

## Lightsource Test Report

### Product Information

Product Category: LED-Röhre  
 Product Spec: LEDtube-090-8Deli-15WM  
 Manufacturer: METOLIGHT  
 Buyer: 7116

Product Type: LED-Röhre-Spezial  
 Product Number: 1  
 Submitted Unit: 105185

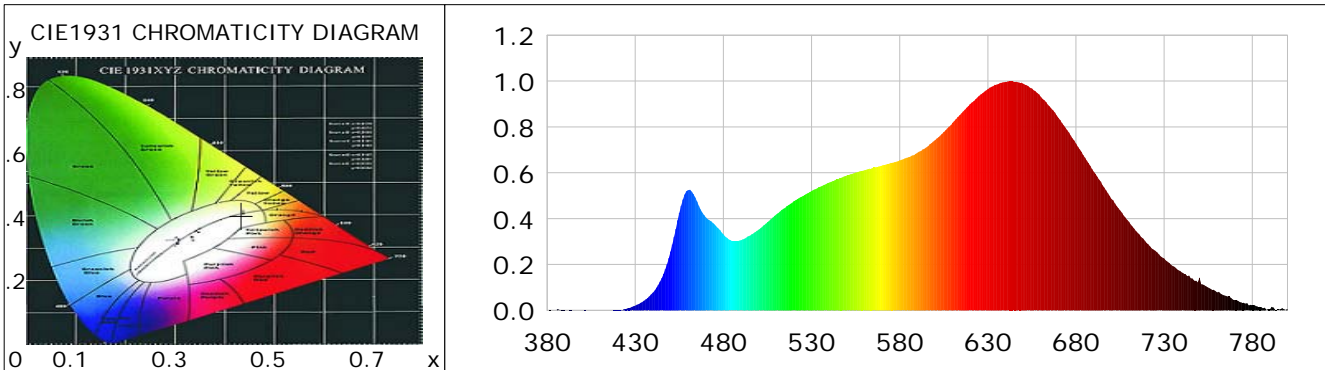
### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.4337$   $y=0.4025$   $u(u')=0.2492$   $v=0.3468$   $v'=0.5203$   
 CCT:  $T_c=3042K$  ( $duv=-0.00020$ ) Color Ratio:  $R=0.250$   $G=0.714$   $B=0.036$   
 Peak Wavelength: 643.0nm Half Bandwidth: 173.6nm  
 Dominant Wavelength: 582.7nm Color Purity: 0.510  
 CRI:  $R_a=96.1$ ,  $avgR(1\sim14)=94.7$ ,  $avgR(1\sim15)=94.7$  TM30:  $R_f=90$ ,  $R_g=98$   
 GAI:  $GAI\_BB\_8=99.9$ ,  $GAI\_BB\_15=106.6$ ,  $GAI\_EES=58.5$   

R1 =96	R2 =97	R3 =99	R4 =96	R5 =96	R6 =95	R7 =95	R8 =94
R9 =90	R10=96	R11=97	R12=81	R13=96	R14=98	R15=95	

Color Quality Scale:  $Q_a=93.3$ ,  $Q_f=94.1$ ,  $Q_p=96.2$ ,  $Q_g=98.1$   

Q1 =87	Q2 =94	Q3 =96	Q4 =93	Q5 =91	Q6 =91	Q7 =96	Q8 =97
Q9 =95	Q10=95	Q11=96	Q12=96	Q13=96	Q14=96	Q15=92	



### Photometric Parameters

Luminous Flux: 1120.7 lm	Efficiency: 74.17 lm/W	Radiant Power: 4.431 W
Total mains efficacy: 87.22 lm/W	Energy Efficiency Class: F (EU 2019/2015)	
Pupil Flux: 1560.33 Plm	Pupil Lumens Per Watt: 103.27 Plm/W	Pupil Factor (Kp): 1.392
Cirtopic Flux: 3058.95 lm		

### Electric Parameters

Voltage: 231.00V	Current: 0.0690A	Power: 15.11W
Power Factor: 0.9430	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: 46718 (2704)	CCD Integration Time: 425.94 ms

Condition:  $T_x=21.4^{\circ}C$ ,  $T_i=0.0^{\circ}C$ , R.H.:60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-01-11 15:43:05  
 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	0.0105	525	0.4982	12.4309	670	0.8404	20.9685
385	0.0010	0.0242	530	0.5201	12.9759	675	0.7854	19.5952
390	0.0008	0.0188	535	0.5393	13.4548	680	0.7274	18.1491
395	0.0002	0.0058	540	0.5573	13.9031	685	0.6662	16.6204
400	0.0006	0.0158	545	0.5715	14.2590	690	0.6051	15.0969
405	0.0001	0.0014	550	0.5880	14.6706	695	0.5457	13.6145
410	0.0003	0.0076	555	0.6008	14.9888	700	0.4872	12.1545
415	0.0011	0.0269	560	0.6109	15.2405	705	0.4359	10.8752
420	0.0015	0.0381	565	0.6228	15.5373	710	0.3862	9.6351
425	0.0065	0.1620	570	0.6322	15.7735	715	0.3381	8.4345
430	0.0209	0.5217	575	0.6432	16.0478	720	0.2945	7.3480
435	0.0421	1.0515	580	0.6545	16.3282	725	0.2600	6.4858
440	0.0770	1.9222	585	0.6675	16.6545	730	0.2266	5.6532
445	0.1405	3.5062	590	0.6873	17.1478	735	0.1932	4.8213
450	0.2563	6.3938	595	0.7104	17.7249	740	0.1659	4.1395
455	0.4252	10.6086	600	0.7416	18.5015	745	0.1404	3.5024
460	0.5249	13.0957	605	0.7779	19.4090	750	0.1422	3.5483
465	0.4751	11.8538	610	0.8178	20.4030	755	0.0993	2.4770
470	0.4060	10.1297	615	0.8591	21.4330	760	0.0782	1.9523
475	0.3742	9.3371	620	0.9003	22.4630	765	0.0635	1.5838
480	0.3322	8.2872	625	0.9354	23.3387	770	0.0451	1.1255
485	0.3022	7.5404	630	0.9650	24.0750	775	0.0334	0.8339
490	0.3061	7.6369	635	0.9850	24.5762	780	0.0229	0.5708
495	0.3258	8.1277	640	0.9967	24.8679	785	0.0141	0.3508
500	0.3519	8.7787	645	0.9964	24.8597	790	0.0052	0.1285
505	0.3851	9.6068	650	0.9888	24.6697	795	0.0036	0.0894
510	0.4188	10.4482	655	0.9678	24.1448	800	0.0073	0.1814
515	0.4473	11.1587	660	0.9313	23.2357			
520	0.4763	11.8845	665	0.8899	22.2024			

Condition: Tx:21.4'C, Ti:0.0'C, R.H.:60%  
 Test Lab:  
 Operator: CRE

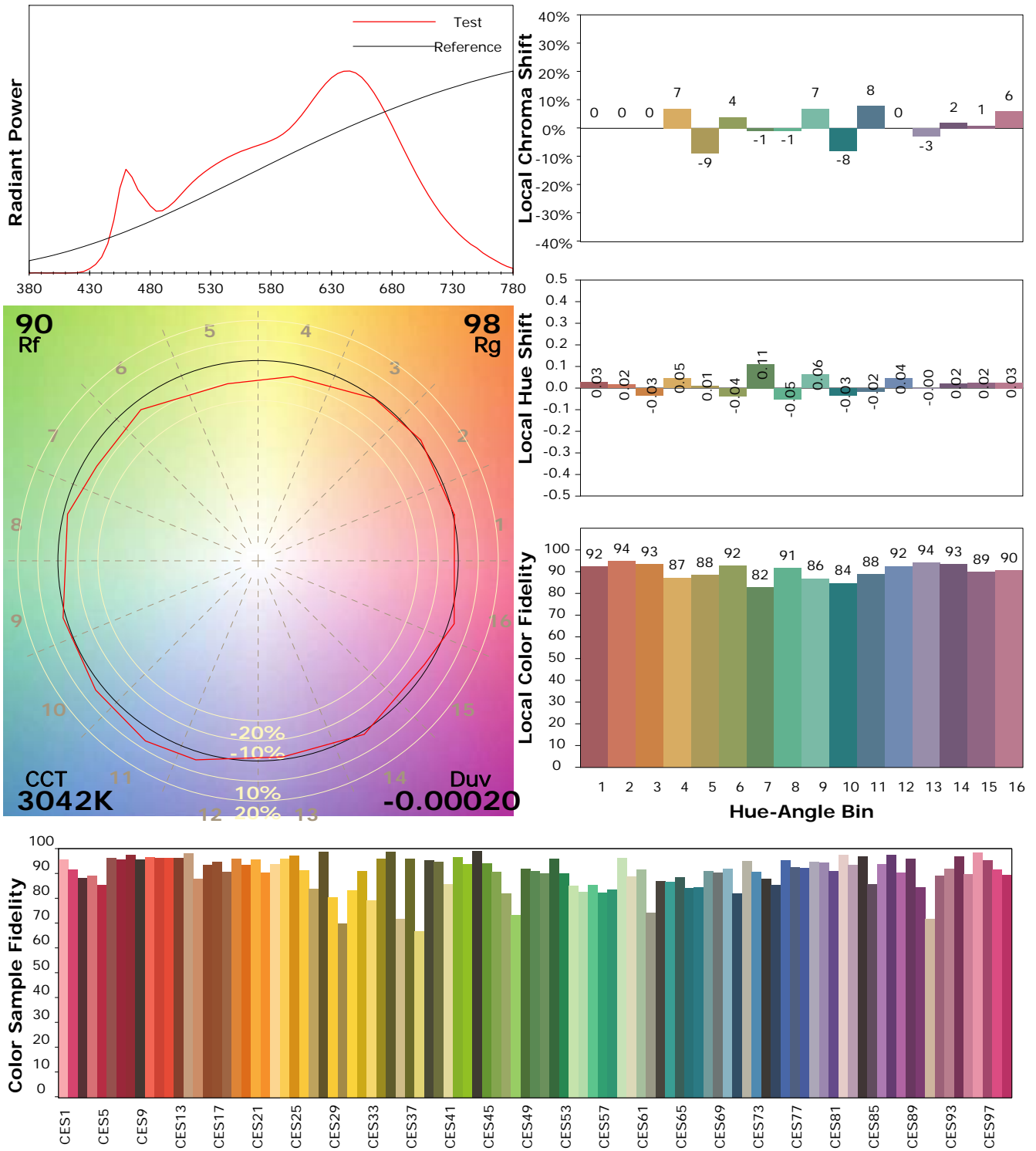
Test Device: Lisun LMS-9000B  
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 Inspector:

## IES TM-30-18 Color Rendition Report

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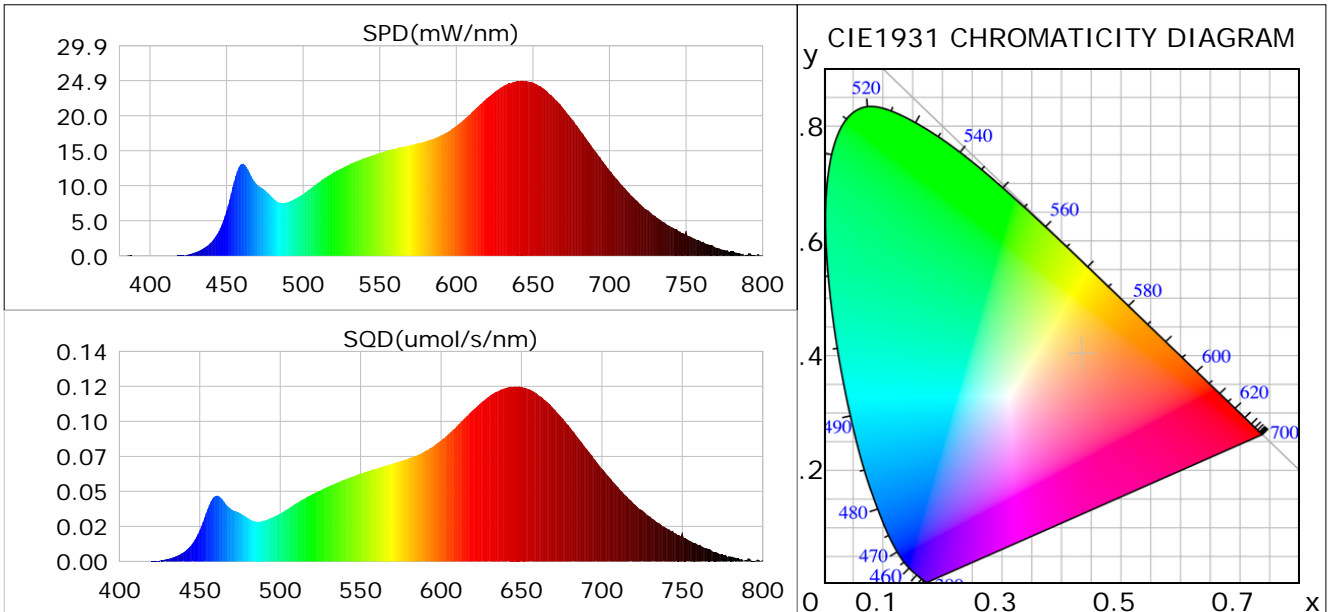
Condition: Tx:21.4°C, Ti:0.0°C, R.H.:60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-01-11 15:43:05  
 Inspector:

## Plant optical param data

### CIE Colorimetric Parameters

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 Peak Wavelength: 643.0nm Half Bandwidth: 173.6nm  
 Dominant Wavelength: 582.7nm Color Purity: 0.510  
 CRI:  $R_a=96.1$



### Plant Optical Param

$\mu_v(\text{lm})$ : 1120.70	$Q_v(\text{lm}\cdot\text{s})$ : 1120.70
$\mu_e, \dot{E}(\text{W}/\text{nm})$ : 4.43	$Q_e(\text{J})$ : 4.43
$\mu_e(\text{W})$ : 4.05	$\mu_{\text{fr}}(\text{W})$ : 0.40
$\zeta_e$ : 0.27	$\zeta_{\text{fr}}$ : 0.03
PPE( $\mu\text{mol}/\text{s}/\text{w}$ ): 1.33	Kfr: 0.16
Erb_Ratio: 3.97	PPF( $\mu\text{mol}/\text{s}$ ): 20.02
PFuv(360-400)( $\mu\text{mol}/\text{s}$ ): 0.00	PPF(400-500)( $\mu\text{mol}/\text{s}$ ): 2.08
PPF(500-600)( $\mu\text{mol}/\text{s}$ ): 6.61	PPF(600-700)( $\mu\text{mol}/\text{s}$ ): 11.33
PPfr(700-800)( $\mu\text{mol}/\text{s}$ ): 2.37	PPF.t( $\mu\text{mol}$ ): 20.02
$\mu_{\text{ch-A.t}}(\text{J})$ : 0.36	$\mu_{\text{ch-A}}(\text{W})$ : 0.36
$\mu_{\text{ch-B.t}}(\text{J})$ : 0.17	$\mu_{\text{ch-B}}(\text{W})$ : 0.17
$\mu_{\text{b.t}}(\text{J})$ : 0.53	$\mu_{\text{b}}(\text{W})$ : 0.53
$\mu_{\text{y.t}}(\text{J})$ : 1.43	$\mu_{\text{y}}(\text{W})$ : 1.43
$\mu_{\text{r.t}}(\text{J})$ : 2.11	$\mu_{\text{r}}(\text{W})$ : 2.11

### Electric Parameters

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Power Factor: 0.9430	Frequency: 49.99Hz	

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