

LM-79-08 Test Report

For

Reno LED Lighting Inc

(Brand Name: RENO)

615 Denison unit 5 Markham L3R 1B8 CA

High Bay Luminaires (Commercial and Industrial)

Model name(s):

RENO-HBU-150W-DV-XK-R1-ECO [@]

Remark: [@] - XK" can be 3K, 4K, 5K to indicate color temperature

Representative (Tested) Model:

RENO-HBU-150W-DV-XK-R1-ECO [@(0%,3500K)

RENO-HBU-150W-DV-XK-R1-ECO [@(50%,4000K)

RENO-HBU-150W-DV-XK-R1-ECO [@(100%,5000K)

Model Different: N/A

Test & Report By:

Ferrum Li

Engineer: Ferrum Li

Date: May.23,2023

Review By:

Garman Mo

Manager: Garman Mo

Note: 1.The results contained in this report pertain only to the tested samples.

2.This report does not imply product certification, approval, or endorsement by A2LA, or any agency of the Federal Government.

Laboratory: STANDARD-TECH TESTING SERVICES

Report Format Number STD-QP019-409-B/0

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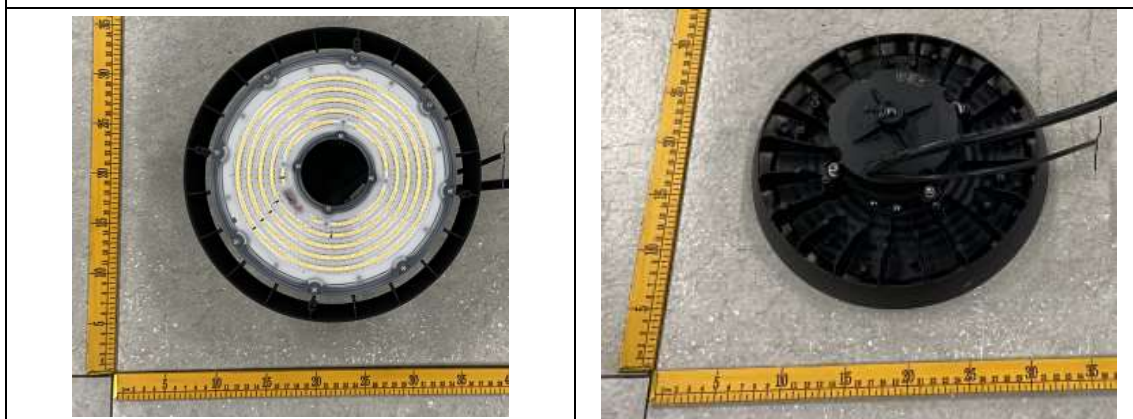
Fax: 8620-32290422

<http://www.standard-tech.com>

1.1 Product Information:

Organization Name	Reno LED Lighting Inc	
Brand Name	RENO	
Model Number	RENO-HBU-150W-DV-XK-R1-ECO [@]	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	High Bay Luminaires (Commercial and Industrial)	
Rated Voltage / Frequency	120-347 Vac, 50/60 Hz	
Nominal Power	100W/125W/150W	
Rated Initial Lamp Lumen	--	
Declared CCT	3500K,4000K,5000K	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-3580RB35001M1 L128-5080RB35001M1	
Integral Controls Availability	Yes	
Dimming	Continuous	
Sample Number	JDE230312-A1	
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	May.20,2023
Date of Test	May.22,2023
Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2017 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

1.3 Test Methods

<p>1) Photometric and Light Distribution Measurement – Goniophotometer Method: Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1 ° vertical intervals and 22.5 ° horizontal intervals.</p>
<p>2) Chromaticity Measurement – Sphere-Spectroradiometer Method: Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.</p>
<p>3) Electrical Measurements: Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.</p>

2.1 Electrical, Photometric and Chromaticity Measurements

Test date	2023-05-22	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	RENO-HBU-150W-DV-XK-R1-ECO [@(0%,3500K)	Total Operating Time (min)	75

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JDE230312-	120.0	60	1.253	150.0	0.9977	2.94
A1	347.1	60	0.4742	150.4	0.9138	17.31
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Photometric Measurement – Goniophotometer Method(Test Distance: 26.000m):

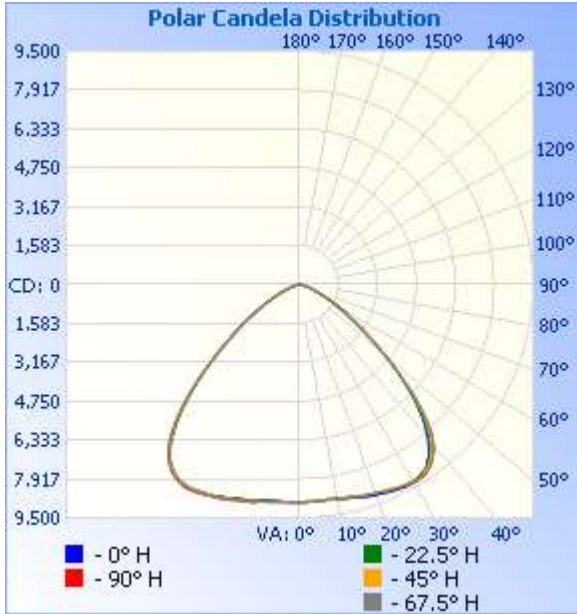
Parameter	Result		DLC V5.1 Pass Criteria	
Test Voltage (V)	120	347	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	22512	22944	>=10000(-10%)	
Luminous Efficacy (lm/W)	150.04	152.56	Standard: >= 120(-3%)	Premium: >= 135(-3%)
Zonal lumens in the 20-50 °zone (%)	66.2	--	>=30(-10)	
Corrected UGR (Crosswise)	27.4	--	Premium: <28.0	
Corrected UGR (Endwise)	26.9	--	Premium: <28.0	
Beam Angle (°)	100.6	--	--	
Center Beam Candle Power (cd)	8854	--	--	

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	7,704.1	34.2%
0-40	13,340.4	59.3%
0-60	20,945.1	93.1%
60-90	1,469.7	6.5%
70-100	407.6	1.8%
90-120	13.8	0.1%
0-90	22,414.8	99.6%
90-180	94.1	0.4%
0-180	22,509.0	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	846.1	3.8%	90-100	0.1	0%
10-20	2,560.0	11.4%	100-110	4.0	0%
20-30	4,298.0	19.1%	110-120	9.6	0%
30-40	5,636.3	25.0%	120-130	16.9	0.1%
40-50	4,968.9	22.1%	130-140	19.7	0.1%
50-60	2,635.7	11.7%	140-150	17.9	0.1%
60-70	1,062.2	4.7%	150-160	13.9	0.1%
70-80	341.0	1.5%	160-170	8.4	0%
80-90	66.4	0.3%	170-180	3.5	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
4.0ft	553.4 fc	7.0 ft	9.4 ft
8.0ft	138.3 fc	14.0 ft	18.7 ft
12.0ft	61.5 fc	21.0 ft	28.1 ft
16.0ft	34.6 fc	27.9 ft	37.4 ft
20.0ft	22.1 fc	34.9 ft	46.8 ft

■ Vert. Spread: 82.2°
■ Horiz. Spread: 98.9°

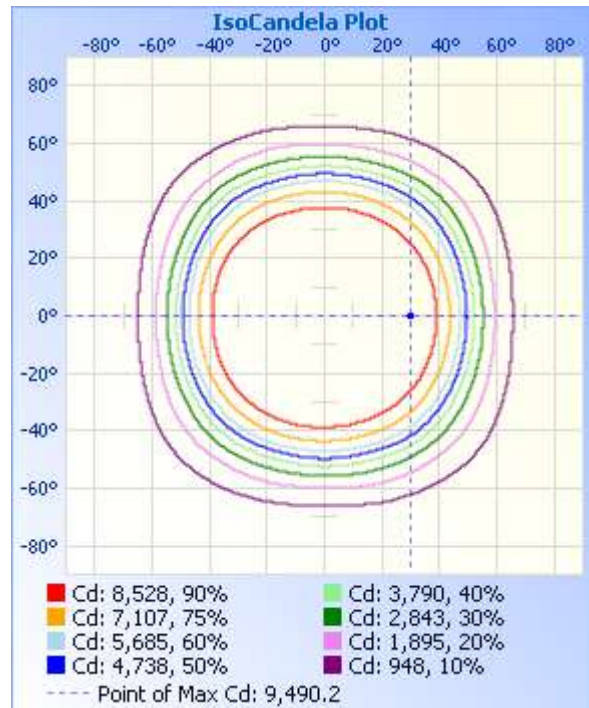
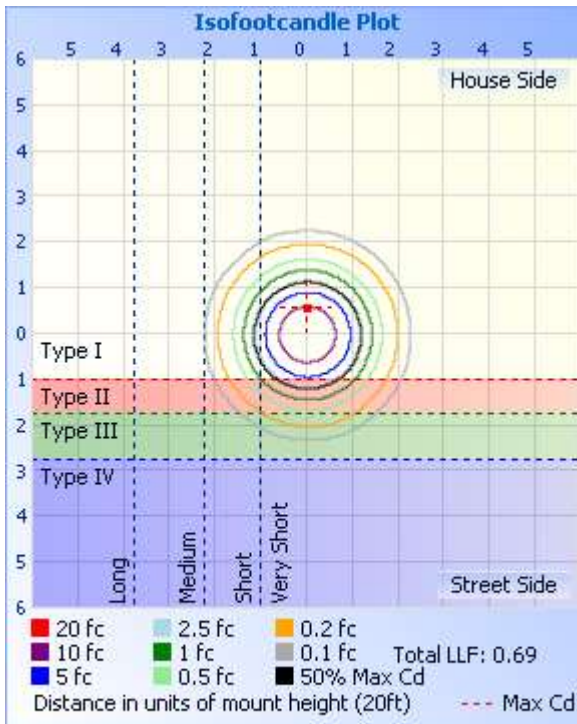


Table--1 UNIT: cd

C (DEG) \ γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	
0	8854	8854	8854	8854	8854	8854	8854	8854	8854	8854	8854	8854	8854	8854	8854	8854	
5	8894	8874	8869	8854	8846	8810	8818	8842	8841	8828	8816	8852	8851	8843	8859	8866	
10	8972	8942	8957	8897	8859	8872	8843	8839	8821	8842	8867	8877	8915	8929	8962	8966	
15	9118	9084	9062	9036	8989	8929	8895	8933	8932	8950	9006	9023	9039	9049	9085	9102	
20	9279	9262	9207	9174	9114	9066	9006	9039	9029	9081	9112	9176	9196	9181	9222	9229	
25	9407	9392	9374	9319	9232	9163	9124	9162	9184	9241	9284	9342	9348	9316	9333	9408	
30	9475	9445	9438	9370	9280	9234	9265	9284	9294	9361	9414	9410	9408	9351	9381	9446	
35	9146	9127	9096	9034	9003	9024	9076	9156	9147	9167	9139	9140	9089	9032	9062	9155	
40	8227	8175	8121	8069	8114	8205	8381	8487	8435	8393	8309	8202	8100	8050	8133	8160	
45	6430	6439	6467	6488	6607	6628	6802	6853	6819	6676	6485	6380	6340	6295	6448	6407	
50	4395	4354	4493	4570	4714	4657	4747	4601	4636	4478	4422	4344	4445	4314	4413	4308	
55	2785	2753	2922	2931	3089	3029	3034	2829	2899	2788	2867	2851	2907	2878	2820	2753	
60	1695	1746	1733	1847	1907	1977	1785	1787	1718	1785	1730	1809	1769	1861	1725	1751	
65	962	1022	1000	1070	1094	1142	1020	1028	985	1007	997	1037	1021	1055	987	1015	
70	533	562	542	604	599	607	571	551	545	563	559	568	557	563	526	551	
75	285	309	305	312	322	315	315	296	306	305	301	292	287	302	278	290	
80	172	174	173	168	171	173	174	174	182	174	168	150	146	147	163	171	
85	61.4	62.1	54.7	48.8	44.6	49.1	55.1	63.0	65.4	60.6	45.4	32.5	26.1	31.4	42.3	58.5	
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100	0.53	1.69	2.39	1.43	0.27	1.06	1.33	1.49	1.53	2.13	1.87	1.41	0.53	0.71	1.24	1.25	
105	4.53	4.18	4.35	4.19	2.14	3.98	4.20	4.27	4.99	4.36	3.65	2.84	1.69	2.66	3.10	3.37	
110	8.59	8.07	7.01	6.84	8.15	7.43	7.64	8.18	7.21	6.57	5.68	5.59	6.12	5.51	5.67	5.07	
115	14.0	12.7	12.4	8.60	11.2	9.66	12.2	12.9	9.96	9.23	8.26	5.76	8.69	6.11	8.15	8.62	
120	18.4	17.2	16.8	16.1	12.8	14.3	16.8	17.2	11.3	10.3	11.2	10.4	9.30	10.4	11.4	10.8	
125	24.4	23.7	19.9	24.5	25.9	24.4	20.6	23.3	13.9	14.3	13.8	16.3	17.6	16.2	14.3	14.3	
130	29.5	27.5	20.8	29.8	30.8	30.2	23.2	27.2	19.3	17.9	15.8	20.9	21.8	21.2	16.6	17.9	
135	31.4	28.4	23.9	33.5	33.6	34.5	25.1	28.3	22.9	20.1	17.8	24.9	24.6	24.5	17.8	20.4	
140	32.8	29.4	25.1	34.2	34.0	35.0	25.6	29.0	25.4	23.1	18.5	26.9	27.1	26.6	18.4	23.5	
145	33.3	27.9	29.0	36.0	33.9	35.8	25.7	29.4	27.3	24.7	20.9	27.0	27.4	28.1	21.4	24.8	
150	33.3	28.0	35.0	35.5	38.6	36.4	31.2	30.5	27.7	25.6	26.1	26.5	28.0	28.7	28.2	25.2	
155	30.1	28.5	37.5	36.8	38.1	36.0	34.0	31.5	25.6	25.6	26.6	25.2	27.5	28.5	25.2	25.3	
160	30.0	28.8	35.9	35.4	36.4	34.8	34.7	30.5	25.3	25.0	25.7	25.6	25.7	26.0	23.9	25.3	
165	30.4	29.1	34.9	31.4	34.0	32.4	33.7	28.4	26.6	24.6	25.3	25.8	24.8	29.1	23.0	25.4	
170	32.9	31.8	38.8	37.5	37.5	37.9	38.7	29.1	31.1	30.3	31.2	36.8	38.3	38.6	34.1	36.4	
175	35.3	34.6	40.8	37.6	44.3	38.6	40.8	30.0	36.5	36.2	33.2	40.2	40.6	45.5	36.1	39.3	
180	33.8	34.3	37.0	35.8	43.0	35.0	38.3	31.0	34.1	34.2	34.0	37.3	35.7	42.8	34.9	38.6	

2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2023-05-22	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	RENO-HBU-150W-DV-XK-R1-ECO [@(0%,3500K)	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JDE230312-	120.0	60	1.263	150.9	0.9958	3.02
A1	347.0	60	0.4781	151.3	0.9119	17.38
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer

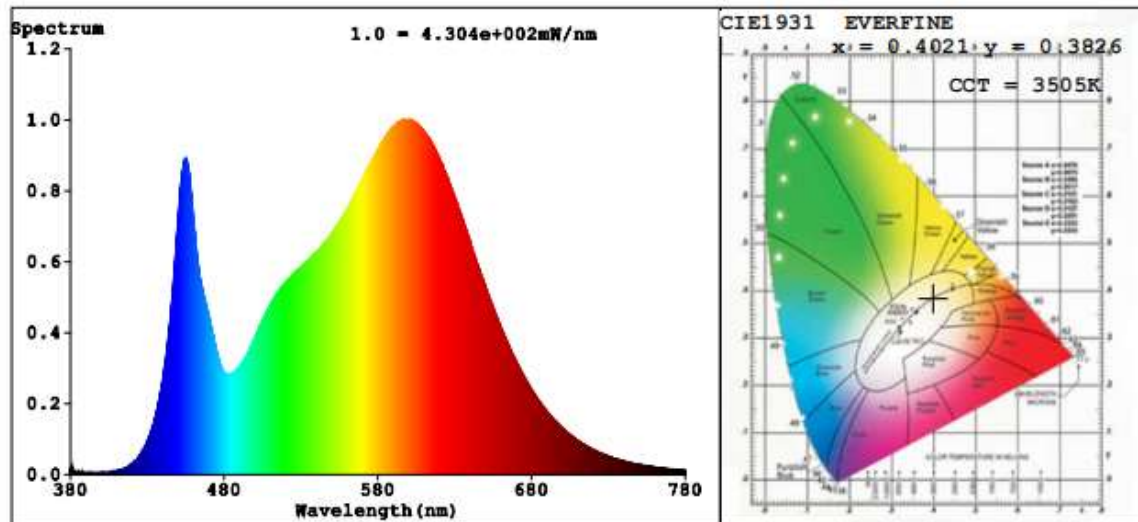
Method(Self-absorption:1.1287)(4π geometry):

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	83.8
Frequency (Hz)	60	R9	11
CCT (K)	3505	Rg	95
Duv	-0.0029	Rf	84
Chromaticity (x, y)	x=0.4021 y=0.3826	Rcs,h1(%)	-12
Chromaticity (u', v')	u'=0.2370 v'=0.5074		

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria	
Test Voltage (V)	120	347	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	22672	23107	>=10000(-10%)	
Luminous Efficacy (lm/W)	150.25	152.72	Standard: >= 120(-3%)	Premium: >= 135(-3%)

Spectral Power Distribution & Chromaticity Diagram



Special Color Rendering Indices

R1 =83 R2 =93 R3 =95 R4 =81 R5 =83 R6 =90 R7 =83
R8 =62 R9 =11 R10=83 R11=80 R12=69 R13=86 R14=98 R15=77

TM30

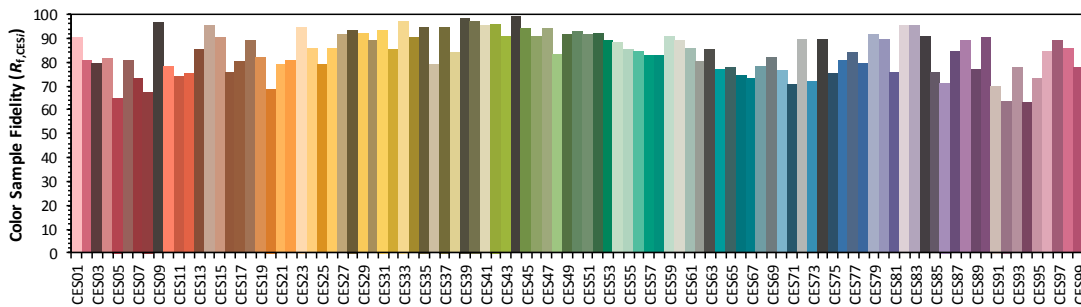
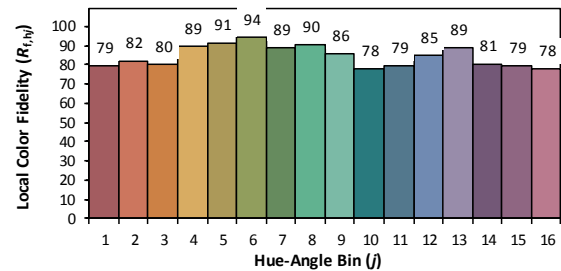
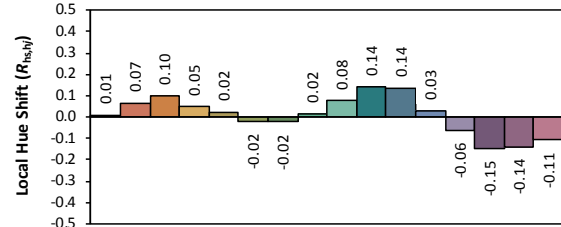
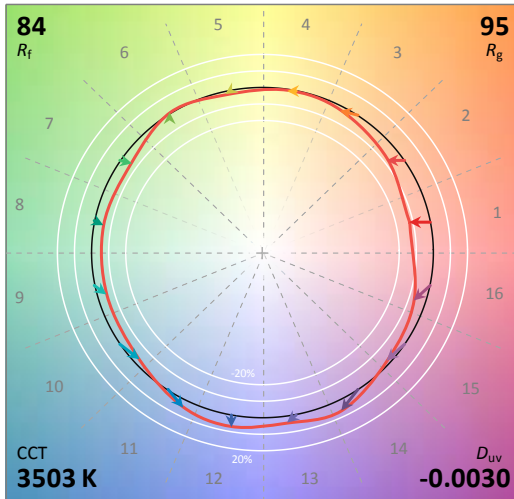
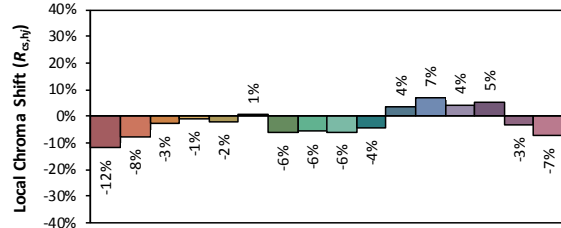
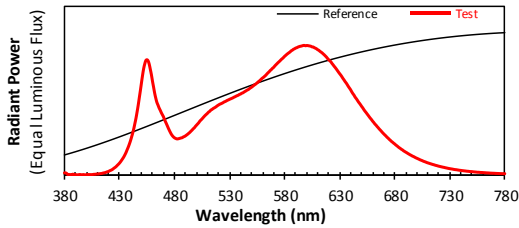
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3580RB35001M1

Manufacturer: Reno LED Lighting Inc

Date: 2023-05-22

Model: RENO-HBU-150W-DV-XK-R1-ECO[@] (0%, 3500K)



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

x 0.4021
y 0.3825
u' 0.2370
v' 0.5073

CIE 13.3-1995 (CRI)	
R _a	84
R _g	11

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

2.3 Electrical, Photometric and Chromaticity Measurements

Test date	2023-05-22	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	RENO-HBU-150W-DV-XK-R1-ECO [@](50%,4000K)	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JDE230312-	120.0	60	1.242	148.4	0.9957	3.03
A1	347.0	60	0.4703	148.8	0.9118	17.39
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer

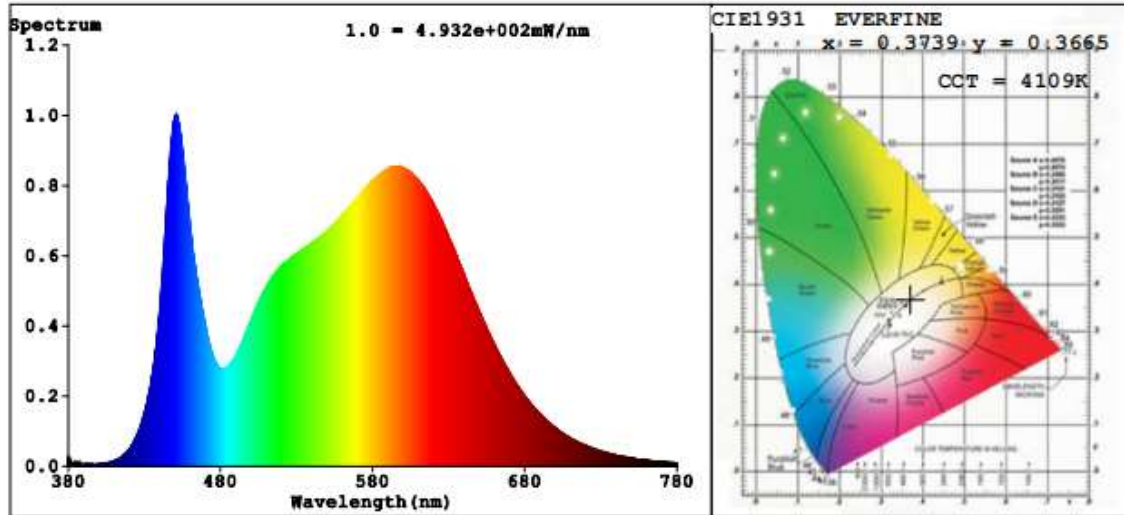
Method(Self-absorption:1.1285)(4π geometry):

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	85.3
Frequency (Hz)	60	R9	19
CCT (K)	4109	Rg	97
Duv	-0.0029	Rf	85
Chromaticity (x, y)	x=0.3739 y=0.3665	Rcs,h1(%)	-12
Chromaticity (u', v')	u'=0.2249 v'=0.4960		

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria	
Test Voltage (V)	120	347	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	24255	24720	>=10000(-10%)	
Luminous Efficacy (lm/W)	163.44	166.13	Standard: >= 120(-3%)	Premium: >= 135(-3%)

Spectral Power Distribution & Chromaticity Diagram



Special Color Rendering Indices

R1 =85	R2 =92	R3 =95	R4 =84	R5 =85	R6 =88	R7 =86		
R8 =68	R9 =19	R10=79	R11=84	R12=66	R13=87	R14=98	R15=79	

TM30

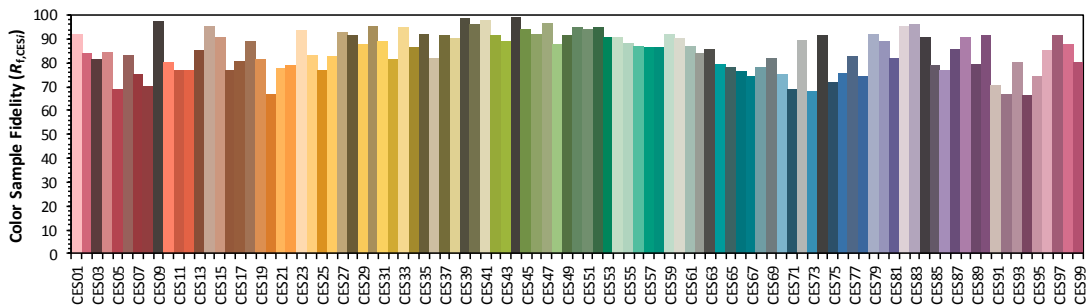
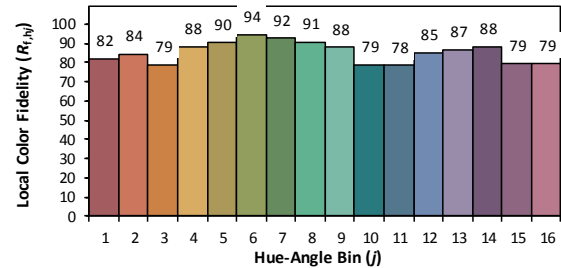
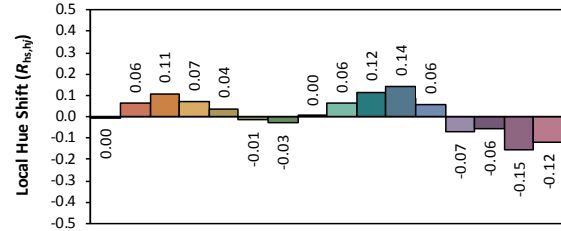
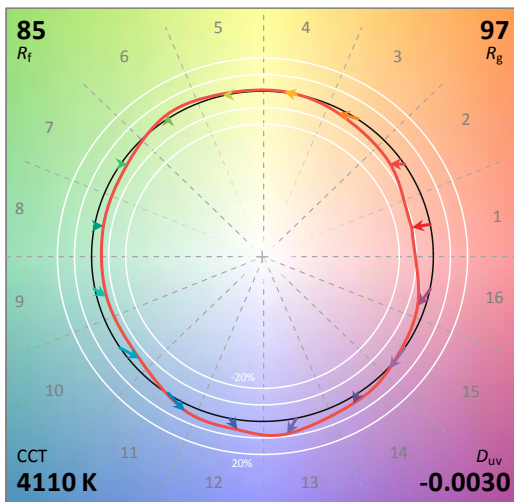
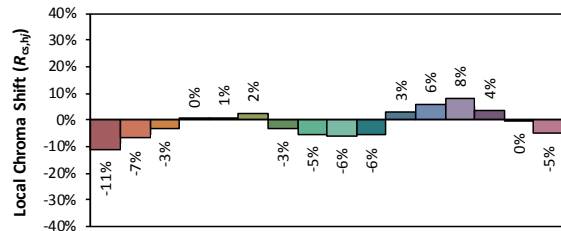
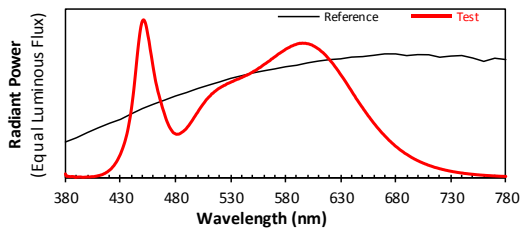
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3580RB35001M1
L128-5080RB35001M1

Date: 2023-05-22

Manufacturer: Reno LED Lighting Inc

Model: RENO-HBU-150W-DV-XK-R1-ECO[@] (50%, 4000K)



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

x 0.3739
 y 0.3663
 u' 0.2249
 v' 0.4959

CIE 13.3-1995 (CRI)	
R _a	85
R _g	19

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

Laboratory: STANDARD-TECH TESTING SERVICES

Report Format Number STD-QP019-409-B/0

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2.4 Electrical, Photometric and Chromaticity Measurements

Test date	2023-05-22	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	RENO-HBU-150W-DV-XK-R1-ECO [@(100%,5000K)	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JDE230312-	120.0	60	1.248	149.2	0.9960	3.00
A1	347.0	60	0.4727	149.6	0.9121	17.36
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer

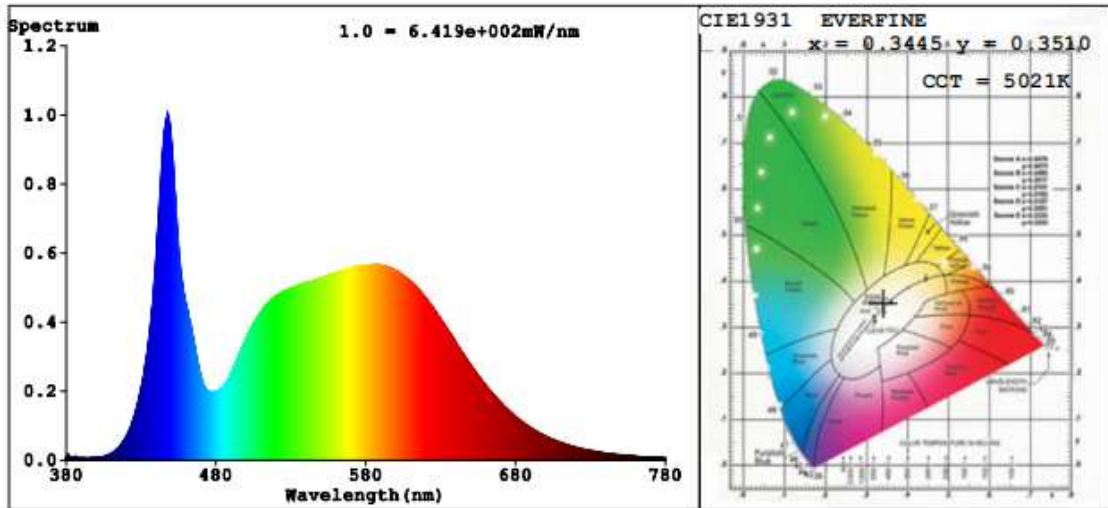
Method(Self-absorption:1.1288)(4π geometry):

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	83.3
Frequency (Hz)	60	R9	14
CCT (K)	5021	Rg	98
Duv	-0.0001	Rf	83
Chromaticity (x, y)	x=0.3445 y=0.3510	Rcs,h1(%)	-12
Chromaticity (u', v')	u'=0.2113 v'=-0.4843		

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria	
Test Voltage (V)	120	347	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	23154	23598	>=10000(-10%)	
Luminous Efficacy (lm/W)	155.19	157.74	Standard: >= 120(-3%)	Premium: >= 135(-3%)

Spectral Power Distribution & Chromaticity Diagram



Special Color Rendering Indices

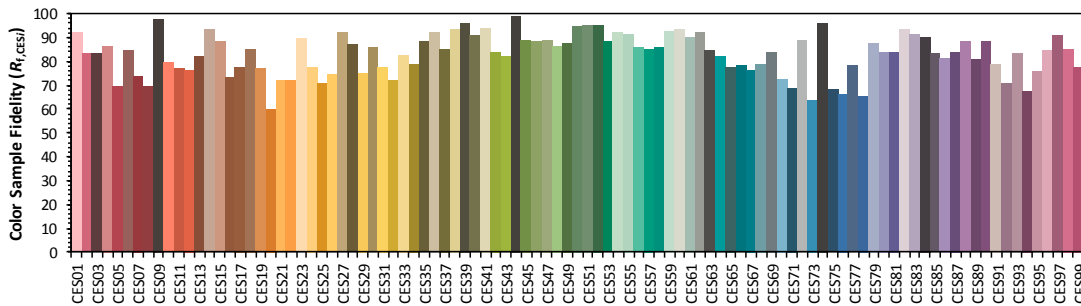
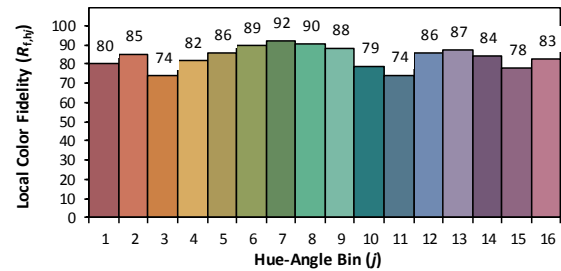
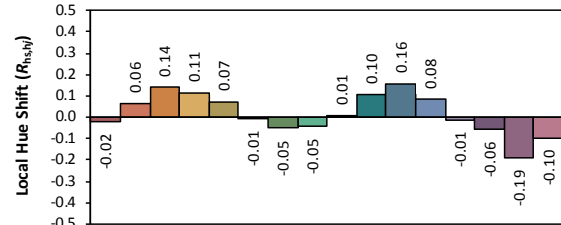
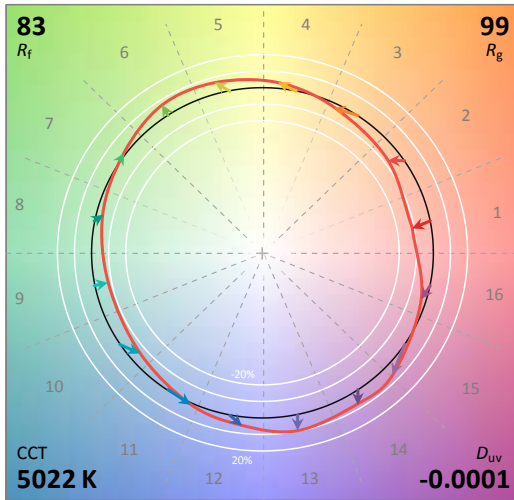
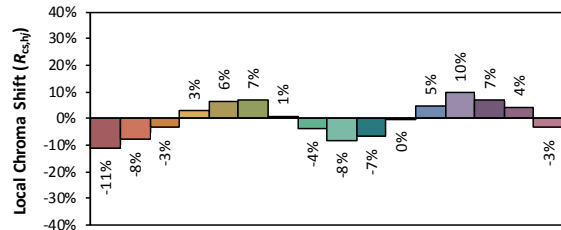
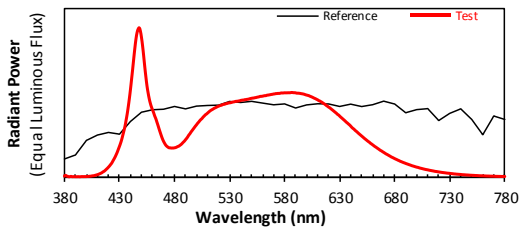
R1 =83	R2 =87	R3 =90	R4 =85	R5 =84	R6 =83	R7 =86		
R8 =70	R9 =14	R10=69	R11=85	R12=66	R13=83	R14=94	R15=78	

TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: L128-5080RB35001M1
Date: 2023-05-22

Manufacturer: Reno LED Lighting Inc
Model: RENO-HBU-150W-DV-XK-R1-ECO[®] (100%, 5000 K)



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

x 0.3444
y 0.3508
u' 0.2113
v' 0.4842

CIE 13.3-1995 (CRI)
R_a 83
R_g 14

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-423	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-327	Spectral analysis system HAAS-2000	Verified by D204 standard lamp	
ST-R-332	Standard Lamp	2022-07-06	2023-07-05
ST-R-333	Power Meter for Integrating Sphere	2022-07-11	2023-07-10
ST-R-405	Temperature Probe for Integrating Sphere	2023-01-18	2024-01-17
ST-R-355	Goniophotometer system	Verified by D908S standard lamp	
ST-R-359	Standard Lamp	2022-07-06	2023-07-05
ST-R-358	Power Meter for Goniophotometer	2022-07-11	2023-07-10
ST-R-354	hygrothermograph for Goniophotometer	2022-07-11	2023-07-10
Expand Uncertainty: Photometric Measurement (Sphere):3.06%, k=2 Chromaticity Measurement(Sphere):43.20K, k=2 Photometric Measurement(Goniophotometer):3.36%, k=2			

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