

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2014

Prepared For

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DLF2310103

Report Number

DLF2310103-26a

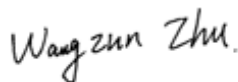
Test Date

2023/10/23

Issue Date

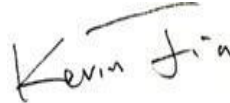
2023/10/24

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

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1.0 Test Summary

DLC Technical Requirements v5.1

Outdoor - Stairwell and Passageway Luminaires Indoor - Direct Linear Ambient Luminaires/Low Bay				
Requirement Category	Test Method	Requirements		Test value
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	5000		5497
Lumen/ft (Goniophotometer - Section 4.2)	IES LM-79-2008	≥375		1374
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 115	Premium 130	154.8
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Wroست Case		35.5
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	5.93%
		20.00%	277V	11.83%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.996
		0.9	277V	0.969
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3985±275	4222
		4 step	3985±154	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥80		85
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥0		19
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥70		85
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥89		96
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%≤IES Rcs,h1≤+23%		-11%
Zonal Lumen Requirement (0°-90°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥85%		97.39%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥40%		82.40%
Zonal Lumen Requirement (20°-50°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥30%		54.13%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	<22 <25		24.8
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wroست Case		120
(Goniophotometer - Section 4.2)		Non-Wroست Case		277
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wroست Case		0.297
(Goniophotometer - Section 4.2)		Non-Wroست Case		0.130
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wroست Case		35.5
(Goniophotometer - Section 4.2)		Non-Wroست Case		35.0

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023/10/23	CS4 @100% Power /4000K	Z1
2	Goniophotometer Test	2023/10/23	CS4 @100% Power /4000K	Z1
3	THD and PF Test	2023/10/23	CS4 @100% Power /4000K	Z1

Remark(If any)

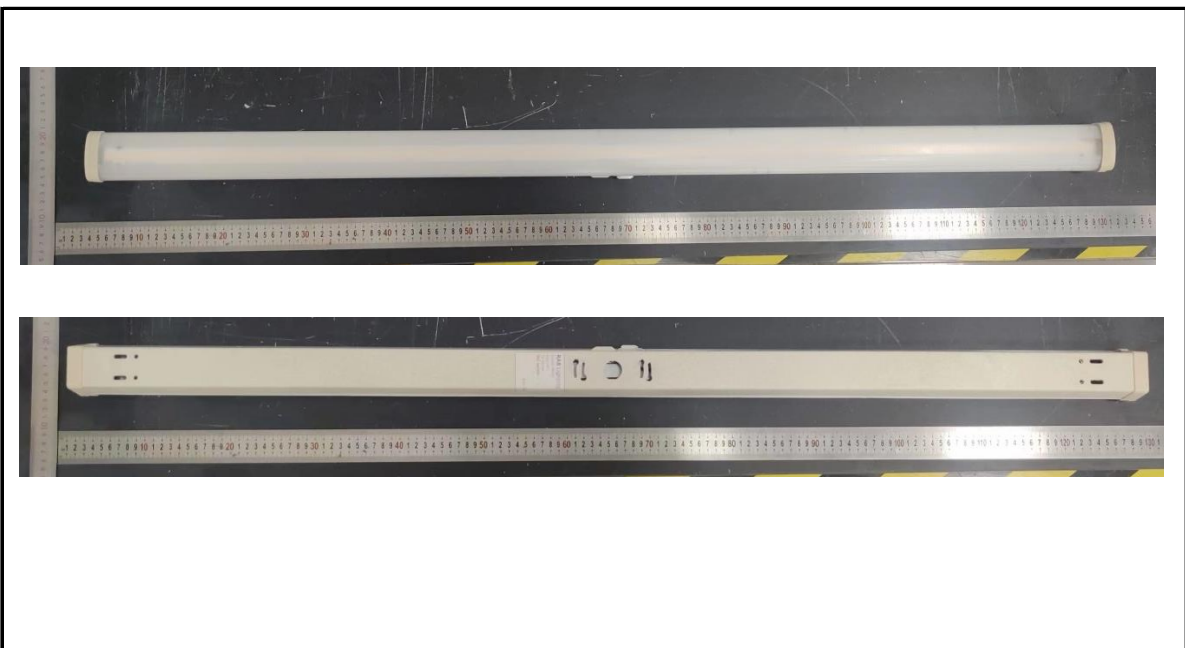
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3.0 Production Description

Luminaire Description: CS4 @100% Power /4000K

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.	CS4 @100% Power /4000K	Sample ID.	Z1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.1	Humidity (%RH)	57.0

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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

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 Result

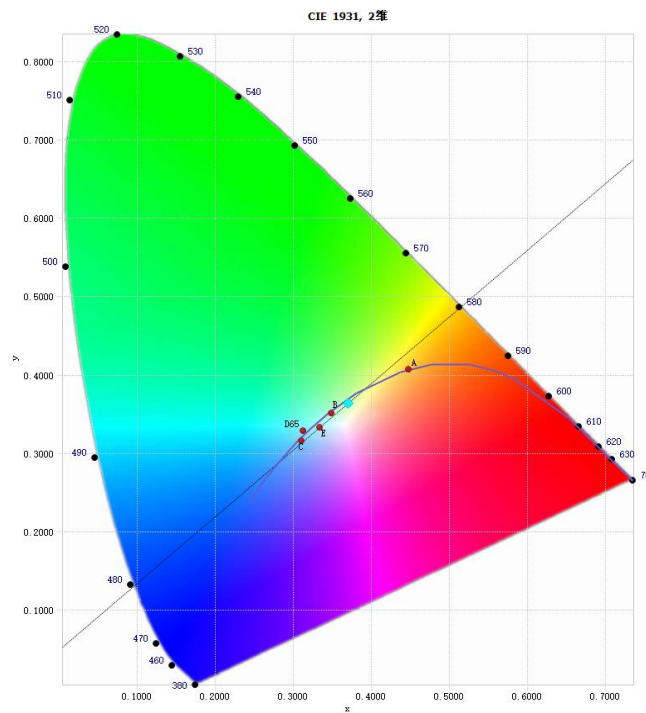
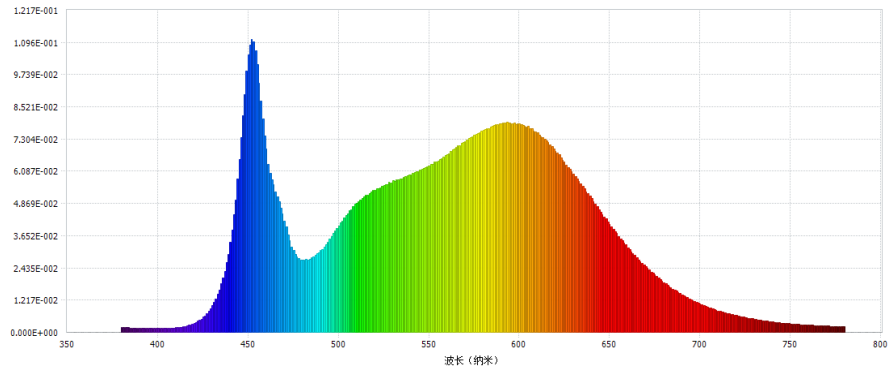
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.01	60	0.297	35.5	0.996
277.04	60	0.130	35.0	0.969

Test Result

CCT (K)	CRI	R9	Duv
4222	85	19	-0.0027

Rf	Rg	IES Rcs,h1
85	96	-11%

4.1 Integrating Sphere Test



4.1 Integrating Sphere Test

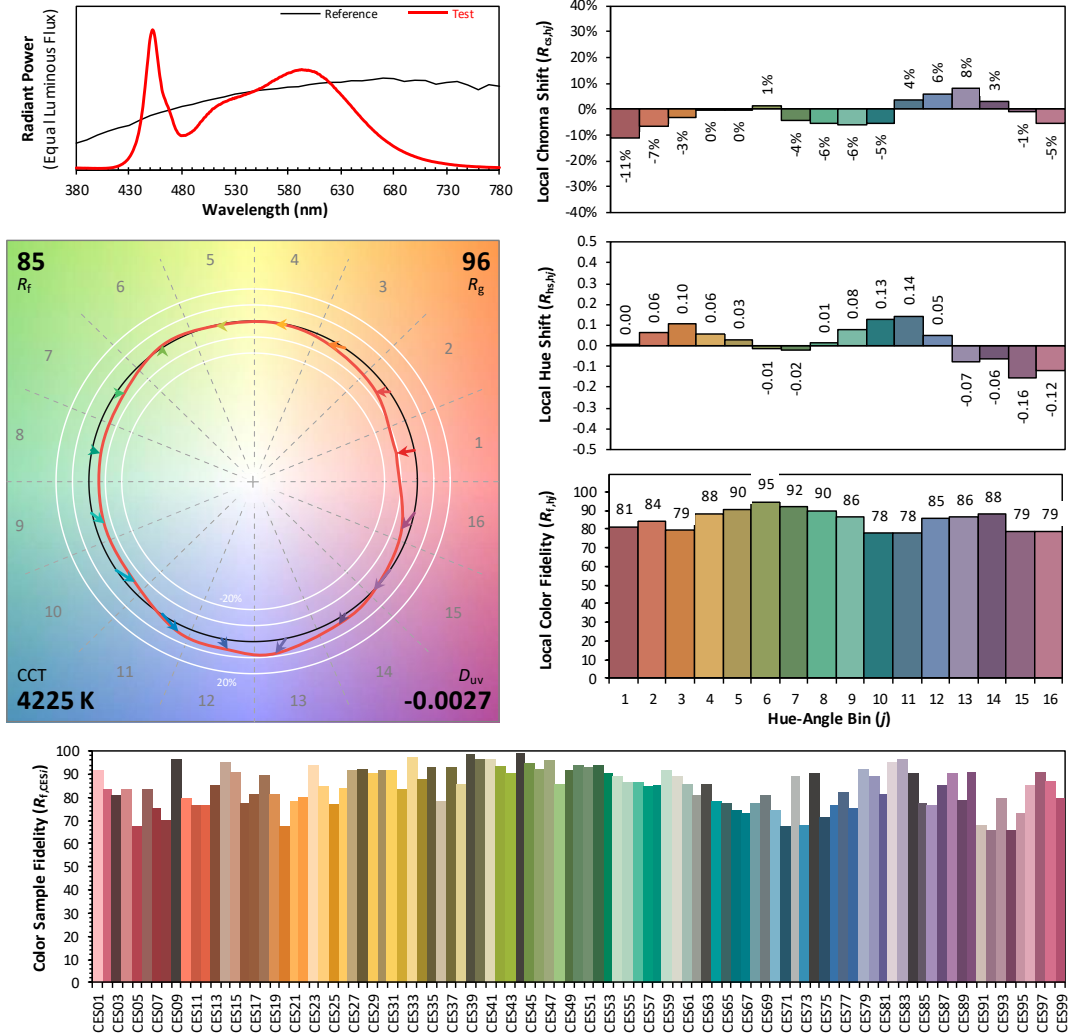
IES TM-30-18 Color Rendition Report

Source: DLF2310103-26a

Manufacturer: RAB Lighting Inc.

Date: 2023/10/23

Model: CS4 @100% Power /4000K



Notes: This is a recommended method for displaying IES TM-30-18 information.

x 0.3695
 y 0.3640
 u' 0.2230
 v' 0.4942

CIE 13.3-1995
(CRI)

R_a 86
 R_g 23

4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength							
WL (nm)	Radiant (Watts/nm)	WL (nm)	Radiant (Watts/nm)	WL (nm)	Radiant (Watts/nm)	WL (nm)	Radiant (Watts/nm)
380	1.81E-03	485	2.82E-02	590	7.88E-02	695	1.24E-02
385	1.67E-03	490	3.09E-02	595	7.91E-02	700	1.07E-02
390	1.62E-03	495	3.52E-02	600	7.87E-02	705	9.35E-03
395	1.52E-03	500	4.03E-02	605	7.78E-02	710	8.11E-03
400	1.44E-03	505	4.46E-02	610	7.55E-02	715	7.11E-03
405	1.50E-03	510	4.86E-02	615	7.23E-02	720	6.32E-03
410	1.69E-03	515	5.17E-02	620	6.85E-02	725	5.64E-03
415	2.17E-03	520	5.38E-02	625	6.45E-02	730	4.97E-03
420	3.39E-03	525	5.56E-02	630	5.98E-02	735	4.40E-03
425	5.78E-03	530	5.72E-02	635	5.51E-02	740	3.93E-03
430	1.00E-02	535	5.81E-02	640	5.04E-02	745	3.51E-03
435	1.84E-02	540	5.96E-02	645	4.54E-02	750	3.18E-03
440	3.40E-02	545	6.13E-02	650	4.07E-02	755	2.92E-03
445	6.52E-02	550	6.30E-02	655	3.63E-02	760	2.73E-03
450	1.05E-01	555	6.47E-02	660	3.20E-02	765	2.52E-03
455	1.01E-01	560	6.71E-02	665	2.82E-02	770	2.31E-03
460	6.94E-02	565	7.00E-02	670	2.47E-02	775	2.22E-03
465	5.30E-02	570	7.20E-02	675	2.16E-02	780	2.11E-03
470	4.21E-02	575	7.44E-02	680	1.88E-02		
475	3.10E-02	580	7.64E-02	685	1.63E-02		
480	2.73E-02	585	7.79E-02	690	1.42E-02		

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	CS4 @100% Power /4000K	Sample ID.	Z1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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° vertical intervals and 10° horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WROST CASE	120.06	60	0.297	35.5	0.996
NON-WROST CASE	277.01	60	0.130	35.0	0.969

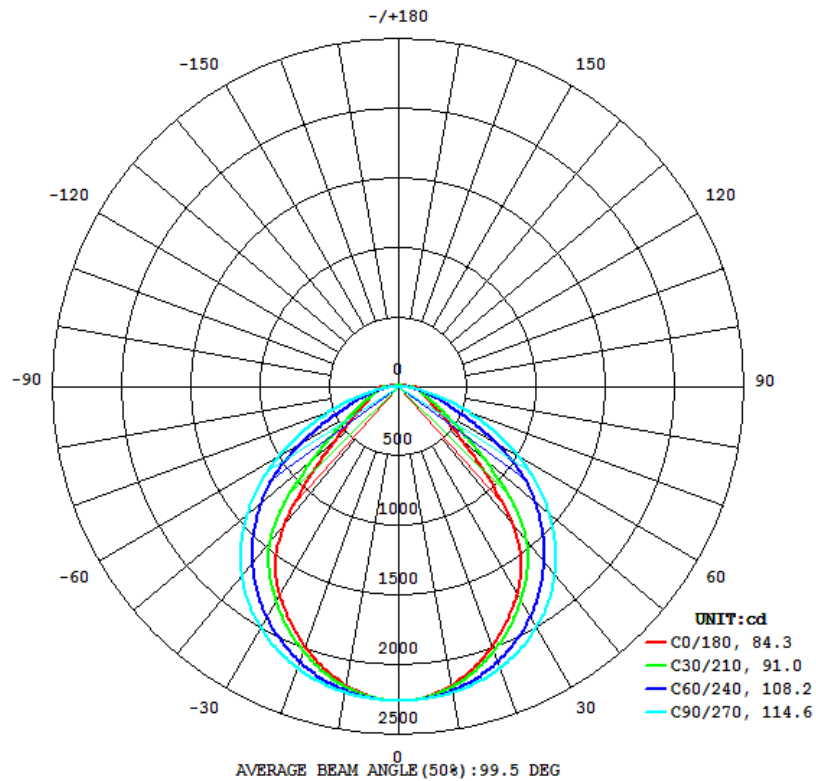
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
5497	138.0	156.4	84.3	114.6	154.8

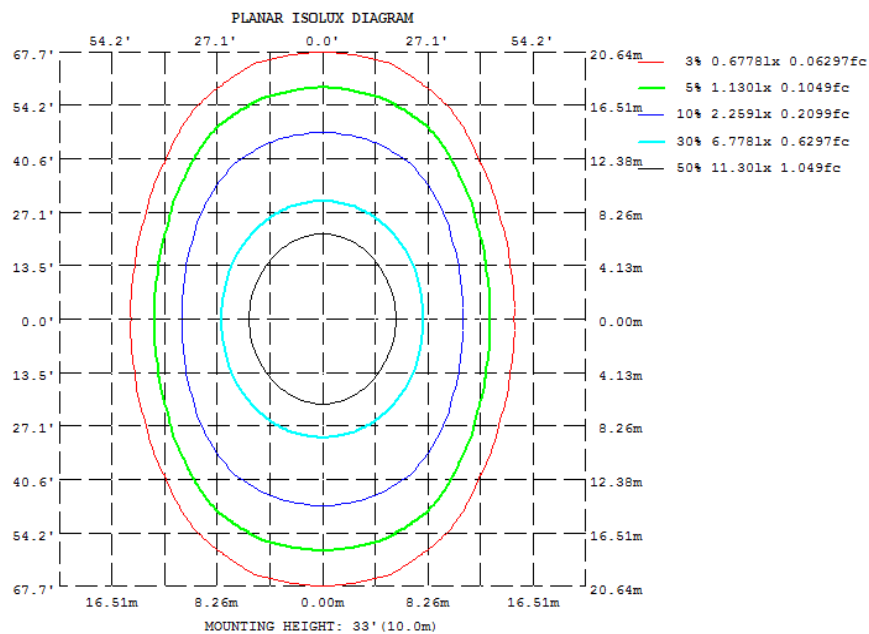
Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (0°-60°)	BUG rating	UGR (X=4H, Y=8H, 70/50/20%)
97.39%	82.40%	B2-U3-G1	24.8
Zonal Lumen Requirement (20°-50°)	Length(ft)	Lumen/ft	
54.13%	4	1374	

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	2181	2204	2231	2204	2181	2204	2231	2204
20	1986	2059	2149	2059	1986	2059	2149	2059
30	1720	1840	1999	1840	1720	1840	1999	1840
40	1290	1549	1764	1549	1290	1549	1764	1549
50	617.6	1105	1429	1105	617.6	1105	1429	1105
60	321.3	542.6	1005	542.6	321.3	542.6	1005	542.6
70	219.5	270.0	544.3	270.0	219.5	270.0	544.3	270.0
80	170.9	136.6	171.3	136.6	170.9	136.6	171.3	136.6
90	119.3	61.29	0.7572	61.29	119.3	61.29	0.7572	61.29
100	65.36	29.03	1.778	29.03	65.36	29.03	1.778	29.03
110	44.91	22.38	4.697	22.38	44.91	22.38	4.697	22.38
120	37.42	19.70	7.125	19.70	37.42	19.70	7.125	19.70
130	27.49	16.14	9.035	16.14	27.49	16.14	9.035	16.14
140	19.58	12.39	10.52	12.39	19.58	12.39	10.52	12.39
150	14.09	10.14	11.17	10.14	14.09	10.14	11.17	10.14
160	10.91	9.321	10.89	9.321	10.91	9.321	10.89	9.321
170	12.83	13.31	11.34	13.31	12.83	13.31	11.34	13.31
180	4.495	12.34	13.53	12.34	4.495	12.34	13.53	12.34
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected										
Reflectances										
Ceiling Cavity	70	70	50	50	30	70	70	50	50	30
Walls	50	30	50	30	30	50	30	50	30	30
Floor Cavity	20	20	20	20	20	20	20	20	20	20
Room Size										
X=2H Y=2H	UGR Viewed Crosswise					UGR Viewed Endwise				
3H	22.7	24.1	23.1	24.5	24.9	16.8	18.3	17.2	18.7	19.1
4H	23.9	25.3	24.4	25.6	26.1	18.3	19.7	18.8	20.1	20.5
6H	24.3	25.5	24.7	25.9	26.4	19.2	20.5	19.7	20.9	21.3
8H	24.4	25.6	24.9	26.0	26.5	20.3	21.4	20.8	21.9	22.3
12H	24.4	25.5	24.9	26.0	26.5	20.9	22.0	21.4	22.4	22.9
	24.4	25.5	24.9	25.9	26.4	21.6	22.6	22.1	23.1	23.6
4H 2H	22.7	23.9	23.1	24.3	24.8	17.6	18.9	18.1	19.3	19.7
3H	24.1	25.1	24.6	25.6	26.1	19.3	20.3	19.7	20.7	21.2
4H	24.5	25.5	25.0	25.9	26.4	20.2	21.1	20.7	21.6	22.1
6H	24.8	25.6	25.3	26.1	26.6	21.4	22.2	21.9	22.7	23.2
8H	24.8	25.6	25.3	26.1	26.6	22.1	22.8	22.6	23.3	23.9
12H	24.8	25.5	25.4	26.0	26.6	22.9	23.5	23.4	24.1	24.6
8H 4H	24.5	25.3	25.0	25.8	26.3	20.5	21.3	21.1	21.8	22.3
6H	24.9	25.5	25.4	26.0	26.6	21.8	22.5	22.4	23.0	23.6
8H	24.9	25.5	25.5	26.0	26.6	22.6	23.2	23.2	23.7	24.3
12H	24.9	25.4	25.5	26.0	26.6	23.6	24.1	24.1	24.6	25.2
12H 4H	24.5	25.2	25.1	25.7	26.3	20.6	21.3	21.1	21.8	22.3
6H	24.9	25.4	25.4	25.9	26.5	21.9	22.5	22.5	23.0	23.6
8H	24.9	25.4	25.5	26.0	26.6	22.7	23.2	23.3	23.8	24.4
Maximum UGR = 26.6										

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	212.96	0 - 10	212.96	3.87%
10-20	604.62	0 - 20	817.58	14.87%
20-30	904.97	0 - 30	1722.55	31.34%
30-40	1068.69	0 - 40	2791.24	50.78%
40-50	1001.92	0 - 50	3793.16	69.01%
50-60	736.36	0 - 60	4529.52	82.40%
60-70	461.65	0 - 70	4991.17	90.80%
70-80	250.60	0 - 80	5241.77	95.36%
80-90	111.69	0 - 90	5353.46	97.39%
90-100	48.35	0 - 100	5401.81	98.27%
100-110	27.99	0 - 110	5429.80	98.78%
110-120	21.77	0 - 120	5451.57	99.18%
120-130	16.66	0 - 130	5468.23	99.48%
130-140	11.39	0 - 140	5479.62	99.69%
140-150	7.66	0 - 150	5487.28	99.83%
150-160	5.09	0 - 160	5492.37	99.92%
160-170	3.15	0 - 170	5495.52	99.98%
170-180	1.23	0 - 180	5496.75	100.00%

4.2 Goniophotometer Test

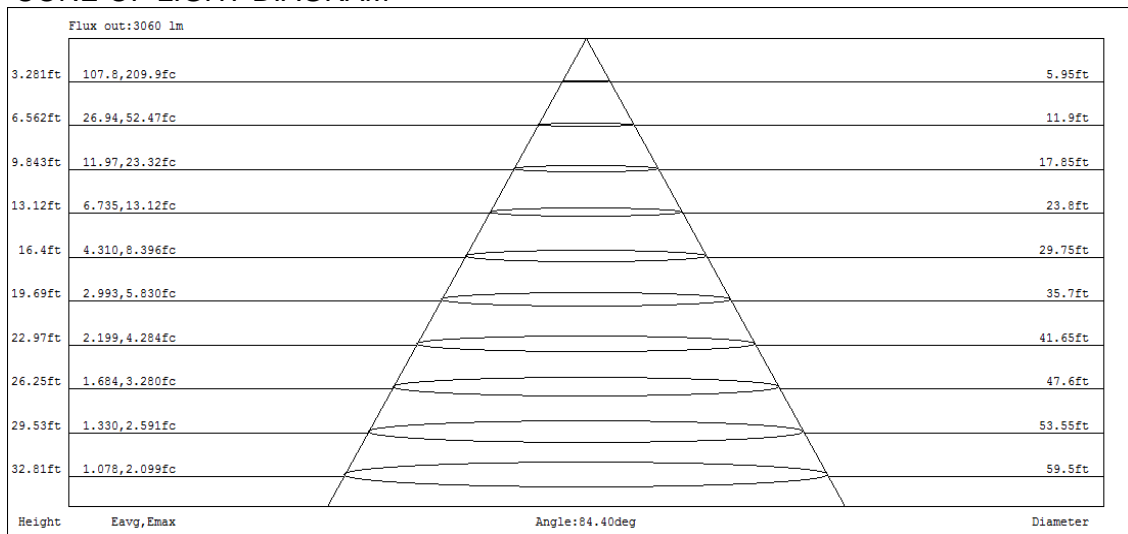
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

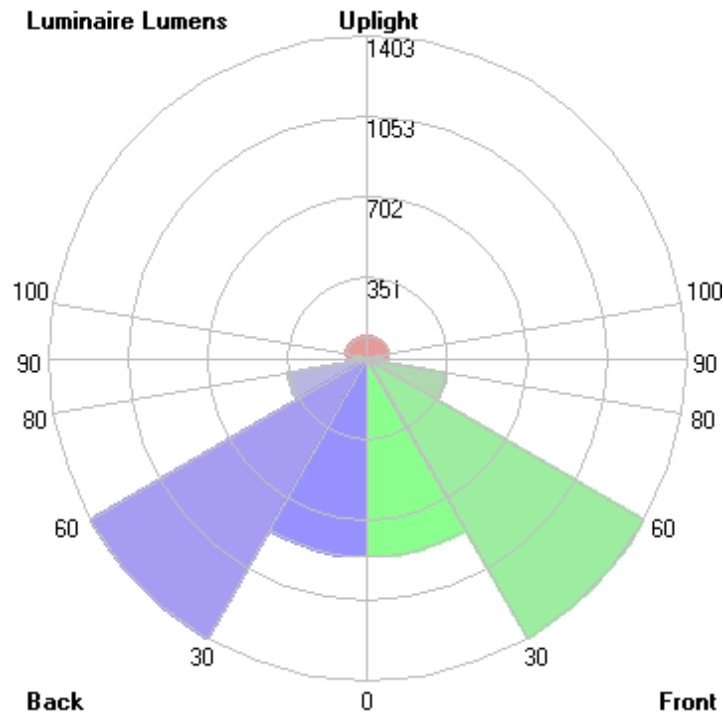
RC	80				70				50			30			10			0
R/W	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	118	118	118	118	115	115	115	115	110	110	110	104	104	104	100	100	100	97
1	109	105	101	97	106	102	98	95	97	94	92	93	91	88	89	87	85	83
2	100	92	86	81	97	90	84	79	86	81	77	83	79	75	79	76	73	71
3	92	82	74	68	89	80	73	67	77	71	66	74	69	65	71	67	63	61
4	84	73	65	59	82	72	64	58	69	62	57	66	61	56	64	59	55	53
5	78	66	57	51	76	65	57	51	62	55	50	60	54	49	58	53	48	46
6	72	60	51	45	70	59	51	45	57	49	44	55	48	44	53	47	43	41
7	67	54	46	40	65	53	45	40	52	45	39	50	44	39	48	43	39	37
8	63	50	42	36	61	49	41	36	47	40	35	46	40	35	45	39	35	33
9	59	46	38	33	57	45	38	32	44	37	32	43	36	32	41	36	32	30
10	55	42	35	30	54	42	34	29	41	34	29	39	33	29	38	33	29	27

CONE OF LIGHT DIAGRAM



4.2 Goniophotometer Test

LCS/BUG



	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	861.3	N.A.	15.7
FM - Front-Medium (30-60)	1403.5	N.A.	25.5
FH - Front-High (60-80)	356.1	N.A.	6.5
FVH - Front-Very High (80-90)	55.8	N.A.	1.0
BL - Back-Low (0-30)	861.3	N.A.	15.7
BM - Back-Medium (30-60)	1403.5	N.A.	25.5
BH - Back-High (60-80)	356.1	N.A.	6.5
BVH - Back-Very High (80-90)	55.8	N.A.	1.0
UL - Uplight-Low (90-100)	48.3	N.A.	0.9
UH - Uplight-High (100-180)	94.9	N.A.	1.7
Total	5496.6	N.A.	100.0
BUG Rating	B2-U3-G1		

4.2 Goniophotometer Test

	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360
0	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03	2257.03
1	2256.38	2257.16	2256.57	2255.73	2255.89	2256.65	2258.42	2256.65	2255.89	2255.73	2256.57	2257.16	2256.38	2257.16	2256.57	2255.73	2255.89	2256.65	2258.42	2256.65	2255.89	2255.73	2256.57	2257.16	2256.38
2	2256.5	2256.31	2255.55	2254.16	2254.01	2253.81	2255.41	2253.81	2254.01	2254.16	2255.55	2256.31	2256.5	2256.31	2255.55	2254.16	2254.01	2253.81	2255.41	2253.81	2254.01	2254.16	2255.55	2256.31	2256.5
3	2254.71	2254.59	2253.87	2251.46	2250.65	2250.38	2251.97	2250.38	2250.65	2251.46	2253.87	2254.59	2254.71	2254.59	2253.87	2251.46	2250.65	2250.38	2251.97	2250.38	2250.65	2251.46	2253.87	2254.59	2254.71
4	2252.99	2252.95	2250.95	2247.71	2245.77	2244.79	2246.53	2244.79	2245.77	2247.71	2250.95	2252.95	2252.99	2252.95	2250.95	2247.71	2245.77	2244.79	2246.53	2244.79	2245.77	2247.71	2250.95	2252.95	2252.99
5	2250.76	2250.14	2247.28	2243.07	2239.86	2238.11	2239.35	2238.11	2239.86	2243.07	2247.28	2250.14	2250.76	2250.14	2247.28	2243.07	2239.86	2238.11	2239.35	2239.86	2243.07	2247.28	2250.14	2250.76	2250.76
6	2247.72	2246.89	2242.91	2237.06	2233.02	2229.93	2230.77	2229.93	2233.02	2237.06	2242.91	2246.89	2247.72	2246.89	2242.91	2237.06	2233.02	2229.93	2230.77	2229.93	2233.02	2237.06	2242.91	2246.89	2247.72
7	2244.16	2242.92	2237.63	2230.44	2224.21	2220.49	2220.34	2220.49	2224.21	2230.44	2237.63	2242.92	2244.16	2242.92	2237.63	2230.44	2224.21	2220.49	2220.34	2220.49	2224.21	2230.44	2237.63	2242.92	2244.16
8	2240.6	2238.45	2231.69	2222.83	2215.28	2209.66	2208.83	2209.66	2215.28	2222.83	2231.69	2238.45	2240.6	2238.45	2231.69	2222.83	2215.28	2209.66	2208.83	2209.66	2215.28	2222.83	2231.69	2238.45	2240.6
9	2236.3	2233.27	2225.56	2214.34	2204.04	2196.89	2195.21	2196.89	2204.04	2214.34	2225.56	2233.27	2236.3	2233.27	2225.56	2214.34	2204.04	2196.89	2195.21	2196.89	2204.04	2214.34	2225.56	2233.27	2236.3
10	2231.24	2227.74	2217.91	2204.5	2191.89	2183.13	2180.75	2183.13	2191.89	2204.5	2217.91	2227.74	2231.24	2227.74	2217.91	2204.5	2191.89	2183.13	2180.75	2183.13	2191.89	2204.5	2217.91	2227.74	2231.24
11	2226.29	2221.04	2209.8	2193.88	2179.44	2168.82	2166.07	2168.82	2179.44	2193.88	2209.8	2221.04	2226.29	2221.04	2209.8	2193.88	2179.44	2168.82	2166.07	2168.82	2179.44	2193.88	2209.8	2221.04	2226.29
12	2219.82	2214.51	2200.56	2182.4	2164.95	2152.85	2149.72	2152.85	2164.95	2182.4	2200.56	2214.51	2219.82	2214.51	2200.56	2182.4	2164.95	2152.85	2149.72	2152.85	2164.95	2182.4	2200.56	2214.51	2219.82
13	2213.09	2206.8	2190.72	2169.6	2149.85	2136.06	2132.61	2136.06	2149.85	2169.6	2190.72	2206.8	2213.09	2206.8	2190.72	2169.6	2149.85	2136.06	2132.61	2136.06	2149.85	2169.6	2190.72	2206.8	2213.09
14	2205.89	2198.34	2180.27	2156.07	2134.06	2118.62	2114.04	2118.62	2134.06	2156.07	2180.27	2198.34	2205.89	2198.34	2180.27	2156.07	2134.06	2118.62	2114.04	2118.62	2134.06	2156.07	2180.27	2198.34	2205.89
15	2198.09	2189.31	2169.37	2141.72	2116.35	2099.49	2094.22	2099.49	2116.35	2141.72	2169.37	2189.31	2198.09	2189.31	2169.37	2141.72	2116.35	2099.49	2094.22	2099.49	2116.35	2141.72	2169.37	2189.31	2198.09
16	2189.91	2180.38	2156.96	2126.67	2098.81	2080.37	2074.23	2080.37	2098.81	2126.67	2156.96	2180.38	2189.91	2180.38	2156.96	2126.67	2098.81	2080.37	2074.23	2080.37	2098.81	2126.67	2156.96	2180.38	2189.91
17	2180.88	2169.98	2144.02	2110.46	2081.04	2060.07	2053.19	2060.07	2081.04	2110.46	2144.02	2169.98	2180.88	2169.98	2144.02	2110.46	2081.04	2060.07	2053.19	2060.07	2081.04	2110.46	2144.02	2169.98	2180.88
18	2171.08	2159.19	2130.8	2094.05	2061.6	2039.44	2031.4	2039.44	2061.6	2094.05	2130.8	2159.19	2171.08	2159.19	2130.8	2094.05	2061.6	2039.44	2031.4	2039.44	2061.6	2094.05	2130.8	2159.19	2171.08
19	2159.96	2147.62	2116.38	2076.55	2041.24	2017.71	2008.4	2017.71	2041.24	2076.55	2116.38	2147.62	2159.96	2147.62	2116.38	2076.55	2041.24	2017.71	2008.4	2017.71	2041.24	2076.55	2116.38	2147.62	2159.96
20	2149.25	2135.26	2101.25	2058.74	2020.62	1995.12	1986.34	1995.12	2020.62	2058.74	2101.25	2135.26	2149.25	2135.26	2101.25	2058.74	2020.62	1995.12	1986.34	1995.12	2020.62	2058.74	2101.25	2135.26	2149.25
21	2138.23	2122.45	2085.1	2039.74	1999.51	1972.23	1962.7	1972.23	1999.51	2039.74	2085.1	2122.45	2138.23	2122.45	2085.1	2039.74	1999.51	1972.23	1962.7	1972.23	1999.51	2039.74	2085.1	2122.45	2138.23
22	2125.26	2108.71	2067.94	2019.52	1977.76	1948.82	1938.09	1948.82	1977.76	2019.52	2067.94	2108.71	2125.26	2108.71	2067.94	2019.52	1977.76	1948.82	1938.09	1948.82	1977.76	2019.52	2067.94	2108.71	2125.26
23	2112.03	2094.39	2050.93	1999.69	1955.21	1924.04	1913.41	1924.04	1955.21	1999.69	2050.93	2094.39	2112.03	2094.39	2050.93	1999.69	1955.21	1924.04	1913.41	1924.04	1955.21	1999.69	2050.93	2094.39	2112.03
24	2098.63	2079.22	2032.67	1978.9	1931.38	1899.23	1887.9	1899.23	1931.38	1978.9	2032.67	2079.22	2098.63	2079.22	2032.67	1978.9	1931.38	1899.23	1887.9	1899.23	1931.38	1978.9	2032.67	2079.22	2098.63
25	2084.35	2063.53	2014.36	1957.14	1907.25	1872.83	1861.9	1872.83	1907.25	1957.14	2014.36	2063.53	2084.35	2063.53	2014.36	1957.14	1907.25	1872.83	1861.9	1872.83	1907.25	1957.14	2014.36	2063.53	2084.35
26	2068.73	2046.83	1994.81	1934.98	1882.24	1846.77	1835.41	1846.77	1882.24	1934.98	1994.81	2046.83	2068.73	2046.83	1994.81	1934.98	1882.24	1846.77	1835.41	1846.77	1882.24	1934.98	1994.81	2046.83	2068.73
27	2052.31	2029.72	1974.59	1912.04	1856.74	1820.02	1807.62	1820.02	1856.74	1912.04	1974.59	2029.72	2052.31	2029.72	1974.59	1912.04	1856.74	1820.02	1807.62	1820.02	1856.74	1912.04	1974.59	2029.72	2052.31
28	2035.78	2011.32	1953.48	1888.58	1830.38	1792.26	1778.26	1792.26	1830.38	1888.58	1953.48	2011.32	2035.78	2011.32	1953.48	1888.58	1830.38	1792.26	1778.26	1792.26	1830.38	1888.58	1953.48	2011.32	2035.78
29	2017.74	1992.61	1932.31	1864.39	1803.87	1764.2	1751.09	1764.2	1803.87	1864.39	1932.31	1992.61	2017.74	1992.61	1932.31	1864.39	1803.87	1764.2	1751.09	1764.2	1803.87	1864.39	1932.31	1992.61	2017.74
30	1999.23	1972.92	1910.03	1839.52	1776.7	1735.6	1720.08	1735.6	1776.7	1839.52	1910.03	1972.92	1999.23	1972.92	1910.03	1839.52	1776.7	1735.6	1720.08	1735.6	1776.7	1839.52	1910.03	1972.92	1999.23
31	1980.12	1952.3	1887.03	1813.43	1748.57	1705.88	1690.47	1705.88	1748.57	1813.43	1887.03	1952.3	1980.12	1952.3	1887.03	1813.43	1748.57	1705.88	1690.47	1705.88	1748.57	1813.43	1887.03	1952.3	1980.12
32	1959.81	1930.73	1864	1787.79	1720.03	1676.05	1661.48	1676.05	1720.03	1787.79	1864	1930.73	1959.81	1930.73	1864	1787.79	1720.03	1676.05	1661.48	1676.05	1720.03	1787.79	1864	1930.73	1959.81
33	1938.81	1908.43	1838.91	1759.87	1690.42	1644.76	1629.11	1644.76	1690.42	1759.87	1838.91	1908.43	1938.81	1908.43	1838.91	1759.87	1690.42	1644.76	1629.11	1644.76	1690.42	1759.87	1838.91	1908.43	1938.81
34	1916.84	1885.31	1813.73	1732.01	1659.82	1612.45	1595.87	1612.45	1659.82	1732.01	1813.73	1885.31	1916.84	1885.31	1813.73	1732.01	1659.82	1612.45	1595.87	1612.45	1659.82	1732.01	1813.73	1885.31	1916.84
35	1893.39	1861.38	1787.51	1703.08	1629.15	1578.03	1559.92	1578.03	1629.15	1703.08	1787.51	1861.38	1893.39	1861.38	1787.51	1703.08	1629.15	1578.03	1559.92	1578.03	1629.15	1703.08	1787.51	1861.38	1893.39
36	1869.12	1835.95	1761.05	1674.29	1597.98	1540.34	1515.36	1540.34	1597.98	1674.29	1761.05	1835.95	1869.12	1835.95	1761.05	1674.29	1597.98	1540.34	1515.36	1540.34	1597.98	1674.29	1761.05	1835.95	1869.12
37	1844.98	1810.11	1733.18	1644.12	1564.09	1497.96	1468.49	1497.96	1564.09	1644.12	1733.18	1810.11	1844.98	1810.11	1733.18	1644.12	1564.09	1497.96	1468.49	1497.96	1564.09	1644.12	1733.18	1810.11	1844.98
38	1818.69	1783.18	1704.65	1613.36	1529.68	1451.08	1414.51	1451.08	1529.68	1613.36	1704.65	1783.18													



51	1390.66	1353.56	1260.91	1041.08	757.07	611.21	571.38	611.21	757.07	1041.08	1260.91	1353.56	1390.66	1353.56	1260.91	1041.08	757.07	611.21	571.38	611.21	757.07	1041.08	1260.91	1353.56	1390.66
52	1352.61	1314.81	1219.59	976.01	701.73	567.19	530	567.19	701.73	976.01	1219.59	1314.81	1352.61	1314.81	1219.59	976.01	701.73	567.19	530	567.19	701.73	976.01	1219.59	1314.81	1352.61
53	1314.06	1274.94	1177.14	912.04	649.84	527.58	493.58	527.58	649.84	912.04	1177.14	1274.94	1314.06	1274.94	1177.14	912.04	649.84	527.58	493.58	527.58	649.84	912.04	1177.14	1274.94	1314.06
54	1272.01	1233.87	1132.69	849.08	604.96	491.23	460.64	491.23	604.96	849.08	1132.69	1233.87	1272.01	1233.87	1132.69	849.08	604.96	491.23	460.64	491.23	604.96	849.08	1132.69	1233.87	1272.01
55	1229.7	1192.26	1086.27	789.09	561.59	458.84	430.9	458.84	561.59	789.09	1086.27	1192.26	1229.7	1192.26	1086.27	789.09	561.59	458.84	430.9	458.84	561.59	789.09	1086.27	1192.26	1229.7
56	1185.98	1149.56	1037.18	731.45	520.63	428.98	404.13	428.98	520.63	731.45	1037.18	1149.56	1185.98	1149.56	1037.18	731.45	520.63	428.98	404.13	428.98	520.63	731.45	1037.18	1149.56	1185.98
57	1141.91	1106.41	986.12	678.31	485.23	402.25	380.09	402.25	485.23	678.31	986.12	1106.41	1141.91	1106.41	986.12	678.31	485.23	402.25	380.09	402.25	485.23	678.31	986.12	1106.41	1141.91
58	1096.3	1062.5	932.72	629.52	452.58	378.18	358.16	378.18	452.58	629.52	932.72	1062.5	1096.3	1062.5	932.72	629.52	452.58	378.18	358.16	378.18	452.58	629.52	932.72	1062.5	1096.3
59	1050.95	1018.13	878.44	583.82	422.76	356.19	338.73	356.19	422.76	583.82	878.44	1018.13	1050.95	1018.13	878.44	583.82	422.76	356.19	338.73	356.19	422.76	583.82	878.44	1018.13	1050.95
60	1005.2	973.87	824.02	542.63	396.23	336.85	321.27	336.85	396.23	542.63	824.02	973.87	1005.2	973.87	824.02	542.63	396.23	336.85	321.27	336.85	396.23	542.63	824.02	973.87	1005.2
61	958.52	928.51	769.08	503.75	371.31	318.6	305.42	318.6	371.31	503.75	769.08	928.51	958.52	928.51	769.08	503.75	371.31	318.6	305.42	318.6	371.31	503.75	769.08	928.51	958.52
62	911.59	883.12	716.17	468.68	349.14	302.81	291.62	302.81	349.14	468.68	716.17	883.12	911.59	883.12	716.17	468.68	349.14	302.81	291.62	302.81	349.14	468.68	716.17	883.12	911.59
63	864.83	837.6	665	436.39	329.04	288.5	278.98	288.5	329.04	436.39	665	837.6	864.83	837.6	665	436.39	329.04	288.5	278.98	288.5	329.04	436.39	665	837.6	864.83
64	817.7	792.43	615.29	406.62	310.39	275.47	267.65	275.47	310.39	406.62	615.29	792.43	817.7	792.43	615.29	406.62	310.39	275.47	267.65	275.47	310.39	406.62	615.29	792.43	817.7
65	770.92	747.08	569.47	379.1	293.45	263.71	257.5	263.71	293.45	379.1	569.47	747.08	770.92	747.08	569.47	379.1	293.45	263.71	257.5	263.71	293.45	379.1	569.47	747.08	770.92
66	724.18	701.76	525.74	353.86	277.88	253.14	248.39	253.14	277.88	353.86	525.74	701.76	724.18	701.76	525.74	353.86	277.88	253.14	248.39	253.14	277.88	353.86	525.74	701.76	724.18
67	678.5	657.17	485.35	330.46	263.67	243.42	240.07	243.42	263.67	330.46	485.35	657.17	678.5	657.17	485.35	330.46	263.67	243.42	240.07	243.42	263.67	330.46	485.35	657.17	678.5
68	633.22	612.88	447.59	309.04	250.66	234.72	232.56	234.72	250.66	309.04	447.59	612.88	633.22	612.88	447.59	309.04	250.66	234.72	232.56	234.72	250.66	309.04	447.59	612.88	633.22
69	588.53	568.71	412.48	288.75	238.63	226.56	225.78	226.56	238.63	288.75	412.48	568.71	588.53	568.71	412.48	288.75	238.63	226.56	225.78	226.56	238.63	288.75	412.48	568.71	588.53
70	544.28	525.23	379.76	269.99	227.42	219.15	219.51	219.15	227.42	269.99	379.76	525.23	544.28	525.23	379.76	269.99	227.42	219.15	219.51	219.15	227.42	269.99	379.76	525.23	544.28
71	500.41	482.2	349.01	252.53	217.05	212.25	213.6	212.25	217.05	252.53	349.01	482.2	500.41	482.2	349.01	252.53	217.05	212.25	213.6	212.25	217.05	252.53	349.01	482.2	500.41
72	458.18	440.82	320.54	236.36	207.38	205.8	208.17	205.8	207.38	236.36	320.54	440.82	458.18	440.82	320.54	236.36	207.38	205.8	208.17	205.8	207.38	236.36	320.54	440.82	458.18
73	417.03	400.63	293.96	221.14	198.37	199.81	202.99	199.81	198.37	221.14	293.96	400.63	417.03	400.63	293.96	221.14	198.37	199.81	202.99	199.81	198.37	221.14	293.96	400.63	417.03
74	377.13	362.59	269.18	207	189.9	194.09	198.11	194.09	189.9	207	269.18	362.59	377.13	362.59	269.18	207	189.9	194.09	198.11	194.09	189.9	207	269.18	362.59	377.13
75	338.57	325.91	245.8	193.4	181.73	188.6	193.41	188.6	181.73	193.4	245.8	325.91	338.57	325.91	245.8	193.4	181.73	188.6	193.41	188.6	181.73	193.4	245.8	325.91	338.57
76	301.6	291.28	223.91	180.73	174.11	183.4	188.84	183.4	174.11	180.73	223.91	291.28	301.6	291.28	223.91	180.73	174.11	183.4	188.84	183.4	174.11	180.73	223.91	291.28	301.6
77	266.7	259.01	203.55	168.95	166.93	178.26	184.36	178.26	166.93	168.95	203.55	259.01	266.7	259.01	203.55	168.95	166.93	178.26	184.36	178.26	166.93	168.95	203.55	259.01	266.7
78	232.71	228.26	184.25	157.66	159.9	173.15	179.85	173.15	159.9	157.66	184.25	228.26	232.71	228.26	184.25	157.66	159.9	173.15	179.85	173.15	159.9	157.66	184.25	228.26	232.71
79	201.36	199.53	166.24	146.92	153.02	168.21	175.33	168.21	153.02	146.92	166.24	199.53	201.36	199.53	166.24	146.92	153.02	168.21	175.33	168.21	153.02	146.92	166.24	199.53	201.36
80	171.3	172.74	149.32	136.59	146.38	163.19	170.92	163.19	146.38	136.59	149.32	172.74	171.3	172.74	149.32	136.59	146.38	163.19	170.92	163.19	146.38	136.59	149.32	172.74	171.3
81	143.61	148.17	133.33	126.96	140	158.16	166.25	158.16	140	126.96	133.33	148.17	143.61	148.17	133.33	126.96	140	158.16	166.25	158.16	140	126.96	133.33	148.17	143.61
82	117.3	124.8	118.28	117.98	133.74	153.08	161.57	153.08	133.74	117.98	118.28	124.8	117.3	124.8	118.28	117.98	133.74	153.08	161.57	153.08	133.74	117.98	118.28	124.8	117.3
83	92.76	103.26	104.79	109.33	127.51	148.01	156.83	148.01	127.51	109.33	104.79	103.26	92.76	103.26	104.79	109.33	127.51	148.01	156.83	148.01	127.51	109.33	104.79	103.26	92.76
84	71.5	84.07	92.08	101.08	121.37	142.77	151.88	142.77	121.37	101.08	92.08	84.07	71.5	84.07	92.08	101.08	121.37	142.77	151.88	142.77	121.37	101.08	92.08	84.07	71.5
85	52.25	67.34	80.53	93.33	115.43	137.56	146.82	137.56	115.43	93.33	80.53	67.34	52.25	67.34	80.53	93.33	115.43	137.56	146.82	137.56	115.43	93.33	80.53	67.34	52.25
86	34.3	52.61	70.28	86.04	109.65	132.31	141.78	132.31	109.65	86.04	70.28	52.61	34.3	52.61	70.28	86.04	109.65	132.31	141.78	132.31	109.65	86.04	70.28	52.61	34.3
87	20.2	39.32	60.92	79.14	103.89	126.89	136.22	126.89	103.89	79.14	60.92	39.32	20.2	39.32	60.92	79.14	103.89	126.89	136.22	126.89	103.89	79.14	60.92	39.32	20.2
88	11.93	28.93	52.49	72.8	98.29	121.4	130.76	121.4	98.29	72.8	52.49	28.93	11.93	28.93	52.49	72.8	98.29	121.4	130.76	121.4	98.29	72.8	52.49	28.93	11.93
89	5.21	21.15	45.08	66.86	92.72	115.87	125.27	115.87	92.72	66.86	45.08	21.15	5.21	21.15	45.08	66.86	92.72	115.87	125.27	115.87	92.72	66.86	45.08	21.15	5.21
90	0.76	15.87	39	61.29	87.19	110.21	119.31	110.21	87.19	61.29	39	15.87	0.76	15.87	39	61.29	87.19	110.21	119.31	110.21	87.19	61.29	39	15.87	0.76
91	0.17	12.81	33.99	56.13	81.8	104.38	113.51	104.38	81.8	56.13	33.99	12.81	0.17	12.81	33.99	56.13	81.8	104.38	113.51	104.38	81.8	56.13	33.99	12.81	0.17
92	0.19	10.16	29.92	51.36	76.44	98.49	107.33	98.49	76.44	51.36	29.92	10.16	0.19	10.16	29.92	51.36	76.44	98.49	107.33	98.49	76.44	51.36	29.92	10.16	0.19
93	0.23	8.62	26.7	47.09	71.44	92.67	101.26	92.67	71.44	47.09	26.7	8.62	0.23	8.62	26.7	47.09	71.44	92.67	101.26	92.67	71.44	47.09	26.7	8.62	0.23
94	0.34	7.75	24.11	43.27	66.5	87.02	95.33	87.02	66.5	43.27	24.11	7.75	0.34	7.75	24.11	43.27	66.5	87.02	95.33	87.02	66.5	43.27	24.11	7.75	0.34
95</																									

106	3.58	5.86	13.86	23.78	35.41	45.83	50.26	45.83	35.41	23.78	13.86	5.86	3.58	5.86	13.86	23.78	35.41	45.83	50.26	45.83	35.41	23.78	13.86	5.86	3.58
107	3.86	5.82	13.55	23.34	34.54	44.55	48.81	44.55	34.54	23.34	13.55	5.82	3.86	5.82	13.55	23.34	34.54	44.55	48.81	44.55	34.54	23.34	13.55	5.82	3.86
108	4.13	5.77	13.35	22.97	33.76	43.36	47.4	43.36	33.76	22.97	13.35	5.77	4.13	5.77	13.35	22.97	33.76	43.36	47.4	43.36	33.76	22.97	13.35	5.77	4.13
109	4.42	5.73	13.18	22.66	33.06	42.29	46.1	42.29	33.06	22.66	13.18	5.73	4.42	5.73	13.18	22.66	33.06	42.29	46.1	42.29	33.06	22.66	13.18	5.73	4.42
110	4.7	5.68	13.06	22.38	32.48	41.34	44.91	41.34	32.48	22.38	13.06	5.68	4.7	5.68	13.06	22.38	32.48	41.34	44.91	41.34	32.48	22.38	13.06	5.68	4.7
111	4.98	5.65	12.94	22.14	32	40.48	43.84	40.48	32	22.14	12.94	5.65	4.98	5.65	12.94	22.14	32	40.48	43.84	40.48	32	22.14	12.94	5.65	4.98
112	5.23	5.62	12.84	21.92	31.6	39.77	42.93	39.77	31.6	21.92	12.84	5.62	5.23	5.62	12.84	21.92	31.6	39.77	42.93	39.77	31.6	21.92	12.84	5.62	5.23
113	5.48	5.59	12.7	21.71	31.29	39.2	42.22	39.2	31.29	21.71	12.7	5.59	5.48	5.59	12.7	21.71	31.29	39.2	42.22	39.2	31.29	21.71	12.7	5.59	5.48
114	5.72	5.58	12.57	21.49	31.01	38.74	41.68	38.74	31.01	21.49	12.57	5.58	5.72	5.58	12.57	21.49	31.01	38.74	41.68	38.74	31.01	21.49	12.57	5.58	5.72
115	5.96	5.57	12.44	21.2	30.68	38.29	41.26	38.29	30.68	21.2	12.44	5.57	5.96	5.57	12.44	21.2	30.68	38.29	41.26	38.29	30.68	21.2	12.44	5.57	5.96
116	6.2	5.57	12.31	20.84	30.34	37.75	40.83	37.75	30.34	20.84	12.31	5.57	6.2	5.57	12.31	20.84	30.34	37.75	40.83	37.75	30.34	20.84	12.31	5.57	6.2
117	6.43	5.58	12.19	20.51	29.95	37.14	40.23	37.14	29.95	20.51	12.19	5.58	6.43	5.58	12.19	20.51	29.95	37.14	40.23	37.14	29.95	20.51	12.19	5.58	6.43
118	6.67	5.6	12.06	20.24	29.51	36.44	39.4	36.44	29.51	20.24	12.06	5.6	6.67	5.6	12.06	20.24	29.51	36.44	39.4	36.44	29.51	20.24	12.06	5.6	6.67
119	6.91	5.63	11.91	19.98	29.03	35.71	38.44	35.71	29.03	19.98	11.91	5.63	6.91	5.63	11.91	19.98	29.03	35.71	38.44	35.71	29.03	19.98	11.91	5.63	6.91
120	7.13	5.68	11.76	19.7	28.52	34.91	37.42	34.91	28.52	19.7	11.76	5.68	7.13	5.68	11.76	19.7	28.52	34.91	37.42	34.91	28.52	19.7	11.76	5.68	7.13
121	7.34	5.73	11.6	19.4	27.97	34.09	36.38	34.09	27.97	19.4	11.6	5.73	7.34	5.73	11.6	19.4	27.97	34.09	36.38	34.09	27.97	19.4	11.6	5.73	7.34
122	7.54	5.79	11.43	19.12	27.38	33.25	35.4	33.25	27.38	19.12	11.43	5.79	7.54	5.79	11.43	19.12	27.38	33.25	35.4	33.25	27.38	19.12	11.43	5.79	7.54
123	7.75	5.86	11.25	18.84	26.76	32.37	34.4	32.37	26.76	18.84	11.25	5.86	7.75	5.86	11.25	18.84	26.76	32.37	34.4	32.37	26.76	18.84	11.25	5.86	7.75
124	7.96	5.93	11.06	18.53	26.1	31.47	33.42	31.47	26.1	18.53	11.06	5.93	7.96	5.93	11.06	18.53	26.1	31.47	33.42	31.47	26.1	18.53	11.06	5.93	7.96
125	8.17	6.01	10.89	18.19	25.42	30.6	32.45	30.6	25.42	18.19	10.89	6.01	8.17	6.01	10.89	18.19	25.42	30.6	32.45	30.6	25.42	18.19	10.89	6.01	8.17
126	8.34	6.09	10.73	17.8	24.72	29.73	31.44	29.73	24.72	17.8	10.73	6.09	8.34	6.09	10.73	17.8	24.72	29.73	31.44	29.73	24.72	17.8	10.73	6.09	8.34
127	8.52	6.18	10.56	17.38	23.93	28.83	30.46	28.83	23.93	17.38	10.56	6.18	8.52	6.18	10.56	17.38	23.93	28.83	30.46	28.83	23.93	17.38	10.56	6.18	8.52
128	8.7	6.26	10.39	16.97	23.17	27.92	29.48	27.92	23.17	16.97	10.39	6.26	8.7	6.26	10.39	16.97	23.17	27.92	29.48	27.92	23.17	16.97	10.39	6.26	8.7
129	8.86	6.34	10.21	16.55	22.5	27.01	28.51	27.01	22.5	16.55	10.21	6.34	8.86	6.34	10.21	16.55	22.5	27.01	28.51	27.01	22.5	16.55	10.21	6.34	8.86
130	9.03	6.43	10.04	16.14	21.85	26.08	27.49	26.08	21.85	16.14	10.04	6.43	9.03	6.43	10.04	16.14	21.85	26.08	27.49	26.08	21.85	16.14	10.04	6.43	9.03
131	9.18	6.52	9.88	15.73	21.23	25.22	26.54	25.22	21.23	15.73	9.88	6.52	9.18	6.52	9.88	15.73	21.23	25.22	26.54	25.22	21.23	15.73	9.88	6.52	9.18
132	9.34	6.6	9.71	15.32	20.59	24.36	25.62	24.36	20.59	15.32	9.71	6.6	9.34	6.6	9.71	15.32	20.59	24.36	25.62	24.36	20.59	15.32	9.71	6.6	9.34
133	9.48	6.7	9.56	14.9	19.96	23.56	24.73	23.56	19.96	14.9	9.56	6.7	9.48	6.7	9.56	14.9	19.96	23.56	24.73	23.56	19.96	14.9	9.56	6.7	9.48
134	9.62	6.79	9.45	14.49	19.34	22.79	23.88	22.79	19.34	14.49	9.45	6.79	9.62	6.79	9.45	14.49	19.34	22.79	23.88	22.79	19.34	14.49	9.45	6.79	9.62
135	9.76	6.92	9.34	14.09	18.71	22.05	23.07	22.05	18.71	14.09	9.34	6.92	9.76	6.92	9.34	14.09	18.71	22.05	23.07	22.05	18.71	14.09	9.34	6.92	9.76
136	9.91	7.07	9.23	13.72	18.08	21.33	22.32	21.33	18.08	13.72	9.23	7.07	9.91	7.07	9.23	13.72	18.08	21.33	22.32	21.33	18.08	13.72	9.23	7.07	9.91
137	10.05	7.22	9.15	13.38	17.48	20.63	21.59	20.63	17.48	13.38	9.15	7.22	10.05	7.22	9.15	13.38	17.48	20.63	21.59	20.63	17.48	13.38	9.15	7.22	10.05
138	10.21	7.39	9.07	13.04	16.91	19.95	20.9	19.95	16.91	13.04	9.07	7.39	10.21	7.39	9.07	13.04	16.91	19.95	20.9	19.95	16.91	13.04	9.07	7.39	10.21
139	10.38	7.6	9.01	12.7	16.36	19.29	20.22	19.29	16.36	12.7	9.01	7.6	10.38	7.6	9.01	12.7	16.36	19.29	20.22	19.29	16.36	12.7	9.01	7.6	10.38
140	10.52	7.8	8.98	12.39	15.84	18.62	19.58	18.62	15.84	12.39	8.98	7.8	10.52	7.8	8.98	12.39	15.84	18.62	19.58	18.62	15.84	12.39	8.98	7.8	10.52
141	10.65	8.02	8.94	12.09	15.35	17.97	18.96	17.97	15.35	12.09	8.94	8.02	10.65	8.02	8.94	12.09	15.35	17.97	18.96	17.97	15.35	12.09	8.94	8.02	10.65
142	10.79	8.27	8.91	11.79	14.89	17.33	18.34	17.33	14.89	11.79	8.91	8.27	10.79	8.27	8.91	11.79	14.89	17.33	18.34	17.33	14.89	11.79	8.91	8.27	10.79
143	10.89	8.58	8.88	11.52	14.44	16.77	17.76	16.77	14.44	11.52	8.88	8.58	10.89	8.58	8.88	11.52	14.44	16.77	17.76	16.77	14.44	11.52	8.88	8.58	10.89
144	10.98	9.03	8.86	11.26	14	16.26	17.17	16.26	14	11.26	8.86	9.03	10.98	9.03	8.86	11.26	14	16.26	17.17	16.26	14	11.26	8.86	9.03	10.98
145	11.04	9.58	8.84	11.02	13.59	15.75	16.62	15.75	13.59	11.02	8.84	9.58	11.04	9.58	8.84	11.02	13.59	15.75	16.62	15.75	13.59	11.02	8.84	9.58	11.04
146	11.09	10.11	8.83	10.81	13.23	15.26	16.08	15.26	13.23	10.81	8.83	10.11	11.09	10.11	8.83	10.81	13.23	15.26	16.08	15.26	13.23	10.81	8.83	10.11	11.09
147	11.12	10.57	8.83	10.61	12.9	14.78	15.56	14.78	12.9	10.61	8.83	10.57	11.12	10.57	8.83	10.61	12.9	14.78	15.56	14.78	12.9	10.61	8.83	10.57	11.12
148	11.14	10.98	8.82	10.42	12.56	14.3	15.04	14.3	12.56	10.42	8.82	10.98	11.14	10.98	8.82	10.42	12.56	14.3	15.04	14.3	12.56	10.42	8.82	10.98	11.14
149	11.15	11.36	8.81	10.27	12.22	13.86	14.56	13.86	12.22	10.27	8.81	11.36	11.15	11.36	8.81	10.27	12.22	13.86	14.56	13.86	12.22	10.27	8.81	11.36	11.15
150	11.17	11.73	8.8	10.14	11.9	13.44	14.09	13.44	11.9	10.14	8.8	11.73	11.17	11.73	8.8	10.14	11.9	13.44	14.09	13.44	11.9	10.14	8.8	11.73	11.17
151	11.18	12.06	8.81	10.02	11.6	13.03	13.65	13.03	11.6	10.02	8.81	12.06	11.18	12.06	8.81	10.02	11.6	13.03	13.65	13.03	11.6	10.02	8.81	12.06	11.18
152	11.18	12.31	8.84	9.92	11.33	12.65	13.24	12.65	11.33	9.92	8.84	12.31	11.18	12.31	8.84	9.92	11.33	12.65	13.24	12.65	11.33	9.92	8.84	12.31	11.18
153	11.21	12.47	8.87	9.82	11.09	12.29	12.84	12.29	11.09	9.82	8.87	12.47	11.21	12.47	8.87	9.82	11.09	12.29	12.84	12.29	11.09	9.82	8.87	12.47	11.21
154	11.26	12.59																							

161	10.81	12.28	11.86	9.41	9.81	10.41	10.75	10.41	9.81	9.41	11.86	12.28	10.81	12.28	11.86	9.41	9.81	10.41	10.75	10.41	9.81	9.41	11.86	12.28	10.81
162	10.77	12.1	12.18	9.74	9.68	10.26	10.59	10.26	9.68	9.74	12.18	12.1	10.77	12.1	12.18	9.74	9.68	10.26	10.59	10.26	9.68	9.74	12.18	12.1	10.77
163	10.76	11.78	12.44	10.15	9.63	10.11	10.45	10.11	9.63	10.15	12.44	11.78	10.76	11.78	12.44	10.15	9.63	10.11	10.45	10.11	9.63	10.15	12.44	11.78	10.76
164	10.72	11.62	12.66	10.67	9.66	9.97	10.32	9.97	9.66	10.67	12.66	11.62	10.72	11.62	12.66	10.67	9.66	9.97	10.32	9.97	9.66	10.67	12.66	11.62	10.72
165	10.68	11.54	12.75	11.3	9.88	9.89	10.25	9.89	9.88	11.3	12.75	11.54	10.68	11.54	12.75	11.3	9.88	9.89	10.25	9.89	9.88	11.3	12.75	11.54	10.68
166	10.56	11.49	12.78	11.93	10.31	9.91	10.24	9.91	10.31	11.93	12.78	11.49	10.56	11.49	12.78	11.93	10.31	9.91	10.24	9.91	10.31	11.93	12.78	11.49	10.56
167	10.43	11.41	12.72	12.34	10.9	10.3	10.37	10.3	10.9	12.34	12.72	11.41	10.43	11.41	12.72	12.34	10.9	10.3	10.37	10.3	10.9	12.34	12.72	11.41	10.43
168	10.52	11.41	12.72	12.62	11.61	10.79	10.69	10.79	11.61	12.62	12.72	11.41	10.52	11.41	12.72	12.62	11.61	10.79	10.69	10.79	11.61	12.62	12.72	11.41	10.52
169	10.9	11.52	12.88	12.95	12.26	11.5	11.4	11.5	12.26	12.95	12.88	11.52	10.9	11.52	12.88	12.95	12.26	11.5	11.4	11.5	12.26	12.95	12.88	11.52	10.9
170	11.34	11.61	13	13.31	12.75	12.29	12.83	12.29	12.75	13.31	13	11.61	11.34	11.61	13	13.31	12.75	12.29	12.83	12.29	12.75	13.31	13	11.61	11.34
171	11.69	11.83	12.92	13.6	13.18	12.73	13.95	12.73	13.18	13.6	12.92	11.83	11.69	11.83	12.92	13.6	13.18	12.73	13.95	12.73	13.18	13.6	12.92	11.83	11.69
172	11.96	12.08	12.94	13.66	13.41	12.91	14.83	12.91	13.41	13.66	12.94	12.08	11.96	12.08	12.94	13.66	13.41	12.91	14.83	12.91	13.41	13.66	12.94	12.08	11.96
173	12.18	12.3	12.87	13.67	13.5	13.1	15.54	13.1	13.5	13.67	12.87	12.3	12.18	12.3	12.87	13.67	13.5	13.1	15.54	13.1	13.5	13.67	12.87	12.3	12.18
174	12.45	12.48	12.78	13.3	13.66	13.18	14.59	13.18	13.66	13.3	12.78	12.48	12.45	12.48	12.78	13.3	13.66	13.18	14.59	13.18	13.66	13.3	12.78	12.48	12.45
175	12.74	12.64	12.79	13.1	13.55	13.13	13.74	13.13	13.55	13.1	12.79	12.64	12.74	12.64	12.79	13.1	13.55	13.13	13.74	13.13	13.55	13.1	12.79	12.64	12.74
176	13.05	12.96	12.93	13.09	13.14	12.57	11.78	12.57	13.14	13.09	12.93	12.96	13.05	12.96	12.93	13.09	13.14	12.57	11.78	12.57	13.14	13.09	12.93	12.96	13.05
177	13.43	13.3	13.14	13.23	12.76	11.81	9.92	11.81	12.76	13.23	13.14	13.3	13.43	13.3	13.14	13.23	12.76	11.81	9.92	11.81	12.76	13.23	13.14	13.3	13.43
178	13.66	13.53	13.26	13.04	12.43	11.18	8.39	11.18	12.43	13.04	13.26	13.53	13.66	13.53	13.26	13.04	12.43	11.18	8.39	11.18	12.43	13.04	13.26	13.53	13.66
179	13.6	13.47	13.23	12.68	12.1	10.15	5.46	10.15	12.1	12.68	13.23	13.47	13.6	13.47	13.23	12.68	12.1	10.15	5.46	10.15	12.1	12.68	13.23	13.47	13.6
180	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	CS4 @100% Power /4000K	Sample ID.	Z1
Temperature (°C)	25.1	Humidity (%RH)	57.0

Test Method

The samples were tested according to the ANSI C82.77:2014.

The total harmonic distortion shall be measured to the 40th order.

The ambient temperature condition was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.01	60	0.297	35.5	0.996	5.93%
277.04	60	0.130	35.0	0.969	11.83%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2022/12/24	2023/12/23
DLF108	Auxiliary Lamp	2022/12/24	2023/12/23
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-directional	2022/12/24	2023/12/23
DLF116	AC Power Source	2022/12/16	2023/12/15
DLF516	Power Meter	2022/12/16	2023/12/15
DLF112	Temperature Recorder	2022/12/28	2023/12/27
DLF114	Temperature & Humidity Datalogger	2022/12/28	2023/12/27
DLF101	Goniophotometer	2022/12/24	2023/12/23
DLF511	AC Power Source	2022/12/16	2023/12/15
DLF512	AC Power Source	2022/12/16	2023/12/15
DLF513	AC Power Source	2022/12/16	2023/12/15
DLF507	DC Power Source	2022/12/16	2023/12/15
DLF111	Temperature & Humidity Datalogger	2022/12/28	2023/12/27
DLF119	Power Meter	2022/12/16	2023/12/15
DLF031	Temperature data logger	2023/6/22	2024/6/21
DLF073	Power Analyzer	2023/6/22	2024/6/21
DLF003	Temperature & Humidity Datalogger	2023/6/22	2024/6/21

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