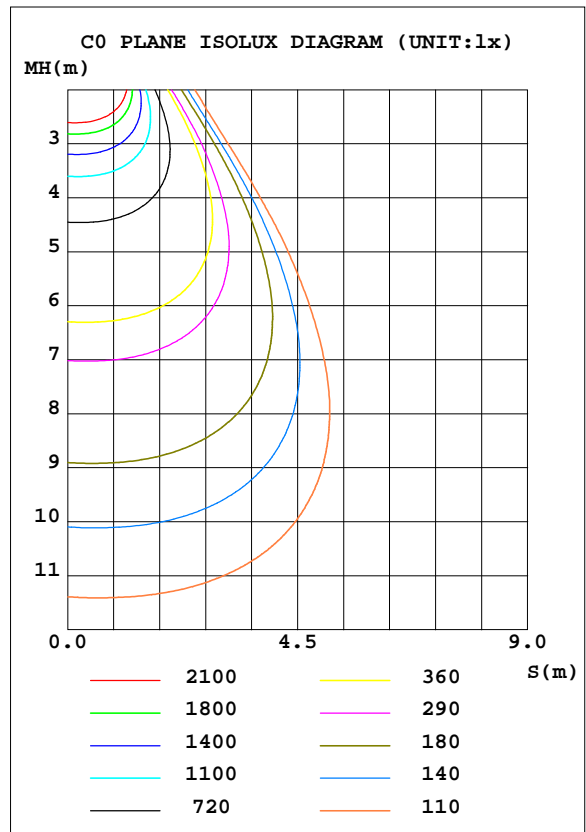
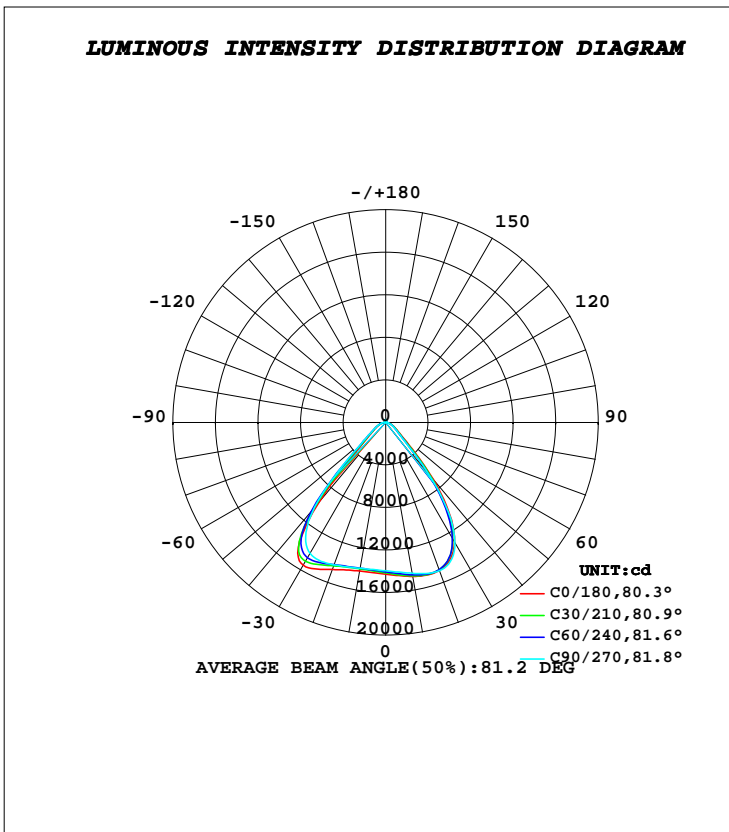


LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:220.2V I:0.9600A P:205.3W PF:0.9710 Lamp Flux:26230.8x1 lm		
NAME: GKU-200W	TYPE:LED	
DIM.: 400*400mm	SUR.:250*250mm	
MFR.: GRANDOL INDUSTRY LTD		

DATA OF LAMP		PHOTOMETRIC DATA Eff: 127.77 lm/W			
MODEL	IMSYLHU200WDL	I _{max} (cd)	15509	S/MH(C0/180)	1.15
NOMINAL POWER(W)	200	LOR(%)	100.0	S/MH(C90/270)	1.13
RATED VOLTAGE(V)	220	TOTAL FLUX(lm)	26231	η UP, DN(C0-180)	1.4, 44.6
NOMINAL FLUX(lm)	26230.8	CIE CLASS	DIRECT	η UP, DN(C180-360)	1.6, 52.5
LAMPS INSIDE	1	η up(%)	3.0	CIBSE SHR NOM	1.00
TEST VOLTAGE(V)	220.2	η down(%)	97.0	CIBSE SHR MAX	1.15



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2017-09-21

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=0.7100]
Remarks:

ZONAL FLUX DIAGRAM

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	1470	1460	1440	1404	1419	1395	1392	1402	0- 10	1347	1347	5.14,5.14
20	1481	1473	1484	1473	1472	1429	1425	1430	10- 20	4086	5433	20.7,20.7
30	1294	1258	1304	1422	1551	1489	1423	1359	20- 30	6658	12091	46.1,46.1
40	689.6	626.4	616.9	669.1	961.3	1065	1040	918.2	30- 40	7251	19342	73.7,73.7
50	199.3	174.0	165.0	170.7	225.4	257.7	271.1	262.7	40- 50	3395	22737	86.7,86.7
60	101.4	93.34	89.38	90.55	114.9	123.3	125.7	120.5	50- 60	1343	24081	91.8,91.8
70	56.10	50.63	48.25	49.75	66.87	71.08	70.84	67.49	60- 70	809.3	24890	94.9,94.9
80	20.70	17.52	16.19	17.49	30.81	34.18	34.34	31.61	70- 80	442.5	25332	96.6,96.6
90	2.528	2.650	2.628	2.457	5.835	5.767	5.682	5.699	80- 90	124.6	25457	97,97
100	4.266	4.458	4.410	4.142	7.234	6.988	6.928	7.053	90-100	52.77	25510	97.3,97.3
110	6.859	7.098	7.050	6.652	9.357	9.018	8.913	9.124	100-110	71.56	25581	97.5,97.5
120	10.23	10.52	10.46	9.959	12.13	11.73	11.65	11.98	110-120	93.81	25675	97.9,97.9
130	14.41	14.62	14.43	13.87	15.37	15.03	15.08	15.47	120-130	115.4	25790	98.3,98.3
140	17.77	17.93	17.76	17.27	18.29	18.01	18.11	18.42	130-140	126.9	25917	98.8,98.8
150	20.12	20.43	20.48	20.10	20.55	20.30	20.32	20.54	140-150	120.2	26038	99.3,99.3
160	22.89	23.30	23.42	23.02	22.54	22.25	22.22	22.41	150-160	99.08	26137	99.6,99.6
170	26.61	26.72	26.68	26.32	25.62	25.33	25.31	25.48	160-170	68.62	26205	99.9,99.9
180	27.65	27.58	27.54	27.38	27.79	27.58	27.44	27.39	170-180	25.52	26231	100,100
DEG	LUMINOUS INTENSITY: $\times 10\text{cd}$								UNIT:lm			

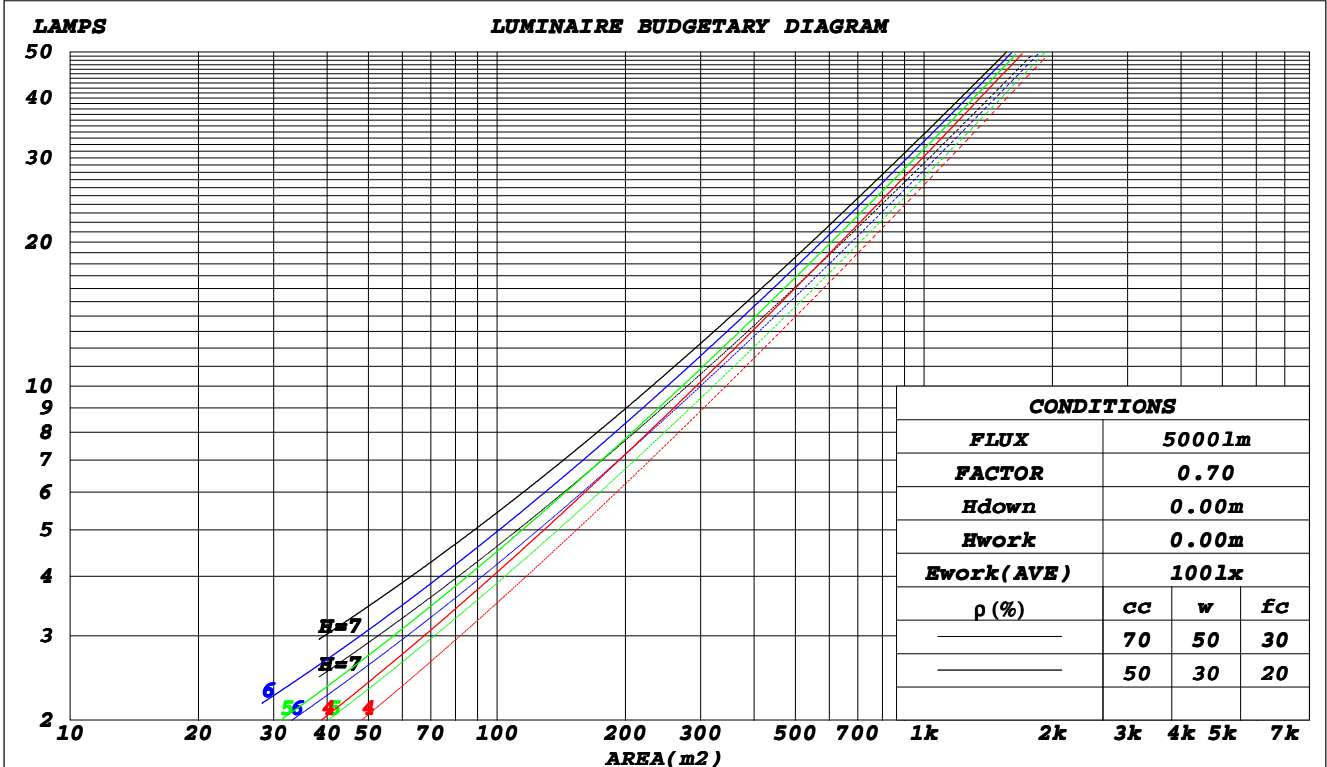
C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2017-09-21

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=0.7100]
 Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:220.2V I:0.9600A P:205.3W PF:0.9710 Lamp Flux:26230.8x1 lm		
NAME: GKU-200W	TYPE:LED	
DIM.: 400*400mm	SUR.:250*250mm	
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	1.09	1.09	1.09	1.04	1.04	1.04	.99	.99	.99	.97
1.0	1.08	1.05	1.02	1.05	1.02	.99	1.01	.98	.96	.96	.94	.93	.92	.91	.90	.87
2.0	.98	.93	.88	.96	.91	.87	.92	.88	.85	.88	.85	.83	.85	.83	.80	.78
3.0	.89	.83	.78	.87	.82	.77	.84	.79	.75	.81	.77	.74	.78	.75	.72	.70
4.0	.81	.74	.69	.80	.74	.69	.77	.72	.67	.75	.70	.66	.72	.68	.65	.63
5.0	.74	.67	.62	.73	.67	.62	.71	.65	.61	.69	.64	.60	.67	.63	.59	.57
6.0	.68	.61	.56	.67	.61	.56	.66	.60	.55	.64	.58	.54	.62	.57	.54	.52
7.0	.63	.56	.51	.62	.55	.51	.61	.55	.50	.59	.54	.50	.58	.53	.49	.47
8.0	.58	.51	.46	.58	.51	.46	.56	.50	.46	.55	.49	.45	.54	.49	.45	.43
9.0	.54	.47	.42	.54	.47	.42	.52	.46	.42	.51	.46	.42	.50	.45	.41	.40
10.0	.50	.44	.39	.50	.43	.39	.49	.43	.39	.48	.42	.38	.47	.42	.38	.37



C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2017-09-21

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=0.7100]
 Remarks:

WEC AND CCEC

Test:U:220.2V I:0.9600A P:205.3W PF:0.9710 Lamp Flux:26230.8x1 lm		
NAME: GKU-200W	TYPE:LED	
DIM.: 400*400mm	SUR.:250*250mm	
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	.224	.127	.040	.216	.123	.039	.201	.116	.037	.188	.108	.035	.176	.102	.033	
2.0	.215	.118	.036	.208	.115	.035	.195	.109	.034	.184	.103	.032	.173	.098	.031	
3.0	.204	.108	.032	.198	.106	.032	.187	.101	.031	.177	.097	.030	.167	.093	.029	
4.0	.193	.100	.029	.187	.098	.029	.178	.094	.028	.169	.091	.027	.160	.087	.027	
5.0	.182	.093	.027	.178	.091	.027	.169	.088	.026	.161	.085	.025	.153	.082	.025	
6.0	.173	.087	.025	.169	.085	.024	.161	.082	.024	.154	.080	.023	.147	.077	.023	
7.0	.164	.081	.023	.160	.080	.023	.153	.077	.022	.147	.075	.022	.140	.073	.021	
8.0	.155	.076	.021	.152	.075	.021	.146	.073	.021	.140	.071	.020	.134	.069	.020	
9.0	.148	.072	.020	.145	.071	.020	.139	.069	.020	.134	.067	.019	.129	.065	.019	
10.0	.141	.068	.019	.138	.067	.019	.133	.065	.018	.128	.064	.018	.123	.062	.018	

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	.213	.213	.213	.182	.182	.182	.124	.124	.124	.071	.071	.071	.023	.023	.023	
2.0	.197	.180	.164	.169	.154	.141	.115	.106	.098	.066	.061	.057	.021	.020	.018	
3.0	.185	.155	.130	.158	.134	.113	.108	.092	.078	.063	.054	.046	.020	.017	.015	
4.0	.175	.137	.107	.150	.118	.092	.103	.082	.065	.059	.048	.038	.019	.016	.013	
5.0	.166	.123	.090	.142	.106	.078	.098	.074	.055	.057	.043	.032	.018	.014	.011	
6.0	.158	.112	.077	.136	.097	.067	.094	.068	.048	.054	.040	.028	.017	.013	.009	
7.0	.152	.103	.068	.130	.089	.059	.090	.062	.042	.052	.037	.025	.017	.012	.008	
8.0	.145	.096	.061	.125	.083	.053	.086	.058	.038	.050	.034	.023	.016	.011	.007	
9.0	.140	.090	.056	.120	.078	.049	.083	.055	.035	.048	.032	.021	.016	.011	.007	
10.0	.135	.085	.052	.116	.074	.045	.080	.052	.032	.047	.031	.019	.015	.010	.006	
10.0	.130	.081	.048	.112	.070	.042	.078	.049	.030	.045	.029	.018	.015	.010	.006	

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2017-09-21

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=0.7100]
 Remarks:

Uncorrected UGR Table

Test:U:220.2V I:0.9600A P:205.3W PF:0.9710 Lamp Flux:26230.8x1 lm		
NAME: GKU-200W	TYPE:LED	
DIM.: 400*400mm	SUR.:250*250mm	
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	24.4	25.5	24.7	25.8	26.0	23.9	25.0	24.2	25.3	25.5
3H	24.7	25.8	25.0	26.0	26.3	24.2	25.2	24.5	25.5	25.8
4H	24.8	25.8	25.2	26.1	26.4	24.3	25.3	24.6	25.6	25.8
6H	24.9	25.9	25.3	26.2	26.5	24.3	25.2	24.7	25.6	25.9
8H	24.9	25.8	25.3	26.1	26.5	24.3	25.2	24.7	25.5	25.8
12H	24.9	25.8	25.3	26.1	26.4	24.3	25.1	24.6	25.4	25.8
4H 2H	24.3	25.3	24.7	25.6	25.9	23.9	24.9	24.2	25.2	25.5
3H	24.8	25.7	25.2	26.0	26.3	24.3	25.2	24.7	25.5	25.8
4H	25.0	25.8	25.4	26.2	26.6	24.5	25.3	24.9	25.6	26.0
6H	25.2	25.9	25.6	26.3	26.7	24.6	25.3	25.0	25.7	26.1
8H	25.2	25.9	25.7	26.3	26.7	24.6	25.2	25.1	25.7	26.1
12H	25.2	25.8	25.7	26.2	26.7	24.6	25.2	25.0	25.6	26.0
8H 4H	25.0	25.7	25.5	26.1	26.5	24.5	25.2	25.0	25.6	26.0
6H	25.3	25.8	25.7	26.2	26.7	24.7	25.2	25.2	25.7	26.1
8H	25.3	25.8	25.8	26.2	26.7	24.7	25.2	25.2	25.6	26.2
12H	25.3	25.7	25.8	26.2	26.7	24.7	25.1	25.2	25.6	26.1
12H 4H	25.0	25.6	25.5	26.0	26.5	24.5	25.1	25.0	25.5	26.0
6H	25.2	25.7	25.7	26.2	26.7	24.7	25.1	25.2	25.6	26.1
8H	25.3	25.7	25.8	26.2	26.7	24.7	25.1	25.2	25.6	26.1
Variations with the observer position at spacings:										
S = 1.0H	+ 1.6 / - 2.1					+ 1.8 / - 2.3				
1.5H	+ 3.0 / - 1.9					+ 3.4 / - 1.9				
2.0H	+ 2.6 / - 1.0					+ 1.8 / - 0.8				

CIE Pub.117 Corrected 26231 lm Total Lamp Luminous Flux.(8log(F/F0) = 11.4)

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2017-09-21

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=0.7100]
 Remarks:

UTILIZATION FACTORS TABLE

Test:U:220.2V I:0.9600A P:205.3W PF:0.9710 Lamp Flux:26230.8x1 lm		
NAME: GKU-200W	TYPE:LED	
DIM.: 400*400mm	SUR.:250*250mm	
MFR.: GRANDOL INDUSTRY LTD		

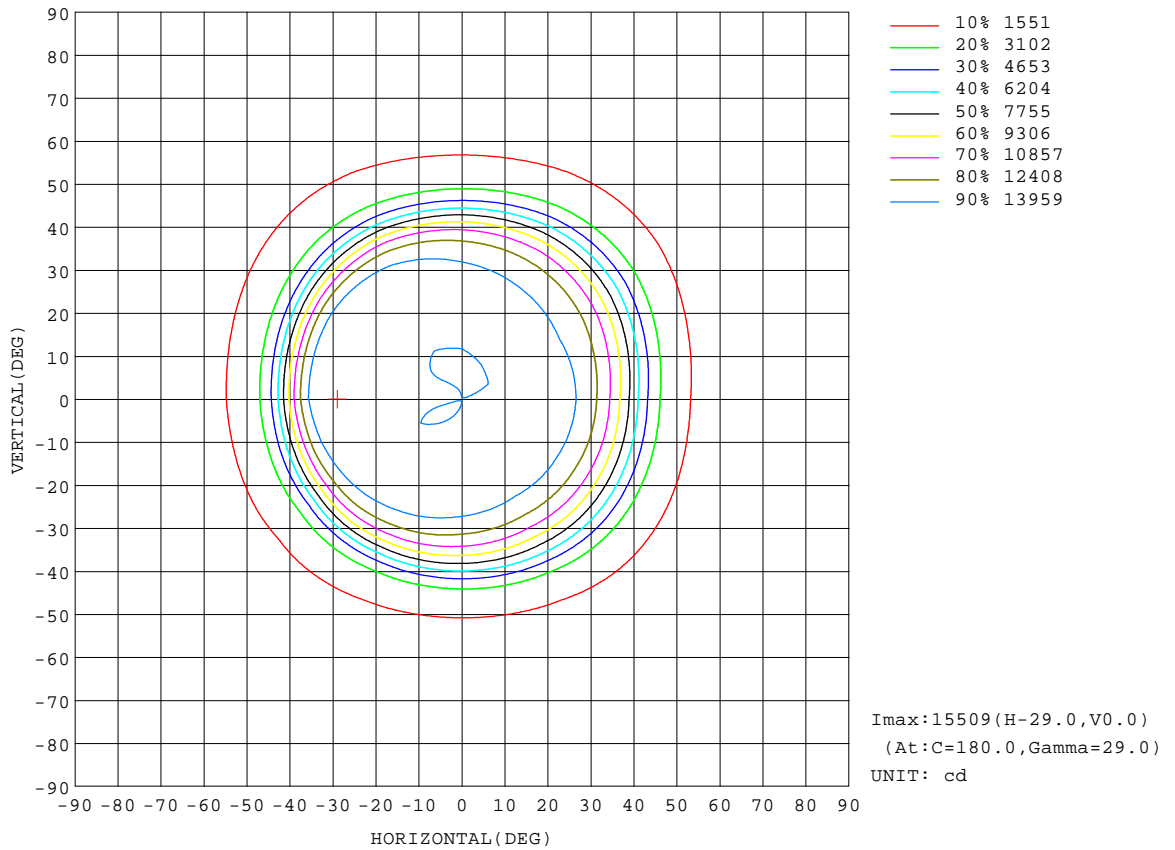
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
k = 0.60	75	67	62	74	67	62	73	66	61	57
0.80	84	76	71	83	75	71	81	75	70	65
1.00	90	83	78	89	82	77	87	82	77	71
1.25	95	88	84	94	88	83	92	86	82	77
1.50	99	93	88	97	92	87	95	90	86	80
2.00	103	98	93	101	96	92	98	94	91	84
2.50	106	101	96	104	99	95	100	96	93	86
3.00	108	103	100	106	102	98	102	98	96	88
4.00	110	107	104	108	105	102	104	101	99	90
5.00	112	109	106	110	107	104	105	103	101	92
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:2017-09-21

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=0.7100]
Remarks:

ISOCANDELA DIAGRAM

Test:U:220.2V I:0.9600A P:205.3W PF:0.9710 Lamp Flux:26230.8x1 lm		
NAME: GKU-200W	TYPE:LED	
DIM.: 400*400mm	SUR.:250*250mm	
MFR.: GRANDOL INDUSTRY LTD		



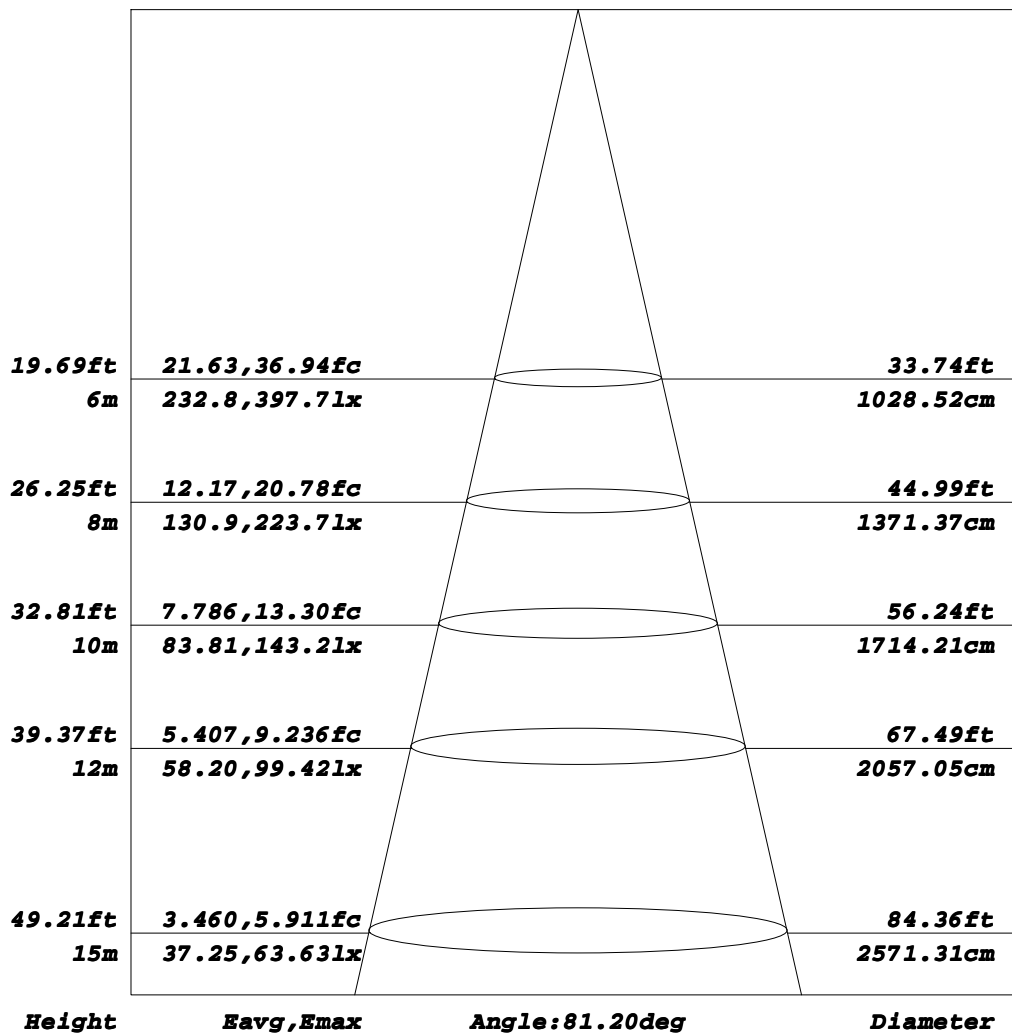
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2017-09-21

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=0.7100]
Remarks:

AAI Figure

Test:U:220.2V I:0.9600A P:205.3W PF:0.9710 Lamp Flux:26230.8x1 lm		
NAME: GKU-200W	TYPE:LED	
DIM.: 400*400mm	SUR.:250*250mm	
MFR.: GRANDOL INDUSTRY LTD		

Flux out:19895 lm



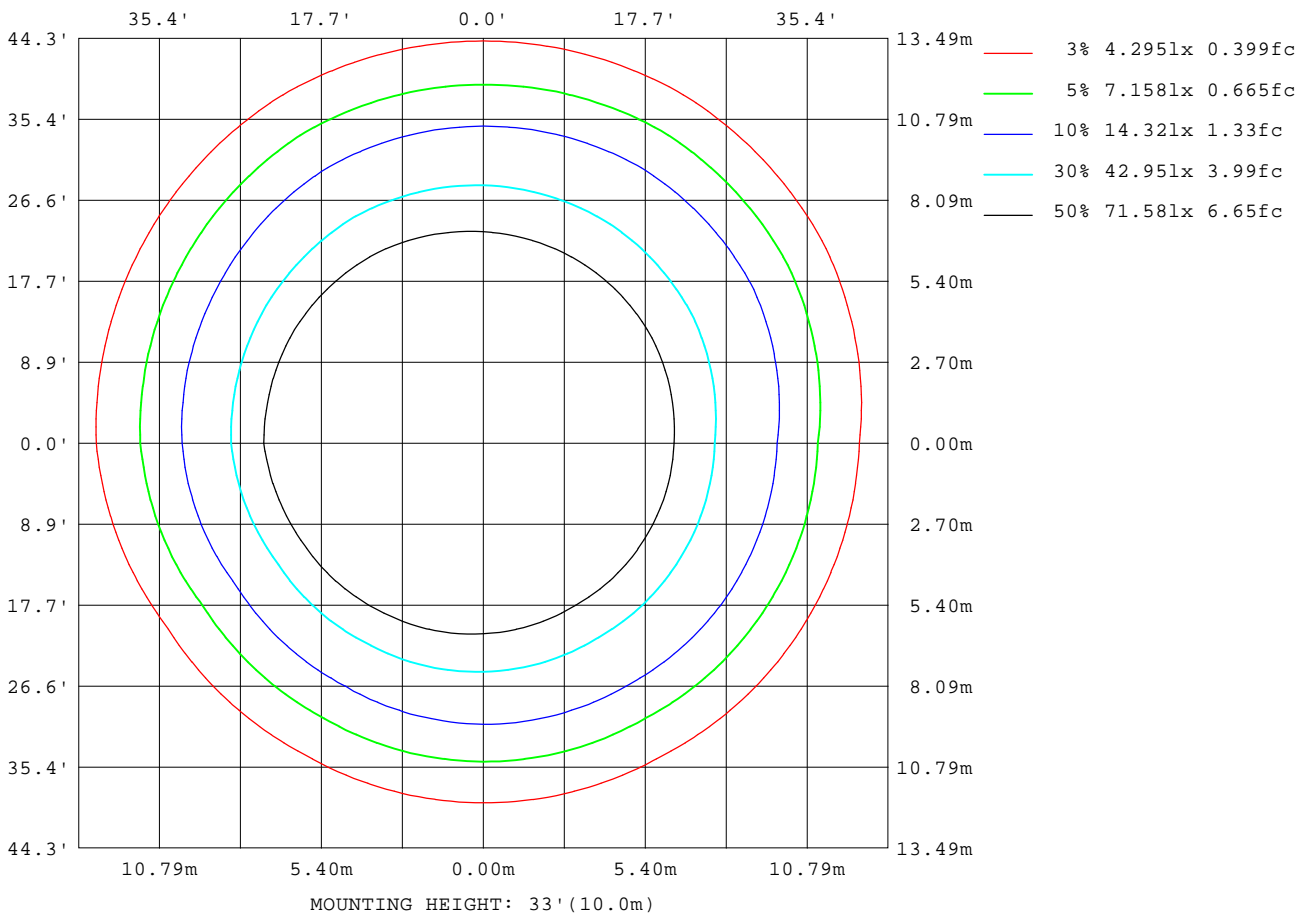
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
 C Interval: 30.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:DAMIN
 Test Date:2017-09-21

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=0.7100]
 Remarks:

ISOLUX DIAGRAM

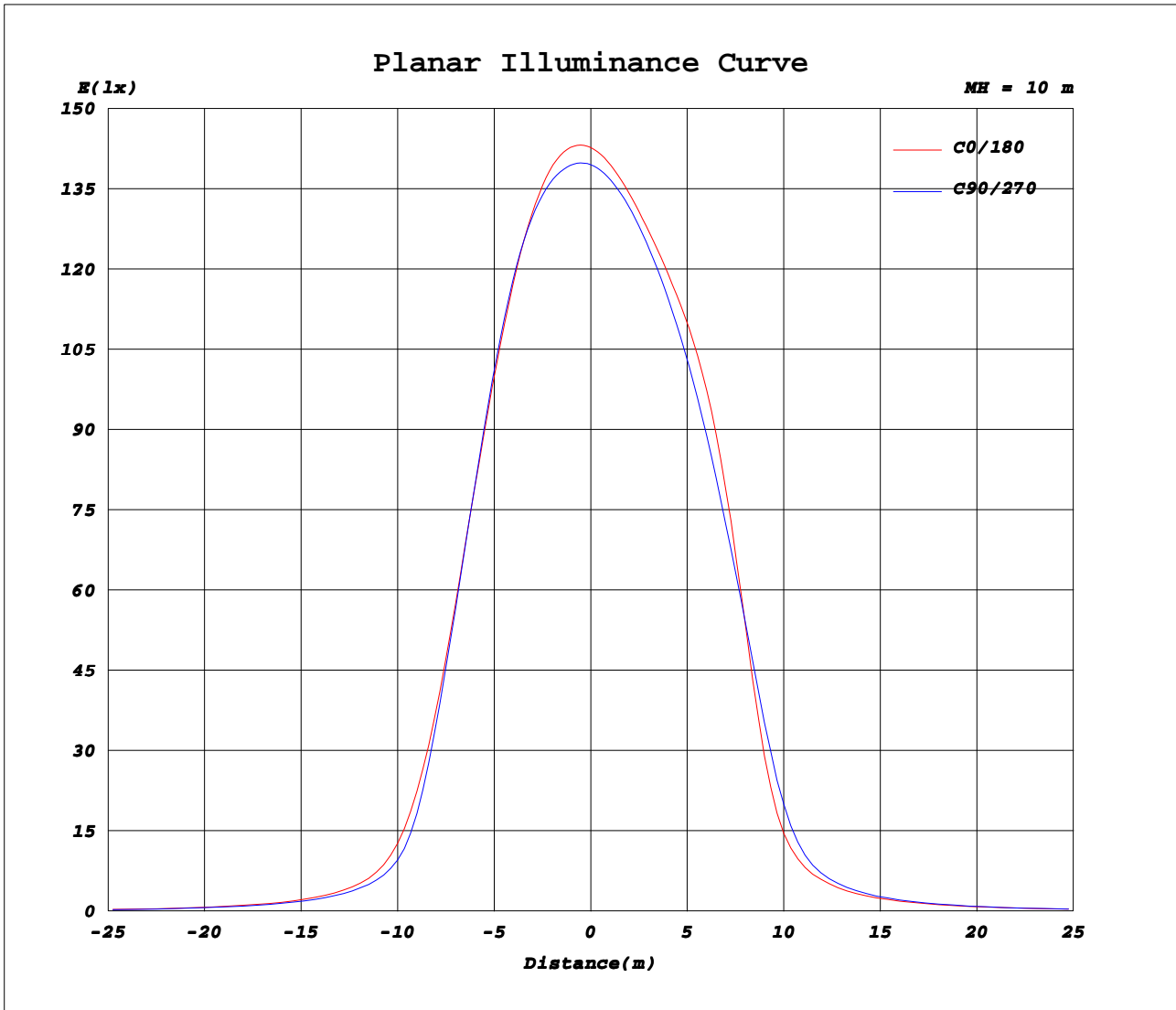
Test:U:220.2V I:0.9600A P:205.3W PF:0.9710 Lamp Flux:26230.8x1 lm		
NAME: GKU-200W	TYPE:LED	
DIM.: 400*400mm	SUR.:250*250mm	
MFR.: GRANDOL INDUSTRY LTD		



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2017-09-21

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=0.7100]
Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: DAMIN
Test Date: 2017-09-21

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=0.7100]
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:220.2V I:0.9600A P:205.3W PF:0.9710 Lamp Flux:26230.8x1 lm		
NAME: GKU-200W	TYPE:LED	
DIM.: 400*400mm	SUR.:250*250mm	
MFR.: GRANDOL INDUSTRY LTD		

Table--1

UNIT: x10cd

C (DEG) \ γ (DEG)	0	30	60	90	120	150	180	210	240	270	300	330							
0	1427	1415	1405	1395	1387	1380	1427	1415	1405	1395	1387	1380							
5	1446	1438	1427	1412	1396	1380	1418	1401	1393	1388	1388	1389							
10	1470	1465	1456	1440	1417	1391	1419	1399	1392	1392	1398	1407							
15	1486	1483	1478	1471	1451	1418	1436	1409	1401	1405	1414	1425							
20	1481	1473	1473	1484	1485	1461	1472	1435	1423	1425	1429	1432							
25	1428	1410	1409	1443	1483	1499	1522	1476	1456	1440	1426	1412							
30	1294	1263	1254	1304	1378	1467	1551	1508	1470	1423	1380	1337							
35	1047	1005	982	1029	1105	1234	1433	1430	1390	1315	1246	1169							
40	690	647	606	617	625	713	961	1042	1088	1040	972	864							
45	359	319	277	272	267	298	413	478	554	568	558	493							
50	199	182	166	165	164	177	225	244	271	271	275	251							
55	137	129	118	119	118	125	153	163	176	175	174	162							
60	101	96.5	90.2	89.4	88.1	93.0	115	119	127	126	125	116							
65	76.2	72.6	68.2	67.5	66.3	70.5	88.5	91.3	95.8	93.9	93.5	87.0							
70	56.1	52.3	49.0	48.2	48.0	51.5	66.9	69.2	72.9	70.8	70.1	64.8							
75	37.5	34.0	31.7	30.9	30.9	34.1	48.0	50.2	53.5	51.7	50.8	46.0							
80	20.7	18.5	16.6	16.2	16.0	18.9	30.8	32.6	35.8	34.3	33.9	29.4							
85	5.45	4.37	3.68	3.60	3.59	4.42	13.7	14.3	17.4	15.9	15.5	12.3							
90	2.53	2.62	2.68	2.63	2.54	2.38	5.83	5.76	5.78	5.68	5.70	5.70							
95	3.29	3.42	3.49	3.43	3.30	3.10	6.42	6.27	6.17	6.19	6.25	6.38							
100	4.27	4.41	4.50	4.41	4.27	4.01	7.23	7.05	6.92	6.93	6.98	7.12							
105	5.47	5.62	5.72	5.62	5.45	5.14	8.22	7.99	7.85	7.83	7.90	8.07							
110	6.86	7.06	7.14	7.05	6.82	6.48	9.36	9.09	8.95	8.91	9.03	9.22							
115	8.42	8.67	8.75	8.66	8.40	8.04	10.7	10.4	10.2	10.2	10.3	10.6							
120	10.2	10.5	10.6	10.5	10.2	9.75	12.1	11.8	11.7	11.7	11.8	12.1							
125	12.3	12.5	12.6	12.4	12.1	11.7	13.7	13.4	13.2	13.3	13.5	13.8							
130	14.4	14.6	14.7	14.4	14.1	13.6	15.4	15.1	15.0	15.1	15.3	15.7							
135	16.3	16.4	16.4	16.2	15.9	15.4	16.9	16.7	16.6	16.7	17.0	17.3							
140	17.8	17.9	17.9	17.8	17.5	17.1	18.3	18.0	18.0	18.1	18.3	18.5							
145	19.0	19.2	19.3	19.2	18.9	18.6	19.5	19.3	19.2	19.3	19.4	19.6							
150	20.1	20.4	20.5	20.5	20.2	20.0	20.5	20.3	20.3	20.3	20.5	20.6							
155	21.3	21.6	21.7	21.8	21.6	21.3	21.5	21.2	21.2	21.2	21.4	21.5							
160	22.9	23.2	23.4	23.4	23.2	22.9	22.5	22.3	22.2	22.2	22.4	22.5							
165	24.9	25.1	25.2	25.2	24.9	24.6	24.0	23.7	23.7	23.7	23.8	24.0							
170	26.6	26.7	26.7	26.7	26.4	26.2	25.6	25.3	25.3	25.3	25.4	25.5							
175	27.6	27.7	27.5	27.5	27.3	27.2	27.0	26.7	26.7	26.6	26.7	26.7							
180	27.7	27.7	27.5	27.5	27.4	27.4	27.8	27.5	27.6	27.4	27.5	27.3							

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2017-09-21

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=0.7100]
Remarks: