

# LM-79-08 Test Report

For

## RAB LIGHTING INC

**(Brand Name: RAB LIGHTING)**

408 W 14th St New York, NY 10014 United States

### Replacement Lamps for High Bay Luminaires (UL Type B)

Model name(s): HIDFA-150S-EX39-8CCT-BYP/480V

Test & Report By:

*Odin Wang*

Engineer: Odin Wang

Date:2023-04-04

Review By:

*Jason Luo*

Manager: Jason Luo

### 1.1 Product Information:

Organization Name	RAB LIGHTING INC	
Brand Name	RAB LIGHTING	
Model Number	HIDFA-150S-EX39-8CCT-BYP/480V	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Replacement Lamps for High Bay Luminaires (UL Type B)	
Rated Voltage / Frequency	277-480Vac, 50/60 Hz	
Nominal Power	150W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,4000K,5000K(Color tunable)	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-3080RC35003P1 L128-5080RC35003P1	
Sample Number	UTC2303033E-B1	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

**Photo**



## 1.2 Test Specifications:

Date of Receipt	2023-03-25
Date of Test	2023-03-30
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
Reference Work Instruction	BL-QP-033

## 1.3 Test Methods

### 1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ , measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 277 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at  $1\text{ }^{\circ}$  vertical intervals and  $22.5\text{ }^{\circ}$  horizontal intervals. Goniophotometer far field detector  $\theta = 1.42\%$ , Test distance: 14.14m

### 2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ . The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 277 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

Self-absorption:

AST-CLW16-150WBCDH1-ad30K:1.1201

AST-CLW16-150WBCDH1-ad40K:1.1201

AST-CLW16-150WBCDH1-ad40K:1.1201

### 3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ . The sample was operated at 277 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

## 2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2023-03-30	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	HIDFA-150S-EX39-8CCT-BYP/480V@150W 3000K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230303	277.0	60	0.554	149.56	0.974	18.13
3E-B1	480.0	60	0.340	153.92	0.943	14.27
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

### Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia

#### THD 400S A15 TB:

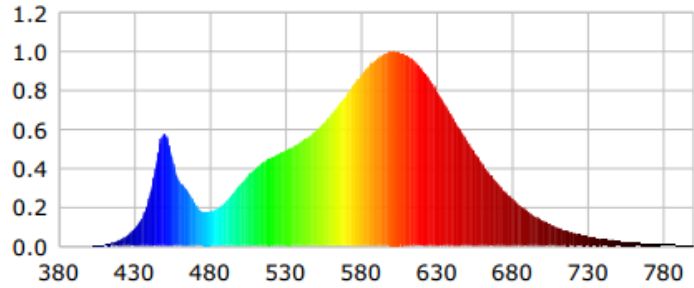
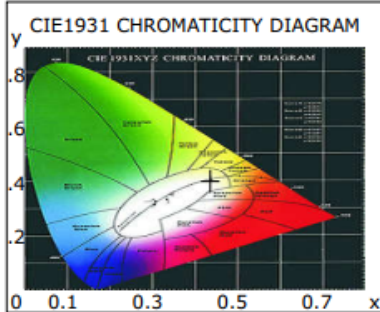
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	79	R9	-1
Frequency (Hz)	60	R2	90	R10	78
CCT (K)	3009	R3	96	R11	79
Duv	-0.0011	R4	79	R12	72
Chromaticity (x, y)	x=0.4346 y=0.4005	R5	80	R13	82
Chromaticity (u', v')	u(u')=0.2506 v'=0.5196	R6	89	R14	98
Color Rendering Index (CRI)	81	R7	80	R15	71
R9	-1	R8	55	--	--
Rf	84	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-12	--	--	--	--

### Photometric Measurement – Goniophotometer Method in Lithonia THD 400S

#### A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	277.0	480.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	17947.1	18063.6	>=10000(-10%)
Luminous Efficacy (lm/W)	120.00	117.36	Standard: >= 120(-3%)
Most worst Luminous/Highest	116.60		
Zonal lumens in the 20-50° (%)	57.2		>=30%(-10%)
Beam Angle (°)	119.0	--	--
Center Beam Candle Power (cd)	3476	--	--

**Spectral Power Distribution & Chromaticity Diagram**



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0004	0.2140	535	0.4730	225.7526	690	0.3225	153.9355
385	0.0001	0.0679	540	0.4906	234.1752	695	0.2792	133.2756
390	0.0005	0.2232	545	0.5102	243.5006	700	0.2428	115.9030
395	0.0004	0.1680	550	0.5353	255.5116	705	0.2086	99.5856
400	0.0010	0.4901	555	0.5595	267.0658	710	0.1793	85.5945
405	0.0027	1.2990	560	0.5924	282.7390	715	0.1541	73.5436
410	0.0069	3.3059	565	0.6288	300.1194	720	0.1315	62.7434
415	0.0155	7.3812	570	0.6745	321.9650	725	0.1122	53.5609
420	0.0299	14.2709	575	0.7222	344.7149	730	0.0947	45.1889
425	0.0521	24.8818	580	0.7724	368.6915	735	0.0808	38.5767
430	0.0871	41.5697	585	0.8272	394.8132	740	0.0694	33.1366
435	0.1435	68.5171	590	0.8782	419.1929	745	0.0586	27.9774
440	0.2501	119.3710	595	0.9216	439.8752	750	0.0497	23.7211
445	0.4490	214.2904	600	0.9584	457.4552	755	0.0423	20.1780
450	0.5794	276.5629	605	0.9861	470.6510	760	0.0353	16.8690
455	0.4571	218.1605	610	1.0000	477.3055	765	0.0314	14.9890
460	0.3350	159.8796	615	0.9982	476.4450	770	0.0260	12.4191
465	0.2875	137.2347	620	0.9818	468.6383	775	0.0224	10.6931
470	0.2204	105.2033	625	0.9528	454.7882	780	0.0187	8.9167
475	0.1780	84.9798	630	0.9093	434.0209	785	0.0158	7.5332
480	0.1769	84.4465	635	0.8587	409.8517	790	0.0146	6.9470
485	0.1924	91.8365	640	0.7970	380.4142	795	0.0120	5.7496
490	0.2220	105.9467	645	0.7348	350.7046	800	0.0094	4.4914
495	0.2671	127.5003	650	0.6706	320.0600			
500	0.3166	151.1248	655	0.6036	288.1046			
505	0.3582	170.9901	660	0.5411	258.2861			
510	0.3967	189.3563	665	0.4799	229.0783			
515	0.4271	203.8683	670	0.4231	201.9579			
520	0.4510	215.2486	675	0.3704	176.8054			
525	0.4730	225.7526	680	0.3225	153.9355			
530	0.4906	234.1752	685	0.2792	133.2756			

**TM30**

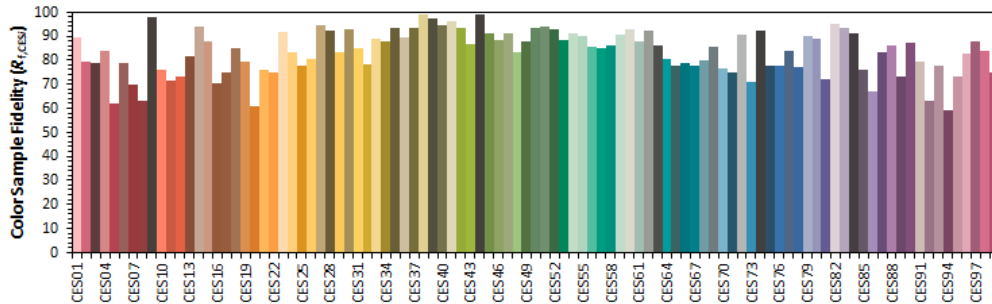
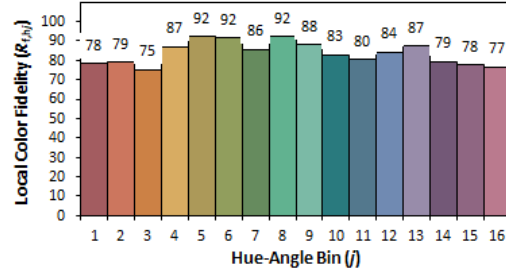
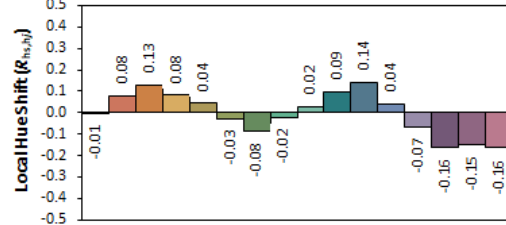
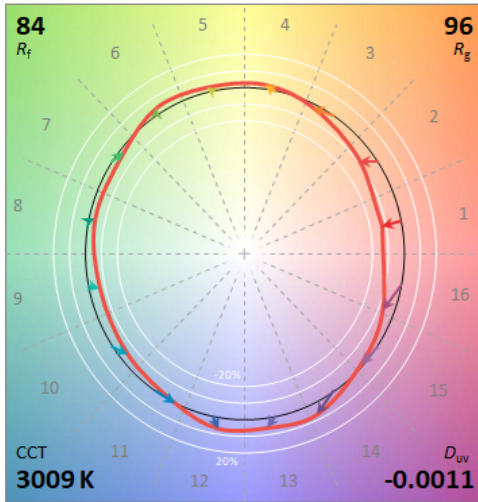
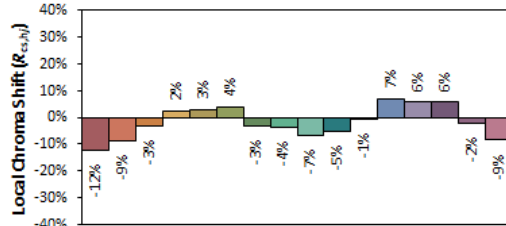
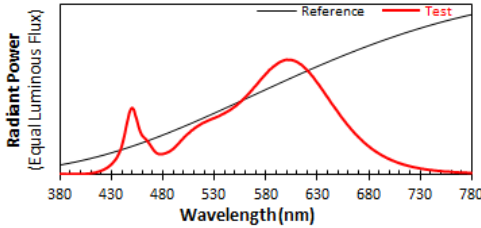
**ANSI/IES TM-30-18 Color Rendition Report**

**Source:** L128-3080RC35003P1

**Manufacturer:** ASmart LIGHT CO., LTD

**Date:** 2023/3/30

**Model:** AST-CLW16-150WBCDH1-ad30K



**Notes:** This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.4346  
 $y$  0.4005  
 $u'$  0.2507  
 $v'$  0.5196

CIE 13.3-1995  
(CRI)  
 $R_a$  81  
 $R_g$  -1

are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version

## Zonal Lumen Tabulation

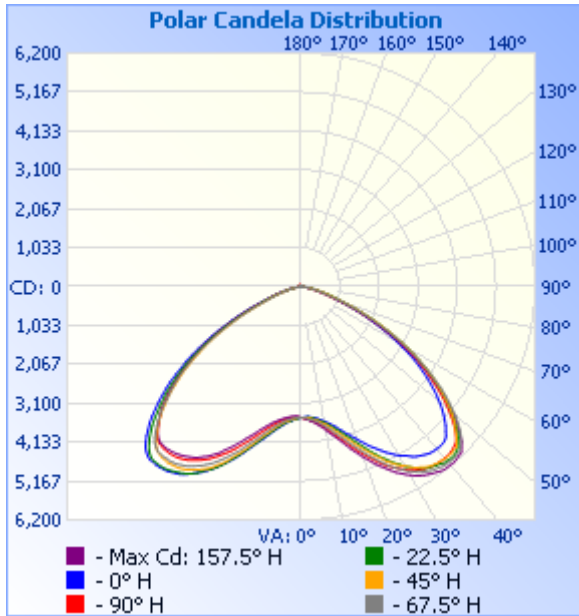
### Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	3,881.9	21.6%	21.6%
0-40	7,494.6	41.8%	41.8%
0-60	15,354.9	85.6%	85.6%
60-90	2,497.9	13.9%	13.9%
70-100	645.7	3.6%	3.6%
90-120	27.2	0.2%	0.2%
0-90	17,852.9	99.5%	99.5%
90-180	92.5	0.5%	0.5%
0-180	17,945.3	100%	100%

### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	344.8	1.9%	90-100	6.8	0%
10-20	1,181.2	6.6%	100-110	9.5	0.1%
20-30	2,355.9	13.1%	110-120	10.8	0.1%
30-40	3,612.7	20.1%	120-130	10.9	0.1%
40-50	4,301.1	24.0%	130-140	15.8	0.1%
50-60	3,559.2	19.8%	140-150	16.9	0.1%
60-70	1,859.0	10.4%	150-160	12.6	0.1%
70-80	553.3	3.1%	160-170	6.9	0%
80-90	85.6	0.5%	170-180	2.2	0%

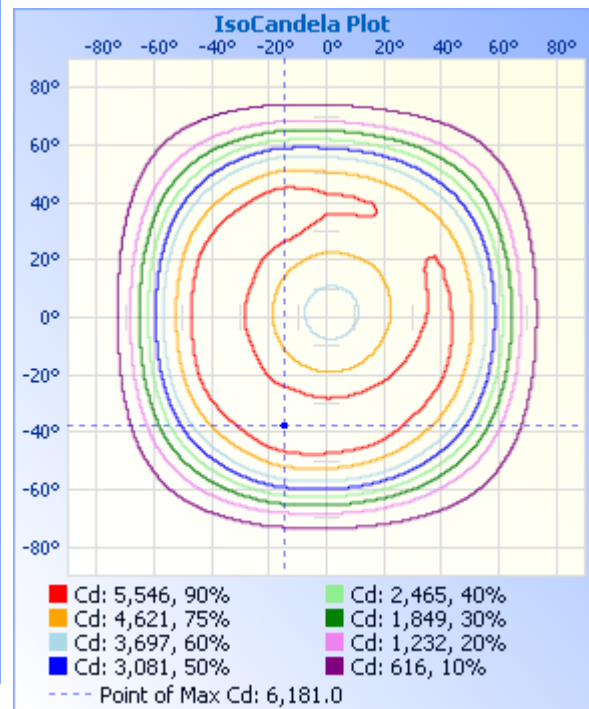
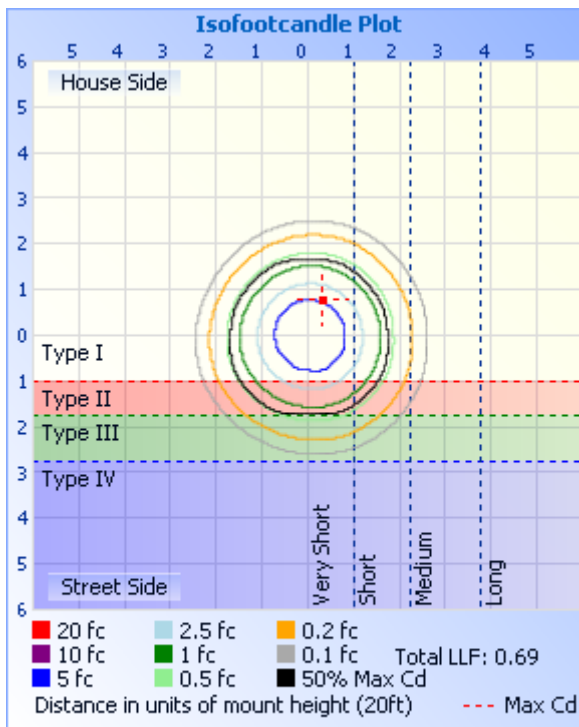
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
17.0ft	12.0 fc	56.7 ft	39.7 ft
34.0ft	3.01 fc	113.5 ft	79.4 ft
51.0ft	1.34 fc	170.2 ft	119.1 ft
68.0ft	0.75 fc	227.0 ft	158.8 ft
85.0ft	0.48 fc	283.7 ft	198.5 ft
102.0ft	0.33 fc	340.5 ft	238.2 ft

■ Vert. Spread: 118.1°  
■ Horiz. Spread: 98.9°



**Candela Table - Type C**

Laboratory: UTEST TECHNICAL LABORATORY CO.LTD A2LA Certificate# 4810.01  
Unit 401, No. 309 Xinxin Seven Road, Zengcheng District,  
Guangzhou, People's Republic of China engineer@etk-utest.com

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	3476	3476	3476	3476	3476	3476	3476	3476	3476	3476	3476	3476	3476	3476	3476	3476	3476
1	3472	3477	3473	3486	3494	3489	3489	3493	3493	3491	3479	3468	3472	3464	3457	3453	3472
2	3462	3476	3485	3491	3511	3509	3513	3515	3503	3515	3495	3486	3474	3456	3443	3444	3462
3	3458	3467	3488	3520	3532	3533	3545	3539	3530	3530	3516	3506	3479	3456	3449	3450	3458
4	3475	3491	3510	3542	3559	3565	3569	3578	3568	3562	3535	3512	3488	3467	3460	3455	3475
5	3487	3508	3531	3559	3590	3600	3603	3605	3593	3593	3566	3541	3511	3487	3474	3474	3487
6	3509	3530	3556	3579	3627	3637	3654	3648	3627	3621	3596	3569	3530	3505	3493	3493	3509
7	3529	3566	3588	3626	3664	3686	3697	3696	3685	3666	3630	3595	3557	3526	3519	3521	3529
8	3570	3601	3624	3667	3706	3731	3749	3747	3736	3715	3675	3648	3593	3549	3545	3550	3570
9	3600	3630	3672	3723	3763	3790	3806	3802	3790	3778	3724	3692	3623	3582	3575	3582	3600
10	3637	3675	3711	3778	3827	3857	3870	3881	3858	3826	3785	3743	3670	3619	3606	3614	3637
11	3688	3726	3771	3836	3894	3927	3949	3955	3923	3902	3859	3804	3727	3675	3649	3661	3688
12	3728	3785	3824	3902	3970	4012	4027	4026	4007	3977	3931	3873	3787	3726	3698	3701	3728
13	3790	3849	3916	3993	4054	4098	4100	4108	4078	4052	4009	3935	3849	3783	3756	3763	3790
14	3841	3914	3984	4062	4136	4175	4187	4202	4166	4139	4088	4024	3919	3850	3815	3828	3841
15	3926	3980	4060	4145	4217	4261	4278	4286	4246	4230	4173	4109	3998	3919	3885	3897	3926
16	3988	4069	4152	4233	4306	4358	4364	4393	4344	4331	4262	4198	4079	3990	3955	3963	3988
17	4074	4156	4232	4337	4411	4467	4472	4507	4443	4417	4382	4293	4163	4072	4017	4055	4074
18	4137	4233	4328	4425	4515	4567	4577	4600	4543	4534	4470	4377	4253	4151	4100	4134	4137
19	4230	4339	4429	4533	4617	4665	4672	4704	4658	4629	4586	4481	4347	4240	4174	4215	4230
20	4303	4434	4525	4635	4712	4763	4771	4814	4762	4749	4698	4589	4436	4329	4262	4302	4303
21	4401	4541	4631	4742	4816	4874	4868	4919	4877	4854	4788	4701	4533	4424	4342	4406	4401
22	4486	4650	4725	4851	4916	4979	4968	5026	4979	4959	4908	4792	4639	4530	4422	4504	4486
23	4589	4774	4838	4955	5015	5107	5069	5133	5079	5080	5028	4891	4736	4624	4515	4605	4589
24	4669	4880	4934	5067	5117	5214	5167	5234	5181	5190	5134	4999	4826	4704	4594	4694	4669
25	4756	4995	5035	5179	5216	5309	5255	5330	5294	5290	5224	5093	4918	4809	4671	4788	4756
26	4845	5091	5159	5282	5306	5398	5340	5431	5384	5386	5329	5186	5008	4905	4753	4908	4845
27	4940	5215	5247	5386	5392	5491	5428	5537	5481	5463	5425	5276	5092	4995	4835	4990	4940
28	5013	5311	5349	5470	5466	5574	5501	5615	5577	5543	5489	5355	5179	5078	4912	5071	5013
29	5101	5400	5424	5566	5541	5659	5575	5702	5647	5655	5553	5428	5252	5148	4979	5159	5101
30	5176	5519	5498	5658	5620	5735	5645	5782	5730	5730	5614	5495	5316	5227	5047	5220	5176

31	5243	5591	5593	5722	5687	5804	5708	5858	5802	5792	5676	5561	5378	5286	5102	5293	5243
32	5298	5672	5667	5805	5743	5865	5769	5916	5875	5849	5737	5628	5434	5347	5164	5351	5298
33	5379	5751	5723	5873	5794	5921	5814	5977	5935	5896	5768	5674	5494	5406	5212	5397	5379
34	5442	5818	5790	5916	5839	5969	5851	6016	5971	5933	5811	5706	5536	5444	5260	5441	5442
35	5483	5876	5841	5971	5873	6007	5888	6061	6011	5977	5827	5754	5571	5482	5299	5479	5483
36	5525	5904	5878	6013	5902	6037	5912	6095	6053	6007	5841	5774	5603	5523	5338	5515	5525
37	5565	5954	5898	6027	5919	6064	5928	6137	6066	6040	5862	5795	5622	5551	5370	5541	5565
38	5595	5974	5923	6067	5929	6085	5943	6169	6090	6052	5854	5791	5637	5570	5403	5561	5595
39	5604	6026	5932	6085	5937	6102	5953	6163	6100	6048	5854	5811	5642	5583	5401	5581	5604
40	5614	6034	5959	6091	5940	6106	5950	6175	6091	6061	5826	5799	5637	5583	5406	5591	5614
41	5618	6049	5962	6102	5933	6095	5942	6181	6100	6041	5811	5799	5628	5587	5404	5580	5618
42	5608	6047	5959	6095	5923	6083	5932	6160	6071	5993	5741	5746	5610	5578	5398	5581	5608
43	5588	6015	5932	6076	5893	6048	5904	6140	6017	5914	5641	5689	5569	5561	5380	5542	5588
44	5530	5974	5925	6054	5860	6020	5870	6124	5944	5808	5523	5588	5488	5492	5317	5468	5530
45	5422	5880	5841	5979	5810	5961	5816	6015	5825	5687	5414	5462	5374	5399	5227	5389	5422
46	5328	5791	5726	5905	5710	5868	5707	5920	5698	5542	5277	5322	5265	5281	5129	5273	5328
47	5212	5672	5592	5793	5588	5737	5583	5763	5545	5398	5124	5171	5137	5153	5008	5142	5212
48	5082	5523	5499	5659	5443	5578	5442	5608	5408	5226	4973	5012	5003	5019	4884	5015	5082
49	4954	5382	5356	5502	5281	5415	5289	5448	5233	5032	4796	4844	4870	4880	4745	4871	4954
50	4802	5214	5211	5350	5119	5243	5133	5270	5042	4865	4636	4641	4706	4722	4597	4697	4802
51	4647	5067	5056	5151	4940	5062	4929	5072	4863	4680	4458	4478	4532	4553	4451	4533	4647
52	4476	4878	4879	4979	4756	4848	4750	4876	4672	4513	4253	4309	4339	4369	4258	4374	4476
53	4304	4699	4694	4789	4560	4648	4543	4676	4476	4299	4069	4121	4155	4196	4088	4190	4304
54	4140	4518	4518	4591	4346	4451	4343	4465	4285	4101	3874	3928	3966	4012	3914	4019	4140
55	3949	4316	4322	4367	4150	4237	4141	4232	4049	3894	3654	3710	3769	3818	3731	3825	3949
56	3773	4123	4106	4156	3947	3997	3917	4022	3825	3681	3440	3512	3569	3621	3541	3633	3773
57	3574	3921	3905	3937	3734	3777	3706	3803	3627	3457	3228	3302	3363	3427	3334	3451	3574
58	3364	3688	3694	3717	3498	3547	3482	3583	3409	3231	3023	3085	3135	3202	3139	3232	3364
59	3144	3493	3485	3496	3254	3308	3252	3341	3172	2993	2810	2845	2921	2985	2941	3039	3144
60	2944	3280	3273	3248	3034	3079	3025	3129	2931	2757	2597	2628	2712	2788	2746	2824	2944
61	2740	3045	3045	3031	2823	2867	2786	2876	2710	2554	2348	2400	2498	2581	2547	2623	2740
62	2537	2818	2814	2800	2570	2624	2571	2647	2490	2302	2128	2184	2286	2360	2330	2411	2537

63	2332	2577	2610	2574	2352	2400	2352	2398	2242	2089	1935	1971	2065	2129	2129	2190	2332
64	2111	2369	2390	2328	2163	2175	2146	2184	2025	1873	1737	1749	1871	1940	1922	1992	2111
65	1931	2185	2178	2120	1946	1977	1922	1970	1825	1678	1528	1543	1664	1740	1717	1796	1931
66	1750	1957	1950	1913	1735	1756	1711	1767	1623	1471	1314	1361	1467	1553	1549	1591	1750
67	1538	1739	1744	1723	1560	1537	1532	1560	1436	1252	1147	1166	1298	1364	1358	1413	1538
68	1361	1549	1562	1526	1372	1369	1367	1353	1232	1128	1023	993	1113	1170	1168	1222	1361
69	1174	1323	1378	1321	1186	1186	1162	1180	1073	998	909	888	964	1001	1021	1055	1174
70	1062	1176	1168	1162	1020	996	990	999	937	881	815	789	858	891	903	937	1062
71	960	1049	1053	992	822	817	829	866	829	767	721	703	765	795	806	842	960
72	855	951	937	829	724	695	721	740	721	682	627	613	675	721	731	773	855
73	773	847	824	723	623	603	619	650	637	581	532	527	601	624	649	684	773
74	676	744	730	640	549	519	542	573	541	505	453	443	501	543	564	597	676
75	573	637	643	559	476	459	474	487	462	435	401	390	426	452	475	504	573
76	498	552	546	483	400	385	395	414	395	372	344	330	366	393	409	434	498
77	436	476	468	403	335	327	334	348	340	322	296	276	308	341	361	378	436
78	374	410	403	343	283	268	285	297	288	276	249	238	260	285	304	334	374
79	322	362	350	300	240	222	244	252	247	227	209	199	223	236	255	275	322
80	275	304	300	252	194	187	200	209	201	187	167	166	177	204	223	240	275
81	228	260	247	209	163	151	164	172	157	148	137	131	144	167	180	200	228
82	186	215	213	178	124	119	124	138	126	115	105	102	111	128	149	157	186
83	152	168	161	136	99	96	88	104	98	91	80	85	90	105	117	128	152
84	119	132	138	112	79	70	74	83	75	67	63	65	65	73	96	101	119
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## 2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2023-03-30	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-150S-EX39-8CCT-BYP/480V@150W 4000K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230303	277.0	60	0.533	143.83	0.974	18.02
3E-B1	480.0	60	0.327	147.92	0.943	14.29
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

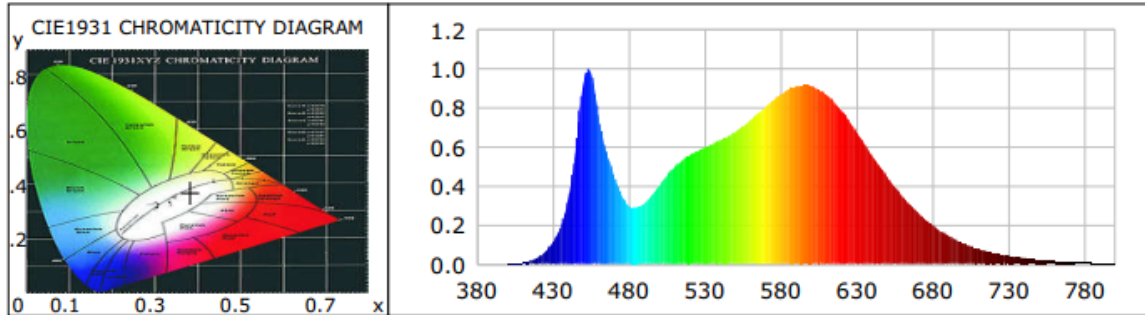
### Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia THD 400S A15 TB:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	83	R9	9
Frequency (Hz)	60	R2	92	R10	80
CCT (K)	3919	R3	95	R11	80
Duv	-0.0028	R4	81	R12	65
Chromaticity (x, y)	x=0.3820 y=0.3717	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2282 v'(v')=0.4996	R6	88	R14	98
Color Rendering Index (CRI)	84	R7	83	R15	77
R9	9	R8	63	--	--
Rf	84	--	--	--	--
Rg	95	--	--	--	--
Rcs,h1(%)	-12	--	--	--	--

### Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	277.0	480.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	19650.1	19830.2	>= 1000(-10%)
Luminous Efficacy (lm/W)	136.62	134.06	Standard: >= 105(-3%)
Most worst Luminous/Highest	132.84		

**Spectral Power Distribution & Chromaticity Diagram**



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0004	0.2041	535	0.5789	282.0334	690	0.2643	128.7381
385	0.0007	0.3633	540	0.5961	290.3777	695	0.2287	111.4003
390	0.0007	0.3606	545	0.6130	298.6259	700	0.1977	96.3165
395	0.0006	0.2867	550	0.6339	308.7943	705	0.1706	83.1016
400	0.0015	0.7490	555	0.6524	317.8199	710	0.1466	71.4019
405	0.0032	1.5758	560	0.6770	329.8219	715	0.1259	61.3325
410	0.0072	3.5242	565	0.7041	343.0049	720	0.1072	52.2136
415	0.0169	8.2131	570	0.7382	359.5986	725	0.0916	44.6032
420	0.0336	16.3887	575	0.7712	375.7112	730	0.0788	38.3906
425	0.0626	30.4927	580	0.8035	391.4107	735	0.0666	32.4553
430	0.1096	53.4006	585	0.8390	408.7316	740	0.0573	27.8924
435	0.1877	91.4361	590	0.8709	424.2437	745	0.0486	23.6838
440	0.3235	157.6113	595	0.8931	435.0720	750	0.0415	20.2005
445	0.5871	286.0219	600	0.9100	443.3189	755	0.0352	17.1485
450	0.9152	445.8471	605	0.9171	446.7472	760	0.0306	14.8943
455	0.9825	478.6342	610	0.9144	445.4771	765	0.0260	12.6501
460	0.7728	376.4755	615	0.8969	436.9118	770	0.0213	10.3854
465	0.5826	283.8305	620	0.8677	422.7044	775	0.0187	9.1103
470	0.4631	225.6055	625	0.8320	405.3273	780	0.0160	7.7763
475	0.3585	174.6471	630	0.7835	381.6662	785	0.0140	6.8080
480	0.2981	145.2003	635	0.7334	357.2870	790	0.0121	5.8835
485	0.2907	141.6194	640	0.6747	328.6630	795	0.0106	5.1792
490	0.3105	151.2419	645	0.6180	301.0723	800	0.0085	4.1346
495	0.3493	170.1480	650	0.5592	272.4379			
500	0.4002	194.9407	655	0.5014	244.2541			
505	0.4499	219.1519	660	0.4460	217.2664			
510	0.4960	241.6463	665	0.3948	192.3324			
515	0.5302	258.2971	670	0.3467	168.8790			
520	0.5572	271.4638	675	0.3037	147.9673			
525	0.5789	282.0334	680	0.2643	128.7381			
530	0.5961	290.3777	685	0.2287	111.4003			

**TM30**

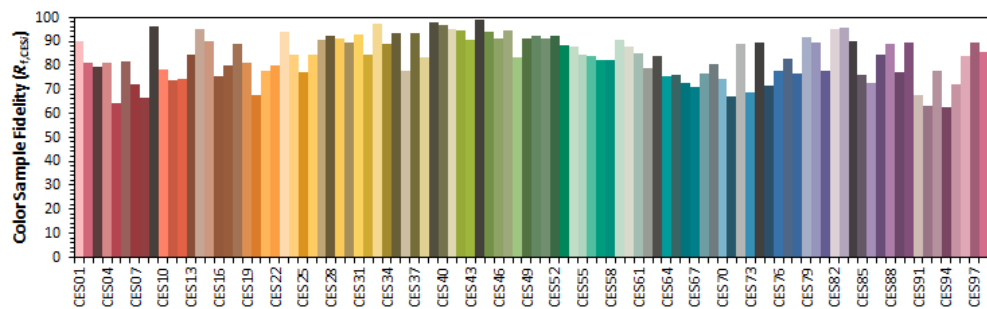
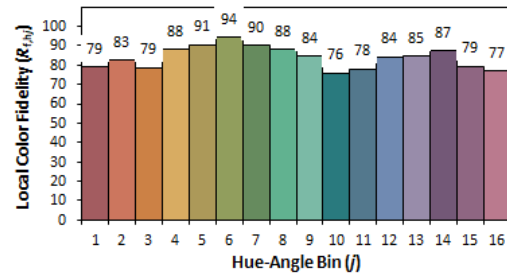
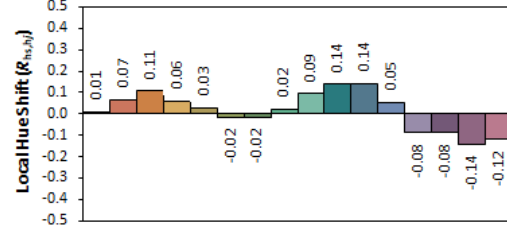
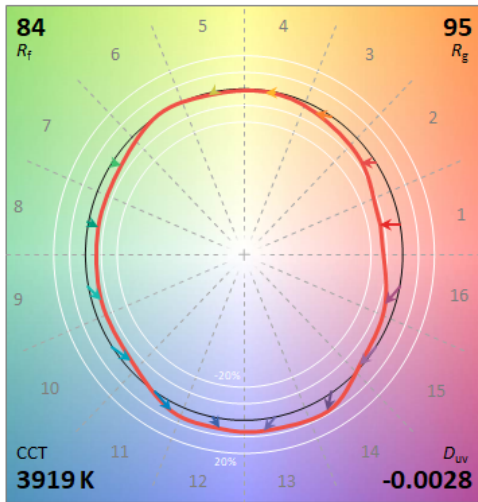
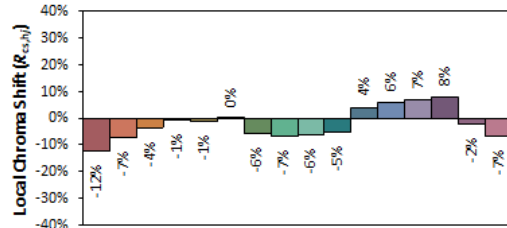
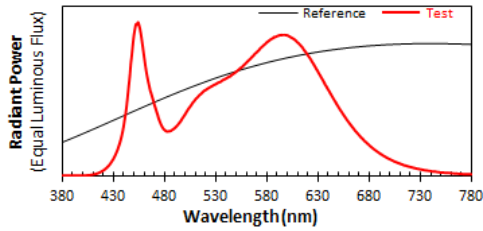
**ANSI/IES TM-30-18 Color Rendition Report**

**Source:** L128-3080RC35003P1  
L128-5080RC35003P1

**Date:** 2023-03-30

**Manufacturer:** ASMART LIGHT CO., LTD

**Model:** AST-CLW16-150WBCDH1-ad40K



**Notes:** This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.3820  
 $y$  0.3717  
 $u'$  0.2282  
 $v'$  0.4996

CIE 13.3-1995 (CRI)  
 $R_a$  84  
 $R_g$  9

are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version

### 2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2023-03-30	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	HIDFA-150S-EX39-8CCT-BYP/480V@150W 5000K		

#### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230303	277.0	60	0.555	149.66	0.973	18.23
3E-B1	480.0	60	0.340	154.00	0.944	14.26
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

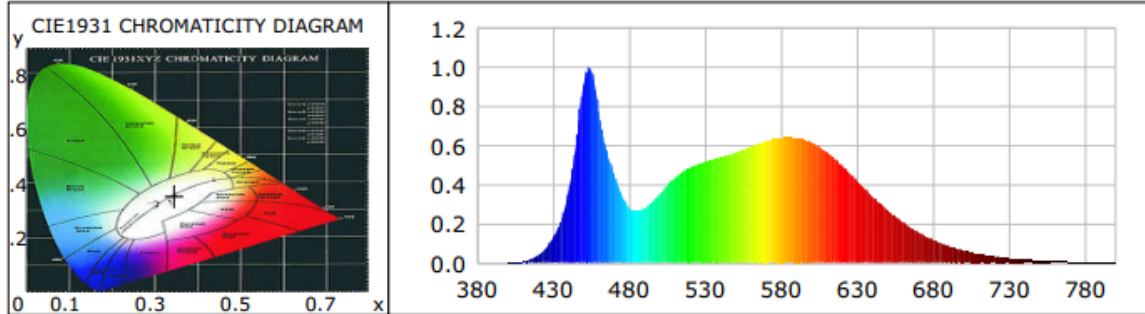
#### Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia THD 400S A15 TB:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	81	R9	1
Frequency (Hz)	60	R2	90	R10	75
CCT (K)	5009	R3	94	R11	79
Duv	0.0004	R4	81	R12	62
Chromaticity (x, y)	x=0.3449 y=0.3522	R5	82	R13	83
Chromaticity (u', v')	u(u')=0.2111 v'(v')=0.4849	R6	85	R14	97
Color Rendering Index (CRI)	82	R7	84	R15	75
R9	1	R8	64	--	--
Rf	83	--	--	--	--
Rg	94	--	--	--	--
Rcs,h1(%)	-14	--	--	--	--

#### Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	277.0	480.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	19270.2	19414.8	>=10000(-10%)
Luminous Efficacy (lm/W)	128.76	126.07	Standard: >= 120(-3%)
Most worst Luminous/Highest	125.13		

**Spectral Power Distribution & Chromaticity Diagram**



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0007	0.4139	535	0.5038	314.0491	690	0.1576	98.2166
385	0.0006	0.3588	540	0.5170	322.2425	695	0.1355	84.4351
390	0.0003	0.1594	545	0.5277	328.9041	700	0.1180	73.5817
395	0.0006	0.3665	550	0.5410	337.2353	705	0.1016	63.3443
400	0.0018	1.0965	555	0.5504	343.0974	710	0.0871	54.2695
405	0.0035	2.1522	560	0.5645	351.8368	715	0.0746	46.5224
410	0.0081	5.0437	565	0.5785	360.5686	720	0.0639	39.8391
415	0.0190	11.8238	570	0.5967	371.9333	725	0.0551	34.3513
420	0.0388	24.1725	575	0.6104	380.4744	730	0.0462	28.7781
425	0.0721	44.9555	580	0.6225	388.0132	735	0.0395	24.5911
430	0.1261	78.5902	585	0.6356	396.1642	740	0.0342	21.3345
435	0.2127	132.5514	590	0.6421	400.2340	745	0.0294	18.3179
440	0.3562	222.0329	595	0.6438	401.2613	750	0.0249	15.5039
445	0.6065	378.0309	600	0.6404	399.1726	755	0.0207	12.9143
450	0.9070	565.3216	605	0.6313	393.4783	760	0.0180	11.1928
455	0.9864	614.8100	610	0.6184	385.4780	765	0.0159	9.9116
460	0.7857	489.7180	615	0.5954	371.1279	770	0.0128	7.9665
465	0.5783	360.4329	620	0.5660	352.8041	775	0.0118	7.3431
470	0.4563	284.4292	625	0.5339	332.8025	780	0.0088	5.5075
475	0.3511	218.8406	630	0.4973	309.9801	785	0.0079	4.9365
480	0.2819	175.7128	635	0.4584	285.7240	790	0.0071	4.4050
485	0.2665	166.1296	640	0.4184	260.7884	795	0.0062	3.8754
490	0.2794	174.1585	645	0.3797	236.6899	800	0.0045	2.7738
495	0.3099	193.1756	650	0.3412	212.7000			
500	0.3524	219.6452	655	0.3036	189.2117			
505	0.3945	245.9137	660	0.2693	167.8493			
510	0.4346	270.9206	665	0.2365	147.4043			
515	0.4644	289.4511	670	0.2076	129.3812			
520	0.4865	303.2218	675	0.1810	112.8481			
525	0.5038	314.0491	680	0.1576	98.2166			
530	0.5170	322.2425	685	0.1355	84.4351			

**TM-30**

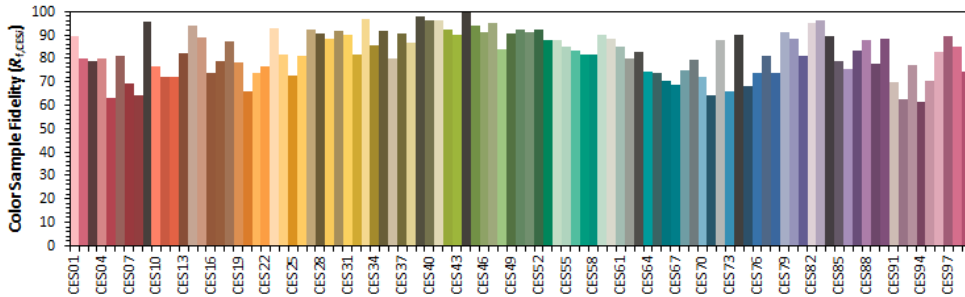
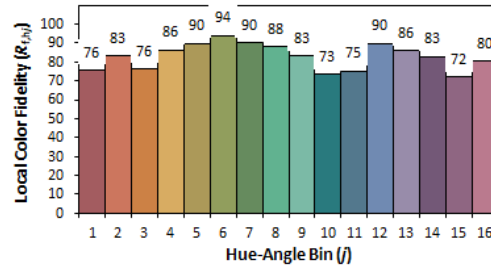
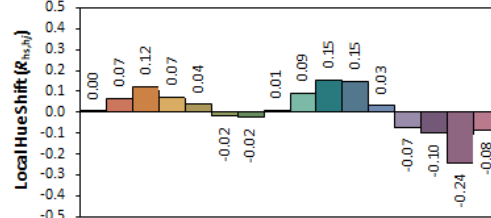
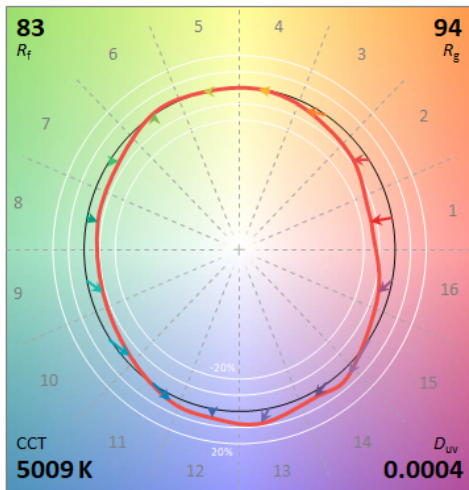
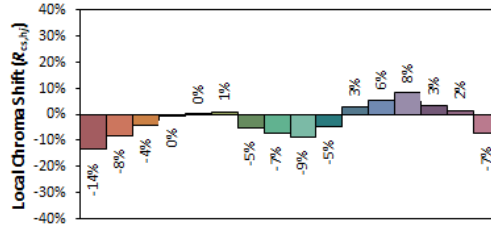
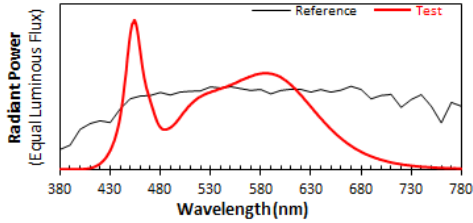
**ANSI/IES TM-30-18 Color Rendition Report**

Source: L128-5080RC35003P1

Manufacturer: ASHART LIGHT CO., LTD

Date: 2023/3/30

Model: AST-CLW16-150WBCDH1-ad50K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.3449  
 $y$  0.3522  
 $u'$  0.2111  
 $v'$  0.4849

CIE 13.3-1995  
(CRI)  
 $R_a$  82  
 $R_g$  1

are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version

### 3. Test Equipment

Equipment Name	Model No.	Serial No.	Calibration Date
Goniophotometric System	GPM-3000	DYHXF120001	2023-01-17
AC Power Source	CHP-500C	DYBWD010159	2023-01-18
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2023-02-01
Digital Power Meter	WT500	DYDWQ20010	2023-01-18
Integral Sphere (2M)	2M	DYJCE120067	2023-01-17
Digital Power Meter	WT500	DYDWQ200006	2023-01-18
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2023-01-17

Expand Uncertainty:  
Photometric Measurement (Sphere): 2.08%, k=2  
Chromaticity Measurement(Sphere):25.6K, k=2  
Photometric Measurement(Goniophotometer):2.645%, k=2

\*\*\*\*\* END OF REPORT \*\*\*\*\*

## 2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2024-09-20	<b>Test Ambient:</b>	25.3 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	HIDFA-150S-EX39-8CCT-BYP/480V @115W 3000K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	277.0	60	0.419	111.72	0.970	14.3
	480.0	60	0.275	122.18	0.926	17.6
<b>DLC Pass Criteria</b>					$\geq 0.9(-3\%)$	$\leq 20(+5)$

### Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia

#### THD 400S A15 TB:

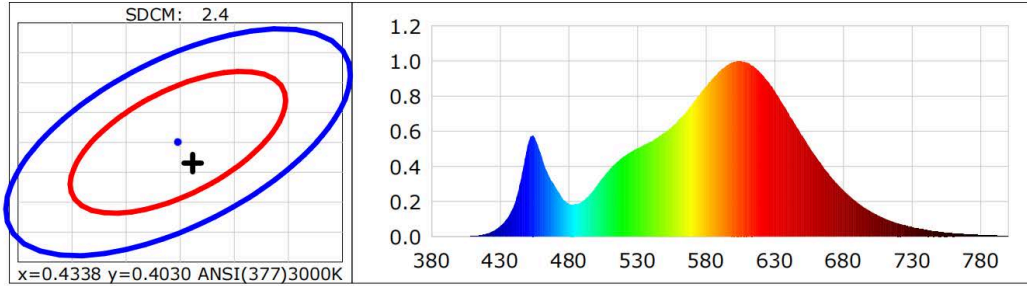
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	82	R9	8
Frequency (Hz)	60	R2	92	R10	81
CCT (K)	2993	R3	96	R11	80
Duv	-0.00158	R4	81	R12	71
Chromaticity (x, y)	x=0.4352 y=0.3995	R5	82	R13	84
Chromaticity (u', v')	u(u')=0.2514 v'(v')=0.5193	R6	90	R14	99
Color Rendering Index (CRI)	82.7	R7	81	R15	74
R9	8	R8	59	--	--
Rf	84	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-12	--	--	--	--

### Photometric Measurement – Goniophotometer Method in Lithonia THD 400S

#### A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	277.0	480.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	17790.7	19560.5	$\geq 10000(-10\%)$
Luminous Efficacy (lm/W)	159.24	160.09	Standard: $\geq 120(-3\%)$
Most worst Luminous/Highest	158.39		
Zonal lumens in the 20-50° (%)	13.8	--	$\geq 30(-10\%)$
Beam Angle (°)	164.7	--	--
Center Beam Candle Power (cd)	766.9	--	--

## Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0448	525	0.4820	183.8726	670	0.3479	132.7224
385	0.0000	0.0014	530	0.5040	192.2709	675	0.3043	116.0769
390	0.0000	0.0163	535	0.5238	199.8411	680	0.2634	100.4824
395	0.0006	0.2108	540	0.5415	206.6023	685	0.2278	86.9141
400	0.0005	0.1869	545	0.5681	216.7508	690	0.1956	74.6306
405	0.0007	0.2635	550	0.5950	227.0029	695	0.1669	63.6922
410	0.0034	1.2827	555	0.6280	239.6048	700	0.1430	54.5711
415	0.0077	2.9320	560	0.6670	254.4735	705	0.1219	46.5149
420	0.0171	6.5065	565	0.7063	269.4733	710	0.1036	39.5172
425	0.0333	12.7206	570	0.7564	288.5823	715	0.0885	33.7742
430	0.0619	23.6302	575	0.8075	308.0738	720	0.0756	28.8239
435	0.1051	40.0964	580	0.8555	326.3730	725	0.0640	24.4109
440	0.1811	69.1042	585	0.9046	345.1311	730	0.0540	20.6040
445	0.3270	124.7584	590	0.9445	360.3514	735	0.0460	17.5598
450	0.5232	199.5962	595	0.9764	372.5138	740	0.0383	14.6239
455	0.5640	215.1733	600	0.9971	380.4002	745	0.0325	12.4170
460	0.4586	174.9513	605	0.9962	380.0528	750	0.0276	10.5384
465	0.3499	133.4830	610	0.9906	377.9459	755	0.0231	8.8216
470	0.2851	108.7558	615	0.9656	368.3710	760	0.0190	7.2493
475	0.2212	84.4024	620	0.9288	354.3517	765	0.0169	6.4347
480	0.1877	71.6015	625	0.8843	337.3847	770	0.0139	5.2980
485	0.1836	70.0609	630	0.8288	316.1893	775	0.0116	4.4390
490	0.2024	77.2328	635	0.7658	292.1792	780	0.0093	3.5498
495	0.2390	91.1701	640	0.7031	268.2249	785	0.0084	3.2184
500	0.2873	109.6022	645	0.6368	242.9471	790	0.0057	2.1809
505	0.3384	129.1166	650	0.5748	219.3089	795	0.0058	2.2132
510	0.3859	147.2195	655	0.5113	195.0721	800	0.0043	1.6363
515	0.4257	162.4091	660	0.4552	173.6686			
520	0.4569	174.3093	665	0.3998	152.5143			

# TM30

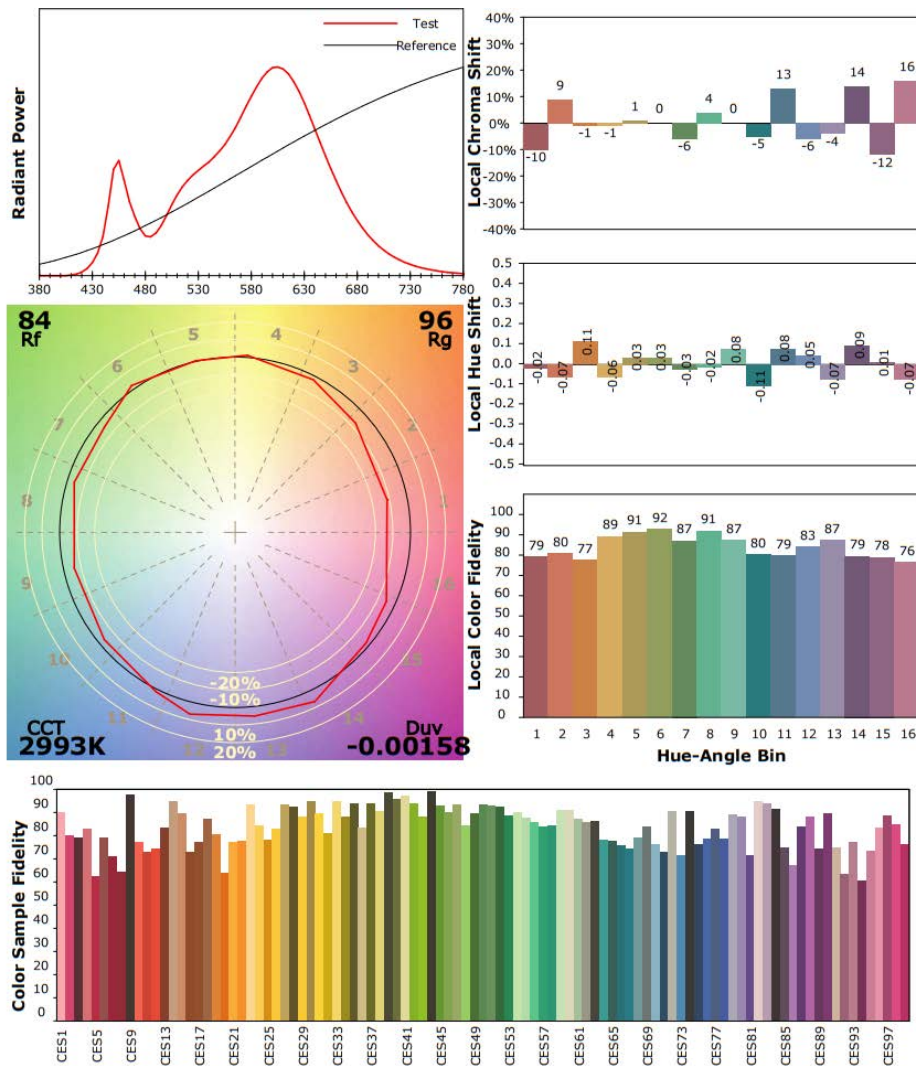
## ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/09/20

Model: HIDFA-150S-EX39-8CCTBYP/480V  
@115W 3000K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.4352  
 $y$  0.3995  
 $u'$  0.2514  
 $v'$  0.5193

(CRI)	
$R_a$	82.7
$R_9$	8

## 2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2024-09-20	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	HIDFA-150S-EX39-8CCT-BYP /480V @115W 4000K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	277.0	60	0.408	108.83	0.988	14.8
	480.0	60	0.270	119.29	0.923	17.5
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

### Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia

#### THD 400S A15 TB:

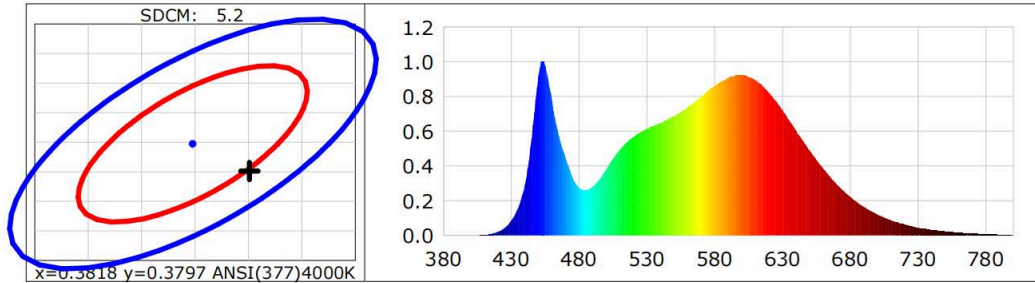
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	84	R9	16
Frequency (Hz)	60	R2	92	R10	80
CCT (K)	3809	R3	96	R11	82
Duv	-0.00265	R4	83	R12	64
Chromaticity (x, y)	x=0.3871 y=0.3751	R5	84	R13	86
Chromaticity (u', v')	u(u')=0.2302 v'(v')=0.5018	R6	89	R14	98
Color Rendering Index (CRI)	84.6	R7	84	R15	79
R9	16	R8	65	--	--
Rf	84	--	--	--	--
Rg	95	--	--	--	--
Rcs,h1(%)	-11	--	--	--	--

### Photometric Measurement – Goniophotometer Method in Lithonia THD 400S

#### A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	277.0	480.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	18695.5	20930.5	>= 10000(-10%)
Luminous Efficacy (lm/W)	171.79	175.45	Standard: >= 120(-3%)
Most worst Luminous/Highest	170.63		

## Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.0951	525	0.5927	228.1791	670	0.2934	112.9516
385	0.0002	0.0766	530	0.6133	236.1279	675	0.2555	98.3777
390	0.0001	0.0469	535	0.6296	242.4042	680	0.2214	85.2363
395	0.0003	0.1054	540	0.6449	248.2932	685	0.1907	73.4226
400	0.0005	0.1944	545	0.6668	256.7272	690	0.1638	63.0745
405	0.0010	0.3735	550	0.6874	264.6591	695	0.1408	54.1920
410	0.0034	1.3086	555	0.7126	274.3418	700	0.1205	46.4072
415	0.0093	3.5885	560	0.7400	284.9034	705	0.1024	39.4054
420	0.0208	8.0244	565	0.7671	295.3362	710	0.0872	33.5645
425	0.0436	16.7713	570	0.7989	307.5695	715	0.0743	28.6197
430	0.0867	33.3776	575	0.8321	320.3727	720	0.0635	24.4413
435	0.1594	61.3851	580	0.8606	331.3298	725	0.0532	20.4749
440	0.2932	112.8759	585	0.8867	341.3883	730	0.0457	17.5802
445	0.5617	216.2392	590	0.9068	349.1201	735	0.0383	14.7292
450	0.9205	354.3768	595	0.9197	354.0734	740	0.0318	12.2490
455	0.9752	375.4444	600	0.9249	356.0652	745	0.0267	10.2773
460	0.7757	298.6620	605	0.9104	350.5137	750	0.0229	8.8181
465	0.5711	219.8605	610	0.8928	343.7200	755	0.0187	7.1977
470	0.4454	171.4785	615	0.8619	331.8151	760	0.0157	6.0439
475	0.3348	128.9024	620	0.8201	315.7179	765	0.0147	5.6575
480	0.2737	105.3666	625	0.7740	297.9713	770	0.0127	4.8716
485	0.2606	100.3112	630	0.7200	277.2144	775	0.0097	3.7454
490	0.2811	108.2365	635	0.6624	255.0144	780	0.0078	2.9848
495	0.3226	124.2086	640	0.6041	232.5702	785	0.0069	2.6538
500	0.3802	146.3665	645	0.5447	209.6931	790	0.0058	2.2270
505	0.4413	169.8889	650	0.4892	188.3520	795	0.0058	2.2398
510	0.4936	190.0312	655	0.4335	166.8945	800	0.0038	1.4604
515	0.5354	206.1137	660	0.3835	147.6389			
520	0.5676	218.5234	665	0.3370	129.7275			

# TM30

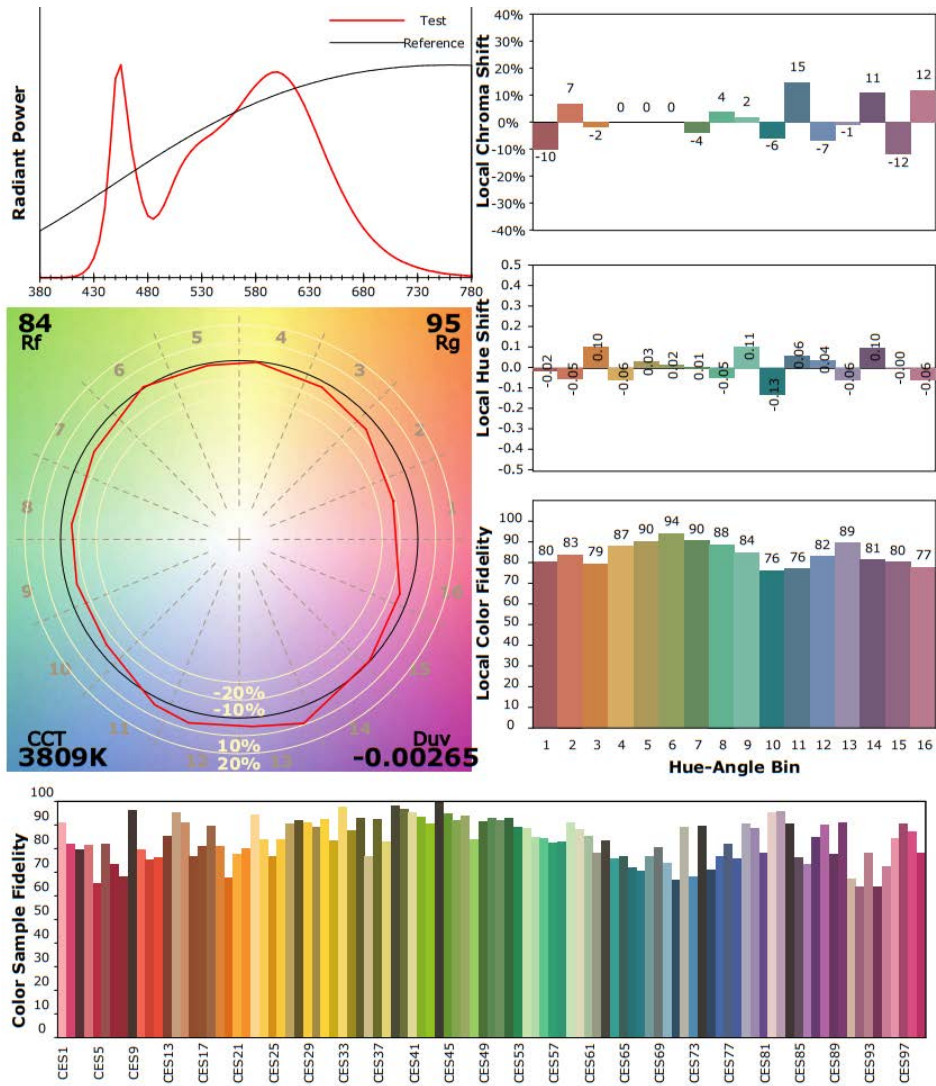
## ANSI/IES TM-30-18 Color Rendition Report

Source: L128-4080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/09/20

Model: HIDFA-150S-EX39-8CCT-BYP/480V @115W 4000K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.3871  
 $y$  0.3751  
 $u'$  0.2302  
 $v'$  0.5018

(CRI)  
 $R_a$  84.6  
 $R_g$  16

### 2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2024-09-20	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	HIDFA-150S-EX39-8CCT-BYP/480V @115W 5000K		

#### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404	277.0	60	0.417	111.39	0.970	14.6
1E-A3	480.0	60	0.275	122.25	0.926	16.9
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

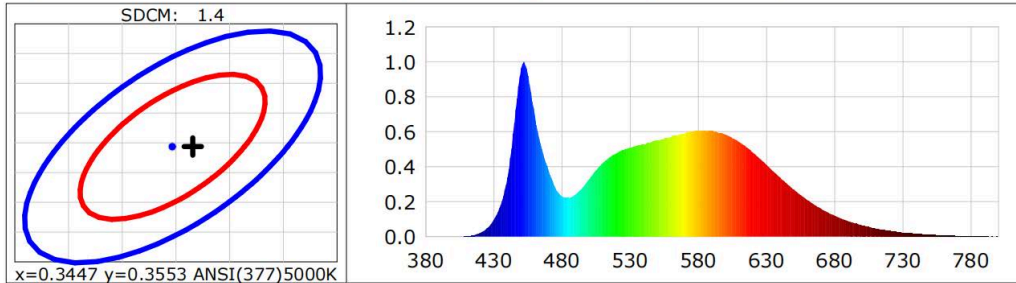
#### Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia THD 400S A15 TB:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	80	R9	5
Frequency (Hz)	60	R2	88	R10	72
CCT (K)	4958	R3	93	R11	79
Duv	0.00128	R4	80	R12	54
Chromaticity (x, y)	x=0.3466 y=0.3554	R5	80	R13	83
Chromaticity (u', v')	u(u')=0.2110 v'(v')=0.4867	R6	83	R14	96
Color Rendering Index (CRI)	82.3	R7	87	R15	75
R9	5	R8	66	--	--
Rf	82	--	--	--	--
Rg	94	--	--	--	--
Rcs,h1(%)	-11	--	--	--	--

#### Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	277.0	480.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	18523.6	20712.0	>= 10000(-10%)
Luminous Efficacy (lm/W)	166.29	169.42	Standard: >= 120(-3%)
Most worst Luminous/Highest	165.72		

## Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0005	0.2647	525	0.4946	262.8343	670	0.1591	84.5712
385	0.0001	0.0559	530	0.5094	270.6845	675	0.1385	73.6226
390	0.0004	0.1984	535	0.5201	276.3696	680	0.1196	63.5518
395	0.0011	0.6008	540	0.5271	280.0802	685	0.1034	54.9450
400	0.0004	0.2281	545	0.5399	286.9082	690	0.0889	47.2174
405	0.0011	0.5815	550	0.5494	291.9598	695	0.0764	40.5738
410	0.0031	1.6714	555	0.5609	298.0541	700	0.0648	34.4217
415	0.0088	4.6940	560	0.5724	304.1832	705	0.0555	29.4990
420	0.0224	11.8948	565	0.5806	308.5104	710	0.0468	24.8517
425	0.0483	25.6460	570	0.5893	313.1391	715	0.0396	21.0522
430	0.0988	52.5003	575	0.5993	318.4634	720	0.0338	17.9375
435	0.1833	97.3876	580	0.6033	320.6024	725	0.0284	15.1086
440	0.3430	182.2884	585	0.6051	321.5736	730	0.0240	12.7625
445	0.6498	345.3036	590	0.6036	320.7572	735	0.0199	10.5935
450	0.9649	512.7453	595	0.5942	315.7740	740	0.0165	8.7781
455	0.9213	489.5745	600	0.5838	310.2403	745	0.0141	7.4990
460	0.6927	368.0723	605	0.5627	299.0197	750	0.0113	6.0187
465	0.5028	267.2073	610	0.5407	287.3031	755	0.0096	5.1109
470	0.3807	202.3214	615	0.5123	272.2147	760	0.0082	4.3569
475	0.2791	148.3338	620	0.4806	255.4098	765	0.0074	3.9552
480	0.2305	122.4973	625	0.4463	237.1809	770	0.0055	2.9206
485	0.2223	118.1351	630	0.4113	218.5617	775	0.0036	1.9310
490	0.2424	128.8285	635	0.3735	198.4527	780	0.0034	1.8043
495	0.2803	148.9347	640	0.3376	179.4228	785	0.0025	1.3029
500	0.3293	175.0000	645	0.3021	160.5206	790	0.0025	1.3386
505	0.3796	201.7041	650	0.2697	143.3004	795	0.0020	1.0556
510	0.4225	224.4924	655	0.2381	126.5437	800	0.0013	0.7058
515	0.4546	241.5863	660	0.2092	111.1737			
520	0.4770	253.4661	665	0.1827	97.0990			

# TM-30

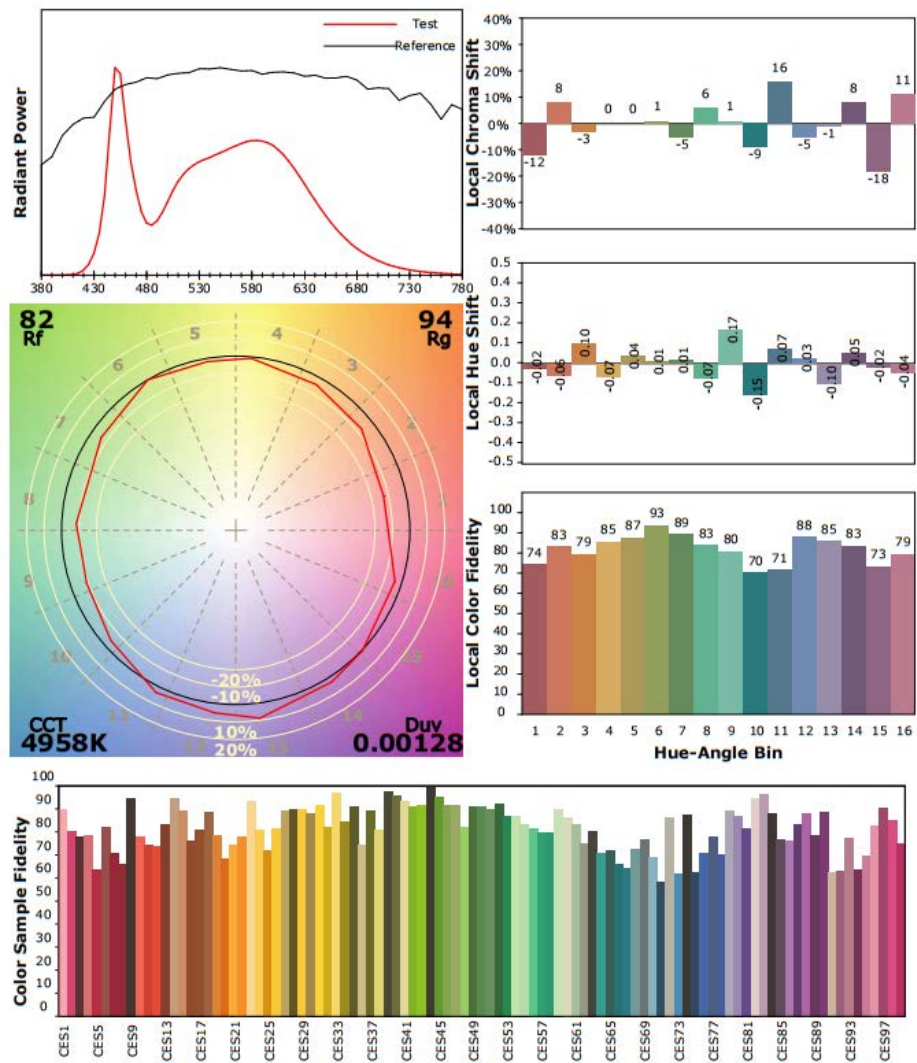
## ANSI/IES TM-30-18 Color Rendition Report

Source: L128-5080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/11/29

Model: HIDFA-150S-EX39-8CCT-BYP/480V  
@115 5000K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.3466  
 $y$  0.3554  
 $u'$  0.2110  
 $v'$  0.4867

(CRI)  
 $R_a$  82.3  
 $R_g$  5

## 2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2024-09-20	<b>Test Ambient:</b>	25.3 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	HIDFA-150S-EX39-8CCT-BYP/480V @80W 3000K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	277.0	60	0.291	77.89	0.970	14.7
	480.0	60	0.214	89.78	0.872	28.1
<b>DLC Pass Criteria</b>					$\geq 0.9(-3\%)$	$\leq 20(+5)$

### Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia

#### THD 400S A15 TB:

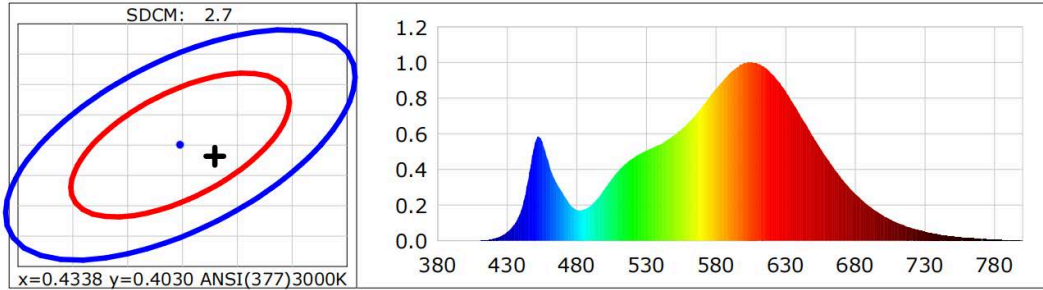
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	82	R9	9
Frequency (Hz)	60	R2	92	R10	81
CCT (K)	2976	R3	96	R11	81
Duv	-0.00117	R4	81	R12	70
Chromaticity (x, y)	x=0.4370 y=0.4011	R5	82	R13	84
Chromaticity (u', v')	u(u')=0.2518 v'(v')=0.5202	R6	90	R14	99
Color Rendering Index (CRI)	83.0	R7	82	R15	74
R9	9	R8	59	--	--
Rf	84	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-12	--	--	--	--

### Photometric Measurement – Goniophotometer Method in Lithonia THD 400S

#### A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	277.0	480.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	12853.0	14839.9	$\geq 10000(-10\%)$
Luminous Efficacy (lm/W)	165.00	165.28	Standard: $\geq 120(-3\%)$
Most worst Luminous/Highest	164.81		
Zonal lumens in the 20-50° (%)	10.8	--	$\geq 30(-10\%)$
Beam Angle (°)	164.4	--	--
Center Beam Candle Power (cd)	552.1	--	--

## Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0293	525	0.4854	138.0215	670	0.3486	99.1408
385	0.0002	0.0470	530	0.5047	143.5167	675	0.3037	86.3776
390	0.0001	0.0224	535	0.5242	149.0751	680	0.2622	74.5677
395	0.0008	0.2150	540	0.5409	153.8180	685	0.2257	64.1757
400	0.0002	0.0621	545	0.5673	161.3147	690	0.1933	54.9809
405	0.0001	0.0369	550	0.5930	168.6316	695	0.1661	47.2448
410	0.0013	0.3789	555	0.6262	178.0843	700	0.1410	40.0880
415	0.0041	1.1574	560	0.6637	188.7295	705	0.1203	34.2037
420	0.0115	3.2620	565	0.7030	199.9116	710	0.1014	28.8410
425	0.0250	7.1223	570	0.7517	213.7603	715	0.0868	24.6829
430	0.0502	14.2725	575	0.8031	228.3770	720	0.0729	20.7244
435	0.0918	26.1095	580	0.8516	242.1669	725	0.0624	17.7502
440	0.1719	48.8700	585	0.8992	255.7068	730	0.0515	14.6555
445	0.3405	96.8323	590	0.9415	267.7411	735	0.0428	12.1809
450	0.5511	156.7244	595	0.9733	276.7908	740	0.0359	10.1970
455	0.5577	158.5968	600	0.9963	283.3124	745	0.0290	8.2435
460	0.4298	122.2347	605	0.9986	283.9803	750	0.0254	7.2152
465	0.3278	93.2114	610	0.9943	282.7386	755	0.0203	5.7770
470	0.2649	75.3446	615	0.9715	276.2739	760	0.0173	4.9132
475	0.2039	57.9796	620	0.9362	266.2250	765	0.0150	4.2617
480	0.1738	49.4133	625	0.8909	253.3461	770	0.0124	3.5349
485	0.1752	49.8209	630	0.8393	238.6621	775	0.0090	2.5492
490	0.1980	56.3002	635	0.7750	220.3828	780	0.0085	2.4220
495	0.2380	67.6754	640	0.7099	201.8675	785	0.0063	1.7948
500	0.2912	82.8134	645	0.6460	183.6953	790	0.0041	1.1522
505	0.3450	98.1051	650	0.5797	164.8397	795	0.0037	1.0432
510	0.3935	111.8869	655	0.5159	146.7045	800	0.0035	0.9833
515	0.4315	122.7179	660	0.4573	130.0457			
520	0.4623	131.4778	665	0.3999	113.7285			

# TM30

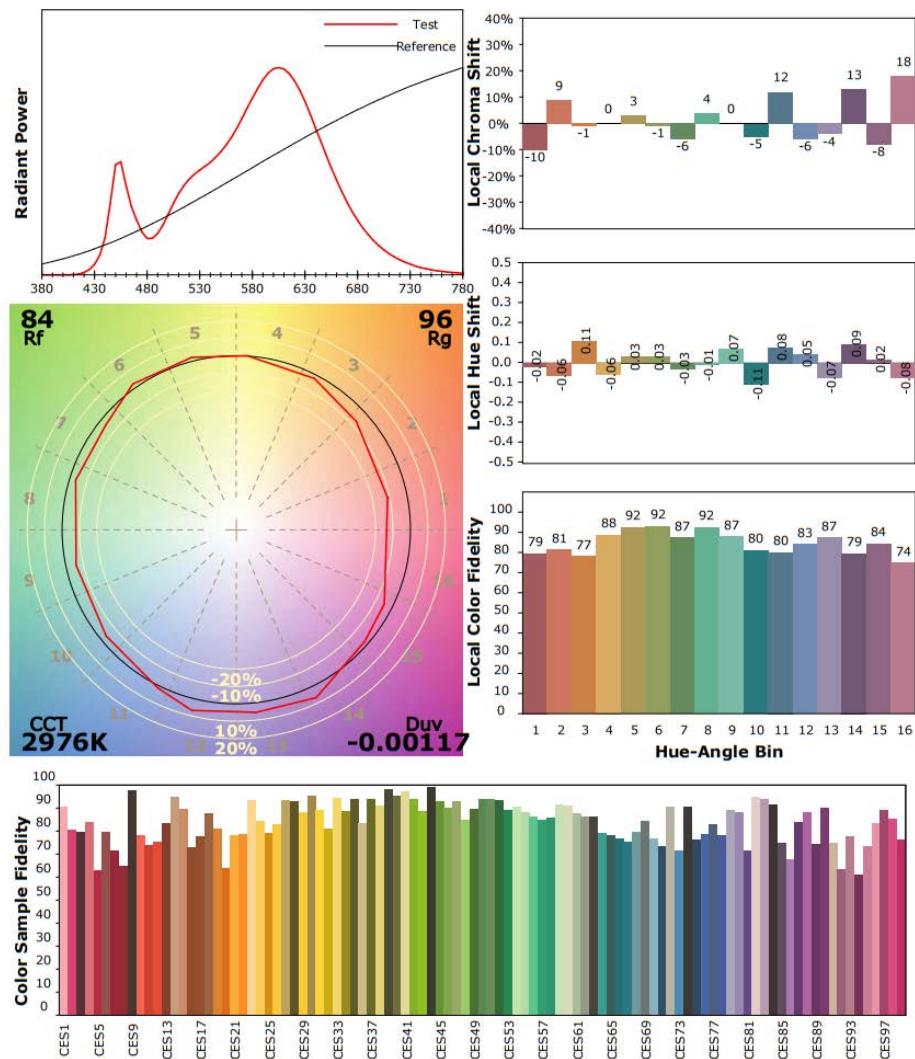
## ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/09/20

Model: HIDFA-150S-EX39-8CCTBYP/480V  
@80W 3000K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.4370  
 $y$  0.4011  
 $u'$  0.2518  
 $v'$  0.5202

(CRI)	
$R_a$	83.0
$R_g$	9

## 2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2024-09-20	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	HIDFA-150S-EX39-8CCT-BYP /480V @80W 4000K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	277.0	60	0.285	76.14	0.969	14.8
	480.0	60	0.212	88.11	0.8677	28.2
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

### Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia

#### THD 400S A15 TB:

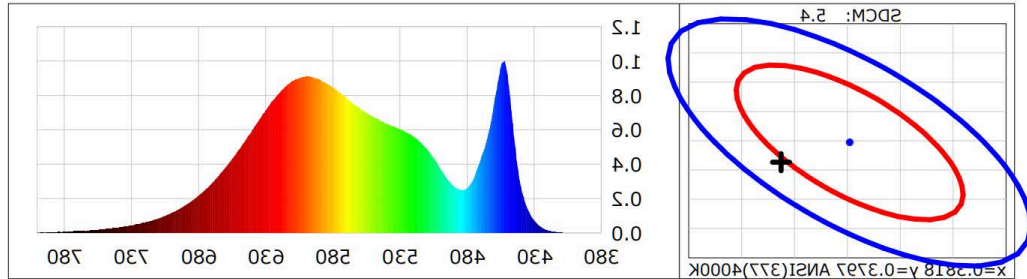
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	84	R9	16
Frequency (Hz)	60	R2	92	R10	80
CCT (K)	3788	R3	96	R11	82
Duv	-0.00240	R4	83	R12	64
Chromaticity (x, y)	x=0.3883 y=0.3763	R5	84	R13	86
Chromaticity (u', v')	u(u')=0.2305 v'(v')=0.5025	R6	89	R14	98
Color Rendering Index (CRI)	84.7	R7	85	R15	79
R9	16	R8	66	--	--
Rf	84	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-11	--	--	--	--

### Photometric Measurement – Goniophotometer Method in Lithonia THD 400S

#### A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	277.0	480.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	13313.1	15616.1	>= 10000(-10%)
Luminous Efficacy (lm/W)	174.83	177.22	Standard: >= 120(-3%)
Most worst Luminous/Highest	173.29		

## Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0005	0.1493	525	0.5838	165.8585	670	0.2886	81.9928
385	0.0004	0.1165	530	0.6047	171.8013	675	0.2507	71.2278
390	0.0002	0.0517	535	0.6198	176.0670	680	0.2176	61.8216
395	0.0012	0.3373	540	0.6343	180.2062	685	0.1868	53.0732
400	0.0008	0.2209	545	0.6558	186.2967	690	0.1603	45.5526
405	0.0013	0.3743	550	0.6759	192.0071	695	0.1367	38.8437
410	0.0024	0.6830	555	0.6986	198.4724	700	0.1179	33.5086
415	0.0067	1.8983	560	0.7279	206.7797	705	0.1003	28.4942
420	0.0162	4.6090	565	0.7526	213.8090	710	0.0846	24.0429
425	0.0357	10.1459	570	0.7853	223.0864	715	0.0711	20.1925
430	0.0743	21.1013	575	0.8167	232.0250	720	0.0612	17.3788
435	0.1422	40.4096	580	0.8458	240.2825	725	0.0520	14.7852
440	0.2737	77.7505	585	0.8714	247.5576	730	0.0439	12.4821
445	0.5574	158.3525	590	0.8919	253.3845	735	0.0371	10.5480
450	0.9264	263.1814	595	0.9052	257.1611	740	0.0307	8.7291
455	0.9589	272.4153	600	0.9119	259.0759	745	0.0255	7.2520
460	0.7455	211.7994	605	0.8976	254.9985	750	0.0220	6.2475
465	0.5460	155.1017	610	0.8838	251.0829	755	0.0173	4.9022
470	0.4250	120.7341	615	0.8514	241.8673	760	0.0158	4.4975
475	0.3168	90.0000	620	0.8123	230.7590	765	0.0143	4.0743
480	0.2602	73.9171	625	0.7678	218.1180	770	0.0121	3.4375
485	0.2508	71.2368	630	0.7134	202.6581	775	0.0088	2.5095
490	0.2741	77.8836	635	0.6566	186.5228	780	0.0069	1.9657
495	0.3166	89.9538	640	0.5983	169.9795	785	0.0063	1.7955
500	0.3763	106.8968	645	0.5384	152.9678	790	0.0056	1.5800
505	0.4367	124.0674	650	0.4838	137.4564	795	0.0046	1.2998
510	0.4899	139.1732	655	0.4289	121.8469	800	0.0026	0.7437
515	0.5307	150.7755	660	0.3796	107.8444			
520	0.5612	159.4449	665	0.3310	94.0277			

# TM30

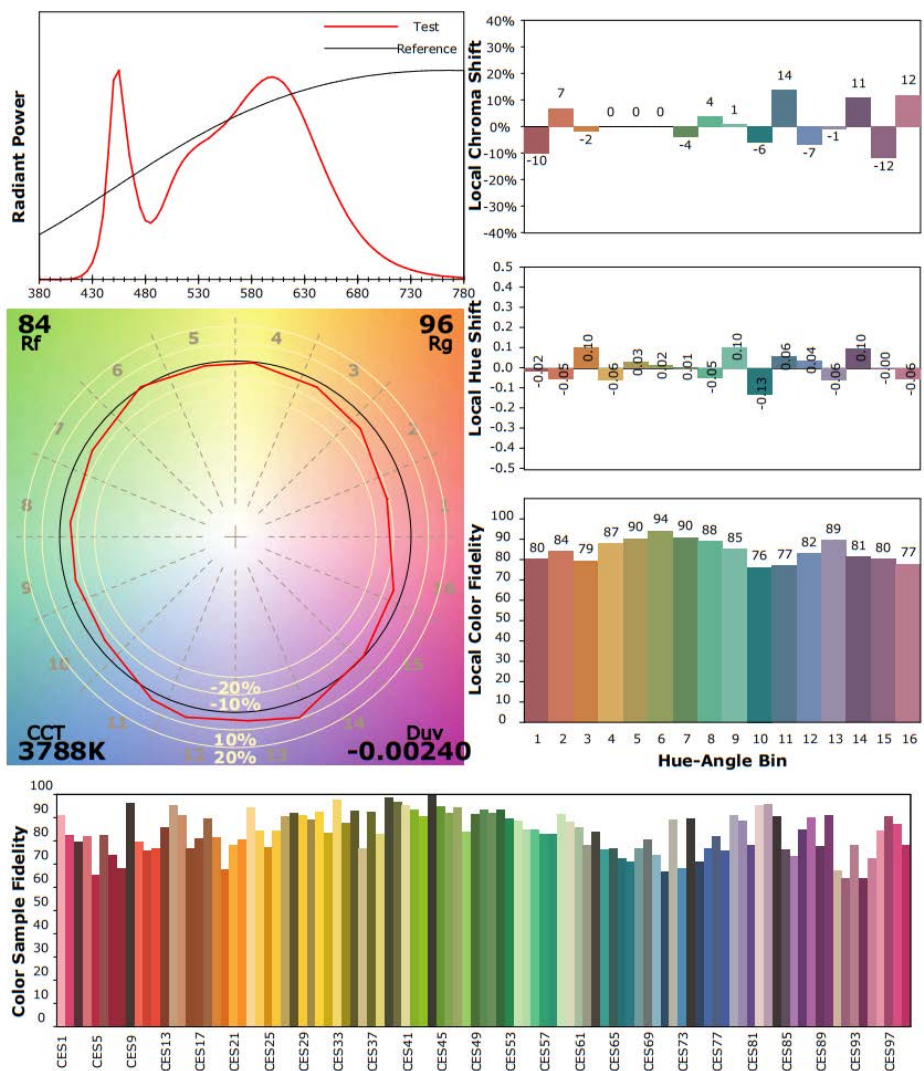
## ANSI/IES TM-30-18 Color Rendition Report

Source: L128-4080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/09/20

Model: HIDFA-150S-EX39-8CCT-BYP/480V  
@80 4000K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.3883  
 $y$  0.3763  
 $u'$  0.2305  
 $v'$  0.5025

(CRI)  
 $R_a$  84.7  
 $R_g$  16

### 2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2024-09-20	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	HIDFA-150S-EX39-8CCT-BYP/480V @80W 5000K		

#### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404	277.0	60	0.290	77.49	0.970	14.6
1E-A3	480.0	60	0.214	89.89	0.873	28.1
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

#### Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia

##### THD 400S A15 TB:

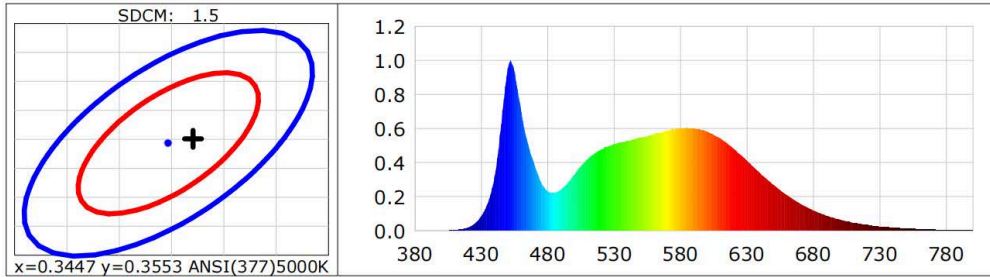
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	81	R9	5
Frequency (Hz)	60	R2	89	R10	72
CCT (K)	4943	R3	93	R11	79
Duv	-0.00144	R4	80	R12	54
Chromaticity (x, y)	x=0.3471 y=0.3561	R5	80	R13	83
Chromaticity (u', v')	u(u')=0.2110 v'(v')=0.4871	R6	83	R14	97
Color Rendering Index (CRI)	82.4	R7	86	R15	75
R9	5	R8	66	--	--
Rf	82	--	--	--	--
Rg	93	--	--	--	--
Rcs,h1(%)	-11	--	--	--	--

#### Photometric Measurement – Goniophotometer Method in Lithonia THD 400S

##### A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	277.0	480.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	13312.9	15688.4	>= 10000(-10%)
Luminous Efficacy (lm/W)	171.80	174.53	Standard: >= 120(-3%)
Most worst Luminous/Highest	170.93		

## Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0004	0.1404	525	0.4927	191.3756	670	0.1588	61.6881
385	0.0005	0.1775	530	0.5056	196.3937	675	0.1381	53.6444
390	0.0005	0.1769	535	0.5167	200.6864	680	0.1184	45.9754
395	0.0007	0.2901	540	0.5244	203.6703	685	0.1027	39.8928
400	0.0005	0.1875	545	0.5361	208.2319	690	0.0879	34.1227
405	0.0011	0.4169	550	0.5458	211.9902	695	0.0753	29.2415
410	0.0031	1.2222	555	0.5570	216.3415	700	0.0643	24.9697
415	0.0080	3.1083	560	0.5674	220.3837	705	0.0549	21.3139
420	0.0192	7.4422	565	0.5772	224.1665	710	0.0463	17.9741
425	0.0424	16.4691	570	0.5866	227.8518	715	0.0396	15.3703
430	0.0879	34.1224	575	0.5940	230.6973	720	0.0338	13.1175
435	0.1664	64.6302	580	0.5989	232.5944	725	0.0283	11.0104
440	0.3206	124.5295	585	0.6024	233.9830	730	0.0237	9.2244
445	0.6269	243.4711	590	0.5991	232.7038	735	0.0207	8.0283
450	0.9570	371.7108	595	0.5925	230.1322	740	0.0172	6.6756
455	0.9279	360.3937	600	0.5827	226.3301	745	0.0145	5.6133
460	0.7012	272.3349	605	0.5612	217.9554	750	0.0122	4.7488
465	0.5097	197.9751	610	0.5409	210.0691	755	0.0102	3.9475
470	0.3860	149.9269	615	0.5126	199.0819	760	0.0090	3.5076
475	0.2811	109.1950	620	0.4804	186.5948	765	0.0078	3.0146
480	0.2315	89.9281	625	0.4464	173.3737	770	0.0077	3.0042
485	0.2229	86.5804	630	0.4101	159.2745	775	0.0049	1.8951
490	0.2422	94.0649	635	0.3732	144.9588	780	0.0040	1.5395
495	0.2805	108.9273	640	0.3370	130.8891	785	0.0031	1.2121
500	0.3297	128.0527	645	0.3016	117.1227	790	0.0025	0.9825
505	0.3800	147.6072	650	0.2692	104.5439	795	0.0033	1.2650
510	0.4203	163.2620	655	0.2369	92.0310	800	0.0020	0.7706
515	0.4522	175.6306	660	0.2088	81.0802			
520	0.4755	184.6722	665	0.1822	70.7778			

# TM-30

## ANSI/IES TM-30-18 Color Rendition Report

Source: L128-5080RC35003P1

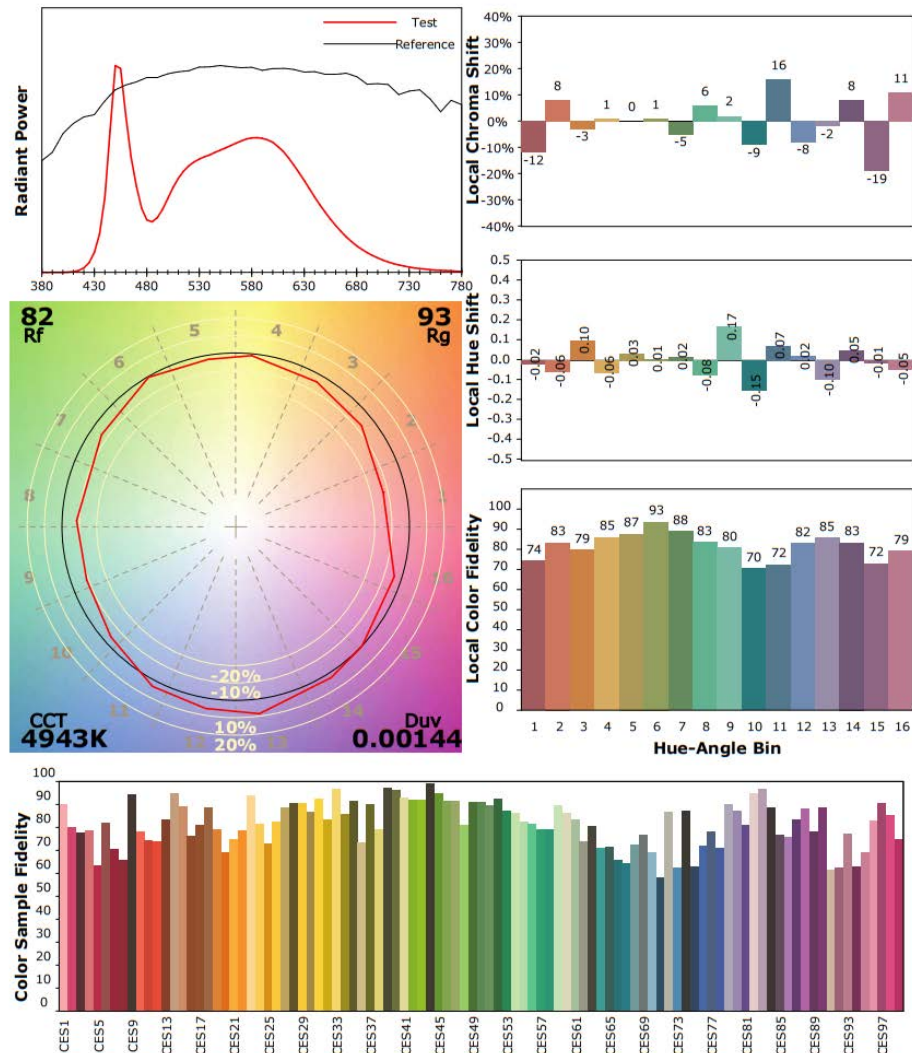
Manufacturer: RAB LIGHTING INC

Date: 2024/11/29

Model:

HIDFA-150S-EX39-8CCT-BYP/480V

@80 5000K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.3471  
 $y$  0.3561  
 $u'$  0.2110  
 $v'$  0.4871

(CRI)	
$R_a$	82.4
$R_g$	5