Photometric Test Report

Relevant Standards

☑IES LM-79-2008

☑ANSI C82.77:2014

Prepared For

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2019/1/7

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2019/1/8

Prepared By	**Approved By**
Wangzun Zhu	Kevin Jia

1.0 Test Summary

DLC Technical Requirements v4.4

Indoor - Troffer/1x4 Luminaires for Ambient Lighting of Interior Commercial Spaces			
Luminaire Description:	EZPANFA1x4 / 40W / 3500K		
Input Control Signal Applied:	0%		
Requirement Category	**Test Method**	**Requirements**	**Test value**
Luminaire Output (lm)	IES LM-79-2008	1500	4391
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	⩾72	77.05%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	97	109.3
Allowable CCTs* (K)	IES LM-79-2008	5000	3303
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	78	79
Power Factor	ANSI C82.77:2014	0.873	0.957
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	8.56%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	40.2
Input Voltage	IES LM-79-2008	Wrost Case	277
Input Current	IES LM-79-2008	Wrost Case	0.152
Luminaire Description:	EZPANFA1x4 / 40W / 4000K		
Input Control Signal Applied:	50%		
Requirement Category	**Test Method**	**Requirements**	**Test value**
Luminaire Output (lm)	IES LM-79-2008	1500	4569
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	⩾72	76.38%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	97	116.9
Allowable CCTs* (K)	IES LM-79-2008	5000	3926
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	78	81
Power Factor	ANSI C82.77:2014	0.873	0.956
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	9.50%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	39.1
Input Voltage	IES LM-79-2008	Wrost Case	277
Input Current	IES LM-79-2008	Wrost Case	0.148

Luminaire Description:	EZPANFA1x4 / 40W / 5000K
Input Control Signal Applied:	100%

Requirement Category	Test Method	Requirements	Test value
Luminaire Output (lm)	IES LM-79-2008	1500	4351
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	⩾72	76.33%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	97	107.4
Allowable CCTs* (K)	IES LM-79-2008	5000	4758
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	78	81
Power Factor	ANSI C82.77:2014	0.873	0.958
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	7.98%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	40.5
Input Voltage	IES LM-79-2008	Wrost Case	277
Input Current	IES LM-79-2008	Wrost Case	0.153

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2019/1/7	EZPANFA1x4 / 40W / 3500K	A1
2	Goniophotometer Test	2019/1/7	EZPANFA1x4 / 40W / 3500K	A1
3	THD and PF Test	2019/1/7	EZPANFA1x4 / 40W / 3500K	A1
4	Integrating Sphere Test	2019/1/7	EZPANFA1x4 / 40W / 4000K	A1
5	Goniophotometer Test	2019/1/7	EZPANFA1x4 / 40W / 4000K	A1
6	THD and PF Test	2019/1/7	EZPANFA1x4 / 40W / 4000K	A1
7	Integrating Sphere Test	2019/1/7	EZPANFA1x4 / 40W / 5000K	A1
8	Goniophotometer Test	2019/1/7	EZPANFA1x4 / 40W / 5000K	A1
9	THD and PF Test	2019/1/7	EZPANFA1x4 / 40W / 5000K	A1

Remark(If any)
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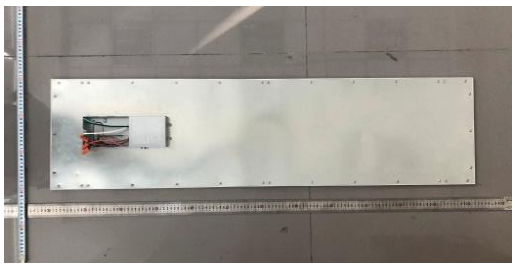
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing 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: EZPANFA1x4 / 40W / 3500K
EZPANFA1x4 / 40W / 4000K
EZPANFA1x4 / 40W / 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.	EZPANFA1x4 / 40W / 3500K	Sample ID.	A1
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	277.04	60	0.152	40.3	0.957

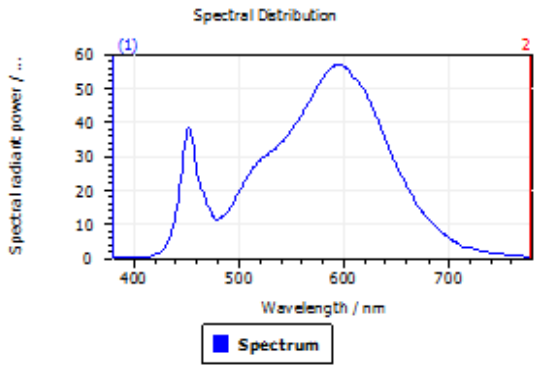
Test Result

CCT (K)	CRI (Ra)	Duv
3303	79	2.0E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

Spectral values

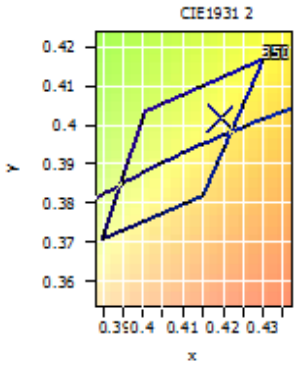
DominantWavelength	580.84 nm
Purity	0.466
PeakWavelength	594.97 nm
Width50%:	129.40 nm

Color Coordinates

Correlated Color Temperatu		3303 K			
x:	0.4194	u:	0.2401	u':	0.2401
y:	0.4022	v:	0.3453	v':	0.5180

CRI01	76.3	CRI09	-11.2
CRI02	88.0	CRI10	72.7
CRI03	95.8	CRI11	74.2
CRI04	75.9	CRI12	61.1
CRI05	76.2	CRI13	79.0
CRI06	84.3	CRI14	98.1
CRI07	81.7	CRI15	67.8
CRI08	53.5	CRI16	65.3

ResultsCRI 79.0



PlanckDistance 2.0E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	EZPANFA1x4 / 40W / 3500K	Sample ID.	A1
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	276.97	60	0.152	40.2	0.953	Light Down

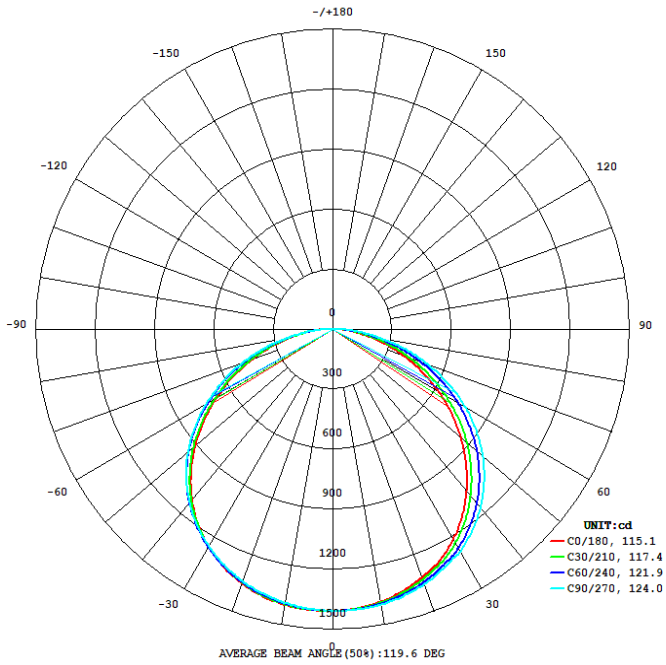
Test Result

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	
4391	77.05%	163.4	166.6	115.1	124.0	109.3

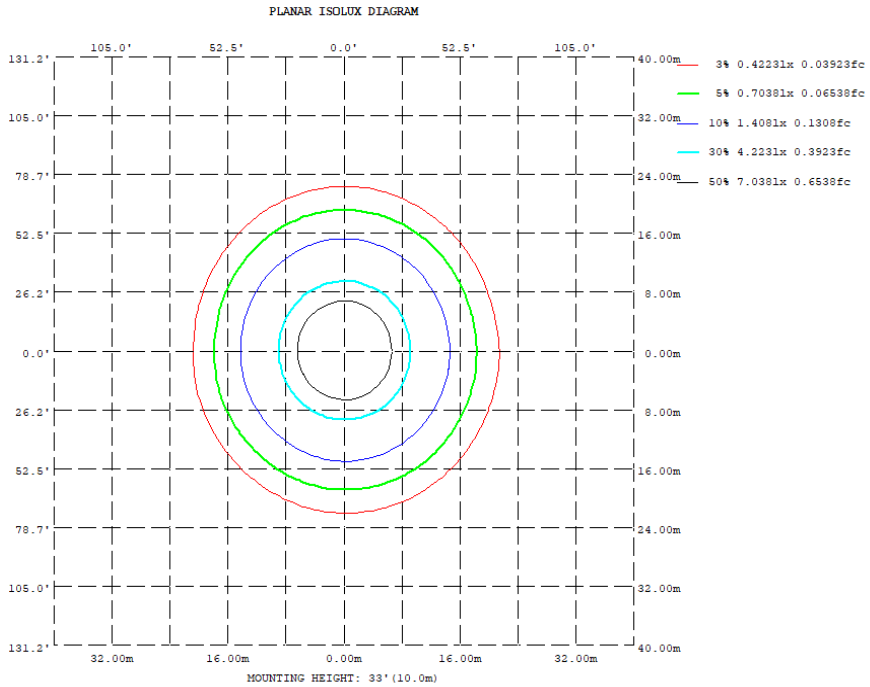
SC:0-180°	SC:90°-270°
1.34	1.34

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	1399	1394	1389	1385	1383	1390	1397	1399
20	1351	1346	1339	1327	1319	1337	1355	1354
30	1256	1258	1254	1228	1217	1252	1285	1275
40	1108	1122	1128	1084	1055	1111	1163	1138
50	908.9	935.5	955.8	892.0	848.9	921.1	993.0	947.8
60	675.5	707.2	736.0	662.7	615.2	690.7	771.9	716.0
70	432.5	456.7	492.0	419.3	374.4	437.0	509.5	458.5
80	198.6	207.0	215.5	180.4	153.6	189.9	233.0	207.3
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	133.64	0 - 10	133.64	3.04%
10-20	387.45	0 - 20	521.09	11.87%
20-30	600.54	0 - 30	1121.63	25.54%
30-40	743.90	0 - 40	1865.53	42.48%
40-50	790.04	0 - 50	2655.57	60.47%
50-60	727.93	0 - 60	3383.50	77.05%
60-70	566.99	0 - 70	3950.49	89.96%
70-80	338.18	0 - 80	4288.67	97.66%
80-90	102.71	0 - 90	4391.38	100.00%
90-100	0.00	0 - 100	4391.38	100.00%
100-110	0.00	0 - 110	4391.38	100.00%
110-120	0.00	0 - 120	4391.38	100.00%
120-130	0.00	0 - 130	4391.38	100.00%
130-140	0.00	0 - 140	4391.38	100.00%
140-150	0.00	0 - 150	4391.38	100.00%
150-160	0.00	0 - 160	4391.38	100.00%
160-170	0.00	0 - 170	4391.38	100.00%
170-180	0.00	0 - 180	4391.38	100.00%

4.3 Goniophotometer Test

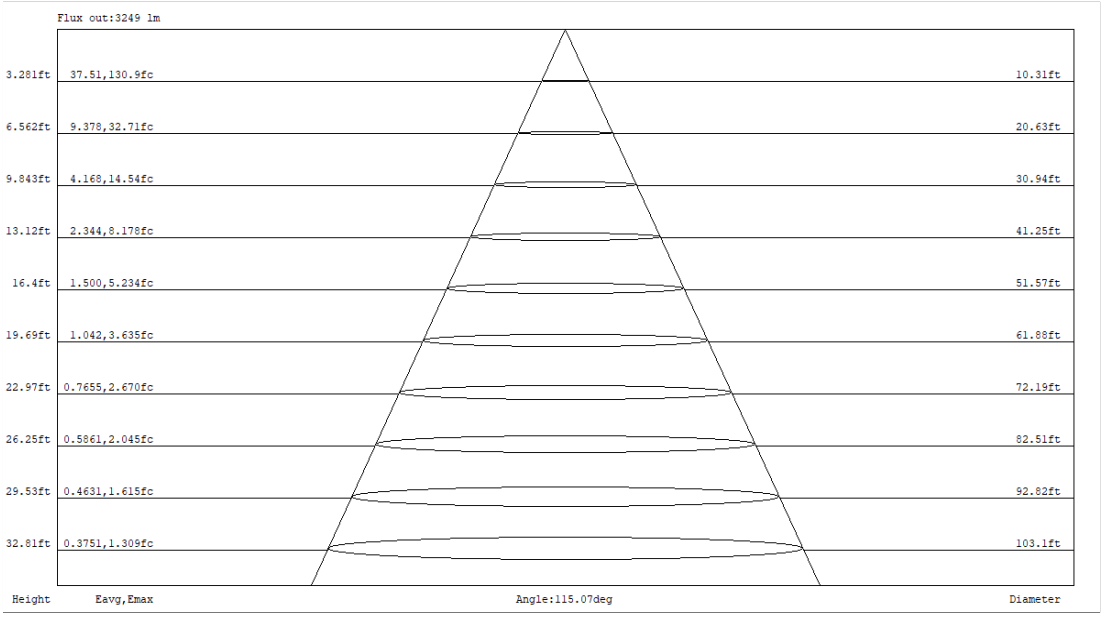
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	60	52	45	58	51	45	56	50	44	54	49	44	42
6	69	55	46	40	67	54	46	39	53	45	39	51	44	39	49	43	38	36
7	64	50	41	35	62	49	41	35	48	40	34	46	39	34	45	39	34	32
8	59	46	37	31	58	45	37	31	44	36	31	42	35	30	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	30	25	51	38	30	25	37	30	25	36	29	25	35	29	25	23

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	EZPANFA1x4 / 40W / 3500K	Sample ID.	A1

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	277.04	60	0.152	40.3	0.957	8.46%
24.9	119.98	60	0.337	40.2	0.993	8.56%

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	EZPANFA1x4 / 40W / 4000K	Sample ID.	A1
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	277.00	60	0.147	39.0	0.956

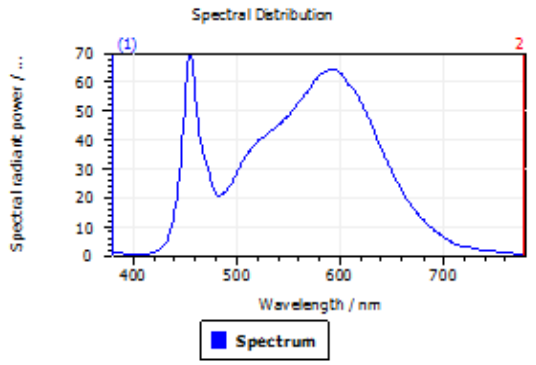
Test Result

CCT (K)	CRI (Ra)	Duv
3926	81	1.9E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

Spectral values

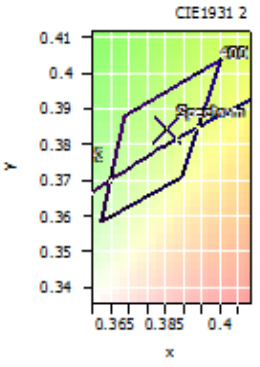
DominantWavelength	578.38 nm
Purity	0.308
PeakWavelength	454.82 nm
Width50%:	22.59 nm

Color Coordinates

Correlated Color Temperatu		3926 K			
x:	0.3852	u:	0.2254	u':	0.2254
y:	0.3839	v:	0.3369	v':	0.5054

CRI01	78.7	CRI09	-4.6
CRI02	90.3	CRI10	77.3
CRI03	94.9	CRI11	75.6
CRI04	77.0	CRI12	59.2
CRI05	79.0	CRI13	81.9
CRI06	86.8	CRI14	97.8
CRI07	82.3	CRI15	70.9
CRI08	57.6	CRI16	67.1

ResultsCRI 80.8



PlanckDistance 1.9E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	EZPANFA1x4 / 40W / 4000K	Sample ID.	A1
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	276.97	60	0.148	39.1	0.953	Light Down

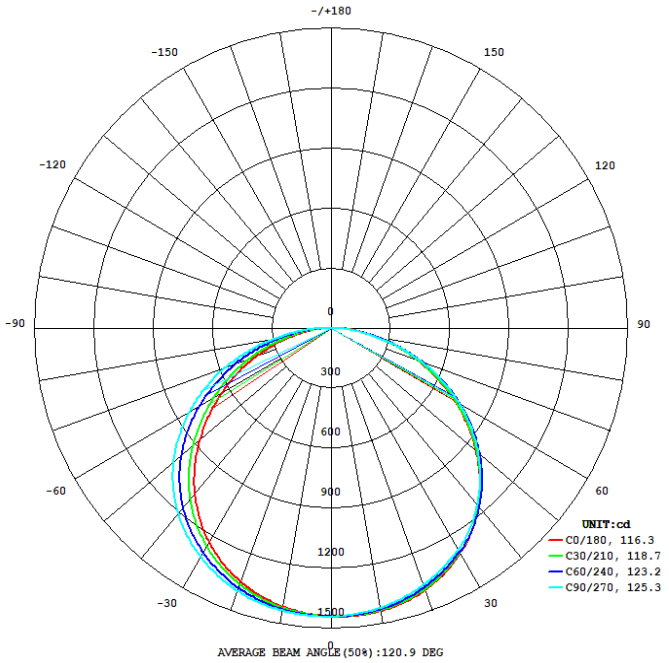
Test Result

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	
4569	76.38%	164.6	167.9	116.3	125.3	116.9

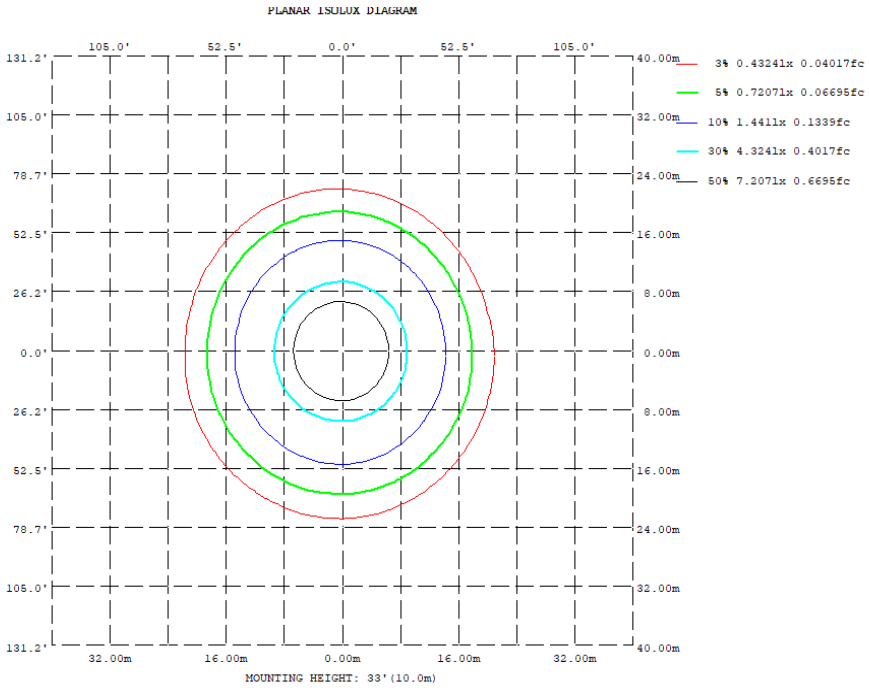
SC:0-180°	SC:90°-270°
1.28	1.38

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	1413	1423	1433	1439	1435	1428	1419	1411
20	1347	1370	1395	1403	1392	1381	1365	1344
30	1236	1278	1321	1325	1300	1297	1283	1245
40	1074	1139	1206	1197	1161	1164	1152	1090
50	870.7	952.7	1042	1017	958.7	974.2	972.6	890.1
60	635.7	724.8	826.9	788.5	719.2	739.6	746.1	655.5
70	397.9	474.5	570.3	532.5	462.0	476.4	481.8	404.2
80	172.0	221.2	286.6	267.1	216.6	215.2	208.7	165.2
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	136.79	0 - 10	136.79	2.99%
10-20	396.90	0 - 20	533.69	11.68%
20-30	615.82	0 - 30	1149.51	25.16%
30-40	765.23	0 - 40	1914.74	41.91%
40-50	816.76	0 - 50	2731.50	59.78%
50-60	758.23	0 - 60	3489.73	76.38%
60-70	597.34	0 - 70	4087.07	89.45%
70-80	365.11	0 - 80	4452.18	97.44%
80-90	117.02	0 - 90	4569.20	100.00%
90-100	0.00	0 - 100	4569.20	100.00%
100-110	0.00	0 - 110	4569.20	100.00%
110-120	0.00	0 - 120	4569.20	100.00%
120-130	0.00	0 - 130	4569.20	100.00%
130-140	0.00	0 - 140	4569.20	100.00%
140-150	0.00	0 - 150	4569.20	100.00%
150-160	0.00	0 - 160	4569.20	100.00%
160-170	0.00	0 - 170	4569.20	100.00%
170-180	0.00	0 - 180	4569.20	100.00%

4.3 Goniophotometer Test

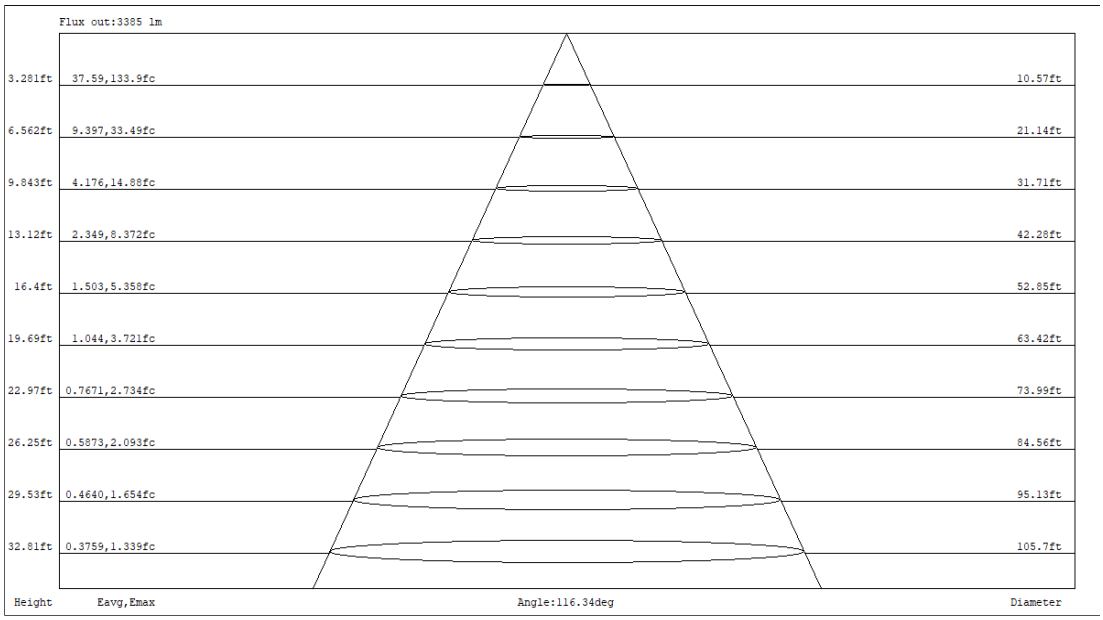
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	94	105	101	97	93	96	93	90	93	90	87	89	87	85	82
2	98	89	82	76	95	87	81	75	84	78	73	80	76	72	77	74	70	68
3	89	78	69	63	86	76	68	62	73	67	61	71	65	60	68	63	59	57
4	81	69	60	53	79	67	59	52	65	57	52	63	56	51	60	55	50	48
5	75	61	52	45	72	60	51	45	58	50	44	56	49	44	54	48	43	41
6	69	55	46	39	67	54	45	39	52	44	39	50	44	38	49	43	38	36
7	64	50	41	34	62	49	40	34	47	40	34	46	39	34	45	38	34	31
8	59	45	37	31	58	45	36	31	43	36	30	42	35	30	41	35	30	28
9	55	42	33	27	54	41	33	27	40	32	27	39	32	27	38	31	27	25
10	52	38	30	25	50	38	30	25	37	30	25	36	29	25	35	29	24	23

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	EZPANFA1x4 / 40W / 4000K	Sample ID.	A1

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	277.00	60	0.147	39.0	0.956	9.50%
24.5	120.07	60	0.326	38.9	0.994	8.28%

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	EZPANFA1x4 / 40W / 5000K	Sample ID.	A1
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
24.8	277.02	60.0	0.153	40.5	0.958

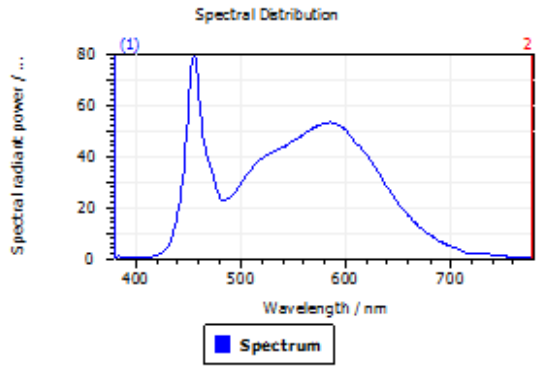
Test Result

CCT (K)	CRI (Ra)	Duv
4758	81	4.8E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

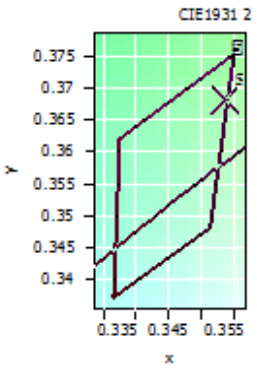
Spectral values

DominantWavelength	571.73 nm
Purity	0.166
PeakWavelength	455.19 nm
Width50%:	22.51 nm

Color Coordinates

Correlated Color Temperatu		4758 K			
x:	0.3537	u:	0.2109	u':	0.2109
y:	0.3680	v:	0.3291	v':	0.4937

CRI01	78.5	CRI09	-4.9
CRI02	89.8	CRI10	75.1
CRI03	95.3	CRI11	75.0
CRI04	76.3	CRI12	52.8
CRI05	78.2	CRI13	81.9
CRI06	84.7	CRI14	97.7
CRI07	84.5	CRI15	71.1
CRI08	61.0	CRI16	66.3
ResultsCRI	81.0		



PlanckDistance 4.8E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	EZPANFA1x4 / 40W / 5000K	Sample ID.	A1
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
24.8	277.00	60	0.153	40.5	0.954	Light Down

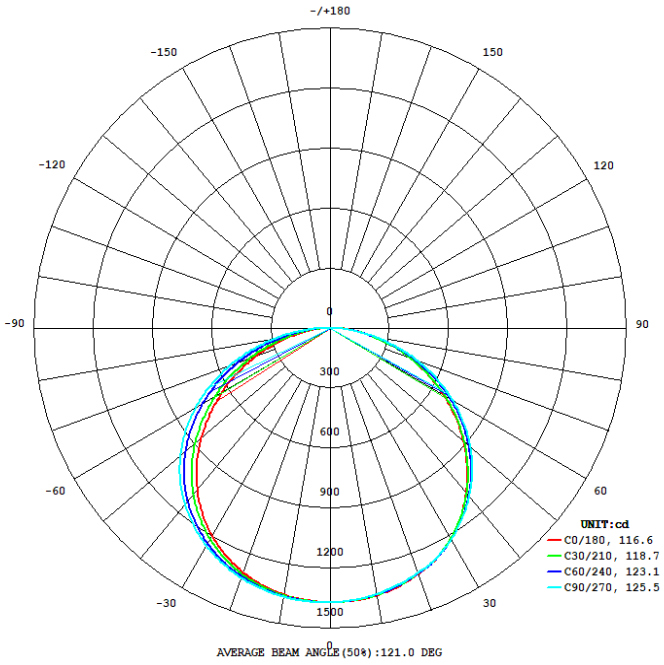
Test Result

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	
4351	76.33%	164.8	168.0	116.5	125.5	107.4

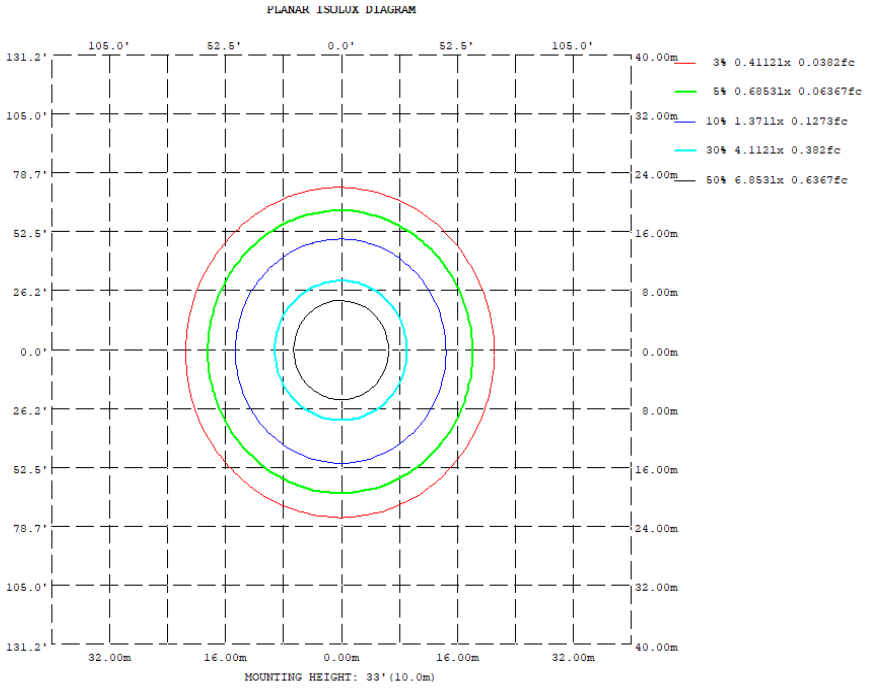
SC:0-180°	SC:90°-270°
1.30	1.38

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	1352	1359	1363	1361	1356	1352	1349	1349
20	1298	1315	1326	1319	1305	1302	1300	1296
30	1199	1232	1256	1238	1218	1220	1222	1206
40	1048	1103	1147	1113	1074	1085	1098	1066
50	854.6	926.3	991.2	940.0	882.4	903.1	928.7	878.4
60	630.4	707.0	786.1	724.7	661.0	682.7	714.3	654.3
70	393.5	463.1	541.6	487.3	424.7	439.1	463.3	409.1
80	170.4	215.1	270.9	242.1	201.0	199.8	202.9	171.5
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	130.08	0 - 10	130.08	2.99%
10-20	377.44	0 - 20	507.52	11.67%
20-30	586.65	0 - 30	1094.17	25.15%
30-40	727.97	0 - 40	1822.14	41.88%
40-50	777.03	0 - 50	2599.17	59.74%
50-60	721.83	0 - 60	3321.00	76.33%
60-70	569.74	0 - 70	3890.74	89.43%
70-80	348.19	0 - 80	4238.93	97.43%
80-90	111.86	0 - 90	4350.79	100.00%
90-100	0.00	0 - 100	4350.79	100.00%
100-110	0.00	0 - 110	4350.79	100.00%
110-120	0.00	0 - 120	4350.79	100.00%
120-130	0.00	0 - 130	4350.79	100.00%
130-140	0.00	0 - 140	4350.79	100.00%
140-150	0.00	0 - 150	4350.79	100.00%
150-160	0.00	0 - 160	4350.79	100.00%
160-170	0.00	0 - 170	4350.79	100.00%
170-180	0.00	0 - 180	4350.79	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	94	105	101	97	93	96	93	90	93	90	87	89	87	85	82
2	98	89	82	76	95	87	81	75	84	78	73	80	76	72	77	73	70	68
3	89	78	69	63	86	76	68	62	73	67	61	71	65	60	68	63	59	57
4	81	69	60	53	79	67	59	52	65	57	52	63	56	51	60	55	50	48
5	75	61	52	45	72	60	51	45	58	50	44	56	49	44	54	48	43	41
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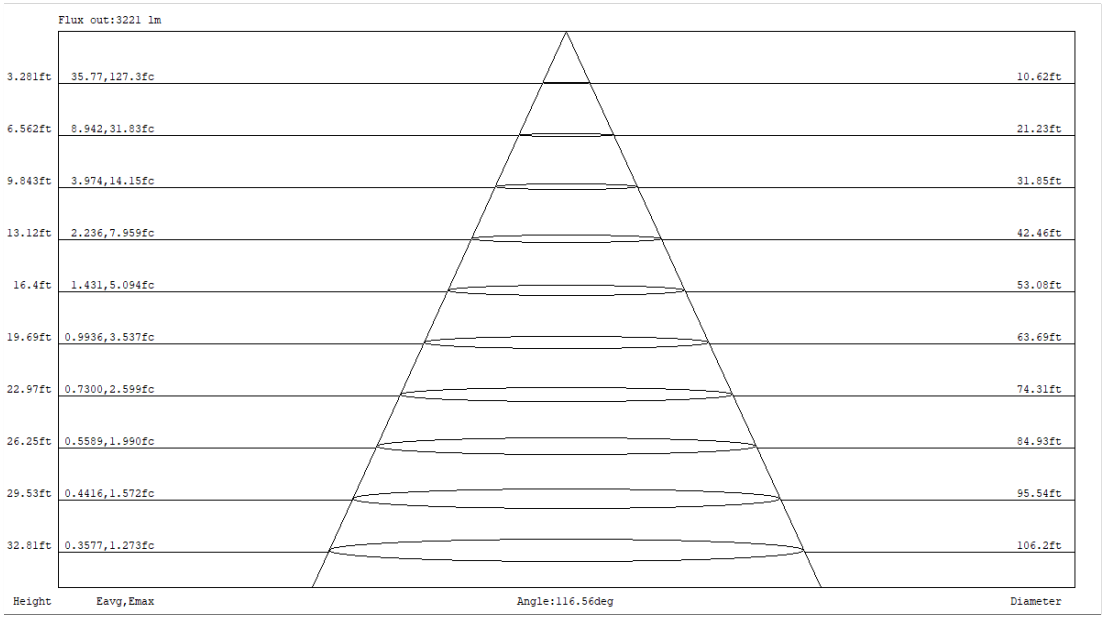
10	52	38	30	25	50	38	30	25	37	30	25	36	29	24	35	29	24	23

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	EZPANFA1x4 / 40W / 5000K	Sample ID.	A1

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
24.8	277.02	60	0.153	40.5	0.958	7.98%
24.8	120.01	60	0.339	40.4	0.993	7.77%

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**********