IES TEST REPORT

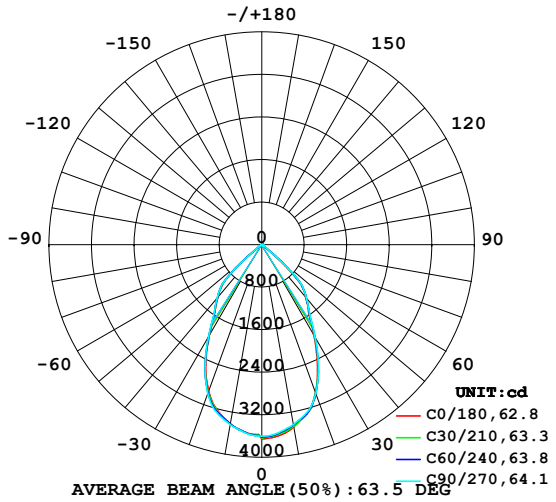
Photometric Filename: HCP-81X22138.IES

LUMINAIRE PHOTOMETRIC TEST REPORT

NAME: HCP-81X22138	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.168	Shielding Angle:

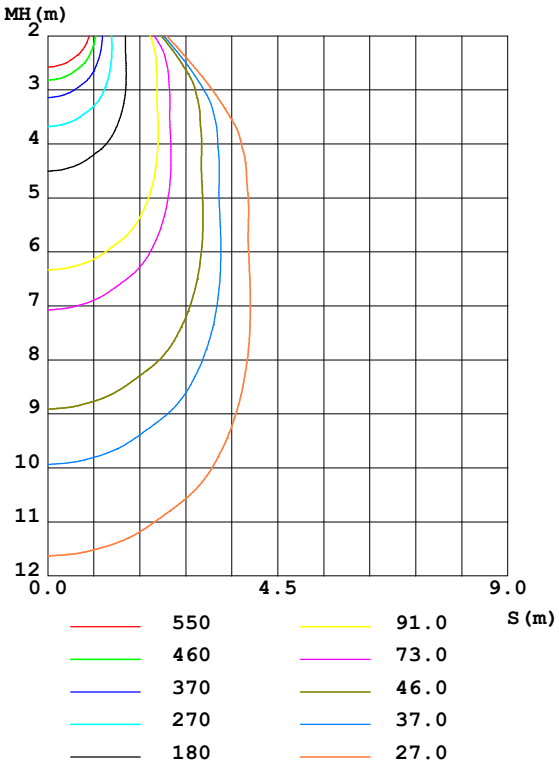
DATA OF LAMP		PHOTOMETRIC DATA Eff: 106.97 lm/W			
MODEL	38W Tri-color	Imax(cd)	3654	S/MH(C0/180)	0.96
NOMINAL POWER(W)	38	LOR(%)	100.0	S/MH(C90/270)	0.96
RATED VOLTAGE(V)	240	TOTAL FLUX(lm)	4218.9	η UP,DN(C0-180)	0.0,50.0
NOMINAL FLUX(lm)	4218.9	CIE CLASS	DIRECT	η UP,DN(C180-360)	0.0,50.0
LAMPS INSIDE	1	η up(%)	0.0	CIBSE SHR NOM	0.75
TEST VOLTAGE(V)	240	η down(%)	100.0	CIBSE SHR MAX	0.95

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



AVERAGE BEAM ANGLE(50%):63.5 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:

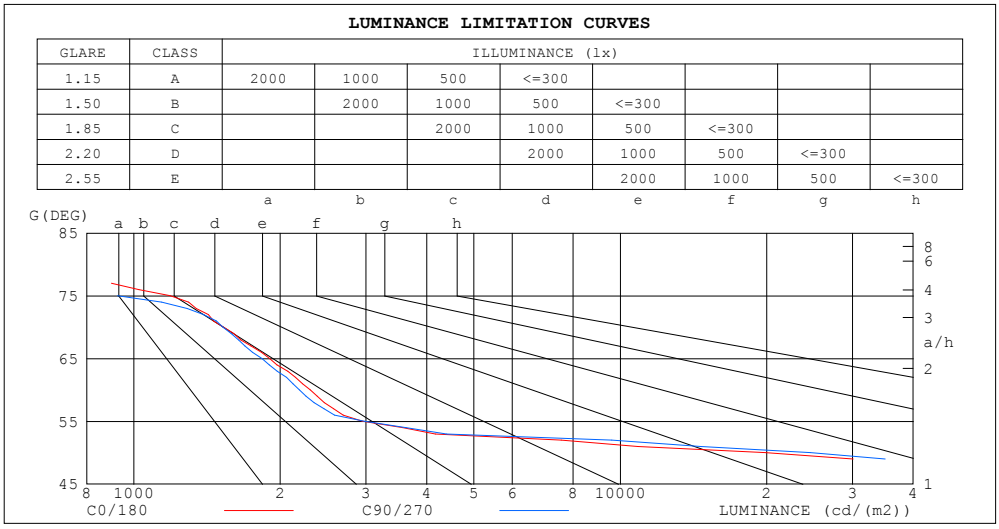
γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	3477	3456	3433	3426	3422	3426	3433	3456	0- 10	336.1	336.1	7.97,7.97
20	2957	2981	2973	2967	2928	2967	2973	2981	10- 20	913.2	1249	29.6,29.6
30	1957	2014	2006	2021	1977	2021	2006	2014	20- 30	1148	2397	56.8,56.8
40	1291	1309	1302	1307	1289	1307	1302	1309	30- 40	994.8	3392	80.4,80.4
50	282.9	340.7	350.1	391.7	360.0	391.7	350.1	340.7	40- 50	734.9	4127	97.8,97.8
60	25.54	25.16	24.26	24.54	24.34	24.54	24.26	25.16	50- 60	67.65	4194	99.4,99.4
70	11.59	12.13	11.56	11.52	11.07	11.52	11.56	12.13	60- 70	17.47	4212	99.8,99.8
80	1.317	1.408	1.096	1.370	1.336	1.370	1.096	1.408	70- 80	6.623	4218	100,100
90	0.1121	0.1044	0.1044	0.1044	0.1044	0.1044	0.1044	0.1044	80- 90	0.5593	4219	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:

LUMINANCE LIMITATION CURVES

NAME: HCP-81X22138	**TYPE:**	**WEIGHT:**
SPEC.:	**DIM.:**	**SERIAL No.:**
MFR.: HAVIT COMMERCIAL	**SUR.:0.168**	**Shielding Angle:**



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	275	193
80	342	285
75	1189	926
70	1530	1525
65	1901	1833
60	2306	2190
55	2949	2979
50	19861	24586
45	65662	67178

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-81X22138	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.168	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	.193	.110	.035	.187	.106	.034	.174	.100	.032	.162	.094	.030	.152	.088	.028	
2.0	.188	.103	.032	.182	.100	.031	.171	.095	.030	.161	.090	.028	.152	.086	.027	
3.0	.180	.096	.029	.175	.094	.028	.166	.090	.027	.157	.086	.026	.149	.083	.026	
4.0	.172	.089	.026	.168	.088	.026	.160	.085	.025	.152	.082	.025	.145	.079	.024	
5.0	.164	.084	.024	.161	.082	.024	.154	.080	.024	.147	.078	.023	.141	.075	.023	
6.0	.157	.079	.023	.154	.078	.022	.147	.076	.022	.141	.074	.022	.136	.072	.021	
7.0	.150	.074	.021	.147	.073	.021	.141	.071	.021	.136	.070	.020	.131	.068	.020	
8.0	.143	.070	.020	.141	.069	.020	.136	.068	.019	.131	.066	.019	.126	.065	.019	
9.0	.137	.066	.018	.135	.066	.018	.130	.064	.018	.126	.063	.018	.122	.062	.018	
10.0	.131	.063	.017	.129	.062	.017	.125	.061	.017	.121	.060	.017	.117	.059	.017	

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	.136	.114	.096	.093	.079	.067	.054	.046	.039	.017	.015	.013	
3.0	.147	.114	.087	.126	.098	.075	.087	.068	.053	.050	.040	.031	.016	.013	.010	
4.0	.138	.099	.070	.118	.086	.061	.081	.060	.043	.047	.035	.025	.015	.011	.008	
5.0	.130	.088	.057	.112	.076	.050	.077	.053	.035	.045	.031	.021	.014	.010	.007	
6.0	.123	.079	.047	.106	.068	.041	.073	.048	.029	.042	.028	.017	.014	.009	.006	
7.0	.117	.072	.040	.101	.062	.035	.069	.044	.025	.040	.026	.015	.013	.008	.005	
8.0	.111	.066	.034	.096	.057	.030	.066	.040	.021	.039	.024	.013	.012	.008	.004	
9.0	.106	.061	.030	.092	.053	.026	.064	.037	.018	.037	.022	.011	.012	.007	.004	
10.0	.102	.056	.026	.088	.049	.023	.061	.034	.016	.036	.020	.010	.012	.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-81X22138	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.168	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	17.3	18.4	17.6	18.6	18.7	17.4	18.5	17.7	18.7	18.9
	3H	17.1	18.1	17.4	18.3	18.5	17.3	18.2	17.5	18.4	18.7
	4H	17.1	18.0	17.3	18.2	18.4	17.2	18.1	17.5	18.3	18.6
	6H	17.0	17.8	17.3	18.1	18.3	17.1	17.9	17.4	18.2	18.4
	8H	16.9	17.7	17.2	18.0	18.3	17.0	17.9	17.3	18.1	18.4
	12H	16.9	17.7	17.2	17.9	18.2	17.0	17.8	17.3	18.1	18.3
4H	2H	17.1	18.0	17.3	18.2	18.4	17.2	18.1	17.5	18.3	18.5
	3H	16.9	17.7	17.2	17.9	18.2	17.0	17.8	17.3	18.1	18.3
	4H	16.8	17.5	17.1	17.8	18.1	16.9	17.6	17.3	17.9	18.2
	6H	16.7	17.3	17.1	17.7	18.0	16.8	17.4	17.2	17.8	18.1
	8H	16.6	17.2	17.0	17.6	18.0	16.8	17.3	17.2	17.7	18.1
	12H	16.6	17.1	17.0	17.5	17.9	16.7	17.2	17.1	17.6	18.0
8H	4H	16.7	17.2	17.0	17.6	18.0	16.8	17.3	17.2	17.7	18.1
	6H	16.6	17.0	17.0	17.4	17.8	16.7	17.1	17.1	17.5	18.0
	8H	16.5	16.9	17.0	17.3	17.8	16.6	17.0	17.1	17.5	17.9
	12H	16.5	16.8	16.9	17.2	17.7	16.6	16.9	17.0	17.4	17.8
12H	4H	16.6	17.1	17.0	17.5	17.9	16.7	17.2	17.1	17.6	18.0
	6H	16.5	16.9	17.0	17.3	17.8	16.6	17.0	17.1	17.5	17.9
	8H	16.5	16.8	16.9	17.2	17.7	16.6	16.9	17.0	17.4	17.8

Variations with the observer position at spacings:		
S = 1.0H	+ 2.9 / -14.9	+ 2.9 / -15.2
1.5H	+ 2.4 / -15.5	+ 2.5 / -15.8
2.0H	+ 7.3 / -13.6	+ 7.2 / -14.1

CIE Pub.117, 4219 lm Total Lamp Luminous Flux Correct (8log(F/F0) = 5.0)

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-81X22138	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.168	Shielding Angle:

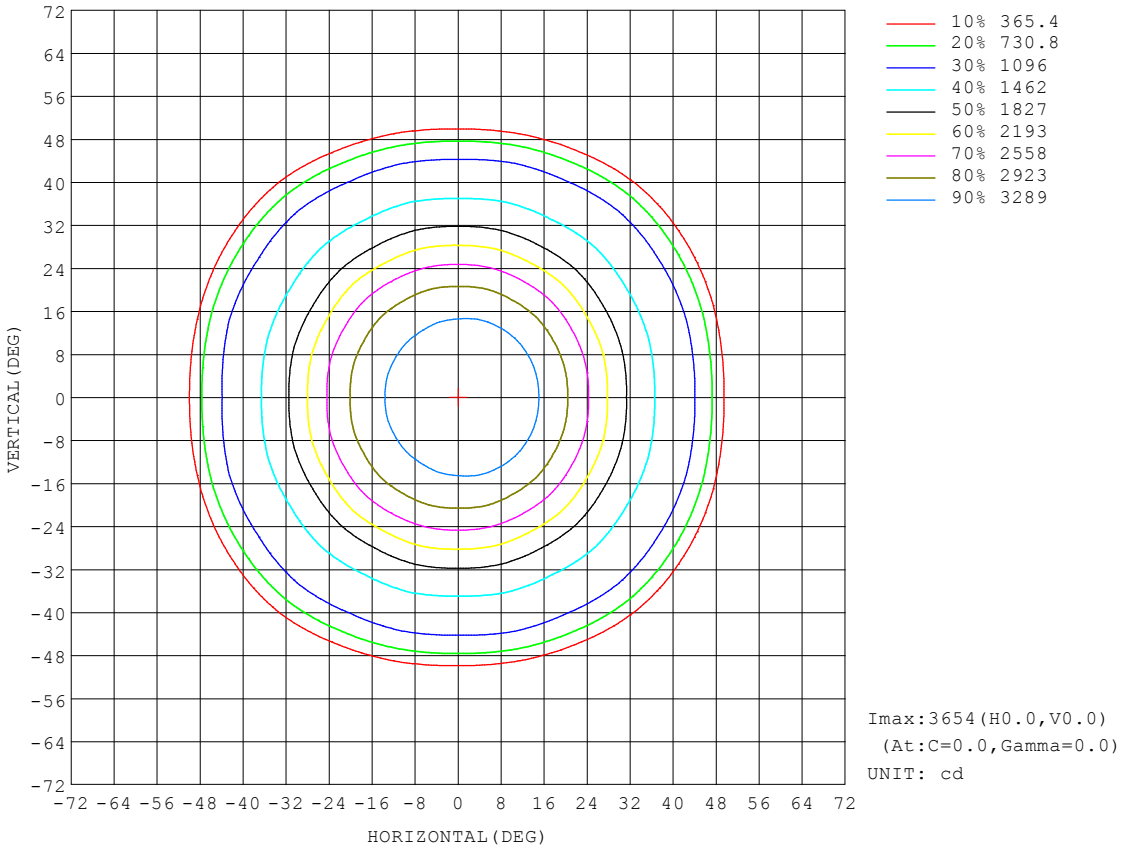
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) k(RI) x RCR = 5									
k = 0.60	79	71	67	79	71	67	78	71	66	62
0.80	88	81	76	87	80	76	86	80	76	71
1.00	94	88	83	93	87	83	92	87	82	78
1.25	99	93	89	98	93	89	96	91	88	83
1.50	103	97	93	101	96	93	99	95	91	86
2.00	106	102	98	105	101	97	102	99	96	90
2.50	108	104	100	107	103	100	104	100	98	91
3.00	110	106	103	108	105	102	105	102	100	93
4.00	112	109	107	110	108	105	107	104	102	95
5.00	114	111	109	112	109	107	108	106	104	96
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-81X22138	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.168	Shielding Angle:

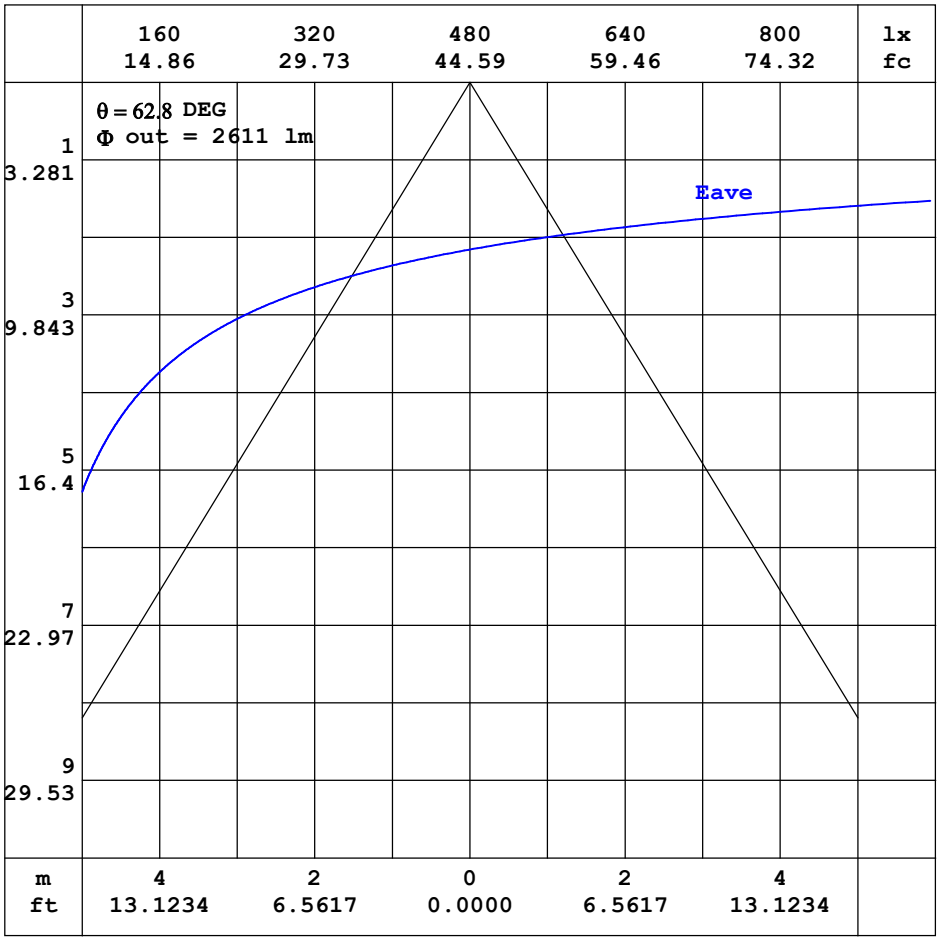


C Range: 0 - 180DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:DAMIN
Test Date:2020-05-28

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-81X22138	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.168	Shielding Angle:

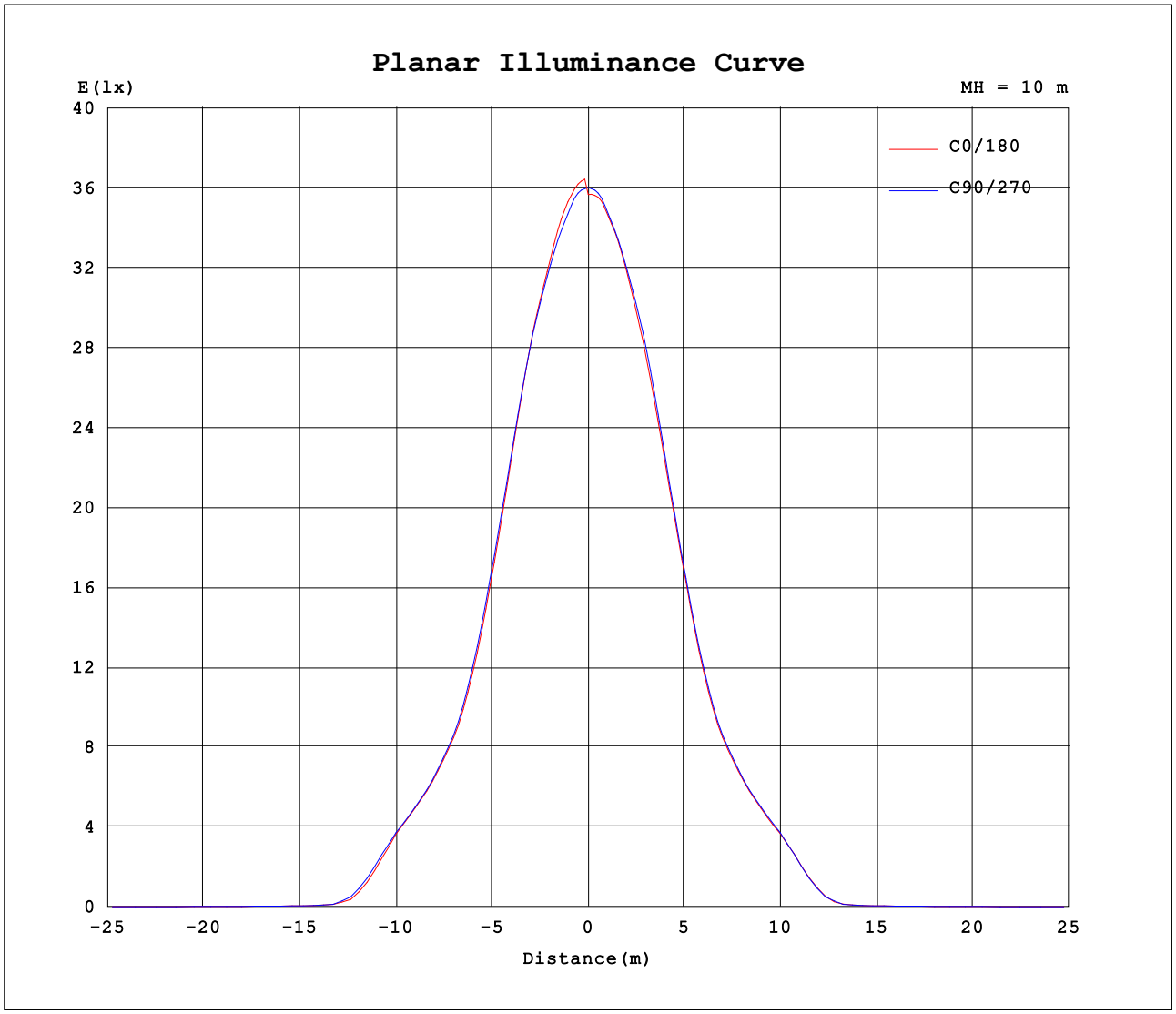


Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

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-81X22138	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.168	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	3654	3638	3634	3620	3617	3605	3603	3592	3589	3580	3578	3569	3568	3569	3578	3580	3589	3592	3603
5	3605	3593	3583	3573	3565	3558	3553	3547	3545	3545	3546	3543	3539	3543	3546	3545	3545	3547	3553
10	3477	3473	3466	3456	3444	3438	3433	3428	3422	3426	3427	3427	3422	3427	3427	3426	3422	3428	3433
15	3289	3294	3297	3297	3292	3287	3274	3266	3252	3246	3235	3234	3230	3234	3235	3246	3252	3266	3274
20	2957	2969	2969	2981	2974	2987	2973	2978	2964	2967	2948	2947	2928	2947	2948	2967	2964	2978	2973
25	2483	2501	2503	2525	2518	2535	2528	2537	2529	2544	2524	2525	2498	2525	2524	2544	2529	2537	2528
30	1957	1987	1981	2014	1999	2024	2006	2027	2002	2021	1993	2009	1977	2009	1993	2021	2002	2027	2006
35	1540	1558	1552	1571	1560	1581	1566	1581	1558	1568	1548	1562	1544	1562	1548	1568	1558	1581	1566
40	1291	1304	1295	1309	1300	1315	1302	1313	1294	1307	1292	1303	1289	1303	1292	1307	1294	1313	1302
45	1029	1060	1049	1066	1049	1070	1052	1067	1050	1069	1053	1072	1039	1072	1053	1069	1050	1067	1052
50	283	327	315	341	332	358	350	377	362	392	369	383	360	383	369	392	362	377	350
55	37.5	39.3	38.7	40.3	38.7	35.3	37.9	35.2	38.5	40.2	38.1	39.3	37.1	39.3	38.1	40.2	38.5	35.2	37.9
60	25.5	25.3	25.2	25.2	24.7	24.6	24.3	24.3	24.4	24.5	24.4	24.7	24.3	24.7	24.4	24.5	24.4	24.3	24.3
65	17.8	17.9	17.7	17.9	17.5	17.5	17.2	17.1	17.0	17.3	17.2	17.4	17.1	17.4	17.2	17.3	17.0	17.1	17.2
70	11.6	11.9	12.0	12.1	12.0	11.8	11.6	11.4	11.5	11.5	11.3	11.2	11.1	11.2	11.3	11.5	11.5	11.4	11.6
75	6.82	6.98	7.03	6.88	6.10	5.52	5.31	5.43	5.91	6.77	6.76	6.44	6.06	6.44	6.76	6.77	5.91	5.43	5.31
80	1.32	1.47	1.45	1.41	1.13	1.12	1.10	1.12	1.14	1.37	1.36	1.29	1.34	1.29	1.36	1.37	1.14	1.12	1.10
85	0.53	0.55	0.50	0.46	0.42	0.38	0.37	0.39	0.42	0.44	0.44	0.47	0.54	0.47	0.44	0.44	0.42	0.39	0.37
90	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.10	0.11	0.10	0.10	0.10	0.10	0.10

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-81X22138	TYPE:	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: HAVIT COMMERCIAL	SUR.:0.168	Shielding Angle:

Table--2 UNIT: cd

γ (DEG) \ C(DEG)	285	300	315	330	345														
0	3605	3617	3620	3634	3638														
5	3558	3565	3573	3583	3593														
10	3438	3444	3456	3466	3473														
15	3287	3292	3297	3297	3294														
20	2987	2974	2981	2969	2969														
25	2535	2518	2525	2503	2501														
30	2024	1999	2014	1981	1987														
35	1581	1560	1571	1552	1558														
40	1315	1300	1309	1295	1304														
45	1070	1049	1066	1049	1060														
50	358	332	341	315	327														
55	35.3	38.7	40.3	38.7	39.3														
60	24.6	24.7	25.2	25.2	25.3														
65	17.5	17.5	17.9	17.7	17.9														
70	11.8	12.0	12.1	12.0	11.9														
75	5.52	6.10	6.88	7.03	6.98														
80	1.12	1.13	1.41	1.45	1.47														
85	0.38	0.42	0.46	0.50	0.55														
90	0.10	0.10	0.10	0.11	0.11														

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: