

# Photometric Test Report

## Relevant Standards

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

## Prepared For

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## Project Number

**DLF2310103**

## Report Number

**DLF2310103-24a**

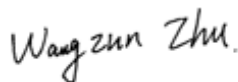
## Test Date

**2023/10/23**

## Issue Date

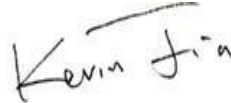
**2023/10/24**

## 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		4048
Lumen/ft (Goniophotometer - Section 4.2)	IES LM-79-2008	≥375		1012
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 115	Premium 130	152.8
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Wroست Case		26.5
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	5.02%
		20.00%	277V	7.25%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.996
		0.9	277V	0.961
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	5029±355	5122
		4 step	5029±220	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥80		84
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥0		13
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥70		84
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%		-12%
Zonal Lumen Requirement (0°-90°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥85%		97.36%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥40%		82.32%
Zonal Lumen Requirement (20°-50°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥30%		54.04%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	<22 <25		23.8
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wroست Case		277
(Goniophotometer - Section 4.2)		Non-Wroست Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wroست Case		0.100
(Goniophotometer - Section 4.2)		Non-Wroست Case		0.222
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wroست Case		26.5
(Goniophotometer - Section 4.2)		Non-Wroست Case		26.5

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023/10/23	CS4 @75% Power /5000K	X1
2	Goniophotometer Test	2023/10/23	CS4 @75% Power /5000K	X1
3	THD and PF Test	2023/10/23	CS4 @75% Power /5000K	X1

### Remark(If any)

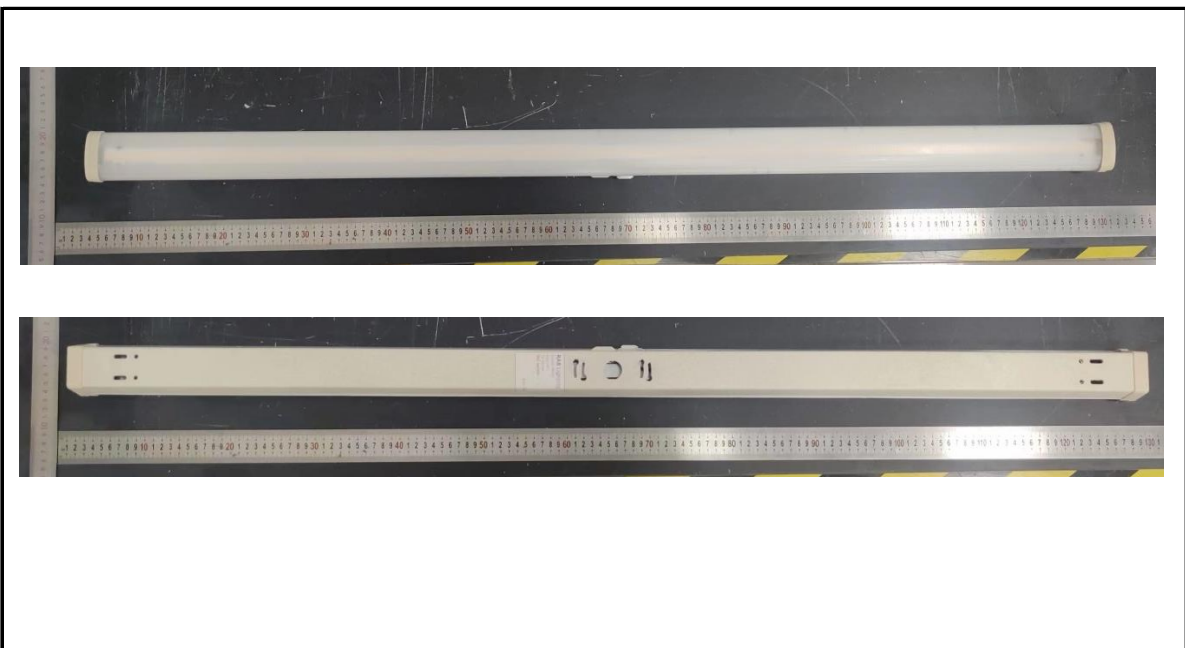
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## 3.0 Production Description

**Luminaire Description:** CS4 @75% Power /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.	CS4 @75% Power /5000K	Sample ID.	X1
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  $\pm 0.2$  percent under load.

The sample was measured using  $4\pi$  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

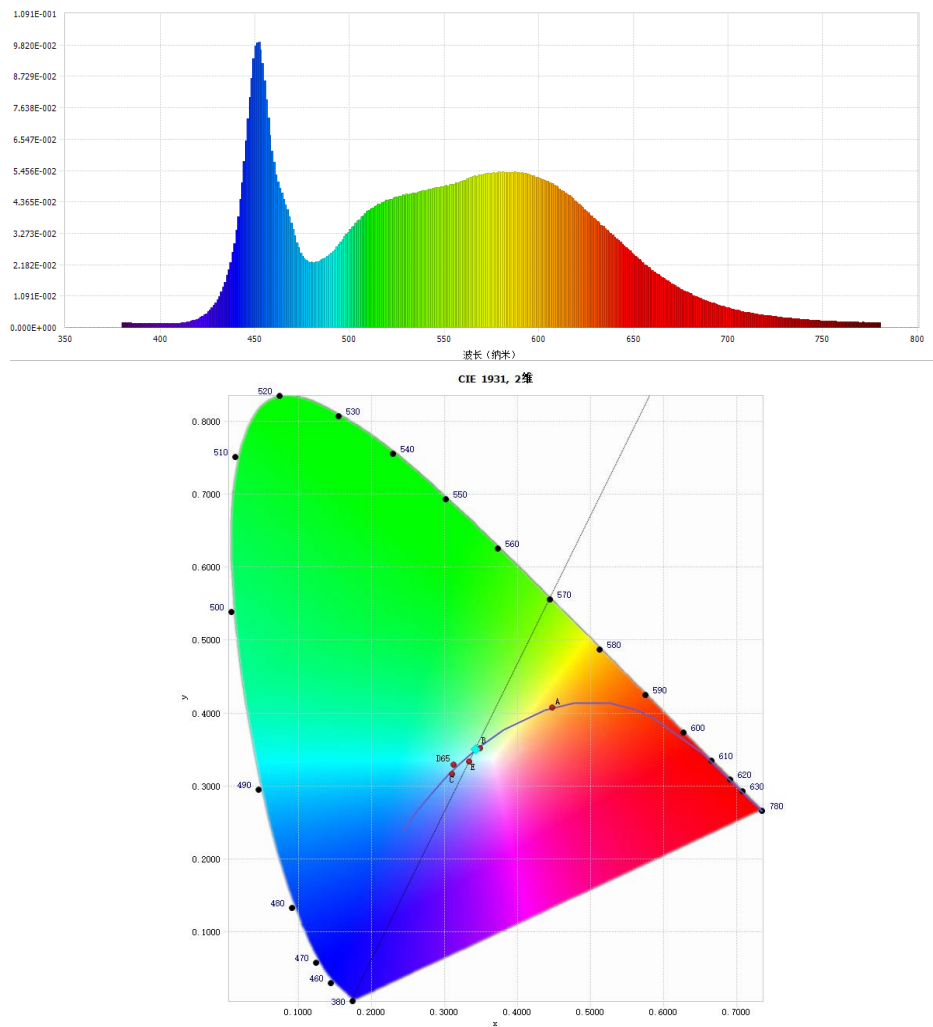
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.04	60	0.222	26.5	0.996
277.05	60	0.100	26.5	0.961

#### Test Result

CCT (K)	CRI	R9	Duv
5122	84	13	0.0008

Rf	Rg	IES Rcs,h1
84	96	-12%

## 4.1 Integrating Sphere Test



## 4.1 Integrating Sphere Test

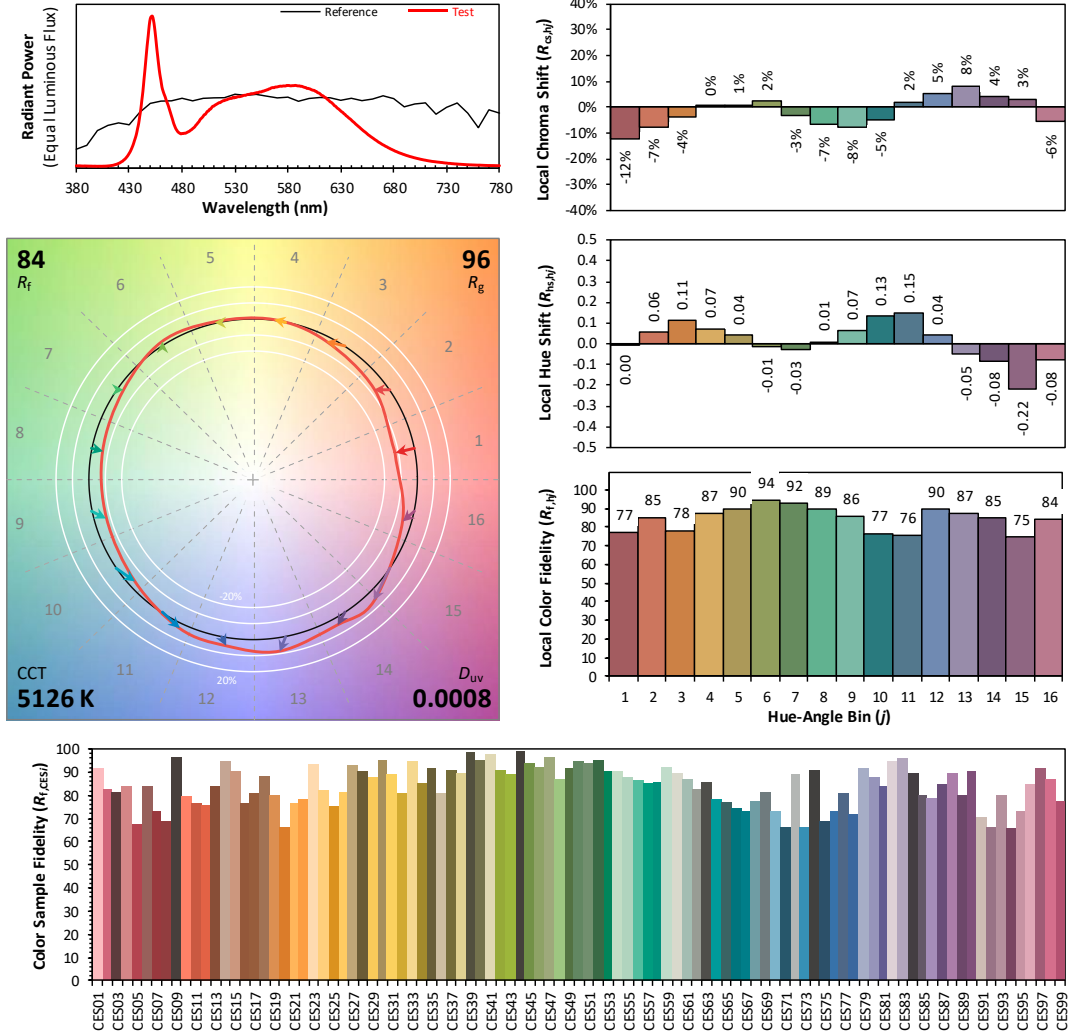
### IES TM-30-18 Color Rendition Report

Source: DLF2310103-24a

Manufacturer: RAB Lighting Inc.

Date: 2023/10/23

Model: CS4 @75% Power /5000K



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

$x$  0.3418  
 $y$  0.3505  
 $u'$  0.2096  
 $v'$  0.4837

CIE 13.3-1995  
(CRI)

$R_a$  85  
 $R_g$  18

#### 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	1.61E-03	485	2.35E-02	590	5.37E-02	695	7.72E-03
385	1.48E-03	490	2.59E-02	595	5.30E-02	700	6.78E-03
390	1.44E-03	495	2.97E-02	600	5.19E-02	705	5.93E-03
395	1.35E-03	500	3.40E-02	605	5.08E-02	710	5.25E-03
400	1.28E-03	505	3.74E-02	610	4.88E-02	715	4.62E-03
405	1.33E-03	510	4.06E-02	615	4.62E-02	720	4.17E-03
410	1.51E-03	515	4.28E-02	620	4.33E-02	725	3.76E-03
415	1.97E-03	520	4.41E-02	625	4.05E-02	730	3.36E-03
420	3.14E-03	525	4.54E-02	630	3.74E-02	735	3.00E-03
425	5.45E-03	530	4.65E-02	635	3.43E-02	740	2.74E-03
430	9.69E-03	535	4.68E-02	640	3.15E-02	745	2.50E-03
435	1.80E-02	540	4.76E-02	645	2.83E-02	750	2.28E-03
440	3.39E-02	545	4.86E-02	650	2.53E-02	755	2.13E-03
445	6.48E-02	550	4.92E-02	655	2.24E-02	760	2.02E-03
450	9.77E-02	555	4.99E-02	660	1.98E-02	765	1.90E-03
455	8.59E-02	560	5.12E-02	665	1.74E-02	770	1.78E-03
460	5.74E-02	565	5.26E-02	670	1.52E-02	775	1.74E-03
465	4.45E-02	570	5.31E-02	675	1.33E-02	780	1.68E-03
470	3.40E-02	575	5.36E-02	680	1.17E-02		
475	2.48E-02	580	5.40E-02	685	1.01E-02		
480	2.27E-02	585	5.39E-02	690	8.90E-03		



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

Model No.	CS4 @75% Power /5000K	Sample ID.	X1
Opreate 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 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° vertical intervals and 10° horizontal intervals.

#### Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WROST CASE	277.03	60	0.100	26.5	0.961
NON-WROST CASE	120.03	60	0.222	26.5	0.996

#### Test Result

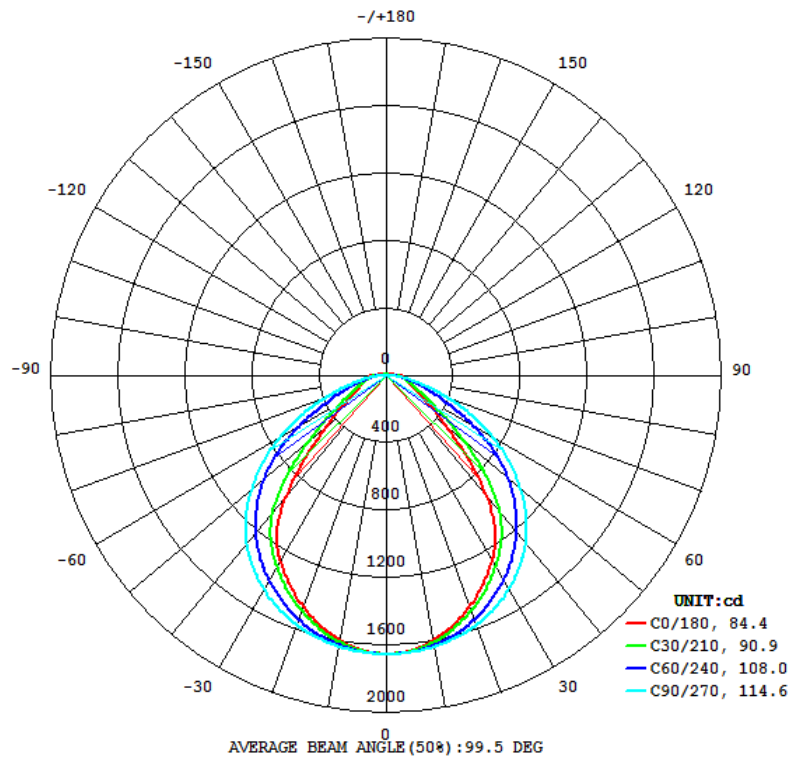
Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
4048	138.6	156.4	84.4	114.6	152.8

Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (0°-60°)	BUG rating	UGR (X=4H, Y=8H, 70/50/20%)
97.36%	82.32%	B2-U3-G1	23.8
Zonal Lumen Requirement (20°-50°)	Length(ft)	Lumen/ft	
54.04%	4	1012	

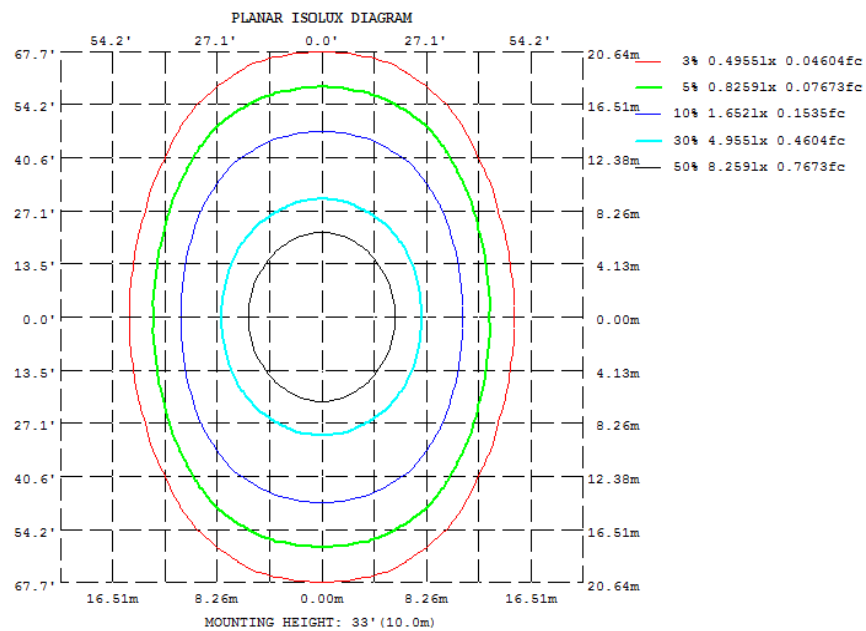


## 4.2 Goniophotometer Test

### Light Distrubtion Curve



### Isolux Plot



## 4.2 Goniophotometer Test

### Zonal Lumen Summary

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315
10	1598	1615	1633	1615	1598	1615	1633	1615
20	1458	1510	1573	1510	1458	1510	1573	1510
30	1267	1354	1465	1354	1267	1354	1465	1354
40	936.0	1142	1298	1142	936.0	1142	1298	1142
50	470.7	804.9	1051	804.9	470.7	804.9	1051	804.9
60	242.0	409.0	736.8	409.0	242.0	409.0	736.8	409.0
70	161.7	201.5	398.4	201.5	161.7	201.5	398.4	201.5
80	124.3	101.1	125.7	101.1	124.3	101.1	125.7	101.1
90	87.50	46.02	1.142	46.02	87.50	46.02	1.142	46.02
100	51.56	22.13	1.447	22.13	51.56	22.13	1.447	22.13
110	33.29	16.59	3.450	16.59	33.29	16.59	3.450	16.59
120	27.18	14.51	5.096	14.51	27.18	14.51	5.096	14.51
130	20.20	11.72	6.487	11.72	20.20	11.72	6.487	11.72
140	14.23	8.838	7.565	8.838	14.23	8.838	7.565	8.838
150	10.03	7.169	7.957	7.169	10.03	7.169	7.957	7.169
160	7.644	7.180	7.969	7.180	7.644	7.180	7.969	7.180
170	10.85	9.779	8.065	9.779	10.85	9.779	8.065	9.779
180	5.344	8.894	9.692	8.894	5.344	8.894	9.692	8.894
DEG	LUMINOUS INTENSITY:cd							

### UGR Table - Corrected

<b>UGR Table - Corrected</b>										
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	21.6	23.1	22.0	23.5	23.9	16.0	17.5	16.4	17.8	18.2
4H	22.9	24.2	23.3	24.6	25.0	17.5	18.8	17.9	19.2	19.6
6H	23.2	24.5	23.7	24.9	25.3	18.3	19.6	18.8	20.0	20.4
8H	23.4	24.5	23.9	25.0	25.4	19.3	20.5	19.8	20.9	21.4
12H	23.4	24.5	23.9	24.9	25.4	19.9	21.0	20.4	21.5	21.9
4H	23.4	24.4	23.9	24.9	25.4	20.6	21.6	21.1	22.1	22.6
2H	21.6	22.9	22.1	23.3	23.7	16.8	18.0	17.2	18.4	18.9
3H	23.1	24.1	23.5	24.6	25.0	18.4	19.4	18.8	19.9	20.3
4H	23.5	24.4	24.0	24.9	25.4	19.3	20.2	19.8	20.7	21.2
6H	23.8	24.6	24.3	25.1	25.6	20.4	21.3	21.0	21.8	22.3
8H	23.8	24.6	24.3	25.1	25.6	21.1	21.8	21.6	22.3	22.9
12H	23.8	24.5	24.3	25.0	25.6	21.9	22.5	22.4	23.1	23.6
8H	23.5	24.3	24.0	24.8	25.3	19.6	20.4	20.1	20.9	21.4
6H	23.8	24.5	24.4	25.0	25.5	20.9	21.5	21.4	22.0	22.6
4H	23.9	24.5	24.5	25.0	25.6	21.6	22.2	22.2	22.7	23.3
12H	23.9	24.4	24.5	25.0	25.6	22.5	23.0	23.1	23.6	24.2
12H	23.5	24.2	24.0	24.7	25.3	19.7	20.3	20.2	20.9	21.4
6H	23.8	24.4	24.4	24.9	25.5	20.9	21.5	21.5	22.0	22.6
8H	23.9	24.4	24.5	25.0	25.6	21.7	22.2	22.3	22.8	23.4
Maximum UGR = 25.6										

## 4.2 Goniophotometer Test

### ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	155.97	0 - 10	155.97	3.85%
10-20	443.26	0 - 20	599.23	14.80%
20-30	664.60	0 - 30	1263.83	31.22%
30-40	785.46	0 - 40	2049.29	50.63%
40-50	737.23	0 - 50	2786.52	68.84%
50-60	545.32	0 - 60	3331.84	82.32%
60-70	341.98	0 - 70	3673.82	90.76%
70-80	184.62	0 - 80	3858.44	95.33%
80-90	82.31	0 - 90	3940.75	97.36%
90-100	36.69	0 - 100	3977.44	98.27%
100-110	21.26	0 - 110	3998.70	98.79%
110-120	15.98	0 - 120	4014.68	99.19%
120-130	12.14	0 - 130	4026.82	99.49%
130-140	8.26	0 - 140	4035.08	99.69%
140-150	5.61	0 - 150	4040.69	99.83%
150-160	3.70	0 - 160	4044.39	99.92%
160-170	2.37	0 - 170	4046.76	99.98%
170-180	0.90	0 - 180	4047.66	100.00%

## 4.2 Goniophotometer Test

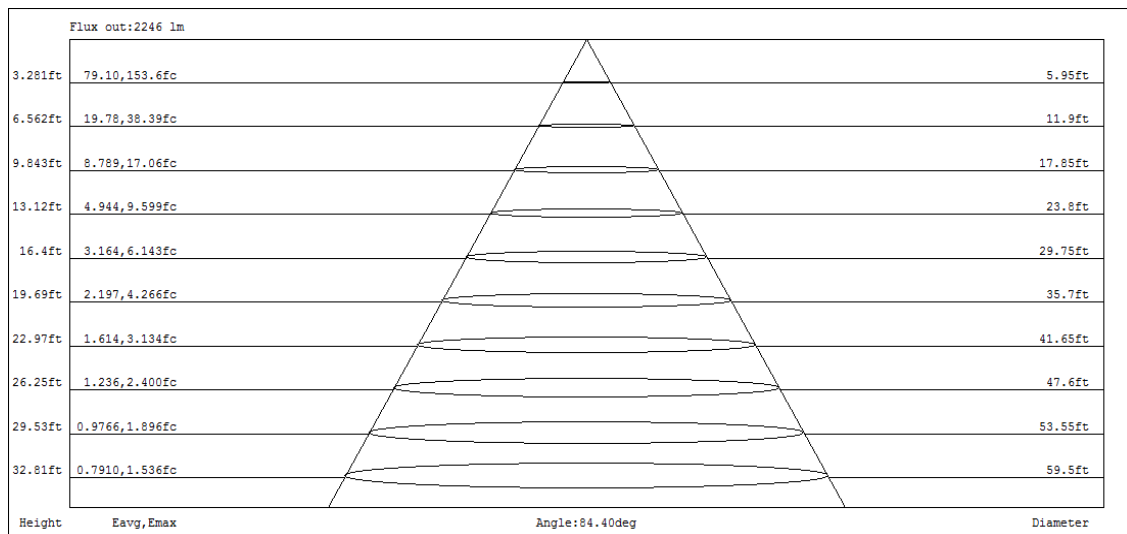
### COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

#### Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

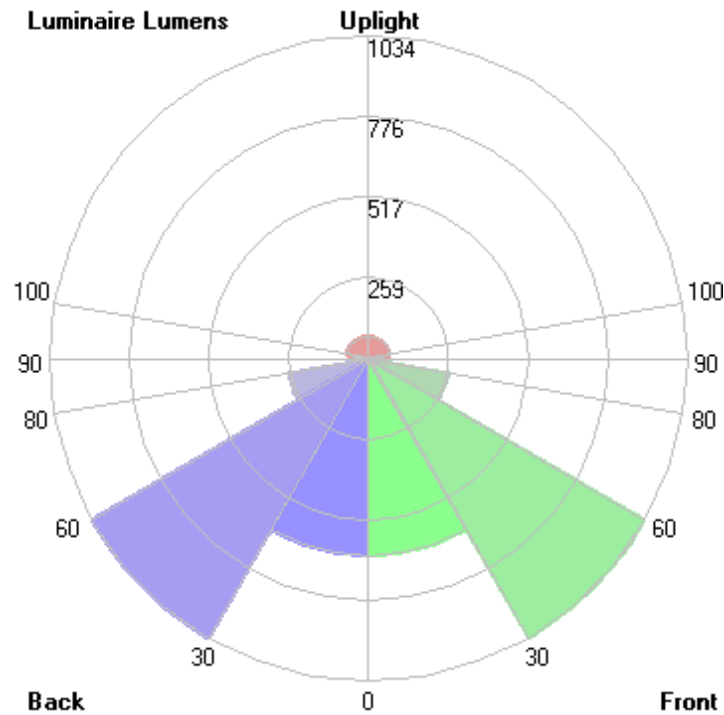
RC	80				70				50			30			10			0
Rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	118	118	118	118	115	115	115	115	110	110	110	104	104	104	100	100	100	97
1	109	104	101	97	106	102	98	95	97	94	92	93	91	88	89	87	85	83
2	100	92	86	81	97	90	84	79	86	81	77	83	79	75	79	76	73	71
3	92	82	74	68	89	80	73	67	77	71	66	74	69	64	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	56	49	44	55	48	44	53	47	43	41
7	67	54	46	40	65	53	45	40	52	44	39	50	44	39	48	43	38	36
8	63	50	42	36	61	49	41	36	47	40	35	46	40	35	45	39	35	33
9	59	46	38	32	57	45	37	32	44	37	32	42	36	32	41	36	31	30
10	55	42	35	30	54	42	34	29	40	34	29	39	33	29	38	33	29	27

### CONE OF LIGHT DIAGRAM



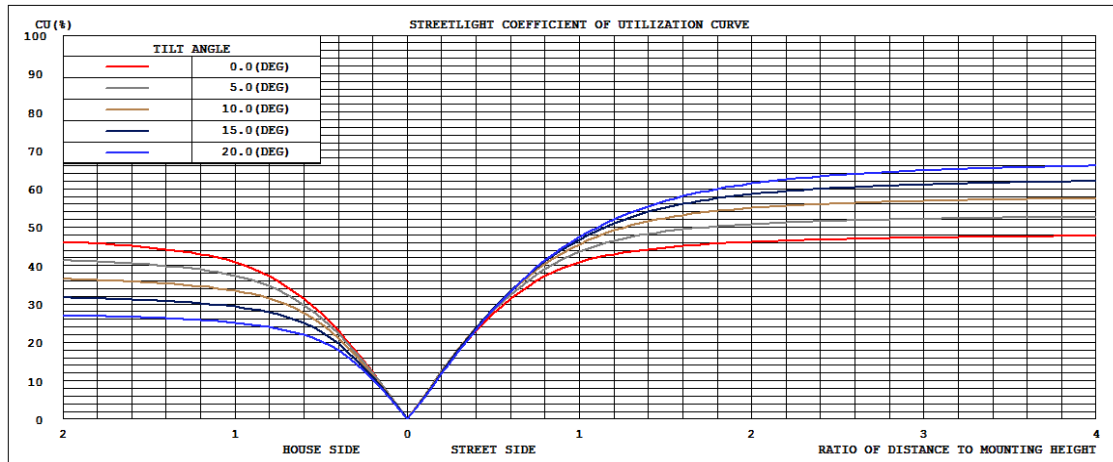
## 4.2 Goniophotometer Test

LCS/BUG

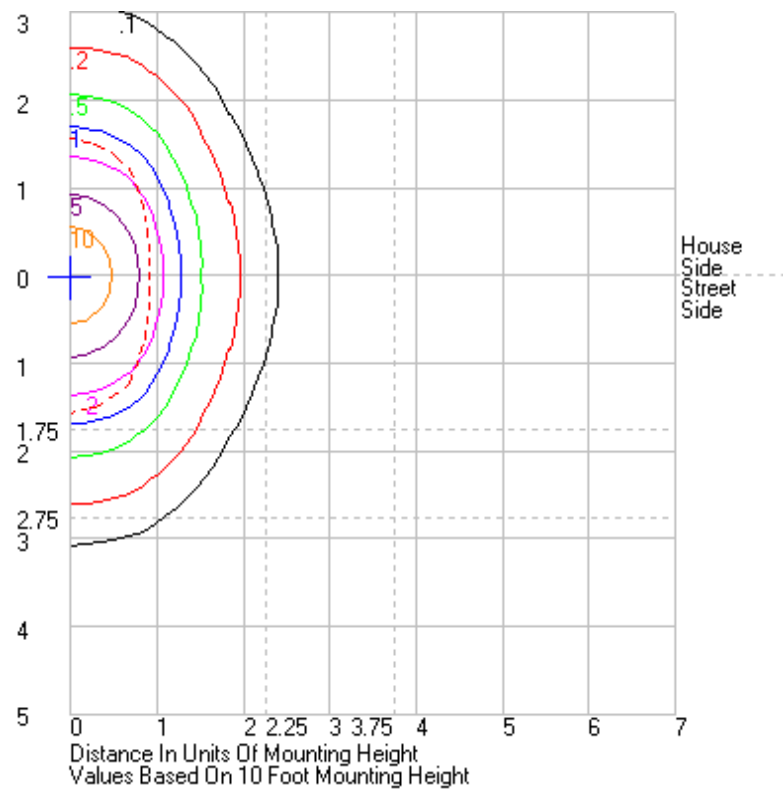


	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	631.9	N.A.	15.6
FM - Front-Medium (30-60)	1034.0	N.A.	25.5
FH - Front-High (60-80)	263.3	N.A.	6.5
FVH - Front-Very High (80-90)	41.2	N.A.	1.0
BL - Back-Low (0-30)	631.9	N.A.	15.6
BM - Back-Medium (30-60)	1034.0	N.A.	25.5
BH - Back-High (60-80)	263.3	N.A.	6.5
BVH - Back-Very High (80-90)	41.2	N.A.	1.0
UL - Uplight-Low (90-100)	36.7	N.A.	0.9
UH - Uplight-High (100-180)	70.2	N.A.	1.7
Total	4047.7	N.A.	100.0
BUG Rating	B2-U3-G1		

## Coefficients of Utilization



## Isolines



## 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	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56	1652.56
1	1652.21	1651.98	1652.69	1651.73	1652.71	1651.93	1650.75	1651.93	1652.71	1651.73	1652.69	1651.98	1652.21	1651.98	1652.69	1651.73	1652.71	1651.93	1650.75	1651.93	1652.71	1651.73	1652.69	1651.98	1652.21
2	1652.08	1651.26	1651.97	1651.38	1650.9	1650.16	1649.49	1650.16	1650.9	1651.38	1651.97	1651.26	1652.08	1651.26	1651.97	1651.38	1650.9	1650.16	1649.49	1650.16	1650.9	1651.38	1651.97	1651.26	1652.08
3	1651.31	1650.12	1650.38	1649.44	1649.51	1647.54	1647.13	1647.54	1649.51	1649.44	1650.38	1650.12	1651.31	1650.12	1650.38	1649.44	1649.51	1647.54	1647.13	1647.54	1649.51	1649.44	1650.38	1650.12	1651.31
4	1649.3	1648.57	1648.39	1646.32	1645.94	1643.79	1642.71	1643.79	1645.94	1646.32	1648.39	1648.57	1649.3	1648.39	1648.57	1649.3	1648.57	1646.32	1645.94	1643.79	1642.71	1643.79	1645.94	1646.32	1649.3
5	1647.62	1646.84	1646.79	1643.16	1641.16	1639.14	1637.34	1639.14	1641.16	1643.16	1646.84	1647.62	1646.84	1647.62	1646.84	1647.62	1646.84	1643.16	1641.16	1639.14	1637.34	1639.14	1641.16	1643.16	1647.62
6	1646.37	1644.48	1642.75	1639.01	1636.52	1632.99	1632.07	1632.99	1636.52	1639.01	1642.75	1644.48	1646.37	1644.48	1642.75	1639.01	1636.52	1632.99	1632.07	1632.99	1636.52	1639.01	1642.75	1644.48	1646.37
7	1643.39	1642.04	1638.64	1633.87	1630.62	1626.19	1624.78	1626.19	1630.62	1633.87	1638.64	1642.04	1643.39	1642.04	1638.64	1633.87	1630.62	1626.19	1624.78	1626.19	1630.62	1633.87	1638.64	1642.04	1643.39
8	1640.09	1638.53	1634.78	1628.5	1623.28	1618.73	1616.34	1618.73	1623.28	1628.5	1634.78	1638.53	1640.09	1638.53	1634.78	1628.5	1623.28	1618.73	1616.34	1618.73	1623.28	1628.5	1634.78	1638.53	1640.09
9	1637.3	1634.85	1629.75	1622.38	1615.7	1610.16	1607.79	1610.16	1615.7	1622.38	1629.75	1634.85	1637.3	1634.85	1629.75	1622.38	1615.7	1610.16	1607.79	1610.16	1615.7	1622.38	1629.75	1634.85	1637.3
10	1633.26	1630.87	1624.43	1614.95	1607.18	1599.89	1597.59	1599.89	1607.18	1614.95	1624.43	1630.87	1633.26	1630.87	1624.43	1614.95	1607.18	1599.89	1597.59	1599.89	1607.18	1614.95	1624.43	1630.87	1633.26
11	1628.81	1626.33	1618.16	1607.64	1597.84	1590.28	1586.39	1590.28	1597.84	1607.64	1618.16	1626.33	1628.81	1626.33	1618.16	1607.64	1597.84	1590.28	1586.39	1590.28	1597.84	1607.64	1618.16	1626.33	1628.81
12	1625.3	1621.26	1612.06	1599.48	1587.82	1578.84	1575.86	1578.84	1587.82	1599.48	1612.06	1621.26	1625.3	1621.26	1612.06	1599.48	1587.82	1578.84	1575.86	1578.84	1587.82	1599.48	1612.06	1621.26	1625.3
13	1620.26	1615.77	1605.1	1590.1	1577.42	1567.02	1562.88	1567.02	1577.42	1590.1	1605.1	1615.77	1620.26	1615.77	1605.1	1590.1	1577.42	1567.02	1562.88	1567.02	1577.42	1590.1	1605.1	1615.77	1620.26
14	1614.12	1609.78	1596.86	1580.37	1565.26	1554.25	1548.69	1554.25	1565.26	1580.37	1596.86	1609.78	1614.12	1609.78	1596.86	1580.37	1565.26	1554.25	1548.69	1554.25	1565.26	1580.37	1596.86	1609.78	1614.12
15	1608.52	1603.55	1588.99	1570.35	1553.16	1541.18	1536.09	1541.18	1553.16	1570.35	1588.99	1603.55	1608.52	1603.55	1588.99	1570.35	1553.16	1541.18	1536.09	1541.18	1553.16	1570.35	1588.99	1603.55	1608.52
16	1602.79	1596.84	1580.43	1559.4	1540.64	1527.25	1521.71	1527.25	1540.64	1559.4	1580.43	1596.84	1602.79	1596.84	1580.43	1559.4	1540.64	1527.25	1521.71	1527.25	1540.64	1559.4	1580.43	1596.84	1602.79
17	1595.72	1589.26	1571.2	1547.84	1527.45	1512.72	1506.9	1512.72	1527.45	1547.84	1571.2	1589.26	1595.72	1589.26	1571.2	1547.84	1527.45	1512.72	1506.9	1512.72	1527.45	1547.84	1571.2	1589.26	1595.72
18	1588.5	1581.4	1561.35	1536.4	1513.42	1497.88	1490.89	1497.88	1513.42	1536.4	1561.35	1581.4	1588.5	1581.4	1561.35	1536.4	1513.42	1497.88	1490.89	1497.88	1513.42	1536.4	1561.35	1581.4	1588.5
19	1581.86	1573.11	1550.71	1523.67	1499.47	1481.98	1475.32	1481.98	1499.47	1523.67	1550.71	1573.11	1581.86	1573.11	1550.71	1523.67	1499.47	1481.98	1475.32	1481.98	1499.47	1523.67	1550.71	1573.11	1581.86
20	1573	1563.97	1539.98	1510.24	1483.79	1465.79	1458.43	1465.79	1483.79	1510.24	1539.98	1563.97	1573	1563.97	1539.98	1510.24	1483.79	1465.79	1458.43	1465.79	1483.79	1510.24	1539.98	1563.97	1573
21	1564	1554.87	1528.42	1497.16	1468.3	1449.61	1441.75	1449.61	1468.3	1497.16	1528.42	1554.87	1564	1554.87	1528.42	1497.16	1468.3	1449.61	1441.75	1449.61	1468.3	1497.16	1528.42	1554.87	1564
22	1555.83	1544.68	1517.19	1482.89	1452.6	1432	1425.01	1432	1452.6	1482.89	1517.19	1544.68	1555.83	1544.68	1517.19	1482.89	1452.6	1432	1425.01	1432	1452.6	1482.89	1517.19	1544.68	1555.83
23	1546.04	1534.47	1504.38	1467.72	1436.01	1414.9	1406.19	1414.9	1436.01	1467.72	1504.38	1534.47	1546.04	1534.47	1504.38	1467.72	1436.01	1414.9	1406.19	1414.9	1436.01	1467.72	1504.38	1534.47	1546.04
24	1536.28	1523.42	1491.23	1453.08	1419.5	1398.17	1387.21	1398.17	1419.5	1453.08	1491.23	1523.42	1536.28	1523.42	1491.23	1453.08	1419.5	1398.17	1387.21	1398.17	1419.5	1453.08	1491.23	1523.42	1536.28
25	1526.14	1512	1477.62	1437.7	1403.05	1379.85	1368.94	1379.85	1403.05	1437.7	1477.62	1512	1526.14	1512	1477.62	1437.7	1403.05	1379.85	1368.94	1379.85	1403.05	1437.7	1477.62	1512	1526.14
26	1514.48	1500.15	1463.63	1421.39	1385.79	1360.38	1348.34	1360.38	1385.79	1421.39	1463.63	1500.15	1514.48	1500.15	1463.63	1421.39	1385.79	1360.38	1348.34	1360.38	1385.79	1421.39	1463.63	1500.15	1514.48
27	1502.83	1487.75	1449.09	1405.81	1367.11	1341	1328.4	1341	1367.11	1405.81	1449.09	1487.75	1502.83	1487.75	1449.09	1405.81	1367.11	1341	1328.4	1341	1367.11	1405.81	1449.09	1487.75	1502.83
28	1491.27	1474.9	1433.97	1389.27	1348.39	1320.4	1307.8	1320.4	1348.39	1389.27	1433.97	1474.9	1491.27	1474.9	1433.97	1389.27	1348.39	1320.4	1307.8	1320.4	1348.39	1389.27	1433.97	1474.9	1491.27
29	1478.22	1461.24	1418.78	1371.5	1328.66	1299.32	1286.89	1299.32	1328.66	1371.5	1418.78	1461.24	1478.22	1461.24	1418.78	1371.5	1328.66	1299.32	1286.89	1299.32	1328.66	1371.5	1418.78	1461.24	1478.22
30	1464.72	1446.32	1402.24	1354.13	1308.5	1278.88	1267.01	1278.88	1308.5	1354.13	1402.24	1446.32	1464.72	1446.32	1402.24	1354.13	1308.5	1278.88	1267.01	1278.88	1308.5	1354.13	1402.24	1446.32	1464.72
31	1451.04	1431.85	1386.48	1335.53	1288.07	1257.64	1247.25	1257.64	1288.07	1335.53	1386.48	1431.85	1451.04	1431.85	1386.48	1335.53	1288.07	1257.64	1247.25	1257.64	1288.07	1335.53	1386.48	1431.85	1451.04
32	1436.38	1416.21	1370.1	1315.39	1267.82	1236.11	1224.12	1236.11	1267.82	1315.39	1370.1	1416.21	1436.38	1416.21	1370.1	1315.39	1267.82	1236.11	1224.12	1236.11	1267.82	1315.39	1370.1	1416.21	1436.38
33	1420.81	1399.54	1352.18	1296.42	1246.54	1212.34	1197.8	1212.34	1246.54	1296.42	1352.18	1399.54	1420.81	1399.54	1352.18	1296.42	1246.54	1212.34	1197.8	1212.34	1246.54	1296.42	1352.18	1399.54	1420.81
34	1405.56	1383.52	1334.27	1276.45	1224.18	1187.24	1171.67	1187.24	1224.18	1276.45	1334.27	1383.52	1405.56	1383.52	1334.27	1276.45	1224.18	1187.24	1171.67	1187.24	1224.18	1276.45	1334.27	1383.52	1405.56
35	1388.4	1366.83	1314.97	1255.66	1201.67	1159.39	1141.7	1159.39	1201.67	1255.66	1314.97	1366.83	1388.4	1366.83	1314.97	1255.66	1201.67	1159.39	1141.7	1159.39	1201.67	1255.66	1314.97	1366.83	1388.4
36	1371.06	1349.59	1295.65	1235.15	1177	1128.86	1107.12	1128.86	1177	1235.15	1295.65	1349.59	1371.06	1349.59	1295.65	1235.15	1177	1128.86	1107.12	1128.86	1177	1235.15	1295.65	1349.59	1371.06
37	1354.15	1330.98	1276.39	1212.85	1150.92	1095.57	1070.24	1095.57	1150.92	1212.85	1276.39	1330.98	1354.15	1330.98	1276.39	1212.85	1150.92	1095.57	1070.24	1095.57	1150.92	1212.85	1276.39	1330.98	1354.15
38	1337.06	1312.4	1256.48	1189.47	1123.11	1057.42	1028.14	1057.42	1123.11	1189.47	1256.48	1312.4	1337.06	1312.4	1256.48	1189.47	1123.11	1057.42	10						



51	1021.87	993.87	923.51	761.58	571.58	466.81	436.01	466.81	571.58	761.58	923.51	993.87	1021.87	993.87	923.51	761.58	571.58	466.81	436.01	466.81	571.58	761.58	923.51	993.87	1021.87
52	992.44	964.32	892.41	717.81	530.78	432.39	404.33	432.39	530.78	717.81	892.41	964.32	992.44	964.32	892.41	717.81	530.78	432.39	404.33	432.39	530.78	717.81	892.41	964.32	992.44
53	962.3	934.94	860.25	674.1	493.02	401.73	376.28	401.73	493.02	674.1	860.25	934.94	962.3	934.94	860.25	674.1	493.02	401.73	376.28	401.73	493.02	674.1	860.25	934.94	962.3
54	931.96	904.05	825.86	631.09	457.57	373.38	350.48	373.38	457.57	631.09	825.86	904.05	931.96	904.05	825.86	631.09	457.57	373.38	350.48	373.38	457.57	631.09	825.86	904.05	931.96
55	900.58	873.19	791.05	589.31	424.87	348.24	327.14	348.24	424.87	589.31	791.05	873.19	900.58	873.19	791.05	589.31	424.87	348.24	327.14	348.24	424.87	589.31	791.05	873.19	900.58
56	868.33	842.52	755.12	548.81	394.08	325.12	306.64	325.12	394.08	548.81	755.12	842.52	868.33	842.52	755.12	548.81	394.08	325.12	306.64	325.12	394.08	548.81	755.12	842.52	868.33
57	836.65	810.8	718.59	511.07	367.28	304.4	287.59	304.4	367.28	511.07	718.59	810.8	836.65	810.8	718.59	511.07	367.28	304.4	287.59	304.4	367.28	511.07	718.59	810.8	836.65
58	803.74	778.88	680.72	474.72	342.19	285.76	270.7	285.76	342.19	474.72	680.72	778.88	803.74	778.88	680.72	474.72	342.19	285.76	270.7	285.76	342.19	474.72	680.72	778.88	803.74
59	770.28	746.66	642.19	440.5	319.01	268.78	255.59	268.78	319.01	440.5	642.19	746.66	770.28	746.66	642.19	440.5	319.01	268.78	255.59	268.78	319.01	440.5	642.19	746.66	770.28
60	736.81	713.27	603.91	409.02	299.01	253.5	241.97	253.5	299.01	409.02	603.91	713.27	736.81	713.27	603.91	409.02	299.01	253.5	241.97	253.5	299.01	409.02	603.91	713.27	736.81
61	702.53	680.54	565.63	379.65	279.87	239.59	229.54	239.59	279.87	379.65	565.63	680.54	702.53	680.54	565.63	379.65	279.87	239.59	229.54	239.59	279.87	379.65	565.63	680.54	702.53
62	667.38	648.06	528.76	352.8	262.76	227.32	218.79	227.32	262.76	352.8	528.76	648.06	667.38	648.06	528.76	352.8	262.76	227.32	218.79	227.32	262.76	352.8	528.76	648.06	667.38
63	634.56	614.88	492.44	328.05	247.2	216.02	208.7	216.02	247.2	328.05	492.44	614.88	634.56	614.88	492.44	328.05	247.2	216.02	208.7	216.02	247.2	328.05	492.44	614.88	634.56
64	600.17	581.8	457.25	305.37	232.86	205.87	199.81	205.87	232.86	305.37	457.25	581.8	600.17	581.8	457.25	305.37	232.86	205.87	199.81	205.87	232.86	305.37	457.25	581.8	600.17
65	565.87	548.25	423.53	284.47	219.89	196.8	191.89	196.8	219.89	284.47	423.53	548.25	565.87	548.25	423.53	284.47	219.89	196.8	191.89	196.8	219.89	284.47	423.53	548.25	565.87
66	531.69	514.43	391.31	265.01	207.89	188.29	184.46	188.29	207.89	265.01	391.31	514.43	531.69	514.43	391.31	265.01	207.89	188.29	184.46	188.29	207.89	265.01	391.31	514.43	531.69
67	497.96	481.3	361.32	247.51	196.92	180.89	178.05	180.89	196.92	247.51	361.32	481.3	497.96	481.3	361.32	247.51	196.92	180.89	178.05	180.89	196.92	247.51	361.32	481.3	497.96
68	464.23	448.42	333.45	230.93	186.84	174.01	172.15	174.01	186.84	230.93	333.45	448.42	464.23	448.42	333.45	230.93	186.84	174.01	172.15	174.01	186.84	230.93	333.45	448.42	464.23
69	431.16	416.02	306.86	215.64	177.57	167.69	166.64	167.69	177.57	215.64	306.86	416.02	431.16	416.02	306.86	215.64	177.57	167.69	166.64	167.69	177.57	215.64	306.86	416.02	431.16
70	398.36	384.08	282.27	201.5	169.06	161.86	161.74	161.86	169.06	201.5	282.27	384.08	398.36	384.08	282.27	201.5	169.06	161.86	161.74	161.86	169.06	201.5	282.27	384.08	398.36
71	366.56	353.25	259.81	188.29	160.93	156.48	157.26	156.48	160.93	188.29	259.81	353.25	366.56	353.25	259.81	188.29	160.93	156.48	157.26	156.48	160.93	188.29	259.81	353.25	366.56
72	335.57	323.04	238.27	176.07	153.6	151.47	152.99	151.47	153.6	176.07	238.27	323.04	335.57	323.04	238.27	176.07	153.6	151.47	152.99	151.47	153.6	176.07	238.27	323.04	335.57
73	304.99	293.69	218.41	164.4	146.64	146.82	148.91	146.82	146.64	164.4	218.41	293.69	304.99	293.69	218.41	164.4	146.64	146.82	148.91	146.82	146.64	164.4	218.41	293.69	304.99
74	275.89	266.03	199.97	153.62	140.21	142.51	145.24	142.51	140.21	153.62	199.97	266.03	275.89	266.03	199.97	153.62	140.21	142.51	145.24	142.51	140.21	153.62	199.97	266.03	275.89
75	247.71	239.29	182.51	143.53	134.11	138.26	141.56	138.26	134.11	143.53	182.51	239.29	247.71	239.29	182.51	143.53	134.11	138.26	141.56	138.26	134.11	143.53	182.51	239.29	247.71
76	220.93	214.01	166.33	134.03	128.33	134.23	138.01	134.23	128.33	134.03	166.33	214.01	220.93	214.01	166.33	134.03	128.33	134.23	138.01	134.23	128.33	134.03	166.33	214.01	220.93
77	195.08	190.23	150.98	125.15	122.74	130.39	134.68	130.39	122.74	125.15	150.98	190.23	195.08	190.23	150.98	125.15	122.74	130.39	134.68	130.39	122.74	125.15	150.98	190.23	195.08
78	170.48	167.79	136.42	116.64	117.39	126.55	131.16	126.55	117.39	116.64	136.42	167.79	170.48	167.79	136.42	116.64	117.39	126.55	131.16	126.55	117.39	116.64	136.42	167.79	170.48
79	147.47	146.82	123.17	108.61	112.32	122.7	127.63	122.7	112.32	108.61	123.17	146.82	147.47	146.82	123.17	108.61	112.32	122.7	127.63	122.7	112.32	108.61	123.17	146.82	147.47
80	125.68	126.87	110.59	101.07	107.39	118.94	124.26	118.94	107.39	110.59	126.87	125.68	126.87	110.59	107.39	118.94	124.26	118.94	107.39	110.59	107.39	118.94	124.26	126.87	125.68
81	104.59	108.57	98.74	93.99	102.6	115.23	120.91	115.23	102.6	93.99	98.74	108.57	104.59	108.57	98.74	93.99	102.6	115.23	120.91	115.23	102.6	93.99	98.74	108.57	104.59
82	85.48	91.77	87.95	87.15	97.95	111.53	117.41	111.53	97.95	87.15	87.95	91.77	85.48	91.77	87.95	87.15	97.95	111.53	117.41	111.53	97.95	87.15	87.95	91.77	85.48
83	68.59	76.45	77.92	81.05	93.48	107.89	114.02	107.89	93.48	81.05	77.92	76.45	68.59	76.45	77.92	81.05	93.48	107.89	114.02	107.89	93.48	81.05	77.92	76.45	68.59
84	52.47	62.39	68.51	74.88	89.07	104.18	110.52	104.18	89.07	74.88	62.39	52.47	52.47	62.39	68.51	74.88	89.07	104.18	110.52	104.18	89.07	74.88	62.39	52.47	52.47
85	37.71	50.1	59.96	69.15	84.79	100.43	106.91	100.43	84.79	69.15	59.96	50.1	37.71	50.1	59.96	69.15	84.79	100.43	106.91	100.43	84.79	69.15	59.96	50.1	37.71
86	25.55	38.98	52.49	63.92	80.66	96.77	103.35	96.77	80.66	63.92	52.49	38.98	25.55	38.98	52.49	63.92	80.66	96.77	103.35	96.77	80.66	63.92	52.49	38.98	25.55
87	16.23	29.81	45.62	58.96	76.53	92.87	99.54	92.87	76.53	58.96	45.62	29.81	16.23	29.81	45.62	58.96	76.53	92.87	99.54	92.87	76.53	58.96	45.62	29.81	16.23
88	9.9	22.44	39.66	54.43	72.46	88.95	95.55	88.95	72.46	54.43	39.66	22.44	9.9	22.44	39.66	54.43	72.46	88.95	95.55	88.95	72.46	54.43	39.66	22.44	9.9
89	4.5	17.06	34.49	50.05	68.45	84.97	91.6	84.97	68.45	50.05	34.49	17.06	4.5	17.06	34.49	50.05	68.45	84.97	91.6	84.97	68.45	50.05	34.49	17.06	4.5
90	1.14	12.76	30.01	46.02	64.53	80.93	87.5	80.93	64.53	46.02	30.01	12.76	1.14	12.76	30.01	46.02	64.53	80.93	87.5	80.93	64.53	46.02	30.01	12.76	1.14
91	0.14	10.11	26.24	42.34	60.71	76.9	83.42	76.9	60.71	42.34	26.24	10.11	0.14	10.11	26.24	42.34	60.71	76.9	83.42	76.9	60.71	42.34	26.24	10.11	0.14
92	0.14	8.13	23.13	38.92	57.03	72.9	79.42	72.9	57.03	38.92	23.13	8.13	0.14	8.13	23.13	38.92	57.03	72.9	79.42	72.9	57.03	38.92	23.13	8.13	0.14
93	0.16	6.67	20.6	35.91	53.55	69.06	75.33	69.06	53.55	35.91	20.6	6.67	0.16	6.67	20.6	35.91	53.55	69.06	75.33	69.06	53.55	35.91	20.6	6.67	0.16
94	0.22	5.9	18.55	33.18	50.28	65.33	71.42	65.33	50.28	33.18	18.55	5.9	0.22	5.9	18.55	33.18	50.28	65.33	71.42	65.33	50.28	33.18	18.55	5.9</	

106	2.7	4.22	10.11	17.82	26.6	34.69	38.18	34.69	26.6	17.82	10.11	4.22	2.7	4.22	10.11	17.82	26.6	34.69	38.18	34.69	26.6	17.82	10.11	4.22	2.7
107	2.9	4.18	9.99	17.46	25.85	33.44	36.62	33.44	25.85	17.46	9.99	4.18	2.9	4.18	9.99	17.46	25.85	33.44	36.62	33.44	25.85	17.46	9.99	4.18	2.9
108	3.09	4.13	9.89	17.14	25.22	32.34	35.28	32.34	25.22	17.14	9.89	4.13	3.09	4.13	9.89	17.14	25.22	32.34	35.28	32.34	25.22	17.14	9.89	4.13	3.09
109	3.27	4.09	9.8	16.85	24.69	31.45	34.17	31.45	24.69	16.85	9.8	4.09	3.27	4.09	9.8	16.85	24.69	31.45	34.17	31.45	24.69	16.85	9.8	4.09	3.27
110	3.45	4.05	9.68	16.59	24.26	30.75	33.29	30.75	24.26	16.59	9.68	4.05	3.45	4.05	9.68	16.59	24.26	30.75	33.29	30.75	24.26	16.59	9.68	4.05	3.45
111	3.62	4.01	9.55	16.34	23.9	30.18	32.59	30.18	23.9	16.34	9.55	4.01	3.62	4.01	9.55	16.34	23.9	30.18	32.59	30.18	23.9	16.34	9.55	4.01	3.62
112	3.8	3.98	9.44	16.1	23.57	29.72	32.07	29.72	23.57	16.1	9.44	3.98	3.8	3.98	9.44	16.1	23.57	29.72	32.07	29.72	23.57	16.1	9.44	3.98	3.8
113	3.98	3.96	9.32	15.83	23.22	29.27	31.62	29.27	23.22	15.83	9.32	3.96	3.98	3.96	9.32	15.83	23.22	29.27	31.62	29.27	23.22	15.83	9.32	3.96	3.98
114	4.16	3.95	9.2	15.55	22.86	28.76	31.17	28.76	22.86	15.55	9.2	3.95	4.16	3.95	9.2	15.55	22.86	28.76	31.17	28.76	22.86	15.55	9.2	3.95	4.16
115	4.32	3.94	9.09	15.32	22.52	28.2	30.6	28.2	22.52	15.32	9.09	3.94	4.32	3.94	9.09	15.32	22.52	28.2	30.6	28.2	22.52	15.32	9.09	3.94	4.32
116	4.5	3.94	8.98	15.1	22.17	27.61	29.9	27.61	22.17	15.1	8.98	3.94	4.5	3.94	8.98	15.1	22.17	27.61	29.9	27.61	22.17	15.1	8.98	3.94	4.5
117	4.66	3.96	8.87	14.94	21.84	27.05	29.17	27.05	21.84	14.94	8.87	3.96	4.66	3.96	8.87	14.94	21.84	27.05	29.17	27.05	21.84	14.94	8.87	3.96	4.66
118	4.8	3.97	8.75	14.81	21.52	26.51	28.48	26.51	21.52	14.81	8.75	3.97	4.8	3.97	8.75	14.81	21.52	26.51	28.48	26.51	21.52	14.81	8.75	3.97	4.8
119	4.94	3.99	8.63	14.66	21.17	25.99	27.8	25.99	21.17	14.66	8.63	3.99	4.94	3.99	8.63	14.66	21.17	25.99	27.8	25.99	21.17	14.66	8.63	3.99	4.94
120	5.1	4.02	8.49	14.51	20.8	25.46	27.18	25.46	20.8	14.51	8.49	4.02	5.1	4.02	8.49	14.51	20.8	25.46	27.18	25.46	20.8	14.51	8.49	4.02	5.1
121	5.26	4.06	8.36	14.31	20.41	24.91	26.56	24.91	20.41	14.31	8.36	4.06	5.26	4.06	8.36	14.31	20.41	24.91	26.56	24.91	20.41	14.31	8.36	4.06	5.26
122	5.42	4.1	8.22	14.07	19.98	24.34	25.91	24.34	19.98	14.07	8.22	4.1	5.42	4.1	8.22	14.07	19.98	24.34	25.91	24.34	19.98	14.07	8.22	4.1	5.42
123	5.6	4.15	8.08	13.82	19.52	23.74	25.26	23.74	19.52	13.82	8.08	4.15	5.6	4.15	8.08	13.82	19.52	23.74	25.26	23.74	19.52	13.82	8.08	4.15	5.6
124	5.77	4.19	7.94	13.57	18.97	23.1	24.59	23.1	18.97	13.57	7.94	4.19	5.77	4.19	7.94	13.57	18.97	23.1	24.59	23.1	18.97	13.57	7.94	4.19	5.77
125	5.92	4.24	7.81	13.29	18.42	22.46	23.88	22.46	18.42	13.29	7.81	4.24	5.92	4.24	7.81	13.29	18.42	22.46	23.88	22.46	18.42	13.29	7.81	4.24	5.92
126	6.05	4.3	7.67	12.99	17.93	21.81	23.15	21.81	17.93	12.99	7.67	4.3	6.05	4.3	7.67	12.99	17.93	21.81	23.15	21.81	17.93	12.99	7.67	4.3	6.05
127	6.17	4.35	7.54	12.68	17.46	21.14	22.41	21.14	17.46	12.68	7.54	4.35	6.17	4.35	7.54	12.68	17.46	21.14	22.41	21.14	17.46	12.68	7.54	4.35	6.17
128	6.28	4.4	7.4	12.37	16.97	20.48	21.66	20.48	16.97	12.37	7.4	4.4	6.28	4.4	7.4	12.37	16.97	20.48	21.66	20.48	16.97	12.37	7.4	4.4	6.28
129	6.38	4.45	7.27	12.05	16.5	19.82	20.92	19.82	16.5	12.05	7.27	4.45	6.38	4.45	7.27	12.05	16.5	19.82	20.92	19.82	16.5	12.05	7.27	4.45	6.38
130	6.49	4.51	7.14	11.72	16.02	19.17	20.2	19.17	16.02	11.72	7.14	4.51	6.49	4.51	7.14	11.72	16.02	19.17	20.2	19.17	16.02	11.72	7.14	4.51	6.49
131	6.59	4.58	7.02	11.4	15.54	18.52	19.51	18.52	15.54	11.4	7.02	4.58	6.59	4.58	7.02	11.4	15.54	18.52	19.51	18.52	15.54	11.4	7.02	4.58	6.59
132	6.69	4.67	6.9	11.07	15.04	17.9	18.81	17.9	15.04	11.07	6.9	4.67	6.69	4.67	6.9	11.07	15.04	17.9	18.81	17.9	15.04	11.07	6.9	4.67	6.69
133	6.79	4.78	6.78	10.76	14.54	17.29	18.15	17.29	14.54	10.76	6.78	4.78	6.79	4.78	6.78	10.76	14.54	17.29	18.15	17.29	14.54	10.76	6.78	4.78	6.79
134	6.91	4.89	6.67	10.44	14.04	16.68	17.54	16.68	14.04	10.44	6.67	4.89	6.91	4.89	6.67	10.44	14.04	16.68	17.54	16.68	14.04	10.44	6.67	4.89	6.91
135	7.03	5.01	6.6	10.14	13.54	16.1	16.91	16.1	13.54	10.14	6.6	5.01	7.03	5.01	6.6	10.14	13.54	16.1	16.91	16.1	13.54	10.14	6.6	5.01	7.03
136	7.16	5.17	6.54	9.86	13.08	15.52	16.33	15.52	13.08	9.86	6.54	5.17	7.16	5.17	6.54	9.86	13.08	15.52	16.33	15.52	13.08	9.86	6.54	5.17	7.16
137	7.29	5.38	6.47	9.58	12.65	14.94	15.79	14.94	12.65	9.58	6.47	5.38	7.29	5.38	6.47	9.58	12.65	14.94	15.79	14.94	12.65	9.58	6.47	5.38	7.29
138	7.39	5.65	6.41	9.33	12.23	14.4	15.24	14.4	12.23	9.33	6.41	5.65	7.39	5.65	6.41	9.33	12.23	14.4	15.24	14.4	12.23	9.33	6.41	5.65	7.39
139	7.49	6	6.36	9.08	11.85	13.92	14.73	13.92	11.85	9.08	6.36	6	7.49	6	6.36	9.08	11.85	13.92	14.73	13.92	11.85	9.08	6.36	6	7.49
140	7.57	6.41	6.32	8.84	11.5	13.45	14.23	13.45	11.5	8.84	6.32	6.41	7.57	6.41	6.32	8.84	11.5	13.45	14.23	13.45	11.5	8.84	6.32	6.41	7.57
141	7.65	6.84	6.28	8.6	11.13	13.02	13.74	13.02	11.13	8.6	6.28	6.84	7.65	6.84	6.28	8.6	11.13	13.02	13.74	13.02	11.13	8.6	6.28	6.84	7.65
142	7.72	7.23	6.25	8.38	10.78	12.6	13.28	12.6	10.78	8.38	6.25	7.23	7.72	7.23	6.25	8.38	10.78	12.6	13.28	12.6	10.78	8.38	6.25	7.23	7.72
143	7.78	7.6	6.23	8.18	10.43	12.18	12.83	12.18	10.43	8.18	6.23	7.6	7.78	7.6	6.23	8.18	10.43	12.18	12.83	12.18	10.43	8.18	6.23	7.6	7.78
144	7.82	7.95	6.21	8	10.1	11.77	12.38	11.77	10.1	8	6.21	7.95	7.82	7.95	6.21	8	10.1	11.77	12.38	11.77	10.1	8	6.21	7.95	7.82
145	7.86	8.28	6.18	7.84	9.77	11.38	11.95	11.38	9.77	7.84	6.18	8.28	7.86	8.28	6.18	7.84	9.77	11.38	11.95	11.38	9.77	7.84	6.18	8.28	7.86
146	7.89	8.57	6.16	7.68	9.47	10.99	11.54	10.99	9.47	7.68	6.16	8.57	7.89	8.57	6.16	7.68	9.47	10.99	11.54	10.99	9.47	7.68	6.16	8.57	7.89
147	7.92	8.79	6.15	7.53	9.2	10.62	11.13	10.62	9.2	7.53	6.15	8.79	7.92	8.79	6.15	7.53	9.2	10.62	11.13	10.62	9.2	7.53	6.15	8.79	7.92
148	7.95	8.97	6.14	7.4	8.95	10.26	10.75	10.26	8.95	7.4	6.14	8.97	7.95	8.97	6.14	7.4	8.95	10.26	10.75	10.26	8.95	7.4	6.14	8.97	7.95
149	7.97	9.08	6.16	7.28	8.7	9.9	10.38	9.9	8.7	7.28	6.16	9.08	7.97	9.08	6.16	7.28	8.7	9.9	10.38	9.9	8.7	7.28	6.16	9.08	7.97
150	7.96	9.16	6.22	7.17	8.48	9.58	10.03	9.58	8.48	7.17	6.22	9.16	7.96	9.16	6.22	7.17	8.48	9.58	10.03	9.58	8.48	7.17	6.22	9.16	7.96
151	7.95	9.2	6.3	7.07	8.26	9.28	9.7	9.28	8.26	7.07	6.3	9.2	7.95	9.2	6.3	7.07	8.26	9.28	9.7	9.28	8.26	7.07	6.3	9.2	7.95
152	7.96	9.22	6.4	6.98	8.06	8.99	9.4	8.99	8.06	6.98	6.4	9.22	7.96	9.22	6.4	6.98	8.06	8.99	9.4	8.99	8.06	6.98	6.4	9.22	7.96
153	7.97	9.25	6.6	6.9	7.88	8.73	9.11	8.73	7.88	6.9	6.6	9.25	7.97	9.25	6.6	6.9	7.88	8.73	9.11	8.73	7.88	6.9	6.6	9.25	7.97
154	8.04	9.29	7.02	6.8	7.72	8.48	8.84	8.48	7.72	6.8	7.02	9.29	8.04	9.29	7.02	6.8	7.72	8.48	8.84	8.48	7.72	6.8	7.02	9.29	8.04
155	8.05	9.35	7.45	6.72	7.57	8.26	8.61	8.26	7.57	6.72	7.45	9.35	8.05	9.35	7.45	6.72	7								



161	7.95	8.82	9.26	7.57	6.87	7.26	7.5	7.26	6.87	7.57	9.26	8.82	7.95	8.82	9.26	7.57	6.87	7.26	7.5	7.26	6.87	7.57	9.26	8.82	7.95
162	7.93	8.63	9.29	8.03	6.91	7.15	7.37	7.15	6.91	8.03	9.29	8.63	7.93	8.63	9.29	8.03	6.91	7.15	7.37	7.15	6.91	8.03	9.29	8.63	7.93
163	7.89	8.49	9.34	8.45	7.15	7.06	7.28	7.06	7.15	8.45	9.34	8.49	7.89	8.49	9.34	8.45	7.15	7.06	7.28	7.06	7.15	8.45	9.34	8.49	7.89
164	7.84	8.47	9.37	8.83	7.56	7.07	7.25	7.07	7.56	8.83	9.37	8.47	7.84	8.47	9.37	8.83	7.56	7.07	7.25	7.07	7.56	8.83	9.37	8.47	7.84
165	7.77	8.41	9.3	9.13	8.02	7.25	7.3	7.25	8.02	9.13	9.3	8.41	7.77	8.41	9.3	9.13	8.02	7.25	7.3	7.25	8.02	9.13	9.3	8.41	7.77
166	7.7	8.36	9.28	9.36	8.58	7.79	7.56	7.79	8.58	9.36	9.28	8.36	7.7	8.36	9.28	9.36	8.58	7.79	7.56	7.79	8.58	9.36	9.28	8.36	7.7
167	7.6	8.27	9.22	9.46	9	8.55	8.25	8.55	9	9.46	9.22	8.27	7.6	8.27	9.22	9.46	9	8.55	8.25	8.55	9	9.46	9.22	8.27	7.6
168	7.65	8.25	9.18	9.55	9.28	9.15	9.27	9.15	9.28	9.55	9.18	8.25	7.65	8.25	9.18	9.55	9.28	9.15	9.27	9.15	9.28	9.55	9.18	8.25	7.65
169	7.84	8.35	9.27	9.66	9.5	9.53	10.12	9.53	9.5	9.66	9.27	8.35	7.84	8.35	9.27	9.66	9.5	9.53	10.12	9.53	9.5	9.66	9.27	8.35	7.84
170	8.07	8.45	9.38	9.78	9.65	9.79	10.85	9.79	9.65	9.78	9.38	8.45	8.07	8.45	9.38	9.78	9.65	9.79	10.85	9.79	9.65	9.78	9.38	8.45	8.07
171	8.3	8.53	9.34	9.92	9.77	9.81	11.41	9.81	9.77	9.92	9.34	8.53	8.3	8.53	9.34	9.92	9.77	9.81	11.41	9.81	9.77	9.92	9.34	8.53	8.3
172	8.55	8.7	9.31	9.89	9.84	9.62	11.74	9.62	9.84	9.89	9.31	8.7	8.55	8.7	9.31	9.89	9.84	9.62	11.74	9.62	9.84	9.89	9.31	8.7	8.55
173	8.78	8.8	9.3	9.81	9.9	9.62	11.72	9.62	9.9	9.81	9.3	8.8	8.78	8.8	9.3	9.81	9.9	9.62	11.72	9.62	9.9	9.81	9.3	8.8	8.78
174	8.94	9	9.2	9.52	9.78	9.59	10.69	9.59	9.78	9.52	9.2	9	8.94	9	9.2	9.52	9.78	9.59	10.69	9.59	9.78	9.52	9.2	9	8.94
175	9.09	9.16	9.11	9.44	9.7	9.39	10.12	9.39	9.7	9.44	9.11	9.16	9.09	9.16	9.11	9.44	9.7	9.39	10.12	9.39	9.7	9.44	9.11	9.16	9.09
176	9.34	9.32	9.33	9.35	9.38	9.16	8.58	9.16	9.38	9.35	9.33	9.32	9.34	9.32	9.33	9.35	9.38	9.16	8.58	9.16	9.38	9.35	9.33	9.32	9.34
177	9.65	9.53	9.45	9.49	9.17	8.5	7.12	8.5	9.17	9.49	9.45	9.53	9.65	9.53	9.45	9.49	9.17	8.5	7.12	8.5	9.17	9.49	9.45	9.53	9.65
178	9.78	9.7	9.56	9.43	9.03	8.02	5.66	8.02	9.03	9.43	9.56	9.7	9.78	9.7	9.56	9.43	9.03	8.02	5.66	8.02	9.03	9.43	9.56	9.7	9.78
179	9.74	9.65	9.42	9.14	8.68	7.31	3.86	7.31	8.68	9.14	9.42	9.65	9.74	9.65	9.42	9.14	8.68	7.31	3.86	7.31	8.68	9.14	9.42	9.65	9.74
180	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69

## 4.0 LM-79 Measurement and Test Results

### 4.3 THD and PF Test

Model No.	CS4 @75% Power /5000K	Sample ID.	X1
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
120.04	60	0.222	26.5	0.996	5.02%
277.05	60	0.100	26.5	0.961	7.25%

## 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\*\*\*\*\*