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 / 25W / 3500K		
Input Control Signal Applied:	0%		
Requirement Category	**Test Method**	**Requirements**	**Test value**
Luminaire Output (lm)	IES LM-79-2008	⩾2000	3140
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	⩾72	77.11%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	97	118.5
Allowable CCTs* (K)	IES LM-79-2008	5000	3352
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	78	79
Power Factor	ANSI C82.77:2014	0.873	0.910
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	11.30%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	26.5
Input Voltage	IES LM-79-2008	Wrost Case	277
Input Current	IES LM-79-2008	Wrost Case	0.106
Luminaire Description:	EZPANFA2x2 / 25W / 4000K		
Input Control Signal Applied:	50%		
Requirement Category	**Test Method**	**Requirements**	**Test value**
Luminaire Output (lm)	IES LM-79-2008	⩾2000	3276
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	⩾72	77.11%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	97	127.5
Allowable CCTs* (K)	IES LM-79-2008	5000	4017
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	78	81
Power Factor	ANSI C82.77:2014	0.873	0.904
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	11.53%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	25.7
Input Voltage	IES LM-79-2008	Wrost Case	277
Input Current	IES LM-79-2008	Wrost Case	0.103

Luminaire Description:	EZPANFA2x2 / 25W / 5000K
Input Control Signal Applied:	100%

Requirement Category	Test Method	Requirements	Test value
Luminaire Output (lm)	IES LM-79-2008	⩾2000	3117
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	⩾72	77.11%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	97	118.1
Allowable CCTs* (K)	IES LM-79-2008	5000	4769
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	78	81
Power Factor	ANSI C82.77:2014	0.873	0.909
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	12.02%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	26.4
Input Voltage	IES LM-79-2008	Wrost Case	277
Input Current	IES LM-79-2008	Wrost Case	0.106

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2019/1/7	EZPANFA2X2 / 25W / 3500K	B1
2	Goniophotometer Test	2019/1/7	EZPANFA2X2 / 25W / 3500K	B1
3	THD and PF Test	2019/1/7	EZPANFA2X2 / 25W / 3500K	B1
4	Integrating Sphere Test	2019/1/7	EZPANFA2x2 / 25W / 4000K	B1
5	Goniophotometer Test	2019/1/7	EZPANFA2x2 / 25W / 4000K	B1
6	THD and PF Test	2019/1/7	EZPANFA2x2 / 25W / 4000K	B1
7	Integrating Sphere Test	2019/1/7	EZPANFA2x2 / 25W / 5000K	B1
8	Goniophotometer Test	2019/1/7	EZPANFA2x2 / 25W / 5000K	B1
9	THD and PF Test	2019/1/7	EZPANFA2x2 / 25W / 5000K	B1

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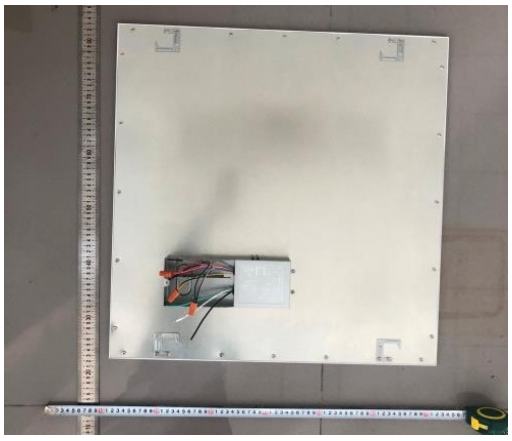
3.0 Production Description

Luminaire Description: EZPANFA2x2 / 25W / 3500K
EZPANFA2x2 / 25W / 4000K
EZPANFA2x2 / 25W / 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 / 25W / 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
24.9	277.00	60	0.106	26.70	0.910

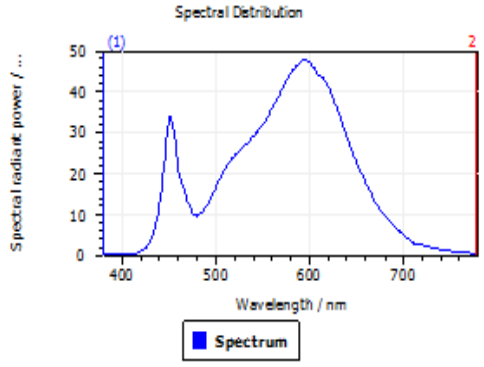
Test Result

CCT (K)	CRI (Ra)	Duv
3352	79	1.8E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

Spectral values

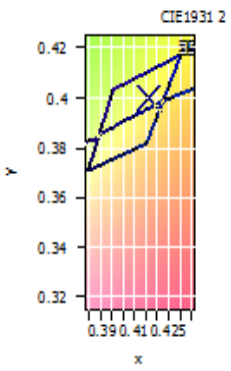
DominantWavelength	580.75 nm
Purity	0.449
PeakWavelength	594.19 nm
Width50%:	130.74 nm

Color Coordinates

Correlated Color Temperatu		3352 K			
x:	0.4160	u:	0.2388	u':	0.2388
y:	0.3999	v:	0.3444	v':	0.5166

CRI01	76.5	CRI09	-10.1
CRI02	87.9	CRI10	72.4
CRI03	96.0	CRI11	74.6
CRI04	76.3	CRI12	61.0
CRI05	76.4	CRI13	79.2
CRI06	83.9	CRI14	98.2
CRI07	82.0	CRI15	68.2
CRI08	54.3	CRI16	65.9

ResultsCRI 79.2



PlanckDistance 1.8E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	EZPANFA2X2 / 25W / 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
24.9	276.96	60	0.106	26.5	0.903	Light Down

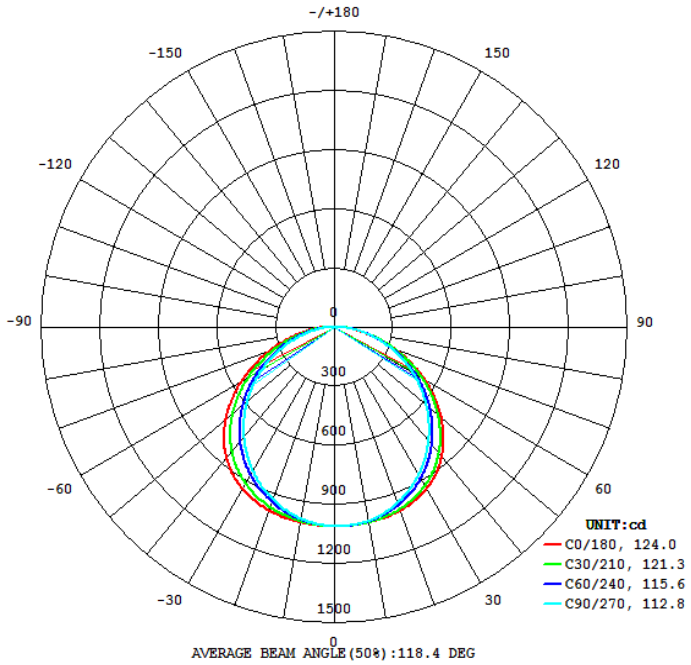
Test Result

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	
3140	77.11%	166.6	164.0	124.0	112.8	118.5

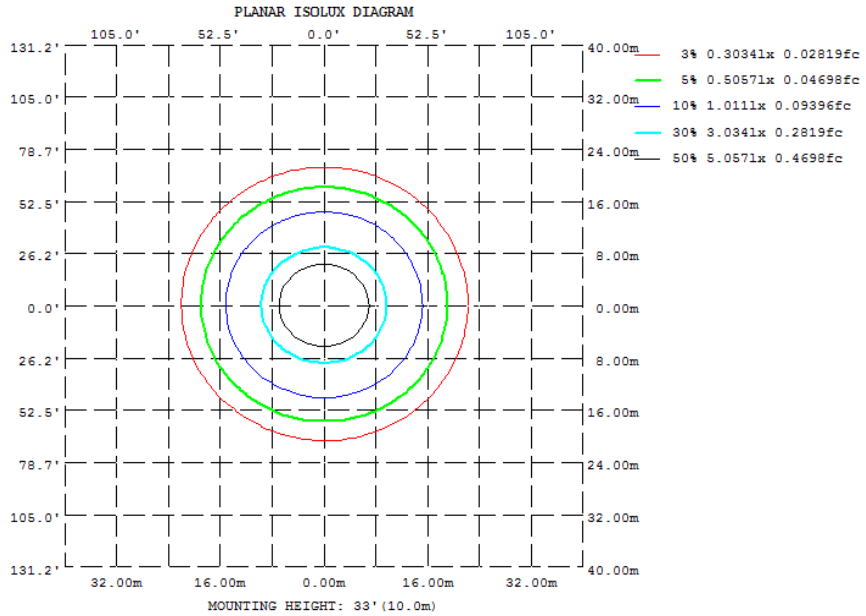
SC:0-180°	SC:90°-270°
1.24	1.44

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

Y	C0	C45	C90	C135	C180	C225	C270	C315
10	1006	996.4	988.1	996.1	1006	1003	997.5	1003
20	989.3	957.3	930.2	956.5	989.3	970.7	948.5	970.6
30	946.7	888.3	839.5	886.7	946.0	907.7	865.7	907.8
40	861.9	784.0	721.7	780.9	858.8	807.4	754.0	808.8
50	727.4	645.6	583.6	639.8	718.5	669.6	619.4	673.5
60	551.8	481.8	430.4	473.0	536.7	503.6	468.5	510.5
70	356.9	305.9	269.0	294.1	336.4	323.8	306.8	333.5
80	168.7	137.2	112.9	124.7	145.6	149.9	147.7	161.4
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	95.96	0 - 10	95.96	3.06%
10-20	278.37	0 - 20	374.33	11.92%
20-30	431.30	0 - 30	805.63	25.66%
30-40	533.10	0 - 40	1338.73	42.64%
40-50	564.53	0 - 50	1903.26	60.62%
50-60	517.74	0 - 60	2421.00	77.11%
60-70	401.48	0 - 70	2822.48	89.90%
70-80	241.24	0 - 80	3063.72	97.58%
80-90	75.89	0 - 90	3139.61	100.00%
90-100	0.00	0 - 100	3139.61	100.00%
100-110	0.00	0 - 110	3139.61	100.00%
110-120	0.00	0 - 120	3139.61	100.00%
120-130	0.00	0 - 130	3139.61	100.00%
130-140	0.00	0 - 140	3139.61	100.00%
140-150	0.00	0 - 150	3139.61	100.00%
150-160	0.00	0 - 160	3139.61	100.00%
160-170	0.00	0 - 170	3139.61	100.00%
170-180	0.00	0 - 180	3139.61	100.00%

4.3 Goniophotometer Test

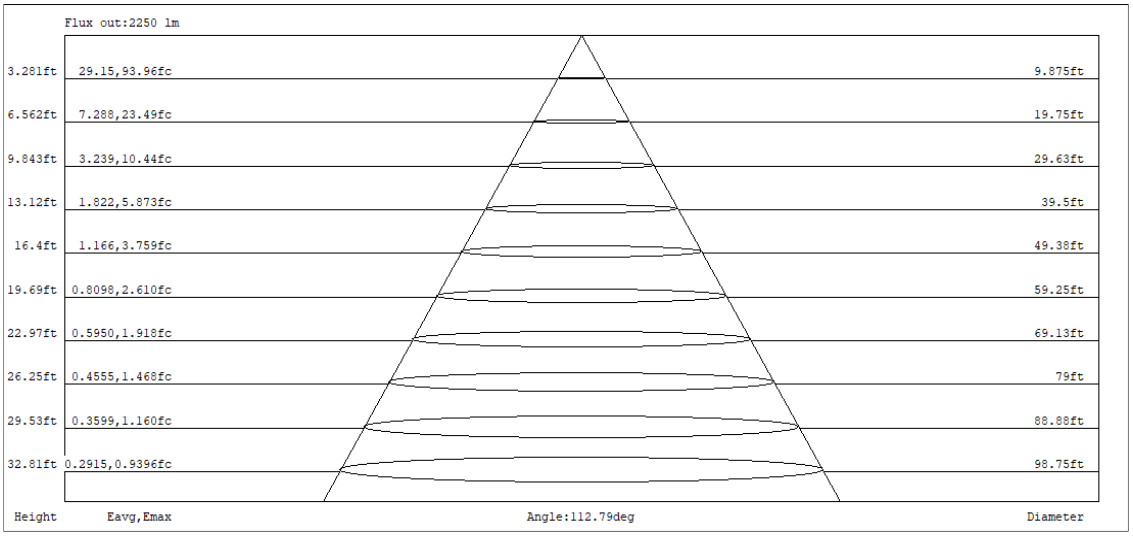
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	105	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	54	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	55	42	33	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 / 25W / 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
24.9	277.00	60	0.106	26.7	0.910	11.30%
24.9	119.99	60	0.221	26.4	0.994	4.72%

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	EZPANFA2x2 / 25W / 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
24.3	277.00	60	0.103	25.8	0.904

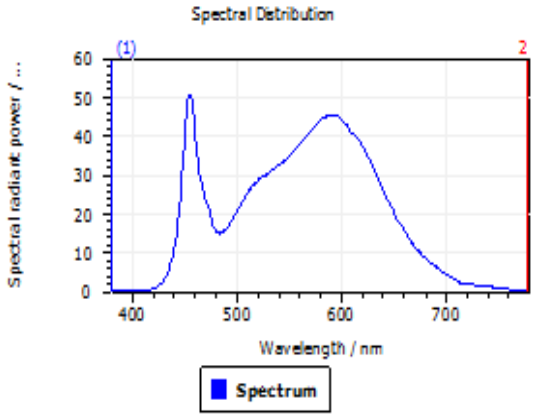
Test Result

CCT (K)	CRI (Ra)	Duv
4017	81	2.3E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

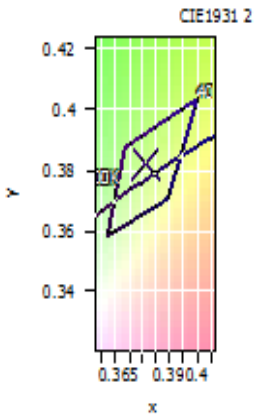
Spectral values

DominantWavelength	577.81 nm
Purity	0.292
PeakWavelength	454.65 nm
Width50%:	22.59 nm

Color Coordinates

Correlated Color Temperatu		4017 K			
x:	0.3813	u:	0.2235	u':	0.2235
y:	0.3823	v:	0.3361	v':	0.5041

CRI01	78.8	CRI09	-3.8
CRI02	90.2	CRI10	76.8
CRI03	95.2	CRI11	75.5
CRI04	76.9	CRI12	58.0
CRI05	78.7	CRI13	82.1
CRI06	86.1	CRI14	97.8
CRI07	83.0	CRI15	71.1
CRI08	58.6	CRI16	67.3
ResultsCRI	80.9		



PlanckDistance 2.3E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	EZPANFA2x2 / 25W / 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
24.3	276.95	60	0.103	25.7	0.897	Light Down

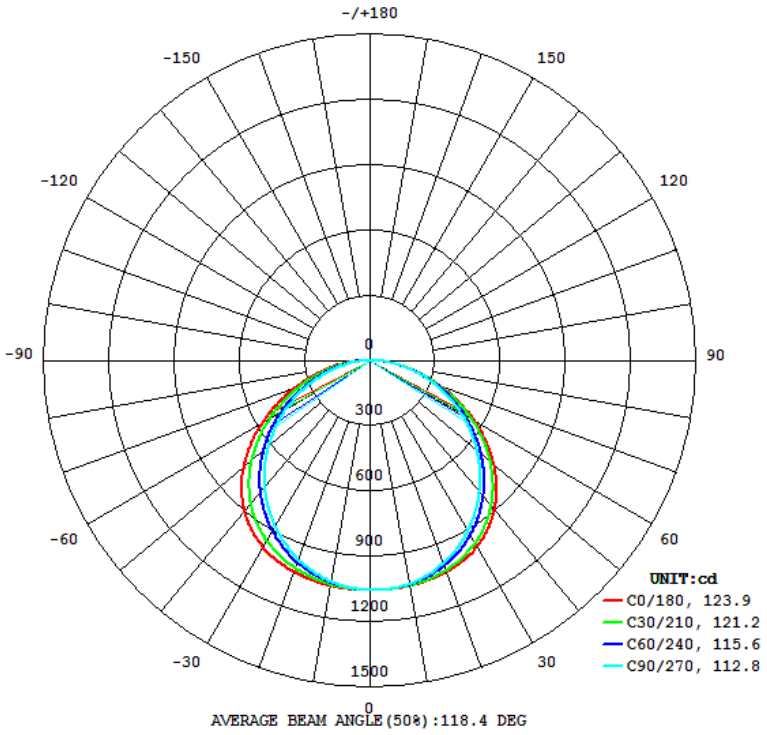
Test Result

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	
3276	77.11%	166.6	163.9	123.9	112.8	127.5

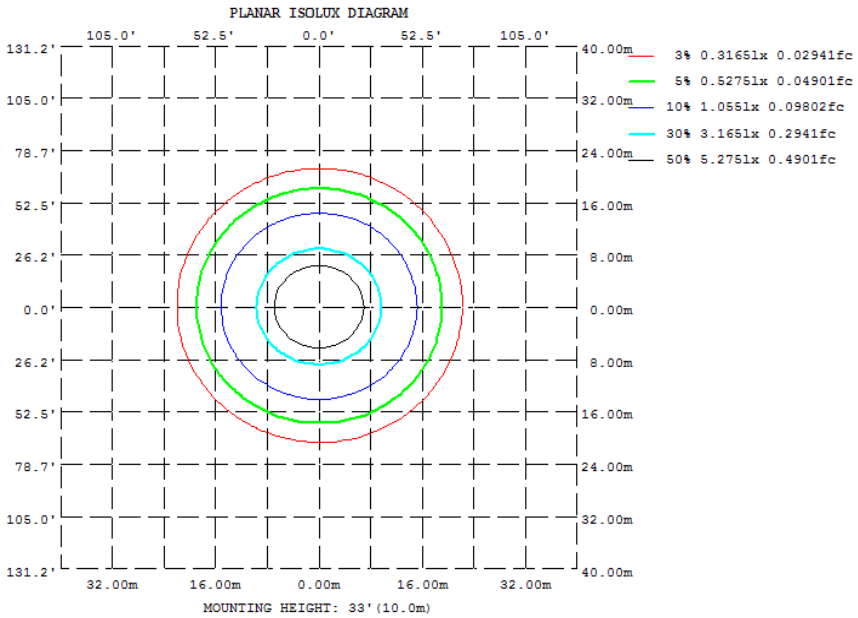
SC:0-180°	SC:90°-270°
1.24	1.40

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	1051	1040	1032	1040	1051	1047	1042	1047
20	1033	999.2	971.3	998.4	1032	1013	990.4	1013
30	987.8	927.0	877.0	925.3	986.4	946.9	904.1	947.6
40	899.2	818.3	754.0	814.8	894.5	842.2	787.2	844.1
50	758.5	673.8	609.5	667.7	747.9	698.0	646.8	702.5
60	575.7	502.8	449.7	493.7	558.5	524.7	488.8	532.3
70	372.9	319.6	281.4	307.7	349.9	336.9	320.0	347.7
80	176.6	143.6	118.5	131.0	151.5	155.9	154.0	167.5
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	100.19	0 - 10	100.19	3.06%
10-20	290.61	0 - 20	390.80	11.93%
20-30	450.17	0 - 30	840.97	25.67%
30-40	556.29	0 - 40	1397.26	42.65%
40-50	589.00	0 - 50	1986.26	60.63%
50-60	540.13	0 - 60	2526.39	77.11%
60-70	418.88	0 - 70	2945.27	89.90%
70-80	251.78	0 - 80	3197.05	97.58%
80-90	79.20	0 - 90	3276.25	100.00%
90-100	0.00	0 - 100	3276.25	100.00%
100-110	0.00	0 - 110	3276.25	100.00%
110-120	0.00	0 - 120	3276.25	100.00%
120-130	0.00	0 - 130	3276.25	100.00%
130-140	0.00	0 - 140	3276.25	100.00%
140-150	0.00	0 - 150	3276.25	100.00%
150-160	0.00	0 - 160	3276.25	100.00%
160-170	0.00	0 - 170	3276.25	100.00%
170-180	0.00	0 - 180	3276.25	100.00%

4.3 Goniophotometer Test

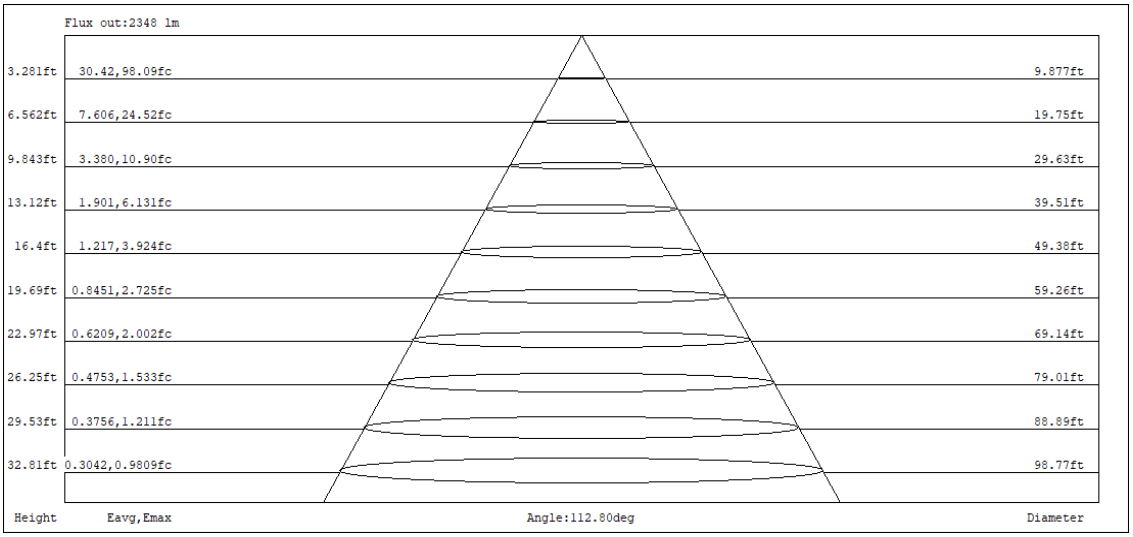
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	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 / 25W / 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
24.3	277.00	60	0.103	25.8	0.904	11.53%
24.3	120.01	60	0.213	25.5	0.994	4.68%

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	EZPANFA2x2 / 25W / 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
24.5	277.01	60	0.105	26.5	0.909

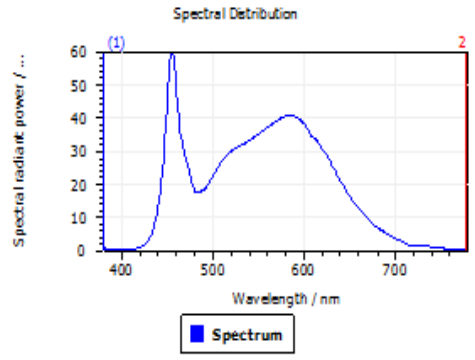
Test Result

CCT (K)	CRI (Ra)	Duv
4769	81	5.1E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



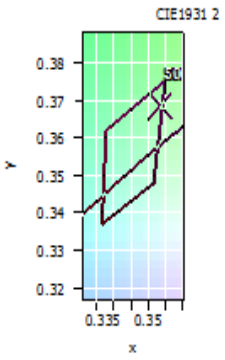
Spectral Distribution

Spectral values

DominantWavelength	571.43 nm
Purity	0.167
PeakWavelength	454.99 nm
Width50%:	22.53 nm

Color Coordinates

Correlated Color Temperatu		4769 K			
x:	0.3535	u:	0.2105	u':	0.2105
y:	0.3686	v:	0.3293	v':	0.4939
CRI01	78.1	CRI09	-5.6		
CRI02	89.4	CRI10	74.5		
CRI03	95.2	CRI11	74.6		
CRI04	76.1	CRI12	52.4		
CRI05	77.8	CRI13	81.5		
CRI06	84.4	CRI14	97.7		
CRI07	84.6	CRI15	70.6		
CRI08	60.9	CRI16	66.0		
ResultsCRI	80.8				



PlanckDistance 5.1E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	EZPANFA2x2 / 25W / 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
24.5	276.96	60	0.106	26.4	0.902	Light Down

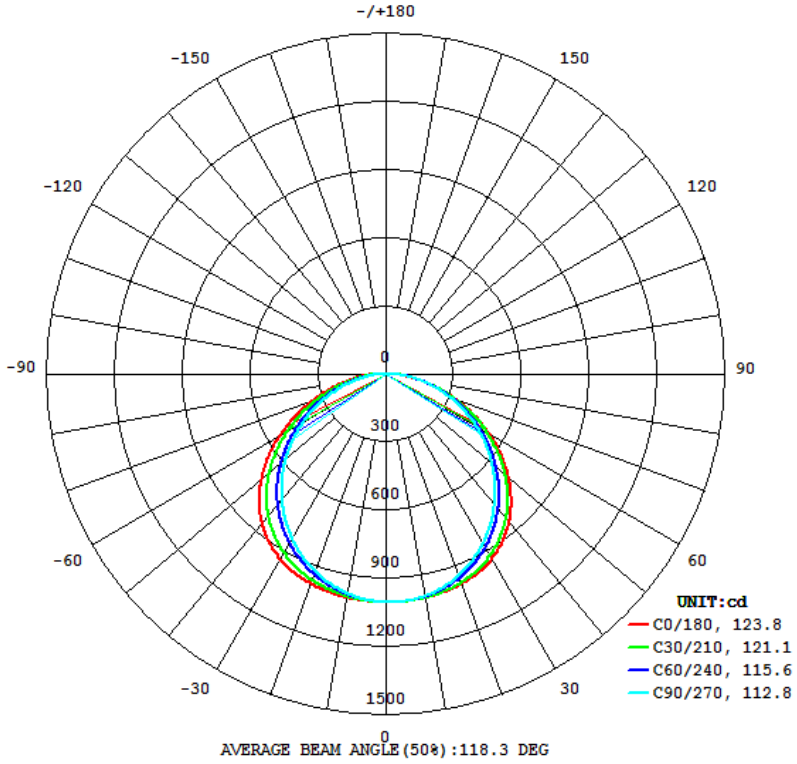
Test Result

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	
3117	77.11%	166.6	164	123.8	112.8	118.1

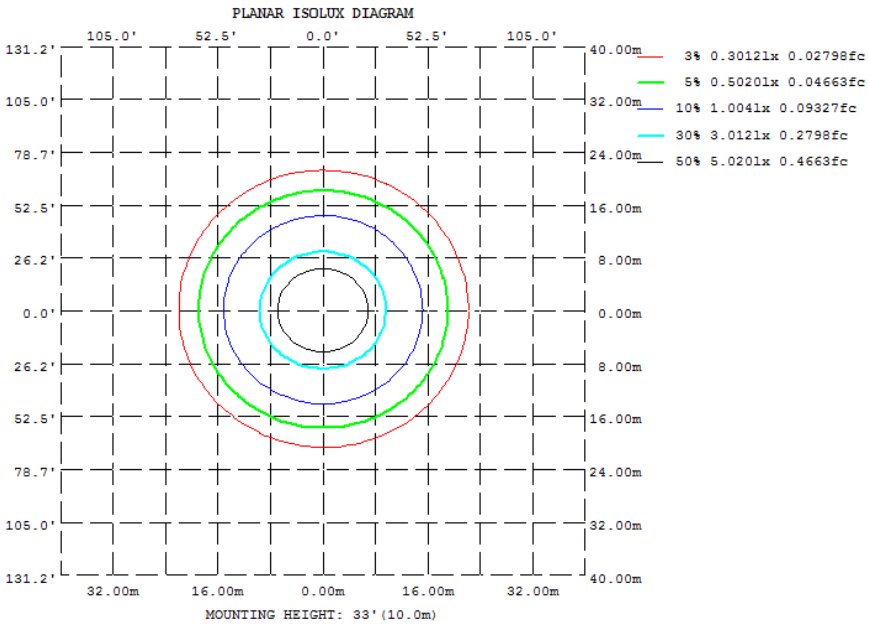
SC:0-180°	SC:90°-270°
1.24	1.40

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	LUMINOUS INTENSITY:cd											
γ	C0	C45	C90	C135	C180	C225	C270	C315				
10	1000.0	990.0	981.9	989.6	1000.0	996.9	991.6	996.9				
20	982.1	950.5	924.1	949.7	981.9	964.5	943.3	964.7				
30	939.1	881.4	834.0	879.8	938.1	901.5	861.2	902.2				
40	854.2	777.8	717.0	774.4	850.7	801.8	750.3	803.8				
50	719.9	640.3	579.5	634.2	711.5	664.8	616.6	669.2				
60	546.1	477.5	427.3	468.7	531.8	500.3	466.6	507.7				
70	353.2	303.1	267.0	291.6	333.8	321.7	305.8	331.6				
80	166.7	136.0	111.9	123.6	144.7	149.2	147.2	160.9				
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				

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	95.37	0 - 10	95.37	3.06%
10-20	276.58	0 - 20	371.95	11.93%
20-30	428.35	0 - 30	800.30	25.67%
30-40	529.22	0 - 40	1329.52	42.65%
40-50	560.26	0 - 50	1889.78	60.63%
50-60	513.80	0 - 60	2403.58	77.11%
60-70	398.52	0 - 70	2802.10	89.90%
70-80	239.57	0 - 80	3041.67	97.58%
80-90	75.40	0 - 90	3117.07	100.00%
90-100	0.00	0 - 100	3117.07	100.00%
100-110	0.00	0 - 110	3117.07	100.00%
110-120	0.00	0 - 120	3117.07	100.00%
120-130	0.00	0 - 130	3117.07	100.00%
130-140	0.00	0 - 140	3117.07	100.00%
140-150	0.00	0 - 150	3117.07	100.00%
150-160	0.00	0 - 160	3117.07	100.00%
160-170	0.00	0 - 170	3117.07	100.00%
170-180	0.00	0 - 180	3117.07	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
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7	64	50	41	35	62	49	41	35	48	40	35	46	39	34	45	39	34	32
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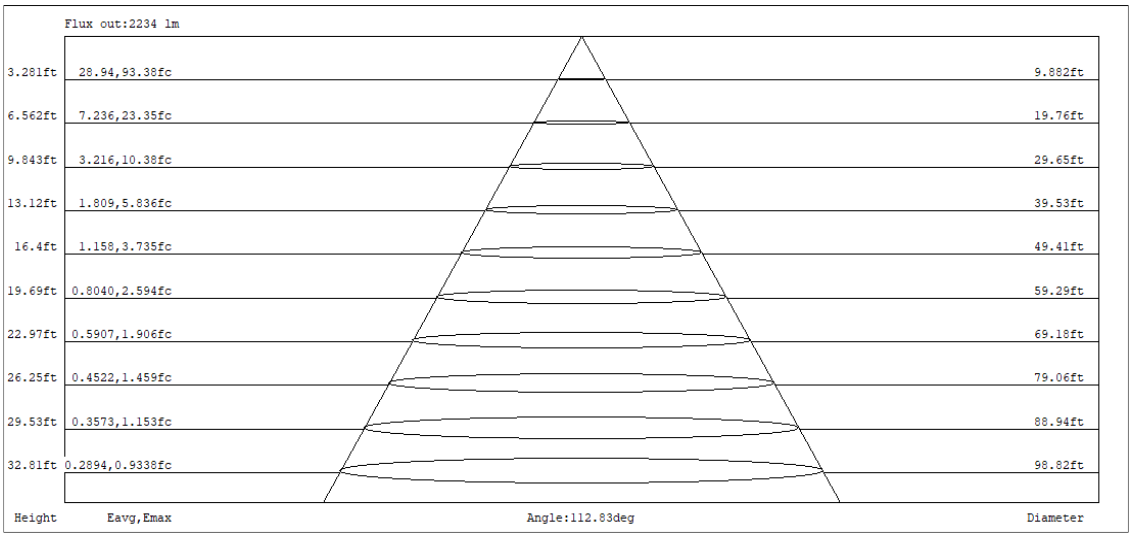
9	56	42	34	28	54	41	33	28	40	33	28	39	32	27	38	32	27	25
10	52	39	31	25	51	38	30	25	37	30	25	36	30	25	35	29	25	23

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	EZPANFA2x2 / 25W / 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
24.5	277.01	60	0.105	26.5	0.909	12.02%
24.5	120.01	60	0.219	26.2	0.994	4.70%

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**********