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## Nata

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LumCAT: 1515-E	
Luminaire: 92.76.046.00	
Report No: NATA0100	Voltage(V): 37.3000
Test No: GC2017083005	Current(A): 0.3000
LampCAT: CREE CXA1512	Power (W): 11.1900
Lamp flux(lm): 945.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 40	Width(mm): 40
Phm Type: C	Height(mm): 0

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## Photometric Results

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Lumens(lm): 815.88  
Efficiency(%): 86.34%  
Lumens(lm)/Power(W): 73.04  
Central intensity(cd): 1659.538  
Maximum intensity(cd): 1659.538  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=44.7  
                                  [C90/270]Total=44.7  
Field angle(10%Imax): [C0/180]Total=62.8  
                                  [C90/270]Total=62.8  
Maximum s/h(1/2): C0\_180=0.69 C90\_270=0.69  
Maximum s/h(1/4): C0\_180=0.69 C90\_270=0.69  
Up flux rate of lamp(%): 0.00%  
Down flux rate of lamp(%): 86.49%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 98.145%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	1659.538	1.588	1.588	.168%	.195%
2.0	1652.036	12.645	14.233	1.338%	1.744%
4.0	1607.234	24.588	38.821	2.602%	4.758%
6.0	1532.908	35.141	73.962	3.719%	9.065%
8.0	1444.818	44.099	118.062	4.667%	14.470%
10.0	1345.441	51.239	169.301	5.422%	20.751%
12.0	1262.650	57.574	226.875	6.092%	27.807%
14.0	1178.049	62.503	289.378	6.614%	35.468%
16.0	1097.873	66.367	355.745	7.023%	43.602%
18.0	1027.290	69.621	425.367	7.367%	52.136%
20.0	943.584	70.778	496.144	7.490%	60.811%
22.0	849.403	69.784	565.928	7.385%	69.364%
24.0	732.470	65.338	631.267	6.914%	77.372%
26.0	577.948	55.564	686.831	5.880%	84.182%
28.0	403.460	41.541	728.372	4.396%	89.274%
30.0	258.738	28.372	756.744	3.002%	92.751%
32.0	125.474	14.582	771.326	1.543%	94.539%
34.0	63.219	7.753	779.079	.820%	95.489%
36.0	37.060	4.777	783.857	.506%	96.075%
38.0	22.917	3.094	786.951	.327%	96.454%
40.0	15.533	2.190	789.141	.232%	96.722%
42.0	11.947	1.753	790.894	.186%	96.937%
44.0	10.117	1.541	792.435	.163%	97.126%
46.0	8.954	1.413	793.848	.149%	97.299%
48.0	8.162	1.330	795.178	.141%	97.462%
50.0	7.501	1.260	796.438	.133%	97.617%
52.0	7.027	1.214	797.653	.129%	97.765%
54.0	6.600	1.171	798.824	.124%	97.909%
56.0	6.290	1.144	799.967	.121%	98.049%
58.0	6.015	1.119	801.086	.118%	98.186%
60.0	5.774	1.097	802.183	.116%	98.321%
62.0	5.595	1.083	803.266	.115%	98.453%
64.0	5.402	1.065	804.331	.113%	98.584%
66.0	5.230	1.048	805.379	.111%	98.712%
68.0	5.072	1.031	806.41	.109%	98.839%
70.0	4.928	1.016	807.426	.107%	98.963%
72.0	4.769	0.995	808.421	.105%	99.085%
74.0	4.611	0.972	809.393	.103%	99.204%

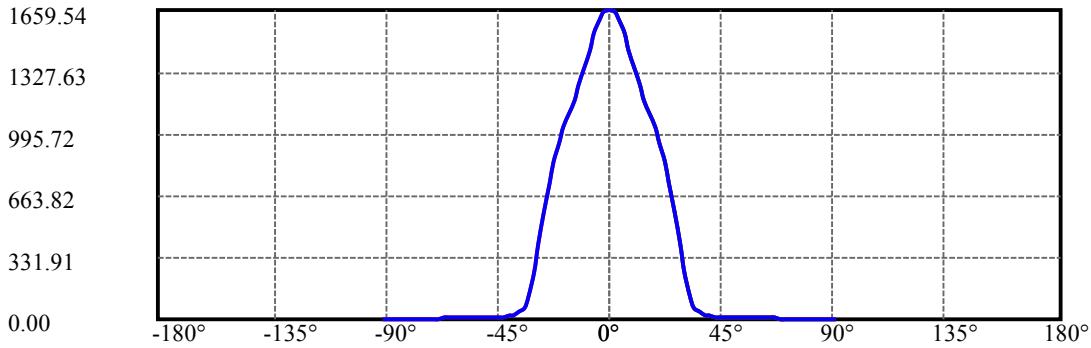
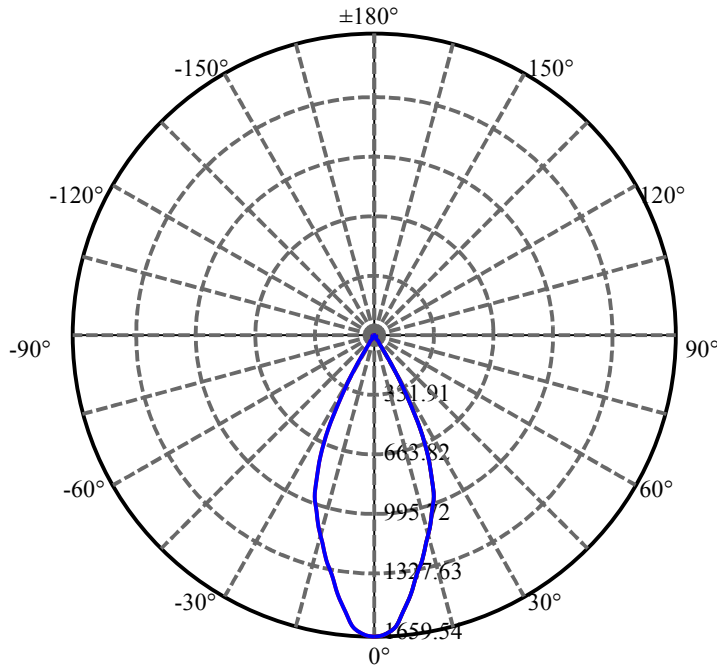
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	4.466	0.950	810.343	.101%	99.321%
78.0	4.343	0.932	811.275	.099%	99.435%
80.0	4.157	0.898	812.173	.095%	99.545%
82.0	4.054	0.880	813.053	.093%	99.653%
84.0	3.937	0.859	813.911	.091%	99.758%
86.0	3.744	0.819	814.731	.087%	99.859%
88.0	3.537	0.775	815.506	.082%	99.954%
90.0	3.448	0.378	815.884	.040%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	756.74	80.08%	92.75%
0-40	789.14	83.51%	96.72%
0-60	802.18	84.89%	98.32%
0-90	815.51	86.30%	99.95%
0-120	815.51	86.30%	99.95%
0-180	815.88	86.34%	100.00%
60-90	14.42	1.53%	1.77%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-24.77	652.71	69.07%	80.00%

ZONAL LUMEN SUMMARY

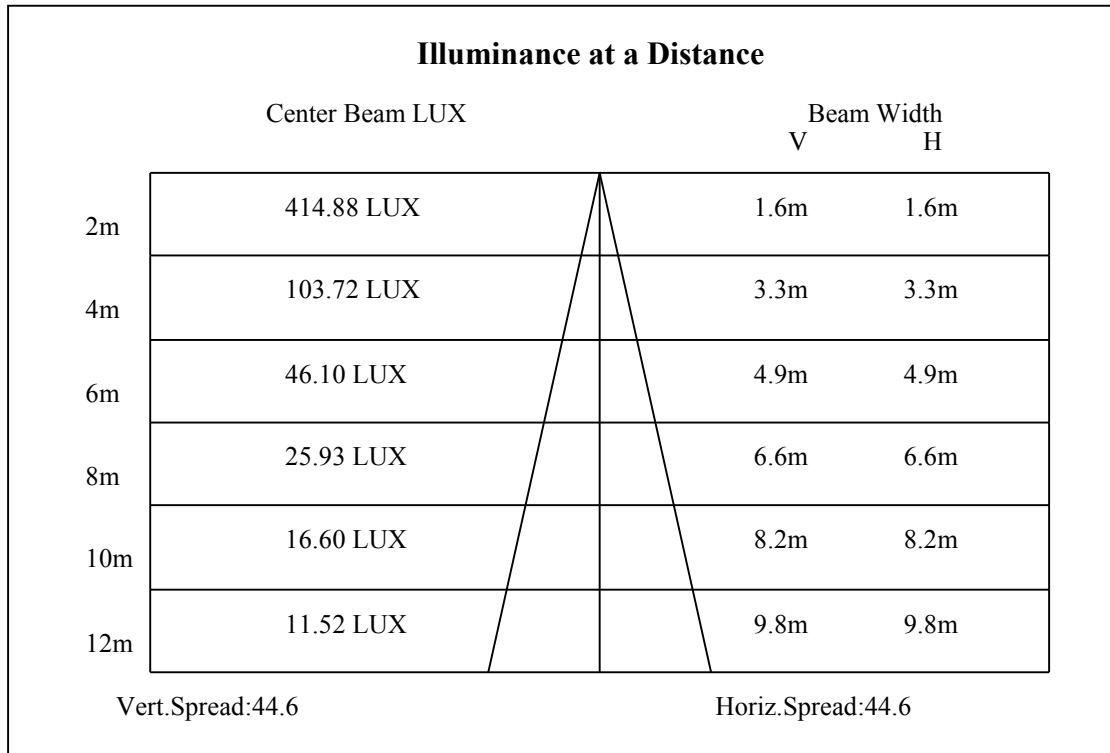
0-10	169.30
10-20	326.84
20-30	260.60
30-40	32.40
40-50	7.30
50-60	5.74
60-70	5.24
70-80	4.75
80-90	3.33
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

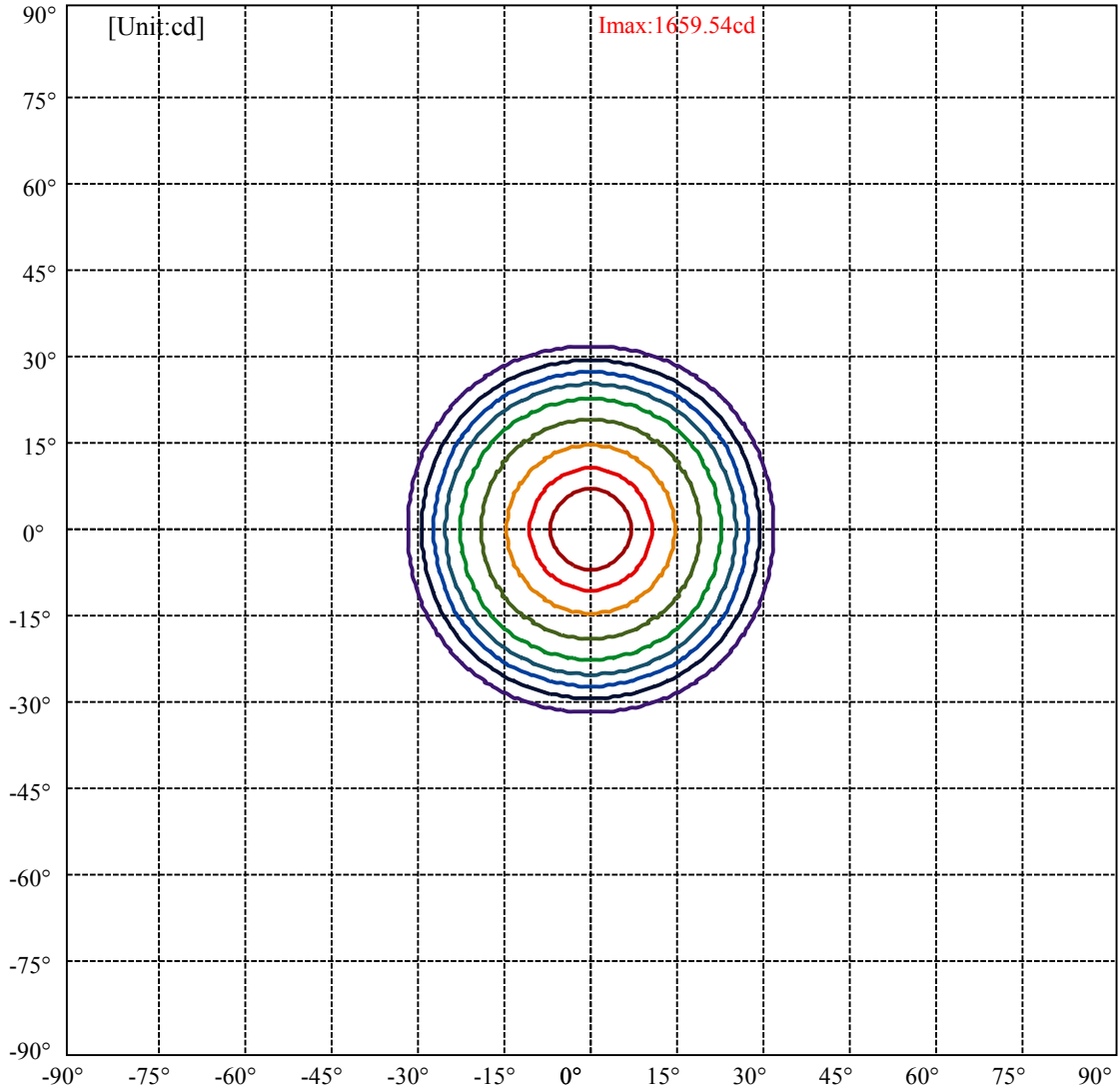


C0(Max): —————  
C0/C180: —————  
C90/C270: —————

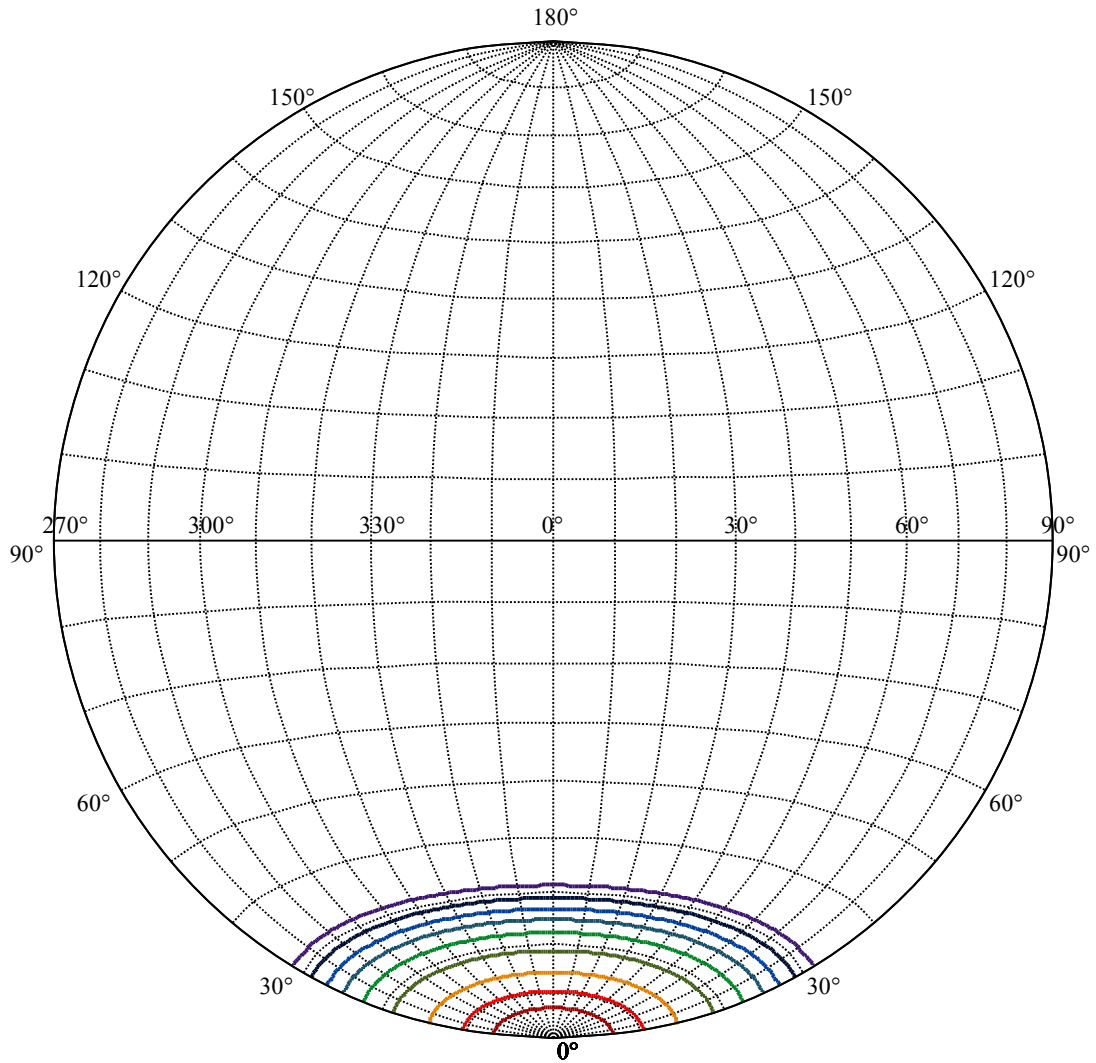
Field angle(10%Imax):C0/180Left:31.4 Right:31.4  
:C90/270Left:31.4 Right:31.4

Beam Angle(50%Imax):C0/180Left:22.3 Right:22.3  
:C90/270Left:22.3 Right:22.3





(10%Imax)	165.954	—
(20%Imax)	331.908	—
(30%Imax)	497.861	—
(40%Imax)	663.815	—
(50%Imax)	829.769	—
(60%Imax)	995.723	—
(70%Imax)	1161.68	—
(80%Imax)	1327.63	—
(90%Imax)	1493.58	—



House

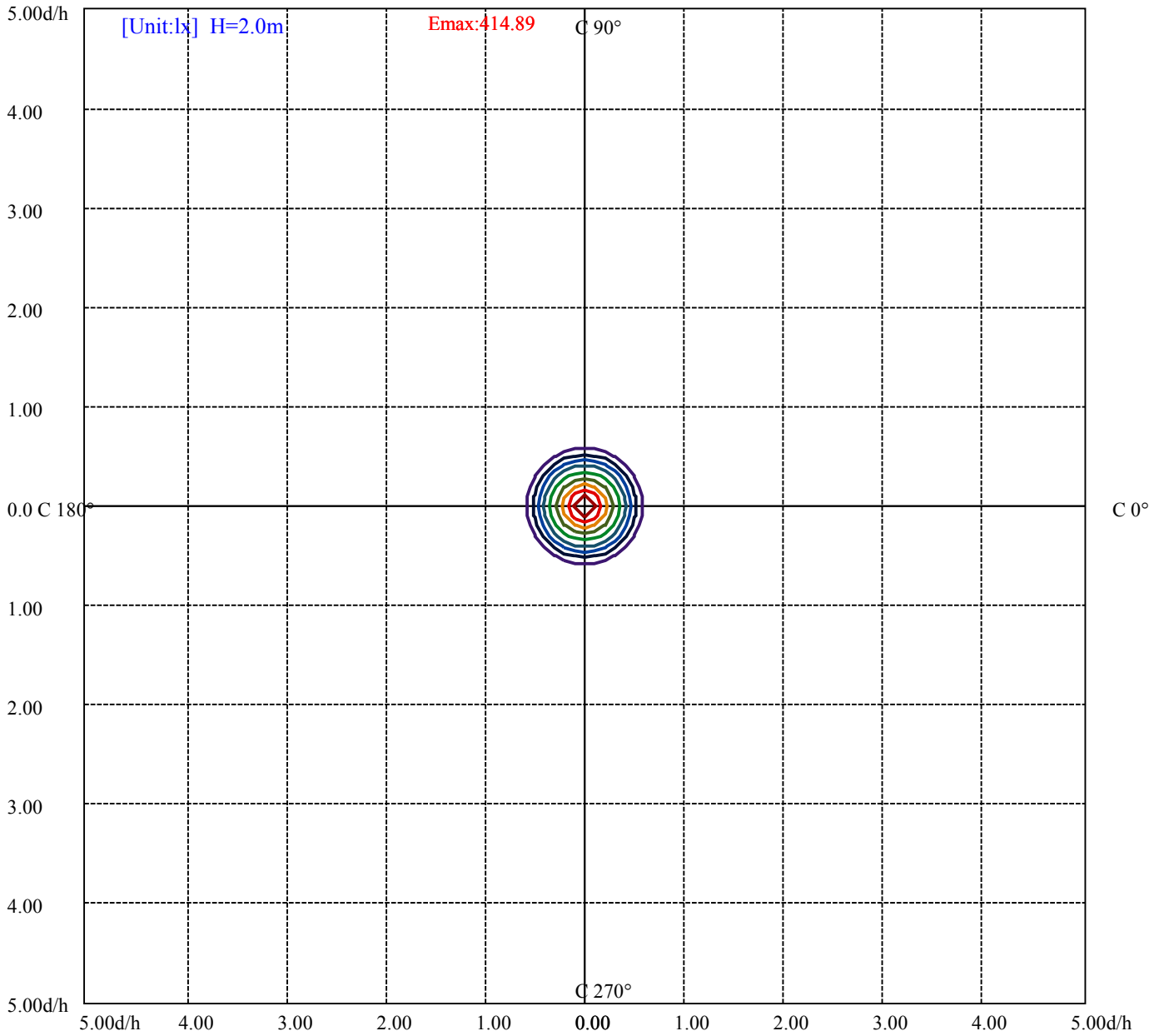
[Unit:cd]

Road

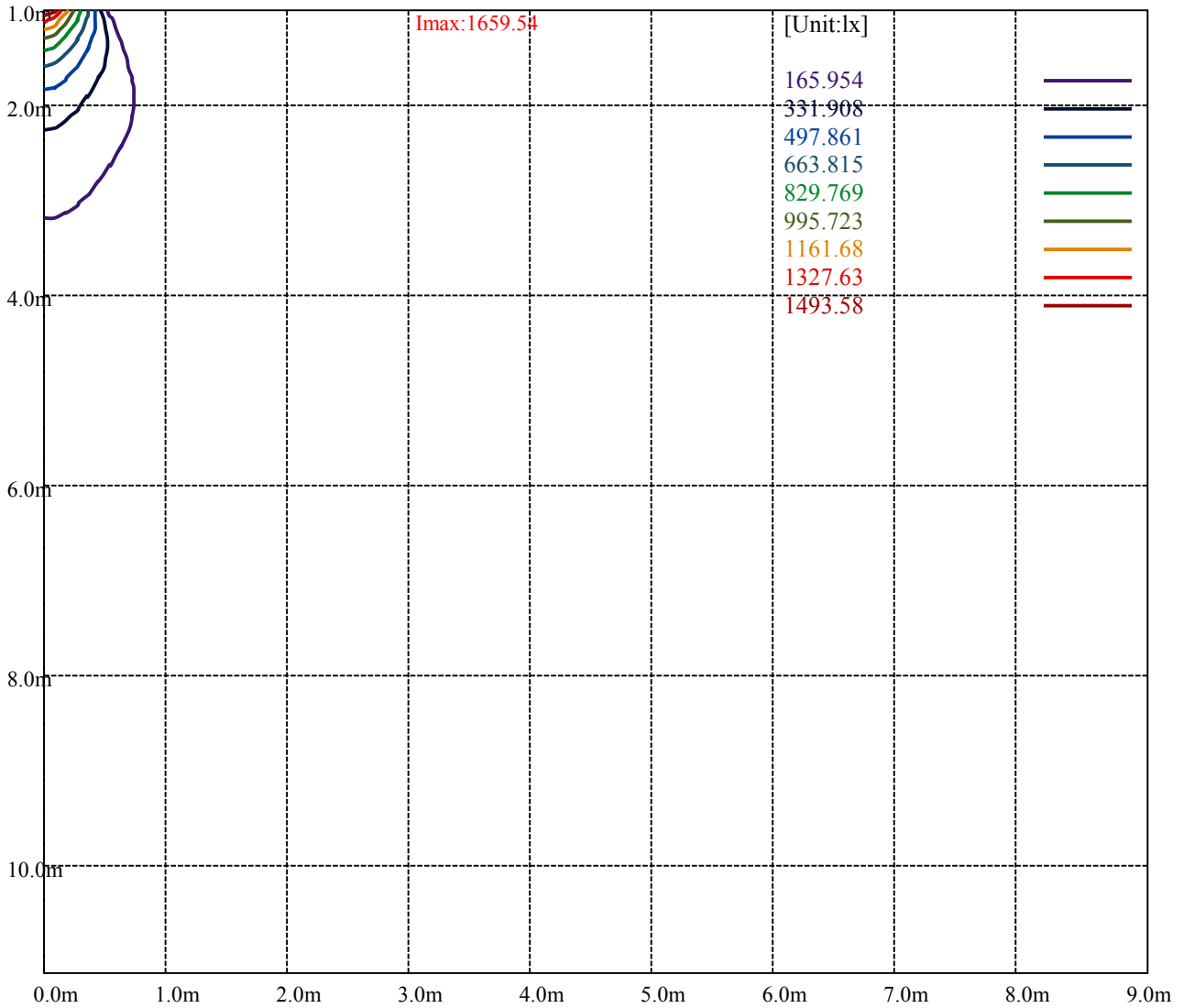
Imax:1659.54

(10%Imax)	165.954	—
(20%Imax)	331.908	—
(30%Imax)	497.861	—
(40%Imax)	663.815	—
(50%Imax)	829.769	—
(60%Imax)	995.723	—
(70%Imax)	1161.68	—
(80%Imax)	1327.63	—
(90%Imax)	1493.58	—





(10%Emax) 41.4885	—
(20%Emax) 82.97675	—
(30%Emax) 124.4652	—
(40%Emax) 165.9538	—
(50%Emax) 207.442	—
(60%Emax) 248.9305	—
(70%Emax) 290.42	—
(80%Emax) 331.9075	—
(90%Emax) 373.395	—



Luminance Table

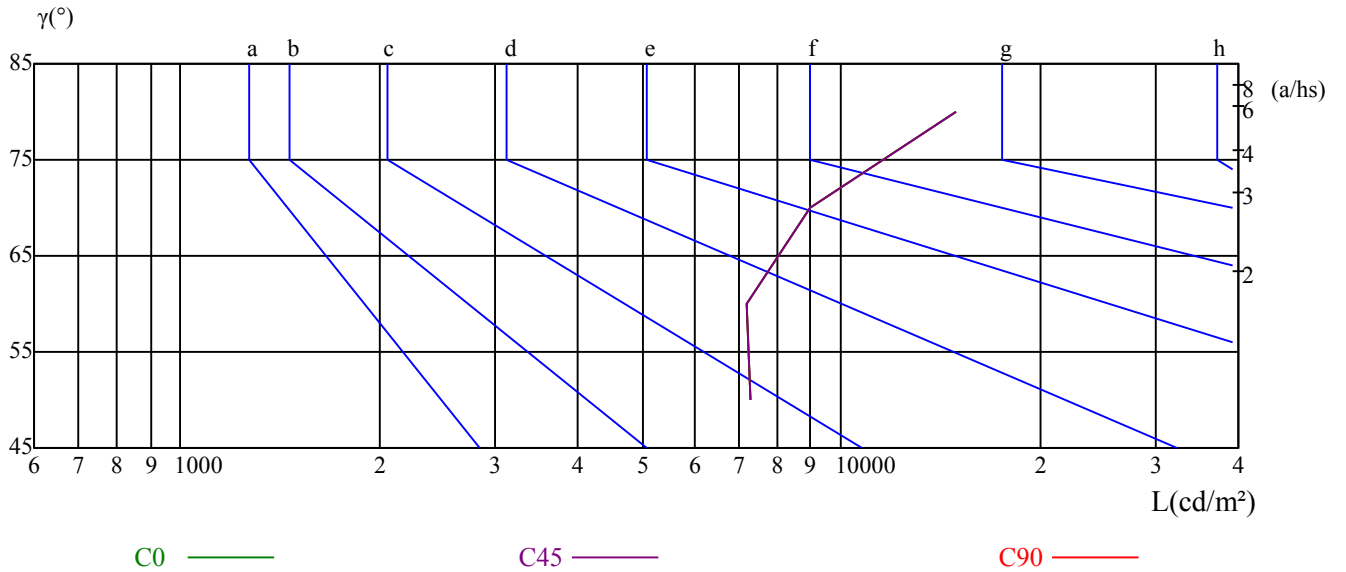
$\gamma$	45	50	55	60	65	70	75	80	85
C0	0	7294	0	7218	0	9004	0	14961	0
C45	0	7294	0	7218	0	9004	0	14961	0
C90	0	7294	0	7218	0	9004	0	14961	0

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
279612	279612	279612	382483	382483	382483	918336	918336	918336

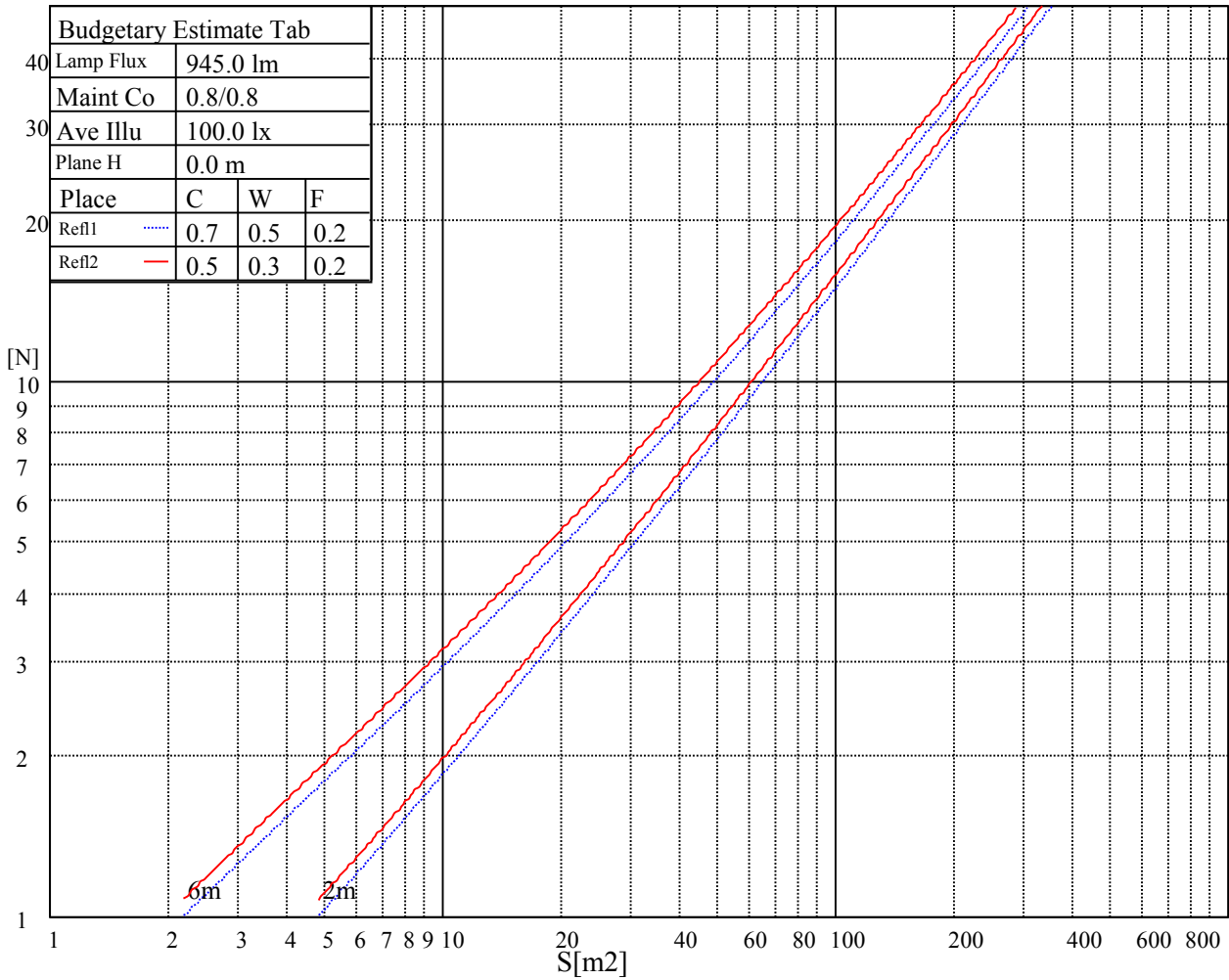
Glare Table

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

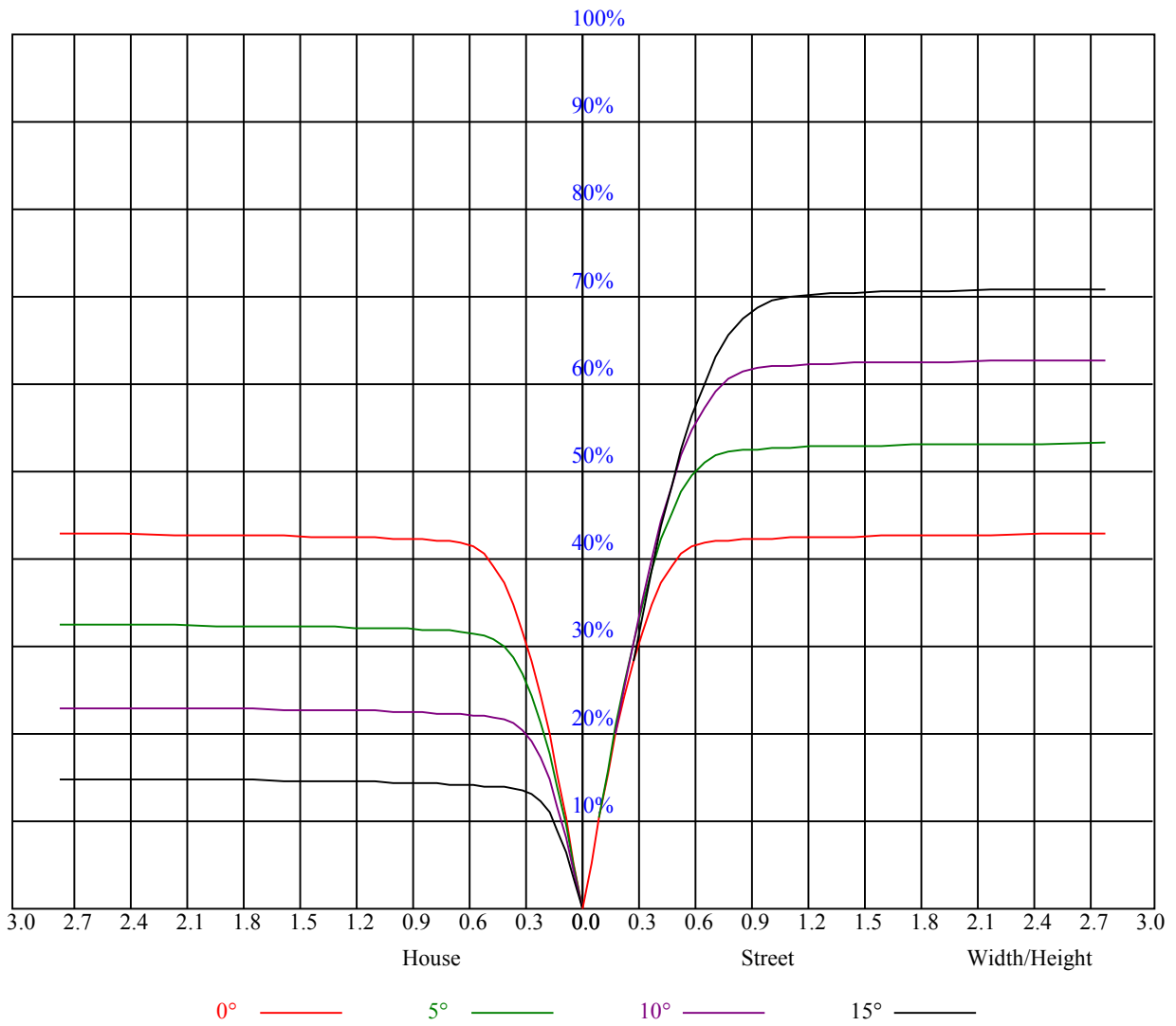
Luminance Limiting Curve



Illumination assessment according UGR											
Rf of Ceiling	70	70	50	50	30	70	70	50	50	30	
Rf of Wall	50	30	50	30	30	50	30	50	30	30	
Rf of Floor	20	20	20	20	20	20	20	20	20	20	
Room dimensions		Viewed crosswise					Viewed endwise				
X	Y										
2H	2H	9.99	10.92	10.35	11.23	11.54	9.76	10.69	10.13	11.00	11.32
	3H	12.68	13.50	13.06	13.83	14.20	12.53	13.35	12.91	13.68	14.05
	4H	14.10	14.86	14.50	15.21	15.60	14.00	14.76	14.41	15.11	15.50
	6H	15.65	16.34	16.07	16.72	17.11	15.60	16.30	16.02	16.67	17.07
	8H	16.50	17.15	16.94	17.54	17.95	16.48	17.13	16.92	17.53	17.94
	12H	17.92	18.55	18.36	18.93	19.36	17.94	18.56	18.37	18.94	19.37
4H	2H	10.68	11.44	11.09	11.79	12.18	10.51	11.27	10.92	11.62	12.01
	3H	13.64	14.27	14.06	14.68	15.08	13.53	14.16	13.95	14.57	14.97
	4H	15.24	15.80	15.68	16.22	16.67	15.17	15.73	15.61	16.16	16.60
	6H	16.89	17.36	17.36	17.82	18.29	16.86	17.34	17.33	17.79	18.26
	8H	17.87	18.32	18.35	18.77	19.25	17.87	18.31	18.35	18.76	19.24
	12H	19.27	19.66	19.77	20.14	20.62	19.29	19.67	19.78	20.16	20.64
8H	4H	15.80	16.25	16.28	16.70	17.17	15.75	16.20	16.23	16.65	17.12
	6H	17.75	18.10	18.26	18.60	19.09	17.73	18.08	18.24	18.59	19.07
	8H	18.92	19.24	19.46	19.76	20.26	18.93	19.24	19.46	19.76	20.26
	12H	20.53	20.80	21.05	21.30	21.88	20.55	20.81	21.07	21.31	21.90
12H	4H	15.95	16.33	16.44	16.82	17.30	15.90	16.28	16.39	16.77	17.25
	6H	18.22	18.31	18.54	18.79	19.34	18.21	18.30	18.53	18.77	19.32
	8H	19.31	19.57	19.83	20.07	20.65	19.31	19.58	19.84	20.08	20.66
Variation with the observer position at spacings:											
S = 1.0H	3.6/-2.1					3.6/-2.1					
S = 1.5H	4.3/-1.7					4.3/-1.7					
S = 2.0H	4.9/-1.3					4.9/-1.3					
Standard tables:	BKBF					BKBF					
Uncorrected UGR	2.4					2.4					



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	1.03	1.03	1.03	1.01	1.01	1.01	0.96	0.96	0.96	0.92	0.92	0.92	0.88	0.88	0.88	0.86
1	0.96	0.94	0.93	0.94	0.93	0.91	0.91	0.90	0.88	0.88	0.87	0.86	0.85	0.84	0.83	0.82
2	0.91	0.88	0.85	0.89	0.87	0.84	0.87	0.84	0.82	0.84	0.82	0.81	0.82	0.80	0.79	0.78
3	0.86	0.82	0.79	0.85	0.81	0.79	0.83	0.80	0.77	0.81	0.78	0.76	0.79	0.77	0.75	0.74
4	0.82	0.78	0.75	0.81	0.77	0.74	0.79	0.76	0.73	0.77	0.75	0.72	0.76	0.74	0.72	0.71
5	0.78	0.74	0.71	0.77	0.73	0.70	0.76	0.72	0.70	0.74	0.71	0.69	0.73	0.71	0.68	0.67
6	0.74	0.70	0.67	0.74	0.70	0.67	0.73	0.69	0.66	0.71	0.68	0.66	0.70	0.68	0.66	0.64
7	0.71	0.67	0.64	0.71	0.67	0.64	0.70	0.66	0.63	0.69	0.66	0.63	0.68	0.65	0.63	0.62
8	0.68	0.64	0.61	0.68	0.64	0.61	0.67	0.63	0.61	0.66	0.63	0.60	0.65	0.62	0.60	0.59
9	0.66	0.61	0.59	0.65	0.61	0.58	0.64	0.61	0.58	0.64	0.60	0.58	0.63	0.60	0.58	0.57
10	0.63	0.59	0.56	0.63	0.59	0.56	0.62	0.58	0.56	0.61	0.58	0.56	0.61	0.58	0.56	0.55



Intensity data(cd)

C/γ(°)	0.0	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0
0.0	1659.40	1657.75	1623.61	1561.40	1483.77	1390.17	1309.24	1233.26	1156.73
45.0	1656.65	1646.19	1602.14	1519.01	1429.81	1332.92	1249.78	1173.25	1102.78
90.0	1657.20	1630.22	1561.95	1479.92	1382.47	1288.87	1200.78	1098.21	1030.82
135.0	1664.91	1650.04	1599.39	1519.01	1434.22	1335.12	1256.94	1190.32	1116.54
180.0	1659.40	1646.74	1596.64	1514.05	1414.40	1325.21	1249.78	1168.30	1097.49
225.0	1656.65	1652.24	1607.10	1537.73	1446.88	1337.32	1258.04	1166.65	1087.14
270.0	1657.20	1659.40	1637.38	1567.46	1489.83	1383.57	1286.67	1193.62	1094.52
315.0	1664.91	1673.71	1629.67	1564.70	1477.16	1370.35	1289.97	1200.78	1096.94
360.0	1659.40	1657.75	1623.61	1561.40	1483.77	1390.17	1309.24	1233.26	1156.73
C/γ(°)	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0
0.0	1086.81	992.67	892.46	766.94	619.94	418.98	284.64	131.20	56.32
45.0	1033.96	928.25	826.40	701.97	528.54	344.65	200.96	84.68	39.75
90.0	956.22	859.65	742.49	617.73	454.38	295.27	160.82	71.96	40.30
135.0	1034.51	951.93	853.92	720.69	562.13	379.89	278.59	108.08	52.80
180.0	1026.47	949.89	867.52	740.62	575.12	410.94	241.97	114.35	62.71
225.0	1019.48	953.80	877.98	788.85	635.24	463.96	302.98	161.54	83.52
270.0	1005.88	932.10	847.87	755.37	640.31	477.34	325.38	191.54	99.82
315.0	1054.99	980.39	886.57	767.60	607.93	436.65	274.57	140.45	70.53
360.0	1086.81	992.67	892.46	766.94	619.94	418.98	284.64	131.20	56.32
C/γ(°)	36.0	38.0	40.0	42.0	44.0	46.0	48.0	50.0	52.0
0.0	31.66	18.22	13.05	10.35	9.08	8.20	7.49	6.94	6.61
45.0	24.78	15.58	11.89	9.91	8.86	7.93	7.43	6.99	6.50
90.0	25.71	17.29	12.88	11.01	9.63	8.81	8.15	7.49	7.10
135.0	30.34	20.32	13.65	10.85	9.63	8.70	8.04	7.49	7.05
180.0	35.68	22.46	14.70	11.34	9.91	9.03	8.20	7.65	7.16
225.0	48.95	30.39	18.72	13.65	11.07	9.69	8.70	7.82	7.32
270.0	60.56	36.12	23.45	16.46	12.88	10.63	9.47	8.42	7.71
315.0	38.81	22.96	15.91	12.00	9.86	8.64	7.82	7.21	6.77
360.0	31.66	18.22	13.05	10.35	9.08	8.20	7.49	6.94	6.61
C/γ(°)	54.0	56.0	58.0	60.0	62.0	64.0	66.0	68.0	70.0
0.0	6.22	6.00	5.78	5.51	5.40	5.29	5.12	5.01	4.90
45.0	6.22	5.95	5.73	5.56	5.40	5.18	5.07	4.90	4.73
90.0	6.72	6.44	6.06	5.84	5.73	5.56	5.29	5.12	5.01
135.0	6.61	6.33	6.06	5.78	5.62	5.40	5.23	5.12	5.01
180.0	6.66	6.33	6.11	5.95	5.67	5.45	5.40	5.18	5.07
225.0	6.83	6.44	6.17	5.89	5.62	5.45	5.29	5.07	4.96
270.0	7.27	6.77	6.44	6.11	5.89	5.67	5.45	5.34	5.12
315.0	6.28	6.06	5.78	5.56	5.45	5.23	5.01	4.84	4.62
360.0	6.22	6.00	5.78	5.51	5.40	5.29	5.12	5.01	4.90
C/γ(°)	72.0	74.0	76.0	78.0	80.0	82.0	84.0	86.0	88.0
0.0	4.73	4.62	4.51	4.35	4.24	4.07	3.96	3.80	3.52
45.0	4.62	4.51	4.35	4.24	4.07	3.96	3.85	3.63	3.41
90.0	4.79	4.62	4.51	4.35	4.07	3.96	3.85	3.58	3.41
135.0	4.84	4.68	4.62	4.46	4.24	4.18	3.91	3.80	3.63
180.0	5.01	4.79	4.68	4.57	4.29	4.18	4.02	3.85	3.74
225.0	4.79	4.62	4.51	4.46	4.24	4.07	4.02	3.80	3.52
270.0	4.96	4.90	4.62	4.51	4.35	4.18	4.02	3.91	3.52
315.0	4.40	4.13	3.91	3.80	3.74	3.80	3.85	3.58	3.52
360.0	4.73	4.62	4.51	4.35	4.24	4.07	3.96	3.80	3.52



Intensity data(cd)

<b>C/γ(°)</b>	<b>90.0</b>
<b>0.0</b>	<b>3.47</b>
<b>45.0</b>	<b>3.41</b>
<b>90.0</b>	<b>3.41</b>
<b>135.0</b>	<b>3.47</b>
<b>180.0</b>	<b>3.41</b>
<b>225.0</b>	<b>3.47</b>
<b>270.0</b>	<b>3.47</b>
<b>315.0</b>	<b>3.47</b>
<b>360.0</b>	<b>3.47</b>