Photometric Test Report

Relevant Standards

☑IES LM-79-2008

☑ANSI C82.77:2014

Prepared For

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2019/1/8

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1.0 Test Summary

DLC Technical Requirements v4.4

Indoor - Troffer/2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces			
Luminaire Description:	EZPANFA2x2 / 30W / 3500K		
Input Control Signal Applied:	0%		
Requirement Category	**Test Method**	**Requirements**	**Test value**
Luminaire Output (lm)	IES LM-79-2008	⩾2000	3618
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	⩾72	77.12%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	97	115.2
Allowable CCTs* (K)	IES LM-79-2008	5000	3359
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	78	79
Power Factor	ANSI C82.77:2014	0.873	0.937
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	11.49%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	31.4
Input Voltage	IES LM-79-2008	Wrost Case	277
Input Current	IES LM-79-2008	Wrost Case	0.122
Luminaire Description:	EZPANFA2x2 / 30W / 4000K		
Input Control Signal Applied:	50%		
Requirement Category	**Test Method**	**Requirements**	**Test value**
Luminaire Output (lm)	IES LM-79-2008	⩾2000	3810
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	⩾72	77.41%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	97	125.3
Allowable CCTs* (K)	IES LM-79-2008	5000	3997
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	78	81
Power Factor	ANSI C82.77:2014	0.873	0.932
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	11.03%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	30.4
Input Voltage	IES LM-79-2008	Wrost Case	277
Input Current	IES LM-79-2008	Wrost Case	0.118

Luminaire Description:	EZPANFA2x2/ 30W / 5000K		
Input Control Signal Applied:	100%		
Requirement Category	**Test Method**	**Requirements**	**Test value**
Luminaire Output (lm)	IES LM-79-2008	⩾2000	3600
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	⩾72	77.11%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	97	115.0
Allowable CCTs* (K)	IES LM-79-2008	5000	4776
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	78	81
Power Factor	ANSI C82.77:2014	0.873	0.937
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	11.93%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	31.3
Input Voltage	IES LM-79-2008	Wrost Case	277
Input Current	IES LM-79-2008	Wrost Case	0.121

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2019/1/7	EZPANFA2x2 / 30W / 3500K	B1
2	Goniophotometer Test	2019/1/7	EZPANFA2x2 / 30W / 3500K	B1
3	THD and PF Test	2019/1/7	EZPANFA2x2 / 30W / 3500K	B1
4	Integrating Sphere Test	2019/1/7	EZPANFA2x2 / 30W / 4000K	B1
5	Goniophotometer Test	2019/1/7	EZPANFA2x2 / 30W / 4000K	B1
6	THD and PF Test	2019/1/7	EZPANFA2x2 / 30W / 4000K	B1
7	Integrating Sphere Test	2019/1/7	EZPANFA2x2/ 30W / 5000K	B1
8	Goniophotometer Test	2019/1/7	EZPANFA2x2/ 30W / 5000K	B1
9	THD and PF Test	2019/1/7	EZPANFA2x2/ 30W / 5000K	B1

Remark(If any)
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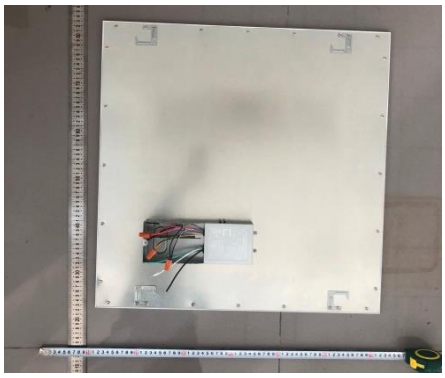
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

3.0 Production Description

Luminaire Description: EZPANFA2x2/ 30W / 3500K
EZPANFA2x2/ 30W / 4000K
EZPANFA2x2/ 30W / 5000K

Electrical Specification: 120V-277V,50/60HZ

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	EZPANFA2x2 / 30W / 3500K	Sample ID.	B1
Opreate time (Min.)	90	Stabilization time (Min.)	45

Test Method
The samples were tested according to the IES LM-79-2008. Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º 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 voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load. The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
24.7	277.00	60	0.121	31.4	0.937

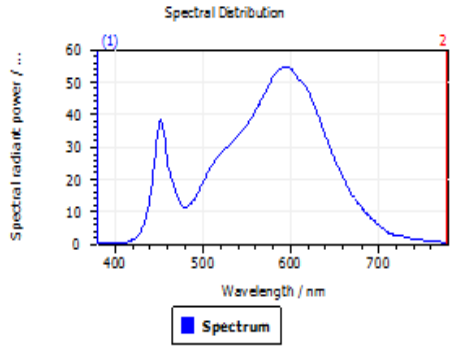
Test Result

CCT (K)	CRI (Ra)	Duv
3359	79	1.6E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

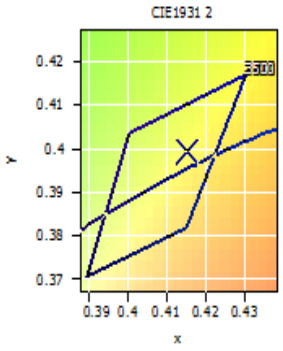
Spectral values

DominantWavelength	580.78 nm
Purity	0.445
PeakWavelength	593.98 nm
Width50%:	130.42 nm

Color Coordinates

Correlated Color Temperatu		3359 K			
x:	0.4153	u:	0.2387	u':	0.2387
y:	0.3992	v:	0.3442	v':	0.5162

CRI01	76.2	CRI09	-10.8
CRI02	88.0	CRI10	72.5
CRI03	95.9	CRI11	74.0
CRI04	75.9	CRI12	61.3
CRI05	76.2	CRI13	79.0
CRI06	83.8	CRI14	98.1
CRI07	81.7	CRI15	67.9
CRI08	53.9	CRI16	65.6
ResultsCRI	78.9		



PlanckDistance	1.6E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	EZPANFA2x2 / 30W / 3500K	Sample ID.	B1
Opreate time (Min.)	90	Stabilization time (Min.)	45

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C 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 voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.7	276.95	60	0.122	31.4	0.931	Light Down

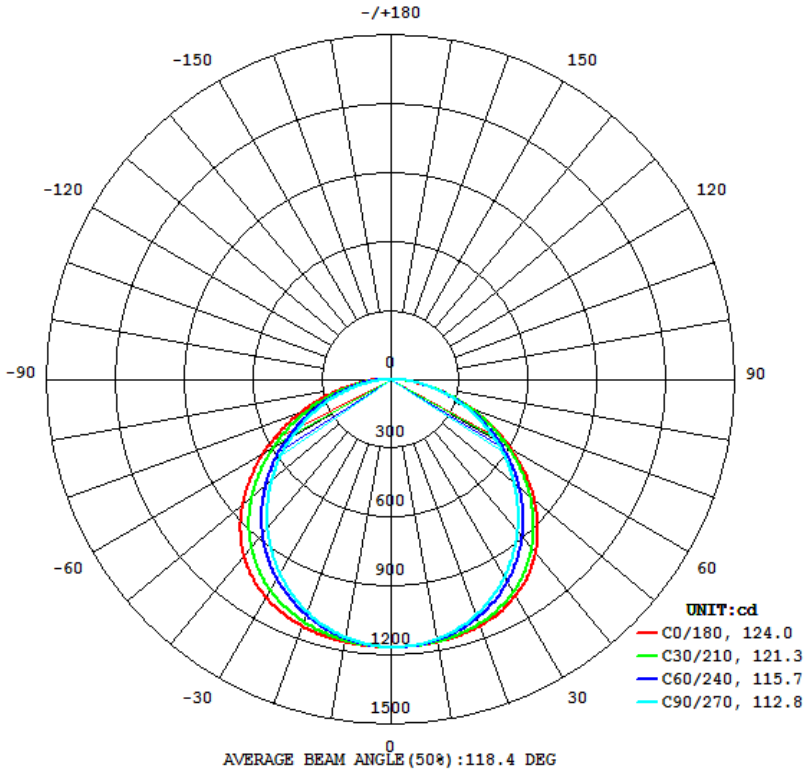
Test Result

Flux(lm)	Zonal Lumen Requirement(0°-60°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
3618	77.12%	166.6	164.0	124.0	112.8	115.2

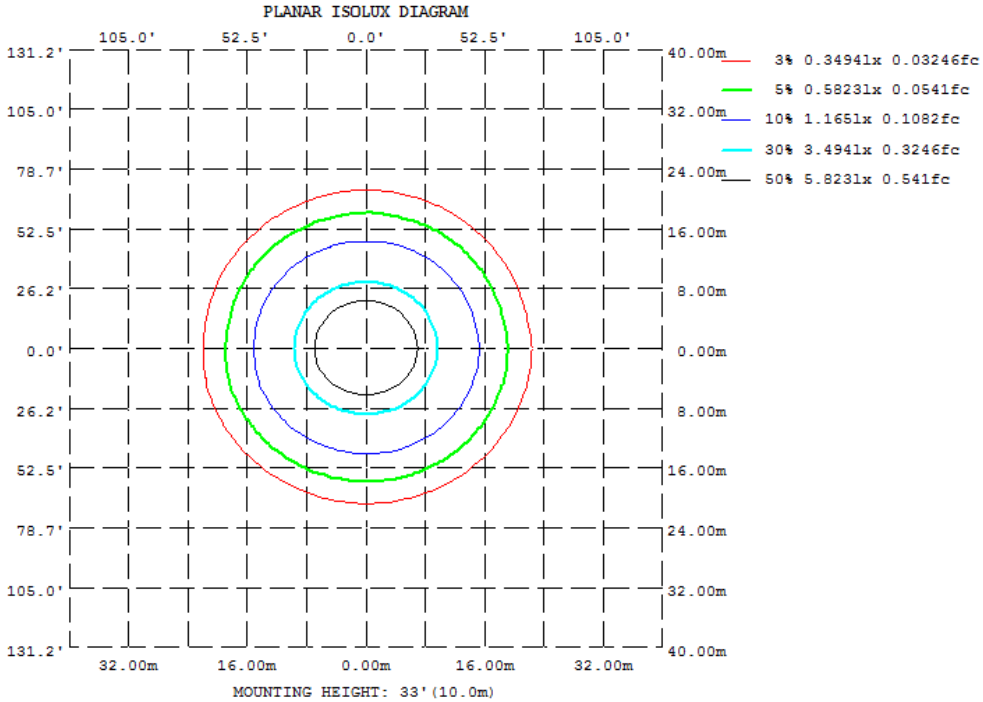
SC:0-180°	SC:90°-270°
1.26	1.40

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ
10	1160	1149	1140	1149	1159	1155	1148	1155	0- 10
20	1141	1105	1075	1105	1139	1116	1090	1116	10- 20
30	1093	1027	972.4	1026	1088	1042	992.8	1042	20- 30
40	998.3	909.2	838.0	905.8	984.3	925.1	862.7	926.0	30- 40
50	844.9	751.3	679.5	744.9	820.3	764.6	706.7	768.6	40- 50
60	644.7	563.5	503.7	553.1	609.1	571.8	532.1	579.5	50- 60
70	420.8	361.1	318.1	347.9	377.9	364.2	345.8	375.4	60- 70
80	202.7	166.0	137.6	151.7	159.2	164.6	162.8	177.4	70- 80
90	0	0	0	0	0	0	0	0	80- 90
100	0	0	0	0	0	0	0	0	90-100
110	0	0	0	0	0	0	0	0	100-110
120	0	0	0	0	0	0	0	0	110-120
130	0	0	0	0	0	0	0	0	120-130
140	0	0	0	0	0	0	0	0	130-140
150	0	0	0	0	0	0	0	0	140-150
160	0	0	0	0	0	0	0	0	150-160
170	0	0	0	0	0	0	0	0	160-170
180	0	0	0	0	0	0	0	0	170-180
DEG	LUMINOUS INTENSITY:cd								

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	110.58	0 - 10	110.58	3.06%
10-20	320.77	0 - 20	431.35	11.92%
20-30	497.03	0 - 30	928.38	25.66%
30-40	614.37	0 - 40	1542.75	42.64%
40-50	650.59	0 - 50	2193.34	60.63%
50-60	596.56	0 - 60	2789.90	77.12%
60-70	462.60	0 - 70	3252.50	89.90%
70-80	277.96	0 - 80	3530.46	97.59%
80-90	87.33	0 - 90	3617.79	100.00%
90-100	0.00	0 - 100	3617.79	100.00%
100-110	0.00	0 - 110	3617.79	100.00%
110-120	0.00	0 - 120	3617.79	100.00%
120-130	0.00	0 - 130	3617.79	100.00%
130-140	0.00	0 - 140	3617.79	100.00%
140-150	0.00	0 - 150	3617.79	100.00%
150-160	0.00	0 - 160	3617.79	100.00%
160-170	0.00	0 - 170	3617.79	100.00%
170-180	0.00	0 - 180	3617.79	100.00%

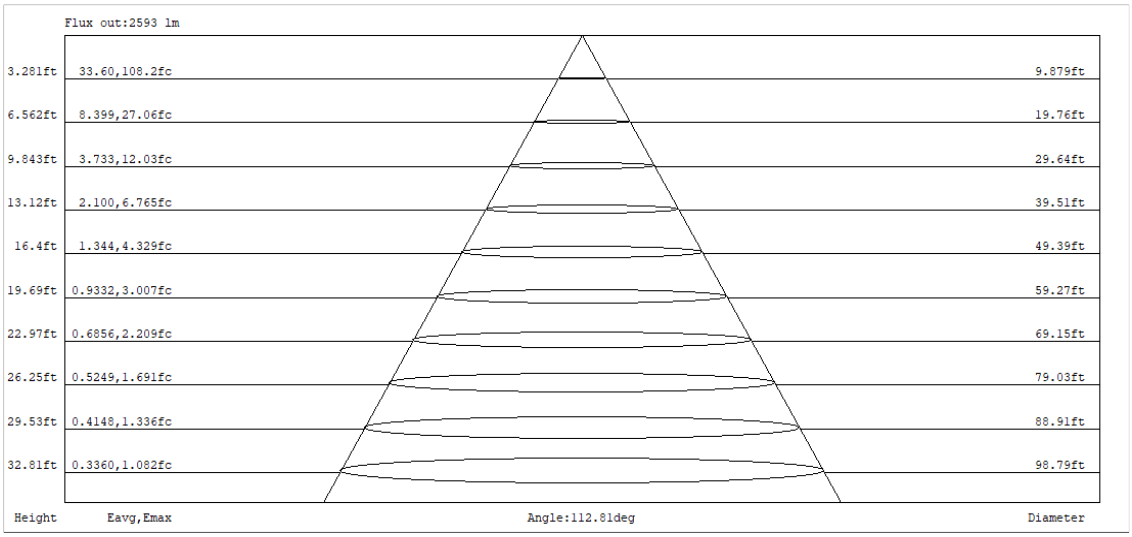
4.3 Goniophotometer Test

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method
Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	108	103	99	95	106	101	97	93	97	93	90	93	90	87	89	87	85	83
2	98	90	83	77	95	88	81	76	84	79	74	81	76	72	78	74	71	68
3	89	78	70	63	87	77	69	63	74	67	62	71	65	60	68	64	59	57
4	82	69	60	53	79	68	59	53	65	58	52	63	57	51	61	55	51	48
5	75	62	52	46	73	61	52	45	58	51	45	56	50	44	55	49	44	42
6	69	55	46	40	67	54	46	40	53	45	39	51	44	39	49	43	38	36
7	64	50	41	35	62	49	41	35	48	40	35	46	39	34	45	39	34	32
8	59	46	37	31	58	45	37	31	44	36	31	42	36	31	41	35	30	28
9	56	42	34	28	54	41	33	28	40	33	28	39	32	27	38	32	27	25
10	52	39	31	25	51	38	30	25	37	30	25	36	30	25	35	29	25	23

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	EZPANFA2x2 / 30W / 3500K	Sample ID.	B1

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
24.7	277.00	60	0.121	31.4	0.937	11.49%
24.7	120.01	60	0.261	31.2	0.994	6.06%

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	EZPANFA2x2 / 30W / 4000K	Sample ID.	B1
Opreate time (Min.)	90	Stabilization time (Min.)	45

Test Method
The samples were tested according to the IES LM-79-2008. Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º 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 voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load. The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
24.4	276.98	60	0.119	30.60	0.932

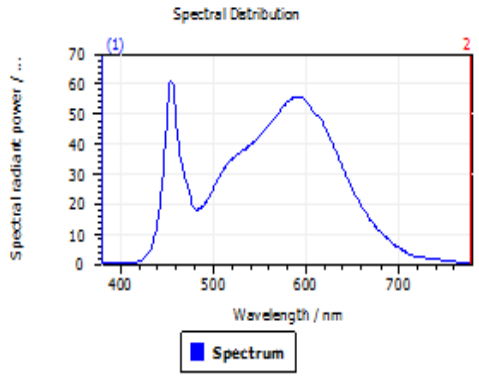
Test Result

CCT (K)	CRI (Ra)	Duv
3997	81	2.4E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



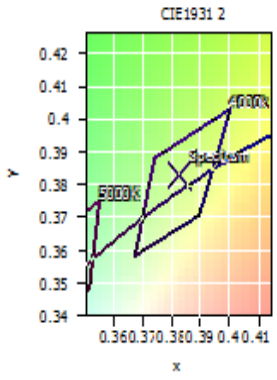
Spectral Distribution

Spectral values

DominantWavelength	577.85 nm
Purity	0.297
PeakWavelength	454.38 nm
Width50%:	22.66 nm

Color Coordinates

Correlated Color Temperatu		3997 K			
x:	0.3823	u:	0.2238	u':	0.2238
y:	0.3831	v:	0.3364	v':	0.5046
CRI01		78.8	CRI09		-3.4
CRI02		89.9	CRI10		76.0
CRI03		95.6	CRI11		75.9
CRI04		77.4	CRI12		57.6
CRI05		78.7	CRI13		81.9
CRI06		85.7	CRI14		98.0
CRI07		83.5	CRI15		71.3
CRI08		59.0	CRI16		67.6
ResultsCRI		81.1			



PlanckDistance 2.4E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	EZPANFA2x2 / 30W / 4000K	Sample ID.	B1
Opreate time (Min.)	90	Stabilization time (Min.)	45

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C 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 voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.4	277.00	60	0.118	30.4	0.927	Light Down

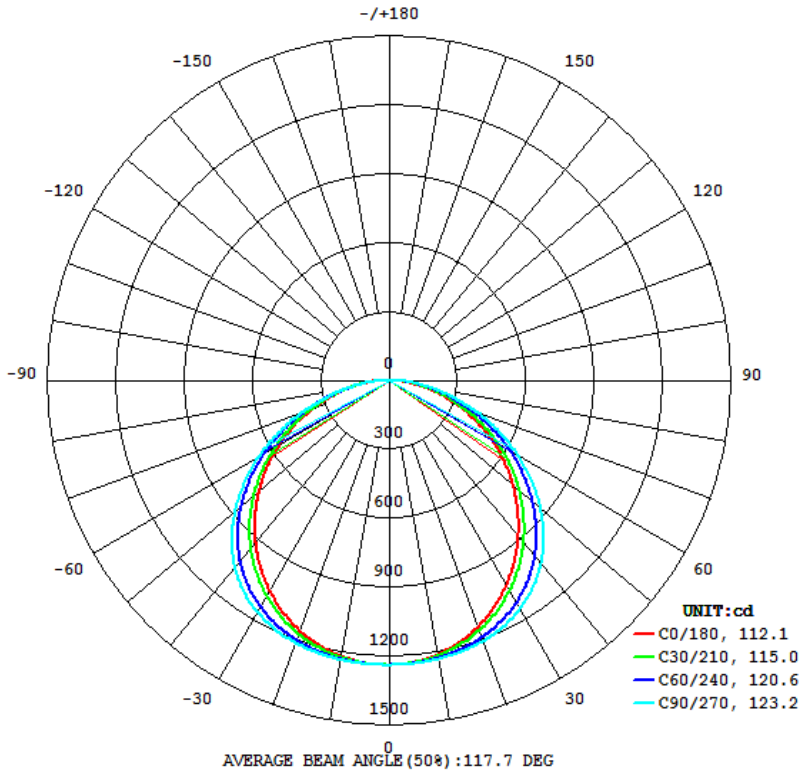
Test Result

Flux(lm)	Zonal Lumen Requirement(0°-60°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
3810	77.41%	163.6	165.8	112.1	123.2	125.3

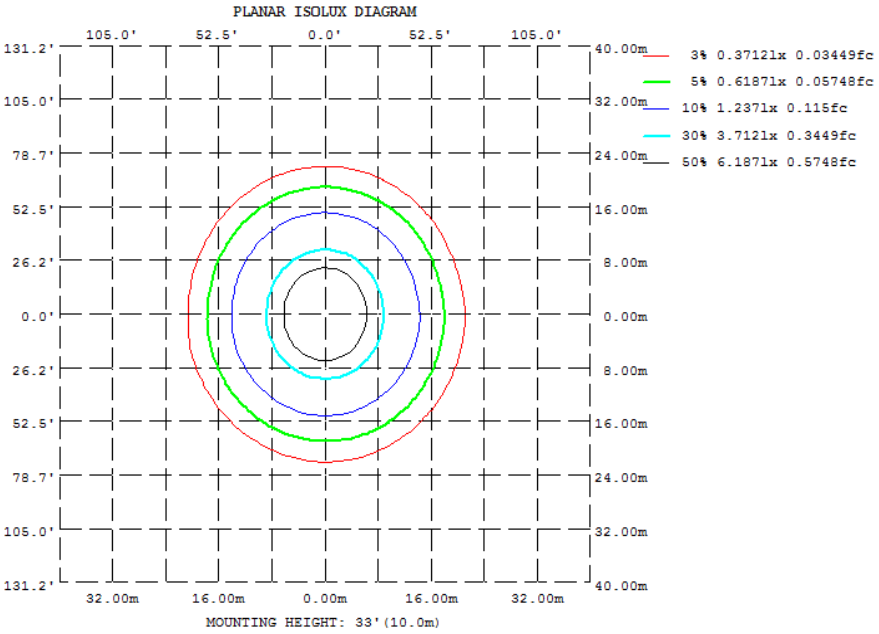
SC:0-180°	SC:90°-270°
1.40	1.24

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1220	1228	1234	1224	1211	1219	1230	1222
20	1158	1187	1214	1180	1140	1171	1205	1176
30	1054	1108	1162	1097	1029	1085	1148	1093
40	915.5	983.9	1057	969.2	883.4	955.9	1038	965.5
50	749.0	813.9	885.7	796.7	712.2	784.6	868.9	796.0
60	562.8	608.7	662.5	591.3	523.6	583.0	652.6	595.5
70	365.2	387.9	416.2	371.9	325.5	368.3	416.2	380.4
80	172.0	175.7	181.1	163.5	138.7	164.4	189.0	174.0
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	117.46	0 - 10	117.46	3.08%
10-20	340.53	0 - 20	457.99	12.02%
20-30	527.00	0 - 30	984.99	25.86%
30-40	650.14	0 - 40	1635.13	42.92%
40-50	686.65	0 - 50	2321.78	60.95%
50-60	627.29	0 - 60	2949.07	77.41%
60-70	483.83	0 - 70	3432.90	90.11%
70-80	287.94	0 - 80	3720.84	97.67%
80-90	88.70	0 - 90	3809.54	100.00%
90-100	0.00	0 - 100	3809.54	100.00%
100-110	0.00	0 - 110	3809.54	100.00%
110-120	0.00	0 - 120	3809.54	100.00%
120-130	0.00	0 - 130	3809.54	100.00%
130-140	0.00	0 - 140	3809.54	100.00%
140-150	0.00	0 - 150	3809.54	100.00%
150-160	0.00	0 - 160	3809.54	100.00%
160-170	0.00	0 - 170	3809.54	100.00%
170-180	0.00	0 - 180	3809.54	100.00%

4.3 Goniophotometer Test

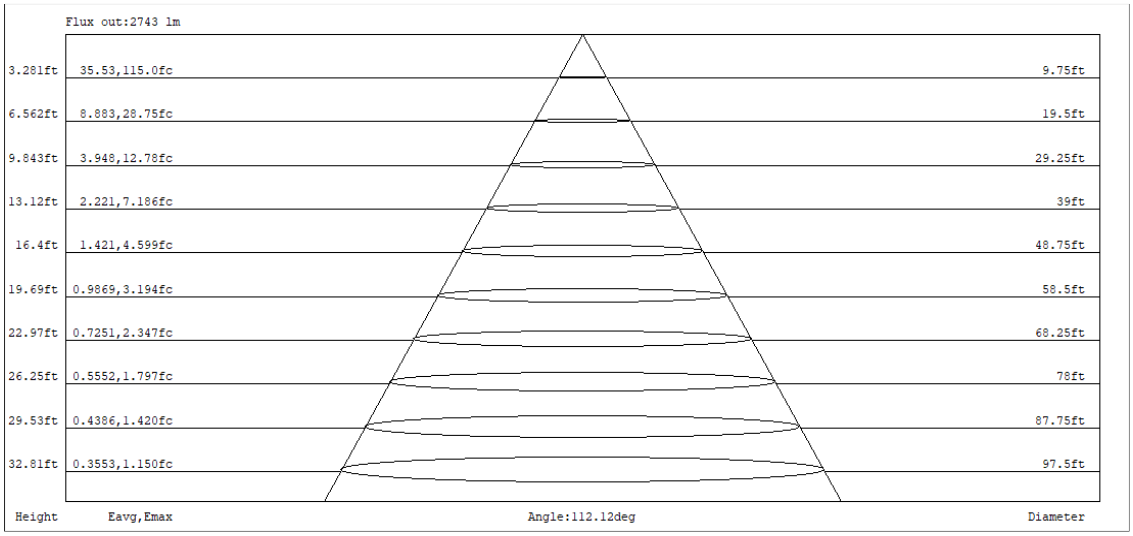
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	108	103	99	95	106	101	97	93	97	93	90	93	90	88	89	87	85	83
2	98	90	83	77	96	88	81	76	84	79	74	81	76	72	78	74	71	69
3	89	79	70	63	87	77	69	63	74	67	62	71	65	61	69	64	60	57
4	82	69	60	53	79	68	60	53	65	58	52	63	57	52	61	55	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	46	40	67	55	46	40	53	45	39	51	44	39	49	43	39	37
7	64	50	41	35	62	49	41	35	48	40	35	46	40	34	45	39	34	32
8	60	46	37	31	58	45	37	31	44	36	31	42	36	31	41	35	31	29
9	56	42	34	28	54	41	33	28	40	33	28	39	32	28	38	32	27	26
10	52	39	31	25	51	38	30	25	37	30	25	36	30	25	35	29	25	23

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	EZPANFA2x2 / 30W / 4000K	Sample ID.	B1

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
24.4	276.98	60	0.119	30.60	0.932	11.03%
24.4	120.01	60	0.253	30.20	0.994	5.80%

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	EZPANFA2x2/ 30W / 5000K	Sample ID.	B1
Opreate time (Min.)	90	Stabilization time (Min.)	45

Test Method
The samples were tested according to the IES LM-79-2008. Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º 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 voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load. The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
24.6	277.00	60	0.121	31.4	0.937

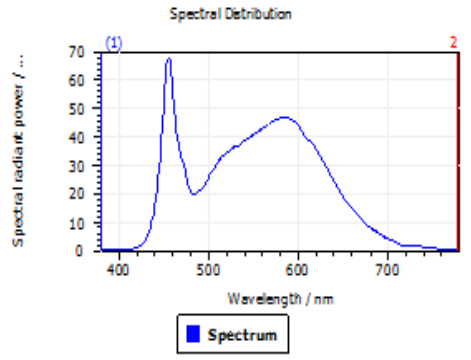
Test Result

CCT (K)	CRI (Ra)	Duv
4776	81	5.1E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

Spectral values

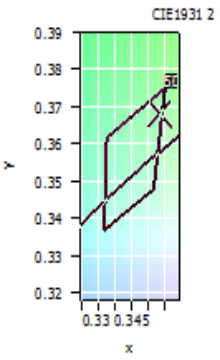
DominantWavelength	571.40 nm
Purity	0.165
PeakWavelength	454.92 nm
Width50%:	23.09 nm

Color Coordinates

Correlated Color Temperatu		4776 K			
x:	0.3532	u:	0.2105	u':	0.2105
y:	0.3683	v:	0.3292	v':	0.4938

CRI01	78.0	CRI09	-6.0
CRI02	89.3	CRI10	74.2
CRI03	95.2	CRI11	74.5
CRI04	76.0	CRI12	52.7
CRI05	77.8	CRI13	81.3
CRI06	84.2	CRI14	97.6
CRI07	84.6	CRI15	70.5
CRI08	60.8	CRI16	66.0

ResultsCRI 80.7



PlanckDistance 5.1E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	EZPANFA2x2/ 30W / 5000K	Sample ID.	B1
Opreate time (Min.)	90	Stabilization time (Min.)	45

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C 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 voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.6	276.94	60	0.121	31.3	0.932	Light Down

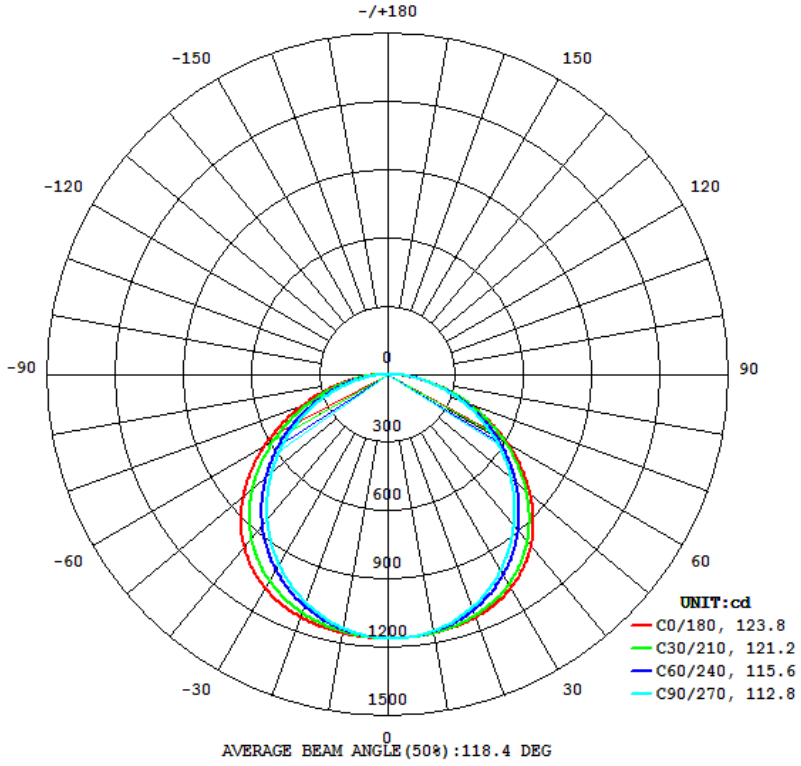
Test Result

Flux(lm)	Zonal Lumen Requirement(0°-60°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
3600	77.11%	166.6	164	123.8	112.8	115.0

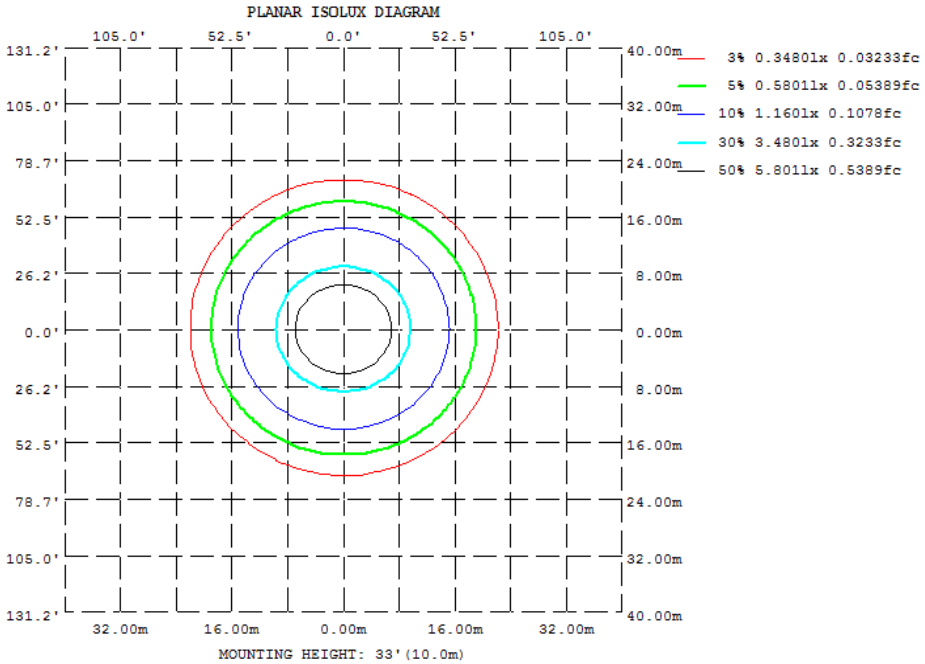
SC:0-180°	SC:90°-270°
1.24	1.40

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1155	1143	1134	1143	1155	1151	1145	1151
20	1134	1098	1067	1097	1134	1114	1089	1114
30	1085	1018	963.1	1016	1084	1041	994.7	1042
40	986.4	898.0	827.9	894.6	982.8	926.2	866.6	928.2
50	831.5	739.1	669.3	732.5	822.1	768.1	712.1	772.9
60	631.0	551.2	493.6	541.4	614.4	578.1	538.7	586.1
70	408.3	350.1	308.4	337.3	385.5	371.6	353.6	383.4
80	192.3	157.0	129.4	142.9	166.8	172.2	170.3	185.2
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	110.14	0 - 10	110.14	3.06%
10-20	319.43	0 - 20	429.57	11.93%
20-30	494.73	0 - 30	924.30	25.67%
30-40	611.24	0 - 40	1535.54	42.65%
40-50	647.07	0 - 50	2182.61	60.63%
50-60	593.41	0 - 60	2776.02	77.11%
60-70	460.32	0 - 70	3236.34	89.90%
70-80	276.66	0 - 80	3513.00	97.58%
80-90	87.01	0 - 90	3600.01	100.00%
90-100	0.00	0 - 100	3600.01	100.00%
100-110	0.00	0 - 110	3600.01	100.00%
110-120	0.00	0 - 120	3600.01	100.00%
120-130	0.00	0 - 130	3600.01	100.00%
130-140	0.00	0 - 140	3600.01	100.00%
140-150	0.00	0 - 150	3600.01	100.00%
150-160	0.00	0 - 160	3600.01	100.00%
160-170	0.00	0 - 170	3600.01	100.00%
170-180	0.00	0 - 180	3600.01	100.00%

4.3 Goniophotometer Test

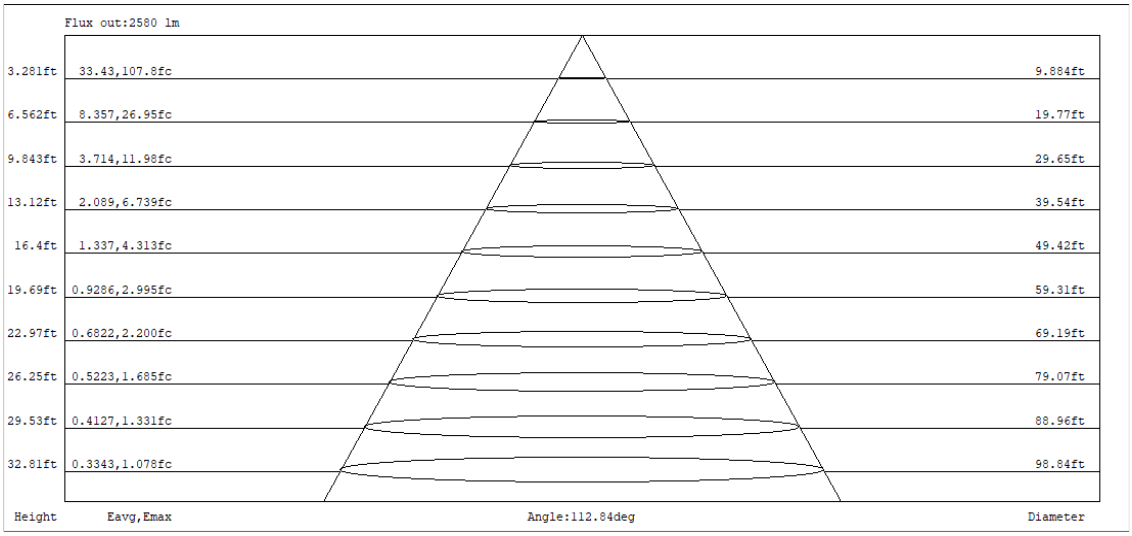
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	108	103	99	95	106	101	97	93	97	93	90	93	90	87	89	87	85	83
2	98	90	83	77	95	88	81	76	84	79	74	81	76	72	78	74	71	68
3	89	78	70	63	87	77	69	63	74	67	62	71	65	60	68	64	59	57
4	82	69	60	53	79	68	59	53	65	58	52	63	57	51	61	55	51	48
5	75	62	52	46	73	61	52	45	58	51	45	56	50	44	55	49	44	42
6	69	55	46	40	67	54	46	40	53	45	39	51	44	39	49	43	38	36
7	64	50	41	35	62	49	41	35	48	40	35	46	39	34	45	39	34	32
8	59	46	37	31	58	45	37	31	44	36	31	42	36	31	41	35	30	28
9	56	42	34	28	54	41	33	28	40	33	28	39	32	27	38	32	27	25
10	52	39	31	25	51	38	30	25	37	30	25	36	30	25	35	29	25	23

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	EZPANFA2x2/ 30W / 5000K	Sample ID.	B1

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
24.6	277.00	60	0.121	31.4	0.937	11.93%
24.6	120.03	60	0.260	31.1	0.994	8.03%

6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2018/12/26	2019/12/25
DLF108	Auxiliary Lamp	2018/12/26	2019/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2018/12/26	2019/12/25
DLF116	AC Power Source	2018/12/26	2019/12/25
DLF113	Power Meter	2018/12/26	2019/12/25
DLF112	Temperature Recorder	2018/12/26	2019/12/25
DLF114	Temperature & Humidity Datalogger	2018/12/26	2019/12/25
DLF101	Goniophotometer	2018/12/26	2019/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2018/12/26	2019/12/25
DLF104	AC Power Source	2018/12/26	2019/12/25
DLF507	DC Power Source	2018/12/26	2019/12/25
DLF102	Power Meter	2018/12/26	2019/12/25
DLF111	Temperature & Humidity Datalogger	2018/12/26	2019/12/25
DLF119	Power Meter	2018/12/26	2019/12/25
DLF031	Temperature data logger	2018/12/26	2019/12/25
DLF022	Digital power meter	2018/12/26	2019/12/25
DLF003	Temperature & Humidity Datalogger	2018/12/26	2019/12/25

********** End of Test Report**********