

## 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-450S-EX39-8CCT-BYP/480V

Test & Report By:

*Odin Wang*

Engineer: Odin Wang

Date:2023-04-04

Review By:

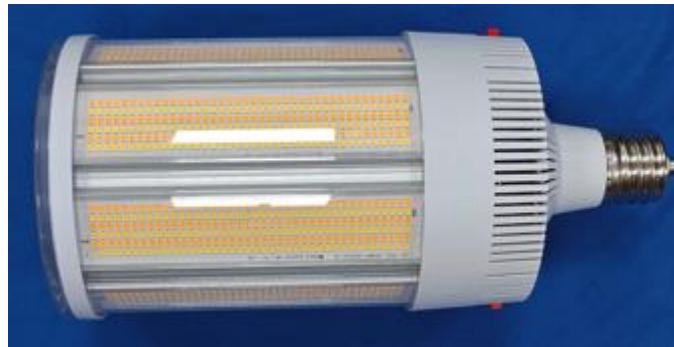
*Jason Luo*

Manager: Jason Luo

**1.1 Product Information:**

Organization Name	RAB LIGHTING INC	
Brand Name	RAB LIGHTING	
Model Number	HIDFA-450S-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	450W	
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-D1(3000K)	
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

<p><b>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</b></p> <p>Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25 °C ± 1 °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 °vertical intervals and 22.5 °horizontal intervals. Goniophotometer far field detector <math>\theta = 1.42\%</math>, Test distance: 14.14m</p>
<p><b>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</b></p> <p>Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °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.</p> <p>Self-absorption:  AST-CLW16-450WBCDH1-ad30K:1.3021  AST-CLW16-450WBCDH1-ad40K:1.3021  AST-CLW16-450WBCDH1-ad40K:1.3021</p>

### 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-450S-EX39-8CCT-BYP/480V @450W 3000K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230303	277.0	60	1.653	445.56	0.973	18.34
3E-D1	480.0	60	1.024	453.72	0.923	18.94
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

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

#### THD 400S A15 TB:

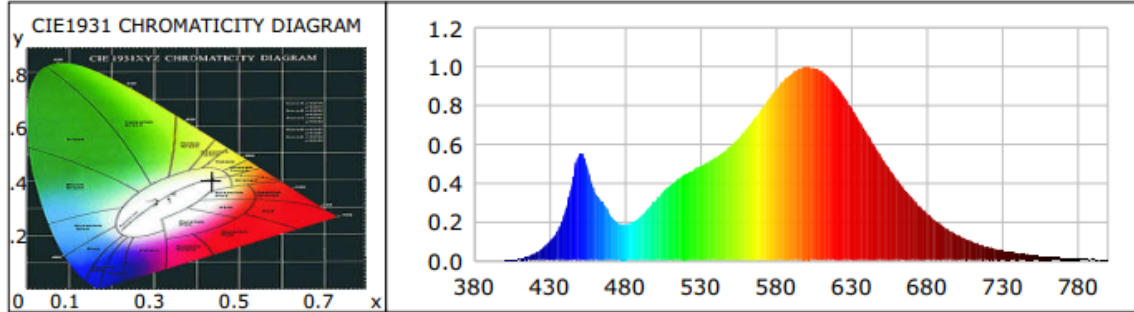
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	79	R9	-3
Frequency (Hz)	60	R2	90	R10	78
CCT (K)	3016	R3	95	R11	77
Duv	-0.0013	R4	78	R12	71
Chromaticity (x, y)	x=0.4339 y=0.3998	R5	80	R13	81
Chromaticity (u', v')	u(u')=0.2505 v'=0.5193	R6	88	R14	98
Color Rendering Index (CRI)	81	R7	80	R15	71
R9	-3	R8	54	--	--
Rf	83	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-13	--	--	--	--

### 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)	52992.3	53380.9	>=10000(-10%)
Luminous Efficacy (lm/W)	118.93	117.65	Standard: >= 120(-3%)
Most worst Luminous/Highest	116.80		
Zonal lumens in the 20-50° (%)	33.30		>=30%(-10%)
Beam Angle (°)	156.8	--	--
Center Beam Candle Power (cd)	3543	--	--

**Spectral Power Distribution & Chromaticity Diagram**



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0006	0.8351	535	0.4658	620.2053	690	0.3222	429.0202
385	0.0002	0.2234	540	0.4860	647.0519	695	0.2794	372.0125
390	0.0008	1.0280	545	0.5064	674.2540	700	0.2420	322.1366
395	0.0007	0.9315	550	0.5331	709.7970	705	0.2097	279.1475
400	0.0016	2.1583	555	0.5577	742.5590	710	0.1813	241.3214
405	0.0040	5.3620	560	0.5894	784.6759	715	0.1556	207.1036
410	0.0092	12.3141	565	0.6279	835.9401	720	0.1331	177.2153
415	0.0200	26.5911	570	0.6752	898.9173	725	0.1142	152.0981
420	0.0358	47.5976	575	0.7250	965.2907	730	0.0973	129.5372
425	0.0603	80.3378	580	0.7755	1032.5189	735	0.0832	110.7309
430	0.0956	127.2273	585	0.8297	1104.6974	740	0.0706	94.0312
435	0.1488	198.0470	590	0.8831	1175.8170	745	0.0609	81.1253
440	0.2392	318.4169	595	0.9264	1233.3730	750	0.0516	68.6451
445	0.4036	537.3718	600	0.9627	1281.7341	755	0.0446	59.4059
450	0.5494	731.4084	605	0.9879	1315.2235	760	0.0371	49.3518
455	0.4833	643.4112	610	1.0000	1331.3932	765	0.0327	43.4824
460	0.3582	476.8542	615	0.9960	1326.0338	770	0.0276	36.6840
465	0.3032	403.6644	620	0.9762	1299.7078	775	0.0233	31.0472
470	0.2419	322.1052	625	0.9436	1256.2709	780	0.0212	28.1606
475	0.1949	259.5340	630	0.8994	1197.4037	785	0.0177	23.5483
480	0.1847	245.9643	635	0.8468	1127.4254	790	0.0149	19.8073
485	0.1974	262.7667	640	0.7872	1048.0750	795	0.0126	16.8369
490	0.2232	297.1954	645	0.7245	964.5331	800	0.0108	14.3272
495	0.2633	350.5866	650	0.6598	878.4296			
500	0.3091	411.4973	655	0.5944	791.3694			
505	0.3504	466.5514	660	0.5334	710.2183			
510	0.3887	517.5214	665	0.4755	633.0522			
515	0.4194	558.4233	670	0.4197	558.8306			
520	0.4439	591.0523	675	0.3680	489.9101			
525	0.4658	620.2053	680	0.3222	429.0202			
530	0.4860	647.0519	685	0.2794	372.0125			

**TM30**

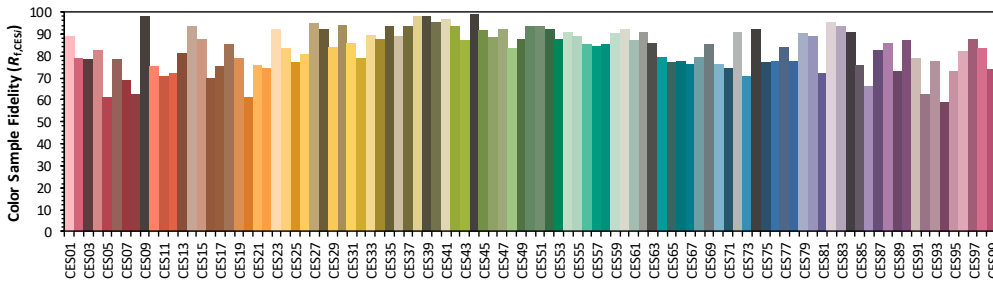
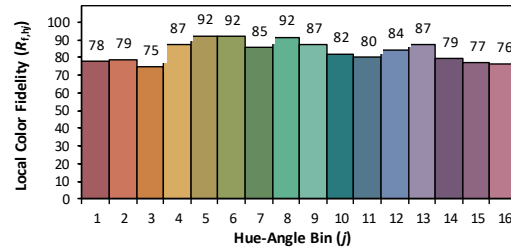
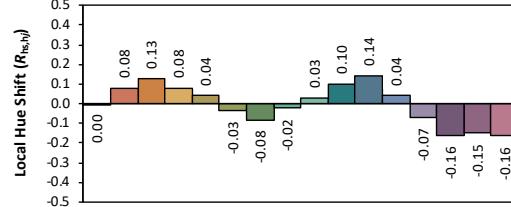
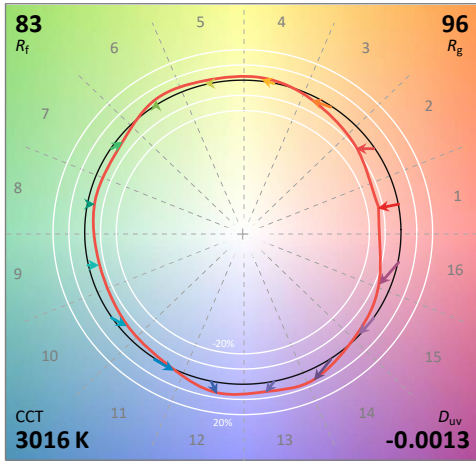
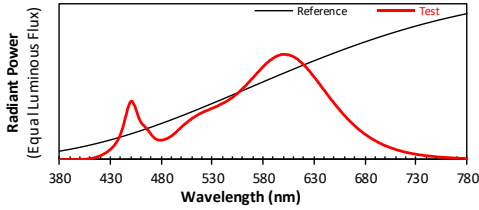
**ANSI/IES TM-30-18 Color Rendition Report**

**Source:** L128-3080RC35003P1

**Manufacturer:** RAB LIGHTING INC

**Date:** 2023/3/30

**Model:** HIDFA-450S-EX39-8CCT-BYP/480V @450W 3000K



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

$x$  0.4340  
 $y$  0.3998  
 $u'$  0.2505  
 $v'$  0.5193

CIE 13.3-1995 (CRI)  
R<sub>a</sub> 81  
R<sub>g</sub> -3

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

## Zonal Lumen Tabulation

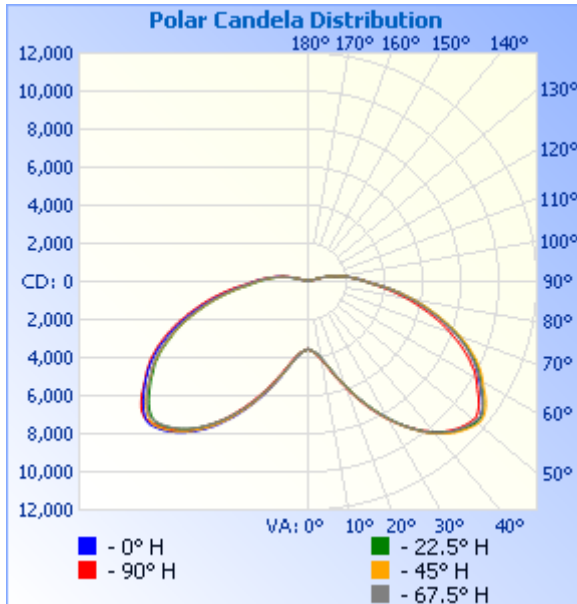
### Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	5,118.3	9.7%	9.7%
0-40	10,990.7	20.7%	20.7%
0-60	29,004.8	54.7%	54.7%
60-90	20,319.4	38.3%	38.3%
70-100	13,810.4	26.1%	26.1%
90-120	3,547.9	6.7%	6.7%
0-90	49,324.2	93.1%	93.1%
90-180	3,669.2	6.9%	6.9%
0-180	52,993.4	100%	100%

### Lumens Per Zone

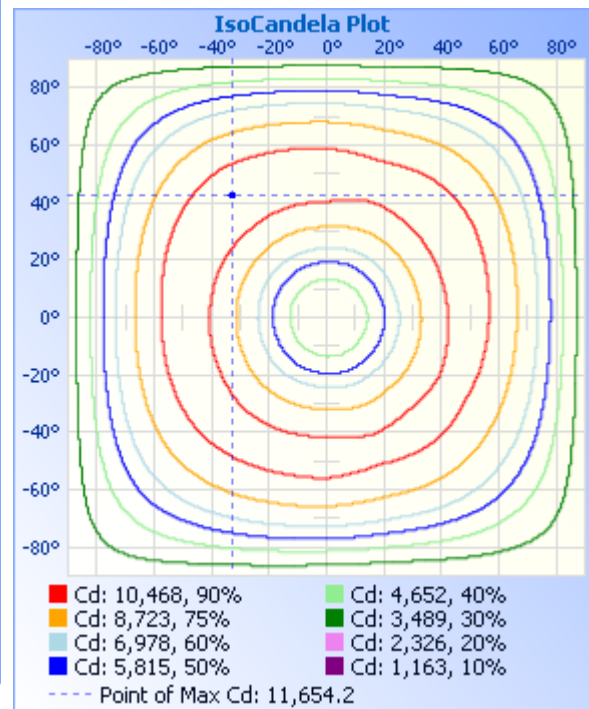
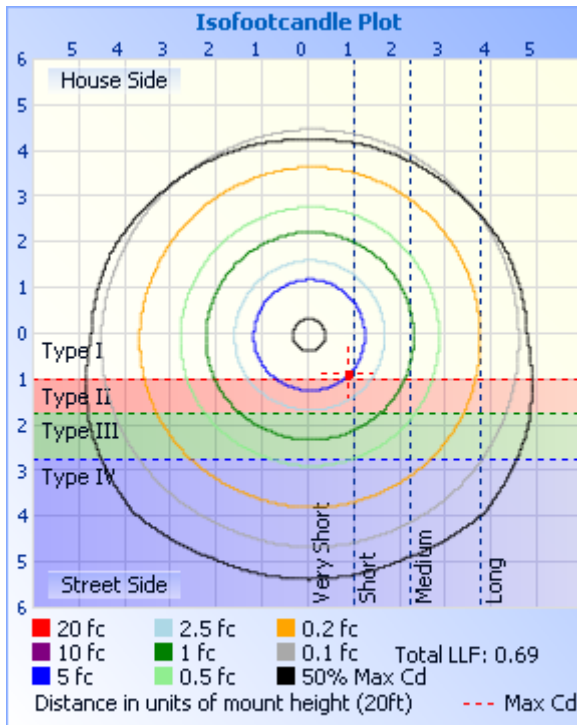
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	368.3	0.7%	90-100	2,458.9	4.6%
10-20	1,434.6	2.7%	100-110	978.0	1.8%
20-30	3,315.4	6.3%	110-120	111.0	0.2%
30-40	5,872.4	11.1%	120-130	39.5	0.1%
40-50	8,407.1	15.9%	130-140	28.4	0.1%
50-60	9,607.0	18.1%	140-150	22.9	0%
60-70	8,967.8	16.9%	150-160	17.0	0%
70-80	6,975.9	13.2%	160-170	10.4	0%
80-90	4,375.6	8.3%	170-180	3.2	0%

**Photometric Data**



	Center Beam fc	Beam Width	
17.0ft	12.3 fc	138.6 ft	119.2 ft
34.0ft	3.06 fc	277.3 ft	238.3 ft
51.0ft	1.36 fc	415.9 ft	357.5 ft
68.0ft	0.77 fc	554.6 ft	476.7 ft
85.0ft	0.49 fc	693.2 ft	595.8 ft
102.0ft	0.34 fc	831.8 ft	715.0 ft

■ Vert. Spread: 152.4°  
■ Horiz. Spread: 148.2°



**Candela Table - Type C**

	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	3543	3543	3543	3543	3543	3543	3543	3543	3543	3543	3543	3543	3543	3543	3543	3543	3543
1	3550	3547	3560	3551	3580	3582	3580	3579	3573	3568	3565	3558	3544	3542	3548	3551	3550
2	3587	3598	3606	3600	3621	3626	3629	3619	3610	3603	3599	3586	3584	3581	3590	3593	3587
3	3638	3643	3650	3643	3653	3656	3660	3648	3643	3636	3638	3627	3620	3621	3632	3634	3638
4	3673	3675	3689	3682	3693	3690	3692	3681	3684	3672	3670	3656	3657	3654	3656	3663	3673
5	3712	3715	3728	3720	3744	3742	3738	3731	3729	3715	3712	3700	3687	3694	3697	3703	3712
6	3766	3769	3785	3774	3808	3803	3803	3795	3788	3770	3768	3752	3742	3749	3752	3762	3766
7	3837	3838	3858	3854	3879	3890	3886	3874	3860	3848	3844	3819	3805	3809	3811	3826	3837
8	3919	3918	3941	3945	3984	3978	3977	3966	3957	3932	3931	3896	3878	3891	3891	3904	3919
9	4013	4007	4038	4049	4081	4090	4080	4068	4055	4035	4035	3997	3976	3976	3989	3993	4013
10	4120	4126	4139	4159	4204	4206	4202	4209	4181	4156	4144	4124	4077	4083	4092	4105	4120
11	4245	4253	4264	4287	4338	4351	4334	4349	4315	4288	4268	4266	4198	4216	4211	4229	4245
12	4378	4387	4416	4419	4484	4500	4495	4490	4459	4419	4421	4406	4329	4353	4354	4369	4378
13	4527	4535	4559	4580	4637	4662	4644	4659	4617	4583	4595	4560	4484	4495	4505	4520	4527
14	4705	4706	4733	4743	4814	4841	4812	4820	4790	4757	4750	4717	4663	4675	4664	4677	4705
15	4877	4869	4904	4939	4980	5032	4989	5007	4972	4949	4936	4906	4802	4845	4836	4845	4877
16	5059	5079	5094	5111	5183	5212	5177	5216	5192	5131	5127	5073	5002	5055	5016	5026	5059
17	5257	5272	5279	5296	5375	5429	5391	5416	5397	5320	5328	5290	5192	5246	5204	5210	5257
18	5461	5468	5478	5521	5583	5619	5591	5623	5600	5517	5562	5489	5402	5454	5416	5400	5461
19	5665	5678	5723	5716	5782	5854	5802	5834	5817	5745	5774	5693	5592	5654	5629	5602	5665
20	5911	5892	5936	5940	6018	6079	6007	6080	6052	5952	5990	5908	5815	5873	5845	5831	5911
21	6137	6101	6157	6165	6257	6298	6234	6299	6276	6168	6222	6118	6054	6089	6056	6035	6137
22	6363	6344	6382	6390	6463	6516	6461	6523	6498	6378	6443	6341	6265	6320	6278	6239	6363
23	6595	6586	6619	6622	6695	6756	6713	6756	6737	6619	6663	6592	6489	6545	6521	6458	6595
24	6830	6821	6864	6841	6927	6978	6937	6984	6961	6845	6918	6809	6721	6785	6746	6684	6830
25	7059	7044	7085	7099	7153	7220	7165	7209	7192	7093	7154	7025	6951	7020	6985	6913	7059
26	7314	7290	7350	7348	7405	7450	7386	7449	7439	7311	7384	7279	7193	7258	7222	7144	7314
27	7558	7528	7568	7584	7633	7674	7604	7668	7663	7528	7605	7504	7428	7500	7445	7381	7558
28	7787	7762	7809	7821	7857	7900	7860	7892	7892	7753	7826	7719	7648	7734	7685	7615	7787
29	8026	8022	8060	8044	8085	8124	8079	8118	8124	7980	8078	7943	7910	7970	7906	7843	8026

30	8257	8244	8292	8283	8313	8370	8300	8344	8350	8213	8311	8166	8134	8194	8148	8065	8257
31	8484	8476	8534	8515	8552	8585	8515	8550	8580	8424	8534	8375	8376	8428	8367	8279	8484
32	8733	8714	8766	8742	8767	8796	8732	8785	8819	8630	8745	8602	8593	8656	8584	8517	8733
33	8964	8947	8999	8958	8973	9010	8948	9000	9042	8838	8962	8813	8825	8883	8828	8736	8964
34	9184	9178	9216	9191	9168	9213	9149	9201	9237	9036	9186	9014	9022	9108	9025	8941	9184
35	9401	9381	9422	9403	9357	9412	9343	9401	9438	9229	9379	9207	9227	9307	9239	9137	9401
36	9598	9593	9644	9610	9574	9615	9521	9588	9636	9441	9567	9389	9442	9524	9449	9349	9598
37	9830	9800	9864	9811	9771	9795	9702	9789	9826	9611	9752	9601	9657	9718	9652	9537	9830
38	10029	10004	10056	10005	9956	9974	9903	9947	9996	9778	9941	9766	9847	9901	9837	9720	10029
39	10210	10184	10244	10184	10133	10140	10064	10111	10158	9958	10102	9927	10023	10066	10019	9889	10210
40	10359	10354	10429	10344	10297	10304	10214	10254	10311	10102	10256	10075	10211	10242	10186	10047	10359
41	10526	10509	10596	10499	10452	10452	10363	10395	10464	10260	10409	10224	10358	10376	10331	10201	10526
42	10671	10639	10753	10657	10603	10590	10506	10535	10608	10370	10537	10347	10489	10538	10480	10343	10671
43	10808	10821	10888	10786	10723	10717	10629	10661	10749	10496	10680	10480	10616	10680	10617	10469	10808
44	10930	10949	11026	10913	10840	10849	10729	10768	10859	10609	10790	10584	10722	10798	10731	10590	10930
45	11052	11069	11147	11018	10950	10945	10830	10864	10959	10713	10879	10680	10818	10904	10845	10697	11052
46	11154	11183	11257	11112	11046	11036	10915	10945	11051	10796	10971	10759	10909	11009	10943	10786	11154
47	11258	11280	11361	11206	11128	11100	10982	11027	11122	10864	11051	10825	10989	11086	11035	10877	11258
48	11343	11361	11454	11281	11206	11147	11052	11088	11193	10881	11052	10887	11065	11156	11133	10961	11343
49	11421	11438	11544	11348	11253	11194	11087	11131	11197	10853	11021	10923	11129	11202	11196	11028	11421
50	11483	11505	11607	11405	11297	11221	11131	11097	11139	10801	10960	10894	11172	11252	11250	11080	11483
51	11511	11539	11654	11460	11321	11210	11100	11058	11055	10706	10871	10800	11127	11279	11296	11109	11511
52	11479	11522	11626	11475	11264	11155	11032	10969	10950	10600	10775	10720	11063	11246	11280	11086	11479
53	11400	11442	11568	11425	11165	11056	10913	10850	10823	10478	10635	10605	10972	11171	11210	11008	11400
54	11293	11329	11481	11296	11065	10929	10803	10724	10710	10343	10501	10480	10838	11035	11102	10891	11293
55	11146	11214	11368	11178	10911	10778	10663	10554	10551	10177	10330	10319	10676	10897	10942	10749	11146
56	11005	11072	11236	11025	10772	10627	10480	10394	10395	10025	10172	10142	10511	10737	10783	10608	11005
57	10847	10889	11071	10874	10613	10490	10330	10246	10244	9880	10011	9995	10323	10580	10618	10462	10847
58	10685	10756	10900	10726	10464	10348	10191	10101	10087	9731	9845	9839	10147	10407	10452	10291	10685
59	10530	10602	10714	10562	10324	10192	10047	9957	9932	9553	9651	9670	9978	10250	10302	10134	10530
60	10352	10451	10576	10403	10175	10044	9896	9790	9749	9386	9482	9499	9825	10089	10162	9992	10352
61	10224	10320	10431	10239	10028	9892	9729	9619	9592	9245	9345	9335	9667	9930	9992	9852	10224

62	10075	10168	10278	10092	9849	9697	9569	9481	9419	9094	9151	9178	9500	9770	9831	9711	10075
63	9889	9985	10105	9919	9628	9508	9401	9301	9230	8884	8959	9023	9329	9568	9681	9541	9889
64	9721	9791	9918	9701	9429	9298	9190	9083	9023	8684	8768	8804	9167	9402	9496	9366	9721
65	9522	9617	9728	9490	9217	9103	8966	8863	8808	8466	8546	8590	8938	9210	9285	9199	9522
66	9310	9379	9496	9278	8968	8873	8726	8652	8592	8243	8317	8360	8734	9005	9088	8983	9310
67	9108	9172	9277	9074	8749	8648	8491	8396	8366	8000	8075	8128	8523	8779	8891	8744	9108
68	8889	8932	9050	8825	8498	8408	8252	8182	8089	7761	7816	7893	8275	8560	8639	8559	8889
69	8622	8678	8783	8601	8220	8168	8029	7923	7852	7550	7608	7646	8041	8305	8398	8291	8622
70	8352	8442	8545	8316	7988	7908	7743	7672	7629	7303	7356	7411	7797	8072	8149	8062	8352
71	8138	8182	8263	8070	7750	7650	7501	7449	7360	7077	7100	7172	7524	7796	7892	7830	8138
72	7823	7917	7955	7804	7473	7406	7268	7182	7112	6811	6853	6938	7302	7542	7621	7556	7823
73	7571	7626	7698	7525	7230	7139	6987	6894	6825	6532	6579	6654	7018	7299	7374	7311	7571
74	7300	7336	7403	7262	6944	6895	6726	6645	6547	6295	6317	6385	6720	7001	7092	7040	7300
75	7004	7069	7138	6963	6687	6602	6455	6360	6304	6001	6041	6135	6501	6732	6849	6761	7004
76	6753	6779	6851	6667	6417	6329	6179	6125	6012	5750	5808	5875	6214	6490	6573	6498	6753
77	6479	6501	6559	6395	6107	6085	5946	5847	5776	5502	5551	5649	5960	6196	6279	6251	6479
78	6219	6231	6298	6114	5871	5819	5657	5566	5475	5243	5297	5341	5703	5945	6050	5979	6219
79	5957	5939	6000	5860	5594	5575	5396	5322	5213	4997	5029	5112	5443	5690	5777	5717	5957
80	5671	5660	5734	5592	5335	5285	5142	5057	4969	4716	4769	4850	5177	5427	5525	5485	5671
81	5403	5399	5424	5268	5082	5049	4865	4781	4652	4478	4538	4588	4927	5173	5242	5210	5403
82	5111	5063	5148	5010	4792	4771	4648	4516	4432	4219	4280	4354	4647	4861	4982	4932	5111
83	4856	4851	4864	4731	4571	4544	4363	4276	4155	3989	4052	4087	4405	4640	4739	4688	4856
84	4573	4519	4559	4447	4302	4277	4123	4032	3939	3750	3791	3896	4146	4365	4427	4389	4573
85	4333	4264	4308	4202	4080	4011	3884	3786	3673	3514	3581	3637	3899	4091	4219	4152	4333
86	4047	3979	3999	3893	3819	3827	3642	3531	3424	3257	3344	3438	3637	3873	3952	3907	4047
87	3759	3693	3762	3705	3566	3556	3420	3316	3230	3086	3164	3204	3414	3586	3698	3650	3759
88	3540	3474	3484	3396	3397	3347	3208	3149	3070	2920	2978	3050	3167	3372	3475	3430	3540
89	3265	3185	3249	3190	3186	3212	3100	3002	2936	2794	2877	2906	3044	3168	3229	3179	3265
90	3131	3086	3123	3064	3040	3033	2933	2868	2781	2660	2723	2774	2884	3023	3113	3052	3131
91	2975	2901	2939	2873	2923	2922	2802	2702	2667	2522	2593	2630	2742	2883	2944	2889	2975
92	2813	2770	2808	2778	2746	2730	2664	2593	2506	2411	2462	2486	2592	2723	2801	2751	2813
93	2688	2631	2641	2606	2623	2604	2503	2430	2370	2253	2319	2378	2465	2592	2660	2620	2688

94	2519	2464	2514	2472	2462	2451	2381	2278	2236	2156	2204	2221	2331	2430	2487	2446	2519
95	2402	2351	2376	2332	2331	2300	2236	2177	2105	1998	2056	2096	2168	2297	2376	2341	2402
96	2229	2207	2216	2175	2184	2185	2084	2004	1974	1910	1944	1967	2070	2167	2213	2186	2229
97	2116	2081	2107	2068	2052	2001	1947	1904	1838	1740	1790	1842	1907	2026	2088	2064	2116
98	1983	1942	1950	1918	1904	1886	1826	1748	1715	1640	1701	1712	1792	1890	1956	1926	1983
99	1841	1809	1829	1778	1764	1751	1686	1615	1583	1503	1549	1580	1665	1738	1809	1786	1841
100	1705	1659	1689	1647	1650	1592	1541	1499	1470	1392	1431	1449	1515	1617	1682	1668	1705
101	1545	1524	1548	1519	1496	1481	1430	1350	1312	1265	1303	1334	1415	1473	1527	1514	1545
102	1441	1408	1434	1397	1354	1323	1279	1236	1189	1130	1183	1209	1267	1348	1406	1401	1441
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104	1157	1135	1159	1127	1077	1042	1020	953	933	882	919	951	1017	1068	1134	1140	1157
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106	876	849	872	839	814	777	751	683	657	645	677	685	766	812	860	860	876
107	754	750	756	723	659	631	613	562	543	538	559	579	625	683	732	745	754
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115	104	107	101	96	55	70	77	80	74	66	72	74	77	87	100	105	104
116	86	85	87	81	53	53	74	68	65	76	80	59	58	70	85	91	86
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118	65	70	73	70	48	47	47	55	65	67	68	57	45	46	70	80	65
119	61	68	70	67	32	43	51	56	63	56	63	48	41	46	71	66	61
120	51	65	61	58	44	45	51	57	64	57	57	49	50	51	61	52	51
121	58	60	54	52	30	39	44	42	54	57	49	42	41	57	51	66	58
122	55	52	54	58	32	46	41	55	52	55	50	47	30	48	51	56	55
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124	42	53	51	48	43	34	36	47	50	58	48	42	44	45	40	57	42
125	46	39	47	38	41	29	39	46	46	46	34	37	50	37	43	57	46

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149	42	38	43	44	31	32	36	40	29	31	34	46	32	39	31	33	42
150	38	37	41	41	28	33	36	34	40	37	43	44	33	40	42	38	38
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168	36	41	34	44	21	21	33	36	37	40	42	24	27	40	35	41	36
169	36	40	32	30	22	29	38	41	41	38	36	34	32	29	40	37	36
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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-450S-EX39-8CCT-BYP/480V @450W 4000K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230303	277.0	60	1.603	432.38	0.974	18.33
3E-D1	480.0	60	0.988	438.08	0.924	18.90
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

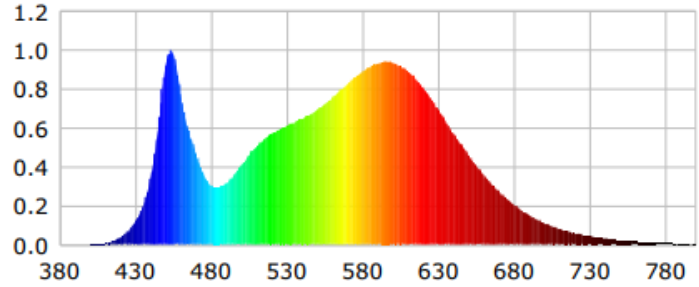
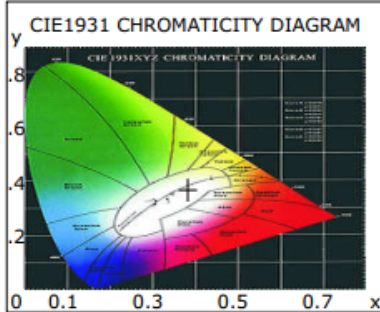
### Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia THD 400S A15 TB:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	82	R9	8
Frequency (Hz)	60	R2	92	R10	80
CCT (K)	3901	R3	95	R11	80
Duv	-0.0027	R4	81	R12	65
Chromaticity (x, y)	x=0.3829 y=0.3726	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2284 v'(v')=0.5001	R6	88	R14	98
Color Rendering Index (CRI)	83	R7	83	R15	76
R9	8	R8	62	--	--
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)	58047.0	58334.7	>= 1000(-10%)
Luminous Efficacy (lm/W)	134.25	133.16	Standard: >= 105(-3%)
Most worst Luminous/Highest	132.50		

**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	0.2009	535	0.5930	823.9843	690	0.2716	377.3525
385	0.0006	0.8348	540	0.6099	847.5565	695	0.2370	329.3387
390	0.0004	0.5877	545	0.6272	871.6091	700	0.2052	285.1056
395	0.0005	0.6477	550	0.6499	903.1653	705	0.1769	245.7779
400	0.0017	2.3255	555	0.6677	927.7940	710	0.1520	211.1797
405	0.0036	4.9478	560	0.6930	962.9532	715	0.1306	181.4172
410	0.0081	11.3065	565	0.7210	1001.8997	720	0.1113	154.6169
415	0.0186	25.7881	570	0.7562	1050.7432	725	0.0945	131.2494
420	0.0368	51.0896	575	0.7916	1099.9931	730	0.0811	112.7395
425	0.0675	93.7372	580	0.8251	1146.5875	735	0.0695	96.5980
430	0.1172	162.9176	585	0.8605	1195.7240	740	0.0587	81.5659
435	0.1978	274.8947	590	0.8914	1238.6668	745	0.0497	69.0661
440	0.3368	468.0705	595	0.9156	1272.2738	750	0.0435	60.5115
445	0.5999	833.6511	600	0.9325	1295.8107	755	0.0364	50.5241
450	0.9186	1276.5238	605	0.9415	1308.3402	760	0.0309	43.0068
455	0.9812	1363.4912	610	0.9360	1300.6699	765	0.0263	36.4891
460	0.7784	1081.6143	615	0.9195	1277.6922	770	0.0219	30.4733
465	0.5898	819.6310	620	0.8917	1239.1489	775	0.0200	27.7733
470	0.4669	648.7916	625	0.8513	1182.9059	780	0.0163	22.6667
475	0.3637	505.3628	630	0.8041	1117.3275	785	0.0135	18.7662
480	0.3038	422.1493	635	0.7510	1043.6391	790	0.0125	17.4002
485	0.2952	410.2764	640	0.6918	961.3652	795	0.0094	13.0896
490	0.3161	439.2616	645	0.6319	878.0993	800	0.0087	12.0442
495	0.3556	494.1017	650	0.5729	796.1103			
500	0.4092	568.6328	655	0.5137	713.8963			
505	0.4592	638.1407	660	0.4580	636.4958			
510	0.5056	702.5111	665	0.4054	563.2923			
515	0.5416	752.6003	670	0.3563	495.1468			
520	0.5692	790.9432	675	0.3122	433.7666			
525	0.5930	823.9843	680	0.2716	377.3525			
530	0.6099	847.5565	685	0.2370	329.3387			

**TM30**

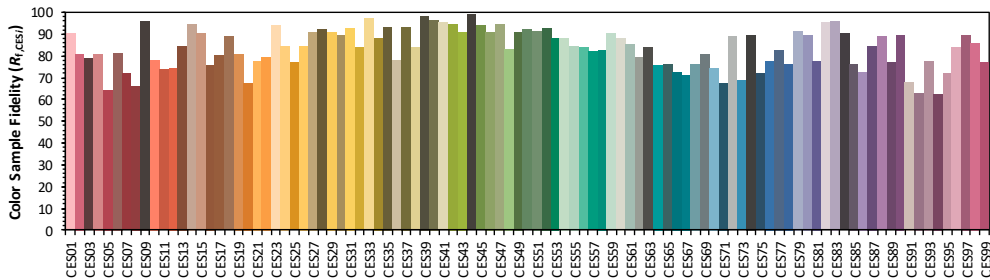
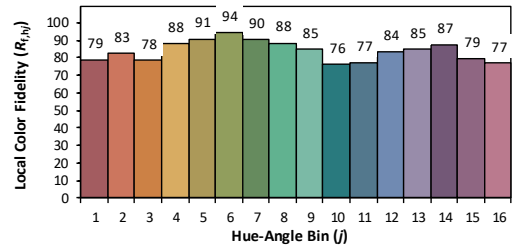
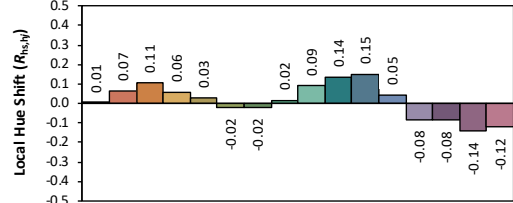
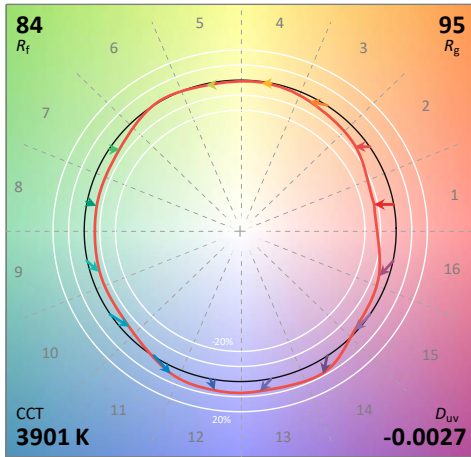
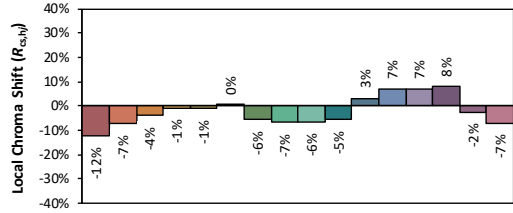
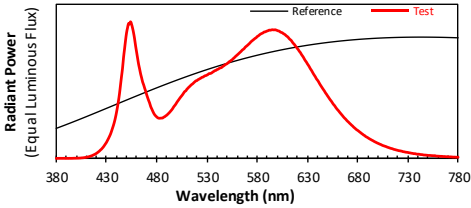
**ANSI/IES TM-30-18 Color Rendition Report**

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

**Date:** 203-03-30

**Manufacturer:** RAB LIGHTING

**Model:** HIDFA-450S-EX39-8CCT-BYP/480V @450W 4000K



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

$x$  0.3829  
 $y$  0.3726  
 $u'$  0.2284  
 $v'$  0.5001

CIE 13.3-1995 (CRI)	
$R_a$	83
$R_9$	8

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

### 2.3 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-450S-EX39-8CCT-BYP/480V @450W 5000K		

#### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230303	277.0	60	1.653	445.56	0.973	18.21
3E-D1	480.0	60	1.024	453.73	0.923	18.79
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

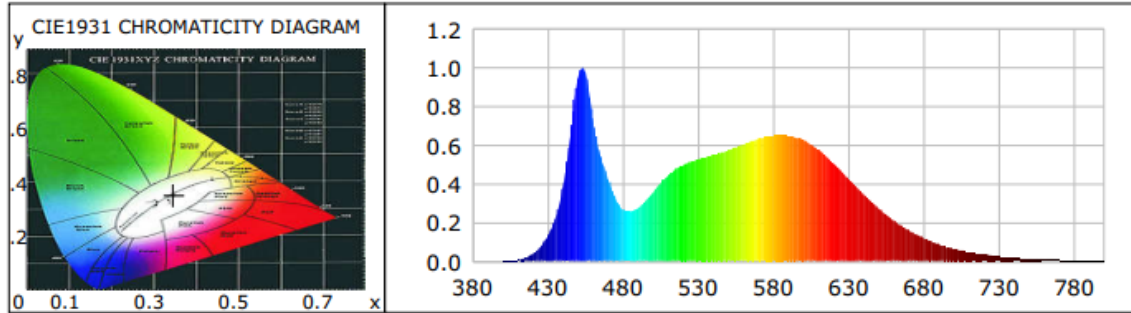
#### Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia THD 400S A15 TB:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	80	R9	1
Frequency (Hz)	60	R2	89	R10	73
CCT (K)	4955	R3	94	R11	78
Duv	0.0007	R4	80	R12	56
Chromaticity (x, y)	x=0.3465 y=0.3542	R5	80	R13	83
Chromaticity (u', v')	u(u')=0.2114 v'(v')=0.4861	R6	84	R14	97
Color Rendering Index (CRI)	82	R7	85	R15	74
R9	1	R8	64	--	--
Rf	82	--	--	--	--
Rg	95	--	--	--	--
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)	56786.6	57342.4	>=10000(-10%)
Luminous Efficacy (lm/W)	127.45	126.38	Standard: >= 120(-3%)
Most worst Luminous/Highest	125.16		

**Spectral Power Distribution & Chromaticity Diagram**



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.5787	535	0.5138	915.2453	690	0.1599	284.9121
385	0.0002	0.3320	540	0.5257	936.3601	695	0.1384	246.4829
390	0.0006	1.1562	545	0.5366	955.8941	700	0.1199	213.5638
395	0.0009	1.6088	550	0.5508	981.2259	705	0.1039	185.0671
400	0.0016	2.8337	555	0.5612	999.6316	710	0.0887	157.9205
405	0.0032	5.7730	560	0.5738	1022.1120	715	0.0760	135.3691
410	0.0081	14.4867	565	0.5867	1045.0407	720	0.0647	115.3105
415	0.0188	33.4523	570	0.6051	1077.8235	725	0.0560	99.7762
420	0.0377	67.2157	575	0.6194	1103.2668	730	0.0472	84.0891
425	0.0715	127.3545	580	0.6327	1127.0091	735	0.0409	72.8241
430	0.1273	226.6779	585	0.6446	1148.1776	740	0.0346	61.5587
435	0.2188	389.7630	590	0.6525	1162.2582	745	0.0296	52.7687
440	0.3746	667.3571	595	0.6533	1163.8184	750	0.0252	44.8713
445	0.6490	1156.1196	600	0.6506	1158.8572	755	0.0215	38.2612
450	0.9432	1680.1738	605	0.6419	1143.5017	760	0.0177	31.5741
455	0.9764	1739.2829	610	0.6284	1119.3584	765	0.0151	26.9395
460	0.7433	1323.9993	615	0.6050	1077.7040	770	0.0133	23.6511
465	0.5468	974.1180	620	0.5774	1028.5477	775	0.0114	20.3587
470	0.4295	765.1447	625	0.5431	967.4872	780	0.0092	16.3828
475	0.3271	582.6553	630	0.5057	900.8462	785	0.0087	15.4829
480	0.2667	475.1648	635	0.4667	831.3435	790	0.0073	13.0122
485	0.2581	459.8230	640	0.4253	757.5814	795	0.0067	11.8724
490	0.2757	491.1831	645	0.3853	686.2780	800	0.0049	8.7034
495	0.3097	551.6976	650	0.3466	617.3205			
500	0.3565	634.9740	655	0.3075	547.7276			
505	0.4030	717.9604	660	0.2730	486.2574			
510	0.4437	790.4393	665	0.2416	430.4438			
515	0.4737	843.8463	670	0.2115	376.7715			
520	0.4963	884.0197	675	0.1841	327.8957			
525	0.5138	915.2453	680	0.1599	284.9121			
530	0.5257	936.3601	685	0.1384	246.4829			

**TM-30**

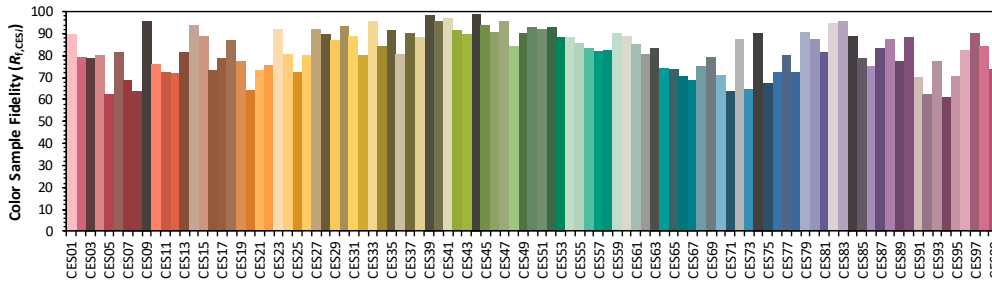
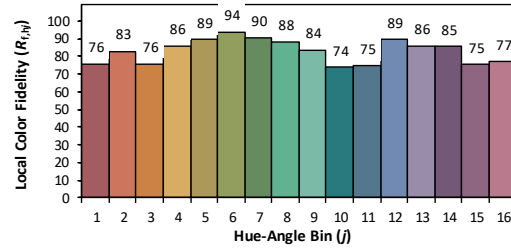
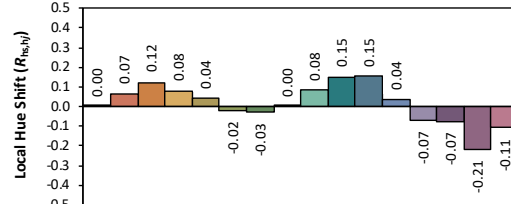
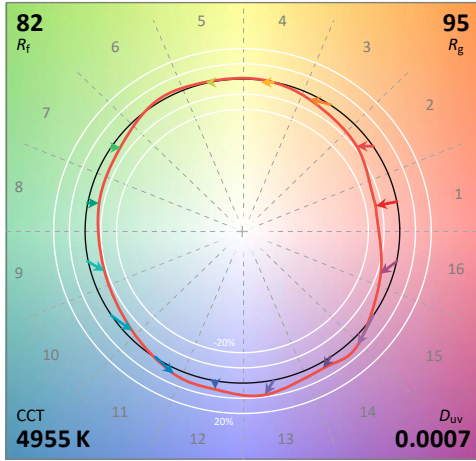
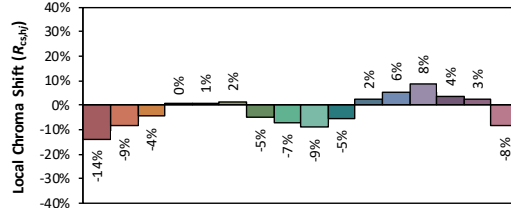
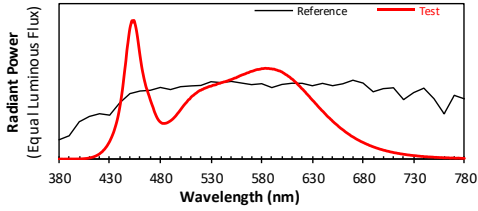
**ANSI/IES TM-30-18 Color Rendition Report**

**Source:** L128-5080RC35003P1

**Manufacturer:** RAB LIGHTING INC

**Date:** 2023/3/30

**Model:** HIDFA-450S-EX39-8CCT-BYP/480V @450W 5000K



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

$x$  0.3465  
 $y$  0.3542  
 $u'$  0.2114  
 $v'$  0.4861

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

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

### 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-450S-EX39-8CCT-BYP/480V @338W 3000K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	277.0	60	1.285	343.12	0.971	18.5
	480.0	60	0.765	343.10	0.972	14.8
<b>DLC Pass Criteria</b>					$\geq 0.9(-3\%)$	$\leq 20(+5)$

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

#### THD 400S A15 TB:

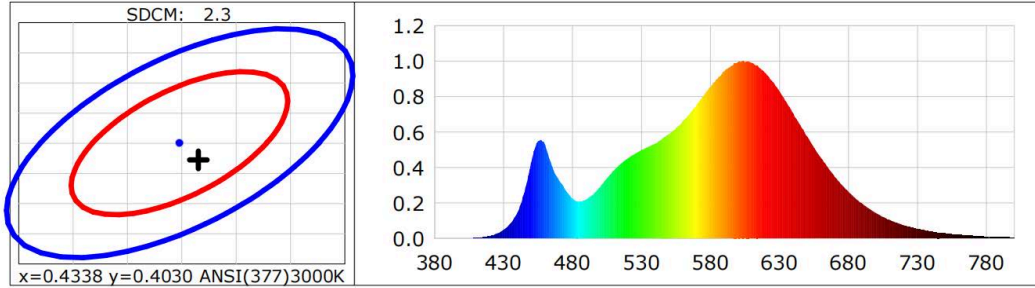
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	82	R9	9
Frequency (Hz)	60	R2	93	R10	83
CCT (K)	2992	R3	95	R11	79
Duv	-0.00135	R4	80	R12	72
Chromaticity (x, y)	x=0.4355 y=0.4002	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2513 v'=0.5197	R6	92	R14	98
Color Rendering Index (CRI)	82.9	R7	81	R15	75
R9	9	R8	59	--	--
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)	53389.1	52359.6	$\geq 10000(-10\%)$
Luminous Efficacy (lm/W)	155.60	154.91	Standard: $\geq 120(-3\%)$
Most worst Luminous/Highest	153.67		
Zonal lumens in the 20-50° (%)	11.1	--	$\geq 30(-10\%)$
Beam Angle (°)	169.6	--	--
Center Beam Candle Power (cd)	17691	--	--

## 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	0.0772	525	0.4758	687.1760	670	0.3473	501.5504
385	0.0005	0.7457	530	0.4980	719.2083	675	0.3028	437.3557
390	0.0001	0.1851	535	0.5172	746.8911	680	0.2637	380.8411
395	0.0006	0.8950	540	0.5357	773.6438	685	0.2265	327.0509
400	0.0003	0.3682	545	0.5628	812.8439	690	0.1961	283.1964
405	0.0008	1.1005	550	0.5898	851.8167	695	0.1679	242.4122
410	0.0027	3.8476	555	0.6244	901.8124	700	0.1422	205.3348
415	0.0064	9.2803	560	0.6628	957.1431	705	0.1212	175.0595
420	0.0135	19.5181	565	0.7042	1016.9255	710	0.1036	149.6412
425	0.0270	39.0563	570	0.7533	1087.9497	715	0.0882	127.4423
430	0.0500	72.2083	575	0.8063	1164.4117	720	0.0747	107.8923
435	0.0851	122.9204	580	0.8560	1236.2690	725	0.0639	92.2351
440	0.1475	213.0312	585	0.9031	1304.1640	730	0.0536	77.3638
445	0.2585	373.2793	590	0.9450	1364.8022	735	0.0457	66.0275
450	0.4294	620.1044	595	0.9738	1406.3924	740	0.0384	55.5080
455	0.5497	793.9332	600	0.9960	1438.3344	745	0.0321	46.4032
460	0.5301	765.5381	605	0.9956	1437.8372	750	0.0277	39.9569
465	0.4074	588.3445	610	0.9910	1431.1318	755	0.0235	33.9887
470	0.3317	479.0201	615	0.9660	1395.0116	760	0.0198	28.5296
475	0.2718	392.5193	620	0.9316	1345.4218	765	0.0167	24.0749
480	0.2245	324.2474	625	0.8851	1278.1966	770	0.0143	20.6189
485	0.2064	298.0532	630	0.8294	1197.7611	775	0.0120	17.3747
490	0.2207	318.7189	635	0.7695	1111.3642	780	0.0099	14.2761
495	0.2496	360.5242	640	0.7057	1019.1154	785	0.0079	11.4233
500	0.2919	421.5090	645	0.6389	922.6382	790	0.0071	10.2888
505	0.3391	489.6894	650	0.5758	831.6250	795	0.0060	8.6265
510	0.3841	554.6975	655	0.5110	737.9425	800	0.0043	6.2527
515	0.4214	608.6306	660	0.4543	656.1604			
520	0.4511	651.5099	665	0.3991	576.3821			

# TM30

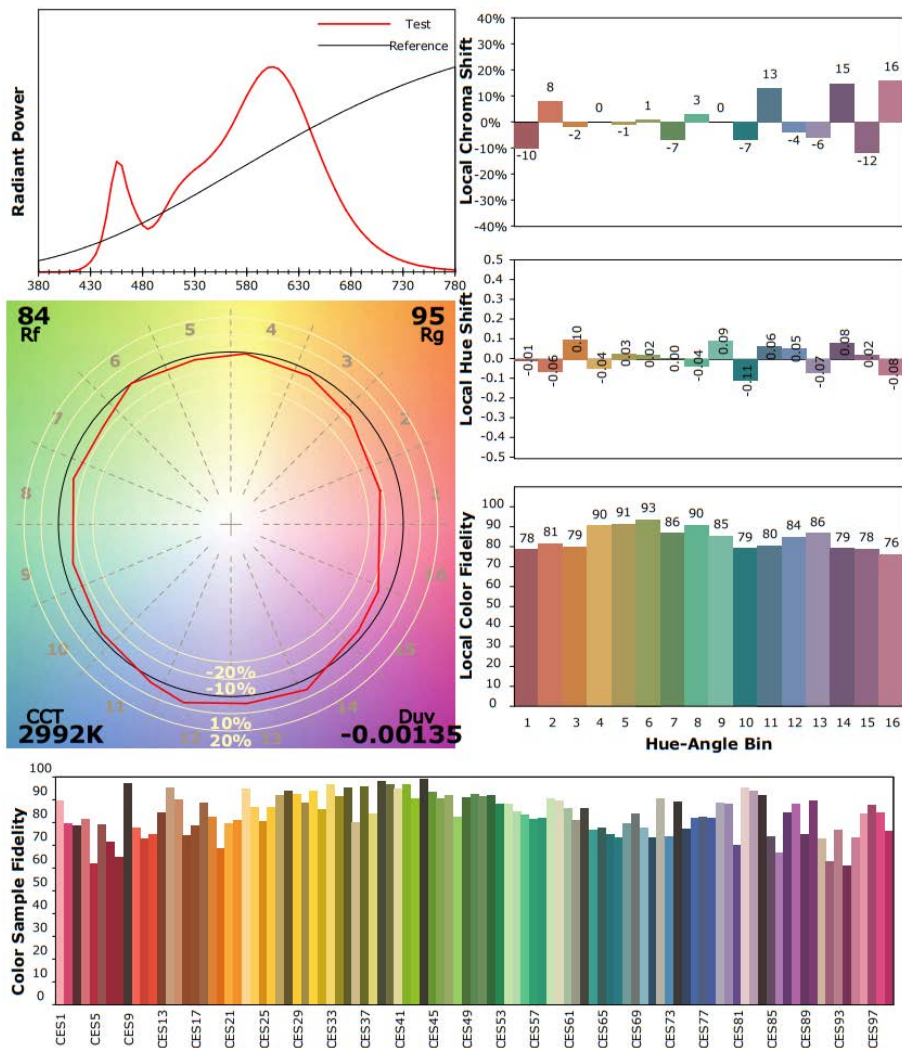
## ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/09/20

Model: HIDFA-450S-EX39-8CCT-BYP/480V @338W 3000K



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

$x$  0.4355  
 $y$  0.4002  
 $u'$  0.2513  
 $v'$  0.5197

(CRI)	
$R_a$	82.9
$R_9$	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-450S-EX39-8CCT-BYP /480V @338W 4000K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	277.0	60	1.248	333.25	0.971	18.9
	480.0	60	0.759	338.51	0.967	20.5
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

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

#### THD 400S A15 TB:

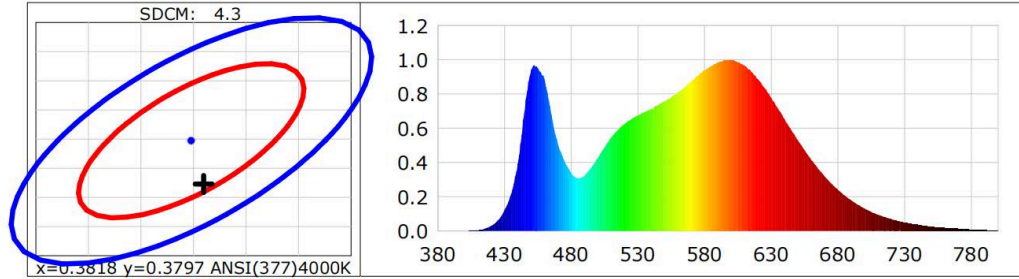
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	84	R9	18
Frequency (Hz)	60	R2	92	R10	81
CCT (K)	3897	R3	96	R11	82
Duv	-0.00284	R4	83	R12	66
Chromaticity (x, y)	x=0.3830 y=0.3723	R5	84	R13	87
Chromaticity (u', v')	u(u')=0.2286 v'=0.5000	R6	89	R14	98
Color Rendering Index (CRI)	85.0	R7	85	R15	79
R9	18	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)	57366.1	57929.8	>= 10000(-10%)
Luminous Efficacy (lm/W)	172.14	171.56	Standard: >= 120(-3%)
Most worst Luminous/Highest	170.83		

## Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.4484	525	0.6515	865.7672	670	0.3178	422.2729
385	0.0001	0.1153	530	0.6751	897.0498	675	0.2776	368.8727
390	0.0003	0.4283	535	0.6939	922.0316	680	0.2409	320.1388
395	0.0006	0.7425	540	0.7115	945.4601	685	0.2078	276.1638
400	0.0009	1.1501	545	0.7344	975.8102	690	0.1792	238.1696
405	0.0023	3.0892	550	0.7565	1005.2803	695	0.1536	204.1700
410	0.0052	6.9756	555	0.7832	1040.7059	700	0.1315	174.7723
415	0.0139	18.4906	560	0.8107	1077.2314	705	0.1116	148.3137
420	0.0304	40.3934	565	0.8399	1116.0440	710	0.0955	126.9486
425	0.0625	83.0810	570	0.8734	1160.5681	715	0.0813	108.0635
430	0.1231	163.5748	575	0.9070	1205.1779	720	0.0698	92.7910
435	0.2189	290.8525	580	0.9371	1245.1820	725	0.0601	79.8034
440	0.3976	528.3492	585	0.9625	1278.9977	730	0.0507	67.3095
445	0.6994	929.3048	590	0.9837	1307.1821	735	0.0428	56.8074
450	0.9418	1251.5020	595	0.9947	1321.8241	740	0.0369	49.0954
455	0.9508	1263.4456	600	1.0000	1328.8026	745	0.0307	40.7341
460	0.8856	1176.8528	605	0.9839	1307.3646	750	0.0261	34.6317
465	0.6811	905.0954	610	0.9649	1282.1974	755	0.0217	28.7897
470	0.5086	675.7976	615	0.9293	1234.8759	760	0.0188	24.9770
475	0.4068	540.5404	620	0.8862	1177.5918	765	0.0165	21.8652
480	0.3388	450.1971	625	0.8344	1108.7067	770	0.0142	18.8707
485	0.3067	407.5091	630	0.7766	1031.9473	775	0.0113	15.0095
490	0.3247	431.5175	635	0.7156	950.9208	780	0.0091	12.1423
495	0.3692	490.5899	640	0.6527	867.3031	785	0.0078	10.4282
500	0.4261	566.1421	645	0.5886	782.1691	790	0.0071	9.4426
505	0.4892	650.1011	650	0.5283	701.9897	795	0.0053	7.0665
510	0.5452	724.4906	655	0.4701	624.6513	800	0.0052	6.8615
515	0.5901	784.1507	660	0.4155	552.1047			
520	0.6254	831.0708	665	0.3645	484.3609			

# TM30

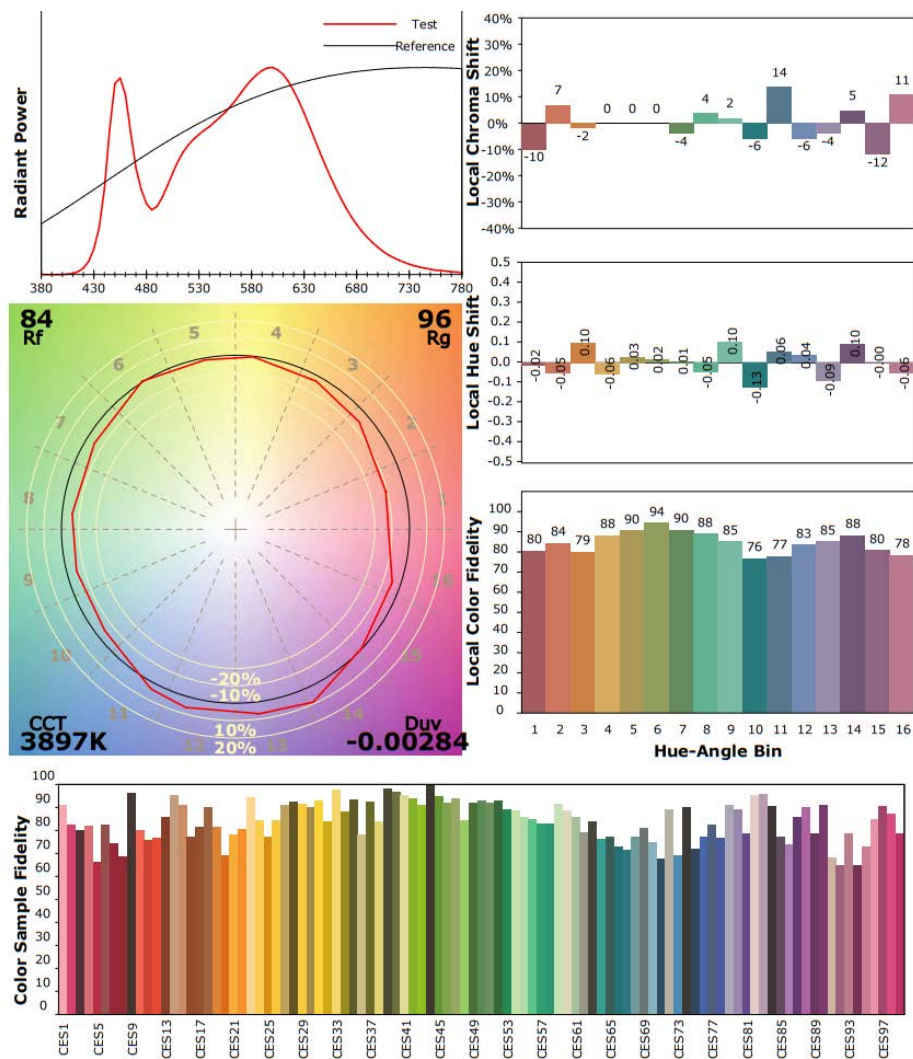
## ANSI/IES TM-30-18 Color Rendition Report

Source: L128-4080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/09/20

Model: HIDFA-450S-EX39-8CCT-BYP/480V @338W 4000K



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

$x$  0.3830  
 $y$  0.3723  
 $u'$  0.2286  
 $v'$  0.5000

(CRI)  
 $R_a$  85.0  
 $R_g$  18

### 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-450S-EX39-8CCT-BYP/480V @338W 5000K		

#### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404	277.0	60	1.281	341.80	0.971	18.7
1E-A3	480.0	60	0.786	344.51	0.975	20.1
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

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

##### THD 400S A15 TB:

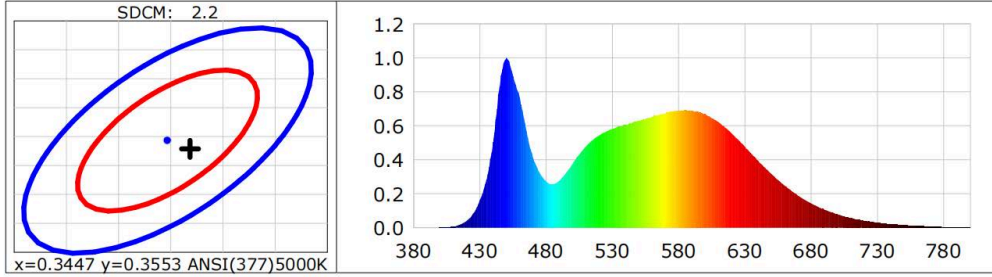
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	81	R9	8
Frequency (Hz)	60	R2	88	R10	71
CCT (K)	4942	R3	92	R11	80
Duv	0.00041	R4	82	R12	57
Chromaticity (x, y)	x=0.3469 y=0.3538	R5	81	R13	83
Chromaticity (u', v')	u(u')=0.2117 v'(v')=0.4860	R6	83	R14	96
Color Rendering Index (CRI)	82.7	R7	87	R15	76
R9	8	R8	67	--	--
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)	56968.2	56433.9	>= 10000(-10%)
Luminous Efficacy (lm/W)	166.67	165.98	Standard: >= 120(-3%)
Most worst Luminous/Highest	165.19		

## 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	0.2831	525	0.5645	976.3390	670	0.1896	327.9535
385	0.0007	1.2188	530	0.5817	1006.0255	675	0.1652	285.7853
390	0.0007	1.1287	535	0.5947	1028.5714	680	0.1435	248.1646
395	0.0010	1.7630	540	0.6041	1044.8111	685	0.1239	214.3578
400	0.0016	2.7017	545	0.6190	1070.5641	690	0.1073	185.6005
405	0.0034	5.9398	550	0.6286	1087.1920	695	0.0920	159.1165
410	0.0078	13.5255	555	0.6416	1109.5876	700	0.0794	137.3973
415	0.0189	32.7226	560	0.6533	1129.9178	705	0.0674	116.6174
420	0.0409	70.7277	565	0.6625	1145.8222	710	0.0578	100.0206
425	0.0842	145.6074	570	0.6737	1165.0970	715	0.0496	85.7200
430	0.1633	282.3965	575	0.6835	1182.1111	720	0.0423	73.1697
435	0.2849	492.8200	580	0.6875	1189.1160	725	0.0359	62.0724
440	0.5074	877.6255	585	0.6899	1193.2194	730	0.0313	54.1034
445	0.8343	1442.9936	590	0.6881	1190.0645	735	0.0264	45.7010
450	1.0000	1729.5011	595	0.6809	1177.5921	740	0.0225	38.8671
455	0.8944	1546.8856	600	0.6695	1157.8767	745	0.0190	32.8562
460	0.7692	1330.2598	605	0.6448	1115.1029	750	0.0164	28.4224
465	0.5720	989.2250	610	0.6216	1075.1197	755	0.0139	24.1031
470	0.4170	721.2358	615	0.5901	1020.5049	760	0.0118	20.3372
475	0.3239	560.2039	620	0.5555	960.6615	765	0.0105	18.1258
480	0.2733	472.6119	625	0.5182	896.2461	770	0.0084	14.5132
485	0.2559	442.6089	630	0.4769	824.7587	775	0.0076	13.0670
490	0.2775	479.9195	635	0.4356	753.4352	780	0.0059	10.1984
495	0.3220	556.8897	640	0.3944	682.1627	785	0.0054	9.3467
500	0.3753	649.0819	645	0.3544	612.9802	790	0.0051	8.7829
505	0.4312	745.6950	650	0.3173	548.7457	795	0.0035	6.0434
510	0.4782	826.9799	655	0.2803	484.7406	800	0.0028	4.8067
515	0.5163	892.8994	660	0.2476	428.3010			
520	0.5445	941.7031	665	0.2174	375.9741			

# TM-30

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

Source: L128-5080RC35003P1

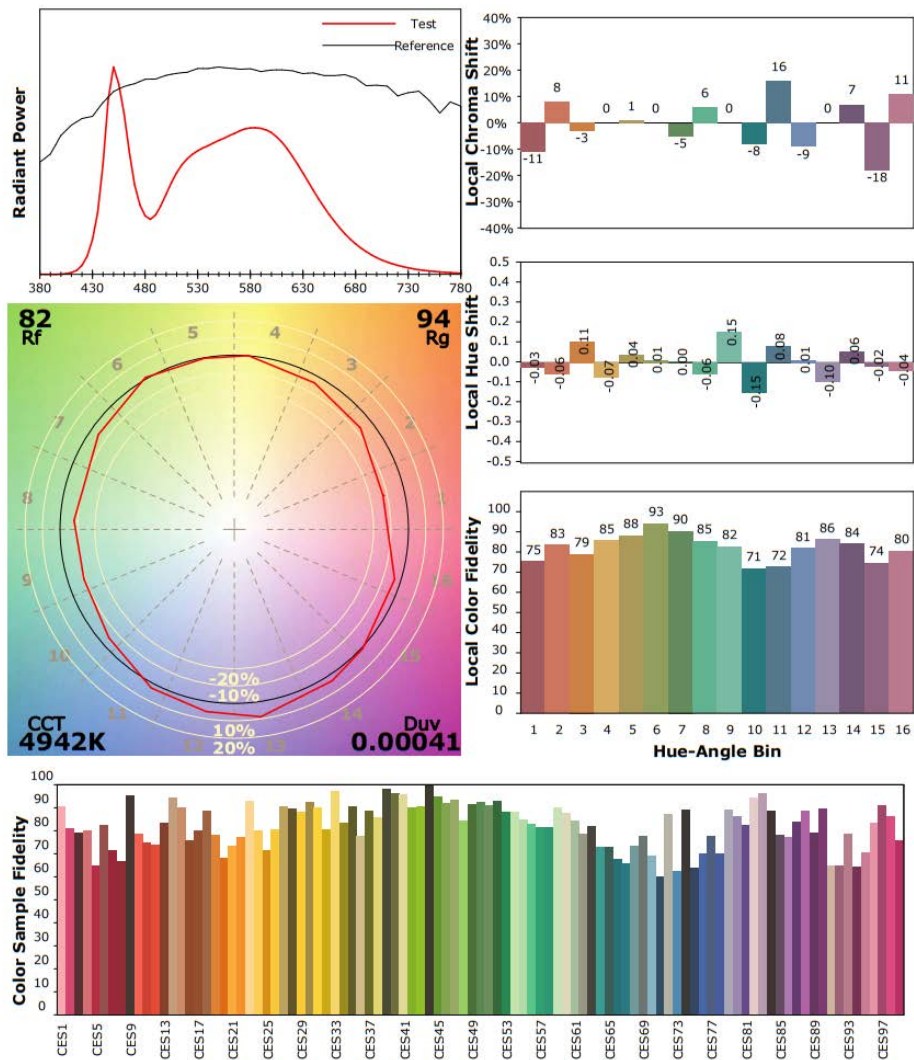
Manufacturer: RAB LIGHTING INC

Date: 2024/11/29

Model:

HIDFA-450S-EX39-8CCT-BYP/480V

@338W 5000K



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

$x$  0.3469  
 $y$  0.3538  
 $u'$  0.2117  
 $v'$  0.4860

(CRI)  
 $R_a$  82.7  
 $R_g$  8

## 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-450S-EX39-8CCT-BYP/480V @225W 3000K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	277.0	60	0.884	232.6	0.956	18.8
	480.0	60	0.567	235.4	0.923	22.2
<b>DLC Pass Criteria</b>					$\geq 0.9(-3\%)$	$\leq 20(+5)$

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

#### THD 400S A15 TB:

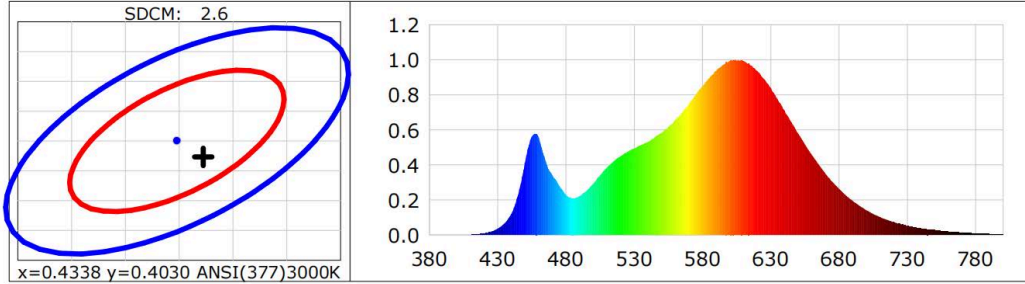
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	83	R9	11
Frequency (Hz)	60	R2	93	R10	85
CCT (K)	2981	R3	94	R11	80
Duv	-0.00141	R4	81	R12	72
Chromaticity (x, y)	x=0.4362 y=0.4003	R5	83	R13	86
Chromaticity (u', v')	u(u')=0.2517 v'=0.5198	R6	93	R14	98
Color Rendering Index (CRI)	83.4	R7	80	R15	75
R9	11	R8	59	--	--
Rf	84	--	--	--	--
Rg	94	--	--	--	--
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)	38244.1	52359.6	$\geq 10000(-10\%)$
Luminous Efficacy (lm/W)	164.35	154.91	Standard: $\geq 120(-3\%)$
Most worst Luminous/Highest	160.66		
Zonal lumens in the 20-50° (%)	11.1	--	$\geq 30(-10\%)$
Beam Angle (°)	169.4	--	--
Center Beam Candle Power (cd)	12641	--	--

## 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	0.1050	525	0.4750	393.3215	670	0.3495	289.4433
385	0.0000	0.0108	530	0.4944	409.4306	675	0.3048	252.3793
390	0.0001	0.0730	535	0.5137	425.4043	680	0.2637	218.3492
395	0.0002	0.1625	540	0.5322	440.6892	685	0.2266	187.6151
400	0.0001	0.1186	545	0.5580	462.0481	690	0.1949	161.4050
405	0.0006	0.5274	550	0.5851	484.4986	695	0.1666	138.0002
410	0.0013	1.0680	555	0.6185	512.1462	700	0.1415	117.1655
415	0.0039	3.2129	560	0.6571	544.1867	705	0.1204	99.7088
420	0.0091	7.5573	565	0.6989	578.7703	710	0.1025	84.8746
425	0.0195	16.1164	570	0.7477	619.1577	715	0.0874	72.3847
430	0.0378	31.3090	575	0.8018	663.9500	720	0.0744	61.5918
435	0.0678	56.1171	580	0.8492	703.2046	725	0.0627	51.9262
440	0.1227	101.5776	585	0.8971	742.8850	730	0.0525	43.4419
445	0.2319	192.0723	590	0.9397	778.1959	735	0.0447	36.9934
450	0.4155	344.1022	595	0.9730	805.7709	740	0.0376	31.1283
455	0.5644	467.3690	600	0.9953	824.2464	745	0.0313	25.9133
460	0.5575	461.6563	605	0.9956	824.4299	750	0.0272	22.4869
465	0.4215	349.0209	610	0.9938	822.9460	755	0.0219	18.1329
470	0.3421	283.2660	615	0.9696	802.9736	760	0.0187	15.5155
475	0.2831	234.4549	620	0.9373	776.1518	765	0.0159	13.1607
480	0.2301	190.5573	625	0.8917	738.4200	770	0.0127	10.5316
485	0.2091	173.1663	630	0.8388	694.6023	775	0.0106	8.8123
490	0.2236	185.1250	635	0.7754	642.1338	780	0.0091	7.5604
495	0.2520	208.6863	640	0.7121	589.6915	785	0.0072	5.9255
500	0.2932	242.7825	645	0.6451	534.2532	790	0.0064	5.2706
505	0.3409	282.3317	650	0.5796	480.0051	795	0.0053	4.3621
510	0.3850	318.8458	655	0.5156	427.0146	800	0.0043	3.5239
515	0.4214	348.9566	660	0.4571	378.5682			
520	0.4504	373.0057	665	0.4018	332.7245			

# TM30

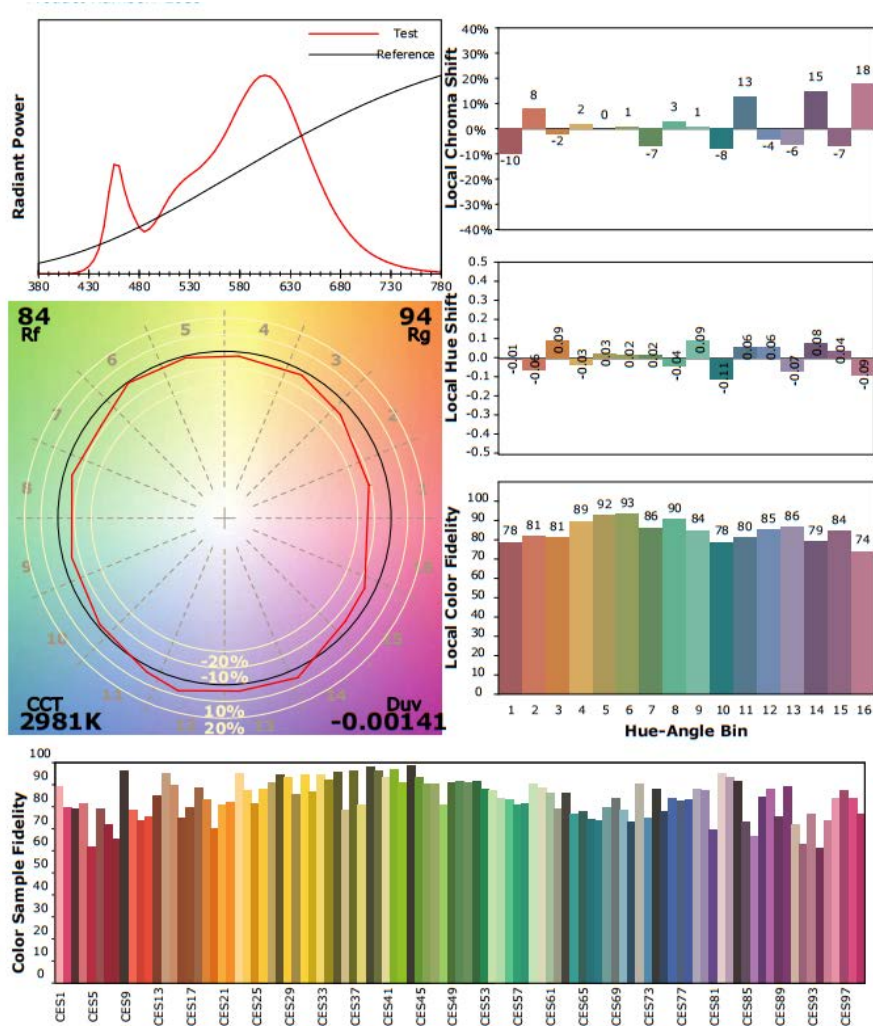
## ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/09/20

Model: HIDFA-450S-EX39-8CCTBYP/480V @225W 3000K



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

$x$  0.4362  
 $y$  0.4003  
 $u'$  0.2517  
 $v'$  0.5198

(CRI)	
$R_a$	83.4
$R_9$	11

## 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-450S-EX39-8CCT-BYP /480V @225W 4000K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	277.0	60	0.863	226.66	0.953	19.8
	480.0	60	0.563	230.12	0.915	22.5
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

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

#### THD 400S A15 TB:

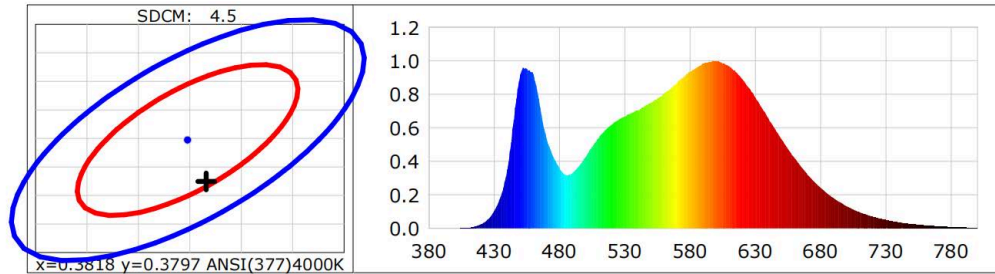
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	85	R9	19
Frequency (Hz)	60	R2	93	R10	83
CCT (K)	3881	R3	96	R11	82
Duv	-0.00294	R4	83	R12	66
Chromaticity (x, y)	x=0.3836 y=0.3724	R5	85	R13	88
Chromaticity (u', v')	u(u')=0.2289 v'(v')=0.5001	R6	90	R14	99
Color Rendering Index (CRI)	85.4	R7	85	R15	80
R9	19	R8	67	--	--
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)	40512.5	39715.8	>= 10000(-10%)
Luminous Efficacy (lm/W)	178.74	176.51	Standard: >= 120(-3%)
Most worst Luminous/Highest	170.84		

## Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0466	525	0.6465	472.4510	670	0.3191	233.2275
385	0.0004	0.3062	530	0.6673	487.6507	675	0.2787	203.6418
390	0.0003	0.2499	535	0.6870	502.0871	680	0.2420	176.8389
395	0.0008	0.5969	540	0.7030	513.7367	685	0.2084	152.2917
400	0.0008	0.5618	545	0.7278	531.8850	690	0.1805	131.9107
405	0.0019	1.4026	550	0.7498	547.9939	695	0.1548	113.1047
410	0.0048	3.4806	555	0.7763	567.3013	700	0.1319	96.3875
415	0.0115	8.3937	560	0.8047	588.0752	705	0.1125	82.2036
420	0.0260	18.9913	565	0.8339	609.4450	710	0.0956	69.8842
425	0.0534	39.0497	570	0.8675	633.9565	715	0.0818	59.7734
430	0.1063	77.6939	575	0.9029	659.8663	720	0.0704	51.4377
435	0.1931	141.1500	580	0.9310	680.3960	725	0.0608	44.4389
440	0.3539	258.6592	585	0.9602	701.6894	730	0.0513	37.5055
445	0.6495	474.6599	590	0.9826	718.0882	735	0.0428	31.2496
450	0.9202	672.4867	595	0.9946	726.8660	740	0.0368	26.9094
455	0.9506	694.7112	600	0.9990	730.0834	745	0.0311	22.7065
460	0.9193	671.8561	605	0.9830	718.3535	750	0.0258	18.8401
465	0.7239	528.9949	610	0.9666	706.4209	755	0.0219	16.0242
470	0.5371	392.5318	615	0.9322	681.2341	760	0.0180	13.1577
475	0.4291	313.6230	620	0.8897	650.2095	765	0.0162	11.8285
480	0.3584	261.9022	625	0.8390	613.1370	770	0.0138	10.1150
485	0.3176	232.1193	630	0.7800	570.0281	775	0.0111	8.0898
490	0.3307	241.6439	635	0.7188	525.2882	780	0.0091	6.6180
495	0.3719	271.7738	640	0.6562	479.5328	785	0.0074	5.4278
500	0.4257	311.0915	645	0.5929	433.2992	790	0.0064	4.7089
505	0.4853	354.6706	650	0.5318	388.6726	795	0.0050	3.6671
510	0.5402	394.7828	655	0.4713	344.4378	800	0.0044	3.2120
515	0.5866	428.6930	660	0.4191	306.2473			
520	0.6188	452.2488	665	0.3671	268.2626			

# TM30

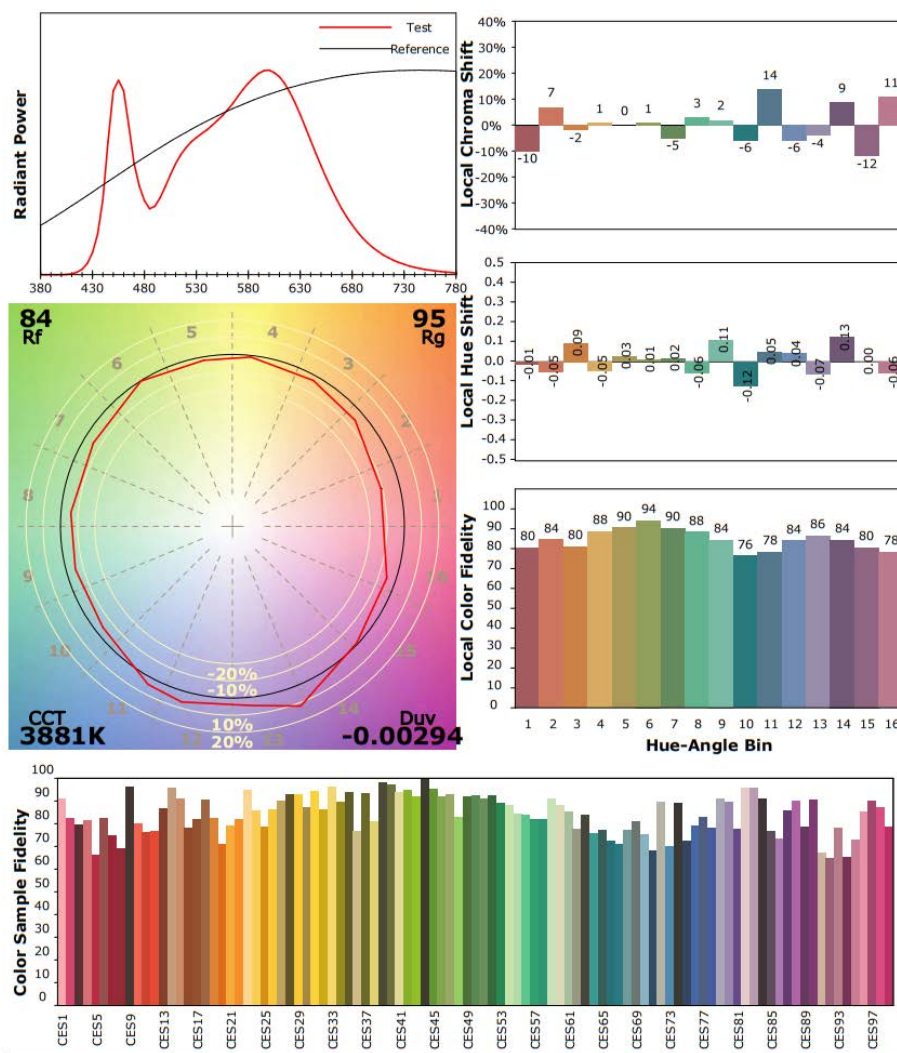
## ANSI/IES TM-30-18 Color Rendition Report

Source: L128-4080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/09/20

Model: HIDFA-450S-EX39-8CCT-BYP/480V @225W 4000K



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

$x$  0.3836  
 $y$  0.3724  
 $u'$  0.2289  
 $v'$  0.5001

(CRI)  
 $R_a$  85.4  
 $R_g$  19

### 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-450S-EX39-8CCT-BYP/480V @225W 5000K		

#### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404	277.0	60	0.880	231.52	0.956	19.5
1E-A3	480.0	60	0.587	233.94	0.921	22.3
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

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

##### THD 400S A15 TB:

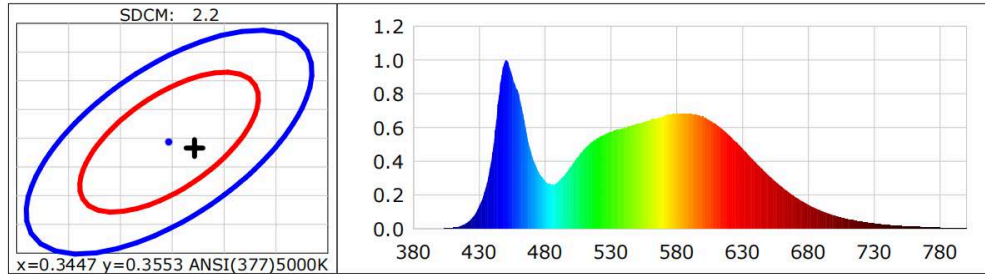
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	81	R9	9
Frequency (Hz)	60	R2	89	R10	73
CCT (K)	4932	R3	93	R11	80
Duv	0.00051	R4	81	R12	57
Chromaticity (x, y)	x=0.3472 y=0.3543	R5	81	R13	84
Chromaticity (u', v')	u(u')=0.2118 v'(v')=0.4863	R6	84	R14	96
Color Rendering Index (CRI)	83.1	R7	87	R15	77
R9	9	R8	67	--	--
Rf	83	--	--	--	--
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)	40876.9	39344.4	>= 10000(-10%)
Luminous Efficacy (lm/W)	176.56	174.86	Standard: >= 120(-3%)
Most worst Luminous/Highest	170.43		

## Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0006	0.5867	525	0.5574	544.2771	670	0.1884	183.9743
385	0.0003	0.3141	530	0.5732	559.7308	675	0.1643	160.4411
390	0.0008	0.8016	535	0.5863	572.4909	680	0.1421	138.7186
395	0.0008	0.8294	540	0.5954	581.3755	685	0.1224	119.5529
400	0.0013	1.3130	545	0.6107	596.2865	690	0.1062	103.7188
405	0.0021	2.0233	550	0.6202	605.5654	695	0.0914	89.2652
410	0.0062	6.0477	555	0.6329	617.9928	700	0.0781	76.2350
415	0.0150	14.6738	560	0.6452	630.0007	705	0.0671	65.4826
420	0.0327	31.9702	565	0.6548	639.4205	710	0.0572	55.8945
425	0.0685	66.9234	570	0.6657	650.0517	715	0.0490	47.8404
430	0.1367	133.4928	575	0.6757	659.7843	720	0.0420	41.0080
435	0.2463	240.4556	580	0.6805	664.4257	725	0.0360	35.1665
440	0.4526	441.9820	585	0.6831	667.0578	730	0.0305	29.7497
445	0.7937	774.9957	590	0.6816	665.5656	735	0.0262	25.5350
450	1.0000	976.4472	595	0.6742	658.2752	740	0.0216	21.1200
455	0.9044	883.1193	600	0.6639	648.2269	745	0.0182	17.7406
460	0.7974	778.6523	605	0.6416	626.4768	750	0.0163	15.9441
465	0.6007	586.5107	610	0.6179	603.3153	755	0.0129	12.5584
470	0.4330	422.7985	615	0.5872	573.3355	760	0.0115	11.2084
475	0.3368	328.9109	620	0.5522	539.1468	765	0.0101	9.8902
480	0.2827	276.0884	625	0.5158	503.6062	770	0.0084	8.2263
485	0.2593	253.1558	630	0.4755	464.3420	775	0.0071	6.9720
490	0.2797	273.1587	635	0.4339	423.6436	780	0.0060	5.8546
495	0.3219	314.3337	640	0.3931	383.8629	785	0.0045	4.3979
500	0.3729	364.1344	645	0.3534	345.0426	790	0.0037	3.6214
505	0.4265	416.4752	650	0.3148	307.4094	795	0.0035	3.4443
510	0.4740	462.8725	655	0.2796	273.0487	800	0.0023	2.2380
515	0.5110	498.9865	660	0.2471	241.3097			
520	0.5379	525.2473	665	0.2166	211.4764			

# TM-30

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

Source: L128-5080RC35003P1

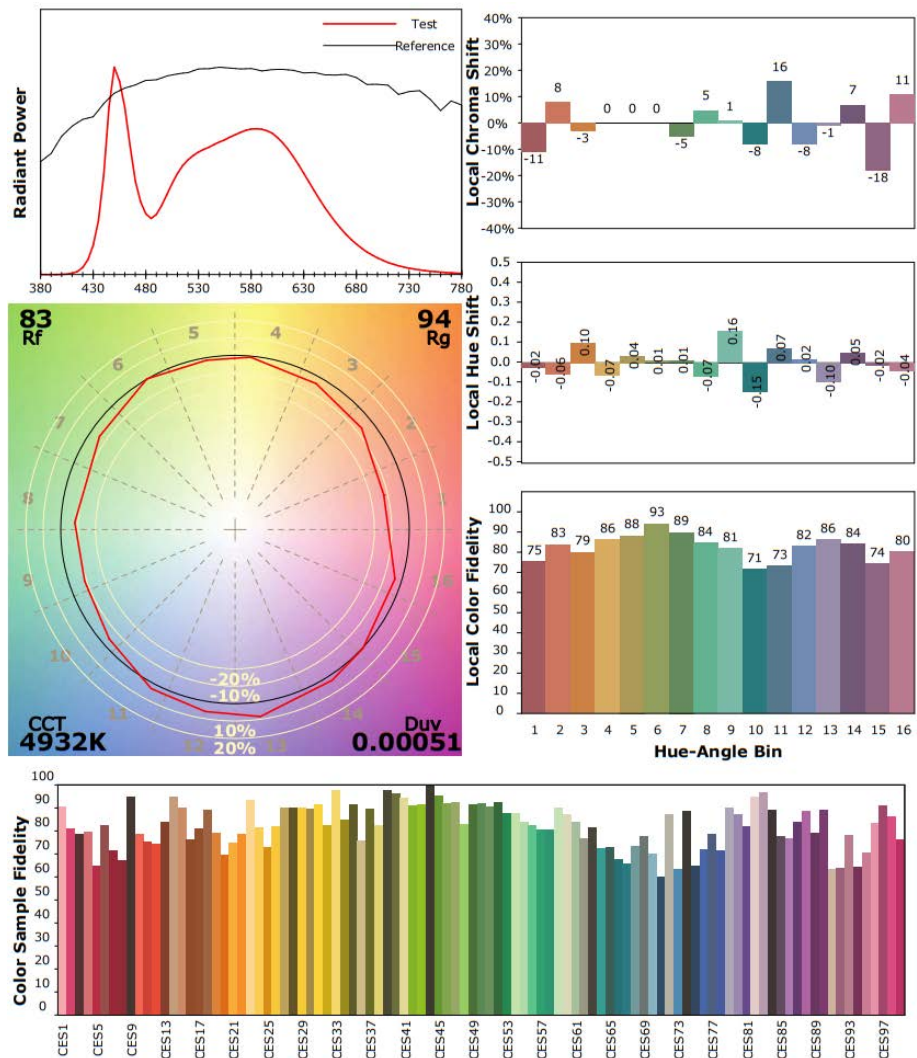
Manufacturer: RAB LIGHTING INC

Date: 2024/11/29

Model:

HIDFA-450S-EX39-8CCT-BYP/480V

@225W 5000K



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

$x$  0.3472  
 $y$  0.3543  
 $u'$  0.2118  
 $v'$  0.4863

(CRI)	
$R_a$	83.1
$R_g$	9