Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

RAB Lighting Inc.

Room 6A33, No.1388, Wuzhong road,Shanghai ,China

Xiao Xiang,15921313292,gary.Xiao@rabweb.com

Prepared By

Deliver Co.， Ltd.
Block 11, 78 Keling Road, SSTP, Suzhou, China
0512-66801950,kevin.jia@szdeliver.com

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2018/1/7

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2018/1/8

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 / 30W / 3500K		
Input Control Signal Applied:	0%		
Requirement Category	**Test Method**	**Requirements**	**Test value**
Luminaire Output (lm)	IES LM-79-2008	⩾1500	3541
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	⩾72%	76.77%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	100	114.2
Allowable CCTs* (K)	IES LM-79-2008	5000	3297
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	78	79
Power Factor	ANSI C82.77:2014	0.873	0.933
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	10.83%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	31.0
Input Voltage	IES LM-79-2008	Wrost Case	277
Input Current	IES LM-79-2008	Wrost Case	0.121
Luminaire Description:	EZPANFA1x4 / 30W / 4000K		
Input Control Signal Applied:	50%		
Requirement Category	**Test Method**	**Requirements**	**Test value**
Luminaire Output (lm)	IES LM-79-2008	⩾1500	3584
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	⩾72%	77.11%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	100	118.7
Allowable CCTs* (K)	IES LM-79-2008	5000	3922
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	78	81
Power Factor	ANSI C82.77:2014	0.873	0.929
Total Harmonic Distortion (A%)	ANSI C82.77:2014	0.25	11.22%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	30.2
Input Voltage	IES LM-79-2008	Wrost Case	277
Input Current	IES LM-79-2008	Wrost Case	0.118

Luminaire Description:	EZPANFA1x4 / 30W / 5000K		
Input Control Signal Applied:	100%		
Requirement Category	**Test Method**	**Requirements**	**Test value**
Luminaire Output (lm)	IES LM-79-2008	⩾1500	3495
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	⩾72%	76.77%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	100	112.0
Allowable CCTs* (K)	IES LM-79-2008	5000	4751
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	78	81
Power Factor	ANSI C82.77:2014	0.873	0.935
Total Harmonic Distortion (A%)	ANSI C82.77:2014	0.25	10.84%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	31.2
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	2018/1/7	EZPANFA1x4 / 30W / 3500K	A1
2	Goniophotometer Test	2018/1/7	EZPANFA1x4 / 30W / 3500K	A1
3	THD and PF Test	2018/1/7	EZPANFA1x4 / 30W / 3500K	A1
4	Integrating Sphere Test	2018/1/7	EZPANFA1x4 / 30W / 4000K	A1
5	Goniophotometer Test	2018/1/7	EZPANFA1x4 / 30W / 4000K	A1
6	THD and PF Test	2018/1/7	EZPANFA1x4 / 30W / 4000K	A1
7	Integrating Sphere Test	2018/1/7	EZPANFA1x4 / 30W / 5000K	A1
8	Goniophotometer Test	2018/1/7	EZPANFA1x4 / 30W / 5000K	A1
9	THD and PF Test	2018/1/7	EZPANFA1x4 / 30W / 5000K	A1

Remark(If any)
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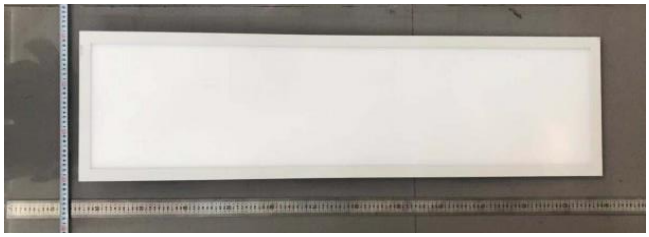
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing 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 / 30W / 3500K
EZPANFA1x4 / 30W / 4000K
EZPANFA1x4 / 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.	EZPANFA1x4 / 30W / 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
24.8	277.03	60	0.120	31.1	0.933

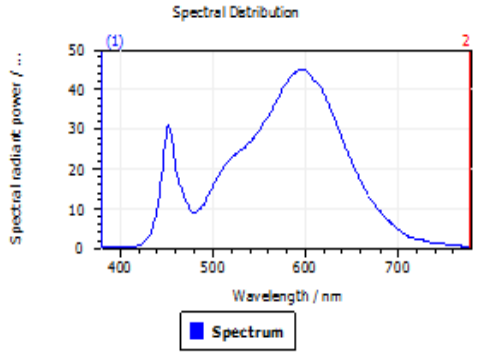
Test Result

CCT (K)	CRI (Ra)	Duv
3297	79	2.1E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

Spectral values

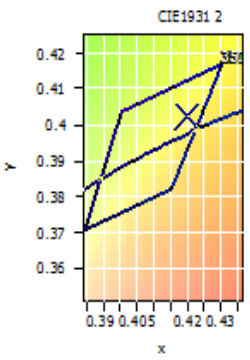
DominantWavelength	580.85 nm
Purity	0.468
PeakWavelength	595.15 nm
Width50%:	129.30 nm

Color Coordinates

Correlated Color Temperatu		3297 K			
x:	0.4197	u:	0.2402	u':	0.2402
y:	0.4024	v:	0.3454	v':	0.5182

CRI01	76.5	CRI09	-10.5
CRI02	88.2	CRI10	73.0
CRI03	95.9	CRI11	74.5
CRI04	76.2	CRI12	60.9
CRI05	76.5	CRI13	79.2
CRI06	84.5	CRI14	98.2
CRI07	81.8	CRI15	68.1
CRI08	53.8	CRI16	65.5

ResultsCRI 79.2



PlanckDistance 2.1E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	EZPANFA1x4 / 30W / 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
24.8	276.94	60	0.121	31.0	0.928	Light Down

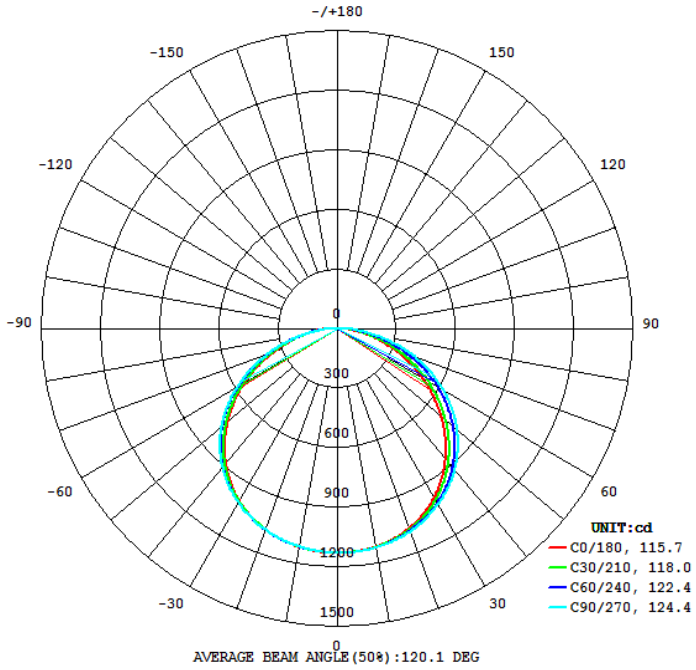
Test Result

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	
3541	76.77%	164.1	167.1	115.7	124.4	114.2

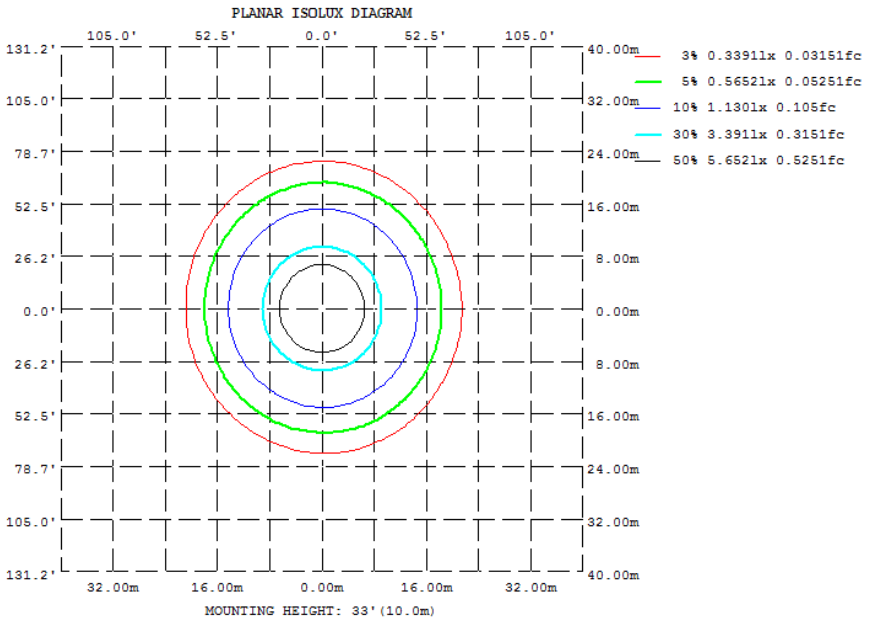
SC:0-180°	SC:90°-270°
1.34	1.30

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	1117	1116	1115	1115	1115	1118	1120	1118
20	1076	1077	1077	1071	1069	1078	1085	1080
30	999.4	1006	1009	993.4	983.8	1006	1023	1011
40	882.1	897.8	907.5	876.2	856.0	895.9	928.4	903.7
50	726.9	750.9	768.1	720.1	690.9	745.7	796.0	758.1
60	545.2	569.8	590.5	533.5	502.5	562.5	624.8	580.0
70	351.7	368.0	382.2	331.2	306.9	359.2	419.6	381.1
80	166.5	168.3	166.7	138.2	126.6	160.6	201.7	183.0
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	107.21	0 - 10	107.21	3.03%
10 - 20	310.95	0 - 20	418.16	11.81%
20 - 30	481.76	0 - 30	899.92	25.42%
30 - 40	596.38	0 - 40	1496.30	42.26%
40 - 50	634.79	0 - 50	2131.09	60.19%
50 - 60	587.13	0 - 60	2718.22	76.77%
60 - 70	459.29	0 - 70	3177.51	89.75%
70 - 80	276.69	0 - 80	3454.20	97.56%
80 - 90	86.32	0 - 90	3540.52	100.00%
90 - 100	0.00	0 - 100	3540.52	100.00%
100 - 110	0.00	0 - 110	3540.52	100.00%
110 - 120	0.00	0 - 120	3540.52	100.00%
120 - 130	0.00	0 - 130	3540.52	100.00%
130 - 140	0.00	0 - 140	3540.52	100.00%
140 - 150	0.00	0 - 150	3540.52	100.00%
150 - 160	0.00	0 - 160	3540.52	100.00%
160 - 170	0.00	0 - 170	3540.52	100.00%
170 - 180	0.00	0 - 180	3540.52	100.00%

4.3 Goniophotometer Test

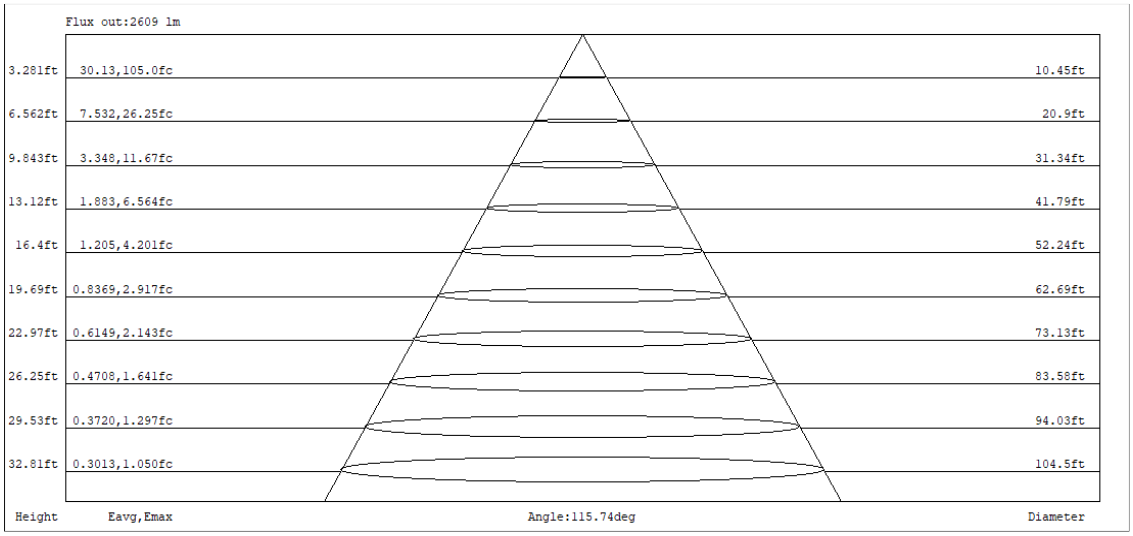
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	89	82	76	95	88	81	75	84	78	74	81	76	72	78	74	70	68
3	89	78	70	63	87	77	69	62	74	67	61	71	65	60	68	63	59	57
4	81	69	60	53	79	68	59	53	65	58	52	63	56	51	61	55	50	48
5	75	61	52	45	73	60	52	45	58	51	45	56	49	44	54	48	44	41
6	69	55	46	39	67	54	46	39	52	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	45	37	31	58	45	37	31	43	36	31	42	35	30	41	35	30	28
9	55	42	33	28	54	41	33	28	40	33	27	39	32	27	38	32	27	25
10	52	38	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 / 30W / 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
24.8	277.03	60	0.120	31.1	0.933	10.83%
24.8	120.00	60	0.258	30.9	0.995	5.75%

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	EZPANFA1x4 / 30W / 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
24.4	277.01	60	0.117	30.2	0.929

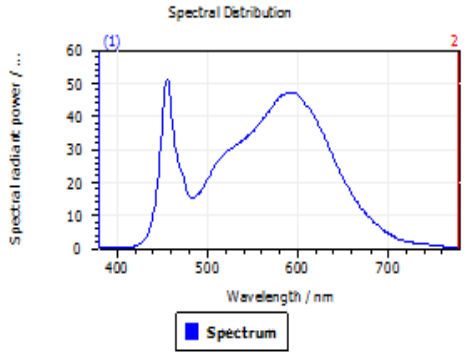
Test Result

CCT (K)	CRI (Ra)	Duv
3922	81	2.0E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



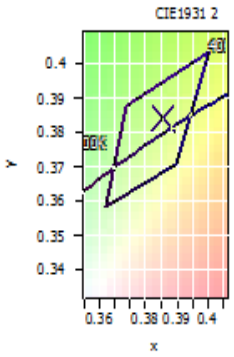
Spectral Distribution

Spectral values

DominantWavelength	578.35 nm
Purity	0.310
PeakWavelength	455.08 nm
Width50%:	22.56 nm

Color Coordinates

Correlated Color Temperatu	3922 K		
x: 0.3855	u: 0.2254	u': 0.2254	
y: 0.3843	v: 0.3371	v': 0.5056	
CRI01	78.8	CRI09	-4.3
CRI02	90.5	CRI10	77.7
CRI03	94.9	CRI11	75.6
CRI04	76.9	CRI12	59.1
CRI05	79.1	CRI13	82.1
CRI06	87.1	CRI14	97.7
CRI07	82.2	CRI15	71.0
CRI08	57.7	CRI16	67.1
ResultsCRI	80.9		



PlanckDistance 2.0E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	EZPANFA1x4 / 30W / 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
24.4	277.01	60	0.118	30.2	0.923	Light Down

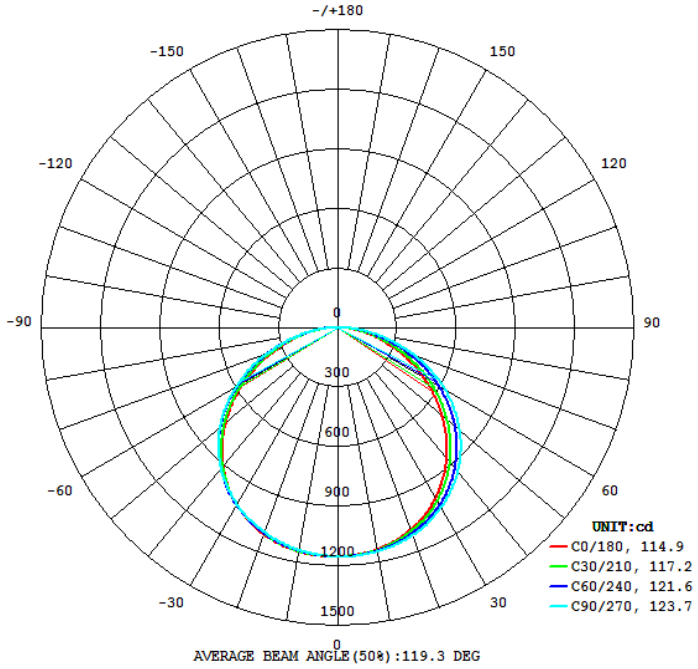
Test Result

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	
3584	77.11%	163.3	166.5	114.9	123.7	118.7

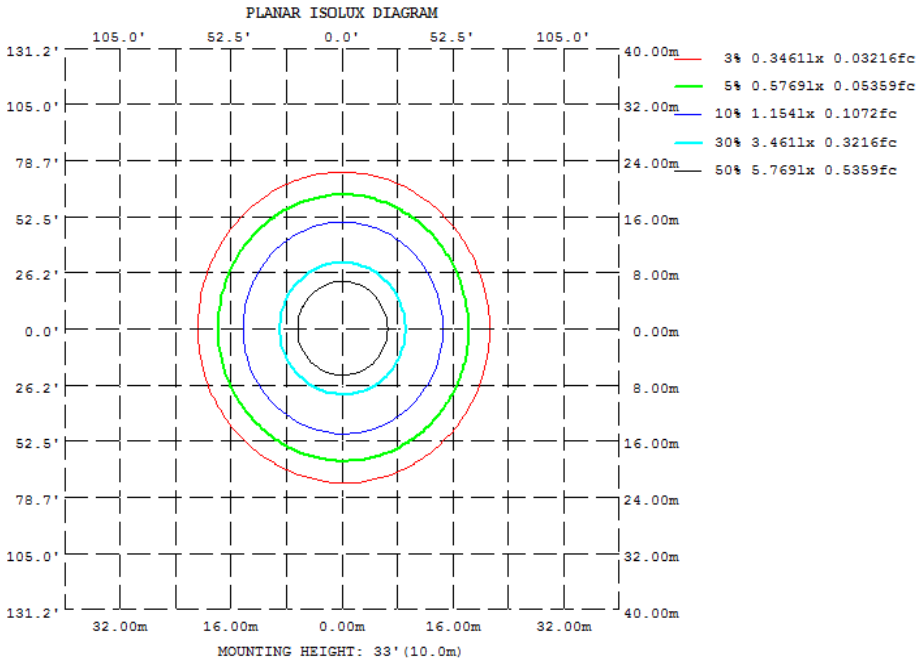
SC:0-180°	SC:90°-270°
1.34	1.28

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	1146	1142	1138	1134	1133	1139	1145	1146					
20	1106	1102	1096	1086	1081	1096	1110	1110					
30	1028	1029	1026	1004	991.4	1020	1046	1039					
40	905.6	916.6	921.4	883.8	860.1	905.3	947.8	927.6					
50	742.1	763.9	779.4	726.8	693.0	751.4	809.2	774.1					
60	551.2	576.3	598.6	539.3	503.1	564.2	630.3	585.3					
70	349.5	368.3	388.0	337.6	307.1	358.1	416.9	376.1					
80	159.5	165.4	171.6	144.7	127.2	157.4	192.3	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					

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0 - 10	109.48	0 - 10	109.48	3.05%
10 - 20	317.37	0 - 20	426.85	11.91%
20 - 30	491.21	0 - 30	918.06	25.62%
30 - 40	607.11	0 - 40	1525.17	42.55%
40 - 50	644.65	0 - 50	2169.82	60.54%
50 - 60	593.93	0 - 60	2763.75	77.11%
60 - 70	461.74	0 - 70	3225.49	90.00%
70 - 80	275.00	0 - 80	3500.49	97.67%
80 - 90	83.58	0 - 90	3584.07	100.00%
90 - 100	0.00	0 - 100	3584.07	100.00%
100 - 110	0.00	0 - 110	3584.07	100.00%
110 - 120	0.00	0 - 120	3584.07	100.00%
120 - 130	0.00	0 - 130	3584.07	100.00%
130 - 140	0.00	0 - 140	3584.07	100.00%
140 - 150	0.00	0 - 150	3584.07	100.00%
150 - 160	0.00	0 - 160	3584.07	100.00%
160 - 170	0.00	0 - 170	3584.07	100.00%
170 - 180	0.00	0 - 180	3584.07	100.00%

4.3 Goniophotometer Test

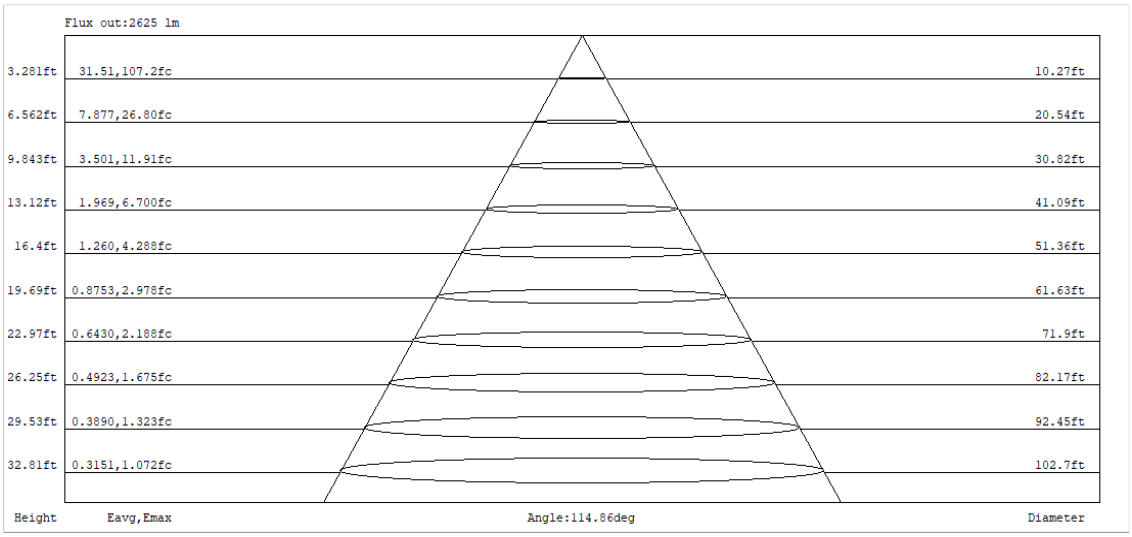
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	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	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	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	29	25	35	29	25	23

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	EZPANFA1x4 / 30W / 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
24.4	277.01	60	0.117	30.2	0.929	11.22%
24.4	120.00	60	0.251	30.0	0.995	5.48%

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	EZPANFA1x4 / 30W / 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
24.7	277.01	60.00	0.121	31.3	0.935

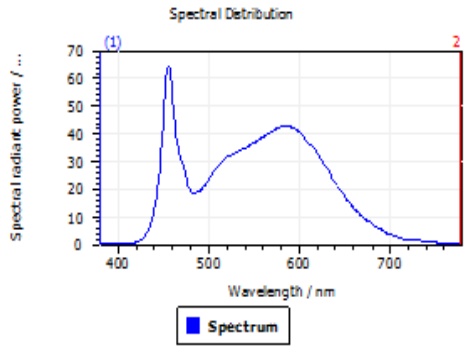
Test Result

CCT (K)	CRI (Ra)	Duv
4751	81	4.9E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

Spectral values

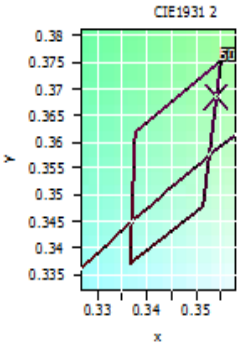
DominantWavelength	571.73 nm
Purity	0.168
PeakWavelength	455.32 nm
Width50%:	21.70 nm

Color Coordinates

Correlated Color Temperatu		4751 K			
x:	0.3540	u:	0.2109	u':	0.2109
y:	0.3686	v:	0.3293	v':	0.4940

CRI01	78.7	CRI09	-4.6
CRI02	89.9	CRI10	75.5
CRI03	95.3	CRI11	75.1
CRI04	76.3	CRI12	52.3
CRI05	78.2	CRI13	82.1
CRI06	84.9	CRI14	97.8
CRI07	84.4	CRI15	71.2
CRI08	61.0	CRI16	66.2

ResultsCRI 81.1



PlanckDistance 4.9E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	EZPANFA1x4 / 30W / 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
24.7	276.95	60	0.121	31.2	0.929	Light Down

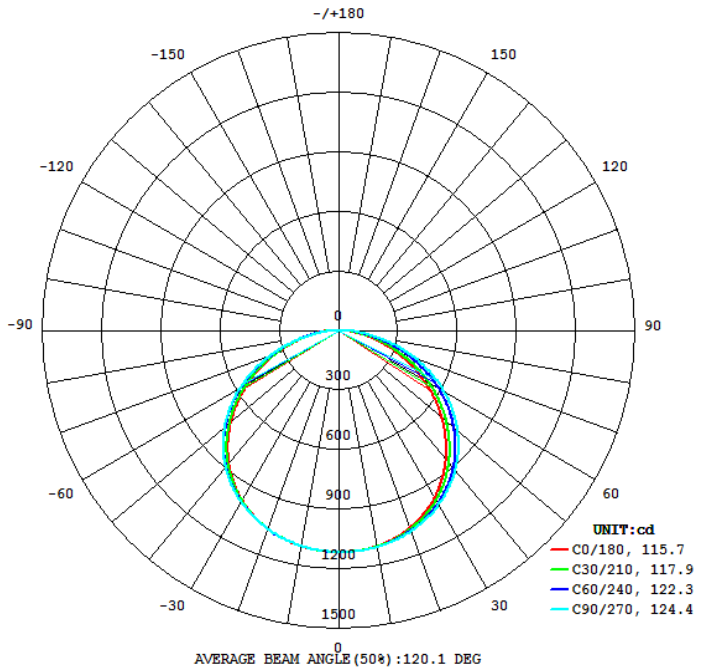
Test Result

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	
3495	76.77%	164.1	167.1	115.7	124.4	112.0

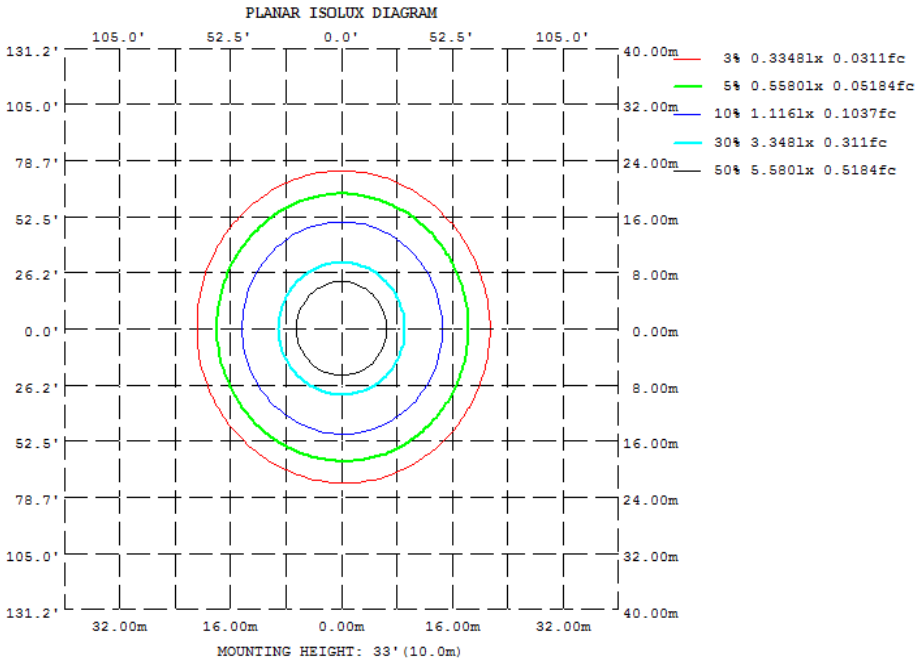
SC:0-180°	SC:90°-270°
1.34	1.30

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	1103	1102	1102	1101	1102	1105	1106	1105
20	1061	1062	1062	1058	1056	1067	1073	1067
30	984.4	990.8	995.0	980.1	972.2	995.7	1012	997.7
40	868.2	883.5	894.4	863.9	846.0	886.7	918.7	891.9
50	715.2	738.3	756.4	709.9	683.1	738.7	788.3	748.7
60	536.1	560.2	580.9	525.6	496.9	557.7	619.5	573.3
70	345.7	361.6	375.7	326.3	303.8	356.4	416.4	377.0
80	163.4	165.2	163.8	135.9	125.7	159.9	200.4	181.6
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	105.90	0 - 10	105.90	3.03%
10 - 20	307.11	0 - 20	413.01	11.82%
20 - 30	475.65	0 - 30	888.66	25.43%
30 - 40	588.66	0 - 40	1477.32	42.27%
40 - 50	626.46	0 - 50	2103.78	60.19%
50 - 60	579.40	0 - 60	2683.18	76.77%
60 - 70	453.30	0 - 70	3136.48	89.74%
70 - 80	273.17	0 - 80	3409.65	97.56%
80 - 90	85.30	0 - 90	3494.95	100.00%
90 - 100	0.00	0 - 100	3494.95	100.00%
100 - 110	0.00	0 - 110	3494.95	100.00%
110 - 120	0.00	0 - 120	3494.95	100.00%
120 - 130	0.00	0 - 130	3494.95	100.00%
130 - 140	0.00	0 - 140	3494.95	100.00%
140 - 150	0.00	0 - 150	3494.95	100.00%
150 - 160	0.00	0 - 160	3494.95	100.00%
160 - 170	0.00	0 - 170	3494.95	100.00%
170 - 180	0.00	0 - 180	3494.95	100.00%

4.3 Goniophotometer Test

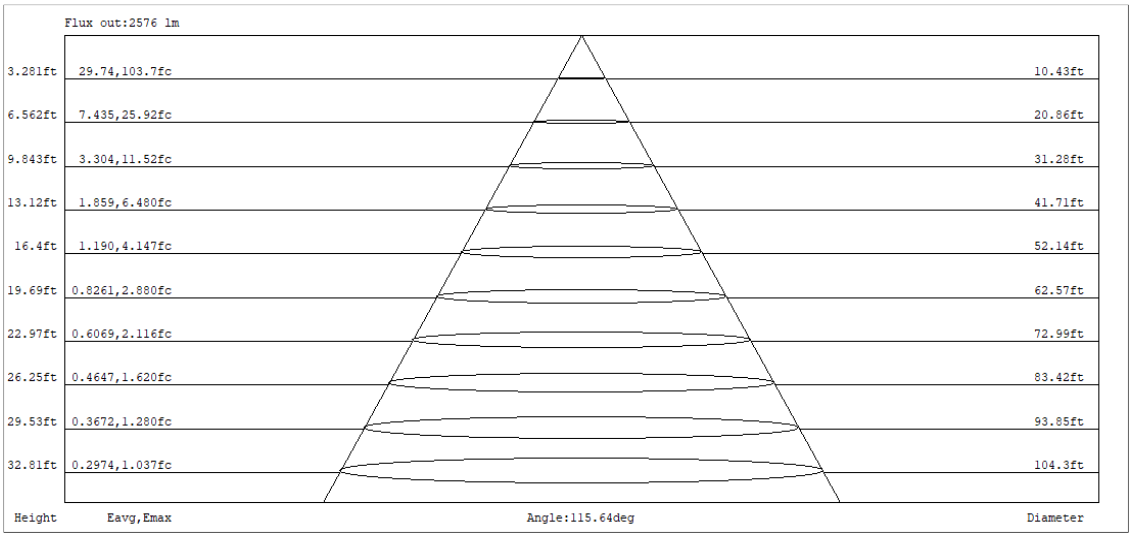
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	89	82	76	95	88	81	75	84	78	74	81	76	72	78	74	70	68
3	89	78	70	63	87	77	69	62	74	67	61	71	65	60	68	63	59	57
4	81	69	60	53	79	68	59	53	65	58	52	63	56	51	61	55	50	48
5	75	61	52	45	73	60	52	45	58	51	45	56	49	44	54	48	44	41
6	69	55	46	39	67	54	46	39	52	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	43	36	31	42	35	30	41	35	30	28
9	55	42	33	28	54	41	33	28	40	33	27	39	32	27	38	32	27	25
10	52	38	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 / 30W / 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
24.7	277.01	60	0.121	31.3	0.935	10.84%
24.7	119.99	60	0.261	31.1	0.995	5.80%

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**********