Certificate#4810.01

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 Outdoor Pole/Arm-mounted Decorative Luminaires (Type B)

Model name(s): HIDFA-80S-EX39-8CCT-BYP

Test & Report By:

Winny Wu

Engineer: Winny Wu

Date:2023-02-23

Review By:

Jason Luo

Manager: Jason Luo

1.1 Product Information:

Organization Name	RAB LIGHTING INC	
Brand Name	RAB LIGHTING	
Model Number	HIDFA-80S-EX39-8CCT-BYP	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Replacement Lamps for Outdoor Pole/Arm-mounted Decorative Luminaires (Type B)	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	80W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,4000K,5000K(Color tunable)	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-XX80RC35003P1	
Sample Number	UTC2301006E-H1(3000K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo

1.2 Test Specifications:

Date of Receipt	2023-01-08
Date of Test	2023-01-10
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:

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	2023-01-10	Test Ambient:	25.2 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-80S-EX39-8CCT-BYP @80W 3000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230100	120.0	60	0.662	79.1	0.996	5.61
6E-H1	277.0	60	0.290	74.96	0.932	11.72
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method in King Luminaire K400 Series (Mogul Socket Version):

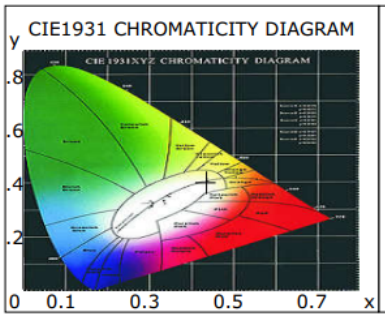
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3023
Duv	-0.0009
Chromaticity (x, y)	x=0.4340 y=0.4008
Chromaticity (u', v')	u(u')=0.2501 v'=0.5196
Color Rendering Index (CRI)	82
R9	4
Rf	84
Rg	96
Rcs,h1(%)	-12

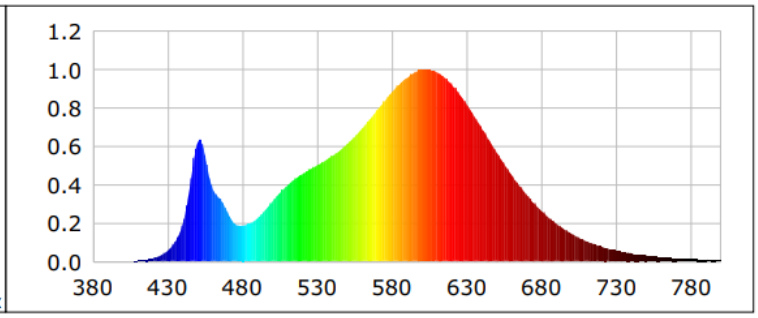
Special Color Rendering Indices			
R1	80	R9	4
R2	91	R10	78
R3	96	R11	78
R4	79	R12	69
R5	80	R13	82
R6	89	R14	99
R7	81	R15	73
R8	57	--	--
--	--	--	--
--	--	--	--
--	--	--	--

Photometric Measurement – Goniophotometer Method in King Luminaire K400 Series (Mogul Socket Version):

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	8570.5	8396.30	>= 1000(-10%)
Luminous Efficacy (lm/W)	108.35	112.01	Standard: >= 105(-3%)
Most worst Luminous/Highest	106.15		
Zonal lumens in the 0-90º (%)	70.9	--	>=65%(-3)
Beam Angle (º)	210.6	--	--
Center Beam Candle Power (cd)	295	--	--

Spectral Power Distribution & Chromaticity Diagram



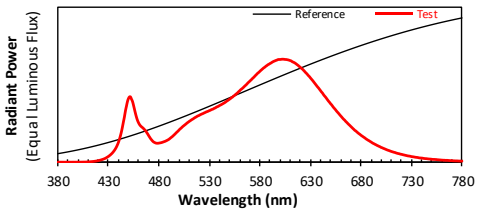


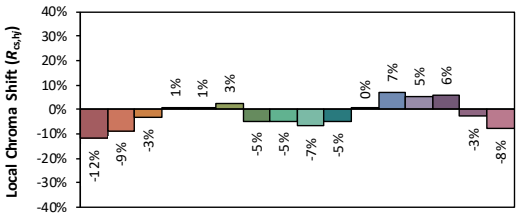
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.0599	535	0.4792	111.5984	690	0.3472	80.8526
385	0.0003	0.0725	540	0.5006	116.5777	695	0.3030	70.5607
390	0.0002	0.0473	545	0.5239	121.9994	700	0.2621	61.0485
395	0.0006	0.1463	550	0.5500	128.0771	705	0.2268	52.8121
400	0.0009	0.2035	555	0.5772	134.4151	710	0.1964	45.7349
405	0.0012	0.2691	560	0.6115	142.4014	715	0.1686	39.2667
410	0.0028	0.6635	565	0.6484	151.0020	720	0.1434	33.3844
415	0.0070	1.6384	570	0.6932	161.4437	725	0.1233	28.7048
420	0.0151	3.5151	575	0.7387	172.0309	730	0.1048	24.3986
425	0.0293	6.8120	580	0.7864	183.1300	735	0.0891	20.7580
430	0.0551	12.8427	585	0.8349	194.4387	740	0.0767	17.8642
435	0.1009	23.5022	590	0.8823	205.4771	745	0.0648	15.0940
440	0.1911	44.4997	595	0.9232	214.9947	750	0.0546	12.7064
445	0.3917	91.2082	600	0.9580	223.0994	755	0.0469	10.9202
450	0.6183	143.9945	605	0.9843	229.2138	760	0.0401	9.3305
455	0.5522	128.5870	610	0.9973	232.2435	765	0.0343	7.9795
460	0.3821	88.9823	615	0.9974	232.2683	770	0.0288	6.6960
465	0.3257	75.8501	620	0.9868	229.7977	775	0.0255	5.9275
470	0.2578	60.0461	625	0.9611	223.8141	780	0.0201	4.6885
475	0.1957	45.5745	630	0.9214	214.5725	785	0.0185	4.3096
480	0.1852	43.1240	635	0.8732	203.3532	790	0.0151	3.5242
485	0.1986	46.2520	640	0.8189	190.7018	795	0.0128	2.9756
490	0.2223	51.7600	645	0.7577	176.4649	800	0.0106	2.4793
495	0.2639	61.4618	650	0.6953	161.9121			
500	0.3121	72.6777	655	0.6321	147.2043			
505	0.3563	82.9771	660	0.5676	132.1818			
510	0.3954	92.0879	665	0.5079	118.2888			
515	0.4279	99.6395	670	0.4494	104.6626			
520	0.4547	105.8803	675	0.3956	92.1218			
525	0.4792	111.5984	680	0.3472	80.8526			
530	0.5006	116.5777	685	0.3030	70.5607			

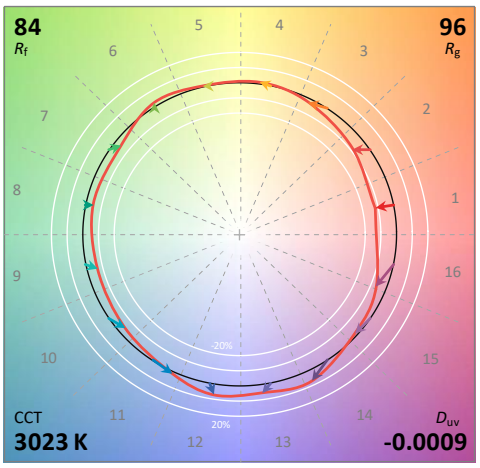
TM30

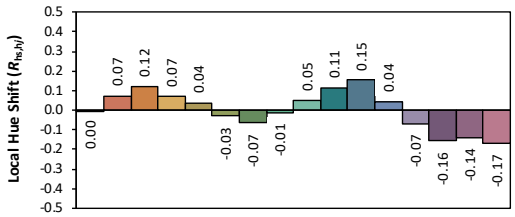
ANSI/IES TM-30-18 Color Rendition Report

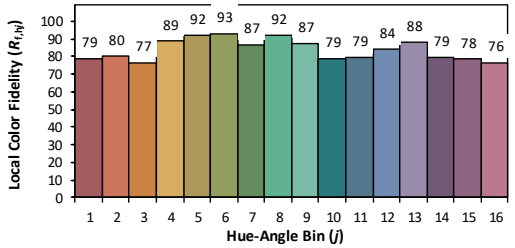
Source:	L128-XX80RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2023/1/10	**Model:**	HIDFA-80S-EX39-8CCT-BYP @80W 3000K

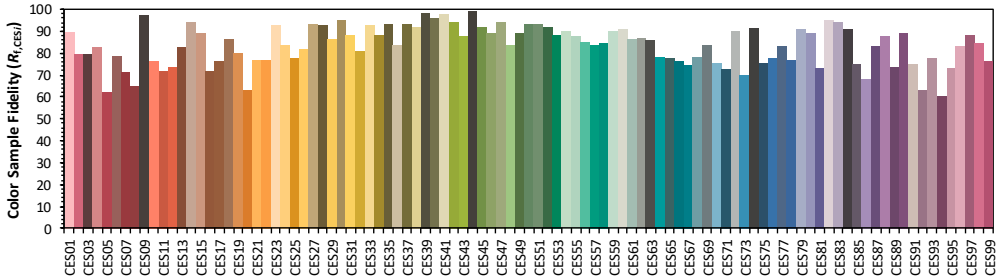












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4340
y	0.4008
u'	0.2501
v'	0.5196

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

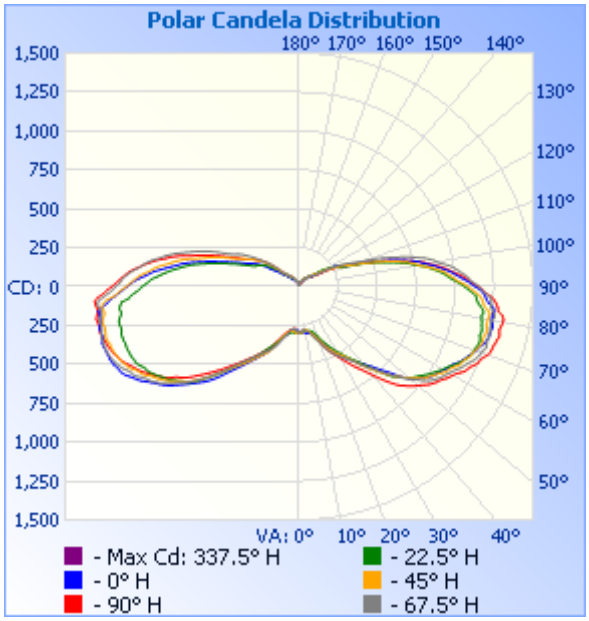
Zonal Lumen Summary

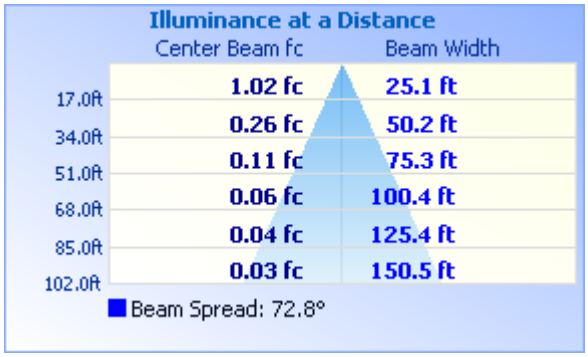
Zone	Lumens	% Lamp	% Luminaire
0-30	326.4	3.8%	3.8%
0-40	697.5	8.1%	8.1%
0-60	2,261.9	26.4%	26.4%
60-90	3,817.4	44.5%	44.5%
70-100	3,722.7	43.4%	43.4%
90-120	2,162.9	25.2%	25.2%
0-90	6,079.3	70.9%	70.9%
90-180	2,492.2	29.1%	29.1%
0-180	8,571.5	100%	100%

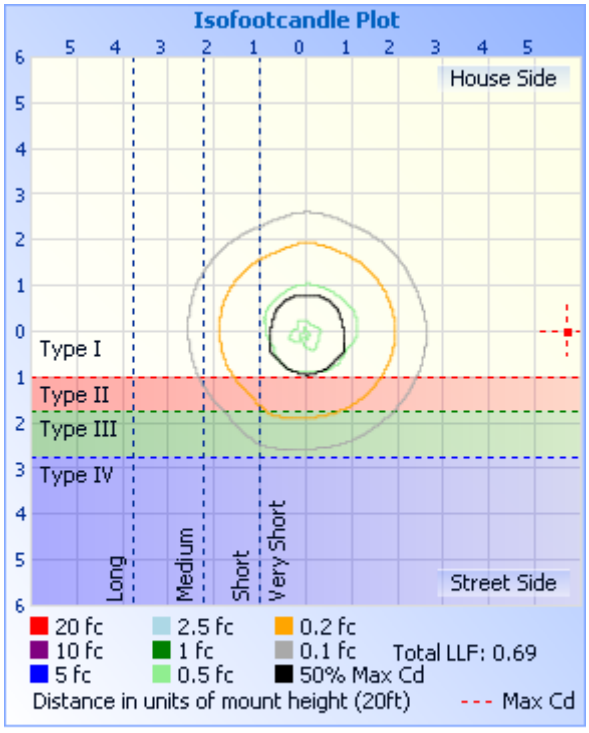
Lumens Per Zone

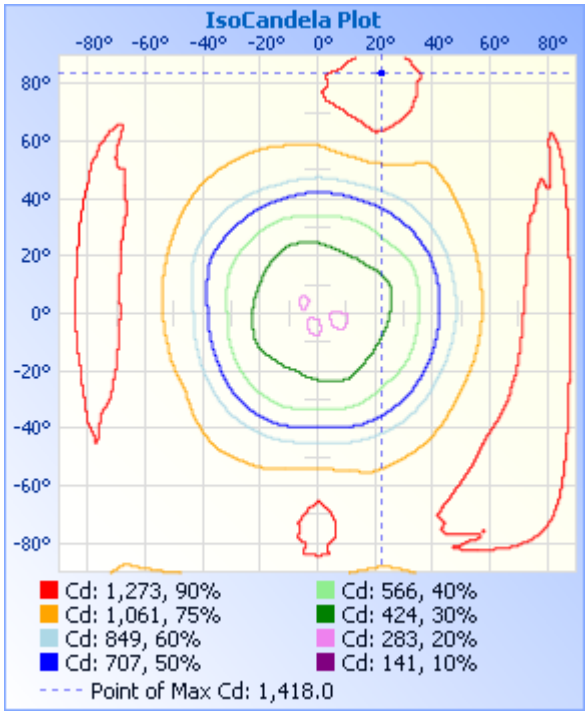
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	27.6	0.3%	90-100	1,080.6	12.6%
10-20	92.9	1.1%	100-110	715.1	8.3%
20-30	205.9	2.4%	110-120	367.2	4.3%
30-40	371.1	4.3%	120-130	182.5	2.1%
40-50	633.3	7.4%	130-140	77.1	0.9%
50-60	931.1	10.9%	140-150	41.3	0.5%
60-70	1,175.3	13.7%	150-160	19.7	0.2%
70-80	1,322.4	15.4%	160-170	7.5	0.1%
80-90	1,319.7	15.4%	170-180	1.2	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	295	295	295	295	295	295	295	295	295	295	295	295	295	295	295	295	295
1	300	300	299	296	292	288	285	286	291	294	297	295	295	297	300	301	300
2	300	299	297	292	286	283	276	275	283	292	296	293	296	300	303	305	300
3	303	300	295	286	287	282	277	271	276	290	297	287	290	298	308	308	303
4	295	293	294	283	288	286	280	274	274	292	296	277	280	293	309	305	295
5	293	287	283	279	288	288	281	274	276	296	292	273	272	295	301	300	293
6	293	286	279	277	289	288	287	277	279	298	288	275	270	294	297	298	293
7	296	288	277	283	291	288	291	280	281	294	287	275	274	300	299	294	296
8	299	289	278	287	291	290	294	286	284	293	285	274	276	306	304	294	299
9	302	290	283	289	291	291	296	295	287	296	285	276	281	304	307	296	302
10	304	290	287	289	290	294	298	304	291	299	289	279	284	301	308	295	304
11	303	290	289	292	293	298	303	310	297	302	292	285	286	298	308	298	303
12	302	291	293	300	296	303	309	317	303	304	295	295	288	294	309	304	302
13	303	292	299	309	302	310	318	325	308	309	301	308	292	293	310	312	303
14	307	294	307	317	309	316	325	336	316	314	307	318	299	294	314	320	307
15	313	297	313	325	317	322	335	346	322	319	315	326	305	300	320	329	313
16	319	301	320	336	326	328	344	357	331	324	323	335	312	306	328	337	319
17	327	308	328	347	336	335	355	370	342	332	334	346	322	314	336	347	327
18	335	317	338	356	348	345	368	383	353	340	347	357	332	322	345	357	335
19	344	327	349	368	361	356	380	396	366	353	360	371	343	332	357	369	344
20	355	338	360	381	376	369	394	412	380	365	375	388	355	340	369	383	355
21	366	351	372	396	391	383	411	427	395	378	392	401	368	348	384	399	366
22	380	364	388	414	407	398	427	439	411	391	408	414	382	358	398	413	380
23	393	378	403	430	424	413	442	451	426	404	428	427	397	370	413	427	393
24	408	392	420	445	439	426	453	462	439	416	444	439	412	381	430	441	408
25	425	407	435	458	455	439	464	472	454	428	457	450	427	393	445	455	425
26	441	421	449	470	471	453	475	480	469	439	473	458	442	407	460	469	441
27	458	435	460	484	485	466	485	488	483	452	483	469	456	423	476	482	458

28	472	450	473	497	500	482	495	497	497	467	495	480	467	440	490	494	472
29	488	466	487	508	516	501	506	507	510	485	509	489	480	456	502	504	488
30	503	481	499	519	531	518	518	515	524	501	521	502	496	473	514	511	503
31	517	496	510	530	550	537	529	526	539	516	534	518	510	487	526	519	517
32	531	510	523	541	569	556	543	537	554	531	548	534	523	501	537	530	531
33	546	527	537	550	590	574	556	550	572	548	564	544	538	514	549	542	546
34	558	544	553	563	610	596	572	563	590	565	581	558	553	528	562	553	558
35	574	560	570	577	629	618	590	579	609	585	597	575	568	541	577	565	574
36	588	577	590	592	649	641	610	600	632	604	614	590	584	556	591	578	588
37	603	594	612	611	670	666	635	622	652	623	629	610	602	573	609	592	603
38	619	614	634	634	694	698	657	647	674	645	647	631	621	592	624	609	619
39	634	637	657	652	720	725	684	674	698	668	666	654	641	612	641	628	634
40	650	659	680	673	748	750	710	701	725	691	687	678	660	633	659	651	650
41	670	684	701	691	777	775	738	726	759	717	711	705	680	655	678	677	670
42	691	713	724	712	807	800	768	751	788	743	736	733	703	682	698	706	691
43	714	740	748	739	837	826	799	779	816	768	765	760	726	706	722	737	714
44	738	771	773	764	864	855	826	807	842	800	792	787	749	732	745	768	738
45	763	803	796	791	894	879	851	836	865	827	819	819	772	758	768	797	763
46	790	830	821	816	916	908	873	867	885	854	847	847	796	786	792	824	790
47	820	853	847	842	933	942	897	897	908	886	875	874	821	813	821	850	820
48	857	870	866	870	953	977	914	923	932	914	901	903	847	840	846	879	857
49	888	891	887	897	973	1008	930	946	955	937	926	932	874	868	871	906	888
50	918	911	912	921	990	1030	947	968	978	952	947	958	902	894	892	937	918
51	943	929	932	944	1007	1049	972	990	1003	966	964	982	929	920	912	967	943
52	961	942	953	973	1026	1063	998	1009	1030	985	984	1003	949	941	929	991	961
53	973	956	978	1001	1045	1079	1016	1030	1055	1000	1010	1030	968	960	940	1011	973
54	995	971	999	1029	1059	1089	1034	1042	1074	1021	1031	1053	991	980	952	1035	995
55	1015	989	1012	1047	1072	1099	1048	1051	1093	1035	1049	1082	1022	1005	965	1062	1015
56	1029	1005	1025	1061	1081	1113	1060	1063	1110	1047	1067	1100	1042	1027	984	1088	1029
57	1040	1018	1041	1076	1095	1127	1075	1074	1129	1060	1085	1119	1061	1048	999	1112	1040
58	1048	1033	1054	1088	1112	1140	1097	1086	1151	1075	1098	1135	1079	1065	1010	1136	1048

59	1059	1048	1073	1098	1126	1146	1115	1105	1176	1089	1113	1146	1098	1080	1022	1155	1059
60	1070	1062	1092	1110	1138	1152	1131	1116	1196	1104	1137	1165	1114	1094	1033	1177	1070
61	1083	1077	1098	1123	1153	1161	1152	1126	1212	1114	1156	1190	1136	1111	1046	1200	1083
62	1096	1092	1109	1139	1175	1174	1173	1138	1230	1119	1164	1204	1155	1129	1063	1220	1096
63	1104	1110	1128	1156	1195	1178	1183	1152	1252	1130	1177	1213	1169	1141	1074	1237	1104
64	1122	1127	1145	1170	1204	1178	1188	1156	1265	1146	1201	1227	1181	1149	1078	1253	1122
65	1141	1144	1151	1182	1216	1181	1197	1160	1273	1155	1215	1246	1198	1162	1087	1272	1141
66	1153	1158	1158	1198	1235	1188	1208	1167	1279	1159	1224	1259	1214	1174	1108	1291	1153
67	1165	1173	1174	1215	1248	1195	1214	1175	1289	1164	1234	1273	1231	1187	1121	1304	1165
68	1178	1184	1188	1227	1255	1196	1217	1178	1294	1167	1243	1278	1242	1199	1124	1311	1178
69	1194	1192	1191	1235	1268	1194	1220	1180	1301	1170	1249	1289	1251	1203	1132	1325	1194
70	1204	1197	1200	1241	1285	1201	1226	1184	1301	1173	1259	1297	1262	1211	1147	1340	1204
71	1215	1199	1213	1254	1297	1206	1233	1188	1305	1174	1262	1300	1269	1217	1152	1346	1215
72	1228	1207	1221	1263	1301	1207	1236	1192	1308	1173	1268	1304	1280	1222	1155	1348	1228
73	1242	1211	1228	1259	1303	1204	1240	1195	1314	1179	1268	1308	1287	1225	1162	1364	1242
74	1252	1208	1226	1255	1310	1209	1244	1195	1315	1179	1275	1306	1291	1226	1169	1369	1252
75	1261	1199	1226	1259	1316	1204	1242	1195	1305	1181	1282	1308	1297	1229	1175	1374	1261
76	1261	1206	1235	1260	1324	1209	1255	1193	1301	1174	1278	1308	1307	1231	1179	1376	1261
77	1263	1204	1238	1257	1318	1200	1248	1202	1305	1172	1276	1300	1309	1227	1175	1375	1263
78	1269	1197	1228	1254	1314	1195	1241	1199	1310	1177	1273	1294	1306	1221	1180	1380	1269
79	1266	1195	1227	1251	1322	1191	1245	1194	1302	1177	1279	1292	1308	1220	1181	1392	1266
80	1254	1188	1228	1257	1328	1194	1240	1194	1291	1171	1282	1299	1313	1222	1185	1388	1254
81	1253	1185	1232	1271	1328	1195	1247	1197	1293	1156	1271	1295	1318	1221	1178	1384	1253
82	1253	1195	1235	1267	1316	1187	1243	1211	1291	1154	1261	1279	1309	1210	1171	1390	1253
83	1260	1186	1219	1248	1287	1165	1216	1206	1298	1162	1262	1279	1300	1203	1173	1400	1260
84	1251	1166	1194	1237	1282	1153	1201	1184	1272	1154	1273	1288	1305	1200	1179	1418	1251
85	1222	1150	1186	1234	1270	1146	1184	1169	1238	1144	1263	1299	1312	1209	1177	1412	1222
86	1206	1141	1176	1236	1256	1129	1163	1152	1217	1098	1239	1289	1315	1202	1167	1385	1206
87	1196	1136	1162	1224	1234	1101	1135	1129	1186	1080	1188	1256	1291	1181	1138	1385	1196
88	1185	1114	1137	1197	1199	1074	1101	1101	1160	1051	1163	1224	1254	1158	1131	1380	1185
89	1162	1086	1109	1175	1178	1055	1083	1083	1129	1025	1137	1197	1232	1135	1122	1371	1162

90	1131	1064	1087	1154	1153	1036	1065	1066	1107	1010	1111	1179	1203	1116	1100	1341	1131
91	1103	1036	1055	1130	1117	1008	1036	1049	1082	983	1086	1155	1178	1085	1074	1310	1103
92	1079	1006	1019	1101	1093	978	1012	1029	1058	965	1066	1142	1156	1061	1043	1282	1079
93	1045	977	999	1087	1068	954	980	1002	1027	946	1045	1127	1137	1038	1023	1256	1045
94	1017	957	976	1068	1041	930	955	980	993	915	1024	1107	1115	1016	995	1223	1017
95	994	935	951	1044	1005	902	922	964	963	888	994	1084	1094	995	966	1192	994
96	967	910	933	1022	977	872	888	943	937	861	963	1056	1067	966	940	1165	967
97	933	880	894	999	949	849	864	922	898	835	944	1029	1033	939	918	1141	933
98	902	853	862	972	916	822	836	897	862	804	917	1012	1007	914	888	1110	902
99	873	823	823	936	881	786	799	873	828	776	885	989	977	883	859	1076	873
100	836	783	787	902	843	751	770	849	795	748	850	965	947	858	828	1047	836
101	805	747	761	883	816	717	738	818	769	721	826	934	912	826	802	1009	805
102	778	717	737	853	779	682	711	787	733	689	801	903	875	801	764	972	778
103	740	681	709	821	737	644	670	752	698	651	770	882	846	767	724	935	740
104	698	644	669	777	692	601	626	714	658	614	734	850	812	733	694	901	698
105	652	606	625	739	642	568	586	668	623	583	692	825	770	699	665	856	652
106	610	572	590	696	604	535	547	628	590	551	662	787	723	662	632	804	610
107	572	536	549	647	567	496	511	590	553	514	633	754	688	627	594	757	572
108	528	503	512	605	524	465	475	552	519	482	612	723	651	595	554	713	528
109	486	466	476	565	482	435	445	522	489	452	582	700	618	560	520	666	486
110	453	434	443	523	446	404	415	480	461	425	553	669	586	528	479	613	453
111	423	397	407	477	415	372	383	449	435	394	524	637	551	494	443	568	423
112	387	364	378	438	381	345	354	424	414	367	494	603	519	462	412	522	387
113	358	340	351	405	351	324	335	393	390	351	466	568	489	428	384	470	358
114	334	322	334	376	329	308	320	372	366	330	443	532	461	396	360	431	334
115	319	302	321	358	312	295	309	364	353	312	426	499	435	369	341	396	319
116	309	284	304	337	295	281	294	356	342	308	410	476	410	341	327	376	309
117	300	275	282	317	277	264	279	342	328	305	396	461	389	324	318	359	300
118	286	267	262	296	259	247	267	323	314	293	380	446	376	309	310	342	286
119	275	267	246	271	238	229	256	305	298	279	365	429	366	296	301	322	275
120	262	254	231	247	215	210	244	292	281	277	351	409	354	284	292	302	262

121	227	238	220	224	191	190	229	279	259	272	336	384	342	273	282	280	227
122	208	223	205	199	170	170	212	266	217	261	322	362	328	261	272	259	208
123	186	210	190	174	150	152	197	247	195	248	310	341	314	248	258	237	186
124	171	198	177	157	136	140	185	229	180	229	295	317	300	237	245	213	171
125	155	188	162	141	127	131	171	212	168	213	280	294	285	224	232	194	155
126	141	171	149	132	121	125	157	200	155	200	264	275	269	213	218	175	141
127	128	158	137	124	116	120	144	184	136	189	246	256	249	201	205	159	128
128	119	140	131	119	111	114	129	158	125	181	216	237	231	192	187	144	119
129	109	134	127	114	107	108	120	148	117	160	187	218	202	179	168	134	109
130	105	129	123	110	102	104	115	137	111	138	161	188	177	164	146	124	105
131	98	126	116	107	99	101	109	130	109	127	134	152	154	141	129	116	98
132	94	105	104	103	95	97	104	121	105	121	121	131	133	126	118	111	94
133	90	102	101	100	92	94	98	107	92	123	113	120	118	116	111	106	90
134	86	96	97	97	89	91	94	97	87	119	109	114	112	110	107	101	86
135	83	93	94	95	87	88	91	94	83	108	105	108	106	105	103	96	83
136	81	90	90	91	83	85	87	87	80	95	102	104	102	101	99	93	81
137	78	86	87	88	80	81	84	84	77	91	98	101	99	97	96	89	78
138	76	83	84	85	78	78	81	80	74	86	95	96	95	93	93	87	76
139	74	80	81	82	75	76	78	77	71	83	92	93	93	90	90	83	74
140	71	76	78	79	72	72	75	74	69	79	88	89	90	86	87	80	71
141	69	73	75	77	69	69	72	72	66	76	85	86	85	83	84	77	69
142	66	70	73	73	66	66	69	70	63	73	82	82	82	80	80	75	66
143	64	68	69	70	64	63	66	67	61	70	79	80	77	76	78	72	64
144	61	65	68	66	61	60	63	65	59	68	76	76	73	73	75	69	61
145	59	63	66	64	59	58	60	62	57	65	74	73	71	70	73	66	59
146	57	60	63	62	56	55	58	59	54	62	71	70	67	66	72	63	57
147	55	58	61	58	54	53	57	57	51	59	69	66	64	64	69	61	55
148	53	55	60	56	51	50	55	54	49	56	67	63	61	61	67	59	53
149	51	53	57	53	49	48	54	52	47	54	65	60	56	57	64	56	51
150	48	51	55	51	45	45	53	50	45	51	63	58	54	55	62	54	48
151	46	49	54	49	43	43	51	47	43	49	61	54	50	52	60	51	46

152	44	47	52	47	40	41	49	44	42	47	58	52	46	50	58	50	44
153	43	46	50	45	37	39	47	42	40	45	55	50	43	48	55	48	43
154	40	44	48	43	35	36	45	40	39	43	52	48	40	46	51	47	40
155	39	42	47	40	32	34	43	39	37	41	50	46	37	44	49	45	39
156	38	41	44	38	30	33	41	38	35	40	48	45	35	42	46	44	38
157	36	40	41	37	27	31	39	37	33	38	45	42	33	40	44	42	36
158	35	39	39	35	25	31	37	36	32	37	44	41	32	39	41	41	35
159	34	37	36	33	23	30	34	34	32	35	41	39	31	36	39	38	34
160	33	36	34	32	24	29	33	32	32	33	38	37	30	35	36	37	33
161	33	34	31	30	23	27	31	30	32	32	36	35	29	33	34	35	33
162	32	32	30	28	22	27	29	29	30	31	33	33	28	32	32	34	32
163	31	32	27	27	23	26	28	28	29	29	32	31	27	30	32	31	31
164	28	29	26	25	22	25	26	27	27	28	29	29	26	28	29	29	28
165	27	28	25	25	20	22	25	31	26	26	27	27	24	27	28	27	27
166	24	25	23	23	19	20	24	24	24	25	26	25	23	25	26	25	24
167	23	24	22	22	17	19	22	23	23	23	24	23	22	23	24	23	23
168	21	21	20	20	15	18	20	21	36	21	21	21	20	21	22	21	21
169	19	20	18	18	14	16	18	19	19	20	20	20	19	19	20	19	19
170	16	17	15	17	12	14	16	17	17	17	18	18	17	17	18	16	16
171	15	15	14	14	10	13	15	16	15	15	14	16	15	14	15	14	15
172	14	14	13	12	9	12	13	15	14	12	13	13	14	12	13	13	14
173	13	13	13	12	9	11	12	13	12	10	12	12	11	12	11	12	13
174	11	11	11	12	8	9	12	12	10	9	12	12	10	11	9	10	11
175	11	11	10	11	8	9	13	11	9	11	12	12	9	11	9	9	11
176	11	11	11	11	9	10	11	11	10	11	12	12	10	10	10	9	11
177	11	12	11	12	9	9	11	10	12	11	12	12	8	10	11	11	11
178	11	11	12	12	9	9	10	10	12	12	11	12	8	10	11	11	11
179	11	11	12	12	9	9	9	11	12	11	11	12	7	8	11	12	11
180	11	11	12	12	8	8	9	11	12	11	11	12	8	9	11	12	11

BUG

Lum. Classification System (LCS)

LCS Zone	Lumens	%Lamp	%Lum
FL (0-30)	160.6	1.9	1.9
FM (30-60)	943.6	11.0	11.0
FH (60-80)	1240.5	14.5	14.5
FVH (80-90)	667.3	7.8	7.8
BL (0-30)	165.8	1.9	1.9
BM (30-60)	992.1	11.6	11.6
BH (60-80)	1256.8	14.7	14.7
BVH (80-90)	652.1	7.6	7.6
UL (90-100)	1080.3	12.6	12.6
UH (100-180)	1411.4	16.5	16.5
Total	8570.5	100.1	100.0
BUG Rating	**B3-U5-G4**		

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2023-01-10	Test Ambient:	25.2 ℃
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-80S-EX39-8CCT-BYP @80W 4000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230100 6E-H2	120.0	60	0.649	77.55	0.995	5.83
	277.0	60	0.281	72.51	0.931	11.83
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method in King Luminaire K400 Series (Mogul Socket Version):

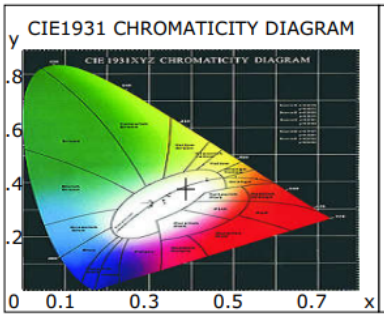
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3804
Duv	-0.0027
Chromaticity (x, y)	x=0.3872 y=0.3750
Chromaticity (u', v')	u(u')=0.2303 v'=0.5018
Color Rendering Index (CRI)	84
R9	12
Rf	84
Rg	96
Rcs,h1(%)	-12

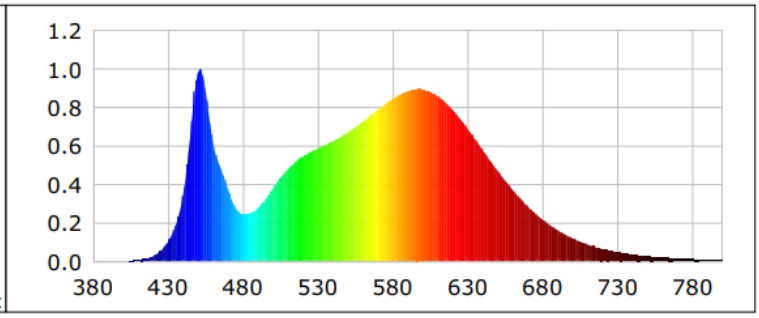
Special Color Rendering Indices			
R1	83	R9	12
R2	91	R10	78
R3	95	R11	81
R4	82	R12	64
R5	83	R13	85
R6	87	R14	98
R7	84	R15	77
R8	64	--	--
--	--	--	--
--	--	--	--
--	--	--	--

Photometric Measurement – Goniophotometer Method in King Luminaire K400 Series (Mogul Socket Version):

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	9669.7	9400.20	>= 1000(-10%)
Luminous Efficacy (lm/W)	124.69	129.64	Standard: >= 105(-3%)
Most worst Luminous/Highest	121.21		

Spectral Power Distribution & Chromaticity Diagram



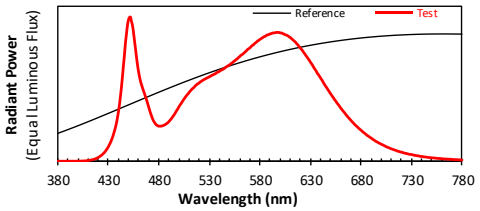


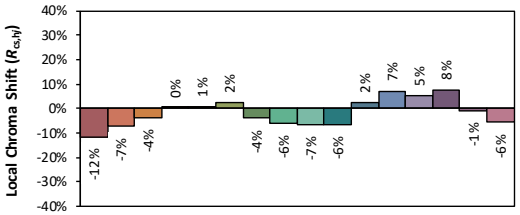
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.0685	535	0.5687	135.8160	690	0.2846	67.9826
385	0.0002	0.0528	540	0.5867	140.1192	695	0.2482	59.2903
390	0.0004	0.0876	545	0.6052	144.5551	700	0.2158	51.5314
395	0.0007	0.1662	550	0.6247	149.1985	705	0.1865	44.5341
400	0.0008	0.2020	555	0.6451	154.0829	710	0.1618	38.6401
405	0.0021	0.5051	560	0.6690	159.7904	715	0.1375	32.8466
410	0.0055	1.3061	565	0.6958	166.1761	720	0.1187	28.3452
415	0.0119	2.8535	570	0.7260	173.3994	725	0.1009	24.1011
420	0.0261	6.2446	575	0.7560	180.5578	730	0.0868	20.7371
425	0.0528	12.6161	580	0.7866	187.8648	735	0.0747	17.8437
430	0.0998	23.8244	585	0.8177	195.2900	740	0.0636	15.1882
435	0.1832	43.7554	590	0.8454	201.9186	745	0.0541	12.9209
440	0.3404	81.2906	595	0.8657	206.7697	750	0.0465	11.1039
445	0.6628	158.3118	600	0.8842	211.1738	755	0.0387	9.2491
450	0.9818	234.4884	605	0.8918	212.9956	760	0.0339	8.1039
455	0.8916	212.9422	610	0.8905	212.6942	765	0.0284	6.7891
460	0.6208	148.2654	615	0.8776	209.6062	770	0.0242	5.7864
465	0.4866	116.2108	620	0.8591	205.1859	775	0.0205	4.8912
470	0.3759	89.7833	625	0.8283	197.8272	780	0.0180	4.2992
475	0.2775	66.2673	630	0.7865	187.8431	785	0.0151	3.6151
480	0.2434	58.1410	635	0.7397	176.6623	790	0.0129	3.0797
485	0.2504	59.7949	640	0.6883	164.4004	795	0.0113	2.7026
490	0.2754	65.7811	645	0.6336	151.3210	800	0.0087	2.0801
495	0.3212	76.7158	650	0.5788	138.2303			
500	0.3790	90.5071	655	0.5217	124.6061			
505	0.4322	103.2306	660	0.4685	111.9028			
510	0.4776	114.0709	665	0.4189	100.0570			
515	0.5140	122.7733	670	0.3697	88.3063			
520	0.5438	129.8907	675	0.3254	77.7138			
525	0.5687	135.8160	680	0.2846	67.9826			
530	0.5867	140.1192	685	0.2482	59.2903			

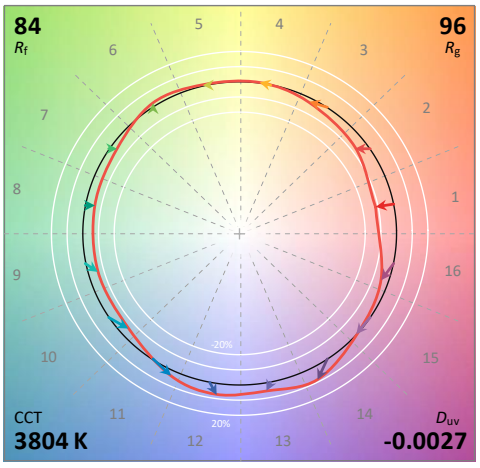
TM30

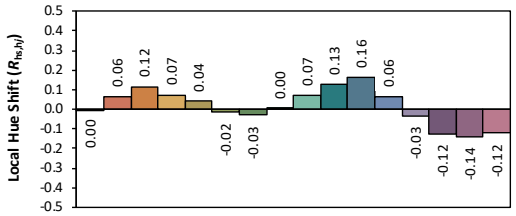
ANSI/IES TM-30-18 Color Rendition Report

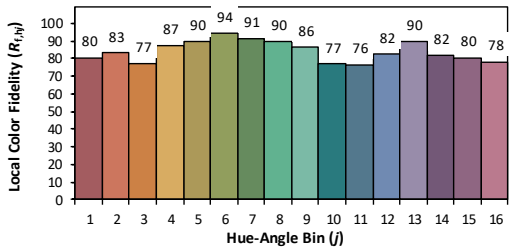
Source:	L128-XX80RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2023/1/10	**Model:**	HIDFA-80S-EX39-8CCT-BYP @80W 4000K

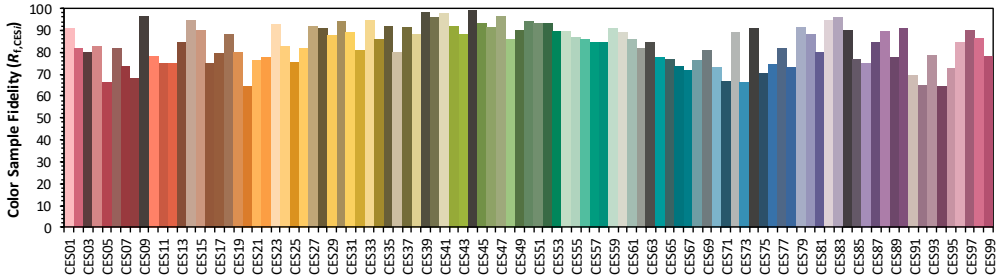












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3872
y	0.3750
u'	0.2303
v'	0.5018

CIE 13.3-1995 (CRI)

R_a	84
R_9	12

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	2023-01-10	Test Ambient:	25.2 ℃
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HIDFA-80S-EX39-8CCT-BYP @80W 5000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230100 6E-H3	120.0	60	0.663	79.29	0.996	5.71
	277.0	60	0.291	75.01	0.932	11.75
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method in King Luminaire K400 Series (Mogul Socket Version):

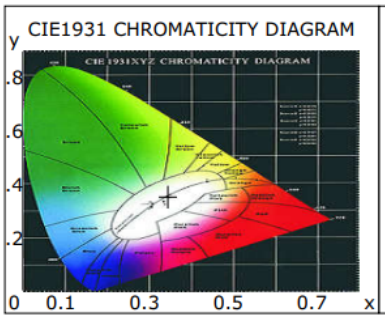
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	4991
Duv	0.0005
Chromaticity (x, y)	x=0.3454 y=0.3529
Chromaticity (u', v')	u(u')=0.2112 v'=0.4853
Color Rendering Index (CRI)	82
R9	5
Rf	82
Rg	97
Rcs,h1(%)	-13

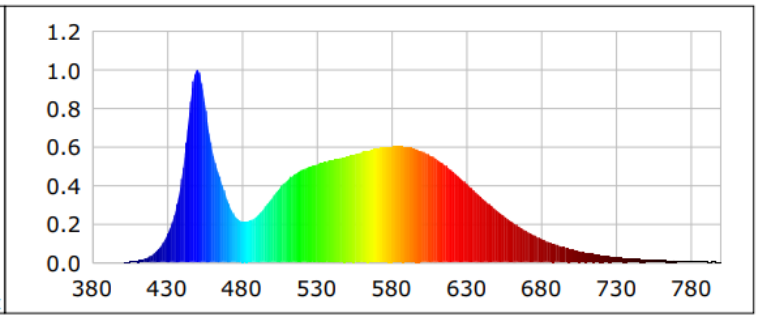
Special Color Rendering Indices			
R1	80	R9	5
R2	87	R10	69
R3	92	R11	80
R4	81	R12	55
R5	80	R13	82
R6	82	R14	95
R7	87	R15	75
R8	67	--	--
--	--	--	--
--	--	--	--
--	--	--	--

Photometric Measurement – Goniophotometer Method in King Luminaire K400 Series (Mogul Socket Version):

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	9497.4	9401.00	>= 1000(-10%)
Luminous Efficacy (lm/W)	119.78	125.33	Standard: >= 105(-3%)
Most worst Luminous/Highest	18.56		

Spectral Power Distribution & Chromaticity Diagram



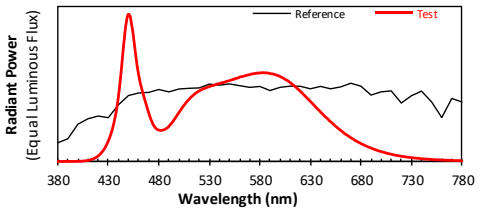


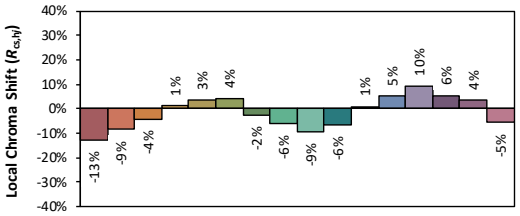
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.0777	535	0.4965	155.1519	690	0.1619	50.5863
385	0.0003	0.0807	540	0.5088	159.0028	695	0.1412	44.1329
390	0.0007	0.2071	545	0.5192	162.2626	700	0.1221	38.1535
395	0.0003	0.0836	550	0.5296	165.5069	705	0.1057	33.0231
400	0.0009	0.2906	555	0.5384	168.2493	710	0.0916	28.6372
405	0.0030	0.9525	560	0.5495	171.7305	715	0.0786	24.5701
410	0.0075	2.3322	565	0.5596	174.8938	720	0.0674	21.0562
415	0.0175	5.4764	570	0.5726	178.9427	725	0.0569	17.7845
420	0.0374	11.6915	575	0.5814	181.6872	730	0.0493	15.4089
425	0.0746	23.3020	580	0.5904	184.5116	735	0.0413	12.9218
430	0.1386	43.3225	585	0.5980	186.8888	740	0.0355	11.1059
435	0.2447	76.4734	590	0.6014	187.9474	745	0.0309	9.6712
440	0.4379	136.8556	595	0.6014	187.9606	750	0.0265	8.2701
445	0.7776	243.0089	600	0.5980	186.8836	755	0.0221	6.9156
450	1.0000	312.5165	605	0.5902	184.4383	760	0.0190	5.9472
455	0.8431	263.4693	610	0.5774	180.4435	765	0.0168	5.2614
460	0.5909	184.6677	615	0.5582	174.4401	770	0.0139	4.3594
465	0.4479	139.9672	620	0.5362	167.5637	775	0.0126	3.9254
470	0.3301	103.1513	625	0.5080	158.7579	780	0.0110	3.4522
475	0.2443	76.3329	630	0.4765	148.9033	785	0.0083	2.6081
480	0.2134	66.6866	635	0.4428	138.3859	790	0.0077	2.4189
485	0.2158	67.4480	640	0.4076	127.3708	795	0.0065	2.0367
490	0.2386	74.5813	645	0.3726	116.4549	800	0.0047	1.4631
495	0.2819	88.1118	650	0.3368	105.2616			
500	0.3330	104.0571	655	0.3019	94.3374			
505	0.3821	119.4217	660	0.2704	84.5057			
510	0.4231	132.2375	665	0.2393	74.7866			
515	0.4553	142.3014	670	0.2109	65.9051			
520	0.4787	149.6000	675	0.1842	57.5500			
525	0.4965	155.1519	680	0.1619	50.5863			
530	0.5088	159.0028	685	0.1412	44.1329			

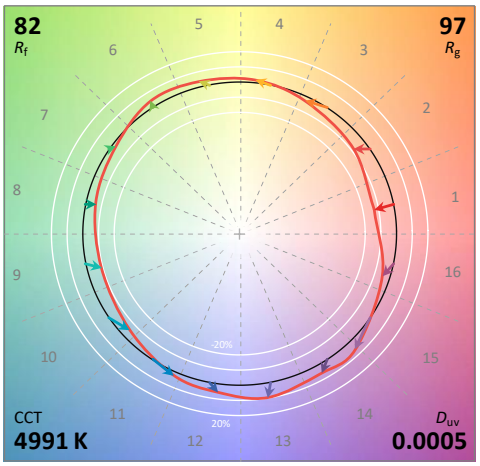
TM-30

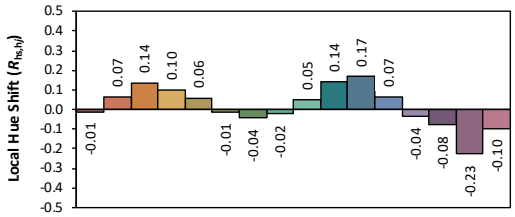
ANSI/IES TM-30-18 Color Rendition Report

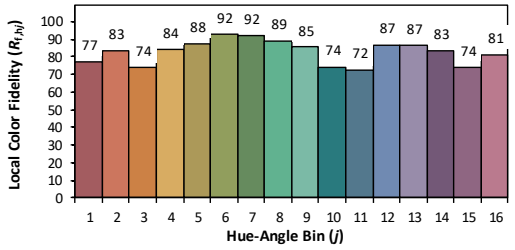
Source:	L128-XX80RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2023/1/10	**Model:**	HIDFA-80S-EX39-8CCT-BYP @80W 5000K

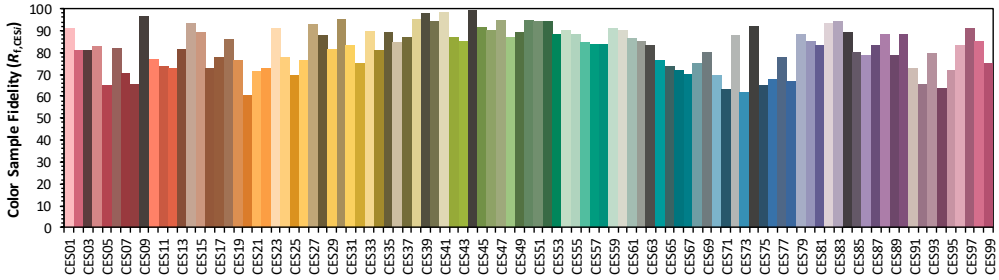












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3454
y	0.3529
u'	0.2112
v'	0.4853

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.

3. Test Equipment

Equipment Name	Model No.	Serial No.	Calibration Date
Goniophotometeric System	GPM-3000	DYHXF120001	2022-01-18
AC Power Source	CHP-500C	DYBWD010159	2022-01-25
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2022-01-25
Digital Power Meter	WT500	DYDWQ20010	2022-01-25
Integral Sphere (2M)	2M	DYJCE120067	2022-01-18
Digital Power Meter	WT500	DYDWQ20006	2022-01-25
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2022-01-18
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-80S-EX39-8CCT-BYP @60W 3000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	120.0	60	0.510	60.621	0.994	5.91
	277.0	60	0.242	61.680	0.906	19.6
				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)	2986
Duv	-0.00109
Chromaticity (x, y)	x=0.4364 y=0.4012
Chromaticity (u', v')	u(u')=0.2515 v'=0.5202
Color Rendering Index (CRI)	82.6
R9	7
Rf	84
Rg	96
Rcs,h1(%)	-12

Special Color Rendering Indices			
R1	81	R9	7
R2	91	R10	79
R3	96	R11	80
R4	81	R12	70
R5	82	R13	84
R6	89	R14	99
R7	81	R15	74
R8	59	--	--
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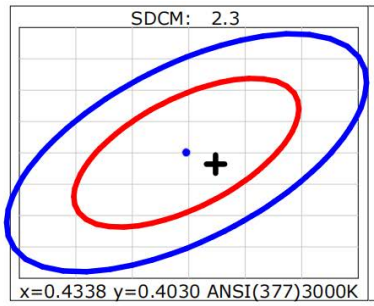
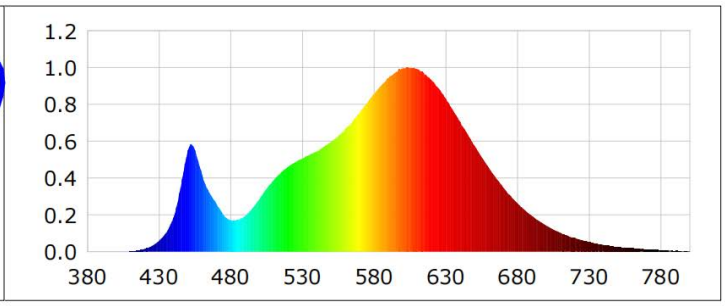
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	9158.19	9752.33	>=10000(-10%)
Luminous Efficacy (lm/W)	157.07	158.11	Standard: >= 120(-3%)
Most worst Luminous/Highest	157.07		
Zonal lumens in the 20-50º (%)	14.1	--	>=30(-10%)
Beam Angle (º)	156.2	--	--
Center Beam Candle Power (cd)	457.9	--	--

Spectral Power Distribution & Chromaticity Diagram



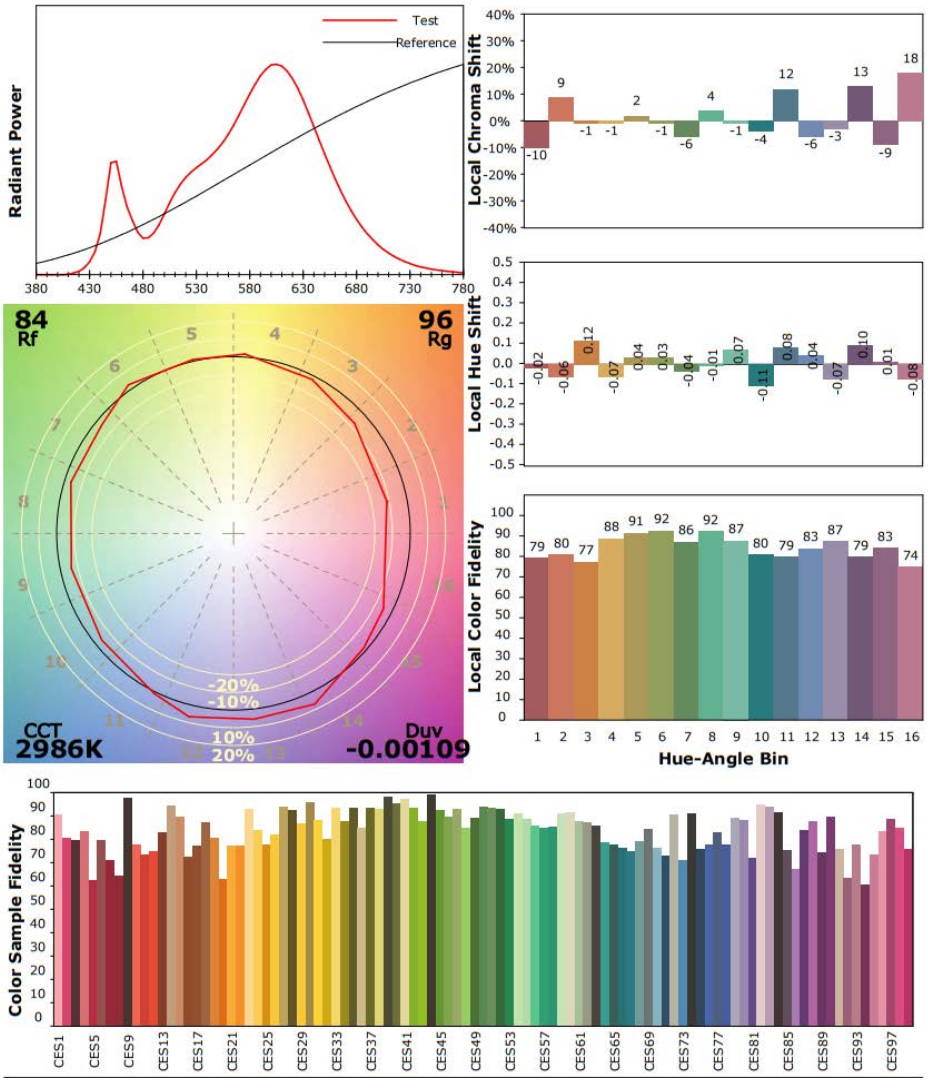


WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0240	525	0.4859	96.1162	670	0.3476	68.7585
385	0.0003	0.0546	530	0.5075	100.4052	675	0.3040	60.1354
390	0.0001	0.0154	535	0.5263	104.1178	680	0.2620	51.8318
395	0.0007	0.1421	540	0.5449	107.7941	685	0.2258	44.6656
400	0.0002	0.0442	545	0.5704	112.8480	690	0.1945	38.4776
405	0.0008	0.1640	550	0.5970	118.1141	695	0.1660	32.8399
410	0.0032	0.6276	555	0.6301	124.6551	700	0.1413	27.9563
415	0.0072	1.4203	560	0.6681	132.1744	705	0.1202	23.7890
420	0.0163	3.2296	565	0.7099	140.4476	710	0.1027	20.3149
425	0.0324	6.4095	570	0.7567	149.6904	715	0.0872	17.2585
430	0.0609	12.0576	575	0.8082	159.8786	720	0.0753	14.8959
435	0.1063	21.0205	580	0.8579	169.7179	725	0.0625	12.3688
440	0.1880	37.1983	585	0.9049	179.0104	730	0.0531	10.5034
445	0.3505	69.3396	590	0.9455	187.0490	735	0.0439	8.6759
450	0.5504	108.8779	595	0.9753	192.9367	740	0.0367	7.2608
455	0.5504	108.8904	600	0.9982	197.4709	745	0.0316	6.2558
460	0.4180	82.6946	605	0.9965	197.1421	750	0.0273	5.3961
465	0.3198	63.2728	610	0.9918	196.2177	755	0.0210	4.1467
470	0.2601	51.4633	615	0.9635	190.6167	760	0.0190	3.7643
475	0.1980	39.1694	620	0.9312	184.2250	765	0.0172	3.3937
480	0.1711	33.8575	625	0.8871	175.5009	770	0.0140	2.7715
485	0.1742	34.4717	630	0.8302	164.2453	775	0.0104	2.0646
490	0.1952	38.6254	635	0.7684	152.0117	780	0.0081	1.6064
495	0.2355	46.5920	640	0.7052	139.5192	785	0.0074	1.4587
500	0.2873	56.8461	645	0.6383	126.2815	790	0.0063	1.2391
505	0.3425	67.7535	650	0.5746	113.6640	795	0.0058	1.1536
510	0.3897	77.0923	655	0.5120	101.2926	800	0.0033	0.6533
515	0.4306	85.1877	660	0.4540	89.8146			
520	0.4620	91.3880	665	0.3985	78.8396			

TM30

ANSI/IES TM-30-18 Color Rendition Report

Source:	L128-3080RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2024/09/20	**Model:**	HIDFA-80S-EX39-8CCT-BYP @60W 3000K



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

x	0.4370
y	0.4018
u'	0.3470
v'	0.5205

(CRI)	
R_a	82.8
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-80S-EX39-8CCT-BYP @60W 4000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	120.0	60	0.496	58.954	0.993	6.01
	277.0	60	0.237	60.123	0.902	20.61
				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)	3805
Duv	-0.00218
Chromaticity (x, y)	x=0.3877 y=0.3765
Chromaticity (u', v')	u(u')=0.2300 v'=0.5025
Color Rendering Index (CRI)	84.3
R9	15
Rf	84
Rg	96
Rcs,h1(%)	-11

Special Color Rendering Indices			
R1	84	R9	15
R2	92	R10	79
R3	96	R11	82
R4	83	R12	63
R5	84	R13	86
R6	88	R14	98
R7	85	R15	78
R8	66	--	--
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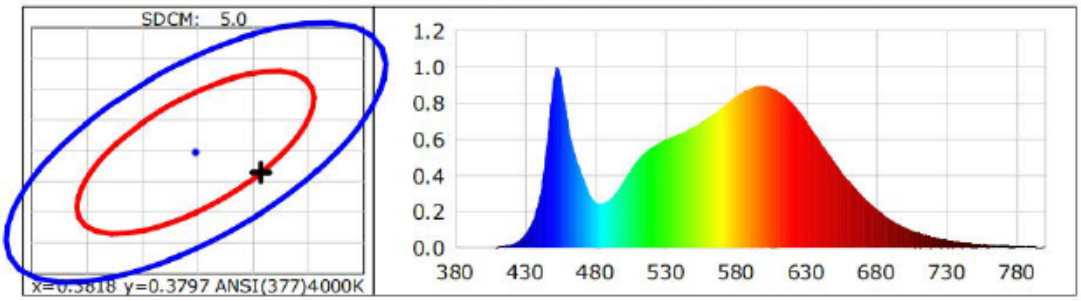
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	9696.4	10276.7	>= 10000(-10%)
Luminous Efficacy (lm/W)	164.47	170.93	Standard: >= 120(-3%)
Most worst Luminous/Highest	164.30		

Spectral Power Distribution & Chromaticity Diagram

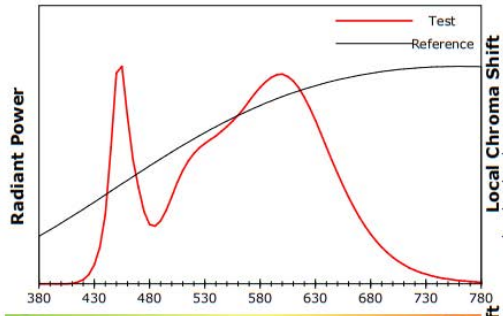


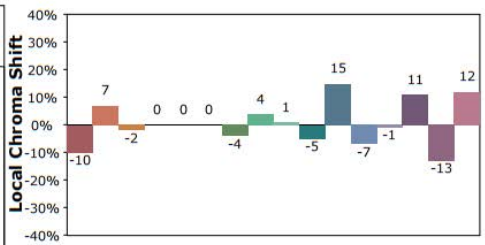
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0006	0.1132	525	0.5795	118.1933	670	0.2820	57.5085
385	0.0007	0.1400	530	0.5985	122.0781	675	0.2454	50.0545
390	0.0000	0.0070	535	0.6149	125.4247	680	0.2118	43.2020
395	0.0006	0.1136	540	0.6287	128.2216	685	0.1825	37.2291
400	0.0004	0.0753	545	0.6502	132.6080	690	0.1558	31.7863
405	0.0006	0.1132	550	0.6705	136.7566	695	0.1333	27.1892
410	0.0026	0.5214	555	0.6948	141.7233	700	0.1140	23.2417
415	0.0063	1.2872	560	0.7199	146.8301	705	0.0960	19.5904
420	0.0172	3.5146	565	0.7474	152.4513	710	0.0811	16.5324
425	0.0382	7.7835	570	0.7778	158.6524	715	0.0686	13.9942
430	0.0801	16.3413	575	0.8096	165.1349	720	0.0578	11.7853
435	0.1510	30.8085	580	0.8364	170.6033	725	0.0476	9.7181
440	0.2848	58.0953	585	0.8624	175.9023	730	0.0412	8.4100
445	0.5648	115.1909	590	0.8815	179.7987	735	0.0350	7.1290
450	0.9323	190.1455	595	0.8932	182.1878	740	0.0278	5.6782
455	0.9503	193.8161	600	0.8969	182.9437	745	0.0230	4.6854
460	0.7141	145.6482	605	0.8834	180.1744	750	0.0203	4.1504
465	0.5242	106.9188	610	0.8657	176.5614	755	0.0151	3.0877
470	0.4109	83.8067	615	0.8363	170.5677	760	0.0149	3.0361
475	0.3027	61.7332	620	0.7960	162.3632	765	0.0134	2.7400
480	0.2493	50.8417	625	0.7517	153.3129	770	0.0112	2.2909
485	0.2442	49.7991	630	0.6983	142.4288	775	0.0079	1.6172
490	0.2670	54.4569	635	0.6406	130.6644	780	0.0059	1.2073
495	0.3107	63.3802	640	0.5840	119.1159	785	0.0059	1.1952
500	0.3703	75.5260	645	0.5258	107.2449	790	0.0047	0.9601
505	0.4311	87.9208	650	0.4722	96.3180	795	0.0036	0.7405
510	0.4832	98.5602	655	0.4183	85.3214	800	0.0026	0.5343
515	0.5251	107.1001	660	0.3712	75.7090			
520	0.5552	113.2330	665	0.3250	66.2880			

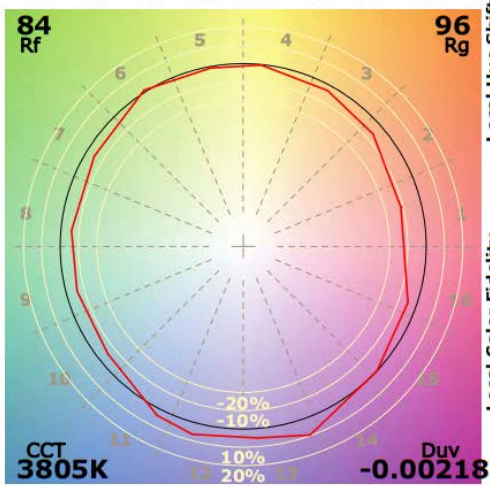
TM30

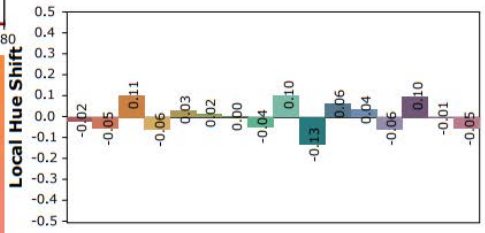
ANSI/IES TM-30-18 Color Rendition Report

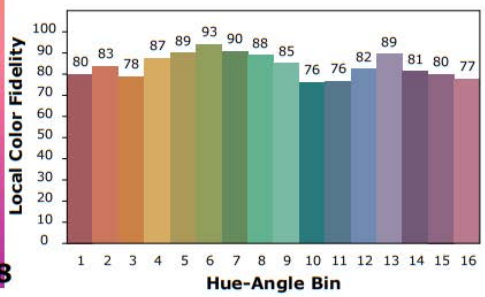
Source:	L128-4080RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2024/09/20	**Model:**	HIDFA-80S-EX39-8CCT-BYP @60W 4000K

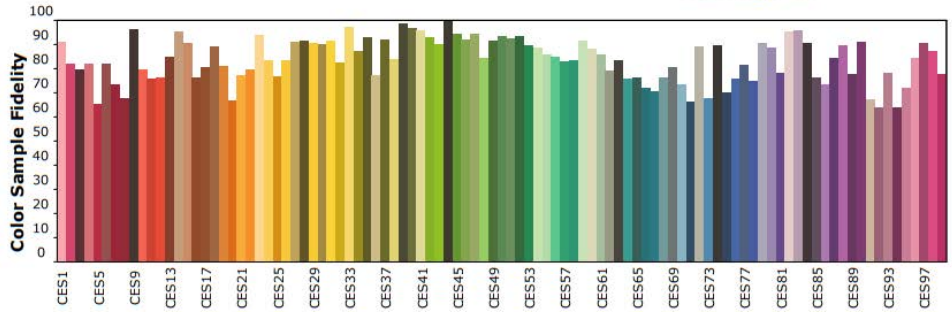












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3877
y	0.3765
u'	0.2300
v'	0.5025

(CRI)

R_a	84.3
R_9	15

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-80S-EX39-8CCT-BYP @60W 5000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404 1E-A3	120.0	60	0.510	60.632	0.994	6.01
	277.0	60	0.242	60.673	0.906	20.11
				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)	4948
Duv	0.00181
Chromaticity (x, y)	x=0.3470 y=0.3568
Chromaticity (u', v')	u(u')=0.2107 v'=0.4874
Color Rendering Index (CRI)	81.8
R9	2
Rf	81
Rg	93
Rcs,h1(%)	-11

Special Color Rendering Indices			
R1	80	R9	2
R2	88	R10	70
R3	93	R11	79
R4	80	R12	53
R5	80	R13	82
R6	82	R14	96
R7	86	R15	74
R8	65	--	--
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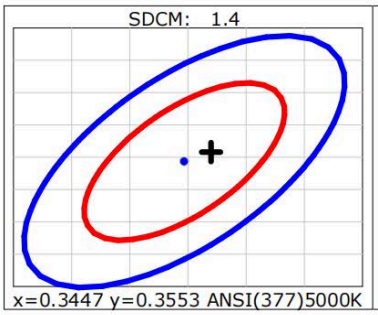
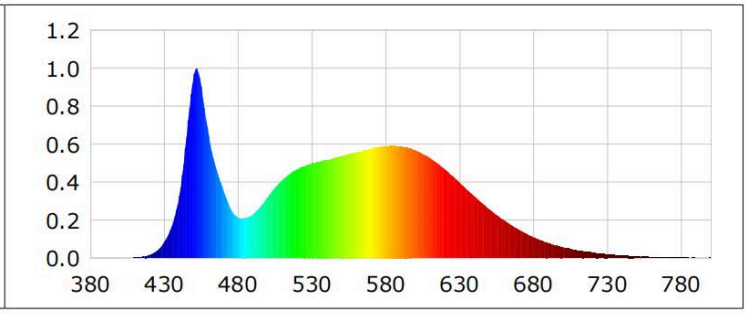
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	9719.4	10194.4	>= 10000(-10%)
Luminous Efficacy (lm/W)	160.30	165.30	Standard: >= 120(-3%)
Most worst Luminous/Highest	160.30		

Spectral Power Distribution & Chromaticity Diagram



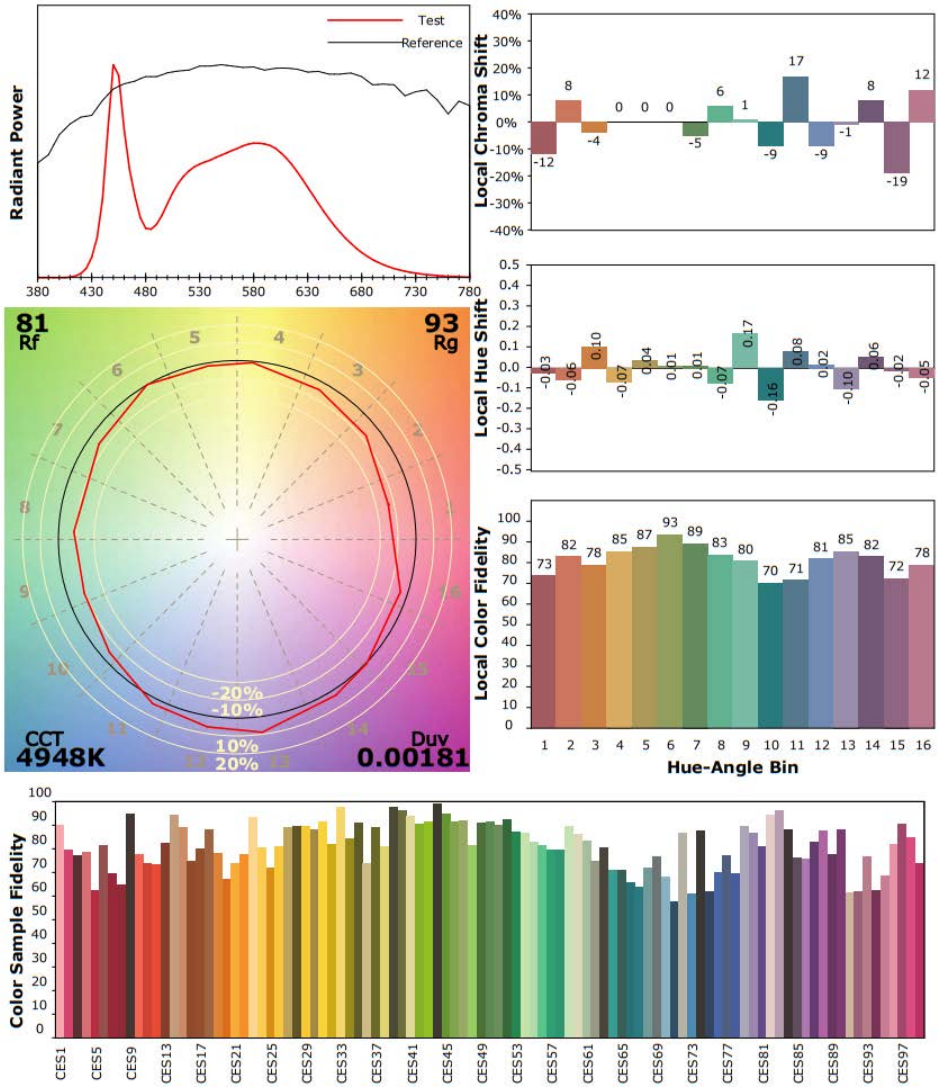


WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0203	525	0.4840	135.2689	670	0.1493	41.7405
385	0.0005	0.1440	530	0.4980	139.1854	675	0.1295	36.2049
390	0.0004	0.1079	535	0.5074	141.8065	680	0.1096	30.6277
395	0.0006	0.1715	540	0.5148	143.8853	685	0.0934	26.1113
400	0.0003	0.0892	545	0.5263	147.1023	690	0.0790	22.0884
405	0.0007	0.2046	550	0.5367	149.9960	695	0.0664	18.5661
410	0.0018	0.5048	555	0.5480	153.1606	700	0.0569	15.8926
415	0.0066	1.8509	560	0.5584	156.0564	705	0.0475	13.2652
420	0.0172	4.7934	565	0.5670	158.4695	710	0.0395	11.0324
425	0.0395	11.0335	570	0.5764	161.0900	715	0.0330	9.2138
430	0.0877	24.5141	575	0.5842	163.2625	720	0.0280	7.8317
435	0.1692	47.2859	580	0.5877	164.2635	725	0.0235	6.5583
440	0.3285	91.8150	585	0.5894	164.7303	730	0.0202	5.6479
445	0.6429	179.6791	590	0.5874	164.1769	735	0.0167	4.6558
450	0.9702	271.1630	595	0.5791	161.8617	740	0.0132	3.6978
455	0.9026	252.2466	600	0.5685	158.8954	745	0.0108	3.0273
460	0.6479	181.0657	605	0.5473	152.9514	750	0.0100	2.7938
465	0.4715	131.7860	610	0.5260	147.0118	755	0.0071	1.9757
470	0.3572	99.8429	615	0.4971	138.9426	760	0.0055	1.5429
475	0.2563	71.6422	620	0.4658	130.1720	765	0.0063	1.7740
480	0.2136	59.6894	625	0.4328	120.9710	770	0.0047	1.3113
485	0.2103	58.7619	630	0.3965	110.8069	775	0.0016	0.4364
490	0.2315	64.6992	635	0.3601	100.6391	780	0.0017	0.4718
495	0.2705	75.5994	640	0.3257	91.0263	785	0.0021	0.5793
500	0.3209	89.6739	645	0.2905	81.1964	790	0.0011	0.2984
505	0.3718	103.9249	650	0.2576	72.0071	795	0.0014	0.3943
510	0.4125	115.2790	655	0.2266	63.3194	800	0.0008	0.2193
515	0.4450	124.3806	660	0.1987	55.5244			
520	0.4675	130.6500	665	0.1727	48.2632			

TM-30

ANSI/IES TM-30-18 Color Rendition Report

Source:	L128-5080RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2024/11/29	**Model:**	HIDFA-80S-EX39-8CCT-BYP @60W 5000K



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

x	0.3470
y	0.3568
u'	0.2107
v'	0.4874

(CRI)

R_a	81.8
R_9	2

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-80S-EX39-8CCT-BYP @40W 3000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	120.0	60	0.349	41.307	0.989	6.61
	277.0	60	0.183	43.838	0.852	27.51
				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)	2973
Duv	-0.00077
Chromaticity (x, y)	x=0.4377 y=0.4024
Chromaticity (u', v')	u(u')=0.2518 v'=0.5208
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	79
R3	97	R11	81
R4	81	R12	69
R5	82	R13	84
R6	90	R14	99
R7	82	R15	74
R8	59	--	--
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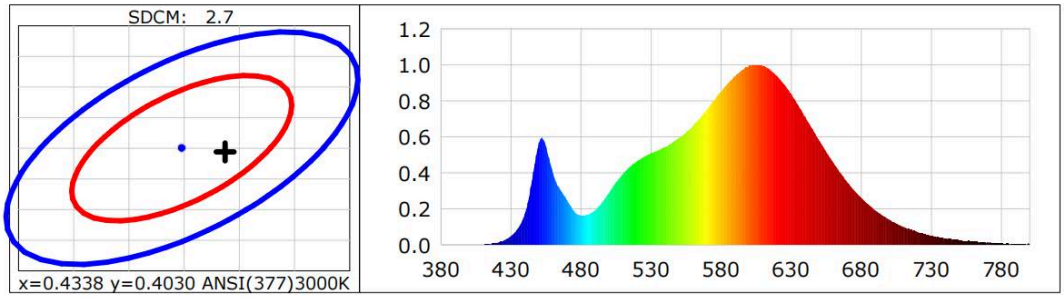
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	6455.38	6870.95	>=10000(-10%)
Luminous Efficacy (lm/W)	156.28	156.74	Standard: >= 120(-3%)
Most worst Luminous/Highest	156.23		
Zonal lumens in the 20-50º (%)	14.1	--	>=30(-10%)
Beam Angle (º)	156.1	--	--
Center Beam Candle Power (cd)	323.1	--	--

Spectral Power Distribution & Chromaticity Diagram

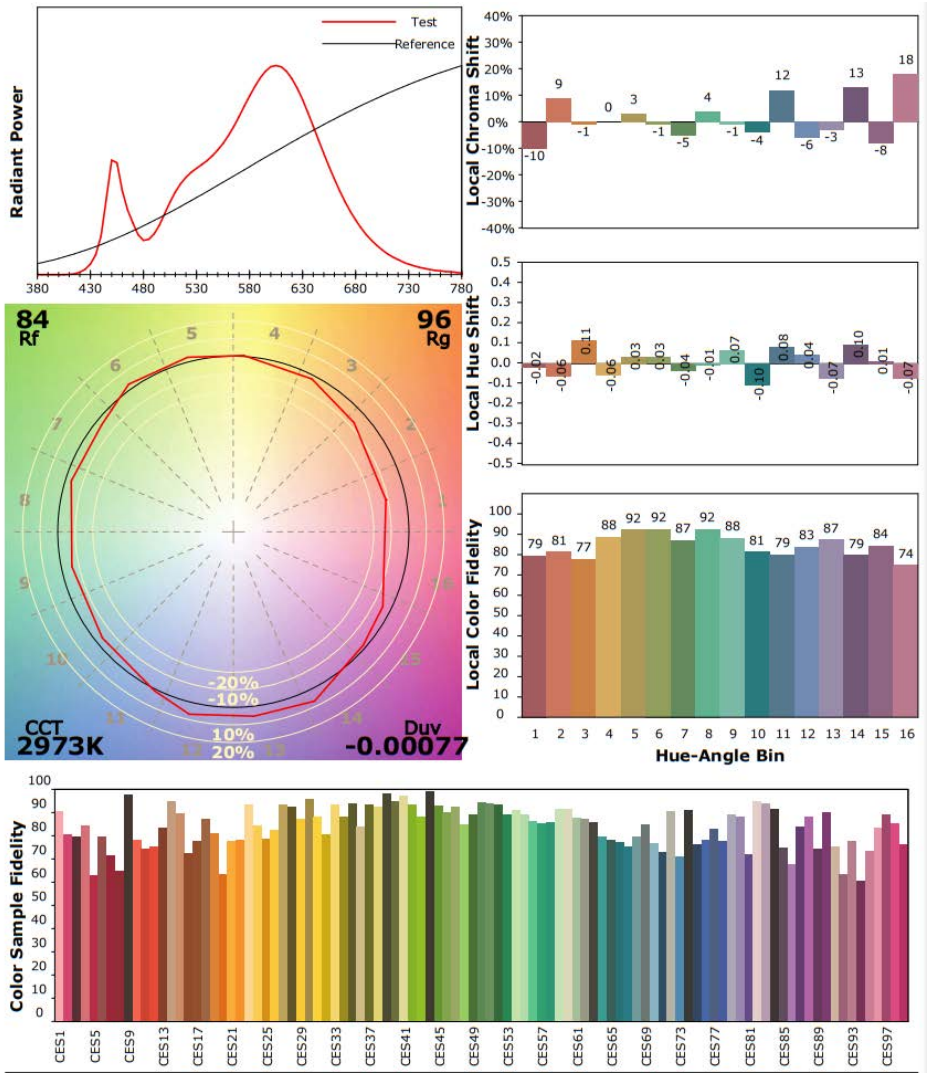


WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0013	0.1760	525	0.4891	67.9034	670	0.3475	48.2462
385	0.0005	0.0740	530	0.5084	70.5883	675	0.3019	41.9170
390	0.0000	0.0030	535	0.5261	73.0511	680	0.2614	36.2942
395	0.0010	0.1357	540	0.5424	75.3126	685	0.2242	31.1302
400	0.0005	0.0647	545	0.5682	78.8875	690	0.1907	26.4756
405	0.0007	0.0967	550	0.5940	82.4755	695	0.1640	22.7759
410	0.0014	0.1956	555	0.6263	86.9588	700	0.1403	19.4790
415	0.0033	0.4636	560	0.6636	92.1327	705	0.1185	16.4560
420	0.0111	1.5427	565	0.7054	97.9464	710	0.0998	13.8540
425	0.0247	3.4298	570	0.7534	104.5975	715	0.0850	11.8035
430	0.0491	6.8228	575	0.8027	111.4511	720	0.0717	9.9581
435	0.0925	12.8370	580	0.8521	118.3140	725	0.0593	8.2376
440	0.1771	24.5854	585	0.8988	124.7901	730	0.0504	6.9916
445	0.3589	49.8310	590	0.9404	130.5616	735	0.0429	5.9495
450	0.5693	79.0393	595	0.9722	134.9835	740	0.0341	4.7338
455	0.5445	75.6064	600	0.9963	138.3307	745	0.0281	3.9057
460	0.3980	55.2580	605	0.9971	138.4377	750	0.0250	3.4694
465	0.3076	42.7075	610	0.9913	137.6334	755	0.0185	2.5640
470	0.2473	34.3389	615	0.9707	134.7757	760	0.0182	2.5267
475	0.1870	25.9590	620	0.9367	130.0581	765	0.0159	2.2059
480	0.1624	22.5483	625	0.8919	123.8302	770	0.0156	2.1639
485	0.1686	23.4063	630	0.8379	116.3305	775	0.0099	1.3810
490	0.1924	26.7116	635	0.7752	107.6339	780	0.0083	1.1522
495	0.2357	32.7283	640	0.7118	98.8346	785	0.0060	0.8374
500	0.2908	40.3707	645	0.6443	89.4566	790	0.0040	0.5571
505	0.3477	48.2795	650	0.5788	80.3681	795	0.0043	0.5940
510	0.3948	54.8147	655	0.5145	71.4279	800	0.0032	0.4504
515	0.4346	60.3405	660	0.4563	63.3565			
520	0.4663	64.7421	665	0.3997	55.5011			

TM30

ANSI/IES TM-30-18 Color Rendition Report

Source:	L128-3080RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2024/09/20	**Model:**	HIDFA-80S-EX39-8CCTBYP @40W 3000K



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

x	0.4377
y	0.4024
u'	0.2518
v'	0.5208

(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-80S-EX39-8CCT-BYP @40W 4000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
	120.0	60	0.340	40.30	0.989	6.01
	277.0	60	0.180	42.94	0.848	27.89
				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)	3792
Duv	-0.00196
Chromaticity (x, y)	x=0.3884 y=0.3773
Chromaticity (u', v')	u(u')=0.2301 v'=0.5030
Color Rendering Index (CRI)	84.5
R9	15
Rf	84
Rg	96
Rcs,h1(%)	-11

Special Color Rendering Indices			
R1	84	R9	15
R2	92	R10	79
R3	96	R11	82
R4	83	R12	63
R5	84	R13	86
R6	88	R14	98
R7	85	R15	78
R8	65	--	--
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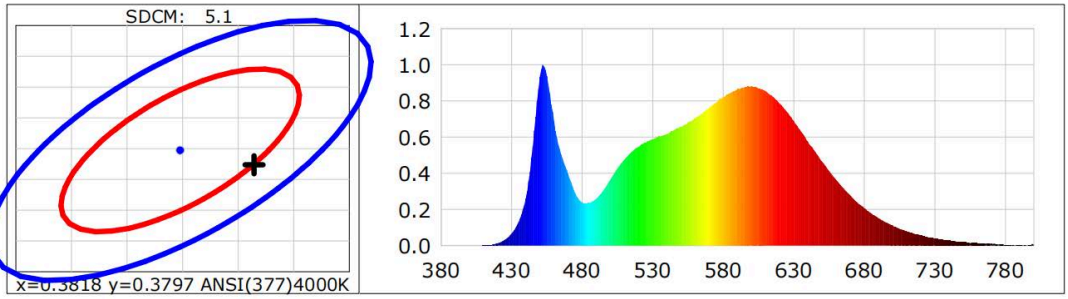
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	6765.7	7137.0	>= 10000(-10%)
Luminous Efficacy (lm/W)	167.89	166.21	Standard: >= 120(-3%)
Most worst Luminous/Highest	165.21		

Spectral Power Distribution & Chromaticity Diagram

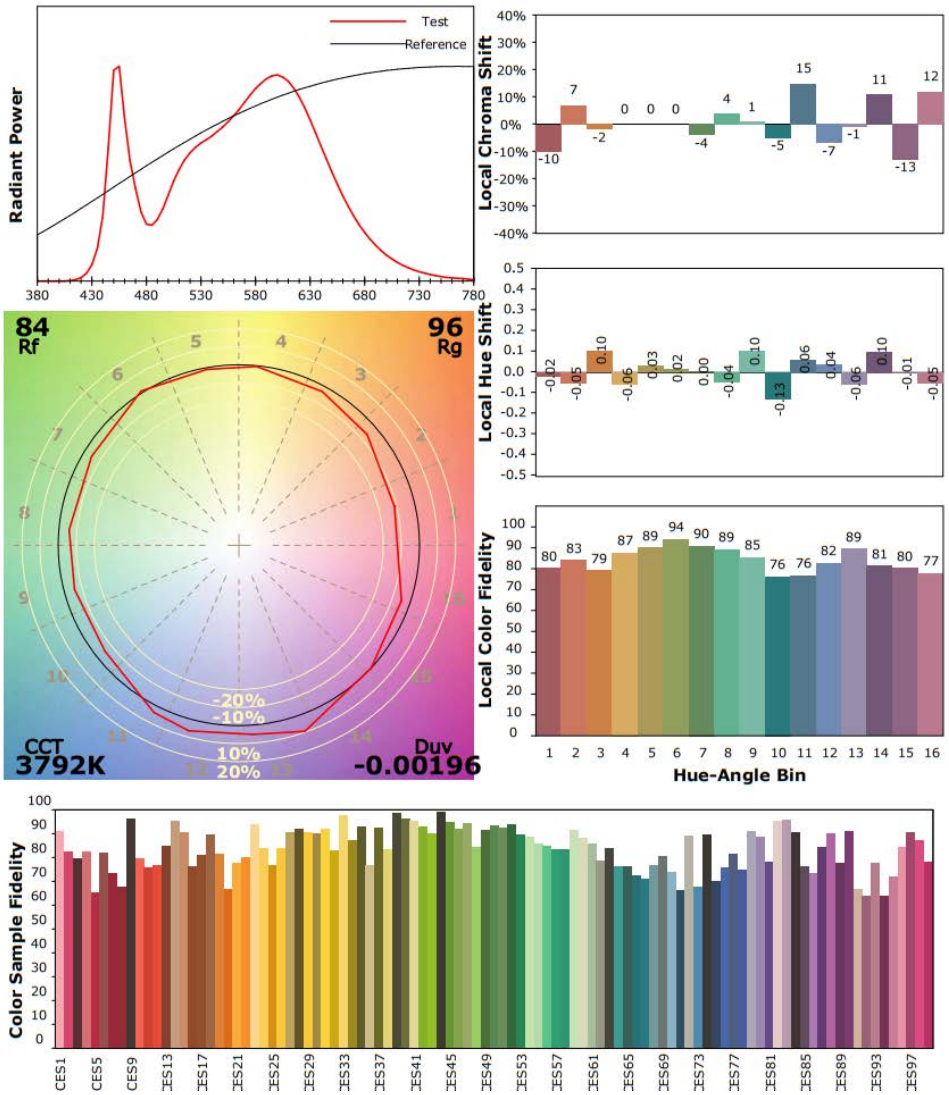


WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0006	0.0896	525	0.5690	81.4492	670	0.2782	39.8154
385	0.0007	0.1042	530	0.5882	84.1968	675	0.2386	34.1514
390	0.0003	0.0464	535	0.6038	86.4284	680	0.2073	29.6696
395	0.0009	0.1336	540	0.6178	88.4257	685	0.1779	25.4700
400	0.0005	0.0658	545	0.6386	91.4144	690	0.1532	21.9226
405	0.0006	0.0817	550	0.6556	93.8351	695	0.1291	18.4795
410	0.0019	0.2698	555	0.6828	97.7412	700	0.1121	16.0437
415	0.0048	0.6865	560	0.7070	101.2003	705	0.0935	13.3904
420	0.0139	1.9937	565	0.7310	104.6330	710	0.0801	11.4672
425	0.0320	4.5769	570	0.7621	109.0784	715	0.0671	9.6027
430	0.0680	9.7401	575	0.7918	113.3336	720	0.0572	8.1914
435	0.1337	19.1338	580	0.8199	117.3645	725	0.0471	6.7382
440	0.2642	37.8112	585	0.8441	120.8258	730	0.0403	5.7649
445	0.5540	79.2925	590	0.8642	123.6982	735	0.0342	4.8987
450	0.9342	133.7263	595	0.8762	125.4220	740	0.0287	4.1143
455	0.9377	134.2195	600	0.8824	126.3047	745	0.0229	3.2714
460	0.6916	98.9999	605	0.8689	124.3774	750	0.0193	2.7615
465	0.5054	72.3425	610	0.8543	122.2784	755	0.0140	2.0040
470	0.3975	56.9025	615	0.8243	117.9824	760	0.0147	2.1058
475	0.2899	41.4910	620	0.7845	112.2897	765	0.0138	1.9775
480	0.2387	34.1696	625	0.7411	106.0752	770	0.0138	1.9784
485	0.2359	33.7675	630	0.6885	98.5511	775	0.0066	0.9495
490	0.2606	37.2990	635	0.6339	90.7284	780	0.0060	0.8607
495	0.3061	43.8177	640	0.5746	82.2447	785	0.0028	0.4023
500	0.3666	52.4755	645	0.5203	74.4773	790	0.0036	0.5223
505	0.4275	61.1983	650	0.4643	66.4650	795	0.0044	0.6292
510	0.4776	68.3646	655	0.4117	58.9359	800	0.0029	0.4151
515	0.5184	74.2068	660	0.3632	51.9944			
520	0.5472	78.3281	665	0.3190	45.6669			

TM30

ANSI/IES TM-30-18 Color Rendition Report

Source:	L128-4080RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2024/09/20	**Model:**	HIDFA-80S-EX39-8CCT-BYP @40W 4000K



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

x	**0.3884**
y	**0.3773**
u'	**0.2301**
v'	**0.5030**

(CRI)	
R_a	84.5
R_9	15

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-80S-EX39-8CCT-BYP @40W 5000K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230404 1E-A3	120.0	60	0.348	41.17	0.989	6.21
	277.0	60	0.183	43.84	0.852	27.93
				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)	4933
Duv	0.00195
Chromaticity (x, y)	x=0.3475 y=0.3575
Chromaticity (u', v')	u(u')=0.2108 v'=0.4878
Color Rendering Index (CRI)	82.1
R9	3
Rf	82
Rg	93
Rcs,h1(%)	-11

Special Color Rendering Indices			
R1	80	R9	3
R2	88	R10	71
R3	93	R11	79
R4	80	R12	53
R5	80	R13	83
R6	83	R14	97
R7	86	R15	75
R8	65	--	--
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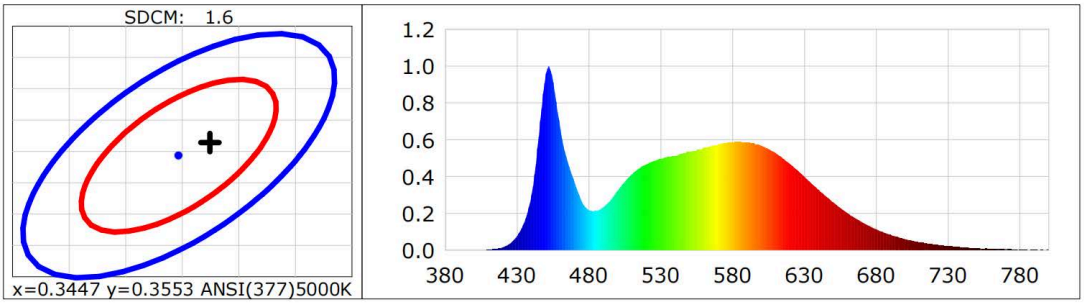
Photometric Measurement – Goniophotometer Method in Lithonia THD 400S A15 TB:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	6903.8	7181.5	>= 10000(-10%)
Luminous Efficacy (lm/W)	167.67	163.81	Standard: >= 120(-3%)
Most worst Luminous/Highest	162.61		

Spectral Power Distribution & Chromaticity Diagram

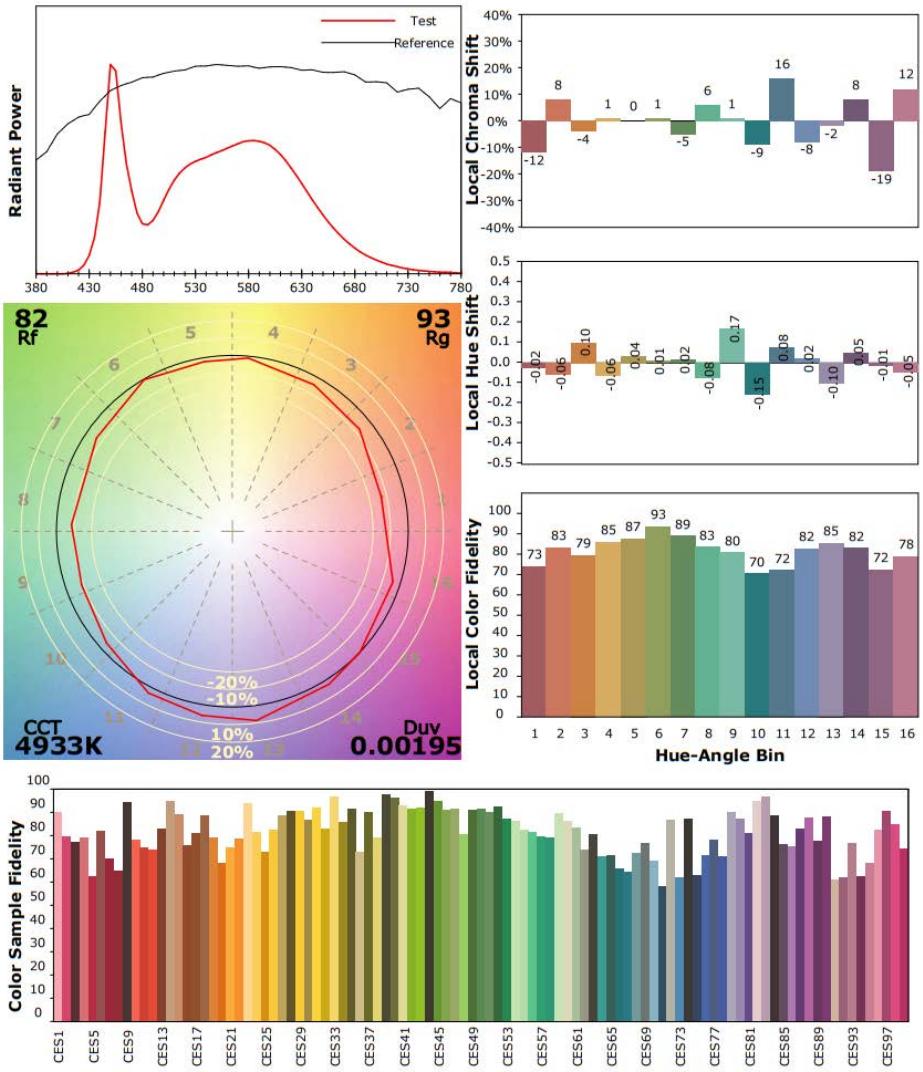


WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.0566	525	0.4838	94.1282	670	0.1525	29.6636
385	0.0001	0.0210	530	0.4958	96.4540	675	0.1320	25.6755
390	0.0000	0.0084	535	0.5066	98.5559	680	0.1145	22.2774
395	0.0008	0.1612	540	0.5128	99.7669	685	0.0973	18.9380
400	0.0005	0.1005	545	0.5251	102.1568	690	0.0840	16.3392
405	0.0005	0.1004	550	0.5342	103.9277	695	0.0711	13.8406
410	0.0025	0.4896	555	0.5450	106.0233	700	0.0609	11.8550
415	0.0062	1.2132	560	0.5561	108.1855	705	0.0519	10.0917
420	0.0166	3.2386	565	0.5653	109.9748	710	0.0436	8.4724
425	0.0365	7.1065	570	0.5746	111.7932	715	0.0373	7.2573
430	0.0793	15.4347	575	0.5829	113.3962	720	0.0315	6.1189
435	0.1544	30.0406	580	0.5852	113.8371	725	0.0256	4.9714
440	0.3043	59.1997	585	0.5885	114.4794	730	0.0221	4.3019
445	0.6176	120.1433	590	0.5863	114.0610	735	0.0181	3.5221
450	0.9594	186.6459	595	0.5793	112.7028	740	0.0154	2.9991
455	0.9124	177.5028	600	0.5686	110.6144	745	0.0119	2.3057
460	0.6606	128.5200	605	0.5490	106.8024	750	0.0109	2.1262
465	0.4808	93.5295	610	0.5273	102.5732	755	0.0078	1.5224
470	0.3662	71.2471	615	0.4990	97.0730	760	0.0071	1.3901
475	0.2634	51.2404	620	0.4674	90.9259	765	0.0086	1.6693
480	0.2180	42.4151	625	0.4355	84.7292	770	0.0073	1.4170
485	0.2136	41.5469	630	0.3988	77.5904	775	0.0033	0.6442
490	0.2343	45.5849	635	0.3625	70.5219	780	0.0030	0.5874
495	0.2722	52.9639	640	0.3278	63.7692	785	0.0025	0.4961
500	0.3239	63.0142	645	0.2921	56.8291	790	0.0022	0.4264
505	0.3730	72.5681	650	0.2602	50.6203	795	0.0035	0.6721
510	0.4133	80.4045	655	0.2294	44.6344	800	0.0021	0.4027
515	0.4452	86.6039	660	0.2008	39.0721			
520	0.4673	90.9127	665	0.1758	34.1925			

TM-30

ANSI/IES TM-30-18 Color Rendition Report

Source:	L128-5080RC35003P1	**Manufacturer:**	RAB LIGHTING INC
Date:	2024/11/29	**Model:**	HIDFA-80S-EX39-8CCT-BYP @40W 5000K



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

x	0.3475
y	0.3574
u'	0.2108
v'	0.4878

(CRI)

R_a	82.3
R_9	5

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