

LM-79-08 Test Report

For

IKIO LED LIGHTING

(Brand Name: IKIO)

8470 Allison Pointe Blvd, Suite 128 Indianapolis, IN 46250

Outdoor Non-Cutoff and Semi-Cutoff WallMounted Area Luminaires

Model name(s): DELPHI MINI WALLPACK

Representative (Tested) Model:

Delphi Mini Wallpack 3000K
Delphi Mini Wallpack 4000K
Delphi Mini Wallpack 5000K

Test & Report By:

Review By:

Ferrum Li

Garman Mo

Engineer: Ferrum Li

Manager: Garman Mo

Date: Oct.26,2021

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.

1.1 Product Information:

Organization Name	IKIO LED LIGHTING	
Brand Name	IKIO	
Model Number	Delphi Mini Wallpack-X-X	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Non-Cutoff and Semi-Cutoff WallMounted Area Luminaires	
Rated Voltage / Frequency	120-277Vac, 50/60Hz	
Nominal Power	25W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K, 4000K, 5000K	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-3080RC35001C1 L128-5080RC35001C1	
Integral Controls Availability	No	
Dimming	Continuous	
Sample Number	JCE210502-F1	
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	Oct.19,2021
Date of Test	Oct.21,2021
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

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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.

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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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.

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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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.

2.1 Electrical, Photometric and Chromaticity Measurements

Test date	2021-10-21	Test Ambient:	25±1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	Delphi Mini Wallpack 3000K	Total Operating Time (min)	75

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JCE210502-	120.1	60	0.2077	24.74	0.9914	8.40
F1	277.2	60	0.0977	24.44	0.9026	12.50
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

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

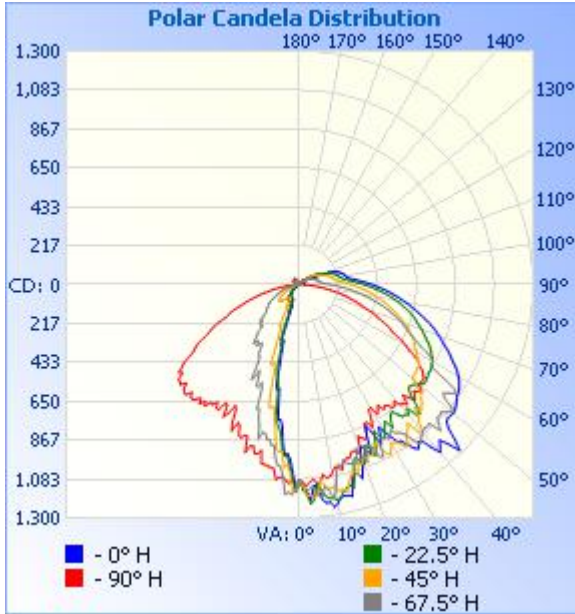
Parameter	Result		DLC V5.1 Pass Criteria	
Test Voltage (V)	120	277	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	3266.8	3218.1	>=300 (-10%)	
Total Luminous (lm) (0-90°)	2918.2	2875.0	--	
Luminous Efficacy (lm/W)	132.04	131.67	--	
Luminous Efficacy (lm/W) (0-90°)	117.95	117.64	Standard: >= 105(-3%)	Premium: >= 120(-3%)
Zonal lumens in the 80-90° zone (%)(0-90°)	6.9	--	<=10(+3)	
Beam Angle (°)	112.3	--	--	
BUG Ratings	B1-U3-G2	--	--	
Center Beam Candle Power (cd)	1089	--	--	

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	645.9	19.8%
0-40	1,035.8	31.7%
0-60	1,985.5	60.8%
60-90	932.7	28.6%
70-100	635.1	19.4%
90-120	271.7	8.3%
0-90	2,918.2	89.3%
90-180	348.3	10.7%
0-180	3,266.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	100.5	3.1%	90-100	119.0	3.6%
10-20	240.2	7.4%	100-110	90.0	2.8%
20-30	305.2	9.3%	110-120	62.7	1.9%
30-40	389.9	11.9%	120-130	38.0	1.2%
40-50	467.9	14.3%	130-140	21.1	0.6%
50-60	481.8	14.7%	140-150	11.2	0.3%
60-70	416.6	12.8%	150-160	4.6	0.1%
70-80	315.0	9.6%	160-170	1.3	0%
80-90	201.1	6.2%	170-180	0.4	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
4.0ft	68.1 fc	8.1 ft	15.1 ft
8.0ft	17.0 fc	16.2 ft	30.2 ft
12.0ft	7.6 fc	24.4 ft	45.3 ft
16.0ft	4.3 fc	32.5 ft	60.3 ft
20.0ft	2.7 fc	40.6 ft	75.4 ft

■ Vert. Spread: 90.8°
■ Horiz. Spread: 124.1°

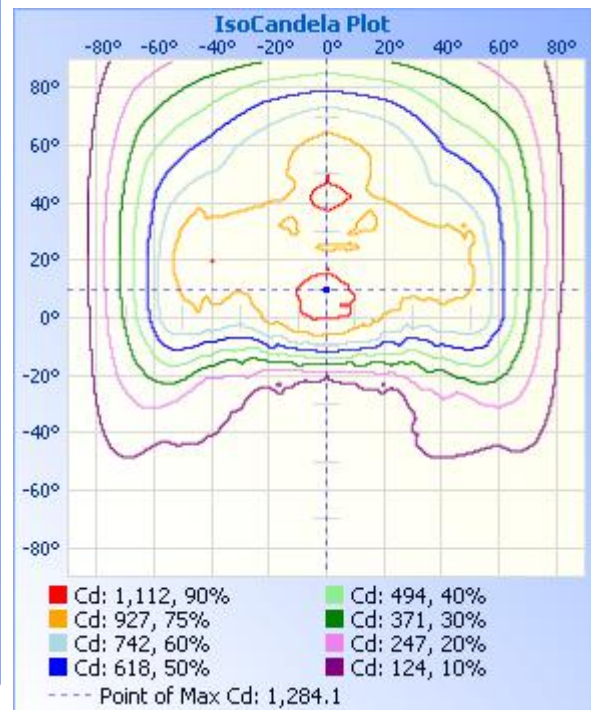
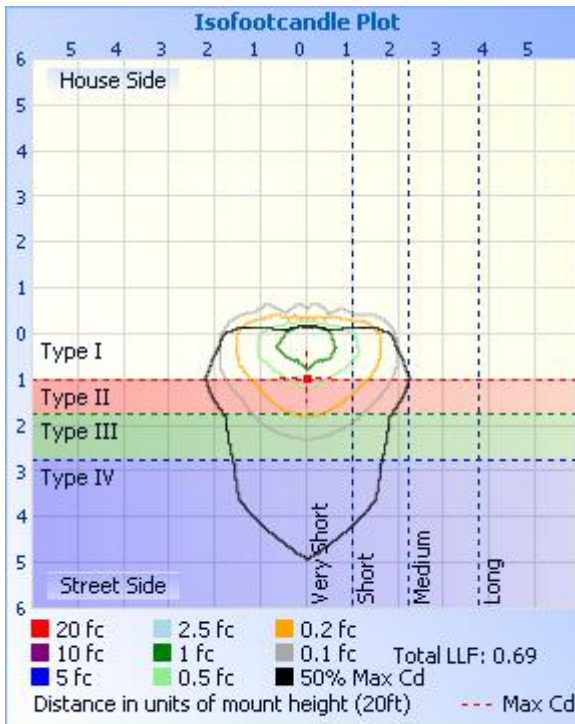
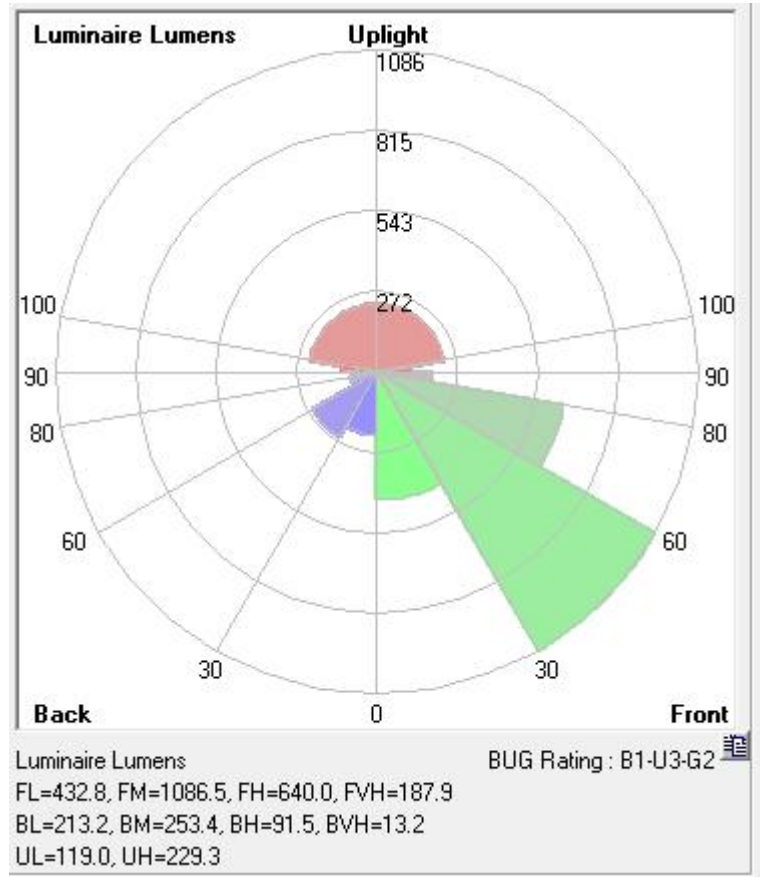


Table--1 UNIT: cd

C (DEG) \ D (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	1089	1089	1089	1089	1089	1089	1089	1089	1089	1089	1089	1089	1089	1089	1089	1089			
5	1073	1148	1181	1115	1126	1109	1175	1176	1114	1087	970	967	956	937	1020	1069			
10	1026	1022	1178	1258	1234	1217	1143	1168	1058	946	797	761	674	768	783	906			
15	970	1017	1074	1115	1130	1170	1103	1030	1001	815	565	464	386	483	629	889			
20	892	1055	966	1047	979	1064	1032	1024	1002	678	354	197	122	245	467	618			
25	897	1030	995	947	870	1004	980	1060	852	539	238	95.3	96.0	103	260	527			
30	850	998	1023	916	945	939	1021	990	790	395	144	113	90.2	106	128	455			
35	798	1080	1004	881	1112	884	1034	1016	825	342	87.3	103	96.8	98.8	85.8	417			
40	866	1118	950	917	1217	944	1072	1067	872	276	90.2	75.4	95.0	68.6	98.6	366			
45	849	1055	936	920	1225	881	958	1095	910	220	88.8	59.6	68.7	61.7	116	312			
50	867	1029	779	896	1116	863	830	1106	868	209	89.5	50.6	36.8	53.9	127	253			
55	798	977	752	892	1071	874	802	1057	835	192	79.1	34.6	20.9	37.3	136	217			
60	653	747	709	877	1021	856	751	854	688	168	68.4	19.2	12.1	22.2	105	187			
65	495	673	645	829	924	797	698	698	539	136	53.4	10.5	8.21	13.1	70.0	143			
70	358	579	578	748	823	723	617	602	399	105	38.6	5.72	5.73	7.03	48.9	109			
75	242	474	502	655	718	647	533	490	286	74.4	27.3	2.99	4.53	3.77	34.1	75.4			
80	139	359	425	553	610	560	455	378	177	48.9	19.5	2.64	3.68	3.16	24.4	44.9			
85	59.7	257	349	455	506	461	372	272	89.4	31.6	16.6	3.40	4.79	4.01	20.0	27.6			
90	27.3	176	273	359	406	361	290	176	29.8	24.8	14.7	4.93	6.25	5.29	16.7	22.5			
95	24.2	142	214	276	314	276	221	121	23.8	19.4	12.8	6.46	8.38	6.07	14.6	18.6			
100	22.7	131	197	239	262	232	193	112	21.6	18.1	12.2	3.91	3.76	3.76	14.3	18.0			
105	24.4	115	178	221	245	213	175	99.1	22.7	18.2	12.2	3.83	3.93	3.76	14.2	19.0			
110	28.1	99.1	154	189	213	184	152	86.7	27.5	19.2	12.1	3.32	3.93	3.76	13.2	21.8			
115	32.4	85.1	128	155	121	151	128	76.6	31.8	21.4	13.2	3.32	3.85	3.67	14.6	25.3			
120	37.1	72.9	105	121	80.4	120	105	67.2	34.6	22.2	9.51	3.32	3.84	3.67	10.6	27.7			
125	39.4	61.8	82.2	91.5	57.3	90.5	83.1	58.2	35.4	20.2	7.47	3.23	3.16	3.42	9.22	25.1			
130	38.6	46.6	59.8	64.6	39.9	65.2	62.1	47.2	34.0	21.7	7.39	3.23	3.16	3.42	9.22	27.0			
135	41.8	33.5	41.6	43.5	26.7	45.1	42.6	33.4	39.2	24.4	8.23	3.23	3.16	3.42	9.31	30.1			
140	42.6	26.2	28.7	28.4	16.1	29.8	29.9	26.8	40.9	27.8	7.90	3.49	3.16	3.67	7.43	29.6			
145	38.2	20.7	20.0	17.2	9.77	18.9	21.3	21.5	36.0	29.9	6.54	3.91	3.16	3.76	5.29	24.8			
150	30.3	16.1	15.2	12.0	7.19	13.6	16.3	16.9	27.6	24.4	7.47	3.32	3.16	2.99	4.27	16.6			
155	18.8	11.5	11.9	8.76	5.14	10.7	12.7	12.4	18.4	16.5	7.81	3.23	3.08	2.99	3.84	10.6			
160	7.15	5.87	9.09	6.37	4.11	7.94	9.46	6.59	6.61	10.6	7.05	3.23	2.82	2.73	3.07	5.64			
165	4.59	4.59	5.60	4.76	3.76	5.54	5.79	4.02	4.66	5.59	5.18	3.23	2.82	2.73	3.07	3.42			
170	3.99	3.65	3.99	3.83	3.34	3.93	4.18	3.42	4.16	4.08	4.33	4.16	3.68	3.59	3.93	4.19			
175	3.99	3.82	3.91	3.66	3.16	3.85	4.01	4.02	4.16	3.99	4.16	4.17	3.85	3.50	3.93	4.11			
180	3.99	3.82	3.99	3.66	3.16	4.02	4.01	4.02	4.16	3.99	3.91	4.00	3.76	3.16	3.93	4.02			

BUG



2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2021-10-21	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	Delphi Mini Wallpack 3000K	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JCE210502-	120.0	60	0.2102	24.97	0.9900	8.52
F1	277.0	60	0.0988	24.67	0.9012	12.62
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer

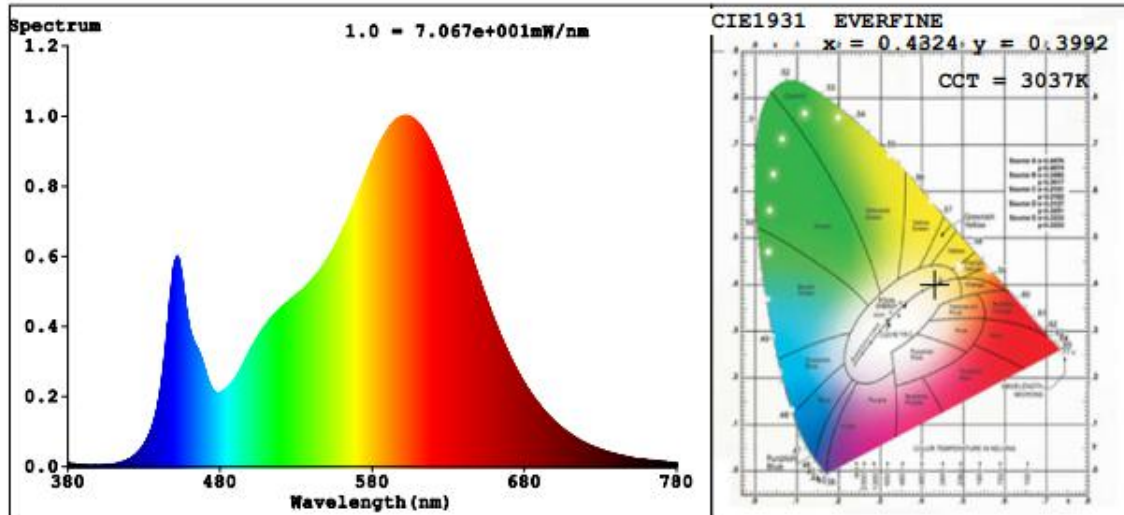
Method(Self-absorption:1.1126)(4π geometry):

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	81.8
Frequency (Hz)	60	R9	2
CCT (K)	3037	Rg	95
Duv	-0.0013	Rf	83
Chromaticity (x, y)	x=0.4324 y=0.3992	Rcs,h1(%)	-13
Chromaticity (u', v')	u'=0.2498 v'=0.5188		

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria	
Test Voltage (V)	120	277	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	3303	3254	>=300 (-10%)	
Luminous Efficacy (lm/W)	132.28	131.90	Standard: >= 105(-3%)	Premium: >= 120(-3%)

Spectral Power Distribution & Chromaticity Diagram



Special Color Rendering Indices

R1 =81 R2 =92 R3 =94 R4 =79 R5 =81 R6 =91 R7 =81
 R8 =56 R9 =2 R10=82 R11=79 R12=73 R13=84 R14=97 R15=73

TM30

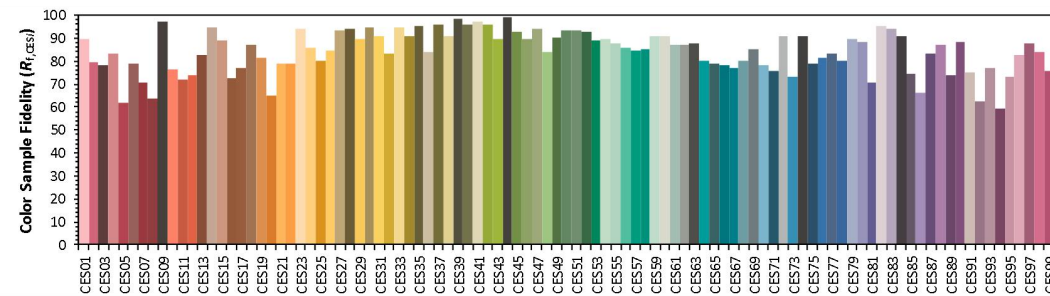
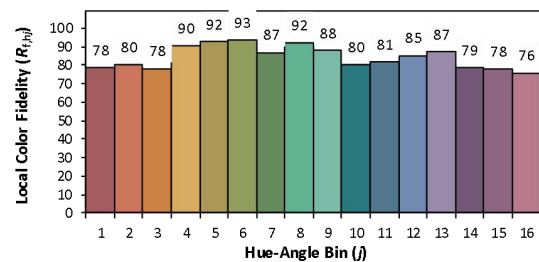
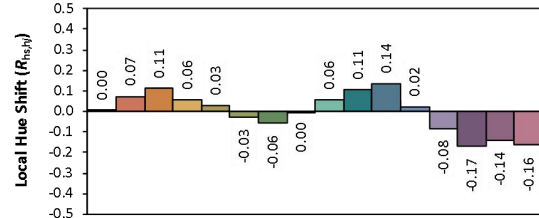
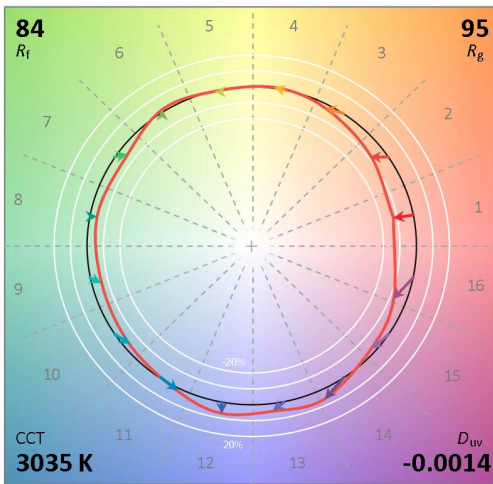
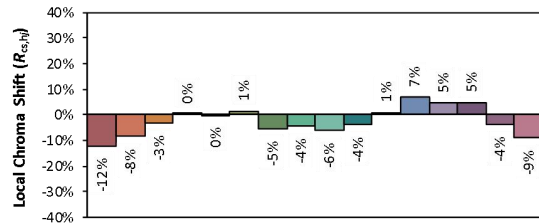
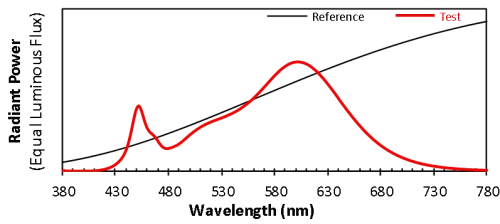
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RC35001C1

Manufacturer: IKIO LED LIGHTING

Date: 2021-10-21

Model: Delphi Mini Wallpack (0%, 3000K)



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

x 0.4325
 y 0.3991
 u' 0.2499
 v' 0.5187

CIE 13.3-1995 (CRI)
 R_a 82
 R_9 2

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	2021-10-21	Test Ambient:	25±1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	Delphi Mini Wallpack 4000K	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JCE210502-	120.0	60	0.2026	24.02	0.9879	8.95
F1	277.0	60	0.0953	23.73	0.8994	13.04
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer

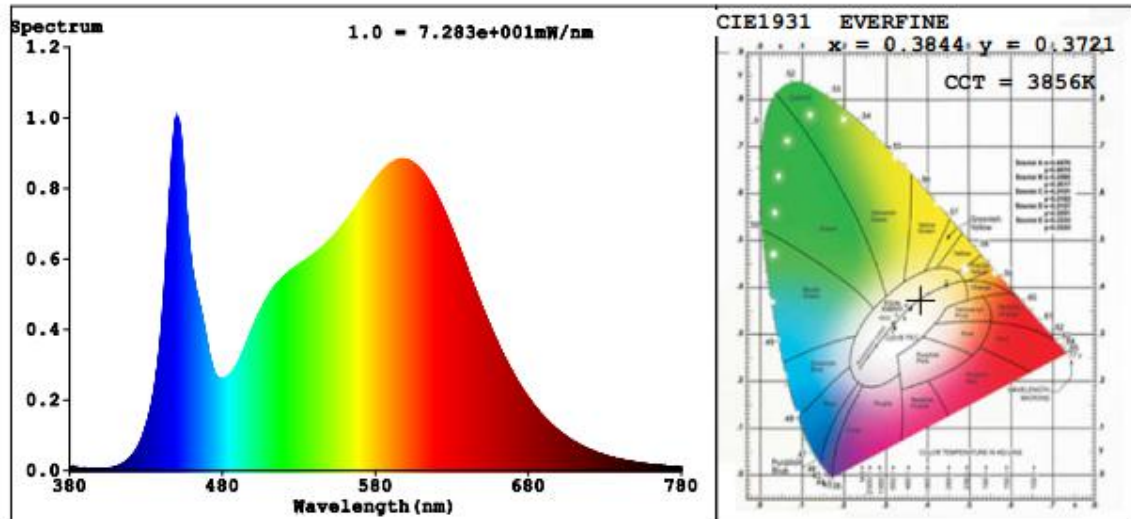
Method(Self-absorption:1.1129)(4π geometry):

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	85.2
Frequency (Hz)	60	R9	17
CCT (K)	3856	Rg	97
Duv	-0.0033	Rf	85
Chromaticity (x, y)	x=0.3844 y=0.3721	Rcs,h1(%)	-12
Chromaticity (u', v')	u'=0.2296 v'=0.5001		

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria	
Test Voltage (V)	120	277	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	3438	3387	>=300 (-10%)	
Luminous Efficacy (lm/W)	143.13	142.73	Standard: >= 105(-3%)	Premium: >= 120(-3%)

Spectral Power Distribution & Chromaticity Diagram



Special Color Rendering Indices

R1 =84 R2 =92 R3 =96 R4 =84 R5 =85 R6 =88 R7 =85
 R8 =66 R9 =17 R10=81 R11=84 R12=68 R13=87 R14=98 R15=79

TM30

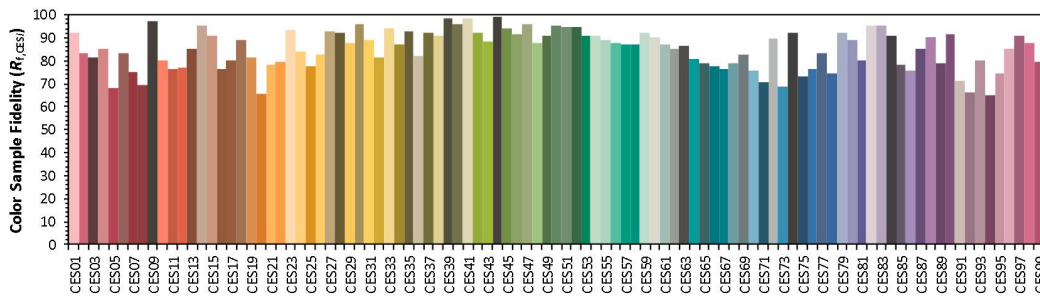
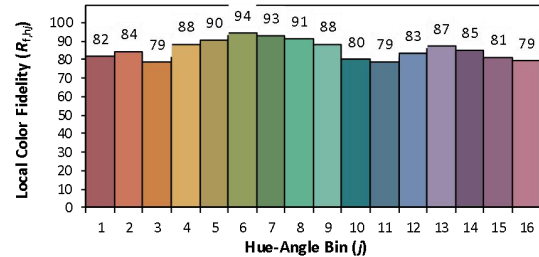
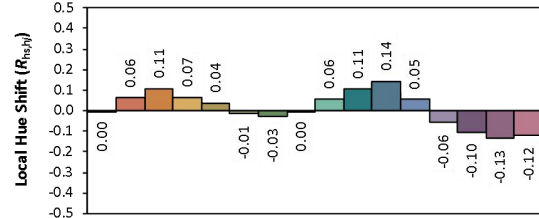
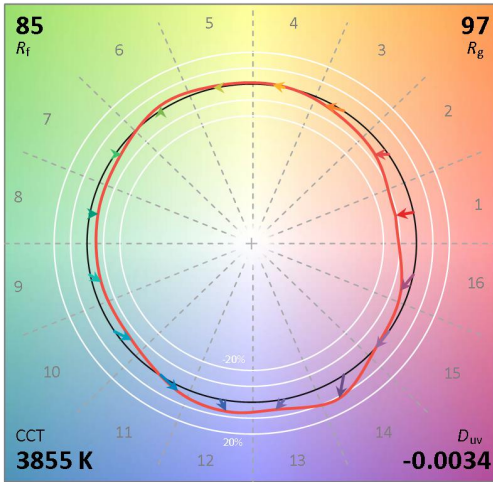
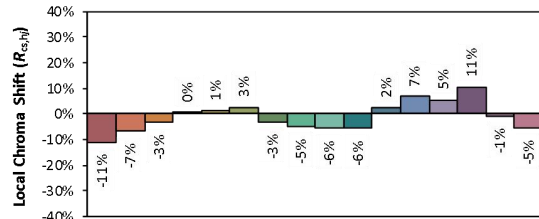
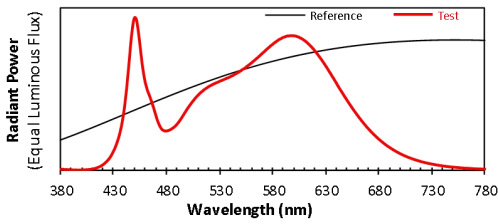
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RC35001C1
L128-5080RC35001C1

Date: 2021-10-21

Manufacturer: IKIO LED LIGHTING

Model: Delphi Mini Wallpack (50%, 4000K)



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

x 0.3844
 y 0.3719
 u' 0.2297
 v' 0.5000

CIE 13.3-1995 (CRI)
 R_a 85
 R_9 17

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

2.4 Electrical, Photometric and Chromaticity Measurements

Test date	2021-10-21	Test Ambient:	25±1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	Delphi Mini Wallpack 5000K	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JCE210502-	120.0	60	0.2088	24.80	0.9899	8.54
F1	277.0	60	0.0982	24.50	0.9011	12.64
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer

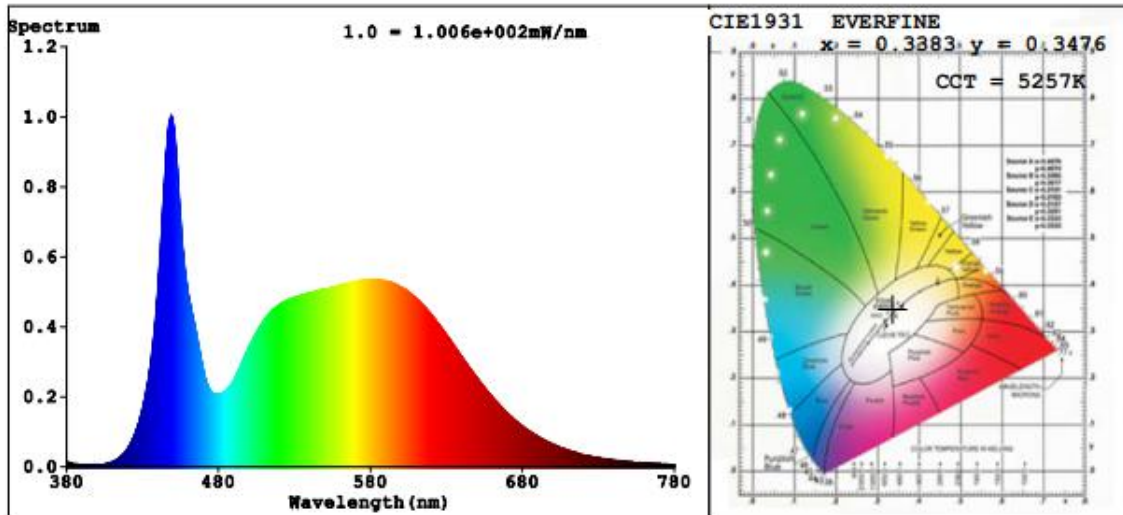
Method(Self-absorption:1.1123π geometry):

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	83.9
Frequency (Hz)	60	R9	15
CCT (K)	5257	Rg	97
Duv	0.0008	Rf	84
Chromaticity (x, y)	x=0.3383 y=0.3476	Rcs,h1(%)	-12
Chromaticity (u', v')	u'=0.2084 v'=0.4817		

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria	
Test Voltage (V)	120	27	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	3361	3311	>=300 (-10%)	
Luminous Efficacy (lm/W)	135.52	135.14	Standard: >= 105(-3%)	Premium: >= 120(-3%)

Spectral Power Distribution & Chromaticity Diagram



Special Color Rendering Indices

R1 =83	R2 =87	R3 =90	R4 =85	R5 =84	R6 =83	R7 =87	
R8 =71	R9 =15	R10=70	R11=85	R12=64	R13=84	R14=95	R15=78

TM30

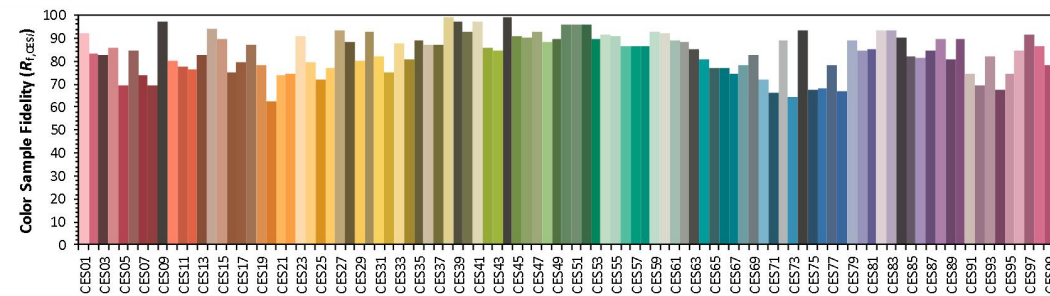
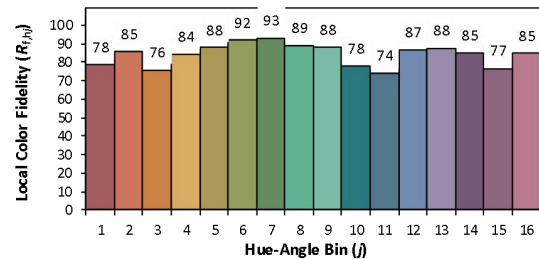
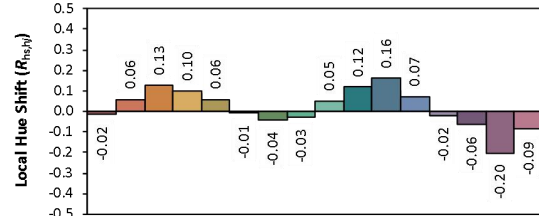
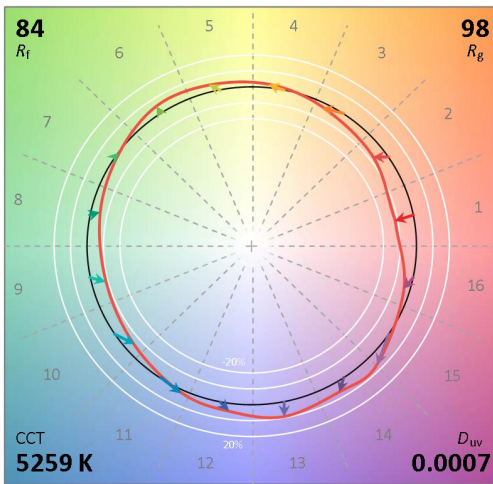
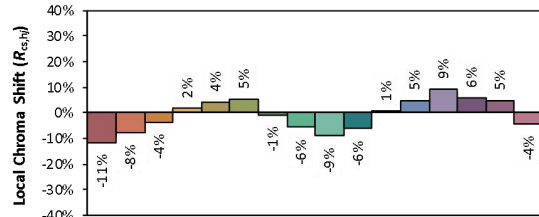
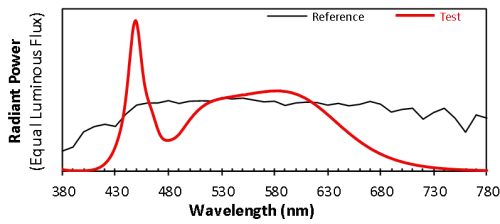
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-5080RC35001C1

Manufacturer: IKIO LED LIGHTING

Date: 2021-10-21

Model: Delphi Mini Wallpack (100%, 5000K)



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

x 0.3383
 y 0.3474
 u' 0.2084
 v' 0.4816

CIE 13.3-1995 (CRI)	
R_a	84
R_9	15

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	2021-07-07	2022-07-06
ST-R-333	Power Meter for Integrating Sphere	2021-06-25	2022-06-24
ST-R-405	Temperature Probe for Integrating Sphere	2021-01-22	2022-01-21
ST-R-355	Goniophotometer system	Verified by D908S standard lamp	
ST-R-359	Standard Lamp	2021-07-07	2022-07-06
ST-R-358	Power Meter for Goniophotometer	2021-06-25	2022-06-24
ST-R-354	hygrothermograph for Goniophotometer	2021-06-26	2022-06-25
Expand Uncertainty: Photometric Measurement (Sphere):3.06%, k=2 Chromaticity Measurement(Sphere):43.46K, k=2 Photometric Measurement(Goniophotometer):3.38%, k=2			

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