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-270S-EX39-8CCT-BYP

Test & Report By:

Winny Wu

Engineer: Winny 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-270S-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	270W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,4000K,5000K(Color tunable)	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-XX80RC35003P1	
Sample Number	UTC2304041E-D1-3	
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	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	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 °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 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 f1'=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 ºC ±1 ºC. 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-CLW16-270WBCDA1-ad30K:1.105
AST-CLW16-270WBCDA1-ad40K:1.105
AST-CLW16-270WBCDA1-ad40K:1.105

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 ºC ±1 ºC. 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 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-270S-EX39-8CCT-BYP @270W 3000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404	120.0	60	2.234	266.21	0.993	10.18
1E-D1	277.0	60	0.988	260.74	0.953	12.46
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

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

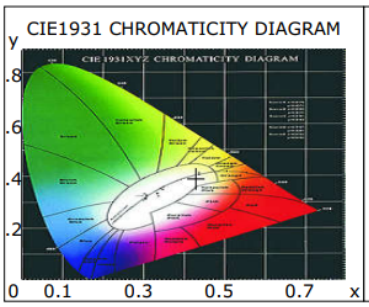
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3037
Duv	-0.0016
Chromaticity (x, y)	x=0.4321 y=0.3984
Chromaticity (u', v')	u(u')=0.2499 v'=0.5184
Color Rendering Index (CRI)	82
R9	5
Rf	84
Rg	95
Rcs,h1(%)	-12

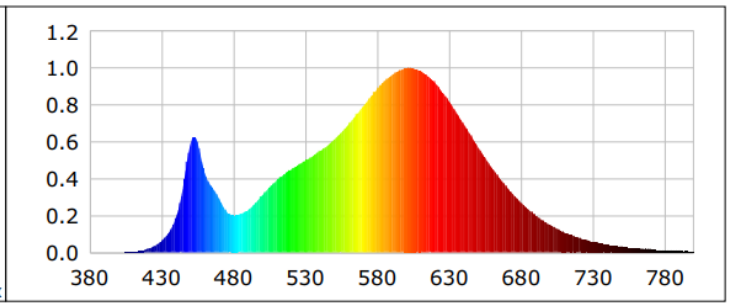
Special Color Rendering Indices			
R1	80	R9	5
R2	91	R10	80
R3	95	R11	77
R4	79	R12	70
R5	81	R13	83
R6	89	R14	98
R7	81	R15	73
R8	57	--	--
--	--	--	--
--	--	--	--
--	--	--	--

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)	32498.9	32446.5	>=10000(-10%)
Luminous Efficacy (lm/W)	122.08	124.44	Standard: >= 120(-3%)
Most worst Luminous/Highest	121.88		
Zonal lumens in the 20-50º (%)	40.30	--	>=30(-10%)
Beam Angle (º)	142.1	--	--
Center Beam Candle Power (cd)	2953	--	--

Spectral Power Distribution & Chromaticity Diagram



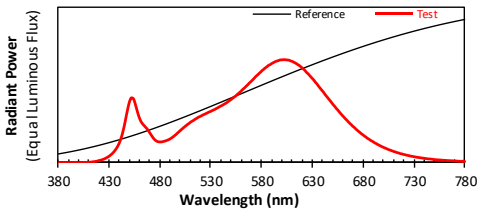


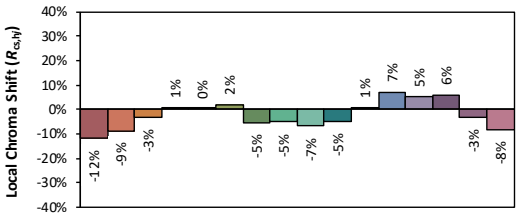
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.1824	535	0.4741	368.0166	690	0.3523	273.4728
385	0.0002	0.1316	540	0.4969	385.6649	695	0.3082	239.1909
390	0.0003	0.2249	545	0.5216	404.8883	700	0.2692	208.9240
395	0.0004	0.3019	550	0.5499	426.7949	705	0.2326	180.5078
400	0.0005	0.3507	555	0.5766	447.5470	710	0.2022	156.9622
405	0.0017	1.3569	560	0.6115	474.6343	715	0.1739	134.9945
410	0.0041	3.1736	565	0.6500	504.5057	720	0.1492	115.7978
415	0.0092	7.1610	570	0.6939	538.5709	725	0.1274	98.9168
420	0.0188	14.6257	575	0.7414	575.4404	730	0.1089	84.5085
425	0.0347	26.9206	580	0.7898	613.0021	735	0.0943	73.2063
430	0.0618	48.0044	585	0.8409	652.7038	740	0.0798	61.9225
435	0.1068	82.9063	590	0.8870	688.4611	745	0.0683	53.0210
440	0.1866	144.8659	595	0.9281	720.3604	750	0.0579	44.9207
445	0.3529	273.9497	600	0.9612	746.0878	755	0.0493	38.2651
450	0.5831	452.6257	605	0.9853	764.8135	760	0.0430	33.3430
455	0.5997	465.4911	610	0.9972	774.0350	765	0.0363	28.2006
460	0.4348	337.5204	615	0.9974	774.2022	770	0.0305	23.7087
465	0.3564	276.6033	620	0.9846	764.2117	775	0.0262	20.3585
470	0.2929	227.3485	625	0.9574	743.1006	780	0.0227	17.6128
475	0.2243	174.0923	630	0.9198	713.9429	785	0.0194	15.0682
480	0.2015	156.4232	635	0.8703	675.5238	790	0.0162	12.5983
485	0.2097	162.7365	640	0.8179	634.8292	795	0.0141	10.9680
490	0.2294	178.0467	645	0.7589	589.0697	800	0.0113	8.7859
495	0.2659	206.3635	650	0.6962	540.3913			
500	0.3096	240.3234	655	0.6332	491.5140			
505	0.3525	273.6181	660	0.5705	442.8553			
510	0.3908	303.3135	665	0.5125	397.8144			
515	0.4225	327.9111	670	0.4543	352.6008			
520	0.4496	349.0044	675	0.4018	311.9017			
525	0.4741	368.0166	680	0.3523	273.4728			
530	0.4969	385.6649	685	0.3082	239.1909			

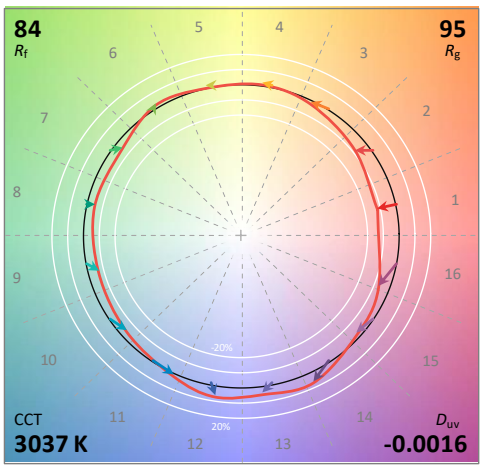
TM30

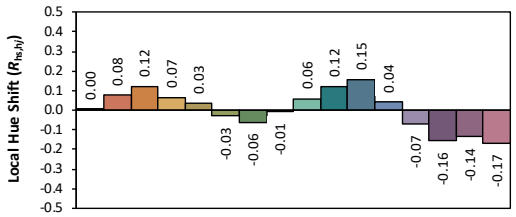
ANSI/IES TM-30-18 Color Rendition Report

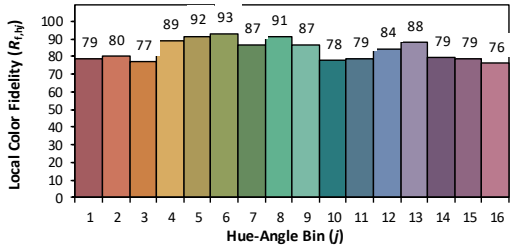
Source:	L128-XX80RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2023/4/25	**Model:**	HIDFA-270S-EX39-8CCT-BYP @270W 3000K

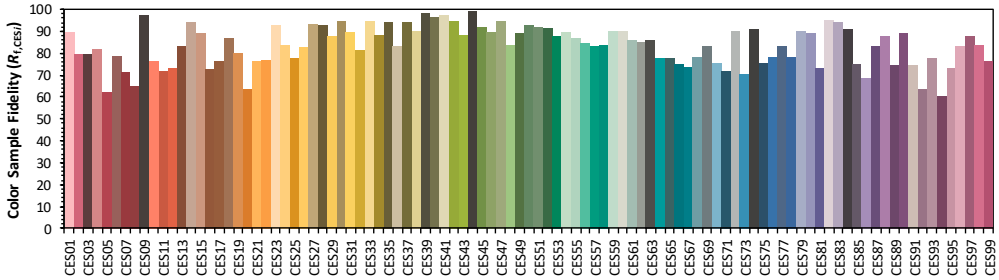












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4321
y	0.3984
u'	0.2499
v'	0.5184

CIE 13.3-1995 (CRI)

R_a	82
R_9	5

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

Zonal Lumen Tabulation

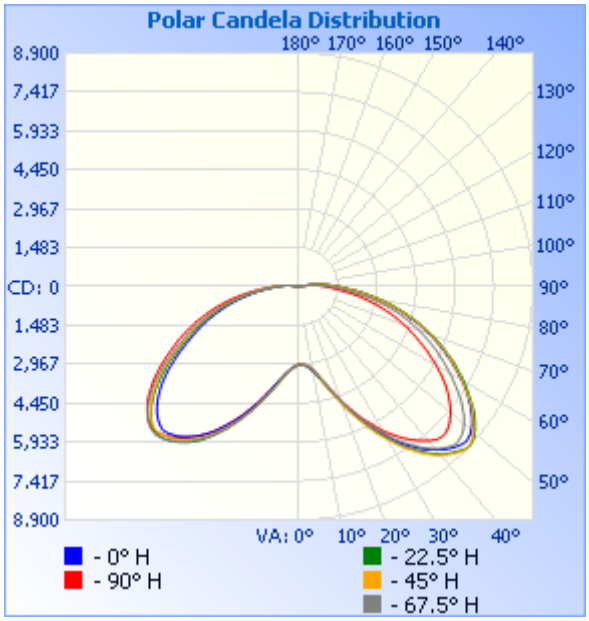
Zonal Lumen Summary

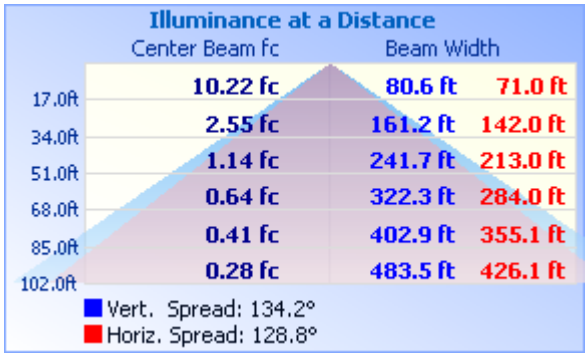
Zone	Lumens	% Lamp	% Luminaire
0-30	4,025.9	12.4%	12.4%
0-40	8,484.7	26.1%	26.1%
0-60	20,803.8	64%	64%
60-90	10,806.9	33.3%	33.3%
70-100	6,308.6	19.4%	19.4%
90-120	818.1	2.5%	2.5%
0-90	31,610.8	97.3%	97.3%
90-180	887.7	2.7%	2.7%
0-180	32,498.4	100%	100%

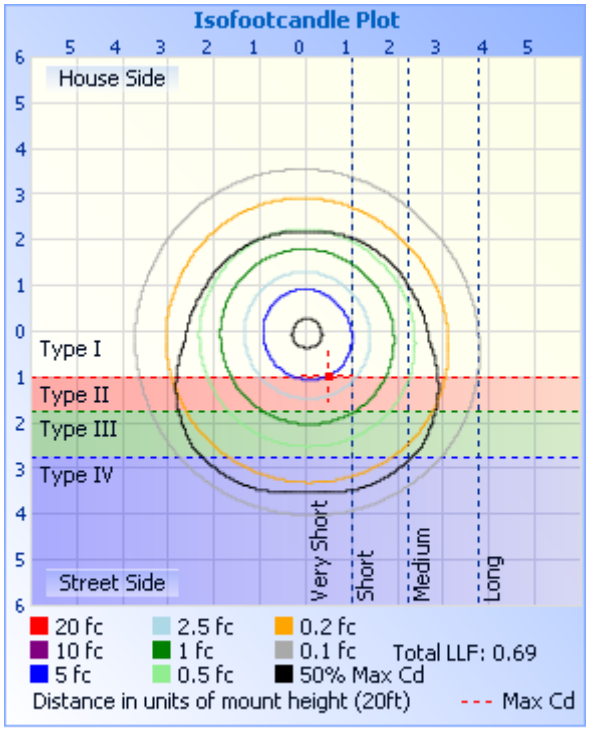
Lumens Per Zone

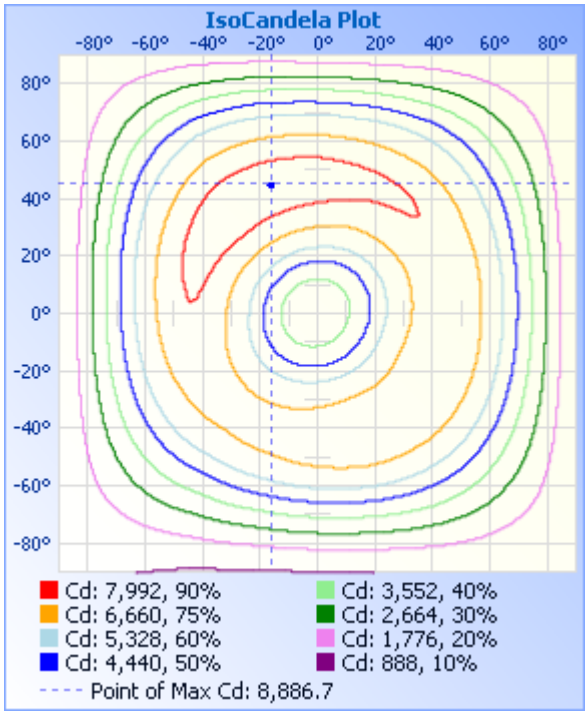
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	302.7	0.9%	90-100	717.9	2.2%
10-20	1,143.7	3.5%	100-110	79.9	0.2%
20-30	2,579.5	7.9%	110-120	20.3	0.1%
30-40	4,458.8	13.7%	120-130	19.1	0.1%
40-50	6,066.0	18.7%	130-140	15.8	0%
50-60	6,253.2	19.2%	140-150	13.7	0%
60-70	5,216.3	16.1%	150-160	11.6	0%
70-80	3,669.8	11.3%	160-170	7.2	0%
80-90	1,920.9	5.9%	170-180	2.1	0%

Photometric Data









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	2953	2953	2953	2953	2953	2953	2953	2953	2953	2953	2953	2953	2953	2953	2953	2953	2953
1	2961	2955	2952	2958	2962	2956	2959	2964	2973	2976	2971	2980	2976	2970	2966	2963	2961
2	2978	2967	2959	2963	2970	2969	2977	2987	3007	3008	3011	3013	3016	2999	3000	2983	2978
3	3003	2986	2981	2974	2983	2979	2998	3016	3036	3056	3055	3066	3061	3045	3032	3008	3003
4	3021	3000	2996	2988	2993	2992	3025	3042	3078	3090	3103	3108	3098	3078	3055	3034	3021
5	3040	3024	3012	2998	3008	3011	3047	3074	3114	3143	3155	3161	3141	3111	3085	3061	3040
6	3076	3047	3035	3023	3033	3041	3080	3118	3167	3194	3214	3213	3199	3164	3125	3092	3076
7	3121	3095	3073	3058	3079	3078	3117	3174	3225	3255	3276	3277	3251	3218	3180	3133	3121
8	3177	3152	3126	3109	3124	3130	3167	3233	3288	3330	3359	3356	3323	3277	3233	3188	3177
9	3240	3220	3192	3176	3180	3186	3232	3298	3363	3407	3439	3438	3400	3347	3299	3247	3240
10	3319	3297	3270	3241	3252	3259	3309	3369	3450	3503	3531	3537	3482	3423	3373	3326	3319
11	3404	3387	3359	3337	3339	3342	3388	3464	3546	3610	3635	3643	3585	3509	3446	3414	3404
12	3517	3504	3463	3431	3440	3436	3485	3566	3652	3723	3751	3755	3684	3612	3543	3507	3517
13	3624	3625	3593	3537	3563	3533	3582	3668	3773	3843	3870	3872	3791	3711	3656	3602	3624
14	3747	3750	3725	3660	3681	3646	3690	3797	3889	3964	4005	4014	3909	3821	3761	3716	3747
15	3883	3897	3873	3803	3813	3772	3810	3920	4028	4105	4128	4144	4033	3944	3885	3841	3883
16	4019	4043	4023	3943	3954	3894	3948	4054	4156	4250	4284	4290	4168	4065	4001	3968	4019
17	4171	4198	4192	4104	4100	4039	4077	4180	4303	4415	4432	4436	4302	4192	4137	4120	4171
18	4336	4369	4352	4268	4250	4177	4215	4321	4469	4564	4580	4585	4459	4325	4269	4266	4336
19	4505	4543	4539	4433	4429	4316	4356	4483	4621	4720	4728	4751	4599	4478	4417	4415	4505
20	4680	4722	4722	4606	4591	4465	4500	4622	4773	4878	4907	4907	4753	4620	4567	4574	4680
21	4856	4928	4932	4787	4765	4622	4653	4776	4920	5043	5066	5066	4901	4767	4721	4736	4856
22	5033	5111	5121	4969	4929	4770	4800	4926	5081	5206	5220	5228	5053	4909	4889	4895	5033
23	5211	5299	5314	5168	5107	4955	4948	5076	5249	5392	5389	5398	5223	5061	5039	5078	5211
24	5408	5493	5504	5348	5281	5112	5104	5228	5416	5558	5553	5563	5380	5221	5191	5242	5408
25	5597	5693	5699	5545	5472	5270	5255	5393	5566	5721	5702	5740	5535	5372	5360	5417	5597
26	5792	5897	5908	5732	5640	5425	5413	5544	5721	5901	5864	5903	5701	5524	5535	5589	5792
27	5991	6100	6114	5918	5803	5594	5563	5685	5878	6066	6018	6056	5840	5661	5704	5775	5991
28	6171	6303	6321	6088	5972	5749	5707	5826	6025	6225	6165	6214	6001	5826	5870	5940	6171

29	6360	6489	6522	6303	6142	5910	5853	5971	6190	6390	6319	6370	6153	5979	6030	6108	6360
30	6541	6673	6706	6481	6331	6064	5998	6129	6343	6547	6455	6538	6326	6131	6189	6281	6541
31	6747	6884	6898	6666	6494	6217	6140	6266	6481	6693	6609	6687	6465	6289	6355	6447	6747
32	6929	7070	7110	6844	6640	6353	6285	6395	6619	6852	6745	6822	6601	6426	6514	6612	6929
33	7104	7249	7291	7013	6789	6501	6407	6513	6745	6987	6872	6955	6735	6571	6673	6777	7104
34	7276	7429	7469	7180	6935	6622	6526	6625	6865	7109	6981	7078	6865	6710	6831	6933	7276
35	7437	7591	7639	7349	7080	6750	6634	6734	6977	7222	7093	7190	6996	6843	6968	7098	7437
36	7593	7752	7819	7498	7210	6871	6734	6838	7075	7323	7209	7309	7105	6981	7094	7236	7593
37	7736	7912	7974	7661	7334	6991	6829	6937	7171	7418	7305	7404	7220	7103	7252	7378	7736
38	7877	8059	8122	7802	7449	7109	6911	7024	7250	7511	7393	7491	7312	7221	7383	7523	7877
39	8005	8211	8266	7943	7553	7202	6990	7106	7336	7588	7468	7580	7406	7321	7509	7652	8005
40	8121	8335	8375	8063	7665	7297	7064	7175	7395	7659	7534	7669	7492	7414	7601	7770	8121
41	8231	8450	8500	8180	7758	7375	7118	7246	7453	7717	7591	7728	7563	7492	7709	7873	8231
42	8340	8545	8594	8268	7837	7415	7138	7279	7500	7768	7644	7777	7635	7563	7790	7960	8340
43	8432	8636	8689	8350	7879	7418	7126	7275	7530	7796	7688	7820	7688	7624	7865	8039	8432
44	8512	8720	8772	8428	7892	7404	7094	7263	7521	7807	7722	7856	7734	7686	7932	8118	8512
45	8580	8797	8843	8465	7885	7373	7053	7209	7481	7787	7732	7850	7780	7743	7995	8187	8580
46	8635	8875	8883	8442	7845	7323	6992	7147	7424	7740	7706	7829	7781	7770	8045	8244	8635
47	8674	**8887**	8864	8408	7783	7265	6926	7067	7355	7666	7645	7786	7753	7764	8089	8292	8674
48	8650	8859	8818	8361	7708	7188	6836	6968	7276	7585	7575	7720	7696	7740	8083	8336	8650
49	8611	8802	8745	8288	7610	7109	6748	6866	7176	7482	7493	7645	7629	7694	8043	8312	8611
50	8546	8715	8658	8190	7524	7013	6631	6752	7060	7359	7373	7533	7545	7617	7995	8264	8546
51	8463	8615	8545	8079	7410	6893	6509	6628	6933	7236	7259	7417	7440	7519	7928	8183	8463
52	8354	8501	8420	7959	7284	6764	6386	6497	6803	7089	7133	7289	7336	7411	7844	8084	8354
53	8235	8374	8299	7803	7157	6643	6262	6360	6658	6945	6994	7147	7218	7295	7744	7970	8235
54	8101	8242	8166	7664	7021	6507	6126	6211	6514	6791	6848	6996	7081	7158	7609	7845	8101
55	7966	8090	8025	7515	6876	6361	5985	6044	6346	6622	6683	6844	6920	7016	7446	7673	7966
56	7810	7907	7861	7337	6732	6196	5824	5872	6163	6426	6518	6674	6774	6853	7297	7526	7810
57	7661	7733	7669	7162	6552	6027	5648	5691	5980	6236	6345	6491	6628	6712	7133	7364	7661
58	7497	7570	7500	6981	6395	5854	5470	5525	5800	6046	6162	6305	6464	6557	6971	7217	7497
59	7330	7405	7338	6817	6202	5702	5309	5336	5612	5857	5967	6085	6275	6381	6795	7049	7330

60	7154	7246	7174	6640	6038	5511	5136	5159	5418	5668	5758	5901	6101	6216	6633	6886	7154
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72	4872	4949	4920	4476	3902	3492	3176	3191	3335	3496	3606	3677	3953	4104	4465	4694	4872
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84	2441	2552	2446	2159	1794	1550	1377	1393	1454	1547	1633	1666	1830	1913	2179	2326	2441
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86	2115	2171	2075	1804	1486	1261	1117	1133	1189	1266	1334	1376	1526	1598	1821	1988	2115
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179	19	23	20	21	15	11	14	18	13	24	23	24	19	18	13	21	19
180	21	24	24	22	11	13	15	16	10	21	24	24	13	15	16	10	21

BUG

Lum. Classification System (LCS)

LCS Zone	Lumens	%Lamp	%Lum
FL (0-30)	2006.8	6.2	6.2
FM (30-60)	8835.9	27.2	27.2
FH (60-80)	4994.3	15.4	15.4
FVH (80-90)	1131.4	3.5	3.5
BL (0-30)	2018.3	6.2	6.2
BM (30-60)	7944.6	24.4	24.4
BH (60-80)	3891.0	12.0	12.0
BVH (80-90)	789.1	2.4	2.4
UL (90-100)	717.8	2.2	2.2
UH (100-180)	169.7	0.5	0.5
Total	32498.9	100.0	100.0
BUG Rating	**B4-U4-G5**		

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2023-04-25	Test Ambient:	25.2 ℃
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-270S-EX39-8CCT-BYP @270W 4000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404 1E-D2	120.0	60	2.168	258.6	0.994	10.05
	277.0	60	0.960	253.08	0.952	12.41
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

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

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3803
Duv	-0.0029
Chromaticity (x, y)	x=0.3872 y=0.3747
Chromaticity (u', v')	u(u')=0.2304v'=0.5017
Color Rendering Index (CRI)	84
R9	13
Rf	84
Rg	96
Rcs,h1(%)	-12

Special Color Rendering Indices			
R1	83	R9	13
R2	91	R10	78
R3	95	R11	81
R4	82	R12	64
R5	83	R13	85
R6	87	R14	98
R7	84	R15	77
R8	65	--	--
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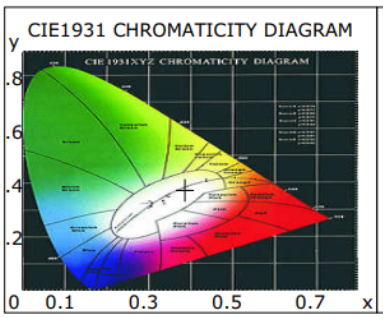
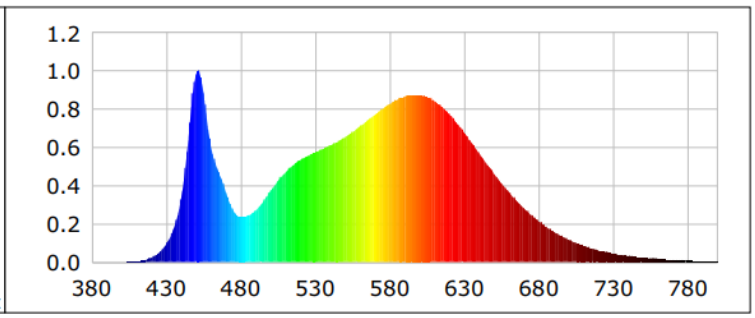
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	35580.8	35422.0	>= 10000(-10%)
Luminous Efficacy (lm/W)	137.59	139.96	Standard: >= 120(-3%)
Most worst Luminous/Highest	136.98		

Spectral Power Distribution & Chromaticity Diagram



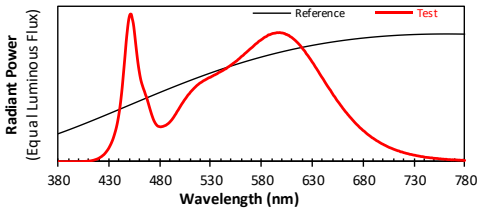


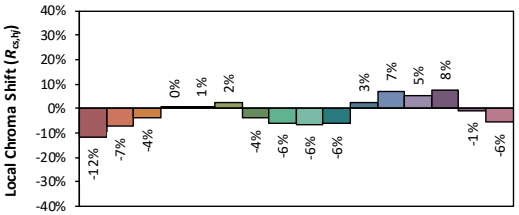
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0008	0.7222	535	0.5559	487.0838	690	0.2808	246.0522
385	0.0003	0.2477	540	0.5728	501.9435	695	0.2449	214.5794
390	0.0004	0.3831	545	0.5916	518.4272	700	0.2118	185.5538
395	0.0007	0.5790	550	0.6109	535.3120	705	0.1833	160.5881
400	0.0007	0.6480	555	0.6295	551.6197	710	0.1591	139.4056
405	0.0019	1.6221	560	0.6552	574.1440	715	0.1367	119.7819
410	0.0046	3.9912	565	0.6806	596.3452	720	0.1169	102.4519
415	0.0104	9.0998	570	0.7107	622.7433	725	0.0992	86.9457
420	0.0234	20.4741	575	0.7399	648.3340	730	0.0848	74.2839
425	0.0478	41.8428	580	0.7704	675.0986	735	0.0735	64.3884
430	0.0935	81.9378	585	0.8010	701.9071	740	0.0615	53.8896
435	0.1745	152.8894	590	0.8275	725.0586	745	0.0527	46.2165
440	0.3293	288.5547	595	0.8492	744.1422	750	0.0448	39.2134
445	0.6513	570.7297	600	0.8661	758.9307	755	0.0379	33.2510
450	0.9818	860.3364	605	0.8746	766.3422	760	0.0323	28.3017
455	0.8843	774.9060	610	0.8728	764.8144	765	0.0277	24.2706
460	0.6051	530.2087	615	0.8628	756.0272	770	0.0233	20.4330
465	0.4762	417.2833	620	0.8416	737.4317	775	0.0192	16.8396
470	0.3663	320.9978	625	0.8108	710.4619	780	0.0164	14.3464
475	0.2687	235.4164	630	0.7718	676.2984	785	0.0144	12.6445
480	0.2374	207.9831	635	0.7253	635.5411	790	0.0136	11.9372
485	0.2443	214.1098	640	0.6755	591.9106	795	0.0111	9.7615
490	0.2695	236.1650	645	0.6226	545.5882	800	0.0089	7.8040
495	0.3161	277.0264	650	0.5680	497.7037			
500	0.3719	325.9059	655	0.5128	449.3142			
505	0.4245	371.9651	660	0.4607	403.6530			
510	0.4699	411.7447	665	0.4102	359.4375			
515	0.5061	443.4896	670	0.3632	318.2453			
520	0.5351	468.8516	675	0.3200	280.4372			
525	0.5559	487.0838	680	0.2808	246.0522			
530	0.5728	501.9435	685	0.2449	214.5794			

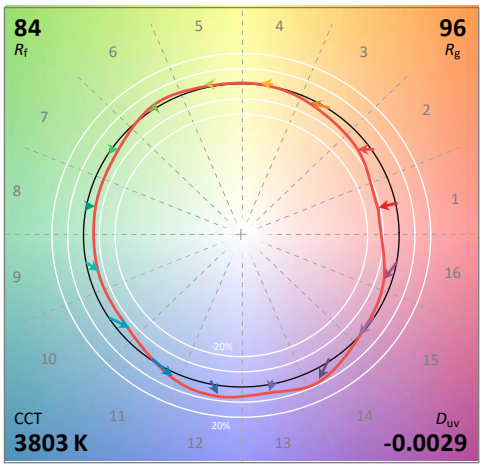
TM30

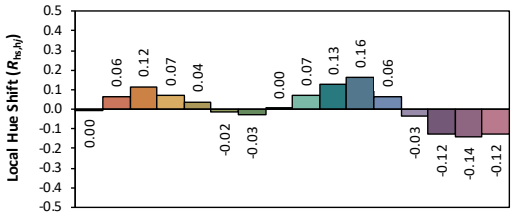
ANSI/IES TM-30-18 Color Rendition Report

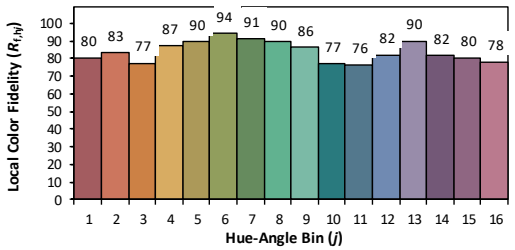
Source:	L128-XX80RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2023/4/25	**Model:**	HIDFA-270S-EX39-8CCT-BYP @270W 4000K

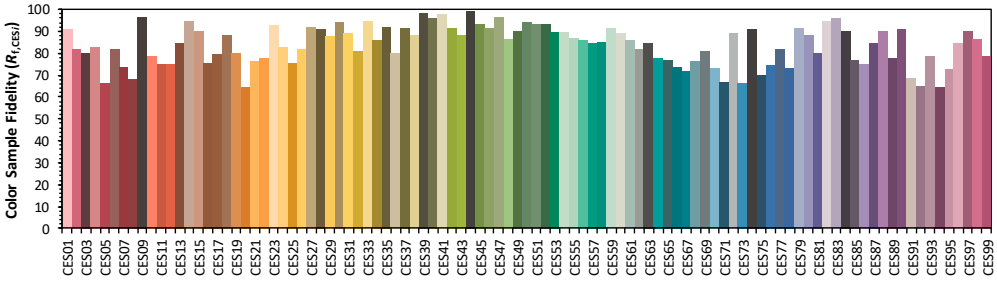












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3872
y	0.3747
u'	0.2304
v'	0.5017

CIE 13.3-1995 (CRI)

R_a	84
R_9	13

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 ℃
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-270S-EX39-8CCT-BYP @270W 5000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404 1E-D3	120.0	60	2.239	266.55	0.992	10.05
	277.0	60	0.989	261.1	0.953	12.43
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

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

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	4980
Duv	0.0001
Chromaticity (x, y)	x=0.3457 y=0.3522
Chromaticity (u', v')	u(u')=0.2116 v'=0.4850
Color Rendering Index (CRI)	82
R9	7
Rf	82
Rg	97
Rcs,h1(%)	-13

Special Color Rendering Indices			
R1	81	R9	7
R2	88	R10	70
R3	92	R11	80
R4	82	R12	55
R5	81	R13	83
R6	82	R14	96
R7	87	R15	76
R8	67	--	--
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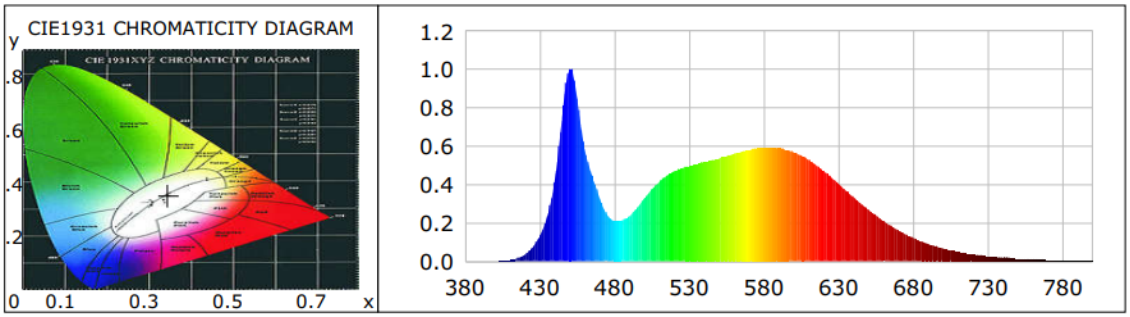
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	35652.5	35448.8	>= 10000(-10%)
Luminous Efficacy (lm/W)	133.76	135.77	Standard: >= 120(-3%)
Most worst Luminous/Highest	132.99		

Spectral Power Distribution & Chromaticity Diagram

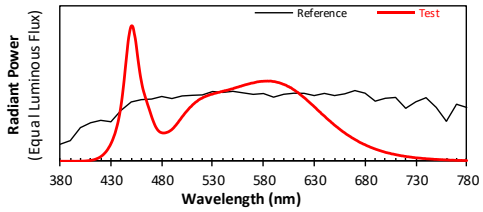


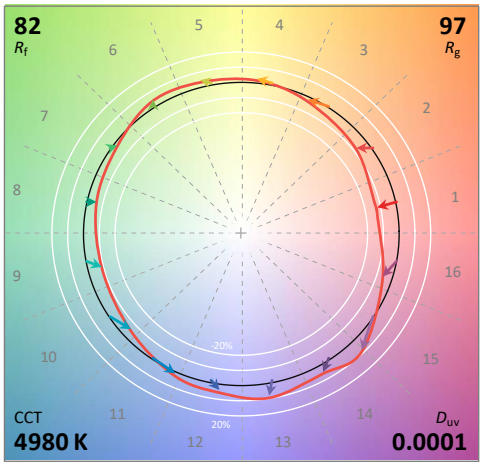
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.1802	535	0.4847	538.6293	690	0.1614	179.4200
385	0.0004	0.4889	540	0.4964	551.6539	695	0.1394	154.9154
390	0.0004	0.4798	545	0.5073	563.8421	700	0.1225	136.1918
395	0.0003	0.3064	550	0.5179	575.5257	705	0.1049	116.5614
400	0.0010	1.1123	555	0.5259	584.4589	710	0.0909	101.0133
405	0.0025	2.7361	560	0.5357	595.3911	715	0.0780	86.7072
410	0.0066	7.2952	565	0.5482	609.2985	720	0.0663	73.7329
415	0.0158	17.5566	570	0.5600	622.3532	725	0.0578	64.2129
420	0.0343	38.1654	575	0.5705	634.0462	730	0.0495	55.0030
425	0.0691	76.8176	580	0.5791	643.6182	735	0.0420	46.6540
430	0.1298	144.2458	585	0.5874	652.7752	740	0.0361	40.1574
435	0.2322	258.0032	590	0.5915	657.3170	745	0.0312	34.6622
440	0.4149	461.0636	595	0.5919	657.8151	750	0.0252	28.0577
445	0.7463	829.4398	600	0.5892	654.7834	755	0.0227	25.2632
450	0.9987	1109.8829	605	0.5814	646.1098	760	0.0188	20.8432
455	0.8520	946.8783	610	0.5683	631.6135	765	0.0164	18.2202
460	0.5898	655.5060	615	0.5516	613.0508	770	0.0142	15.7362
465	0.4472	496.9507	620	0.5280	586.8334	775	0.0114	12.6665
470	0.3312	368.0367	625	0.5008	556.5820	780	0.0101	11.2761
475	0.2428	269.8907	630	0.4710	523.4789	785	0.0084	9.2960
480	0.2108	234.3149	635	0.4372	485.8374	790	0.0073	8.0825
485	0.2135	237.2448	640	0.4035	448.4191	795	0.0068	7.5055
490	0.2351	261.2272	645	0.3674	408.3001	800	0.0054	5.9537
495	0.2774	308.2615	650	0.3341	371.3549			
500	0.3281	364.5941	655	0.2997	333.1207			
505	0.3735	415.1375	660	0.2668	296.5014			
510	0.4142	460.3160	665	0.2377	264.2014			
515	0.4445	493.9765	670	0.2099	233.3057			
520	0.4678	519.8752	675	0.1846	205.1067			
525	0.4847	538.6293	680	0.1614	179.4200			
530	0.4964	551.6539	685	0.1394	154.9154			

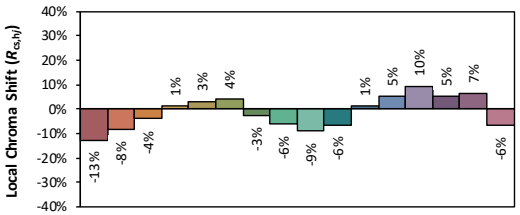
TM-30

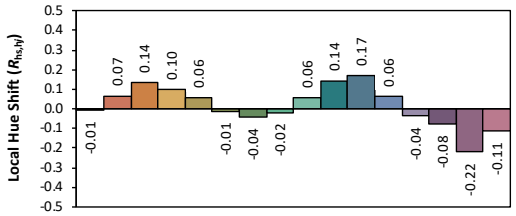
ANSI/IES TM-30-18 Color Rendition Report

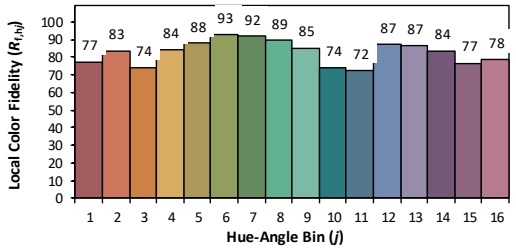
Source:	L128-XX80RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2023/4/25	**Model:**	HIDFA-270S-EX39-8CCT-BYP @270W 5000K

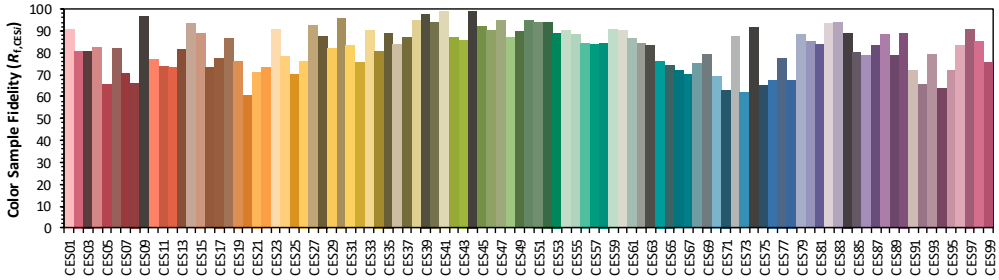












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3457
y	0.3522
u'	0.2116
v'	0.4850

CIE 13.3-1995 (CRI)

R_a	82
R_9	7

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
Goniophotometeric 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 ℃
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-270S-EX39-8CCT-BYP @200W 3000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	120.0	60	1.700	201.36	0.992	17.5
	277.0	60	0.767	203.67	0.967	18.6
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

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

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2988
Duv	-0.00109
Chromaticity (x, y)	x=0.4360 y=0.4006
Chromaticity (u', v')	u(u')=0.2514 v'=0.5199
Color Rendering Index (CRI)	82.9
R9	9
Rf	84
Rg	97
Rcs,h1(%)	-12

Special Color Rendering Indices			
R1	82	R9	9
R2	91	R10	79
R3	96	R11	81
R4	81	R12	70
R5	82	R13	84
R6	90	R14	99
R7	81	R15	74
R8	60	--	--
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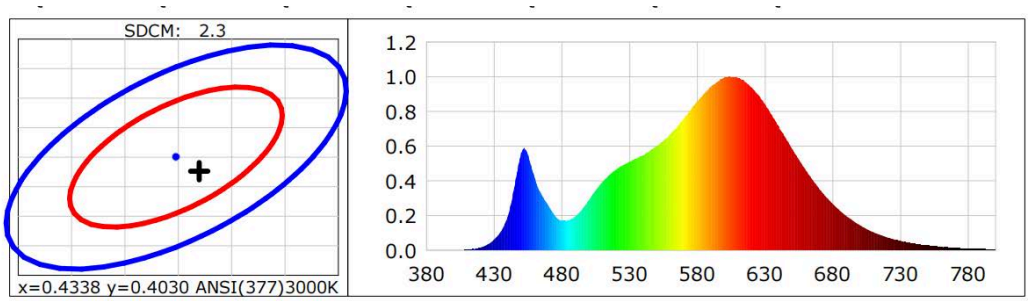
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	32498.9	33038.9	>=10000(-10%)
Luminous Efficacy (lm/W)	161.40	162.22	Standard: >= 120(-3%)
Most worst Luminous/Highest	161.4		
Zonal lumens in the 20-50º (%)	10.8	--	>=30(-10%)
Beam Angle ( )	170.7	--	--
Center Beam Candle Power (cd)	10401	--	--

Spectral Power Distribution & Chromaticity Diagram

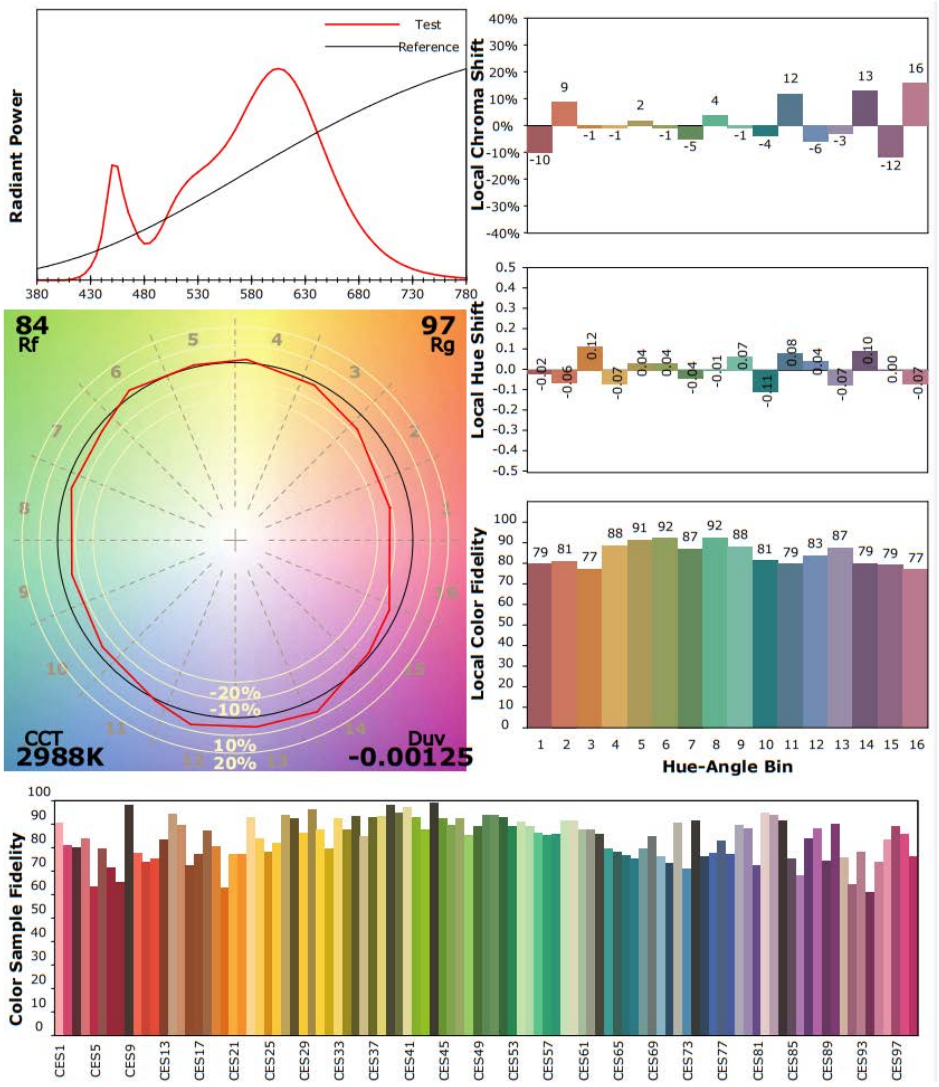


WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.1609	525	0.4901	330.2945	670	0.3525	237.5730
385	0.0002	0.1493	530	0.5107	344.1508	675	0.3078	207.4022
390	0.0001	0.0898	535	0.5288	356.3335	680	0.2664	179.5151
395	0.0004	0.2663	540	0.5478	369.1710	685	0.2292	154.4923
400	0.0003	0.1769	545	0.5737	386.6076	690	0.1969	132.7027
405	0.0010	0.6648	550	0.6013	405.2354	695	0.1696	114.3105
410	0.0031	2.0600	555	0.6342	427.3771	700	0.1435	96.7023
415	0.0070	4.7485	560	0.6697	451.2906	705	0.1219	82.1745
420	0.0161	10.8262	565	0.7114	479.4182	710	0.1041	70.1324
425	0.0332	22.3413	570	0.7592	511.6594	715	0.0885	59.6192
430	0.0632	42.6150	575	0.8098	545.7290	720	0.0748	50.3938
435	0.1101	74.1683	580	0.8575	577.8689	725	0.0637	42.9587
440	0.1969	132.6904	585	0.9037	608.9857	730	0.0539	36.3535
445	0.3675	247.6720	590	0.9441	636.2429	735	0.0455	30.6434
450	0.5630	379.4384	595	0.9733	655.9529	740	0.0375	25.2664
455	0.5471	368.7142	600	0.9961	671.2870	745	0.0316	21.2791
460	0.4161	280.4151	605	0.9983	672.7871	750	0.0269	18.1578
465	0.3184	214.5481	610	0.9939	669.8366	755	0.0229	15.4480
470	0.2572	173.3360	615	0.9705	654.0219	760	0.0186	12.5628
475	0.1962	132.2493	620	0.9386	632.5517	765	0.0163	10.9962
480	0.1699	114.5317	625	0.8960	603.7960	770	0.0138	9.2930
485	0.1727	116.3547	630	0.8410	566.7552	775	0.0112	7.5714
490	0.1967	132.5861	635	0.7800	525.6688	780	0.0100	6.7394
495	0.2372	159.8755	640	0.7150	481.8728	785	0.0084	5.6354
500	0.2905	195.7738	645	0.6479	436.6053	790	0.0063	4.2723
505	0.3466	233.5823	650	0.5843	393.7679	795	0.0056	3.7731
510	0.3946	265.9600	655	0.5195	350.0889	800	0.0046	3.0912
515	0.4342	292.6167	660	0.4607	310.4507			
520	0.4653	313.5879	665	0.4048	272.8235			

TM30

ANSI/IES TM-30-18 Color Rendition Report

Source:	L128-3080RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2024/09/20	**Model:**	HIDFA-270S-EX39-8CCT-BYP @200W 3000K



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

x	0.4360
y	0.4006
u'	0.2514
v'	0.5199

(CRI)

R_a	82.9
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 ºC
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	HIDFA-270S-EX39-8CCT-BYP @200W 4000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	120.0	60	1.654	195.90	0.992	17.71
	277.0	60	0.746	198.14	0.967	19.10
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

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

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3847
Duv	-0.00192
Chromaticity (x, y)	x=0.3859 y=0.3760
Chromaticity (u', v')	u(u')=0.2290 v'=0.5021
Color Rendering Index (CRI)	84.9
R9	17
Rf	83
Rg	94
Rcs,h1(%)	-11

Special Color Rendering Indices			
R1	85	R9	17
R2	94	R10	84
R3	96	R11	81
R4	82	R12	64
R5	84	R13	88
R6	90	R14	99
R7	84	R15	79
R8	65	--	--
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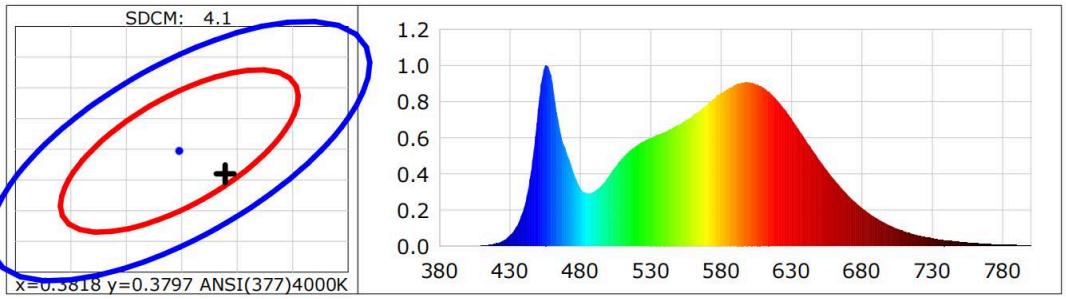
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	34581.4	35334.1	>= 10000(-10%)
Luminous Efficacy (lm/W)	176.52	178.33	Standard: >= 120(-3%)
Most worst Luminous/Highest	170.8		

Spectral Power Distribution & Chromaticity Diagram

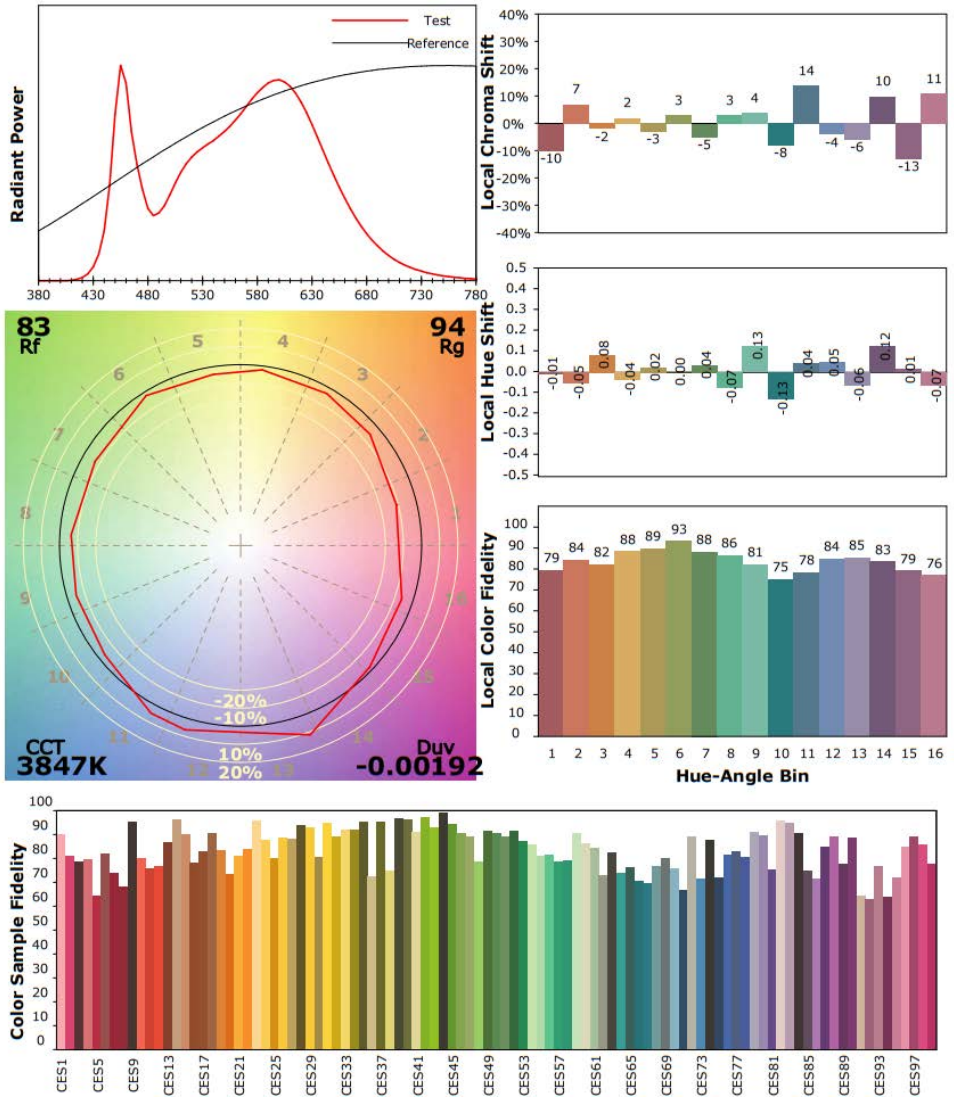


WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0004	0.2674	525	0.5808	397.1315	670	0.2815	192.4834
385	0.0006	0.3786	530	0.5997	410.1005	675	0.2457	168.0311
390	0.0005	0.3464	535	0.6160	421.1875	680	0.2120	144.9328
395	0.0004	0.3074	540	0.6307	431.2553	685	0.1821	124.5134
400	0.0005	0.3355	545	0.6526	446.2144	690	0.1573	107.5652
405	0.0010	0.6745	550	0.6725	459.8503	695	0.1342	91.7667
410	0.0025	1.6995	555	0.6980	477.2607	700	0.1147	78.4288
415	0.0063	4.2824	560	0.7254	496.0218	705	0.0972	66.4884
420	0.0142	9.7220	565	0.7525	514.5876	710	0.0821	56.1581
425	0.0306	20.9243	570	0.7844	536.4037	715	0.0695	47.5414
430	0.0613	41.9416	575	0.8179	559.2657	720	0.0595	40.7057
435	0.1147	78.4312	580	0.8463	578.6753	725	0.0502	34.3581
440	0.2163	147.9004	585	0.8715	595.9527	730	0.0432	29.5529
445	0.4170	285.1621	590	0.8928	610.5300	735	0.0362	24.7232
450	0.7631	521.7857	595	0.9035	617.8105	740	0.0304	20.7645
455	1.0000	683.8007	600	0.9088	621.4320	745	0.0256	17.5363
460	0.9114	623.1980	605	0.8930	610.6212	750	0.0217	14.8161
465	0.6568	449.1541	610	0.8773	599.8761	755	0.0187	12.8180
470	0.5228	357.4840	615	0.8457	578.2936	760	0.0153	10.4430
475	0.4093	279.8680	620	0.8061	551.1918	765	0.0138	9.4313
480	0.3205	219.1878	625	0.7594	519.2850	770	0.0111	7.6231
485	0.2898	198.1321	630	0.7050	482.0788	775	0.0094	6.4165
490	0.3040	207.8845	635	0.6471	442.5102	780	0.0074	5.0633
495	0.3364	230.0076	640	0.5893	402.9797	785	0.0063	4.3417
500	0.3853	263.4552	645	0.5299	362.3344	790	0.0057	3.9013
505	0.4402	300.9878	650	0.4749	324.7292	795	0.0052	3.5578
510	0.4889	334.2876	655	0.4199	287.0994	800	0.0044	3.0151
515	0.5284	361.3174	660	0.3707	253.4875			
520	0.5575	381.2418	665	0.3245	221.8605			

TM30

ANSI/IES TM-30-18 Color Rendition Report

Source:	L128-4080RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2024/09/20	**Model:**	HIDFA-270S-EX39-8CCT-BYP @200W 4000K



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

x	0.3859
y	0.3760
u'	0.2290
v'	0.5021

(CRI)

R_a	84.9
R_9	17

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	2024-09-20	Test Ambient:	25.2 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-270S-EX39-8CCT-BYP @200W 5000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404 1E-A3	120.0	60	1.694	200.66	0.992	17.82
	277.0	60	0.764	202.91	0.967	19.22
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

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

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	4860
Duv	0.00177
Chromaticity (x, y)	x=0.3496 y=0.3588
Chromaticity (u', v')	u(u')=0.2117 v'=0.4888
Color Rendering Index (CRI)	82.8
R9	6
Rf	81
Rg	91
Rcs,h1(%)	-11

Special Color Rendering Indices			
R1	82	R9	6
R2	92	R10	79
R3	95	R11	77
R4	78	R12	55
R5	81	R13	85
R6	87	R14	98
R7	84	R15	76
R8	64	--	--
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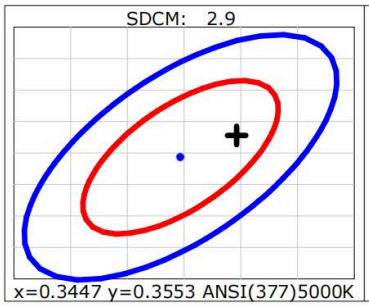
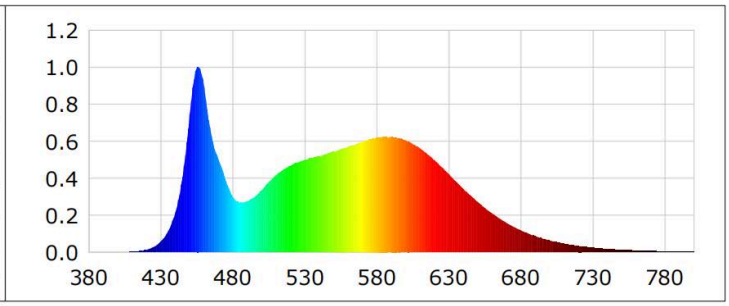
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	34542.4	35183.1	>= 10000(-10%)
Luminous Efficacy (lm/W)	172.15	173.40	Standard: >= 120(-3%)
Most worst Luminous/Highest	170.4		

Spectral Power Distribution & Chromaticity Diagram



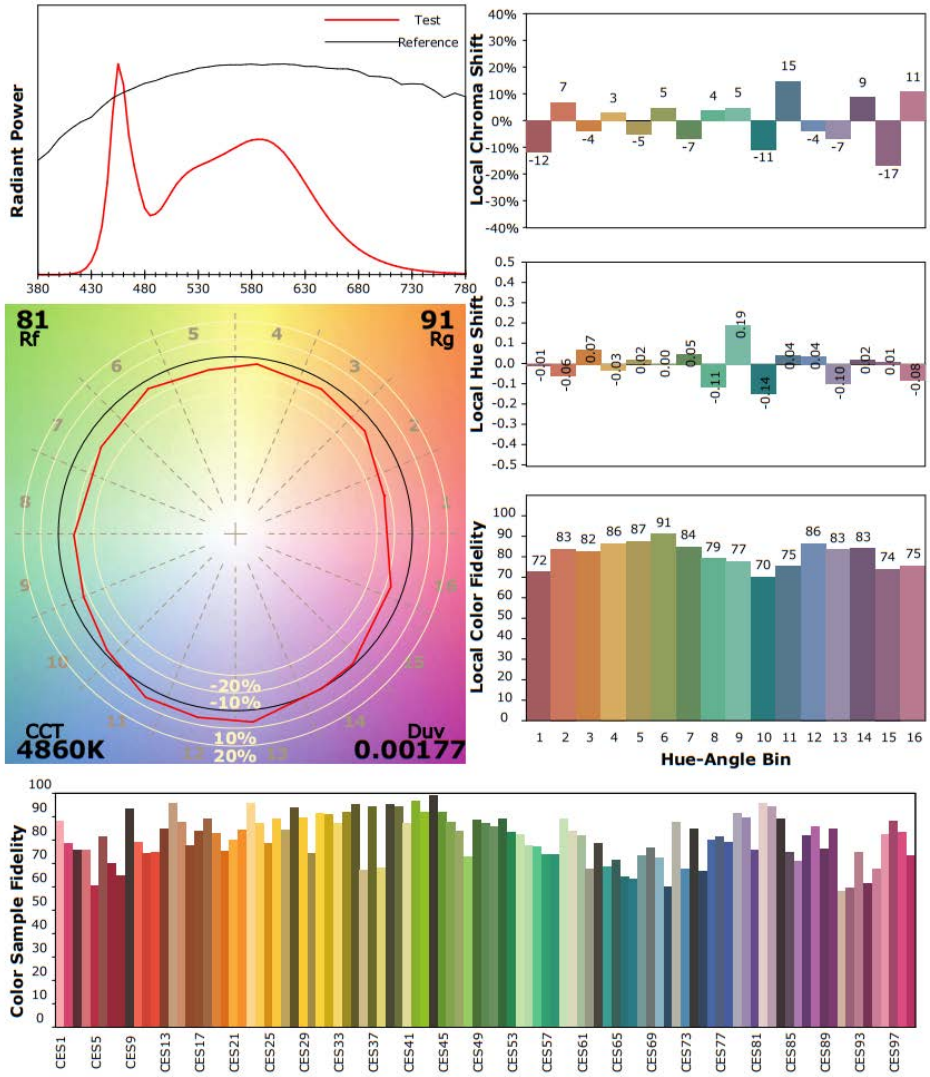


WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.2442	525	0.4857	441.0384	670	0.1578	143.3081
385	0.0003	0.2946	530	0.4994	453.4200	675	0.1370	124.4093
390	0.0002	0.1906	535	0.5095	462.6102	680	0.1181	107.2179
395	0.0004	0.3472	540	0.5178	470.1380	685	0.1011	91.8132
400	0.0005	0.4983	545	0.5320	483.0238	690	0.0880	79.9020
405	0.0010	0.8860	550	0.5430	493.0010	695	0.0751	68.1631
410	0.0026	2.3626	555	0.5582	506.8137	700	0.0639	58.0610
415	0.0061	5.5650	560	0.5726	519.9252	705	0.0540	49.0567
420	0.0136	12.3530	565	0.5842	530.4090	710	0.0461	41.8130
425	0.0292	26.5122	570	0.5965	541.6455	715	0.0393	35.6708
430	0.0609	55.3093	575	0.6094	553.3032	720	0.0337	30.5573
435	0.1150	104.4011	580	0.6174	560.5927	725	0.0288	26.1218
440	0.2171	197.1335	585	0.6216	564.4107	730	0.0239	21.7186
445	0.4089	371.3141	590	0.6222	564.9174	735	0.0209	19.0137
450	0.7502	681.1207	595	0.6152	558.6238	740	0.0177	16.0280
455	0.9999	907.9224	600	0.6056	549.9092	745	0.0147	13.3795
460	0.8950	812.6351	605	0.5838	530.1099	750	0.0127	11.5001
465	0.6308	572.7127	610	0.5615	509.8286	755	0.0106	9.6112
470	0.5010	454.9247	615	0.5296	480.8218	760	0.0086	7.7883
475	0.3878	352.0780	620	0.4970	451.2551	765	0.0080	7.2570
480	0.2991	271.5805	625	0.4600	417.6820	770	0.0068	6.1711
485	0.2674	242.7569	630	0.4215	382.7294	775	0.0053	4.8080
490	0.2769	251.4268	635	0.3819	346.7307	780	0.0039	3.5688
495	0.2994	271.8054	640	0.3436	311.9867	785	0.0032	2.9096
500	0.3374	306.3245	645	0.3066	278.3416	790	0.0025	2.3145
505	0.3792	344.2741	650	0.2717	246.6614	795	0.0029	2.6489
510	0.4175	379.0970	655	0.2391	217.1226	800	0.0020	1.8420
515	0.4468	405.7010	660	0.2093	190.0546			
520	0.4686	425.4815	665	0.1828	166.0147			

TM-30

ANSI/IES TM-30-18 Color Rendition Report

Source:	L128-5080RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2024/11/29	**Model:**	HIDFA-270S-EX39-8CCT-BYP @200W 5000K



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

x	0.3496
y	0.3588
u'	0.2117
v'	0.4888

(CRI)

R_a	82.8
R_9	6

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

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2024-09-20	**Test Ambient:**	25.3 ℃
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	HIDFA-270S-EX39-8CCT-BYP @135W 3000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	120.0	60	1.169	138.22	0.990	20.51
	277.0	60	0.528	137.61	0.947	37.42
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

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

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2963
Duv	-0.00111
Chromaticity (x, y)	x=0.4379 y=0.4016
Chromaticity (u', v')	u(u')=0.2523 v'=0.5206
Color Rendering Index (CRI)	82.9
R9	8
Rf	84
Rg	96
Rcs,h1(%)	-12

Special Color Rendering Indices			
R1	82	R9	8
R2	91	R10	80
R3	96	R11	81
R4	81	R12	70
R5	82	R13	84
R6	90	R14	99
R7	82	R15	74
R8	59	--	--
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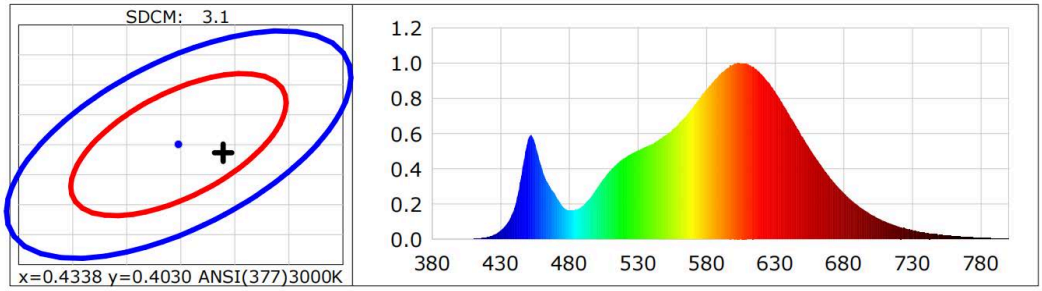
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	23412.5	23160.6	>=10000(-10%)
Luminous Efficacy (lm/W)	169.38	168.31	Standard: >= 120(-3%)
Most worst Luminous/Highest	169.38		
Zonal lumens in the 20-50º (%)	10.8	--	>=30(-10%)
Beam Angle (º)	171.1	--	--
Center Beam Candle Power (cd)	731.3	--	--

Spectral Power Distribution & Chromaticity Diagram

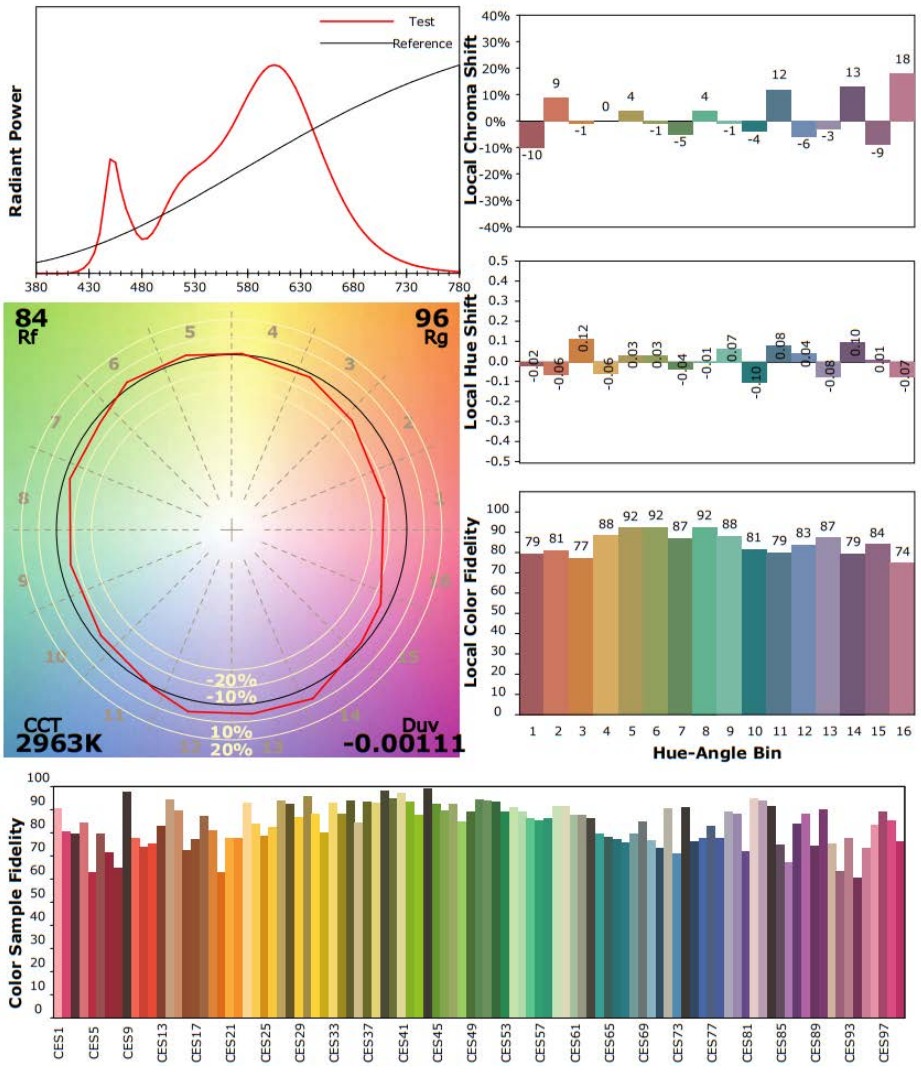


WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.0963	525	0.4843	234.7375	670	0.3481	168.7078
385	0.0005	0.2493	530	0.5048	244.6686	675	0.3034	147.0350
390	0.0001	0.0415	535	0.5224	253.1964	680	0.2613	126.6575
395	0.0005	0.2295	540	0.5392	261.3409	685	0.2253	109.2065
400	0.0003	0.1606	545	0.5648	273.7384	690	0.1941	94.0811
405	0.0003	0.1595	550	0.5912	286.5081	695	0.1649	79.9195
410	0.0017	0.8013	555	0.6242	302.5010	700	0.1402	67.9440
415	0.0042	2.0337	560	0.6614	320.5317	705	0.1191	57.7195
420	0.0114	5.5445	565	0.7020	340.2129	710	0.1012	49.0283
425	0.0259	12.5286	570	0.7497	363.3259	715	0.0856	41.4618
430	0.0518	25.0932	575	0.8009	388.1790	720	0.0720	34.9004
435	0.0951	46.0822	580	0.8501	412.0202	725	0.0610	29.5637
440	0.1810	87.7275	585	0.8970	434.7480	730	0.0516	25.0010
445	0.3626	175.7524	590	0.9394	455.3022	735	0.0420	20.3603
450	0.5697	276.1119	595	0.9718	470.9701	740	0.0348	16.8580
455	0.5404	261.9262	600	0.9959	482.6750	745	0.0295	14.3013
460	0.4004	194.0670	605	0.9982	483.7538	750	0.0243	11.7622
465	0.3068	148.6773	610	0.9951	482.2945	755	0.0201	9.7566
470	0.2475	119.9673	615	0.9714	470.7952	760	0.0167	8.1029
475	0.1863	90.2918	620	0.9371	454.1869	765	0.0148	7.1832
480	0.1622	78.6302	625	0.8922	432.4161	770	0.0123	5.9756
485	0.1670	80.9520	630	0.8376	405.9430	775	0.0099	4.7739
490	0.1921	93.0939	635	0.7764	376.2948	780	0.0071	3.4651
495	0.2339	113.3711	640	0.7116	344.8598	785	0.0064	3.1016
500	0.2884	139.7606	645	0.6447	312.4299	790	0.0049	2.3616
505	0.3437	166.5711	650	0.5798	280.9854	795	0.0043	2.1011
510	0.3918	189.8616	655	0.5146	249.4050	800	0.0034	1.6583
515	0.4316	209.1699	660	0.4563	221.1454			
520	0.4605	223.1760	665	0.4008	194.2508			

TM30

ANSI/IES TM-30-18 Color Rendition Report

Source:	L128-3080RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2024/09/20	**Model:**	HIDFA-270S-EX39-8CCTBYP @135W 3000K



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

x	0.4379
y	0.4016
u'	0.2523
v'	0.5206

(CRI)

R_a	82.9
R_9	8

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2024-09-20	**Test Ambient:**	25.2 ºC
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	HIDFA-270S-EX39-8CCT-BYP @135W 4000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	120.0	60	1.141	134.84	0.989	20.61
	277.0	60	0.517	134.27	0.943	37.41
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

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

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3865
Duv	-0.00203
Chromaticity (x, y)	x=0.3850 y=0.3752
Chromaticity (u', v')	u(u')=0.2288 v'=0.5016
Color Rendering Index (CRI)	84.8
R9	16
Rf	83
Rg	93
Rcs,h1(%)	-11

Special Color Rendering Indices			
R1	85	R9	16
R2	94	R10	85
R3	95	R11	81
R4	81	R12	64
R5	84	R13	88
R6	91	R14	98
R7	83	R15	79
R8	65	--	--
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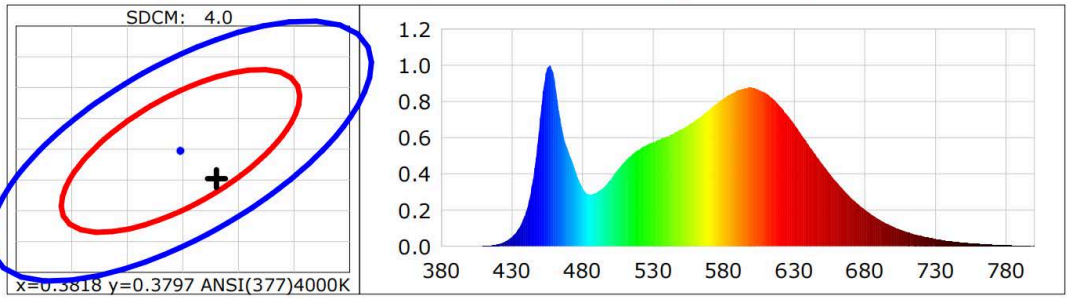
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	24449.6	24442.2	>= 10000(-10%)
Luminous Efficacy (lm/W)	181.33	182.04	Standard: >= 120(-3%)
Most worst Luminous/Highest	181.23		

Spectral Power Distribution & Chromaticity Diagram

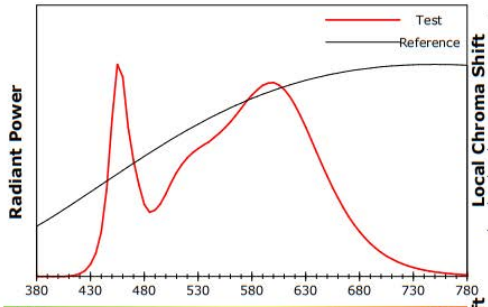


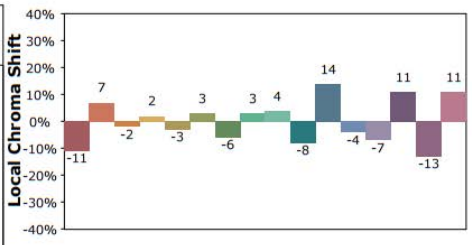
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.0998	525	0.5572	273.6259	670	0.2680	131.6210
385	0.0001	0.0580	530	0.5760	282.8478	675	0.2342	115.0086
390	0.0001	0.0639	535	0.5914	290.3896	680	0.2017	99.0222
395	0.0005	0.2531	540	0.6051	297.1076	685	0.1733	85.1216
400	0.0003	0.1604	545	0.6266	307.6750	690	0.1493	73.3325
405	0.0006	0.3152	550	0.6462	317.2990	695	0.1276	62.6794
410	0.0021	1.0220	555	0.6718	329.8702	700	0.1088	53.4357
415	0.0052	2.5337	560	0.6982	342.8666	705	0.0926	45.4728
420	0.0124	6.1057	565	0.7251	356.0462	710	0.0788	38.6844
425	0.0257	12.6335	570	0.7552	370.8474	715	0.0662	32.5057
430	0.0533	26.1857	575	0.7879	386.8817	720	0.0570	27.9773
435	0.1025	50.3358	580	0.8165	400.9254	725	0.0486	23.8478
440	0.1929	94.7398	585	0.8411	412.9960	730	0.0405	19.8696
445	0.3758	184.5471	590	0.8617	423.1305	735	0.0346	17.0026
450	0.7123	349.7781	595	0.8726	428.4678	740	0.0289	14.2018
455	0.9866	484.4348	600	0.8768	430.5425	745	0.0249	12.2280
460	0.9235	453.4925	605	0.8628	423.6805	750	0.0206	10.1209
465	0.6601	324.1585	610	0.8446	414.7117	755	0.0164	8.0752
470	0.5217	256.1833	615	0.8129	399.1735	760	0.0146	7.1910
475	0.4114	201.9912	620	0.7721	379.1188	765	0.0133	6.5090
480	0.3205	157.3944	625	0.7259	356.4297	770	0.0112	5.4791
485	0.2851	139.9853	630	0.6747	331.2974	775	0.0090	4.4147
490	0.2973	145.9793	635	0.6184	303.6622	780	0.0070	3.4193
495	0.3261	160.1510	640	0.5620	275.9495	785	0.0051	2.5192
500	0.3702	181.7885	645	0.5062	248.5408	790	0.0050	2.4340
505	0.4235	207.9474	650	0.4529	222.3894	795	0.0051	2.5178
510	0.4694	230.5007	655	0.4001	196.4467	800	0.0037	1.8344
515	0.5066	248.7386	660	0.3537	173.6869			
520	0.5351	262.7708	665	0.3091	151.7671			

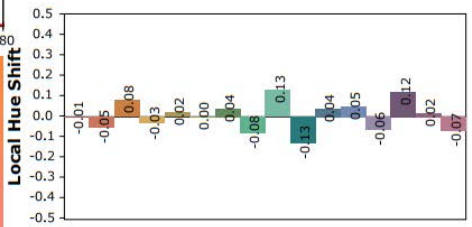
TM30

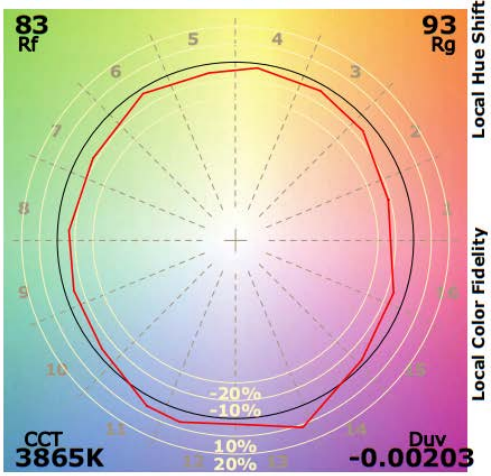
ANSI/IES TM-30-18 Color Rendition Report

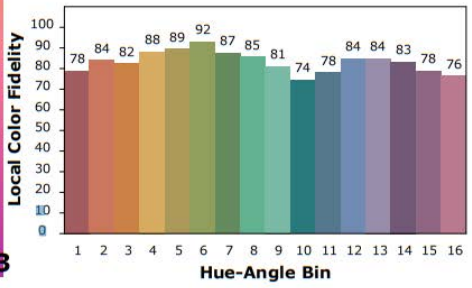
Source:	L128-4080RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2024/09/20	**Model:**	HIDFA-270S-EX39-8CCT-BYP @135W 4000K

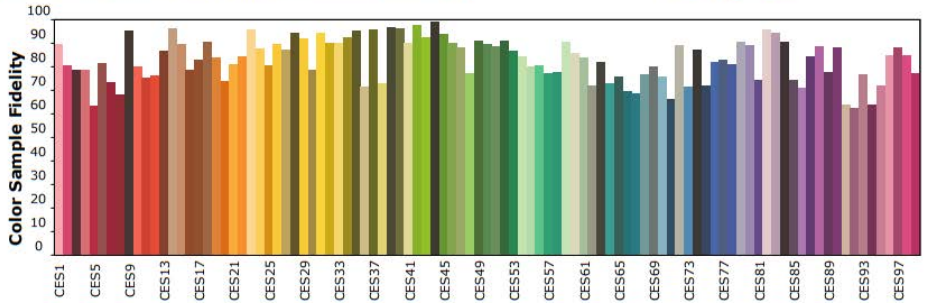












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3850
y	0.3752
u'	0.2288
v'	0.5016

(CRI)

R_a	84.8
R_9	16

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	2024-09-20	**Test Ambient:**	25.2 ºC
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	HIDFA-270S-EX39-8CCT-BYP @135W 5000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404 1E-A3	120.0	60	1.164	137.7	0.990	20.31
	277.0	60	0.390	102.8	0.954	38.18
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

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

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	4861
Duv	0.00182
Chromaticity (x, y)	x=0.3496 y=0.3588
Chromaticity (u', v')	u(u')=0.2117 v'=0.4888
Color Rendering Index (CRI)	82.9
R9	7
Rf	81
Rg	91
Rcs,h1(%)	-11

Special Color Rendering Indices			
R1	82	R9	7
R2	93	R10	81
R3	95	R11	77
R4	78	R12	55
R5	81	R13	86
R6	88	R14	98
R7	84	R15	76
R8	64	--	--
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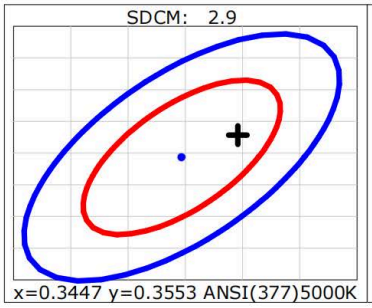
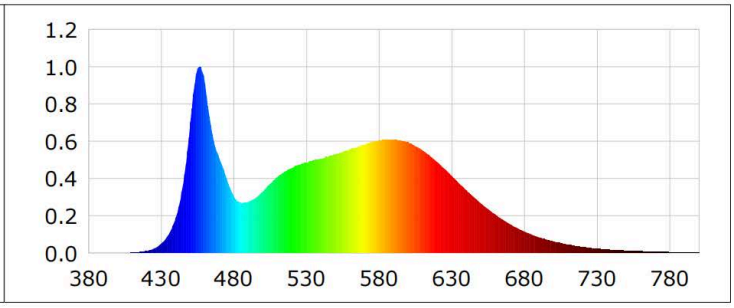
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	24725.3	18444.7	>= 10000(-10%)
Luminous Efficacy (lm/W)	179.56	179.38	Standard: >= 120(-3%)
Most worst Luminous/Highest	179.56		

Spectral Power Distribution & Chromaticity Diagram



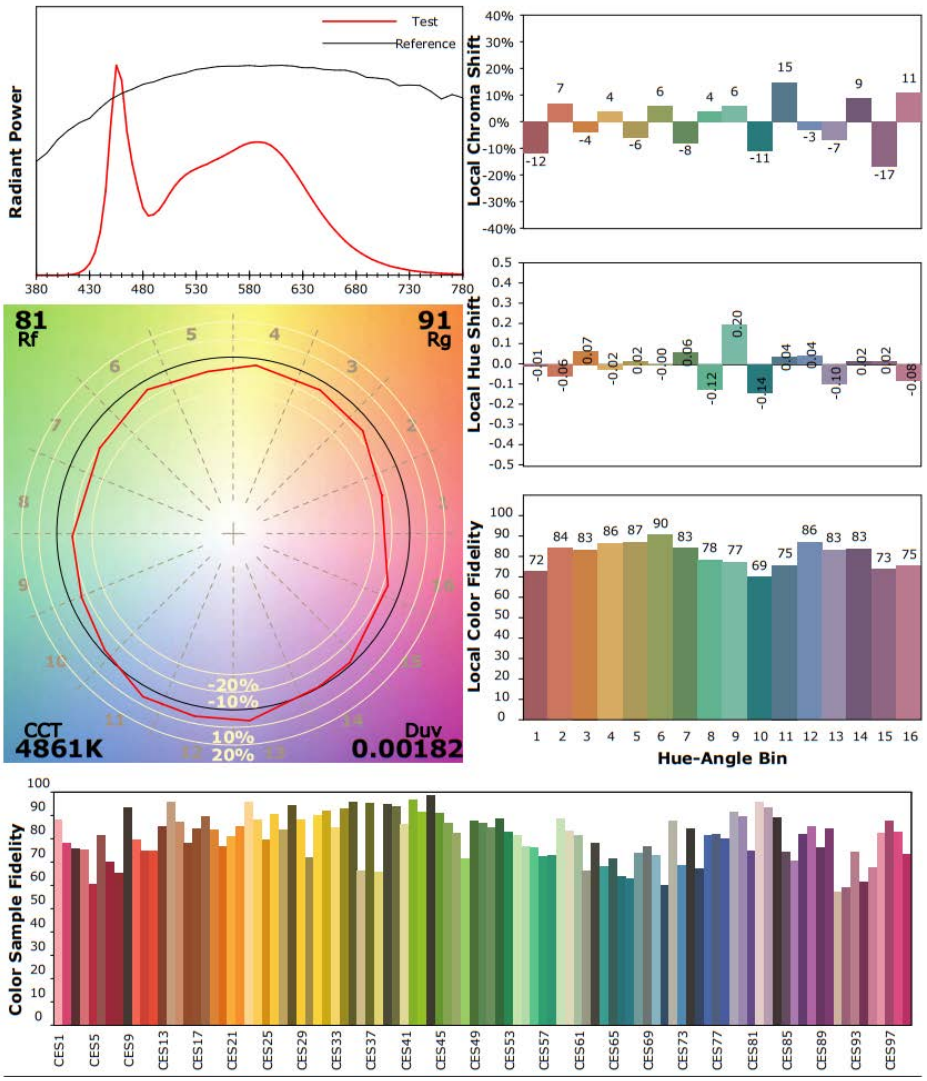


WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0006	0.4212	525	0.4733	306.9025	670	0.1549	100.4433
385	0.0007	0.4237	530	0.4859	315.0659	675	0.1339	86.8407
390	0.0003	0.2208	535	0.4971	322.3406	680	0.1156	74.9643
395	0.0005	0.3480	540	0.5061	328.1352	685	0.0993	64.3633
400	0.0005	0.3536	545	0.5190	336.5291	690	0.0851	55.1495
405	0.0009	0.5840	550	0.5298	343.5041	695	0.0724	46.9547
410	0.0018	1.1810	555	0.5442	352.9010	700	0.0619	40.1661
415	0.0044	2.8820	560	0.5578	361.7124	705	0.0530	34.3646
420	0.0111	7.2252	565	0.5691	369.0076	710	0.0447	28.9602
425	0.0247	16.0256	570	0.5827	377.8120	715	0.0380	24.6688
430	0.0516	33.4868	575	0.5954	386.0620	720	0.0322	20.8824
435	0.0993	64.4197	580	0.6030	390.9999	725	0.0272	17.6339
440	0.1915	124.1798	585	0.6080	394.2377	730	0.0234	15.1665
445	0.3685	238.9390	590	0.6087	394.7015	735	0.0199	12.9038
450	0.7044	456.7160	595	0.6038	391.5363	740	0.0162	10.5022
455	0.9918	643.0809	600	0.5935	384.8524	745	0.0138	8.9190
460	0.9139	592.6116	605	0.5730	371.5616	750	0.0122	7.8972
465	0.6407	415.4487	610	0.5502	356.7397	755	0.0100	6.4618
470	0.5076	329.1326	615	0.5192	336.6400	760	0.0086	5.5962
475	0.3976	257.8351	620	0.4868	315.6556	765	0.0079	5.1181
480	0.3031	196.5386	625	0.4518	292.9732	770	0.0064	4.1649
485	0.2684	174.0393	630	0.4136	268.1984	775	0.0048	3.0840
490	0.2754	178.5890	635	0.3743	242.7112	780	0.0038	2.4749
495	0.2967	192.4161	640	0.3376	218.9320	785	0.0035	2.2590
500	0.3307	214.4044	645	0.3007	194.9734	790	0.0022	1.4145
505	0.3725	241.5058	650	0.2666	172.8391	795	0.0025	1.6057
510	0.4086	264.9154	655	0.2341	151.7637	800	0.0017	1.0772
515	0.4379	283.9535	660	0.2059	133.5274			
520	0.4579	296.8993	665	0.1787	115.8908			

TM-30

ANSI/IES TM-30-18 Color Rendition Report

Source:	L128-5080RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2024/11/29	**Model:**	HIDFA-270S-EX39-8CCT-BYP @135W 5000K



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

x	0.3496
y	0.3588
u'	0.2117
v'	0.4888

(CRI)

R_a	82.9
R_9	7

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