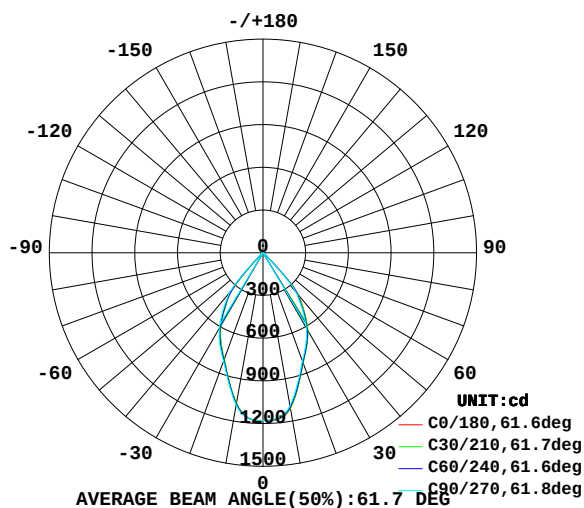


LUMINAIRE PHOTOMETRIC TEST REPORT

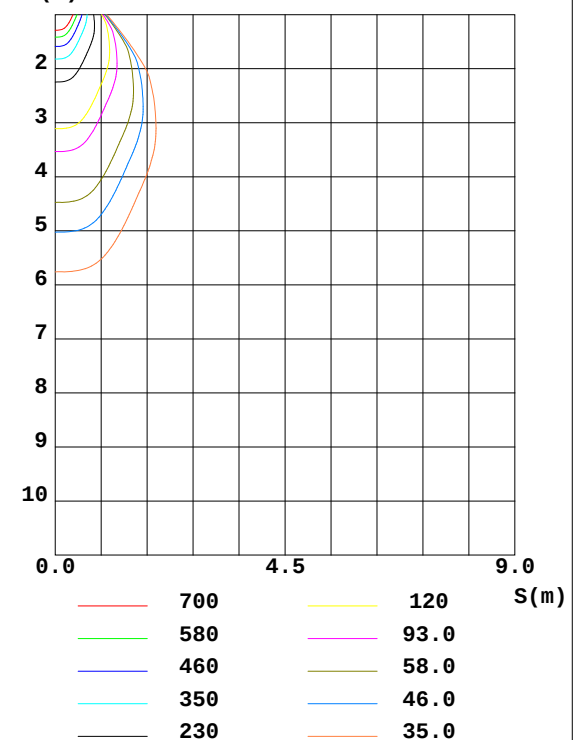
Test:U:240.1V I:0.0540A P:12.70W PF:0.9780 Lamp Flux:1139.37x1 lm		
NAME: LED-DL13WCOB-WW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:3000K	SERIAL No.:1
MFR.:	SUR.:0.04	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 89.71 lm/W			
MODEL	LED-DL13WCOB-WW-W	I _{max} (cd)	1181	S/MH(C0/180)	0.86
NOMINAL POWER(W)	13	LOR(%)	100.0	S/MH(C90/270)	0.84
RATED VOLTAGE(V)	240	TOTAL FLUX(lm)	1139.4	η UP, DN(C0-180)	0.0, 50.3
NOMINAL FLUX(lm)	1139.37	CIE CLASS	DIRECT	η UP, DN(C180-360)	0.0, 49.7
LAMPS INSIDE	1	η up(%)	0.0	CIBSE SHR NOM	1.00
TEST VOLTAGE(V)	240.0	η down(%)	100.0	CIBSE SHR MAX	1.05

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



C0 PLANE ISOLUX DIAGRAM (UNIT:lx)



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-11-09

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE G0-2000A_V1 SYSTEM V2.0.276
Humidity:65.0%
Test Distance:9.600m [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	1110	1105	1092	1077	1074	1075	1087	1102	0- 10	109.2	109.2	9.58,9.58
20	823.8	822.0	809.2	795.5	800.3	799.3	810.1	816.3	10- 20	263.7	372.9	32.7,32.7
30	627.4	625.2	609.5	592.2	591.4	594.7	613.5	626.1	20- 30	326.4	699.3	61.4,61.4
40	386.3	376.6	353.5	350.8	343.5	333.7	369.5	383.2	30- 40	301.4	1001	87.8,87.8
50	30.08	25.74	20.89	20.19	20.31	19.92	20.30	26.84	40- 50	100.7	1101	96.7,96.7
60	14.42	14.00	13.94	14.10	14.33	14.40	14.08	14.29	50- 60	15.09	1117	98,98
70	12.34	12.09	11.05	11.20	11.26	11.21	10.80	11.88	60- 70	13.47	1130	99.2,99.2
80	4.921	4.243	3.375	3.022	3.462	3.149	3.240	3.887	70- 80	8.196	1138	99.9,99.9
90	0	0	0	0	0	0	0	0	80- 90	1.207	1139	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		

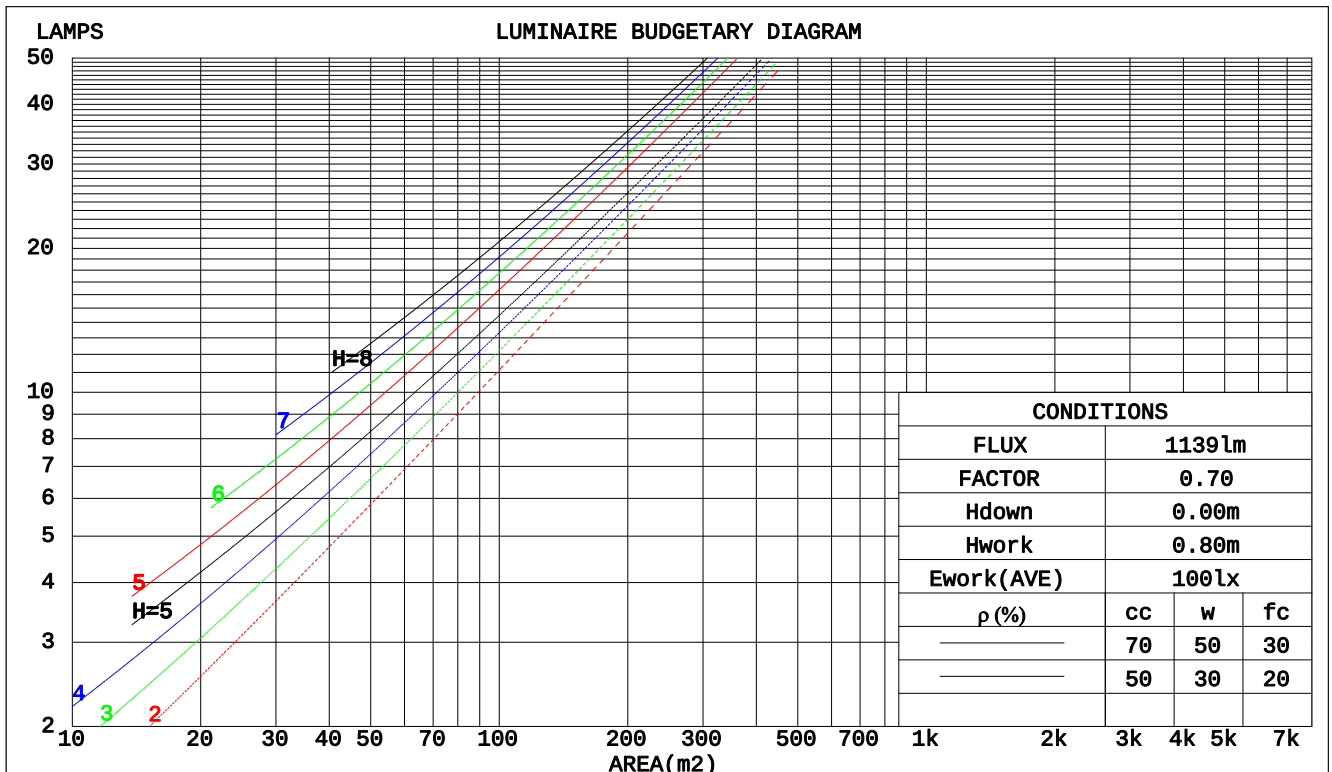
C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-11-09

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE G0-2000A_V1 SYSTEM V2.0.276
Humidity:65.0%
Test Distance:9.600m [K=1.0000]
Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:240.1V I:0.0540A P:12.70W PF:0.9780 Lamp Flux:1139.37x1 lm		
NAME: LED-DL13WCOB-WW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:3000K	SERIAL No.:1
MFR.:	SUR.:0.04	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	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	1.00
1.0	1.10	1.07	1.05	1.08	1.05	1.03	1.04	1.02	1.00	1.00	.99	.97	.97	.95	.94	.93
2.0	1.02	.97	.94	.90	.96	.93	.97	.93	.91	.94	.91	.89	.91	.89	.87	.85
3.0	.94	.89	.85	.93	.88	.84	.90	.86	.83	.88	.84	.81	.85	.82	.80	.78
4.0	.87	.81	.77	.86	.81	.76	.84	.79	.76	.82	.78	.75	.80	.77	.74	.72
5.0	.81	.75	.70	.80	.75	.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	.67	.63	.62
7.0	.71	.64	.60	.70	.64	.60	.69	.63	.60	.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:2018-11-09

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
Test System:EVERFINE G0-2000A_V1 SYSTEM V2.0.276
Humidity:65.0%
Test Distance:9.600m [K=1.0000]
Remarks:

WEC AND CCEC

Test:U:240.1V I:0.0540A P:12.70W PF:0.9780 Lamp Flux:1139.37x1 lm								
NAME: LED-DL13WCOB-WW-W				TYPE:13W			WEIGHT:	
DIM.:				SPEC.:3000K			SERIAL No.:1	
MFR.:				SUR.:0.04			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	.191	.109	.034	.185	.105	.033	.172	.099	.031	.160	.092	.030	.150	.087	.028	
2.0	.184	.101	.031	.178	.098	.030	.167	.093	.029	.158	.088	.028	.148	.084	.026	
3.0	.175	.093	.028	.170	.091	.027	.161	.087	.027	.153	.084	.026	.145	.080	.025	
4.0	.167	.087	.025	.163	.085	.025	.155	.082	.024	.147	.079	.024	.140	.076	.023	
5.0	.159	.081	.023	.155	.080	.023	.148	.077	.023	.142	.075	.022	.135	.072	.022	
6.0	.151	.076	.022	.148	.075	.022	.142	.073	.021	.136	.071	.021	.131	.069	.020	
7.0	.144	.071	.020	.141	.070	.020	.136	.069	.020	.131	.067	.020	.126	.065	.019	
8.0	.138	.067	.019	.135	.067	.019	.130	.065	.019	.126	.064	.018	.121	.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	.086	.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	.036	.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	.025	.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:2018-11-09

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
Test System:EVERFINE G0-2000A_V1 SYSTEM V2.0.276
Humidity:65.0%
Test Distance:9.600m [K=1.0000]
Remarks:

Uncorrected UGR Table

Test:U:240.1V I:0.0540A P:12.70W PF:0.9780 Lamp Flux:1139.37x1 lm											
NAME: LED-DL13WCOB-WW-W					TYPE:13W			WEIGHT:			
DIM.:					SPEC.:3000K			SERIAL No.:1			
MFR.:					SUR.:0.04			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		22.3	23.3	22.5	23.5	23.6	21.9	22.9	22.1	23.1	23.2
	3H	22.2	23.1	22.5	23.3	23.6	21.8	22.8	22.1	23.0	23.2
	4H	22.2	23.1	22.5	23.3	23.5	21.8	22.7	22.1	22.9	23.1
	6H	22.2	23.0	22.5	23.2	23.5	21.7	22.6	22.1	22.8	23.1
	8H	22.1	22.9	22.5	23.2	23.5	21.7	22.5	22.0	22.8	23.0
	12H	22.1	22.9	22.4	23.1	23.4	21.7	22.4	22.0	22.7	23.0
4H	2H	22.0	22.9	22.3	23.1	23.4	21.6	22.5	21.9	22.8	23.0
	3H	22.0	22.8	22.4	23.1	23.4	21.7	22.4	22.0	22.7	23.0
	4H	22.1	22.8	22.4	23.1	23.4	21.7	22.4	22.0	22.7	23.0
	6H	22.1	22.7	22.5	23.0	23.4	21.7	22.3	22.0	22.6	23.0
	8H	22.1	22.6	22.5	23.0	23.4	21.6	22.2	22.0	22.5	22.9
	12H	22.0	22.5	22.4	22.9	23.3	21.6	22.1	22.0	22.5	22.9
8H	4H	22.0	22.6	22.4	22.9	23.3	21.6	22.2	22.0	22.5	22.9
	6H	22.0	22.5	22.5	22.9	23.3	21.6	22.1	22.0	22.5	22.9
	8H	22.0	22.4	22.5	22.9	23.3	21.6	22.0	22.0	22.4	22.8
	12H	22.0	22.3	22.5	22.8	23.3	21.5	21.9	22.0	22.3	22.8
12H	4H	21.9	22.5	22.4	22.8	23.2	21.6	22.1	22.0	22.5	22.8
	6H	22.0	22.4	22.4	22.8	23.3	21.6	22.0	22.0	22.4	22.8
	8H	22.0	22.3	22.5	22.8	23.3	21.5	21.9	22.0	22.3	22.8
Variations with the observer position at spacings:											
S = 1.0H		+ 2.1 / - 6.4					+ 2.2 / - 6.7				
1.5H		+ 4.5 / - 6.4					+ 4.7 / - 6.7				
2.0H		+ 5.2 / - 1.2					+ 4.1 / - 1.0				

CIE Pub.117 Corrected 1139 lm Total Lamp Luminous Flux.(8log(F/F0) = 0.5)

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-11-09

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE G0-2000A_V1 SYSTEM V2.0.276
Humidity:65.0%
Test Distance:9.600m [K=1.0000]
Remarks:

UTILIZATION FACTORS TABLE

Test:U:240.1V I:0.0540A P:12.70W PF:0.9780 Lamp Flux:1139.37x1 lm		
NAME: LED-DL13WCOB-WW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:3000K	SERIAL No.:1
MFR.:	SUR.:0.04	PROTECTION ANGLE:

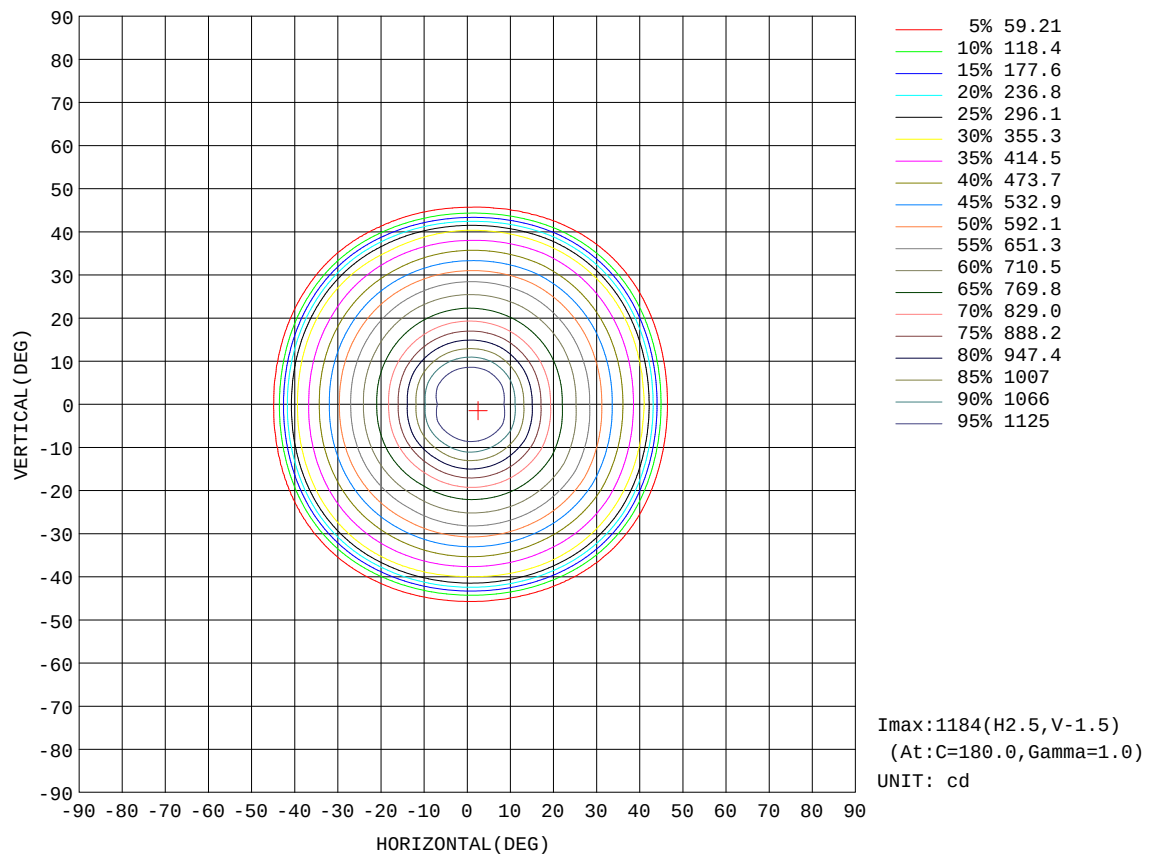
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	84	77	73	83	77	73	83	77	73	69
0.80	92	85	81	91	85	81	90	84	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:2018-11-09

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
Test System:EVERFINE G0-2000A_V1 SYSTEM V2.0.276
Humidity:65.0%
Test Distance:9.600m [K=1.0000]
Remarks:

ISOCANDELA DIAGRAM

Test:U:240.1V I:0.0540A P:12.70W PF:0.9780 Lamp Flux:1139.37x1 lm		
NAME: LED-DL13WCOB-WW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:3000K	SERIAL No.:1
MFR.:	SUR.:0.04	PROTECTION ANGLE:

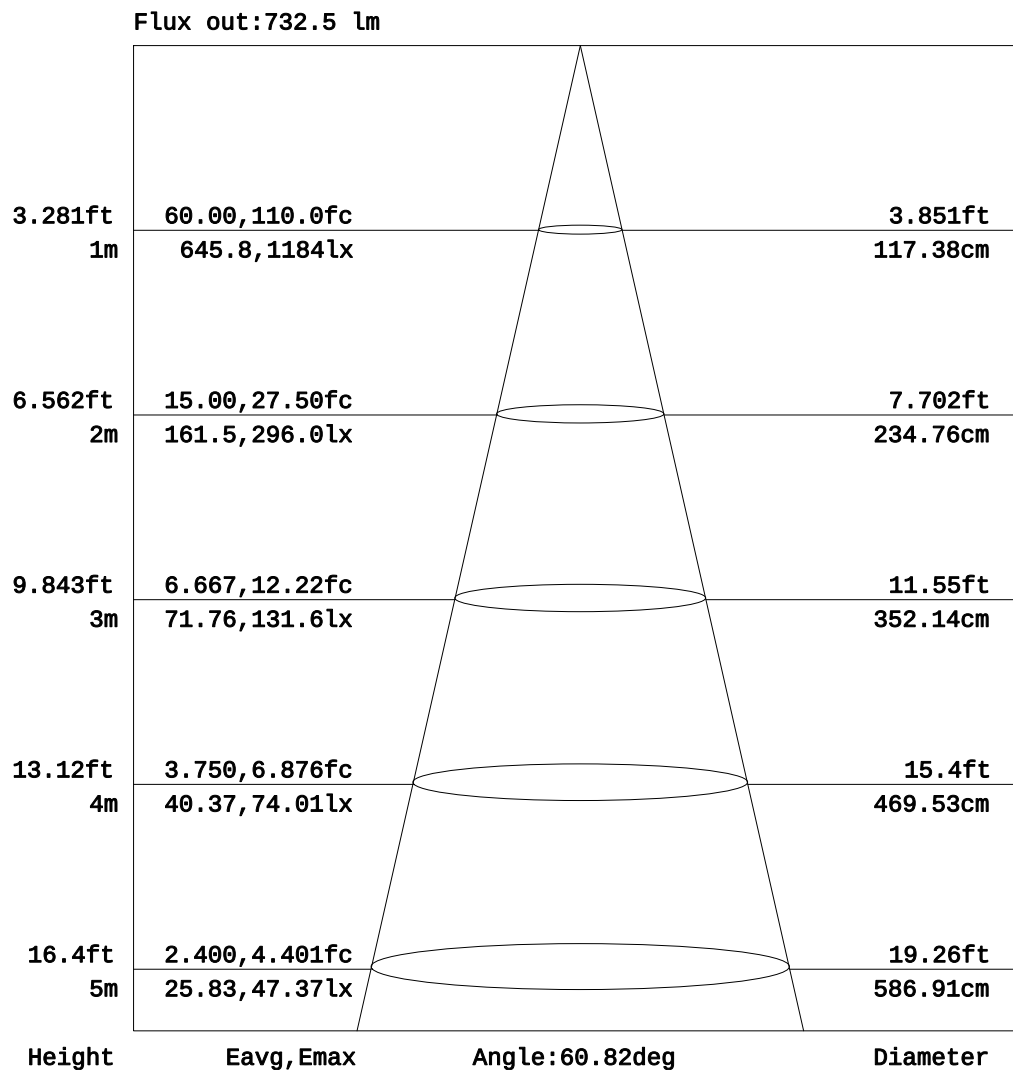


C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-11-09

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE G0-2000A_V1 SYSTEM V2.0.276
Humidity:65.0%
Test Distance:9.600m [K=1.0000]
Remarks:

AAI Figure

Test:U:240.1V I:0.0540A P:12.70W PF:0.9780 Lamp Flux:1139.37x1 lm		
NAME: LED-DL13WCOB-WW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:3000K	SERIAL No.:1
MFR.:	SUR.:0.04	PROTECTION ANGLE:



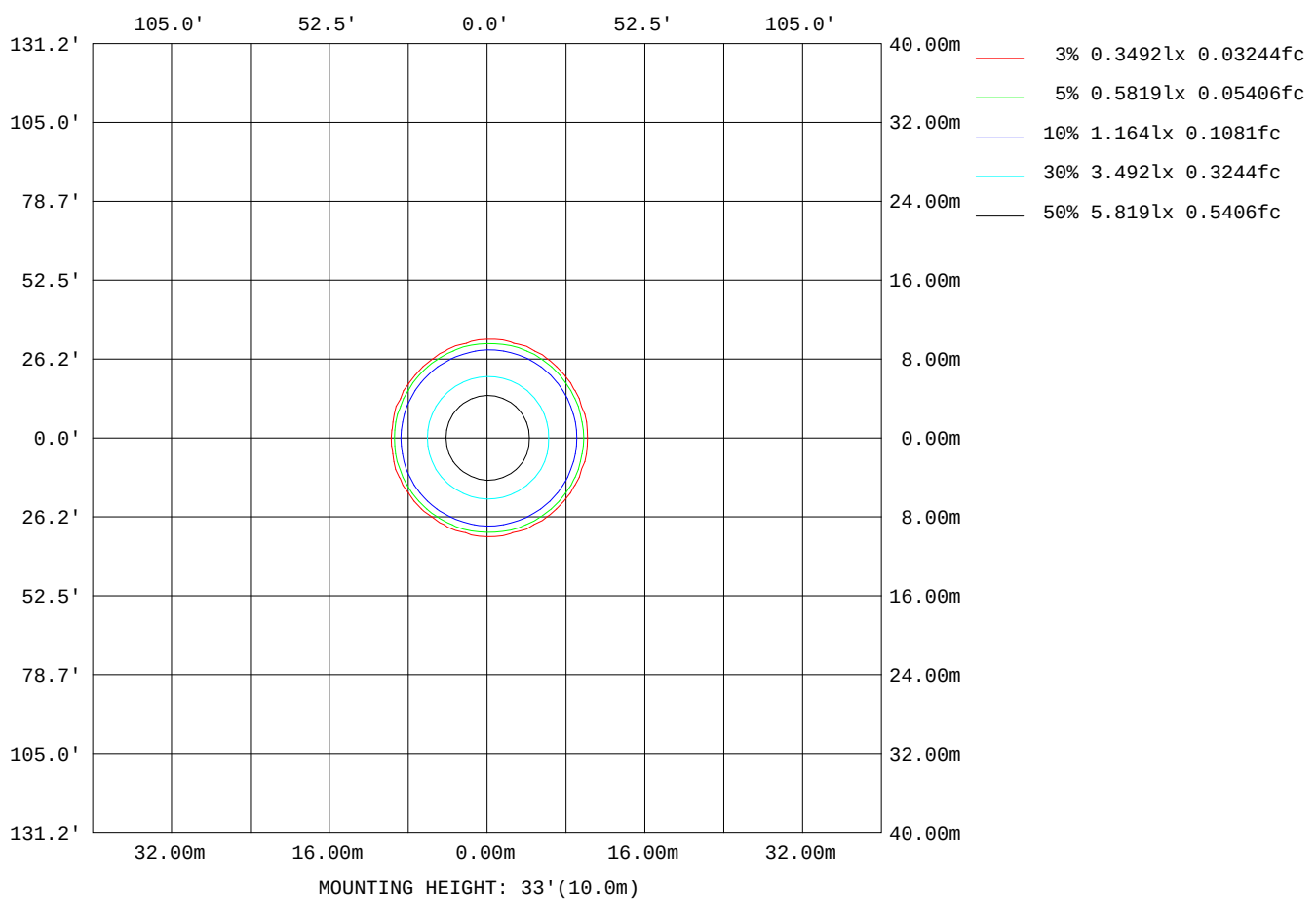
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-11-09

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE G0-2000A_V1 SYSTEM V2.0.276
Humidity:65.0%
Test Distance:9.600m [K=1.0000]
Remarks:

ISOLUX DIAGRAM

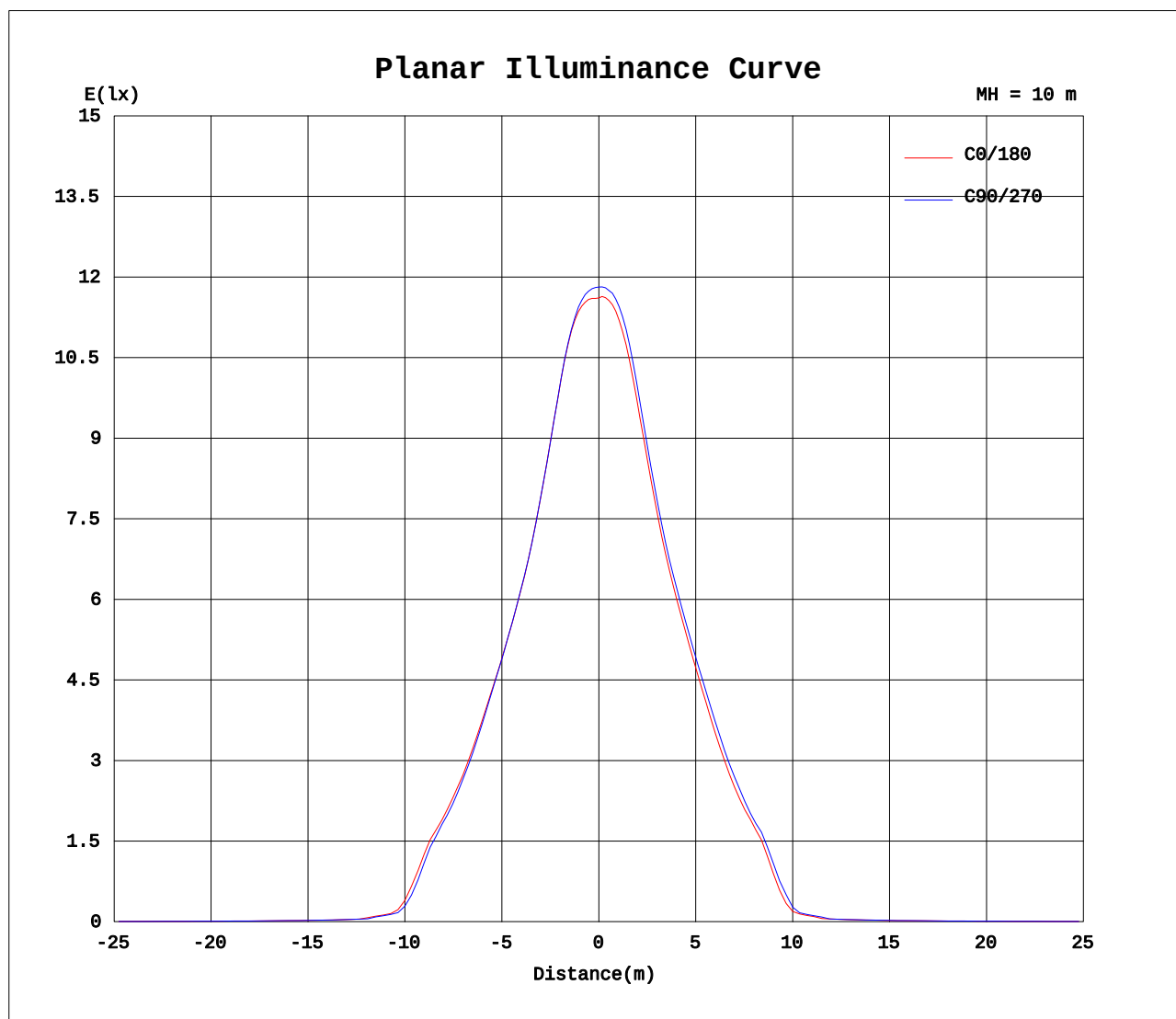
Test:U:240.1V I:0.0540A P:12.70W PF:0.9780 Lamp Flux:1139.37x1 lm		
NAME: LED-DL13WCOB-WW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:3000K	SERIAL No.:1
MFR.:	SUR.:0.04	PROTECTION ANGLE:



C Range: 0 - 360DEG
C Interval: 30.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2018-11-09

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE G0-2000A_V1 SYSTEM V2.0.276
Humidity:65.0%
Test Distance:9.600m [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: 2018-11-09

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
Test System: EVERFINE G0-2000A_V1 SYSTEM V2.0.276
Humidity: 65.0%
Test Distance: 9.600m [K=1.0000]
Remarks:

```

Range: 0 - 90DEG
Interval: 1.0DEG
Test System:EVERFINE G0-2000A_V1 SYSTEM V2.0.276
Humidity:65.0%
Test Distance:9.600m [K=1.0000]
Remarks:

```