

## Lightsource Test Report

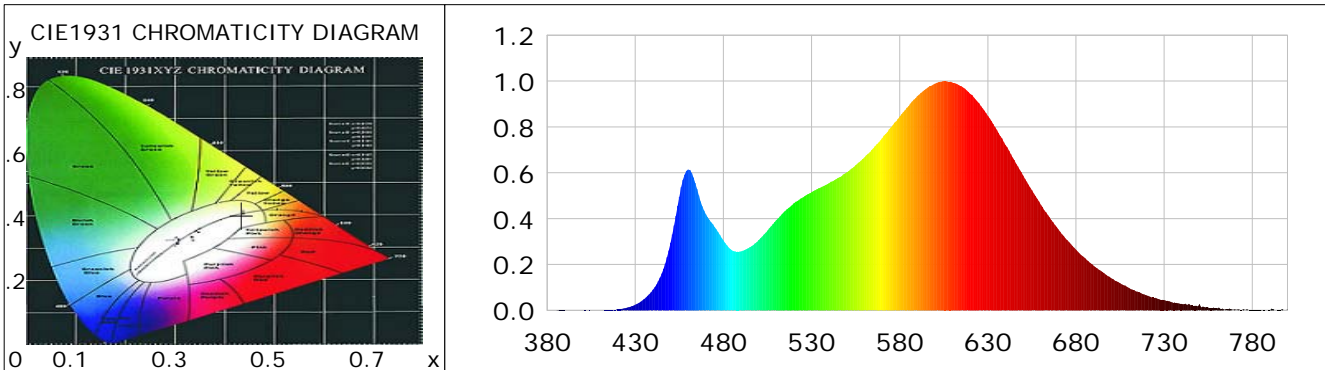
### Product Information

Product Category: LED-Technik  
 Product Spec: LED-MODUL-180-20-WW  
 Manufacturer: METOLIGHT  
 Buyer: 5318

Product Type: LED-Technik-Module  
 Product Number: 1  
 Submitted Unit: 103236

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.4343$   $y=0.4035$   $u(u')=0.2491$   $v=0.3472$   $v'=0.5207$   
 CCT:  $T_c=3041K$  ( $duv=0.00013$ ) Color Ratio:  $R=0.231$   $G=0.737$   $B=0.031$   
 Peak Wavelength: 605.5nm Half Bandwidth: 130.4nm  
 Dominant Wavelength: 582.6nm Color Purity: 0.515  
 CRI:  $R_a = 84.5$ ,  $avgR(1\sim14) = 79.8$ ,  $avgR(1\sim15) = 79.6$  TM30:  $R_f = 83$ ,  $R_g = 92$   
 GAI:  $GAI\_BB\_8=90.4$ ,  $GAI\_BB\_15=100.1$ ,  $GAI\_EES=52.9$   
 R1 =85 R2 =95 R3 =94 R4 =81 R5 =85 R6 =94 R7 =81 R8 =61  
 R9 =16 R10=87 R11=81 R12=72 R13=88 R14=98 R15=77  
 Color Quality Scale:  $Q_a = 83.8$ ,  $Q_f = 85.6$ ,  $Q_p = 83.6$ ,  $Q_g = 89.3$   
 Q1 =79 Q2 =93 Q3 =87 Q4 =80 Q5 =80 Q6 =82 Q7 =85 Q8 =89  
 Q9 =95 Q10=94 Q11=90 Q12=87 Q13=85 Q14=75 Q15=77



### Photometric Parameters

Luminous Flux: 1914.3 lm Efficiency: 104.26 lm/W Radiant Power: 5.807 W  
 Total mains efficacy: 122.62 lm/W Energy Efficiency Class: E (EU 2019/2015)  
 Pupil Flux: 2511.72 Plm Pupil Lumens Per Watt: 136.80 Plm/W Pupil Factor (Kp): 1.312  
 Circopic Flux: 4784.48 lm

### Electric Parameters

Voltage: 231.30V Current: 0.1540A Power: 18.36W  
 Power Factor: 0.5130 Frequency: 50.00Hz

### 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: 43315 (2817) CCD Integration Time: 180.48 ms

## Lightsource Test Report

### Product Information

Product Category: LED-Technik  
 Product Spec: LED-MODUL-180-20-WW  
 Manufacturer: METOLIGHT  
 Buyer: 5318

Product Type: LED-Technik-Module  
 Product Number: 1  
 Submitted Unit: 103236

WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0007	0.0276	525	0.4927	19.3073	670	0.3539	13.8681
385	0.0006	0.0223	530	0.5149	20.1780	675	0.3065	12.0124
390	0.0008	0.0309	535	0.5352	20.9722	680	0.2648	10.3767
395	0.0002	0.0093	540	0.5550	21.7495	685	0.2283	8.9481
400	0.0004	0.0152	545	0.5780	22.6478	690	0.1946	7.6250
405	0.0001	0.0051	550	0.6021	23.5945	695	0.1675	6.5620
410	0.0005	0.0200	555	0.6327	24.7943	700	0.1402	5.4945
415	0.0018	0.0686	560	0.6668	26.1285	705	0.1185	4.6432
420	0.0050	0.1942	565	0.7067	27.6943	710	0.0982	3.8461
425	0.0110	0.4316	570	0.7508	29.4220	715	0.0813	3.1869
430	0.0245	0.9582	575	0.7980	31.2687	720	0.0653	2.5585
435	0.0490	1.9182	580	0.8457	33.1394	725	0.0549	2.1505
440	0.0897	3.5156	585	0.8901	34.8813	730	0.0448	1.7537
445	0.1607	6.2972	590	0.9354	36.6550	735	0.0342	1.3389
450	0.2948	11.5511	595	0.9664	37.8708	740	0.0283	1.1081
455	0.4956	19.4190	600	0.9887	38.7423	745	0.0223	0.8723
460	0.6148	24.0918	605	1.0000	39.1860	750	0.0267	1.0463
465	0.5298	20.7600	610	0.9929	38.9071	755	0.0123	0.4821
470	0.4190	16.4203	615	0.9778	38.3162	760	0.0088	0.3464
475	0.3634	14.2405	620	0.9441	36.9944	765	0.0053	0.2061
480	0.3056	11.9762	625	0.9029	35.3814	770	0.0042	0.1659
485	0.2617	10.2557	630	0.8476	33.2158	775	0.0046	0.1808
490	0.2571	10.0745	635	0.7881	30.8814	780	0.0022	0.0875
495	0.2756	10.7999	640	0.7205	28.2346	785	0.0024	0.0959
500	0.3067	12.0168	645	0.6561	25.7086	790	0.0014	0.0537
505	0.3481	13.6398	650	0.5883	23.0545	795	0.0007	0.0283
510	0.3940	15.4394	655	0.5241	20.5381	800	0.0053	0.2077
515	0.4335	16.9885	660	0.4612	18.0741			
520	0.4676	18.3234	665	0.4057	15.8994			

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

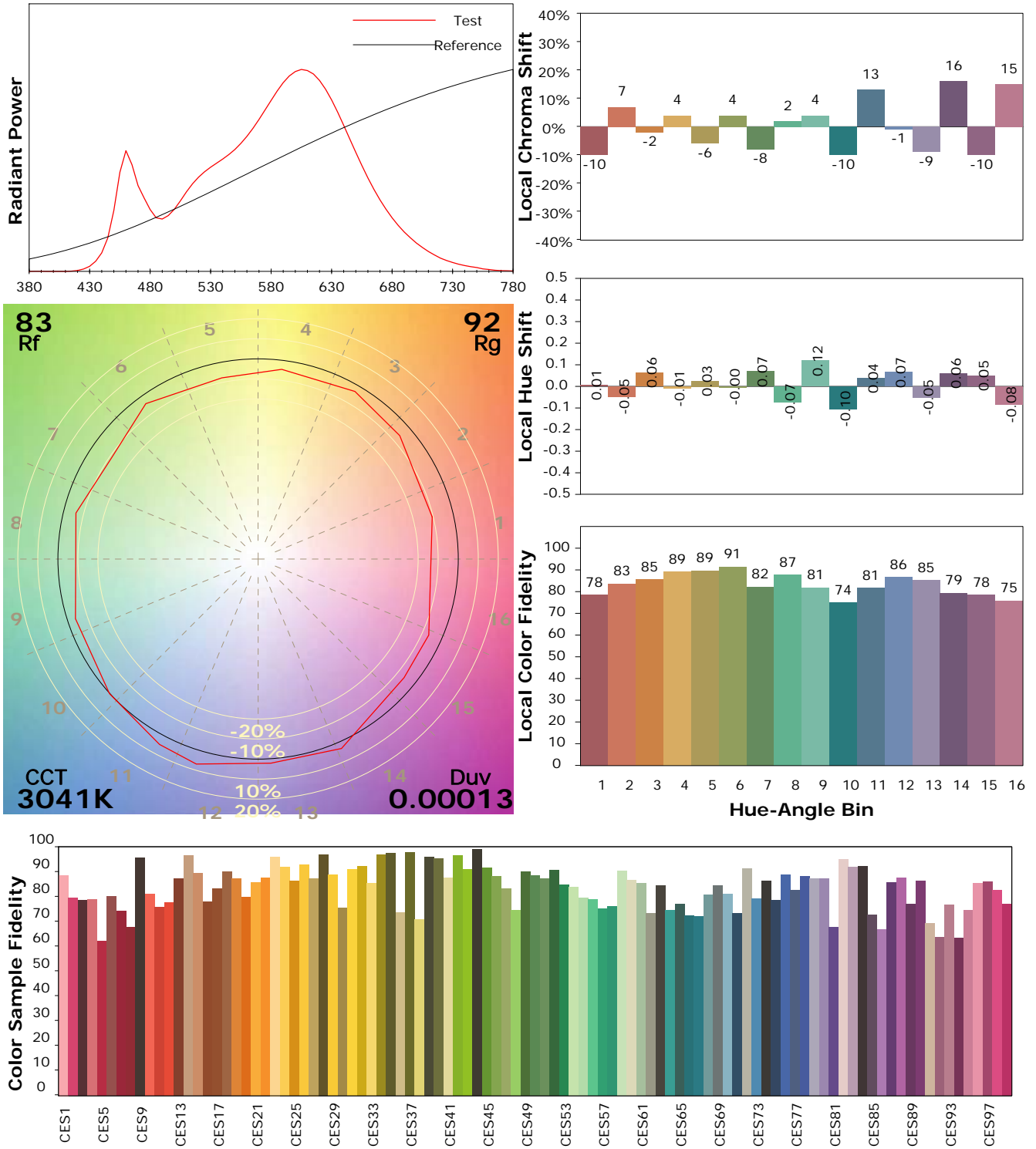
Test Device: Lisun LMS-9000B  
 Test Time: 2021-08-16 13:05:57  
 Inspector:

## IES TM-30-18 Color Rendition Report

### Product Information

Product Category: LED-Technik  
 Product Spec: LED-MODUL-180-20-WW  
 Manufacturer: METOLIGHT  
 Buyer: 5318

Product Type: LED-Technik-Module  
 Product Number: 1  
 Submitted Unit: 103236



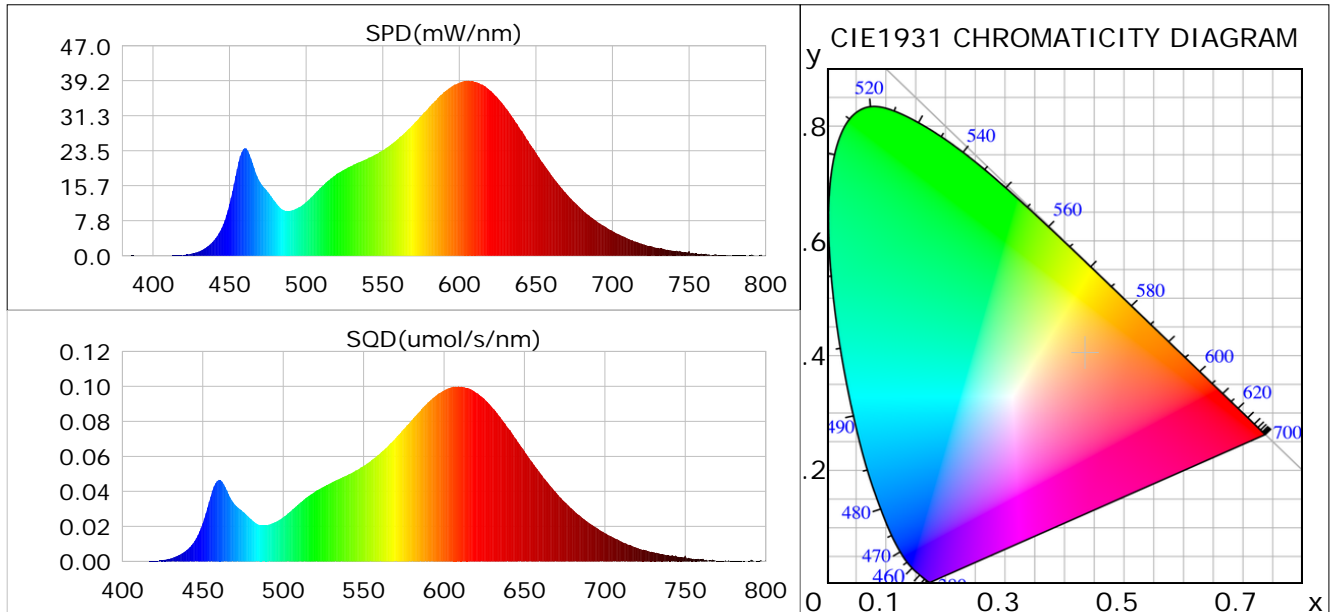
Condition: Tx:0.0°C, Ti:0.0°C, R.H.: 60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-08-16 13:05:57  
 Inspector:

## Plant optical param data

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.4343$   $y=0.4035$   $u(u')=0.2491$   $v=0.3472$   $v'=0.5207$   
 CCT:  $T_c=3041K$  ( $duv=0.00013$ ) Color Ratio:  $R=0.231$   $G=0.737$   $B=0.031$   
 Peak Wavelength: 605.5nm Half Bandwidth: 130.4nm  
 Dominant Wavelength: 582.6nm Color Purity: 0.515  
 CRI:  $R_a=84.5$



### Plant Optical Param

$ \mu_v(lm)$ : 1914.30	$Q_v(lm.s)$ : 1914.30
$ \mu_e, \dot{E}(W/nm)$ : 5.81	$Q_e(J)$ : 5.81
$ \mu_e(W)$ : 5.68	$ \mu_{fr}(W)$ : 0.14
$ \zeta_e$ : 0.31	$ \zeta_{fr}$ : 0.01
PPE(umol/s/w): 1.49	Kfr: 0.04
Erb_Ratio: 2.72	PPF(umol/s): 27.38
PFuv(360-400)(umol/s): 0.00	PPF(400-500)(umol/s): 3.33
PPF(500-600)(umol/s): 11.75	PPF(600-700)(umol/s): 12.30
PPfr(700-800)(umol/s): 0.79	PPF.t(umol): 27.38
$ \mu_{ch-A.t}(J)$ : 0.43	$ \mu_{ch-A}(W)$ : 0.43
$ \mu_{ch-B.t}(J)$ : 0.24	$ \mu_{ch-B}(W)$ : 0.24
$ \mu_b.t(J)$ : 0.85	$ \mu_b(W)$ : 0.85
$ \mu_y.t(J)$ : 2.53	$ \mu_y(W)$ : 2.53
$ \mu_r.t(J)$ : 2.35	$ \mu_r(W)$ : 2.35

### Electric Parameters

Voltage: 231.30V	Current: 0.1540A	Power: 18.36W
Power Factor: 0.5130	Frequency: 50.00Hz	

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

Test Device: Lisun LMS-9000B  
 Test Time: 2021-08-16 13:05:57  
 Inspector: