IES TEST REPORT

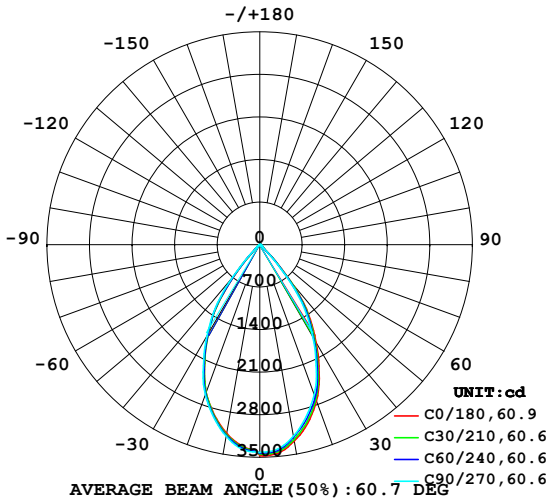
Photometric Filename: HCP-81X22128.IES

LUMINAIRE PHOTOMETRIC TEST REPORT

NAME: HCP-81X22128	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.112	Shielding Angle:

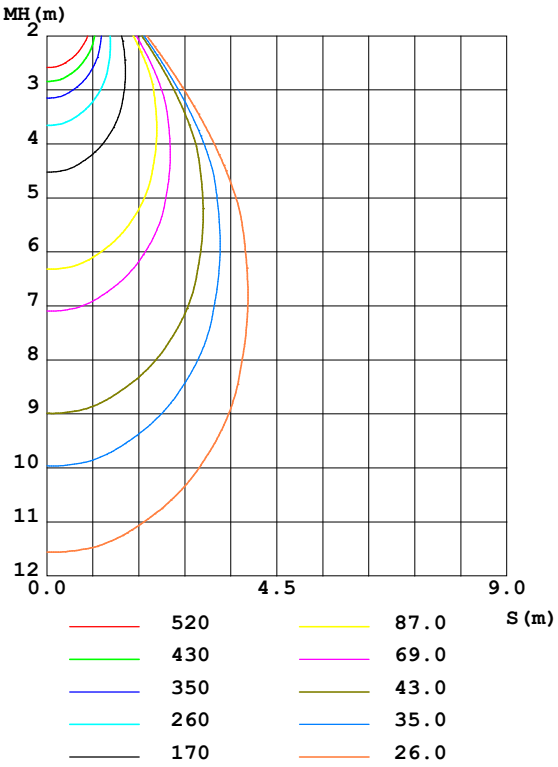
DATA OF LAMP		PHOTOMETRIC DATA Eff: 104.94 lm/W			
MODEL	28W Tri-color	Imax(cd)	3476	S/MH(C0/180)	0.90
NOMINAL POWER(W)	28	LOR(%)	100.0	S/MH(C90/270)	0.91
RATED VOLTAGE(V)	240	TOTAL FLUX(lm)	3191.6	η UP,DN(C0-180)	0.0,50.2
NOMINAL FLUX(lm)	3191.59	CIE CLASS	DIRECT	η UP,DN(C180-360)	0.0,49.8
LAMPS INSIDE	1	η up(%)	0.0	CIBSE SHR NOM	1.00
TEST VOLTAGE(V)	240	η down(%)	100.0	CIBSE SHR MAX	1.00

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



AVERAGE BEAM ANGLE(50%):60.7 DEG

C0 PLANE ISOLUX DIAGRAM (UNIT:lx)



C Range: 0 - 180DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2020-05-28

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.366
Humidity:65.0%
Test Distance:8.120m [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	3280	3239	3201	3183	3151	3183	3201	3239	0- 10	317.0	317.0	9.93,9.93
20	2732	2699	2627	2613	2586	2613	2627	2699	10- 20	827.1	1144	35.8,35.8
30	1862	1820	1741	1725	1704	1725	1741	1820	20- 30	1015	2159	67.6,67.6
40	809.0	784.1	689.1	630.1	613.2	630.1	689.1	784.1	30- 40	788.2	2947	92.3,92.3
50	76.75	72.69	64.26	60.67	58.11	60.67	64.26	72.69	40- 50	193.2	3140	98.4,98.4
60	24.16	23.68	21.88	21.70	21.05	21.70	21.88	23.68	50- 60	33.98	3174	99.5,99.5
70	8.365	7.885	6.884	7.290	7.165	7.290	6.884	7.885	60- 70	13.78	3188	99.9,99.9
80	0.7670	0.6834	0.5577	0.6253	0.6470	0.6253	0.5577	0.6834	70- 80	3.289	3191	100,100
90	0.0464	0.0309	0.0348	0.0271	0.0348	0.0271	0.0348	0.0309	80- 90	0.2489	3192	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 - 180DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2020-05-28

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.366
Humidity:65.0%
Test Distance:8.120m [K=1.0000]
Remarks:

IES TEST REPORT

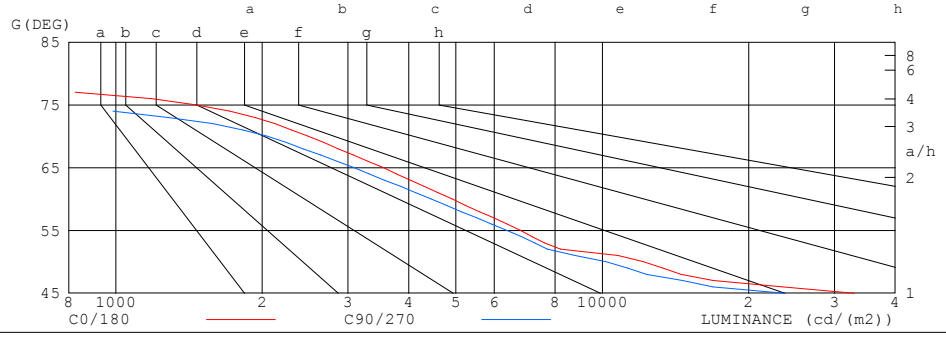
Photometric Filename: HCP-81X22128.IES

LUMINANCE LIMITATION CURVES

NAME: HCP-81X22128	**TYPE:**	**WEIGHT:**
SPEC.:	**DIM.:**	**SERIAL No.:**
MFR.: HAVIT COMMERCIAL	**SUR.:0.112**	**Shielding Angle:**

LUMINANCE LIMITATION CURVES

GLARE	CLASS	ILLUMINANCE (lx)							
1.15	A	2000	1000	500	<=300				
1.50	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.20	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h



LUMINANCE cd/(m2)		
G(DEG)	C0/180	C90/270
85	289	163
80	449	326
75	1454	660
70	2484	2044
65	3545	3084
60	4907	4444
55	6783	6354
50	12125	10153
45	32989	23696

C Range: 0 - 180DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2020-05-28

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.366
Humidity:65.0%
Test Distance:8.120m [K=1.0000]
Remarks:

WEC AND CCEC

NAME: HCP-81X22128	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.112	Shielding 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 Coeffcients(WEC)												
0.0																
1.0	.180	.103	.032	.174	.099	.031	.161	.092	.030	.149	.086	.028	.139	.080	.026	
2.0	.174	.095	.029	.168	.092	.028	.157	.087	.027	.147	.083	.026	.138	.078	.025	
3.0	.166	.088	.026	.161	.086	.026	.152	.082	.025	.143	.079	.024	.136	.075	.023	
4.0	.158	.082	.024	.154	.081	.024	.146	.078	.023	.139	.075	.023	.132	.072	.022	
5.0	.151	.077	.022	.147	.076	.022	.141	.073	.022	.134	.071	.021	.128	.069	.021	
6.0	.144	.072	.021	.141	.071	.021	.135	.069	.020	.129	.067	.020	.124	.065	.019	
7.0	.138	.068	.019	.135	.067	.019	.130	.066	.019	.125	.064	.019	.120	.062	.018	
8.0	.132	.065	.018	.130	.064	.018	.125	.062	.018	.120	.061	.018	.116	.060	.017	
9.0	.127	.061	.017	.125	.061	.017	.120	.059	.017	.116	.058	.017	.112	.057	.016	
10.0	.122	.058	.016	.120	.058	.016	.116	.057	.016	.112	.056	.016	.109	.055	.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	.171	.157	.145	.147	.135	.124	.100	.093	.086	.058	.054	.050	.018	.017	.016	
2.0	.156	.132	.112	.134	.114	.097	.092	.079	.068	.053	.046	.040	.017	.015	.013	
3.0	.144	.114	.089	.124	.098	.077	.085	.068	.054	.049	.040	.032	.016	.013	.010	
4.0	.134	.099	.072	.115	.086	.062	.079	.060	.044	.046	.035	.026	.015	.011	.009	
5.0	.126	.087	.059	.108	.076	.051	.075	.053	.036	.043	.031	.021	.014	.010	.007	
6.0	.119	.078	.049	.102	.068	.043	.070	.047	.030	.041	.028	.018	.013	.009	.006	
7.0	.113	.071	.041	.097	.061	.036	.067	.043	.026	.039	.025	.015	.013	.008	.005	
8.0	.107	.065	.036	.092	.056	.031	.064	.039	.022	.037	.023	.013	.012	.008	.004	
9.0	.102	.059	.031	.088	.052	.027	.061	.036	.019	.035	.021	.011	.011	.007	.004	
10.0	.097	.055	.027	.084	.048	.024	.058	.034	.017	.034	.020	.010	.011	.007	.003	

C Range: 0 - 180DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2020-05-28

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.366
Humidity:65.0%
Test Distance:8.120m [K=1.0000]
Remarks:

UGR(Unified Glare Rating) Table

NAME: HCP-81X22128	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.112	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	18.2	19.2	18.5	19.4	19.6	17.8	18.8	18.0	19.0	19.1
	3H	18.1	19.0	18.3	19.2	19.4	17.6	18.5	17.9	18.7	18.9
	4H	18.0	18.8	18.3	19.1	19.3	17.6	18.4	17.8	18.6	18.8
	6H	17.9	18.7	18.2	18.9	19.2	17.5	18.3	17.8	18.5	18.7
	8H	17.9	18.6	18.2	18.9	19.1	17.4	18.2	17.7	18.4	18.7
	12H	17.8	18.5	18.1	18.8	19.1	17.4	18.1	17.7	18.4	18.6
4H	2H	18.0	18.8	18.3	19.1	19.3	17.6	18.4	17.8	18.6	18.8
	3H	17.8	18.6	18.1	18.8	19.1	17.4	18.1	17.7	18.4	18.7
	4H	17.7	18.4	18.1	18.7	19.0	17.3	18.0	17.6	18.3	18.6
	6H	17.6	18.2	18.0	18.6	18.9	17.2	17.8	17.6	18.1	18.5
	8H	17.6	18.1	18.0	18.5	18.8	17.2	17.7	17.5	18.0	18.4
	12H	17.5	18.0	18.0	18.4	18.8	17.1	17.6	17.5	18.0	18.4
8H	4H	17.6	18.1	18.0	18.5	18.8	17.2	17.7	17.6	18.0	18.4
	6H	17.5	17.9	17.9	18.3	18.7	17.1	17.5	17.5	17.9	18.3
	8H	17.4	17.8	17.9	18.2	18.7	17.0	17.4	17.5	17.8	18.2
	12H	17.4	17.7	17.9	18.2	18.6	17.0	17.3	17.4	17.7	18.2
12H	4H	17.5	18.0	18.0	18.4	18.8	17.1	17.6	17.5	18.0	18.4
	6H	17.4	17.8	17.9	18.2	18.7	17.0	17.4	17.5	17.8	18.2
	8H	17.4	17.7	17.9	18.2	18.6	17.0	17.3	17.4	17.7	18.2

Variations with the observer position at spacings:		
S = 1.0H	+ 3.2 / -13.0	+ 3.1 / -13.0
1.5H	+ 5.8 / -11.2	+ 5.7 / -10.7
2.0H	+ 7.1 / - 5.1	+ 5.9 / - 4.5

CIE Pub.117, 3192 lm Total Lamp Luminous Flux Correct (8log(F/F0) = 4.0)

C Range: 0 - 180DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2020-05-28

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.366
Humidity:65.0%
Test Distance:8.120m [K=1.0000]
Remarks:

UTILIZATION FACTORS TABLE

NAME: HCP-81X22128	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.112	Shielding Angle:

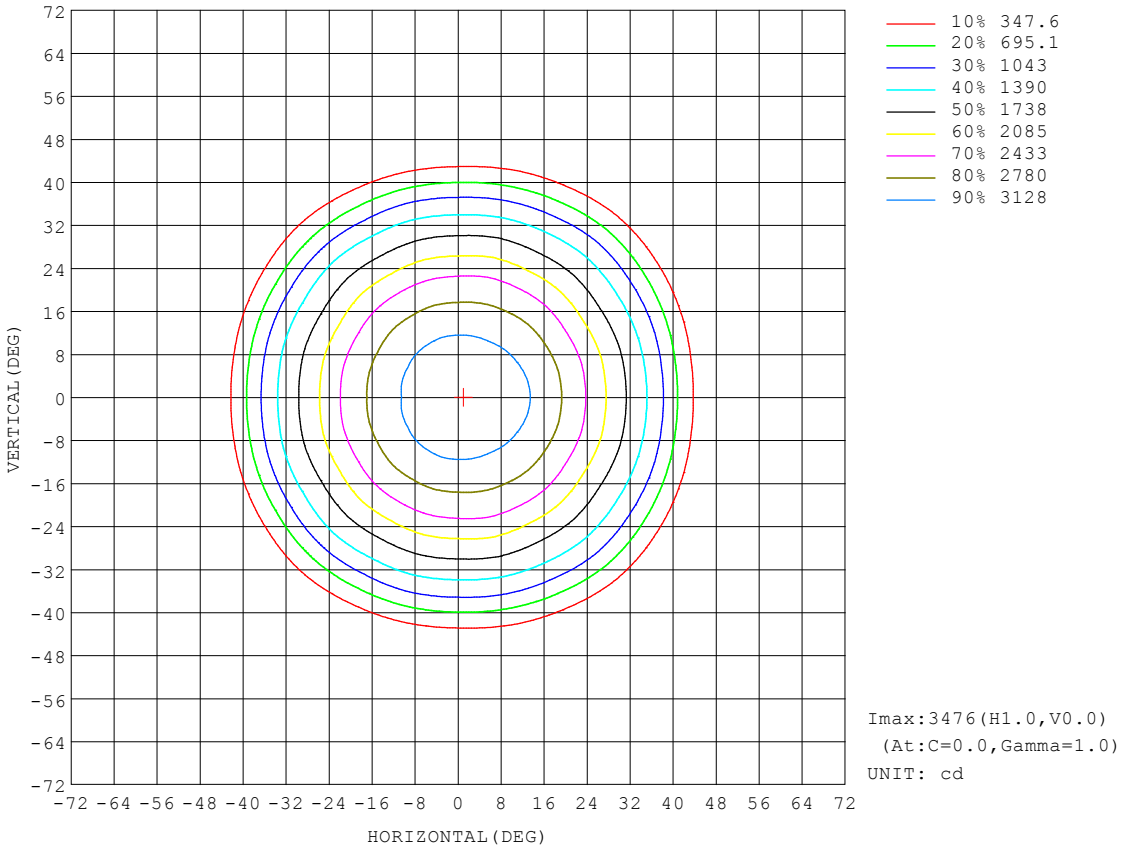
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) k(RI) x RCR = 5									
k = 0.60	87	80	76	86	80	76	85	80	76	73
0.80	94	88	85	94	88	84	92	87	84	80
1.00	99	93	90	98	93	89	97	93	89	85
1.25	103	98	94	102	97	94	100	96	93	89
1.50	106	101	98	105	100	97	102	99	96	92
2.00	109	104	101	107	103	100	104	101	99	94
2.50	110	106	103	109	105	103	106	103	101	95
3.00	112	108	106	110	107	105	107	104	102	96
4.00	114	111	109	112	109	107	108	106	105	98
5.00	115	113	111	113	111	109	109	107	106	99
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004				Suspended					SHRNOM = 1.25	

C Range: 0 - 180DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2020-05-28

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.366
Humidity:65.0%
Test Distance:8.120m [K=1.0000]
Remarks:

ISOCANDELA DIAGRAM

NAME: HCP-81X22128	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.112	Shielding Angle:

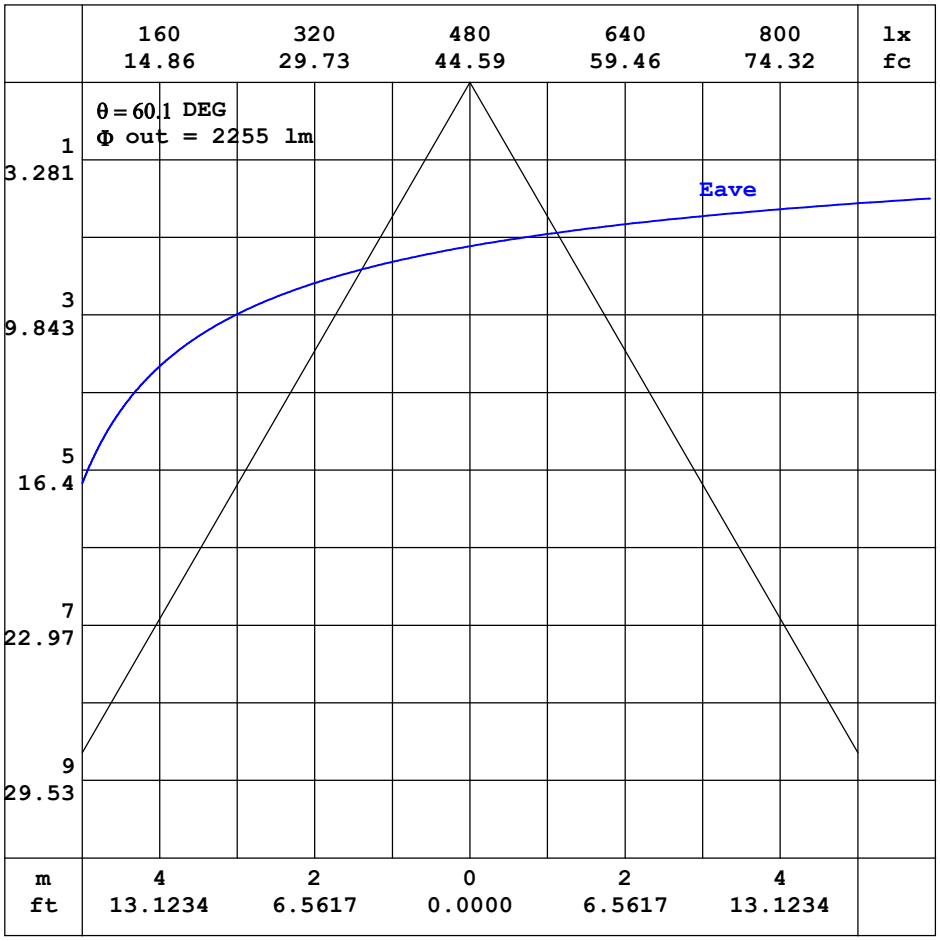


C Range: 0 - 180DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2020-05-28

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.366
Humidity:65.0%
Test Distance:8.120m [K=1.0000]
Remarks:

AAI CURVES

NAME: HCP-81X22128	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.112	Shielding Angle:

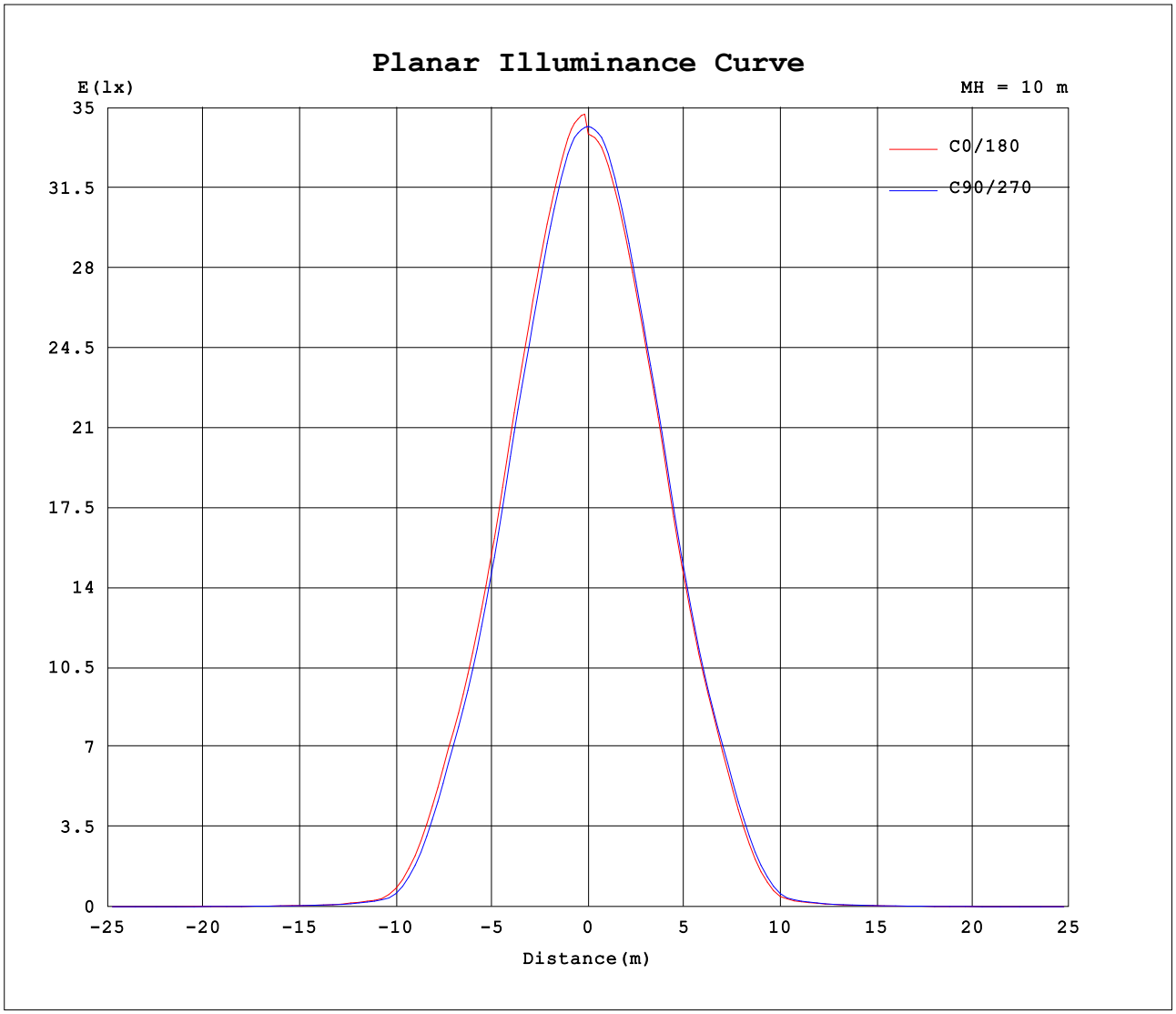


Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 180DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2020-05-28

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.366
Humidity:65.0%
Test Distance:8.120m [K=1.0000]
Remarks:

Planar Illuminance Curve



C Range: 0 - 180DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2020-05-28

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.366
Humidity:65.0%
Test Distance:8.120m [K=1.0000]
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

NAME: HCP-81X22128	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.112	Shielding Angle:

Table--1 UNIT: cd

γ (DEG) \ C(DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	3473	3456	3452	3438	3435	3423	3421	3410	3409	3400	3398	3389	3387	3389	3398	3400	3409	3410	3421
5	3446	3432	3419	3406	3398	3390	3379	3367	3360	3350	3341	3336	3330	3336	3341	3350	3360	3367	3379
10	3280	3271	3256	3239	3216	3210	3201	3198	3186	3183	3170	3164	3151	3164	3170	3183	3186	3198	3201
15	3047	3038	3014	2997	2972	2958	2940	2936	2926	2924	2908	2907	2899	2907	2908	2924	2926	2936	2940
20	2732	2730	2707	2699	2669	2659	2627	2629	2612	2613	2587	2593	2586	2593	2587	2613	2612	2629	2627
25	2314	2317	2271	2279	2242	2244	2200	2200	2169	2180	2150	2168	2150	2168	2150	2180	2169	2200	2200
30	1862	1864	1817	1820	1779	1784	1741	1742	1710	1725	1696	1720	1704	1720	1696	1725	1710	1742	1741
35	1403	1398	1368	1369	1333	1324	1292	1295	1262	1272	1235	1258	1238	1258	1235	1272	1262	1295	1292
40	809	808	788	784	738	721	689	674	632	630	603	616	613	616	603	630	632	674	689
45	230	249	223	232	199	193	165	161	138	139	127	133	127	133	127	139	138	161	165
50	76.7	76.9	74.4	72.7	70.5	68.2	64.3	63.5	61.0	60.7	59.2	59.3	58.1	59.3	59.2	60.7	61.0	63.5	64.3
55	38.3	38.5	38.0	38.1	37.3	37.3	35.9	35.6	34.6	35.0	34.2	34.6	34.0	34.6	34.2	35.0	34.6	35.6	35.9
60	24.2	24.2	23.8	23.7	22.9	22.7	21.9	21.9	21.5	21.7	21.4	21.6	21.1	21.6	21.4	21.7	21.5	21.9	21.9
65	14.8	14.8	14.3	14.3	13.6	13.3	12.8	13.0	12.9	13.2	13.0	13.0	12.7	13.0	13.0	13.2	12.9	13.0	12.8
70	8.36	8.37	8.09	7.88	7.39	7.20	6.88	6.95	7.02	7.29	7.21	7.27	7.16	7.27	7.21	7.29	7.02	6.95	6.88
75	3.71	3.67	3.28	2.96	2.49	2.00	1.68	1.83	2.10	2.46	2.62	2.68	2.73	2.68	2.62	2.46	2.10	1.83	1.68
80	0.77	0.83	0.76	0.68	0.62	0.59	0.56	0.56	0.58	0.63	0.66	0.61	0.65	0.61	0.66	0.63	0.58	0.56	0.56
85	0.25	0.25	0.23	0.17	0.17	0.12	0.14	0.12	0.15	0.13	0.15	0.13	0.17	0.13	0.15	0.13	0.15	0.12	0.14
90	0.05	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

C Range: 0 - 180DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2020-05-28

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.366
Humidity:65.0%
Test Distance:8.120m [K=1.0000]
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

NAME: HCP-81X22128	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.112	Shielding Angle:

Table--2 UNIT: cd

γ (DEG) \ C(DEG)	285	300	315	330	345
0	3423	3435	3438	3452	3456
5	3390	3398	3406	3419	3432
10	3210	3216	3239	3256	3271
15	2958	2972	2997	3014	3038
20	2659	2669	2699	2707	2730
25	2244	2242	2279	2271	2317
30	1784	1779	1820	1817	1864
35	1324	1333	1369	1368	1398
40	721	738	784	788	808
45	193	199	232	223	249
50	68.2	70.5	72.7	74.4	76.9
55	37.3	37.3	38.1	38.0	38.5
60	22.7	22.9	23.7	23.8	24.2
65	13.3	13.6	14.3	14.3	14.8
70	7.20	7.39	7.88	8.09	8.37
75	2.00	2.49	2.96	3.28	3.67
80	0.59	0.62	0.68	0.76	0.83
85	0.12	0.17	0.17	0.23	0.25
90	0.03	0.03	0.03	0.03	0.04

C Range: 0 - 180DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2020-05-28

γ Range: 0 - 90DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.366
Humidity:65.0%
Test Distance:8.120m [K=1.0000]
Remarks: