TEST REPORT

For

RENO LED LIGHTING INC.

9133 Leslie St, Unit 120,Richmond Hill, ON L4B 4N1, Canada

Model Number:	RENO-14CTF-UNV/347-MWMCCT-HL	
Report Type:	Electrical, Photometric and ISTMT tests according to the following standards and show the compliance to DLC Program SSL Technical Requirements V5.1	
Standards:	ANSI/IES LM-79-19: Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products ANSI C82.77-10-2014: Harmonic Emission Limits – Related Power Quality Requirements for Lighting ANSI/UL 1598-2008: Standard for Safety of Luminaires *CIE 190:2010 Calculation and presentation of unified glare rating tables for indoor lighting luminaires (This method is not in NVLAP accreditation scope) *IES TM-30-18: IES Method for Evaluating Light Source Color Rendition (This method is not in NVLAP accreditation scope)	
Reviewed By:	Hill Liu	Hill Liu
Report Number:	2402U65810E-EE-1	
Sample Size:	One test sample was in good condition and received on 2024-06-24, and used for testing.	
Test Date:	2024-06-24 to 2024-07-04	
Report Date:	2024-07-22	
Approved by:	Blake Zhang / EE Engineer	Blake zhang
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 5F (B-West), 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Road, Futian Free Trade Zone Shenzhen, 518038, China. Tel: +86-755-33320018 Fax: +86-755-33320008	
Test Location 1:	Test facility was located at No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.	
Test Location 2:	Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.	

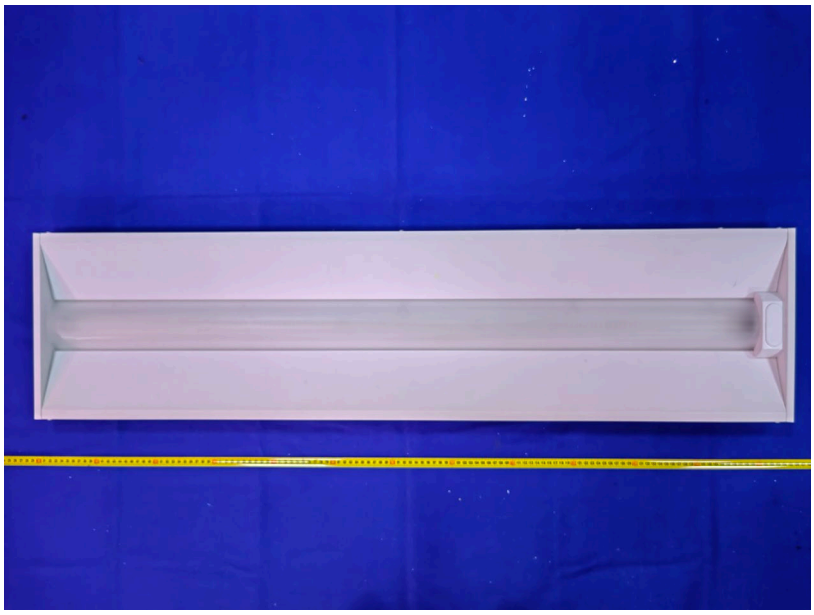
Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.(Shenzhen). This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, or any agency of the U.S. Government. *This report contains data that are not covered by the NVLAP accreditation.

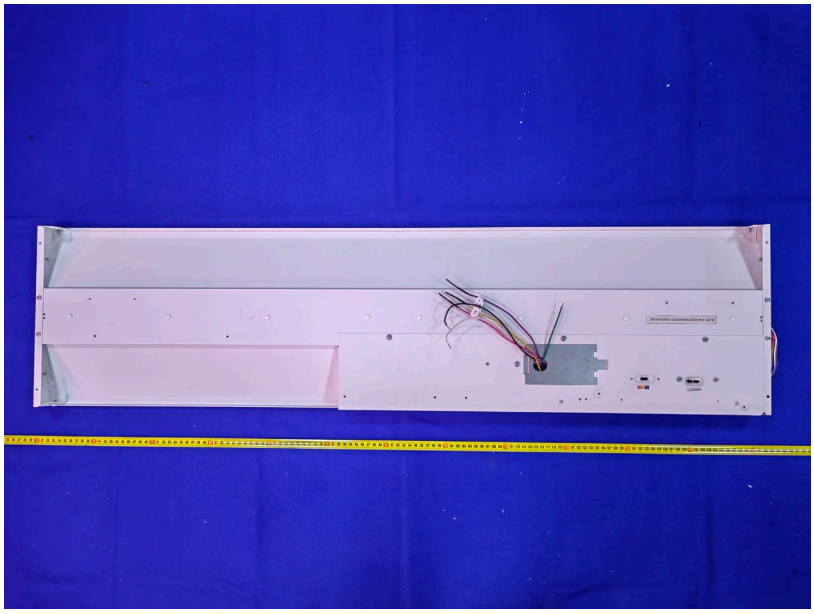
1. Product Description and Rating#

Test Model	Primary Use	Rated Voltage	Power(W)	CCT(K)	LED Model	LED manufacturer	Driver Model	Test Item
RENO-14CTF-UNV/347-MWMCCT-HL	Low-Bay Luminaires for Commercial and Industrial Buildings	120-347VAC 50/60Hz	20/25/30/40	3500K/ 4000K/ 5000K	L128-xx80RA3500xxx	Lumileds Holding B.V.	RENO-SDC40CS085V42DN3A	All

Test Model	Power(W)	CCT(K)	Light Output (lm)	Luminous Efficacy (lm/W)
RENO-14CTF-UNV/347-MWMCCT-HL	20	3500	2680	134
		4000	2880	144
		5000	2740	137
	25	3500	3325	133
		4000	3575	143
		5000	3400	136
	30	3500	3960	132
		4000	4260	142
		5000	4050	135
	40	3500	5232	130.8
		4000	5640	141
		5000	5360	134

2. Product Photo





LED Driver Photo

3. Test Result

Test Model: RENO-14CTF-UNV/347-MWMCCT-HL
Test CCT: 3500K (Input Control Signal Applied: 0%)
Test Wattage: 40W

Test Condition: Method: Integrating Sphere System; Orientation: Downward; Test Voltage: 120V 60Hz;

Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
Light Output(lm) ΔΔ	5134.4	5000~10000	4500≤Light output≤11000	Pass
Power(W) ΔΔ	38.65	None.	None.	N/A
Total Efficacy(lm/W) ΔΔ	132.84	≥130	≥126.1	Pass[i]
CCT(K) ΔΔ	3458	3341~3589	No tolerances	Pass
Duv ΔΔ	0.0000257	-0.0028~0.0038	No tolerances	Pass
IES Rf ΔΔ	84	70	69	Pass
IES Rg ΔΔ	96	89	88	
IES Rcs,h1 ΔΔ	-12%	-12%~23%	-13%~24%	
Ra ΔΔ	82.6	≥80	≥79	
R9 ΔΔ	9	≥0	≥-1	

Test Condition: Method: Goniophotometer; Orientation: Downward; Test Voltage: 120.0V 60Hz;

Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
Light Output(lm) Δ	5145.57	≥5000	4500≤Light output≤11000	Pass
Power(W) Δ	38.7	None.	None.	N/A
Total Efficacy(lm/W) Δ	132.96	≥130	≥126.1	Pass[i]
Zonal Lumen Distribution(20-50) Δ	51.33%	20-50º≥30%	20-50º≥20%	Pass
UGR crosswise view Δ	22.1	<25	No tolerances	Pass
UGR endwise view Δ	20.7	<25	No tolerances	Pass

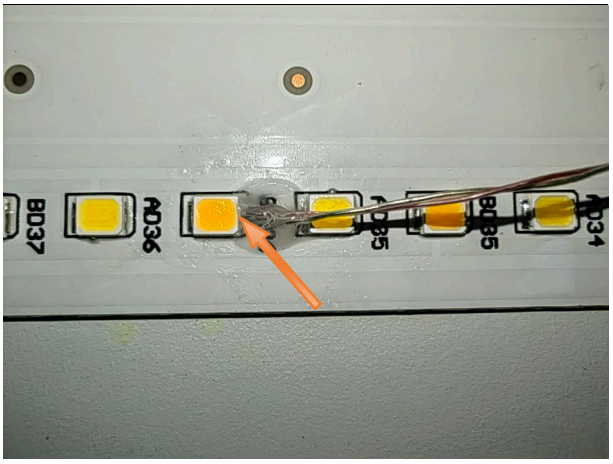
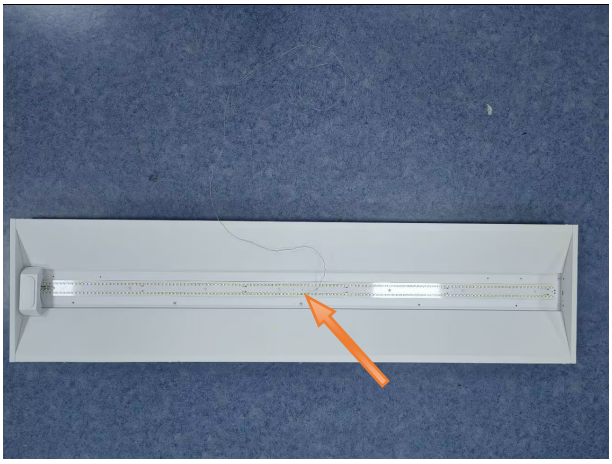
Test Condition: Test Voltage: 120V 60Hz;

Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
TMP_{LED}(°C) ΔΔ	37.6	≤115	With tolerance of ⩽ 1.1°C or 0.4%, whichever is greater due to thermocouple tolerance	Pass
TMP_c(°C) ΔΔ	48.5	≤90	With tolerance of ⩽ 1.1°C or 0.4%, whichever is greater due to thermocouple tolerance	Pass
Drive Current/Individual LED source(mA) ΔΔ	84	≤150	With +5% Tolerence	Pass
L_{90} Lumen Maintenance Life (Hours) ΔΔ	51000	≥36000	None.	Pass
Color Maintenance ΔΔ	0.002	≤0.004	≤0.0044	Pass

Test Condition: Method: Integrating THDi、PF Test ; Orientation: Downward;

Test Voltage	Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
120	Power Factor ΔΔ	0.9964	≥0.9	⩾0.87	Pass
120	THDi ΔΔ	3.34%	≤20%	⩽25%	Pass
277	Power Factor ΔΔ	0.9553	≥0.9	⩾0.87	Pass
277	THDi ΔΔ	6.85%	≤20%	⩽25%	Pass
347	Power Factor ΔΔ	0.9186	≥0.9	⩾0.87	Pass
347	THDi ΔΔ	10.90%	≤20%	⩽25%	Pass

Note:
1. The test results were measured directly from the test equipment.
2. The DLC requirements were listed according to DLC Technical Requirements V5.1.
3. The conclusion is only for information. When determining the compliance of the result, tolerances and/or allowances may be applied to the measured value.
4. ΔTest facility was located at No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.
5. ΔΔTest facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.

Test CCT: 3500K (Input Control Signal Applied: 0%)	
Temperature measurement point on TMP_{LED}	
	
Driver Case Measurement Point T_c	

[Integrating Sphere System]

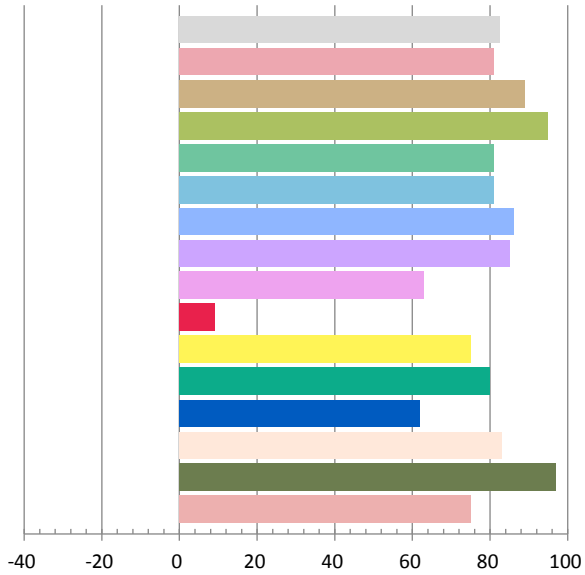
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.3231	38.65	0.9965	5134.4	132.84

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
15.454	3458	0.0000257	0.4077	0.3920	0.2368	0.5121

Color Rendering Index

Ra			
82.6			
R1	R2	R3	R4
81	89	95	81
R5	R6	R7	R8
81	86	85	63
R9	R10	R11	R12
9	75	80	62
R13	R14	R15	
83	97	75	



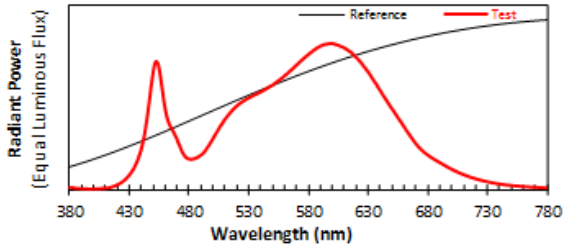
ANSI/IES TM-30-18 Color Rendition Report

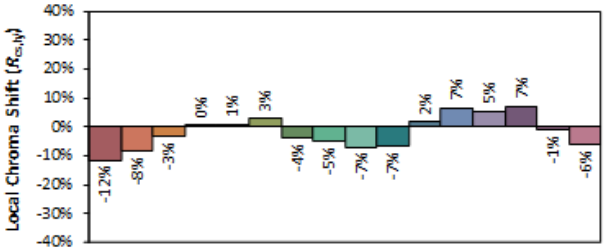
Source: User SPD

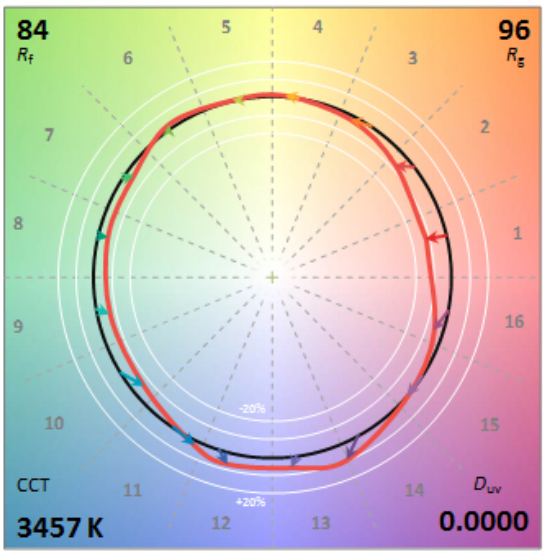
Manufacturer: RENO LED LIGHTING INC.

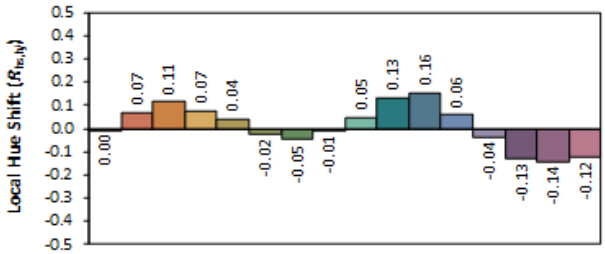
Date: 2024/6/24

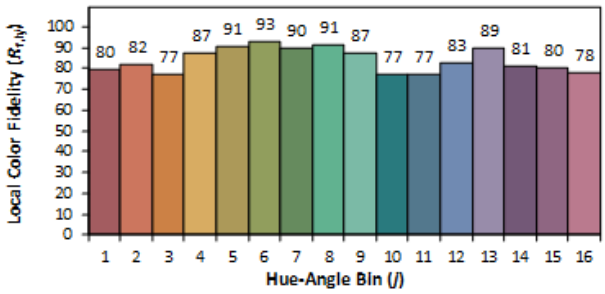
Model: RENO-14CTF-UNV/347-MWMCCT-HL

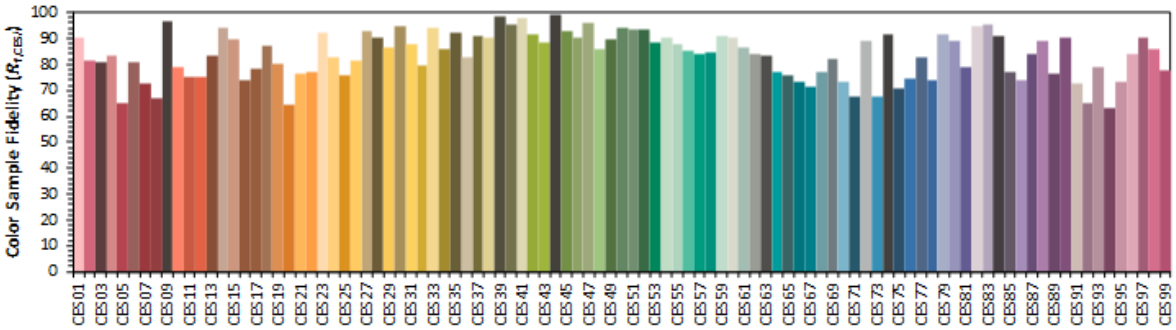












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

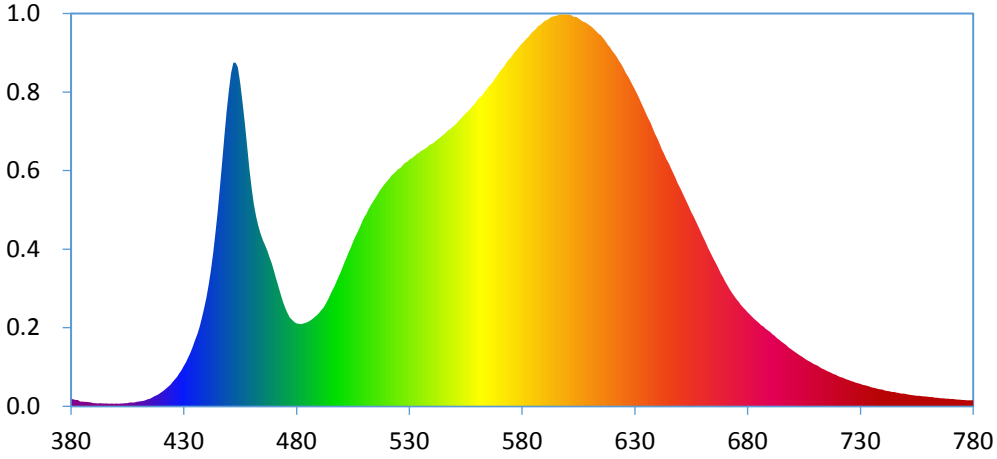
x	**0.4077**
y	**0.3918**
u'	**0.2368**
v'	**0.5121**

CIE 13.3-1995 (CRI)

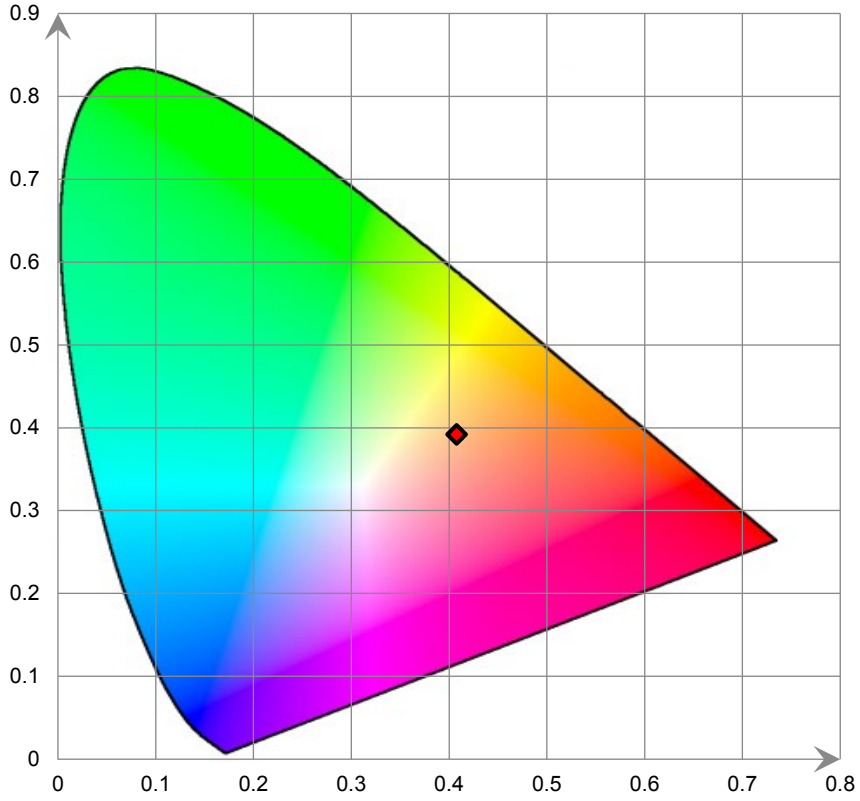
R_a	83
R_9	9

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

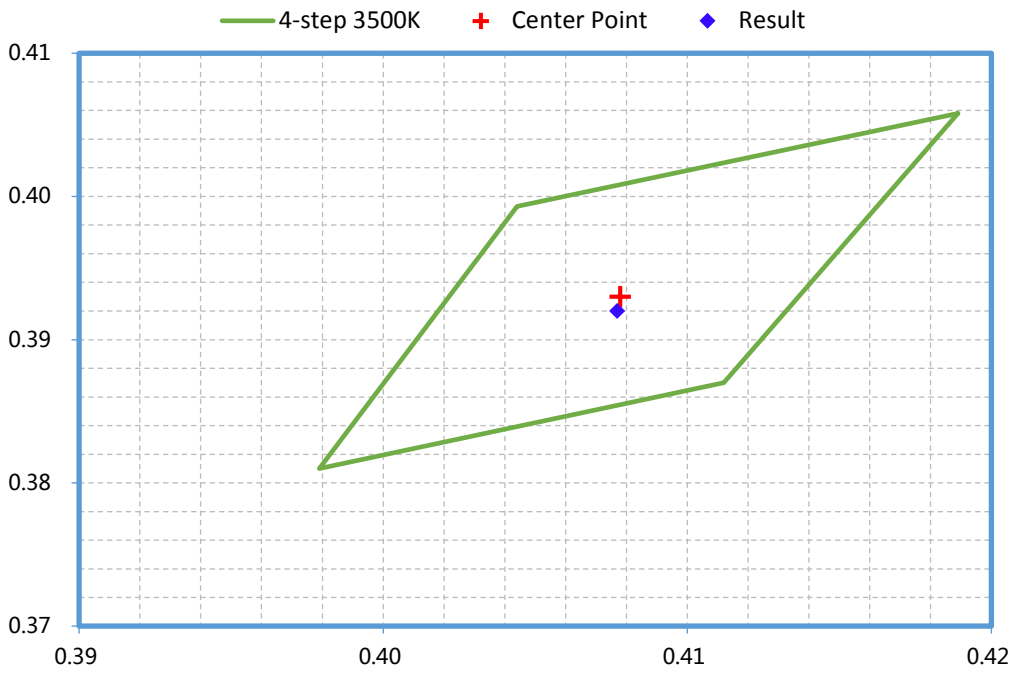
Relative Spectral Power Distribution



CIE 1931 x y Chromaticity Diagram



ANSI C78.377-2017 Chromaticity Quadrangles



[Goniophotometer System]

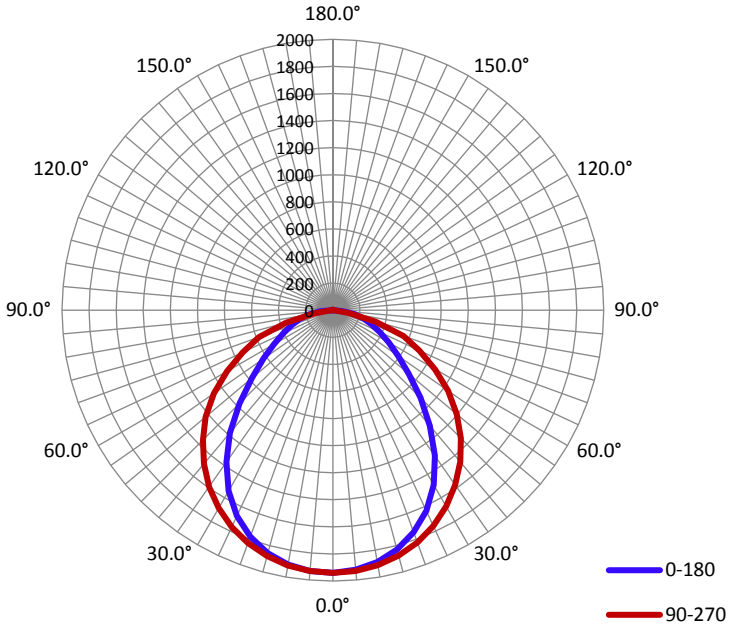
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.3234	38.7	0.9969

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
5145.57	132.96	1941.0	1.19	1.29

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	88.7	107.0	115.2	107.6	104.6
Field Angle (10% I_{max}):	156.8	160.7	156.2	160.7	158.6

Luminous Intensity (cd) Distribution Data

γ \ C	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0°	1940	1940	1940	1940	1940	1940	1940	1940
1°	1938	1938	1938	1939	1939	1940	1940	1940
2°	1936	1936	1937	1938	1939	1939	1940	1939
3°	1933	1933	1935	1936	1938	1938	1938	1938
4°	1929	1929	1932	1935	1936	1936	1936	1936
5°	1925	1925	1928	1932	1933	1934	1933	1933
6°	1919	1921	1924	1928	1930	1931	1930	1929
7°	1913	1914	1919	1924	1927	1927	1926	1924
8°	1905	1908	1913	1919	1922	1923	1921	1919
9°	1897	1900	1906	1913	1918	1918	1916	1913
10°	1888	1891	1899	1907	1912	1913	1910	1906
11°	1878	1882	1891	1901	1906	1907	1904	1898
12°	1867	1872	1883	1893	1899	1901	1896	1889
13°	1856	1861	1873	1885	1892	1893	1887	1879
14°	1843	1849	1864	1877	1885	1885	1878	1868
15°	1829	1837	1853	1868	1877	1877	1869	1857
16°	1814	1823	1842	1859	1868	1868	1858	1845
17°	1798	1809	1829	1849	1858	1858	1846	1831
18°	1781	1793	1817	1838	1848	1847	1834	1817
19°	1764	1777	1803	1826	1837	1836	1822	1801
20°	1746	1759	1789	1814	1825	1824	1808	1785
21°	1726	1741	1774	1801	1813	1811	1794	1767
22°	1705	1722	1759	1788	1800	1799	1780	1750
23°	1682	1702	1743	1773	1786	1785	1764	1731
24°	1659	1681	1725	1758	1772	1771	1748	1711
25°	1634	1658	1708	1743	1758	1757	1731	1690
26°	1608	1634	1689	1727	1742	1741	1713	1668
27°	1580	1611	1671	1711	1726	1725	1695	1645
28°	1551	1584	1651	1694	1709	1708	1676	1621
29°	1520	1558	1631	1677	1691	1691	1656	1595
30°	1489	1530	1610	1658	1674	1673	1636	1569
31°	1456	1501	1588	1640	1655	1654	1614	1541
32°	1423	1471	1566	1620	1637	1635	1592	1512
33°	1387	1441	1542	1600	1617	1614	1569	1482
34°	1351	1410	1518	1579	1597	1594	1546	1451
35°	1314	1378	1493	1558	1576	1573	1523	1419
36°	1276	1345	1467	1536	1555	1551	1498	1386
37°	1237	1314	1442	1513	1534	1529	1473	1353
38°	1198	1283	1415	1490	1511	1506	1447	1321
39°	1157	1252	1388	1466	1488	1483	1421	1289
40°	1116	1216	1360	1442	1464	1459	1393	1258
41°	1076	1178	1330	1418	1440	1435	1366	1220
42°	1035	1142	1302	1392	1415	1410	1337	1184
43°	994	1104	1272	1367	1390	1385	1308	1146
44°	954	1067	1242	1340	1364	1359	1278	1109
45°	915	1030	1212	1317	1337	1333	1248	1072
46°	876	993	1182	1293	1310	1309	1218	1034
47°	838	956	1150	1269	1282	1284	1187	997
48°	801	921	1119	1240	1254	1260	1156	960
49°	765	885	1087	1211	1224	1231	1124	924

Luminous Intensity (cd) Distribution Data

γ \ C	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
50°	732	850	1055	1181	1196	1201	1092	888
51°	700	816	1023	1150	1166	1170	1060	853
52°	669	783	990	1119	1134	1139	1027	819
53°	641	751	958	1088	1103	1108	995	786
54°	615	721	925	1056	1071	1076	962	754
55°	590	691	893	1023	1040	1044	930	723
56°	565	663	861	991	1007	1011	898	694
57°	541	636	829	958	975	978	866	665
58°	517	610	797	924	941	944	834	638
59°	495	585	765	891	906	912	802	612
60°	474	562	735	858	872	879	771	588
61°	454	539	704	825	837	845	739	564
62°	434	517	673	791	803	812	708	540
63°	416	496	644	759	770	779	678	518
64°	398	475	617	727	737	747	649	496
65°	381	455	591	696	705	716	622	475
66°	364	435	564	665	675	686	596	455
67°	348	416	537	635	644	656	569	435
68°	333	397	511	607	615	626	542	416
69°	318	378	484	577	586	596	516	396
70°	303	360	460	548	557	568	491	377
71°	288	341	434	518	521	537	465	358
72°	274	323	410	486	479	505	440	340
73°	261	305	387	448	432	467	416	323
74°	248	287	363	403	380	423	392	305
75°	234	270	341	356	330	376	367	288
76°	221	252	316	308	279	326	343	271
77°	206	236	288	260	230	278	313	255
78°	192	220	256	215	185	230	279	239
79°	177	203	222	181	147	187	243	223
80°	161	188	191	147	120	153	208	207
81°	145	171	160	113	95	119	174	190
82°	127	153	134	89	73	94	145	173
83°	110	135	108	66	51	69	117	152
84°	91	116	81	45	29	48	90	131
85°	71	94	65	25	7	27	62	109
86°	52	68	49	5	5	6	34	83
87°	33	46	33	4	4	5	6	54
88°	14	23	17	2	2	3	4	36
89°	9	1	1	1	1	1	1	18
90°	5	0	0	0	0	0	0	0
91°	1	0	0	0	0	0	0	0
92°	1	0	0	0	0	0	0	0
93°	1	1	0	0	0	0	0	1
94°	2	1	0	0	0	0	0	1
95°	1	1	0	1	1	0	0	1
96°	1	1	0	1	1	0	0	1
97°	2	1	1	1	1	1	0	1
98°	1	1	1	1	1	1	0	1
99°	1	1	1	1	1	1	0	1

Luminous Intensity (cd) Distribution Data

γ \ C	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
100°	1	1	1	1	1	1	0	1
101°	1	1	1	1	1	1	0	1
102°	2	1	1	1	1	1	1	1
103°	1	1	1	1	1	1	1	1
104°	1	1	1	1	1	1	1	1
105°	2	1	1	1	1	1	1	1
106°	2	1	1	1	1	1	1	1
107°	2	1	1	1	1	1	1	1
108°	2	1	1	1	1	1	1	1
109°	2	1	1	1	1	1	1	1
110°	1	1	1	1	1	1	1	1
111°	2	1	1	1	1	1	1	1
112°	1	1	1	1	1	1	1	1
113°	1	1	1	1	1	1	1	1
114°	2	1	1	1	1	1	1	1
115°	1	1	1	1	1	1	1	1
116°	1	1	1	1	1	1	1	1
117°	1	1	1	1	1	1	1	1
118°	2	1	1	1	1	1	1	1
119°	2	1	1	1	1	1	1	1
120°	1	1	1	1	1	1	1	1
121°	1	1	1	1	1	1	1	1
122°	1	1	1	1	1	1	1	1
123°	1	1	1	1	1	1	1	1
124°	2	2	1	1	1	1	1	1
125°	2	2	1	1	1	1	1	1
126°	2	2	1	1	1	1	1	1
127°	2	2	1	1	1	1	1	1
128°	2	2	1	1	1	1	1	1
129°	2	2	2	1	1	1	1	1
130°	2	2	2	2	2	1	1	1
131°	2	2	2	2	2	2	1	1
132°	2	2	2	2	2	2	1	1
133°	2	2	2	2	2	2	2	1
134°	2	2	2	2	2	2	2	2
135°	2	2	2	2	2	2	2	2
136°	2	2	2	2	2	2	2	2
137°	2	2	2	2	2	2	2	2
138°	2	2	2	2	2	2	2	2
139°	2	3	2	2	2	2	2	2
140°	2	3	2	2	2	2	2	2
141°	2	3	3	2	2	2	2	2
142°	2	3	3	3	3	3	2	2
143°	3	3	3	3	3	3	2	2
144°	3	3	3	3	3	3	2	2
145°	3	3	3	3	3	3	2	2
146°	3	3	3	3	3	3	3	3
147°	3	3	3	3	3	3	3	3
148°	2	3	3	3	3	3	3	3
149°	2	3	3	3	3	3	3	3

Luminous Intensity (cd) Distribution Data

γ \ C	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
150°	2	4	3	3	3	3	3	3
151°	3	3	3	3	3	3	3	3
152°	3	3	3	3	3	3	3	3
153°	3	3	3	3	3	3	3	3
154°	3	3	3	4	3	3	3	3
155°	3	3	3	3	4	3	3	3
156°	3	4	4	3	4	4	3	3
157°	3	4	4	4	4	3	3	3
158°	3	4	4	4	4	3	3	3
159°	3	4	4	4	3	3	3	3
160°	3	3	4	4	4	3	3	4
161°	3	3	4	4	4	3	3	3
162°	3	3	4	4	4	3	3	3
163°	3	3	4	4	4	3	3	3
164°	3	3	4	4	4	3	3	3
165°	3	3	4	4	4	4	3	3
166°	3	3	3	4	4	3	3	3
167°	3	3	3	3	3	3	3	3
168°	3	3	3	3	3	3	3	3
169°	3	3	3	3	3	3	3	3
170°	3	3	3	3	3	3	3	3
171°	3	3	3	3	3	3	3	3
172°	3	3	3	3	3	3	3	3
173°	3	3	3	3	3	3	3	3
174°	3	3	3	3	3	3	3	3
175°	3	3	3	3	3	3	3	3
176°	3	3	3	3	3	2	3	3
177°	3	3	3	3	2	2	3	3
178°	3	3	3	2	2	2	2	3
179°	3	3	2	2	2	2	2	3
180°	3	3	2	2	2	2	2	3

Luminous Intensity (cd) Distribution Data (cont.)

γ \ C	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0°	1940	1940	1940	1940	1940	1940	1940	1940
1°	1941	1940	1940	1940	1940	1939	1939	1938
2°	1940	1939	1940	1939	1939	1938	1937	1937
3°	1939	1938	1938	1938	1938	1936	1935	1934
4°	1937	1936	1936	1937	1936	1934	1932	1931
5°	1934	1933	1934	1934	1933	1931	1929	1927
6°	1930	1930	1931	1932	1931	1928	1925	1922
7°	1926	1925	1928	1929	1928	1925	1920	1916
8°	1921	1921	1924	1925	1924	1920	1915	1909
9°	1915	1915	1919	1921	1920	1915	1908	1902
10°	1907	1908	1913	1916	1915	1909	1901	1894
11°	1900	1901	1906	1909	1909	1903	1894	1885
12°	1891	1892	1899	1903	1902	1896	1886	1876
13°	1881	1883	1891	1896	1896	1889	1878	1866
14°	1870	1873	1882	1888	1888	1881	1869	1855
15°	1858	1862	1873	1880	1880	1872	1860	1843
16°	1844	1850	1863	1871	1871	1863	1848	1830
17°	1829	1837	1853	1862	1862	1853	1836	1815
18°	1814	1823	1842	1852	1852	1842	1824	1800
19°	1798	1808	1830	1842	1842	1831	1811	1784
20°	1780	1792	1817	1831	1831	1819	1797	1768
21°	1762	1775	1803	1819	1819	1807	1783	1750
22°	1743	1758	1788	1806	1807	1793	1768	1732
23°	1722	1739	1772	1793	1794	1780	1753	1712
24°	1700	1719	1756	1778	1781	1767	1736	1692
25°	1677	1698	1739	1763	1767	1752	1719	1670
26°	1653	1675	1721	1748	1752	1736	1701	1648
27°	1627	1652	1703	1733	1737	1720	1683	1625
28°	1600	1628	1684	1717	1721	1704	1664	1600
29°	1571	1602	1664	1699	1704	1687	1645	1574
30°	1541	1576	1644	1682	1687	1669	1624	1547
31°	1509	1548	1624	1664	1669	1650	1603	1519
32°	1476	1520	1602	1646	1650	1631	1582	1490
33°	1442	1490	1580	1627	1631	1612	1559	1460
34°	1407	1459	1557	1607	1612	1591	1536	1430
35°	1370	1427	1533	1587	1592	1571	1511	1398
36°	1336	1394	1510	1565	1570	1549	1487	1365
37°	1301	1359	1485	1543	1549	1527	1461	1331
38°	1266	1325	1459	1522	1526	1505	1436	1297
39°	1225	1289	1433	1498	1504	1481	1410	1262
40°	1184	1254	1406	1475	1480	1458	1383	1227
41°	1142	1217	1378	1450	1457	1433	1356	1191
42°	1101	1180	1350	1426	1432	1409	1331	1155
43°	1059	1142	1324	1400	1408	1383	1307	1117
44°	1017	1105	1299	1374	1382	1357	1282	1081
45°	976	1067	1273	1348	1356	1331	1251	1044
46°	934	1029	1242	1320	1330	1303	1221	1007
47°	894	992	1211	1293	1306	1276	1190	971
48°	855	955	1179	1264	1282	1247	1159	935
49°	817	918	1147	1236	1257	1218	1127	899

Luminous Intensity (cd) Distribution Data (cont.)

γ \ C	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
50°	781	882	1115	1206	1228	1189	1095	864
51°	746	848	1082	1176	1198	1160	1064	830
52°	713	813	1049	1146	1167	1129	1031	796
53°	682	780	1016	1114	1136	1098	999	765
54°	652	749	984	1083	1104	1067	966	733
55°	624	717	951	1051	1072	1035	934	704
56°	597	688	918	1019	1040	1003	901	674
57°	572	660	885	987	1007	971	869	647
58°	547	643	853	955	973	938	836	623
59°	524	615	821	921	939	906	805	599
60°	501	587	789	888	904	874	773	575
61°	480	563	757	856	869	840	741	552
62°	459	540	726	823	835	808	710	529
63°	439	517	694	790	801	775	680	507
64°	421	496	664	758	768	744	651	486
65°	403	475	635	727	736	712	622	465
66°	386	454	607	696	705	681	593	446
67°	370	434	578	666	673	651	565	426
68°	353	415	551	632	643	623	538	407
69°	336	396	524	606	611	596	511	389
70°	320	377	499	581	581	568	485	370
71°	305	359	473	551	546	537	460	352
72°	291	341	448	519	506	505	434	333
73°	277	323	424	483	460	467	410	315
74°	264	306	399	441	408	423	385	297
75°	251	288	375	392	357	374	361	280
76°	237	272	350	344	306	325	336	262
77°	223	256	324	295	256	277	308	245
78°	209	240	293	247	209	230	274	229
79°	194	223	259	200	174	185	239	212
80°	178	207	223	161	139	148	205	196
81°	162	190	189	129	105	119	175	179
82°	145	173	160	102	82	94	145	163
83°	127	156	132	78	60	70	116	145
84°	108	136	103	54	42	56	90	125
85°	89	113	76	30	23	43	62	101
86°	69	88	52	7	5	29	42	75
87°	49	60	28	4	4	15	22	42
88°	34	32	4	2	2	2	2	10
89°	18	4	2	0	0	0	1	5
90°	3	2	0	0	0	0	0	0
91°	0	0	0	0	0	0	0	0
92°	0	0	0	0	0	0	0	0
93°	1	0	0	0	0	0	0	0
94°	1	0	0	0	0	0	0	0
95°	2	0	0	0	0	0	0	0
96°	3	1	0	0	0	0	0	1
97°	3	1	0	0	0	0	0	1
98°	3	1	0	0	0	0	0	1
99°	2	1	0	0	0	0	0	1

Luminous Intensity (cd) Distribution Data (cont.)

γ \ C	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
100°	2	1	0	0	0	0	0	1
101°	2	1	0	0	0	0	0	1
102°	1	1	0	0	0	0	0	1
103°	1	1	0	0	0	0	0	1
104°	1	1	0	0	0	0	0	1
105°	1	1	0	0	0	0	0	1
106°	1	1	0	0	0	0	0	1
107°	1	1	0	0	0	0	0	1
108°	1	1	0	0	0	0	0	1
109°	1	1	0	0	0	0	0	1
110°	1	1	0	0	0	0	0	1
111°	1	1	0	0	0	0	0	1
112°	1	1	0	0	0	0	0	1
113°	1	1	0	0	0	0	0	1
114°	1	1	0	0	0	0	0	1
115°	1	1	0	0	0	0	0	1
116°	1	1	0	0	0	0	0	1
117°	1	1	0	0	0	0	0	1
118°	1	1	0	1	0	0	0	1
119°	1	1	1	1	0	1	1	1
120°	1	1	1	1	1	1	1	1
121°	1	1	1	1	1	1	1	2
122°	1	1	1	1	1	1	1	3
123°	1	1	1	1	1	1	1	3
124°	1	1	1	1	1	1	1	2
125°	1	1	1	1	1	1	1	1
126°	1	1	1	1	1	1	1	1
127°	1	1	1	1	1	1	1	1
128°	1	1	1	1	1	1	1	1
129°	1	1	1	1	1	1	1	1
130°	1	1	1	1	1	1	1	1
131°	1	1	1	1	1	1	1	1
132°	1	1	1	1	1	1	1	1
133°	1	1	1	1	1	1	1	1
134°	1	1	1	1	1	1	1	1
135°	1	1	1	1	1	1	1	1
136°	1	1	1	1	1	1	1	1
137°	1	1	1	1	1	1	1	1
138°	1	1	1	1	1	1	1	1
139°	1	1	1	1	1	1	1	1
140°	1	1	1	1	1	1	1	1
141°	1	1	1	1	1	1	1	1
142°	1	1	1	1	1	1	1	1
143°	1	1	1	1	1	1	1	1
144°	1	1	1	1	1	1	1	1
145°	1	1	1	1	1	1	1	1
146°	1	1	1	1	1	1	1	1
147°	1	1	1	1	1	1	1	1
148°	1	1	1	1	1	1	1	1
149°	1	1	1	1	1	1	1	1

Luminous Intensity (cd) Distribution Data (cont.)

γ \ C	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
150°	1	1	1	1	1	1	1	1
151°	1	1	1	1	1	1	1	1
152°	1	1	1	1	1	1	1	1
153°	1	1	1	1	1	1	1	1
154°	1	1	1	1	1	1	2	2
155°	1	1	1	1	1	1	2	2
156°	1	1	1	1	1	1	2	2
157°	1	1	1	1	1	1	1	2
158°	1	1	1	1	1	1	1	2
159°	1	1	1	1	1	1	2	2
160°	1	1	1	1	1	1	2	2
161°	2	1	1	1	1	1	2	2
162°	2	1	2	1	1	1	2	2
163°	2	2	2	1	1	2	2	2
164°	2	2	2	1	1	2	2	2
165°	2	2	2	1	1	2	2	2
166°	2	2	2	2	1	2	2	2
167°	2	2	2	2	1	2	2	2
168°	2	2	2	2	2	2	2	2
169°	2	2	2	2	2	2	2	2
170°	2	2	2	2	2	2	2	2
171°	2	2	2	2	2	2	2	2
172°	2	2	2	2	2	2	2	2
173°	2	2	2	2	2	2	2	2
174°	2	2	2	2	2	2	2	2
175°	2	2	2	2	2	2	2	2
176°	2	2	2	2	2	2	2	2
177°	2	2	2	2	2	2	2	2
178°	3	2	2	2	2	2	2	2
179°	3	3	2	2	2	2	2	2
180°	3	3	2	2	2	2	2	3

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	46.3	0.90
5-10	137.3	2.67
10-15	223.5	4.34
15-20	301.8	5.86
20-25	368.8	7.17
25-30	421.4	8.19
30-35	456.8	8.88
35-40	473.3	9.20
40-45	470.5	9.14
45-50	450.1	8.75
50-55	414.8	8.06
55-60	369.9	7.19
60-65	318.8	6.20
65-70	266.1	5.17
70-75	208.5	4.05
75-80	134.0	2.60
80-85	63.9	1.25
85-90	12.6	0.24
90-95	0.2	0.00
95-100	0.4	0.01
100-105	0.4	0.01
105-110	0.4	0.01
110-115	0.4	0.00
115-120	0.4	0.01
120-125	0.5	0.01
125-130	0.5	0.01
130-135	0.5	0.01
135-140	0.6	0.01
140-145	0.6	0.01
145-150	0.6	0.01
150-155	0.5	0.01
155-160	0.5	0.01
160-165	0.4	0.01
165-170	0.3	0.01
170-175	0.2	0.00
175-180	0.1	0.00

Deg	Flux (lm)	%
0-5	46.3	0.90
0-10	183.5	3.57
0-15	407.0	7.91
0-20	708.8	13.77
0-25	1077.5	20.94
0-30	1499.0	29.13
0-35	1955.8	38.01
0-40	2429.1	47.21
0-45	2899.6	56.35
0-50	3349.7	65.10
0-55	3764.6	73.16
0-60	4134.5	80.35
0-65	4453.3	86.55
0-70	4719.4	91.72
0-75	4927.9	95.77
0-80	5061.9	98.37
0-85	5125.8	99.62
0-90	5138.4	99.86
0-95	5138.6	99.86
0-100	5139.0	99.87
0-105	5139.3	99.88
0-110	5139.7	99.89
0-115	5140.1	99.89
0-120	5140.4	99.90
0-125	5140.9	99.91
0-130	5141.4	99.92
0-135	5141.9	99.93
0-140	5142.5	99.94
0-145	5143.0	99.95
0-150	5143.6	99.96
0-155	5144.2	99.97
0-160	5144.7	99.98
0-165	5145.1	99.99
0-170	5145.3	100.00
0-175	5145.5	100.00
0-180	5145.6	100.00

Test Model: RENO-14CTF-UNV/347-MWMCCT-HL
Test CCT: 4000K (Input Control Signal Applied: 50%)
Test Wattage: 40W

Test Condition: Method: Integrating Sphere System; Orientation: Downward; Test Voltage: 120.1V 60Hz;

Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
Light Output(lm) ΔΔ	5356.9	5000~10000	4500≤Light output≤11000	Pass
Power(W) ΔΔ	37.32	None.	None.	N/A
Total Efficacy(lm/W) ΔΔ	143.52	≥130	≥126.1	Pass
CCT(K) ΔΔ	4095	3831~4139	No tolerances	Pass
Duv ΔΔ	0.000247	-0.0023~0.0043	No tolerances	Pass
IES Rf ΔΔ	84	70	69	Pass
IES Rg ΔΔ	96	89	88	
IES Rcs,h1 ΔΔ	-11%	-12%~23%	-13%~24%	
Ra ΔΔ	83.9	≥80	≥79	
R9 ΔΔ	15	≥0	≥-1	

Test Condition: Method: Integrating THDi、PF Test ; Orientation: Downward;

Test Voltage	Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
120	Power Factor ΔΔ	0.9962	≥0.9	≥0.87	Pass
120	THDi ΔΔ	3.43%	≤20%	≤25%	Pass
277	Power Factor ΔΔ	0.9523	≥0.9	≥0.87	Pass
277	THDi ΔΔ	7.09%	≤20%	≤25%	Pass
347	Power Factor ΔΔ	0.9137	≥0.9	≥0.87	Pass
347	THDi ΔΔ	10.99%	≤20%	≤25%	Pass

Note:
1. The test results were measured directly from the test equipment.
2. The DLC requirements were listed according to DLC Technical Requirements V5.1.
3. The conclusion is only for information. When determining the compliance of the result, tolerances and/or allowances may be applied to the measured value.
4. ΔΔ Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.

[Integrating Sphere System]

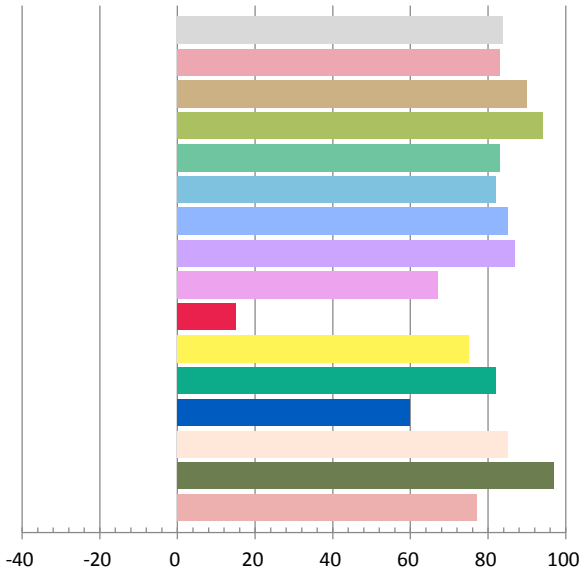
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.3122	37.32	0.9963	5356.9	143.52

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
16.377	4095	0.000247	0.3764	0.3747	0.2233	0.5001

Color Rendering Index

Ra			
83.9			
R1	R2	R3	R4
83	90	94	83
R5	R6	R7	R8
82	85	87	67
R9	R10	R11	R12
15	75	82	60
R13	R14	R15	
85	97	77	



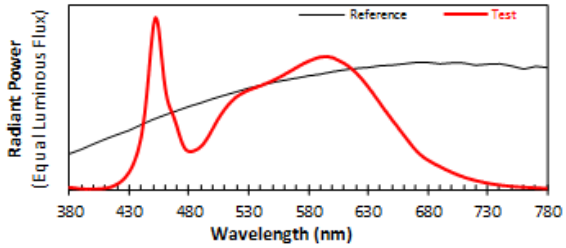
ANSI/IES TM-30-18 Color Rendition Report

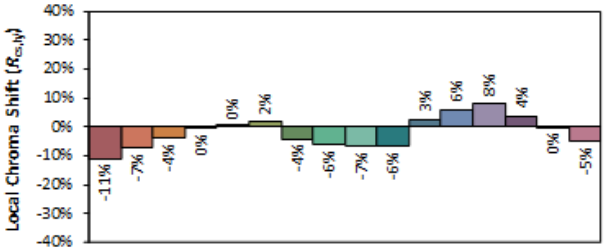
Source: User SPD

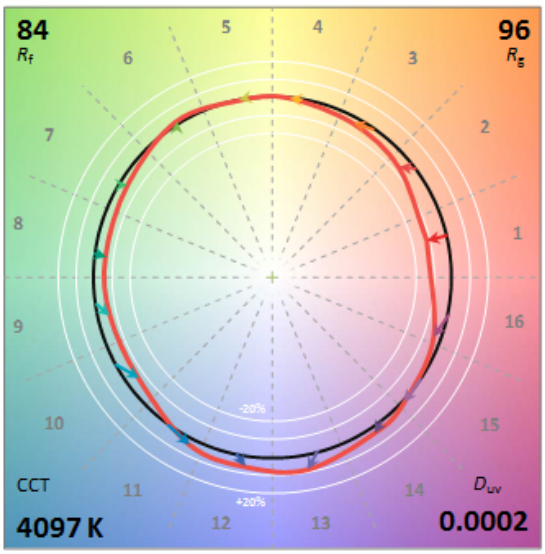
Manufacturer: RENO LED LIGHTING INC.

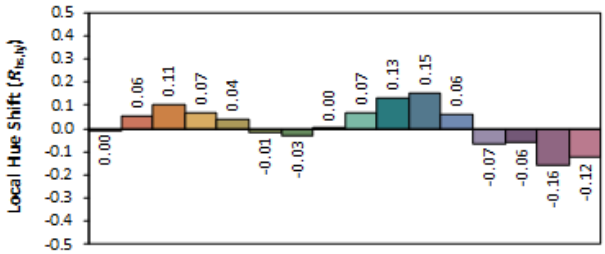
Date: 2024/6/24

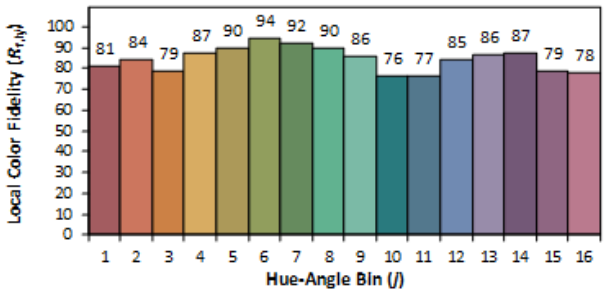
Model: RENO-14CTF-UNV/347-MWMCCT-HL

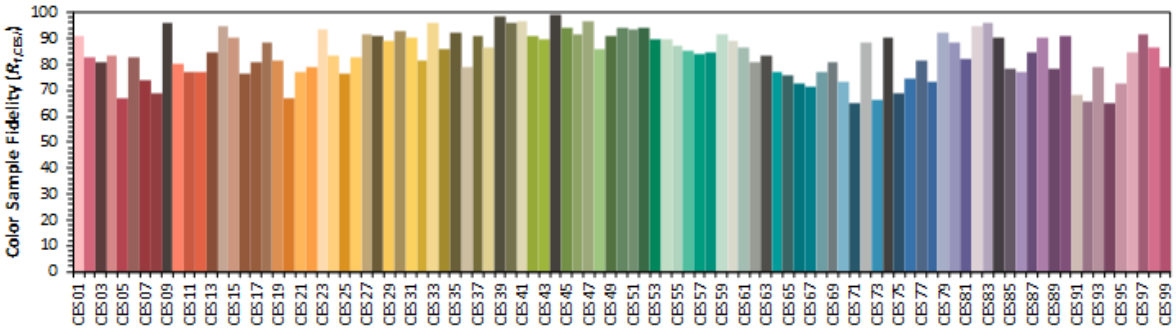












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

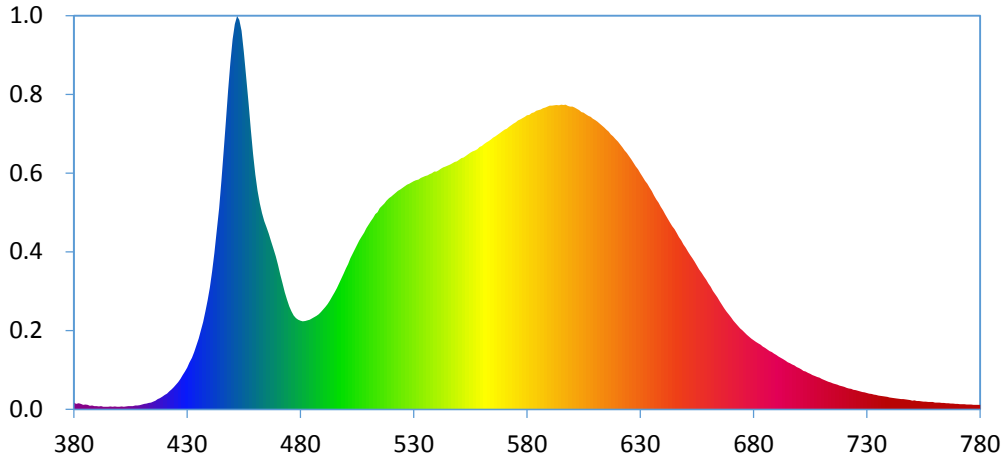
x	**0.3764**
y	**0.3746**
u'	**0.2233**
v'	**0.5000**

CIE 13.3-1995 (CRI)

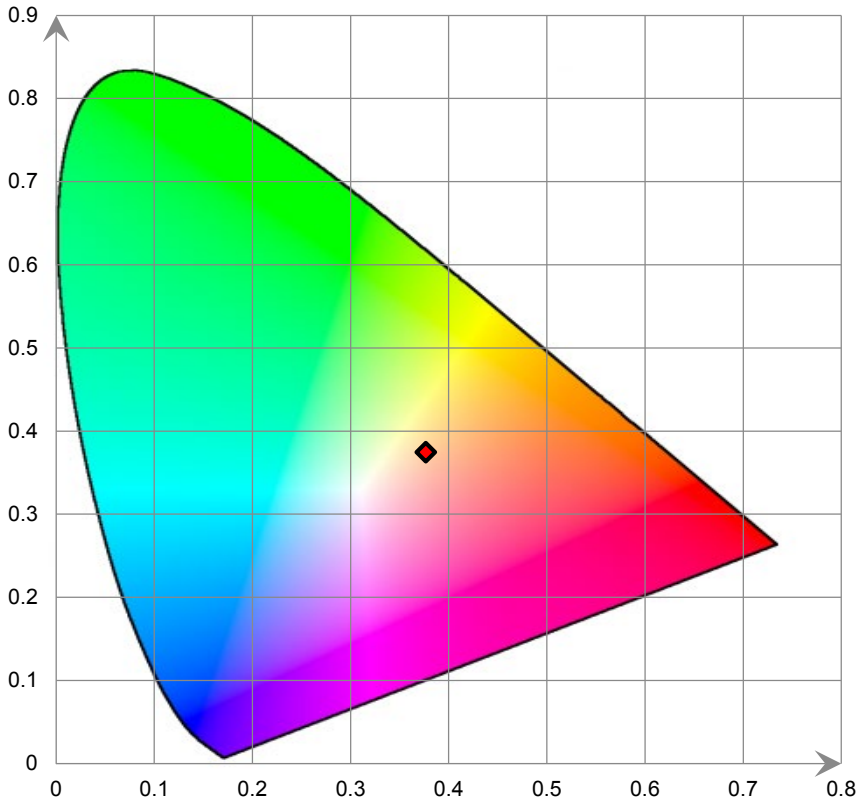
R_a	84
R_9	14

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

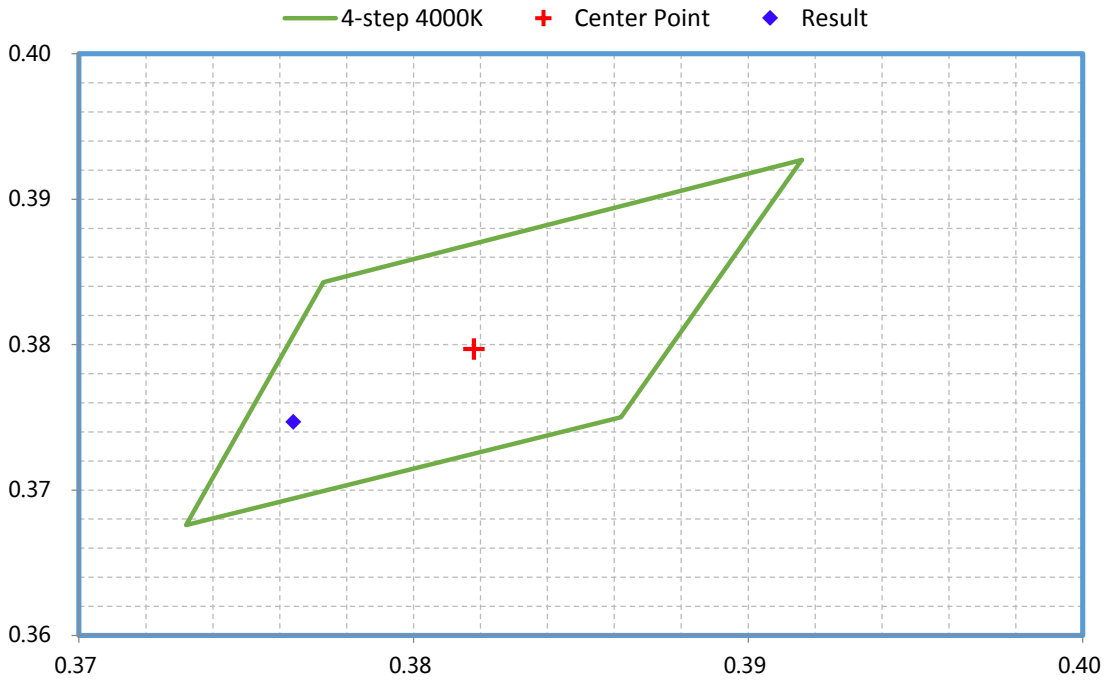
Relative Spectral Power Distribution



CIE 1931 x y Chromaticity Diagram



ANSI C78.377-2017 Chromaticity Quadrangles



Test Model: RENO-14CTF-UNV/347-MWMCCT-HL
Test CCT: 5000K (Input Control Signal Applied: 100%)
Test Wattage: 40W

Test Condition: Method: Integrating Sphere System; Orientation: Downward; Test Voltage: 120.1V 60Hz;

Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
Light Output(lm) ΔΔ	5264.8	5000~10000	4500≤Light output≤11000	Pass
Power(W) ΔΔ	38.57	None.	None.	N/A
Total Efficacy(lm/W) ΔΔ	136.5	≥130	≥126.1	Pass
CCT(K) ΔΔ	4935	4809~5249	No tolerances	Pass
Duv ΔΔ	0.00271	-0.0013~0.0053	No tolerances	Pass
IES Rf ΔΔ	84	70	69	Pass
IES Rg ΔΔ	97	89	88	
IES Rcs,h1 ΔΔ	-12%	-12%~23%	-13%~24%	
Ra ΔΔ	82.9	≥80	≥79	
R9 ΔΔ	10	≥0	≥-1	

Test Condition: Method: Integrating THDi、PF Test ; Orientation: Downward;

Test Voltage	Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
120	Power Factor ΔΔ	0.9963	≥0.9	≥0.87	Pass
120	THDi ΔΔ	3.37%	≤20%	≤25%	Pass
277	Power Factor ΔΔ	0.9551	≥0.9	≥0.87	Pass
277	THDi ΔΔ	6.66%	≤20%	≤25%	Pass
347	Power Factor ΔΔ	0.9181	≥0.9	≥0.87	Pass
347	THDi ΔΔ	0.93%	≤20%	≤25%	Pass

Note:
1. The test results were measured directly from the test equipment.
2. The DLC requirements were listed according to DLC Technical Requirements V5.1.
3. The conclusion is only for information. When determining the compliance of the result, tolerances and/or allowances may be applied to the measured value.
4. ΔΔ Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.

[Integrating Sphere System]

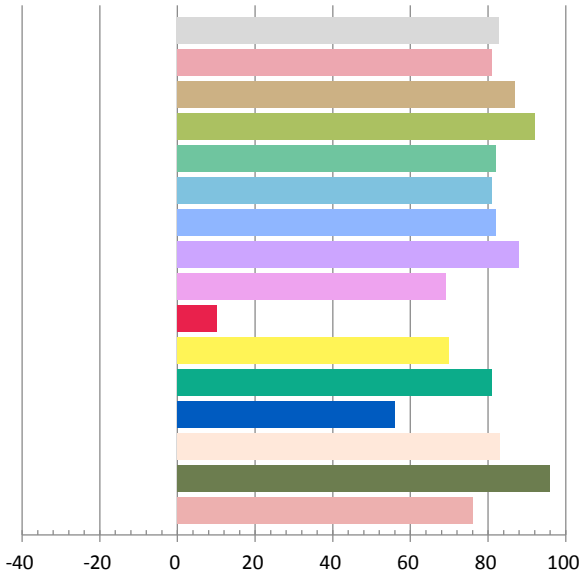
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.3225	38.57	0.9963	5264.8	136.5

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
16.305	4935	0.00271	0.3476	0.3590	0.2102	0.4886

Color Rendering Index

Ra			
82.9			
R1	R2	R3	R4
81	87	92	82
R5	R6	R7	R8
81	82	88	69
R9	R10	R11	R12
10	70	81	56
R13	R14	R15	
83	96	76	



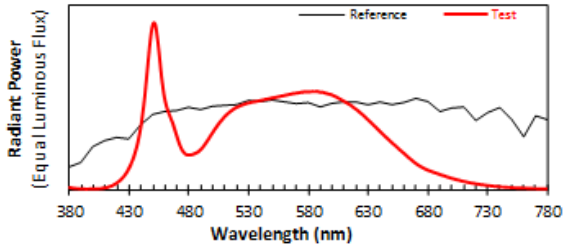
ANSI/IES TM-30-18 Color Rendition Report

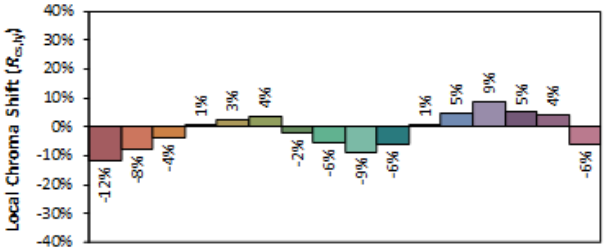
Source: User SPD

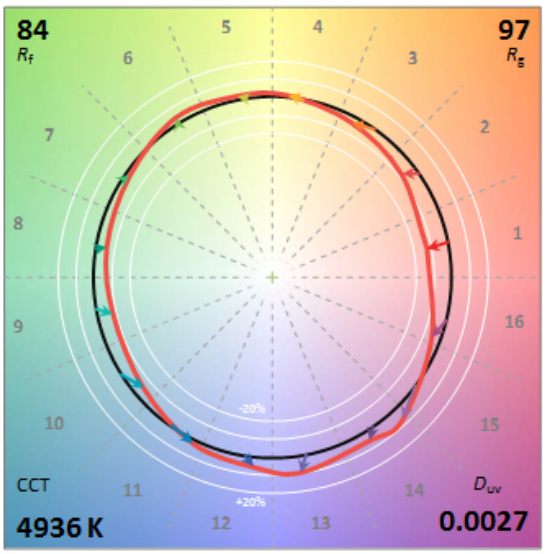
Manufacturer: RENO LED LIGHTING INC.

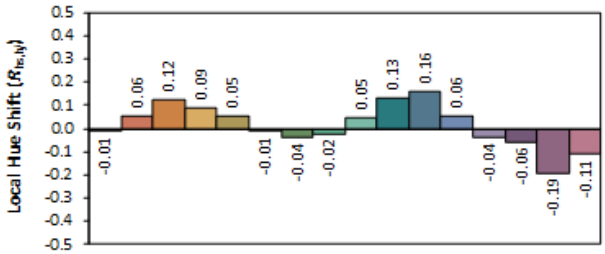
Date: 2024/6/24

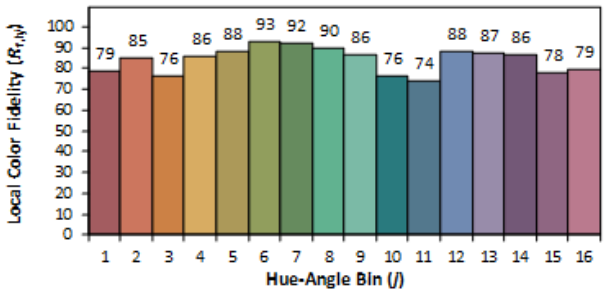
Model: RENO-14CTF-UNV/347-MWMCCT-HL

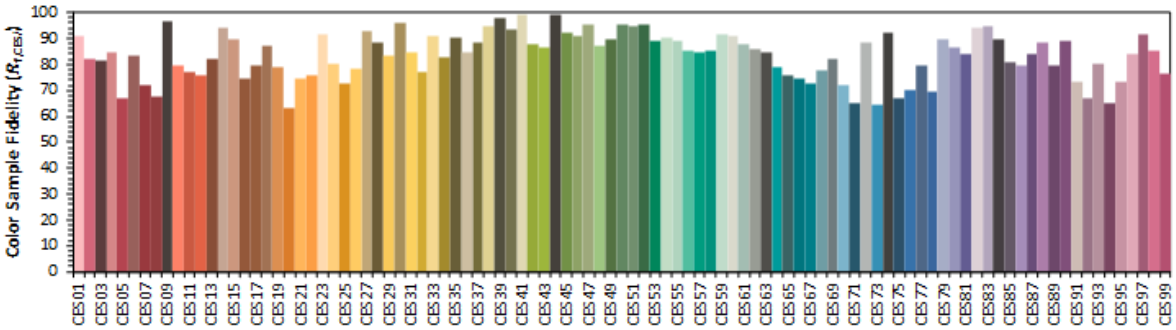












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

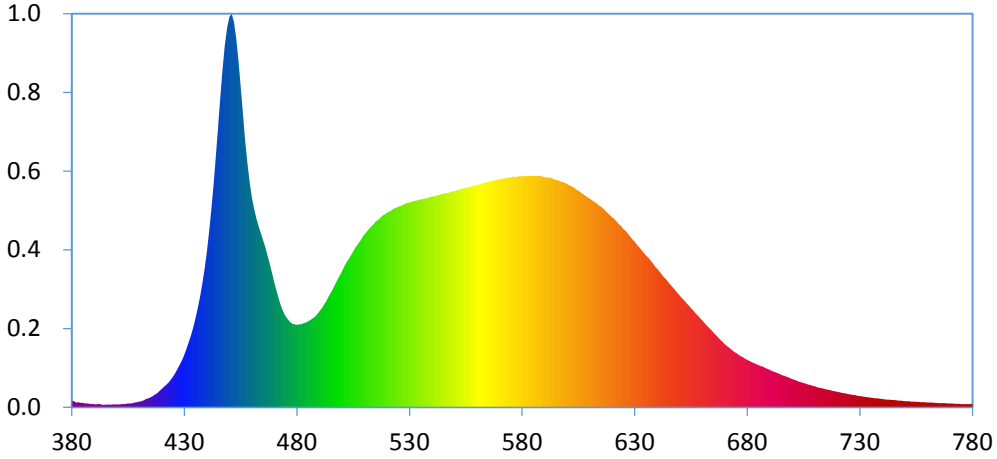
x	**0.3475**
y	**0.3589**
u'	**0.2103**
v'	**0.4885**

CIE 13.3-1995 (CRI)

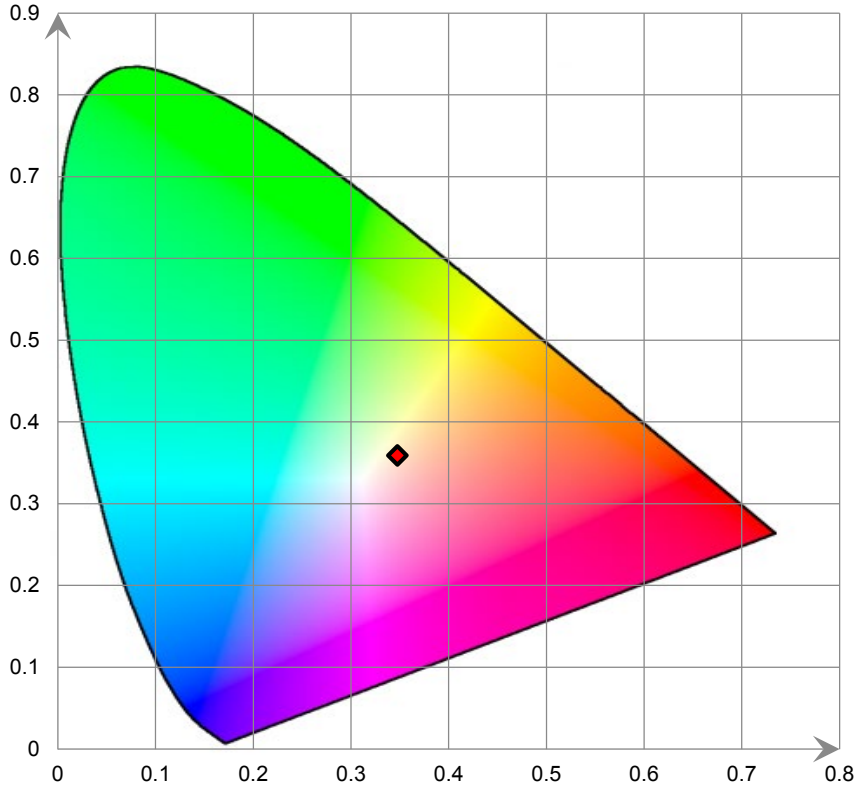
R_a	83
R_9	8

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

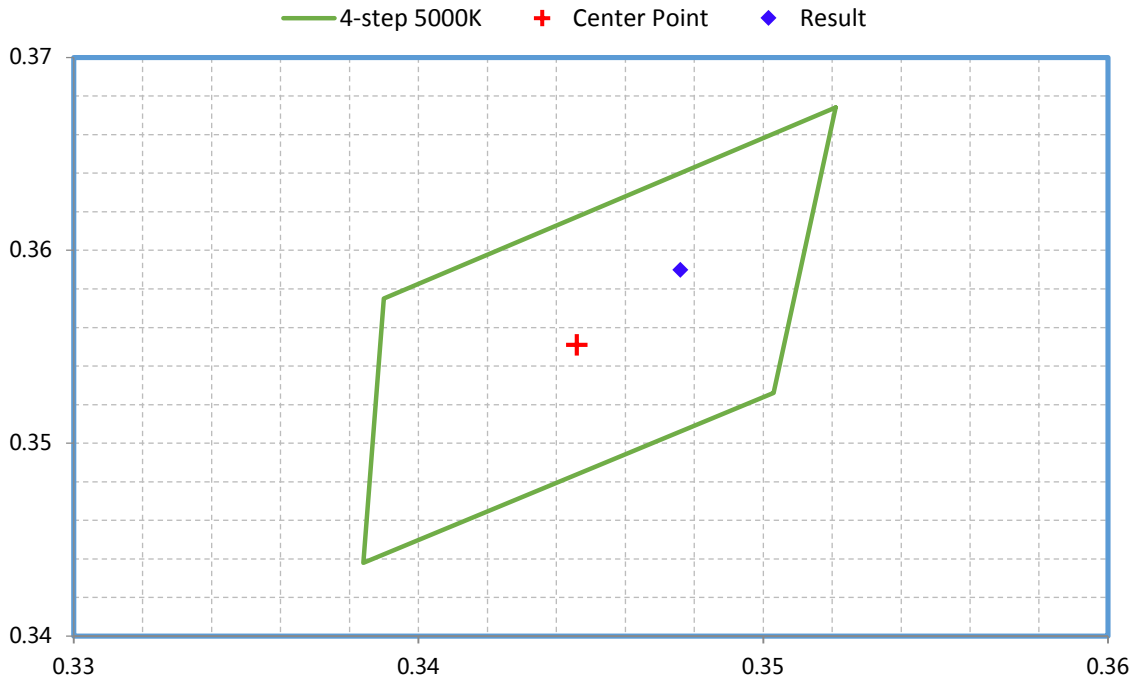
Relative Spectral Power Distribution



CIE 1931 x y Chromaticity Diagram



ANSI C78.377-2017 Chromaticity Quadrangles



4. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	11010018	2023-09-02	2024-09-01
spectroradiometer	EVERFINE	HAAS-2000	G112048TS81331121	2023-09-02	2024-09-01
Digital Power Meter	EVERFINE	PF2010A	1011004	2023-09-02	2024-09-01
Digital CC&CV DC Power Supply	EVERFINE	WY305-V1	1101047	2023-09-02	2024-09-01
Standard Light Source	EVERFINE	D204	N/A	2023-05-12	2025-05-11
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	2023-09-02	2024-09-01
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	2023-09-02	2024-09-01
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	2023-09-02	2024-09-01
Digital power meter	YOKOGAWA	WT-210	91j926132	2023-09-02	2024-09-01
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	2023-09-02	2024-09-01
wireless remote thermohygrometer	N/A	AOK-5017B	N/A	2023-09-02	2024-09-01
Standard Light Source	EVERFINE	D908	N/A	2023-05-12	2025-05-11
Multimeter	FLUKE	115C	N/A	2023-09-02	2024-09-01
Hybrid Recorder	YOKOGAWA	DR240	10#	2023-11-09	2024-11-08
AC POWER SUPPLY	HengPu	HPA 1103	0003394	2023-09-02	2024-09-01
Variable-Voltage Transformer	CHKO	TDGC2G-3	201102	N/A	N/A

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

5. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-19. The ambient temperature of the sample was maintained at 25°C±1°C during measurement. And relative humidity is less than 65%. The product was operated in its intended orientation in application during all testing.

Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, Spectroradiometer, and integrating sphere. The integrating sphere system is calibrated by standard spectrum light source before measurement. 4π geometry was used during measurement.

Goniophotometer System

Type C goniophotometer was used for measuring luminous intensity distribution. The vertical angle (γ) test intervals were set no more than 1 degree while data for 5 degree intervals is reported. The horizontal angle (C plane) test intervals were set no more than 22.5 degree.

ISTMT Test

The LED which has the highest temperature was measured at the location of LED case which is specified by LED source manufacturer and detailed by LM-80 report. The drive current of LED package/module/ array was calculated as the total output current of the driver measured by multimeter, divided by the number of branches in parallel of LEDs.

Directions

1. The information marked “superscript #” is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.

2. This report includes some test methods are not in NVLAP accreditation scope marked *.

3. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

4. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

5. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K=2 with the 95% confidence interval.

6. This report cannot be reproduced except in full, without prior written approval of the Company.

7. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

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