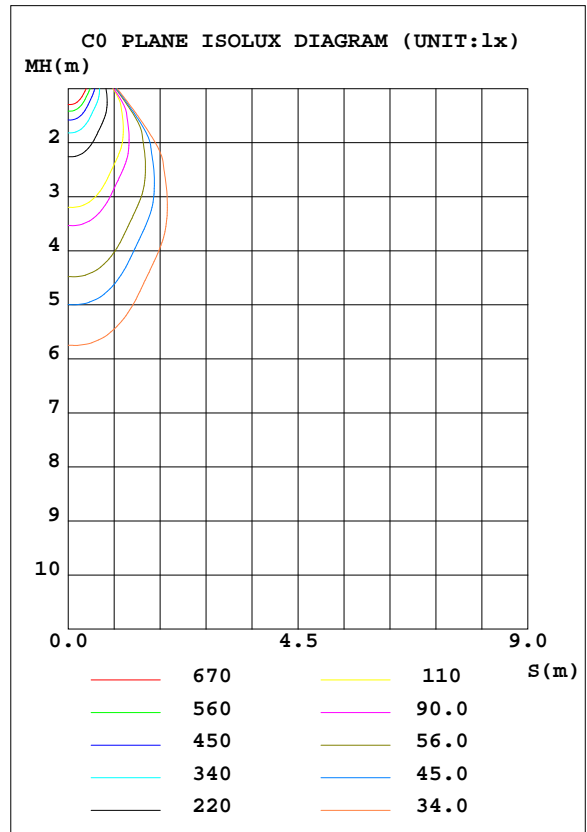
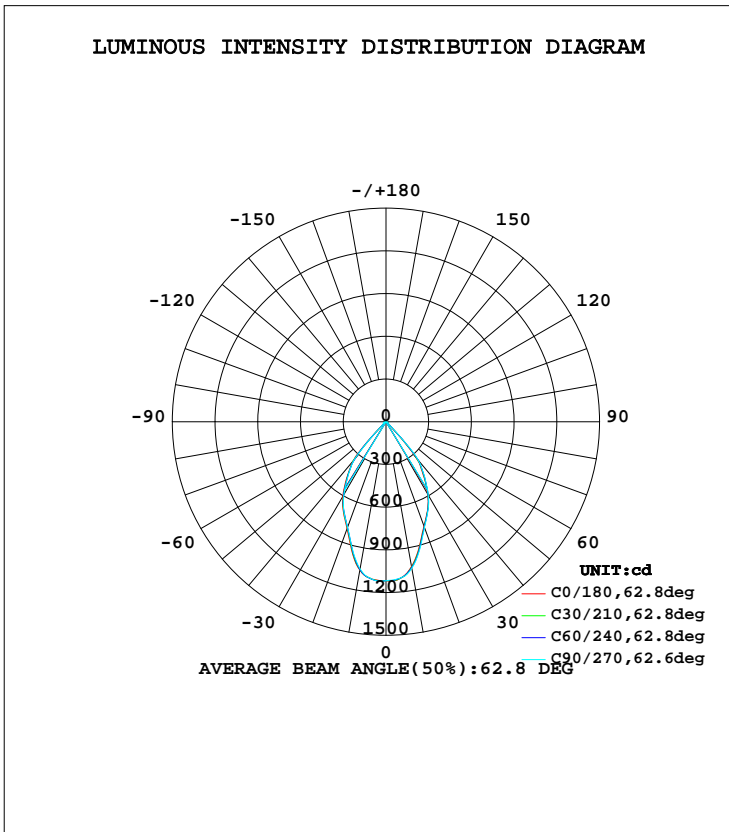


LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:240.2V I:0.0590A P:13.20W PF:0.9310 Lamp Flux:1101.79x1 lm		
NAME: LED-DL13WCOB-CW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:5700K	SERIAL No.:1
MFR.:	SUR.:0.040	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 83.47 lm/W			
MODEL	LED-DL13WCOB-CW-W	Imax(cd)	1121	S/MH(C0/180)	0.86
NOMINAL POWER(W)	13	LOR(%)	100.0	S/MH(C90/270)	0.87
RATED VOLTAGE(V)	240	TOTAL FLUX(lm)	1101.8	η UP, DN(C0-180)	0.0, 49.9
NOMINAL FLUX(lm)	1101.79	CIE CLASS	DIRECT	η UP, DN(C180-360)	0.0, 50.1
LAMPS INSIDE	1	η up(%)	0.0	CIBSE SHR NOM	1.00
TEST VOLTAGE(V)	240.2	η down(%)	100.0	CIBSE SHR MAX	1.05



C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2019-10-23

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.443m [K=1.0000]  
 Remarks:

ZONAL FLUX DIAGRAM

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	Φlum,lamp
10	1033	1038	1045	1047	1058	1056	1050	1047	0- 10	103.9	103.9	9.43,9.43
20	781.2	785.9	791.5	790.8	800.9	793.0	790.0	785.5	10- 20	256.4	360.3	32.7,32.7
30	585.6	590.9	594.6	594.1	606.2	597.4	591.1	587.5	20- 30	318.7	679.0	61.6,61.6
40	333.3	345.3	349.7	353.9	358.0	350.7	347.3	336.2	30- 40	292.6	971.6	88.2,88.2
50	19.87	20.67	21.33	21.46	21.70	20.59	20.38	19.87	40- 50	88.33	1060	96.2,96.2
60	15.27	15.61	16.20	16.36	16.18	15.74	15.35	14.78	50- 60	15.71	1076	97.6,97.6
70	12.36	12.92	13.57	13.58	14.06	13.07	12.52	12.20	60- 70	14.89	1091	99,99
80	4.307	4.452	5.832	5.163	6.088	4.719	4.591	3.751	70- 80	9.726	1100	99.9,99.9
90	0	0	0	0	0	0	0	0	80- 90	1.535	1102	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		

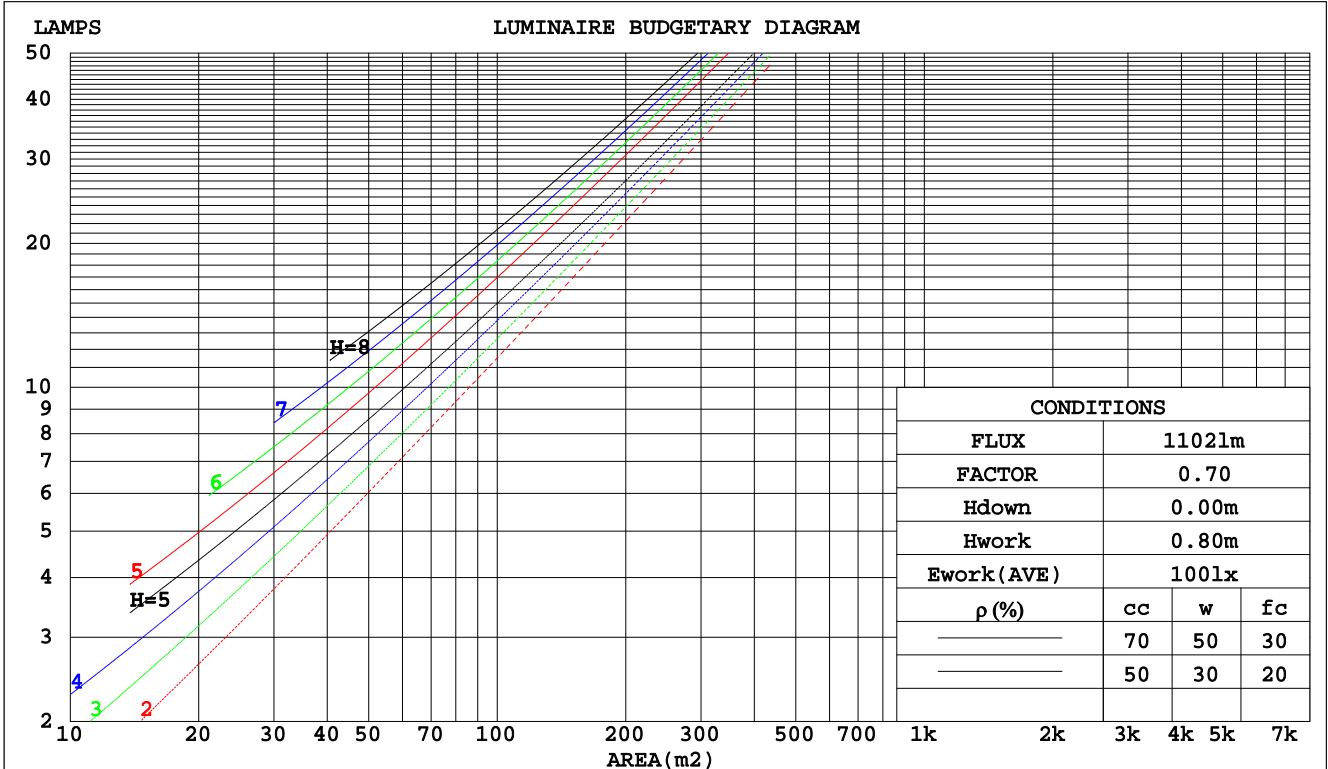
C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2019-10-23

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.443m [K=1.0000]  
 Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:240.2V I:0.0590A P:13.20W PF:0.9310 Lamp Flux:1101.79x1 lm		
NAME: LED-DL13WCOB-CW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:5700K	SERIAL No.:1
MFR.:	SUR.:0.040	PROTECTION ANGLE:

pcc	80%			70%			50%			30%			10%			0
	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pw																0
pfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio      Coefficients of Utilization(CU)															
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	.00
1.0	1.10	1.07	1.05	1.08	1.05	1.03	1.04	1.02	1.00	1.00	.98	.97	.97	.95	.94	.92
2.0	1.02	.97	.94	.90	.96	.93	.97	.93	.90	.94	.91	.89	.91	.89	.87	.85
3.0	.94	.89	.84	.86	.88	.84	.90	.86	.82	.87	.84	.81	.85	.82	.80	.78
4.0	.87	.81	.77	.86	.81	.76	.84	.79	.75	.82	.78	.75	.80	.77	.74	.72
5.0	.81	.75	.70	.80	.74	.70	.78	.73	.69	.77	.72	.69	.75	.71	.68	.67
6.0	.76	.69	.65	.75	.69	.65	.73	.68	.64	.72	.67	.64	.71	.66	.63	.62
7.0	.71	.64	.60	.70	.64	.60	.69	.63	.59	.68	.63	.59	.66	.62	.59	.57
8.0	.66	.60	.56	.66	.60	.56	.65	.59	.55	.64	.59	.55	.63	.58	.55	.53
9.0	.62	.56	.52	.62	.56	.52	.61	.55	.52	.60	.55	.51	.59	.55	.51	.50
10.0	.59	.53	.49	.58	.52	.48	.57	.52	.48	.57	.52	.48	.56	.51	.48	.47



C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2019-10-23

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.443m [K=1.0000]  
 Remarks:

WEC AND CCEC

Test:U:240.2V I:0.0590A P:13.20W PF:0.9310 Lamp Flux:1101.79x1 lm		
NAME: LED-DL13WCOB-CW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:5700K	SERIAL No.:1
MFR.:	SUR.:0.040	PROTECTION ANGLE:

ρcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)									
0.0																
1.0	.193	.110	.035	.186	.106	.034	.173	.099	.032	.162	.093	.030	.151	.087	.028	
2.0	.185	.101	.031	.179	.099	.030	.168	.094	.029	.159	.089	.028	.149	.084	.027	
3.0	.176	.094	.028	.171	.092	.028	.162	.088	.027	.153	.084	.026	.145	.080	.025	
4.0	.167	.087	.026	.163	.085	.025	.155	.082	.025	.148	.079	.024	.141	.076	.023	
5.0	.159	.081	.023	.155	.080	.023	.148	.077	.023	.142	.075	.022	.136	.073	.022	
6.0	.151	.076	.022	.148	.075	.022	.142	.073	.021	.136	.071	.021	.131	.069	.020	
7.0	.144	.071	.020	.142	.071	.020	.136	.069	.020	.131	.067	.020	.126	.066	.019	
8.0	.138	.067	.019	.135	.067	.019	.130	.065	.019	.126	.064	.018	.122	.062	.018	
9.0	.132	.064	.018	.130	.063	.018	.125	.062	.018	.121	.061	.017	.117	.059	.017	
10.0	.126	.061	.017	.124	.060	.017	.120	.059	.017	.116	.058	.016	.113	.057	.016	

ρcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	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	.172	.157	.144	.147	.135	.124	.101	.093	.085	.058	.054	.050	.019	.017	.016	
2.0	.158	.132	.111	.135	.114	.096	.093	.079	.067	.053	.046	.039	.017	.015	.013	
3.0	.146	.114	.088	.125	.098	.076	.086	.068	.053	.050	.040	.031	.016	.013	.010	
4.0	.137	.099	.071	.117	.086	.061	.081	.060	.043	.047	.035	.026	.015	.011	.008	
5.0	.128	.088	.058	.110	.076	.050	.076	.053	.035	.044	.031	.021	.014	.010	.007	
6.0	.121	.079	.048	.104	.068	.042	.072	.048	.030	.042	.028	.018	.013	.009	.006	
7.0	.115	.071	.041	.099	.062	.035	.068	.043	.025	.040	.026	.015	.013	.008	.005	
8.0	.109	.065	.035	.094	.056	.030	.065	.040	.022	.038	.023	.013	.012	.008	.004	
9.0	.104	.060	.030	.090	.052	.026	.062	.037	.019	.036	.022	.011	.012	.007	.004	
10.0	.100	.056	.026	.086	.048	.023	.060	.034	.016	.035	.020	.010	.011	.007	.003	

C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2019-10-23

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.443m [K=1.0000]  
 Remarks:

Uncorrected UGR Table

Test:U:240.2V I:0.0590A P:13.20W PF:0.9310 Lamp Flux:1101.79x1 lm										
NAME: LED-DL13WCOB-CW-W					TYPE:13W			WEIGHT:		
DIM.:					SPEC.:5700K			SERIAL No.:1		
MFR.:					SUR.:0.040			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	21.1	22.1	21.3	22.3	22.4	21.4	22.5	21.7	22.6	22.8
3H	21.1	22.0	21.3	22.2	22.4	21.4	22.4	21.7	22.6	22.8
4H	21.1	22.0	21.4	22.2	22.5	21.5	22.4	21.8	22.6	22.8
6H	21.1	22.0	21.4	22.2	22.5	21.5	22.3	21.8	22.6	22.8
8H	21.1	21.9	21.4	22.2	22.4	21.5	22.3	21.8	22.5	22.8
12H	21.1	21.8	21.4	22.1	22.4	21.4	22.2	21.8	22.5	22.8
4H 2H	20.9	21.8	21.2	22.0	22.2	21.2	22.1	21.5	22.4	22.6
3H	21.0	21.8	21.3	22.0	22.3	21.3	22.1	21.7	22.4	22.7
4H	21.1	21.8	21.4	22.1	22.4	21.4	22.1	21.8	22.4	22.7
6H	21.1	21.8	21.5	22.1	22.4	21.5	22.1	21.9	22.4	22.8
8H	21.1	21.7	21.5	22.0	22.4	21.5	22.0	21.9	22.4	22.8
12H	21.1	21.6	21.5	22.0	22.4	21.4	22.0	21.8	22.3	22.7
8H 4H	21.0	21.6	21.4	22.0	22.3	21.4	21.9	21.8	22.3	22.7
6H	21.1	21.6	21.6	22.0	22.4	21.5	21.9	21.9	22.3	22.7
8H	21.1	21.5	21.6	22.0	22.4	21.4	21.9	21.9	22.3	22.7
12H	21.1	21.5	21.6	21.9	22.4	21.4	21.8	21.9	22.2	22.7
12H 4H	21.0	21.5	21.4	21.9	22.3	21.3	21.9	21.7	22.2	22.6
6H	21.1	21.5	21.6	21.9	22.4	21.4	21.8	21.9	22.3	22.7
8H	21.1	21.5	21.6	21.9	22.4	21.4	21.8	21.9	22.2	22.7
Variations with the observer position at spacings:										
S = 1.0H	+ 2.5 / - 5.5					+ 2.3 / - 5.4				
1.5H	+ 5.0 / - 5.6					+ 4.8 / - 5.6				
2.0H	+ 1.4 / - 0.5					+ 2.8 / - 0.6				

CIE Pub.117 Corrected 1102 lm Total Lamp Luminous Flux.(8log(F/F0) = 0.3)

C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2019-10-23

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.443m [K=1.0000]  
 Remarks:

UTILIZATION FACTORS TABLE

Test:U:240.2V I:0.0590A P:13.20W PF:0.9310 Lamp Flux:1101.79x1 lm		
NAME: LED-DL13WCOB-CW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:5700K	SERIAL No.:1
MFR.:	SUR.:0.040	PROTECTION ANGLE:

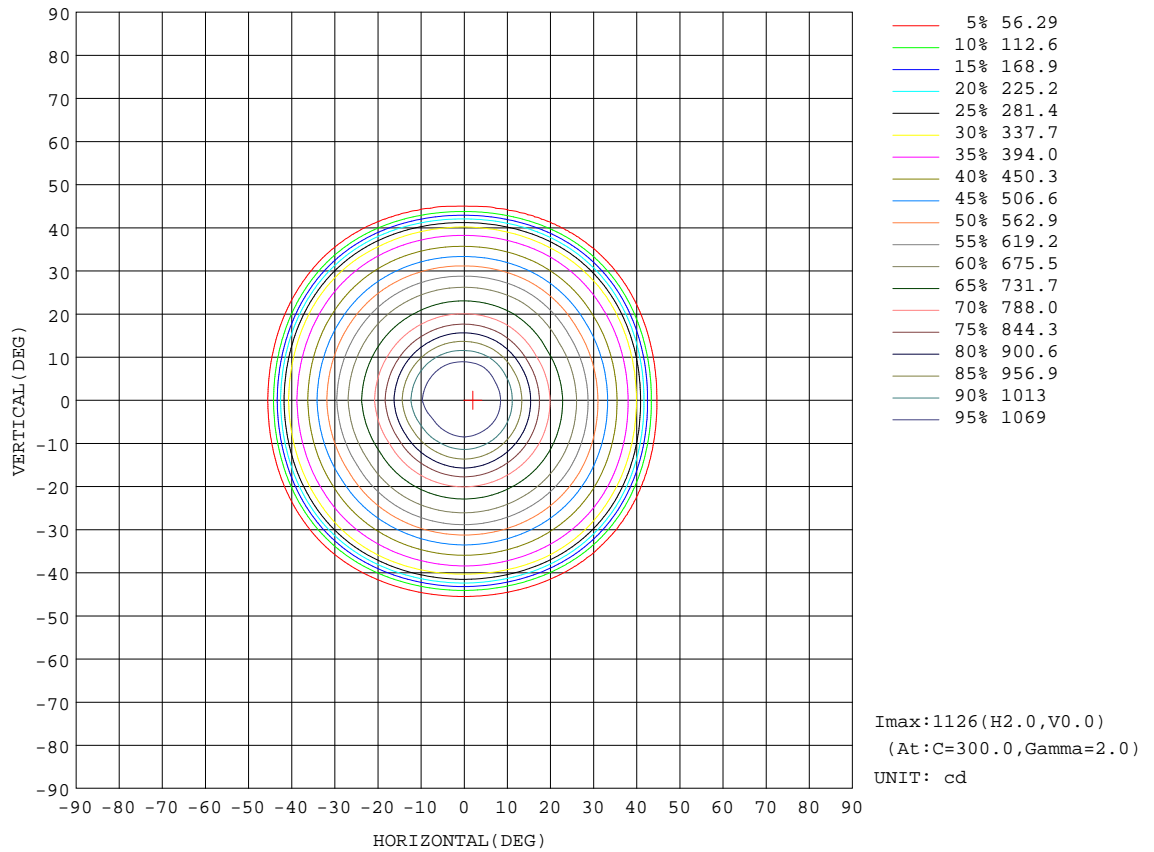
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
k = 0.60	84	77	73	84	77	73	83	77	73	69
0.80	92	86	82	91	85	81	90	85	81	77
1.00	97	91	87	96	90	87	94	90	86	82
1.25	101	96	92	100	95	91	98	94	91	86
1.50	104	99	95	103	98	95	101	97	94	89
2.00	107	103	99	106	102	99	103	100	97	92
2.50	109	105	102	108	104	101	104	101	99	93
3.00	111	107	104	109	106	103	106	103	101	94
4.00	113	110	108	111	108	106	107	105	104	96
5.00	114	112	110	112	110	108	108	107	105	98
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:2019-10-23

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.443m [K=1.0000]  
 Remarks:

**ISOCANDELA DIAGRAM**

Test:U:240.2V I:0.0590A P:13.20W PF:0.9310 Lamp Flux:1101.79x1 lm		
NAME: LED-DL13WCOB-CW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:5700K	SERIAL No.:1
MFR.:	SUR.:0.040	PROTECTION ANGLE:

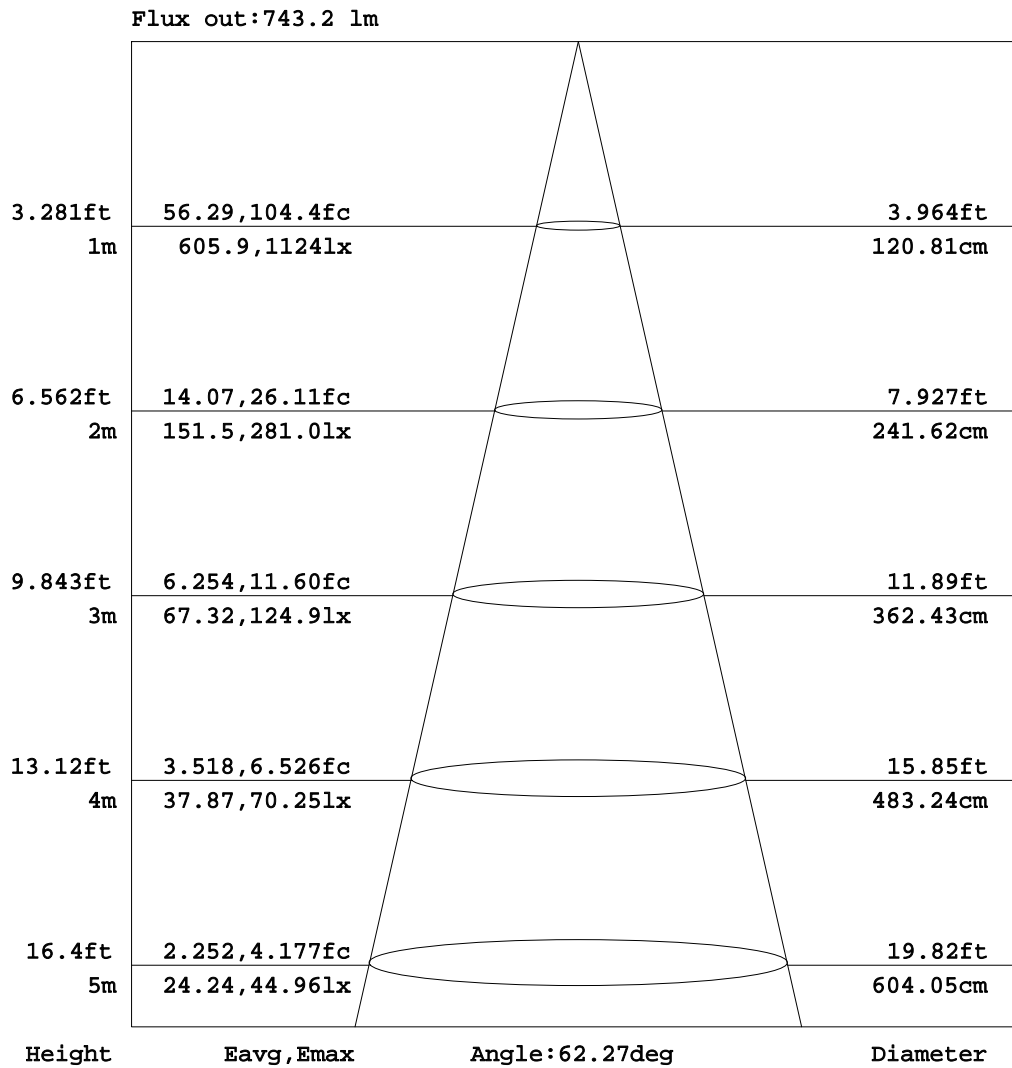


C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature: 25.3DEG  
 Operators: DAMIN  
 Test Date: 2019-10-23

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System: EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity: 65.0%  
 Test Distance: 9.443m [K=1.0000]  
 Remarks:

AAI Figure

Test:U:240.2V I:0.0590A P:13.20W PF:0.9310 Lamp Flux:1101.79x1 lm		
NAME: LED-DL13WCOB-CW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:5700K	SERIAL No.:1
MFR.:	SUR.:0.040	PROTECTION ANGLE:



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

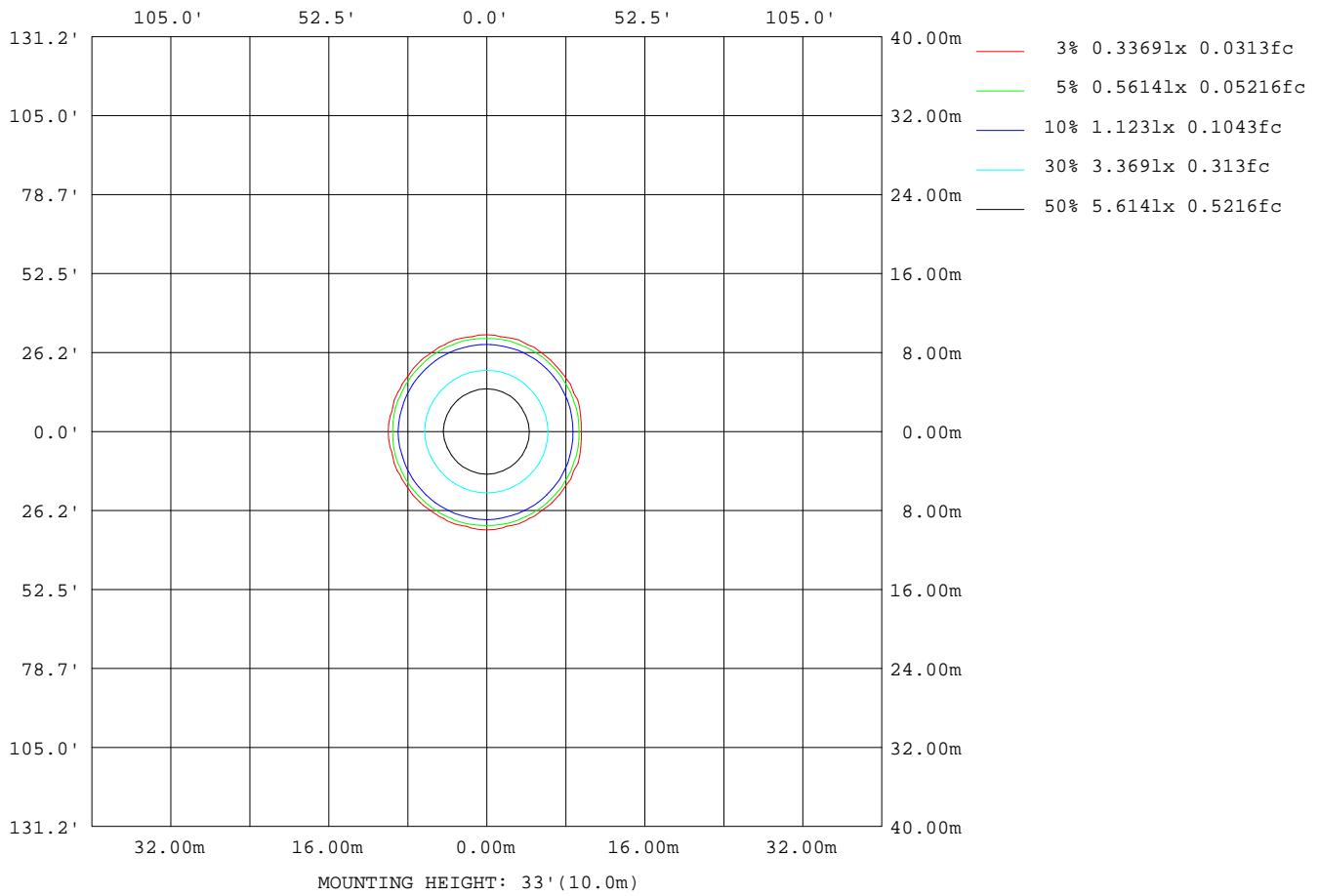
C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2019-10-23

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.443m [K=1.0000]  
 Remarks:



**ISOLUX DIAGRAM**

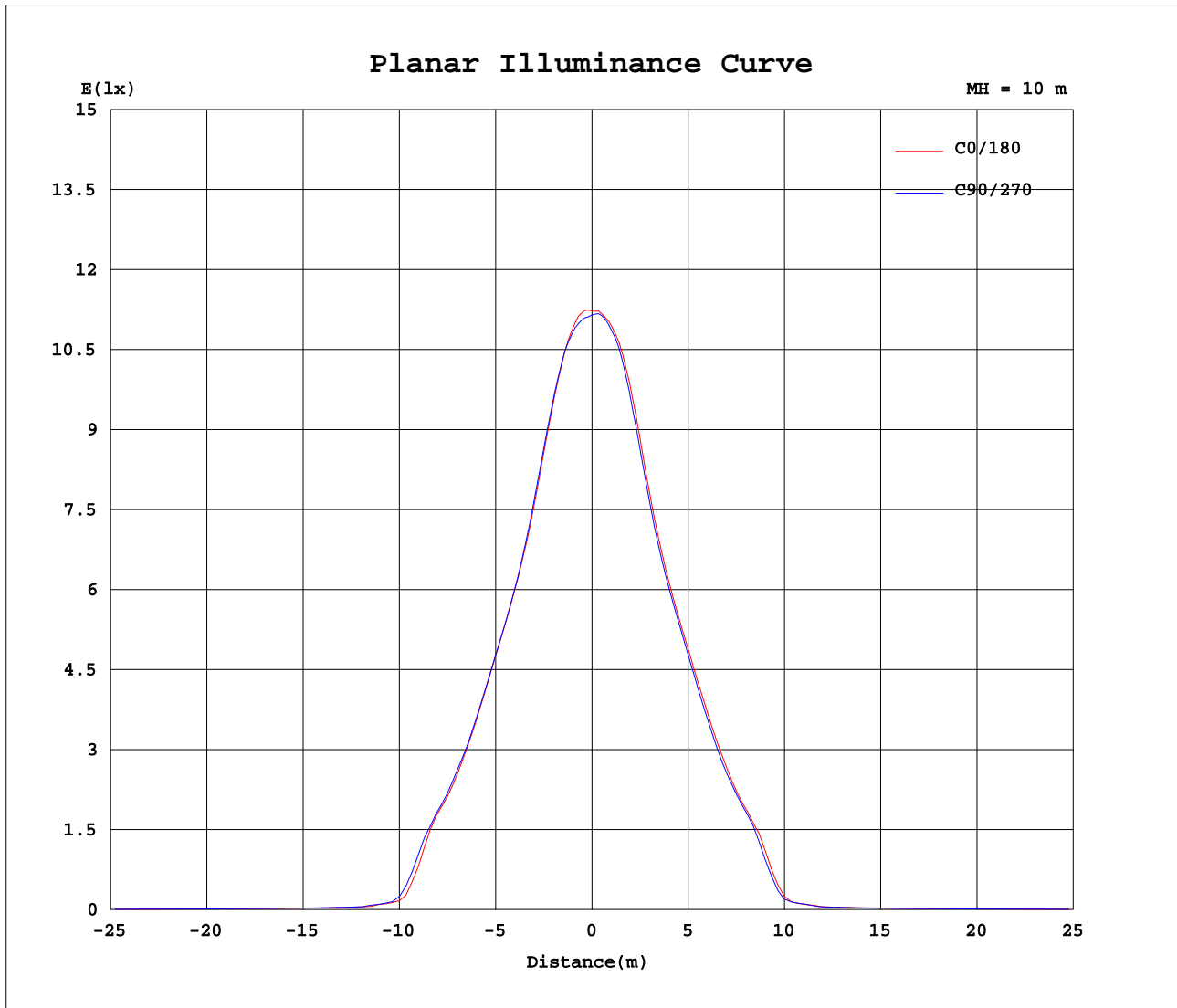
Test:U:240.2V I:0.0590A P:13.20W PF:0.9310 Lamp Flux:1101.79x1 lm		
NAME: LED-DL13WCOB-CW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:5700K	SERIAL No.:1
MFR.:	SUR.:0.040	PROTECTION ANGLE:



C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2019-10-23

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.443m [K=1.0000]  
 Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature: 25.3DEG  
 Operators: DAMIN  
 Test Date: 2019-10-23

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System: EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity: 65.0%  
 Test Distance: 9.443m [K=1.0000]  
 Remarks:

