

## Lightsource Test Report

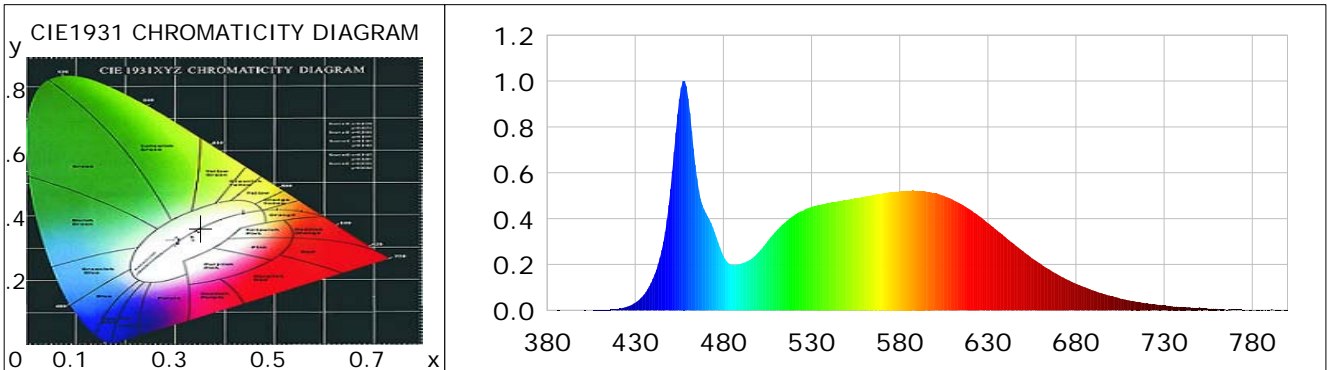
### Product Information

Product Category: LED-Röhre  
 Product Spec: LEDtube-060-8DWC-09W-TRF-RC  
 Manufacturer: METOLIGHT  
 Buyer: 6961

Product Type: LED-Röhre-TRF  
 Product Number: 1  
 Submitted Unit: 102274

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.3519$   $y=0.3624$   $u(u')=0.2118$   $v=0.3272$   $v'=0.4909$   
 CCT:  $T_c=4794K$  ( $duv=0.00269$ ) Color Ratio:  $R=0.163$   $G=0.791$   $B=0.046$   
 Peak Wavelength: 457.5nm Half Bandwidth: 17.1nm  
 Dominant Wavelength: 572.7nm Color Purity: 0.144  
 CRI:  $R_a=83.3$ ,  $avgR(1\sim14)=76.3$ ,  $avgR(1\sim15)=76.4$  TM30:  $R_f=81$ ,  $R_g=91$   
 GAI:  $GAI\_BB\_8=87.3$ ,  $GAI\_BB\_15=95.9$ ,  $GAI\_EES=77.8$   
 R1 =82 R2 =91 R3 =95 R4 =78 R5 =80 R6 =86 R7 =86 R8 =67  
 R9 =14 R10=77 R11=77 R12=50 R13=86 R14=98 R15=77  
 Color Quality Scale:  $Q_a=81.4$ ,  $Q_f=81.7$ ,  $Q_p=79.9$ ,  $Q_g=89.9$   
 Q1 =79 Q2 =96 Q3 =80 Q4 =70 Q5 =74 Q6 =76 Q7 =83 Q8 =89  
 Q9 =97 Q10=91 Q11=87 Q12=86 Q13=85 Q14=75 Q15=77



### Photometric Parameters

Luminous Flux: 1313.6 lm Efficiency: 147.60 lm/W Radiant Power: 4.030 W  
 Total mains efficacy: 173.57 lm/W Energy Efficiency Class: C (EU 2019/2015)  
 Pupil Flux: 2200.36 Plm Pupil Lumens Per Watt: 247.23 Plm/W Pupil Factor (Kp): 1.675  
 Circopic Flux: 4788.19 lm

### Electric Parameters

Voltage: 231.00V Current: 0.0350A Power: 8.90W  
 Power Factor: 0.9710 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: 46078 (2411) CCD Integration Time: 79.12 ms

Condition:  $T_x=20.8^{\circ}C$ ,  $T_i=0.0^{\circ}C$ , R.H.: 60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2020-12-16 14:00:57  
 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 | 0.0090    | 525    | 0.4329 | 17.2715   | 670    | 0.1549 | 6.1818    |
| 385    | 0.0002 | 0.0071    | 530    | 0.4513 | 18.0058   | 675    | 0.1345 | 5.3681    |
| 390    | 0.0002 | 0.0086    | 535    | 0.4600 | 18.3542   | 680    | 0.1160 | 4.6301    |
| 395    | 0.0003 | 0.0128    | 540    | 0.4683 | 18.6860   | 685    | 0.1009 | 4.0244    |
| 400    | 0.0005 | 0.0188    | 545    | 0.4758 | 18.9866   | 690    | 0.0864 | 3.4472    |
| 405    | 0.0005 | 0.0209    | 550    | 0.4818 | 19.2245   | 695    | 0.0740 | 2.9511    |
| 410    | 0.0018 | 0.0703    | 555    | 0.4885 | 19.4923   | 700    | 0.0618 | 2.4661    |
| 415    | 0.0033 | 0.1309    | 560    | 0.4958 | 19.7809   | 705    | 0.0518 | 2.0665    |
| 420    | 0.0065 | 0.2587    | 565    | 0.5040 | 20.1105   | 710    | 0.0438 | 1.7494    |
| 425    | 0.0151 | 0.6025    | 570    | 0.5102 | 20.3554   | 715    | 0.0372 | 1.4834    |
| 430    | 0.0332 | 1.3234    | 575    | 0.5158 | 20.5793   | 720    | 0.0305 | 1.2169    |
| 435    | 0.0690 | 2.7516    | 580    | 0.5199 | 20.7437   | 725    | 0.0259 | 1.0324    |
| 440    | 0.1373 | 5.4787    | 585    | 0.5218 | 20.8219   | 730    | 0.0221 | 0.8812    |
| 445    | 0.2628 | 10.4856   | 590    | 0.5220 | 20.8265   | 735    | 0.0171 | 0.6807    |
| 450    | 0.5290 | 21.1056   | 595    | 0.5186 | 20.6920   | 740    | 0.0135 | 0.5390    |
| 455    | 0.9216 | 36.7718   | 600    | 0.5110 | 20.3894   | 745    | 0.0121 | 0.4845    |
| 460    | 0.9245 | 36.8870   | 605    | 0.4998 | 19.9436   | 750    | 0.0127 | 0.5058    |
| 465    | 0.5759 | 22.9797   | 610    | 0.4832 | 19.2787   | 755    | 0.0072 | 0.2880    |
| 470    | 0.4258 | 16.9902   | 615    | 0.4629 | 18.4715   | 760    | 0.0064 | 0.2571    |
| 475    | 0.3402 | 13.5735   | 620    | 0.4393 | 17.5272   | 765    | 0.0033 | 0.1330    |
| 480    | 0.2371 | 9.4618    | 625    | 0.4110 | 16.3995   | 770    | 0.0040 | 0.1598    |
| 485    | 0.1972 | 7.8679    | 630    | 0.3807 | 15.1907   | 775    | 0.0035 | 0.1380    |
| 490    | 0.2032 | 8.1065    | 635    | 0.3500 | 13.9650   | 780    | 0.0018 | 0.0726    |
| 495    | 0.2198 | 8.7719    | 640    | 0.3189 | 12.7261   | 785    | 0.0026 | 0.1054    |
| 500    | 0.2537 | 10.1226   | 645    | 0.2881 | 11.4951   | 790    | 0.0014 | 0.0571    |
| 505    | 0.3012 | 12.0164   | 650    | 0.2577 | 10.2816   | 795    | 0.0016 | 0.0623    |
| 510    | 0.3468 | 13.8395   | 655    | 0.2275 | 9.0793    | 800    | 0.0019 | 0.0757    |
| 515    | 0.3829 | 15.2765   | 660    | 0.2025 | 8.0792    |        |        |           |
| 520    | 0.4139 | 16.5163   | 665    | 0.1779 | 7.0978    |        |        |           |

Condition: Tx:20.8'C, Ti:0.0'C, R.H.:60%  
 Test Lab:  
 Operator: CRE

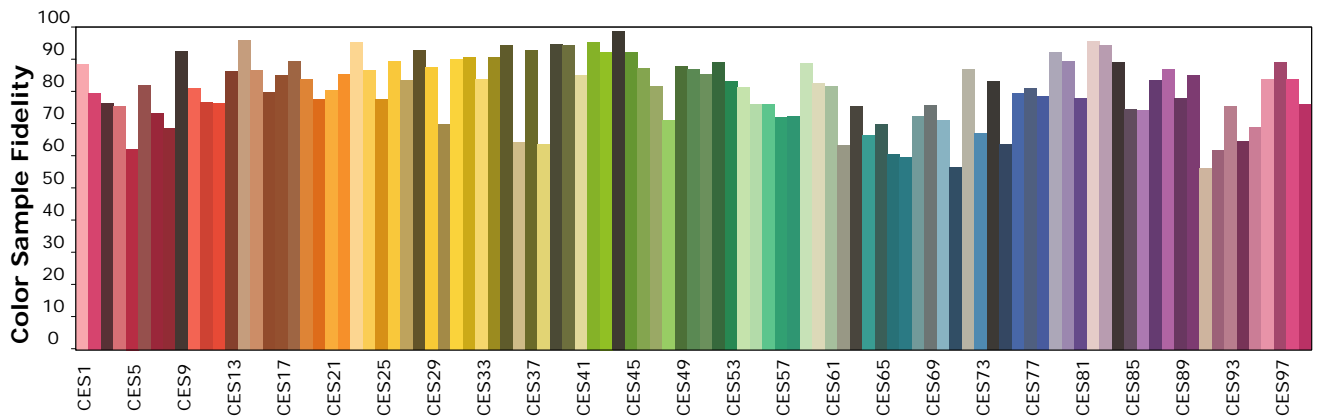
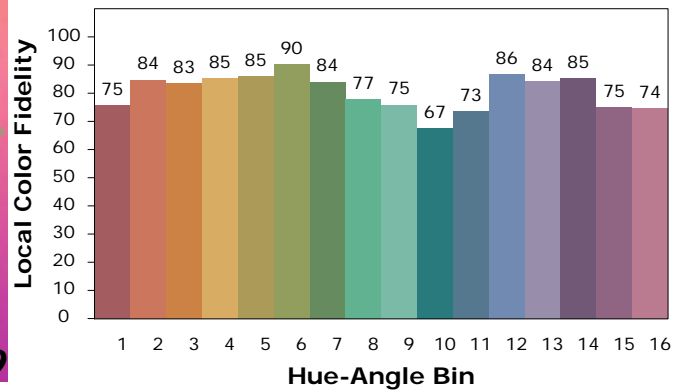
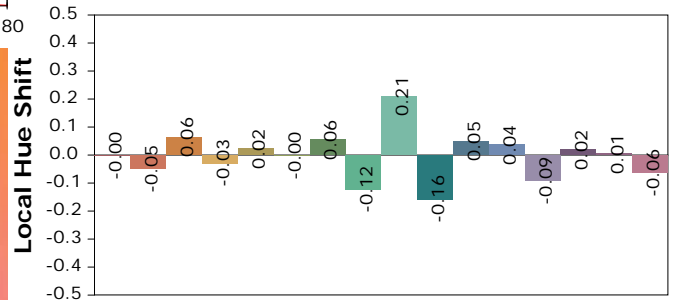
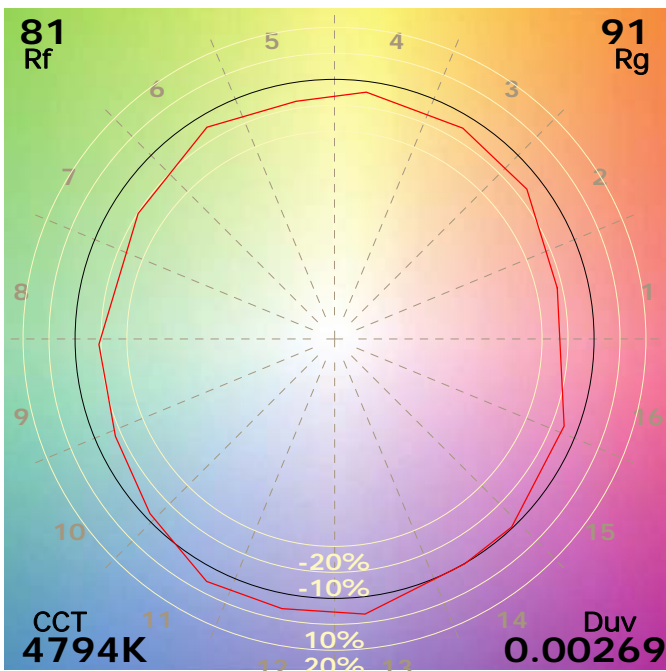
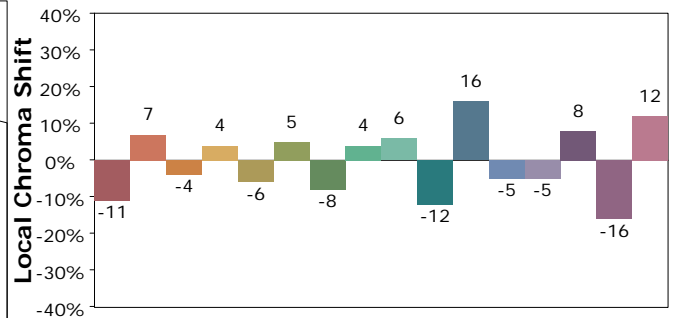
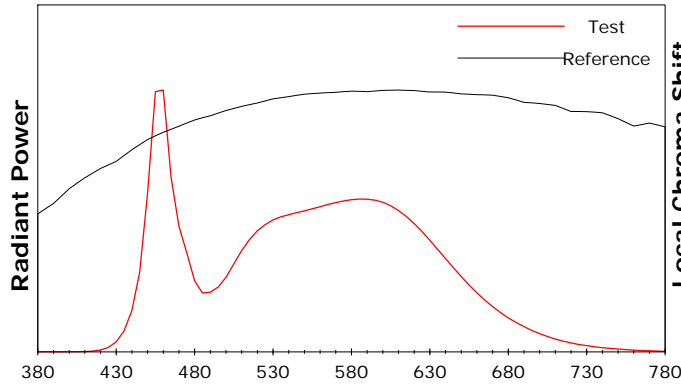
Test Device: Lisun LMS-9000B  
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 Inspector:

## IES TM-30-18 Color Rendition Report

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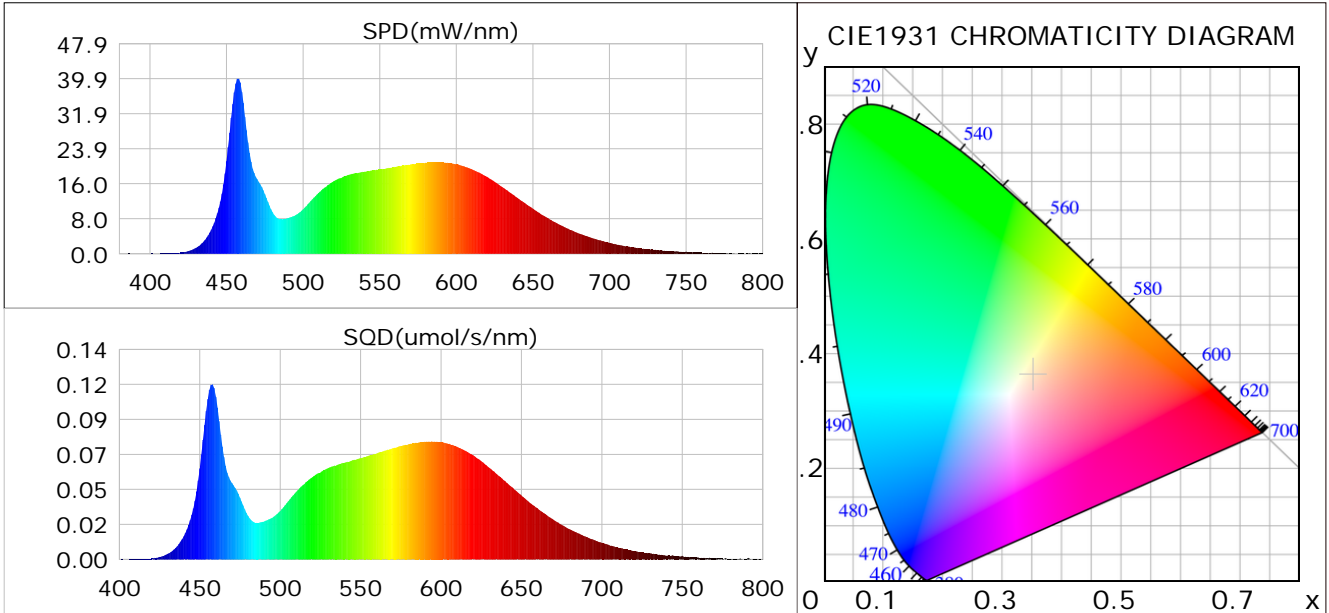
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 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2020-12-16 14:00:57  
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## Plant optical param data

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Chromaticity coordinates:  $x=0.3519$   $y=0.3624$   $u(u')=0.2118$   $v=0.3272$   $v'=0.4909$   
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 Peak Wavelength: 457.5nm Half Bandwidth: 17.1nm  
 Dominant Wavelength: 572.7nm Color Purity: 0.144  
 CRI:  $R_a=83.3$



### Plant Optical Param

|                                   |                              |
|-----------------------------------|------------------------------|
| $ \mu_v(lm): 1313.60$             | $Q_v(lm.s): 1313.60$         |
| $ \mu_e, \dot{E}(W/nm): 4.03$     | $Q_e(J): 4.03$               |
| $ \mu_e(W): 3.97$                 | $ \mu_{fr}(W): 0.07$         |
| $ \zeta_e: 0.45$                  | $ \zeta_{fr}: 0.01$          |
| $PPE(umol/s/w): 2.06$             | $K_{fr}: 0.04$               |
| $Erb\_Ratio: 1.03$                | $PPF(umol/s): 18.32$         |
| $PF_{uv}(360-400)(umol/s): 0.00$  | $PPF(400-500)(umol/s): 4.07$ |
| $PPF(500-600)(umol/s): 8.53$      | $PPF(600-700)(umol/s): 5.72$ |
| $PPF_{fr}(700-800)(umol/s): 0.39$ | $PPF.t(umol): 18.32$         |
| $ \mu_{ch-A.t}(J): 0.29$          | $ \mu_{ch-A}(W): 0.29$       |
| $ \mu_{ch-B.t}(J): 0.21$          | $ \mu_{ch-B}(W): 0.21$       |
| $ \mu_b.t(J): 1.05$               | $ \mu_b(W): 1.05$            |
| $ \mu_y.t(J): 1.85$               | $ \mu_y(W): 1.85$            |
| $ \mu_r.t(J): 1.10$               | $ \mu_r(W): 1.10$            |

### Electric Parameters

|                      |                    |              |
|----------------------|--------------------|--------------|
| Voltage: 231.00V     | Current: 0.0350A   | Power: 8.90W |
| Power Factor: 0.9710 | Frequency: 49.99Hz |              |

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