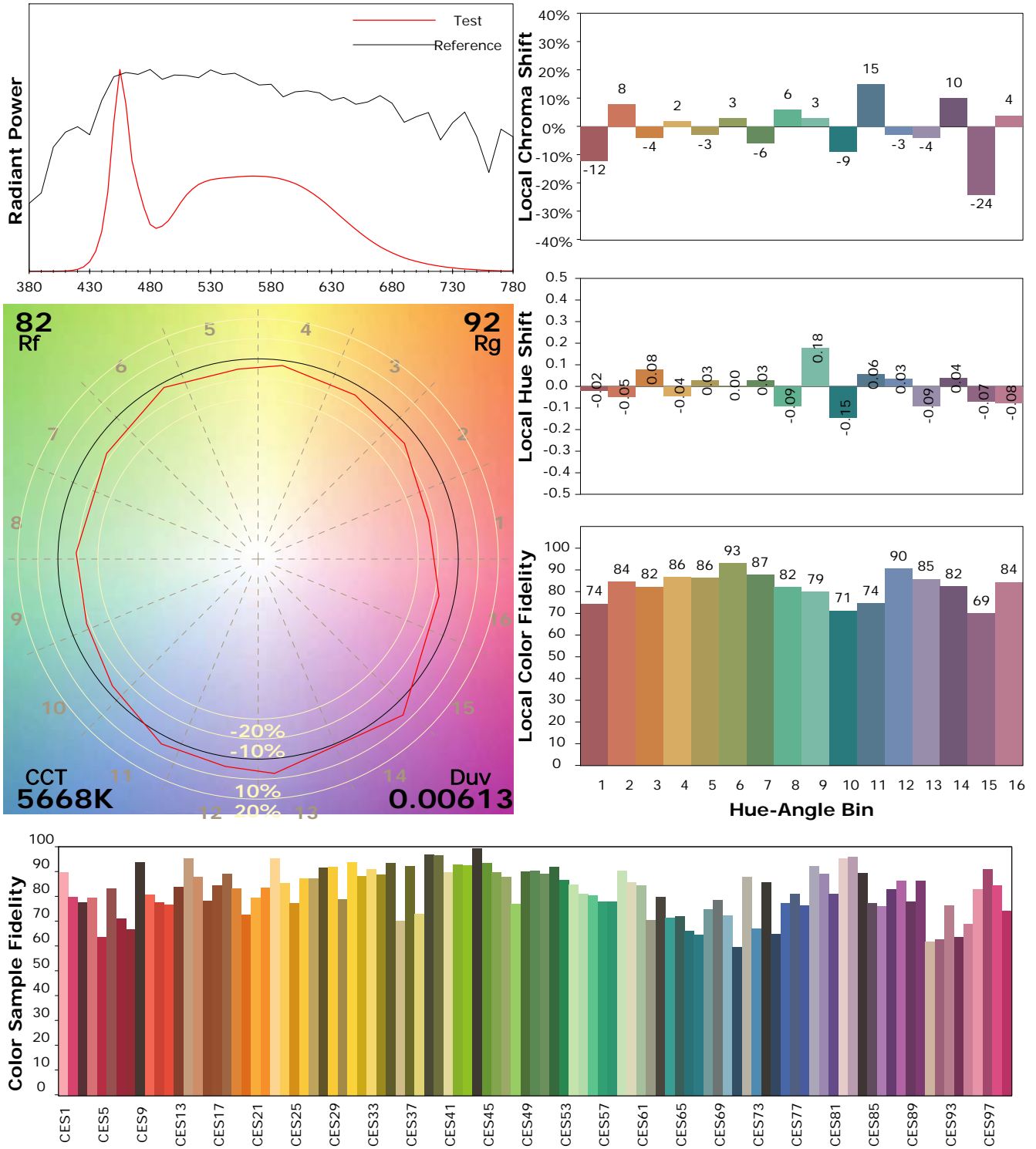
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## IES TM-30-18 Color Rendition Report

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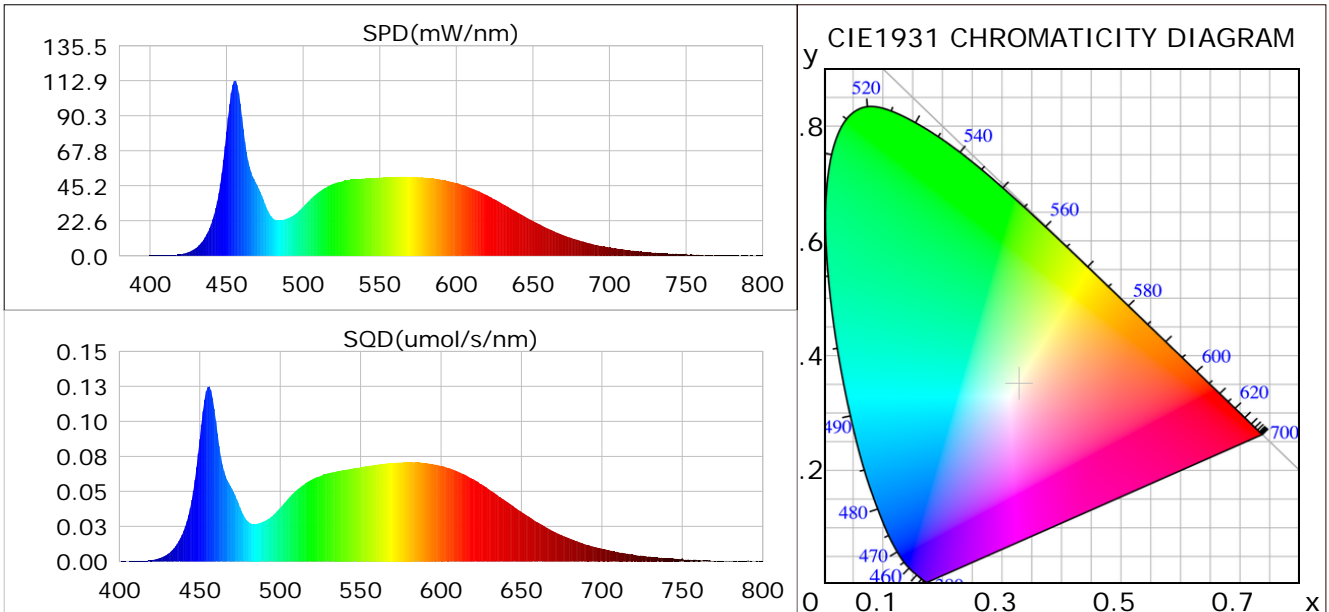
Condition: Tx:20.6°C, Ti:0.0°C, R.H.:60%  
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## Plant optical param data

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 Dominant Wavelength: 536.7nm Color Purity: 0.037  
 CRI:  $R_a=83.2$



### Plant Optical Param

$ \mu_v(lm)$ : 3341.20	$Q_v(lm.s)$ : 3341.20
$ \mu_e, \dot{E}(W/nm)$ : 10.39	$Q_e(J)$ : 10.39
$ \mu_e(W)$ : 10.25	$ \mu_{fr}(W)$ : 0.15
$ \zeta_e$ : 0.44	$ \zeta_{fr}$ : 0.01
PPE(umol/s/w): 2.02	Kfr: 0.04
Erb_Ratio: 0.77	PPF(umol/s): 46.64
PFuv(360-400)(umol/s): 0.01	PPF(400-500)(umol/s): 11.92
PPF(500-600)(umol/s): 22.09	PPF(600-700)(umol/s): 12.63
PPfr(700-800)(umol/s): 0.86	PPF.t(umol): 46.64
$ \mu_{ch-A.t}(J)$ : 0.77	$ \mu_{ch-A}(W)$ : 0.77
$ \mu_{ch-B.t}(J)$ : 0.58	$ \mu_{ch-B}(W)$ : 0.58
$ \mu_b.t(J)$ : 3.08	$ \mu_b(W)$ : 3.08
$ \mu_y.t(J)$ : 4.82	$ \mu_y(W)$ : 4.82
$ \mu_r.t(J)$ : 2.43	$ \mu_r(W)$ : 2.43

### Electric Parameters

Voltage: 230.00V	Current: 0.1000A	Power: 23.12W
Power Factor: 0.9560	Frequency: 49.99Hz	

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