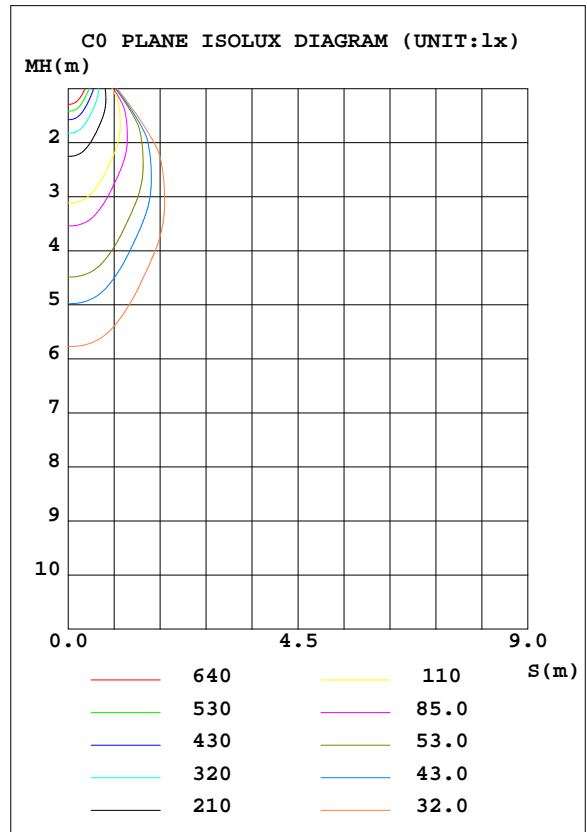
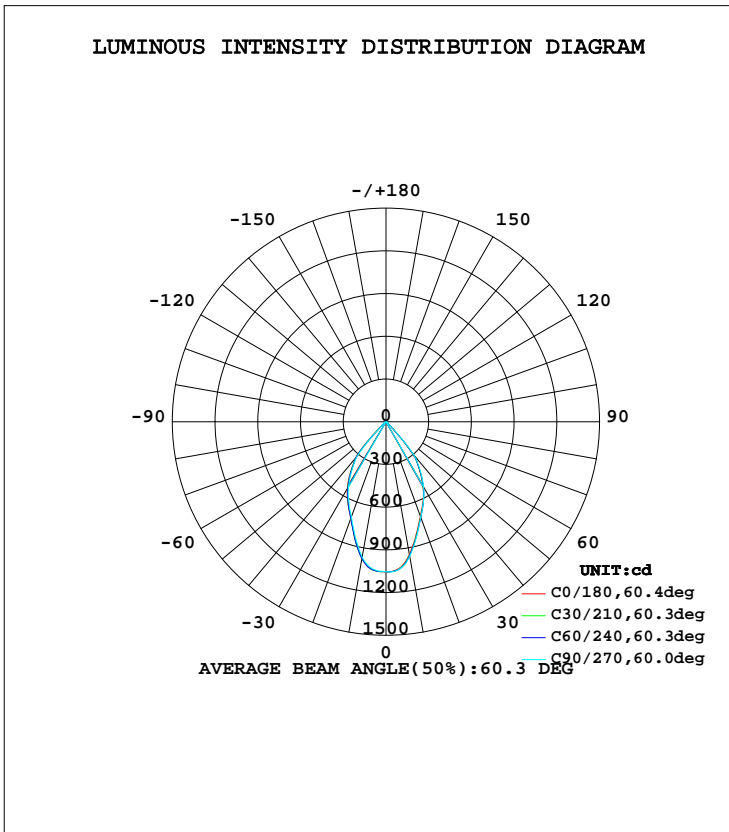


LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:240.4V I:0.0540A P:12.60W PF:0.9600 Lamp Flux:995.299x1 lm		
NAME: LED-DL13WCOB-NW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.:	SUR.:0.04	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 78.99 lm/W			
MODEL	LED-DL13WCOB-NW-W	I <sub>max</sub> (cd)	1055	S/MH(C0/180)	0.82
NOMINAL POWER(W)	12	LOR(%)	100.0	S/MH(C90/270)	0.83
RATED VOLTAGE(V)	240	TOTAL FLUX(lm)	995.30	η UP, DN(C0-180)	0.0, 49.6
NOMINAL FLUX(lm)	995.299	CIE CLASS	DIRECT	η UP, DN(C180-360)	0.0, 50.4
LAMPS INSIDE	1	η up(%)	0.0	CIBSE SHR NOM	1.00
TEST VOLTAGE(V)	240.5	η down(%)	100.0	CIBSE SHR MAX	1.00



C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2018-04-10

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.600m [K=1.0000]  
 Remarks:

ZONAL FLUX DIAGRAM

ZONAL FLUX DIAGRAM:

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi$ zone	$\Phi$ total	$\%lum, lamp$
10	946.5	953.9	960.9	966.6	976.2	976.3	964.5	953.7	0- 10	96.90	96.90	9.74,9.74
20	706.7	713.8	715.6	715.7	723.9	722.7	712.6	706.7	10- 20	233.0	329.9	33.1,33.1
30	518.2	523.6	528.0	534.0	543.4	537.0	527.1	519.8	20- 30	285.5	615.4	61.8,61.8
40	284.0	291.5	306.8	322.1	330.1	329.2	314.1	297.4	30- 40	262.0	877.4	88.2,88.2
50	17.36	17.67	18.34	20.24	24.57	21.58	18.57	17.88	40- 50	83.92	961.3	96.6,96.6
60	12.70	13.31	13.45	13.02	13.17	12.85	12.48	12.09	50- 60	13.50	974.8	97.9,97.9
70	9.702	10.50	10.63	10.40	11.00	10.87	10.10	9.161	60- 70	11.97	986.8	99.1,99.1
80	2.663	3.192	3.750	3.300	4.456	4.487	3.638	2.315	70- 80	7.508	994.3	99.9,99.9
90	0	0	0	0	0	0	0	0	80- 90	1.019	995.3	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		

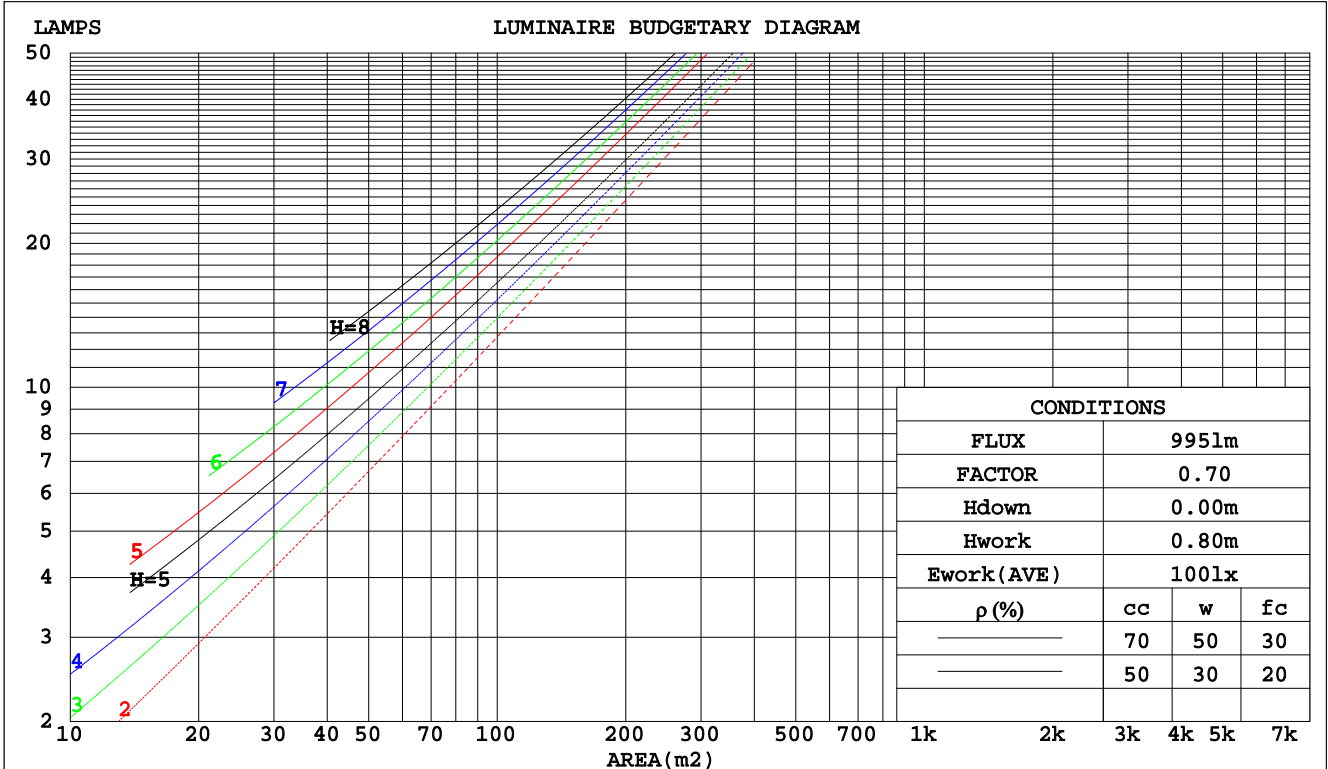
C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2018-04-10

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System:EVERFINE GO-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:240.4V I:0.0540A P:12.60W PF:0.9600 Lamp Flux:995.299x1 lm		
NAME: LED-DL13WCOB-NW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.:	SUR.:0.04	PROTECTION ANGLE:

pcc	80%			70%			50%			30%			10%			0
	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	
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	1.06	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	.83	.80	.78
4.0	.87	.82	.77	.86	.81	.77	.84	.79	.76	.82	.78	.75	.80	.77	.74	.72
5.0	.81	.75	.71	.80	.75	.70	.79	.74	.70	.77	.73	.69	.75	.71	.68	.67
6.0	.76	.70	.65	.75	.69	.65	.74	.68	.64	.72	.68	.64	.71	.67	.63	.62
7.0	.71	.65	.60	.70	.64	.60	.69	.64	.60	.68	.63	.59	.67	.62	.59	.58
8.0	.67	.60	.56	.66	.60	.56	.65	.59	.56	.64	.59	.55	.63	.58	.55	.54
9.0	.63	.56	.52	.62	.56	.52	.61	.56	.52	.60	.55	.52	.59	.55	.51	.50
10.0	.59	.53	.49	.59	.53	.49	.58	.52	.49	.57	.52	.48	.56	.52	.48	.47



C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature: 25.3DEG  
 Operators: DAMIN  
 Test Date: 2018-04-10

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System: EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity: 65.0%  
 Test Distance: 9.600m [K=1.0000]  
 Remarks:

WEC AND CCEC

Test:U:240.4V I:0.0540A P:12.60W PF:0.9600 Lamp Flux:995.299x1 lm		
NAME: LED-DL13WCOB-NW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.:	SUR.:0.04	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	.191	.109	.034	.184	.105	.033	.172	.098	.031	.160	.092	.030	.149	.086	.028	
2.0	.183	.101	.031	.178	.098	.030	.167	.093	.029	.157	.088	.028	.148	.084	.026	
3.0	.175	.093	.028	.170	.091	.027	.161	.087	.026	.152	.083	.026	.144	.080	.025	
4.0	.166	.086	.025	.162	.085	.025	.154	.082	.024	.147	.079	.024	.140	.076	.023	
5.0	.158	.081	.023	.155	.079	.023	.148	.077	.023	.141	.074	.022	.135	.072	.022	
6.0	.151	.076	.022	.148	.075	.021	.141	.072	.021	.136	.070	.021	.130	.069	.020	
7.0	.144	.071	.020	.141	.070	.020	.135	.069	.020	.130	.067	.019	.126	.065	.019	
8.0	.137	.067	.019	.135	.066	.019	.130	.065	.019	.125	.063	.018	.121	.062	.018	
9.0	.131	.064	.018	.129	.063	.018	.125	.062	.017	.121	.060	.017	.117	.059	.017	
10.0	.126	.060	.017	.124	.060	.017	.120	.059	.017	.116	.058	.016	.112	.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	.136	.099	.071	.117	.086	.061	.080	.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	.099	.056	.027	.086	.048	.023	.059	.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:2018-04-10

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.600m [K=1.0000]  
 Remarks:

Uncorrected UGR Table

Test:U:240.4V I:0.0540A P:12.60W PF:0.9600 Lamp Flux:995.299x1 lm										
NAME: LED-DL13WCOB-NW-W					TYPE:13W			WEIGHT:		
DIM.:					SPEC.:4000K			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	20.5	21.5	20.7	21.7	21.9	20.7	21.7	20.9	21.9	22.0
3H	20.5	21.4	20.7	21.6	21.8	20.7	21.6	20.9	21.8	22.0
4H	20.5	21.4	20.8	21.6	21.8	20.7	21.6	21.0	21.8	22.0
6H	20.5	21.3	20.8	21.5	21.8	20.7	21.5	21.0	21.8	22.0
8H	20.4	21.2	20.7	21.5	21.7	20.7	21.5	21.0	21.7	22.0
12H	20.4	21.1	20.7	21.4	21.7	20.6	21.4	20.9	21.7	21.9
4H 2H	20.3	21.2	20.6	21.4	21.6	20.5	21.4	20.8	21.6	21.8
3H	20.4	21.1	20.7	21.4	21.7	20.6	21.3	20.9	21.6	21.9
4H	20.4	21.1	20.8	21.4	21.7	20.6	21.3	21.0	21.6	21.9
6H	20.4	21.0	20.8	21.4	21.7	20.7	21.3	21.1	21.6	22.0
8H	20.4	21.0	20.8	21.3	21.7	20.6	21.2	21.0	21.6	21.9
12H	20.4	20.9	20.8	21.2	21.6	20.6	21.1	21.0	21.5	21.9
8H 4H	20.4	20.9	20.8	21.3	21.7	20.6	21.1	21.0	21.5	21.9
6H	20.4	20.9	20.8	21.3	21.7	20.6	21.1	21.1	21.5	21.9
8H	20.4	20.8	20.8	21.2	21.6	20.6	21.0	21.1	21.4	21.9
12H	20.3	20.7	20.8	21.1	21.6	20.6	20.9	21.0	21.4	21.8
12H 4H	20.3	20.9	20.8	21.2	21.6	20.5	21.1	21.0	21.4	21.8
6H	20.4	20.8	20.8	21.2	21.6	20.6	21.0	21.1	21.4	21.9
8H	20.3	20.7	20.8	21.1	21.6	20.6	20.9	21.0	21.4	21.8
Variations with the observer position at spacings:										
S = 1.0H	+ 2.6 / - 6.3					+ 2.5 / - 5.9				
1.5H	+ 5.2 / - 6.2					+ 5.0 / - 5.8				
2.0H	+ 2.5 / - 0.8					+ 3.2 / - 0.7				

CIE Pub.117 Corrected 995.3 lm Total Lamp Luminous Flux.(8log(F/F0) = -0.0)

C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2018-04-10

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.600m [K=1.0000]  
 Remarks:

UTILIZATION FACTORS TABLE

Test:U:240.4V I:0.0540A P:12.60W PF:0.9600 Lamp Flux:995.299x1 lm		
NAME: LED-DL13WCOB-NW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.:	SUR.:0.04	PROTECTION ANGLE:

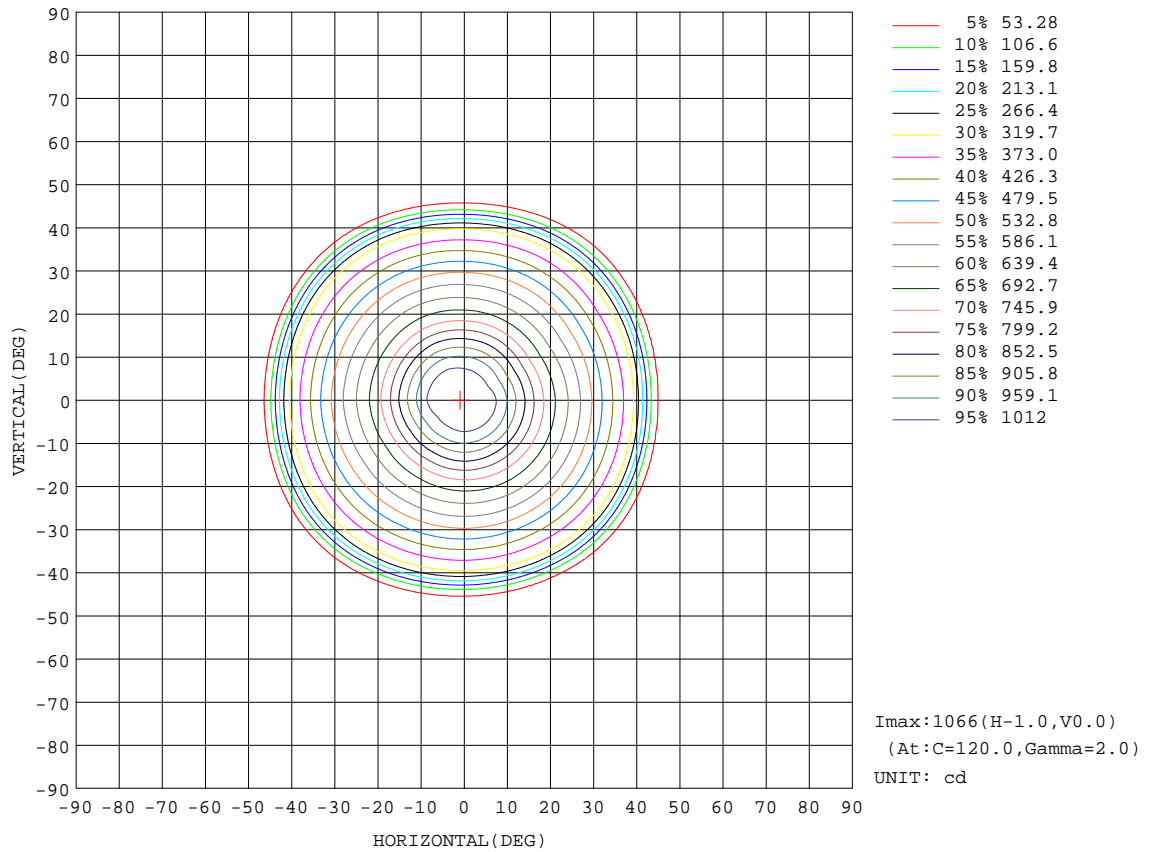
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
k = 0.60	84	77	73	84	77	73	83	77	73	69
0.80	92	86	82	91	85	81	90	85	81	77
1.00	97	91	87	96	91	87	95	90	86	82
1.25	101	96	92	100	95	92	98	94	91	86
1.50	104	99	96	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	102	99	93
3.00	111	107	104	109	106	103	106	103	101	95
4.00	113	110	108	111	109	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:2018-04-10

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.600m [K=1.0000]  
 Remarks:

**ISOCANDELA DIAGRAM**

Test:U:240.4V I:0.0540A P:12.60W PF:0.9600 Lamp Flux:995.299x1 lm		
NAME: LED-DL13WCOB-NW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.:	SUR.:0.04	PROTECTION ANGLE:

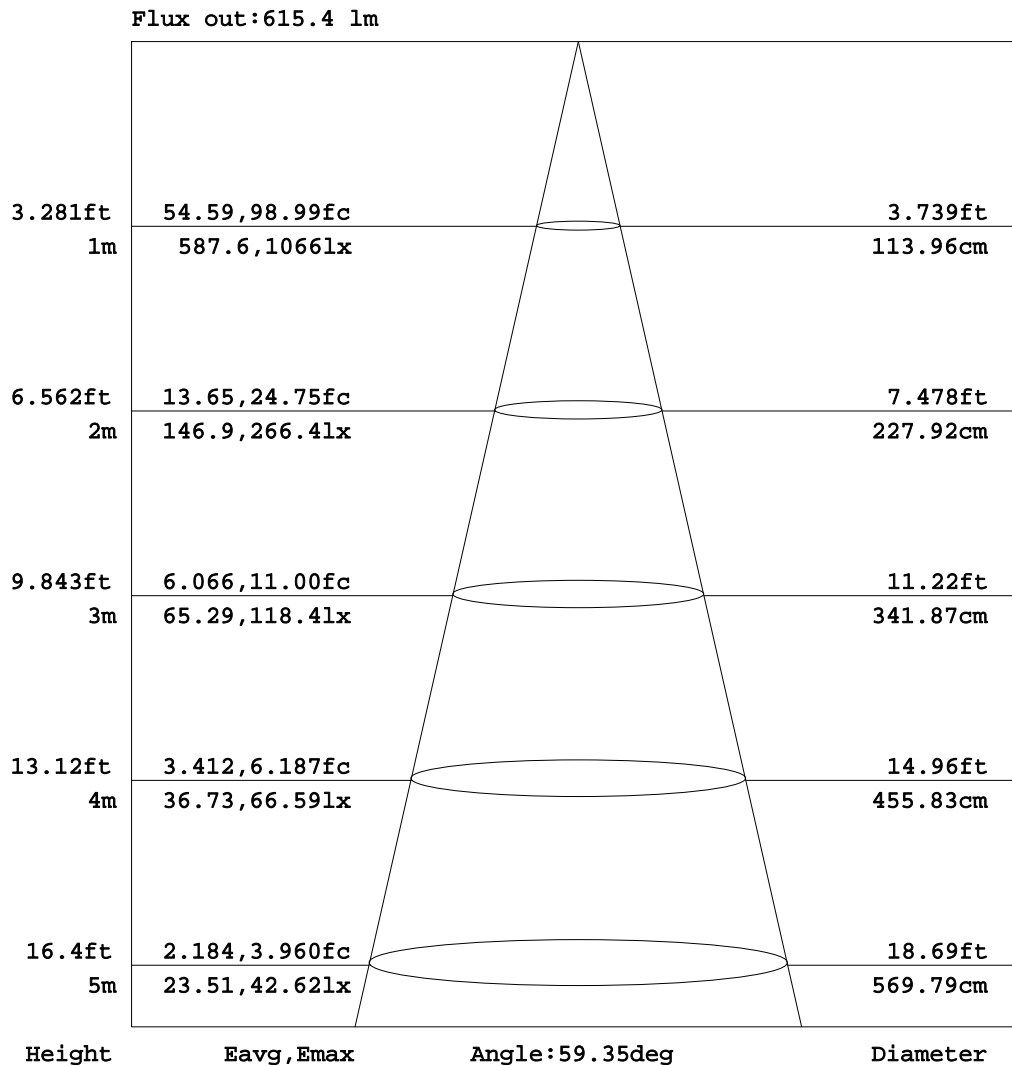


C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2018-04-10

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.600m [K=1.0000]  
 Remarks:

AAI Figure

Test:U:240.4V I:0.0540A P:12.60W PF:0.9600 Lamp Flux:995.299x1 lm		
NAME: LED-DL13WCOB-NW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:4000K	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.

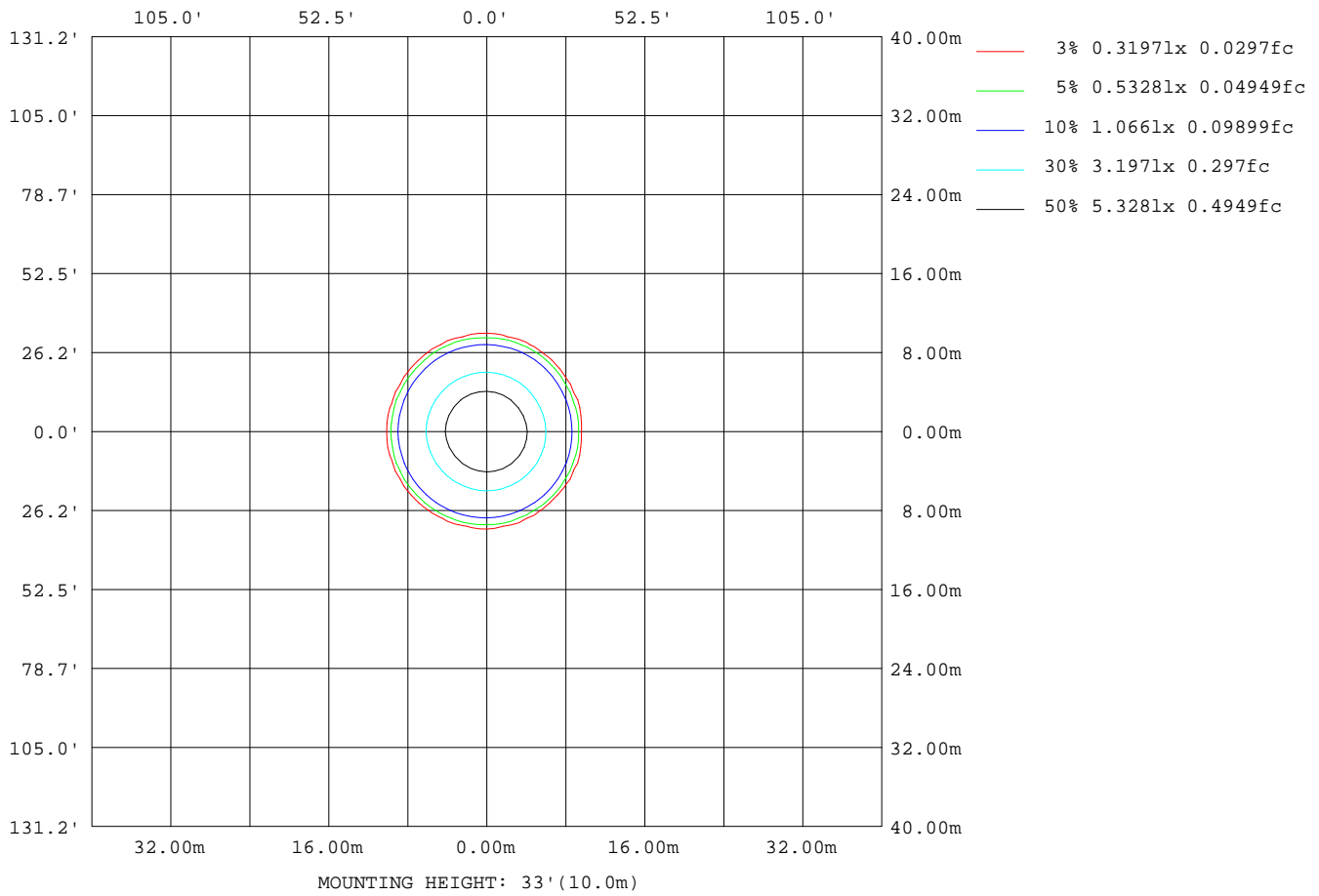
C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2018-04-10

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.600m [K=1.0000]  
 Remarks:



ISOLUX DIAGRAM

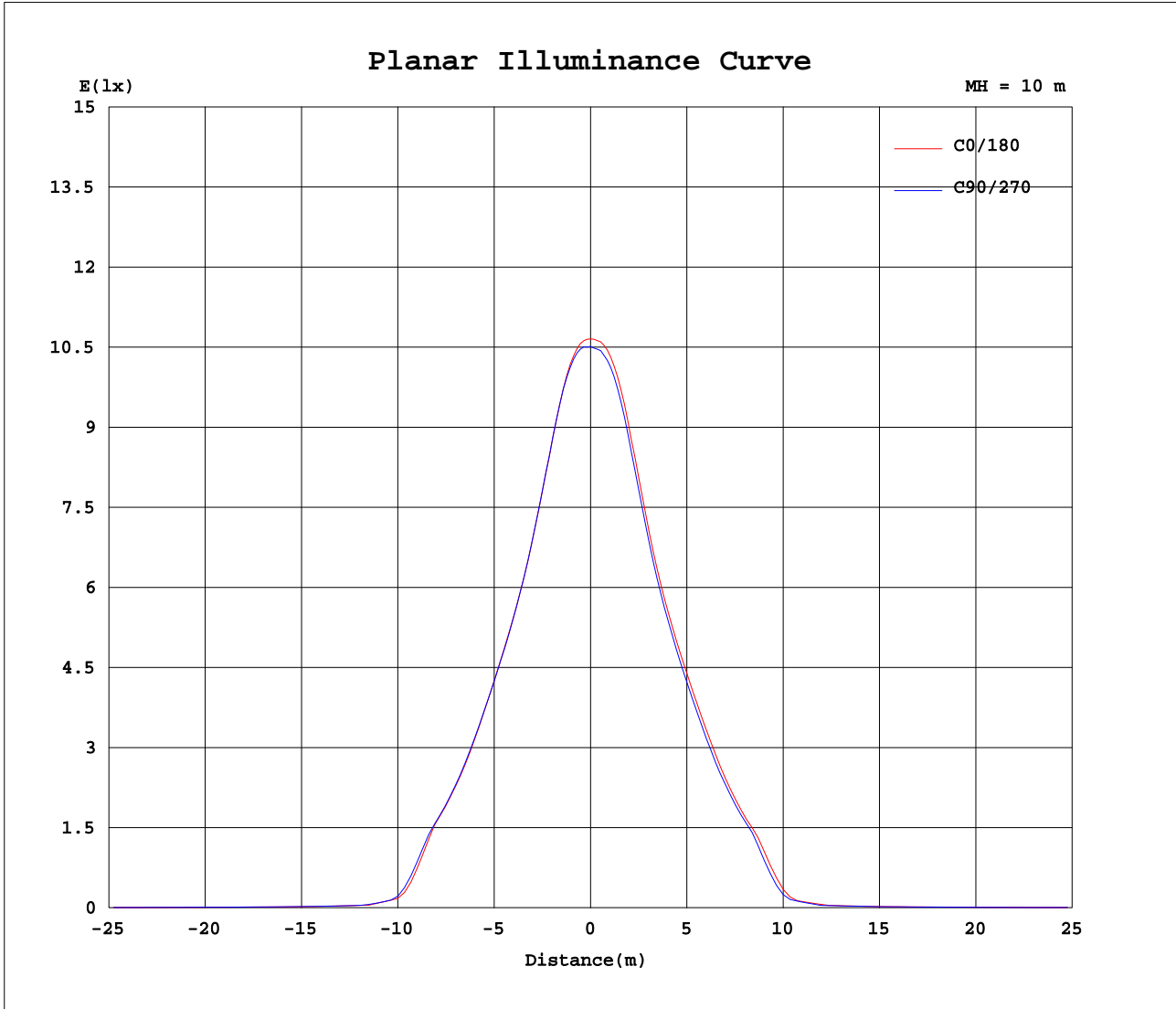
Test:U:240.4V I:0.0540A P:12.60W PF:0.9600 Lamp Flux:995.299x1 lm		
NAME: LED-DL13WCOB-NW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.:	SUR.:0.04	PROTECTION ANGLE:



C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2018-04-10

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-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: 2018-04-10

$\gamma$  Range: 0 - 90DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System: EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity: 65.0%  
 Test Distance: 9.600m [K=1.0000]  
 Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:240.4V I:0.0540A P:12.60W PF:0.9600 Lamp Flux:995.299x1 lm		
NAME: LED-DL13WCOB-NW-W	TYPE:13W	WEIGHT:
DIM.:	SPEC.:4000K	SERIAL No.:1
MFR.:	SUR.:0.04	PROTECTION ANGLE:

Table--1

UNIT: cd

C(DEG) γ (DEG)	0	30	60	90	120	150	180	210	240	270	300	330							
0	1054	1054	1054	1054	1054	1054	1054	1054	1054	1054	1054	1054							
5	1034	1038	1042	1042	1043	1045	1045	1045	1045	1040	1038	1034							
10	947	953	955	961	962	971	976	976	976	965	958	949							
15	820	827	830	833	831	841	848	847	848	835	828	820							
20	707	712	715	716	712	719	724	723	722	713	709	705							
25	616	621	623	623	622	627	633	630	629	619	617	613							
30	518	523	524	528	530	538	543	539	535	527	523	516							
35	410	413	413	419	423	433	436	432	430	421	417	409							
40	284	290	293	307	317	328	330	331	327	314	307	287							
45	50.5	51.1	51.7	61.7	71.4	91.1	97.2	86.8	82.6	70.3	64.8	54.0							
50	17.4	17.5	17.8	18.3	18.8	21.6	24.6	22.2	20.9	18.6	18.1	17.7							
55	14.0	14.3	14.7	15.2	15.3	15.3	15.5	15.2	15.0	14.7	14.3	14.0							
60	12.7	13.2	13.4	13.4	13.2	12.8	13.2	12.9	12.8	12.5	12.2	12.0							
65	12.3	12.8	12.9	12.9	12.5	12.3	12.9	12.7	12.5	12.0	11.6	11.5							
70	9.70	10.4	10.6	10.6	10.4	10.4	11.0	10.9	10.9	10.1	9.34	8.99							
75	6.73	7.40	7.73	7.86	6.92	7.25	8.13	8.18	8.17	7.37	5.89	5.53							
80	2.66	3.10	3.28	3.75	3.23	3.37	4.46	4.57	4.41	3.64	2.53	2.09							
85	0.42	0.47	0.44	0.65	0.20	0.56	1.07	1.19	1.05	0.86	0.07	0.25							
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							

C Range: 0 - 360DEG  
 C Interval: 30.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:DAMIN  
 Test Date:2018-04-10

γ Range: 0 - 90DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.276  
 Humidity:65.0%  
 Test Distance:9.600m [K=1.0000]  
 Remarks: