

Lightsource Test Report

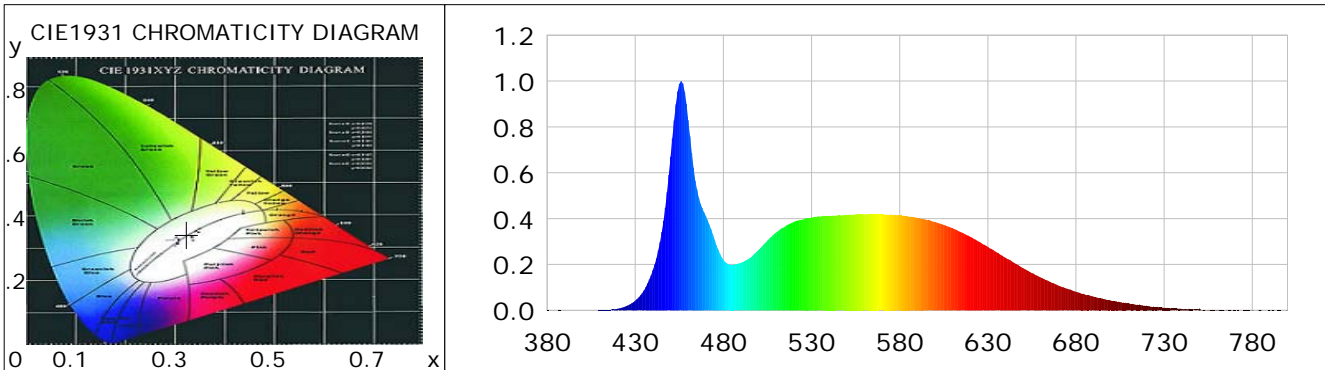
Product Information

Product Category: LED-Röhre
 Product Spec: LED-PL-2G11-09W-CWM-TRF
 Manufacturer: METOLIGHT
 Buyer: 7709

Product Type: LED-PL-Röhre-2G11
 Product Number: 1
 Submitted Unit: 105009

CIE Colorimetric Parameters

Chromaticity coordinates: $x=0.3233$ $y=0.3425$ $u(u')=0.2001$ $v=0.3179$ $v'=0.4769$
 CCT: $T_c=5914K$ ($duv=0.00491$) Color Ratio: $R=0.143$ $G=0.802$ $B=0.055$
 Peak Wavelength: 456.0nm Half Bandwidth: 18.0nm
 Dominant Wavelength: 504.1nm Color Purity: 0.030
 CRI: $R_a=84.1$, $avgR(1\sim14)=77.2$, $avgR(1\sim15)=77.3$ TM30: $R_f=82$, $R_g=93$
 GAI: $GAI_BB_8=88.9$, $GAI_BB_15=95.6$, $GAI_EES=84.1$
 R1 =83 R2 =91 R3 =94 R4 =81 R5 =82 R6 =86 R7 =87 R8 =70
 R9 =15 R10=77 R11=80 R12=54 R13=86 R14=97 R15=78
 Color Quality Scale: $Q_a=81.8$, $Q_f=81.9$, $Q_p=81.0$, $Q_g=90.6$
 Q1 =81 Q2 =97 Q3 =79 Q4 =71 Q5 =76 Q6 =79 Q7 =85 Q8 =89
 Q9 =97 Q10=90 Q11=86 Q12=85 Q13=84 Q14=74 Q15=77



Photometric Parameters

Luminous Flux: 1032.4 lm Efficiency: 116.39 lm/W Radiant Power: 3.252 W
 Total mains efficacy: 136.88 lm/W Energy Efficiency Class: D (EU 2019/2015)
 Pupil Flux: 1902.05 Plm Pupil Lumens Per Watt: 214.44 Plm/W Pupil Factor (Kp): 1.842
 Circopic Flux: 4346.47 lm

Electric Parameters

Voltage: 230.90V Current: 0.0400A Power: 8.87W
 Power Factor: 0.9380 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: 46848 (2287) CCD Integration Time: 130.22 ms

Condition: Tx: 18.6°C, Ti: 0.0°C, R.H.: 60%
 Test Lab:
 Operator: CRE

Test Device: Lisun LMS-9000B
 Test Time: 2021-01-06 15:00:34
 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 | 0.0014 | 0.0510 | 525 | 0.3961 | 14.7738 | 670 | 0.1086 | 4.0501 |
| 385 | 0.0005 | 0.0182 | 530 | 0.4044 | 15.0842 | 675 | 0.0949 | 3.5382 |
| 390 | 0.0004 | 0.0143 | 535 | 0.4084 | 15.2345 | 680 | 0.0816 | 3.0442 |
| 395 | 0.0007 | 0.0261 | 540 | 0.4120 | 15.3667 | 685 | 0.0698 | 2.6030 |
| 400 | 0.0003 | 0.0128 | 545 | 0.4142 | 15.4508 | 690 | 0.0594 | 2.2152 |
| 405 | 0.0003 | 0.0107 | 550 | 0.4160 | 15.5155 | 695 | 0.0512 | 1.9114 |
| 410 | 0.0007 | 0.0263 | 555 | 0.4184 | 15.6078 | 700 | 0.0421 | 1.5717 |
| 415 | 0.0026 | 0.0958 | 560 | 0.4181 | 15.5958 | 705 | 0.0361 | 1.3462 |
| 420 | 0.0071 | 0.2647 | 565 | 0.4202 | 15.6733 | 710 | 0.0302 | 1.1258 |
| 425 | 0.0191 | 0.7121 | 570 | 0.4187 | 15.6169 | 715 | 0.0249 | 0.9282 |
| 430 | 0.0421 | 1.5720 | 575 | 0.4182 | 15.5986 | 720 | 0.0206 | 0.7692 |
| 435 | 0.0879 | 3.2797 | 580 | 0.4146 | 15.4666 | 725 | 0.0151 | 0.5641 |
| 440 | 0.1754 | 6.5423 | 585 | 0.4088 | 15.2478 | 730 | 0.0114 | 0.4257 |
| 445 | 0.3427 | 12.7814 | 590 | 0.4047 | 15.0938 | 735 | 0.0086 | 0.3202 |
| 450 | 0.6695 | 24.9737 | 595 | 0.3956 | 14.7572 | 740 | 0.0067 | 0.2516 |
| 455 | 0.9882 | 36.8600 | 600 | 0.3859 | 14.3943 | 745 | 0.0058 | 0.2158 |
| 460 | 0.8298 | 30.9539 | 605 | 0.3727 | 13.9015 | 750 | 0.0083 | 0.3112 |
| 465 | 0.5266 | 19.6438 | 610 | 0.3584 | 13.3697 | 755 | 0.0035 | 0.1287 |
| 470 | 0.4118 | 15.3605 | 615 | 0.3404 | 12.6964 | 760 | 0.0028 | 0.1061 |
| 475 | 0.3080 | 11.4877 | 620 | 0.3209 | 11.9681 | 765 | 0.0012 | 0.0441 |
| 480 | 0.2200 | 8.2045 | 625 | 0.2993 | 11.1628 | 770 | 0.0019 | 0.0716 |
| 485 | 0.1984 | 7.4002 | 630 | 0.2768 | 10.3249 | 775 | 0.0009 | 0.0322 |
| 490 | 0.2074 | 7.7363 | 635 | 0.2533 | 9.4494 | 780 | 0.0022 | 0.0805 |
| 495 | 0.2282 | 8.5107 | 640 | 0.2294 | 8.5565 | 785 | 0.0026 | 0.0954 |
| 500 | 0.2640 | 9.8489 | 645 | 0.2071 | 7.7253 | 790 | 0.0008 | 0.0310 |
| 505 | 0.3050 | 11.3781 | 650 | 0.1840 | 6.8651 | 795 | 0.0019 | 0.0725 |
| 510 | 0.3405 | 12.7026 | 655 | 0.1620 | 6.0418 | 800 | 0.0035 | 0.1297 |
| 515 | 0.3652 | 13.6223 | 660 | 0.1433 | 5.3470 | | | |
| 520 | 0.3860 | 14.3992 | 665 | 0.1253 | 4.6748 | | | |

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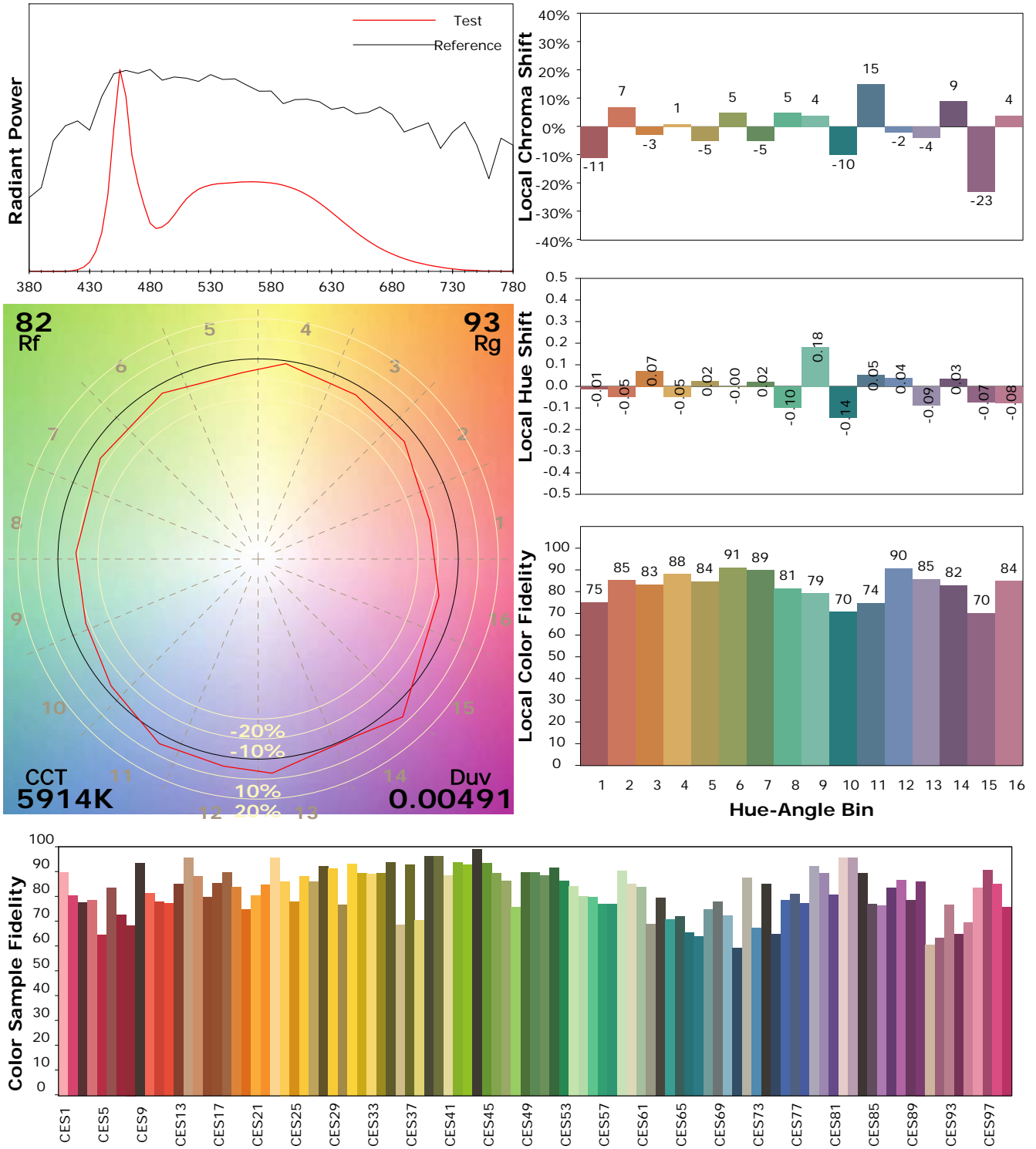
Test Device: Lisun LMS-9000B
 Test Time: 2021-01-06 15:00:34
 Inspector:

IES TM-30-18 Color Rendition Report

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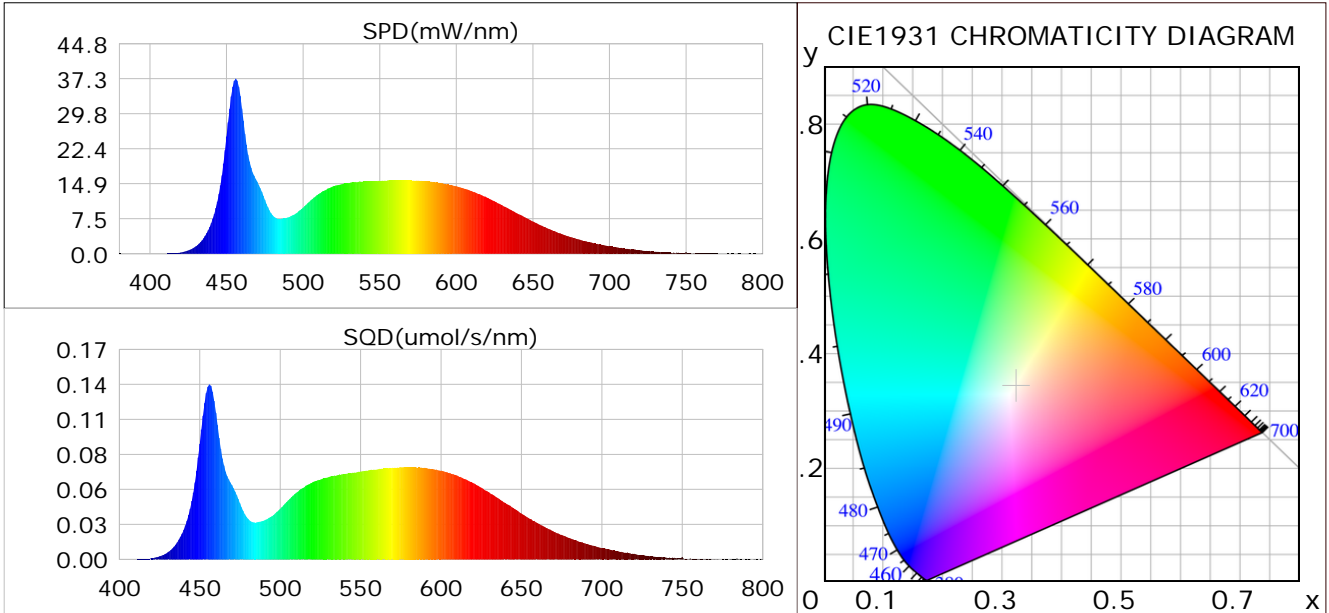
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Plant optical param data

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 CRI: $R_a=84.1$



Plant Optical Param

| | |
|-----------------------------------|------------------------------|
| $ \mu_v(lm): 1032.40$ | $Q_v(lm.s): 1032.40$ |
| $ \mu_e, \dot{E}(W/nm): 3.25$ | $Q_e(J): 3.25$ |
| $ \mu_e(W): 3.22$ | $ \mu_{fr}(W): 0.04$ |
| $ \zeta_e: 0.36$ | $ \zeta_{fr}: 0.00$ |
| $PPE(umol/s/w): 1.65$ | $K_{fr}: 0.02$ |
| $Erb_Ratio: 0.72$ | $PPF(umol/s): 14.59$ |
| $PF_{uv}(360-400)(umol/s): 0.00$ | $PPF(400-500)(umol/s): 3.91$ |
| $PPF(500-600)(umol/s): 6.81$ | $PPF(600-700)(umol/s): 3.87$ |
| $PPF_{fr}(700-800)(umol/s): 0.22$ | $PPF.t(umol): 14.59$ |
| $ \mu_{ch-A.t}(J): 0.24$ | $ \mu_{ch-A}(W): 0.24$ |
| $ \mu_{ch-B.t}(J): 0.19$ | $ \mu_{ch-B}(W): 0.19$ |
| $ \mu_b.t(J): 1.01$ | $ \mu_b(W): 1.01$ |
| $ \mu_y.t(J): 1.49$ | $ \mu_y(W): 1.49$ |
| $ \mu_r.t(J): 0.74$ | $ \mu_r(W): 0.74$ |

Electric Parameters

| | | |
|----------------------|--------------------|--------------|
| Voltage: 230.90V | Current: 0.0400A | Power: 8.87W |
| Power Factor: 0.9380 | Frequency: 49.99Hz | |

Condition: $T_x: 18.6^\circ C$, $T_i: 0.0^\circ C$, R.H.: 60%
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