

TEST REPORT

For

RENO LED LIGHTING INC.

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

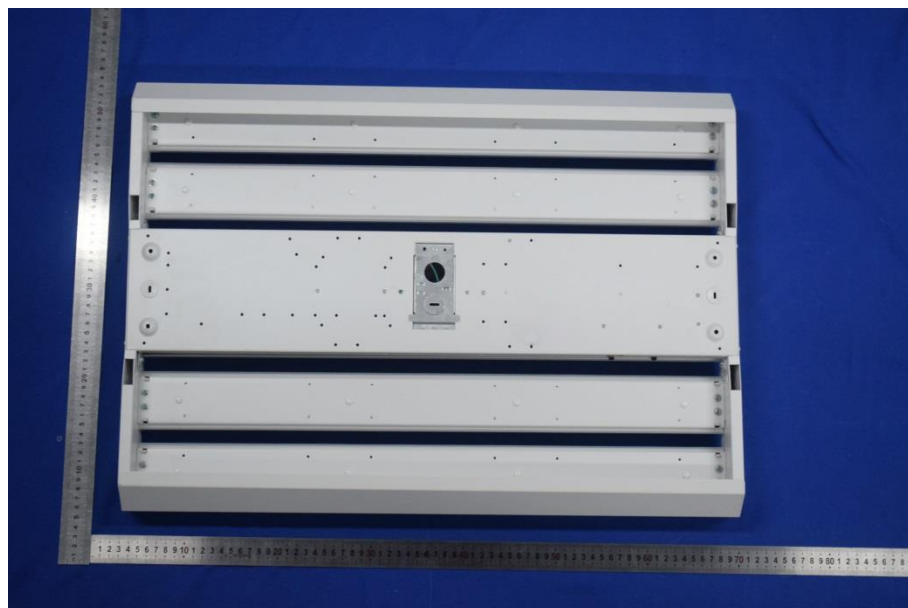
Model Number:	RENO-LHB2-DV-MV-MCCT-R2	
Report Type:	Electrical, Photometric and ISTMT tests according to the following standards and show the compliance to DLC Program SSL Technical Requirements V5.1	
Standards:	ANSI/IES LM-79-19: Approved Method: Optical and Electrical Measurements of Solid-State Lighting 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:	Ezer Pan	Ezer Pan
Report Number:	KS2240320-14352E-EE-1	
Sample Size:	1 test samples were in good condition and received on 2024-03-20, and used for testing. The Product is Color Tunable and field-adjustable light output, all tests are conducted at the maximum light output and the least efficient white light setting.	
Test Date:	2024-03-27 to 2024-03-28	
Report Date:	2024-04-18	
Approved by:	Blake Zhang / EE Engineer	
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.

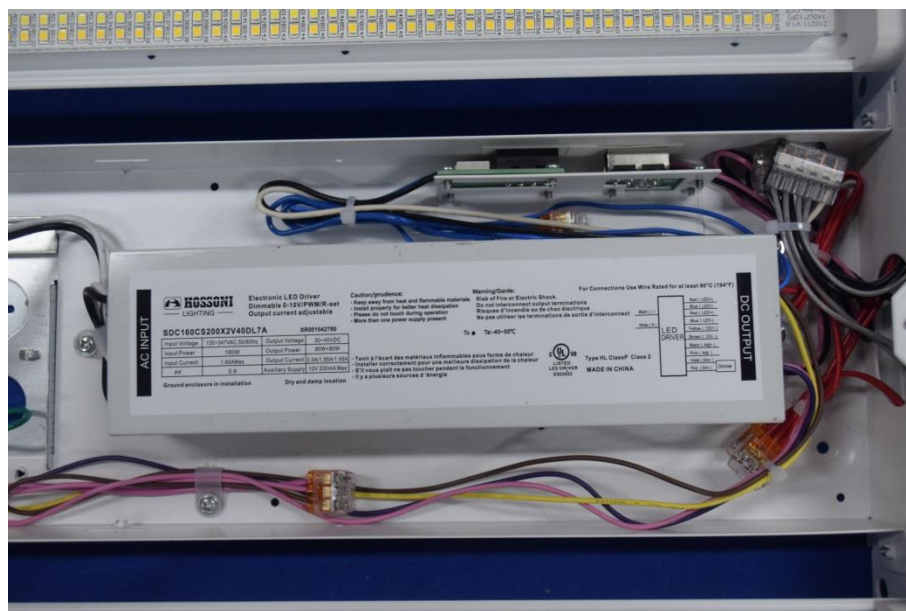
1. Product Description and Rating[#]

Test Model	Primary Use	Rated Voltage	Power(W)	Light Output(lm)	Efficacy (lm/W)	CCT(K)	LED Model	Driver Model	Test Item
RENO-LHB2-DV-MV-MCCT-R2	High-Bay Luminaires for Commercial and Industrial Buildings	120-347V AC 50/60Hz	140	23940	171	3500	L128-xx80RA3500xxx	SDC160CS200X2V40DL7A	All
				24780	177	4000			
				24080	172	5000			
			155	25885	167	3500			
				27125	175	4000			
				26040	168	5000			
			175	28560	163.2	3500			
				30275	173	4000			
				28700	164	5000			

2. Product Photo



3. Driver Photo



4. Test Result

Test power and CCT: <u>175W 3500K (Input Control Signal Applied: 0%)</u>						
Test Condition: Method: <u>Integrating Sphere System</u> ; Orientation: <u>Downward</u> ; Test Voltage: <u>120.0V 60Hz</u> ; Housing: <u>None</u> . Driver model: <u>SDC160CS200X2V40DL7A</u>						
Test Item		Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion	
Light Output(lm) ^{△△}		28561	≥10000	≥9000	Pass	
Power(W) ^{△△}		173.1	None.	None.	N/A	
Total Efficacy(lm/W) ^{△△}		165	≥135	≥130.95	Pass	
CCT(K) ^{△△}		3362	3220~3710	No tolerances	Pass	
Duv ^{△△}		0.00052	-0.0055~0.0065	No tolerances	Pass	
IES R _r ^{△△}		82	70	69	Pass	
IES R _g ^{△△}		100	89	88	Pass	
IES R _{cs,h1} ^{△△}		-10%	-18%~23%	-19%~22%	Pass	
R _a ^{△△}		83	≥70	≥69	Pass	
R _g ^{△△}		29	≥-40	≥-41	Pass	
Test Condition: Method: <u>Goniophotometer</u> ; Orientation: <u>Downward</u> ; Test Voltage: <u>120.0V 60Hz</u> ; Housing: <u>None</u> . Driver model: <u>SDC160CS200X2V40DL7A</u>						
Test Item		Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion	
Light Output(lm) [△]		28565.7	≥10000	≥9000	Pass	
Power(W) [△]		172.59	None.	None.	N/A	
Total Efficacy(lm/W) [△]		165.51	≥135	≥130.95	Pass	
Zonal Lumen Distribution(20-50°) [△]		49.71%	20-50°≥30%	20-50°≥20%	Pass	
Power Factor [△]		0.9975	≥0.9	≥0.87	Pass	
THDi [△]		5.62%	≤20%	≤25%	Pass	
Test Condition: Test Voltage: <u>120.0V 60Hz</u> ; Housing: <u>None</u> . Driver model: <u>SDC160CS200X2V40DL7A</u>						
Test Item		Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion	
TMP _{LED1} (°C) ^{△△}		61.6	≤115	With tolerance of ≤ 1.1°C or 0.4%, whichever is greater due to thermocouple tolerance	Pass	
TMP _{LED2} (°C) ^{△△}		60.9	≤115	With tolerance of ≤ 1.1°C or 0.4%, whichever is greater due to thermocouple tolerance	Pass	
TMP _c (°C) ^{△△}		57.8	≤90	With tolerance of ≤ 1.1°C or 0.4%, whichever is greater due to thermocouple tolerance	Pass	
Drive Current/Individual LED source(mA) ^{△△}		84.2	≤150	With +5% Tolerance	Pass	
L ₉₀ Lumen Maintenance Life (Hours) ^{△△}		51000	≥36000	None.	Pass	
Color Maintenance ^{△△}		0.002	≤0.007	≤0.0074	Pass	
Test Condition: Method: <u>Integrating THDi</u> 、 <u>PF Test</u> ; Orientation: <u>Downward</u> ;						
Test Voltage		Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
347	Power Factor ^{△△}	0.9569	≥0.9	≥0.87	Pass	
347	THDi ^{△△}	6.32%	≤20%	≤25%	Pass	
120	Power Factor ^{△△}	0.9977	≥0.9	≥0.87	Pass	
120	THDi ^{△△}	5.77%	≤20%	≤25%	Pass	
277	Power Factor ^{△△}	0.9776	≥0.9	≥0.87	Pass	
277	THDi ^{△△}	5.56%	≤20%	≤25%	Pass	

Note:

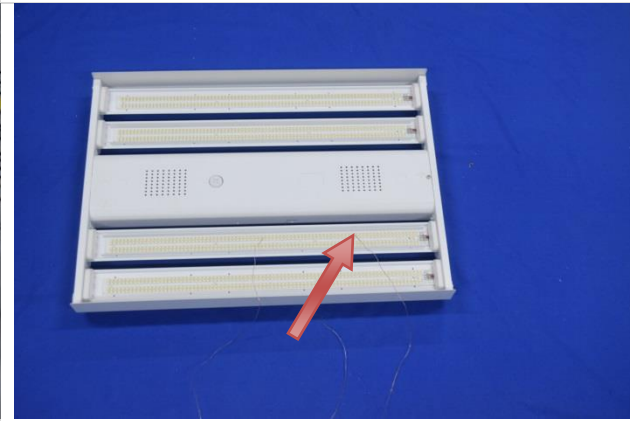
1. The test results were measured directly from the test equipment.
2. The DLC requirements were listed according to DLC Technical Requirements V5.1.
3. The conclusion is only for information. When determining the compliance of the result, tolerances and/or allowances may be applied to the measured value.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

Test power and CCT: 175W 3500K (Input Control Signal Applied: 0%)

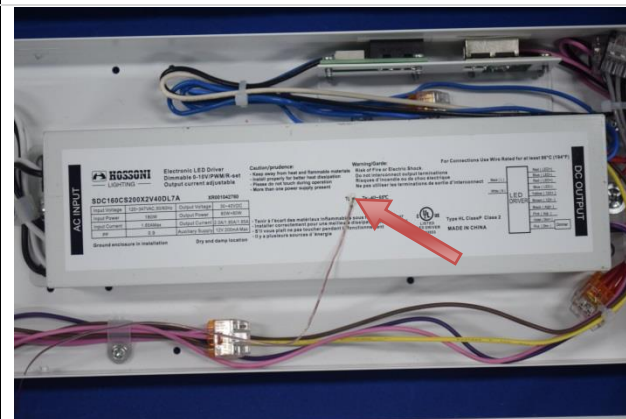
Temperature measurement point on TMP_{LED#1}



Temperature measurement point on TMP_{LED#2}



Driver Case Measurement Point T_c



[Integrating Sphere System]

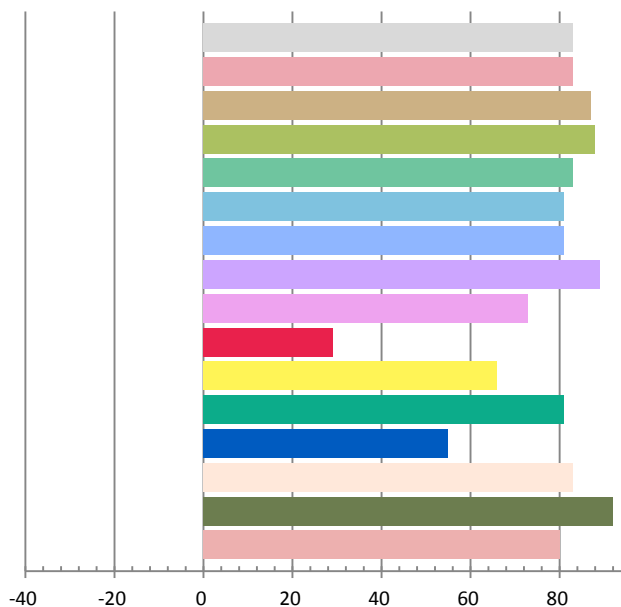
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	1.445	173.1	0.9977	28561	165

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
81.4300	3362	0.00052	0.4139	0.3961	0.2391	0.5147

Color Rendering Index

Ra 83.0			
R1 83	R2 87	R3 88	R4 83
R5 81	R6 81	R7 89	R8 73
R9 29	R10 66	R11 81	R12 55
R13 83	R14 92	R15 80	



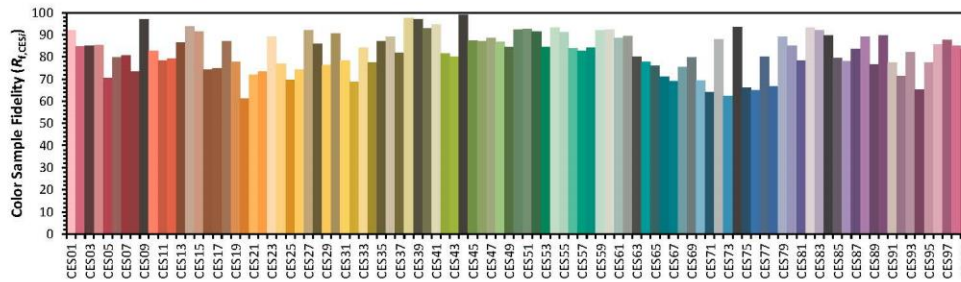
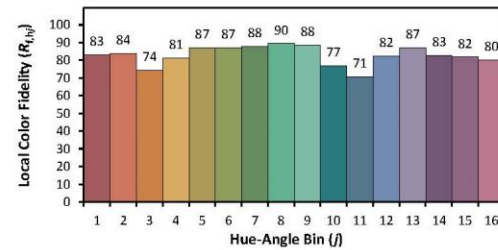
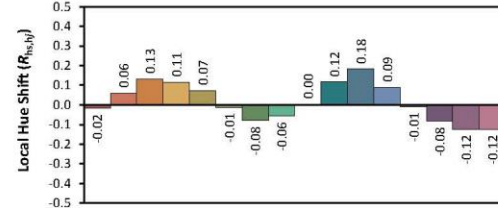
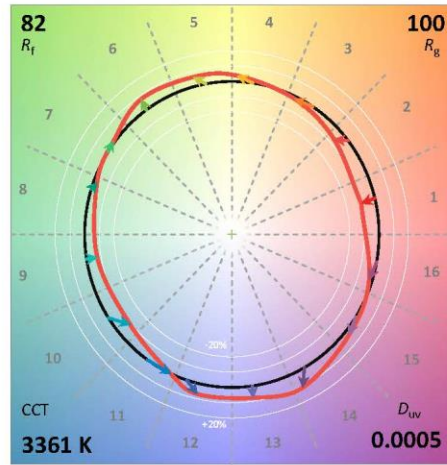
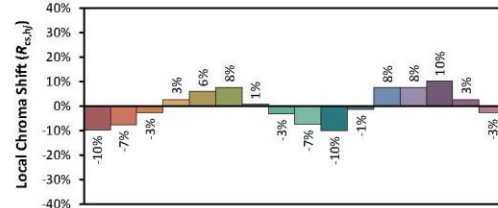
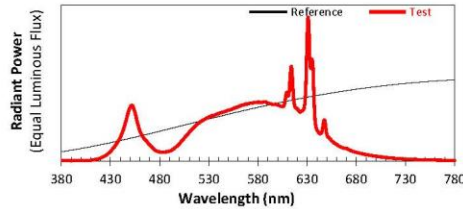
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: RENO LED LIGHTING INC.

Date: 2024/3/28

Model: RENO-LHB2-DV-MV-MOCT-R2



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

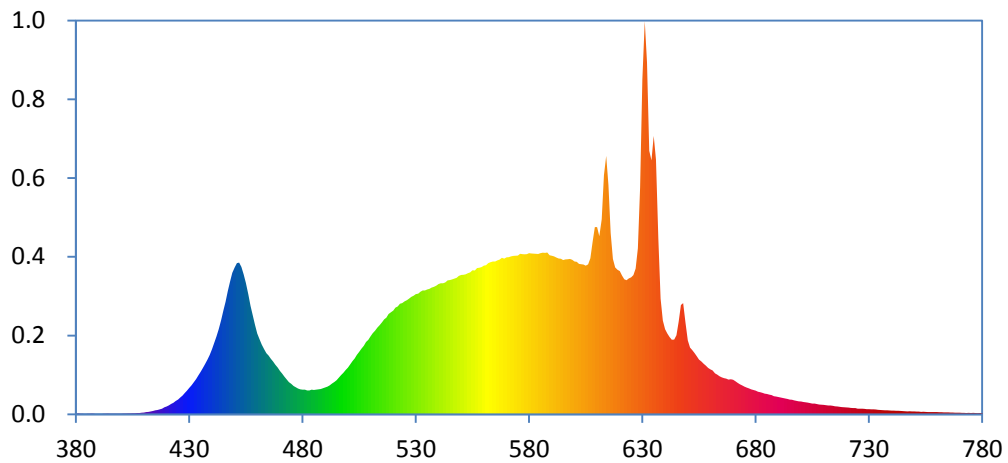
x 0.4139
 y 0.3959
 u' 0.2391
 v' 0.5147

CIE 13.3-1995
(CRI)

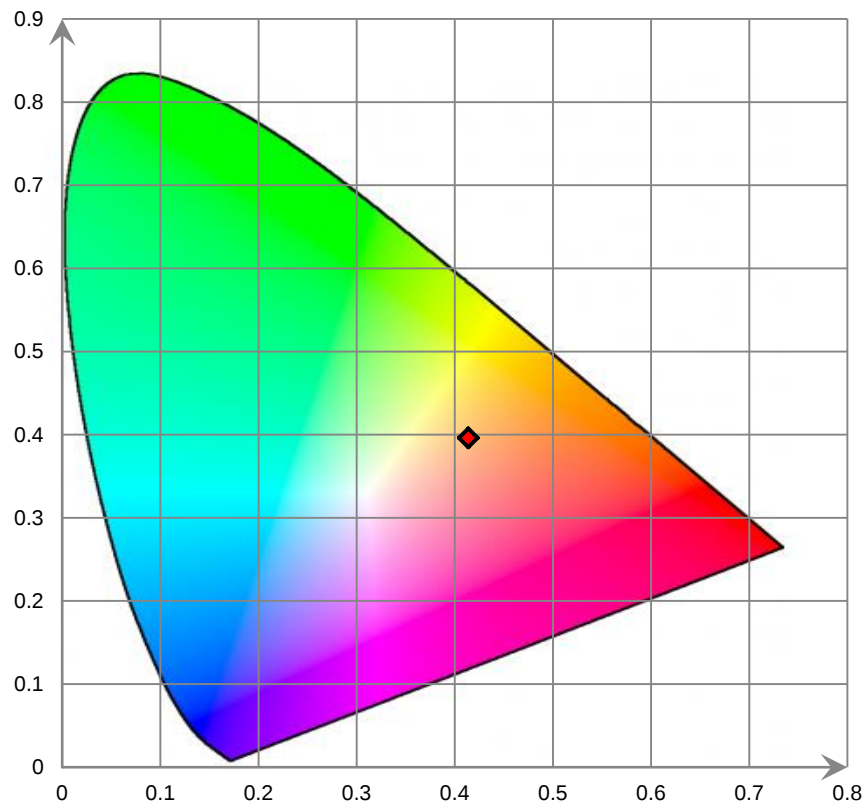
R_a 83
 R_g 30

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

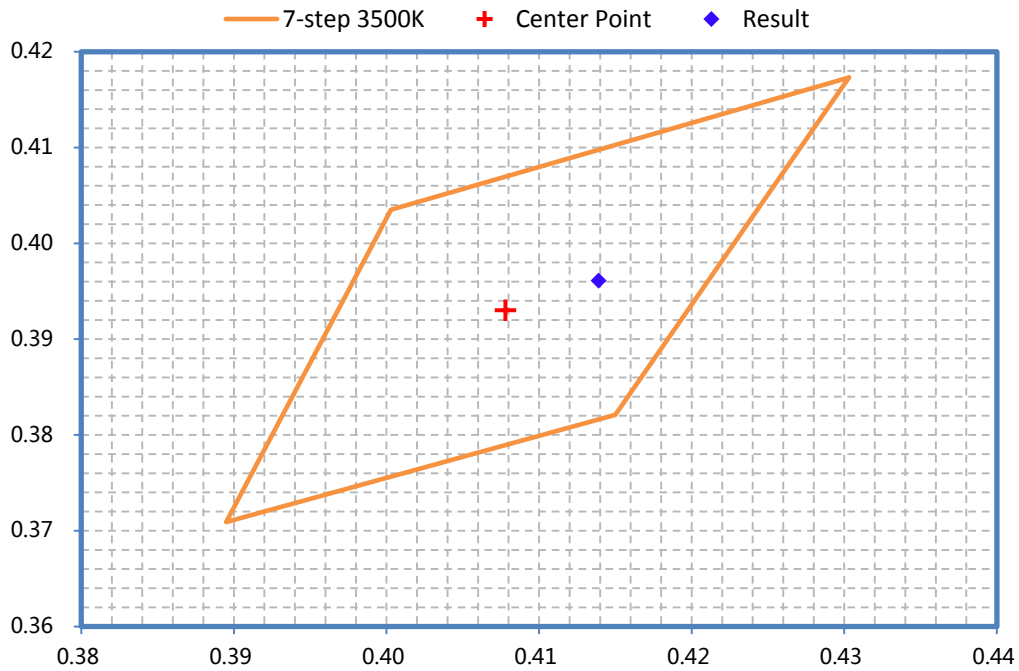
Relative Spectral Power Distribution



CIE 1931 x y Chromaticity Diagram



ANSI C78.377-2017 Chromaticity Quadrangles



[Goniophotometer System]

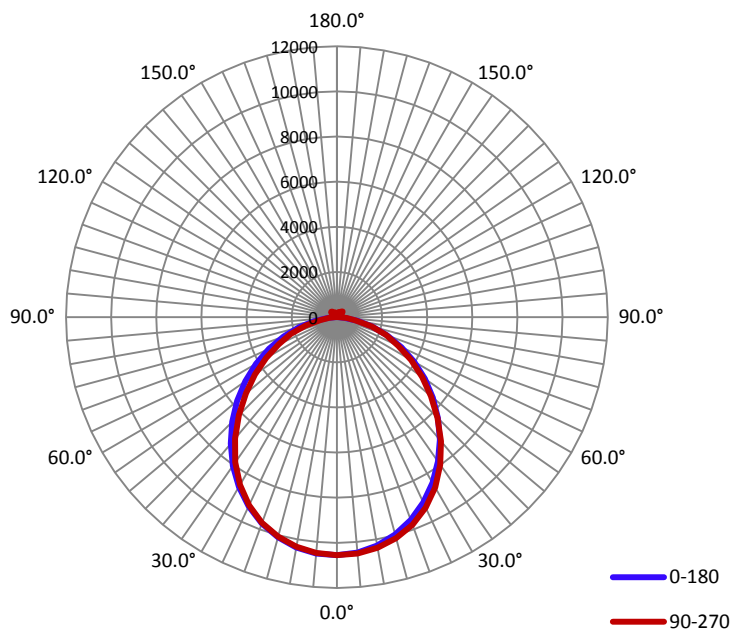
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	1.4418	172.59	0.9975

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
28565.7	165.51	10554.0	1.23	1.21

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	104.7	105.0	100.9	104.9	103.9
Field Angle (10% I _{max}):	158.6	159.0	155.5	158.8	158.0

Luminous Intensity (cd) Distribution Data

$\begin{matrix} C \\ \backslash \\ Y \end{matrix}$	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	10547	10547	10547	10547	10547	10547	10547	10547
5.0°	10470	10473	10485	10498	10511	10516	10517	10517
10.0°	10275	10290	10319	10347	10374	10385	10384	10371
15.0°	9973	9999	10053	10099	10137	10150	10143	10120
20.0°	9565	9607	9682	9749	9791	9812	9799	9762
25.0°	9061	9120	9221	9274	9309	9350	9358	9300
30.0°	8474	8554	8664	8686	8710	8767	8817	8755
35.0°	7812	7915	8010	7990	7987	8073	8172	8130
40.0°	7094	7225	7286	7204	7173	7287	7450	7446
45.0°	6336	6491	6499	6358	6308	6442	6661	6710
50.0°	5553	5724	5677	5494	5440	5571	5830	5936
55.0°	4754	4930	4839	4654	4613	4722	4977	5129
60.0°	3955	4127	4002	3847	3798	3906	4123	4306
65.0°	3161	3326	3193	3032	2998	3080	3294	3482
70.0°	2376	2536	2395	2315	2323	2354	2477	2664
75.0°	1618	1762	1666	1651	1608	1679	1728	1860
80.0°	919	1032	1003	847	820	861	1040	1100
85.0°	343	431	430	440	449	449	450	473
90.0°	44	84	108	73	57	69	110	91
95.0°	18	20	23	19	15	19	23	21
100.0°	30	46	27	23	24	24	28	48
105.0°	42	103	69	54	46	55	74	110
110.0°	54	151	104	93	94	94	107	156
115.0°	66	162	160	129	116	130	167	166
120.0°	79	160	234	185	181	188	243	162
125.0°	90	157	277	255	230	260	282	162
130.0°	101	164	265	330	319	333	269	169
135.0°	111	178	249	329	357	333	248	183
140.0°	122	178	231	299	327	301	233	181
145.0°	132	178	223	273	293	272	227	182
150.0°	140	176	229	253	266	254	233	181
155.0°	147	172	221	247	252	248	219	178
160.0°	148	163	196	234	246	231	197	169
165.0°	140	148	165	194	207	180	168	152
170.0°	127	131	134	143	143	139	139	131
175.0°	122	122	118	105	111	122	119	114
180.0°	128	126	125	134	159	144	126	126

Luminous Intensity (cd) Distribution Data (cont.)

$\begin{matrix} C \\ \backslash \\ Y \end{matrix}$	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	10547	10547	10547	10547	10547	10547	10547	10547
5.0°	10514	10507	10499	10493	10487	10479	10468	10463
10.0°	10363	10354	10350	10338	10327	10306	10284	10269
15.0°	10096	10091	10093	10081	10064	10034	9998	9968
20.0°	9725	9726	9733	9725	9699	9661	9615	9568
25.0°	9250	9262	9281	9249	9201	9173	9139	9074
30.0°	8683	8709	8729	8653	8586	8569	8572	8495
35.0°	8035	8077	8078	7951	7852	7865	7911	7852
40.0°	7318	7388	7351	7148	7018	7063	7180	7158
45.0°	6561	6654	6555	6286	6134	6203	6391	6423
50.0°	5766	5876	5717	5405	5260	5328	5560	5656
55.0°	4954	5071	4857	4558	4433	4489	4715	4865
60.0°	4136	4251	3999	3741	3619	3680	3873	4064
65.0°	3316	3425	3174	2926	2841	2871	3066	3262
70.0°	2508	2608	2361	2225	2184	2181	2270	2473
75.0°	1723	1806	1637	1526	1430	1488	1576	1701
80.0°	1004	1066	948	767	746	749	893	990
85.0°	384	433	399	387	350	372	377	390
90.0°	26	82	89	28	64	28	80	72
95.0°	17	21	23	19	18	19	22	20
100.0°	29	55	35	25	26	25	35	46
105.0°	41	115	76	64	58	63	69	100
110.0°	54	161	120	97	97	95	102	141
115.0°	67	167	170	144	123	133	161	149
120.0°	80	161	252	191	178	185	237	145
125.0°	91	159	283	272	248	268	263	147
130.0°	101	167	269	340	335	332	250	155
135.0°	111	176	245	322	346	313	232	163
140.0°	119	172	225	289	315	285	219	168
145.0°	127	165	217	254	276	257	214	169
150.0°	133	156	211	233	250	241	219	170
155.0°	139	149	188	228	238	235	217	171
160.0°	142	143	167	199	220	222	204	164
165.0°	136	137	145	162	175	187	169	146
170.0°	125	125	123	132	132	131	129	123
175.0°	118	118	108	113	118	108	102	112
180.0°	126	126	124	122	135	139	136	124

Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	251.5	0.88	0-5	251.5	0.88
5-10	745.1	2.61	0-10	996.6	3.49
10-15	1210.3	4.24	0-15	2206.9	7.73
15-20	1629.3	5.70	0-20	3836.3	13.43
20-25	1985.3	6.95	0-25	5821.6	20.38
25-30	2262.5	7.92	0-30	8084.1	28.30
30-35	2449.2	8.57	0-35	10533.4	36.87
35-40	2538.6	8.89	0-40	13072.0	45.76
40-45	2531.1	8.86	0-45	15603.2	54.62
45-50	2433.2	8.52	0-50	18036.4	63.14
50-55	2258.4	7.91	0-55	20294.8	71.05
55-60	2020.3	7.07	0-60	22315.1	78.12
60-65	1727.4	6.05	0-65	24042.4	84.17
65-70	1400.4	4.90	0-70	25442.8	89.07
70-75	1056.5	3.70	0-75	26499.3	92.77
75-80	686.4	2.40	0-80	27185.8	95.17
80-85	354.0	1.24	0-85	27539.7	96.41
85-90	114.7	0.40	0-90	27654.4	96.81
90-95	17.8	0.06	0-95	27672.2	96.87
95-100	13.6	0.05	0-100	27685.8	96.92
100-105	26.8	0.09	0-105	27712.5	97.01
105-110	47.1	0.17	0-110	27759.6	97.18
110-115	61.8	0.21	0-115	27821.4	97.39
115-120	77.2	0.27	0-120	27898.6	97.66
120-125	90.9	0.32	0-125	27989.6	97.98
125-130	100.4	0.35	0-130	28089.9	98.33
130-135	99.3	0.35	0-135	28189.3	98.68
135-140	87.6	0.31	0-140	28276.8	98.99
140-145	74.2	0.26	0-145	28351.0	99.25
145-150	62.6	0.22	0-150	28413.6	99.47
150-155	52.1	0.18	0-155	28465.7	99.65
155-160	41.5	0.15	0-160	28507.3	99.80
160-165	29.4	0.10	0-165	28536.6	99.90
165-170	17.5	0.06	0-170	28554.2	99.96
170-175	8.7	0.03	0-175	28562.9	99.99
175-180	2.8	0.01	0-180	28565.7	100.00

Test power and CCT: <u>175W 4000K (Input Control Signal Applied: 50%)</u>					
Test Condition: Method: <u>Integrating Sphere System</u> ; Orientation: <u>Downward</u> ; Test Voltage: <u>120.0V 60Hz</u> ; Housing: <u>None</u> . Driver model: <u>SDC160CS200X2V40DL7A</u>					
Test Item		Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
Light Output(lm) ^{△△}		29406	≥10000	≥9000	Pass
Power(W) ^{△△}		168.6	None.	None.	N/A
Total Efficacy(lm/W) ^{△△}		174.42	≥135	≥130.95	Pass
CCT(K) ^{△△}		3904	3710~4260	No tolerances	Pass
Duv ^{△△}		0.00000135	-0.005~0.007	No tolerances	Pass
IES R _r ^{△△}		83	70	69	Pass
IES R _g ^{△△}		100	89	88	Pass
IES R _{cs,h1} ^{△△}		-9%	-18%~23%	-19%~22%	Pass
R _a ^{△△}		84.1	≥70	≥69	Pass
R ₉ ^{△△}		38	≥-40	≥-41	Pass
Test Condition: Method: <u>Integrating THDi、PF Test</u> ; Orientation: <u>Downward</u> ;					
Test Voltage	Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
347	Power Factor ^{△△}	0.9574	≥0.9	≥0.87	Pass
347	THDi ^{△△}	6.44%	≤20%	≤25%	Pass
120	Power Factor ^{△△}	0.9978	≥0.9	≥0.87	Pass
120	THDi ^{△△}	5.84%	≤20%	≤25%	Pass
277	Power Factor ^{△△}	0.9783	≥0.9	≥0.87	Pass
277	THDi ^{△△}	5.61%	≤20%	≤25%	Pass

Note:

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

[Integrating Sphere System]

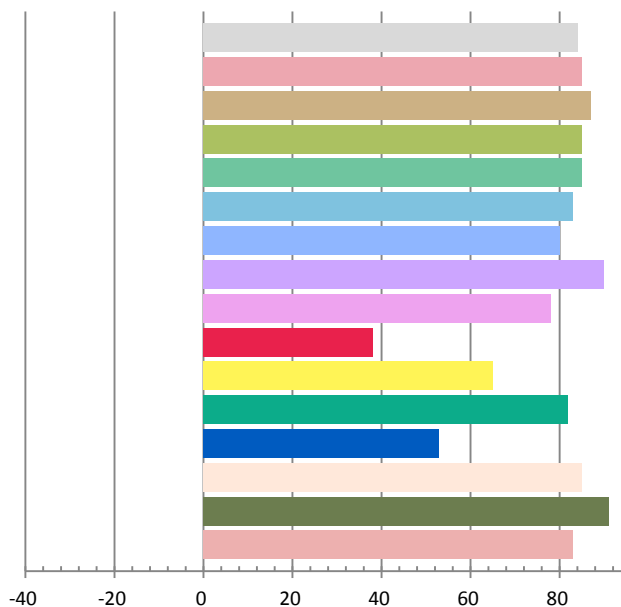
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	1.408	168.6	0.9978	29406	174.42

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
85.6440	3904	0.00000135	0.3848	0.3794	0.2269	0.5034

Color Rendering Index

Ra			
84.1			
R1	R2	R3	R4
85	87	85	85
R5	R6	R7	R8
83	80	90	78
R9	R10	R11	R12
38	65	82	53
R13	R14	R15	
85	91	83	



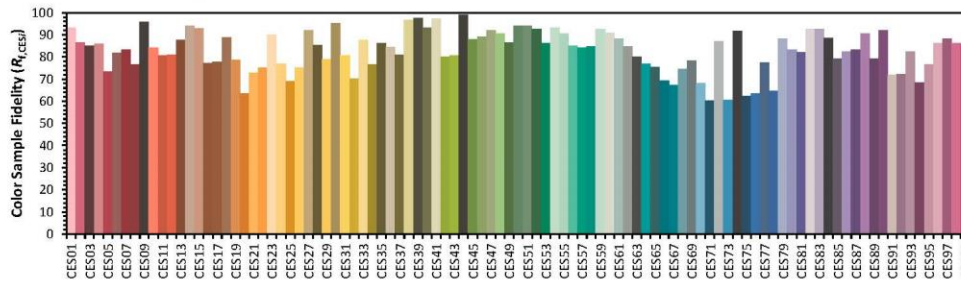
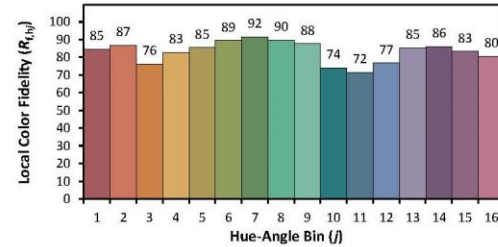
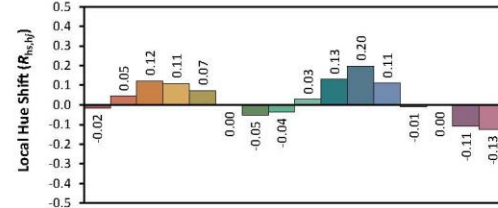
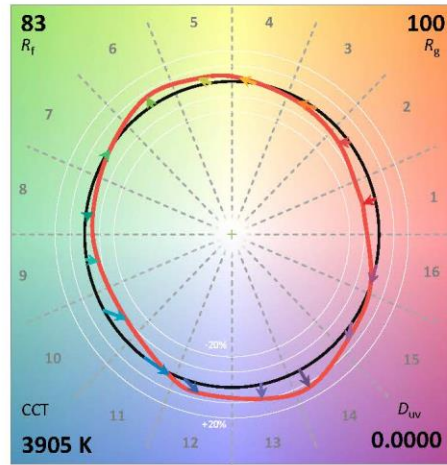
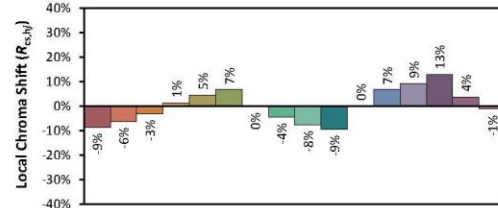
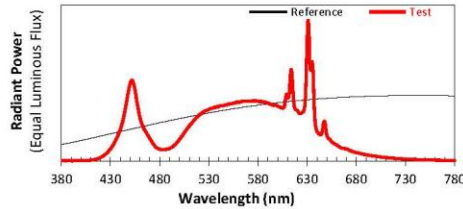
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: RENO LED LIGHTING INC.

Date: 2024/3/28

Model: RENO-LHB2-DV-MV-MOCT-R2



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

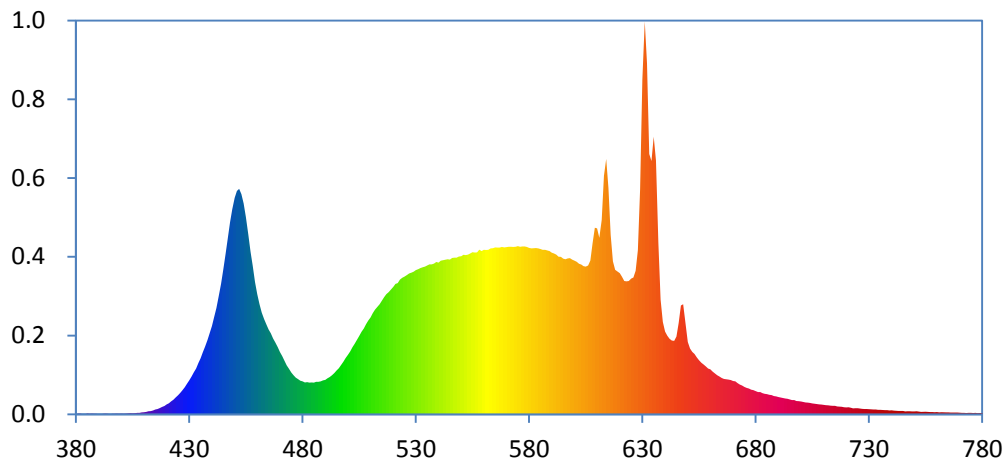
x 0.3847
 y 0.3793
 u' 0.2269
 v' 0.5033

CIE 13.3-1995
(CRI)

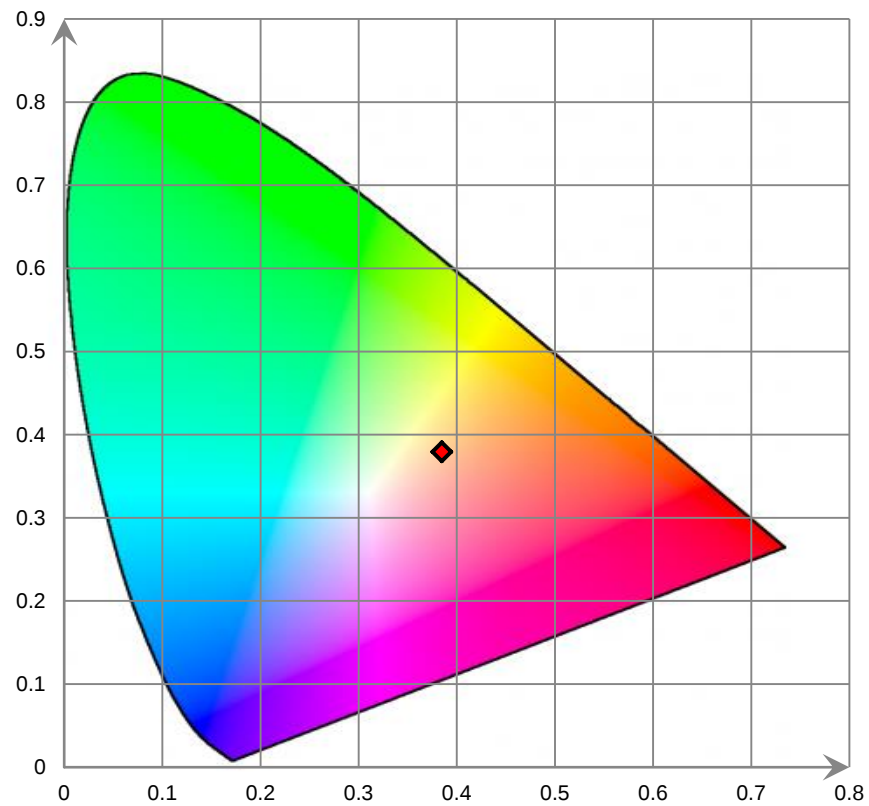
R_a 84
 R_g 38

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

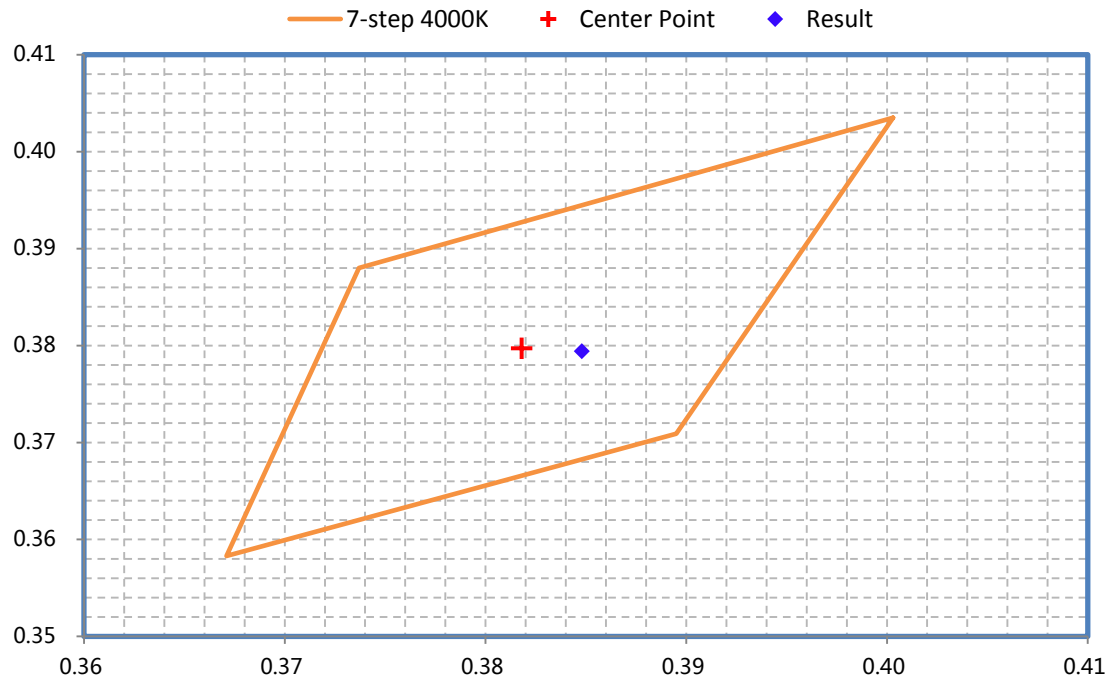
Relative Spectral Power Distribution



CIE 1931 x y Chromaticity Diagram



ANSI C78.377-2017 Chromaticity Quadrangles



Test power and CCT: <u>175W 5000K (Input Control Signal Applied: 100%)</u>						
Test Condition: Method: <u>Integrating Sphere System</u> ; Orientation: <u>Downward</u> ; Test Voltage: <u>120.1V 60Hz</u> ; Housing: <u>None</u> ; Driver model: <u>SDC160CS200X2V40DL7A</u>						
Test Item		Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion	
Light Output(lm) ^{△△}		29017	≥10000	≥9000	Pass	
Power(W) ^{△△}		173.8	None.	None.	N/A	
Total Efficacy(lm/W) ^{△△}		166.99	≥135	≥130.95	Pass	
CCT(K) ^{△△}		4759	4746~5312	No tolerances	Pass	
Duv ^{△△}		0.00059	-0.004~0.008	No tolerances	Pass	
IES R _r ^{△△}		81	70	69	Pass	
IES R _g ^{△△}		100	89	88	Pass	
IES R _{cs,h1} ^{△△}		-9%	-18%~23%	-19%~22%	Pass	
R _a ^{△△}		83.2	≥70	≥69	Pass	
R ₉ ^{△△}		40	≥-40	≥-41	Pass	
Test Condition: Method: <u>Integrating THDi、PF Test</u> ; Orientation: <u>Downward</u> ;						
Test Voltage		Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
347	Power Factor ^{△△}		0.9577	≥0.9	≥0.87	Pass
347	THDi ^{△△}		6.54%	≤20%	≤25%	Pass
120	Power Factor ^{△△}		0.9977	≥0.9	≥0.87	Pass
120	THDi ^{△△}		5.93%	≤20%	≤25%	Pass
277	Power Factor ^{△△}		0.9791	≥0.9	≥0.87	Pass
277	THDi ^{△△}		5.67%	≤20%	≤25%	Pass

Note:

- The test results were measured directly from the test equipment.
- The DLC requirements were listed according to DLC Technical Requirements V5.1.
- The conclusion is only for information. When determining the compliance of the result, tolerances and/or allowances may be applied to the measured value.
- [△] Test facility was located at No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.
- ^{△△} Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.

[Integrating Sphere System]

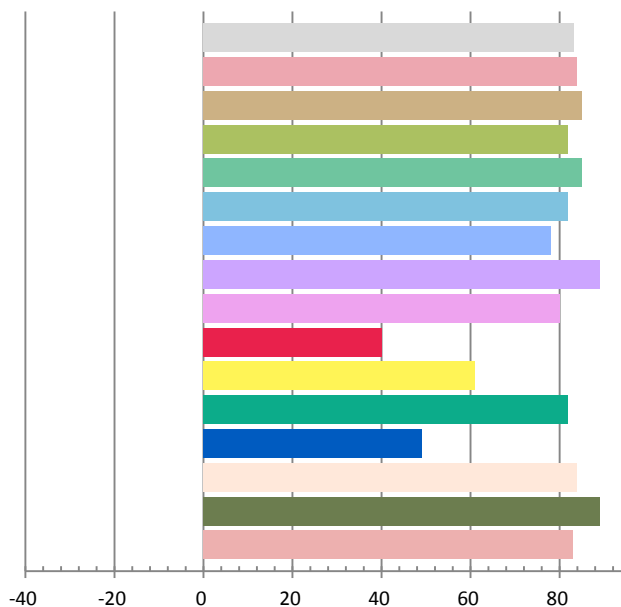
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.1	60	1.451	173.8	0.9977	29017	166.99

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
87.0380	4759	0.00059	0.3524	0.3585	0.2137	0.4891

Color Rendering Index

Ra 83.2			
R1 84	R2 85	R3 82	R4 85
R5 82	R6 78	R7 89	R8 80
R9 40	R10 61	R11 82	R12 49
R13 84	R14 89	R15 83	



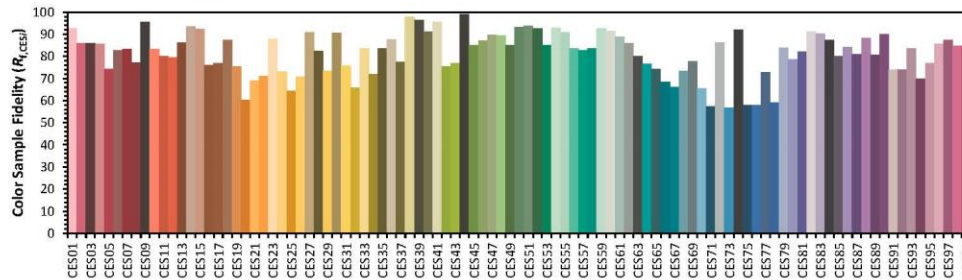
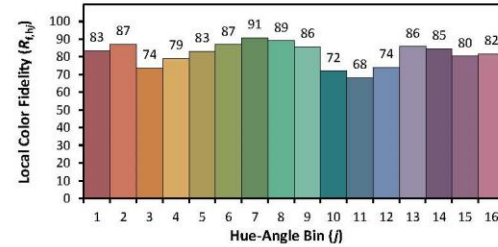
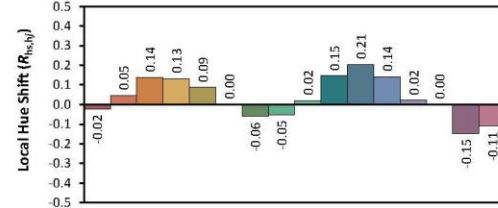
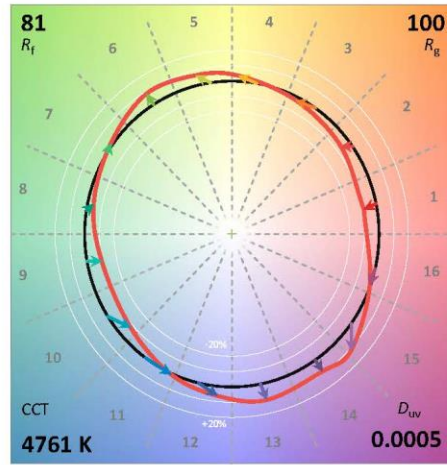
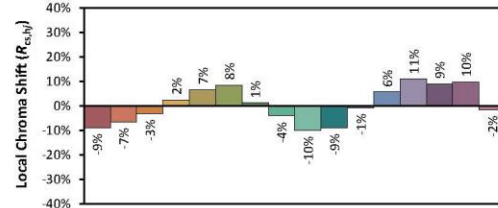
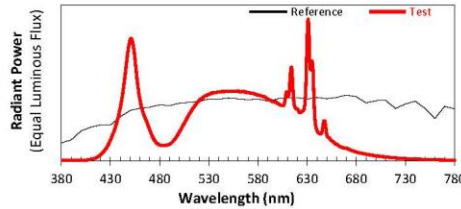
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: RENO LED LIGHTING INC.

Date: 2024/3/28

Model: RENO-LHB2-DV-MV-MOCT-R2



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

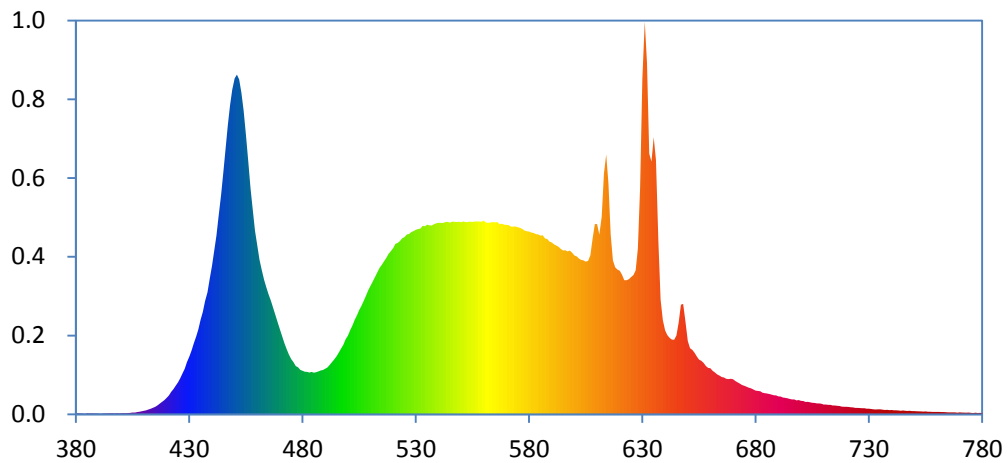
x 0.3523
 y 0.3583
 u' 0.2137
 v' 0.4890

CIE 13.3-1995
(CRI)

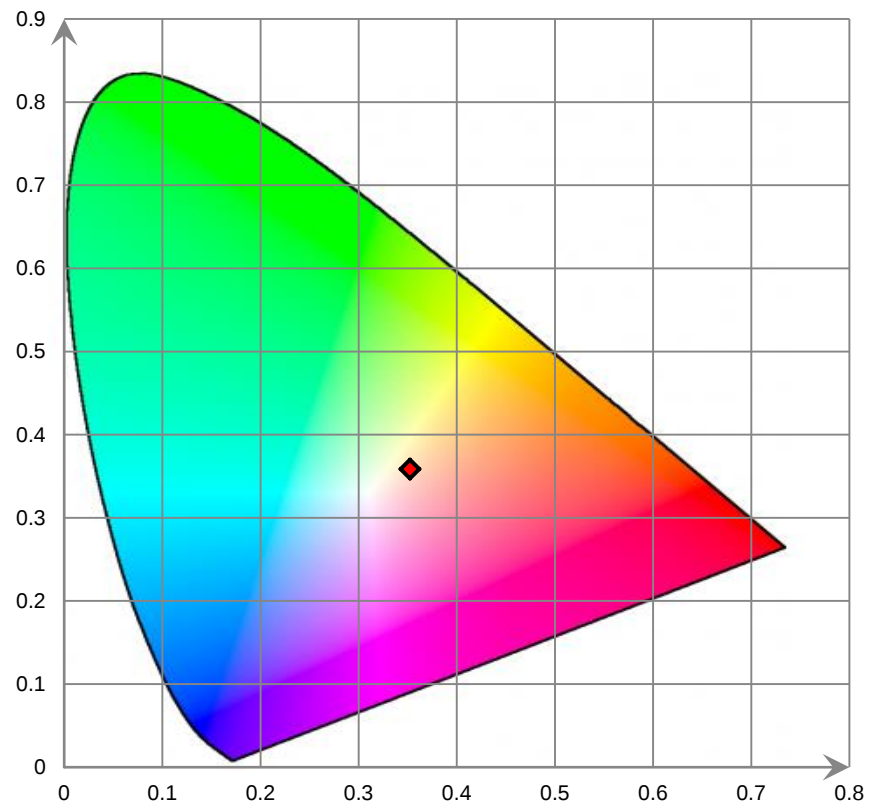
R_a 83
 R_g 40

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

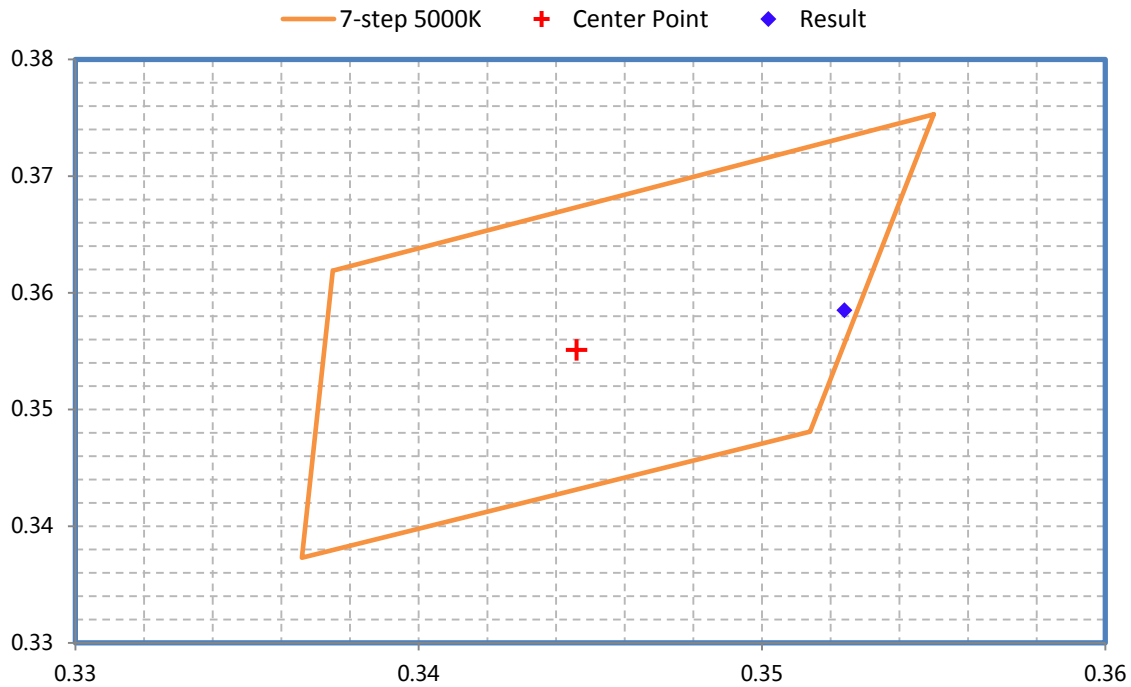
Relative Spectral Power Distribution



CIE 1931 x y Chromaticity Diagram



ANSI C78.377-2017 Chromaticity Quadrangles



Test power and CCT: <u>140W 3500K (Input Control Signal Applied: 0%)</u>						
Test Condition: Method: <u>Integrating Sphere System</u> ; Orientation: <u>Downward</u> ; Test Voltage: <u>120.0V 60Hz</u> ; Housing: <u>None</u> . Driver model: <u>SDC160CS200X2V40DL7A</u>						
Test Item		Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion	
Light Output(lm) ^{△△}		23100	≥10000	≥9000	Pass	
Power(W) ^{△△}		134.4	None.	None.	N/A	
Total Efficacy(lm/W) ^{△△}		171.92	≥135	≥130.95	Pass	
CCT(K) ^{△△}		3361	3220~3710	No tolerances	Pass	
Duv ^{△△}		0.00084	-0.0055~0.0065	No tolerances	Pass	
IES R _r ^{△△}		82	70	69	Pass	
IES R _g ^{△△}		99	89	88	Pass	
IES R _{cs,h1} ^{△△}		-10%	-18%~23%	-19%~22%	Pass	
R _a ^{△△}		83	≥70	≥69	Pass	
R ₉ ^{△△}		29	≥-40	≥-41	Pass	
Test Condition: Method: <u>Goniophotometer</u> ; Orientation: <u>Downward</u> ; Test Voltage: <u>120.0V 60Hz</u> ; Housing: <u>None</u> . Driver model: <u>SDC160CS200X2V40DL7A</u>						
Test Item		Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion	
Light Output(lm) [△]		23107.3	≥10000	≥9000	Pass	
Power(W) [△]		134.1	None.	None.	N/A	
Total Efficacy(lm/W) [△]		172.31	≥135	≥130.95	Pass	
Zonal Lumen Distribution(20-50°) [△]		49.71%	20-50°≥30%	20-50°≥20%	Pass	
Power Factor [△]		0.9965	≥0.9	≥0.87	Pass	
THDi [△]		5.81%	≤20%	≤25%	Pass	
Test Condition: Test Voltage: <u>120.0V 60Hz</u> ; Housing: <u>None</u> . Driver model: <u>SDC160CS200X2V40DL7A</u>						
Test Item		Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion	
TMP _{LED1} (°C) ^{△△}		55.1	≤115	With tolerance of ≤ 1.1°C or 0.4%, whichever is greater due to thermocouple tolerance	Pass	
TMP _{LED2} (°C) ^{△△}		54.7	≤115	With tolerance of ≤ 1.1°C or 0.4%, whichever is greater due to thermocouple tolerance	Pass	
TMP _c (°C) ^{△△}		52.4	≤90	With tolerance of ≤ 1.1°C or 0.4%, whichever is greater due to thermocouple tolerance	Pass	
Drive Current/Individual LED source(mA) ^{△△}		67.7	≤150	With +5% Tolerance	Pass	
L ₉₀ Lumen Maintenance Life (Hours) ^{△△}		51000	≥36000	None.	Pass	
Color Maintenance ^{△△}		0.002	≤0.007	≤0.0074	Pass	
Test Condition: Method: <u>Integrating THDi, PF Test</u> ; Orientation: <u>Downward</u> :						
Test Voltage		Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
347	Power Factor ^{△△}	0.9391	≥0.9	≥0.87	Pass	
347	THDi ^{△△}	7.05%	≤20%	≤25%	Pass	
120	Power Factor ^{△△}	0.9968	≥0.9	≥0.87	Pass	
120	THDi ^{△△}	5.96%	≤20%	≤25%	Pass	
277	Power Factor ^{△△}	0.9689	≥0.9	≥0.87	Pass	
277	THDi ^{△△}	5.12%	≤20%	≤25%	Pass	

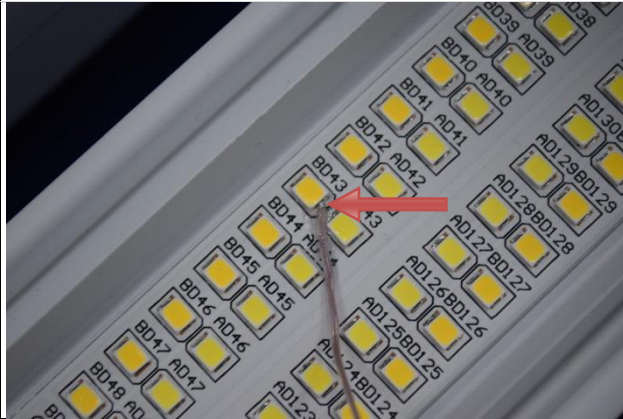
Note:

- The test results were measured directly from the test equipment.
- The DLC requirements were listed according to DLC Technical Requirements V5.1.

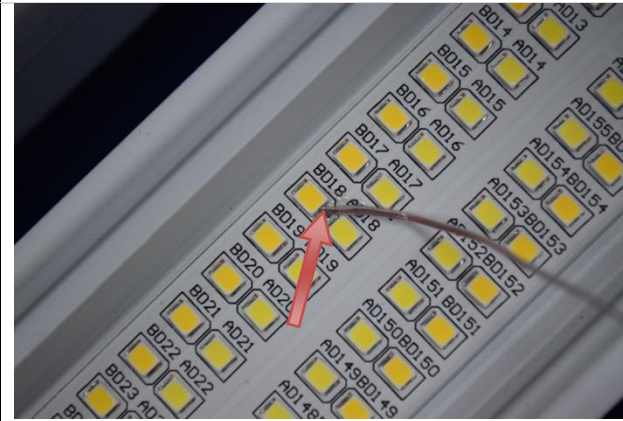
3. The conclusion is only for information. When determining the compliance of the result, tolerances and/or allowances may be applied to the measured value.
4. [△] Test facility was located at No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.
5. ^{△△} Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.

Test power and CCT: 140W 3500K (Input Control Signal Applied: 0%)

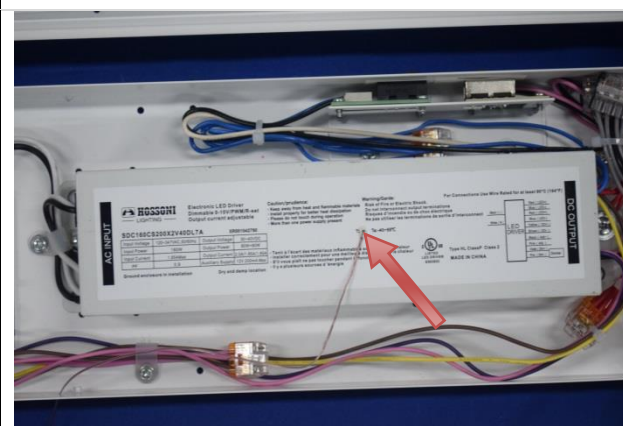
Temperature measurement point on TMP_{LED#1}



Temperature measurement point on TMP_{LED#2}



Driver Case Measurement Point T_c



[Integrating Sphere System]

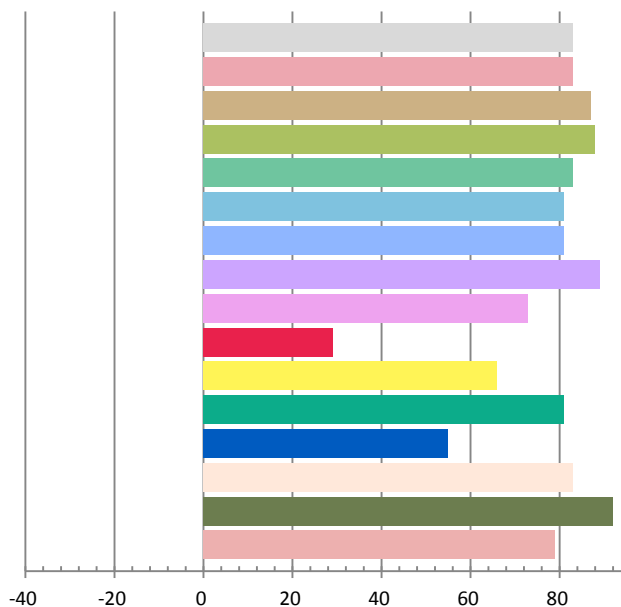
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	1.123	134.4	0.9968	23100	171.92

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
65.7110	3361	0.00084	0.4143	0.3970	0.2390	0.5152

Color Rendering Index

Ra 83.0			
R1 83	R2 87	R3 88	R4 83
R5 81	R6 81	R7 89	R8 73
R9 29	R10 66	R11 81	R12 55
R13 83	R14 92	R15 79	



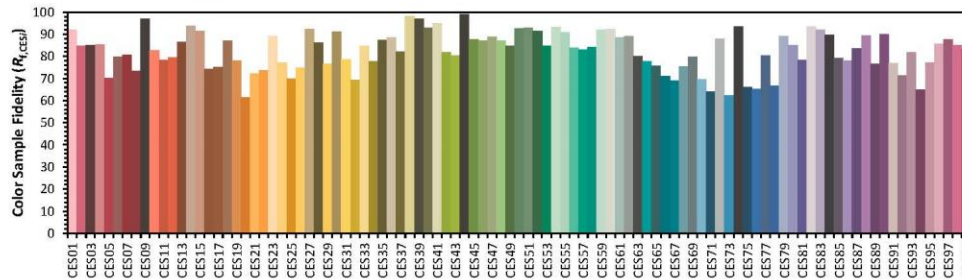
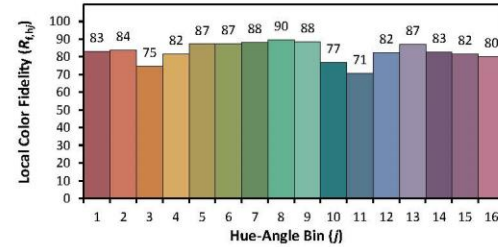
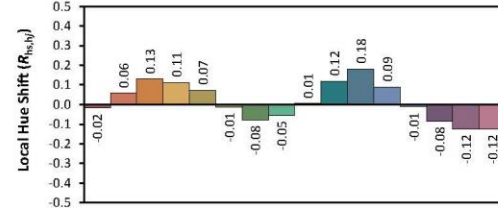
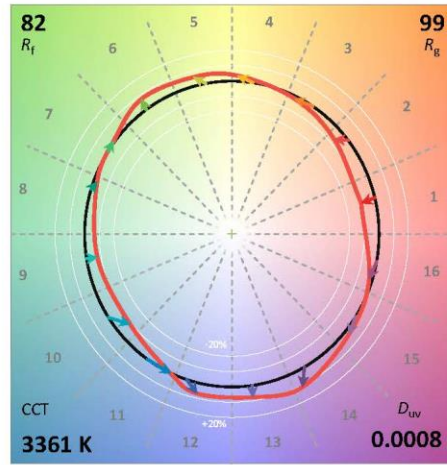
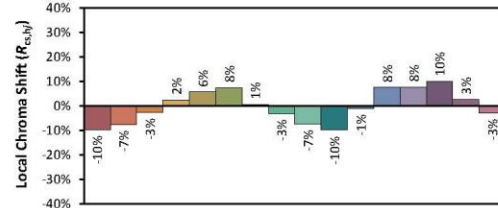
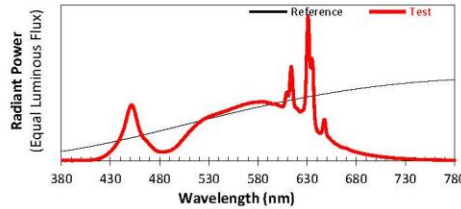
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: RENO LED LIGHTING INC.

Date: 2024/3/28

Model: RENO-LHB2-DV-MV-MOCT-R2



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

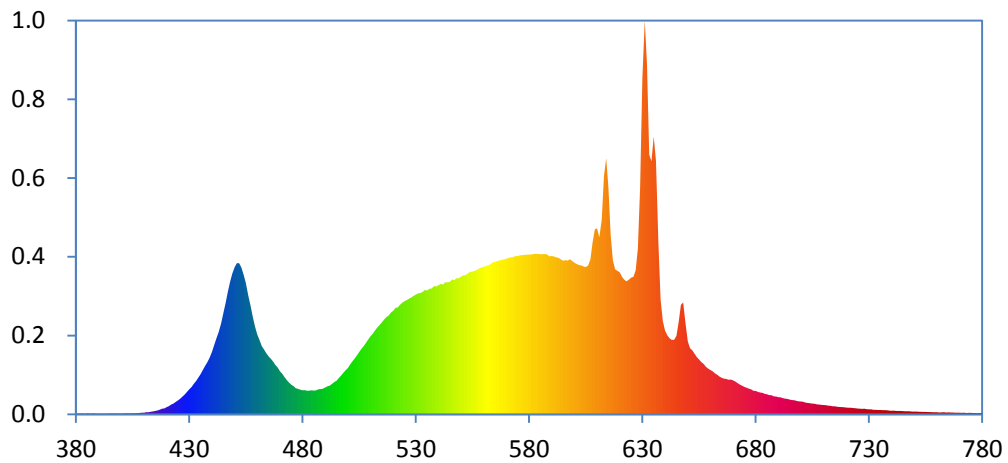
x 0.4143
 y 0.3969
 u' 0.2390
 v' 0.5151

CIE 13.3-1995
(CRI)

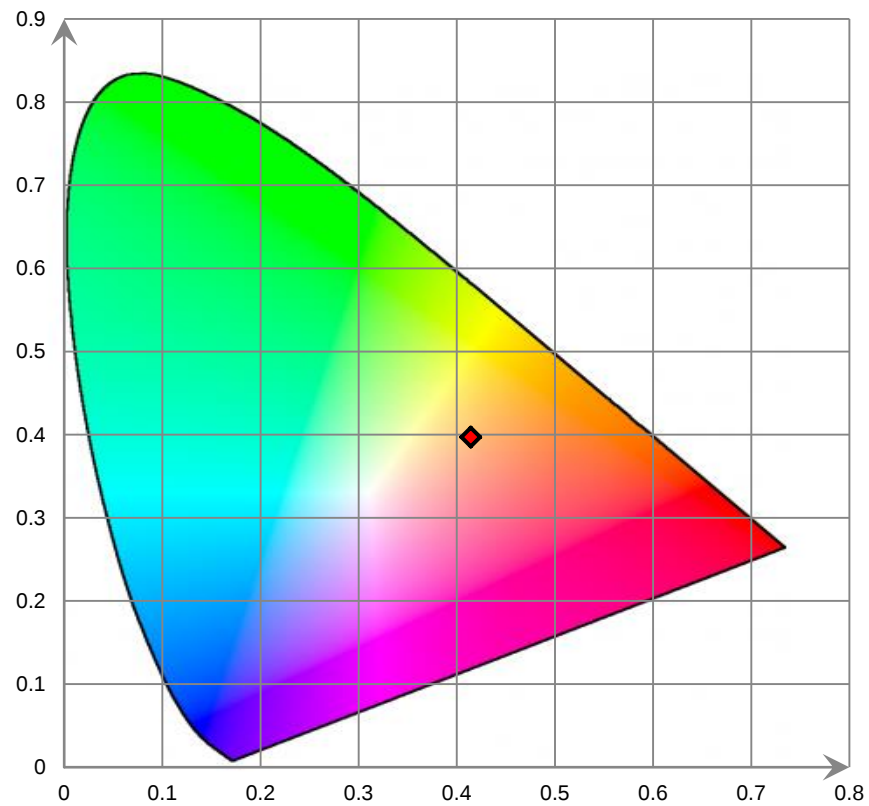
R_a 83
 R_g 29

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

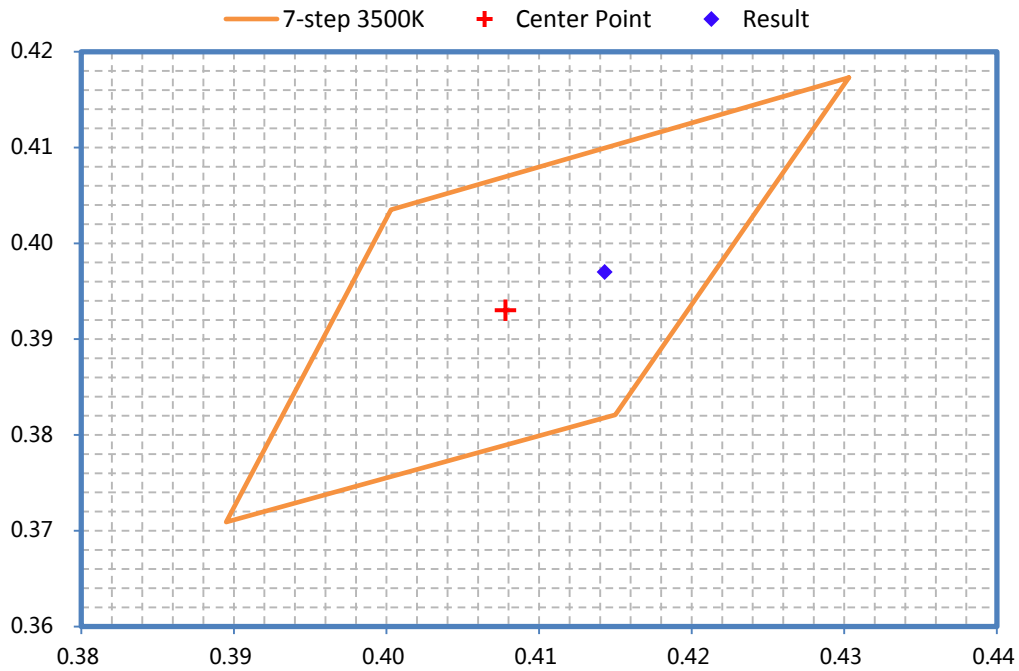
Relative Spectral Power Distribution



CIE 1931 x y Chromaticity Diagram



ANSI C78.377-2017 Chromaticity Quadrangles



[Goniophotometer System]

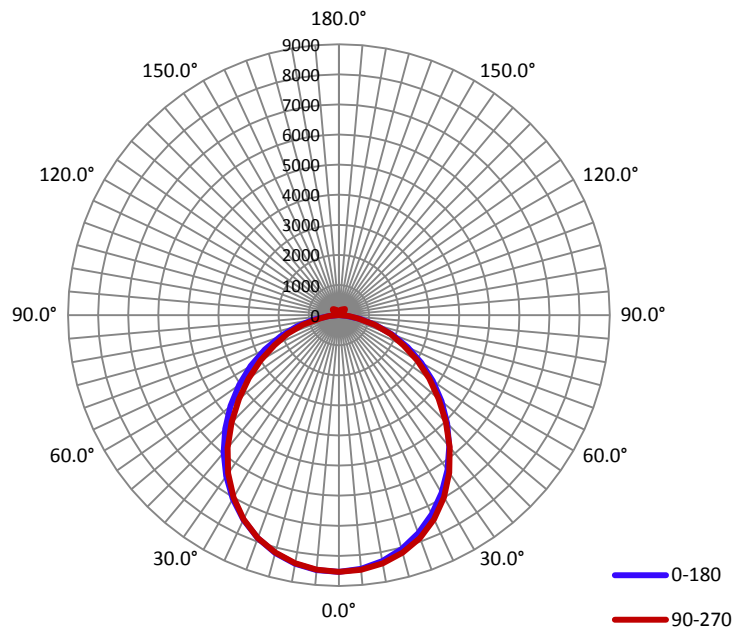
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	1.1211	134.1	0.9965

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
23107.3	172.31	8533.0	1.23	1.22

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	104.8	105.0	100.9	105.0	103.9
Field Angle (10% I _{max}):	158.6	159.0	155.6	158.9	158.0

Luminous Intensity (cd) Distribution Data

$\begin{matrix} C \\ \backslash \\ Y \end{matrix}$	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	8531	8531	8531	8531	8531	8531	8531	8531
5.0°	8462	8466	8475	8484	8493	8500	8499	8499
10.0°	8301	8312	8334	8357	8375	8384	8384	8378
15.0°	8051	8070	8110	8147	8173	8188	8182	8167
20.0°	7714	7748	7804	7853	7884	7904	7895	7871
25.0°	7303	7349	7425	7457	7482	7520	7535	7495
30.0°	6823	6884	6964	6972	6987	7040	7087	7045
35.0°	6288	6367	6433	6404	6398	6474	6562	6538
40.0°	5703	5805	5839	5760	5732	5831	5970	5981
45.0°	5088	5209	5199	5077	5030	5143	5329	5385
50.0°	4454	4584	4533	4378	4332	4438	4654	4752
55.0°	3809	3943	3856	3702	3666	3755	3965	4101
60.0°	3161	3291	3178	3047	3004	3094	3273	3435
65.0°	2520	2644	2528	2393	2367	2430	2607	2767
70.0°	1887	2005	1883	1821	1827	1852	1946	2106
75.0°	1277	1378	1305	1279	1229	1300	1352	1460
80.0°	715	795	758	667	642	679	789	848
85.0°	256	317	321	329	334	335	336	346
90.0°	18	64	77	51	6	48	78	66
95.0°	16	16	18	15	13	15	18	16
100.0°	24	39	25	19	20	20	25	40
105.0°	34	87	58	47	41	48	61	92
110.0°	44	123	91	77	77	77	95	127
115.0°	54	129	131	114	96	116	135	132
120.0°	64	127	194	153	148	154	201	128
125.0°	73	126	224	212	191	216	227	129
130.0°	82	132	212	268	264	270	215	136
135.0°	91	143	200	263	287	266	197	147
140.0°	99	143	186	238	261	239	187	145
145.0°	107	142	180	218	233	218	183	145
150.0°	114	141	186	203	213	204	189	145
155.0°	119	138	177	200	203	200	175	142
160.0°	119	130	156	187	196	184	158	135
165.0°	112	117	131	154	164	142	134	121
170.0°	102	104	107	113	114	111	111	104
175.0°	99	98	95	84	89	99	96	92
180.0°	103	100	100	111	124	115	102	101

Luminous Intensity (cd) Distribution Data (cont.)

$\begin{matrix} C \\ \backslash \\ Y \end{matrix}$	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	8531	8531	8531	8531	8531	8531	8531	8531
5.0°	8507	8505	8502	8495	8489	8483	8473	8469
10.0°	8389	8388	8385	8381	8368	8354	8335	8318
15.0°	8182	8183	8187	8182	8166	8142	8109	8081
20.0°	7882	7891	7902	7899	7878	7849	7804	7765
25.0°	7504	7518	7543	7524	7488	7464	7424	7368
30.0°	7048	7077	7104	7053	6999	6987	6976	6905
35.0°	6526	6570	6583	6492	6416	6421	6446	6389
40.0°	5954	6017	6000	5854	5750	5782	5862	5827
45.0°	5340	5424	5363	5158	5038	5092	5226	5236
50.0°	4698	4799	4686	4445	4328	4383	4557	4619
55.0°	4043	4149	3993	3754	3656	3698	3875	3983
60.0°	3381	3485	3296	3096	2998	3043	3192	3334
65.0°	2718	2818	2628	2429	2357	2387	2536	2685
70.0°	2061	2156	1968	1853	1820	1817	1893	2046
75.0°	1438	1515	1384	1319	1233	1286	1329	1433
80.0°	842	903	823	661	635	644	775	842
85.0°	334	385	352	342	336	333	333	350
90.0°	24	75	83	26	5	26	77	66
95.0°	12	17	19	15	14	15	18	16
100.0°	23	39	25	20	21	20	26	36
105.0°	33	88	61	49	43	48	55	77
110.0°	44	128	92	78	77	76	81	113
115.0°	54	135	133	113	96	105	125	121
120.0°	64	131	198	150	140	145	186	118
125.0°	73	128	229	212	193	211	213	119
130.0°	82	133	219	273	264	267	204	125
135.0°	89	141	201	263	282	255	190	132
140.0°	96	139	184	237	258	234	178	136
145.0°	102	133	175	208	226	210	174	138
150.0°	107	127	171	189	204	196	177	138
155.0°	112	121	152	185	192	190	177	139
160.0°	115	116	136	163	179	182	167	134
165.0°	111	111	118	133	147	155	140	120
170.0°	102	102	100	108	108	108	107	101
175.0°	95	95	87	92	96	88	84	90
180.0°	102	102	98	98	110	117	107	101

Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	203.5	0.88	0-5	203.5	0.88
5-10	602.6	2.61	0-10	806.1	3.49
10-15	979.0	4.24	0-15	1785.1	7.73
15-20	1317.9	5.70	0-20	3102.9	13.43
20-25	1605.7	6.95	0-25	4708.6	20.38
25-30	1829.9	7.92	0-30	6538.5	28.30
30-35	1981.0	8.57	0-35	8519.5	36.87
35-40	2053.5	8.89	0-40	10573.0	45.76
40-45	2047.5	8.86	0-45	12620.5	54.62
45-50	1968.4	8.52	0-50	14588.9	63.14
50-55	1827.1	7.90	0-55	16416.0	71.04
55-60	1634.6	7.08	0-60	18050.6	78.12
60-65	1397.6	6.04	0-65	19448.2	84.16
65-70	1133.0	4.91	0-70	20581.2	89.07
70-75	855.7	3.70	0-75	21436.9	92.77
75-80	556.6	2.41	0-80	21993.5	95.18
80-85	287.1	1.24	0-85	22280.7	96.42
85-90	91.9	0.40	0-90	22372.5	96.82
90-95	13.3	0.06	0-95	22385.9	96.88
95-100	11.0	0.05	0-100	22396.8	96.93
100-105	21.6	0.09	0-105	22418.5	97.02
105-110	38.1	0.16	0-110	22456.6	97.18
110-115	49.8	0.22	0-115	22506.4	97.40
115-120	62.4	0.27	0-120	22568.8	97.67
120-125	73.2	0.32	0-125	22642.0	97.99
125-130	81.0	0.35	0-130	22723.0	98.34
130-135	80.2	0.34	0-135	22803.2	98.68
135-140	70.7	0.31	0-140	22873.9	98.99
140-145	60.0	0.26	0-145	22933.9	99.25
145-150	50.5	0.22	0-150	22984.4	99.47
150-155	42.1	0.18	0-155	23026.5	99.65
155-160	33.6	0.15	0-160	23060.1	99.80
160-165	23.7	0.10	0-165	23083.8	99.90
165-170	14.2	0.06	0-170	23098.0	99.96
170-175	7.0	0.03	0-175	23105.0	99.99
175-180	2.3	0.01	0-180	23107.3	100.00

Test power and CCT: <u>140W 4000K (Input Control Signal Applied: 50%)</u>					
Test Condition: Method: <u>Integrating Sphere System</u> ; Orientation: <u>Downward</u> ; Test Voltage: <u>120.1V 60Hz</u> ; Housing: <u>None</u> . Driver model: <u>SDC160CS200X2V40DL7A</u>					
Test Item		Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
Light Output(lm) ^{△△}		23569	≥10000	≥9000	Pass
Power(W) ^{△△}		131.9	None.	None.	N/A
Total Efficacy(lm/W) ^{△△}		178.69	≥135	≥130.95	Pass
CCT(K) ^{△△}		3902	3710~4260	No tolerances	Pass
Duv ^{△△}		0.00028	-0.005~0.007	No tolerances	Pass
IES R _r ^{△△}		83	70	69	Pass
IES R _g ^{△△}		100	89	88	Pass
IES R _{cs,h1} ^{△△}		-9%	-18%~23%	-19%~22%	Pass
R _a ^{△△}		84	≥70	≥69	Pass
R ₉ ^{△△}		37	≥-40	≥-41	Pass
Test Condition: Method: <u>Integrating THDi、PF Test</u> ; Orientation: <u>Downward</u> :					
Test Voltage	Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
347	Power Factor ^{△△}	0.9397	≥0.9	≥0.87	Pass
347	THDi ^{△△}	7.15%	≤20%	≤25%	Pass
120	Power Factor ^{△△}	0.9963	≥0.9	≥0.87	Pass
120	THDi ^{△△}	6.01%	≤20%	≤25%	Pass
277	Power Factor ^{△△}	0.9694	≥0.9	≥0.87	Pass
277	THDi ^{△△}	5.17%	≤20%	≤25%	Pass

Note:

- The test results were measured directly from the test equipment.
- The DLC requirements were listed according to DLC Technical Requirements V5.1.
- The conclusion is only for information. When determining the compliance of the result, tolerances and/or allowances may be applied to the measured value.
- [△] Test facility was located at No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.
- ^{△△} Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.

[Integrating Sphere System]

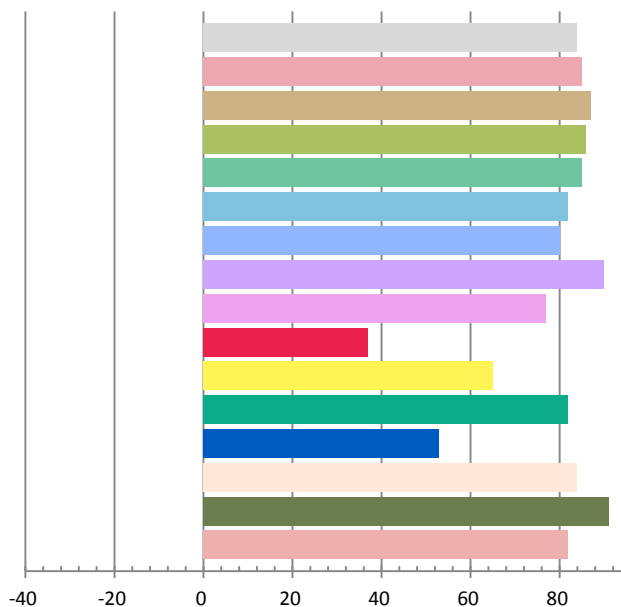
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.1	60	1.102	131.9	0.9963	23569	178.69

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
68.5040	3902	0.00028	0.3851	0.3802	0.2268	0.5038

Color Rendering Index

Ra 84.0			
R1 85	R2 87	R3 86	R4 85
R5 82	R6 80	R7 90	R8 77
R9 37	R10 65	R11 82	R12 53
R13 84	R14 91	R15 82	



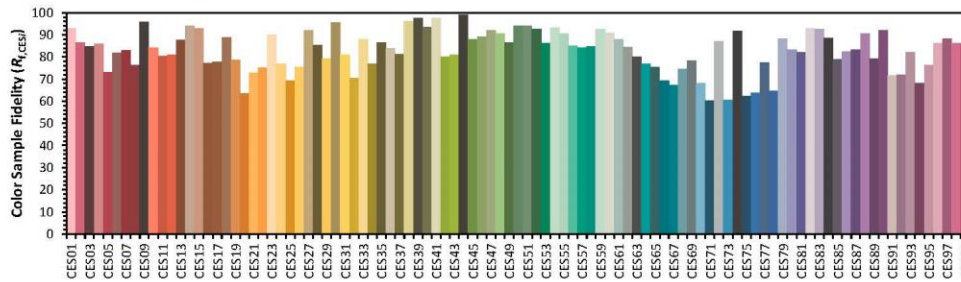
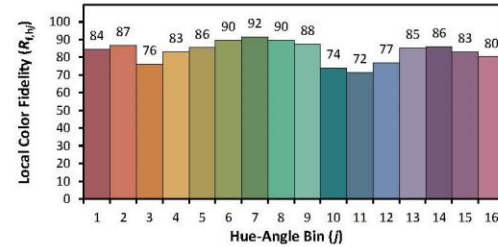
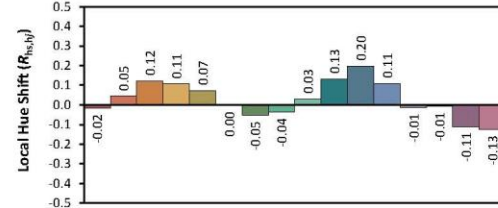
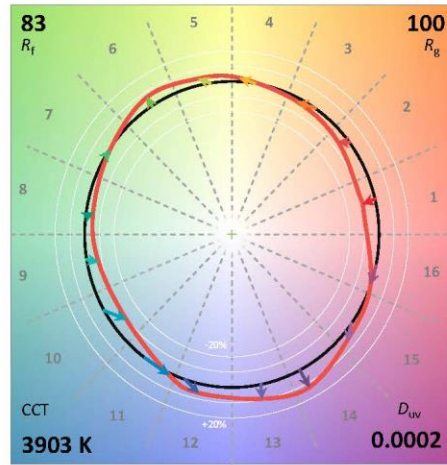
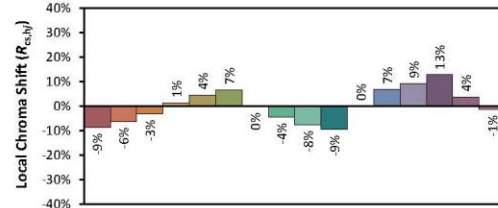
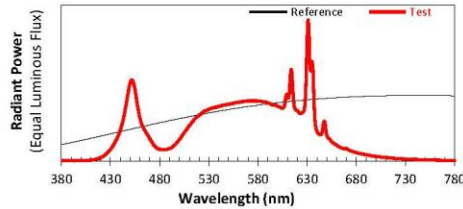
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: RENO LED LIGHTING INC.

Date: 2024/3/28

Model: RENO-LHB2-DV-MV-MOCT-R2



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

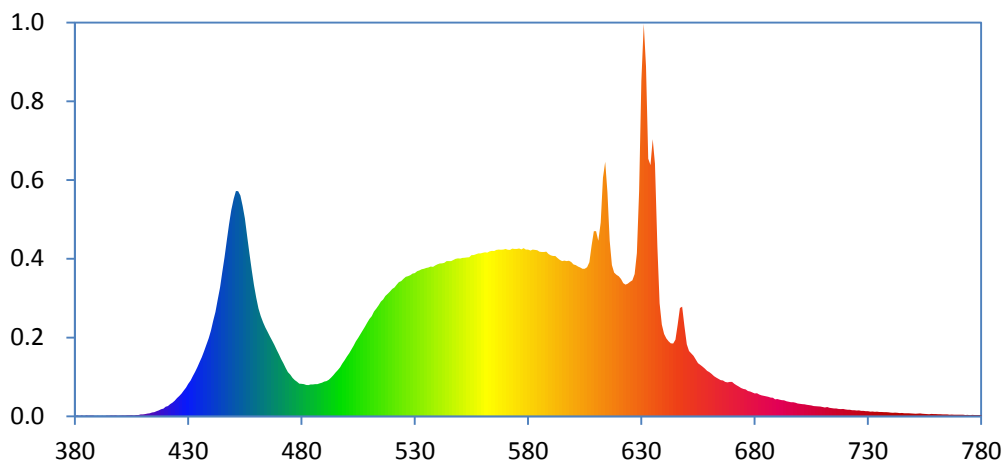
x 0.3850
 y 0.3800
 u' 0.2268
 v' 0.5037

CIE 13.3-1995
(CRI)

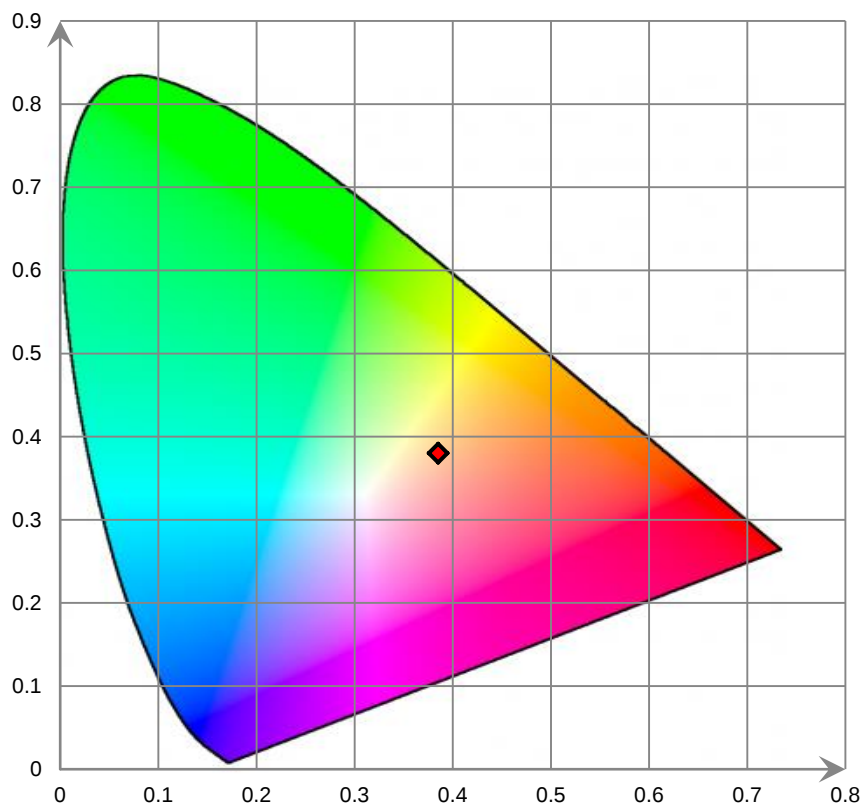
R_a 84
 R_g 37

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

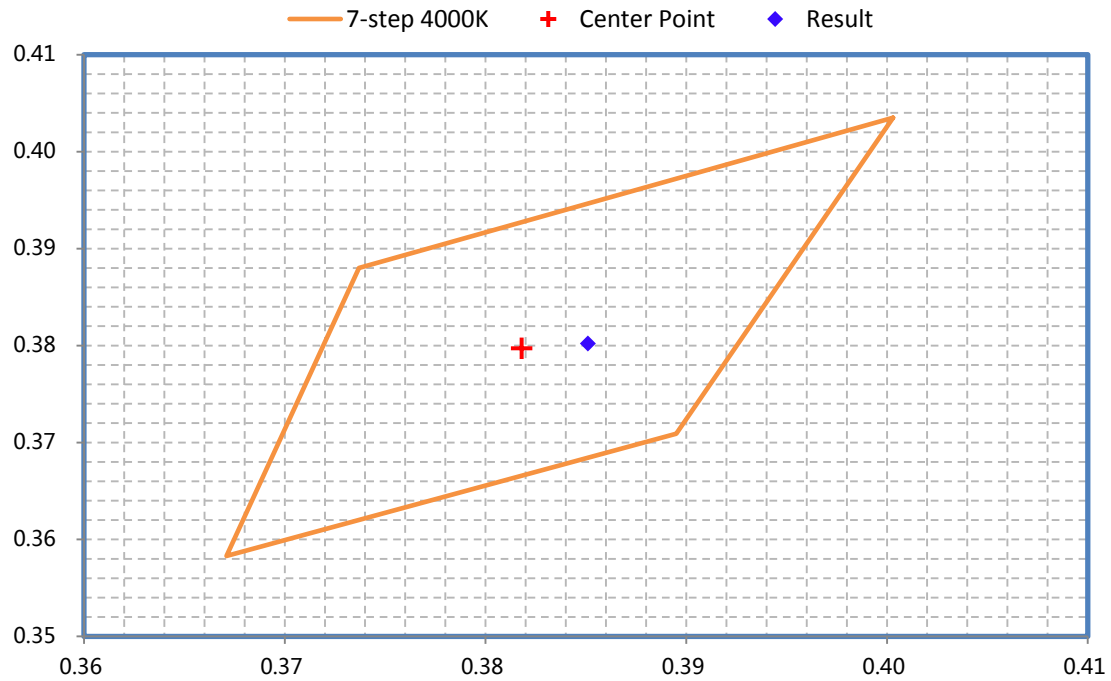
Relative Spectral Power Distribution



CIE 1931 x y Chromaticity Diagram



ANSI C78.377-2017 Chromaticity Quadrangles



Test power and CCT: <u>140W 5000K (Input Control Signal Applied: 100%)</u>					
Test Condition: Method: <u>Integrating Sphere System</u> ; Orientation: <u>Downward</u> ; Test Voltage: <u>120.1V 60Hz</u> ; Housing: <u>None</u> ; Driver model: <u>SDC160CS200X2V40DL7A</u>					
Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion	
Light Output(lm) ^{△△}	23450	≥10000	≥9000	Pass	
Power(W) ^{△△}	135.6	None.	None.	N/A	
Total Efficacy(lm/W) ^{△△}	172.96	≥135	≥130.95	Pass	
CCT(K) ^{△△}	4766	4746~5312	No tolerances	Pass	
Duv ^{△△}	0.0011	-0.004~0.008	No tolerances	Pass	
IES R _r ^{△△}	81	70	69	Pass	
IES R _g ^{△△}	100	89	88	Pass	
IES R _{cs,h1} ^{△△}	-9%	-18%~23%	-19%~22%	Pass	
R _a ^{△△}	83.1	≥70	≥69	Pass	
R ₉ ^{△△}	39	≥-40	≥-41	Pass	
Test Condition: Method: <u>Integrating THDi、PF Test</u> ; Orientation: <u>Downward</u> ;					
Test Voltage	Test Item	Test Result	DLC Requirements	DLC Requirements(With tolerances and/or allowances)	Conclusion
347	Power Factor ^{△△}	0.9404	≥0.9	≥0.87	Pass
347	THDi ^{△△}	7.24%	≤20%	≤25%	Pass
120	Power Factor ^{△△}	0.9969	≥0.9	≥0.87	Pass
120	THDi ^{△△}	6.13%	≤20%	≤25%	Pass
277	Power Factor ^{△△}	0.9704	≥0.9	≥0.87	Pass
277	THDi ^{△△}	5.21%	≤20%	≤25%	Pass

Note:

- The test results were measured directly from the test equipment.
- The DLC requirements were listed according to DLC Technical Requirements V5.1.
- The conclusion is only for information. When determining the compliance of the result, tolerances and/or allowances may be applied to the measured value.
- [△] Test facility was located at No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.
- ^{△△} Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.

[Integrating Sphere System]

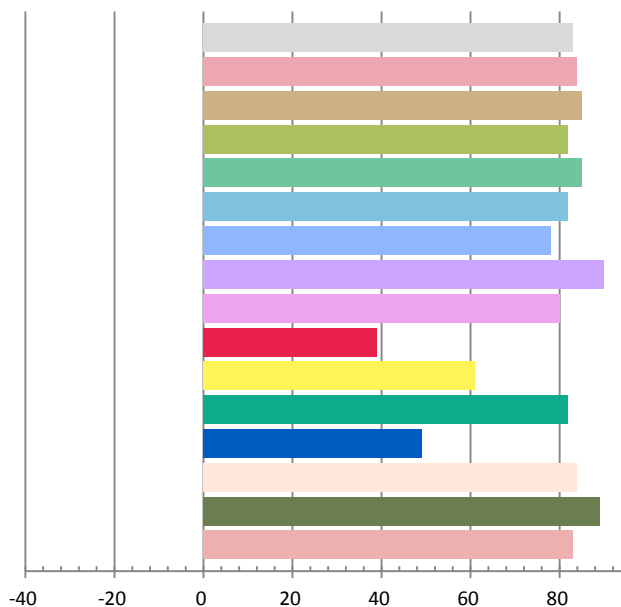
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.1	60	1.132	135.6	0.9969	23450	172.96

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
70.1630	4766	0.00110	0.3523	0.3595	0.2132	0.4895

Color Rendering Index

Ra 83.1			
R1 84	R2 85	R3 82	R4 85
R5 82	R6 78	R7 90	R8 80
R9 39	R10 61	R11 82	R12 49
R13 84	R14 89	R15 83	



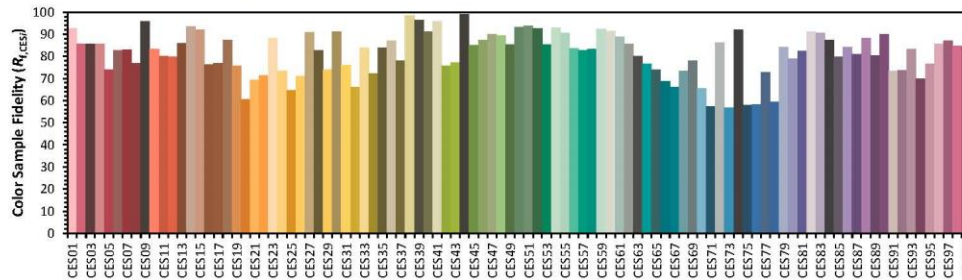
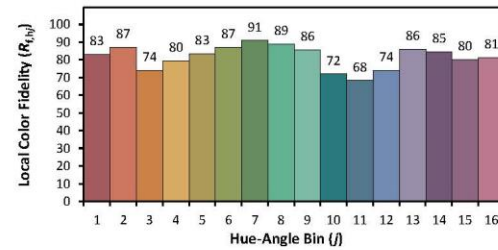
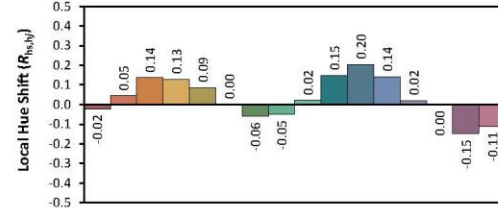
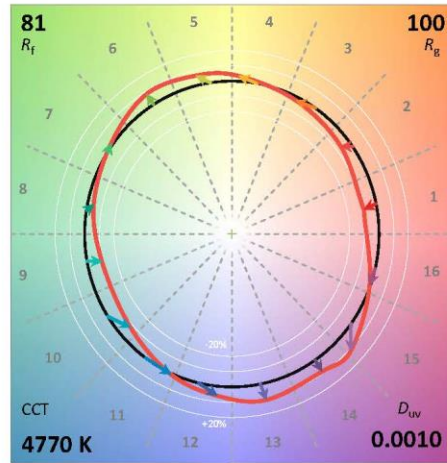
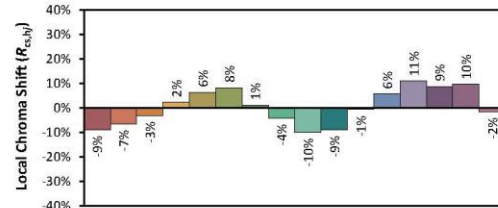
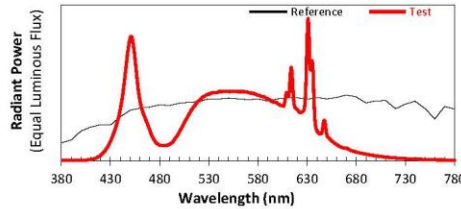
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: RENO LED LIGHTING INC.

Date: 2024/3/28

Model: RENO-LHB2-DV-MV-MOCT-R2



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

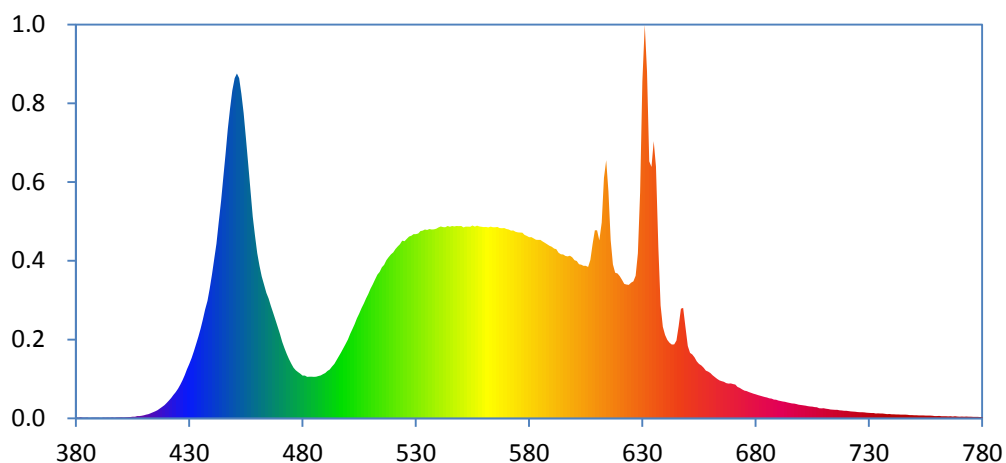
x 0.3522
 y 0.3593
 u' 0.2132
 v' 0.4894

CIE 13.3-1995
(CRI)

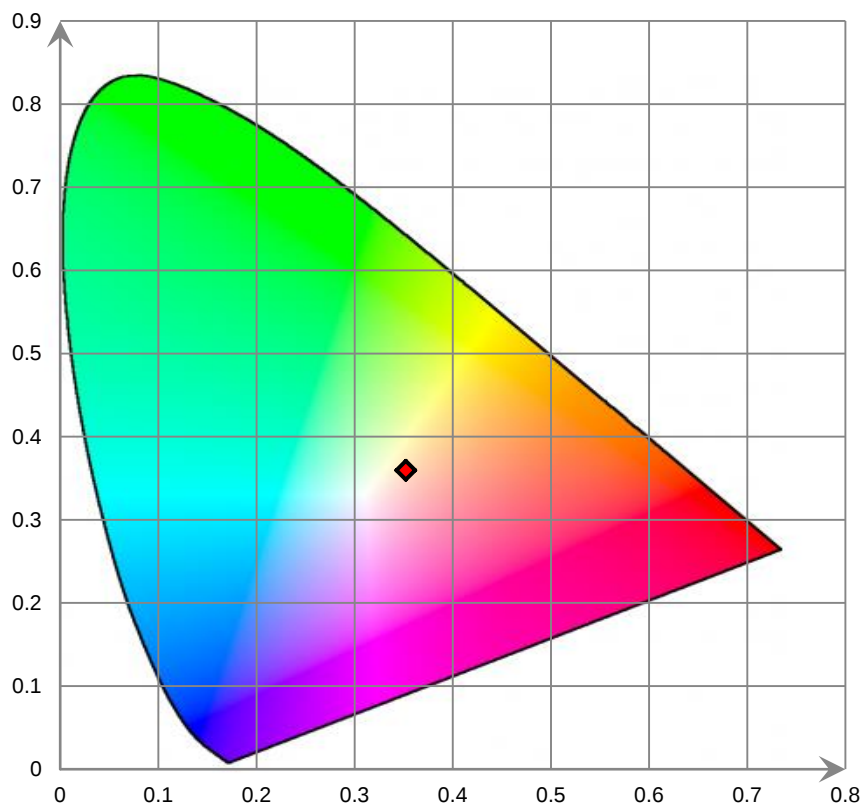
R_a 83
 R_9 40

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

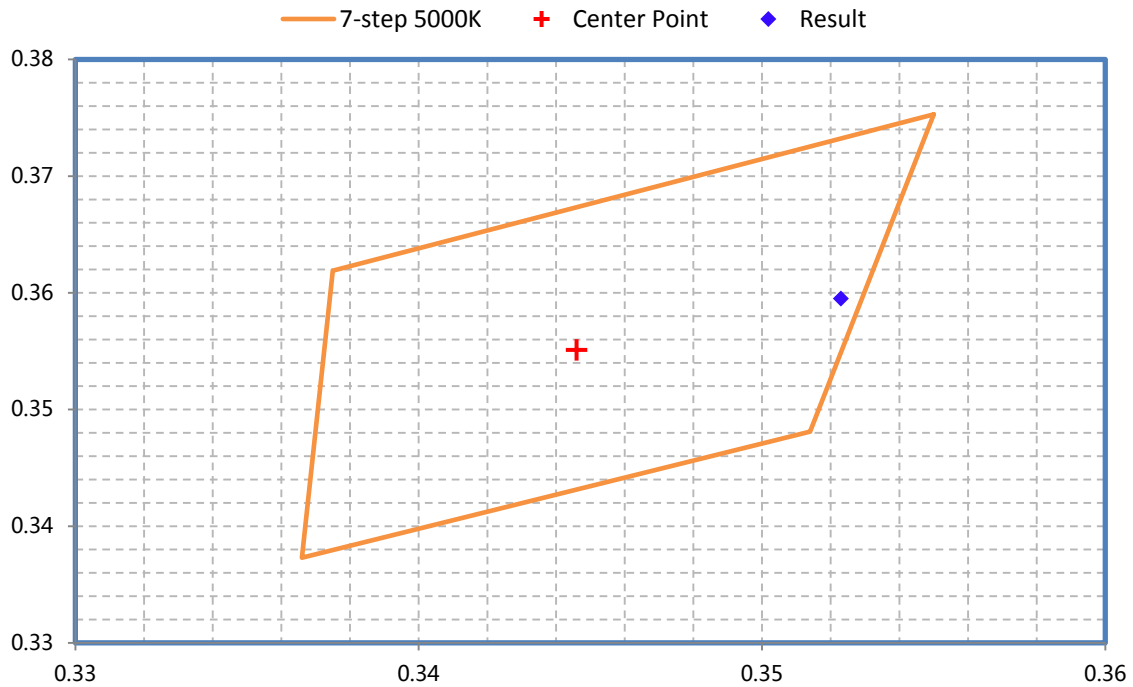
Relative Spectral Power Distribution



CIE 1931 x y Chromaticity Diagram



ANSI C78.377-2017 Chromaticity Quadrangles



5. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Multimeter	FLUKE	115C	N/A	2023-09-02	2024-09-01
Hybrid Recorder	YOKOGAWA	DR240	10#	2023-11-19	2024-11-08
AC POWER SUPPLY	HengPu	HPA 1103	0003394	2023-09-02	2024-09-01
1.5m temperature integrating sphere	SENSING	SPR-600	S09008	2023-09-02	2024-09-01
High-precision rapid spectral analysis system	EVERFINE	HAAS-2000	M112048CA1361125	2023-09-02	2024-09-01
Digital power meter	YOKOGAWA	WT310	13398	2023-10-13	2024-10-12
Programmable Precision DC Power Supply	EVERFINE	WY5015	11060010	2023-09-02	2024-09-01
thermometer	SENSING	N/A	N/A	2023-10-13	2024-10-12
Standard Light Source	EVERFINE	D204	N/A	2023-05-12	2025-05-11
Precision frequency power supply	ALL Power	APW-105N	970613	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

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).

6. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-08. 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*****