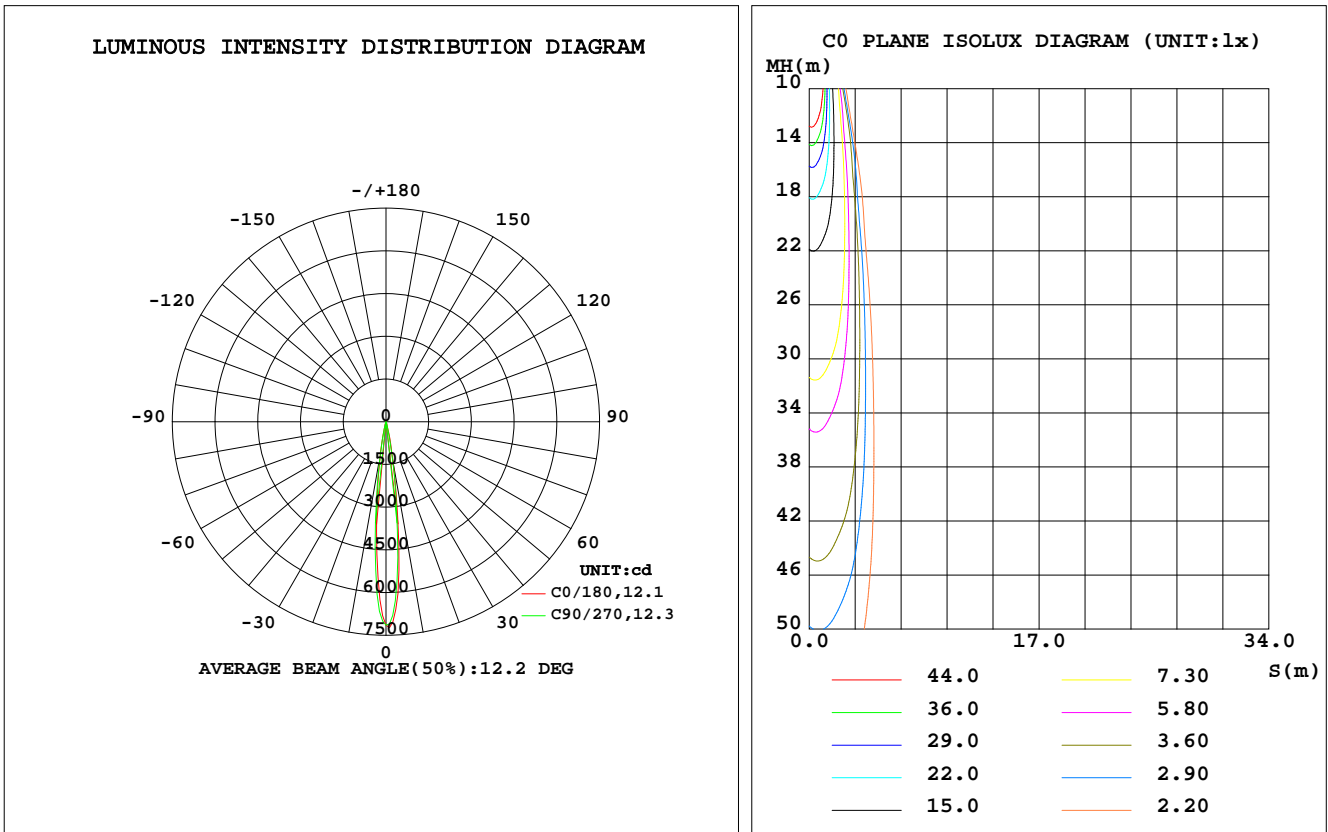


## LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:0V I:0A P:0W PF:0.0000 Freq:0Hz Lamp Flux:450.947x1 lm		
NAME: PB15 PixelBrick	TYPE:LED	WEIGHT:N/A
SPEC.:N/A	DIM.:	SERIAL No.:N/A
MFR.: Astera LED Technology GmbH	SUR.:	Shielding Angle:N/A

DATA OF LAMP		PHOTOMETRIC DATA			
MODEL	PB15 3200K	Imax(cd)	7230	S/MH(C0/180)	0.19
NOMINAL POWER(W)		LOR(%)	100.0	S/MH(C90/270)	0.21
RATED VOLTAGE(V)		TOTAL FLUX(lm)	450.95	$\eta$ UP,DN(C0-180)	0.1,52.0
NOMINAL FLUX(lm)	450.947	CIE CLASS	DIRECT	$\eta$ UP,DN(C180-360)	0.1,47.8
LAMPS INSIDE	1	$\eta$ up(%)	0.2	CIBSE SHR NOM	0.00
TEST VOLTAGE(V)		$\eta$ down(%)	99.8	CIBSE SHR MAX	1.00



C Range: 0 - 360DEG  
 C Interval: 22.5DEG  
 Test Speed: HIGH  
 Temperature:24.5DEG  
 Operators:William  
 Test Date:2021-04-15

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System:EVERFINE GO-R5000\_V2 SYSTEM V2.0.366  
 Humidity:56.4%  
 Test Distance:26.000m [K=1.4238]  
 Remarks:

## ZONAL FLUX DIAGRAM

### ZONAL FLUX DIAGRAM:

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi$ zone	$\Phi$ total	%lum, lamp
10	1468	1608	1303	1140	1135	1110	1160	1282	0- 10	320.7	320.7	71.1,71.1
20	77.48	80.21	74.52	73.75	74.57	72.63	66.00	72.54	10- 20	91.44	412.1	91.4,91.4
30	21.12	21.93	20.32	20.11	19.37	19.01	17.99	19.96	20- 30	17.98	430.1	95.4,95.4
40	9.895	10.09	9.688	10.85	9.810	9.780	8.035	8.860	30- 40	8.412	438.5	97.2,97.2
50	6.619	6.279	5.327	6.950	7.135	6.415	4.372	5.059	40- 50	6.004	444.5	98.6,98.6
60	3.426	3.218	2.504	3.201	2.811	2.674	1.554	2.570	50- 60	3.881	448.4	99.4,99.4
70	1.068	0.6969	0.7075	0.9449	0.3036	0.2231	0	0	60- 70	1.536	449.9	99.8,99.8
80	0	0	0	0	0	0	0	0	70- 80	0.1739	450.1	99.8,99.8
90	0	0	0	0	0	0	0	0	80- 90	0	450.1	99.8,99.8
100	0	0	0	0	0	0	0	0	90-100	0	450.1	99.8,99.8
110	0	0	0	0	0	0	0	0	100-110	0	450.1	99.8,99.8
120	0	0	0	0	0	0	0	0	110-120	0	450.1	99.8,99.8
130	0	0	0	0	0	0	0	0	120-130	0	450.1	99.8,99.8
140	0	0	0	0	0	0	0	0	130-140	0	450.1	99.8,99.8
150	0	0	0	0	0	0	0	0	140-150	0	450.1	99.8,99.8
160	0.4556	0.5270	0.3850	0.8560	1.677	1.614	1.485	1.413	150-160	0.0940	450.2	99.8,99.8
170	2.142	2.503	2.183	2.799	2.313	2.376	2.576	2.367	160-170	0.5381	450.7	100,100
180	2.358	1.826	2.578	1.938	2.054	2.140	2.192	2.026	170-180	0.2246	450.9	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Conical surface Flux(90deg): 441.71 lm

%lum = 98.0%

%lamp = 98.0%

Conical surface Flux(120deg): 448.38 lm

%lum = 99.4%

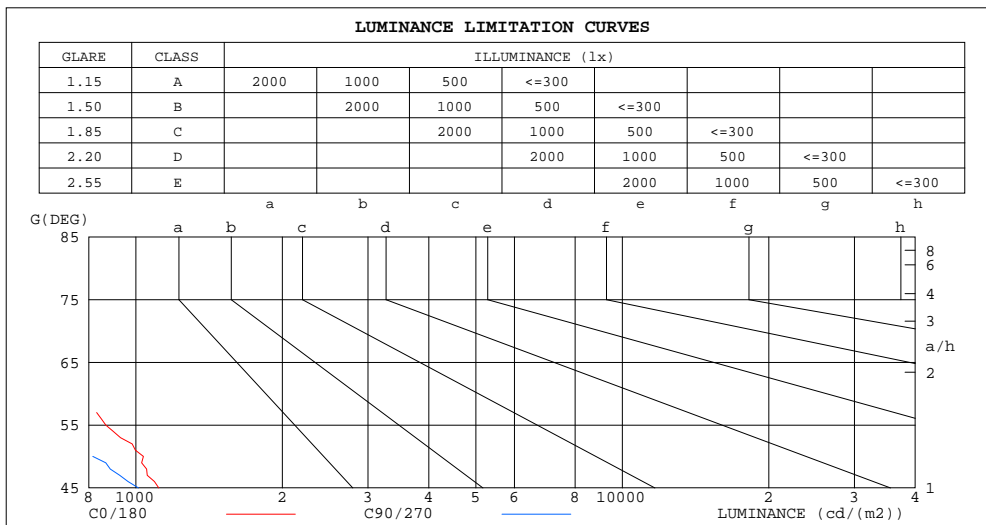
%lamp = 99.4%

C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:24.5DEG  
Operators:William  
Test Date:2021-04-15

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
Test System:EVERFINE GO-R5000\_V2 SYSTEM V2.0.366  
Humidity:56.4%  
Test Distance:26.000m [K=1.4238]  
Remarks:

## LUMINANCE LIMITATION CURVES

Test:U:0V I:0A P:0W PF:0.0000 Freq:0Hz Lamp Flux:450.947x1 lm		
NAME: PixelBrick	TYPE:LED	WEIGHT:N/A
SPEC.:N/A	DIM.:	SERIAL No.:N/A
MFR.: Astera LED Technology GmbH	SUR.:	Shielding Angle:N/A



LUMINANCE cd/(m2)		
G(DEG)	C0/180	C90/270
85	0	0
80	0	0
75	148	60
70	314	204
65	471	346
60	689	493
55	867	657
50	1036	816
45	1115	1012

C Range: 0 - 360DEG  
 C Interval: 22.5DEG  
 Test Speed: HIGH  
 Temperature:24.5DEG  
 Operators:William  
 Test Date:2021-04-15

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-R5000\_V2 SYSTEM V2.0.366  
 Humidity:56.4%  
 Test Distance:26.000m [K=1.4238]  
 Remarks:

## WEC AND CCEC

Test:U:0V I:0A P:0W PF:0.0000 Freq:0Hz Lamp Flux:450.947x1 lm									
NAME: PixelBrick				TYPE:LED			WEIGHT:N/A		
SPEC.:N/A				DIM.:			SERIAL No.:N/A		
MFR.: Astera LED Technology GmbH				SUR.:			Shielding Angle:N/A		

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	.115	.065	.021	.108	.062	.020	.096	.055	.017	.084	.049	.016	.074	.043	.014		
2.0	.104	.057	.018	.099	.054	.017	.089	.049	.015	.079	.044	.014	.071	.040	.013		
3.0	.095	.051	.015	.091	.049	.015	.082	.045	.014	.075	.041	.013	.068	.037	.012		
4.0	.087	.045	.013	.084	.044	.013	.077	.041	.012	.070	.038	.011	.064	.035	.011		
5.0	.081	.041	.012	.078	.040	.012	.072	.037	.011	.067	.035	.010	.061	.033	.010		
6.0	.075	.038	.011	.073	.037	.011	.068	.035	.010	.063	.033	.010	.059	.031	.009		
7.0	.070	.035	.010	.068	.034	.010	.064	.032	.009	.060	.031	.009	.056	.029	.009		
8.0	.066	.032	.009	.064	.032	.009	.060	.030	.009	.057	.029	.008	.054	.028	.008		
9.0	.062	.030	.008	.060	.029	.008	.057	.028	.008	.054	.027	.008	.052	.026	.008		
10.0	.059	.028	.008	.057	.028	.008	.055	.027	.008	.052	.026	.007	.049	.025	.007		

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	.192	.192	.192	.164	.164	.164	.112	.112	.112	.064	.064	.064	.021	.021	.021		
1.0	.168	.159	.151	.144	.137	.130	.098	.094	.090	.057	.054	.052	.018	.018	.017		
2.0	.149	.134	.122	.127	.116	.106	.087	.080	.074	.050	.047	.043	.016	.015	.014		
3.0	.132	.115	.101	.113	.099	.087	.078	.069	.061	.045	.040	.036	.014	.013	.012		
4.0	.118	.099	.084	.102	.085	.073	.070	.060	.051	.040	.035	.030	.013	.011	.010		
5.0	.107	.086	.071	.092	.075	.062	.063	.052	.044	.037	.031	.026	.012	.010	.009		
6.0	.097	.076	.061	.083	.066	.053	.057	.046	.037	.033	.027	.022	.011	.009	.007		
7.0	.088	.067	.052	.076	.058	.046	.053	.041	.032	.031	.024	.019	.010	.008	.006		
8.0	.081	.060	.045	.070	.052	.040	.048	.037	.028	.028	.022	.017	.009	.007	.006		
9.0	.075	.054	.040	.064	.047	.035	.045	.033	.025	.026	.019	.015	.008	.006	.005		
10.0	.069	.049	.035	.060	.042	.031	.041	.030	.022	.024	.018	.013	.008	.006	.004		

C Range: 0 - 360DEG  
 C Interval: 22.5DEG  
 Test Speed: HIGH  
 Temperature:24.5DEG  
 Operators:William  
 Test Date:2021-04-15

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-R5000\_V2 SYSTEM V2.0.366  
 Humidity:56.4%  
 Test Distance:26.000m [K=1.4238]  
 Remarks:

## UGR(Unified Glare Rating) Table

Test:U:0V I:0A P:0W PF:0.0000 Freq:0Hz Lamp Flux:450.947x1 lm										
NAME: PixelBrick					TYPE:LED			WEIGHT:N/A		
SPEC.:N/A					DIM.:			SERIAL No.:N/A		
MFR.: Astera LED Technology GmbH					SUR.:			Shielding Angle:N/A		
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	3.2	3.7	3.4	3.8	4.0	2.1	2.6	2.3	2.7	2.9
3H	3.5	4.0	3.7	4.1	4.3	2.3	2.7	2.5	2.9	3.1
4H	3.5	3.9	3.7	4.1	4.3	2.2	2.7	2.5	2.9	3.1
6H	3.4	3.8	3.7	4.0	4.3	2.1	2.6	2.4	2.8	3.0
8H	3.3	3.8	3.6	4.0	4.2	2.1	2.5	2.4	2.8	3.0
12H	3.3	3.7	3.6	4.0	4.2	2.1	2.5	2.4	2.7	3.0
4H 2H	3.4	3.8	3.6	4.0	4.2	2.5	2.9	2.7	3.1	3.3
3H	3.7	4.1	4.0	4.4	4.6	2.6	3.0	2.9	3.3	3.5
4H	3.7	4.0	4.0	4.3	4.6	2.6	2.9	2.9	3.2	3.5
6H	3.6	3.9	3.9	4.2	4.6	2.4	2.8	2.8	3.1	3.4
8H	3.5	3.8	3.9	4.2	4.5	2.4	2.7	2.8	3.0	3.4
12H	3.4	3.7	3.8	4.1	4.5	2.3	2.6	2.7	3.0	3.4
8H 4H	3.5	3.8	3.9	4.2	4.5	2.4	2.7	2.8	3.1	3.4
6H	3.4	3.7	3.8	4.1	4.5	2.3	2.6	2.7	3.0	3.4
8H	3.3	3.6	3.8	4.0	4.4	2.2	2.5	2.7	2.9	3.3
12H	3.3	3.5	3.7	3.9	4.4	2.2	2.4	2.6	2.8	3.3
12H 4H	3.5	3.7	3.9	4.1	4.5	2.4	2.7	2.8	3.0	3.4
6H	3.3	3.6	3.8	4.0	4.4	2.2	2.5	2.7	2.9	3.3
8H	3.3	3.5	3.7	3.9	4.4	2.2	2.4	2.6	2.8	3.3
Variations with the observer position at spacings:										
S = 1.0H	+ 0.6 / - 0.9					+ 1.0 / - 1.6				
1.5H	+ 0.3 / - 0.8					+ 0.6 / - 0.9				
2.0H	+ 1.3 / - 1.6					+ 1.5 / - 2.2				

CIE Pub.117, 450.9 lm Total Lamp Luminous Flux Corrected ( $8\log(F/F_0) = -2.8$ )

C Range: 0 - 360DEG  
 C Interval: 22.5DEG  
 Test Speed: HIGH  
 Temperature:24.5DEG  
 Operators:William  
 Test Date:2021-04-15

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-R5000\_V2 SYSTEM V2.0.366  
 Humidity:56.4%  
 Test Distance:26.000m [K=1.4238]  
 Remarks:

## UTILIZATION FACTORS TABLE

Test:U:0V I:0A P:0W PF:0.0000 Freq:0Hz Lamp Flux:450.947x1 lm		
NAME: PixelBrick	TYPE:LED	WEIGHT:N/A
SPEC.:N/A	DIM.:	SERIAL No.:N/A
MFR.: Astera LED Technology GmbH	SUR.:	Shielding Angle:N/A

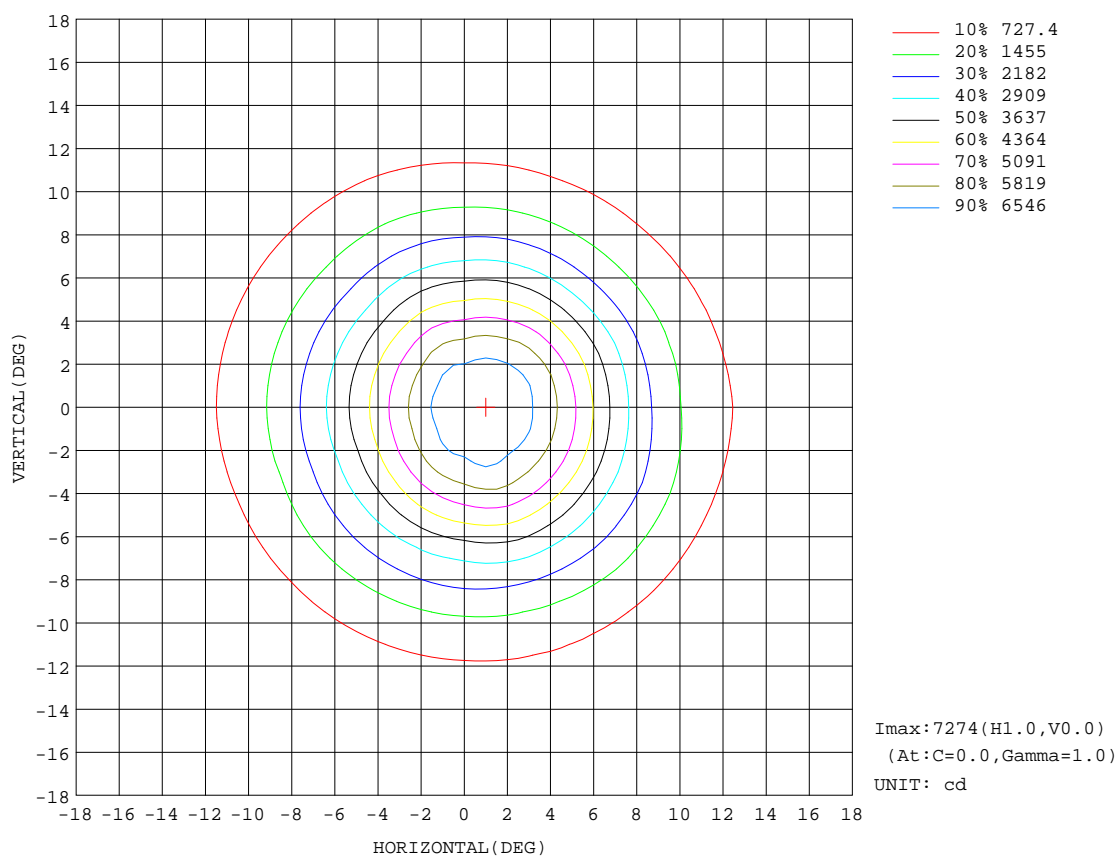
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	90	84	80	89	84	80	89	83	80	77
0.80	97	92	88	96	91	88	95	91	88	84
1.00	101	96	92	100	95	92	98	95	92	88
1.25	105	100	97	104	99	96	102	98	95	91
1.50	107	103	100	106	102	99	104	100	98	94
2.00	109	106	103	108	104	102	105	102	100	95
2.50	111	107	105	109	106	104	106	104	102	96
3.00	112	109	107	111	108	106	107	105	103	97
4.00	114	112	110	112	110	108	109	107	106	99
5.00	115	113	112	113	112	110	109	108	107	99
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended					SHRNOM = 1.25		

C Range: 0 - 360DEG  
 C Interval: 22.5DEG  
 Test Speed: HIGH  
 Temperature:24.5DEG  
 Operators:William  
 Test Date:2021-04-15

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System:EVERFINE GO-R5000\_V2 SYSTEM V2.0.366  
 Humidity:56.4%  
 Test Distance:26.000m [K=1.4238]  
 Remarks:

## ISOCANDELA DIAGRAM

Test:U:0V I:0A P:0W PF:0.0000 Freq:0Hz Lamp Flux:450.947x1 lm		
NAME: PixelBrick	TYPE:LED	WEIGHT:N/A
SPEC.:N/A	DIM.:	SERIAL No.:N/A
MFR.: Astera LED Technology GmbH	SUR.:	Shielding Angle:N/A

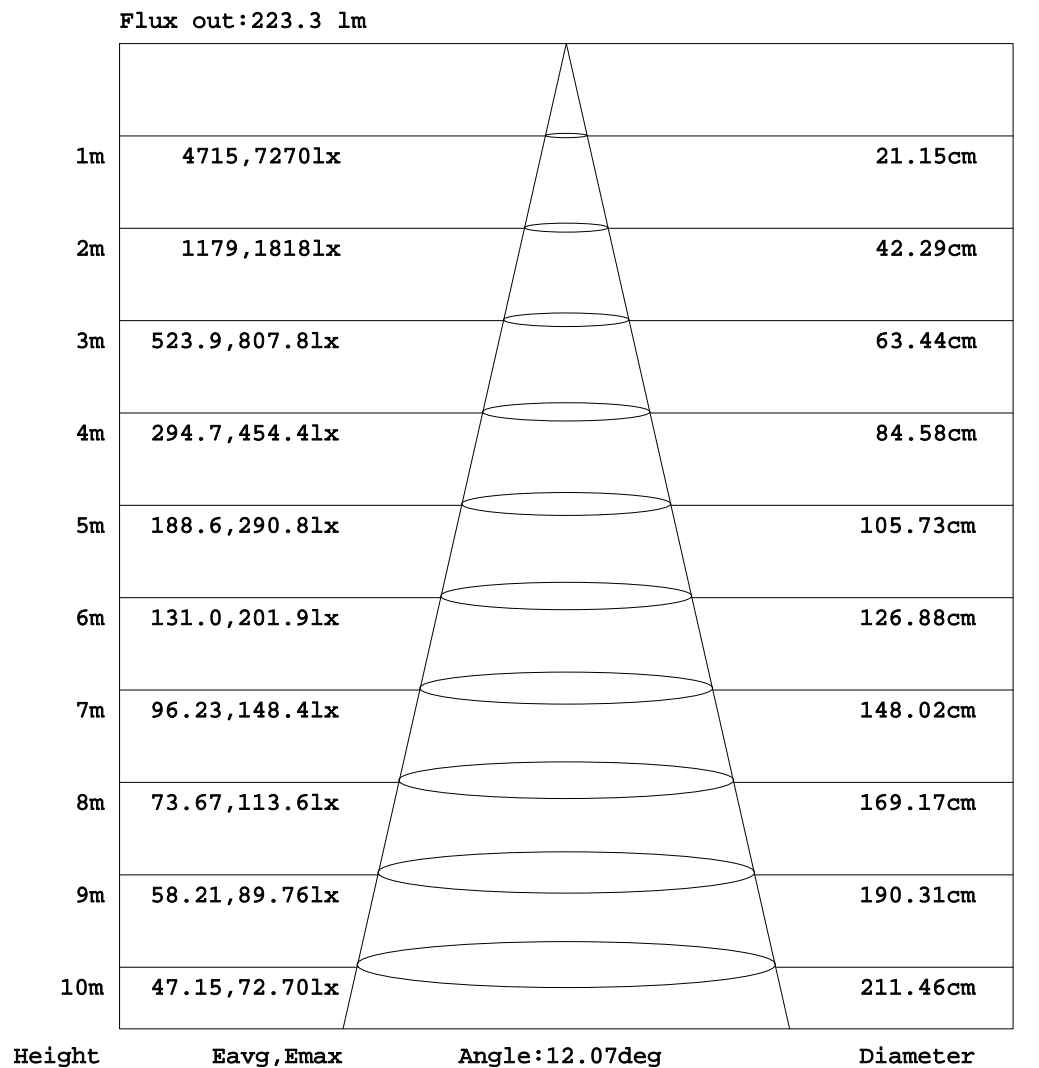


C Range: 0 - 360DEG  
 C Interval: 22.5DEG  
 Test Speed: HIGH  
 Temperature:24.5DEG  
 Operators:William  
 Test Date:2021-04-15

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System:EVERFINE GO-R5000\_V2 SYSTEM V2.0.366  
 Humidity:56.4%  
 Test Distance:26.000m [K=1.4238]  
 Remarks:

## AAI Figure

Test:U:0V I:0A P:0W PF:0.0000 Freq:0Hz Lamp Flux:450.947x1 lm		
NAME: PixelBrick	TYPE:LED	WEIGHT:N/A
SPEC.:N/A	DIM.:	SERIAL No.:N/A
MFR.: Astera LED Technology GmbH	SUR.:	Shielding Angle:N/A



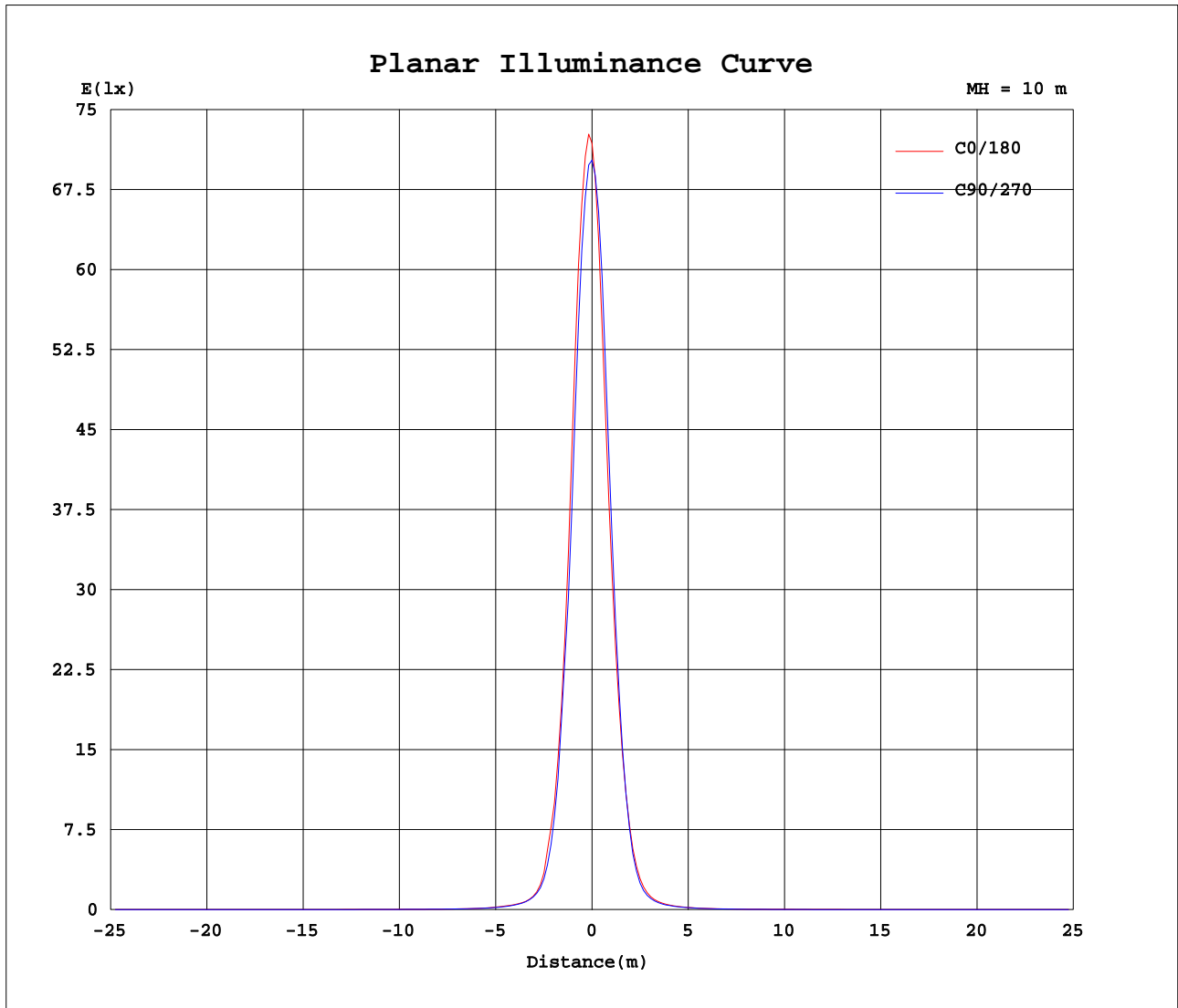
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG  
 C Interval: 22.5DEG  
 Test Speed: HIGH  
 Temperature:24.5DEG  
 Operators:William  
 Test Date:2021-04-15

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-R5000\_V2 SYSTEM V2.0.366  
 Humidity:56.4%  
 Test Distance:26.000m [K=1.4238]  
 Remarks:



## Planar Illuminance Curve



C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature: 24.5DEG  
Operators: William  
Test Date: 2021-04-15

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
Test System: EVERFINE GO-R5000\_V2 SYSTEM V2.0.366  
Humidity: 56.4%  
Test Distance: 26.000m [K=1.4238]  
Remarks:

## LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:0V I:0A P:0W PF:0.0000 Freq:0Hz Lamp Flux:450.947x1 lm																		
NAME: PixelBrick									TYPE:LED					WEIGHT:N/A				
SPEC.:N/A									DIM.:					SERIAL No.:N/A				
MFR.: Astera LED Technology GmbH									SUR.:					Shielding Angle:N/A				

Table--1

UNIT: cd

C(DEG) γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	7141	7141	7141	7141	7141	7141	7141	7141	7141	7141	7141	7141	7141	7141	7141	7141			
5	5223	5307	5227	5034	4777	4411	4108	3885	3854	3893	3991	4191	4394	4622	4997	5185			
10	1468	1631	1608	1409	1303	1192	1140	1110	1135	1127	1110	1148	1160	1188	1282	1411			
15	260	274	261	241	233	230	229	224	236	243	237	220	205	200	218	251			
20	77.5	82.9	80.2	75.6	74.5	74.0	73.8	72.4	74.6	76.2	72.6	70.0	66.0	67.3	72.5	76.3			
25	41.5	46.4	43.6	39.3	37.1	35.7	35.2	34.4	35.5	36.4	35.0	34.2	33.5	35.4	39.8	41.8			
30	21.1	22.1	21.9	21.1	20.3	20.0	20.1	19.7	19.4	20.1	19.0	18.7	18.0	18.8	20.0	20.6			
35	13.6	13.9	14.0	13.6	13.5	13.3	13.3	13.3	12.7	13.3	12.5	12.0	11.5	11.8	12.4	12.6			
40	9.90	10.1	10.1	9.80	9.69	10.7	10.8	10.8	9.81	10.4	9.78	8.70	8.03	8.31	8.86	8.93			
45	7.84	8.07	7.65	7.26	7.27	8.47	9.35	9.56	8.74	9.29	8.78	6.78	6.24	6.20	6.54	6.75			
50	6.62	6.84	6.28	5.55	5.33	6.22	6.95	7.24	7.13	7.22	6.41	5.24	4.37	4.74	5.06	5.59			
55	4.94	5.46	4.97	4.17	3.83	4.28	4.83	5.21	4.63	4.82	4.35	3.62	2.80	2.95	3.97	4.19			
60	3.43	3.69	3.22	2.70	2.50	2.80	3.20	3.50	2.81	2.91	2.67	2.08	1.55	1.71	2.57	2.56			
65	1.98	2.24	2.14	1.54	1.49	1.56	2.19	2.26	1.52	1.45	1.45	0.62	0.39	0.47	1.40	1.39			
70	1.07	1.00	0.70	0.62	0.71	0.93	0.94	1.17	0.30	0.23	0.22	0.00	0.00	0.00	0.00	0.15			
75	0.38	0.31	0.23	0.16	0.16	0.31	0.24	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
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	0.00	0.00	0.00	0.00			
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.31	0.24	0.23	0.24	0.16	0.08	0.31			
160	0.46	0.46	0.53	0.38	0.38	0.30	0.86	0.46	1.68	1.77	1.61	1.62	1.48	1.33	1.41	1.40			
165	1.67	1.53	2.05	1.69	1.33	1.48	2.10	1.63	2.18	2.38	2.52	2.54	2.58	2.26	2.65	2.39			
170	2.14	2.37	2.50	2.46	2.18	1.90	2.80	2.50	2.31	2.38	2.38	2.54	2.58	2.33	2.37	2.51			
175	2.30	2.43	2.60	2.62	2.55	2.10	2.52	2.55	2.15	2.24	2.17	2.27	2.22	2.22	2.12	2.10			
180	2.36	2.46	1.83	3.01	2.58	2.18	1.94	2.80	2.05	2.23	2.14	2.08	2.19	2.25	2.03	2.17			

C Range: 0 - 360DEG  
 C Interval: 22.5DEG  
 Test Speed: HIGH  
 Temperature:24.5DEG  
 Operators:William  
 Test Date:2021-04-15

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-R5000\_V2 SYSTEM V2.0.366  
 Humidity:56.4%  
 Test Distance:26.000m [K=1.4238]  
 Remarks: