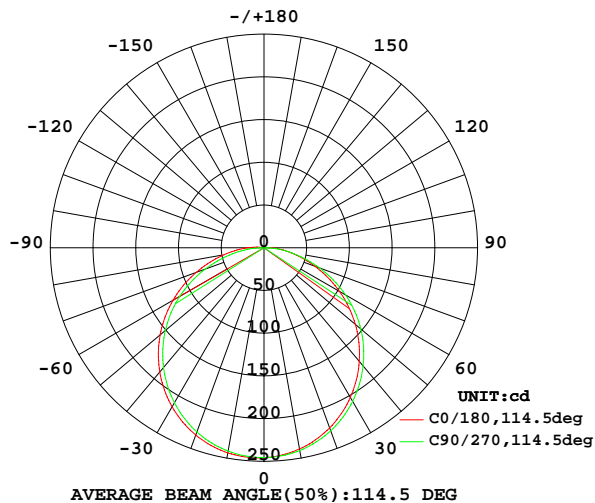


## LUMINAIRE PHOTOMETRIC TEST REPORT

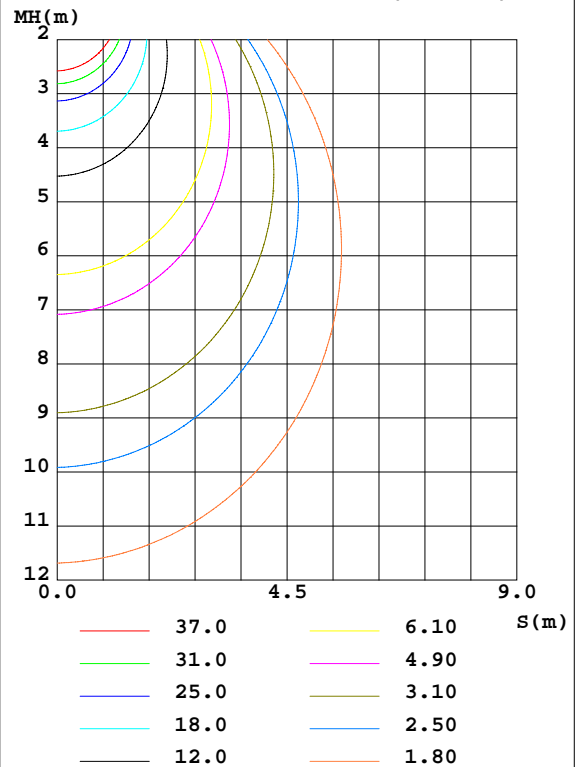
Test:U:120.7V I:0.0870A P:9.880W PF:0.9380 Lamp Flux:736.663x1 lm		
NAME:	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.:	SUR.:	Shielding Angle:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 74.56 lm/W			
MODEL	HM15-DR4-10W-120-LKL	I <sub>max</sub> (cd)	246.1	S/MH(C0/180)	1.30
NOMINAL POWER(W)	10	LOR(%)	100.0	S/MH(C90/270)	1.27
RATED VOLTAGE(V)	120	TOTAL FLUX(lm)	736.66	η UP,DN(C0-180)	0.3,47.4
NOMINAL FLUX(lm)	736.663	CIE CLASS	DIRECT	η UP,DN(C180-360)	0.6,51.6
LAMPS INSIDE	1	η up(%)	0.9	CIBSE SHR NOM	1.25
TEST VOLTAGE(V)	120	η down(%)	99.1	CIBSE SHR MAX	1.35

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



C0 PLANE ISOLUX DIAGRAM (UNIT:lx)



C Range: 0 - 360DEG  
 C Interval: 90.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2020-02-27

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
 Humidity:65.0%  
 Test Distance:8.200m [K=1.0000]  
 Remarks:

## ZONAL FLUX DIAGRAM

## ZONAL FLUX DIAGRAM:

$\gamma$	C0	C90	C180	C270					$\gamma$	$\Phi$ zone	$\Phi$ total	$\%lum, lamp$
10	239.2	240.9	243.8	241.7					0- 10	23.25	23.25	3.16,3.16
20	224.5	228.0	233.4	229.5					10- 20	66.64	89.89	12.2,12.2
30	202.2	207.5	215.0	209.6					20- 30	101.2	191.1	25.9,25.9
40	173.5	180.5	189.7	183.0					30- 40	122.6	313.7	42.6,42.6
50	139.6	148.0	158.7	150.7					40- 50	128.1	441.8	60,60
60	102.0	110.1	123.0	113.8					50- 60	117.2	559.0	75.9,75.9
70	63.60	68.96	84.51	73.14					60- 70	91.51	650.5	88.3,88.3
80	30.62	30.85	47.57	34.30					70- 80	56.59	707.1	96,96
90	8.317	2.296	18.87	3.186					80- 90	22.57	729.7	99.1,99.1
100	0.2375	0.2422	2.553	0.5345					90-100	3.955	733.6	99.6,99.6
110	0.3195	0.4842	0.3563	0.5252					100-110	0.4839	734.1	99.7,99.7
120	0.4384	0.6531	0.4751	0.5344					110-120	0.4628	734.6	99.7,99.7
130	0.5616	0.5937	0.6030	0.5343					120-130	0.4908	735.1	99.8,99.8
140	0.6576	0.6440	0.7263	0.6211					130-140	0.4750	735.6	99.8,99.8
150	0.7673	0.7080	0.8359	0.6988					140-150	0.4429	736.0	99.9,99.9
160	0.8040	0.7902	0.7856	0.7626					150-160	0.3582	736.4	100,100
170	0.8267	0.8084	0.8267	0.7810					160-170	0.2265	736.6	100,100
180	0.8312	0.8084	0.8267	0.7901					170-180	0.0775	736.7	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

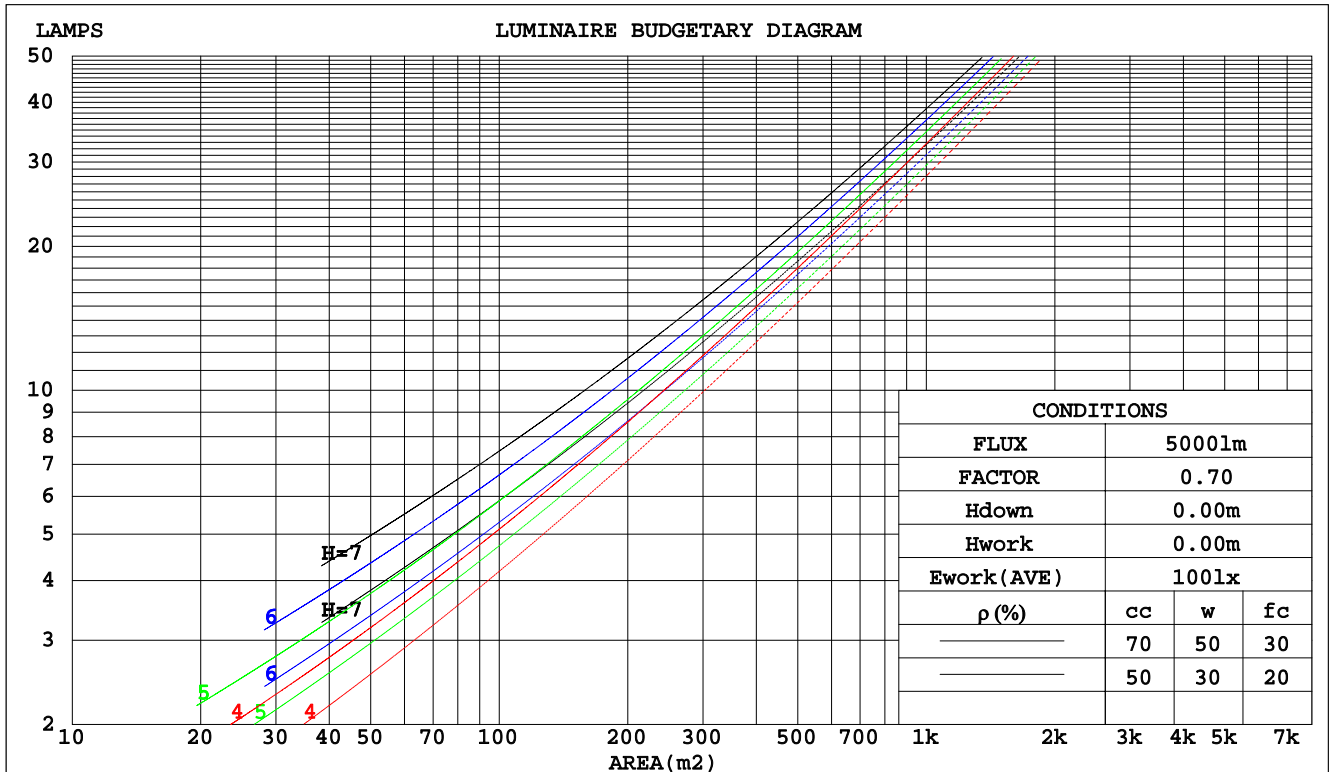
C Range: 0 - 360DEG  
 C Interval: 90.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2020-02-27

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
 Humidity:65.0%  
 Test Distance:8.200m [K=1.0000]  
 Remarks:

## CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:120.7V I:0.0870A P:9.880W PF:0.9380 Lamp Flux:736.663x1 lm		
NAME:	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.:	SUR.:	Shielding Angle:

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	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	1.01	1.01	1.01	.99
1.0	1.03	.98	.94	1.00	.96	.93	.96	.93	.89	.92	.89	.86	.88	.86	.84	.82
2.0	.89	.82	.76	.87	.81	.75	.83	.78	.73	.80	.75	.71	.77	.73	.70	.67
3.0	.78	.70	.63	.76	.69	.62	.73	.67	.61	.70	.65	.60	.68	.63	.59	.56
4.0	.69	.60	.53	.68	.59	.53	.65	.58	.52	.62	.56	.51	.60	.55	.50	.48
5.0	.62	.52	.46	.60	.52	.45	.58	.51	.45	.56	.49	.44	.54	.48	.44	.41
6.0	.55	.46	.40	.54	.46	.39	.52	.45	.39	.51	.44	.39	.49	.43	.38	.36
7.0	.50	.41	.35	.49	.41	.35	.48	.40	.35	.46	.39	.34	.45	.39	.34	.32
8.0	.46	.37	.31	.45	.37	.31	.44	.36	.31	.42	.35	.31	.41	.35	.30	.28
9.0	.42	.34	.28	.41	.33	.28	.40	.33	.28	.39	.32	.27	.38	.32	.27	.25
10.0	.39	.31	.25	.38	.30	.25	.37	.30	.25	.36	.30	.25	.35	.29	.25	.23



C Range: 0 - 360DEG  
 C Interval: 90.0DEG  
 Test Speed: HIGH  
 Temperature: 25.3DEG  
 Operators:  
 Test Date: 2020-02-27

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System: EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
 Humidity: 65.0%  
 Test Distance: 8.200m [K=1.0000]  
 Remarks:

## WEC AND CCEC

Test:U:120.7V I:0.0870A P:9.880W PF:0.9380 Lamp Flux:736.663x1 lm								
NAME:			TYPE:LED			WEIGHT:		
SPEC.:			DIM.:			SERIAL No.:		
MFR.:			SUR.:			Shielding Angle:		

pcc	80%			70%			50%			30%			10%			0	
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0	
pfc	20%			20%			20%			20%			20%			0	
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)										
0.0																	
1.0	.326	.186	.059	.319	.182	.058	.305	.175	.056	.292	.169	.054	.281	.163	.052		
2.0	.302	.165	.051	.295	.162	.050	.283	.157	.049	.271	.152	.048	.261	.148	.047		
3.0	.277	.147	.044	.271	.145	.044	.260	.141	.043	.250	.137	.042	.241	.133	.041		
4.0	.254	.132	.039	.249	.130	.038	.239	.127	.038	.230	.124	.037	.222	.121	.037		
5.0	.234	.119	.035	.229	.118	.034	.221	.115	.034	.213	.112	.033	.205	.110	.033		
6.0	.216	.108	.031	.212	.107	.031	.205	.105	.031	.197	.103	.030	.191	.100	.030		
7.0	.201	.099	.028	.197	.098	.028	.191	.096	.028	.184	.094	.027	.178	.092	.027		
8.0	.187	.092	.026	.184	.091	.026	.178	.089	.025	.172	.087	.025	.167	.086	.025		
9.0	.175	.085	.024	.173	.084	.024	.167	.083	.023	.162	.081	.023	.157	.080	.023		
10.0	.165	.079	.022	.162	.078	.022	.157	.077	.022	.152	.076	.022	.148	.074	.021		

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients(CCEC)									
0.0	.198	.198	.198	.169	.169	.169	.115	.115	.115	.066	.066	.066	.021	.021	.021	
1.0	.189	.163	.140	.161	.140	.121	.110	.096	.084	.064	.056	.049	.020	.018	.016	
2.0	.181	.139	.104	.155	.120	.090	.106	.083	.063	.061	.048	.037	.020	.016	.012	
3.0	.173	.122	.081	.148	.105	.070	.102	.073	.049	.059	.043	.029	.019	.014	.009	
4.0	.165	.108	.065	.142	.094	.056	.098	.065	.040	.056	.038	.024	.018	.012	.008	
5.0	.158	.098	.054	.136	.085	.047	.093	.059	.033	.054	.035	.020	.017	.011	.006	
6.0	.151	.090	.046	.129	.078	.040	.089	.054	.028	.052	.032	.017	.017	.010	.006	
7.0	.144	.083	.040	.124	.072	.035	.085	.050	.025	.050	.030	.015	.016	.010	.005	
8.0	.137	.077	.036	.118	.067	.031	.082	.047	.022	.048	.028	.013	.015	.009	.004	
9.0	.131	.072	.033	.113	.063	.028	.078	.044	.020	.046	.026	.012	.015	.009	.004	
10.0	.125	.068	.030	.108	.059	.026	.075	.042	.018	.044	.025	.011	.014	.008	.004	

C Range: 0 - 360DEG  
 C Interval: 90.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2020-02-27

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
 Humidity:65.0%  
 Test Distance:8.200m [K=1.0000]  
 Remarks:

## UGR(Unified Glare Rating) Table

Test:U:120.7V I:0.0870A P:9.880W PF:0.9380 Lamp Flux:736.663x1 lm											
NAME:					TYPE:LED			WEIGHT:			
SPEC.:					DIM.:			SERIAL No.:			
MFR.:					SUR.:			Shielding 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		15.2	16.7	15.5	17.0	17.2	15.5	17.0	15.8	17.2	17.5
3H		16.7	18.1	17.0	18.4	18.6	17.0	18.4	17.3	18.7	19.0
4H		17.3	18.7	17.6	18.9	19.2	17.7	19.0	18.0	19.3	19.6
6H		17.8	19.1	18.2	19.4	19.7	18.1	19.4	18.5	19.7	20.0
8H		18.0	19.3	18.4	19.6	19.9	18.3	19.5	18.7	19.8	20.2
12H		18.2	19.4	18.6	19.7	20.0	18.4	19.6	18.8	19.9	20.3
4H 2H		15.8	17.2	16.2	17.5	17.7	16.1	17.4	16.4	17.7	18.0
3H		17.5	18.7	17.9	19.0	19.3	17.8	19.0	18.2	19.3	19.6
4H		18.3	19.3	18.7	19.7	20.0	18.5	19.6	18.9	20.0	20.3
6H		18.9	19.9	19.3	20.2	20.6	19.2	20.1	19.6	20.5	20.9
8H		19.2	20.1	19.6	20.5	20.9	19.4	20.3	19.8	20.7	21.1
12H		19.4	20.3	19.9	20.7	21.1	19.6	20.4	20.0	20.8	21.2
8H 4H		18.6	19.5	19.0	19.9	20.3	18.8	19.7	19.2	20.1	20.5
6H		19.4	20.1	19.8	20.6	21.0	19.6	20.4	20.1	20.8	21.2
8H		19.8	20.4	20.2	20.9	21.4	19.9	20.6	20.4	21.1	21.5
12H		20.1	20.7	20.6	21.2	21.7	20.2	20.8	20.7	21.3	21.8
12H 4H		18.6	19.4	19.0	19.8	20.2	18.8	19.7	19.3	20.1	20.5
6H		19.5	20.1	19.9	20.6	21.1	19.7	20.3	20.1	20.8	21.3
8H		19.9	20.5	20.4	21.0	21.4	20.1	20.6	20.6	21.1	21.6
Variations with the observer position at spacings:											
S = 1.0H		+ 0.2 / - 0.2					+ 0.1 / - 0.2				
1.5H		+ 0.2 / - 0.3					+ 0.2 / - 0.3				
2.0H		+ 0.1 / - 0.3					+ 0.2 / - 0.3				

CIE Pub.117 Corrected 736.7 lm Total Lamp Luminous Flux.(8log(F/F0) = -1.1)

C Range: 0 - 360DEG  
 C Interval: 90.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2020-02-27

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
 Humidity:65.0%  
 Test Distance:8.200m [K=1.0000]  
 Remarks:

## UTILIZATION FACTORS TABLE

Test:U:120.7V I:0.0870A P:9.880W PF:0.9380 Lamp Flux:736.663x1 lm		
NAME:	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.:	SUR.:	Shielding Angle:

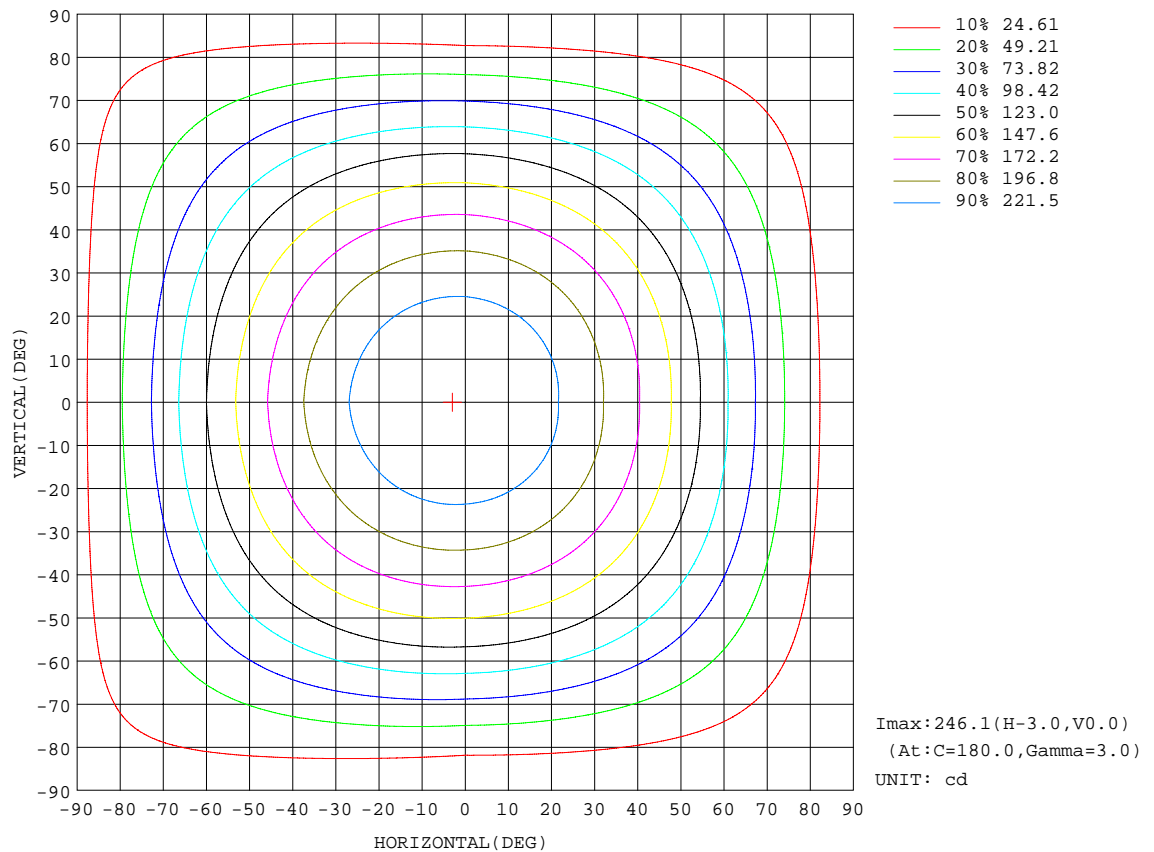
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	56	45	38	56	44	37	54	44	37	31
0.80	66	54	47	65	54	47	63	53	46	39
1.00	75	63	56	73	63	55	71	64	55	48
1.25	82	71	63	80	70	63	77	69	62	55
1.50	87	76	69	85	76	69	82	74	68	60
2.00	94	85	78	92	83	77	88	81	76	67
2.50	98	89	83	95	88	82	91	85	80	72
3.00	101	94	88	99	92	87	95	89	85	76
4.00	105	99	94	103	97	93	98	94	90	81
5.00	108	103	98	105	101	97	100	97	93	84
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended					SHRNOM = 1.25		

C Range: 0 - 360DEG  
 C Interval: 90.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2020-02-27

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
 Humidity:65.0%  
 Test Distance:8.200m [K=1.0000]  
 Remarks:

## ISOCANDELA DIAGRAM

Test:U:120.7V I:0.0870A P:9.880W PF:0.9380 Lamp Flux:736.663x1 lm		
NAME:	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.:	SUR.:	Shielding Angle:

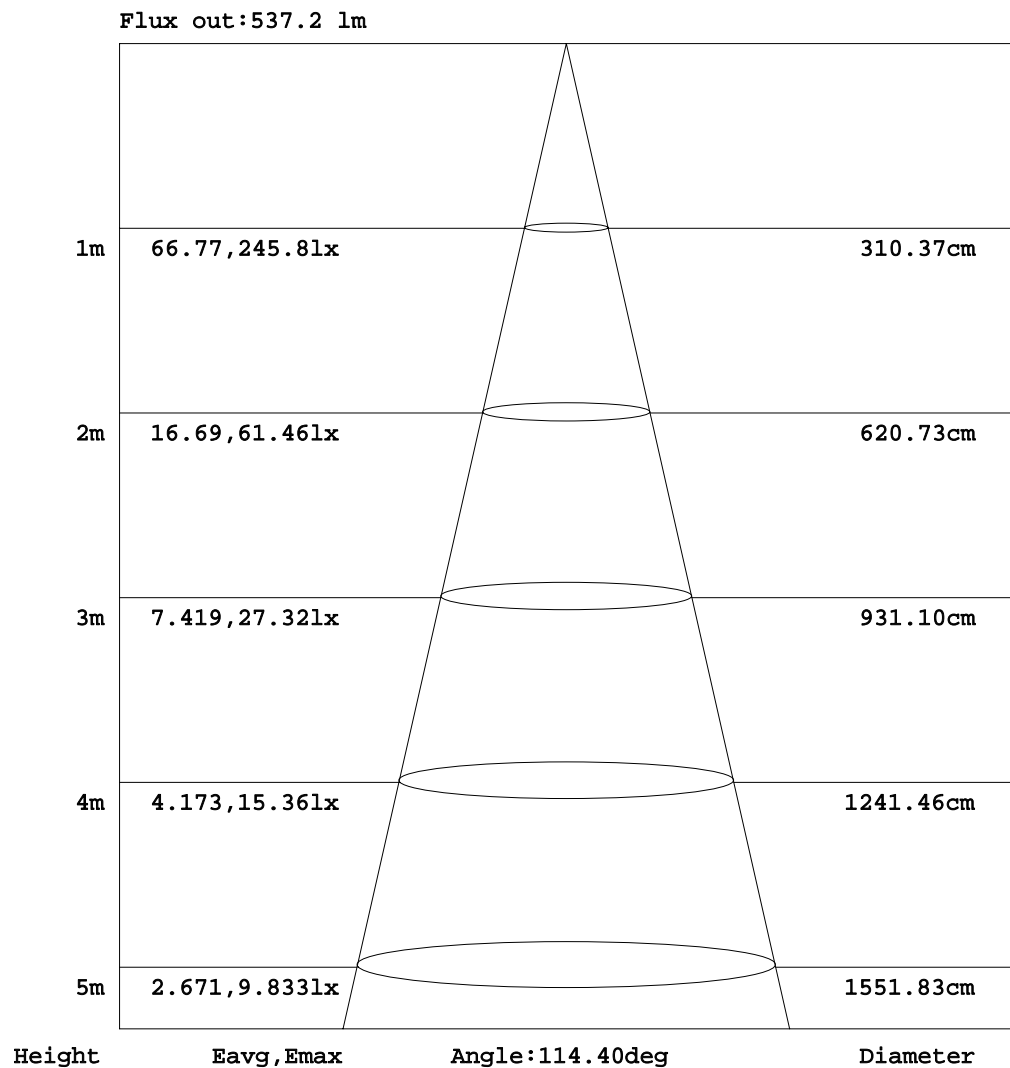


C Range: 0 - 360DEG  
C Interval: 90.0DEG  
Test Speed: HIGH  
Temperature: 25.3DEG  
Operators:  
Test Date: 2020-02-27

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
Test System: EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity: 65.0%  
Test Distance: 8.200m [K=1.0000]  
Remarks:

## AAI Figure

Test:U:120.7V I:0.0870A P:9.880W PF:0.9380 Lamp Flux:736.663x1 lm		
NAME:	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.:	SUR.:	Shielding Angle:



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

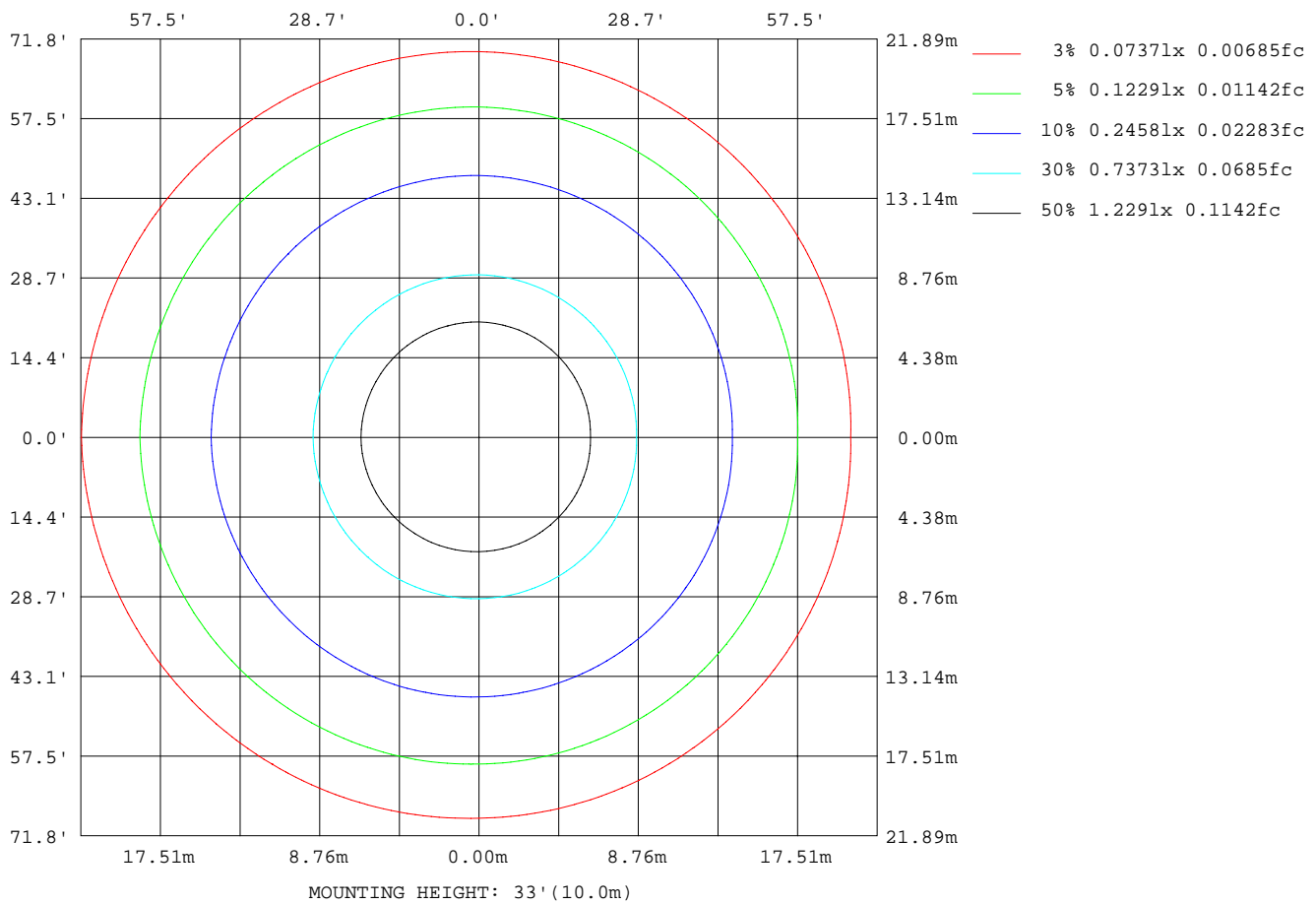
C Range: 0 - 360DEG  
 C Interval: 90.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2020-02-27

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
 Humidity:65.0%  
 Test Distance:8.200m [K=1.0000]  
 Remarks:



## ISOLUX DIAGRAM

Test:U:120.7V I:0.0870A P:9.880W PF:0.9380 Lamp Flux:736.663x1 lm		
NAME:	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.:	SUR.:	Shielding Angle:



C Range: 0 - 360DEG  
 C Interval: 90.0DEG  
 Test Speed: HIGH  
 Temperature: 25.3DEG  
 Operators:  
 Test Date: 2020-02-27

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System: EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
 Humidity: 65.0%  
 Test Distance: 8.200m [K=1.0000]  
 Remarks:

## LED Avg.L Report

Test:U:120.7V I:0.0870A P:9.880W PF:0.9380 Lamp Flux:736.663x1 lm		
NAME:	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.:	SUR.:	Shielding Angle:

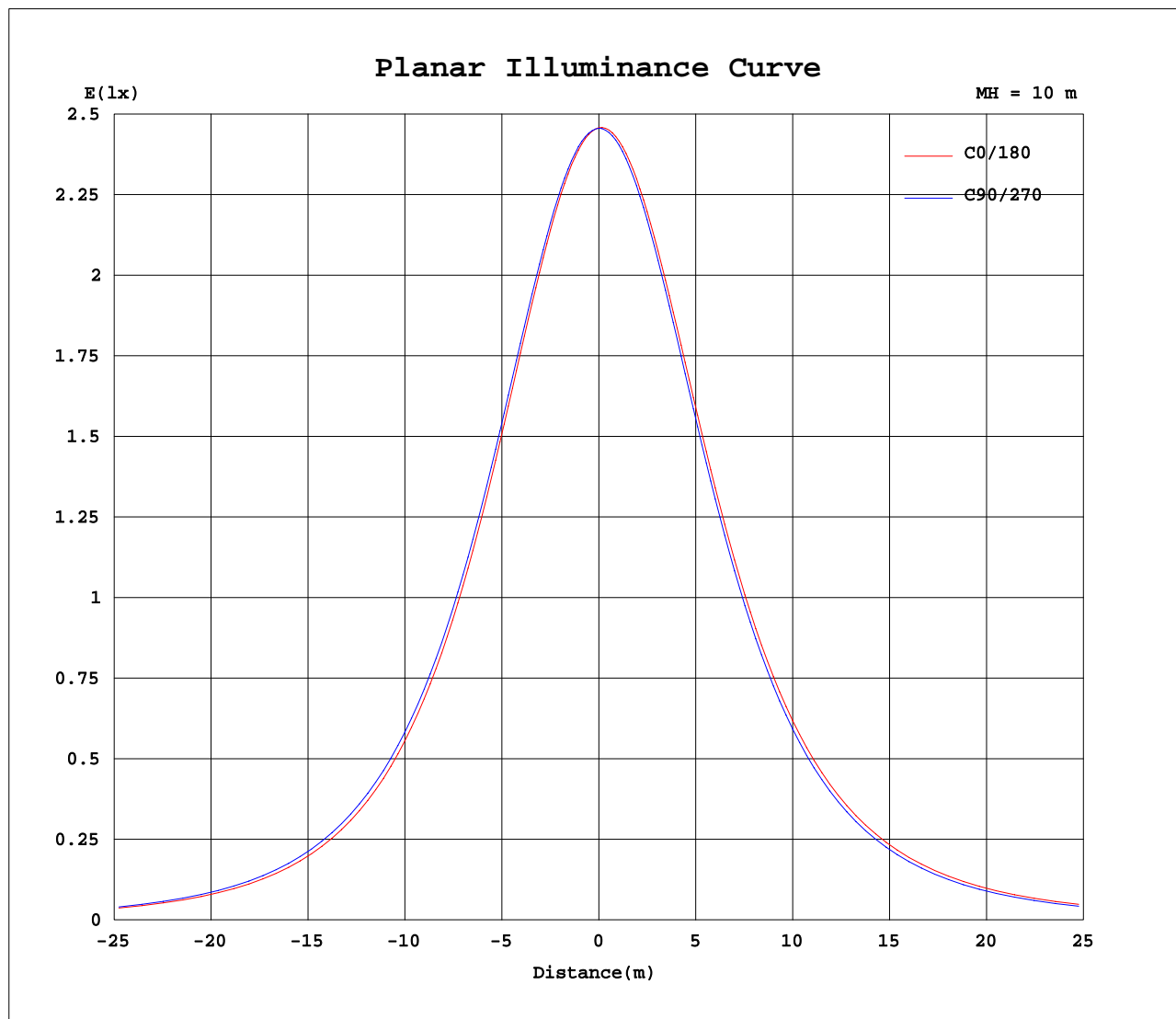
AvgL	cd/m2
L_0~180(65)av	2207
L_0~180(75)av	2151
L_0~180(85)av	2856
L_90~270(65)av	2170
L_90~270(75)av	1970
L_90~270(85)av	1792
L_45(65)av	2200
L_45(75)av	2061
L_45(85)av	2241

Standard: GB/T 29293-2012

C Range: 0 - 360DEG  
 C Interval: 90.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2020-02-27

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
 Humidity:65.0%  
 Test Distance:8.200m [K=1.0000]  
 Remarks:

## Planar Illuminance Curve



C Range: 0 - 360DEG  
C Interval: 90.0DEG  
Test Speed: HIGH  
Temperature: 25.3DEG  
Operators:  
Test Date: 2020-02-27

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
Test System: EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
Humidity: 65.0%  
Test Distance: 8.200m [K=1.0000]  
Remarks:

## LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:120.7V I:0.0870A P:9.880W PF:0.9380 Lamp Flux:736.663x1 lm		
NAME:	TYPE:LED	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.:	SUR.:	Shielding Angle:

Table--1

UNIT: cd

C(DEG) γ (DEG)	0	90	180	270															
0	246	246	246	246															
5	244	244	246	245															
10	239	241	244	242															
15	233	235	240	237															
20	225	228	233	229															
25	214	219	225	220															
30	202	208	215	210															
35	189	195	203	197															
40	174	181	190	183															
45	157	165	175	167															
50	140	148	159	151															
55	121	130	141	133															
60	102	110	123	114															
65	82.6	89.7	104	93.8															
70	63.6	69.0	84.5	73.1															
75	46.0	49.0	65.4	53.0															
80	30.6	30.9	47.6	34.3															
85	17.9	14.5	31.9	16.8															
90	8.32	2.30	18.9	3.19															
95	2.20	0.53	8.93	0.71															
100	0.24	0.24	2.55	0.53															
105	0.26	0.34	0.29	0.53															
110	0.32	0.48	0.36	0.53															
115	0.37	0.54	0.41	0.53															
120	0.44	0.65	0.48	0.53															
125	0.49	0.62	0.53	0.53															
130	0.56	0.59	0.60	0.53															
135	0.61	0.60	0.67	0.58															
140	0.66	0.64	0.73	0.62															
145	0.71	0.67	0.79	0.66															
150	0.77	0.71	0.84	0.70															
155	0.82	0.75	0.83	0.73															
160	0.80	0.79	0.79	0.76															
165	0.81	0.81	0.82	0.77															
170	0.83	0.81	0.83	0.78															
175	0.83	0.81	0.83	0.78															
180	0.83	0.81	0.83	0.79															

C Range: 0 - 360DEG  
 C Interval: 90.0DEG  
 Test Speed: HIGH  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2020-02-27

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-2000A\_V1 SYSTEM V2.0.295  
 Humidity:65.0%  
 Test Distance:8.200m [K=1.0000]  
 Remarks: