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## NATA

LumCAT: LM01D03040AE

Luminaire:

Report No: NATA0100

Test No: GC2018122603

LampCAT: LUMILEDS LUXEON 1202S

Lamp flux(lm): 1218.0

Number of Lamps: 1

Length(mm): 30

Phm Type: C

Voltage(V): 36.7000

Current(A): 0.2500

Power (W): 9.1750

PF: 0.0000

Ballast type: DC

Width(mm): 30

Height(mm): 0

## Photometric Results

Lumens(lm): 1108.38

Efficiency(%): 91.00%

Lumens(lm)/Power(W): 121.87

Central intensity(cd): 1818.281

Maximum intensity(cd): 1818.281

Angle of maximum intensity: C=0.0  $\gamma$ =0.0

Beam Angle(50%Imax): [C0/180]Total=40.5

[C90/270]Total=40.5

Field angle(10%Imax): [C0/180]Total=75.7

[C90/270]Total=75.7

Maximum s/h(1/2): C0\_180=0.65 C90\_270=0.65

Maximum s/h(1/4): C0\_180=0.66 C90\_270=0.66

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 91.81%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 94.287%

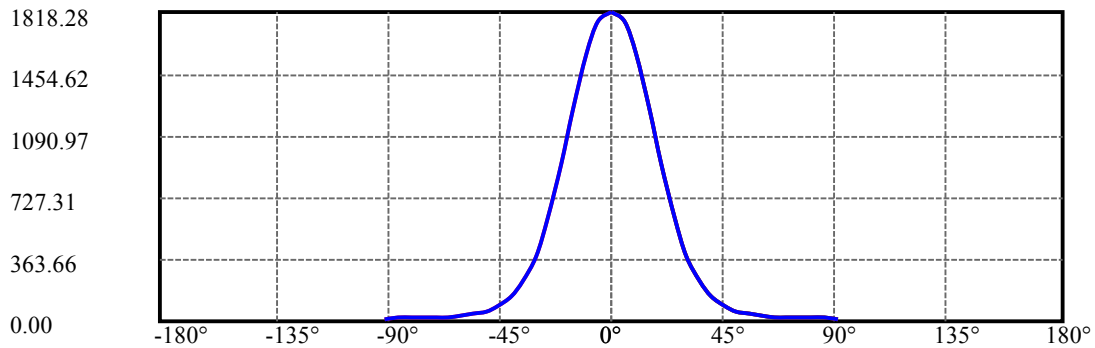
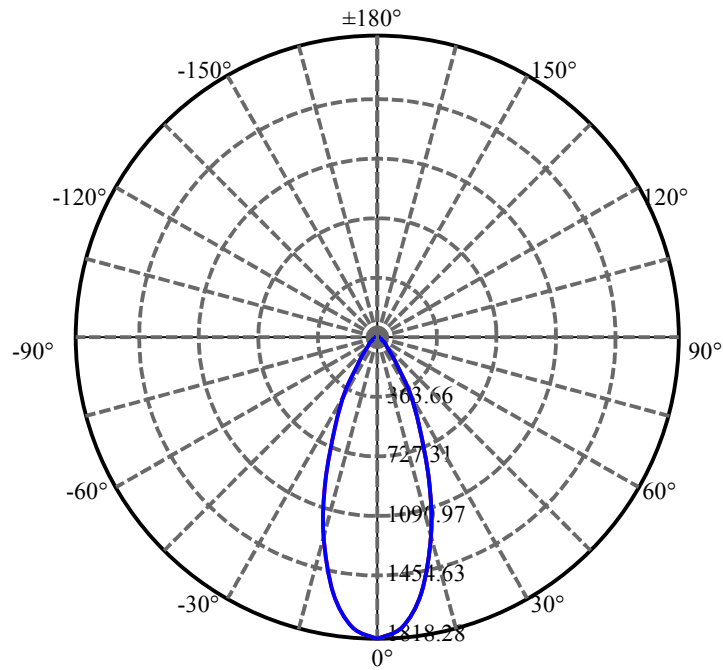
| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0                | 1818.281      | 10.874      | 10.874    | .893%       | .981%      |
| 5.0                | 1758.586      | 84.013      | 94.887    | 6.898%      | 8.561%     |
| 10.0               | 1565.438      | 149.003     | 243.89    | 12.233%     | 22.004%    |
| 15.0               | 1238.203      | 175.662     | 419.552   | 14.422%     | 37.853%    |
| 20.0               | 924.019       | 173.230     | 592.782   | 14.222%     | 53.482%    |
| 25.0               | 605.243       | 140.206     | 732.988   | 11.511%     | 66.132%    |
| 30.0               | 383.027       | 104.976     | 837.964   | 8.619%      | 75.603%    |
| 35.0               | 232.059       | 72.959      | 910.923   | 5.990%      | 82.185%    |
| 40.0               | 144.345       | 50.858      | 961.781   | 4.176%      | 86.774%    |
| 45.0               | 89.360        | 34.635      | 996.416   | 2.844%      | 89.899%    |
| 50.0               | 58.317        | 24.487      | 1020.903  | 2.010%      | 92.108%    |
| 55.0               | 42.694        | 19.170      | 1040.073  | 1.574%      | 93.838%    |
| 60.0               | 30.002        | 14.242      | 1054.315  | 1.169%      | 95.123%    |
| 65.0               | 21.790        | 10.825      | 1065.14   | .889%       | 96.099%    |
| 70.0               | 19.245        | 9.912       | 1075.052  | .814%       | 96.994%    |
| 75.0               | 18.759        | 9.932       | 1084.985  | .815%       | 97.890%    |
| 80.0               | 20.897        | 11.280      | 1096.265  | .926%       | 98.907%    |
| 85.0               | 17.191        | 9.387       | 1105.653  | .771%       | 99.754%    |
| 90.0               | 9.935         | 2.723       | 1108.375  | .224%       | 100.000%   |

## ZONAL LUMEN SUMMARY

| Zone    | Lumens  | %Lamp  | %Fixt   |
|---------|---------|--------|---------|
| 0-30    | 837.96  | 68.80% | 75.60%  |
| 0-40    | 961.78  | 78.96% | 86.77%  |
| 0-60    | 1054.32 | 86.56% | 95.12%  |
| 0-90    | 1105.65 | 90.78% | 99.75%  |
| 0-120   | 1105.65 | 90.78% | 99.75%  |
| 0-180   | 1108.38 | 91.00% | 100.00% |
| 60-90   | 65.58   | 5.38%  | 5.92%   |
| 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%   |
| 0-33.34 | 886.70  | 72.80% | 80.00%  |

## ZONAL LUMEN SUMMARY

|         |        |
|---------|--------|
| 0-10    | 243.89 |
| 10-20   | 348.89 |
| 20-30   | 245.18 |
| 30-40   | 123.82 |
| 40-50   | 59.12  |
| 50-60   | 33.41  |
| 60-70   | 20.74  |
| 70-80   | 21.21  |
| 80-90   | 9.39   |
| 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: —————

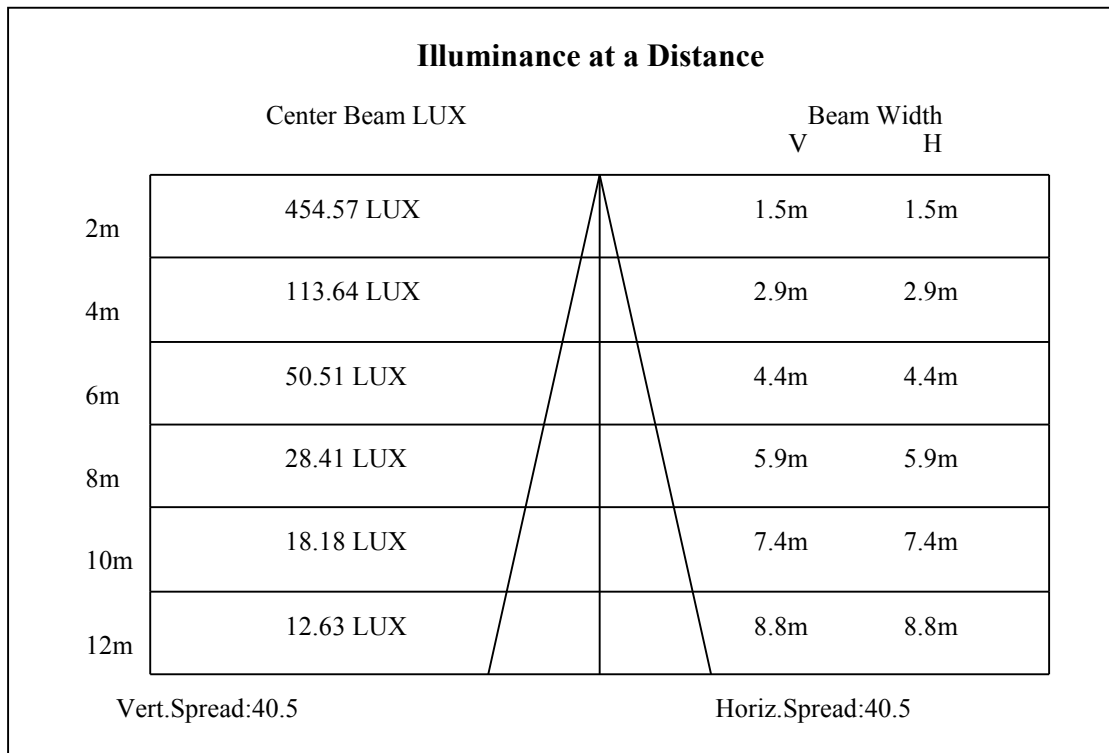
C90/C270: —————

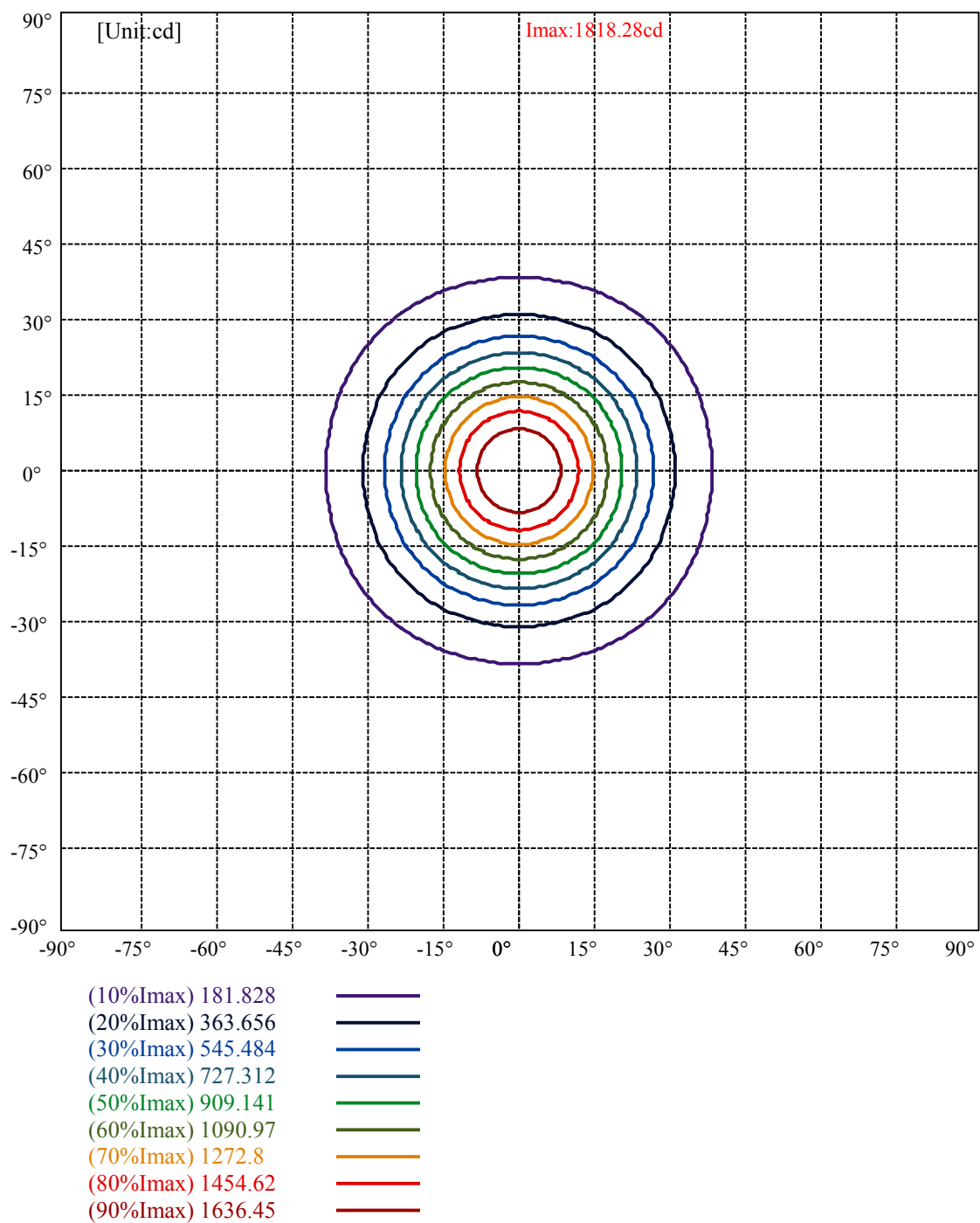
Field angle(10%Imax):C0/180Left:37.9 Right:37.9

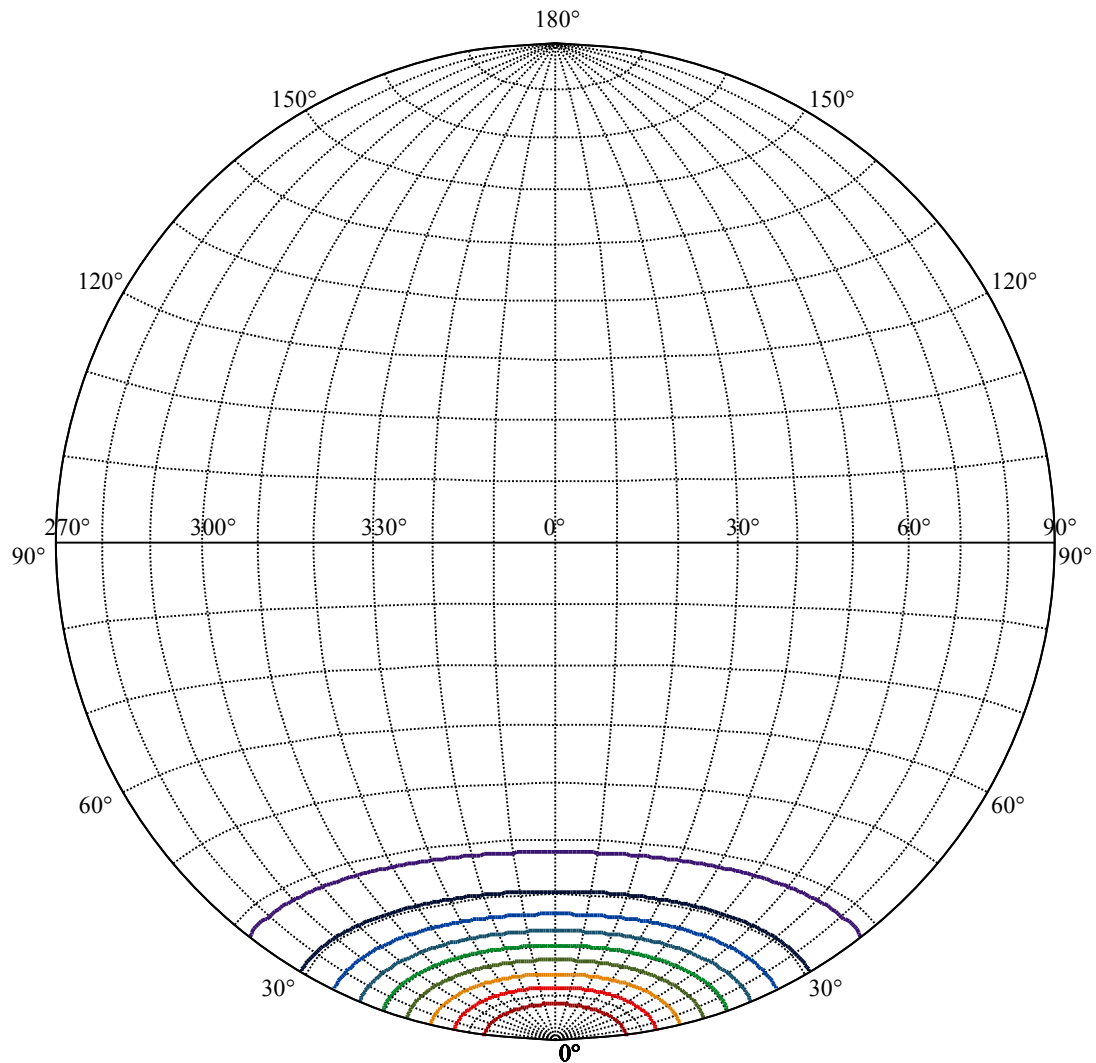
:C90/270Left:37.9 Right:37.9

Beam Angle(50%Imax):C0/180Left:20.2 Right:20.2

:C90/270Left:20.2 Right:20.2







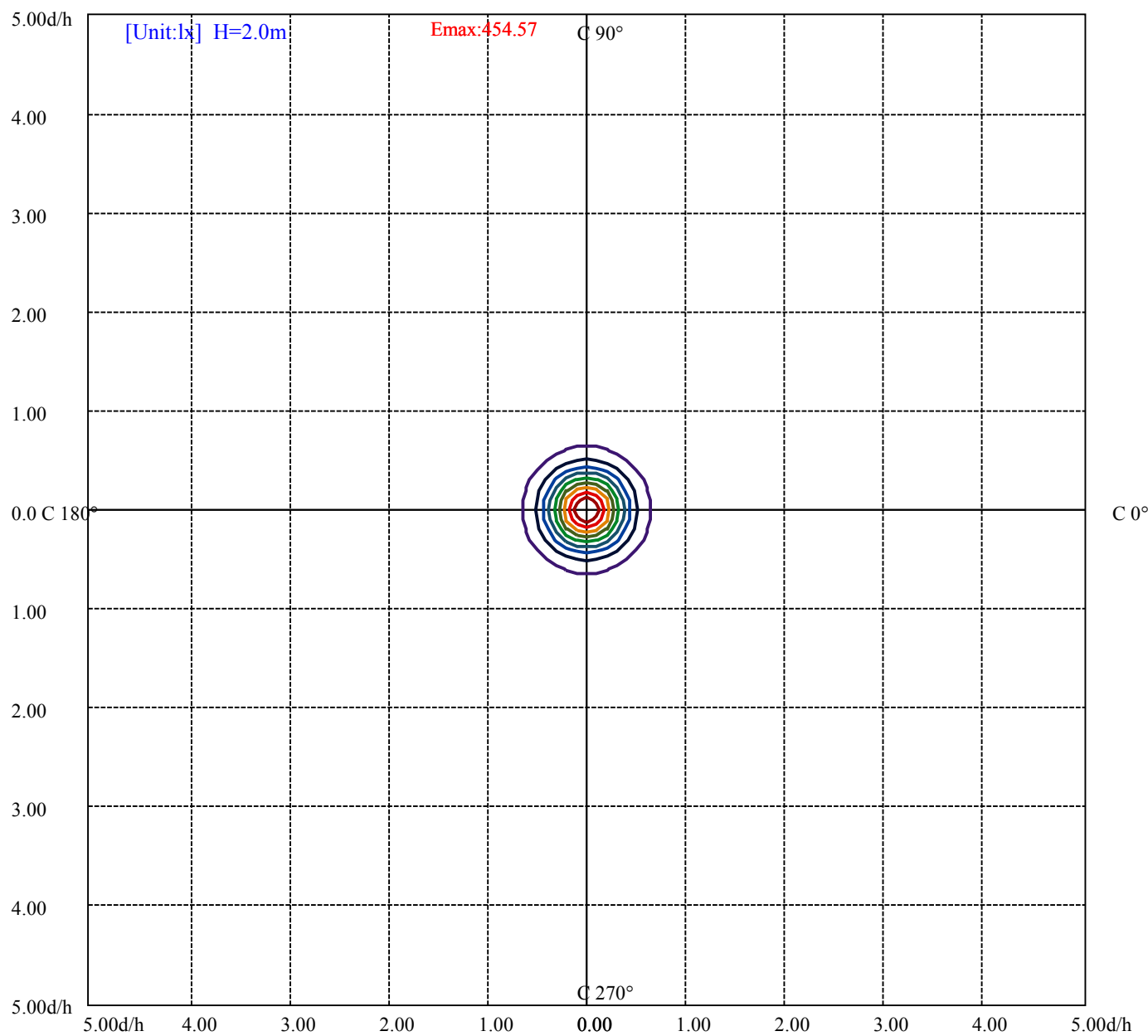
House

[Unit:cd]

Road

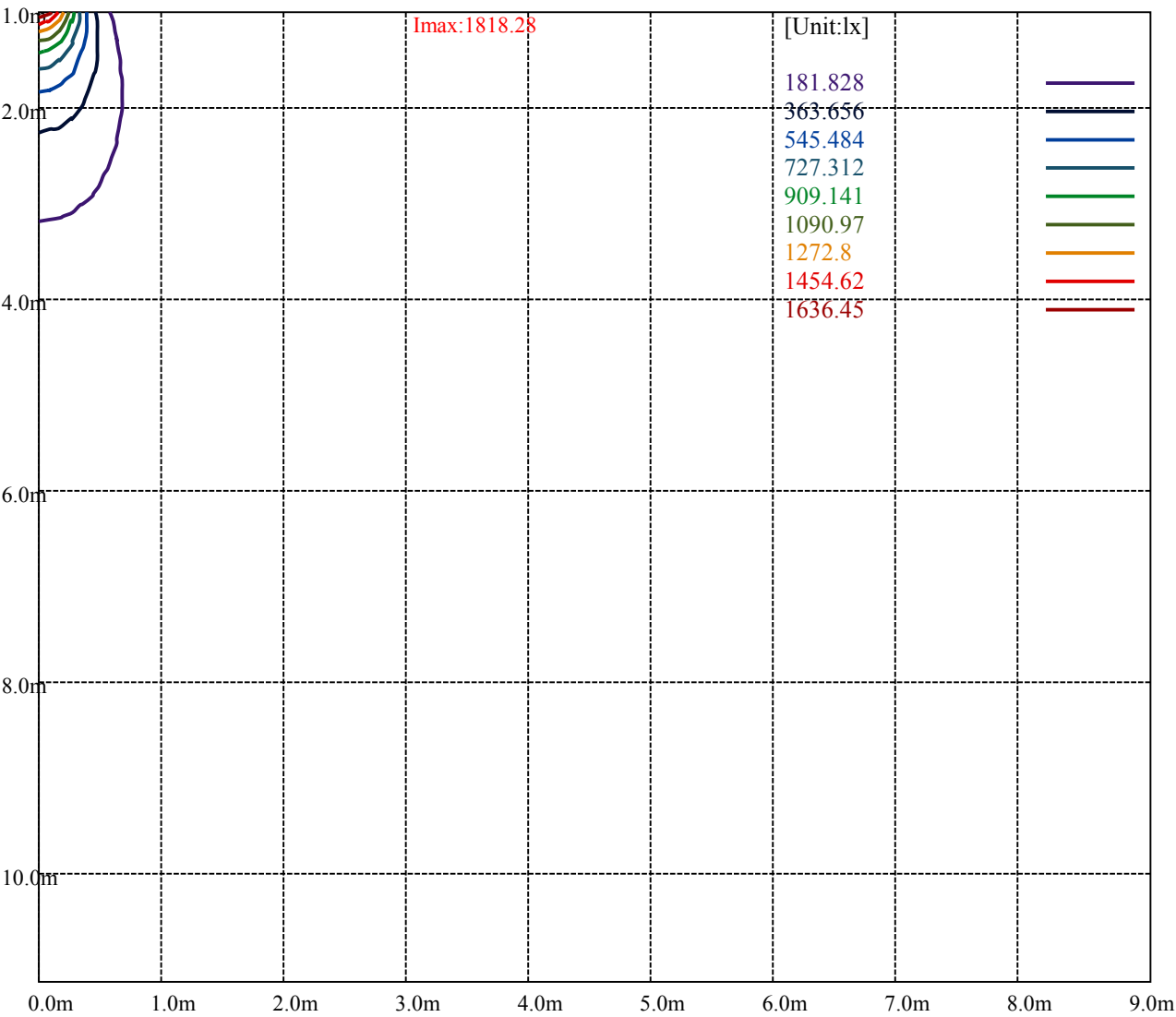
**Imax:1818.28**

|           |         |   |
|-----------|---------|---|
| (10%Imax) | 181.828 | — |
| (20%Imax) | 363.656 | — |
| (30%Imax) | 545.484 | — |
| (40%Imax) | 727.312 | — |
| (50%Imax) | 909.141 | — |
| (60%Imax) | 1090.97 | — |
| (70%Imax) | 1272.8  | — |
| (80%Imax) | 1454.62 | — |
| (90%Imax) | 1636.45 | — |



(10%Emax) 45.457  
(20%Emax) 90.914  
(30%Emax) 136.371  
(40%Emax) 181.828  
(50%Emax) 227.285  
(60%Emax) 272.7425  
(70%Emax) 318.2  
(80%Emax) 363.655  
(90%Emax) 409.1125





Luminance Table

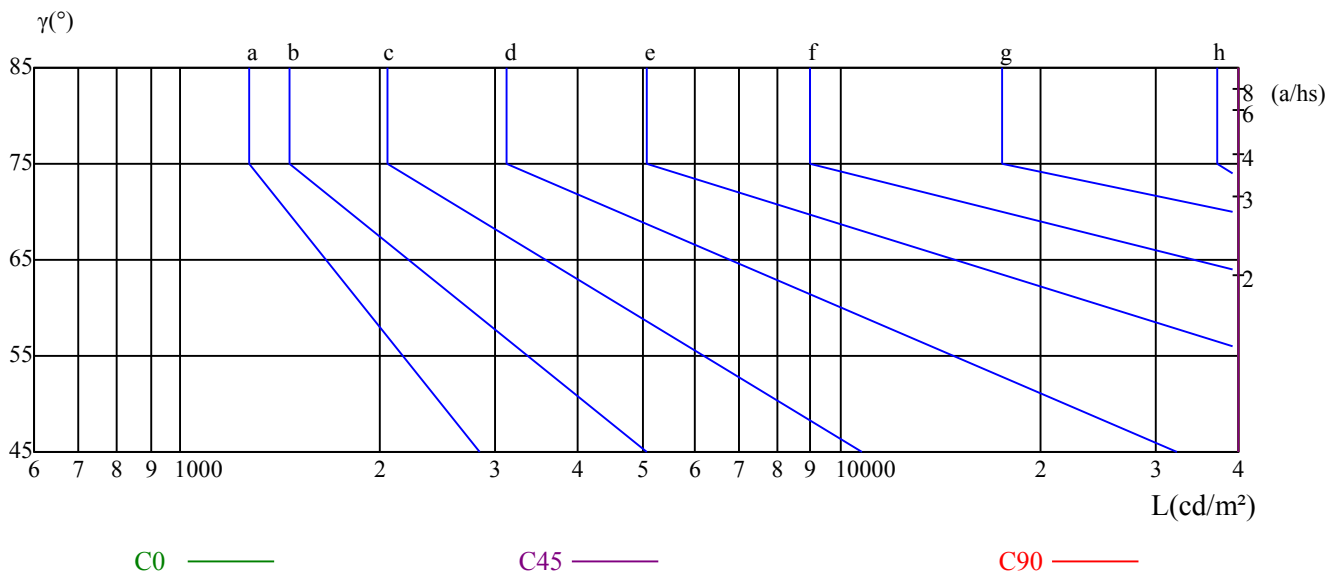
| $\gamma$ | 45     | 50     | 55    | 60    | 65    | 70    | 75    | 80     | 85     |
|----------|--------|--------|-------|-------|-------|-------|-------|--------|--------|
| C0       | 140416 | 100806 | 82705 | 66672 | 57288 | 62519 | 80534 | 133711 | 219166 |
| C45      | 140416 | 100806 | 82705 | 66672 | 57288 | 62519 | 80534 | 133711 | 219166 |
| C90      | 140416 | 100806 | 82705 | 66672 | 57288 | 62519 | 80534 | 133711 | 219166 |

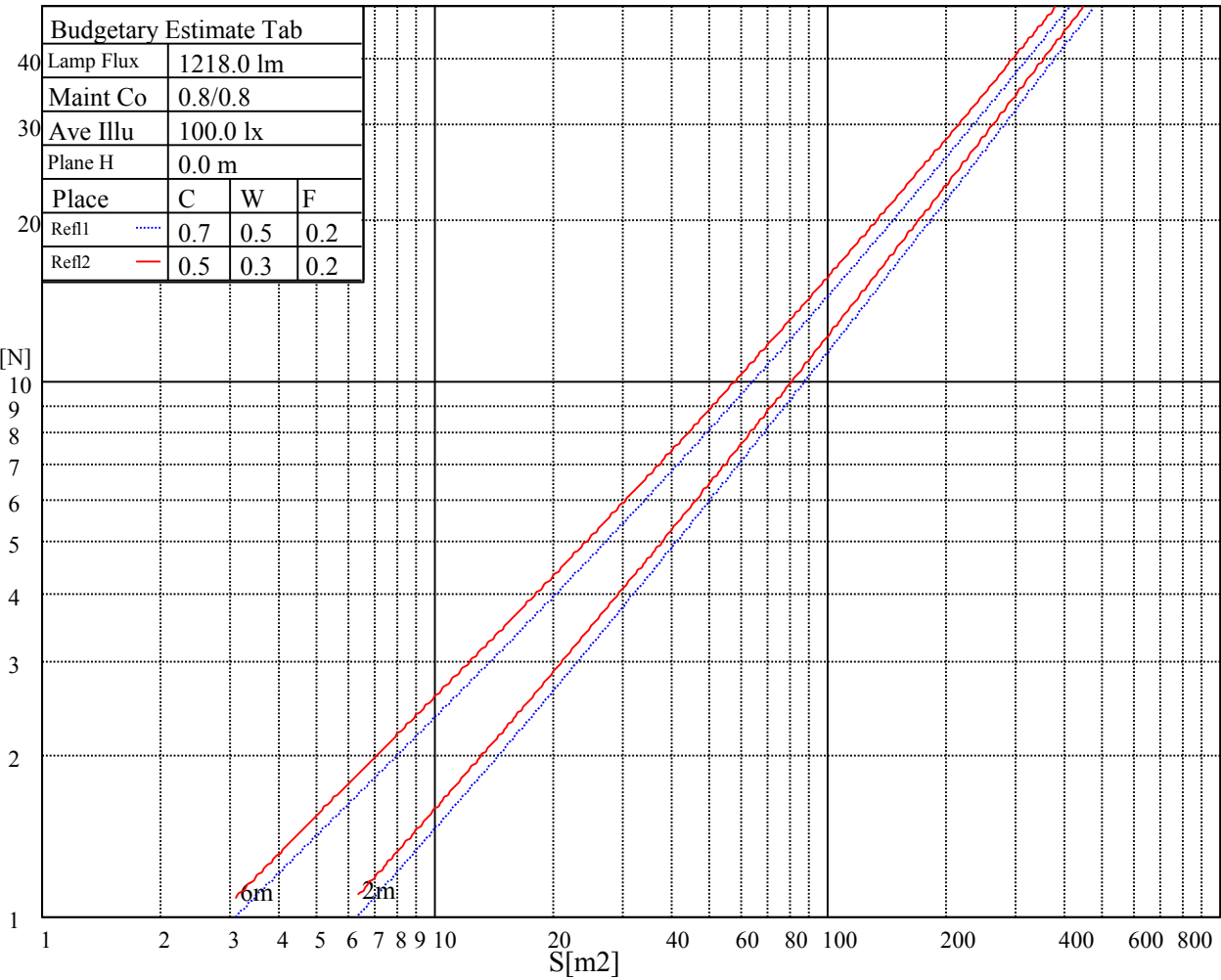
| L(Hor)(65) | L(Ver)(65) | L45(65) | L(Hor)(75) | L(Ver)(75) | L45(75) | L(Hor)(85) | L(Ver)(85) | L45(85) |
|------------|------------|---------|------------|------------|---------|------------|------------|---------|
| 57288      | 57288      | 57288   | 80534      | 80534      | 80534   | 219166     | 219166     | 219166  |

Glare Table

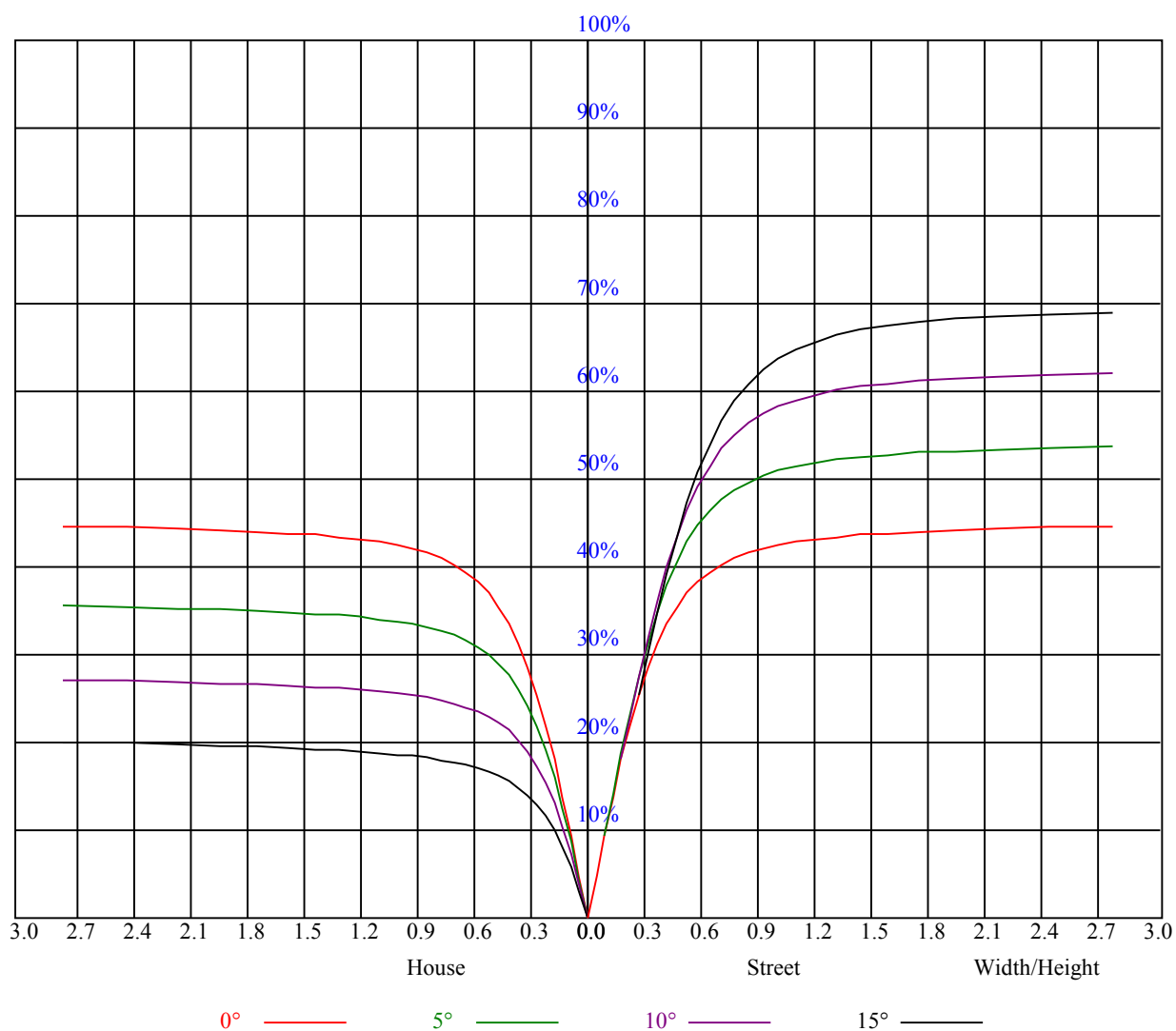
| Glare | Quality | Service Values Illuminance(lx) |      |      |            |            |            |            |            |
|-------|---------|--------------------------------|------|------|------------|------------|------------|------------|------------|
| 1.15  | A       | 2000            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

Luminance Limiting Curve





| RHOC | 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    | 1.09                                    | 1.09 | 1.09 | 1.07 | 1.07 | 1.07 | 1.02 | 1.02 | 1.02 | 0.98 | 0.98 | 0.98 | 0.94 | 0.94 | 0.94 | 0.92 |
| 1    | 1.00                                    | 0.97 | 0.95 | 0.98 | 0.95 | 0.93 | 0.94 | 0.92 | 0.90 | 0.91 | 0.89 | 0.88 | 0.88 | 0.86 | 0.85 | 0.83 |
| 2    | 0.93                                    | 0.89 | 0.86 | 0.91 | 0.88 | 0.85 | 0.88 | 0.85 | 0.83 | 0.86 | 0.83 | 0.81 | 0.83 | 0.81 | 0.79 | 0.78 |
| 3    | 0.87                                    | 0.82 | 0.79 | 0.86 | 0.81 | 0.78 | 0.83 | 0.80 | 0.77 | 0.81 | 0.78 | 0.75 | 0.79 | 0.76 | 0.74 | 0.73 |
| 4    | 0.82                                    | 0.77 | 0.73 | 0.81 | 0.76 | 0.72 | 0.79 | 0.75 | 0.72 | 0.77 | 0.74 | 0.71 | 0.75 | 0.72 | 0.70 | 0.69 |
| 5    | 0.77                                    | 0.72 | 0.68 | 0.77 | 0.72 | 0.68 | 0.75 | 0.71 | 0.67 | 0.73 | 0.70 | 0.67 | 0.72 | 0.69 | 0.66 | 0.65 |
| 6    | 0.73                                    | 0.68 | 0.64 | 0.73 | 0.68 | 0.64 | 0.71 | 0.67 | 0.64 | 0.70 | 0.66 | 0.63 | 0.69 | 0.65 | 0.63 | 0.61 |
| 7    | 0.70                                    | 0.65 | 0.61 | 0.69 | 0.64 | 0.61 | 0.68 | 0.64 | 0.60 | 0.67 | 0.63 | 0.60 | 0.66 | 0.62 | 0.60 | 0.58 |
| 8    | 0.67                                    | 0.61 | 0.58 | 0.66 | 0.61 | 0.58 | 0.65 | 0.61 | 0.57 | 0.64 | 0.60 | 0.57 | 0.63 | 0.60 | 0.57 | 0.56 |
| 9    | 0.64                                    | 0.59 | 0.55 | 0.63 | 0.58 | 0.55 | 0.62 | 0.58 | 0.55 | 0.62 | 0.58 | 0.55 | 0.61 | 0.57 | 0.55 | 0.53 |
| 10   | 0.61                                    | 0.56 | 0.53 | 0.61 | 0.56 | 0.53 | 0.60 | 0.56 | 0.53 | 0.59 | 0.55 | 0.52 | 0.59 | 0.55 | 0.52 | 0.51 |



## Intensity data(cd)

| C/ $\gamma$ (°) | 0.0     | 5.0     | 10.0    | 15.0    | 20.0    | 25.0   | 30.0   | 35.0   | 40.0   |
|-----------------|---------|---------|---------|---------|---------|--------|--------|--------|--------|
| 0.0             | 1820.81 | 1802.81 | 1667.25 | 1404.56 | 1098.56 | 715.50 | 452.25 | 285.19 | 171.84 |
| 45.0            | 1810.69 | 1803.38 | 1650.38 | 1421.44 | 1064.25 | 711.00 | 467.44 | 290.81 | 171.90 |
| 90.0            | 1820.81 | 1762.31 | 1544.63 | 1212.75 | 914.74  | 610.88 | 381.94 | 229.61 | 146.14 |
| 135.0           | 1820.81 | 1750.50 | 1558.13 | 1265.06 | 914.06  | 620.44 | 380.81 | 225.51 | 146.14 |
| 180.0           | 1820.81 | 1737.00 | 1517.63 | 1121.74 | 840.26  | 529.88 | 337.16 | 207.68 | 130.33 |
| 225.0           | 1810.69 | 1694.25 | 1487.81 | 1118.81 | 762.58  | 497.48 | 303.64 | 180.62 | 119.19 |
| 270.0           | 1820.81 | 1752.19 | 1540.13 | 1248.75 | 898.88  | 578.81 | 372.38 | 218.59 | 134.10 |
| 315.0           | 1820.81 | 1766.25 | 1557.56 | 1112.51 | 898.82  | 577.97 | 368.61 | 218.48 | 135.11 |
| 360.0           | 1820.81 | 1802.81 | 1667.25 | 1404.56 | 1098.56 | 715.50 | 452.25 | 285.19 | 171.84 |

| C/ $\gamma$ (°) | 45.0   | 50.0  | 55.0  | 60.0  | 65.0  | 70.0  | 75.0  | 80.0  | 85.0  |
|-----------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.0             | 108.11 | 69.75 | 47.64 | 35.38 | 25.76 | 21.71 | 18.96 | 17.27 | 16.20 |
| 45.0            | 108.00 | 69.53 | 44.94 | 34.37 | 24.24 | 20.36 | 18.79 | 17.44 | 15.30 |
| 90.0            | 88.43  | 58.95 | 44.33 | 28.41 | 20.42 | 18.23 | 20.87 | 29.14 | 25.20 |
| 135.0           | 85.16  | 54.73 | 42.75 | 29.08 | 20.59 | 18.73 | 16.82 | 19.41 | 16.26 |
| 180.0           | 80.44  | 56.14 | 39.32 | 30.43 | 22.95 | 20.14 | 18.17 | 18.68 | 17.72 |
| 225.0           | 73.80  | 47.42 | 34.20 | 25.09 | 19.29 | 17.33 | 15.30 | 14.96 | 15.47 |
| 270.0           | 86.79  | 55.74 | 46.58 | 28.24 | 20.48 | 18.73 | 23.29 | 29.98 | 16.48 |
| 315.0           | 84.15  | 54.28 | 41.79 | 29.03 | 20.59 | 18.73 | 17.89 | 20.31 | 14.91 |
| 360.0           | 108.11 | 69.75 | 47.64 | 35.38 | 25.76 | 21.71 | 18.96 | 17.27 | 16.20 |

| C/ $\gamma$ (°) | 90.0  |
|-----------------|-------|
| 0.0             | 13.11 |
| 45.0            | 10.35 |
| 90.0            | 7.99  |
| 135.0           | 8.38  |
| 180.0           | 10.74 |
| 225.0           | 9.34  |
| 270.0           | 10.07 |
| 315.0           | 9.51  |
| 360.0           | 13.11 |