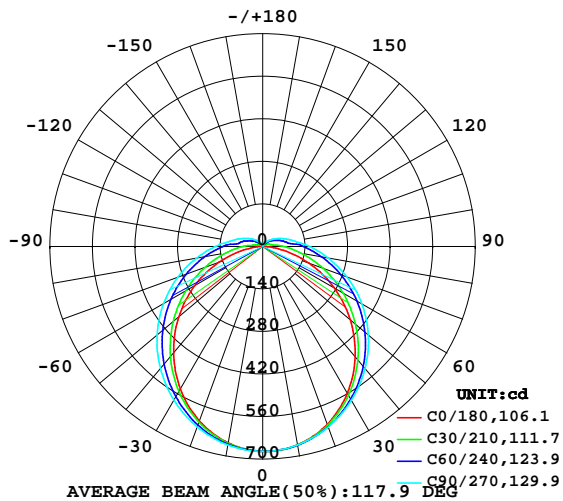


LUMINAIRE PHOTOMETRIC TEST REPORT

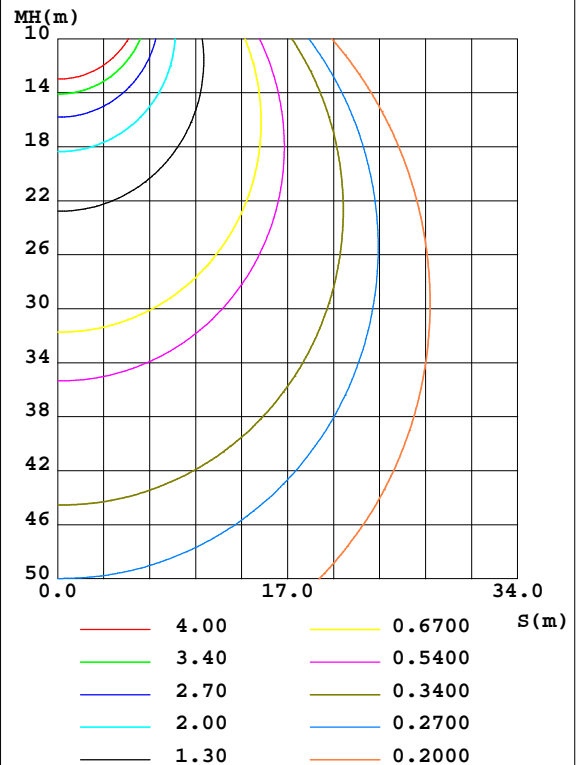
Test:U:220.0V I:0.0807A P:17.27W PF:0.9734 Lamp Flux:2347.52x1 lm		
NAME: 칠판등-18W-(1)	TYPE:LED	WEIGHT:
SPEC.:18W	DIM.:	SERIAL No.:1
MFR.: ICEPIPE	SUR.:	Shielding Angle:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 135.90 lm/W			
MODEL	GRW-18	Imax(cd)	675.2	S/MH(C0/180)	1.20
NOMINAL POWER(W)	18	LOR(%)	100.0	S/MH(C90/270)	1.29
RATED VOLTAGE(V)	220	TOTAL FLUX(lm)	2347.5	η UP,DN(C0-180)	4.3,45.7
NOMINAL FLUX(lm)	2347.52	CIE CLASS	DIRECT	η UP,DN(C180-360)	4.3,45.6
LAMPS INSIDE	1	η up(%)	8.6	CIBSE SHR NOM	1.25
TEST VOLTAGE(V)	220	η down(%)	91.4	CIBSE SHR MAX	1.35

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



C0 PLANE ISOLUX DIAGRAM (UNIT:lx)



C Range: 0 - 360DEG
 C Interval: 15.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: OHS
 Test Date: 19 October 2022

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.351
 Humidity: 65.0%
 Test Distance: 8.100m [K=1.0000]
 Remarks: Z-WPL-18eS

ZONAL FLUX DIAGRAM

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	662.5	663.9	663.6	659.4	656.2	658.9	663.1	663.8	0- 10	63.77	63.77	2.72,2.72
20	623.0	628.9	632.0	620.4	610.6	619.7	631.8	628.5	10- 20	182.2	246.0	10.5,10.5
30	557.5	573.5	584.4	561.0	542.0	560.7	584.3	572.0	20- 30	275.5	521.5	22.2,22.2
40	473.5	502.1	524.4	487.7	456.6	488.1	524.0	500.0	30- 40	333.1	854.7	36.4,36.4
50	376.6	420.5	453.8	405.3	360.5	406.8	454.0	417.8	40- 50	350.6	1205	51.3,51.3
60	271.4	333.8	376.5	319.1	258.5	321.3	377.2	330.8	50- 60	329.4	1535	65.4,65.4
70	162.7	247.7	295.6	234.4	153.6	237.1	297.3	244.3	60- 70	276.3	1811	77.1,77.1
80	61.42	168.0	218.4	156.9	55.84	160.1	220.9	164.6	70- 80	203.4	2014	85.8,85.8
90	3.933	106.9	154.2	98.56	3.122	101.5	155.5	103.4	80- 90	130.5	2145	91.4,91.4
100	4.081	58.43	106.3	52.29	3.514	54.19	107.2	55.73	90-100	77.42	2222	94.7,94.7
110	4.684	41.60	75.90	34.44	4.109	34.89	76.62	39.32	100-110	48.96	2271	96.7,96.7
120	5.270	28.64	52.34	20.20	4.676	21.67	52.77	26.38	110-120	32.07	2303	98.1,98.1
130	5.852	19.11	34.63	13.61	5.253	14.56	34.88	17.79	120-130	19.69	2323	99,99
140	6.469	12.60	21.94	9.494	5.912	9.705	21.61	11.92	130-140	11.54	2335	99.4,99.4
150	7.023	8.292	12.91	7.403	6.577	7.275	12.78	7.911	140-150	6.508	2341	99.7,99.7
160	7.524	7.478	7.395	7.376	7.218	7.055	7.417	7.129	150-160	3.628	2345	99.9,99.9
170	7.906	7.762	7.683	7.697	7.762	7.557	7.530	7.585	160-170	2.114	2347	100,100
180	8.045	7.850	7.804	7.827	8.050	7.845	7.808	7.832	170-180	0.7406	2348	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Conical surface Flux(90deg): 1030.3 lm

%lum = 43.9%

%lamp = 43.9%

Conical surface Flux(120deg): 1534.7 lm

%lum = 65.4%

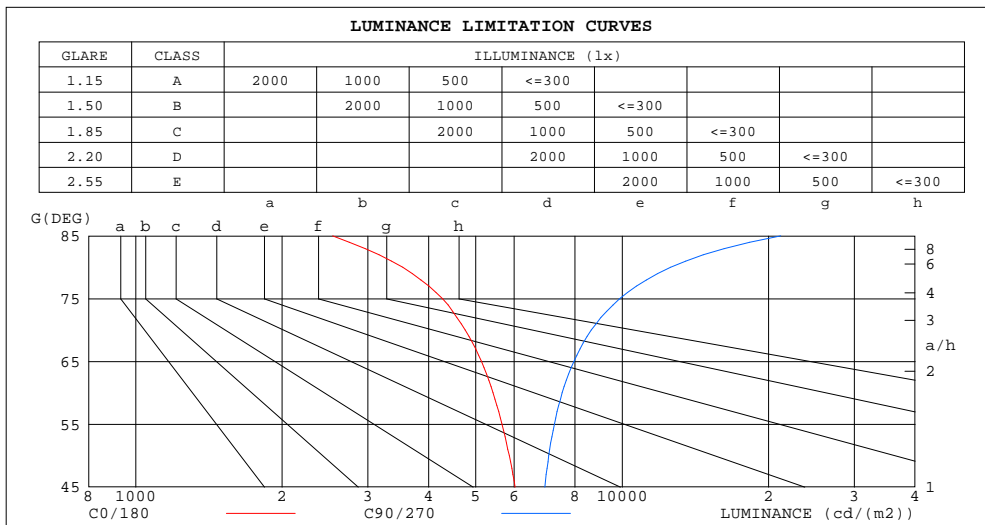
%lamp = 65.4%

C Range: 0 - 360DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:OHS
Test Date:19 October 2022

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.351
Humidity:65.0%
Test Distance:8.100m [K=1.0000]
Remarks: Z-WPL-18eS

LUMINANCE LIMITATION CURVES

Test:U:220.0V I:0.0807A P:17.27W PF:0.9734 Lamp Flux:2347.52x1 lm		
NAME: 칠판등-18W-(1)	TYPE:LED	WEIGHT:
SPEC.:18W	DIM.:	SERIAL No.:1
MFR.: ICEPIPE	SUR.:	Shielding Angle:



LUMINANCE cd/(m2)		
G(DEG)	C0/180	C90/270
85	2541	21185
80	3537	12577
75	4268	9891
70	4758	8643
65	5139	7955
60	5428	7530
55	5661	7253
50	5859	7060
45	6028	6934

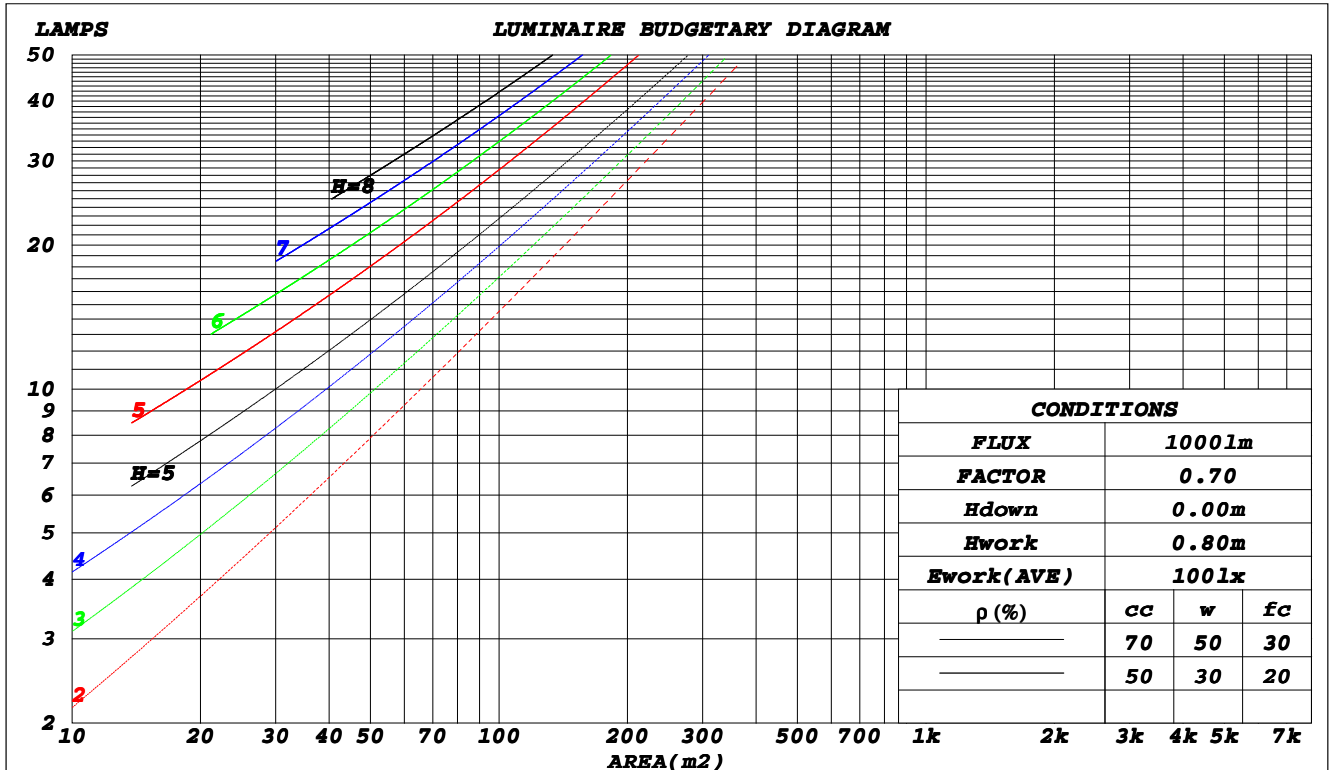
C Range: 0 - 360DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: OHS
Test Date: 19 October 2022

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.351
Humidity: 65.0%
Test Distance: 8.100m [K=1.0000]
Remarks: Z-WPL-18eS

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:220.0V I:0.0807A P:17.27W PF:0.9734 Lamp Flux:2347.52x1 lm		
NAME: 칠판동-18W-(1)	TYPE:LED	WEIGHT:
SPEC.:18W	DIM.:	SERIAL No.:1
MFR.: ICEPIPE	SUR.:	Shielding Angle:

ρ_{cc}	80%			70%			50%			30%			10%			0
ρ_w	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρ_{fc}	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Coefficients of Utilization(CU)									
0.0	1.17	1.17	1.17	1.13	1.13	1.13	1.06	1.06	1.06	.00	.00	.00	.94	.94	.94	.91
1.0	.99	.94	.90	.96	.92	.88	.90	.87	.83	.85	.82	.79	.80	.77	.75	.72
2.0	.86	.78	.72	.83	.76	.70	.78	.72	.67	.73	.69	.64	.69	.65	.62	.59
3.0	.75	.66	.59	.72	.64	.58	.68	.61	.56	.64	.58	.54	.61	.56	.52	.49
4.0	.66	.57	.50	.64	.55	.49	.60	.53	.47	.57	.51	.46	.54	.48	.44	.41
5.0	.59	.49	.42	.57	.48	.42	.54	.46	.40	.51	.44	.39	.48	.43	.38	.36
6.0	.53	.43	.37	.51	.43	.36	.49	.41	.35	.46	.39	.34	.44	.38	.33	.31
7.0	.48	.39	.32	.46	.38	.32	.44	.37	.31	.42	.35	.30	.40	.34	.29	.27
8.0	.43	.35	.29	.42	.34	.28	.40	.33	.28	.38	.32	.27	.37	.31	.26	.24
9.0	.40	.31	.26	.39	.31	.25	.37	.30	.25	.35	.29	.24	.34	.28	.24	.22
10.0	.37	.29	.23	.36	.28	.23	.34	.27	.23	.33	.26	.22	.31	.26	.22	.20



C Range: 0 - 360DEG
 C Interval: 15.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: OHS
 Test Date: 19 October 2022

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.351
 Humidity: 65.0%
 Test Distance: 8.100m [K=1.0000]
 Remarks: Z-WPL-18eS

WEC AND CCEC

Test:U:220.0V I:0.0807A P:17.27W PF:0.9734 Lamp Flux:2347.52x1 lm		
NAME: 칠판동-18W-(1)	TYPE:LED	WEIGHT:
SPEC.:18W	DIM.:	SERIAL No.:1
MFR.: ICEPIPE	SUR.:	Shielding Angle:

ρ_{cc}	80%			70%			50%			30%			10%			0	
ρ_w	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0	
ρ_{fc}	20%			20%			20%			20%			20%			0	
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)										
0.0																	
1.0	.358	.204	.064	.348	.199	.063	.330	.189	.060	.313	.180	.058	.297	.172	.056		
2.0	.318	.174	.053	.309	.170	.053	.293	.163	.051	.278	.156	.049	.264	.149	.047		
3.0	.287	.153	.046	.279	.149	.045	.264	.143	.043	.250	.137	.042	.238	.132	.041		
4.0	.260	.135	.040	.253	.133	.039	.240	.127	.038	.228	.122	.037	.216	.117	.036		
5.0	.238	.121	.035	.232	.119	.035	.220	.114	.034	.209	.110	.033	.198	.106	.032		
6.0	.219	.110	.031	.213	.108	.031	.203	.104	.030	.192	.100	.029	.183	.096	.029		
7.0	.203	.100	.028	.198	.098	.028	.188	.095	.027	.179	.092	.027	.170	.088	.026		
8.0	.188	.092	.026	.184	.090	.026	.175	.087	.025	.167	.084	.024	.159	.081	.024		
9.0	.176	.085	.024	.172	.084	.023	.164	.081	.023	.156	.078	.022	.149	.076	.022		
10.0	.165	.079	.022	.161	.078	.022	.154	.075	.021	.147	.073	.021	.140	.070	.020		

ρ_{cc}	80%			70%			50%			30%			10%			0
ρ_w	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρ_{fc}	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients(CCEC)									
0.0	.256	.256	.256	.219	.219	.219	.149	.149	.149	.086	.086	.086	.027	.027	.027	
1.0	.250	.222	.197	.214	.191	.169	.146	.131	.117	.084	.076	.068	.027	.024	.022	
2.0	.243	.199	.162	.208	.171	.140	.142	.118	.097	.082	.069	.057	.026	.022	.019	
3.0	.235	.182	.139	.201	.157	.121	.138	.109	.085	.080	.064	.050	.026	.021	.016	
4.0	.227	.169	.124	.195	.146	.108	.134	.102	.076	.077	.059	.045	.025	.019	.015	
5.0	.219	.159	.114	.188	.137	.099	.130	.096	.070	.075	.056	.041	.024	.018	.014	
6.0	.212	.150	.106	.182	.130	.093	.126	.091	.065	.073	.054	.039	.024	.018	.013	
7.0	.205	.144	.101	.176	.124	.088	.122	.087	.062	.071	.051	.037	.023	.017	.012	
8.0	.198	.138	.097	.171	.120	.084	.118	.084	.060	.069	.050	.036	.022	.016	.012	
9.0	.192	.133	.093	.165	.115	.081	.115	.081	.058	.067	.048	.034	.022	.016	.011	
10.0	.186	.129	.091	.161	.112	.079	.111	.079	.056	.065	.047	.034	.021	.015	.011	

C Range: 0 - 360DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:OHS
Test Date:19 October 2022

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.351
Humidity:65.0%
Test Distance:8.100m [K=1.0000]
Remarks: Z-WPL-18eS

UGR(Unified Glare Rating) Table

Test:U:220.0V I:0.0807A P:17.27W PF:0.9734 Lamp Flux:2347.52x1 lm										
NAME: 칠판동-18W-(1)					TYPE:LED			WEIGHT:		
SPEC.:18W					DIM.:			SERIAL No.:1		
MFR.: ICEPIPE					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	18.1	19.6	18.5	20.0	20.3	19.5	21.0	19.9	21.3	21.7
3H	19.6	20.9	20.0	21.3	21.7	21.7	23.1	22.2	23.5	23.9
4H	20.1	21.4	20.6	21.8	22.2	22.9	24.2	23.4	24.6	25.1
6H	20.5	21.7	20.9	22.1	22.6	24.2	25.4	24.6	25.8	26.3
8H	20.6	21.8	21.1	22.2	22.7	24.9	26.0	25.3	26.5	26.9
12H	20.6	21.8	21.1	22.2	22.7	25.6	26.8	26.1	27.2	27.7
4H 2H	19.0	20.3	19.5	20.7	21.2	20.1	21.4	20.5	21.8	22.2
3H	20.7	21.8	21.2	22.3	22.8	22.6	23.7	23.0	24.1	24.6
4H	21.4	22.5	21.9	22.9	23.5	23.9	25.0	24.4	25.4	25.9
6H	22.0	22.9	22.5	23.4	24.0	25.4	26.3	25.9	26.8	27.4
8H	22.1	23.0	22.7	23.5	24.1	26.2	27.1	26.7	27.6	28.2
12H	22.2	23.0	22.8	23.6	24.2	27.1	27.9	27.7	28.4	29.0
8H 4H	22.2	23.1	22.7	23.6	24.1	24.2	25.1	24.8	25.6	26.2
6H	23.0	23.8	23.6	24.3	24.9	26.0	26.7	26.6	27.3	27.9
8H	23.4	24.0	24.0	24.6	25.2	27.0	27.7	27.6	28.2	28.9
12H	23.6	24.2	24.2	24.8	25.5	28.2	28.7	28.8	29.3	30.0
12H 4H	22.4	23.2	23.0	23.7	24.3	24.3	25.1	24.8	25.6	26.2
6H	23.4	24.1	24.0	24.7	25.3	26.1	26.8	26.7	27.3	28.0
8H	23.9	24.5	24.5	25.1	25.7	27.2	27.8	27.8	28.4	29.0
Variations with the observer position at spacings:										
S = 1.0H	+ 0.1 / - 0.2					+ 0.1 / - 0.1				
1.5H	+ 0.2 / - 0.3					+ 0.2 / - 0.3				
2.0H	+ 0.1 / - 0.4					+ 0.2 / - 0.4				

CIE Pub.117 Corrected 2348 lm Total Lamp Luminous Flux.(8log(F/F0) = 3.0)

C Range: 0 - 360DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:OHS
Test Date:19 October 2022

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.351
Humidity:65.0%
Test Distance:8.100m [K=1.0000]
Remarks: Z-WPL-18eS

UTILIZATION FACTORS TABLE

Test:U:220.0V I:0.0807A P:17.27W PF:0.9734 Lamp Flux:2347.52x1 lm		
NAME: 칠판등-18W-(1)	TYPE:LED	WEIGHT:
SPEC.:18W	DIM.:	SERIAL No.:1
MFR.: ICEPIPE	SUR.:	Shielding Angle:

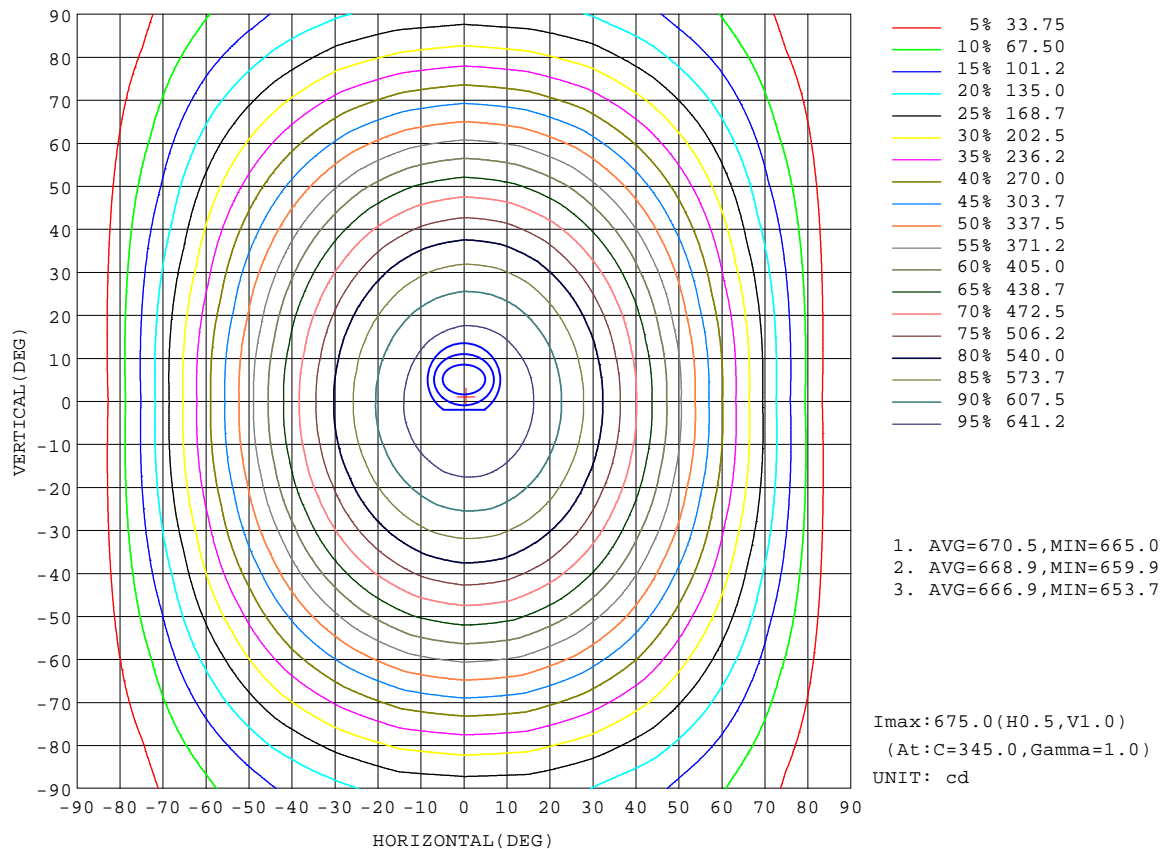
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	53	40	33	52	40	33	50	39	33	26
0.80	62	50	42	61	49	42	59	48	41	34
1.00	70	58	50	68	57	50	66	58	49	41
1.25	77	65	57	75	64	57	72	62	56	47
1.50	82	71	63	80	70	62	76	67	61	52
2.00	89	79	71	87	77	70	82	74	68	59
2.50	93	84	77	91	82	76	86	79	73	63
3.00	97	88	82	94	86	80	89	82	77	67
4.00	101	94	88	98	92	86	92	87	83	71
5.00	104	98	93	101	95	91	95	90	86	74
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended					SHRNOM = 1.25		

C Range: 0 - 360DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature:25.3DEG
Operators:OHS
Test Date:19 October 2022

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.351
Humidity:65.0%
Test Distance:8.100m [K=1.0000]
Remarks: Z-WPL-18eS

ISOCANDELA DIAGRAM

Test:U:220.0V I:0.0807A P:17.27W PF:0.9734 Lamp Flux:2347.52x1 lm		
NAME: 칠판등-18W-(1)	TYPE:LED	WEIGHT:
SPEC.:18W	DIM.:	SERIAL No.:1
MFR.: ICEPIPE	SUR.:	Shielding Angle:

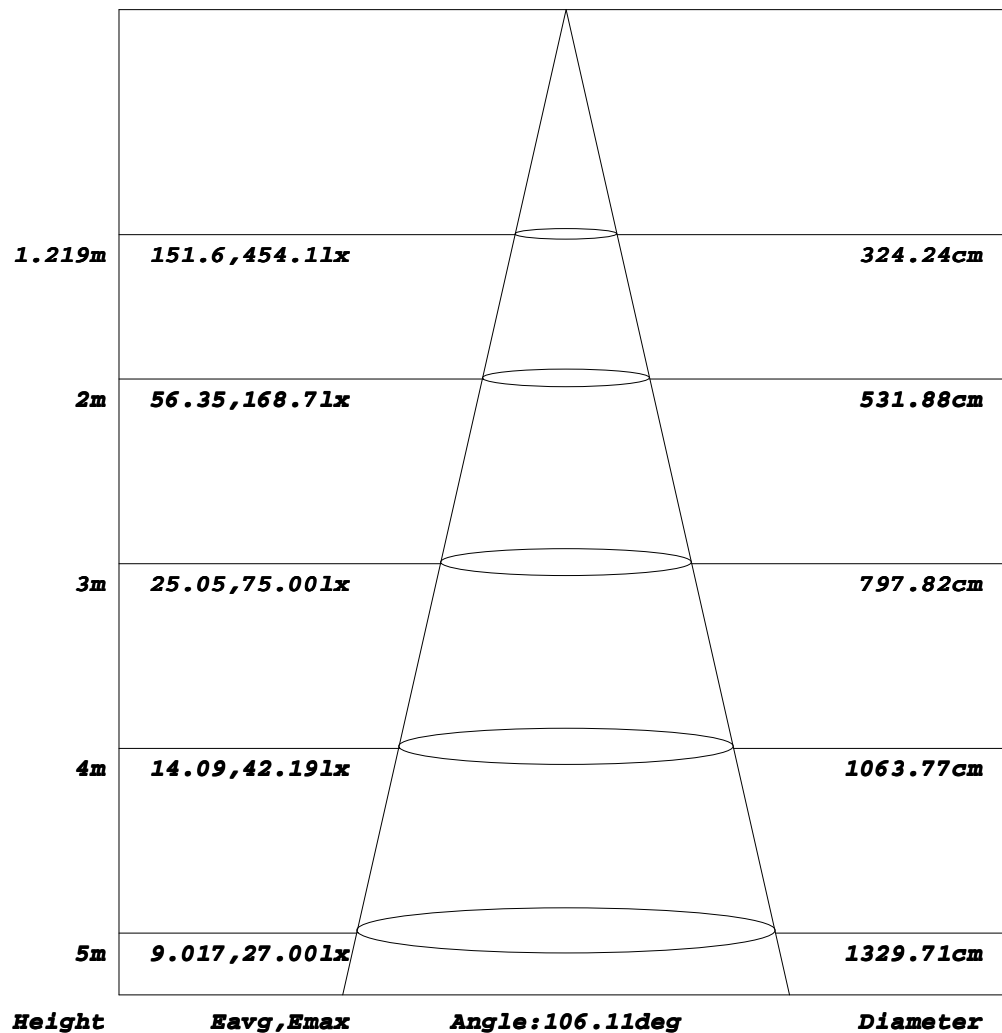


C Range: 0 - 360DEG
 C Interval: 15.0DEG
 Test Speed: HIGH
 Temperature:25.3DEG
 Operators:OHS
 Test Date:19 October 2022

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.351
 Humidity:65.0%
 Test Distance:8.100m [K=1.0000]
 Remarks: Z-WPL-18eS

AAI Figure

Test:U:220.0V I:0.0807A P:17.27W PF:0.9734 Lamp Flux:2347.52x1 lm		
NAME: 칠판등-18W-(1)	TYPE:LED	WEIGHT:
SPEC.:18W	DIM.:	SERIAL No.:1
MFR.: ICEPIPE	SUR.:	Shielding Angle:

Flux out:1342 lm


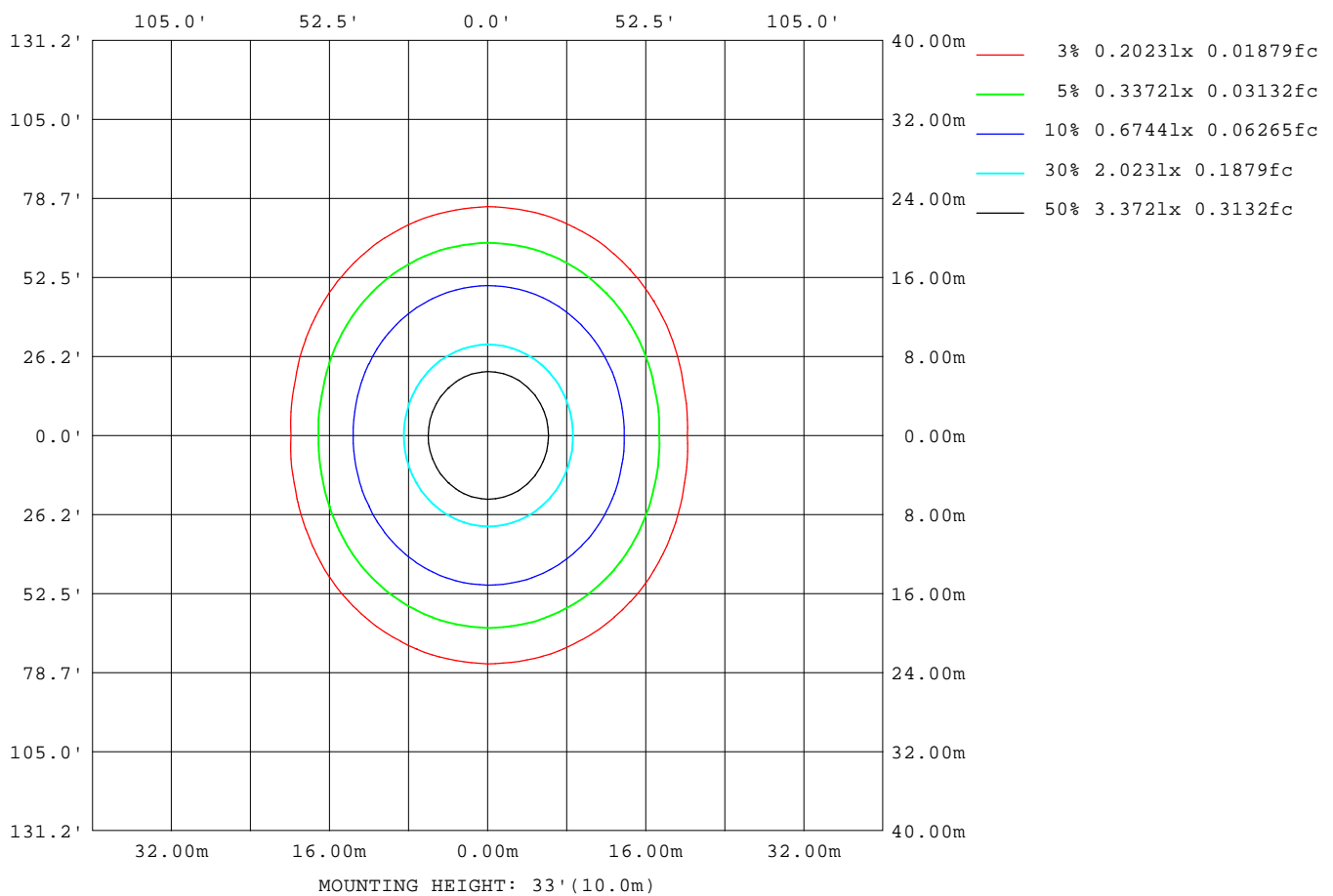
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: OHS
Test Date: 19 October 2022

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.351
Humidity: 65.0%
Test Distance: 8.100m [K=1.0000]
Remarks: Z-WPL-18eS

ISOLUX DIAGRAM

Test:U:220.0V I:0.0807A P:17.27W PF:0.9734 Lamp Flux:2347.52x1 lm		
NAME: 칠판등-18W-(1)	TYPE:LED	WEIGHT:
SPEC.:18W	DIM.:	SERIAL No.:1
MFR.: ICEPIPE	SUR.:	Shielding Angle:



C Range: 0 - 360DEG
 C Interval: 15.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: OHS
 Test Date: 19 October 2022

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.351
 Humidity: 65.0%
 Test Distance: 8.100m [K=1.0000]
 Remarks: Z-WPL-18eS

LED Avg.L Report

Test:U:220.0V I:0.0807A P:17.27W PF:0.9734 Lamp Flux:2347.52x1 lm		
NAME: 칠판등-18W-(1)	TYPE:LED	WEIGHT:
SPEC.:18W	DIM.:	SERIAL No.:1
MFR.: ICEPIPE	SUR.:	Shielding Angle:

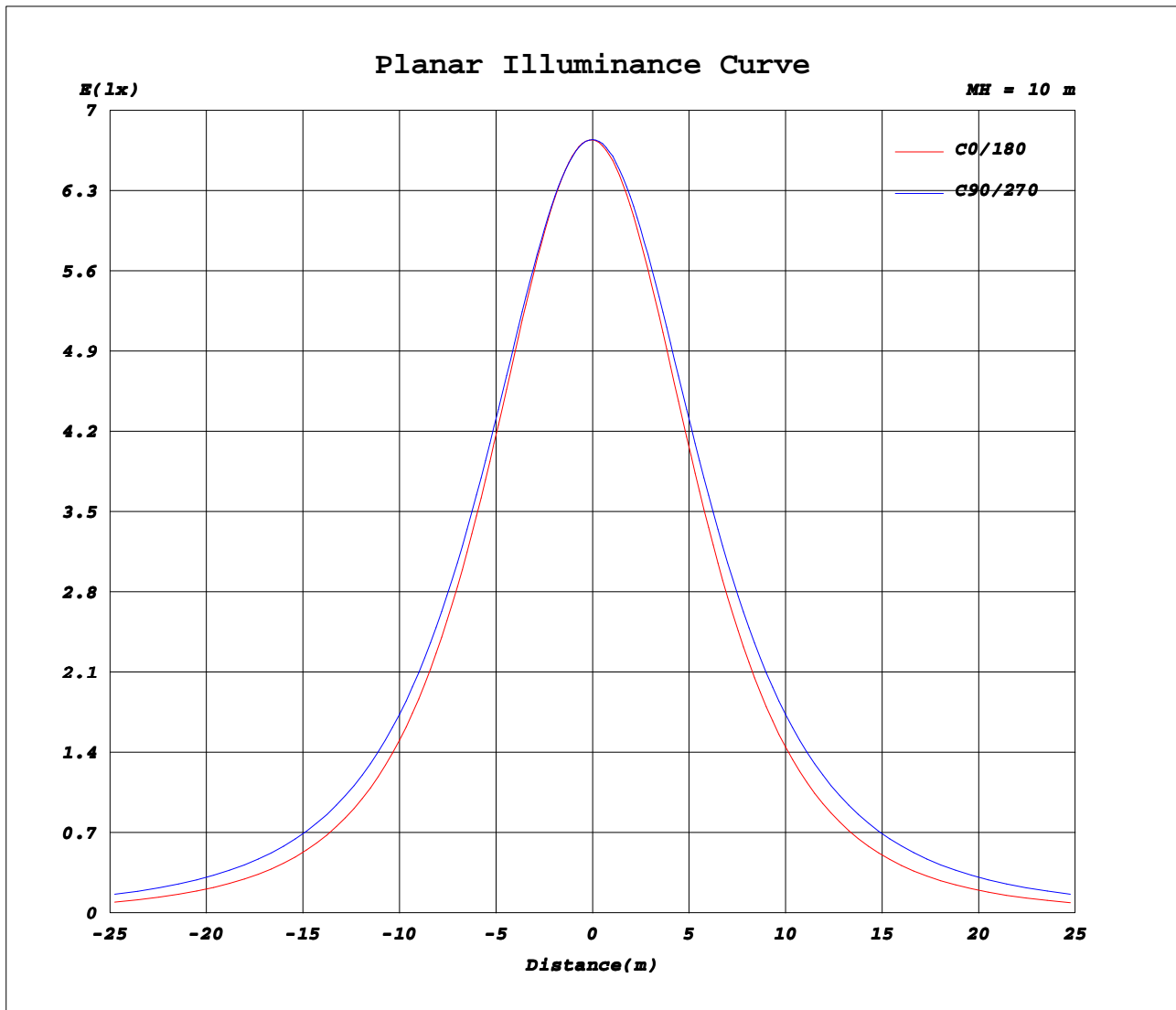
AvgL	cd/m2
L_0~180(65)av	5006
L_0~180(75)av	4115
L_0~180(85)av	2356
L_90~270(65)av	7970
L_90~270(75)av	9941
L_90~270(85)av	21320
L_45(65)av	6698
L_45(75)av	7736
L_45(85)av	14864

Standard: GB/T 29293-2012

C Range: 0 - 360DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: OHS
Test Date: 19 October 2022

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.351
Humidity: 65.0%
Test Distance: 8.100m [K=1.0000]
Remarks: Z-WPL-18eS

Planar Illuminance Curve



C Range: 0 - 360DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: OHS
Test Date: 19 October 2022

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.351
Humidity: 65.0%
Test Distance: 8.100m [K=1.0000]
Remarks: Z-WPL-18eS

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:220.0V I:0.0807A P:17.27W PF:0.9734 Lamp Flux:2347.52x1 lm																			
NAME: 칠판동-18W-(1)										TYPE:LED					WEIGHT:				
SPEC.:18W										DIM.:					SERIAL No.:1				
MFR.: ICEPIPE										SUR.:					Shielding Angle:				

Table--1

UNIT: cd

C(DEG) γ (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	674	674	674	674	674	675	675	675	675	675	675	675	674	674	674	674	674	675	675
5	672	672	672	672	672	672	672	672	671	670	670	670	669	669	669	670	671	671	672
10	663	663	663	664	664	664	664	663	661	659	658	657	656	656	658	659	661	662	663
15	646	647	648	649	650	651	650	649	646	643	640	638	637	637	639	642	646	648	649
20	623	624	626	629	631	633	632	630	625	620	615	612	611	611	615	620	625	629	632
25	592	595	598	603	608	611	610	607	600	593	586	581	579	580	586	592	600	606	610
30	558	560	565	574	580	585	584	580	571	561	551	545	542	544	551	561	572	579	584
35	518	521	528	539	549	556	556	551	539	526	513	504	501	504	513	526	540	550	556
40	474	478	487	502	515	524	524	518	504	488	471	461	457	460	472	488	505	518	524
45	426	432	444	462	478	489	490	483	467	447	427	414	410	414	429	448	468	483	490
50	377	383	399	421	439	452	454	446	428	405	382	366	361	367	384	407	430	446	454
55	325	333	352	377	399	414	416	407	387	362	336	317	310	317	339	364	390	408	416
60	271	282	305	334	358	374	376	368	346	319	289	267	258	268	292	321	349	368	377
65	217	231	258	290	316	333	336	327	305	276	243	217	206	218	247	279	308	328	337
70	163	181	212	248	275	292	296	287	264	234	198	167	154	169	203	237	269	288	297
75	110	132	169	206	234	253	256	248	225	194	155	120	103	123	161	197	230	249	259
80	61.4	88.5	129	168	197	215	218	211	188	157	117	78.0	55.8	81.5	123	160	193	212	221
85	22.1	52.9	95.2	134	163	181	185	177	155	124	84.9	44.2	18.9	47.9	89.9	128	160	178	187
90	3.93	30.0	69.8	107	134	151	154	148	128	98.6	61.5	23.9	3.12	26.8	65.3	102	131	148	156
95	3.78	18.3	49.6	75.9	99.8	120	127	115	91.6	66.7	41.4	13.6	3.25	15.5	44.1	67.5	94.3	116	128
100	4.08	11.2	33.1	58.4	80.8	98.5	106	93.9	75.1	52.3	28.0	8.64	3.51	9.34	29.8	54.2	76.9	96.3	107
105	4.39	9.27	27.3	50.1	70.1	85.2	90.2	80.9	65.2	44.9	21.9	7.16	3.82	7.88	22.9	43.9	67.3	83.8	90.9
110	4.68	8.03	22.3	41.6	59.6	72.0	75.9	68.6	54.9	34.4	16.6	6.38	4.11	6.75	18.3	34.9	54.3	71.0	76.6
115	4.98	7.14	18.6	34.7	49.9	60.1	63.3	57.4	45.5	26.5	13.2	5.87	4.38	5.90	14.8	29.1	45.8	59.3	63.9
120	5.27	6.49	15.5	28.6	41.1	49.7	52.3	47.7	37.0	20.2	10.8	5.67	4.68	5.42	12.0	21.7	37.0	46.5	52.8
125	5.56	6.01	13.0	23.4	33.5	40.7	42.8	39.2	27.0	16.3	9.24	5.69	4.96	5.18	9.95	17.6	29.2	38.5	43.1
130	5.85	5.96	10.9	19.1	27.2	32.9	34.6	31.9	20.7	13.6	8.31	5.98	5.25	5.23	8.43	14.6	21.2	31.4	34.9
135	6.17	6.24	9.22	15.6	21.9	26.4	27.7	25.6	16.2	11.1	7.50	6.28	5.58	5.54	7.38	11.7	17.0	22.1	27.8
140	6.47	6.53	7.93	12.6	17.4	20.9	21.9	19.3	12.9	9.49	6.95	6.56	5.91	5.86	6.71	9.71	13.5	18.8	21.6
145	6.76	6.80	6.93	10.2	13.6	16.2	17.0	14.0	10.6	8.32	6.82	6.84	6.25	6.20	6.33	8.25	10.9	14.3	16.7
150	7.02	7.07	7.12	8.29	10.6	12.4	12.9	10.3	8.71	7.40	7.03	7.08	6.58	6.51	6.49	7.27	8.87	10.7	12.8
155	7.27	7.33	7.33	7.29	8.27	9.38	9.73	8.38	7.57	7.20	7.25	7.30	6.90	6.83	6.78	6.78	7.57	8.54	9.23
160	7.52	7.55	7.55	7.48	7.39	7.32	7.40	7.35	7.36	7.38	7.44	7.51	7.22	7.12	7.08	7.05	7.05	7.19	7.42
165	7.74	7.75	7.72	7.65	7.56	7.49	7.53	7.52	7.53	7.56	7.61	7.69	7.52	7.41	7.35	7.32	7.31	7.32	7.28
170	7.91	7.89	7.84	7.76	7.68	7.62	7.68	7.66	7.67	7.70	7.75	7.83	7.76	7.66	7.59	7.56	7.53	7.55	7.53
175	8.02	7.97	7.90	7.84	7.78	7.72	7.78	7.74	7.75	7.79	7.85	7.92	7.95	7.85	7.79	7.74	7.70	7.70	7.72
180	8.05	7.97	7.92	7.85	7.79	7.77	7.80	7.76	7.78	7.83	7.88	7.96	8.05	7.98	7.91	7.85	7.79	7.77	7.81

C Range: 0 - 360DEG

C Interval: 15.0DEG

Test Speed: HIGH

Temperature:25.3DEG

Operators:OHS

Test Date:19 October 2022

γ Range: 0 - 180DEG

γ Interval: 1.0DEG

Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.351

Humidity:65.0%

Test Distance:8.100m [K=1.0000]

Remarks: Z-WPL-18eS

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:220.0V I:0.0807A P:17.27W PF:0.9734 Lamp Flux:2347.52x1 lm		
NAME: 칠판등-18W-(1)	TYPE:LED	WEIGHT:
SPEC.:18W	DIM.:	SERIAL No.:1
MFR.: ICEPIPE	SUR.:	Shielding Angle:

Table--2

UNIT: cd

C(DEG) γ (DEG)	285	300	315	330	345														
0	675	675	675	675	675														
5	672	673	673	673	673														
10	664	664	664	664	664														
15	651	650	649	648	647														
20	632	631	629	626	624														
25	610	607	602	598	594														
30	584	579	572	565	559														
35	554	548	538	528	520														
40	522	514	500	487	477														
45	487	477	460	443	430														
50	450	438	418	398	382														
55	412	398	375	351	331														
60	373	356	331	303	280														
65	332	315	287	257	228														
70	292	274	244	211	177														
75	252	234	203	167	129														
80	215	197	165	126	84.7														
85	180	163	131	91.9	48.7														
90	149	133	103	65.9	25.9														
95	118	97.4	73.1	46.4	15.0														
100	96.1	78.7	55.7	30.4	9.12														
105	82.6	68.0	47.5	24.9	7.39														
110	69.9	57.0	39.3	20.2	6.53														
115	58.6	47.4	32.3	16.4	5.86														
120	48.6	39.3	26.4	13.7	5.41														
125	39.9	32.2	21.7	11.6	5.10														
130	32.3	26.1	17.8	9.80	5.28														
135	25.9	21.1	14.6	8.38	5.58														
140	20.5	16.9	11.9	7.25	5.90														
145	15.9	13.4	9.68	6.39	6.22														
150	12.1	10.4	7.91	6.60	6.54														
155	9.25	8.14	6.88	6.89	6.85														
160	7.17	7.07	7.13	7.14	7.14														
165	7.26	7.32	7.38	7.41	7.43														
170	7.48	7.52	7.58	7.62	7.67														
175	7.66	7.69	7.75	7.79	7.86														
180	7.76	7.78	7.83	7.88	7.95														

C Range: 0 - 360DEG

C Interval: 15.0DEG

Test Speed: HIGH

Temperature:25.3DEG

Operators:OHS

Test Date:19 October 2022

γ Range: 0 - 180DEG

γ Interval: 1.0DEG

Test System:EVERFINE GO-2000A_V1 SYSTEM V2.0.351

Humidity:65.0%

Test Distance:8.100m [K=1.0000]

Remarks: Z-WPL-18eS

Photometric Data Table [cd]

G/C	0.0	15.0	30.0	45.0	60.0	75.0	90.0	105.0	120.0	135.0
0.0	674.4	674.1	674.1	674.3	674.4	674.8	674.7	674.9	674.6	675.0
3.0	674.0	674.2	673.8	673.8	674.0	673.9	673.7	673.5	672.8	672.9
6.0	671.1	670.9	671.1	671.0	670.9	671.0	670.3	670.0	669.4	668.6
9.0	665.1	665.7	665.6	666.3	666.1	665.8	665.5	664.9	663.6	662.1
12.0	656.9	657.5	657.8	658.5	659.1	659.6	658.5	657.6	655.6	653.4
15.0	645.9	646.7	647.8	649.4	650.1	650.7	649.8	648.5	645.6	642.6
18.0	632.5	633.7	635.0	637.6	639.5	640.7	639.9	637.8	633.7	629.5
21.0	616.8	618.5	620.4	624.3	627.0	628.6	628.0	625.4	620.1	615.1
24.0	599.1	600.9	603.9	608.8	612.5	615.4	614.8	611.5	605.4	598.5
27.0	579.5	581.3	585.2	591.9	597.6	600.9	600.2	596.7	589.1	580.5
30.0	557.5	560.0	565.0	573.5	580.2	584.9	584.4	580.1	571.3	561.0
33.0	534.0	537.0	543.4	553.2	561.8	567.7	567.9	563.1	552.3	540.3
36.0	509.0	512.4	520.3	532.0	542.3	549.5	549.8	544.1	532.3	518.3
39.0	482.7	486.7	496.0	509.7	522.0	530.3	530.7	525.0	511.2	495.6
42.0	455.1	459.7	470.7	486.4	500.4	510.2	511.0	504.4	489.4	471.7
45.0	426.2	431.7	444.3	462.3	478.1	489.1	490.3	483.0	466.8	447.3
48.0	396.8	402.7	417.5	437.4	455.1	467.2	468.9	461.2	443.6	422.3
51.0	366.3	373.3	389.7	411.8	431.5	444.6	446.4	438.4	419.8	396.6
54.0	335.2	343.4	361.7	385.9	407.1	421.7	423.8	415.3	395.4	371.0
57.0	303.5	312.9	333.5	360.0	382.8	397.8	400.2	391.5	371.2	345.1
60.0	271.4	282.4	305.0	333.8	357.6	373.7	376.5	367.6	346.4	319.1
63.0	238.8	251.8	276.8	307.3	332.8	349.2	352.2	343.2	321.5	293.1
66.0	206.3	221.1	248.7	281.4	307.6	324.9	328.0	319.1	296.7	267.8
69.0	173.6	190.7	221.2	256.1	282.9	300.4	303.7	294.8	272.4	242.7
72.0	141.3	161.0	194.2	230.9	258.3	276.6	279.5	271.2	248.3	218.0
75.0	110.5	132.4	168.5	206.4	234.4	252.8	256.0	247.8	224.8	194.1
78.0	80.28	105.3	143.9	183.0	211.4	229.9	233.1	225.1	202.2	171.3
81.0	52.52	80.60	121.9	160.8	189.3	208.0	211.4	203.5	180.7	149.9
84.0	28.75	59.18	101.3	140.4	168.9	187.6	191.0	183.3	161.0	130.3
87.0	11.45	41.85	83.41	122.2	150.0	167.9	170.4	164.1	143.1	113.3
90.0	3.933	30.05	69.81	106.9	134.4	151.3	154.2	147.6	128.0	98.56
93.0	3.643	22.76	59.63	94.89	121.9	137.9	140.6	134.5	115.3	86.61
96.0	3.843	15.92	44.03	68.35	92.65	113.1	121.3	108.6	84.02	59.70
99.0	4.019	11.75	34.30	59.78	82.49	100.9	109.6	96.28	76.54	53.37
102.0	4.201	10.35	30.83	55.33	76.59	93.36	99.60	88.80	71.41	49.60
105.0	4.387	9.272	27.32	50.06	70.08	85.16	90.20	80.90	65.24	44.92
108.0	4.568	8.462	24.17	44.79	63.75	77.12	81.40	73.43	58.95	39.90
111.0	4.740	7.831	21.48	40.10	57.60	69.49	73.25	66.22	52.87	32.83
114.0	4.922	7.295	19.22	35.96	51.72	62.37	65.67	59.51	47.26	27.76
117.0	5.094	6.849	17.25	32.15	46.21	55.76	58.74	53.33	42.26	23.83
120.0	5.270	6.491	15.48	28.64	41.11	49.71	52.34	47.70	37.01	20.20
123.0	5.447	6.181	13.91	25.40	36.42	44.11	46.44	42.46	30.32	17.84
126.0	5.610	5.916	12.51	22.49	32.18	39.02	41.07	37.64	25.65	15.72
129.0	5.791	5.908	11.24	19.90	28.37	34.39	36.19	33.27	21.88	14.16
132.0	5.972	6.066	10.15	17.65	24.94	30.19	31.76	29.27	18.65	12.50
135.0	6.171	6.238	9.217	15.58	21.87	26.39	27.73	25.62	16.21	11.14
138.0	6.349	6.405	8.394	13.72	19.10	22.97	24.13	21.46	13.96	10.10
141.0	6.534	6.582	7.696	12.06	16.59	19.90	20.90	17.82	12.40	9.229
144.0	6.702	6.754	7.051	10.63	14.35	17.10	17.92	14.81	11.05	8.542
147.0	6.873	6.916	6.980	9.371	12.36	14.57	15.23	12.29	9.743	7.910
150.0	7.023	7.074	7.120	8.292	10.63	12.39	12.91	10.34	8.711	7.403
153.0	7.172	7.232	7.250	7.352	9.122	10.49	10.91	9.069	7.974	7.130
156.0	7.329	7.372	7.380	7.330	7.851	8.870	9.186	8.094	7.373	7.237
159.0	7.468	7.507	7.511	7.442	7.357	7.514	7.760	7.362	7.325	7.344
162.0	7.608	7.636	7.618	7.548	7.459	7.372	7.417	7.428	7.436	7.455
165.0	7.742	7.748	7.715	7.646	7.562	7.488	7.534	7.525	7.534	7.558
168.0	7.850	7.836	7.790	7.725	7.576	7.436	7.636	7.623	7.622	7.646
171.0	7.929	7.915	7.850	7.790	7.706	7.646	7.710	7.692	7.683	7.720
174.0	7.999	7.953	7.897	7.832	7.752	7.706	7.766	7.734	7.739	7.780
177.0	8.036	7.985	7.915	7.850	7.794	7.748	7.799	7.762	7.771	7.822
180.0	8.045	7.971	7.915	7.850	7.790	7.771	7.804	7.757	7.776	7.827
G/C	150.0	165.0	180.0	195.0	210.0	225.0	240.0	255.0	270.0	285.0
0.0	674.5	674.9	674.4	674.1	674.1	674.3	674.4	674.8	674.7	674.9
3.0	672.5	672.5	671.7	671.9	672.1	672.5	672.8	673.3	673.8	674.0
6.0	668.3	667.7	667.0	666.9	667.6	668.3	669.0	669.9	671.0	671.5
9.0	660.9	660.1	659.2	659.4	660.3	661.6	663.5	664.7	665.3	666.2
12.0	651.7	650.4	649.3	649.4	650.9	653.1	655.5	657.2	658.6	659.4
15.0	639.8	637.7	636.5	636.9	639.2	642.0	645.6	648.1	649.4	650.8
18.0	625.7	623.4	621.6	622.1	625.5	629.2	633.8	637.1	639.5	640.0
21.0	609.7	606.7	604.6	605.8	609.7	614.4	620.5	624.6	627.7	628.3
24.0	591.8	587.7	585.6	586.9	591.6	598.2	605.6	610.9	614.6	614.6
27.0	572.0	567.0	564.6	566.3	572.4	580.3	589.2	595.9	599.9	599.9
30.0	551.1	544.7	542.0	544.1	551.3	560.7	571.6	579.5	584.3	583.6

C Range: 0 - 360DEG

C Interval: 15.0DEG

Test Speed: HIGH

Temperature: 25.3DEG

Operators: OHS

Test Date: 19 October 2022

γ Range: 0 - 180DEG

γ Interval: 1.0DEG

Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.351

Humidity: 65.0%

Test Distance: 8.100m [K=1.0000]

Remarks: Z-WPL-18eS

Photometric Data Table [cd]

33.0	528.5	521.2	517.8	520.2	529.2	540.2	552.7	562.1	567.4	566.5
36.0	504.6	496.2	492.4	495.4	505.4	518.5	533.0	543.6	549.4	548.0
39.0	479.8	469.7	466.0	469.2	480.9	495.9	512.1	524.2	530.3	528.7
42.0	454.0	442.7	438.1	442.5	455.3	472.3	490.2	503.8	510.7	508.5
45.0	427.4	414.5	409.6	414.5	429.1	448.1	468.1	482.7	490.2	487.5
48.0	400.5	386.0	380.5	386.0	402.4	423.2	445.1	461.1	468.8	465.5
51.0	372.9	356.6	350.5	356.8	375.3	398.1	421.6	438.6	446.7	443.0
54.0	344.9	326.8	320.2	327.5	347.7	372.6	397.8	415.5	423.9	419.9
57.0	317.2	297.0	289.3	297.6	320.3	347.0	373.5	392.1	400.7	396.3
60.0	289.1	267.3	258.5	267.6	292.4	321.3	349.1	368.1	377.2	372.5
63.0	261.2	237.0	227.0	237.8	265.6	295.8	324.7	344.4	353.2	348.4
66.0	233.7	206.8	195.5	207.9	238.4	270.2	300.4	320.4	329.2	324.2
69.0	206.7	177.3	164.0	178.6	211.9	245.4	276.4	296.4	305.4	299.8
72.0	180.5	148.2	132.9	150.1	186.0	221.0	252.8	272.6	281.7	275.9
75.0	155.3	120.3	102.5	123.3	161.1	197.3	229.6	249.1	258.6	252.2
78.0	132.1	94.10	73.70	97.43	137.5	174.6	207.1	226.6	235.6	229.2
81.0	110.4	70.38	47.39	74.04	115.5	153.2	185.7	205.0	213.8	207.3
84.0	90.75	50.10	25.05	53.79	95.84	134.1	165.8	184.9	193.5	186.9
87.0	74.07	34.18	9.296	37.66	78.66	117.0	147.4	164.9	172.4	166.4
90.0	61.46	23.87	3.122	26.83	65.32	101.5	130.7	148.0	155.5	149.4
93.0	52.04	17.72	3.137	20.23	55.59	88.75	117.9	133.4	141.9	135.0
96.0	36.48	11.88	3.305	13.36	38.83	60.53	86.83	109.7	122.2	111.3
99.0	28.86	9.091	3.450	9.824	30.72	55.25	78.39	98.47	110.6	98.64
102.0	25.86	7.906	3.640	8.683	25.66	51.39	73.21	91.60	100.5	90.75
105.0	21.85	7.161	3.817	7.879	22.94	43.92	67.29	83.83	90.95	82.57
108.0	19.15	6.688	4.002	7.251	20.10	38.14	59.66	75.97	82.13	74.86
111.0	15.65	6.226	4.165	6.527	17.69	34.78	53.12	68.56	73.93	67.51
114.0	13.62	5.944	4.332	6.020	15.40	30.98	48.04	61.52	66.30	60.75
117.0	12.31	5.777	4.495	5.675	13.82	25.36	39.64	55.07	59.26	54.48
120.0	10.84	5.675	4.676	5.415	12.04	21.67	37.03	46.54	52.77	48.62
123.0	9.797	5.606	4.852	5.248	10.71	19.20	33.10	41.02	46.81	43.25
126.0	9.001	5.750	5.015	5.154	9.582	16.97	27.51	37.00	41.38	38.28
129.0	8.460	5.927	5.187	5.177	8.686	15.23	22.94	32.69	36.42	33.74
132.0	7.946	6.094	5.387	5.344	7.955	13.32	18.97	28.29	31.90	29.62
135.0	7.502	6.275	5.578	5.535	7.378	11.73	16.97	22.13	27.85	25.91
138.0	7.154	6.451	5.773	5.735	6.944	10.43	14.52	20.27	23.98	22.57
141.0	6.861	6.619	5.978	5.930	6.618	9.374	13.03	17.97	20.53	19.54
144.0	6.762	6.781	6.187	6.125	6.394	8.507	11.36	15.05	17.61	16.80
147.0	6.906	6.930	6.387	6.325	6.312	7.807	9.969	12.83	15.05	14.30
150.0	7.032	7.084	6.577	6.511	6.493	7.275	8.868	10.73	12.78	12.13
153.0	7.162	7.219	6.773	6.693	6.666	6.903	8.016	9.302	9.796	10.30
156.0	7.287	7.344	6.968	6.883	6.838	6.837	7.379	8.197	8.808	8.770
159.0	7.399	7.469	7.154	7.064	7.019	7.004	7.005	7.394	7.732	7.529
162.0	7.510	7.586	7.339	7.245	7.186	7.162	7.163	7.171	7.116	7.116
165.0	7.613	7.688	7.520	7.408	7.348	7.320	7.311	7.325	7.279	7.264
168.0	7.706	7.781	7.669	7.566	7.502	7.469	7.451	7.469	7.446	7.399
171.0	7.780	7.860	7.813	7.696	7.637	7.599	7.571	7.585	7.562	7.515
174.0	7.831	7.911	7.911	7.822	7.753	7.710	7.664	7.678	7.683	7.622
177.0	7.869	7.943	8.008	7.910	7.855	7.794	7.743	7.748	7.767	7.711
180.0	7.878	7.957	8.050	7.976	7.906	7.845	7.790	7.771	7.808	7.757
G/C	300.0	315.0	330.0	345.0						
0.0	674.6	675.0	674.5	674.9						
3.0	674.1	674.0	674.5	674.3						
6.0	671.4	671.5	671.7	671.8						
9.0	666.5	666.0	666.0	665.6						
12.0	659.4	659.0	658.3	657.7						
15.0	650.0	649.1	647.7	646.7						
18.0	639.6	637.3	635.4	633.6						
21.0	626.9	623.5	620.5	618.2						
24.0	612.4	607.8	603.9	600.4						
27.0	596.6	590.8	585.2	580.8						
30.0	579.4	572.0	565.2	559.4						
33.0	561.3	551.8	543.0	536.3						
36.0	541.3	530.2	519.8	511.6						
39.0	520.9	507.8	495.4	485.7						
42.0	499.1	484.4	469.9	458.6						
45.0	476.7	459.8	443.5	430.4						
48.0	453.6	434.9	416.3	401.5						
51.0	430.0	409.4	388.8	371.9						
54.0	406.0	383.4	360.5	341.9						
57.0	381.4	357.1	332.1	310.9						
60.0	356.4	330.8	303.5	280.0						
63.0	331.7	304.6	275.5	248.9						
66.0	306.8	278.4	247.5	217.8						

C Range: 0 - 360DEG

C Interval: 15.0DEG

Test Speed: HIGH

Temperature: 25.3DEG

Operators: OHS

Test Date: 19 October 2022

γ Range: 0 - 180DEG

γ Interval: 1.0DEG

Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.351

Humidity: 65.0%

Test Distance: 8.100m [K=1.0000]

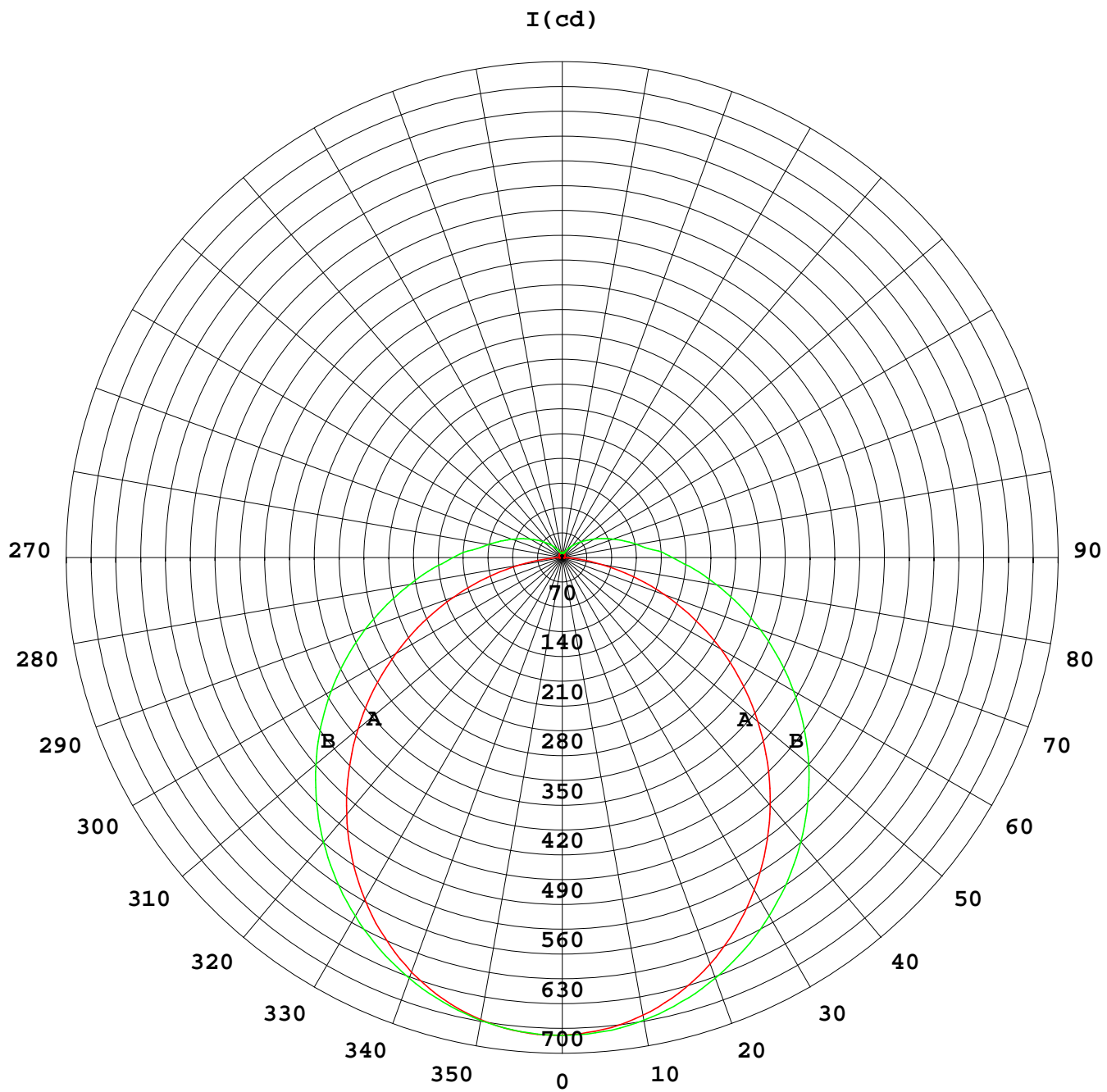
Remarks: Z-WPL-18eS

Photometric Data Table [cd]

69.0	282.3	252.8	219.8	187.3
72.0	258.3	227.6	192.9	157.2
75.0	234.4	203.1	166.7	128.7
78.0	211.5	179.5	142.0	101.6
81.0	189.4	157.3	119.0	76.61
84.0	168.9	136.8	98.23	54.98
87.0	149.7	119.1	79.95	37.60
90.0	132.7	103.4	65.86	25.91
93.0	119.8	91.36	55.75	19.08
96.0	90.00	65.76	41.05	13.02
99.0	80.38	57.08	31.55	9.619
102.0	74.67	52.62	28.13	8.285
105.0	68.01	47.49	24.93	7.390
108.0	61.31	42.46	21.99	6.833
111.0	54.97	37.84	19.33	6.378
114.0	49.22	33.60	17.03	5.982
117.0	44.00	29.77	15.20	5.661
120.0	39.26	26.38	13.67	5.411
123.0	34.89	23.44	12.35	5.229
126.0	30.91	20.82	11.19	5.071
129.0	27.27	18.51	10.13	5.219
132.0	24.01	16.45	9.184	5.396
135.0	21.09	14.63	8.382	5.582
138.0	18.47	12.95	7.680	5.767
141.0	16.13	11.43	7.058	5.962
144.0	14.00	10.10	6.523	6.153
147.0	12.11	8.931	6.438	6.353
150.0	10.41	7.911	6.600	6.544
153.0	8.946	7.066	6.773	6.720
156.0	7.771	6.930	6.935	6.911
159.0	7.018	7.078	7.089	7.083
162.0	7.168	7.232	7.246	7.254
165.0	7.320	7.380	7.409	7.427
168.0	7.447	7.511	7.544	7.580
171.0	7.558	7.627	7.655	7.729
174.0	7.650	7.720	7.767	7.827
177.0	7.748	7.799	7.841	7.910
180.0	7.776	7.832	7.878	7.948

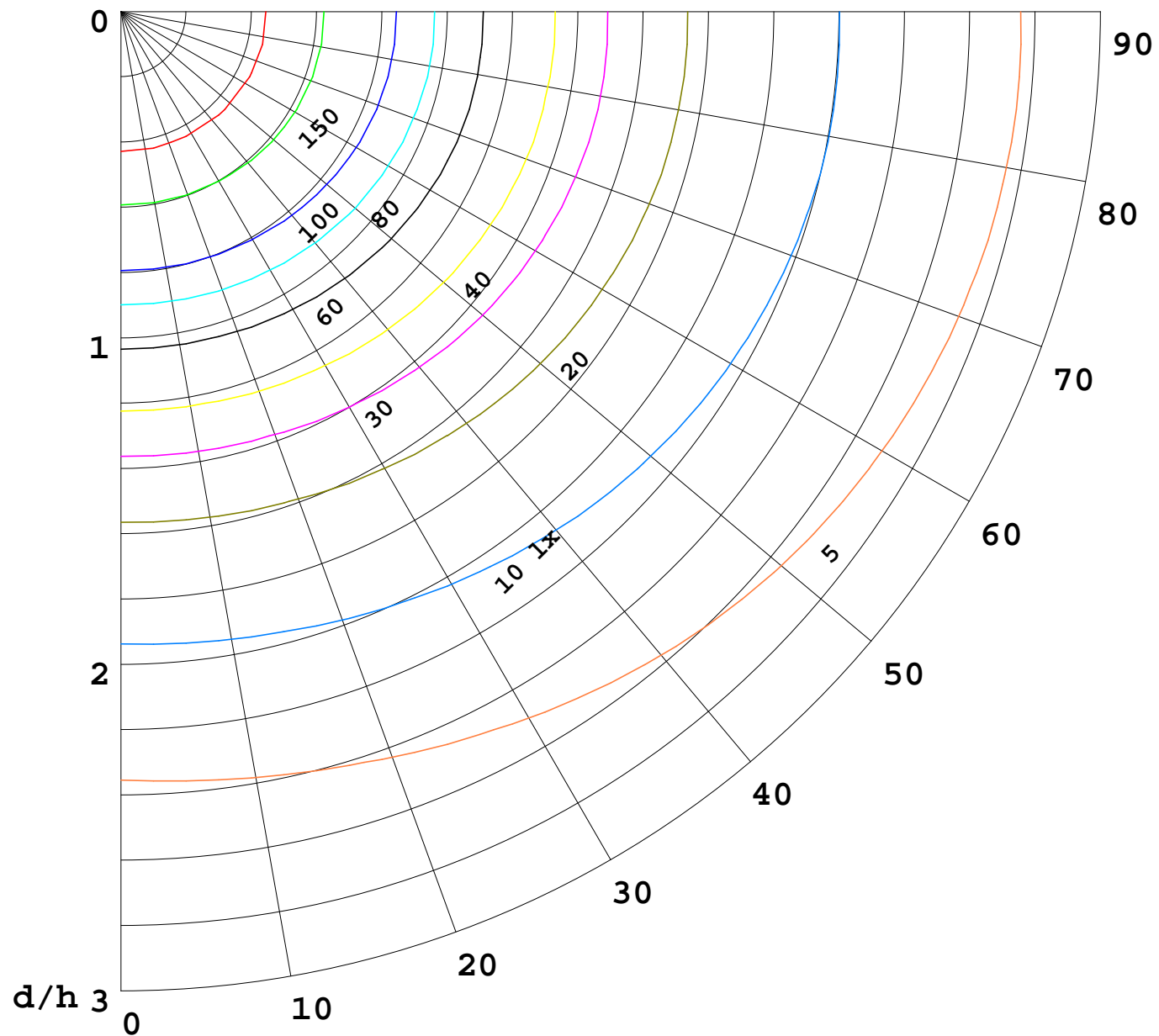
C Range: 0 - 360DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: OHS
Test Date: 19 October 2022

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System: EVERFINE GO-2000A_V1 SYSTEM V2.0.351
Humidity: 65.0%
Test Distance: 8.100m [K=1.0000]
Remarks: Z-WPL-18eS



1000 lm

$\kappa = 1$



F = 1000 lm
 K = 0.7
 H_{cc} = 0.8 m
 H_{fc} = 0.0 m
 E_{ave} = 100 lx

	P_{cc}	P_w	P_{fc}
—————	70	50	30
—————	50	30	20

