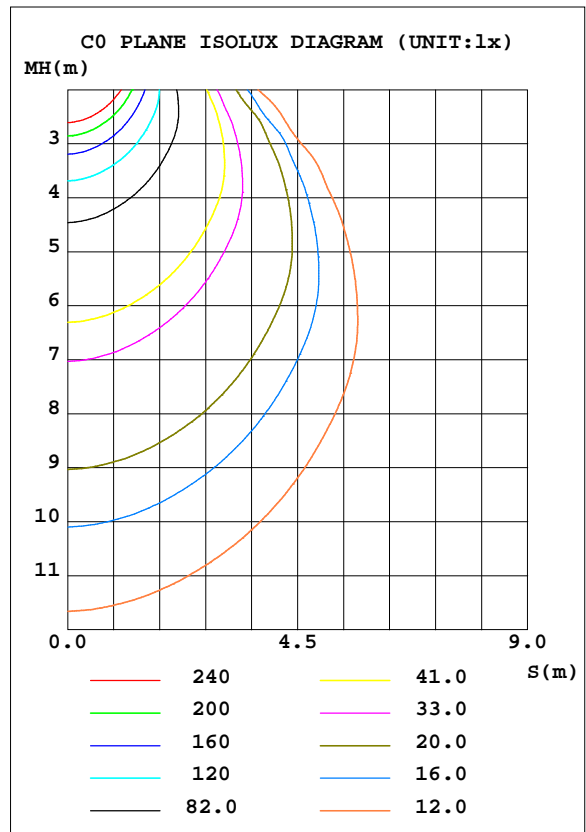
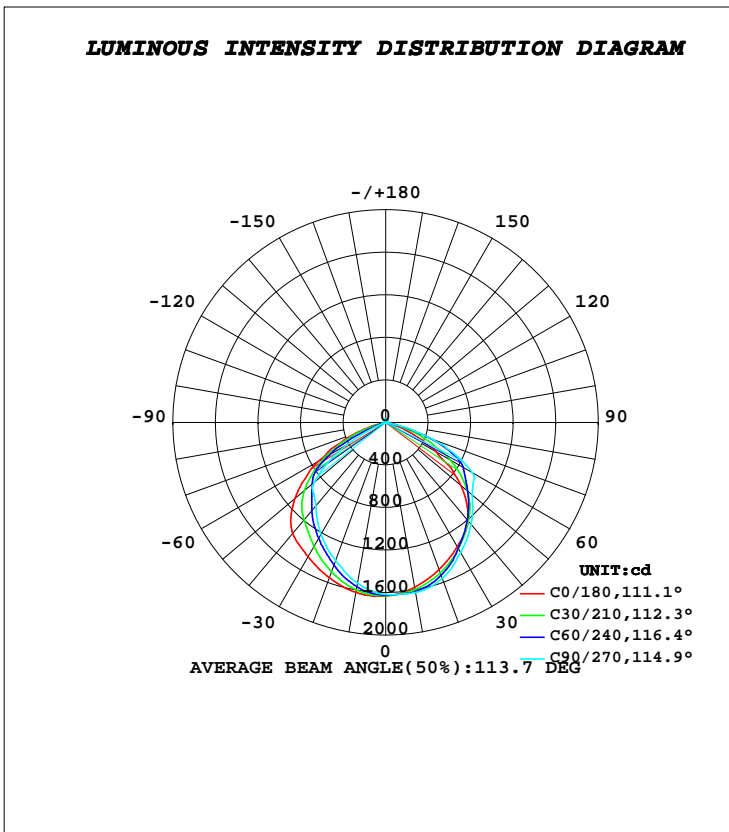


LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:220.9V I:0.2190A P:47.60W PF:0.9800 Lamp Flux:4349.02x1 lm		
NAME: GFL-50W-5730	TYPE:LED	
DIM.: 285*240MM	SUR.:175*155MM	
MFR.: GRANDOL INDUSTRY LIMITED		

DATA OF LAMP		PHOTOMETRIC DATA			
MODEL	GFL-50W-5730	Imax(cd)	1637	S/MH(C0/180)	1.24
NOMINAL POWER(W)	50	LOR(%)	100.0	S/MH(C90/270)	1.30
RATED VOLTAGE(V)	220	TOTAL FLUX(lm)	4349.0	η UP, DN(C0-180)	1.3, 53.0
NOMINAL FLUX(lm)	4349.02	CIE CLASS	DIRECT	η UP, DN(C180-360)	1.5, 44.2
LAMPS INSIDE	1	η up(%)	2.8	CIBSE SHR NOM	1.25
TEST VOLTAGE(V)	220.9	η down(%)	97.2	CIBSE SHR MAX	1.35



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2016-11-03

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.267
Humidity:65.0%
Test Distance:8.000m [K=0.7063]
Remarks:

ZONAL FLUX DIAGRAM

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	1573	1604	1623	1610	1621	1583	1535	1523	0- 10	152.8	152.8	3.51,3.51
20	1471	1516	1559	1552	1554	1460	1381	1372	10- 20	433.9	586.7	13.5,13.5
30	1349	1369	1411	1435	1459	1305	1216	1209	20- 30	651.8	1238	28.5,28.5
40	1208	1202	1250	1292	1362	1139	1024	1041	30- 40	790.6	2029	46.7,46.7
50	925.8	1005	1064	1103	1116	951.3	876.3	844.8	40- 50	840.8	2870	66,66
60	542.9	769.0	940.1	858.2	735.9	641.0	414.2	506.5	50- 60	752.5	3622	83.3,83.3
70	166.5	392.2	474.6	486.5	305.9	174.6	11.21	90.30	60- 70	469.6	4092	94.1,94.1
80	8.512	11.06	8.981	53.88	11.91	10.44	10.15	10.56	70- 80	125.2	4217	97,97
90	7.601	7.032	6.988	7.341	8.896	9.934	10.63	10.64	80- 90	10.75	4228	97.2,97.2
100	11.08	9.306	7.794	8.170	11.20	12.89	14.07	13.77	90-100	10.46	4238	97.5,97.5
110	15.46	13.30	11.34	11.59	14.93	16.78	18.06	17.61	100-110	13.62	4252	97.8,97.8
120	19.85	17.60	15.68	15.57	19.10	20.83	22.21	21.43	110-120	16.78	4269	98.2,98.2
130	23.53	21.75	19.93	19.42	22.79	24.25	25.32	24.28	120-130	18.67	4287	98.6,98.6
140	26.42	25.11	23.29	22.62	25.61	26.89	27.53	26.68	130-140	18.58	4306	99,99
150	29.39	28.42	26.69	25.86	28.33	29.31	29.87	29.04	140-150	16.84	4323	99.4,99.4
160	32.37	31.55	30.19	29.20	31.35	31.70	32.00	31.30	150-160	13.71	4337	99.7,99.7
170	34.88	34.29	33.04	32.27	34.14	34.05	33.85	33.34	160-170	9.150	4346	99.9,99.9
180	36.01	35.59	34.77	34.19	36.12	35.59	34.67	34.20	170-180	3.275	4349	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

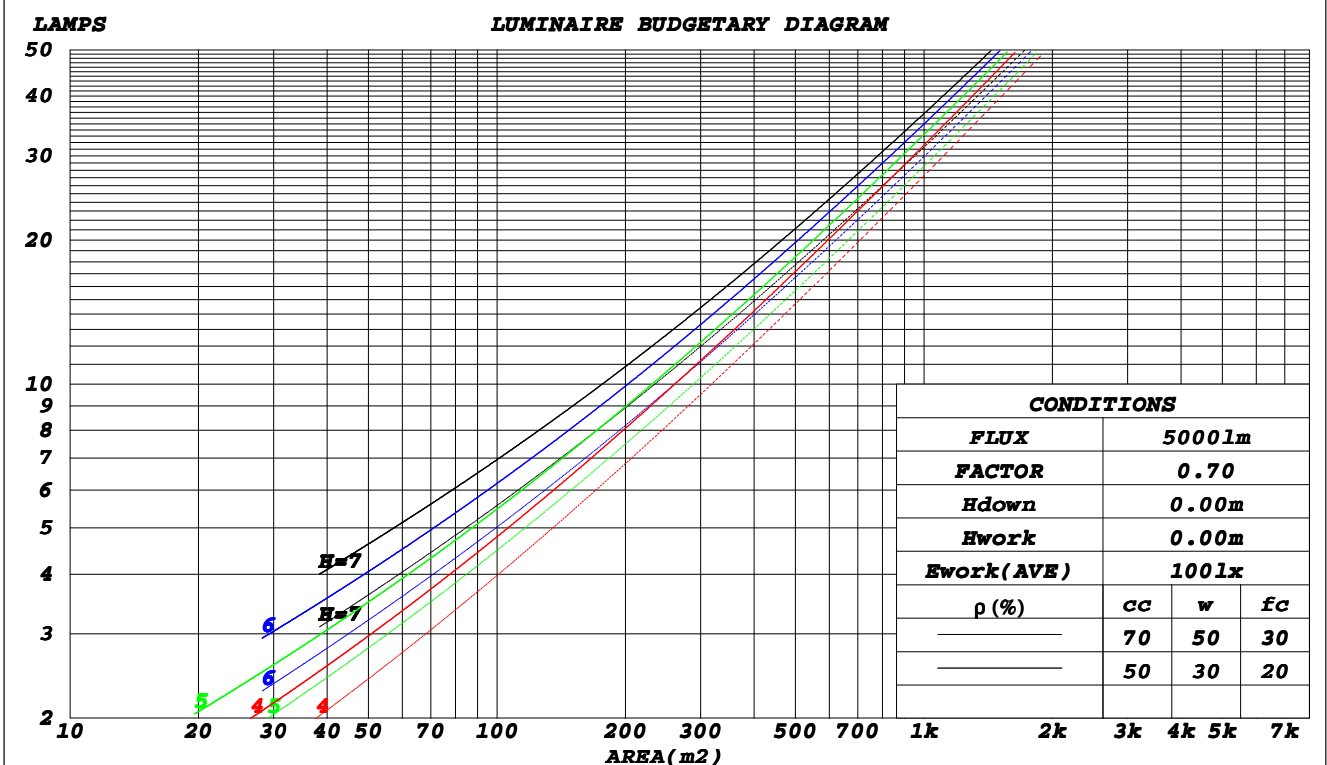
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2016-11-03

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.267
Humidity:65.0%
Test Distance:8.000m [K=0.7063]
Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:220.9V I:0.2190A P:47.60W PF:0.9800 Lamp Flux:4349.02lx1 lm		
NAME: GFL-50W-5730	TYPE:LED	
DIM.: 285*240MM	SUR.:175*155MM	
MFR.: GRANDOL INDUSTRY LIMITED		

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						Coefficients of Utilization(CU)									
0.0	1.18	1.18	1.18	1.15	1.15	1.15	1.10	1.10	1.10	1.04	1.04	1.04	.99	.99	.99	.97
1.0	1.05	1.01	.98	1.03	.99	.96	.98	.95	.93	.94	.91	.89	.90	.88	.86	.84
2.0	.93	.86	.81	.91	.85	.80	.87	.82	.78	.83	.79	.76	.80	.76	.74	.71
3.0	.82	.74	.68	.80	.73	.67	.77	.71	.66	.74	.69	.64	.71	.67	.63	.61
4.0	.73	.64	.58	.71	.63	.57	.68	.62	.56	.66	.60	.55	.63	.58	.54	.52
5.0	.65	.56	.50	.64	.56	.50	.61	.54	.49	.59	.53	.48	.57	.52	.47	.45
6.0	.58	.50	.44	.57	.49	.43	.55	.48	.43	.53	.47	.42	.52	.46	.42	.39
7.0	.53	.44	.38	.52	.44	.38	.50	.43	.38	.49	.42	.37	.47	.41	.37	.35
8.0	.48	.40	.34	.47	.40	.34	.46	.39	.34	.44	.38	.33	.43	.37	.33	.31
9.0	.44	.36	.31	.44	.36	.31	.42	.35	.30	.41	.35	.30	.40	.34	.30	.28
10.0	.41	.33	.28	.40	.33	.28	.39	.32	.28	.38	.32	.27	.37	.31	.27	.25



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2016-11-03

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.267
 Humidity: 65.0%
 Test Distance: 8.000m [K=0.7063]
 Remarks:

WEC AND CCEC

Test:U:220.9V I:0.2190A P:47.60W PF:0.9800 Lamp Flux:4349.02x1 lm		
NAME: GFL-50W-5730	TYPE:LED	
DIM.: 285*240MM	SUR.:175*155MM	
MFR.: GRANDOL INDUSTRY LIMITED		

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	.271	.154	.049	.263	.150	.048	.248	.142	.045	.235	.135	.043	.222	.129	.042	
2.0	.264	.145	.044	.257	.142	.044	.244	.136	.042	.233	.130	.041	.222	.125	.040	
3.0	.250	.133	.040	.244	.131	.039	.233	.126	.038	.222	.122	.037	.212	.117	.036	
4.0	.235	.122	.036	.229	.120	.035	.219	.116	.035	.209	.112	.034	.201	.109	.033	
5.0	.219	.112	.032	.215	.110	.032	.205	.107	.031	.197	.104	.031	.189	.101	.030	
6.0	.205	.103	.029	.201	.101	.029	.193	.099	.029	.185	.096	.028	.178	.094	.028	
7.0	.192	.095	.027	.188	.094	.027	.181	.091	.026	.174	.089	.026	.167	.087	.026	
8.0	.180	.088	.025	.177	.087	.025	.170	.085	.024	.164	.083	.024	.158	.081	.024	
9.0	.169	.082	.023	.166	.081	.023	.160	.079	.022	.155	.077	.022	.149	.076	.022	
10.0	.160	.077	.021	.157	.076	.021	.151	.074	.021	.146	.073	.021	.141	.071	.020	

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	.212	.212	.212	.181	.181	.181	.123	.123	.123	.071	.071	.071	.023	.023	.023	
1.0	.199	.178	.159	.170	.153	.137	.116	.105	.095	.067	.061	.055	.021	.020	.018	
2.0	.190	.154	.123	.163	.132	.106	.112	.091	.074	.064	.053	.043	.021	.017	.014	
3.0	.182	.136	.099	.156	.117	.086	.107	.081	.060	.062	.048	.035	.020	.015	.012	
4.0	.175	.122	.082	.150	.106	.071	.103	.074	.050	.060	.043	.030	.019	.014	.010	
5.0	.168	.112	.071	.144	.097	.061	.099	.068	.043	.058	.040	.026	.019	.013	.008	
6.0	.161	.104	.062	.139	.090	.054	.096	.063	.038	.055	.037	.023	.018	.012	.008	
7.0	.155	.097	.056	.133	.084	.049	.092	.059	.035	.053	.035	.021	.017	.011	.007	
8.0	.149	.091	.051	.128	.079	.045	.089	.055	.032	.052	.033	.019	.017	.011	.006	
9.0	.143	.086	.048	.123	.075	.042	.085	.053	.030	.050	.031	.018	.016	.010	.006	
10.0	.137	.082	.045	.118	.071	.039	.082	.050	.028	.048	.030	.017	.016	.010	.006	

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2016-11-03

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.267
 Humidity:65.0%
 Test Distance:8.000m [K=0.7063]
 Remarks:

Uncorrected UGR Table

Test:U:220.9V I:0.2190A P:47.60W PF:0.9800 Lamp Flux:4349.02x1 lm		
NAME: GFL-50W-5730	TYPE:LED	
DIM.: 285*240MM	SUR.:175*155MM	
MFR.: GRANDOL INDUSTRY LIMITED		

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	26.4	27.9	26.7	28.1	28.4	28.0	29.4	28.3	29.6	29.9
3H	27.0	28.3	27.3	28.5	28.8	29.4	30.7	29.8	31.0	31.3
4H	26.9	28.2	27.3	28.5	28.8	29.6	30.9	30.0	31.2	31.5
6H	26.8	28.0	27.2	28.3	28.6	29.5	30.7	29.9	31.0	31.3
8H	26.8	27.9	27.1	28.2	28.6	29.5	30.6	29.9	30.9	31.3
12H	26.7	27.8	27.1	28.1	28.5	29.4	30.5	29.8	30.8	31.2
4H 2H	27.2	28.4	27.6	28.7	29.0	28.4	29.7	28.8	30.0	30.3
3H	27.9	28.9	28.3	29.3	29.6	30.0	31.1	30.4	31.4	31.8
4H	27.9	28.8	28.3	29.2	29.6	30.2	31.2	30.6	31.6	31.9
6H	27.8	28.6	28.2	29.0	29.5	30.2	31.0	30.6	31.4	31.8
8H	27.7	28.5	28.2	28.9	29.4	30.1	30.9	30.6	31.3	31.8
12H	27.7	28.4	28.2	28.9	29.3	30.1	30.8	30.5	31.2	31.7
8H 4H	28.0	28.8	28.4	29.2	29.6	30.2	31.0	30.6	31.4	31.8
6H	27.9	28.6	28.4	29.0	29.5	30.1	30.8	30.6	31.2	31.7
8H	27.9	28.4	28.4	28.9	29.4	30.1	30.6	30.6	31.1	31.6
12H	27.8	28.3	28.4	28.8	29.3	30.0	30.5	30.6	31.0	31.5
12H 4H	27.9	28.7	28.4	29.1	29.6	30.1	30.8	30.6	31.3	31.7
6H	27.9	28.4	28.4	28.9	29.4	30.1	30.6	30.6	31.1	31.6
8H	27.8	28.3	28.3	28.8	29.3	30.0	30.5	30.6	31.0	31.5
Variations with the observer position at spacings:										
S = 1.0H	+ 0.4 / - 0.4					+ 0.2 / - 0.3				
1.5H	+ 0.5 / - 0.6					+ 0.2 / - 0.3				
2.0H	+ 0.5 / - 0.9					+ 0.5 / - 0.8				

CIE Pub.117 Corrected 4349 lm Total Lamp Luminous Flux.(8log(F/F0) = 5.1)

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2016-11-03

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.267
 Humidity:65.0%
 Test Distance:8.000m [K=0.7063]
 Remarks:

UTILIZATION FACTORS TABLE

Test:U:220.9V I:0.2190A P:47.60W PF:0.9800 Lamp Flux:4349.02x1 lm		
NAME: GFL-50W-5730	TYPE:LED	
DIM.: 285*240MM	SUR.:175*155MM	
MFR.: GRANDOL INDUSTRY LIMITED		

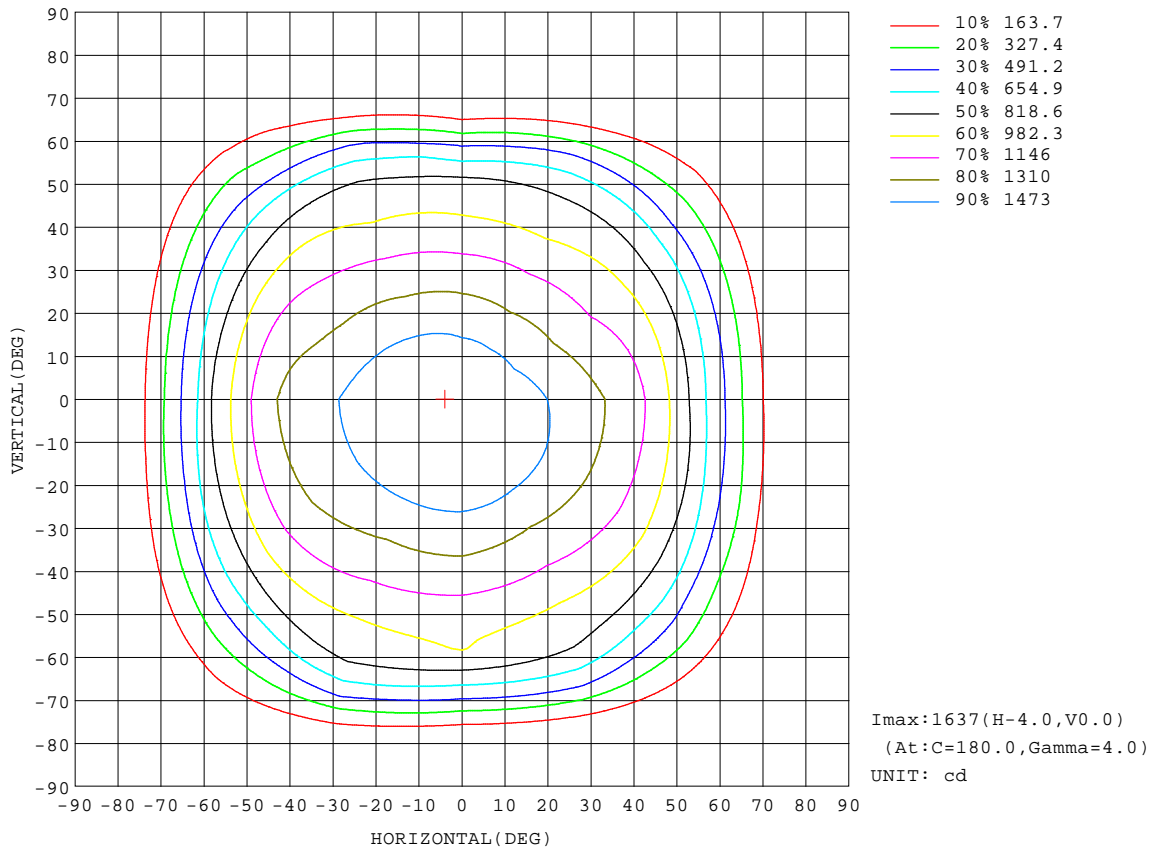
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
k = 0.60	58	47	40	57	46	40	56	46	39	33
0.80	69	57	50	67	57	50	66	56	50	43
1.00	78	67	60	76	66	60	74	67	59	52
1.25	85	75	68	83	74	68	80	72	67	59
1.50	90	81	74	88	80	73	85	78	72	65
2.00	97	89	83	95	87	82	91	85	80	72
2.50	100	93	88	98	92	87	94	89	84	76
3.00	103	97	92	101	95	91	97	92	88	80
4.00	107	102	98	105	100	96	100	96	93	84
5.00	109	105	101	107	103	100	102	99	96	86
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended					SHRNOM = 1.25		

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2016-11-03

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.267
Humidity:65.0%
Test Distance:8.000m [K=0.7063]
Remarks:

ISOCANDELA DIAGRAM

Test:U:220.9V I:0.2190A P:47.60W PF:0.9800 Lamp Flux:4349.02x1 lm		
NAME: GFL-50W-5730	TYPE:LED	
DIM.: 285*240MM	SUR.:175*155MM	
MFR.: GRANDOL INDUSTRY LIMITED		



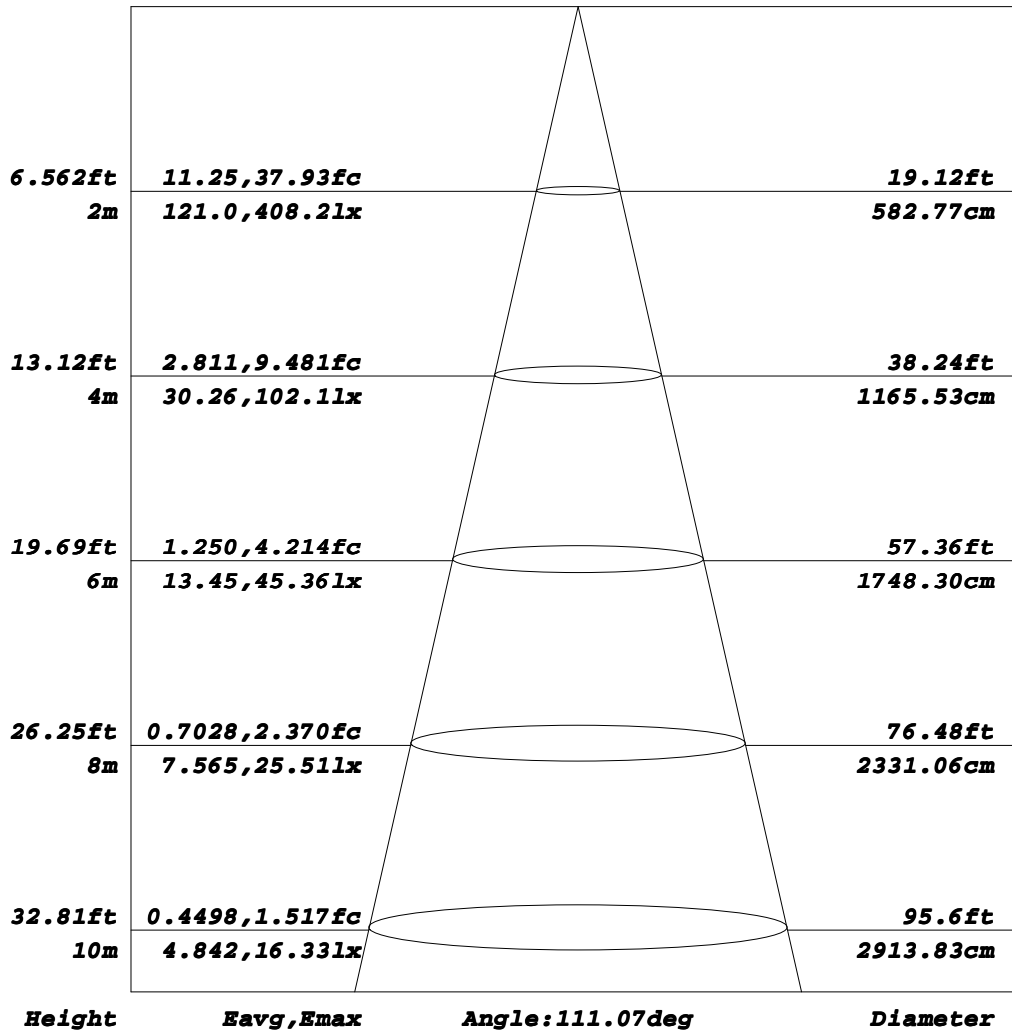
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2016-11-03

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.267
Humidity:65.0%
Test Distance:8.000m [K=0.7063]
Remarks:

AAI Figure

Test:U:220.9V I:0.2190A P:47.60W PF:0.9800 Lamp Flux:4349.02x1 lm		
NAME: GFL-50W-5730	TYPE:LED	
DIM.: 285*240MM	SUR.:175*155MM	
MFR.: GRANDOL INDUSTRY LIMITED		

Flux out:3343 lm



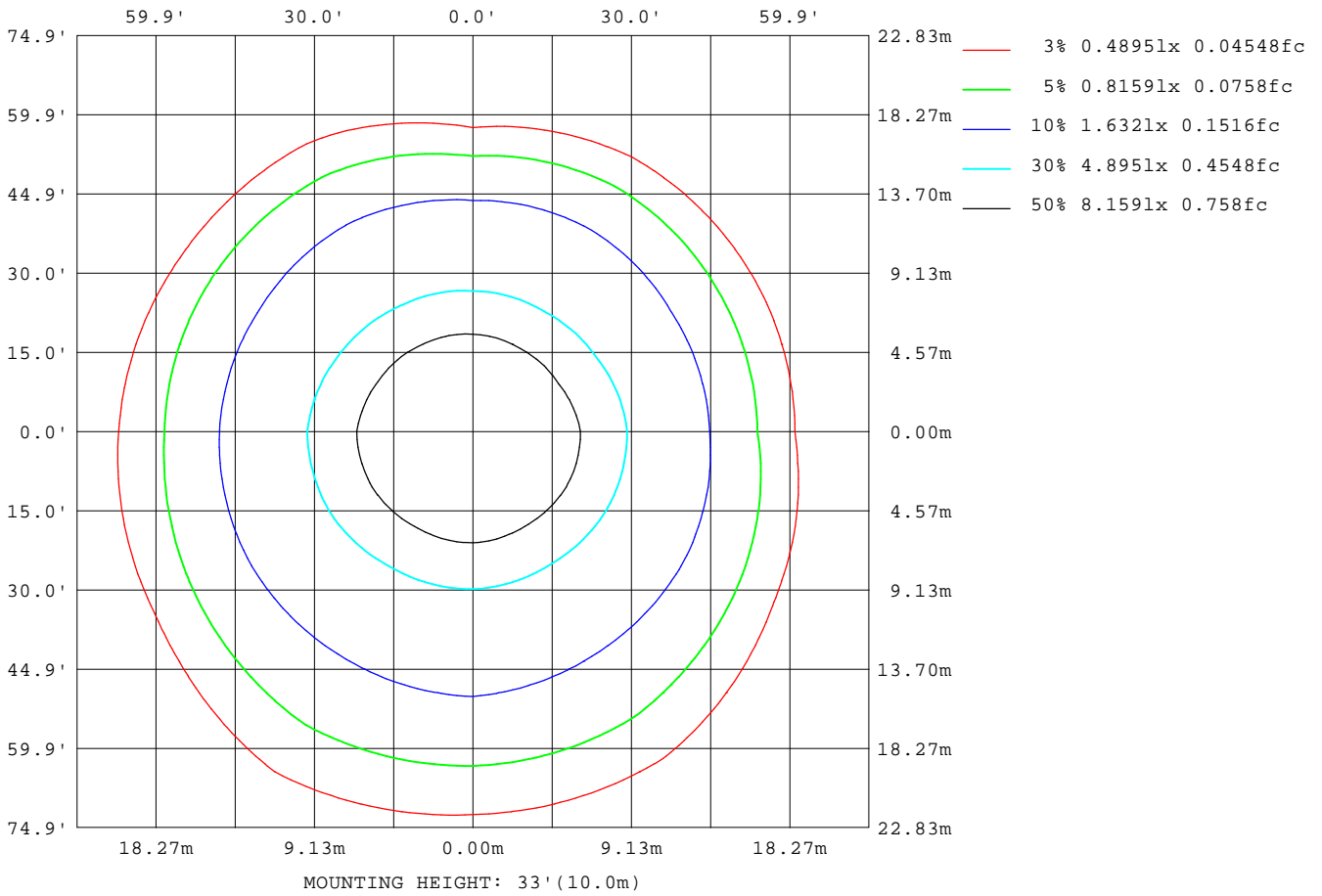
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2016-11-03

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.267
 Humidity: 65.0%
 Test Distance: 8.000m [K=0.7063]
 Remarks:

ISOLUX DIAGRAM

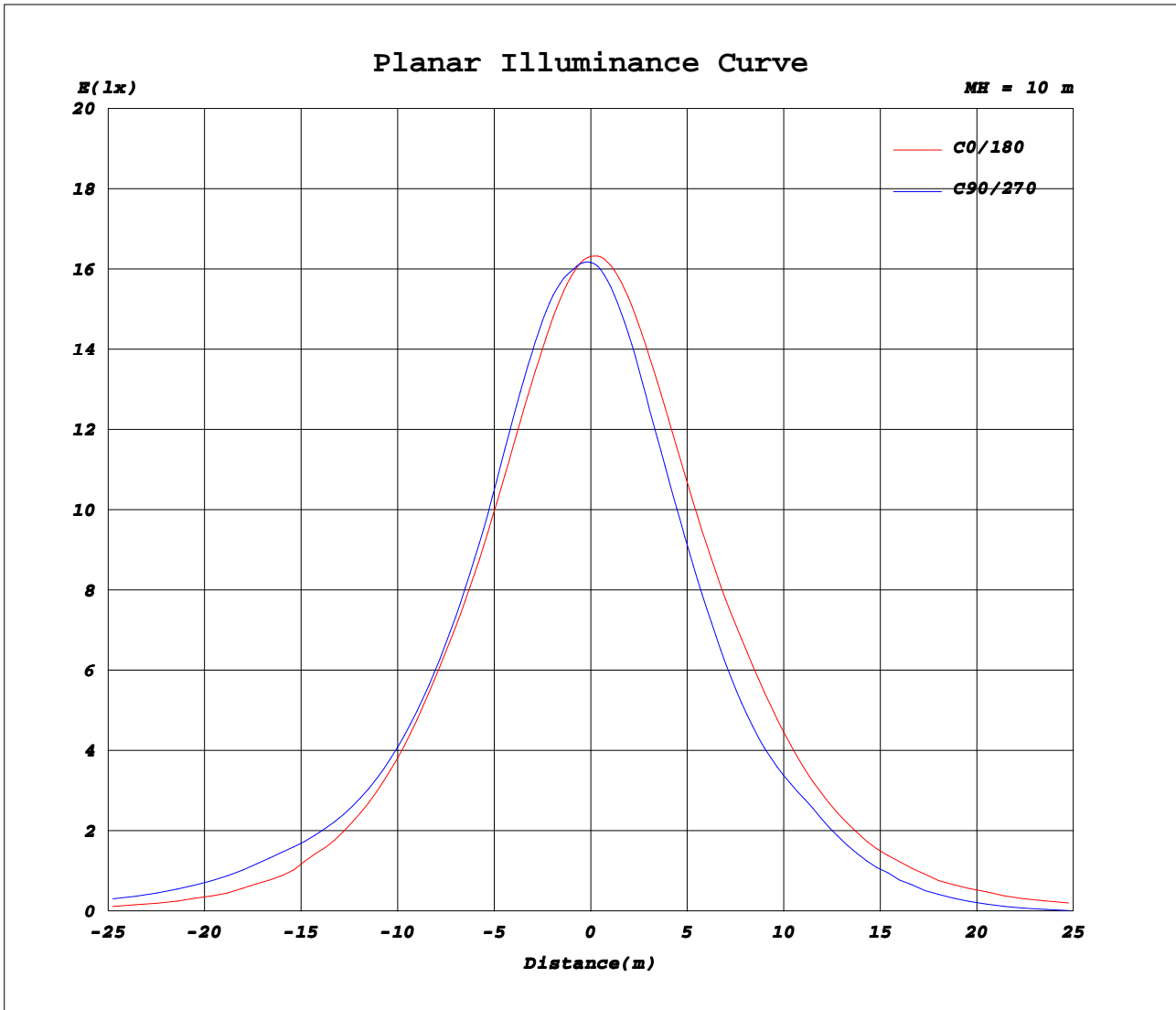
Test:U:220.9V I:0.2190A P:47.60W PF:0.9800 Lamp Flux:4349.02x1 lm		
NAME: GFL-50W-5730	TYPE:LED	
DIM.: 285*240MM	SUR.:175*155MM	
MFR.: GRANDOL INDUSTRY LIMITED		



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2016-11-03

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.267
Humidity:65.0%
Test Distance:8.000m [K=0.7063]
Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2016-11-03

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.267
Humidity: 65.0%
Test Distance: 8.000m [K=0.7063]
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:220.9V I:0.2190A P:47.60W PF:0.9800 Lamp Flux:4349.02x1 lm		
NAME: GFL-50W-5730	TYPE:LED	
DIM.: 285*240MM	SUR.:175*155MM	
MFR.: GRANDOL INDUSTRY LIMITED		

Table--1

UNIT: cd

C(DEG) γ (DEG)	0	30	60	90	120	150	180	210	240	270	300	330							
0	1632	1629	1623	1617	1611	1604	1632	1629	1623	1617	1611	1604							
5	1611	1618	1621	1619	1619	1611	1636	1625	1610	1590	1579	1575							
10	1573	1595	1613	1623	1618	1602	1621	1598	1569	1535	1522	1523							
15	1524	1554	1583	1605	1600	1576	1593	1554	1508	1462	1447	1459							
20	1471	1504	1528	1559	1560	1544	1554	1493	1427	1381	1359	1386							
25	1412	1443	1459	1493	1497	1504	1509	1427	1343	1303	1276	1306							
30	1349	1371	1366	1411	1417	1452	1459	1348	1261	1216	1193	1225							
35	1288	1291	1280	1334	1332	1392	1412	1266	1175	1121	1105	1145							
40	1208	1208	1196	1250	1254	1329	1362	1196	1082	1024	1010	1073							
45	1080	1120	1104	1157	1170	1250	1262	1117	986	957	914	980							
50	926	1004	1007	1064	1076	1130	1116	999	904	876	837	853							
55	754	859	918	1004	981	985	928	844	806	668	719	690							
60	543	697	840	940	902	814	736	672	610	414	521	492							
65	336	493	693	728	796	603	504	467	353	162	250	321							
70	167	315	470	475	575	398	306	254	95.2	11.2	31.8	149							
75	30.5	137	191	196	290	224	126	67.3	10.7	10.4	10.8	18.9							
80	8.51	12.9	9.24	8.98	47.3	60.5	11.9	10.6	10.3	10.1	10.4	10.7							
85	7.50	7.93	7.87	7.71	8.38	8.27	10.0	9.92	10.2	9.44	9.65	9.83							
90	7.60	6.89	7.17	6.99	7.41	7.27	8.90	9.57	10.3	10.6	10.9	10.4							
95	9.17	8.19	7.30	6.56	6.70	7.06	9.81	10.9	11.7	12.1	12.3	11.8							
100	11.1	9.90	8.72	7.79	7.93	8.41	11.2	12.4	13.4	14.1	14.1	13.5							
105	13.2	11.9	10.5	9.35	9.43	10.0	12.9	14.3	15.3	16.1	16.0	15.3							
110	15.5	14.0	12.6	11.3	11.3	11.9	14.9	16.3	17.3	18.1	17.9	17.3							
115	17.7	16.2	14.7	13.5	13.3	13.9	17.0	18.3	19.3	20.2	19.9	19.2							
120	19.9	18.4	16.9	15.7	15.3	15.9	19.1	20.3	21.3	22.2	21.9	21.0							
125	21.8	20.4	19.1	17.9	17.4	17.8	21.0	22.1	23.2	23.9	23.5	22.4							
130	23.5	22.3	21.2	19.9	19.3	19.5	22.8	23.7	24.7	25.3	24.9	23.6							
135	25.0	24.0	23.0	21.7	21.0	21.2	24.2	25.2	26.0	26.4	26.1	24.8							
140	26.4	25.6	24.6	23.3	22.6	22.7	25.6	26.5	27.3	27.5	27.3	26.1							
145	27.9	27.4	26.1	24.9	24.2	24.2	27.0	27.7	28.5	28.7	28.4	27.4							
150	29.4	29.0	27.8	26.7	26.0	25.8	28.3	29.0	29.7	29.9	29.5	28.6							
155	30.9	30.5	29.6	28.5	27.7	27.4	29.8	30.2	30.8	31.0	30.6	29.8							
160	32.4	32.0	31.1	30.2	29.4	29.0	31.3	31.5	31.9	32.0	31.7	30.9							
165	33.7	33.3	32.6	31.6	30.9	30.7	32.8	32.8	33.0	32.9	32.7	32.0							
170	34.9	34.6	33.9	33.0	32.3	32.2	34.1	34.0	34.1	33.9	33.6	33.1							
175	35.9	35.6	35.0	34.2	33.6	33.4	35.4	35.1	34.9	34.5	34.2	33.9							
180	36.0	35.9	35.3	34.8	34.3	34.1	36.1	35.8	35.4	34.7	34.3	34.1							

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2016-11-03

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.267
Humidity:65.0%
Test Distance:8.000m [K=0.7063]
Remarks: