

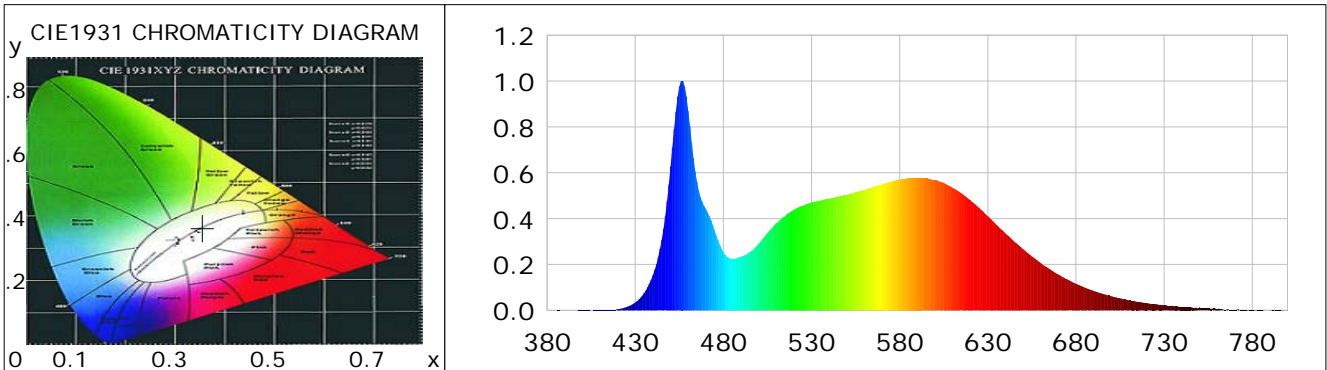
## Lightsource Test Report

### Product Information

Product Category: LED-Röhre  
 Product Spec: Ledtube-120-T10-DWM-24W-2120-230  
 Manufacturer: METOLIGHT  
 Buyer: 4624  
 Product Type: LED-Röhre-Spezial  
 Product Number: 1  
 Submitted Unit: 105122

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.3556$   $y=0.3638$   $u(u')=0.2138$   $v=0.3280$   $v'=0.4920$   
 CCT:  $T_c=4674K$  ( $duv=0.00198$ )  
 Peak Wavelength: 456.5nm  
 Dominant Wavelength: 574.3nm  
 CRI:  $R_a=83.3$ ,  $avgR(1\sim14)=76.4$ ,  $avgR(1\sim15)=76.4$   
 GAI:  $GAI\_BB\_8=87.7$ ,  $GAI\_BB\_15=96.0$ ,  $GAI\_EES=77.1$   
 Color Quality Scale:  $Q_a=81.6$ ,  $Q_f=81.9$ ,  $Q_p=80.0$ ,  $Q_g=89.8$   
 TM30:  $R_f=81$ ,  $R_g=91$   
 R1 =82 R2 =92 R3 =95 R4 =79 R5 =81 R6 =87 R7 =85 R8 =65  
 R9 =10 R10=79 R11=78 R12=53 R13=86 R14=98 R15=77  
 Q1 =79 Q2 =96 Q3 =81 Q4 =72 Q5 =76 Q6 =78 Q7 =84 Q8 =89  
 Q9 =97 Q10=92 Q11=87 Q12=86 Q13=85 Q14=73 Q15=76



### Photometric Parameters

Luminous Flux: 2985.1 lm  
 Total mains efficacy: 123.15 lm/W  
 Pupil Flux: 4959.45 Plm  
 Circopic Flux: 10750.28 lm  
 Efficiency: 123.15 lm/W  
 Energy Efficiency Class: E (EU 2019/2015)  
 Pupil Lumens Per Watt: 204.60 Plm/W  
 Radiant Power: 9.094 W  
 Pupil Factor (Kp): 1.661

### Electric Parameters

Voltage: 230.30V  
 Power Factor: 0.9520  
 Current: 0.1100A  
 Frequency: 49.99Hz  
 Power: 24.24W

### Test Information

Scan Range: 380~800:1nm  
 Stabilization Time: 0 ms  
 Max of Signal: 45266 (2331)  
 ALC.: 1.0000  
 Photometric Method: sphere-spectroradiometer  
 Photometric Condition: Sphere diameter: 2.00m, 4PI  
 CCD Integration Time: 71.45 ms

Condition: Tx:19.4'C, Ti:0.0'C, R.H.:60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-01-22 11:29:54  
 Inspector:

## Lightsource Test Report

### Product Information

Product Category: LED-Röhre  
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WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.0281	525	0.4545	38.3397	670	0.1569	13.2350
385	0.0006	0.0544	530	0.4705	39.6913	675	0.1353	11.4106
390	0.0006	0.0500	535	0.4796	40.4521	680	0.1162	9.8034
395	0.0005	0.0394	540	0.4875	41.1192	685	0.0990	8.3552
400	0.0011	0.0932	545	0.4959	41.8299	690	0.0851	7.1753
405	0.0006	0.0522	550	0.5044	42.5486	695	0.0724	6.1055
410	0.0012	0.1053	555	0.5154	43.4754	700	0.0619	5.2232
415	0.0018	0.1499	560	0.5263	44.3985	705	0.0524	4.4203
420	0.0052	0.4371	565	0.5393	45.4936	710	0.0439	3.7050
425	0.0143	1.2094	570	0.5500	46.3926	715	0.0383	3.2319
430	0.0343	2.8933	575	0.5618	47.3940	720	0.0322	2.7145
435	0.0747	6.3017	580	0.5710	48.1662	725	0.0273	2.3049
440	0.1531	12.9176	585	0.5756	48.5545	730	0.0223	1.8816
445	0.3092	26.0835	590	0.5782	48.7766	735	0.0189	1.5937
450	0.6277	52.9517	595	0.5753	48.5263	740	0.0148	1.2500
455	0.9765	82.3685	600	0.5675	47.8737	745	0.0145	1.2261
460	0.8706	73.4379	605	0.5570	46.9863	750	0.0132	1.1114
465	0.5607	47.2981	610	0.5342	45.0658	755	0.0085	0.7159
470	0.4426	37.3392	615	0.5106	43.0750	760	0.0065	0.5458
475	0.3482	29.3730	620	0.4813	40.6026	765	0.0033	0.2750
480	0.2533	21.3701	625	0.4471	37.7162	770	0.0034	0.2887
485	0.2244	18.9269	630	0.4101	34.5913	775	0.0033	0.2743
490	0.2336	19.7092	635	0.3721	31.3901	780	0.0016	0.1334
495	0.2534	21.3772	640	0.3348	28.2379	785	0.0015	0.1291
500	0.2902	24.4765	645	0.2996	25.2738	790	0.0011	0.0906
505	0.3372	28.4451	650	0.2666	22.4870	795	0.0009	0.0746
510	0.3799	32.0475	655	0.2352	19.8373	800	0.0024	0.2011
515	0.4111	34.6785	660	0.2069	17.4561			
520	0.4396	37.0860	665	0.1804	15.2136			

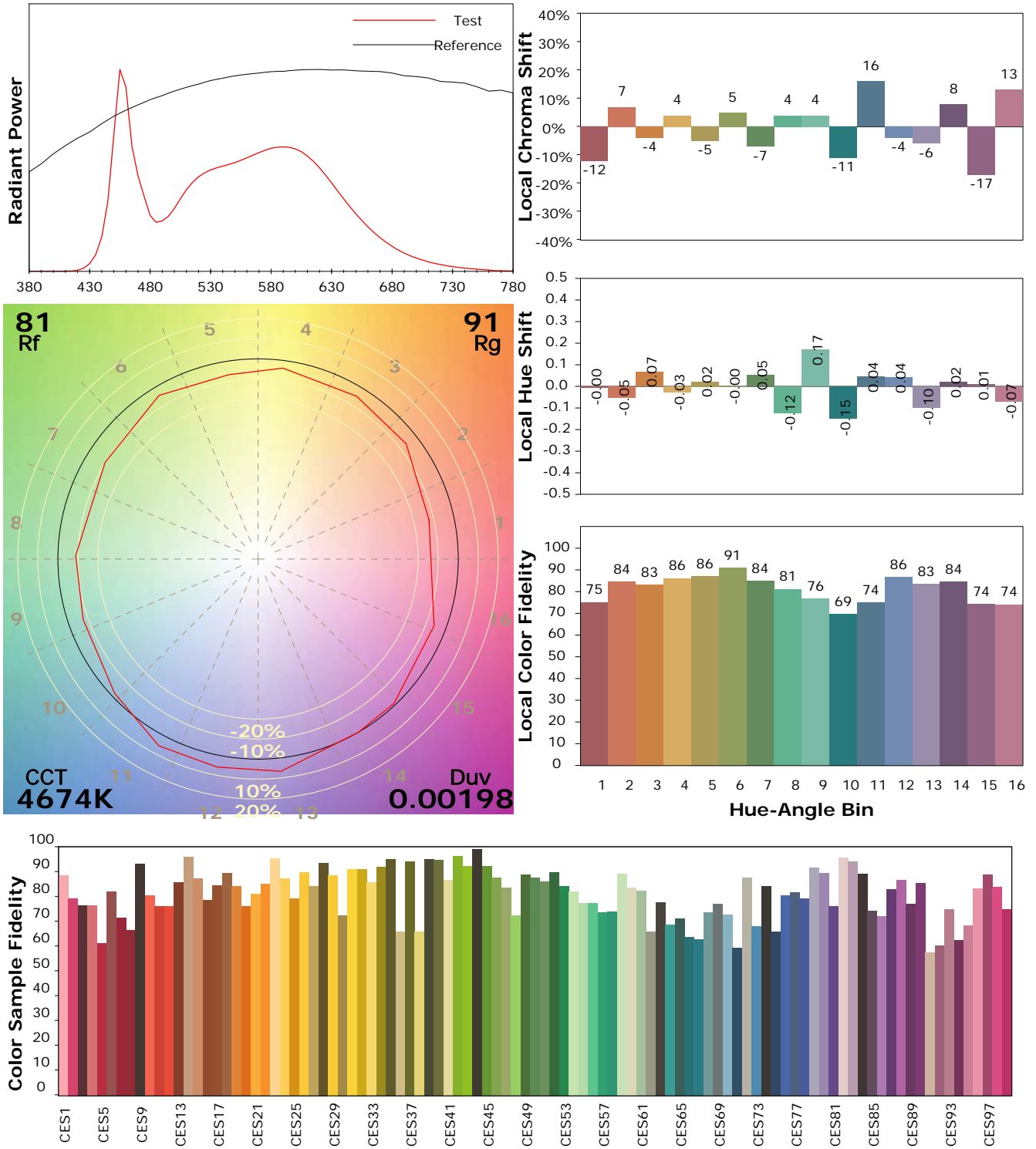
Condition: Tx: 19.4°C, Ti: 0.0°C, R.H.: 60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-01-22 11:29:54  
 Inspector:

## IES TM-30-18 Color Rendition Report

### Product Information

Product Category: LED-Röhre  
 Product Type: LED-Röhre-Spezial  
 Product Spec: Ledtube-120-T10-DWM-24W-2120-230V  
 Product Number: 1  
 Manufacturer: METOLIGHT  
 Submitted Unit: 105122  
 Buyer: 4624



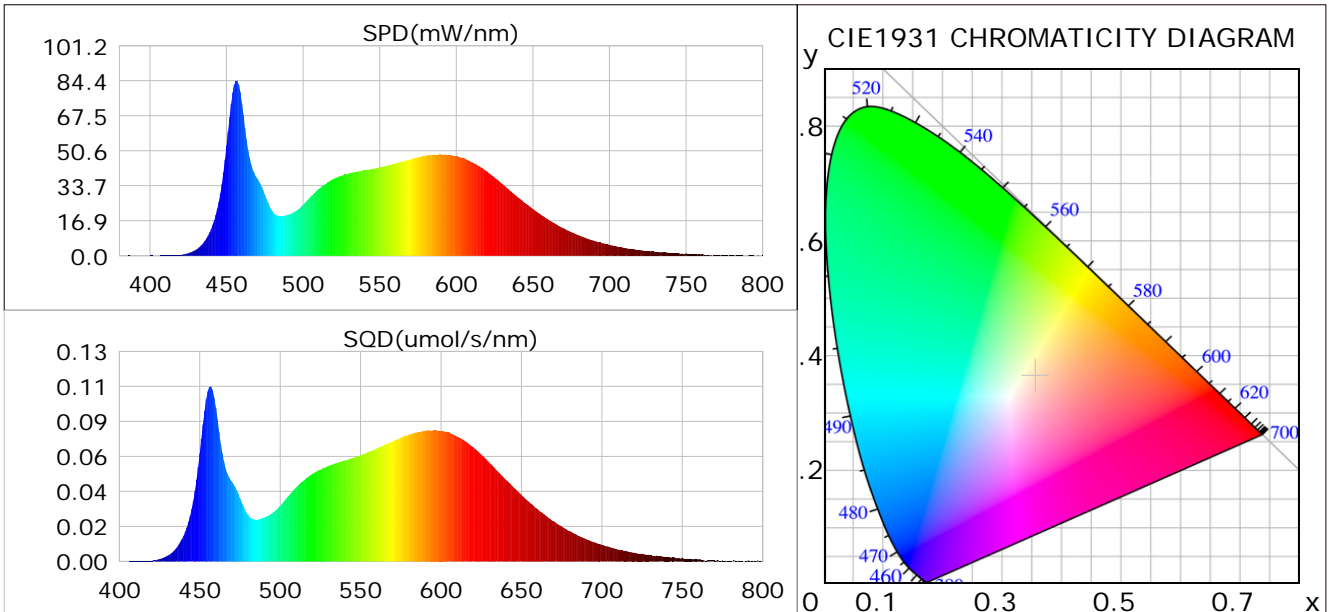
Condition: Tx: 19.4°C, Ti: 0.0°C, R.H.: 60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-01-22 11:29:54  
 Inspector:

## Plant optical param data

### CIE Colorimetric Parameters

Chromaticity coordinates:  $x=0.3556$   $y=0.3638$   $u(u')=0.2138$   $v=0.3280$   $v'=0.4920$   
 CCT:  $T_c=4674K$  ( $duv=0.00198$ ) Color Ratio:  $R=0.166$   $G=0.788$   $B=0.046$   
 Peak Wavelength: 456.5nm Half Bandwidth: 18.4nm  
 Dominant Wavelength: 574.3nm Color Purity: 0.159  
 CRI:  $R_a=83.3$



### Plant Optical Param

$ \mu_v(lm): 2985.10$	$Q_v(lm.s): 2985.10$
$ \mu_e, \dot{E}(W/nm): 9.09$	$Q_e(J): 9.09$
$ \mu_e(W): 8.96$	$ \mu_{fr}(W): 0.14$
$ \zeta_e: 0.37$	$ \zeta_{fr}: 0.01$
$PPE(umol/s/w): 1.71$	$K_{fr}: 0.03$
$Erb\_Ratio: 1.04$	$PPF(umol/s): 41.37$
$PF_{uv}(360-400)(umol/s): 0.00$	$PPF(400-500)(umol/s): 9.09$
$PPF(500-600)(umol/s): 19.39$	$PPF(600-700)(umol/s): 12.89$
$PPF_r(700-800)(umol/s): 0.84$	$PPF.t(umol): 41.37$
$ \mu_{ch-A.t}(J): 0.66$	$ \mu_{ch-A}(W): 0.66$
$ \mu_{ch-B.t}(J): 0.47$	$ \mu_{ch-B}(W): 0.47$
$ \mu_b.t(J): 2.34$	$ \mu_b(W): 2.34$
$ \mu_y.t(J): 4.21$	$ \mu_y(W): 4.21$
$ \mu_r.t(J): 2.48$	$ \mu_r(W): 2.48$

### Electric Parameters

Voltage: 230.30V	Current: 0.1100A	Power: 24.24W
Power Factor: 0.9520	Frequency: 49.99Hz	

Condition:  $T_x: 19.4^\circ C$ ,  $T_i: 0.0^\circ C$ , R.H.: 60%  
 Test Lab:  
 Operator: CRE

Test Device: Lisun LMS-9000B  
 Test Time: 2021-01-22 11:29:54  
 Inspector: