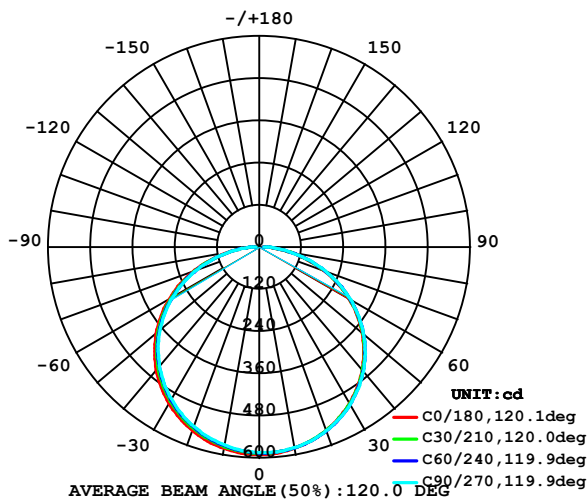


LUMINAIRE PHOTOMETRIC TEST REPORT

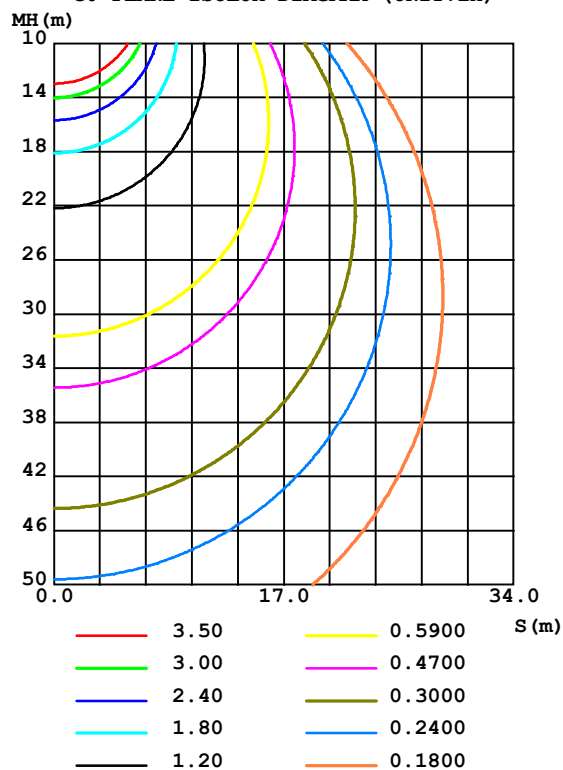
Test:U:110.3V I:0.1757A P:19.31W PF:0.9964 Lamp Flux:1827.75x1 lm		
NAME: LED lighting	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: OPTOMA	SUR.:	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 94.64 lm/W			
MODEL	FP3060N1LB-1	I _{max} (cd)	590.2	S/MH (C0/180)	1.29
NOMINAL POWER(W)	20	LOR (%)	100.0	S/MH (C90/270)	1.27
RATED VOLTAGE(V)	220.0	TOTAL FLUX (lm)	1827.7	η UP,DN (C0-180)	0.0,50.8
NOMINAL FLUX(lm)	1827.75	CIE CLASS	DIRECT	η UP,DN (C180-360)	0.0,49.2
LAMPS INSIDE	1	η up (%)	0.0	CIBSE SHR NOM	1.50
TEST VOLTAGE (V)	220.2	η down (%)	100.0	CIBSE SHR MAX	1.50

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



C0 PLANE ISOLUX DIAGRAM (UNIT:lx)



C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:001
Test Date:2015-02-26

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.286
Humidity:65.0%
Test Distance:6.930m [K=1.0000]
Remarks:

ZONAL FLUX DIAGRAM

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	581.4	580.2	579.5	577.5	581.5	574.8	572.1	571.9	0- 10	55.43	55.43	3.03,3.03
20	555.8	556.9	557.1	554.6	555.9	546.9	543.4	544.2	10- 20	159.8	215.2	11.8,11.8
30	513.7	516.8	517.6	514.6	513.7	503.2	499.6	500.8	20- 30	245.3	460.5	25.2,25.2
40	455.8	460.1	461.2	458.1	455.9	444.8	441.4	442.8	30- 40	301.9	762.4	41.7,41.7
50	382.9	388.0	388.6	386.0	383.2	372.5	369.2	370.9	40- 50	322.0	1084	59.3,59.3
60	295.6	299.9	300.5	298.5	295.6	286.0	283.4	284.7	50- 60	301.7	1386	75.8,75.8
70	195.1	199.4	199.4	198.6	195.6	187.5	187.1	186.9	60- 70	241.3	1627	89,89
80	91.48	94.50	95.61	93.88	90.08	86.24	87.30	86.65	70- 80	149.3	1777	97.2,97.2
90	11.20	11.92	13.81	11.63	9.734	9.053	9.990	9.502	80- 90	51.06	1828	100,100
100									90-100			
110									100-110			
120									110-120			
130									120-130			
140									130-140			
150									140-150			
160									150-160			
170									160-170			
180									170-180			
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

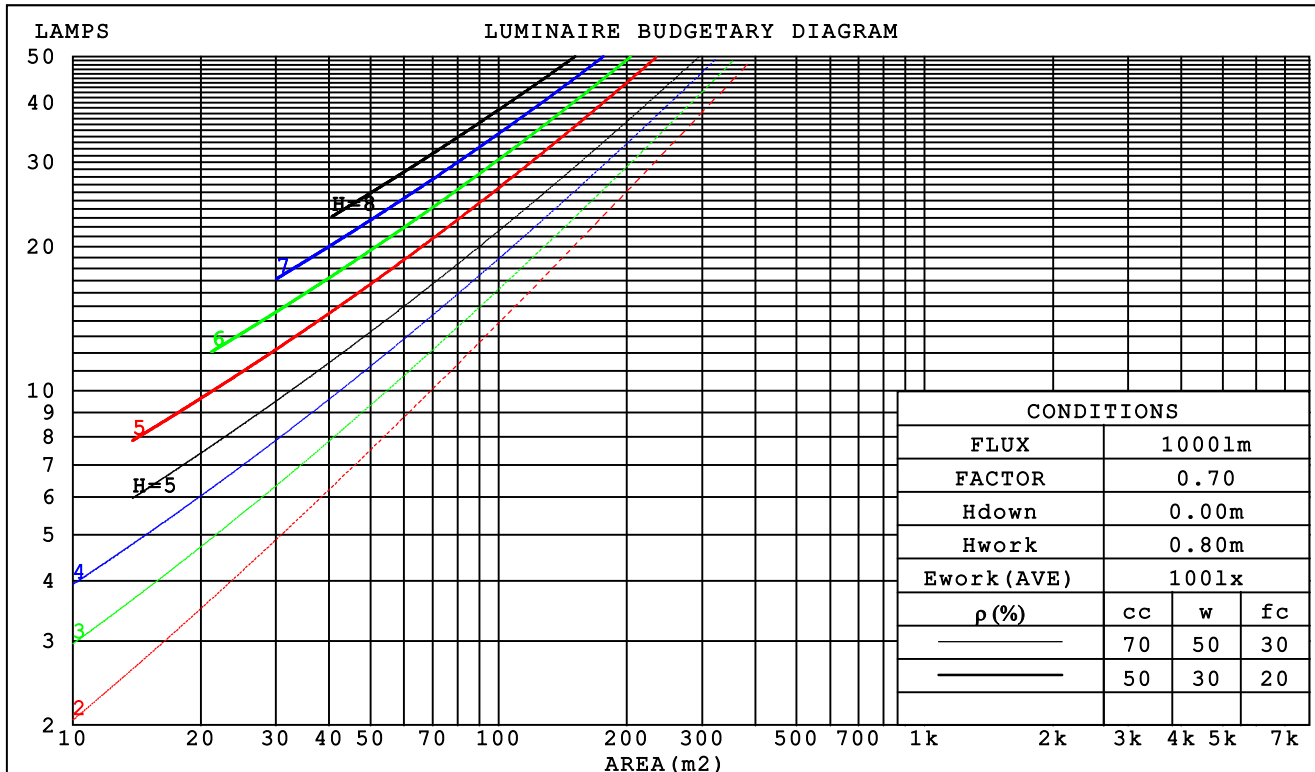
C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:001
Test Date:2015-02-26

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.286
Humidity:65.0%
Test Distance:6.930m [K=1.0000]
Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:110.3V I:0.1757A P:19.31W PF:0.9964 Lamp Flux:1827.75x1 lm		
NAME: LED lighting	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: OPTOMA	SUR.:	PROTECTION ANGLE:

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pfc	20%			20%			20%			20%			20%			0
RCR	Coefficients of Utilization(CU)															
	RCR:Room Cavity Ratio															
0.0	1.19	1.19	1.19	1.16	1.16	1.16	1.11	1.11	1.11	1.06	1.06	1.06	1.02	1.02	1.02	1.00
1.0	1.03	.98	.94	1.01	.96	.93	.96	.93	.90	.92	.90	.87	.89	.86	.84	.82
2.0	.89	.82	.76	.87	.81	.75	.84	.78	.73	.80	.76	.71	.77	.73	.70	.68
3.0	.78	.69	.62	.76	.68	.62	.73	.66	.61	.70	.65	.60	.68	.63	.59	.56
4.0	.69	.60	.53	.67	.59	.52	.65	.57	.51	.62	.56	.51	.60	.55	.50	.48
5.0	.61	.52	.45	.60	.51	.45	.58	.50	.44	.56	.49	.44	.54	.48	.43	.41
6.0	.55	.46	.39	.54	.45	.39	.52	.44	.39	.50	.43	.38	.49	.43	.38	.36
7.0	.50	.41	.34	.49	.40	.34	.47	.40	.34	.46	.39	.34	.44	.38	.33	.31
8.0	.45	.37	.31	.45	.36	.30	.43	.36	.30	.42	.35	.30	.41	.34	.30	.28
9.0	.41	.33	.27	.41	.33	.27	.40	.32	.27	.39	.32	.27	.38	.31	.27	.25
10.0	.38	.30	.25	.38	.30	.25	.37	.30	.25	.36	.29	.24	.35	.29	.24	.23



C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:001
Test Date:2015-02-26

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.286
Humidity:65.0%
Test Distance:6.930m [K=1.0000]
Remarks:

WEC AND CCEC

Test:U:110.3V I:0.1757A P:19.31W PF:0.9964 Lamp Flux:1827.75x1 lm		
NAME: LED lighting	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: OPTOMA	SUR.:	PROTECTION ANGLE:

ρ_{cc}	80%			70%			50%			30%			10%			0
ρ_w	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρ_{fc}	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio Wall Exitance Coefficients (WEC)															
0.0																
1.0	.329	.187	.059	.321	.183	.058	.308	.177	.056	.296	.171	.055	.285	.165	.053	
2.0	.305	.167	.051	.299	.165	.051	.287	.160	.050	.276	.155	.048	.266	.150	.047	
3.0	.280	.149	.045	.274	.147	.044	.264	.143	.043	.254	.139	.043	.245	.136	.042	
4.0	.257	.134	.039	.252	.132	.039	.243	.129	.038	.234	.126	.038	.226	.123	.037	
5.0	.237	.121	.035	.232	.119	.035	.224	.117	.034	.216	.114	.034	.209	.112	.034	
6.0	.219	.110	.031	.215	.109	.031	.207	.106	.031	.201	.104	.031	.194	.102	.030	
7.0	.203	.100	.028	.200	.099	.028	.193	.098	.028	.187	.096	.028	.181	.094	.028	
8.0	.189	.092	.026	.186	.092	.026	.180	.090	.026	.175	.089	.026	.170	.087	.025	
9.0	.177	.086	.024	.174	.085	.024	.169	.084	.024	.164	.082	.024	.159	.081	.023	
10.0	.166	.080	.022	.164	.079	.022	.159	.078	.022	.154	.077	.022	.150	.076	.022	

ρ_{cc}	80%			70%			50%			30%			10%			0
ρ_w	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρ_{fc}	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio Ceiling Cavity Exitance Coefficients (CCEC)															
0.0	.190	.190	.190	.163	.163	.163	.111	.111	.111	.064	.064	.064	.020	.020	.020	
1.0	.182	.156	.133	.155	.134	.114	.106	.092	.079	.061	.053	.046	.020	.017	.015	
2.0	.174	.132	.096	.149	.113	.083	.102	.079	.058	.059	.046	.034	.019	.015	.011	
3.0	.166	.114	.073	.143	.099	.063	.098	.069	.044	.057	.040	.026	.018	.013	.009	
4.0	.159	.101	.057	.136	.087	.050	.094	.061	.035	.054	.036	.021	.017	.012	.007	
5.0	.151	.091	.046	.130	.079	.040	.089	.055	.028	.052	.032	.017	.017	.011	.006	
6.0	.144	.083	.038	.124	.071	.033	.085	.050	.024	.050	.029	.014	.016	.010	.005	
7.0	.137	.076	.033	.118	.066	.028	.081	.046	.020	.047	.027	.012	.015	.009	.004	
8.0	.130	.070	.028	.112	.061	.025	.078	.043	.017	.045	.025	.010	.015	.008	.003	
9.0	.124	.065	.025	.107	.056	.022	.074	.040	.015	.043	.023	.009	.014	.008	.003	
10.0	.118	.061	.022	.102	.053	.019	.071	.037	.014	.041	.022	.008	.013	.007	.003	

C Range: 0 - 360DEG
 C Interval: 5.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:001
 Test Date:2015-02-26

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.286
 Humidity:65.0%
 Test Distance:6.930m [K=1.0000]
 Remarks:

UGR(Unified Glare Rating) Table

Test:U:110.3V I:0.1757A P:19.31W PF:0.9964 Lamp Flux:1827.75x1 lm											
NAME: LED lighting					TYPE:			WEIGHT:			
SPEC.:					DIM.:			SERIAL No.:			
MFR.: OPTOMA					SUR.:			PROTECTION ANGLE:			
ceiling/cavity	0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3	
walls	0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3	
working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
Room dimensions		Viewed crosswise					Viewed endwise				
x = 2H y = 2H		17.6	19.2	17.9	19.4	19.6	17.7	19.2	17.9	19.4	19.6
	3H	19.3	20.7	19.6	21.0	21.2	19.4	20.8	19.7	21.1	21.3
	4H	20.0	21.4	20.3	21.7	21.9	20.1	21.5	20.4	21.8	22.0
	6H	20.6	21.9	20.9	22.1	22.4	20.7	22.0	21.0	22.3	22.6
	8H	20.8	22.0	21.1	22.3	22.6	20.9	22.2	21.3	22.5	22.8
	12H	20.9	22.1	21.3	22.4	22.7	21.1	22.3	21.4	22.6	22.9
4H	2H	18.3	19.7	18.6	19.9	20.2	18.3	19.7	18.6	20.0	20.2
	3H	20.2	21.4	20.5	21.7	22.0	20.2	21.5	20.6	21.8	22.1
	4H	21.0	22.1	21.4	22.5	22.8	21.1	22.2	21.5	22.6	22.9
	6H	21.7	22.7	22.1	23.1	23.4	21.8	22.8	22.2	23.2	23.6
	8H	22.0	22.9	22.4	23.3	23.7	22.1	23.0	22.5	23.4	23.8
	12H	22.2	23.0	22.6	23.4	23.8	22.4	23.2	22.8	23.6	24.0
8H	4H	21.4	22.3	21.8	22.6	23.0	21.4	22.4	21.9	22.7	23.1
	6H	22.2	23.0	22.7	23.4	23.8	22.3	23.1	22.8	23.5	23.9
	8H	22.6	23.3	23.0	23.7	24.1	22.7	23.4	23.2	23.8	24.3
	12H	22.9	23.5	23.4	23.9	24.4	23.1	23.7	23.5	24.1	24.6
12H	4H	21.4	22.2	21.8	22.6	23.0	21.5	22.3	21.9	22.7	23.1
	6H	22.3	23.0	22.8	23.4	23.9	22.4	23.1	22.9	23.5	24.0
	8H	22.7	23.3	23.2	23.8	24.2	22.9	23.5	23.3	23.9	24.4
Variations with the observer position at spacings:											
S = 1.0H		+ 0.1 / - 0.2					+ 0.1 / - 0.2				
1.5H		+ 0.2 / - 0.3					+ 0.2 / - 0.3				
2.0H		+ 0.2 / - 0.4					+ 0.2 / - 0.4				

CIE Pub.117 Corrected 1828 lm Total Lamp Luminous Flux. (8log(F/F0) = 2.1)

C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:001
Test Date:2015-02-26

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.286
Humidity:65.0%
Test Distance:6.930m [K=1.0000]
Remarks:

UTILIZATION FACTORS TABLE

Test:U:110.3V I:0.1757A P:19.31W PF:0.9964 Lamp Flux:1827.75x1 lm		
NAME: LED lighting	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: OPTOMA	SUR.:	PROTECTION ANGLE:

REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS (PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	56	44	37	55	44	37	54	43	37	30
0.80	66	54	46	65	53	46	63	53	46	39
1.00	74	63	55	73	62	55	71	64	54	47
1.25	81	71	63	80	70	63	77	68	62	54
1.50	87	76	69	85	75	68	82	73	67	60
2.00	94	85	78	92	83	77	88	81	76	67
2.50	98	89	83	96	88	82	92	85	80	72
3.00	101	94	88	99	92	87	95	89	85	76
4.00	105	99	94	103	98	93	99	94	90	81
5.00	108	103	98	105	101	97	101	97	94	84
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended					SHRNOM = 1.25		

C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:001
Test Date:2015-02-26

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.286
Humidity:65.0%
Test Distance:6.930m [K=1.0000]
Remarks:

ISOCANDELA DIAGRAM

Test:U:110.3V I:0.1757A P:19.31W PF:0.9964 Lamp Flux:1827.75x1 lm		
NAME: LED lighting	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: OPTOMA	SUR.:	PROTECTION ANGLE:

Conical surface Flux(90deg):

923.38 lm

%lum = 50.5%

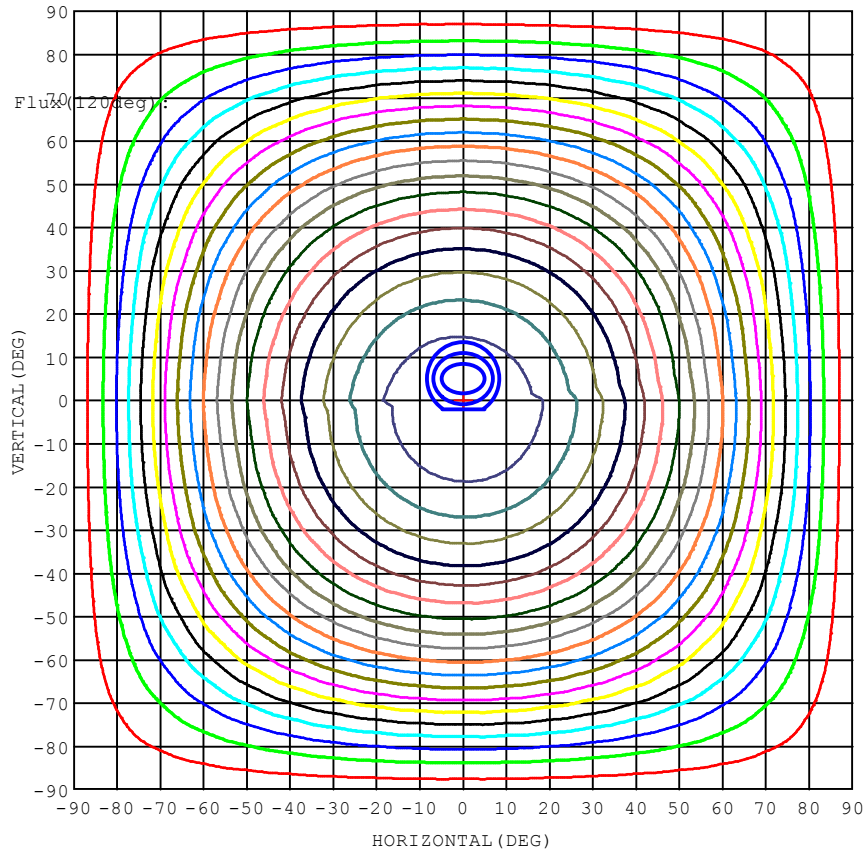
%lamp = 50.5%

Conical surface Flux(120deg):

1386.1 lm

%lum = 75.8%

%lamp = 75.8%



5%	29.51
10%	59.02
15%	88.54
20%	118.0
25%	147.6
30%	177.1
35%	206.6
40%	236.1
45%	265.6
50%	295.1
55%	324.6
60%	354.1
65%	383.7
70%	413.2
75%	442.7
80%	472.2
85%	501.7
90%	531.2
95%	560.7

1. AVG=579.6,MIN=574.5
2. AVG=578.9,MIN=569.9
3. AVG=577.6,MIN=563.9

Imax:590.2 (H0.0,V0.0)
 (At:C=0.0,Gamma=0.0)

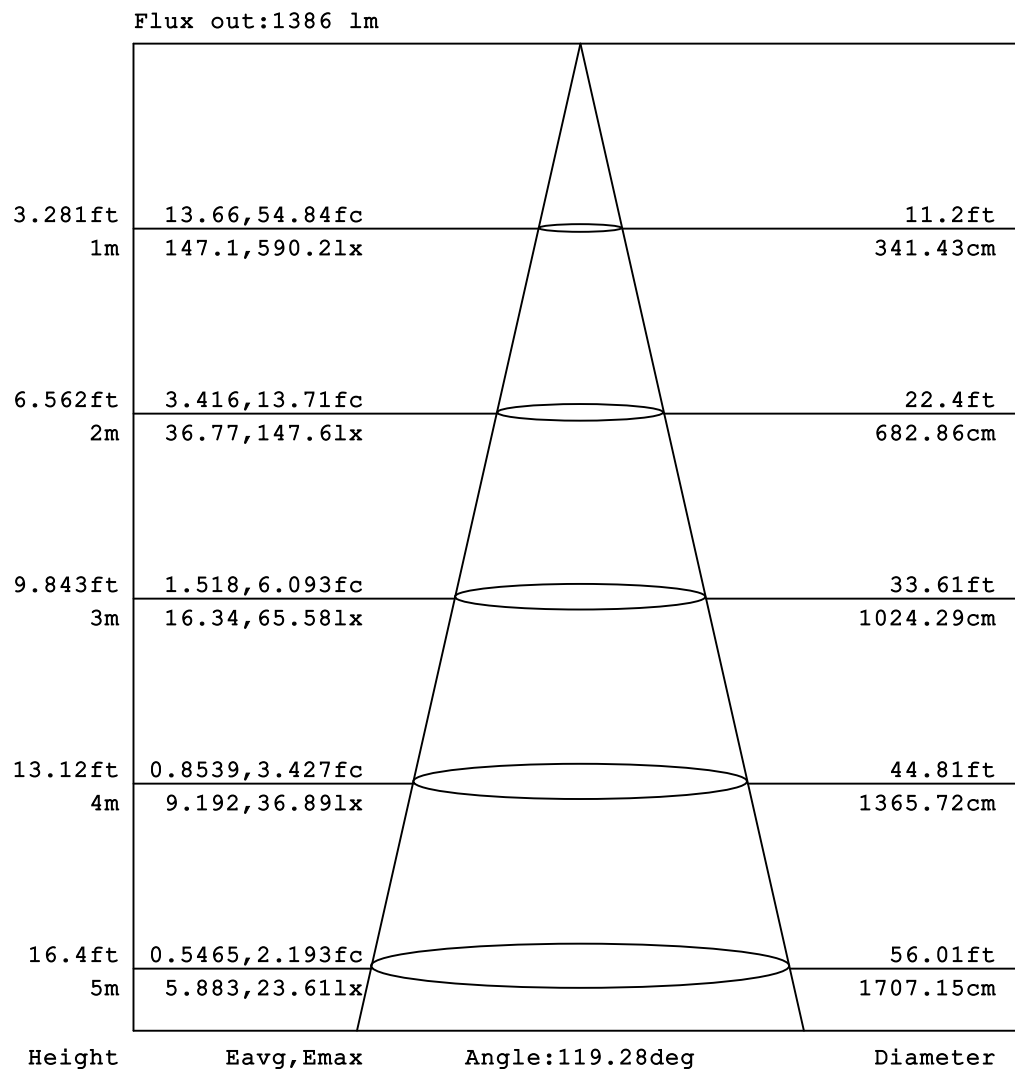
UNIT: cd

C Range: 0 - 360DEG
 C Interval: 5.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:001
 Test Date:2015-02-26

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.286
 Humidity:65.0%
 Test Distance:6.930m [K=1.0000]
 Remarks:

AAI Figure

Test:U:110.3V I:0.1757A P:19.31W PF:0.9964 Lamp Flux:1827.75x1 lm		
NAME: LED lighting	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: OPTOMA	SUR.:	PROTECTION ANGLE:



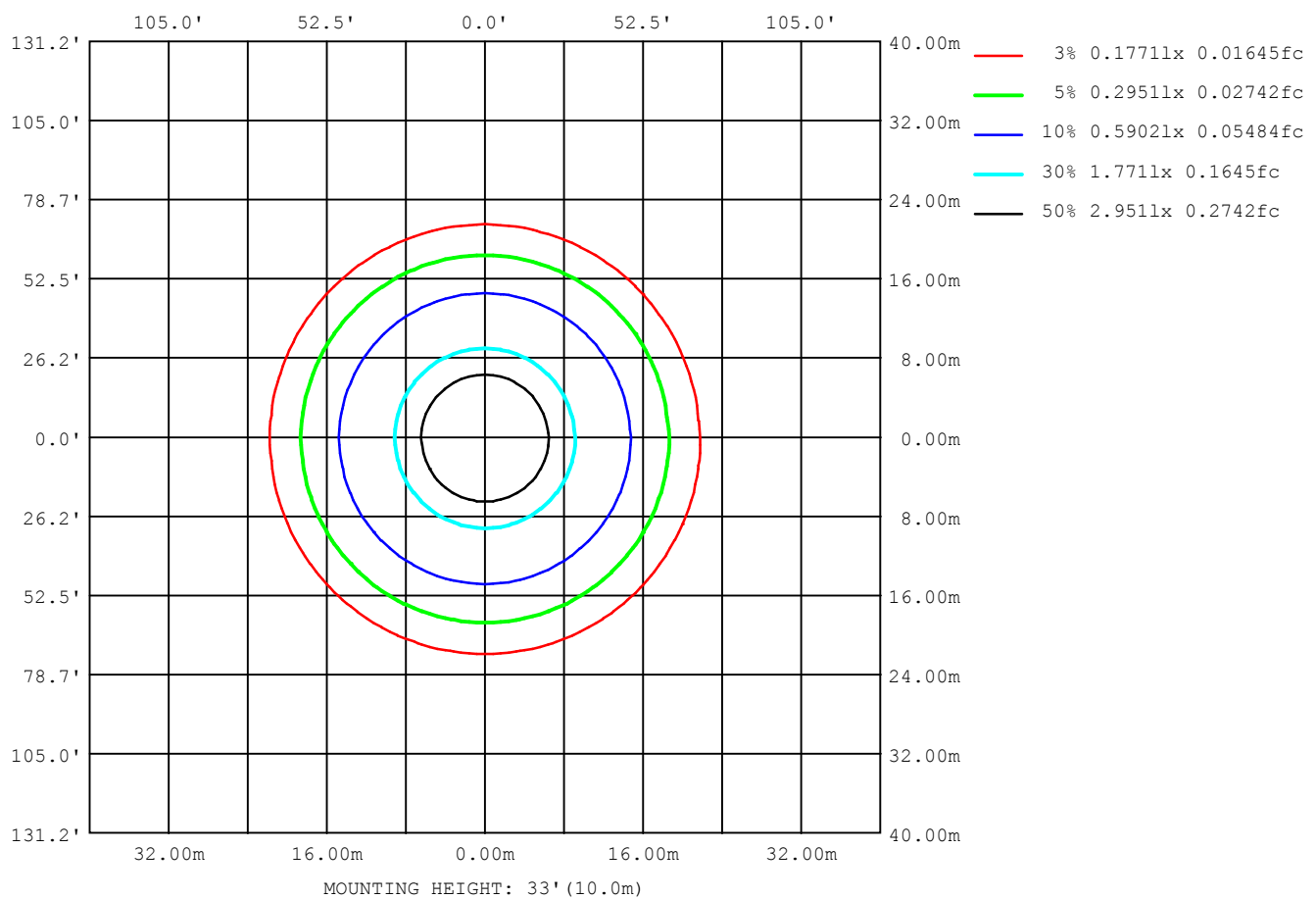
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
 C Interval: 5.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: 001
 Test Date: 2015-02-26

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.286
 Humidity: 65.0%
 Test Distance: 6.930m [K=1.0000]
 Remarks:

ISOLUX DIAGRAM

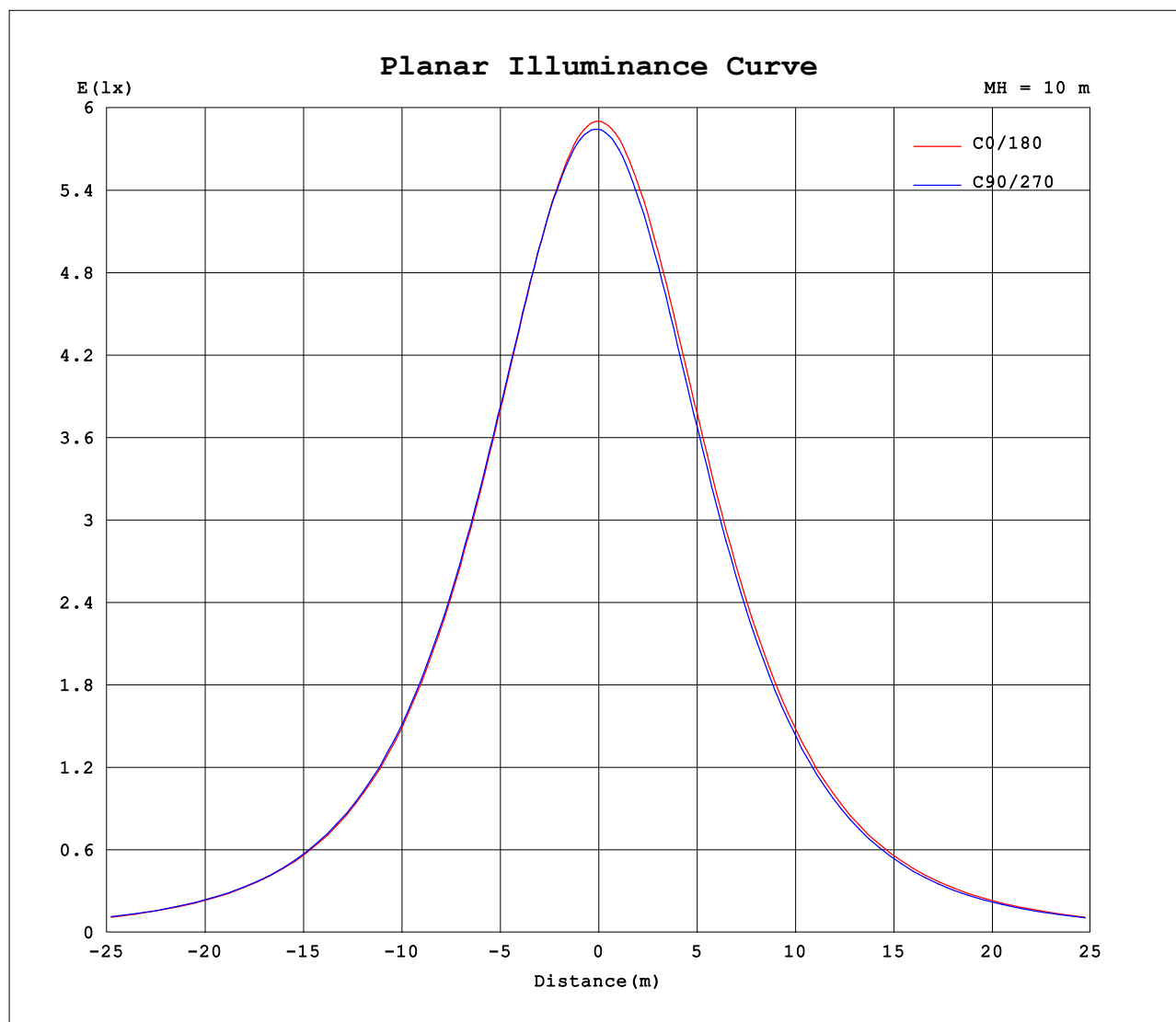
Test:U:110.3V I:0.1757A P:19.31W PF:0.9964 Lamp Flux:1827.75x1 lm		
NAME: LED lighting	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: OPTOMA	SUR.:	PROTECTION ANGLE:



C Range: 0 - 360DEG
 C Interval: 5.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:001
 Test Date:2015-02-26

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.286
 Humidity:65.0%
 Test Distance:6.930m [K=1.0000]
 Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: 001
Test Date: 2015-02-26

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.286
Humidity: 65.0%
Test Distance: 6.930m [K=1.0000]
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:110.3V I:0.1757A P:19.31W PF:0.9964 Lamp Flux:1827.75x1 lm		
NAME: LED lighting	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: OPTOMA	SUR.:	PROTECTION ANGLE:

Table--1

UNIT: cd

[illegible]

C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:001
Test Date:2015-02-26

```

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.286
Humidity:65.0%
Test Distance:6.930m [K=1.0000]
Remarks:

```

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:110.3V I:0.1757A P:19.31W PF:0.9964 Lamp Flux:1827.75x1 lm		
NAME: LED lighting	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: OPTOMA	SUR.:	PROTECTION ANGLE:

Table-2

UNIT: cd

[illegible]

C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:001
Test Date:2015-02-26

```

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.286
Humidity:65.0%
Test Distance:6.930m [K=1.0000]
Remarks:

```

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:110.3V I:0.1757A P:19.31W PF:0.9964 Lamp Flux:1827.75x1 lm		
NAME: LED lighting	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: OPTOMA	SUR.:	PROTECTION ANGLE:

Table--3

UNIT: cd

[illegible]

C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:001
Test Date:2015-02-26

```

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.286
Humidity:65.0%
Test Distance:6.930m [K=1.0000]
Remarks:

```

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:110.3V I:0.1757A P:19.31W PF:0.9964 Lamp Flux:1827.75x1 lm		
NAME: LED lighting	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: OPTOMA	SUR.:	PROTECTION ANGLE:

Table--4

UNIT: cd

[illegible]

C Range: 0 - 360DEG
C Interval: 5.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:001
Test Date:2015-02-26

```

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.286
Humidity:65.0%
Test Distance:6.930m [K=1.0000]
Remarks:

```