LM-79-08 Test Report

For

RAB LIGHTING INC

(Brand Name: N/A)

170 Ludlow Ave,PO BOX 970,Northvale, NJ 07647-2305 USA

Model name(s): DLW0093(WFRL5R129CCT120WB)

Report Type:	Testing and Report According to IES LM-79-2008
Type of Luminaire:	Downlights
Report Date:	2022-08-12

Prepared By:

Test & Report By:

Engineer: Sun Fangfang

Review By:

Manager: Huang Qichong

1.1 Rated Values:	
Rated Voltage / Frequency	120Vac, 60 Hz
Nominal Power	12.0 W
Rated Initial Lamp Lumen	850 lm
Declared CCT	2700K/3000K/3500K/4000K/5000K

1.2 Test Specifications:

Test item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

1.3 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25°C ±1°C, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1°vertical intervals and 22.5°horizontal intervals.

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 25ºC ±1ºC. 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 25ºC ±1ºC. 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.

2.1.1 Electrical, Photometric and Chromaticity Measurements

Test date	2022-08-12	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0093(WFRL5R129CCT120WB)	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202208090013	120.0	60	0.100	11.80	0.986

Chromaticity Measurement - Sphere-Spectroradiometer Method:

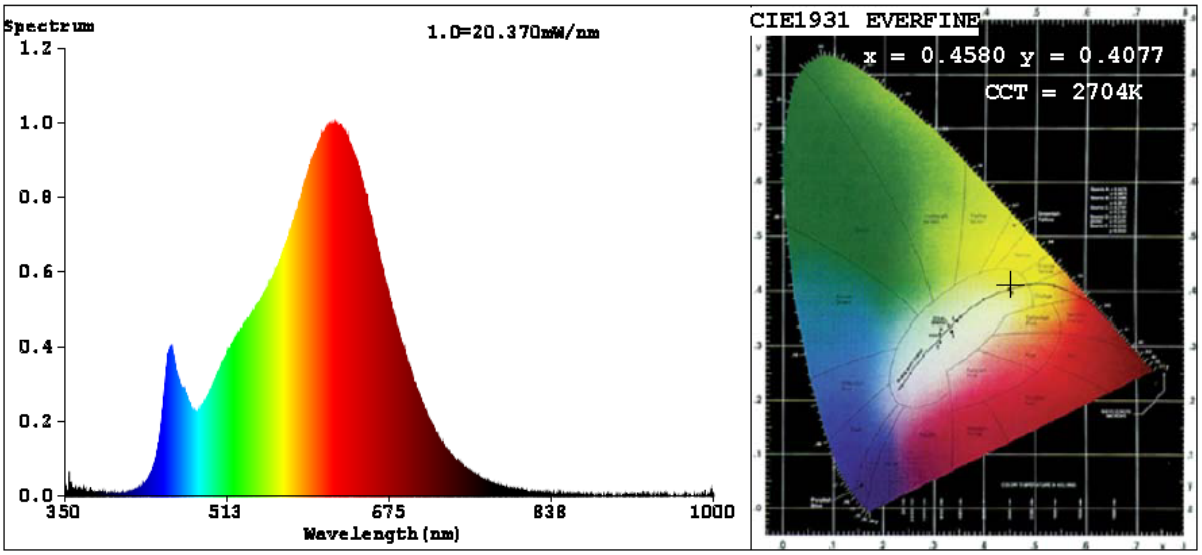
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2704
Duv	-0.0009
Chromaticity (x, y)	x=0.4580 y=0.4077
Chromaticity (u', v')	u'=0.2626 v'=0.5260
Color Rendering Index (CRI)	91.8
R9	53

Special Color Rendering Indices			
R1	93	R9	53
R2	98	R10	96
R3	96	R11	93
R4	91	R12	84
R5	93	R13	95
R6	97	R14	99
R7	88	R15	87
R8	77	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	924.2
Luminous Efficacy (lm/W)	78.32
Beam Angle (°)	110.8
Center Beam Candle Power (cd)	335.3

Spectral Power Distribution & Chromaticity Diagram



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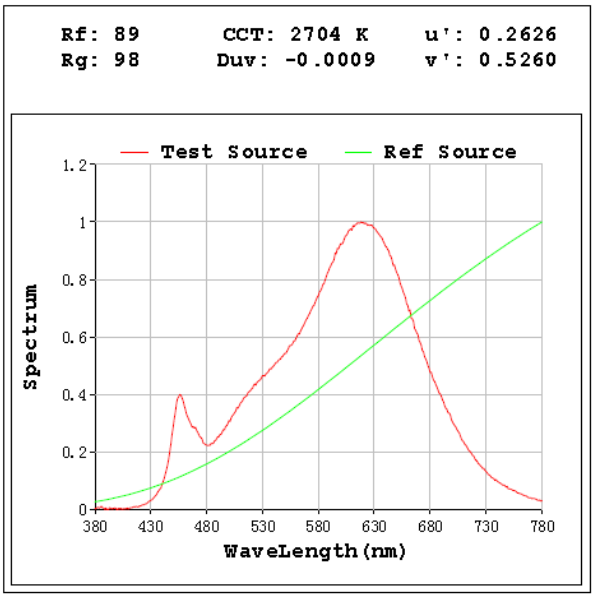
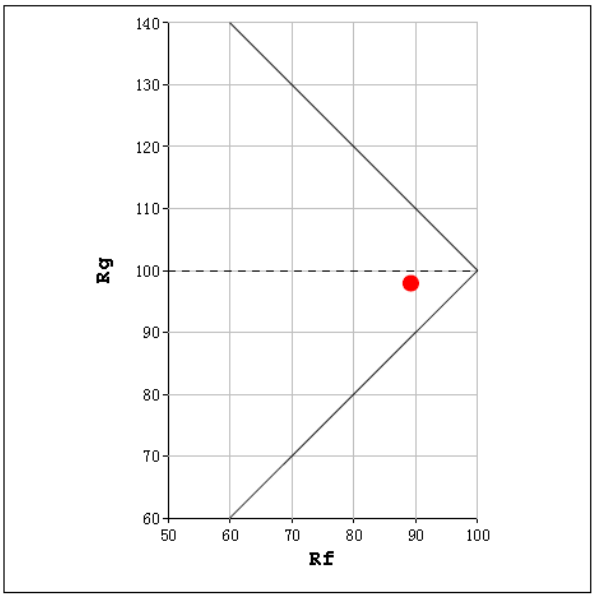
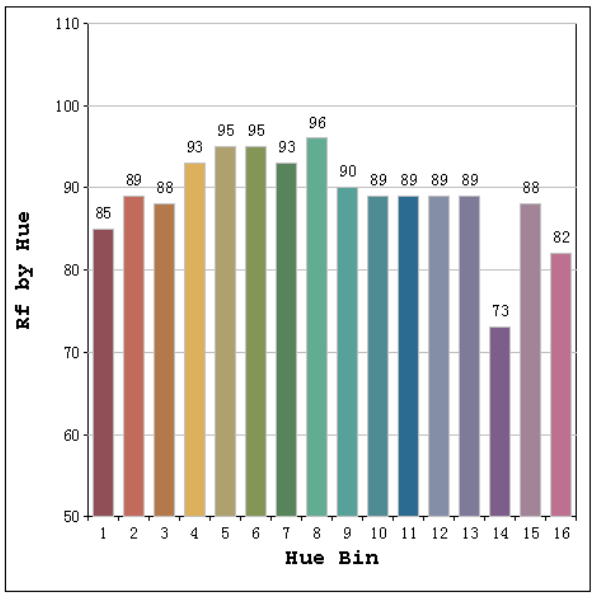
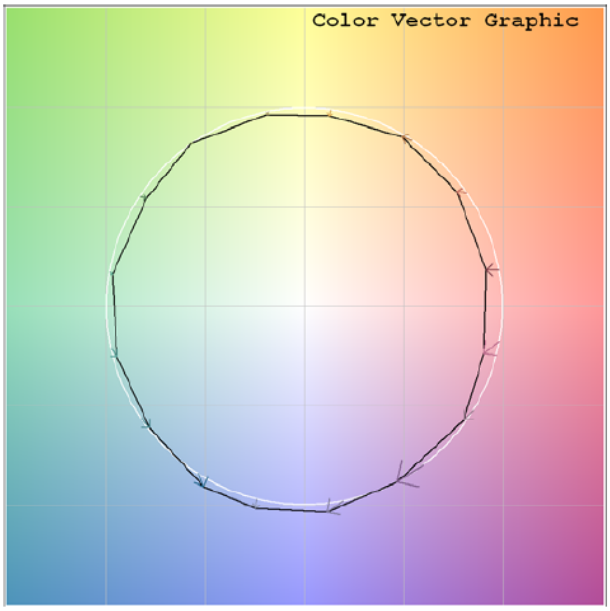






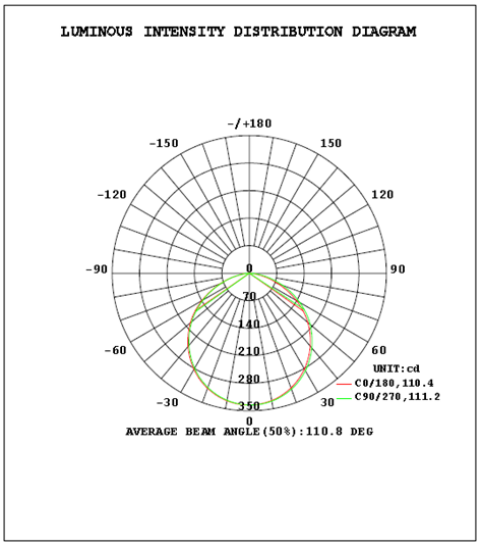


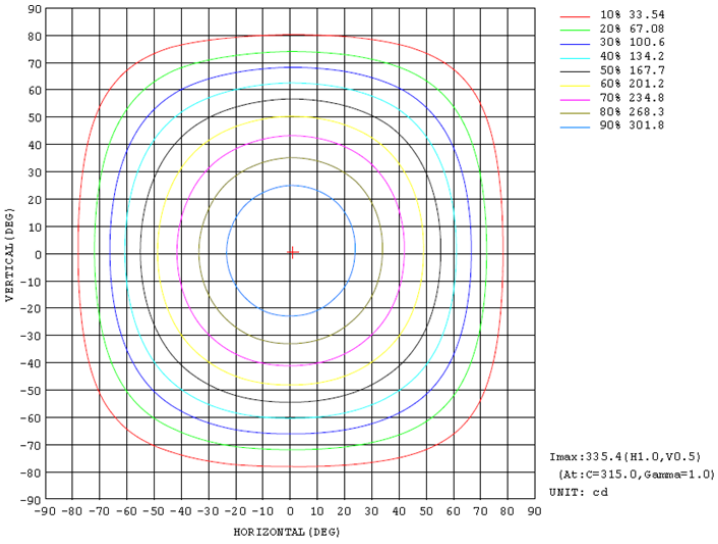
Zonal Lumen Tabulation

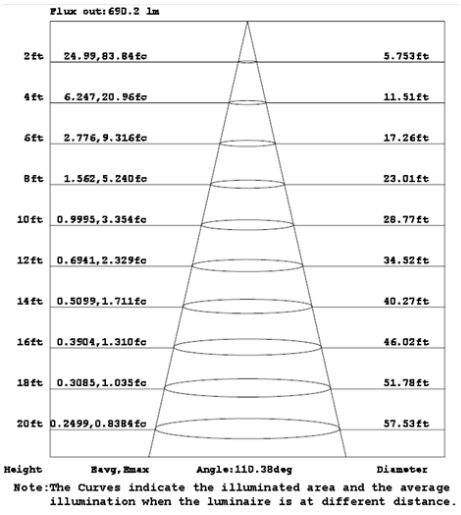
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	260.0	28.1%
0-40	425.1	46.0%
0-60	747.0	80.8%
60-90	177.2	19.2%
70-100	66.8	7.2%
90-120	0.0	0.0%
0-90	924.2	100.0%
90-180	0.0	0.0%
0-180	924.2	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	31.7	3.4%	90-100	0.0	0.0%
10-20	90.8	9.8%	100-110	0.0	0.0%
20-30	137.5	14.9%	110-120	0.0	0.0%
30-40	165.1	17.9%	120-130	0.0	0.0%
40-50	170.3	18.4%	130-140	0.0	0.0%
50-60	151.6	16.4%	140-150	0.0	0.0%
60-70	110.4	11.9%	150-160	0.0	0.0%
70-80	56.5	6.1%	160-170	0.0	0.0%
80-90	10.3	1.1%	170-180	0.0	0.0%

Photometric Data







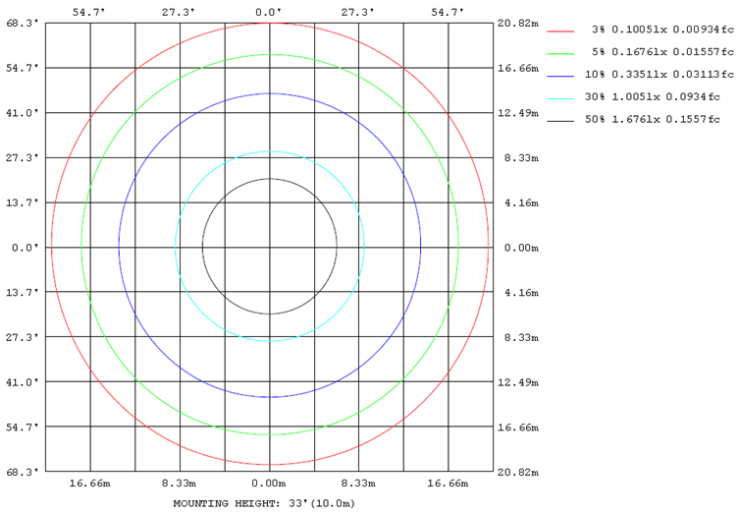


Table--1 UNIT: cd

γ (DEG) \ C(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	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335			
5	334	334	333	333	333	333	333	333	333	334	334	334	334	334	334	334			
10	329	329	329	328	328	328	328	328	329	329	330	330	331	331	331	330			
15	322	322	321	321	320	321	320	321	321	322	322	323	324	324	324	323			
20	312	311	310	310	309	310	310	310	311	311	312	313	314	314	315	313			
25	298	297	296	296	296	296	296	296	297	298	299	300	302	302	302	301			
30	282	281	280	280	279	280	280	280	281	282	283	285	286	287	287	285			
35	264	263	261	261	261	261	261	261	263	263	265	267	269	269	269	267			
40	243	242	240	240	240	241	240	241	242	243	245	246	249	249	249	246			
45	221	219	217	217	217	218	217	218	219	220	223	224	227	227	227	224			
50	196	195	193	193	192	193	192	193	195	196	198	200	203	203	202	200			
55	170	169	166	166	165	166	165	166	168	169	172	174	177	177	176	173			
60	140	140	137	137	136	137	136	136	138	141	144	146	149	149	148	144			
65	110	110	108	108	107	108	106	106	108	111	115	117	120	120	118	114			
70	79.8	79.7	79.4	78.9	77.6	78.4	75.5	75.7	78.2	81.1	86.3	87.8	90.3	90.1	87.9	83.3			
75	51.0	50.6	51.6	50.9	49.5	50.1	46.8	47.0	49.5	51.9	57.9	59.3	61.5	61.3	58.2	54.2			
80	24.2	25.9	26.0	25.4	23.9	24.4	22.5	20.9	23.1	26.6	31.6	32.8	34.7	34.3	32.0	27.0			
85	6.02	6.38	5.06	4.34	3.44	3.78	3.60	3.82	5.05	6.93	9.43	10.1	11.5	11.2	10.5	7.61			
90	0.48	0.37	0.37	0.37	0.39	0.39	0.39	0.39	0.36	0.39	0.63	0.86	0.92	0.98	0.84	0.70			

2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2022-08-12	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0093(WFRL5R129CCT120WB)	3000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202208090013	120.0	60	0.099	11.70	0.986

Chromaticity Measurement - Sphere-Spectroradiometer Method:

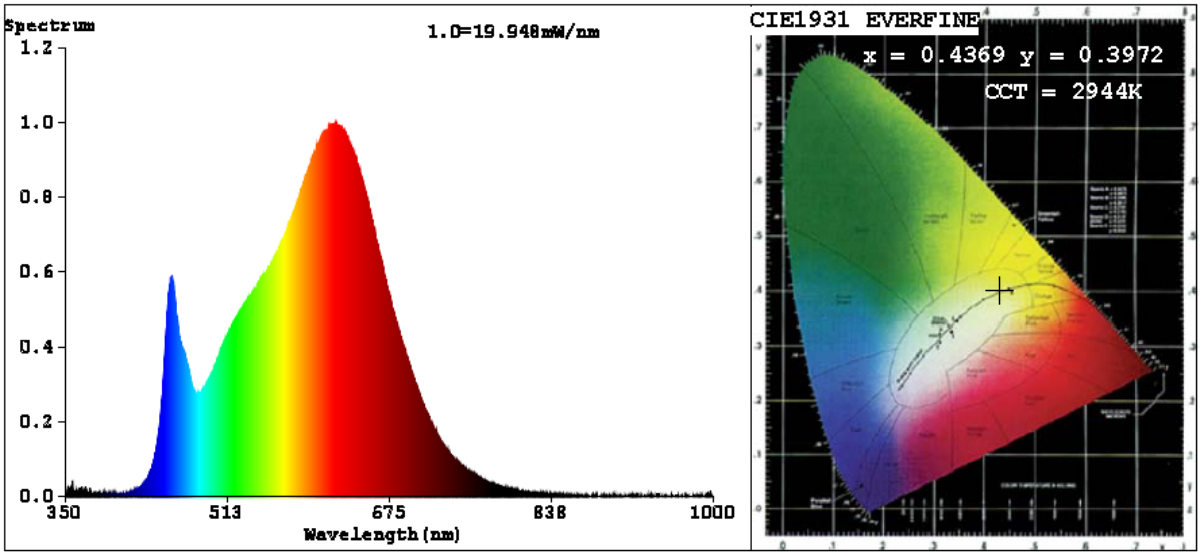
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2944
Duv	-0.0028
Chromaticity (x, y)	x=0.4369 y=0.3972
Chromaticity (u', v')	u'=0.2535 v'=0.5186
Color Rendering Index (CRI)	93.0
R9	62

Special Color Rendering Indices			
R1	95	R9	62
R2	99	R10	98
R3	96	R11	94
R4	92	R12	81
R5	95	R13	97
R6	96	R14	99
R7	89	R15	91
R8	81	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	965.6
Luminous Efficacy (lm/W)	82.53
Beam Angle (°)	109.8
Center Beam Candle Power (cd)	353.8

Spectral Power Distribution & Chromaticity Diagram



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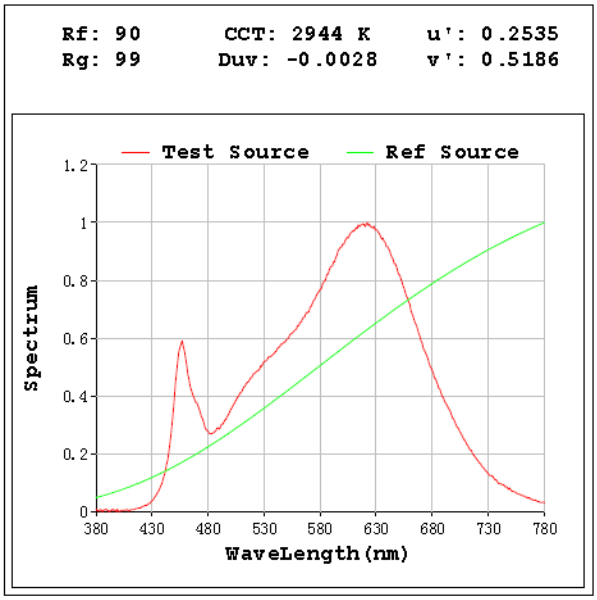
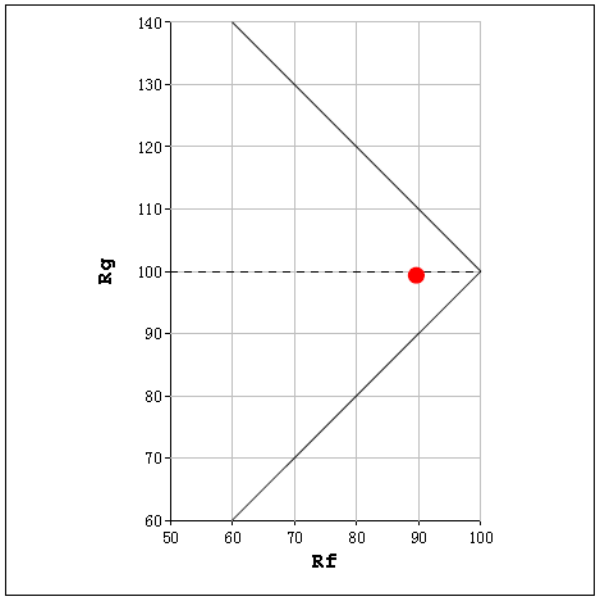
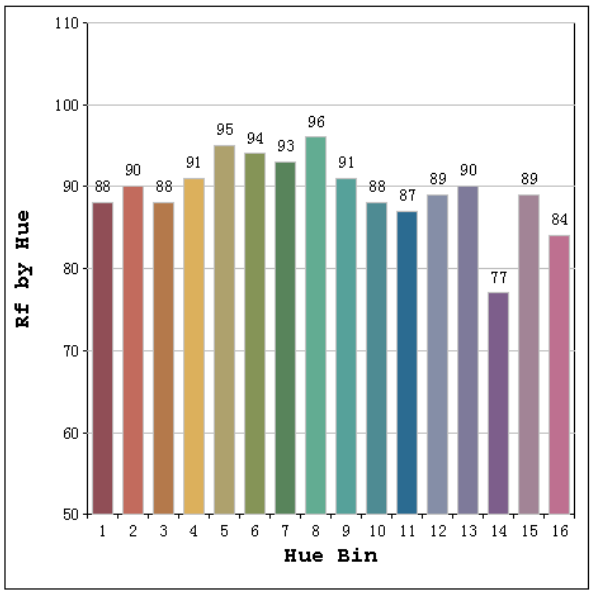
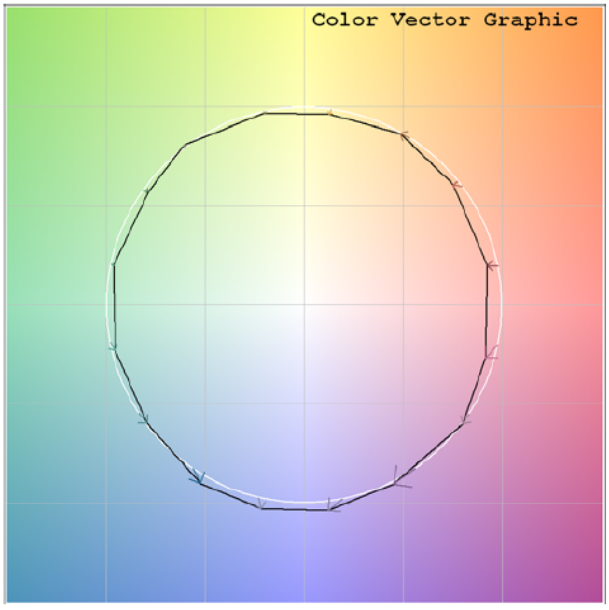






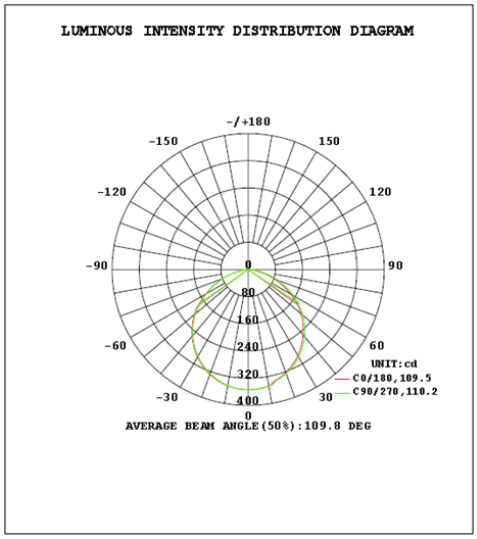


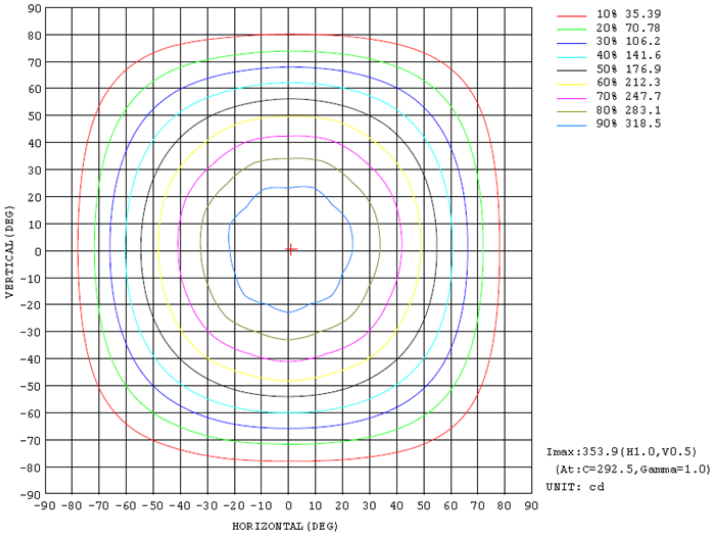
Zonal Lumen Tabulation

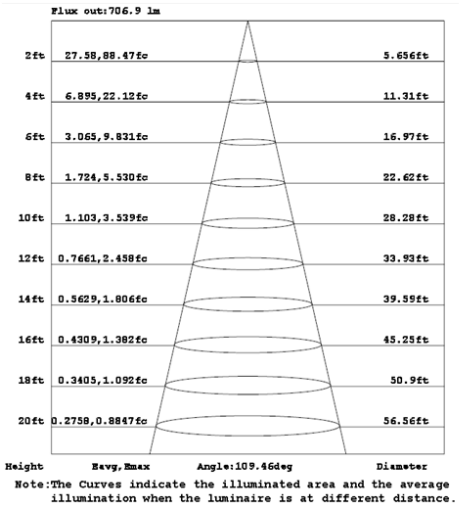
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	272.5	28.2%
0-40	445.4	46.1%
0-60	781.6	80.9%
60-90	184.0	19.1%
70-100	69.4	7.2%
90-120	0.0	0.0%
0-90	965.6	100.0%
90-180	0.0	0.0%
0-180	965.6	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	33.5	3.5%	90-100	0.0	0.0%
10-20	95.2	9.9%	100-110	0.0	0.0%
20-30	143.9	14.9%	110-120	0.0	0.0%
30-40	172.8	17.9%	120-130	0.0	0.0%
40-50	178.3	18.5%	130-140	0.0	0.0%
50-60	158.0	16.4%	140-150	0.0	0.0%
60-70	114.6	11.9%	150-160	0.0	0.0%
70-80	58.7	6.1%	160-170	0.0	0.0%
80-90	10.7	1.1%	170-180	0.0	0.0%

Photometric Data







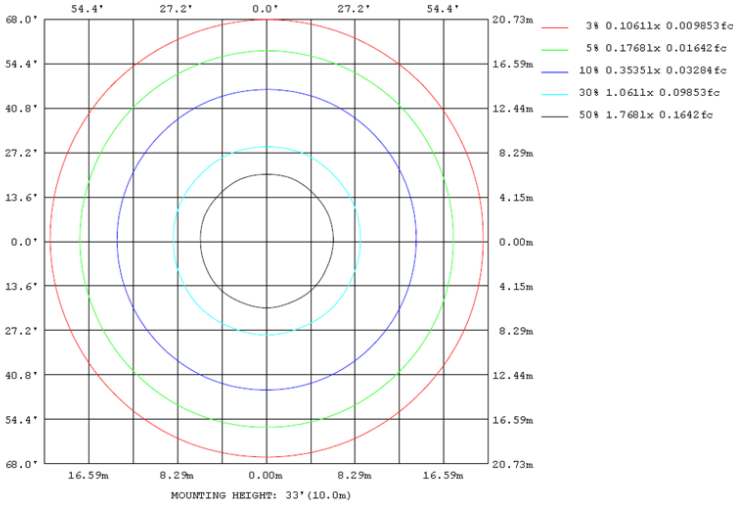


Table--1 UNIT: cd

γ (DEG) \ C(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	354	354	354	354	354	354	354	354	354	354	354	354	354	354	354	354			
5	352	352	352	352	352	352	352	352	352	352	352	352	353	353	353	352			
10	348	347	347	347	346	347	346	347	347	347	348	348	349	349	349	348			
15	340	334	338	333	338	333	338	333	334	339	335	341	336	342	336	341			
20	329	323	327	322	326	322	327	322	323	328	324	330	326	332	326	330			
25	315	309	312	307	312	308	313	308	309	314	311	317	313	318	313	317			
30	298	292	295	290	295	291	295	291	292	297	295	300	297	302	298	300			
35	278	273	275	271	275	272	275	272	273	278	276	281	279	284	279	281			
40	257	251	253	249	253	250	253	250	251	256	254	260	258	262	258	260			
45	233	227	229	226	229	226	229	226	228	233	231	237	235	239	235	236			
50	207	202	203	200	203	200	203	201	203	207	206	211	210	214	210	211			
55	176	175	172	172	171	172	172	172	175	176	179	182	184	185	183	179			
60	145	145	143	142	141	142	142	142	144	147	150	152	154	154	154	149			
65	114	114	112	112	111	112	110	110	113	116	120	122	124	124	123	118			
70	82.7	82.5	82.4	81.9	80.7	81.5	78.6	78.8	81.5	84.4	89.7	91.3	93.7	93.5	91.1	86.4			
75	52.8	52.3	53.5	52.8	51.5	52.1	48.7	49.0	51.6	54.0	60.3	61.7	63.8	63.6	60.2	56.2			
80	25.0	26.7	27.0	26.3	24.9	25.4	23.4	21.8	24.0	27.8	33.0	34.0	36.0	35.6	33.1	27.9			
85	6.17	6.55	5.25	4.49	3.58	3.92	3.76	3.96	5.28	7.26	9.78	10.6	11.9	11.6	10.9	7.87			
90	0.49	0.39	0.39	0.39	0.40	0.40	0.40	0.40	0.37	0.41	0.66	0.89	0.95	1.01	0.87	0.72			

2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2022-08-12	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0093(WFRL5R129CCT120WB)	3500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202208090013	120.0	60	0.097	11.50	0.985

Chromaticity Measurement - Sphere-Spectroradiometer Method:

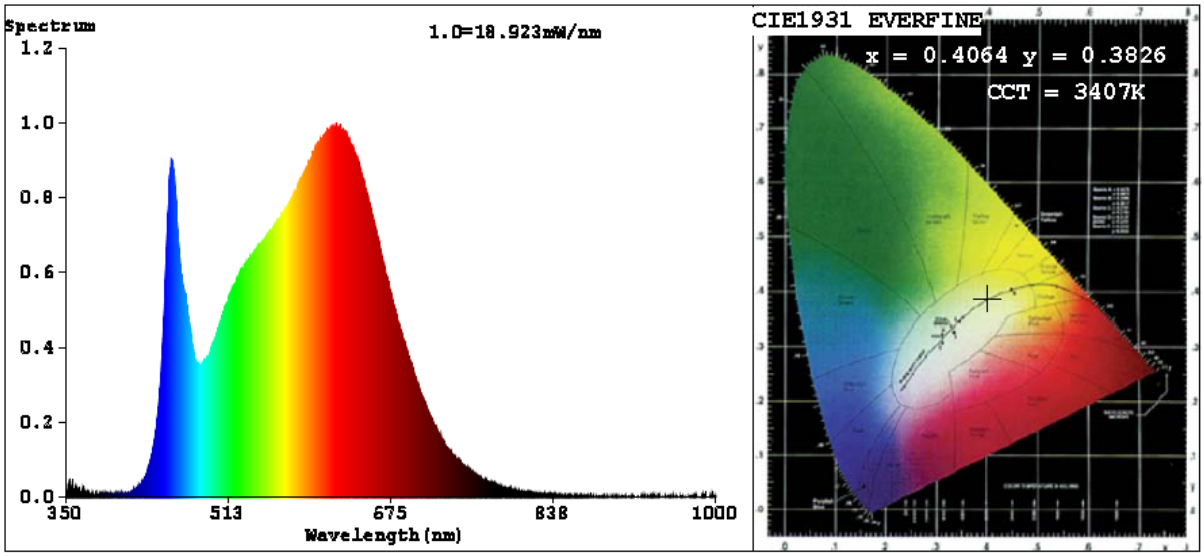
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3407
Duv	-0.0039
Chromaticity (x, y)	x=0.4064 y=0.3826
Chromaticity (u', v')	u'=0.2398 v'=0.5080
Color Rendering Index (CRI)	94.5
R9	73

Special Color Rendering Indices			
R1	97	R9	73
R2	99	R10	98
R3	97	R11	94
R4	94	R12	77
R5	96	R13	99
R6	95	R14	100
R7	92	R15	95
R8	87	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1009.1
Luminous Efficacy (lm/W)	87.75
Beam Angle (°)	110.1
Center Beam Candle Power (cd)	369.3

Spectral Power Distribution & Chromaticity Diagram



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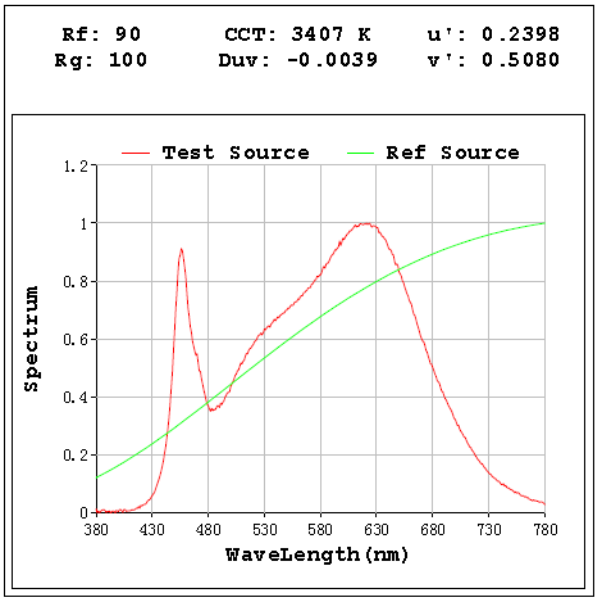
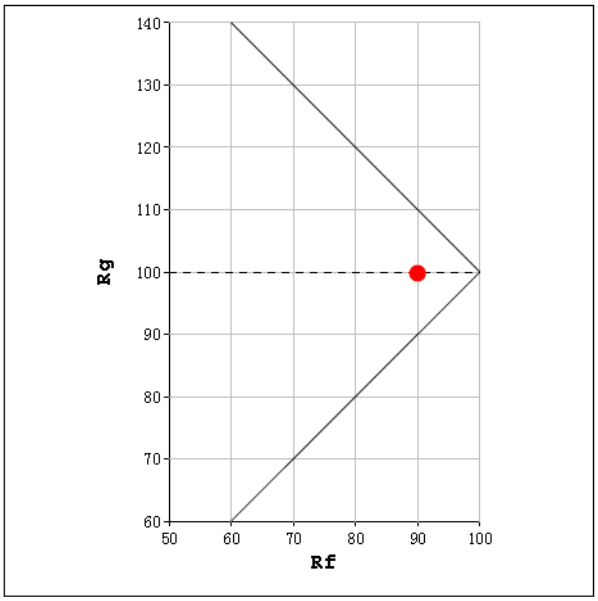
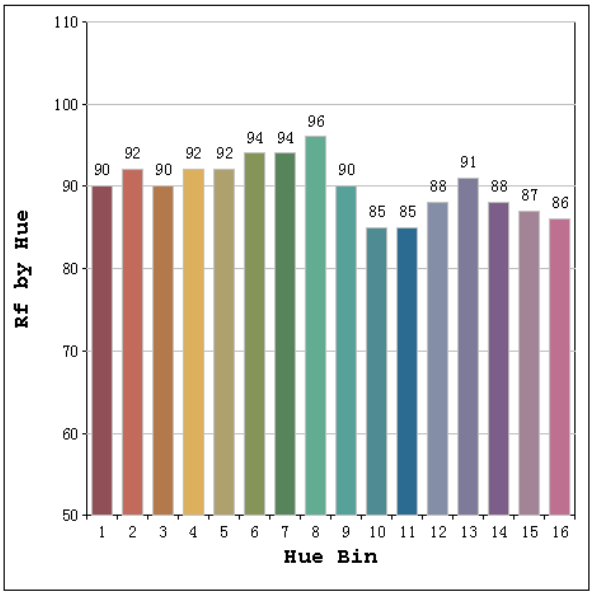
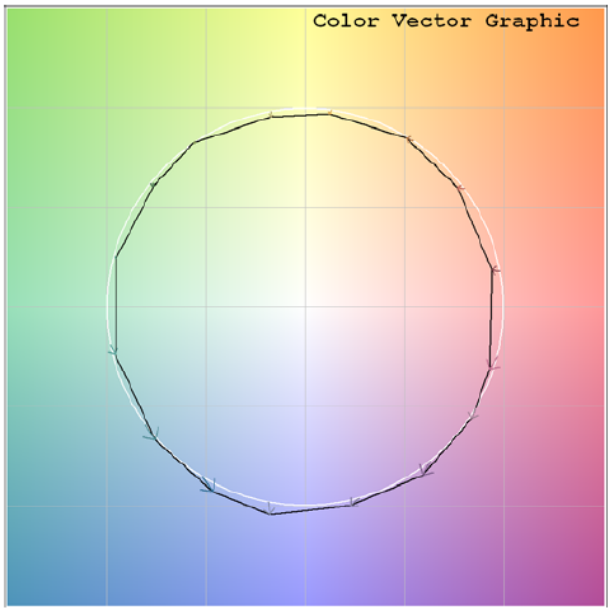






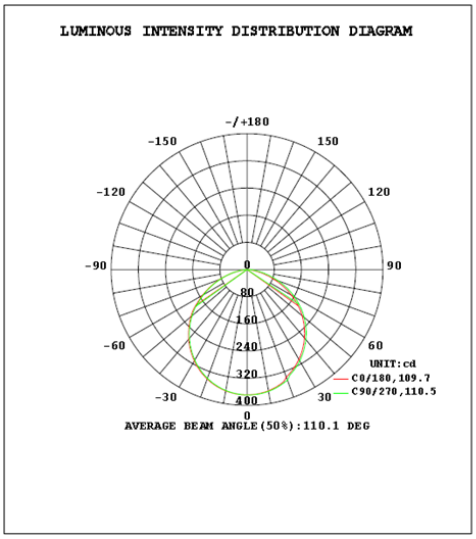


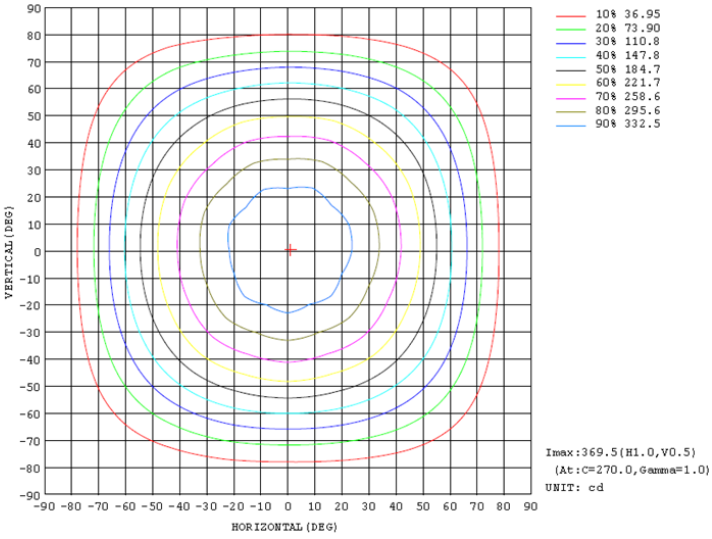
Zonal Lumen Tabulation

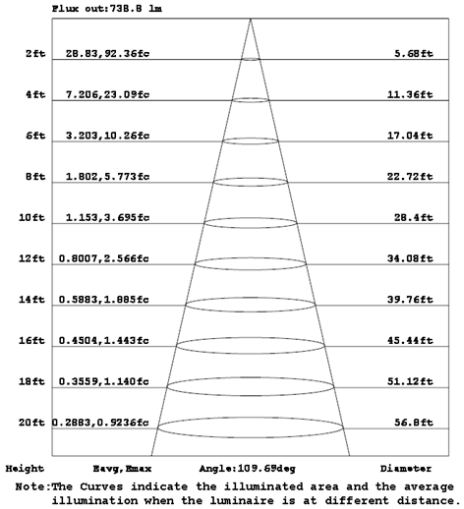
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	285.2	28.3%
0-40	465.6	46.1%
0-60	816.9	80.9%
60-90	192.2	19.0%
70-100	72.5	7.2%
90-120	0.0	0.0%
0-90	1009.1	100.0%
90-180	0.0	0.0%
0-180	1009.1	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	34.9	3.5%	90-100	0.0	0.0%
10-20	100.0	9.9%	100-110	0.0	0.0%
20-30	150.2	14.9%	110-120	0.0	0.0%
30-40	180.4	17.9%	120-130	0.0	0.0%
40-50	186.1	18.4%	130-140	0.0	0.0%
50-60	165.2	16.4%	140-150	0.0	0.0%
60-70	119.7	11.9%	150-160	0.0	0.0%
70-80	61.3	6.1%	160-170	0.0	0.0%
80-90	11.2	1.1%	170-180	0.0	0.0%

Photometric Data







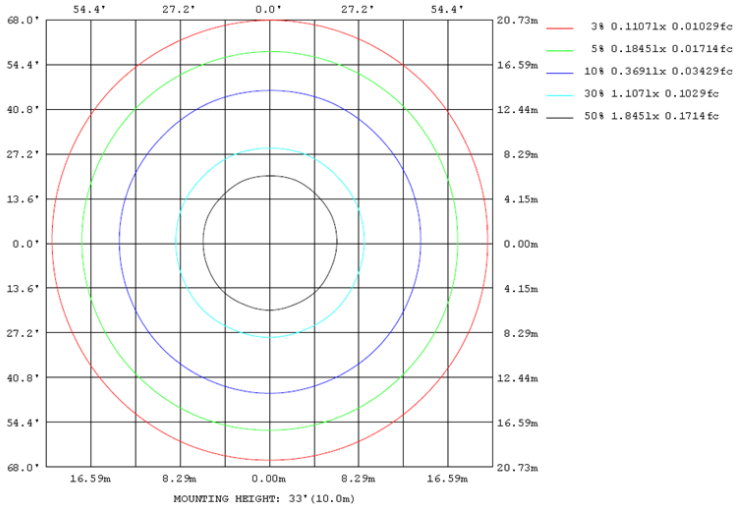


Table--1 UNIT: cd

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	369	369	369	369	369	369	369	369	369	369	369	369	369	369	369	369			
5	368	368	367	367	367	367	367	367	367	368	368	368	368	368	368	368			
10	363	362	362	362	361	362	362	362	363	363	363	363	364	364	364	364			
15	355	354	353	353	353	354	353	354	354	354	355	356	357	357	357	356			
20	343	337	341	336	341	336	341	336	337	343	342	345	347	346	347	345			
25	328	322	326	321	326	322	326	322	323	328	324	331	327	332	327	331			
30	311	305	308	303	308	304	308	304	305	311	308	314	310	315	310	313			
35	290	284	287	283	287	284	288	284	285	290	288	294	291	296	291	294			
40	268	262	264	260	264	261	265	261	263	268	266	271	269	274	269	271			
45	243	237	239	235	239	236	240	237	238	243	242	247	245	250	245	246			
50	216	211	212	209	212	209	212	210	212	216	215	221	220	223	219	220			
55	185	182	179	179	179	180	179	180	182	185	187	192	192	195	191	191			
60	152	151	149	149	148	149	148	148	150	153	157	158	161	161	160	156			
65	119	119	117	117	116	117	115	115	118	121	125	127	130	129	128	123			
70	86.3	86.1	86.0	85.6	84.2	85.2	82.2	82.4	85.2	88.3	93.8	95.3	97.8	97.5	95.1	90.1			
75	55.1	54.5	55.9	55.2	53.9	54.5	51.0	51.2	54.0	56.5	63.0	64.4	66.7	66.3	62.9	58.6			
80	26.1	27.9	28.2	27.5	26.1	26.6	24.5	22.8	25.1	29.1	34.4	35.6	37.5	37.2	34.4	29.0			
85	6.45	6.82	5.47	4.70	3.76	4.12	3.93	4.16	5.53	7.61	10.3	11.1	12.4	12.1	11.3	8.20			
90	0.52	0.41	0.41	0.41	0.42	0.44	0.42	0.42	0.39	0.43	0.72	0.93	1.00	1.05	0.92	0.75			

2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2022-08-12	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0093(WFRL5R129CCT120WB)	4000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202208090013	120.0	60	0.098	11.60	0.985

Chromaticity Measurement - Sphere-Spectroradiometer Method:

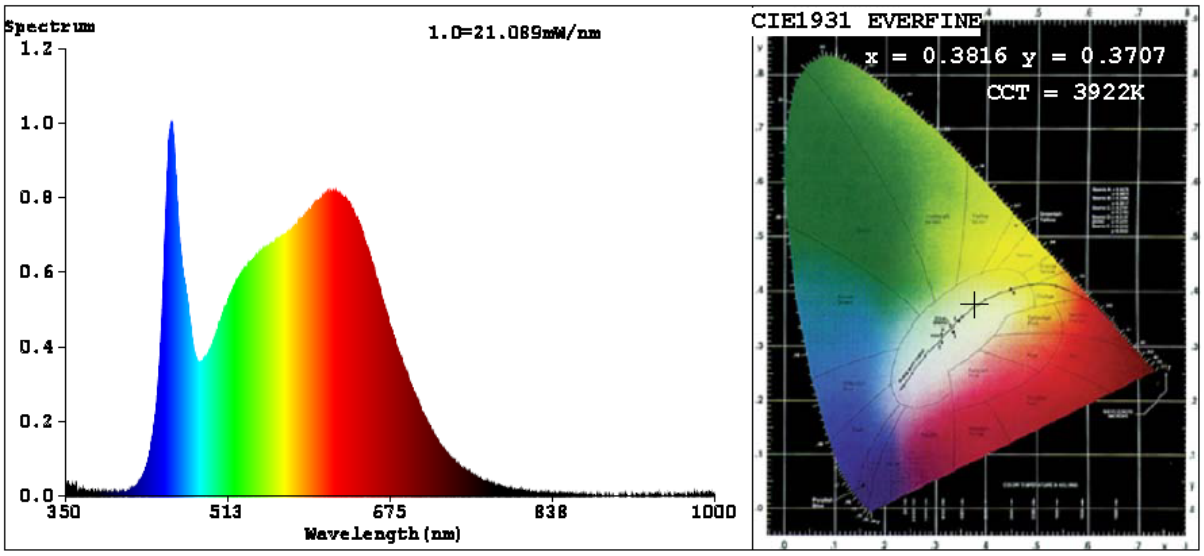
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3922
Duv	-0.0032
Chromaticity (x, y)	x=0.3816 y=0.3707
Chromaticity (u', v')	u'=0.2283 v'=0.4991
Color Rendering Index (CRI)	94.9
R9	78

Special Color Rendering Indices			
R1	97	R9	78
R2	99	R10	97
R3	98	R11	94
R4	93	R12	72
R5	95	R13	99
R6	95	R14	99
R7	93	R15	95
R8	89	--	--

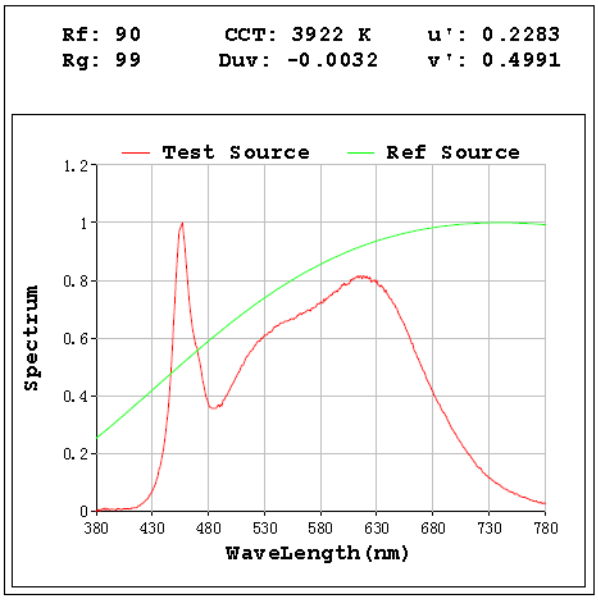
Photometric Measurement – Goniophotometer Method:

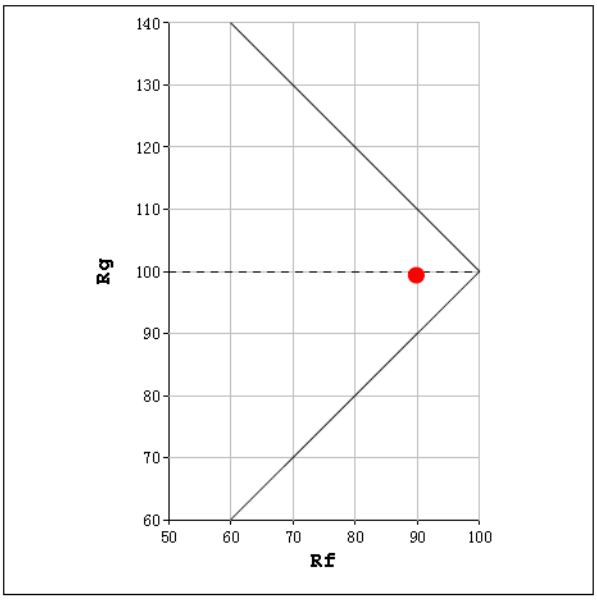
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1023.4
Luminous Efficacy (lm/W)	88.22
Beam Angle (°)	110.3
Center Beam Candle Power (cd)	374.5

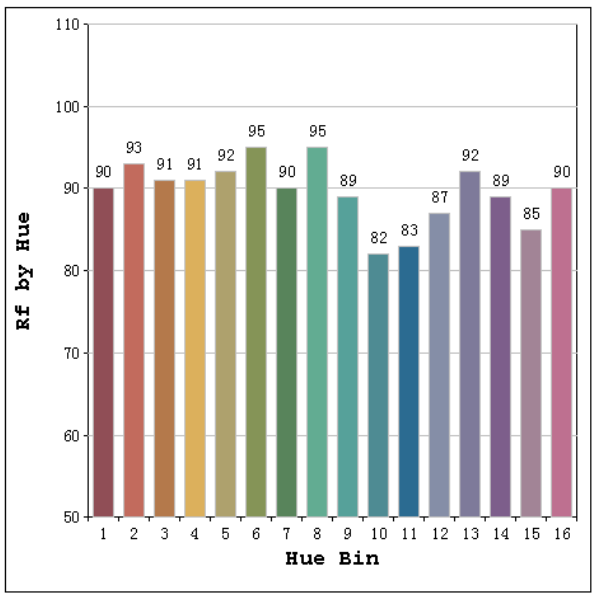
Spectral Power Distribution & Chromaticity Diagram

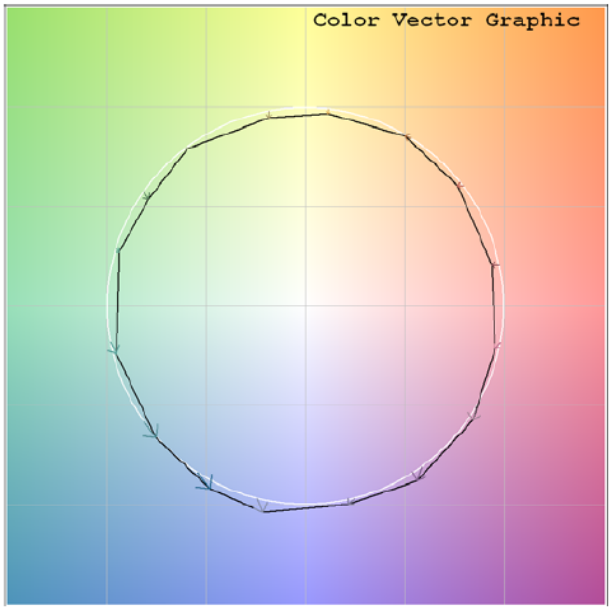


TM30







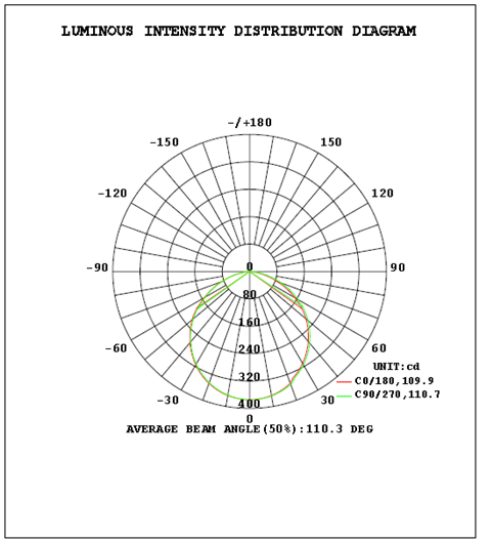


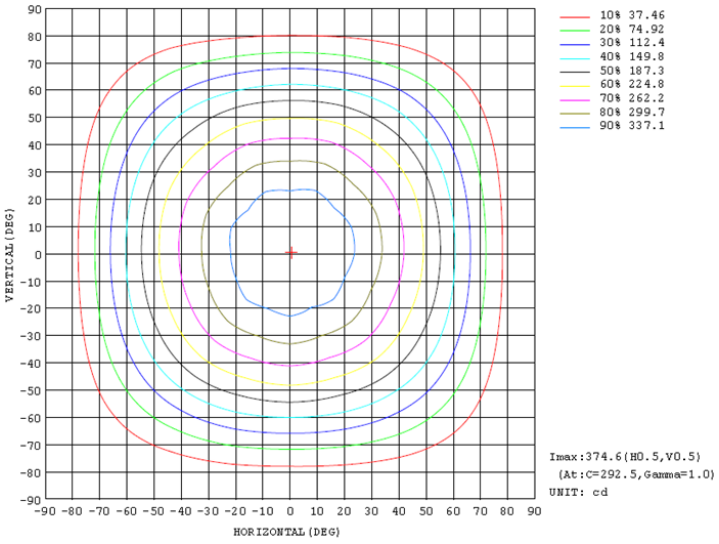
Zonal Lumen Tabulation

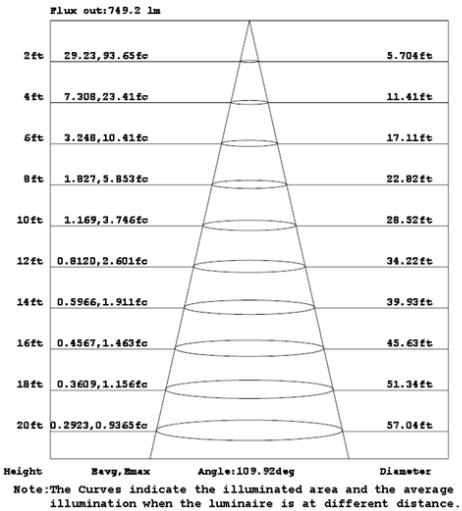
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	289.3	28.3%
0-40	472.2	46.1%
0-60	828.4	81.0%
60-90	194.9	19.0%
70-100	73.5	7.2%
90-120	0.0	0.0%
0-90	1023.4	100.0%
90-180	0.0	0.0%
0-180	1023.4	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	35.4	3.5%	90-100	0.0	0.0%
10-20	101.4	9.9%	100-110	0.0	0.0%
20-30	152.4	14.9%	110-120	0.0	0.0%
30-40	182.9	17.9%	120-130	0.0	0.0%
40-50	188.7	18.4%	130-140	0.0	0.0%
50-60	167.6	16.4%	140-150	0.0	0.0%
60-70	121.4	11.9%	150-160	0.0	0.0%
70-80	62.2	6.1%	160-170	0.0	0.0%
80-90	11.3	1.1%	170-180	0.0	0.0%

Photometric Data







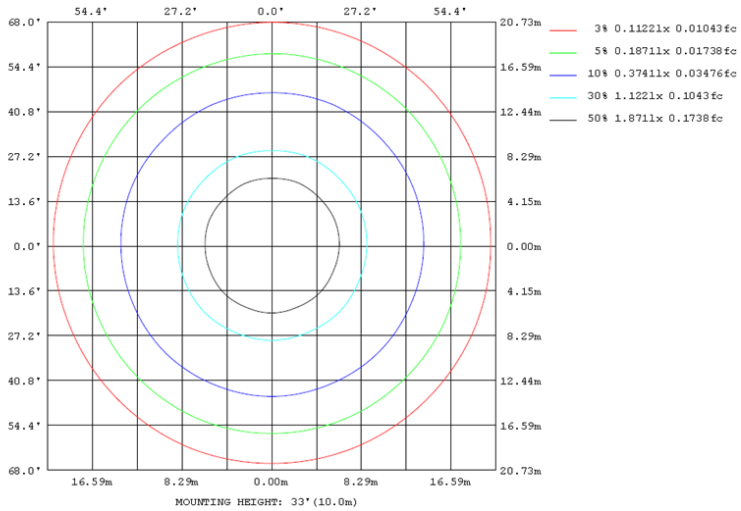


Table--1

UNIT: cd

γ (DEG) \ C(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	374	374	374	374	374	374	374	374	374	374	374	374	374	374	374	374			
5	373	373	372	372	372	372	372	372	373	373	373	373	373	373	373	373			
10	368	367	367	367	367	367	367	367	368	368	368	369	369	369	369	369			
15	359	359	358	358	358	358	358	359	359	359	360	361	361	361	362	361			
20	348	347	346	343	346	347	346	347	348	348	349	349	351	351	351	350			
25	333	327	331	325	330	326	331	326	327	333	329	335	331	337	331	335			
30	315	309	312	307	312	308	313	308	310	315	312	318	315	320	315	318			
35	294	288	291	287	291	288	292	288	289	294	292	298	295	300	295	298			
40	271	266	268	264	268	265	268	265	266	271	269	275	273	278	273	275			
45	246	241	243	239	242	239	243	240	241	246	245	250	249	253	248	250			
50	219	214	215	212	215	212	215	213	215	219	218	224	223	226	222	223			
55	189	185	184	182	183	183	184	183	185	190	190	195	194	197	193	193			
60	154	153	151	151	150	151	150	150	153	155	159	161	163	163	163	158			
65	121	121	119	119	118	119	117	117	120	123	127	129	131	131	130	125			
70	87.5	87.3	87.3	86.9	85.5	86.4	83.4	83.7	86.5	89.5	95.1	96.7	99.2	98.8	96.3	91.3			
75	55.9	55.3	56.7	56.0	54.6	55.3	51.7	52.0	54.8	57.3	63.9	65.4	67.6	67.2	63.7	59.3			
80	26.4	28.2	28.6	27.8	26.5	27.0	25.0	23.2	25.5	29.5	34.9	36.0	38.1	37.6	34.9	29.4			
85	6.54	6.92	5.55	4.78	3.82	4.20	4.00	4.23	5.62	7.70	10.4	11.2	12.6	12.3	11.5	8.31			
90	0.53	0.41	0.41	0.42	0.42	0.44	0.44	0.44	0.40	0.44	0.72	0.95	1.01	1.08	0.93	0.76			

2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2022-08-12	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0093(WFRL5R129CCT120WB)	5000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202208090013	120.0	60	0.100	11.80	0.986

Chromaticity Measurement - Sphere-Spectroradiometer Method:

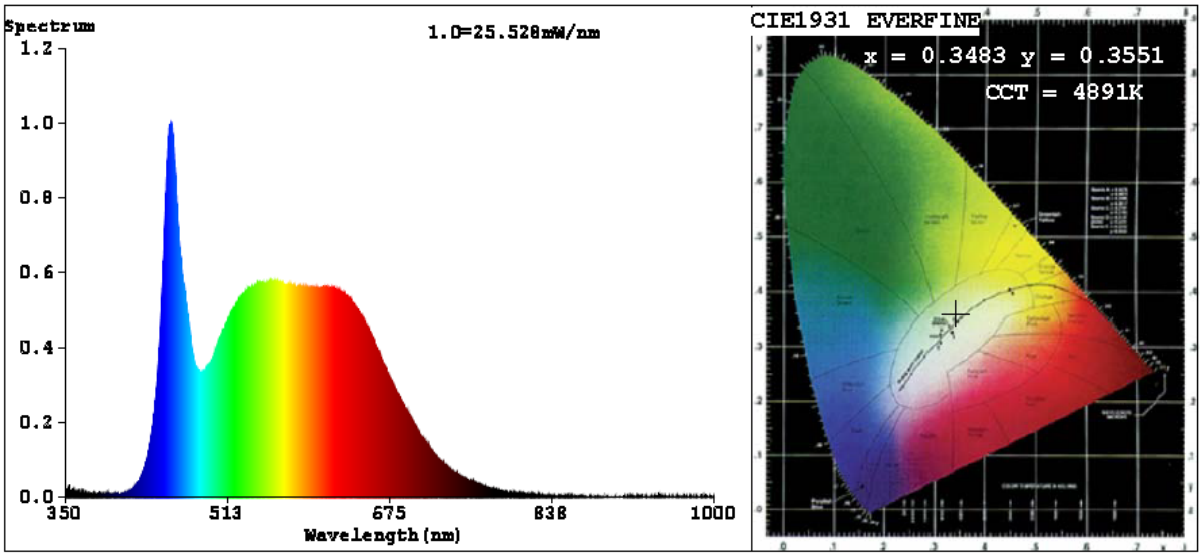
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4891
Duv	0.0005
Chromaticity (x, y)	x=0.3483 y=0.3551
Chromaticity (u', v')	u'=0.2122 v'=0.4869
Color Rendering Index (CRI)	93.0
R9	75

Special Color Rendering Indices			
R1	94	R9	75
R2	97	R10	91
R3	96	R11	90
R4	90	R12	63
R5	91	R13	96
R6	92	R14	98
R7	94	R15	92
R8	89	--	--

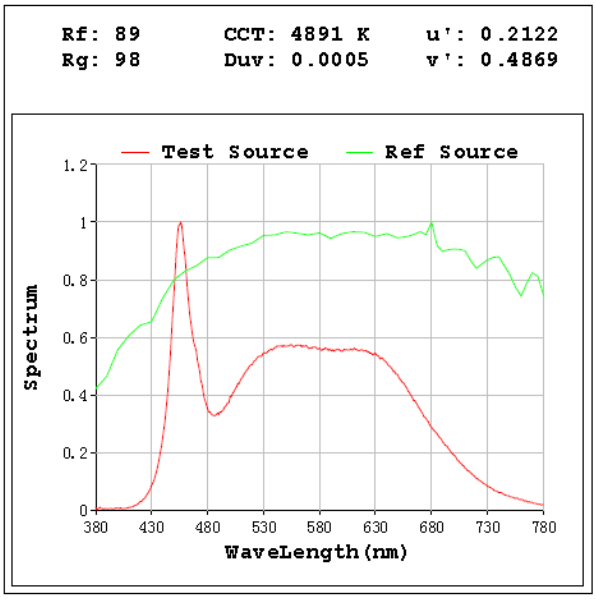
Photometric Measurement – Goniophotometer Method:

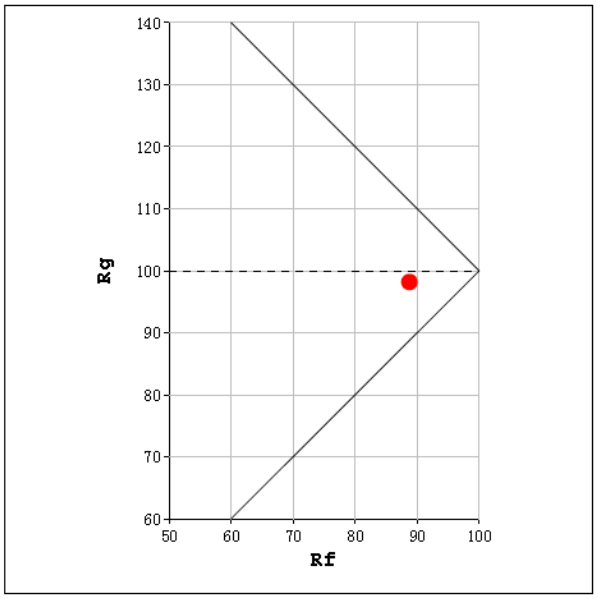
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1002.6
Luminous Efficacy (lm/W)	84.96
Beam Angle (°)	110.1
Center Beam Candle Power (cd)	366.9

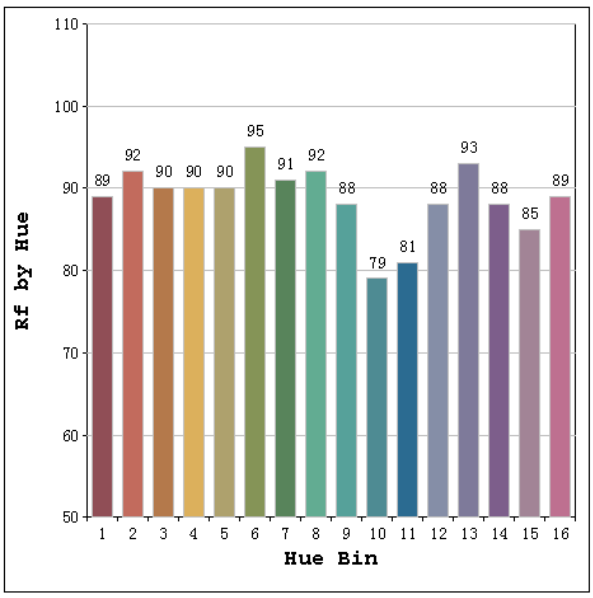
Spectral Power Distribution & Chromaticity Diagram

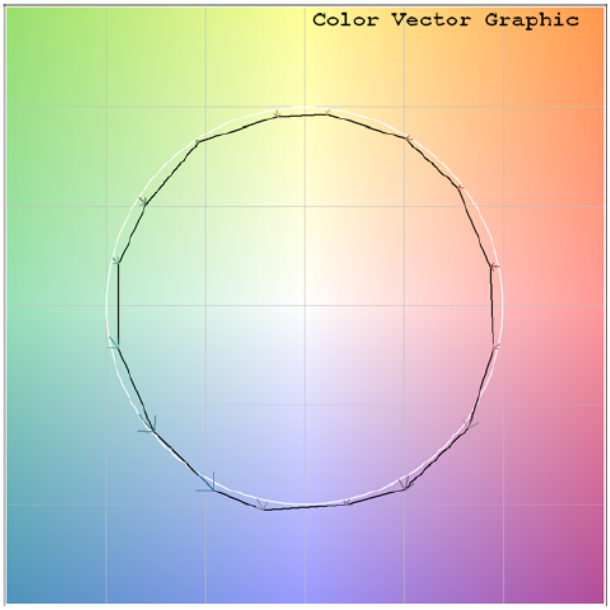


TM30







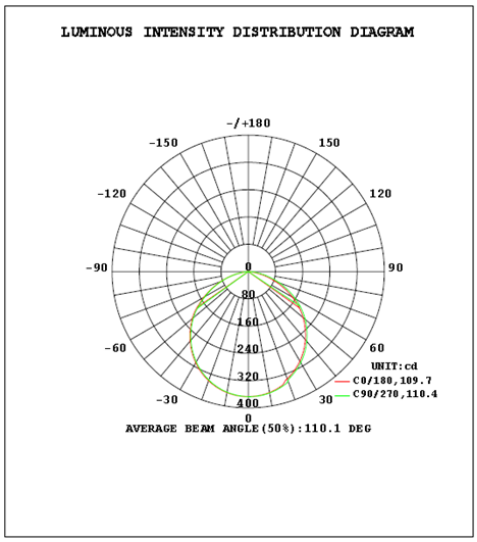


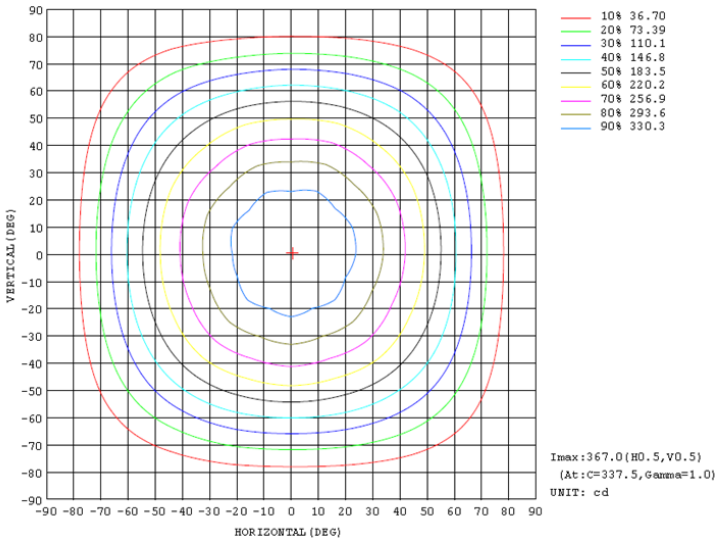
Zonal Lumen Tabulation

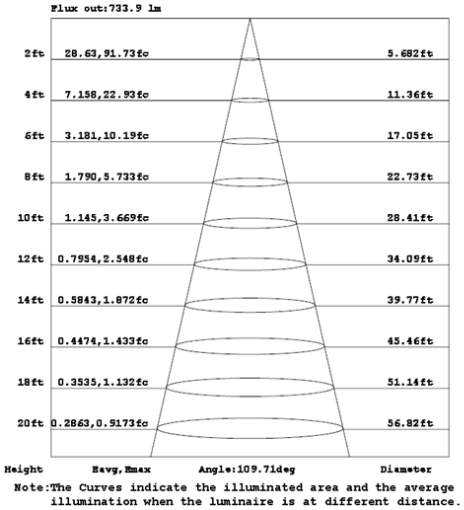
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	283.2	28.2%
0-40	462.4	46.1%
0-60	811.5	80.9%
60-90	191.1	19.1%
70-100	72.1	7.2%
90-120	0.0	0.0%
0-90	1002.6	100.0%
90-180	0.0	0.0%
0-180	1002.6	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	34.7	3.5%	90-100	0.0	0.0%
10-20	99.3	9.9%	100-110	0.0	0.0%
20-30	149.2	14.9%	110-120	0.0	0.0%
30-40	179.2	17.9%	120-130	0.0	0.0%
40-50	184.9	18.4%	130-140	0.0	0.0%
50-60	164.1	16.4%	140-150	0.0	0.0%
60-70	119.0	11.9%	150-160	0.0	0.0%
70-80	61.0	6.1%	160-170	0.0	0.0%
80-90	11.1	1.1%	170-180	0.0	0.0%

Photometric Data







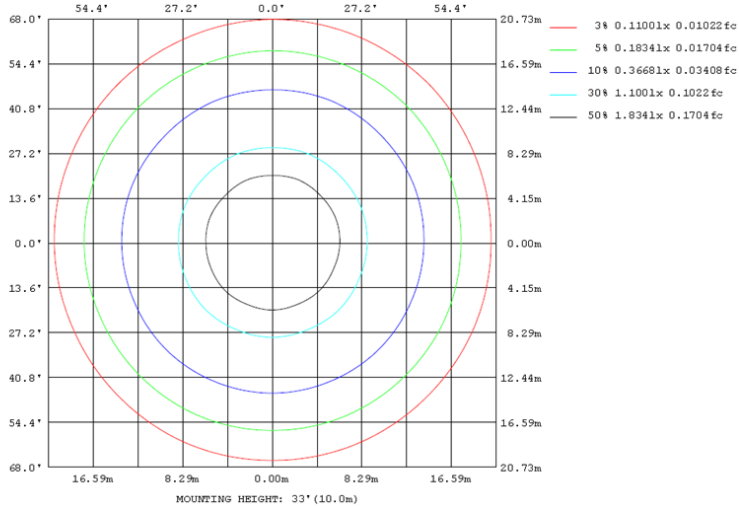
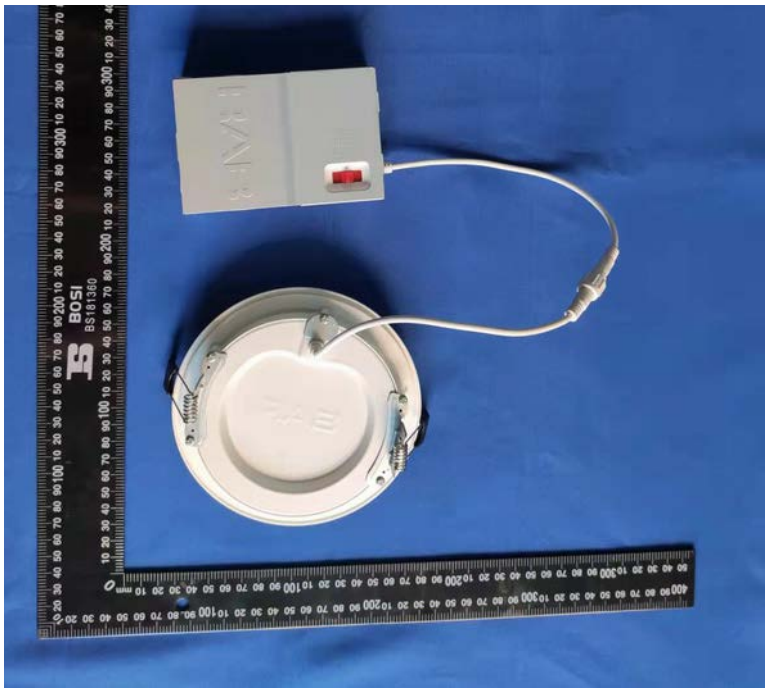
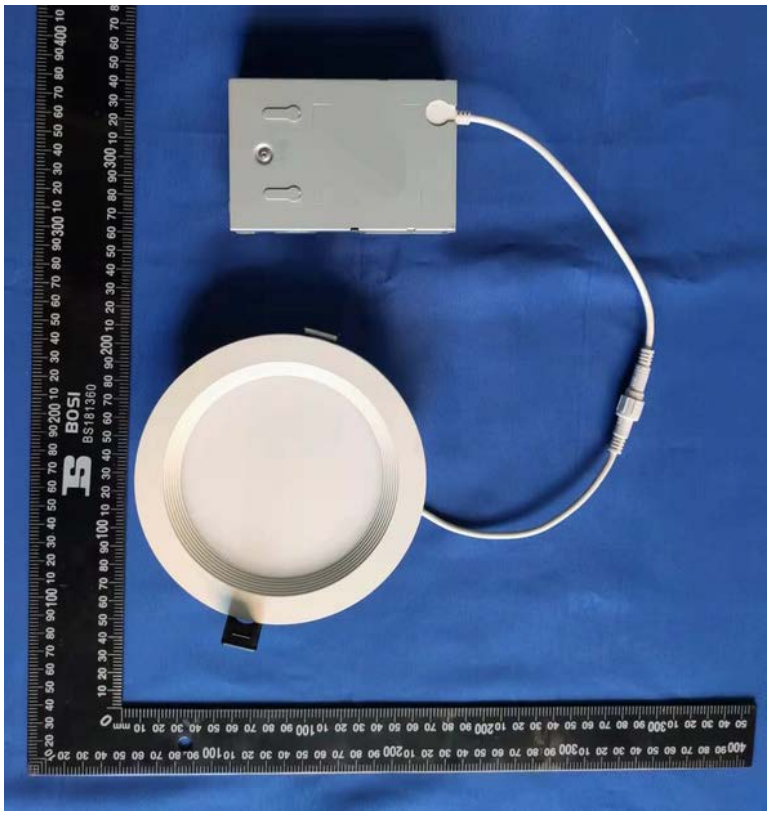


Table--1 UNIT: cd

γ (DEG) \ C(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	367	367	367	367	367	367	367	367	367	367	367	367	367	367	367	367			
5	365	365	365	365	365	365	365	365	365	365	365	365	366	366	366	366			
10	360	360	359	359	359	359	359	360	360	360	361	361	362	362	362	361			
15	352	352	351	351	351	351	351	351	352	352	353	353	354	354	354	354			
20	341	335	339	334	339	334	339	334	335	340	336	342	341	344	341	343			
25	326	320	324	319	324	319	324	320	320	326	322	328	325	330	325	329			
30	309	303	306	301	306	302	306	302	303	308	305	311	308	313	308	312			
35	289	283	285	281	285	282	286	282	283	288	286	292	289	294	289	292			
40	266	260	263	259	263	259	263	260	261	266	264	270	268	272	267	269			
45	241	236	238	234	238	235	238	235	236	241	240	245	244	248	243	245			
50	215	210	211	208	210	208	211	209	210	215	214	219	218	222	218	219			
55	184	181	179	179	178	179	178	179	181	184	186	191	190	193	190	190			
60	151	151	148	148	147	148	147	147	150	152	156	157	160	160	159	155			
65	118	118	117	117	115	116	115	114	117	120	124	126	129	129	127	122			
70	85.9	85.8	85.7	85.2	83.9	84.7	81.8	81.9	84.7	87.7	93.1	94.7	97.2	96.9	94.5	89.7			
75	54.9	54.3	55.6	55.0	53.6	54.2	50.6	50.9	53.6	56.1	62.5	64.0	66.3	65.9	62.5	58.3			
80	26.0	27.8	28.1	27.3	26.0	26.5	24.4	22.7	24.9	28.8	34.2	35.3	37.2	36.8	34.3	28.9			
85	6.44	6.81	5.47	4.72	3.74	4.10	3.91	4.14	5.51	7.58	10.2	11.0	12.4	12.0	11.2	8.17			
90	0.53	0.41	0.40	0.40	0.41	0.42	0.41	0.42	0.39	0.42	0.70	0.93	0.99	1.05	0.91	0.76			

3. Product Photo





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