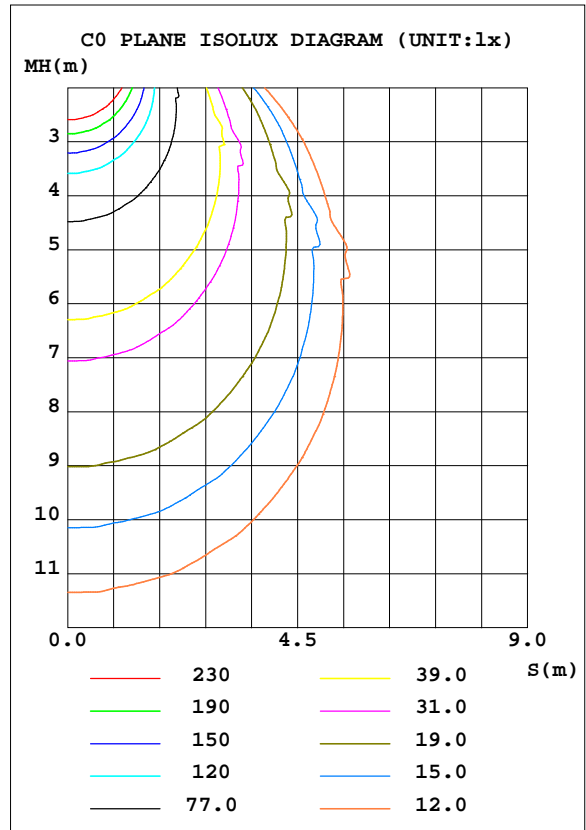
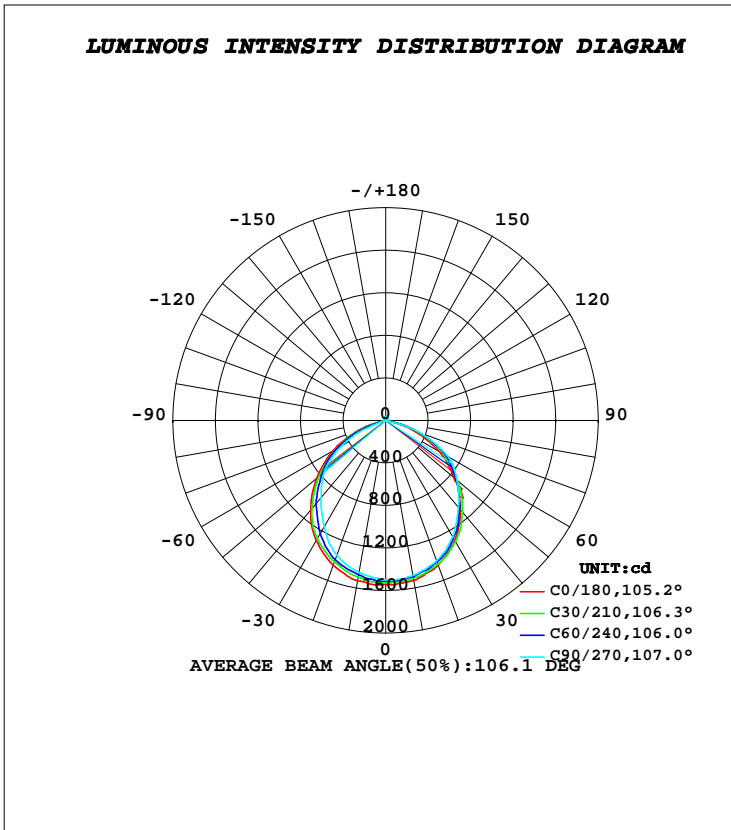


LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:220.1V I:0.2160A P:47.00W PF:0.9870 Lamp Flux:3907.3x1 lm		
NAME: DFL-50W	TYPE:LED	
MFR.: GRANDOL INDUSTRY LTD		

DATA OF LAMP		PHOTOMETRIC DATA Eff: 83.13 lm/W			
MODEL	DFL-50W	I _{max} (cd)	1550	S/MH(C0/180)	1.25
NOMINAL POWER(W)	50	LOR(%)	100.0	S/MH(C90/270)	1.25
RATED VOLTAGE(V)	220	TOTAL FLUX(lm)	3907.3	η UP, DN(C0-180)	1.3, 51.1
NOMINAL FLUX(lm)	3907.3	CIE CLASS	DIRECT	η UP, DN(C180-360)	1.5, 46.1
LAMPS INSIDE	1	η up(%)	2.8	CIBSE SHR NOM	1.25
TEST VOLTAGE(V)	220.1	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: 2018-05-17

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	1528	1499	1480	1470	1531	1484	1451	1438	0- 10	142.6	142.6	3.65,3.65
20	1446	1426	1403	1399	1448	1403	1350	1353	10- 20	408.3	550.9	14.1,14.1
30	1299	1295	1264	1275	1306	1258	1156	1199	20- 30	615.4	1166	29.8,29.8
40	1094	1101	1065	1092	1096	1048	946.7	997.1	30- 40	726.8	1893	48.5,48.5
50	838.4	873.0	875.6	861.4	849.4	801.6	754.7	770.7	40- 50	729.9	2623	67.1,67.1
60	577.3	635.9	675.1	624.2	575.4	537.4	475.0	510.9	50- 60	630.0	3253	83.3,83.3
70	274.5	327.1	346.1	329.2	269.9	231.4	90.71	191.9	60- 70	417.2	3670	93.9,93.9
80	6.398	11.23	5.943	15.44	9.812	9.798	8.928	9.539	70- 80	119.9	3790	97,97
90	5.682	5.399	5.022	5.407	8.967	9.261	9.344	9.467	80- 90	8.137	3798	97.2,97.2
100	8.535	8.007	7.311	7.782	11.51	11.88	12.07	11.96	90-100	9.300	3807	97.4,97.4
110	12.19	11.51	10.74	11.08	15.02	15.36	15.59	15.28	100-110	12.21	3820	97.8,97.8
120	16.05	15.36	14.64	14.72	18.70	18.93	19.18	18.67	110-120	15.05	3835	98.1,98.1
130	19.53	19.00	18.27	18.11	21.83	21.93	22.04	21.48	120-130	16.70	3851	98.6,98.6
140	22.73	22.23	21.50	21.24	24.46	24.44	24.41	23.94	130-140	16.74	3868	99,99
150	25.76	25.38	24.68	24.28	26.90	26.72	26.65	26.24	140-150	15.31	3883	99.4,99.4
160	28.67	28.29	27.67	27.16	29.48	28.99	28.78	28.37	150-160	12.49	3896	99.7,99.7
170	31.56	31.08	30.38	29.98	31.84	31.18	30.70	30.31	160-170	8.351	3904	99.9,99.9
180	33.06	32.63	32.11	31.54	33.38	32.62	31.91	31.56	170-180	3.004	3907	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

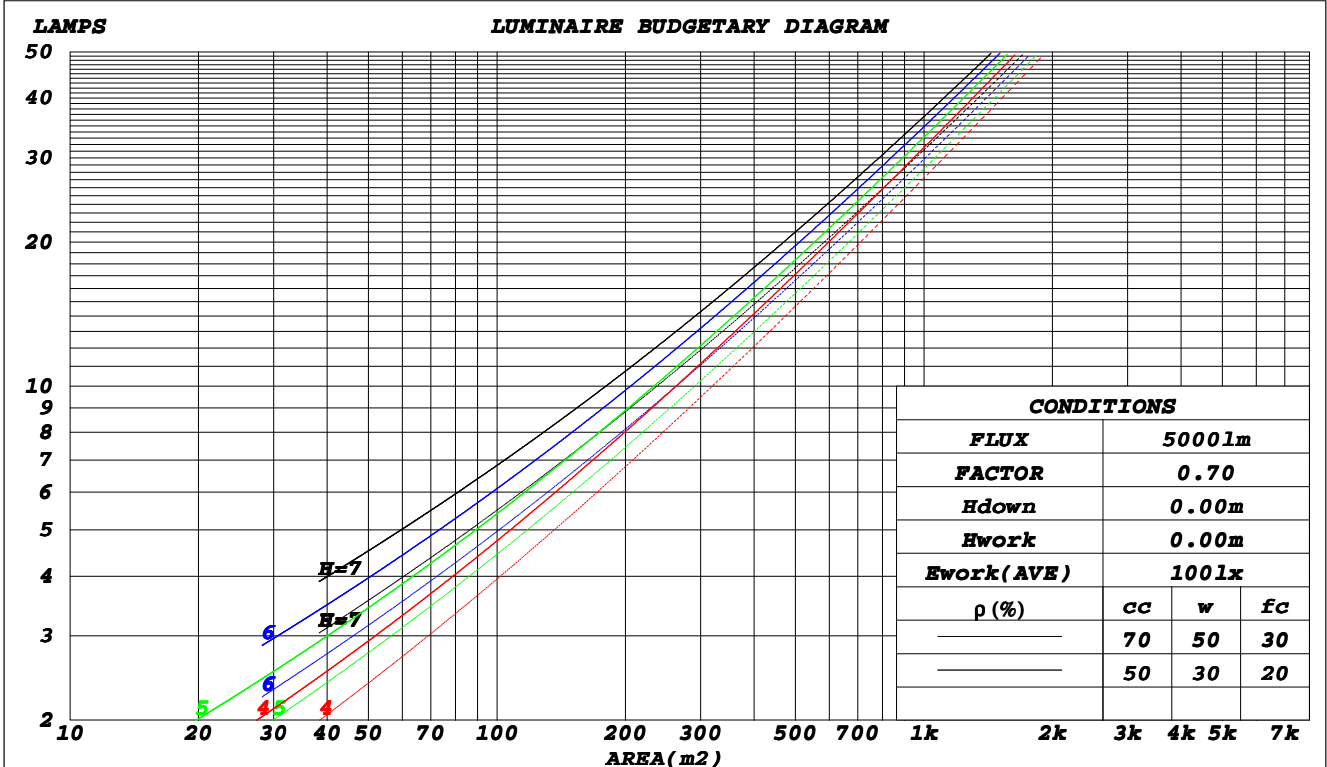
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-05-17

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:220.1V I:0.2160A P:47.00W PF:0.9870 Lamp Flux:3907.3x1 lm		
NAME: DFL-50W	TYPE:LED	
MFR.: GRANDOL INDUSTRY LTD		

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	1.02	.98	1.03	.99	.96	.98	.95	.93	.94	.92	.90	.90	.88	.86	.84
2.0	.93	.87	.82	.91	.85	.80	.87	.82	.78	.83	.79	.76	.80	.77	.74	.72
3.0	.82	.75	.69	.80	.73	.68	.77	.71	.66	.74	.69	.65	.71	.67	.63	.61
4.0	.73	.65	.59	.72	.64	.58	.69	.62	.57	.66	.60	.56	.64	.59	.55	.53
5.0	.65	.57	.51	.64	.56	.50	.62	.55	.49	.60	.53	.49	.58	.52	.48	.46
6.0	.59	.50	.44	.58	.50	.44	.56	.49	.43	.54	.48	.43	.52	.47	.42	.40
7.0	.54	.45	.39	.53	.45	.39	.51	.44	.39	.49	.43	.38	.48	.42	.38	.36
8.0	.49	.41	.35	.48	.40	.35	.47	.40	.35	.45	.39	.34	.44	.38	.34	.32
9.0	.45	.37	.32	.44	.37	.31	.43	.36	.31	.42	.35	.31	.40	.35	.31	.29
10.0	.41	.34	.29	.41	.34	.29	.40	.33	.28	.39	.32	.28	.38	.32	.28	.26



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2018-05-17

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:220.1V I:0.2160A P:47.00W PF:0.9870 Lamp Flux:3907.3x1 lm		
NAME: DFL-50W	TYPE:LED	
MFR.: GRANDOL INDUSTRY LTD		

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	.268	.153	.048	.261	.149	.047	.246	.141	.045	.233	.134	.043	.220	.128	.041	
2.0	.262	.144	.044	.255	.141	.043	.242	.135	.042	.230	.129	.040	.219	.124	.039	
3.0	.248	.132	.040	.242	.129	.039	.230	.125	.038	.220	.120	.037	.210	.116	.036	
4.0	.232	.121	.035	.227	.119	.035	.217	.115	.034	.207	.111	.034	.198	.108	.033	
5.0	.217	.111	.032	.212	.109	.032	.203	.106	.031	.195	.103	.031	.187	.100	.030	
6.0	.203	.102	.029	.199	.100	.029	.191	.098	.028	.183	.095	.028	.176	.093	.027	
7.0	.190	.094	.027	.186	.093	.026	.179	.090	.026	.172	.088	.026	.166	.086	.025	
8.0	.179	.087	.025	.175	.086	.024	.168	.084	.024	.162	.082	.024	.156	.080	.023	
9.0	.168	.081	.023	.165	.080	.023	.159	.079	.022	.153	.077	.022	.148	.075	.022	
10.0	.158	.076	.021	.156	.075	.021	.150	.074	.021	.145	.072	.020	.140	.070	.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																
1.0	.212	.212	.212	.181	.181	.181	.124	.124	.124	.071	.071	.071	.023	.023	.023	
2.0	.199	.178	.159	.170	.153	.137	.116	.105	.095	.067	.061	.055	.021	.020	.018	
3.0	.190	.154	.123	.163	.132	.107	.111	.092	.074	.064	.053	.044	.021	.017	.014	
4.0	.182	.136	.099	.156	.117	.086	.107	.081	.060	.062	.048	.036	.020	.015	.012	
5.0	.175	.122	.083	.150	.106	.072	.103	.074	.051	.060	.043	.030	.019	.014	.010	
6.0	.167	.112	.071	.144	.097	.062	.099	.068	.044	.057	.040	.026	.018	.013	.009	
7.0	.161	.104	.063	.138	.090	.055	.095	.063	.039	.055	.037	.023	.018	.012	.008	
8.0	.154	.097	.056	.133	.084	.049	.092	.059	.035	.053	.035	.021	.017	.011	.007	
9.0	.148	.091	.052	.127	.079	.045	.088	.055	.032	.051	.033	.019	.017	.011	.006	
10.0	.142	.086	.048	.123	.075	.042	.085	.052	.030	.049	.031	.018	.016	.010	.006	
10.0	.137	.082	.045	.118	.071	.039	.082	.050	.028	.048	.030	.017	.015	.010	.006	

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-05-17

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:220.1V I:0.2160A P:47.00W PF:0.9870 Lamp Flux:3907.3x1 lm		
NAME: DFL-50W	TYPE:LED	
MFR.: GRANDOL INDUSTRY LTD		

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	25.0	26.4	25.3	26.6	26.9	25.3	26.7	25.6	27.0	27.2
3H	26.0	27.2	26.3	27.5	27.8	26.5	27.8	26.8	28.1	28.4
4H	26.1	27.3	26.5	27.6	27.9	26.7	27.9	27.0	28.2	28.5
6H	26.0	27.2	26.4	27.5	27.8	26.6	27.7	27.0	28.0	28.4
8H	26.0	27.1	26.4	27.4	27.7	26.5	27.6	26.9	28.0	28.3
12H	25.9	27.0	26.3	27.3	27.7	26.5	27.5	26.9	27.9	28.2
4H 2H	25.5	26.7	25.9	27.0	27.3	25.8	27.0	26.1	27.3	27.6
3H	26.7	27.7	27.1	28.1	28.4	27.1	28.2	27.5	28.5	28.9
4H	26.9	27.9	27.3	28.2	28.6	27.4	28.3	27.8	28.7	29.1
6H	26.9	27.7	27.3	28.1	28.5	27.3	28.1	27.7	28.5	28.9
8H	26.8	27.6	27.3	28.0	28.4	27.2	28.0	27.7	28.4	28.9
12H	26.8	27.5	27.2	27.9	28.4	27.2	27.9	27.6	28.3	28.8
8H 4H	27.0	27.8	27.4	28.2	28.6	27.4	28.2	27.8	28.6	29.0
6H	26.9	27.6	27.4	28.0	28.5	27.3	27.9	27.8	28.4	28.9
8H	26.9	27.4	27.4	27.9	28.4	27.3	27.8	27.8	28.3	28.8
12H	26.9	27.3	27.4	27.8	28.4	27.2	27.7	27.7	28.2	28.7
12H 4H	26.9	27.7	27.4	28.1	28.5	27.3	28.0	27.8	28.5	28.9
6H	26.9	27.4	27.4	27.9	28.4	27.3	27.8	27.8	28.3	28.8
8H	26.8	27.3	27.4	27.8	28.4	27.2	27.7	27.7	28.2	28.7
Variations with the observer position at spacings:										
S = 1.0H	+ 0.3 / - 0.4					+ 0.3 / - 0.3				
1.5H	+ 0.3 / - 0.6					+ 0.3 / - 0.6				
2.0H	+ 0.4 / - 0.7					+ 0.3 / - 0.5				

CIE Pub.117 Corrected 3907 lm Total Lamp Luminous Flux.(8log(F/F0) = 4.7)

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2018-05-17

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:220.1V I:0.2160A P:47.00W PF:0.9870 Lamp Flux:3907.3x1 lm		
NAME: DFL-50W	TYPE:LED	
MFR.: GRANDOL INDUSTRY LTD		

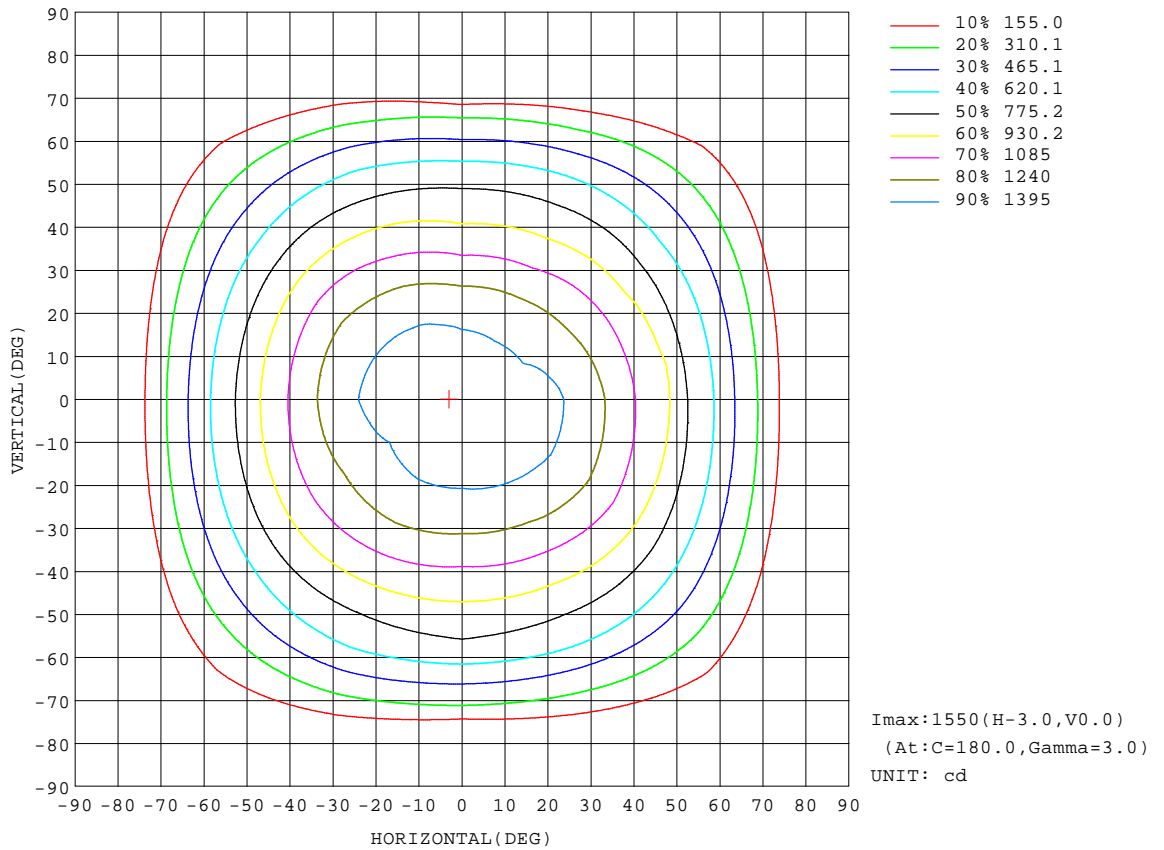
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
k = 0.60	59	48	41	58	48	41	57	47	41	35
0.80	70	59	52	69	58	51	67	57	51	44
1.00	78	68	61	77	67	61	75	68	60	53
1.25	85	76	69	84	75	69	81	73	68	60
1.50	90	81	75	88	80	74	85	78	73	65
2.00	97	89	83	95	88	82	91	85	81	73
2.50	100	93	88	98	92	87	94	89	85	76
3.00	104	98	93	101	96	91	97	93	89	80
4.00	107	102	98	105	100	97	100	97	93	84
5.00	109	105	102	107	103	100	102	99	96	87
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:2018-05-17

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:220.1V I:0.2160A P:47.00W PF:0.9870 Lamp Flux:3907.3x1 lm		
NAME: DFL-50W	TYPE:LED	
MFR.: GRANDOL INDUSTRY LTD		



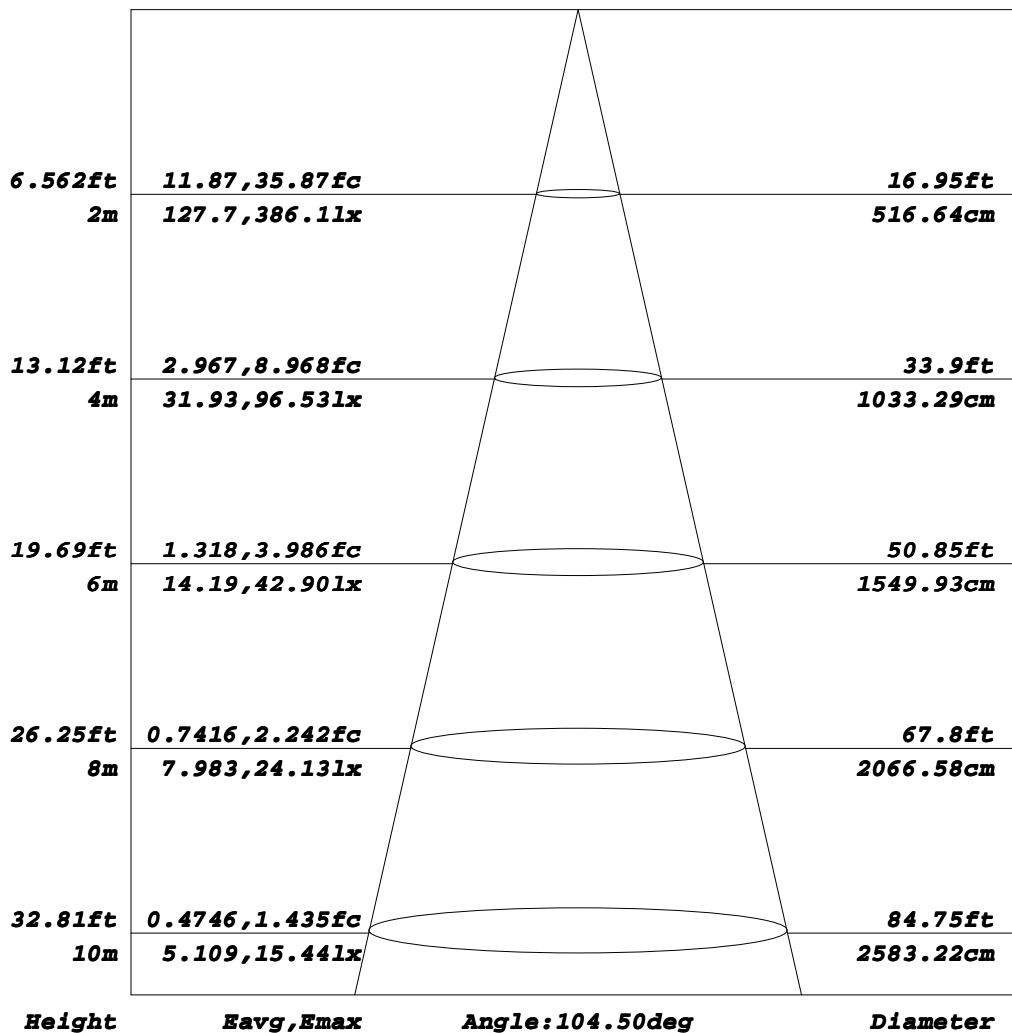
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-05-17

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:220.1V I:0.2160A P:47.00W PF:0.9870 Lamp Flux:3907.3x1 lm		
NAME: DFL-50W	TYPE:LED	
MFR.: GRANDOL INDUSTRY LTD		

Flux out:2827 lm



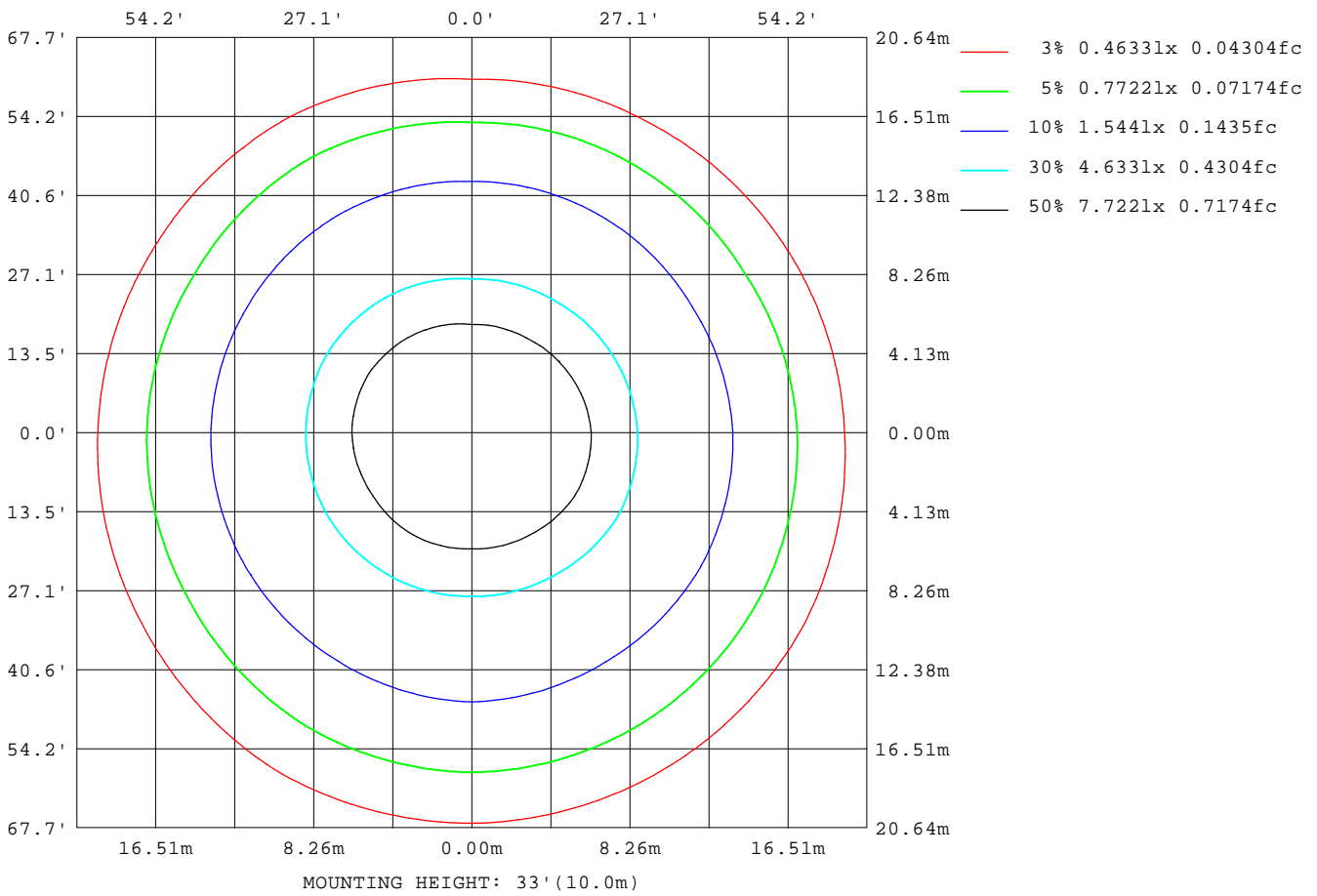
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: DAMIN
 Test Date: 2018-05-17

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

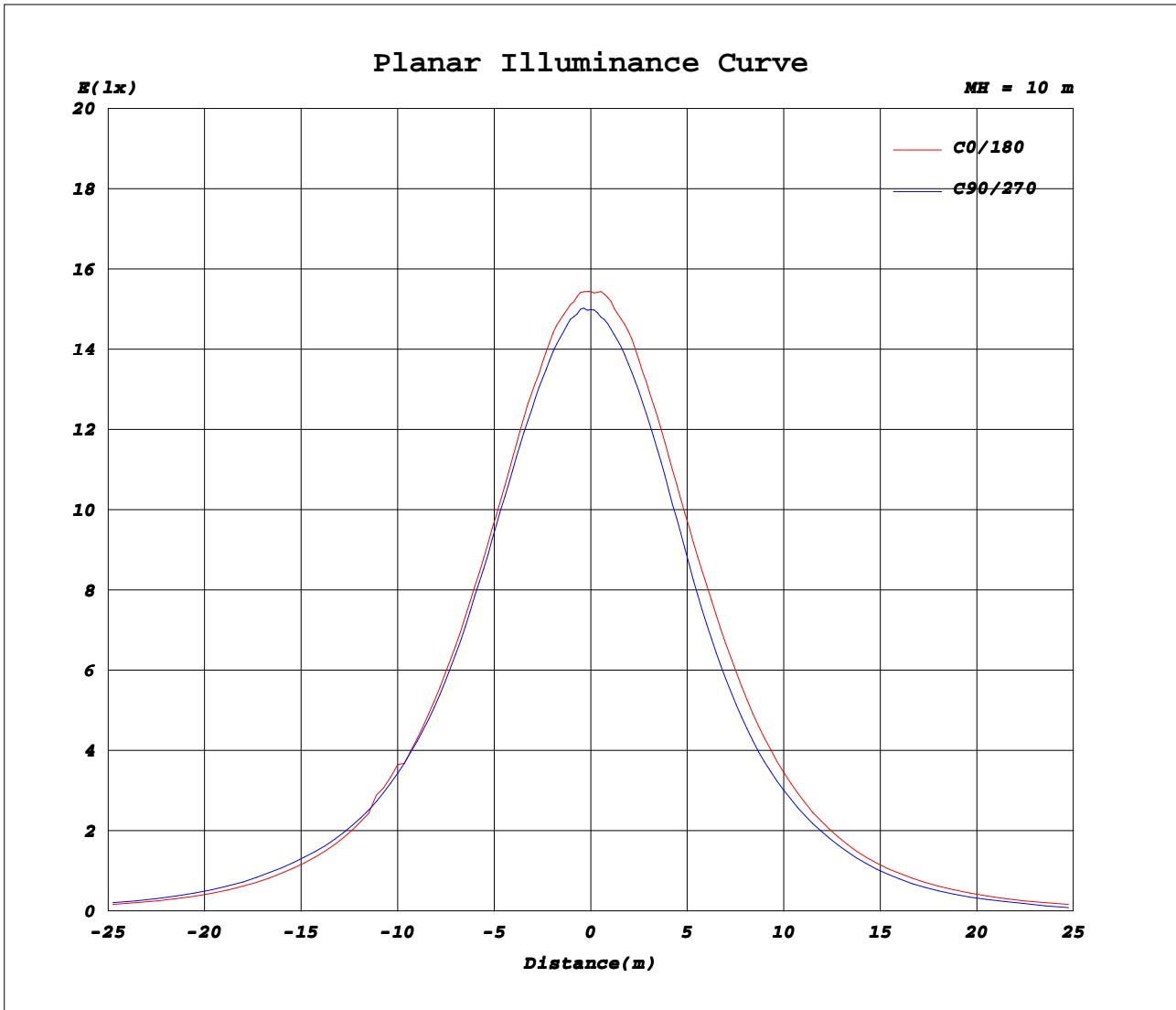
Test:U:220.1V I:0.2160A P:47.00W PF:0.9870 Lamp Flux:3907.3x1 lm		
NAME: DFL-50W	TYPE:LED	
MFR.: GRANDOL INDUSTRY LTD		



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2018-05-17

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: 2018-05-17

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:220.1V I:0.2160A P:47.00W PF:0.9870 Lamp Flux:3907.3x1 lm		
NAME: DFL-50W	TYPE:LED	
MFR.: GRANDOL INDUSTRY LTD		

Table--1

UNIT: cd

C (DEG) \ γ (DEG)	0	30	60	90	120	150	180	210	240	270	300	330							
0	1544	1525	1511	1499	1487	1469	1544	1525	1511	1499	1487	1469							
5	1537	1521	1510	1498	1497	1476	1547	1523	1498	1482	1463	1457							
10	1528	1506	1491	1480	1471	1469	1531	1496	1472	1451	1439	1437							
15	1487	1478	1459	1449	1444	1432	1493	1461	1439	1408	1400	1407							
20	1446	1436	1415	1403	1407	1391	1448	1414	1391	1350	1346	1360							
25	1377	1384	1358	1344	1350	1334	1381	1356	1323	1267	1271	1303							
30	1299	1315	1275	1264	1283	1267	1306	1286	1230	1156	1170	1228							
35	1204	1231	1188	1165	1194	1193	1213	1196	1122	1053	1070	1137							
40	1094	1121	1081	1065	1083	1100	1096	1079	1017	947	967	1027							
45	1032	1011	974	973	975	989	978	951	898	853	860	909							
50	838	883	863	876	862	861	849	819	784	755	759	782							
55	715	749	753	787	753	729	711	678	669	629	642	651							
60	577	619	653	675	650	599	575	542	533	475	498	524							
65	418	470	490	504	510	459	422	398	372	323	335	388							
70	275	322	332	346	351	307	270	249	214	90.7	147	236							
75	102	181	159	123	182	170	105	102	15.9	10.1	10.2	93.7							
80	6.40	16.2	6.23	5.94	6.93	23.9	9.81	9.90	9.69	8.93	9.21	9.87							
85	5.47	5.74	5.52	5.29	5.63	5.92	8.91	8.86	8.61	8.43	8.63	8.93							
90	5.68	5.53	5.27	5.02	5.25	5.56	8.97	9.16	9.36	9.34	9.52	9.41							
95	6.98	6.75	6.39	6.03	6.21	6.66	10.1	10.4	10.6	10.5	10.7	10.5							
100	8.53	8.23	7.78	7.31	7.53	8.04	11.5	11.8	11.9	12.1	12.1	11.8							
105	10.3	9.90	9.43	8.92	9.07	9.61	13.2	13.4	13.6	13.8	13.7	13.4							
110	12.2	11.8	11.2	10.7	10.8	11.4	15.0	15.2	15.5	15.6	15.5	15.0							
115	14.2	13.7	13.2	12.7	12.7	13.2	16.9	17.1	17.3	17.5	17.3	16.7							
120	16.0	15.6	15.1	14.6	14.5	14.9	18.7	18.8	19.1	19.2	19.0	18.3							
125	17.8	17.4	17.0	16.5	16.3	16.6	20.3	20.4	20.6	20.7	20.6	19.7							
130	19.5	19.1	18.9	18.3	18.0	18.2	21.8	21.8	22.0	22.0	21.9	21.1							
135	21.1	20.8	20.4	20.0	19.6	19.8	23.1	23.1	23.3	23.2	23.1	22.3							
140	22.7	22.5	22.0	21.5	21.2	21.3	24.5	24.4	24.5	24.4	24.3	23.6							
145	24.3	24.1	23.6	23.1	22.7	22.8	25.7	25.5	25.6	25.5	25.4	24.8							
150	25.8	25.6	25.1	24.7	24.3	24.3	26.9	26.7	26.8	26.7	26.5	26.0							
155	27.2	27.0	26.6	26.3	25.7	25.7	28.2	27.8	27.9	27.8	27.6	27.1							
160	28.7	28.5	28.0	27.7	27.2	27.2	29.5	29.0	29.0	28.8	28.6	28.1							
165	30.2	30.0	29.4	29.0	28.6	28.6	30.7	30.1	30.1	29.8	29.6	29.2							
170	31.6	31.4	30.8	30.4	30.0	30.0	31.8	31.2	31.1	30.7	30.5	30.1							
175	32.7	32.5	31.9	31.6	31.2	31.1	32.9	32.2	32.1	31.6	31.3	31.0							
180	33.1	33.0	32.3	32.1	31.6	31.5	33.4	32.7	32.5	31.9	31.7	31.4							

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-05-17

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: