

Lightsource Test Report

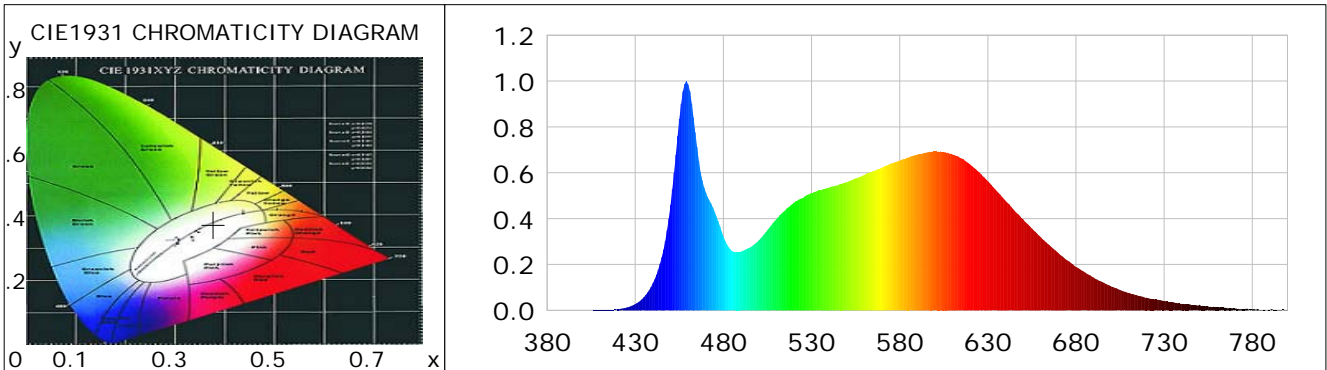
Product Information

Product Category: LED-Röhre
 Product Spec: Ledtube-145-5NWM-HO-28W-TRF
 Manufacturer: METOLIGHT
 Buyer: 7709

Product Type: LED-Röhre-TRF
 Product Number: 1
 Submitted Unit: 104534

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: 3483.0 lm Efficiency: 116.49 lm/W Radiant Power: 10.878 W
 Total mains efficacy: 126.86 lm/W Energy Efficiency Class: E (EU 2019/2015)
 Pupil Flux: 5497.95 Plm Pupil Lumens Per Watt: 183.88 Plm/W Pupil Factor (Kp): 1.579
 Circopic Flux: 11667.06 lm

Electric Parameters

Voltage: 230.00V Current: 0.1300A Power: 29.90W
 Power Factor: 0.9370 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:

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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 | 0.0160 | 525 | 0.4898 | 41.9265 | 670 | 0.2503 | 21.4251 |
| 385 | 0.0006 | 0.0545 | 530 | 0.5112 | 43.7599 | 675 | 0.2185 | 18.7018 |
| 390 | 0.0003 | 0.0218 | 535 | 0.5236 | 44.8147 | 680 | 0.1897 | 16.2402 |
| 395 | 0.0003 | 0.0263 | 540 | 0.5361 | 45.8835 | 685 | 0.1660 | 14.2096 |
| 400 | 0.0006 | 0.0475 | 545 | 0.5458 | 46.7179 | 690 | 0.1426 | 12.2039 |
| 405 | 0.0006 | 0.0494 | 550 | 0.5586 | 47.8115 | 695 | 0.1231 | 10.5337 |
| 410 | 0.0012 | 0.1068 | 555 | 0.5754 | 49.2536 | 700 | 0.1044 | 8.9394 |
| 415 | 0.0025 | 0.2097 | 560 | 0.5908 | 50.5662 | 705 | 0.0888 | 7.6010 |
| 420 | 0.0050 | 0.4292 | 565 | 0.6082 | 52.0632 | 710 | 0.0762 | 6.5217 |
| 425 | 0.0123 | 1.0530 | 570 | 0.6226 | 53.2878 | 715 | 0.0647 | 5.5337 |
| 430 | 0.0273 | 2.3389 | 575 | 0.6407 | 54.8395 | 720 | 0.0552 | 4.7207 |
| 435 | 0.0581 | 4.9723 | 580 | 0.6535 | 55.9380 | 725 | 0.0476 | 4.0726 |
| 440 | 0.1184 | 10.1306 | 585 | 0.6666 | 57.0541 | 730 | 0.0413 | 3.5329 |
| 445 | 0.2318 | 19.8434 | 590 | 0.6793 | 58.1439 | 735 | 0.0350 | 2.9942 |
| 450 | 0.4606 | 39.4283 | 595 | 0.6881 | 58.9010 | 740 | 0.0286 | 2.4490 |
| 455 | 0.8350 | 71.4737 | 600 | 0.6932 | 59.3330 | 745 | 0.0248 | 2.1230 |
| 460 | 0.9850 | 84.3127 | 605 | 0.6907 | 59.1224 | 750 | 0.0239 | 2.0488 |
| 465 | 0.7134 | 61.0612 | 610 | 0.6794 | 58.1515 | 755 | 0.0173 | 1.4819 |
| 470 | 0.5141 | 44.0063 | 615 | 0.6630 | 56.7457 | 760 | 0.0146 | 1.2455 |
| 475 | 0.4301 | 36.8147 | 620 | 0.6362 | 54.4544 | 765 | 0.0113 | 0.9667 |
| 480 | 0.3224 | 27.5943 | 625 | 0.6022 | 51.5493 | 770 | 0.0085 | 0.7316 |
| 485 | 0.2581 | 22.0900 | 630 | 0.5632 | 48.2029 | 775 | 0.0063 | 0.5415 |
| 490 | 0.2568 | 21.9794 | 635 | 0.5204 | 44.5405 | 780 | 0.0046 | 0.3966 |
| 495 | 0.2740 | 23.4559 | 640 | 0.4780 | 40.9140 | 785 | 0.0026 | 0.2256 |
| 500 | 0.3045 | 26.0616 | 645 | 0.4362 | 37.3340 | 790 | 0.0021 | 0.1835 |
| 505 | 0.3505 | 30.0012 | 650 | 0.3967 | 33.9591 | 795 | 0.0032 | 0.2698 |
| 510 | 0.3979 | 34.0576 | 655 | 0.3573 | 30.5806 | 800 | 0.0040 | 0.3425 |
| 515 | 0.4360 | 37.3195 | 660 | 0.3195 | 27.3506 | | | |
| 520 | 0.4694 | 40.1826 | 665 | 0.2836 | 24.2770 | | | |

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

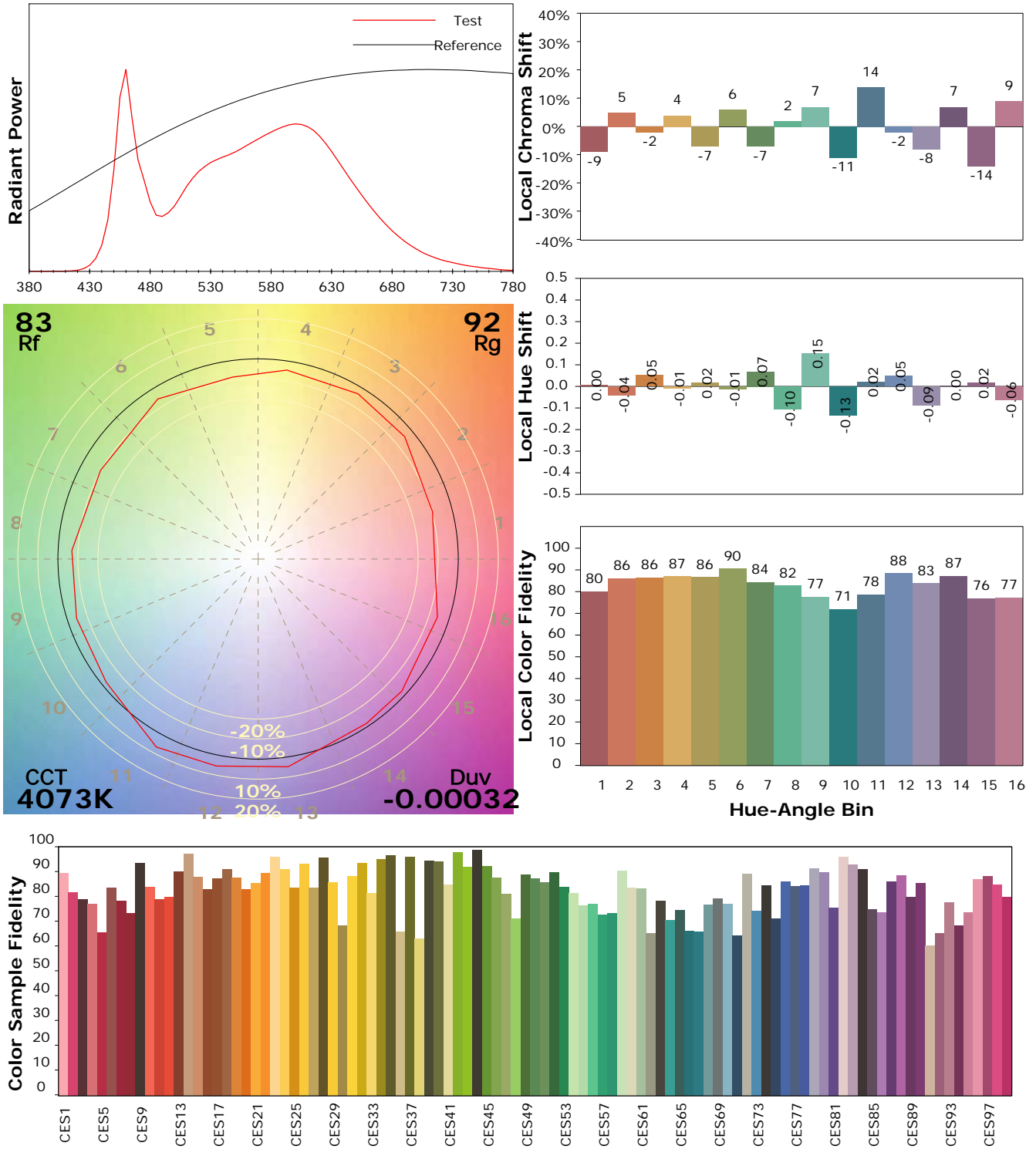
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 Test Time: 2021-01-22 11:50:17
 Inspector:

IES TM-30-18 Color Rendition Report

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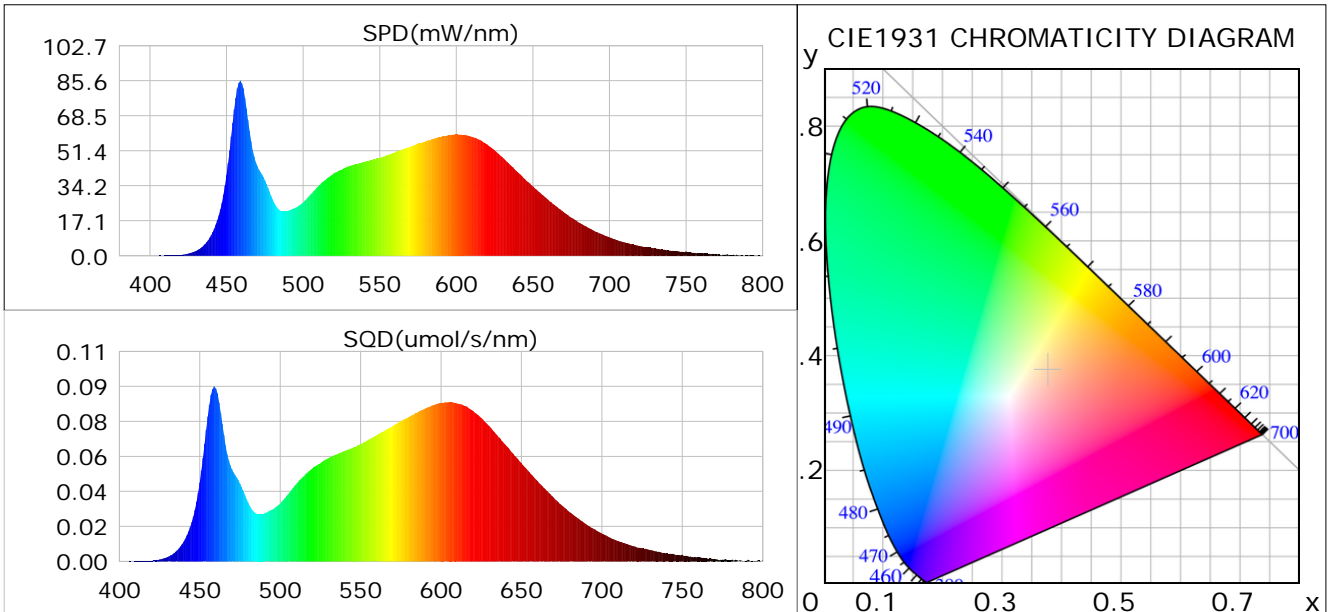
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Plant optical param data

CIE Colorimetric Parameters

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 CRI: $R_a=86.4$



Plant Optical Param

| | |
|-----------------------------------|-------------------------------|
| $ \mu_v(lm): 3483.00$ | $Q_v(lm.s): 3483.00$ |
| $ \mu_e, \dot{E}(W/nm): 10.88$ | $Q_e(J): 10.88$ |
| $ \mu_e(W): 10.63$ | $ \mu_{fr}(W): 0.26$ |
| $ \zeta_e: 0.36$ | $ \zeta_{fr}: 0.01$ |
| $PPE(umol/s/w): 1.67$ | $K_{fr}: 0.05$ |
| $Erb_Ratio: 1.42$ | $PPF(umol/s): 49.87$ |
| $PF_{uv}(360-400)(umol/s): 0.00$ | $PPF(400-500)(umol/s): 9.48$ |
| $PPF(500-600)(umol/s): 22.05$ | $PPF(600-700)(umol/s): 18.34$ |
| $PPF_{fr}(700-800)(umol/s): 1.54$ | $PPF.t(umol): 49.87$ |
| $ \mu_{ch-A.t}(J): 0.79$ | $ \mu_{ch-A}(W): 0.79$ |
| $ \mu_{ch-B.t}(J): 0.54$ | $ \mu_{ch-B}(W): 0.54$ |
| $ \mu_b.t(J): 2.43$ | $ \mu_b(W): 2.43$ |
| $ \mu_y.t(J): 4.77$ | $ \mu_y(W): 4.77$ |
| $ \mu_r.t(J): 3.51$ | $ \mu_r(W): 3.51$ |

Electric Parameters

| | | |
|----------------------|--------------------|---------------|
| Voltage: 230.00V | Current: 0.1300A | Power: 29.90W |
| Power Factor: 0.9370 | Frequency: 49.99Hz | |

Condition: $T_x: 19.8^\circ C$, $T_i: 0.0^\circ C$, R.H.: 60%
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