
Eurofase

Client:

LumCAT: 49241

Luminaire: LED LAMP

Report No:

Ballast type:

Test No:

Voltage(V): 119.990

LampCAT:

Current(A): 0.143

Lamp flux(lm): 198.0

Power (W): 16.220

Number of Lamps: 1

PF: 0.947

Length(mm): 125

Width(mm): 25

Phm Type: C

Height(mm): 0

Photometric Results

Lumens(lm): 197.95, Efficiency(%): 100.00% , Luminous Efficacy(lm/W): 12.20

Central intensity(cd): 120.534, Maximum intensity(cd): 144.159

Angle of maximum intensity: C=90.0 γ =15.0

Beam Angle(50%Imax): [C0/180]Total=93.2

[C90/270]Total=51.4

Field angle(10%Imax): [C0/180]Total=152.2

[C90/270]Total=82.6

Maximum s/h(1/2): C0_180=1.11 C90_270=1.38

Maximum s/h(1/4): C0_180=1.23 C90_270=1.37

Up flux rate of lamp(%): 2.04%

Down flux rate of lamp(%): 97.97%

Up flux rate of LUM(%): 2.04%

Down flux rate of LUM(%): 97.97%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 83.423%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	119.897	0.000	0	0.00%	0.00%
2.5	116.539	0.707	0.707	0.36%	0.36%
5.0	108.681	2.019	2.726	1.02%	1.38%
7.5	98.640	3.094	5.82	1.56%	2.94%
10.0	90.163	3.937	9.756	1.99%	4.93%
12.5	85.010	4.684	14.441	2.37%	7.29%
15.0	81.802	5.435	19.875	2.75%	10.04%
17.5	79.237	6.177	26.052	3.12%	13.16%
20.0	76.828	6.876	32.928	3.47%	16.63%
22.5	74.263	7.506	40.434	3.79%	20.43%
25.0	71.489	8.046	48.48	4.06%	24.49%
27.5	68.681	8.498	56.977	4.29%	28.78%
30.0	65.681	8.858	65.835	4.47%	33.26%
32.5	62.369	9.105	74.94	4.60%	37.86%
35.0	59.016	9.244	84.184	4.67%	42.53%
37.5	55.571	9.287	93.471	4.69%	47.22%
40.0	52.074	9.235	102.706	4.67%	51.88%
42.5	48.582	9.097	111.803	4.60%	56.48%
45.0	44.899	8.860	120.664	4.48%	60.96%
47.5	41.326	8.537	129.201	4.31%	65.27%
50.0	37.835	8.158	137.359	4.12%	69.39%
52.5	34.407	7.722	145.081	3.90%	73.29%
55.0	31.014	7.231	152.312	3.65%	76.94%
57.5	27.742	6.696	159.009	3.38%	80.33%
60.0	24.575	6.130	165.139	3.10%	83.42%
62.5	21.564	5.544	170.684	2.80%	86.22%
65.0	18.663	4.945	175.629	2.50%	88.72%
67.5	15.860	4.331	179.96	2.19%	90.91%
70.0	13.133	3.704	183.664	1.87%	92.78%
72.5	10.562	3.075	186.739	1.55%	94.33%
75.0	8.211	2.470	189.209	1.25%	95.58%
77.5	5.970	1.888	191.097	0.95%	96.54%
80.0	3.972	1.337	192.434	0.68%	97.21%
82.5	2.276	0.846	193.28	0.43%	97.64%
85.0	0.996	0.446	193.726	0.23%	97.86%
87.5	0.203	0.164	193.89	0.08%	97.95%
90.0	0.058	0.036	193.926	0.02%	97.96%
92.5	0.029	0.012	193.938	0.01%	97.97%

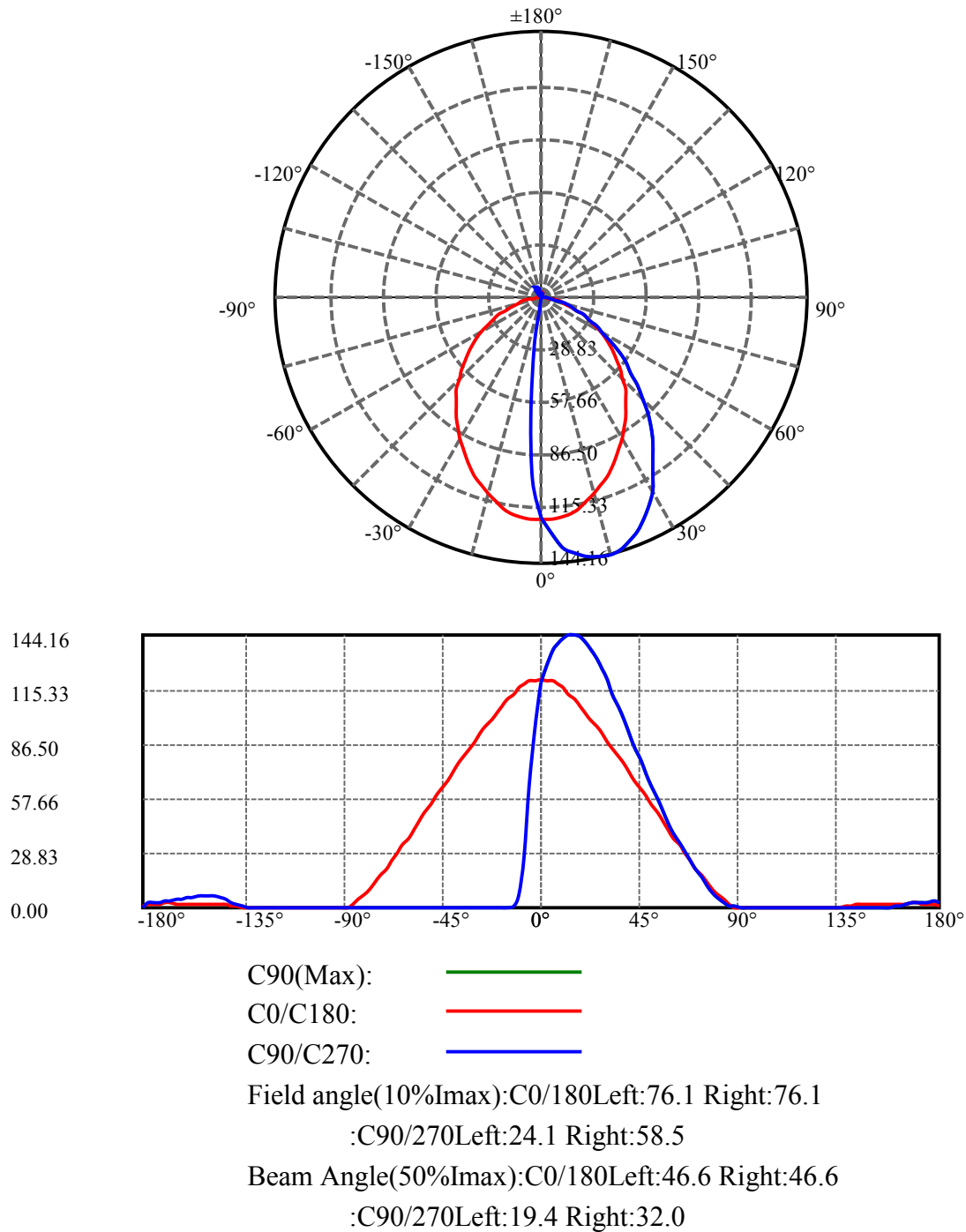
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
95.0	0.023	0.007	193.945	0.00%	97.97%
97.5	0.000	0.003	193.948	0.00%	97.98%
100.0	0.000	0.000	193.948	0.00%	97.98%
102.5	0.000	0.000	193.948	0.00%	97.98%
105.0	0.000	0.000	193.948	0.00%	97.98%
107.5	0.000	0.000	193.948	0.00%	97.98%
110.0	0.000	0.000	193.948	0.00%	97.98%
112.5	0.000	0.000	193.948	0.00%	97.98%
115.0	0.000	0.000	193.948	0.00%	97.98%
117.5	0.000	0.000	193.948	0.00%	97.98%
120.0	0.000	0.000	193.948	0.00%	97.98%
122.5	0.000	0.000	193.948	0.00%	97.98%
125.0	0.000	0.000	193.948	0.00%	97.98%
127.5	0.000	0.000	193.948	0.00%	97.98%
130.0	0.000	0.000	193.948	0.00%	97.98%
132.5	0.046	0.005	193.953	0.00%	97.98%
135.0	0.290	0.033	193.986	0.02%	98.00%
137.5	0.730	0.097	194.082	0.05%	98.04%
140.0	1.251	0.179	194.261	0.09%	98.13%
142.5	1.836	0.265	194.526	0.13%	98.27%
145.0	2.357	0.340	194.866	0.17%	98.44%
147.5	2.565	0.375	195.241	0.19%	98.63%
150.0	2.727	0.376	195.617	0.19%	98.82%
152.5	2.733	0.360	195.977	0.18%	99.00%
155.0	2.617	0.324	196.301	0.16%	99.17%
157.5	2.669	0.292	196.593	0.15%	99.31%
160.0	2.693	0.266	196.86	0.13%	99.45%
162.5	2.750	0.240	197.1	0.12%	99.57%
165.0	2.988	0.220	197.32	0.11%	99.68%
167.5	3.023	0.196	197.515	0.10%	99.78%
170.0	2.988	0.161	197.676	0.08%	99.86%
172.5	2.982	0.124	197.801	0.06%	99.92%
175.0	2.930	0.088	197.889	0.04%	99.97%
177.5	2.889	0.052	197.941	0.03%	99.99%
180.0	1.465	0.013	197.954	0.01%	100.00%

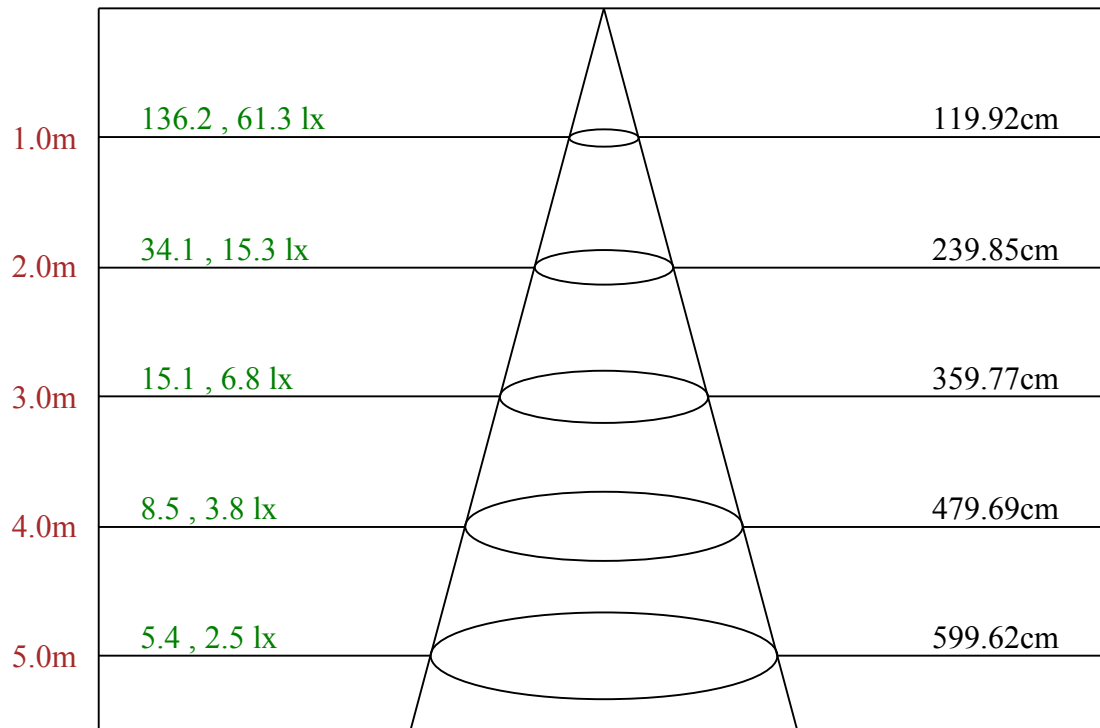
ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	65.84	33.26%	33.26%
0-40	102.71	51.89%	51.88%
0-60	165.14	83.42%	83.42%
0-90	193.93	97.97%	97.96%
0-120	193.95	97.98%	97.98%
0-180	197.95	100.00%	100.00%
60-90	28.79	14.54%	14.54%
90-120	0.02	0.01%	0.01%
90-130	0.02	0.01%	0.01%
90-150	1.69	0.85%	0.85%
90-180	4.02	2.03%	2.03%
0-57.26	158.36	80.00%	80.00%

ZONAL LUMEN SUMMARY

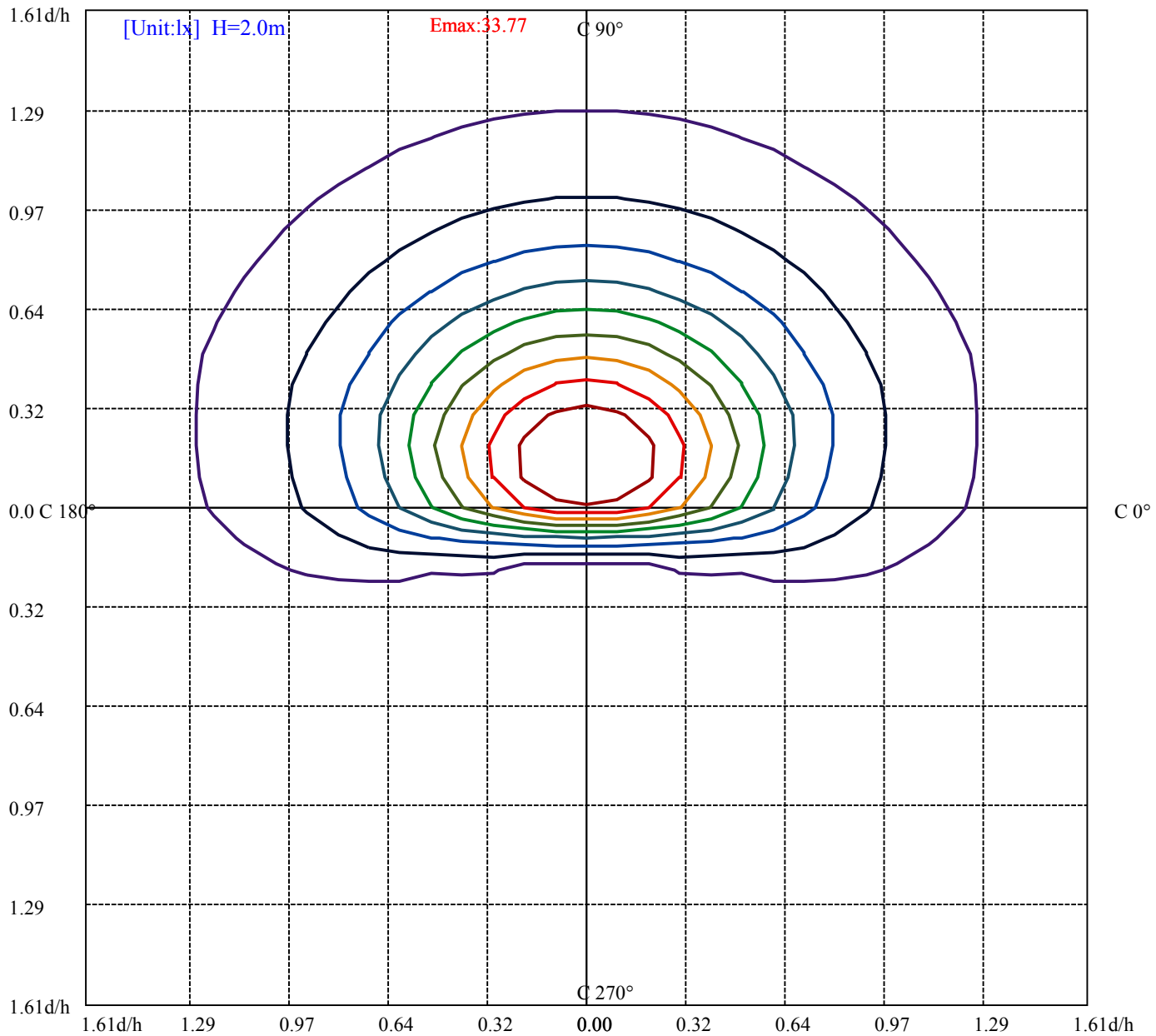
0-10	9.76
10-20	23.17
20-30	32.91
30-40	36.87
40-50	34.65
50-60	27.78
60-70	18.52
70-80	8.77
80-90	1.49
90-100	0.02
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.31
140-150	1.36
150-160	1.24
160-170	0.82
170-180	0.26



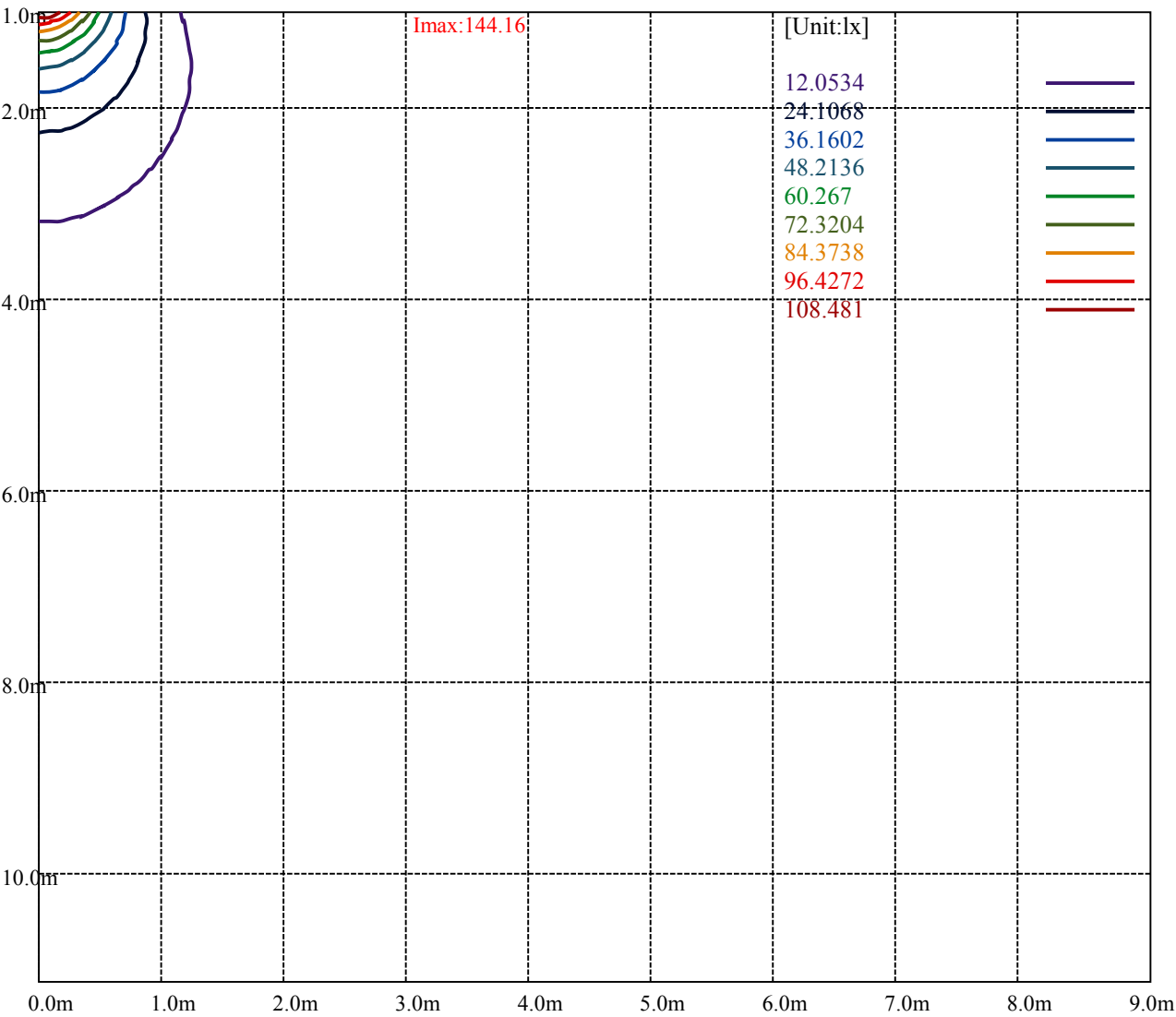


Max , Ave

Beam angle of C90 plane 61.90



(10%Emax)	3.37705	—
(20%Emax)	6.754075	—
(30%Emax)	10.13113	—
(40%Emax)	13.50815	—
(50%Emax)	16.8852	—
(60%Emax)	20.26225	—
(70%Emax)	23.63927	—
(80%Emax)	27.01625	—
(90%Emax)	30.39325	—



Luminance Table

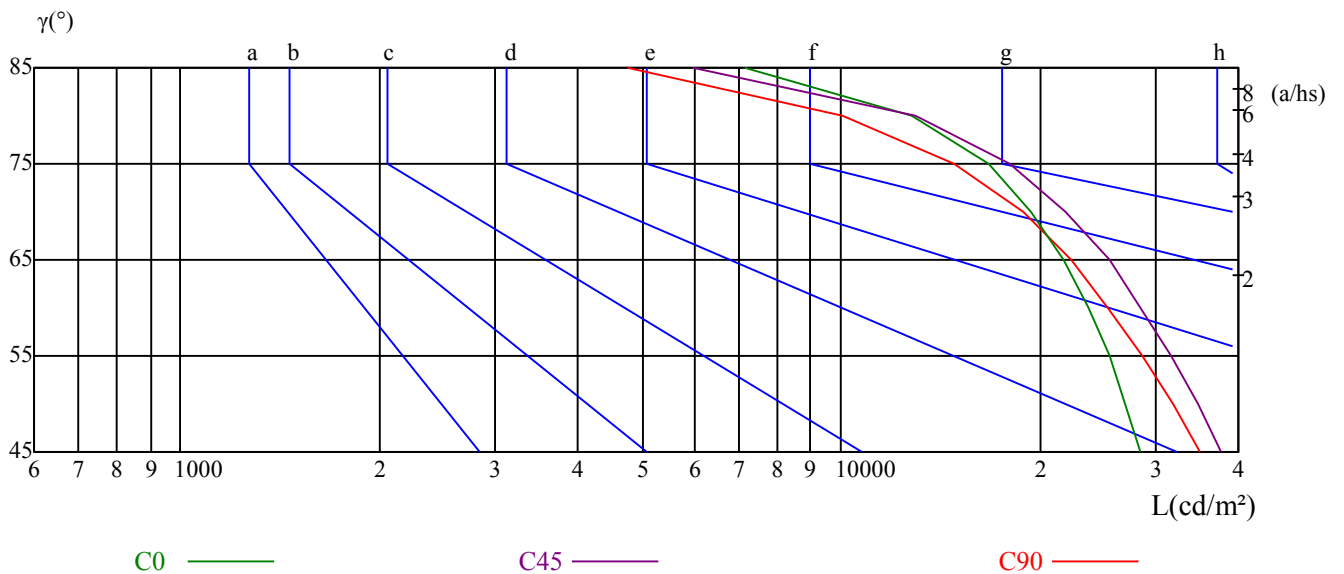
γ	45	50	55	60	65	70	75	80	85
C0	28448	27005	25456	23658	21817	19417	16724	12805	7143
C45	37609	34638	31711	28491	25500	21931	17984	12976	5953
C90	35051	31917	28532	25319	22308	18897	14891	10073	4762

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
21817	11154	12960	16724	7446	9107	7143	2381	2976

Glare Table

Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	≤ 300				
1.5	B		2000	1000	500	≤ 300			
1.85	C			2000	1000	500	≤ 300		
2.2	D				2000	1000	500	≤ 300	
2.55	E					2000	1000	500	≤ 300
		a	b	c	d	e	f	g	h

Luminance Limiting Curve



RHOCC	80			70			50			30			10			0
RHOW	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR	COEFFICIENTS OF UTILIZATION RHOFC=20 CU															
0	1.19	1.19	1.19	1.16	1.16	1.16	1.10	1.10	1.10	1.05	1.05	1.05	1.00	1.00	1.00	0.98
1	1.05	1.02	0.98	1.03	0.99	0.96	0.98	0.96	0.93	0.94	0.92	0.90	0.90	0.88	0.87	0.85
2	0.93	0.87	0.82	0.91	0.85	0.81	0.87	0.83	0.79	0.84	0.80	0.76	0.81	0.77	0.75	0.72
3	0.83	0.75	0.69	0.81	0.74	0.69	0.78	0.72	0.67	0.75	0.70	0.66	0.72	0.68	0.64	0.62
4	0.74	0.66	0.60	0.73	0.65	0.59	0.70	0.63	0.58	0.67	0.62	0.57	0.65	0.60	0.56	0.54
5	0.67	0.58	0.52	0.66	0.58	0.52	0.63	0.56	0.51	0.61	0.55	0.50	0.59	0.54	0.50	0.48
6	0.61	0.52	0.46	0.60	0.52	0.46	0.58	0.51	0.45	0.56	0.50	0.45	0.54	0.49	0.44	0.42
7	0.55	0.47	0.41	0.54	0.47	0.41	0.53	0.46	0.41	0.51	0.45	0.40	0.50	0.44	0.40	0.38
8	0.51	0.43	0.37	0.50	0.42	0.37	0.48	0.42	0.37	0.47	0.41	0.36	0.46	0.40	0.36	0.34
9	0.47	0.39	0.34	0.46	0.39	0.34	0.45	0.38	0.33	0.44	0.37	0.33	0.43	0.37	0.33	0.31
10	0.43	0.36	0.31	0.43	0.36	0.31	0.42	0.35	0.30	0.41	0.35	0.30	0.40	0.34	0.30	0.28

Intensity data(cd)

C/γ(°)	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0
0.0	120.53	120.90	120.72	119.98	119.14	117.48	115.90	113.68	111.18
22.5	120.53	122.57	126.19	131.47	133.88	134.71	134.34	133.32	131.56
45.0	120.16	125.26	134.15	137.86	139.99	141.75	142.03	141.19	139.43
67.5	119.70	127.02	136.28	140.27	142.77	144.44	144.53	143.70	141.56
90.0	119.05	127.39	136.01	139.80	142.49	143.97	144.16	143.33	140.73
112.5	119.14	125.91	134.34	138.32	140.55	142.03	142.03	140.92	139.34
135.0	119.98	123.59	131.10	134.99	136.93	137.49	137.21	136.19	134.06
157.5	120.07	121.18	122.48	124.15	126.09	127.58	127.02	125.54	123.41
180.0	120.53	119.79	119.05	117.11	113.21	108.86	104.41	99.97	95.61
202.5	120.53	114.23	98.67	81.53	65.69	49.38	35.39	24.55	18.90
225.0	120.16	106.08	79.58	51.51	24.46	10.10	4.73	3.24	2.78
247.5	119.70	101.73	68.56	32.43	9.26	1.30	0.37	0.19	0.09
270.0	119.05	98.95	64.48	27.05	7.60	0.46	0.09	0.00	0.00
292.5	119.14	102.56	72.36	38.63	12.60	3.52	0.65	0.46	0.37
315.0	119.98	109.14	87.00	65.32	40.95	20.75	10.93	6.21	4.73
337.5	120.07	118.31	107.93	97.84	87.00	76.34	65.04	55.31	45.49
360.0	120.53	120.90	120.72	119.98	119.14	117.48	115.90	113.68	111.18
C/γ(°)	22.5	25.0	27.5	30.0	32.5	35.0	37.5	40.0	42.5
0.0	108.40	105.43	102.00	98.21	94.31	90.52	86.16	81.53	76.80
22.5	128.96	126.28	122.39	118.13	113.68	108.58	103.02	97.65	91.35
45.0	136.75	132.95	128.59	123.78	117.75	111.36	104.60	98.30	91.44
67.5	138.23	133.50	128.04	121.74	115.07	108.03	101.26	93.48	86.53
90.0	137.12	131.93	126.37	120.72	113.21	105.99	98.95	92.28	85.24
112.5	135.91	131.37	126.19	120.63	114.05	107.29	100.34	93.02	86.44
135.0	131.37	128.04	123.96	118.96	113.31	107.66	101.45	95.06	88.48
157.5	120.44	117.20	113.59	109.42	104.78	99.97	94.69	89.13	83.94
180.0	91.07	86.44	82.46	78.01	73.56	69.39	65.32	61.43	57.90
202.5	15.66	13.25	12.60	11.95	11.30	10.65	9.91	9.36	8.62
225.0	2.69	2.50	2.22	2.04	1.85	1.67	1.58	1.30	1.30
247.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
270.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292.5	0.19	0.09	0.19	0.09	0.09	0.09	0.09	0.09	0.09
315.0	4.35	4.08	3.80	3.61	3.34	3.06	2.87	2.69	2.50
337.5	37.06	30.76	26.50	23.63	21.59	20.01	18.90	17.88	16.68
360.0	108.40	105.43	102.00	98.21	94.31	90.52	86.16	81.53	76.80
C/γ(°)	45.0	47.5	50.0	52.5	55.0	57.5	60.0	62.5	65.0
0.0	71.71	66.71	61.70	56.89	51.88	46.79	41.97	37.34	32.43
22.5	85.24	78.84	72.91	66.71	60.41	54.20	48.18	42.71	37.15
45.0	84.40	77.18	70.23	63.46	57.53	51.05	44.56	39.28	33.82
67.5	79.40	72.26	65.50	59.02	52.53	46.88	41.23	35.76	30.57
90.0	77.45	70.60	64.11	57.53	51.14	45.12	39.56	34.28	29.46
112.5	79.40	72.26	65.50	58.83	52.53	46.88	41.14	35.67	30.85
135.0	81.81	75.14	68.93	62.54	56.14	50.21	44.47	38.54	33.54
157.5	78.01	72.64	66.71	61.43	55.59	49.94	44.75	39.10	33.91
180.0	54.01	50.68	46.79	43.08	39.38	35.58	31.96	28.54	25.20
202.5	7.88	7.32	6.67	6.11	5.47	5.00	4.45	3.89	3.34
225.0	1.11	1.02	0.93	0.83	0.65	0.56	0.56	0.56	0.28
247.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
270.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315.0	2.32	2.04	1.95	1.76	1.58	1.39	1.20	1.11	0.83
337.5	15.66	14.55	13.43	12.32	11.40	10.28	9.17	8.25	7.23
360.0	71.71	66.71	61.70	56.89	51.88	46.79	41.97	37.34	32.43

Intensity data(cd)

Appendix Page: 12 Total:13

C/γ(°)	67.5	70.0	72.5	75.0	77.5	80.0	82.5	85.0	87.5
0.0	28.07	23.44	18.99	15.10	11.21	7.60	4.54	2.13	0.28
22.5	31.78	26.50	21.49	16.77	12.60	8.34	4.82	2.22	0.46
45.0	28.63	23.63	18.90	14.55	10.56	7.13	4.08	1.67	0.37
67.5	25.66	21.03	16.58	12.88	8.89	5.84	3.24	1.39	0.37
90.0	24.64	20.20	16.03	12.04	8.43	5.47	2.96	1.30	0.46
112.5	25.76	21.03	16.68	12.88	9.17	5.93	3.24	1.39	0.28
135.0	28.26	23.25	18.62	14.55	10.47	6.95	3.89	1.58	0.28
157.5	29.18	24.37	19.73	15.29	11.21	7.50	4.26	1.95	0.28
180.0	21.59	18.07	14.92	11.95	9.08	6.30	3.80	1.76	0.37
202.5	2.87	2.50	2.04	1.48	1.02	0.65	0.46	0.09	0.00
225.0	0.19	0.19	0.09	0.00	0.00	0.00	0.00	0.00	0.00
247.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
270.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315.0	0.74	0.65	0.46	0.37	0.19	0.09	0.00	0.00	0.00
337.5	6.39	5.28	4.45	3.52	2.69	1.76	1.11	0.46	0.09
360.0	28.07	23.44	18.99	15.10	11.21	7.60	4.54	2.13	0.28
C/γ(°)	90.0	92.5	95.0	97.5	100.0	102.5	105.0	107.5	110.0
0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.0	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67.5	0.19	0.19	0.19	0.00	0.00	0.00	0.00	0.00	0.00
90.0	0.28	0.19	0.09	0.00	0.00	0.00	0.00	0.00	0.00
112.5	0.19	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00
135.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
247.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
270.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
337.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
360.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C/γ(°)	112.5	115.0	117.5	120.0	122.5	125.0	127.5	130.0	132.5
0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
202.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
225.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
247.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
270.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
292.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
315.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
337.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
360.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Intensity data(cd)

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C/γ(°)	135.0	137.5	140.0	142.5	145.0	147.5	150.0	152.5	155.0
0.0	0.00	0.00	0.09	0.09	0.28	0.46	0.56	0.65	0.56
22.5	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.28	0.46
45.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
67.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
90.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
112.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.19
135.0	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.46	0.56
157.5	0.00	0.00	0.00	0.09	0.19	0.37	0.56	0.74	0.93
180.0	0.65	1.30	2.04	2.87	3.61	3.80	3.89	3.61	3.15
202.5	0.65	1.58	2.69	3.71	4.54	4.91	5.10	4.91	4.54
225.0	0.74	1.76	2.87	4.17	5.19	5.74	5.93	5.84	5.47
247.5	0.74	1.85	2.96	4.26	5.56	6.02	6.30	6.21	5.74
270.0	0.83	1.67	3.06	4.26	5.56	6.02	6.30	6.21	5.84
292.5	0.56	1.67	2.78	4.08	5.37	5.74	6.02	5.93	5.56
315.0	0.46	1.20	2.22	3.52	4.45	4.73	5.10	5.10	4.82
337.5	0.00	0.65	1.30	2.32	2.96	3.24	3.61	3.71	3.61
360.0	0.00	0.00	0.09	0.09	0.28	0.46	0.56	0.65	0.56
C/γ(°)	157.5	160.0	162.5	165.0	167.5	170.0	172.5	175.0	177.5
0.0	0.83	1.02	1.30	1.67	2.04	2.13	2.13	2.13	2.13
22.5	0.65	0.74	1.20	1.67	2.04	2.22	2.32	2.32	2.22
45.0	0.46	0.65	1.20	1.67	2.13	2.32	2.59	2.50	2.50
67.5	0.37	0.65	1.20	1.76	2.13	2.59	2.69	2.78	2.69
90.0	0.37	0.65	1.30	2.04	2.59	2.78	3.06	3.06	3.15
112.5	0.46	0.83	1.58	2.32	2.87	3.24	3.43	3.61	3.52
135.0	0.83	1.20	1.85	2.78	3.24	3.52	3.80	3.98	3.89
157.5	1.20	1.48	2.50	3.15	3.52	3.80	3.80	3.98	3.98
180.0	3.06	2.96	2.69	2.78	2.69	2.59	2.32	2.22	2.04
202.5	4.26	4.17	3.52	3.52	3.15	2.78	2.50	2.22	2.13
225.0	5.19	4.91	4.26	3.98	3.43	2.87	2.69	2.32	2.32
247.5	5.56	5.28	4.45	4.17	3.61	3.24	2.87	2.69	2.59
270.0	5.56	5.10	4.54	4.17	3.71	3.24	2.96	2.78	2.87
292.5	5.37	5.10	4.35	4.08	3.71	3.34	3.24	3.15	3.24
315.0	4.73	4.54	4.17	4.08	3.71	3.43	3.52	3.43	3.34
337.5	3.80	3.80	3.89	3.98	3.80	3.71	3.80	3.71	3.61
360.0	0.83	1.02	1.30	1.67	2.04	2.13	2.13	2.13	2.13
C/γ(°)	180.0								
0.0	2.13								
22.5	2.13								
45.0	2.32								
67.5	2.69								
90.0	2.96								
112.5	3.43								
135.0	3.80								
157.5	3.98								
180.0	0.00								
202.5	0.00								
225.0	0.00								
247.5	0.00								
270.0	0.00								
292.5	0.00								
315.0	0.00								
337.5	0.00								
360.0	2.13								