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## Nata

LumCAT: 3-2115-N  
Luminaire: 92.70.135.00  
Report No: NATA0100  
Test No: GC2018062717  
LampCAT: NICHIA NFCWD096B-V3  
Lamp flux(lm): 2274.7  
Number of Lamps: 1  
Length(mm): 81  
Phm Type: C

Voltage(V): 34.3000  
Current(A): 0.5100  
Power (W): 17.4930  
PF: 0.0000  
Ballast type: DC  
Width(mm): 81  
Height(mm): 0

## Photometric Results

Lumens(lm): 1952.63  
Efficiency(%): 85.84%  
Lumens(lm)/Power(W): 111.62  
Central intensity(cd): 13395.220  
Maximum intensity(cd): 13395.220  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=14.9  
[C90/270]Total=14.9  
Field angle(10%Imax): [C0/180]Total=39.5  
[C90/270]Total=39.5  
Maximum s/h(1/2): C0\_180=0.26 C90\_270=0.26  
Maximum s/h(1/4): C0\_180=0.29 C90\_270=0.29  
Up flux rate of lamp(%): 0.00%  
Down flux rate of lamp(%): 86.39%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 97.524%

| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0                | 13395.222     | 12.819      | 12.819    | .564%       | .656%      |
| 2.0                | 12861.891     | 98.444      | 111.263   | 4.328%      | 5.698%     |
| 4.0                | 10884.871     | 166.523     | 277.785   | 7.321%      | 14.226%    |
| 6.0                | 8390.761      | 192.354     | 470.139   | 8.456%      | 24.077%    |
| 8.0                | 6077.951      | 185.514     | 655.654   | 8.155%      | 33.578%    |
| 10.0               | 4432.371      | 168.800     | 824.453   | 7.421%      | 42.223%    |
| 12.0               | 3401.384      | 155.096     | 979.549   | 6.818%      | 50.166%    |
| 14.0               | 2614.408      | 138.712     | 1118.261  | 6.098%      | 57.269%    |
| 16.0               | 1994.969      | 120.598     | 1238.859  | 5.302%      | 63.446%    |
| 18.0               | 1603.242      | 108.654     | 1347.513  | 4.777%      | 69.010%    |
| 20.0               | 1302.084      | 97.669      | 1445.182  | 4.294%      | 74.012%    |
| 22.0               | 1082.849      | 88.963      | 1534.144  | 3.911%      | 78.568%    |
| 24.0               | 922.305       | 82.272      | 1616.417  | 3.617%      | 82.781%    |
| 26.0               | 798.043       | 76.724      | 1693.141  | 3.373%      | 86.711%    |
| 28.0               | 669.926       | 68.977      | 1762.118  | 3.032%      | 90.243%    |
| 30.0               | 491.488       | 53.895      | 1816.013  | 2.369%      | 93.003%    |
| 32.0               | 289.542       | 33.650      | 1849.663  | 1.479%      | 94.727%    |
| 34.0               | 126.740       | 15.543      | 1865.206  | .683%       | 95.523%    |
| 36.0               | 59.956        | 7.729       | 1872.935  | .340%       | 95.919%    |
| 38.0               | 43.880        | 5.925       | 1878.86   | .260%       | 96.222%    |
| 40.0               | 34.355        | 4.843       | 1883.703  | .213%       | 96.470%    |
| 42.0               | 28.079        | 4.121       | 1887.823  | .181%       | 96.681%    |
| 44.0               | 24.060        | 3.665       | 1891.489  | .161%       | 96.869%    |
| 46.0               | 21.362        | 3.370       | 1894.859  | .148%       | 97.041%    |
| 48.0               | 19.710        | 3.212       | 1898.071  | .141%       | 97.206%    |
| 50.0               | 18.444        | 3.099       | 1901.17   | .136%       | 97.365%    |
| 52.0               | 17.618        | 3.045       | 1904.214  | .134%       | 97.520%    |
| 54.0               | 17.123        | 3.038       | 1907.253  | .134%       | 97.676%    |
| 56.0               | 16.792        | 3.053       | 1910.306  | .134%       | 97.832%    |
| 58.0               | 16.572        | 3.082       | 1913.388  | .135%       | 97.990%    |
| 60.0               | 16.407        | 3.116       | 1916.504  | .137%       | 98.150%    |
| 62.0               | 16.297        | 3.156       | 1919.66   | .139%       | 98.311%    |
| 64.0               | 16.076        | 3.169       | 1922.829  | .139%       | 98.474%    |
| 66.0               | 15.085        | 3.022       | 1925.851  | .133%       | 98.629%    |
| 68.0               | 13.819        | 2.810       | 1928.661  | .124%       | 98.772%    |
| 70.0               | 12.883        | 2.655       | 1931.316  | .117%       | 98.908%    |
| 72.0               | 12.223        | 2.549       | 1933.866  | .112%       | 99.039%    |
| 74.0               | 11.782        | 2.484       | 1936.349  | .109%       | 99.166%    |

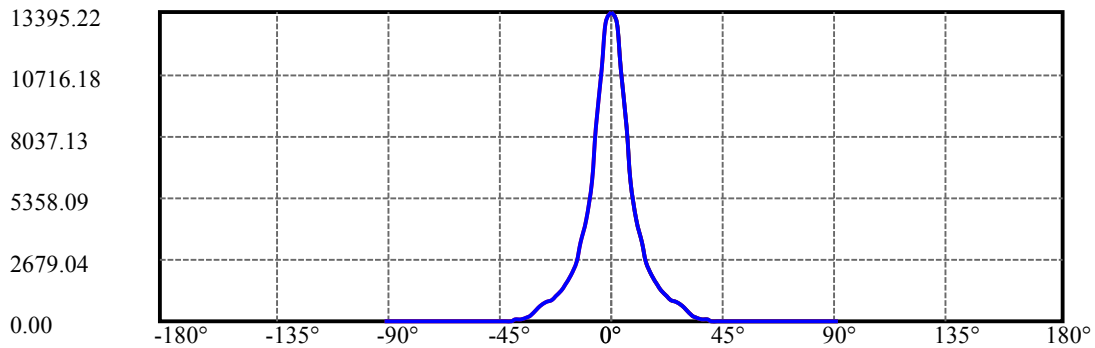
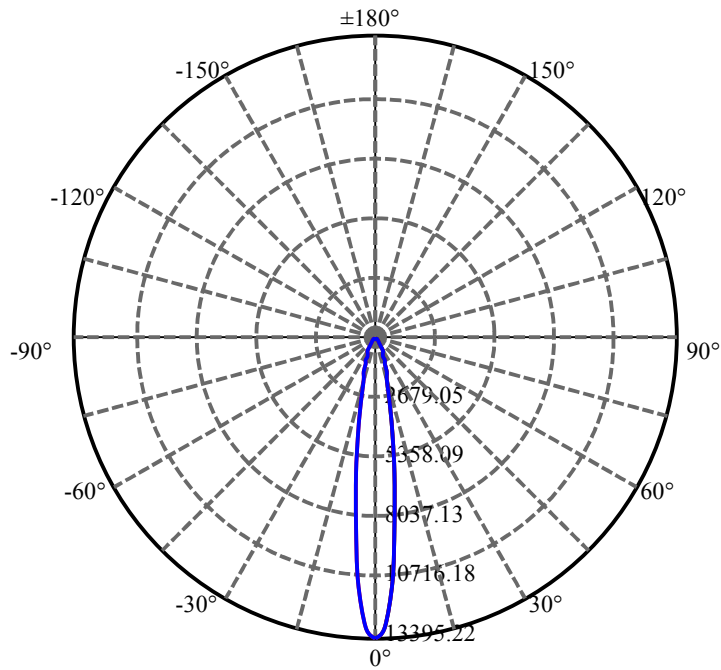
| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 76.0               | 11.342        | 2.413       | 1938.763  | .106%       | 99.290%    |
| 78.0               | 10.901        | 2.339       | 1941.101  | .103%       | 99.410%    |
| 80.0               | 10.461        | 2.259       | 1943.361  | .099%       | 99.525%    |
| 82.0               | 10.075        | 2.188       | 1945.549  | .096%       | 99.637%    |
| 84.0               | 9.690         | 2.113       | 1947.662  | .093%       | 99.746%    |
| 86.0               | 9.360         | 2.048       | 1949.71   | .090%       | 99.850%    |
| 88.0               | 8.974         | 1.967       | 1951.677  | .086%       | 99.951%    |
| 90.0               | 8.699         | 0.954       | 1952.631  | .042%       | 100.000%   |

## ZONAL LUMEN SUMMARY

| Zone    | Lumens  | %Lamp  | %Fixt   |
|---------|---------|--------|---------|
| 0-30    | 1816.01 | 79.83% | 93.00%  |
| 0-40    | 1883.70 | 82.81% | 96.47%  |
| 0-60    | 1916.50 | 84.25% | 98.15%  |
| 0-90    | 1951.68 | 85.80% | 99.95%  |
| 0-120   | 1951.68 | 85.80% | 99.95%  |
| 0-180   | 1952.63 | 85.84% | 100.00% |
| 60-90   | 38.29   | 1.68%  | 1.96%   |
| 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%   |
| 0-22.68 | 1562.11 | 68.67% | 80.00%  |

## ZONAL LUMEN SUMMARY

|         |        |
|---------|--------|
| 0-10    | 824.45 |
| 10-20   | 620.73 |
| 20-30   | 370.83 |
| 30-40   | 67.69  |
| 40-50   | 17.47  |
| 50-60   | 15.33  |
| 60-70   | 14.81  |
| 70-80   | 12.04  |
| 80-90   | 8.32   |
| 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: —————

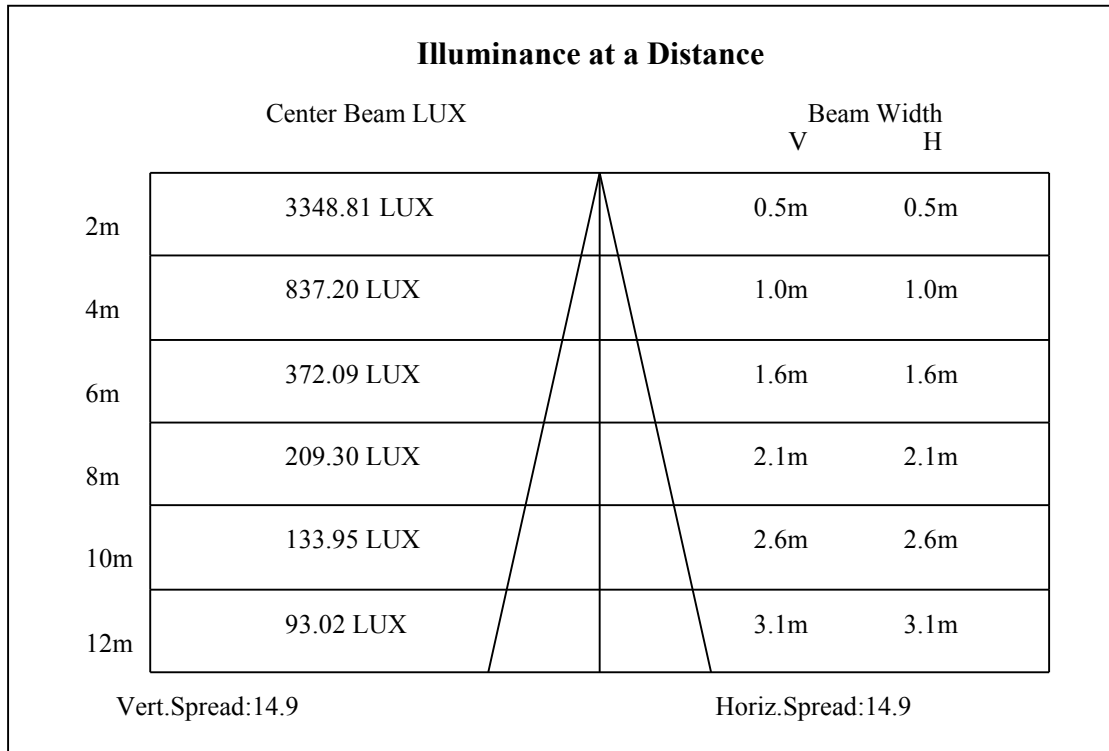
C90/C270: —————

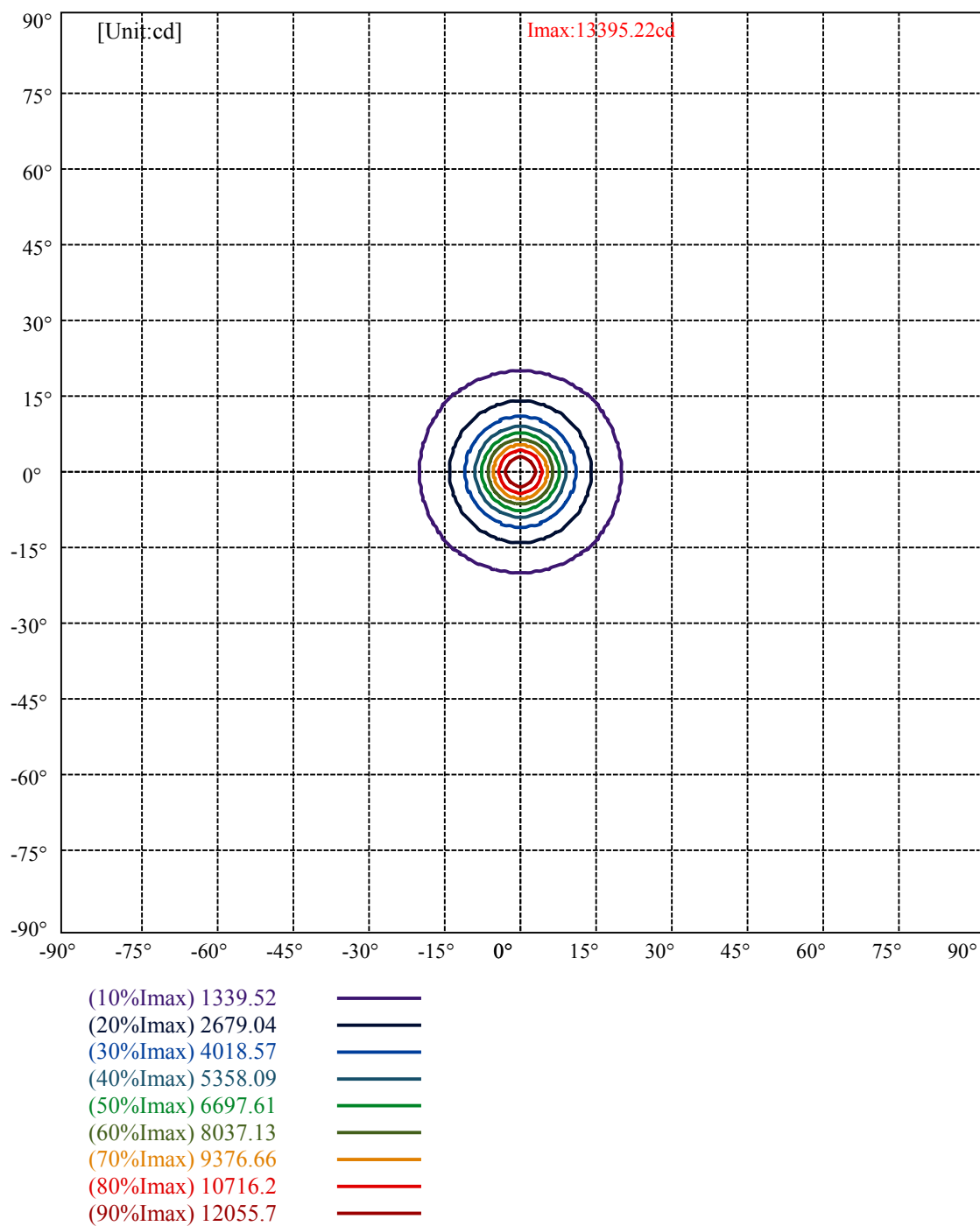
Field angle(10%Imax):C0/180Left:19.8 Right:19.8

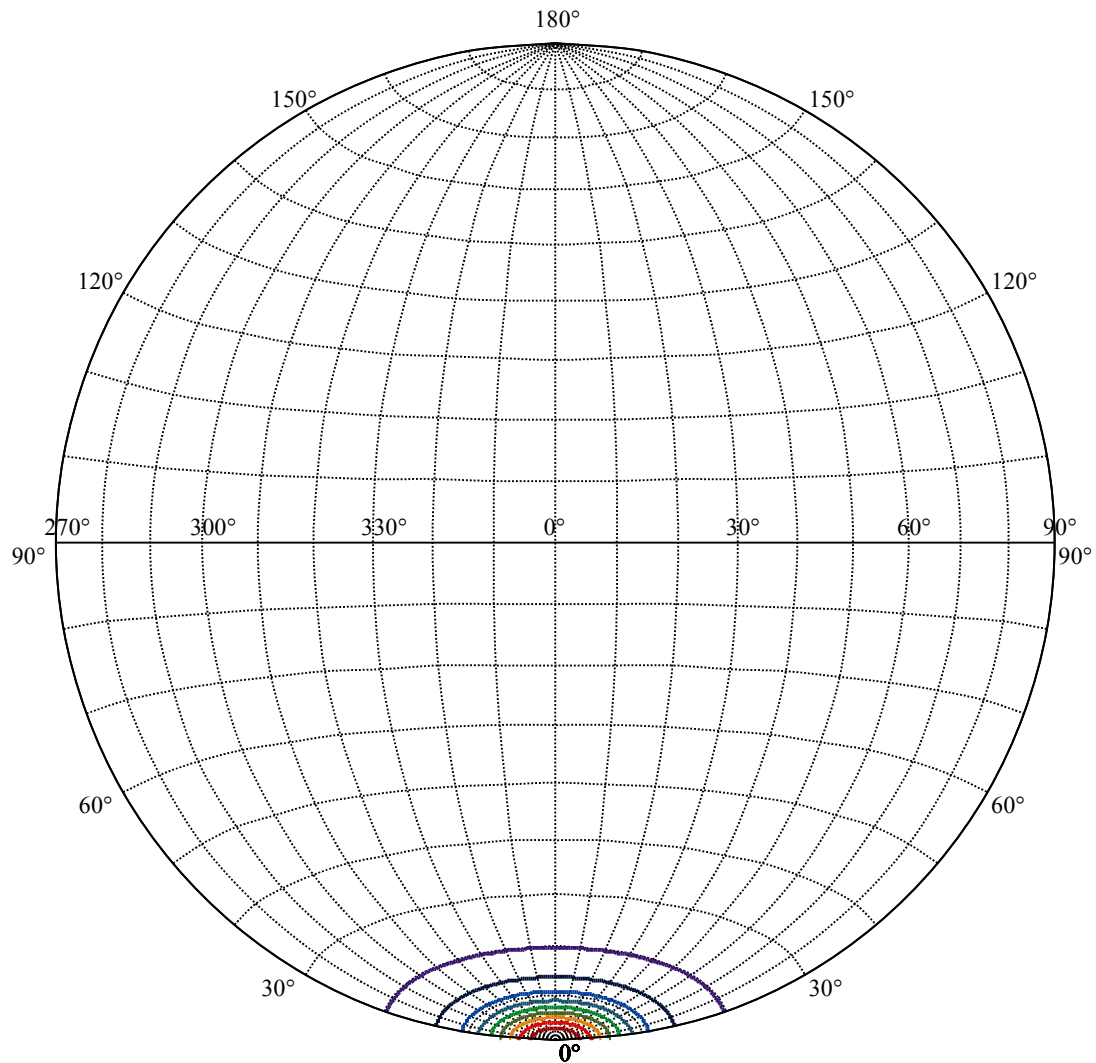
:C90/270Left:19.8 Right:19.8

Beam Angle(50%Imax):C0/180Left:7.5 Right:7.5

:C90/270Left:7.5 Right:7.5







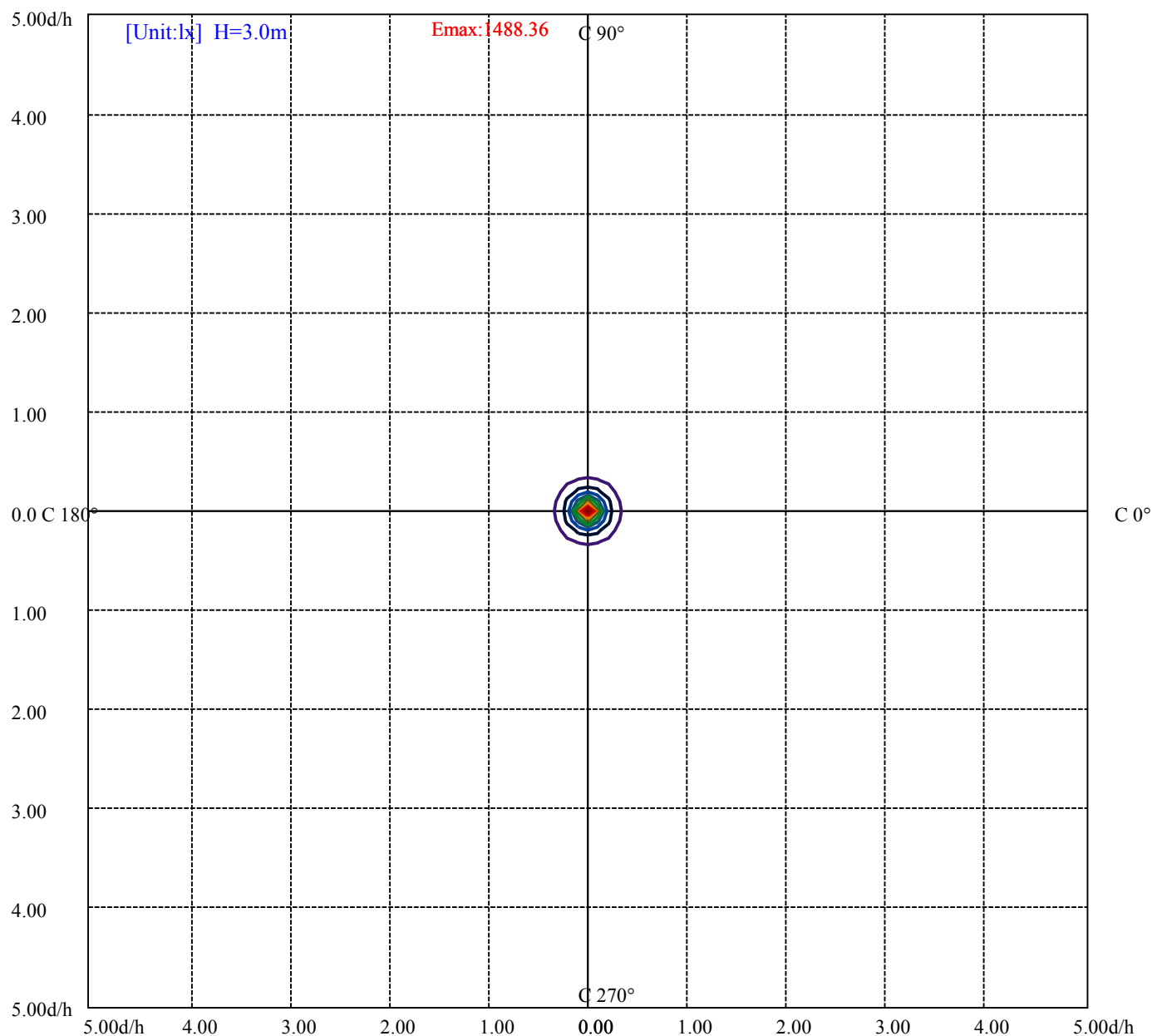
House

[Unit:cd]

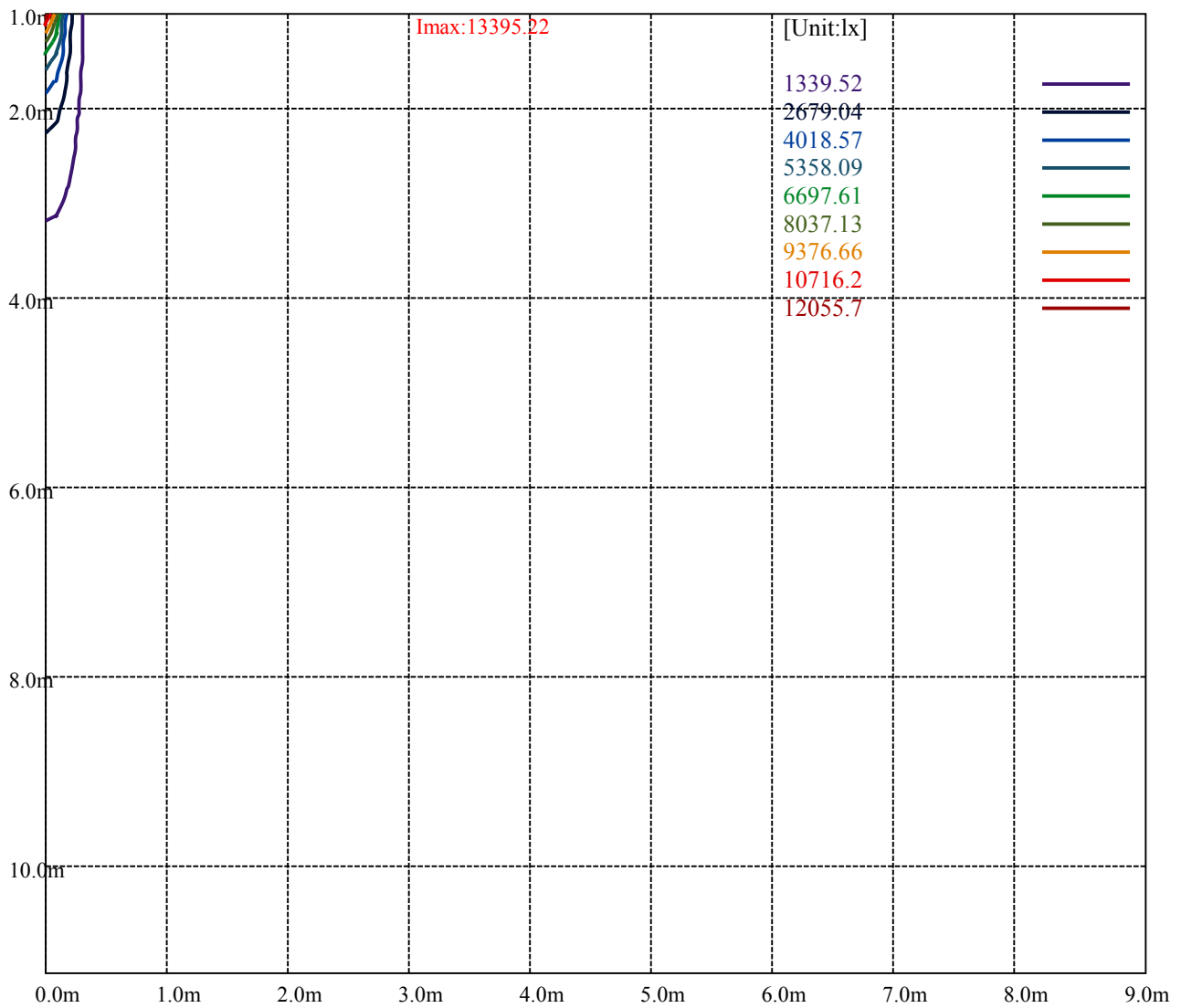
Road

**Imax:13395.22**

|           |         |   |
|-----------|---------|---|
| (10%Imax) | 1339.52 | — |
| (20%Imax) | 2679.04 | — |
| (30%Imax) | 4018.57 | — |
| (40%Imax) | 5358.09 | — |
| (50%Imax) | 6697.61 | — |
| (60%Imax) | 8037.13 | — |
| (70%Imax) | 9376.66 | — |
| (80%Imax) | 10716.2 | — |
| (90%Imax) | 12055.7 | — |



|           |          |   |
|-----------|----------|---|
| (10%Emax) | 148.8356 | — |
| (20%Emax) | 297.6711 | — |
| (30%Emax) | 446.5067 | — |
| (40%Emax) | 595.3411 | — |
| (50%Emax) | 744.1766 | — |
| (60%Emax) | 893.0122 | — |
| (70%Emax) | 1041.848 | — |
| (80%Emax) | 1190.678 | — |
| (90%Emax) | 1339.522 | — |



Luminance Table

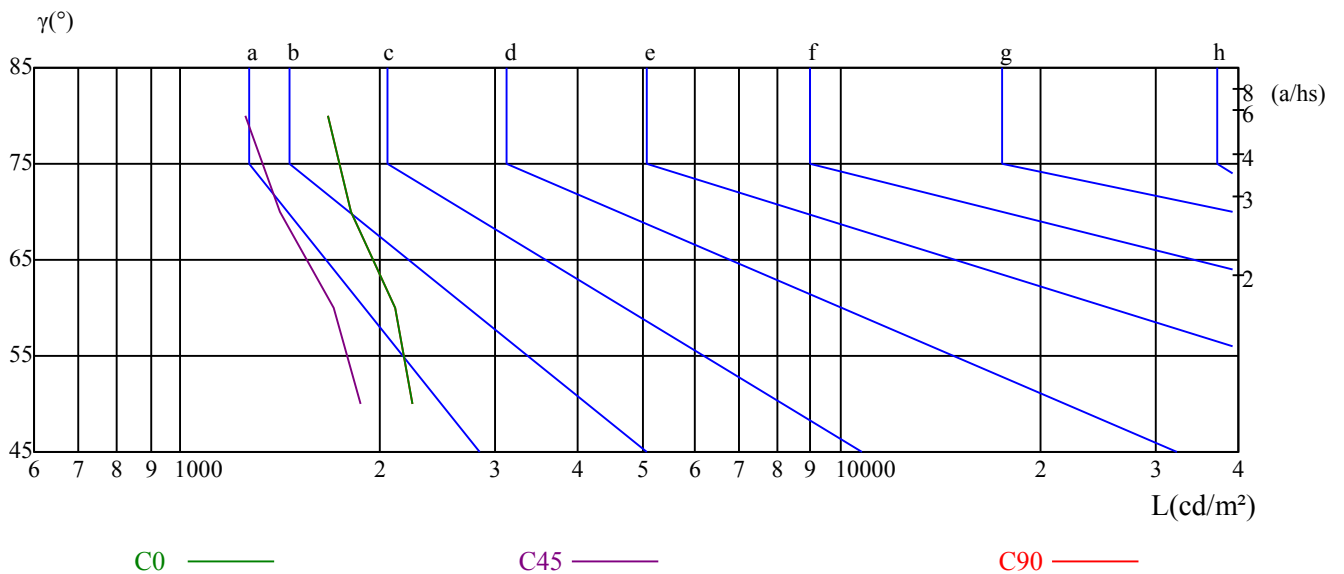
| $\gamma$ | 45 | 50   | 55 | 60   | 65 | 70   | 75 | 80   | 85 |
|----------|----|------|----|------|----|------|----|------|----|
| C0       | 0  | 2252 | 0  | 2112 | 0  | 1811 | 0  | 1675 | 0  |
| C45      | 0  | 1876 | 0  | 1704 | 0  | 1411 | 0  | 1251 | 0  |
| C90      | 0  | 2252 | 0  | 2112 | 0  | 1811 | 0  | 1675 | 0  |

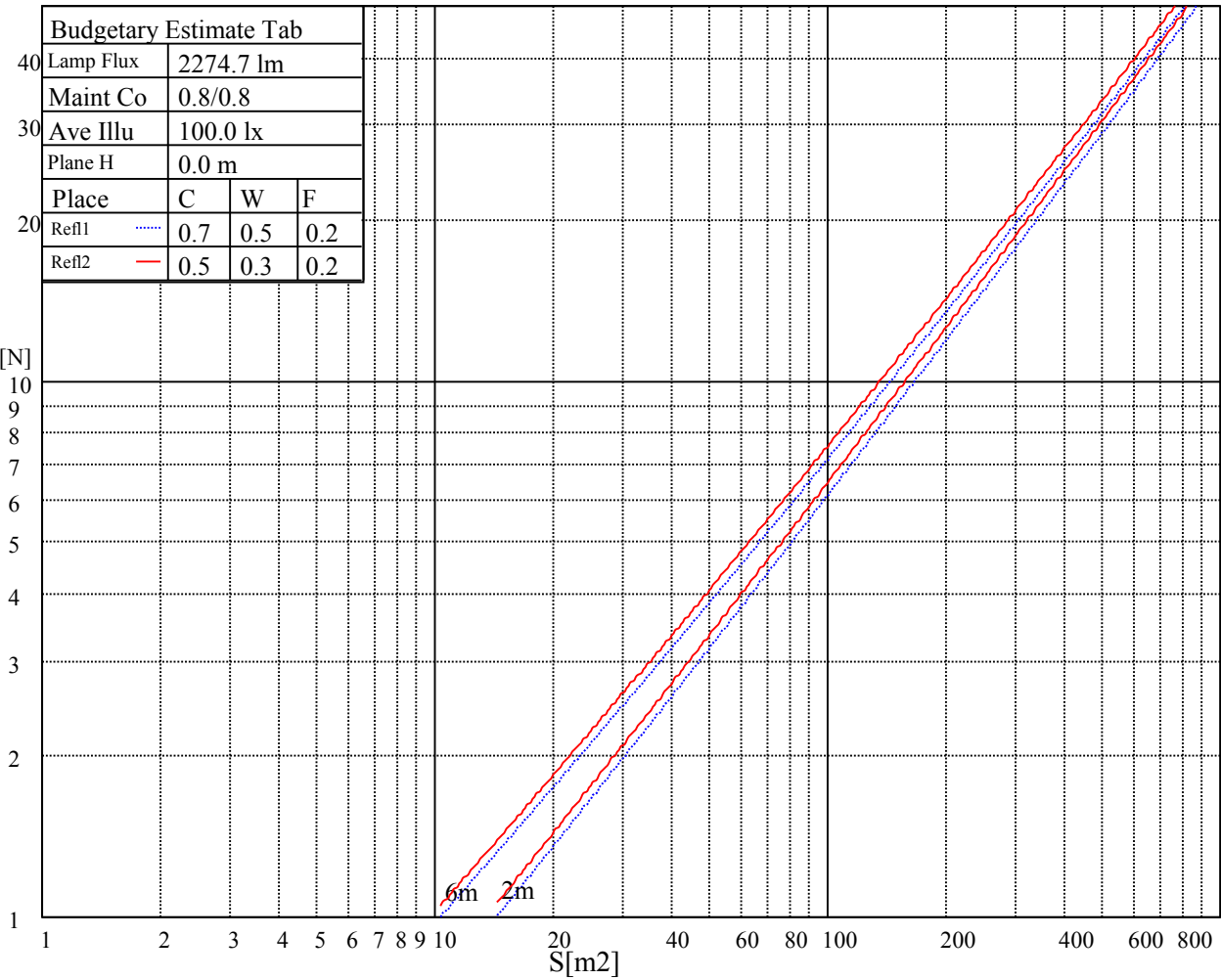
| L(Hor)(65) | L(Ver)(65) | L45(65) | L(Hor)(75) | L(Ver)(75) | L45(75) | L(Hor)(85) | L(Ver)(85) | L45(85) |
|------------|------------|---------|------------|------------|---------|------------|------------|---------|
| 4616       | 4587       | 4616    | 6355       | 6339       | 6347    | 15886      | 15790      | 15862   |

Glare Table

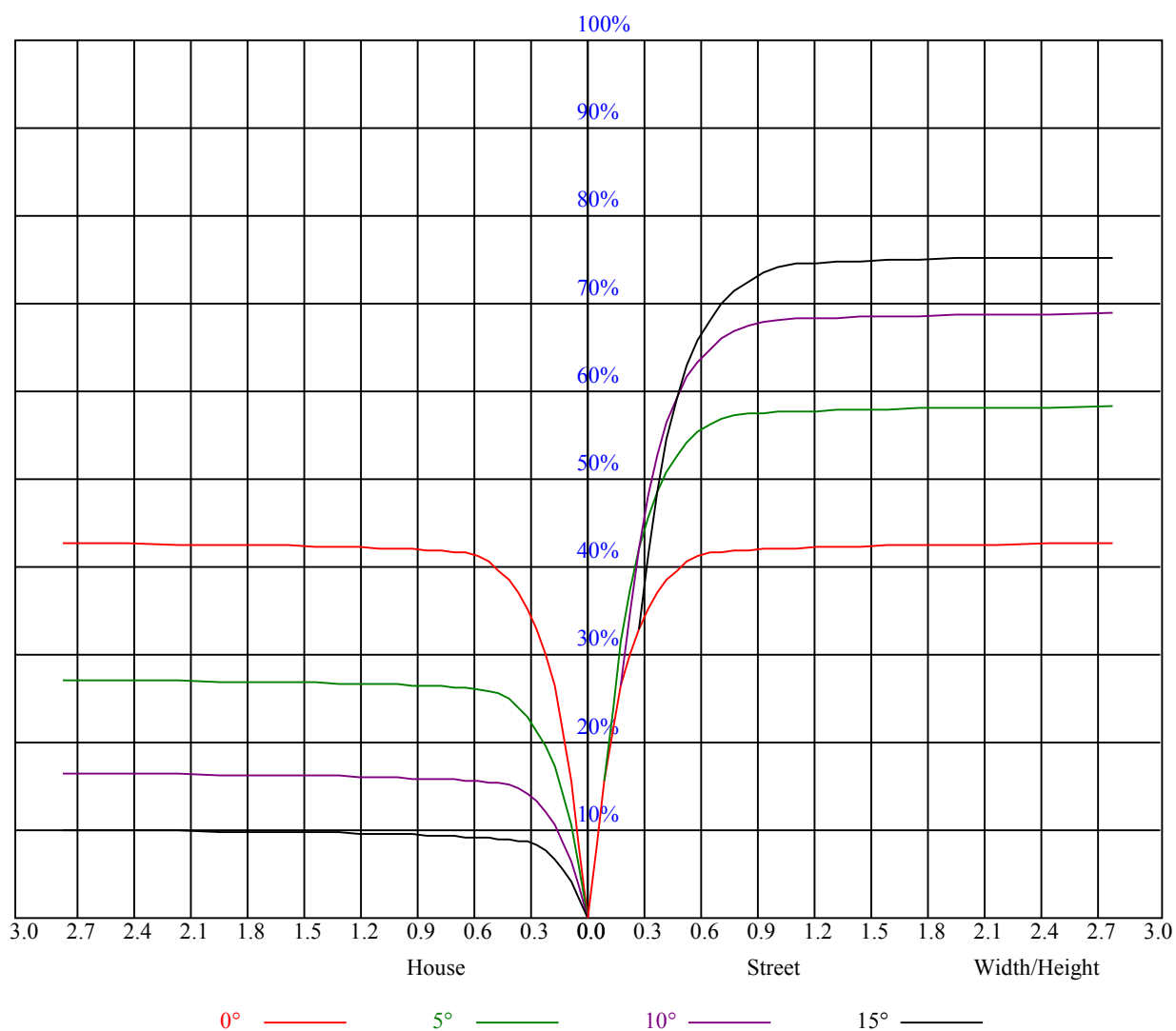
| Glare | Quality | Service Values Illuminance(lx) |      |      |            |            |            |            |            |
|-------|---------|--------------------------------|------|------|------------|------------|------------|------------|------------|
| 1.15  | A       | 2000                           | 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    | 1.03                                    | 1.03 | 1.03 | 1.00 | 1.00 | 1.00 | 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 | 0.95 | 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    | 0.92                                    | 0.89 | 0.86 | 0.90 | 0.88 | 0.85 | 0.87 | 0.85 | 0.84 | 0.85 | 0.83 | 0.82 | 0.83 | 0.81 | 0.80 | 0.79 |
| 3    | 0.88                                    | 0.84 | 0.82 | 0.86 | 0.83 | 0.81 | 0.84 | 0.82 | 0.80 | 0.82 | 0.80 | 0.78 | 0.80 | 0.79 | 0.77 | 0.76 |
| 4    | 0.84                                    | 0.80 | 0.78 | 0.83 | 0.80 | 0.77 | 0.81 | 0.79 | 0.76 | 0.80 | 0.77 | 0.76 | 0.78 | 0.76 | 0.75 | 0.74 |
| 5    | 0.81                                    | 0.77 | 0.75 | 0.80 | 0.77 | 0.74 | 0.79 | 0.76 | 0.74 | 0.78 | 0.75 | 0.73 | 0.76 | 0.74 | 0.72 | 0.71 |
| 6    | 0.78                                    | 0.75 | 0.72 | 0.78 | 0.74 | 0.72 | 0.77 | 0.73 | 0.71 | 0.75 | 0.73 | 0.71 | 0.74 | 0.72 | 0.70 | 0.69 |
| 7    | 0.76                                    | 0.72 | 0.69 | 0.75 | 0.72 | 0.69 | 0.74 | 0.71 | 0.69 | 0.73 | 0.71 | 0.69 | 0.73 | 0.70 | 0.68 | 0.67 |
| 8    | 0.74                                    | 0.70 | 0.67 | 0.73 | 0.70 | 0.67 | 0.72 | 0.69 | 0.67 | 0.72 | 0.69 | 0.67 | 0.71 | 0.68 | 0.67 | 0.66 |
| 9    | 0.72                                    | 0.68 | 0.66 | 0.71 | 0.68 | 0.65 | 0.70 | 0.67 | 0.65 | 0.70 | 0.67 | 0.65 | 0.69 | 0.67 | 0.65 | 0.64 |
| 10   | 0.70                                    | 0.66 | 0.64 | 0.69 | 0.66 | 0.64 | 0.69 | 0.66 | 0.64 | 0.68 | 0.65 | 0.63 | 0.68 | 0.65 | 0.63 | 0.62 |



## 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    | 13395.22 | 12861.89 | 10884.87 | 8390.76 | 6077.95 | 4432.37 | 3401.38 | 2614.41 | 1994.97 |
| 45.0   | 13395.22 | 12861.89 | 10884.87 | 8390.76 | 6077.95 | 4432.37 | 3401.38 | 2614.41 | 1994.97 |
| 90.0   | 13395.22 | 12861.89 | 10884.87 | 8390.76 | 6077.95 | 4432.37 | 3401.38 | 2614.41 | 1994.97 |
| 135.0  | 13395.22 | 12861.89 | 10884.87 | 8390.76 | 6077.95 | 4432.37 | 3401.38 | 2614.41 | 1994.97 |
| 180.0  | 13395.22 | 12861.89 | 10884.87 | 8390.76 | 6077.95 | 4432.37 | 3401.38 | 2614.41 | 1994.97 |
| 225.0  | 13395.22 | 12861.89 | 10884.87 | 8390.76 | 6077.95 | 4432.37 | 3401.38 | 2614.41 | 1994.97 |
| 270.0  | 13395.22 | 12861.89 | 10884.87 | 8390.76 | 6077.95 | 4432.37 | 3401.38 | 2614.41 | 1994.97 |
| 315.0  | 13395.22 | 12861.89 | 10884.87 | 8390.76 | 6077.95 | 4432.37 | 3401.38 | 2614.41 | 1994.97 |
| 360.0  | 13395.22 | 12861.89 | 10884.87 | 8390.76 | 6077.95 | 4432.37 | 3401.38 | 2614.41 | 1994.97 |
| C/γ(°) | 18.0     | 20.0     | 22.0     | 24.0    | 26.0    | 28.0    | 30.0    | 32.0    | 34.0    |
| 0.0    | 1603.24  | 1302.08  | 1082.85  | 922.30  | 798.04  | 669.93  | 491.49  | 289.54  | 126.74  |
| 45.0   | 1603.24  | 1302.08  | 1082.85  | 922.30  | 798.04  | 669.93  | 491.49  | 289.54  | 126.74  |
| 90.0   | 1603.24  | 1302.08  | 1082.85  | 922.30  | 798.04  | 669.93  | 491.49  | 289.54  | 126.74  |
| 135.0  | 1603.24  | 1302.08  | 1082.85  | 922.30  | 798.04  | 669.93  | 491.49  | 289.54  | 126.74  |
| 180.0  | 1603.24  | 1302.08  | 1082.85  | 922.30  | 798.04  | 669.93  | 491.49  | 289.54  | 126.74  |
| 225.0  | 1603.24  | 1302.08  | 1082.85  | 922.30  | 798.04  | 669.93  | 491.49  | 289.54  | 126.74  |
| 270.0  | 1603.24  | 1302.08  | 1082.85  | 922.30  | 798.04  | 669.93  | 491.49  | 289.54  | 126.74  |
| 315.0  | 1603.24  | 1302.08  | 1082.85  | 922.30  | 798.04  | 669.93  | 491.49  | 289.54  | 126.74  |
| 360.0  | 1603.24  | 1302.08  | 1082.85  | 922.30  | 798.04  | 669.93  | 491.49  | 289.54  | 126.74  |
| C/γ(°) | 36.0     | 38.0     | 40.0     | 42.0    | 44.0    | 46.0    | 48.0    | 50.0    | 52.0    |
| 0.0    | 59.96    | 43.88    | 34.36    | 28.08   | 24.06   | 21.36   | 19.71   | 18.44   | 17.62   |
| 45.0   | 59.96    | 43.88    | 34.36    | 28.08   | 24.06   | 21.36   | 19.71   | 18.44   | 17.62   |
| 90.0   | 59.96    | 43.88    | 34.36    | 28.08   | 24.06   | 21.36   | 19.71   | 18.44   | 17.62   |
| 135.0  | 59.96    | 43.88    | 34.36    | 28.08   | 24.06   | 21.36   | 19.71   | 18.44   | 17.62   |
| 180.0  | 59.96    | 43.88    | 34.36    | 28.08   | 24.06   | 21.36   | 19.71   | 18.44   | 17.62   |
| 225.0  | 59.96    | 43.88    | 34.36    | 28.08   | 24.06   | 21.36   | 19.71   | 18.44   | 17.62   |
| 270.0  | 59.96    | 43.88    | 34.36    | 28.08   | 24.06   | 21.36   | 19.71   | 18.44   | 17.62   |
| 315.0  | 59.96    | 43.88    | 34.36    | 28.08   | 24.06   | 21.36   | 19.71   | 18.44   | 17.62   |
| 360.0  | 59.96    | 43.88    | 34.36    | 28.08   | 24.06   | 21.36   | 19.71   | 18.44   | 17.62   |
| C/γ(°) | 54.0     | 56.0     | 58.0     | 60.0    | 62.0    | 64.0    | 66.0    | 68.0    | 70.0    |
| 0.0    | 17.12    | 16.79    | 16.57    | 16.41   | 16.30   | 16.08   | 15.09   | 13.82   | 12.88   |
| 45.0   | 17.12    | 16.79    | 16.57    | 16.41   | 16.30   | 16.08   | 15.09   | 13.82   | 12.88   |
| 90.0   | 17.12    | 16.79    | 16.57    | 16.41   | 16.30   | 16.08   | 15.09   | 13.82   | 12.88   |
| 135.0  | 17.12    | 16.79    | 16.57    | 16.41   | 16.30   | 16.08   | 15.09   | 13.82   | 12.88   |
| 180.0  | 17.12    | 16.79    | 16.57    | 16.41   | 16.30   | 16.08   | 15.09   | 13.82   | 12.88   |
| 225.0  | 17.12    | 16.79    | 16.57    | 16.41   | 16.30   | 16.08   | 15.09   | 13.82   | 12.88   |
| 270.0  | 17.12    | 16.79    | 16.57    | 16.41   | 16.30   | 16.08   | 15.09   | 13.82   | 12.88   |
| 315.0  | 17.12    | 16.79    | 16.57    | 16.41   | 16.30   | 16.08   | 15.09   | 13.82   | 12.88   |
| 360.0  | 17.12    | 16.79    | 16.57    | 16.41   | 16.30   | 16.08   | 15.09   | 13.82   | 12.88   |
| C/γ(°) | 72.0     | 74.0     | 76.0     | 78.0    | 80.0    | 82.0    | 84.0    | 86.0    | 88.0    |
| 0.0    | 12.22    | 11.78    | 11.34    | 10.90   | 10.46   | 10.08   | 9.69    | 9.36    | 8.97    |
| 45.0   | 12.22    | 11.78    | 11.34    | 10.90   | 10.46   | 10.08   | 9.69    | 9.36    | 8.97    |
| 90.0   | 12.22    | 11.78    | 11.34    | 10.90   | 10.46   | 10.08   | 9.69    | 9.36    | 8.97    |
| 135.0  | 12.22    | 11.78    | 11.34    | 10.90   | 10.46   | 10.08   | 9.69    | 9.36    | 8.97    |
| 180.0  | 12.22    | 11.78    | 11.34    | 10.90   | 10.46   | 10.08   | 9.69    | 9.36    | 8.97    |
| 225.0  | 12.22    | 11.78    | 11.34    | 10.90   | 10.46   | 10.08   | 9.69    | 9.36    | 8.97    |
| 270.0  | 12.22    | 11.78    | 11.34    | 10.90   | 10.46   | 10.08   | 9.69    | 9.36    | 8.97    |
| 315.0  | 12.22    | 11.78    | 11.34    | 10.90   | 10.46   | 10.08   | 9.69    | 9.36    | 8.97    |
| 360.0  | 12.22    | 11.78    | 11.34    | 10.90   | 10.46   | 10.08   | 9.69    | 9.36    | 8.97    |

## Intensity data(cd)

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|                 |      |
|-----------------|------|
| C/ $\gamma$ (°) | 90.0 |
| 0.0             | 8.70 |
| 45.0            | 8.70 |
| 90.0            | 8.70 |
| 135.0           | 8.70 |
| 180.0           | 8.70 |
| 225.0           | 8.70 |
| 270.0           | 8.70 |
| 315.0           | 8.70 |
| 360.0           | 8.70 |