

## Lightsource Test Report

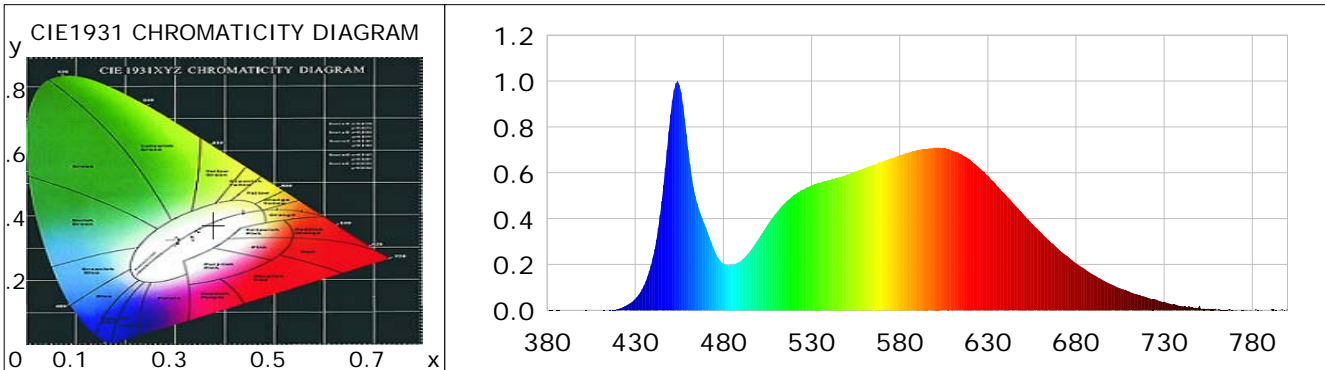
### Product Information

Product Category: LED-Röhre  
 Product Spec: LEDtube-086-6NWM-12W  
 Manufacturer: METOLIGHT  
 Buyer: 2105

Product Type: LED-Röhre-SCE  
 Product Number: 1  
 Submitted Unit: 104082

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.3776$   $y=0.3727$   $u(u')=0.2248$   $v=0.3329$   $v'=0.4994$   
 CCT:  $T_c=4050K$  ( $duv=-0.00106$ ) Color Ratio:  $R=0.188$   $G=0.775$   $B=0.036$   
 Peak Wavelength: 453.9nm Half Bandwidth: 18.7nm  
 Dominant Wavelength: 579.5nm Color Purity: 0.252  
 CRI:  $R_a=85.9$ ,  $avgR(1\sim14)=79.9$ ,  $avgR(1\sim15)=80.0$  TM30:  $R_f=84$ ,  $R_g=96$   
 GAI:  $GAI\_BB\_8=95.6$ ,  $GAI\_BB\_15=103.3$ ,  $GAI\_EES=76.1$   
 R1 =86 R2 =91 R3 =94 R4 =85 R5 =85 R6 =87 R7 =88 R8 =72  
 R9 =28 R10=78 R11=84 R12=58 R13=87 R14=96 R15=82  
 Color Quality Scale:  $Q_a=84.2$ ,  $Q_f=84.0$ ,  $Q_p=84.9$ ,  $Q_g=94.8$   
 Q1 =85 Q2 =98 Q3 =78 Q4 =75 Q5 =81 Q6 =84 Q7 =87 Q8 =90  
 Q9 =97 Q10=89 Q11=86 Q12=86 Q13=87 Q14=79 Q15=81



### Photometric Parameters

Luminous Flux: 1384.2 lm Efficiency: 122.93 lm/W Radiant Power: 4.289 W  
 Total mains efficacy: 144.57 lm/W Energy Efficiency Class: D (EU 2019/2015)  
 Pupil Flux: 2117.21 Plm Pupil Lumens Per Watt: 188.03 Plm/W Pupil Factor (Kp): 1.530  
 Circopic Flux: 4344.53 lm

### Electric Parameters

Voltage: 230.40V Current: 0.0490A Power: 11.26W  
 Power Factor: 0.9820 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: 46738 (2530) CCD Integration Time: 202.32 ms

Condition: Tx:21.1'C, Ti:0.0'C, R.H.:60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-02-22 12:04:05  
 Inspector:

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| WL(nm) | PL     | PE(mW/nm) | WL(nm) | PL     | PE(mW/nm) | WL(nm) | PL     | PE(mW/nm) |
|--------|--------|-----------|--------|--------|-----------|--------|--------|-----------|
| 380    | 0.0004 | 0.0147    | 525    | 0.5260 | 17.2427   | 670    | 0.2677 | 8.7753    |
| 385    | 0.0013 | 0.0423    | 530    | 0.5445 | 17.8505   | 675    | 0.2373 | 7.7785    |
| 390    | 0.0006 | 0.0200    | 535    | 0.5569 | 18.2566   | 680    | 0.2057 | 6.7440    |
| 395    | 0.0001 | 0.0035    | 540    | 0.5685 | 18.6383   | 685    | 0.1801 | 5.9050    |
| 400    | 0.0008 | 0.0257    | 545    | 0.5792 | 18.9873   | 690    | 0.1549 | 5.0765    |
| 405    | 0.0001 | 0.0023    | 550    | 0.5923 | 19.4179   | 695    | 0.1322 | 4.3328    |
| 410    | 0.0005 | 0.0177    | 555    | 0.6061 | 19.8686   | 700    | 0.1136 | 3.7241    |
| 415    | 0.0012 | 0.0379    | 560    | 0.6201 | 20.3289   | 705    | 0.0963 | 3.1581    |
| 420    | 0.0059 | 0.1918    | 565    | 0.6350 | 20.8175   | 710    | 0.0829 | 2.7165    |
| 425    | 0.0211 | 0.6931    | 570    | 0.6483 | 21.2527   | 715    | 0.0693 | 2.2734    |
| 430    | 0.0500 | 1.6396    | 575    | 0.6630 | 21.7361   | 720    | 0.0570 | 1.8700    |
| 435    | 0.1083 | 3.5500    | 580    | 0.6784 | 22.2407   | 725    | 0.0477 | 1.5648    |
| 440    | 0.2297 | 7.5308    | 585    | 0.6883 | 22.5635   | 730    | 0.0381 | 1.2499    |
| 445    | 0.4766 | 15.6253   | 590    | 0.6992 | 22.9231   | 735    | 0.0256 | 0.8408    |
| 450    | 0.8535 | 27.9802   | 595    | 0.7040 | 23.0784   | 740    | 0.0188 | 0.6155    |
| 455    | 0.9832 | 32.2318   | 600    | 0.7100 | 23.2749   | 745    | 0.0134 | 0.4402    |
| 460    | 0.6992 | 22.9210   | 605    | 0.7068 | 23.1708   | 750    | 0.0200 | 0.6542    |
| 465    | 0.4696 | 15.3959   | 610    | 0.6956 | 22.8043   | 755    | 0.0072 | 0.2371    |
| 470    | 0.3617 | 11.8589   | 615    | 0.6807 | 22.3139   | 760    | 0.0021 | 0.0678    |
| 475    | 0.2601 | 8.5264    | 620    | 0.6574 | 21.5516   | 765    | 0.0030 | 0.0986    |
| 480    | 0.2029 | 6.6510    | 625    | 0.6223 | 20.4000   | 770    | 0.0015 | 0.0504    |
| 485    | 0.1979 | 6.4884    | 630    | 0.5875 | 19.2593   | 775    | 0.0018 | 0.0582    |
| 490    | 0.2159 | 7.0789    | 635    | 0.5442 | 17.8405   | 780    | 0.0006 | 0.0204    |
| 495    | 0.2566 | 8.4114    | 640    | 0.5051 | 16.5570   | 785    | 0.0022 | 0.0725    |
| 500    | 0.3124 | 10.2416   | 645    | 0.4621 | 15.1503   | 790    | 0.0006 | 0.0197    |
| 505    | 0.3729 | 12.2247   | 650    | 0.4199 | 13.7670   | 795    | 0.0001 | 0.0019    |
| 510    | 0.4249 | 13.9307   | 655    | 0.3777 | 12.3835   | 800    | 0.0060 | 0.1971    |
| 515    | 0.4679 | 15.3397   | 660    | 0.3409 | 11.1750   |        |        |           |
| 520    | 0.5037 | 16.5127   | 665    | 0.3030 | 9.9318    |        |        |           |

Condition: Tx:21.1'C, Ti:0.0'C, R.H.:60%  
 Test Lab:  
 Operator: CRE

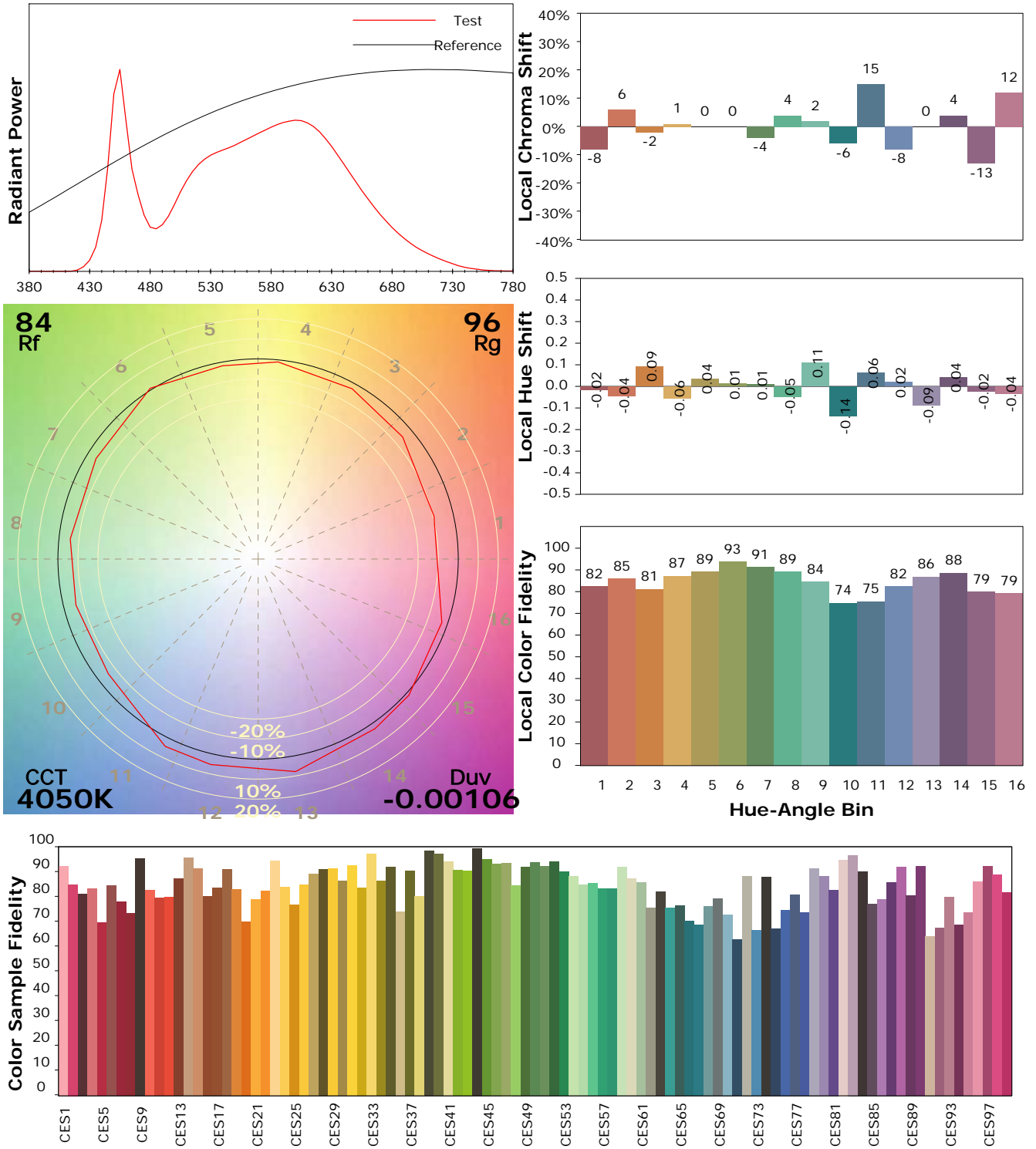
Test Device: Lisun LMS-9000B  
 Test Time: 2021-02-22 12:04:05  
 Inspector:

## IES TM-30-18 Color Rendition Report

### Product Information

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 Manufacturer: METOLIGHT  
 Buyer: 2105

Product Type: LED-Röhre-SCE  
 Product Number: 1  
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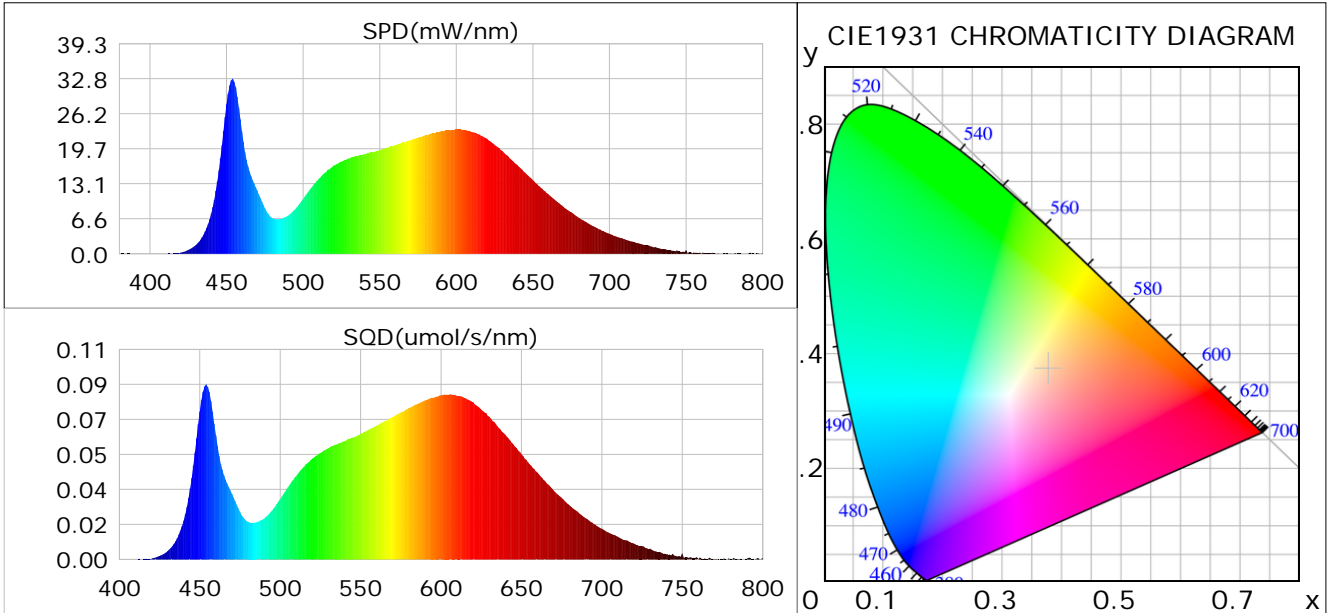
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 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-02-22 12:04:05  
 Inspector:

## Plant optical param data

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.3776$   $y=0.3727$   $u(u')=0.2248$   $v=0.3329$   $v'=0.4994$   
 CCT:  $T_c=4050K$  ( $duv=-0.00106$ ) Color Ratio:  $R=0.188$   $G=0.775$   $B=0.036$   
 Peak Wavelength: 453.9nm Half Bandwidth: 18.7nm  
 Dominant Wavelength: 579.5nm Color Purity: 0.252  
 CRI:  $R_a=85.9$



### Plant Optical Param

|                                   |                              |
|-----------------------------------|------------------------------|
| $ \mu_v(lm): 1384.20$             | $Q_v(lm.s): 1384.20$         |
| $ \mu_e, \dot{E}(W/nm): 4.29$     | $Q_e(J): 4.29$               |
| $ \mu_e(W): 4.20$                 | $ \mu_{fr}(W): 0.09$         |
| $ \zeta_e: 0.37$                  | $ \zeta_{fr}: 0.01$          |
| $PPE(umol/s/w): 1.75$             | $K_{fr}: 0.05$               |
| $Erb\_Ratio: 1.51$                | $PPF(umol/s): 19.74$         |
| $PF_{uv}(360-400)(umol/s): 0.00$  | $PPF(400-500)(umol/s): 3.53$ |
| $PPF(500-600)(umol/s): 8.85$      | $PPF(600-700)(umol/s): 7.36$ |
| $PPF_{fr}(700-800)(umol/s): 0.52$ | $PPF.t(umol): 19.74$         |
| $ \mu_{ch-A.t}(J): 0.33$          | $ \mu_{ch-A}(W): 0.33$       |
| $ \mu_{ch-B.t}(J): 0.20$          | $ \mu_{ch-B}(W): 0.20$       |
| $ \mu_b.t(J): 0.91$               | $ \mu_b(W): 0.91$            |
| $ \mu_y.t(J): 1.92$               | $ \mu_y(W): 1.92$            |
| $ \mu_r.t(J): 1.41$               | $ \mu_r(W): 1.41$            |

### Electric Parameters

|                      |                    |               |
|----------------------|--------------------|---------------|
| Voltage: 230.40V     | Current: 0.0490A   | Power: 11.26W |
| Power Factor: 0.9820 | Frequency: 49.99Hz |               |

Condition:  $T_x: 21.1^\circ C$ ,  $T_i: 0.0^\circ C$ , R.H.: 60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-02-22 12:04:05  
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