

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-200S-EX39-8CCT-BYP

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Winnie Wu

Engineer: Winnie Wu

Date:2023-04-26

Review By:

Jason Luo

Manager: Jason Luo

1.1 Product Information:

Organization Name	RAB LIGHTING INC	
Brand Name	RAB LIGHTING	
Model Number	HIDFA-200S-EX39-8CCT-BYP	
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	120-277Vac, 50/60 Hz	
Nominal Power	200W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,4000K,5000K(Color tunable)	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-XX80RC35003P1	
Sample Number	UTC2304041E-C1-3	
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	2023-04-23
Date of Test	2023-04-25
Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
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 120 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 $f\theta = 1.42\%$, 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 120 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-CLW16-200WBCDA1-ad30K:1.104

AST-CLW16-200WBCDA1-ad40K:1.104

AST-CLW16-200WBCDA1-ad40K:1.104

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 120 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)

Test date	2023-04-25	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-200S-EX39-8CCT-BYP @200W 3000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404 1E-C1	120.0	60	1.724	204.84	0.99	11.77
	277.0	60	0.758	194.34	0.926	15.43
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia

THD 400S A15 TB:

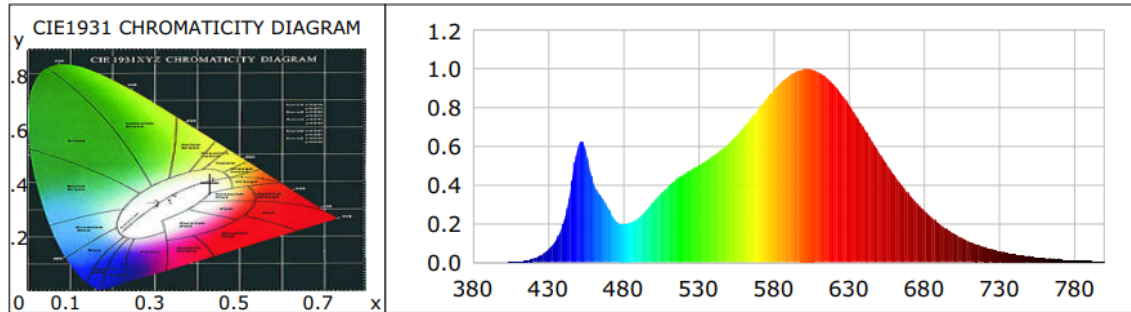
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	4
Frequency (Hz)	60	R2	91	R10	79
CCT (K)	3042	R3	96	R11	7
Duv	-0.0014	R4	79	R12	69
Chromaticity (x, y)	x=0.4321 y=0.3990	R5	80	R13	82
Chromaticity (u', v')	u(u')=0.2496 v'=0.5186	R6	89	R14	98
Color Rendering Index (CRI)	82	R7	81	R15	73
R9	4	R8	57	--	--
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)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	25162.5	24380.0	>=10000(-10%)
Luminous Efficacy (lm/W)	122.84	125.45	Standard: >= 120(-3%)
Most worst Luminous/Highest	119.02		
Zonal lumens in the 20-50° (%)	49.20	--	>=30(-10%)
Beam Angle (°)	131.1	--	--
Center Beam Candle Power (cd)	3410	--	--

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	0.1551	535	0.4769	283.9488	690	0.3512	209.1199
385	0.0003	0.1800	540	0.5004	297.9193	695	0.3061	182.2350
390	0.0004	0.2623	545	0.5249	312.5283	700	0.2673	159.1395
395	0.0003	0.1690	550	0.5518	328.5559	705	0.2303	137.1317
400	0.0007	0.4287	555	0.5792	344.8578	710	0.2007	119.4763
405	0.0018	1.0434	560	0.6136	365.3543	715	0.1719	102.3647
410	0.0041	2.4255	565	0.6526	388.5667	720	0.1482	88.2133
415	0.0094	5.5985	570	0.6974	415.2327	725	0.1272	75.7286
420	0.0192	11.4386	575	0.7436	442.7320	730	0.1080	64.3056
425	0.0359	21.3774	580	0.7915	471.2476	735	0.0930	55.3451
430	0.0635	37.8003	585	0.8425	501.6256	740	0.0794	47.2546
435	0.1107	65.9186	590	0.8886	529.0378	745	0.0667	39.7081
440	0.1951	116.1592	595	0.9296	553.4438	750	0.0568	33.8415
445	0.3723	221.6819	600	0.9617	572.6016	755	0.0488	29.0356
450	0.5963	355.0056	605	0.9860	587.0484	760	0.0419	24.9541
455	0.5830	347.1280	610	0.9988	594.6530	765	0.0362	21.5706
460	0.4176	248.6331	615	0.9980	594.1848	770	0.0302	18.0056
465	0.3455	205.7032	620	0.9842	585.9945	775	0.0259	15.4460
470	0.2804	166.9637	625	0.9574	570.0152	780	0.0225	13.3946
475	0.2149	127.9699	630	0.9190	547.1672	785	0.0189	11.2757
480	0.1966	117.0798	635	0.8689	517.3382	790	0.0159	9.4419
485	0.2055	122.3229	640	0.8166	486.2042	795	0.0139	8.2745
490	0.2275	135.4542	645	0.7571	450.7707	800	0.0118	7.0068
495	0.2658	158.2504	650	0.6943	413.3496			
500	0.3119	185.7068	655	0.6300	375.0645			
505	0.3536	210.5024	660	0.5684	338.4342			
510	0.3930	233.9771	665	0.5082	302.5529			
515	0.4250	253.0415	670	0.4526	269.4694			
520	0.4532	269.8098	675	0.3996	237.9250			
525	0.4769	283.9488	680	0.3512	209.1199			
530	0.5004	297.9193	685	0.3061	182.2350			

TM30

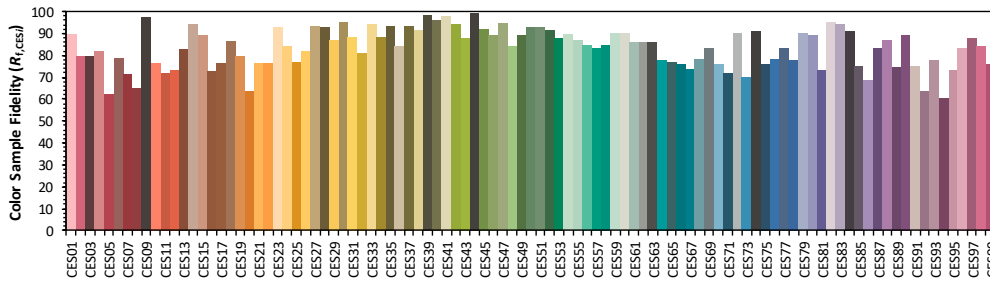
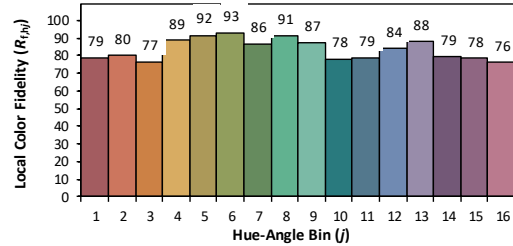
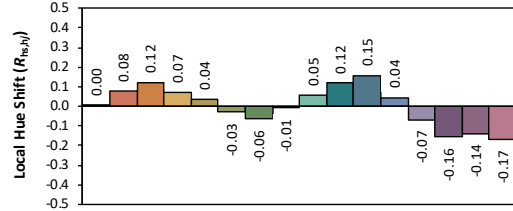
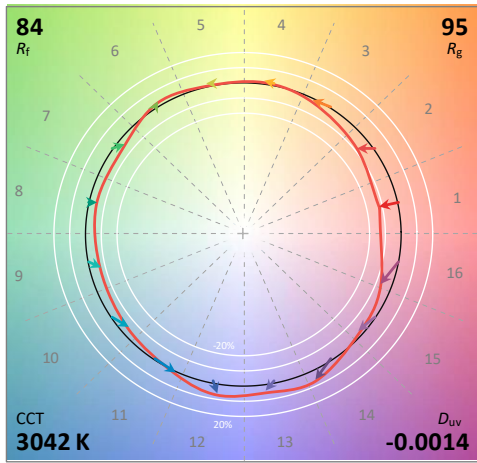
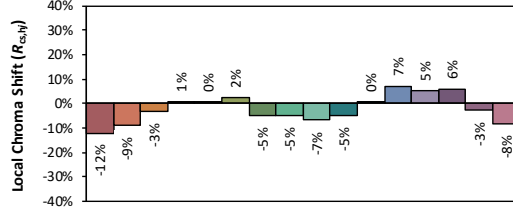
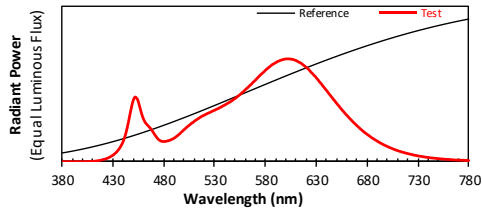
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2023/4/25

Model: HIDFA-200S-EX39-8CCT-BYP
@200W 3000K



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

x 0.4321
 y 0.3990
 u' 0.2496
 v' 0.5186

CIE 13.3-1995 (CRI)	
R_a	82
R_9	4

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

Zonal Lumen Tabulation

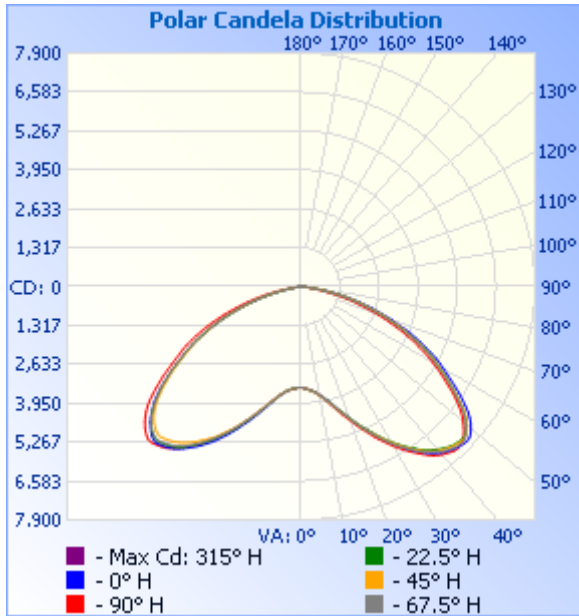
Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	4,050.4	16.1%	16.1%
0-40	8,269.0	32.9%	32.9%
0-60	19,314.7	76.8%	76.8%
60-90	5,802.5	23.1%	23.1%
70-100	1,953.4	7.8%	7.8%
90-120	8.8	0%	0%
0-90	25,117.2	99.8%	99.8%
90-180	43.7	0.2%	0.2%
0-180	25,160.8	100%	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	340.6	1.4%	90-100	1.8	0%
10-20	1,195.1	4.7%	100-110	1.5	0%
20-30	2,514.7	10.0%	110-120	5.4	0%
30-40	4,218.6	16.8%	120-130	6.4	0%
40-50	5,633.2	22.4%	130-140	6.9	0%
50-60	5,412.5	21.5%	140-150	8.0	0%
60-70	3,850.9	15.3%	150-160	7.3	0%
70-80	1,729.9	6.9%	160-170	4.8	0%
80-90	221.7	0.9%	170-180	1.4	0%

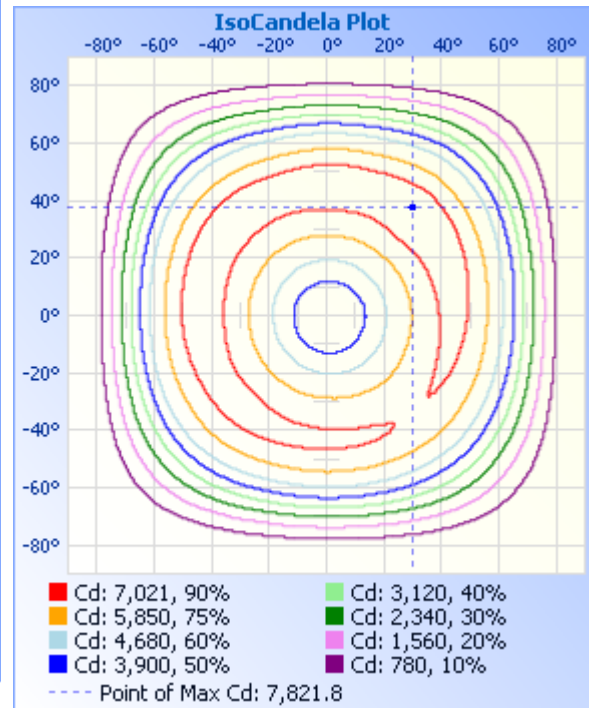
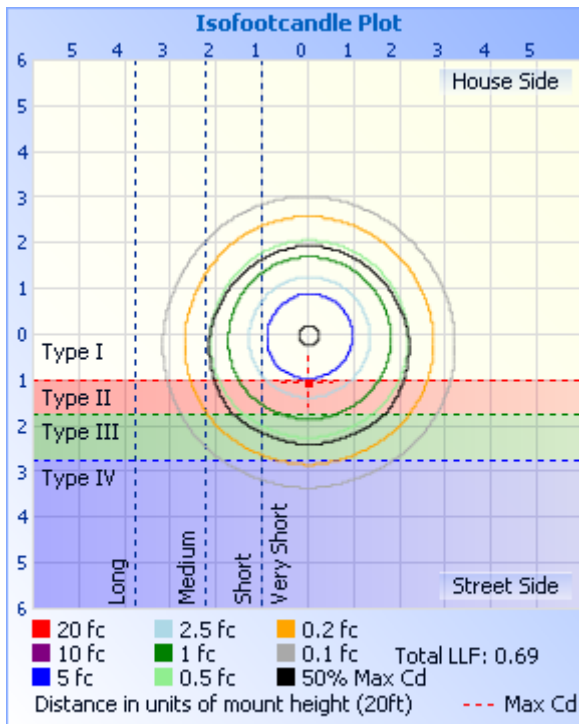
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	11.80 fc	61.0 ft	57.4 ft
34.0ft	2.95 fc	122.1 ft	114.8 ft
51.0ft	1.31 fc	183.1 ft	172.1 ft
68.0ft	0.74 fc	244.1 ft	229.5 ft
85.0ft	0.47 fc	305.1 ft	286.9 ft
102.0ft	0.33 fc	366.2 ft	344.3 ft

■ Vert. Spread: 121.8°
■ Horiz. Spread: 118.7°



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	3410	3410	3410	3410	3410	3410	3410	3410	3410	3410	3410	3410	3410	3410	3410	3410	3410
1	3410	3419	3427	3420	3434	3428	3433	3423	3417	3411	3408	3404	3407	3407	3417	3415	3410
2	3439	3441	3443	3441	3445	3448	3444	3438	3425	3425	3425	3415	3419	3426	3435	3441	3439
3	3470	3473	3474	3464	3467	3468	3462	3454	3436	3433	3434	3434	3442	3449	3462	3470	3470
4	3492	3495	3500	3495	3479	3480	3477	3468	3457	3449	3453	3449	3467	3476	3486	3496	3492
5	3515	3521	3523	3524	3512	3503	3496	3486	3481	3473	3470	3470	3478	3493	3505	3510	3515
6	3540	3543	3553	3541	3540	3536	3528	3516	3506	3495	3496	3492	3505	3516	3531	3538	3540
7	3585	3584	3597	3584	3587	3577	3571	3556	3536	3527	3530	3525	3544	3551	3565	3574	3585
8	3629	3632	3637	3633	3632	3629	3613	3598	3579	3574	3560	3559	3578	3589	3606	3615	3629
9	3684	3682	3698	3684	3687	3686	3669	3648	3630	3617	3610	3606	3623	3637	3660	3667	3684
10	3740	3747	3758	3747	3762	3752	3728	3713	3691	3676	3671	3674	3672	3683	3709	3718	3740
11	3800	3821	3813	3818	3838	3826	3803	3791	3760	3743	3735	3741	3728	3747	3776	3786	3800
12	3871	3888	3900	3905	3925	3910	3885	3874	3837	3823	3812	3808	3790	3811	3849	3859	3871
13	3958	3967	3976	3977	4008	4000	3987	3956	3920	3900	3899	3898	3888	3882	3928	3938	3958
14	4048	4057	4064	4075	4108	4108	4097	4058	4022	4002	3984	3980	3973	3972	4018	4029	4048
15	4141	4149	4165	4170	4213	4219	4192	4161	4112	4085	4073	4068	4068	4059	4119	4122	4141
16	4245	4254	4266	4270	4317	4323	4300	4261	4229	4184	4172	4172	4168	4179	4219	4230	4245
17	4362	4360	4375	4377	4444	4445	4417	4397	4337	4299	4278	4282	4272	4282	4332	4336	4362
18	4474	4478	4498	4507	4568	4565	4546	4519	4462	4410	4399	4404	4381	4389	4456	4448	4474
19	4587	4592	4610	4623	4691	4688	4684	4639	4577	4541	4504	4508	4501	4504	4575	4570	4587
20	4718	4713	4746	4744	4812	4835	4814	4760	4712	4657	4627	4624	4621	4631	4711	4701	4718
21	4847	4848	4872	4885	4947	4968	4952	4897	4847	4780	4748	4750	4751	4760	4838	4827	4847
22	4995	4980	5000	5014	5091	5096	5089	5029	4973	4899	4860	4873	4887	4882	4972	4964	4995
23	5130	5110	5148	5154	5224	5237	5224	5177	5109	5036	4984	5013	5008	5021	5119	5097	5130
24	5256	5244	5281	5299	5362	5379	5364	5310	5249	5172	5129	5150	5133	5157	5264	5227	5256
25	5396	5372	5413	5431	5501	5508	5524	5441	5386	5318	5253	5279	5277	5302	5404	5375	5396
26	5538	5506	5550	5560	5659	5655	5661	5581	5534	5438	5381	5420	5416	5435	5548	5506	5538
27	5676	5649	5676	5711	5796	5797	5801	5733	5667	5576	5503	5557	5543	5583	5693	5648	5676

28	5828	5777	5816	5854	5940	5942	5951	5866	5805	5711	5623	5686	5679	5715	5844	5788	5828
29	5972	5929	5958	6001	6083	6079	6110	5997	5948	5844	5763	5815	5821	5870	5996	5926	5972
30	6108	6066	6101	6135	6225	6214	6244	6125	6077	5985	5888	5946	5950	6002	6156	6063	6108
31	6244	6186	6228	6273	6364	6358	6380	6252	6192	6105	5995	6065	6092	6142	6297	6191	6244
32	6384	6322	6354	6405	6495	6470	6511	6367	6327	6230	6099	6203	6238	6287	6438	6326	6384
33	6531	6451	6489	6528	6630	6593	6629	6502	6439	6350	6209	6322	6358	6424	6578	6463	6531
34	6667	6577	6614	6659	6758	6713	6749	6606	6546	6464	6329	6439	6487	6553	6718	6598	6667
35	6782	6684	6738	6784	6888	6841	6884	6718	6660	6577	6430	6552	6606	6685	6861	6718	6782
36	6910	6819	6857	6905	7005	6963	6988	6830	6769	6702	6526	6665	6723	6819	7024	6849	6910
37	7037	6921	6969	7017	7144	7067	7088	6929	6869	6802	6609	6755	6837	6950	7151	6978	7037
38	7143	7021	7064	7120	7252	7156	7179	7020	6957	6885	6693	6842	6944	7062	7267	7092	7143
39	7242	7106	7162	7218	7342	7235	7259	7083	7027	6953	6767	6908	7042	7166	7374	7204	7242
40	7335	7189	7247	7297	7416	7296	7320	7139	7087	7011	6820	6967	7123	7274	7472	7284	7335
41	7405	7266	7303	7371	7480	7356	7371	7191	7134	7059	6876	7018	7179	7352	7555	7358	7405
42	7467	7334	7369	7438	7538	7414	7408	7228	7178	7099	6917	7065	7230	7418	7632	7409	7467
43	7521	7386	7413	7490	7592	7437	7397	7218	7217	7131	6958	7107	7274	7488	7691	7473	7521
44	7577	7436	7457	7541	7613	7411	7352	7201	7192	7117	6952	7095	7314	7544	7737	7519	7577
45	7618	7464	7495	7574	7597	7356	7278	7156	7134	7076	6920	7060	7311	7575	7788	7567	7618
46	7648	7497	7520	7604	7560	7285	7189	7075	7049	7012	6863	7004	7255	7554	7822	7598	7648
47	7663	7498	7533	7566	7496	7209	7094	6965	6952	6918	6791	6922	7189	7513	7809	7618	7663
48	7650	7467	7487	7479	7394	7108	6984	6845	6855	6819	6702	6812	7105	7447	7746	7584	7650
49	7585	7385	7420	7382	7278	6986	6850	6709	6730	6696	6584	6702	6999	7351	7664	7529	7585
50	7491	7285	7309	7276	7154	6837	6707	6565	6593	6548	6460	6571	6878	7230	7567	7445	7491
51	7380	7158	7182	7148	7013	6690	6548	6405	6439	6391	6308	6418	6742	7098	7443	7318	7380
52	7231	7013	7034	6983	6849	6530	6380	6210	6278	6205	6146	6238	6592	6956	7294	7149	7231
53	7071	6825	6857	6796	6658	6320	6177	6021	6082	6007	5952	6053	6420	6785	7116	6949	7071
54	6858	6616	6632	6594	6457	6108	5954	5802	5885	5815	5763	5873	6208	6568	6906	6727	6858
55	6654	6394	6418	6378	6249	5888	5728	5591	5646	5585	5557	5676	5982	6356	6684	6510	6654
56	6437	6189	6189	6146	6005	5676	5511	5356	5425	5379	5352	5444	5770	6155	6447	6277	6437
57	6206	5976	5970	5936	5781	5457	5263	5127	5212	5175	5127	5236	5568	5940	6227	6077	6206
58	5972	5764	5740	5704	5575	5241	5045	4896	4976	4951	4915	5008	5323	5703	6021	5867	5972

59	5761	5540	5525	5483	5363	5011	4828	4700	4764	4707	4708	4784	5099	5490	5796	5657	5761
60	5554	5343	5341	5283	5146	4793	4607	4501	4558	4518	4496	4585	4896	5296	5578	5456	5554
61	5362	5154	5151	5092	4928	4606	4412	4278	4338	4336	4310	4382	4696	5075	5364	5261	5362
62	5164	4964	4948	4875	4704	4392	4188	4065	4143	4131	4105	4193	4528	4905	5159	5028	5164
63	4923	4747	4697	4651	4444	4127	3955	3861	3930	3895	3903	3986	4335	4690	4942	4831	4923
64	4671	4488	4469	4423	4250	3889	3725	3628	3669	3671	3691	3772	4104	4462	4693	4602	4671
65	4440	4257	4240	4179	3974	3639	3481	3384	3454	3460	3470	3538	3899	4226	4461	4375	4440
66	4216	4029	4019	3953	3743	3403	3243	3156	3213	3225	3251	3302	3684	3975	4220	4137	4216
67	3989	3782	3801	3710	3495	3155	2996	2912	2986	3014	3032	3099	3447	3747	3989	3919	3989
68	3715	3543	3572	3459	3227	2924	2772	2706	2757	2770	2803	2877	3220	3504	3728	3670	3715
69	3432	3310	3306	3224	3012	2697	2531	2466	2532	2537	2590	2638	2967	3245	3493	3421	3432
70	3240	3081	3083	2998	2756	2463	2315	2231	2307	2332	2376	2430	2756	3020	3227	3178	3240
71	2970	2852	2843	2737	2540	2241	2066	2012	2081	2093	2149	2199	2519	2746	2958	2940	2970
72	2744	2588	2614	2530	2269	1994	1842	1792	1878	1875	1923	1994	2293	2539	2736	2683	2744
73	2521	2374	2395	2286	2037	1774	1648	1626	1638	1664	1742	1786	2074	2303	2504	2469	2521
74	2283	2149	2162	2047	1823	1579	1430	1379	1457	1489	1537	1592	1854	2070	2262	2244	2283
75	2050	1948	1953	1840	1599	1353	1232	1198	1248	1273	1334	1378	1663	1840	2026	2006	2050
76	1833	1725	1738	1628	1394	1178	1015	1008	1073	1072	1145	1205	1440	1635	1813	1802	1833
77	1627	1523	1536	1411	1154	936	836	821	856	890	953	1007	1242	1392	1572	1605	1627
78	1404	1342	1330	1196	940	754	636	619	691	716	773	809	1062	1205	1379	1383	1404
79	1218	1142	1116	1016	746	560	482	456	487	530	576	628	851	977	1136	1189	1218
80	1009	949	937	808	555	436	363	346	364	378	423	475	644	800	944	994	1009
81	807	768	719	639	395	313	271	270	272	289	324	356	489	592	724	787	807
82	616	589	574	439	301	241	211	202	207	222	251	276	365	427	522	608	616
83	443	424	368	324	221	173	161	151	158	173	194	220	272	332	391	429	443
84	296	281	266	243	163	140	114	111	119	125	144	169	209	250	284	297	296
85	223	216	205	185	113	81	73	67	73	76	100	127	156	186	207	229	223
86	172	164	154	130	62	36	40	40	27	37	51	78	113	136	146	168	172
87	123	104	111	82	31	16	17	21	22	23	36	39	54	76	111	118	123
88	74	70	68	43	0	0	0	10	12	12	18	21	18	39	64	74	74
89	45	39	38	17	0	0	0	0	0	0	12	16	0	17	24	47	45

90	25	37	22	21	0	0	0	0	0	0	10	0	0	0	24	25	25
91	16	19	20	15	0	0	0	0	0	0	0	0	0	0	11	21	16
92	16	16	10	0	0	0	0	0	0	0	0	0	0	0	0	0	16
93	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	12	0
94	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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105	0	0	10	10	0	0	0	0	0	0	12	0	0	0	0	0	0
106	0	13	0	15	0	0	0	0	0	0	11	0	0	0	11	0	0
107	0	15	14	11	0	0	0	0	0	0	0	0	0	0	0	0	0
108	0	0	0	12	0	0	0	0	0	0	12	0	0	0	0	0	0
109	0	0	10	11	0	0	0	0	0	10	0	0	0	0	0	0	0
110	0	14	14	13	0	0	0	0	0	0	10	15	0	0	0	10	0
111	0	11	0	15	0	0	0	0	0	0	0	15	0	0	14	12	0
112	10	15	0	13	0	0	0	12	0	0	13	13	0	0	0	0	10
113	0	12	0	15	0	0	0	12	0	0	0	15	0	0	0	12	0
114	13	11	11	14	0	0	0	0	10	0	10	13	0	10	10	0	13
115	12	15	16	19	0	0	0	0	0	0	12	13	0	0	11	0	12
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118	0	14	0	19	0	0	0	0	9	0	10	13	0	0	0	0	0
119	0	14	16	17	0	0	11	0	14	10	14	15	0	11	10	0	0
120	12	17	13	15	0	0	0	10	0	0	14	15	0	0	10	12	12

121	0	12	12	16	0	0	0	0	11	0	13	16	0	14	11	0	0
122	0	0	12	15	0	0	0	10	13	11	18	14	0	10	11	0	0
123	11	10	18	15	0	0	0	0	0	0	15	18	0	11	10	0	11
124	0	9	12	13	0	0	0	0	0	0	13	15	0	0	12	15	0
125	0	15	14	15	0	0	0	0	0	10	13	17	0	0	13	13	0
126	11	15	17	16	0	0	0	11	0	10	11	14	0	11	13	10	11
127	13	14	11	15	0	0	0	11	0	10	15	14	0	13	17	10	13
128	0	16	0	23	0	0	10	0	0	0	12	17	0	0	13	0	0
129	0	12	16	21	0	0	0	10	0	15	16	15	0	0	13	14	0
130	11	14	18	16	0	0	0	14	0	13	14	13	0	0	0	0	11
131	13	13	12	12	0	0	0	10	11	11	13	0	0	11	16	14	13
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133	0	17	14	0	0	0	12	11	12	12	17	0	0	0	14	13	0
134	15	16	16	19	0	0	0	13	0	16	19	15	0	10	10	11	15
135	12	16	12	13	0	0	10	10	9	14	16	16	0	0	11	14	12
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145	0	21	12	11	0	0	12	11	15	16	19	18	0	10	10	19	0
146	10	24	18	19	0	0	12	14	14	20	22	21	0	12	15	18	10
147	11	23	19	10	0	0	15	21	20	19	21	18	0	13	15	23	11
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150	18	0	23	13	0	0	12	19	18	21	22	15	0	12	13	22	18
151	18	27	16	16	0	0	17	21	15	16	20	18	0	17	21	22	18

152	17	29	16	20	0	0	15	18	15	20	23	21	0	13	10	19	17
153	20	29	16	18	0	0	14	25	15	16	18	19	0	13	17	23	20
154	21	28	21	11	0	0	13	19	15	21	25	19	0	14	15	21	21
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157	16	33	22	20	0	0	13	20	18	18	27	20	0	18	18	23	16
158	25	35	26	18	0	0	26	23	22	16	28	24	0	14	10	20	25
159	18	37	21	18	0	0	26	21	14	26	22	23	10	14	27	17	18
160	20	38	20	13	0	0	32	22	18	28	23	20	0	12	24	23	20
161	27	27	22	20	0	0	28	16	13	16	23	22	0	0	20	21	27
162	28	24	16	22	0	0	28	24	18	29	23	24	0	14	15	24	28
163	17	23	26	18	0	0	28	29	15	27	24	22	12	14	10	16	17
164	19	0	20	14	0	0	25	27	16	36	21	22	0	16	12	17	19
165	16	22	20	22	0	0	13	24	21	32	22	22	0	10	20	20	16
166	16	23	27	22	0	0	14	28	24	35	25	27	0	15	23	17	16
167	22	27	22	22	0	10	15	30	16	32	23	20	0	13	15	19	22
168	22	20	22	20	0	0	17	19	16	27	25	20	0	0	20	19	22
169	19	29	21	21	0	0	18	16	16	27	26	24	0	16	19	17	19
170	12	24	19	25	10	0	19	17	16	23	27	18	0	12	18	17	12
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173	16	20	18	20	0	13	17	18	18	18	28	23	0	13	19	14	16
174	10	20	23	19	0	0	10	0	17	19	23	0	0	11	21	18	10
175	15	23	19	22	0	0	12	14	19	20	19	20	0	14	18	18	15
176	11	23	14	22	0	0	10	16	15	15	18	24	0	0	14	16	11
177	15	22	18	18	0	0	0	18	20	16	20	22	0	0	15	10	15
178	0	13	19	13	0	0	14	16	14	16	20	18	0	10	12	12	0
179	0	15	15	15	0	0	12	14	11	13	21	15	0	14	11	14	0
180	16	19	14	16	0	0	12	18	16	16	19	14	0	12	19	16	16

BUG

Lum. Classification System (LCS)

LCS Zone	Lumens	%Lamp	%Lum
FL (0-30)	2025.7	8.1	8.1
FM (30-60)	7886.5	31.3	31.3
FH (60-80)	3120.4	12.4	12.4
FVH (80-90)	152.3	0.6	0.6
BL (0-30)	2024.0	8.0	8.0
BM (30-60)	7380.3	29.3	29.3
BH (60-80)	2460.2	9.8	9.8
BVH (80-90)	69.4	0.3	0.3
UL (90-100)	1.8	0.0	0.0
UH (100-180)	41.9	0.2	0.2
Total	25162.5	100.0	100.0
BUG Rating	B4-U2-G2		

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2023-04-25	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-200S-EX39-8CCT-BYP @200W 4000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404	120.0	60	1.674	199.05	0.991	11.82
1E-C2	277.0	60	0.735	188.38	0.925	15.45
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

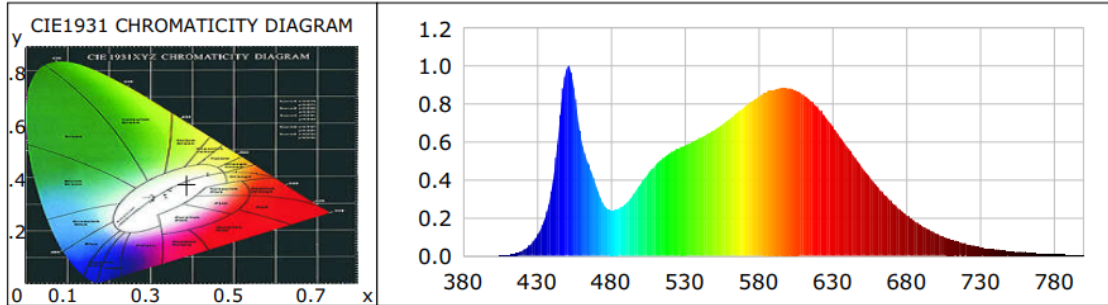
Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia THD 400S A15 TB:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	13
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	3813	R3	95	R11	81
Duv	-0.0029	R4	82	R12	64
Chromaticity (x, y)	x=0.3867 y=0.3743	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2302 v'(v')=0.5014	R6	87	R14	98
Color Rendering Index (CRI)	84	R7	84	R15	77
R9	13	R8	65	--	--
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)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	27805.3	26767.5	>= 10000(-10%)
Luminous Efficacy (lm/W)	139.69	142.09	Standard: >= 120(-3%)
Most worst Luminous/Highest	134.48		

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	0.3901	535	0.5622	352.9330	690	0.2821	177.0997
385	0.0002	0.1476	540	0.5812	364.8208	695	0.2461	154.5046
390	0.0006	0.4030	545	0.6002	376.7429	700	0.2150	134.9632
395	0.0005	0.3308	550	0.6201	389.2761	705	0.1855	116.4661
400	0.0011	0.6968	555	0.6399	401.6710	710	0.1609	101.0318
405	0.0020	1.2302	560	0.6627	416.0291	715	0.1383	86.8438
410	0.0047	2.9609	565	0.6897	432.9712	720	0.1177	73.8567
415	0.0121	7.5990	570	0.7190	451.3194	725	0.1019	63.9767
420	0.0263	16.5204	575	0.7511	471.5184	730	0.0865	54.3309
425	0.0533	33.4365	580	0.7806	490.0379	735	0.0742	46.6028
430	0.1020	64.0005	585	0.8127	510.1939	740	0.0632	39.6571
435	0.1866	117.1443	590	0.8386	526.4297	745	0.0537	33.6826
440	0.3465	217.5128	595	0.8593	539.4141	750	0.0463	29.0378
445	0.6700	420.5680	600	0.8753	549.4532	755	0.0391	24.5345
450	0.9826	616.8299	605	0.8837	554.7421	760	0.0332	20.8517
455	0.8854	555.8278	610	0.8829	554.2136	765	0.0283	17.7613
460	0.6150	386.0775	615	0.8711	546.8054	770	0.0242	15.1904
465	0.4809	301.8805	620	0.8505	533.8831	775	0.0210	13.2018
470	0.3708	232.7882	625	0.8171	512.9293	780	0.0176	11.0288
475	0.2731	171.4335	630	0.7785	488.7294	785	0.0145	9.1239
480	0.2401	150.7424	635	0.7320	459.4817	790	0.0140	8.7571
485	0.2470	155.0286	640	0.6822	428.2588	795	0.0116	7.2949
490	0.2731	171.4515	645	0.6268	393.4687	800	0.0085	5.3474
495	0.3206	201.2755	650	0.5728	359.5537			
500	0.3761	236.1261	655	0.5180	325.1571			
505	0.4287	269.1432	660	0.4656	292.2551			
510	0.4750	298.1565	665	0.4146	260.2687			
515	0.5105	320.4584	670	0.3660	229.7860			
520	0.5400	338.9809	675	0.3231	202.8418			
525	0.5622	352.9330	680	0.2821	177.0997			
530	0.5812	364.8208	685	0.2461	154.5046			

TM30

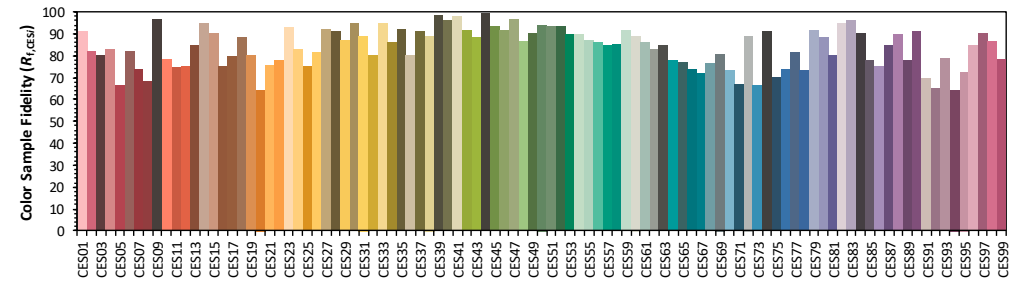
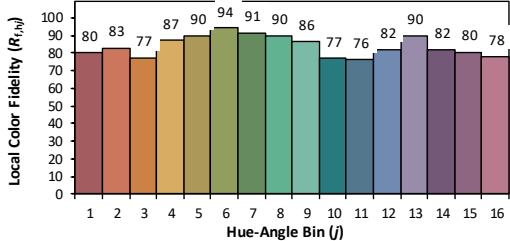
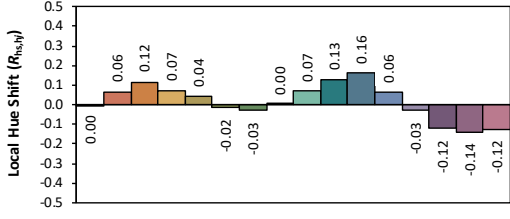
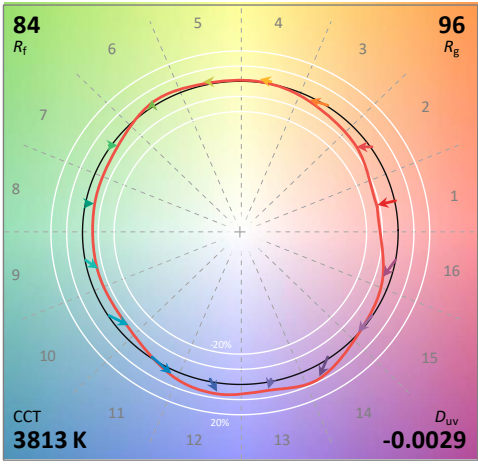
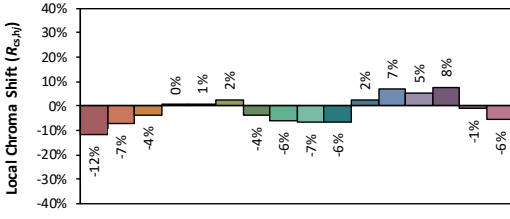
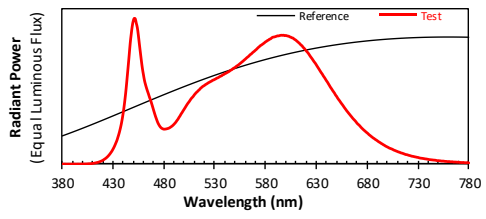
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2023/4/25

Model: HIDFA-200S-EX39-8CCT-BYP
@200W 4000K



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

x	0.3867	CIE 13.3-1995 (CRI) R_a 84 R_9 13
y	0.3743	
u'	0.2302	
v'	0.5014	

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	2023-04-25	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-200S-EX39-8CCT-BYP @200W 5000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404	120.0	60	1.721	204.62	0.991	11.83
1E-C3	277.0	60	0.758	194.26	0.925	15.34
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

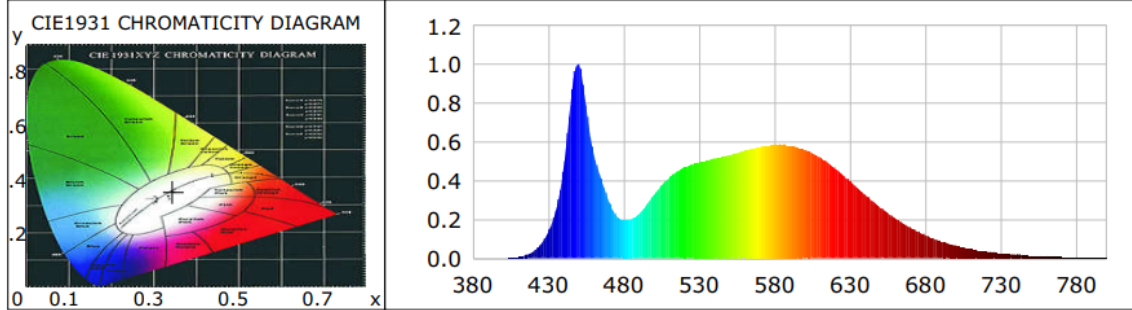
Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia THD 400S A15 TB:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	6
Frequency (Hz)	60	R2	87	R10	68
CCT (K)	4985	R3	91	R11	80
Duv	0.0003	R4	82	R12	55
Chromaticity (x, y)	x=0.3456 y=0.3527	R5	80	R13	82
Chromaticity (u', v')	u(u')=0.2113 v'(v')=0.4853	R6	81	R14	95
Color Rendering Index (CRI)	82	R7	87	R15	75
R9	6	R8	67	--	--
Rf	82	--	--	--	--
Rg	97	--	--	--	--
Rcs,h1(%)	-13	--	--	--	--

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

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	27715.3	26870.7	>= 10000(-10%)
Luminous Efficacy (lm/W)	135.45	138.32	Standard: >= 120(-3%)
Most worst Luminous/Highest	131.32		

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	0.0977	535	0.4832	410.8393	690	0.1575	133.8925
385	0.0001	0.1201	540	0.4934	419.5242	695	0.1371	116.5648
390	0.0006	0.4958	545	0.5036	428.2365	700	0.1183	100.6142
395	0.0005	0.4014	550	0.5147	437.6085	705	0.1027	87.3620
400	0.0009	0.7285	555	0.5227	444.4688	710	0.0885	75.2525
405	0.0021	1.8252	560	0.5329	453.1452	715	0.0757	64.3535
410	0.0066	5.5910	565	0.5422	461.0510	720	0.0656	55.7825
415	0.0158	13.4326	570	0.5547	471.6154	725	0.0554	47.1247
420	0.0342	29.0958	575	0.5646	480.1071	730	0.0476	40.4782
425	0.0699	59.4288	580	0.5729	487.1664	735	0.0404	34.3818
430	0.1335	113.4745	585	0.5802	493.3178	740	0.0346	29.4330
435	0.2433	206.8600	590	0.5838	496.3554	745	0.0300	25.5275
440	0.4513	383.7566	595	0.5842	496.7254	750	0.0249	21.1853
445	0.8079	686.9072	600	0.5806	493.7069	755	0.0218	18.5604
450	1.0000	850.2809	605	0.5729	487.1491	760	0.0180	15.2872
455	0.7893	671.1310	610	0.5593	475.6038	765	0.0162	13.7979
460	0.5450	463.3952	615	0.5422	461.0467	770	0.0127	10.8315
465	0.4115	349.8995	620	0.5221	443.9350	775	0.0109	9.2524
470	0.2989	254.1388	625	0.4936	419.7207	780	0.0100	8.5423
475	0.2208	187.7267	630	0.4637	394.3125	785	0.0090	7.6540
480	0.1969	167.4588	635	0.4305	366.0132	790	0.0081	6.9295
485	0.2013	171.1547	640	0.3964	337.0271	795	0.0070	5.9808
490	0.2283	194.1514	645	0.3614	307.3060	800	0.0057	4.8464
495	0.2742	233.1179	650	0.3276	278.5626			
500	0.3253	276.6166	655	0.2942	250.1738			
505	0.3741	318.0583	660	0.2615	222.3381			
510	0.4136	351.6771	665	0.2331	198.1817			
515	0.4439	377.4348	670	0.2052	174.5031			
520	0.4682	398.1202	675	0.1805	153.4818			
525	0.4832	410.8393	680	0.1575	133.8925			
530	0.4934	419.5242	685	0.1371	116.5648			

TM-30

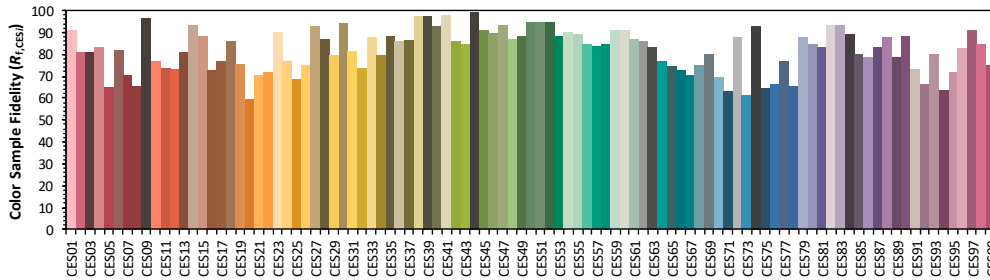
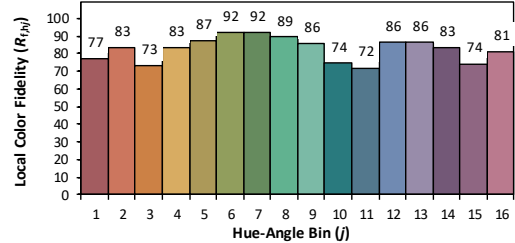
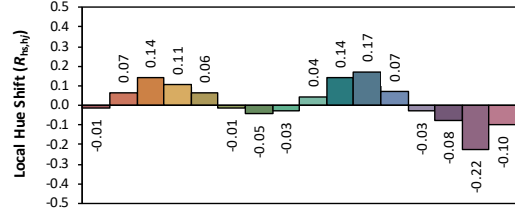
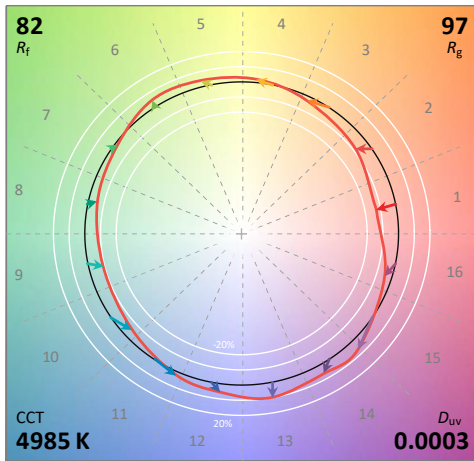
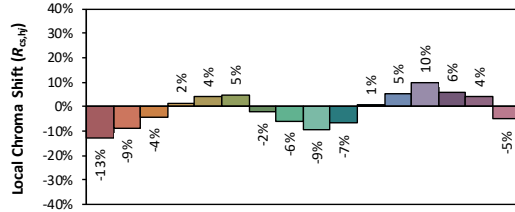
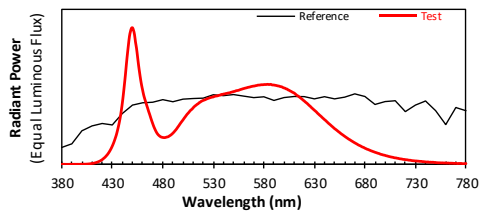
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2023/4/25

Model: HIDFA-200S-EX39-8CCT-BYP
@200W 5000K



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

x 0.3456
 y 0.3527
 u' 0.2113
 v' 0.4853

CIE 13.3-1995 (CRI)
 R_a 82
 R_g 6

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)

Test date	2024-09-20	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-200S-EX39-8CCT-BYP @150W 3000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	120.0	60	1.286	152.00	0.989	15.2
	277.0	60	0.562	151.39	0.975	18.4
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia

THD 400S A15 TB:

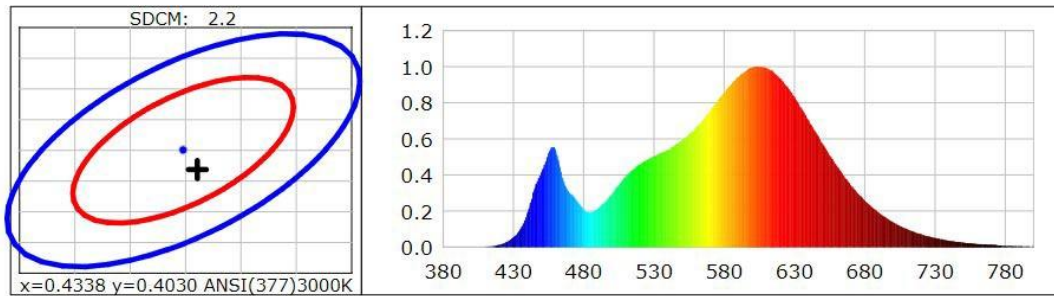
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	9
Frequency (Hz)	60	R2	92	R10	82
CCT (K)	2997	R3	95	R11	80
Duv	-0.00144	R4	81	R12	72
Chromaticity (x, y)	x=0.4351 y=0.3998	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2512 v'(v')=0.5194	R6	91	R14	98
Color Rendering Index (CRI)	83.0	R7	81	R15	75
R9	9	R8	59	--	--
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)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	24624.9	24269.6	$\geq 10000(-10\%)$
Luminous Efficacy (lm/W)	162.00	160.31	Standard: $\geq 120(-3\%)$
Most worst Luminous/Highest	161.89		
Zonal lumens in the 20-50° (%)	12.8	--	$\geq 30(-10\%)$
Beam Angle (°)	140.5	--	--
Center Beam Candle Power (cd)	680.0	--	--

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	0.1004	525	0.4818	252.7336	670	0.3429	179.8676
385	0.0001	0.0743	530	0.5021	263.4130	675	0.2989	156.7984
390	0.0000	0.0125	535	0.5202	272.8902	680	0.2587	135.7232
395	0.0004	0.2301	540	0.5386	282.5517	685	0.2217	116.3241
400	0.0003	0.1597	545	0.5639	295.8182	690	0.1907	100.0490
405	0.0004	0.1861	550	0.5918	310.4288	695	0.1632	85.5952
410	0.0015	0.7819	555	0.6252	327.9687	700	0.1379	72.3562
415	0.0051	2.6640	560	0.6630	347.7775	705	0.1172	61.4850
420	0.0124	6.5147	565	0.7045	369.5874	710	0.0995	52.2083
425	0.0270	14.1866	570	0.7539	395.5018	715	0.0842	44.1485
430	0.0550	28.8694	575	0.8057	422.6844	720	0.0716	37.5541
435	0.0999	52.4063	580	0.8546	448.2851	725	0.0595	31.2356
440	0.1892	99.2654	585	0.9020	473.1575	730	0.0510	26.7359
445	0.3211	168.4662	590	0.9431	494.7268	735	0.0426	22.3281
450	0.4164	218.4262	595	0.9742	511.0687	740	0.0352	18.4873
455	0.5211	273.3396	600	0.9967	522.8475	745	0.0285	14.9666
460	0.5405	283.5256	605	0.9972	523.1323	750	0.0246	12.8887
465	0.3829	200.8499	610	0.9924	520.5845	755	0.0200	10.5042
470	0.3014	158.1313	615	0.9689	508.2678	760	0.0167	8.7484
475	0.2584	135.5699	620	0.9325	489.1667	765	0.0147	7.7105
480	0.2077	108.9779	625	0.8872	465.4076	770	0.0119	6.2654
485	0.1908	100.0851	630	0.8313	436.1111	775	0.0091	4.7573
490	0.2128	111.6176	635	0.7691	403.4631	780	0.0075	3.9509
495	0.2480	130.0798	640	0.7047	369.7008	785	0.0063	3.3276
500	0.2930	153.6844	645	0.6381	334.7165	790	0.0066	3.4627
505	0.3443	180.5911	650	0.5727	300.4442	795	0.0046	2.4178
510	0.3911	205.1757	655	0.5088	266.9116	800	0.0031	1.6344
515	0.4282	224.6357	660	0.4513	236.7459			
520	0.4579	240.2271	665	0.3956	207.5202			

TM30

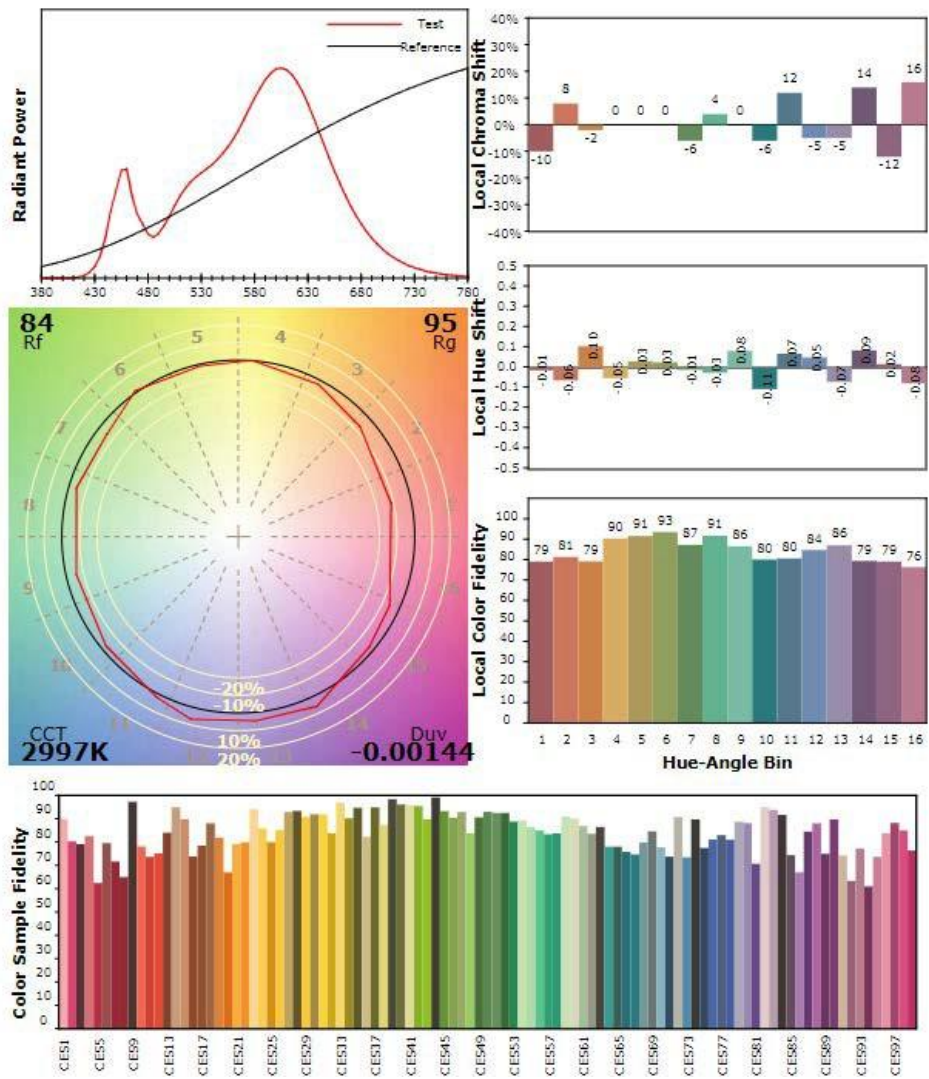
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/09/20

Model: HIDFA-200S-EX39-8CCTBYP
@150W 3000K



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

x 0.4344
 y 0.3989
 u' 0.2512
 v' 0.5190

(CRI)	
R_a	83.2
R_9	9

2.2 Electrical, Photometric and Chromaticity Measurements
(Refer to Work Instruction BL-QP-033)

Test date	2024-09-20	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-200S-EX39-8CCT-BYP @150W 4000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	120.0	60	1.252	147.81	0.988	15.5
	277.0	60	0.546	147.25	0.975	18.7
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

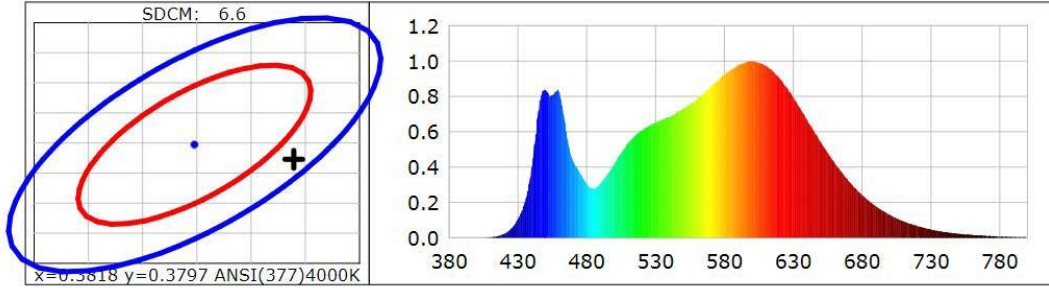
Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia THD 400S A15 TB:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	85	R9	18
Frequency (Hz)	60	R2	92	R10	81
CCT (K)	3728	R3	96	R11	83
Duv	-0.00265	R4	84	R12	68
Chromaticity (x, y)	x=0.3910 y=0.3773	R5	85	R13	87
Chromaticity (u', v')	u(u')=0.2318 v'=-0.5034	R6	89	R14	98
Color Rendering Index (CRI)	85.3	R7	85	R15	79
R9	18	R8	66	--	--
Rf	85	--	--	--	--
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)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	26081.0	25544.7	>= 10000(-10%)
Luminous Efficacy (lm/W)	176.45	173.47	Standard: >= 120(-3%)
Most worst Luminous/Highest	170.86		

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	0.3510	525	0.6308	303.3764	670	0.3216	154.6700
385	0.0002	0.1034	530	0.6505	312.8787	675	0.2803	134.8170
390	0.0001	0.0413	535	0.6680	321.2593	680	0.2422	116.5043
395	0.0003	0.1500	540	0.6832	328.5751	685	0.2077	99.8854
400	0.0003	0.1677	545	0.7073	340.1628	690	0.1787	85.9505
405	0.0011	0.5484	550	0.7285	350.3608	695	0.1528	73.4996
410	0.0030	1.4650	555	0.7561	363.6256	700	0.1299	62.4580
415	0.0091	4.3820	560	0.7872	378.6091	705	0.1105	53.1489
420	0.0220	10.5789	565	0.8165	392.7042	710	0.0926	44.5289
425	0.0511	24.5747	570	0.8513	409.4250	715	0.0793	38.1419
430	0.1069	51.4329	575	0.8894	427.7321	720	0.0670	32.2470
435	0.2008	96.5803	580	0.9220	443.4523	725	0.0560	26.9312
440	0.3972	191.0337	585	0.9514	457.5741	730	0.0468	22.5283
445	0.7196	346.0902	590	0.9756	469.1992	735	0.0381	18.3193
450	0.8375	402.7696	595	0.9920	477.1177	740	0.0318	15.3026
455	0.8089	389.0297	600	1.0000	480.9471	745	0.0273	13.1504
460	0.8246	396.5667	605	0.9883	475.3278	750	0.0225	10.8234
465	0.6004	288.7751	610	0.9744	468.6586	755	0.0182	8.7546
470	0.4342	208.8338	615	0.9421	453.0984	760	0.0156	7.5238
475	0.3667	176.3496	620	0.9018	433.7118	765	0.0139	6.7064
480	0.3040	146.2116	625	0.8524	409.9684	770	0.0114	5.5061
485	0.2771	133.2586	630	0.7953	382.4959	775	0.0090	4.3106
490	0.3073	147.8166	635	0.7320	352.0301	780	0.0075	3.6019
495	0.3574	171.8905	640	0.6673	320.9456	785	0.0060	2.8979
500	0.4155	199.8324	645	0.6017	289.3960	790	0.0047	2.2413
505	0.4789	230.3156	650	0.5404	259.9149	795	0.0040	1.9085
510	0.5338	256.7346	655	0.4795	230.6216	800	0.0026	1.2289
515	0.5769	277.4530	660	0.4229	203.3812			
520	0.6072	292.0414	665	0.3707	178.2862			

TM30

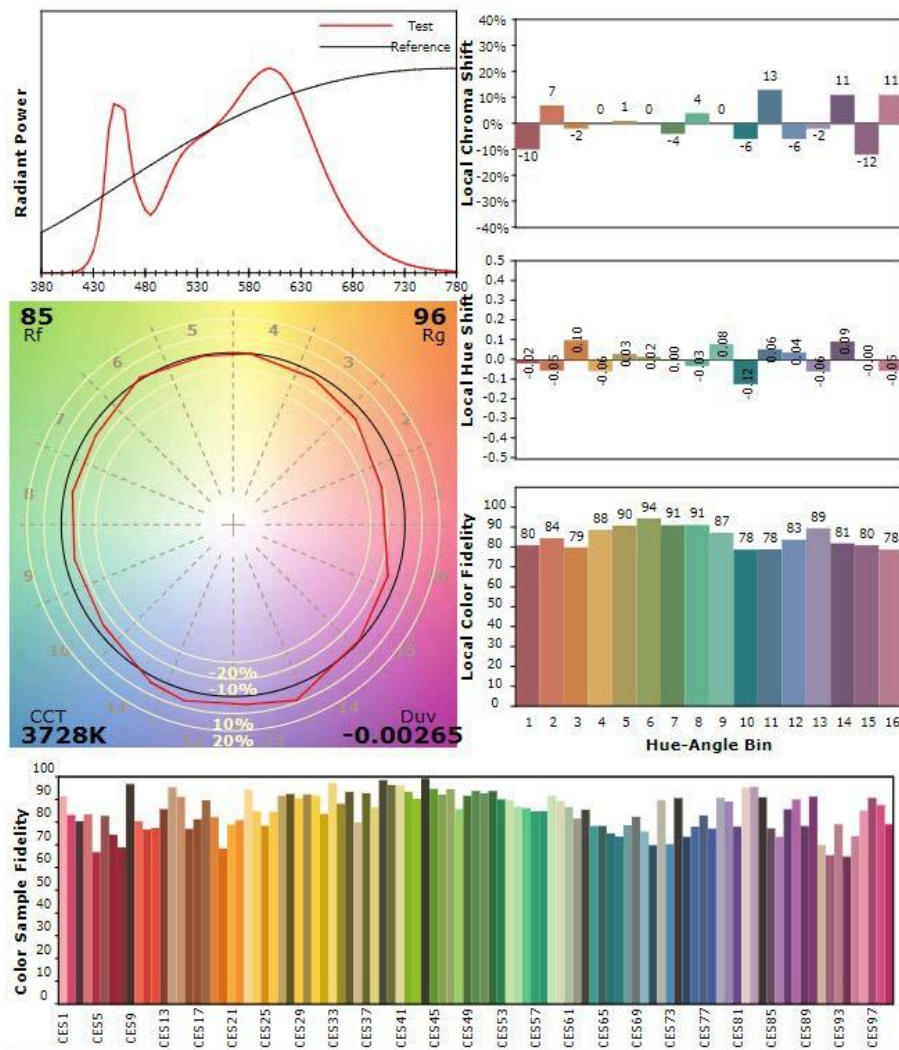
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-4080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/09/20

Model: HIDFA-200S-EX39-8CCT-BYP
@150W 4000K



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

x 0.3887
 y 0.3760
 u' 0.2309
 v' 0.5025

(CRI)

R_a 85.5
 R_9 23

2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2024-09-20	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-200S-EX39-8CCT-BYP @150W 5000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404	120.0	60	1.283	151.66	0.989	15.3
1E-A3	277.0	60	0.562	151.32	0.975	18.4
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia

THD 400S A15 TB:

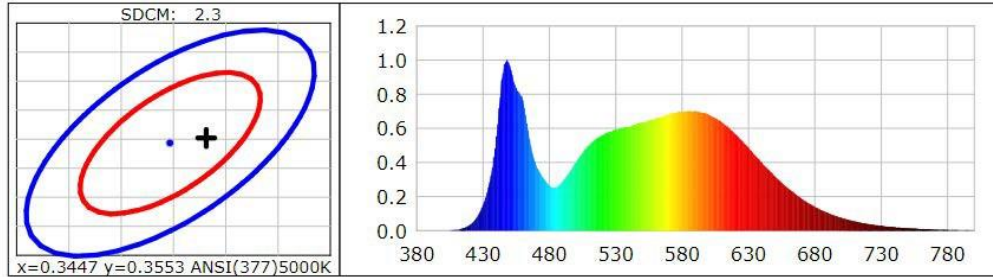
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	7
Frequency (Hz)	60	R2	88	R10	71
CCT (K)	4903	R3	93	R11	81
Duv	0.00108	R4	82	R12	58
Chromaticity (x, y)	x=0.3481 y=0.3562	R5	81	R13	83
Chromaticity (u', v')	u(u')=0.2117 v'=0.4873	R6	83	R14	96
Color Rendering Index (CRI)	82.8	R7	87	R15	76
R9	7	R8	67	--	--
Rf	83	--	--	--	--
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)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	25871.1	25350.3	>= 10000(-10%)
Luminous Efficacy (lm/W)	170.58	167.59	Standard: >= 120(-3%)
Most worst Luminous/Highest	165.31		

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	0.3021	525	0.5773	352.1464	670	0.1869	114.0244
385	0.0002	0.1525	530	0.5906	360.2963	675	0.1629	99.3708
390	0.0005	0.2914	535	0.6014	366.8640	680	0.1399	85.3106
395	0.0006	0.3671	540	0.6090	371.5043	685	0.1207	73.6129
400	0.0010	0.6128	545	0.6224	379.6546	690	0.1036	63.2243
405	0.0018	1.1231	550	0.6325	385.8514	695	0.0885	53.9636
410	0.0055	3.3634	555	0.6461	394.1531	700	0.0753	45.9456
415	0.0145	8.8377	560	0.6589	401.9387	705	0.0642	39.1479
420	0.0340	20.7145	565	0.6685	407.7677	710	0.0545	33.2439
425	0.0739	45.1010	570	0.6806	415.1689	715	0.0468	28.5295
430	0.1525	93.0261	575	0.6912	421.6603	720	0.0394	24.0072
435	0.2852	173.9510	580	0.6964	424.8037	725	0.0337	20.5673
440	0.5533	337.5414	585	0.6995	426.6767	730	0.0280	17.1019
445	0.9224	562.6416	590	0.6995	426.7257	735	0.0241	14.6726
450	0.9715	592.6181	595	0.6915	421.8456	740	0.0206	12.5511
455	0.8357	509.7708	600	0.6804	415.0771	745	0.0170	10.3743
460	0.7641	466.1337	605	0.6586	401.7333	750	0.0146	8.8923
465	0.5368	327.4375	610	0.6346	387.1383	755	0.0115	7.0431
470	0.3823	233.2166	615	0.6025	367.5549	760	0.0096	5.8671
475	0.3119	190.2482	620	0.5668	345.7271	765	0.0093	5.6589
480	0.2651	161.6870	625	0.5280	322.0914	770	0.0082	4.9803
485	0.2529	154.2681	630	0.4864	296.6937	775	0.0062	3.7938
490	0.2887	176.0947	635	0.4416	269.3983	780	0.0045	2.7326
495	0.3409	207.9619	640	0.3999	243.9275	785	0.0034	2.0909
500	0.3976	242.5439	645	0.3580	218.3741	790	0.0037	2.2449
505	0.4559	278.0825	650	0.3187	194.3987	795	0.0030	1.8294
510	0.5015	305.9002	655	0.2808	171.3038	800	0.0018	1.1192
515	0.5361	327.0389	660	0.2475	150.9537			
520	0.5601	341.6832	665	0.2163	131.9580			

TM-30

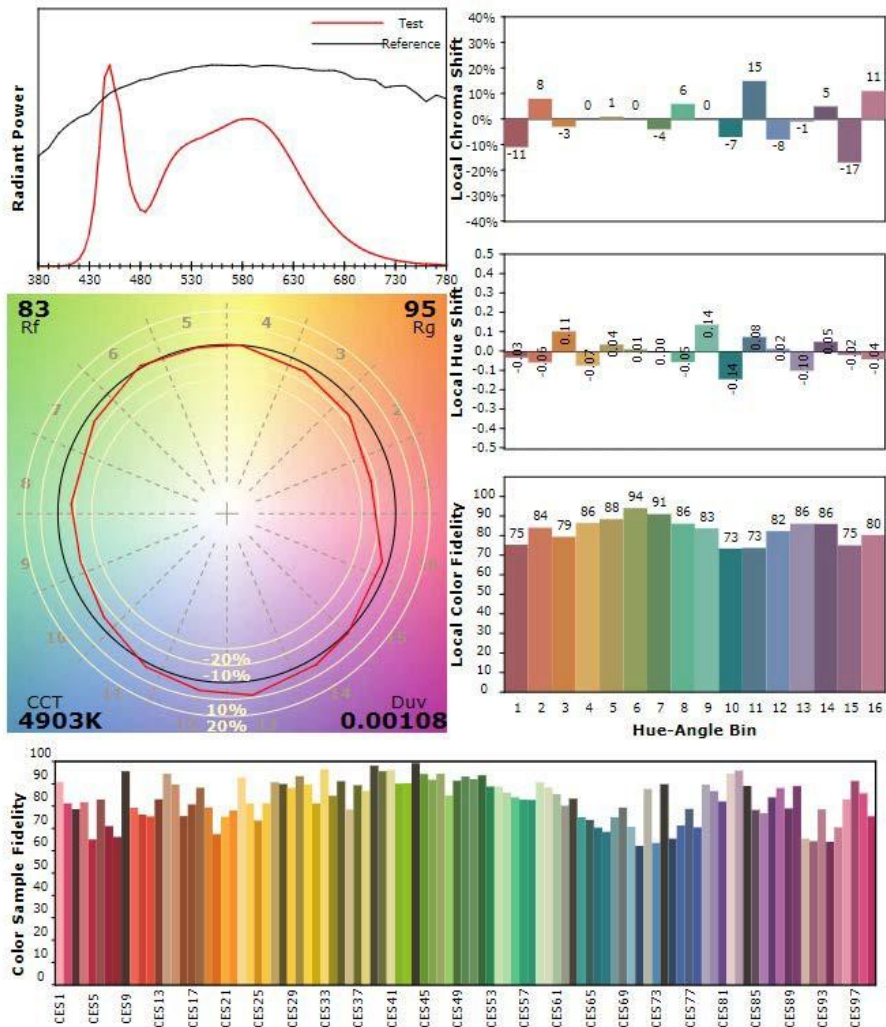
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-5080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/11/29

Model: HIDFA-200S-EX39-8CCT-BYP
@150W 5000K



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

x 0.3479
 y 0.3559
 u' 0.2116
 v' 0.4872

(CRI)	
R_a	83.1
R_g	8

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2024-09-20	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-200S-EX39-8CCT-BYP @100W 3000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	120.0	60	0.870	102.26	0.983	16.6
	277.0	60	0.389	102.45	0.953	27.4
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia

THD 400S A15 TB:

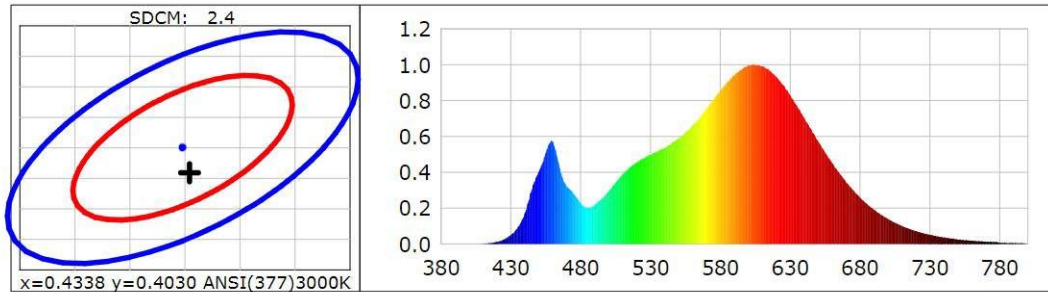
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	9
Frequency (Hz)	60	R2	93	R10	84
CCT (K)	3000	R3	95	R11	80
Duv	-0.00200	R4	81	R12	73
Chromaticity (x, y)	x=0.4344 y=0.3989	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2512 v'(v')=0.5190	R6	92	R14	98
Color Rendering Index (CRI)	83.2	R7	81	R15	75
R9	9	R8	59	--	--
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)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	17290.6	17220.4	$\geq 10000(-10\%)$
Luminous Efficacy (lm/W)	169.08	168.08	Standard: $\geq 120(-3\%)$
Most worst Luminous/Highest	166.94		
Zonal lumens in the 20-50° (%)	12.8	--	$\geq 30(-10\%)$
Beam Angle (°)	160.0	--	--
Center Beam Candle Power (cd)	476.0	--	--

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	0.0744	525	0.4778	164.3451	670	0.3445	118.4830
385	0.0002	0.0690	530	0.4987	171.5297	675	0.3008	103.4530
390	0.0001	0.0229	535	0.5173	177.9229	680	0.2590	89.1068
395	0.0008	0.2691	540	0.5350	184.0390	685	0.2240	77.0419
400	0.0005	0.1588	545	0.5618	193.2461	690	0.1924	66.1710
405	0.0006	0.2221	550	0.5891	202.6295	695	0.1637	56.3131
410	0.0018	0.6325	555	0.6232	214.3532	700	0.1395	47.9949
415	0.0049	1.6778	560	0.6611	227.3927	705	0.1187	40.8254
420	0.0123	4.2410	565	0.7025	241.6384	710	0.1009	34.7009
425	0.0256	8.8039	570	0.7518	258.6160	715	0.0854	29.3693
430	0.0508	17.4734	575	0.8031	276.2497	720	0.0726	24.9590
435	0.0922	31.7235	580	0.8535	293.5774	725	0.0611	21.0031
440	0.1712	58.8740	585	0.9009	309.8967	730	0.0512	17.6077
445	0.3009	103.4928	590	0.9425	324.1824	735	0.0434	14.9251
450	0.4034	138.7652	595	0.9740	335.0306	740	0.0363	12.4785
455	0.5081	174.7620	600	0.9974	343.0954	745	0.0299	10.2748
460	0.5720	196.7437	605	0.9963	342.7032	750	0.0253	8.7162
465	0.4233	145.6118	610	0.9912	340.9422	755	0.0208	7.1401
470	0.3231	111.1476	615	0.9679	332.9374	760	0.0183	6.2951
475	0.2800	96.3011	620	0.9324	320.7330	765	0.0166	5.7012
480	0.2276	78.2948	625	0.8868	305.0550	770	0.0140	4.8085
485	0.2019	69.4327	630	0.8295	285.3239	775	0.0106	3.6307
490	0.2194	75.4555	635	0.7684	264.2970	780	0.0085	2.9218
495	0.2511	86.3833	640	0.7048	242.4189	785	0.0062	2.1282
500	0.2930	100.8017	645	0.6386	219.6745	790	0.0055	1.8879
505	0.3422	117.7222	650	0.5730	197.1057	795	0.0049	1.6700
510	0.3876	133.3223	655	0.5100	175.4108	800	0.0025	0.8576
515	0.4250	146.1874	660	0.4512	155.2136			
520	0.4540	156.1490	665	0.3960	136.2052			

TM30

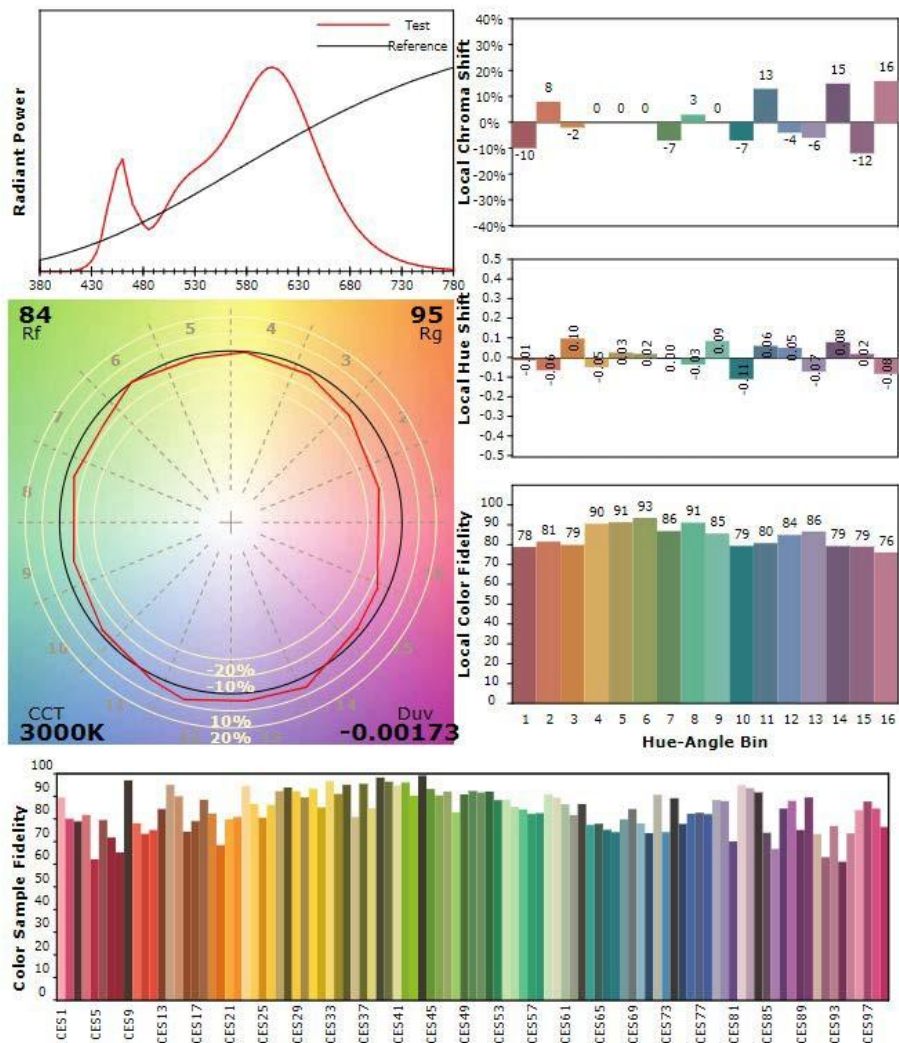
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/09/20

Model: HIDFA-200S-EX39-8CCTBYP
@100W 3000K



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

x 0.4344
 y 0.3989
 u' 0.2512
 v' 0.5190

(CRI)	
R_a	83.2
R_9	9

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2024-09-20	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-200S-EX39-8CCT-BYP @100W 4000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	120.0	60	0.852	100.03	0.982	16.7
	277.0	60	0.382	100.38	0.951	27.5
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia

THD 400S A15 TB:

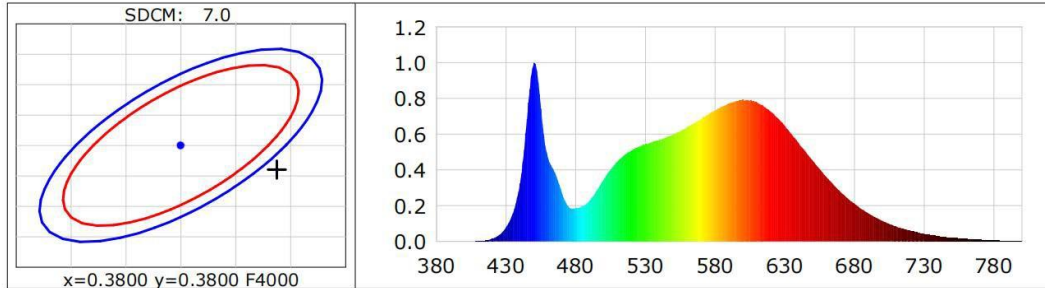
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	85	R9	23
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	3774	R3	95	R11	85
Duv	-0.00265	R4	85	R12	65
Chromaticity (x, y)	x=0.3887 y=0.3760	R5	85	R13	86
Chromaticity (u', v')	u(u')=0.2309 v'=-0.5025	R6	87	R14	97
Color Rendering Index (CRI)	85.5	R7	86	R15	80
R9	23	R8	69	--	--
Rf	85	--	--	--	--
Rg	98	--	--	--	--
Rcs,h1(%)	-11	--	--	--	--

Photometric Measurement – Goniophotometer Method in Lithonia THD 400S

A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	18123.7	18095.0	>= 10000(-10%)
Luminous Efficacy (lm/W)	181.18	180.27	Standard: >= 120(-3%)
Most worst Luminous/Highest	179.43		

Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0926	525	0.5296	345.1127	670	0.2761	179.9238
385	0.0002	0.1493	530	0.5429	353.8176	675	0.2425	158.0347
390	0.0001	0.0936	535	0.5562	362.4705	680	0.2118	138.0055
395	0.0003	0.1689	540	0.5660	368.8602	685	0.1813	118.1332
400	0.0004	0.2675	545	0.5834	380.1672	690	0.1576	102.7247
405	0.0008	0.5212	550	0.5999	390.9729	695	0.1353	88.1668
410	0.0025	1.6462	555	0.6184	402.9974	700	0.1149	74.9037
415	0.0062	4.0079	560	0.6412	417.8839	705	0.0981	63.9274
420	0.0158	10.3049	565	0.6613	430.9351	710	0.0846	55.1093
425	0.0365	23.7556	570	0.6850	446.3797	715	0.0714	46.4987
430	0.0802	52.2902	575	0.7108	463.2407	720	0.0612	39.8723
435	0.1613	105.1180	580	0.7325	477.3760	725	0.0511	33.3325
440	0.3278	213.5943	585	0.7537	491.1936	730	0.0433	28.2272
445	0.6856	446.8163	590	0.7724	503.3604	735	0.0368	23.9787
450	1.0000	651.6764	595	0.7845	511.2327	740	0.0301	19.6340
455	0.7436	484.6002	600	0.7922	516.2699	745	0.0252	16.4391
460	0.4695	305.9756	605	0.7870	512.8431	750	0.0215	14.0184
465	0.3851	250.9476	610	0.7779	506.9414	755	0.0182	11.8793
470	0.2727	177.7019	615	0.7534	490.9911	760	0.0143	9.3369
475	0.1923	125.3278	620	0.7252	472.6124	765	0.0125	8.1238
480	0.1848	120.4133	625	0.6896	449.3955	770	0.0104	6.7615
485	0.1976	128.7438	630	0.6458	420.8279	775	0.0083	5.4047
490	0.2298	149.7490	635	0.5996	390.7207	780	0.0068	4.4517
495	0.2845	185.4172	640	0.5503	358.6114	785	0.0056	3.6363
500	0.3462	225.6058	645	0.4998	325.7185	790	0.0046	2.9760
505	0.4028	262.4730	650	0.4517	294.3813	795	0.0041	2.6548
510	0.4492	292.7087	655	0.4030	262.6576	800	0.0038	2.4803
515	0.4850	316.0599	660	0.3577	233.1212			
520	0.5095	332.0131	665	0.3162	206.0787			

TM30

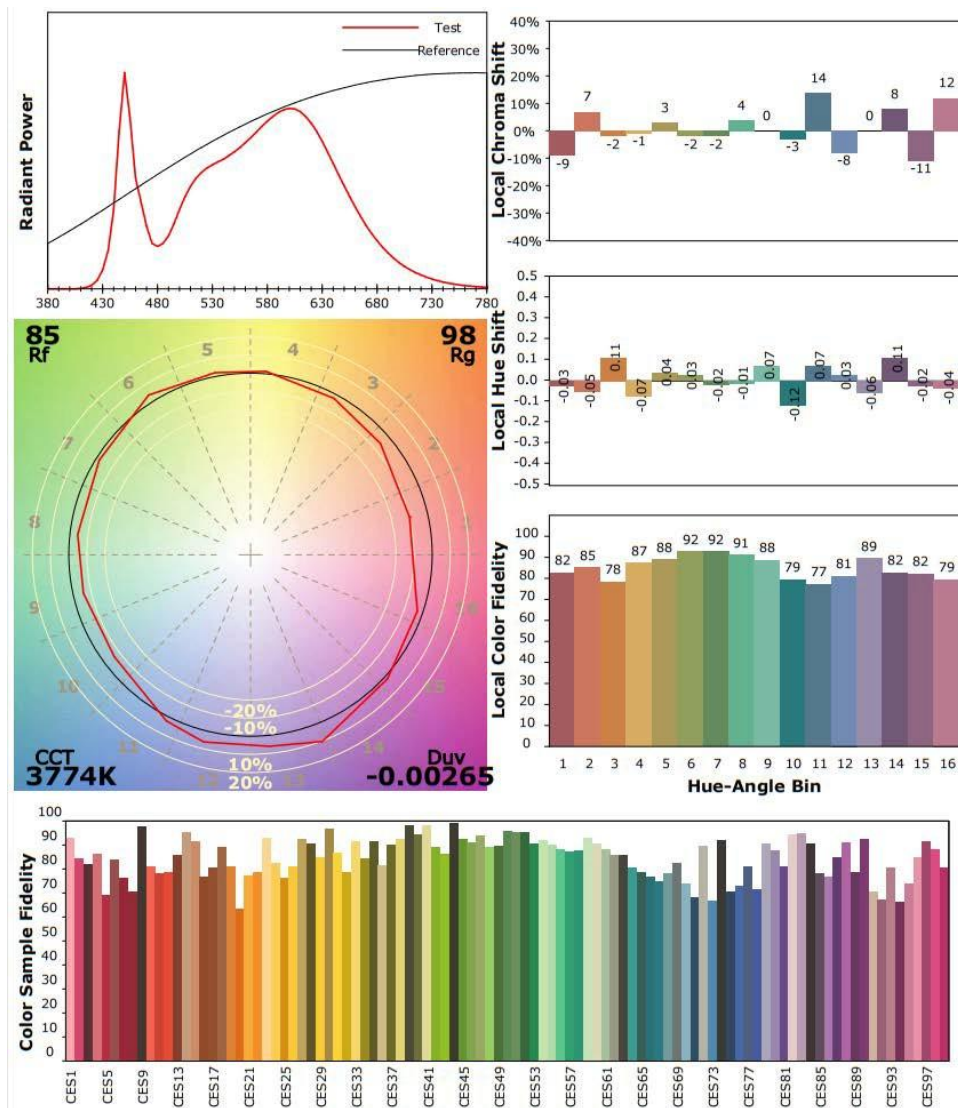
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-4080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/09/20

Model: HIDFA-200S-EX39-8CCT-BYP
@100W 4000K



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

x 0.3887
 y 0.3760
 u' 0.2309
 v' 0.5025

(CRI)
 R_a 85.5
 R_9 23

2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2024-09-20	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-200S-EX39-8CCT-BYP @100W 5000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404	120.0	60	0.868	102.02	0.983	16.5
1E-A3	277.0	60	0.390	102.83	0.954	27.1
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method in Lithonia

THD 400S A15 TB:

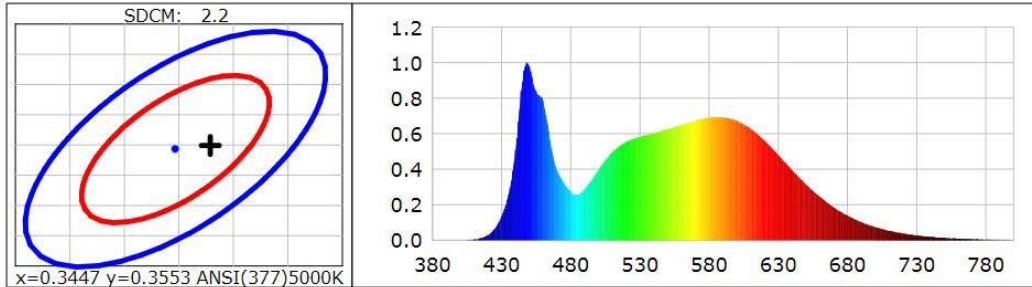
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	8
Frequency (Hz)	60	R2	89	R10	72
CCT (K)	4912	R3	93	R11	81
Duv	0.00103	R4	82	R12	58
Chromaticity (x, y)	x=0.3479 y=0.3559	R5	81	R13	83
Chromaticity (u', v')	u(u')=0.2116 v'=0.4872	R6	84	R14	96
Color Rendering Index (CRI)	83.1	R7	87	R15	76
R9	8	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)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	18225.5	18444.7	>= 10000(-10%)
Luminous Efficacy (lm/W)	178.64	179.38	Standard: >= 120(-3%)
Most worst Luminous/Highest	175.75		

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	0.1732	525	0.5694	232.1676	670	0.1850	75.4284
385	0.0002	0.0812	530	0.5827	237.6153	675	0.1608	65.5847
390	0.0003	0.1091	535	0.5930	241.7971	680	0.1391	56.7332
395	0.0008	0.3223	540	0.6002	244.7250	685	0.1198	48.8409
400	0.0006	0.2470	545	0.6135	250.1519	690	0.1023	41.7243
405	0.0015	0.6126	550	0.6244	254.6127	695	0.0873	35.6084
410	0.0044	1.8117	555	0.6375	259.9377	700	0.0748	30.4883
415	0.0118	4.7939	560	0.6509	265.3910	705	0.0634	25.8481
420	0.0296	12.0847	565	0.6596	268.9600	710	0.0531	21.6380
425	0.0657	26.7893	570	0.6725	274.2321	715	0.0450	18.3528
430	0.1365	55.6769	575	0.6830	278.5065	720	0.0383	15.6103
435	0.2577	105.0608	580	0.6887	280.8304	725	0.0315	12.8534
440	0.5070	206.7488	585	0.6918	282.0745	730	0.0276	11.2436
445	0.8910	363.3185	590	0.6898	281.2721	735	0.0224	9.1423
450	0.9819	400.3902	595	0.6840	278.8995	740	0.0188	7.6513
455	0.8363	340.9926	600	0.6730	274.4191	745	0.0155	6.3033
460	0.7850	320.0954	605	0.6505	265.2327	750	0.0136	5.5394
465	0.5620	229.1649	610	0.6280	256.0892	755	0.0098	3.9854
470	0.3951	161.1068	615	0.5966	243.2697	760	0.0097	3.9371
475	0.3224	131.4569	620	0.5603	228.4703	765	0.0087	3.5494
480	0.2732	111.4069	625	0.5224	213.0199	770	0.0080	3.2545
485	0.2561	104.4318	630	0.4798	195.6402	775	0.0059	2.4195
490	0.2880	117.4514	635	0.4372	178.2878	780	0.0041	1.6873
495	0.3387	138.1192	640	0.3956	161.2994	785	0.0030	1.2115
500	0.3937	160.5188	645	0.3537	144.2362	790	0.0025	1.0095
505	0.4484	182.8438	650	0.3148	128.3562	795	0.0021	0.8548
510	0.4944	201.5876	655	0.2775	113.1682	800	0.0007	0.3040
515	0.5287	215.5618	660	0.2444	99.6603			
520	0.5520	225.0673	665	0.2134	87.0286			

TM-30

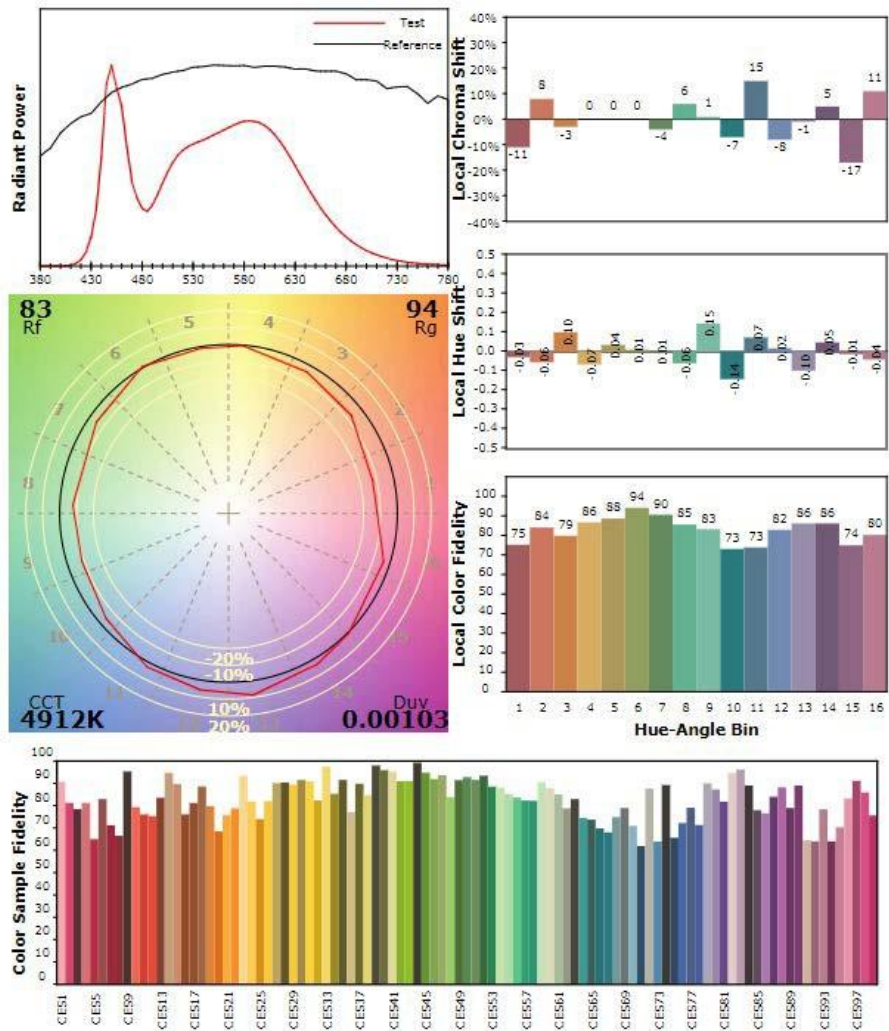
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-5080RC35003P1

Manufacturer: RAB LIGHTING INC

Date: 2024/11/29

Model: HIDFA-200S-EX39-8CCT-BYP
@100W 5000K



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

x 0.3479
 y 0.3559
 u' 0.2116
 v' 0.4872

(CRI)	
R_a	83.1
R_g	8