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## Nata

LumCAT: 3-2042-M  
Luminaire: 92.70.135.00  
Report No: NATA0100  
Test No: GC2018062609  
LampCAT: NICHIA NFCWJ120B-V3  
Lamp flux(lm): 2251.6  
Number of Lamps: 1  
Length(mm): 84  
Phm Type: C

Voltage(V): 33.5000  
Current(A): 0.5000  
Power (W): 16.7500  
PF: 0.0000  
Ballast type: DC  
Width(mm): 84  
Height(mm): 0

## Photometric Results

Lumens(lm): 2019.78  
Efficiency(%): 89.70%  
Lumens(lm)/Power(W): 121.58  
Central intensity(cd): 17809.370  
Maximum intensity(cd): 17809.370  
Angle of maximum intensity:  $C=0.0$   $\gamma=0.0$   
Beam Angle(50%Imax): [C0/180]Total=14.0  
[C90/270]Total=14.0  
Field angle(10%Imax): [C0/180]Total=27.3  
[C90/270]Total=27.3  
Maximum s/h(1/2): C0\_180=0.24 C90\_270=0.24  
Maximum s/h(1/4): C0\_180=0.24 C90\_270=0.24  
Up flux rate of lamp(%): 0.00%  
Down flux rate of lamp(%): 89.32%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 97.883%

| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0                | 17809.369     | 17.043      | 17.043    | .747%       | .844%      |
| 2.0                | 17189.297     | 131.566     | 148.608   | 5.770%      | 7.358%     |
| 4.0                | 14891.380     | 227.816     | 376.425   | 9.992%      | 18.637%    |
| 6.0                | 10842.876     | 248.567     | 624.992   | 10.902%     | 30.944%    |
| 8.0                | 6946.260      | 212.017     | 837.01    | 9.299%      | 41.441%    |
| 10.0               | 3878.035      | 147.689     | 984.698   | 6.478%      | 48.753%    |
| 12.0               | 2521.239      | 114.963     | 1099.661  | 5.042%      | 54.445%    |
| 14.0               | 1618.521      | 85.873      | 1185.535  | 3.766%      | 58.696%    |
| 16.0               | 1210.043      | 73.148      | 1258.683  | 3.208%      | 62.318%    |
| 18.0               | 1023.519      | 69.365      | 1328.048  | 3.042%      | 65.752%    |
| 20.0               | 909.711       | 68.237      | 1396.285  | 2.993%      | 69.131%    |
| 22.0               | 839.232       | 68.948      | 1465.234  | 3.024%      | 72.544%    |
| 24.0               | 794.285       | 70.852      | 1536.086  | 3.108%      | 76.052%    |
| 26.0               | 759.056       | 72.976      | 1609.062  | 3.201%      | 79.665%    |
| 28.0               | 727.316       | 74.885      | 1683.948  | 3.284%      | 83.373%    |
| 30.0               | 703.683       | 77.164      | 1761.111  | 3.384%      | 87.193%    |
| 32.0               | 656.499       | 76.297      | 1837.408  | 3.346%      | 90.971%    |
| 34.0               | 517.551       | 63.472      | 1900.88   | 2.784%      | 94.113%    |
| 36.0               | 346.298       | 44.641      | 1945.521  | 1.958%      | 96.324%    |
| 38.0               | 172.808       | 23.333      | 1968.854  | 1.023%      | 97.479%    |
| 40.0               | 43.639        | 6.152       | 1975.006  | .270%       | 97.783%    |
| 42.0               | 18.726        | 2.748       | 1977.754  | .121%       | 97.919%    |
| 44.0               | 12.780        | 1.947       | 1979.701  | .085%       | 98.016%    |
| 46.0               | 10.846        | 1.711       | 1981.412  | .075%       | 98.101%    |
| 48.0               | 10.419        | 1.698       | 1983.11   | .074%       | 98.185%    |
| 50.0               | 10.096        | 1.696       | 1984.806  | .074%       | 98.269%    |
| 52.0               | 9.848         | 1.702       | 1986.508  | .075%       | 98.353%    |
| 54.0               | 9.614         | 1.706       | 1988.214  | .075%       | 98.437%    |
| 56.0               | 9.442         | 1.717       | 1989.931  | .075%       | 98.522%    |
| 58.0               | 9.270         | 1.724       | 1991.655  | .076%       | 98.608%    |
| 60.0               | 9.146         | 1.737       | 1993.392  | .076%       | 98.694%    |
| 62.0               | 9.029         | 1.748       | 1995.141  | .077%       | 98.780%    |
| 64.0               | 8.933         | 1.761       | 1996.902  | .077%       | 98.867%    |
| 66.0               | 8.857         | 1.775       | 1998.676  | .078%       | 98.955%    |
| 68.0               | 8.781         | 1.786       | 2000.462  | .078%       | 99.044%    |
| 70.0               | 8.726         | 1.798       | 2002.26   | .079%       | 99.133%    |
| 72.0               | 8.671         | 1.809       | 2004.069  | .079%       | 99.222%    |
| 74.0               | 8.644         | 1.822       | 2005.891  | .080%       | 99.313%    |

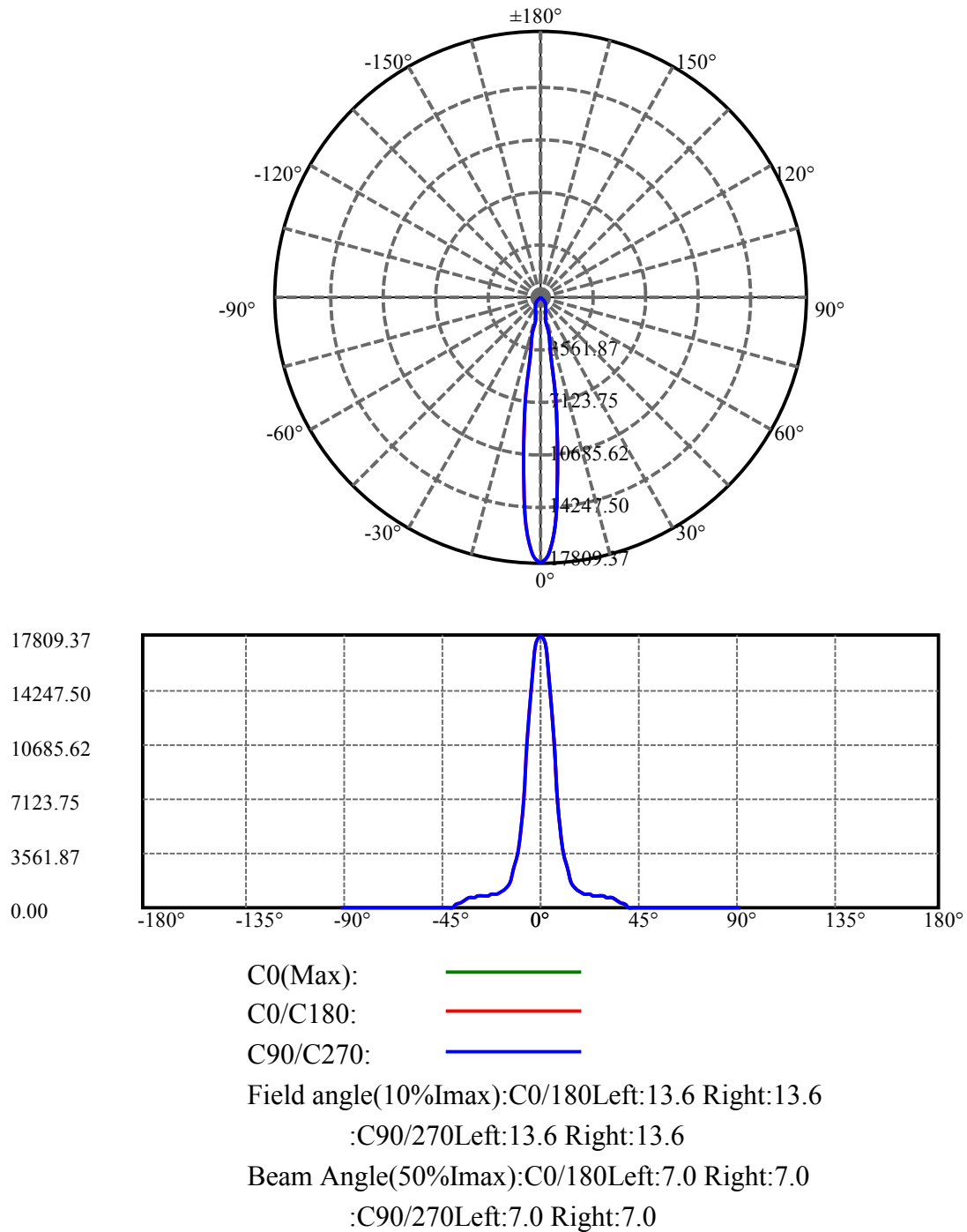
| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 76.0               | 8.603         | 1.831       | 2007.722  | .080%       | 99.403%    |
| 78.0               | 8.589         | 1.842       | 2009.564  | .081%       | 99.494%    |
| 80.0               | 8.554         | 1.848       | 2011.412  | .081%       | 99.586%    |
| 82.0               | 8.554         | 1.858       | 2013.27   | .081%       | 99.678%    |
| 84.0               | 8.534         | 1.861       | 2015.131  | .082%       | 99.770%    |
| 86.0               | 8.492         | 1.858       | 2016.989  | .081%       | 99.862%    |
| 88.0               | 8.479         | 1.858       | 2018.847  | .082%       | 99.954%    |
| 90.0               | 8.479         | 0.930       | 2019.777  | .041%       | 100.000%   |

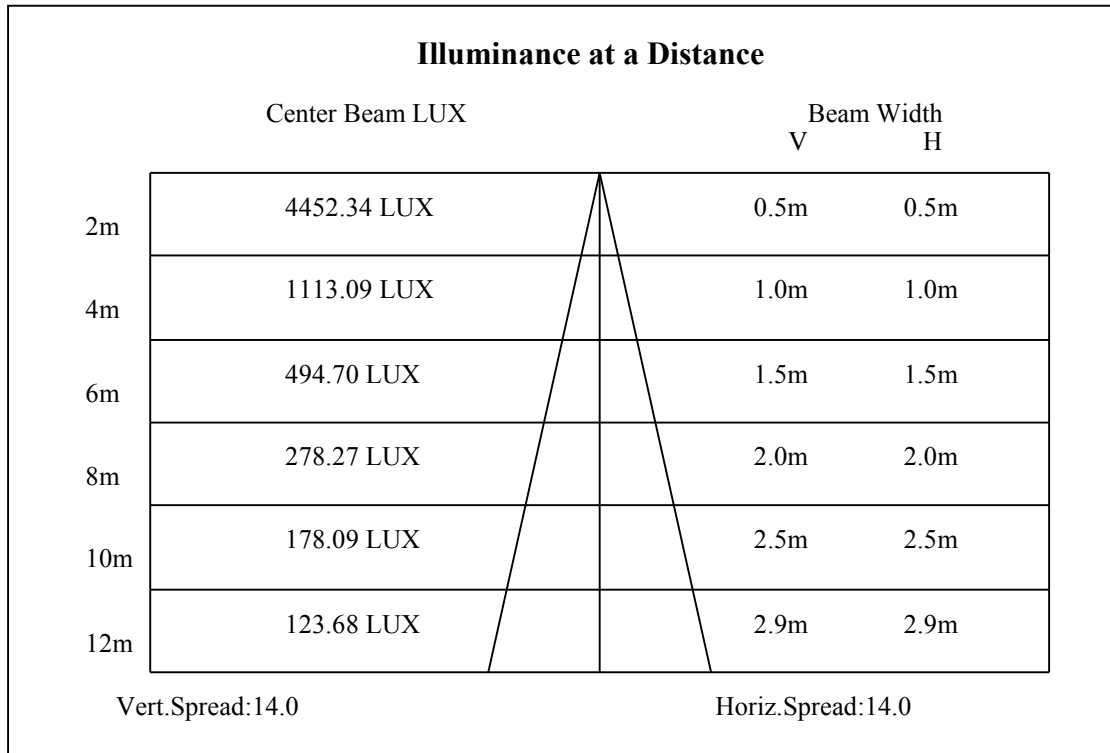
## ZONAL LUMEN SUMMARY

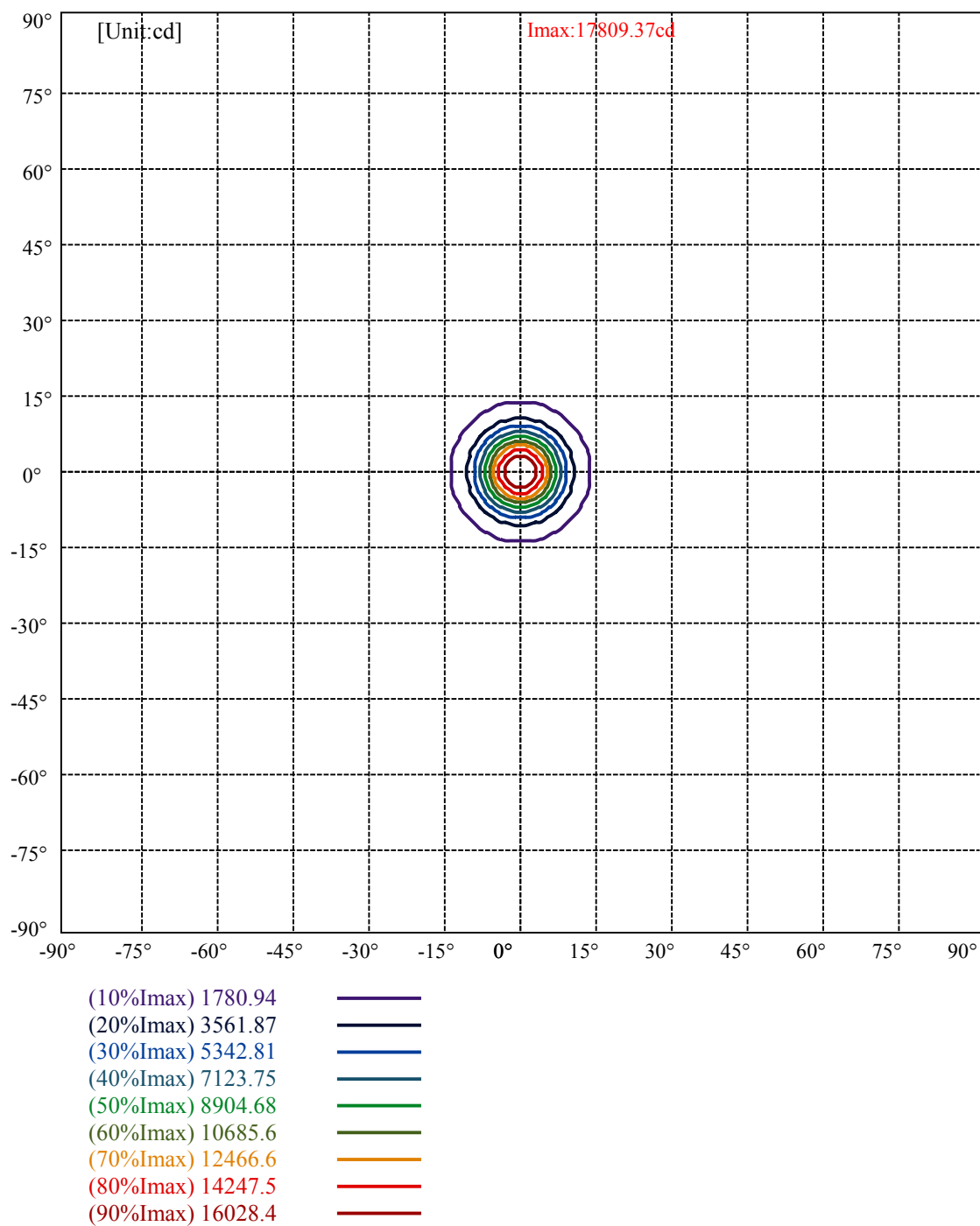
| Zone    | Lumens  | %Lamp  | %Fixt   |
|---------|---------|--------|---------|
| 0-30    | 1761.11 | 78.22% | 87.19%  |
| 0-40    | 1975.01 | 87.72% | 97.78%  |
| 0-60    | 1993.39 | 88.53% | 98.69%  |
| 0-90    | 2018.85 | 89.66% | 99.95%  |
| 0-120   | 2018.85 | 89.66% | 99.95%  |
| 0-180   | 2019.78 | 89.71% | 100.00% |
| 60-90   | 27.19   | 1.21%  | 1.35%   |
| 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%   |
| 0-26.18 | 1615.82 | 71.76% | 80.00%  |

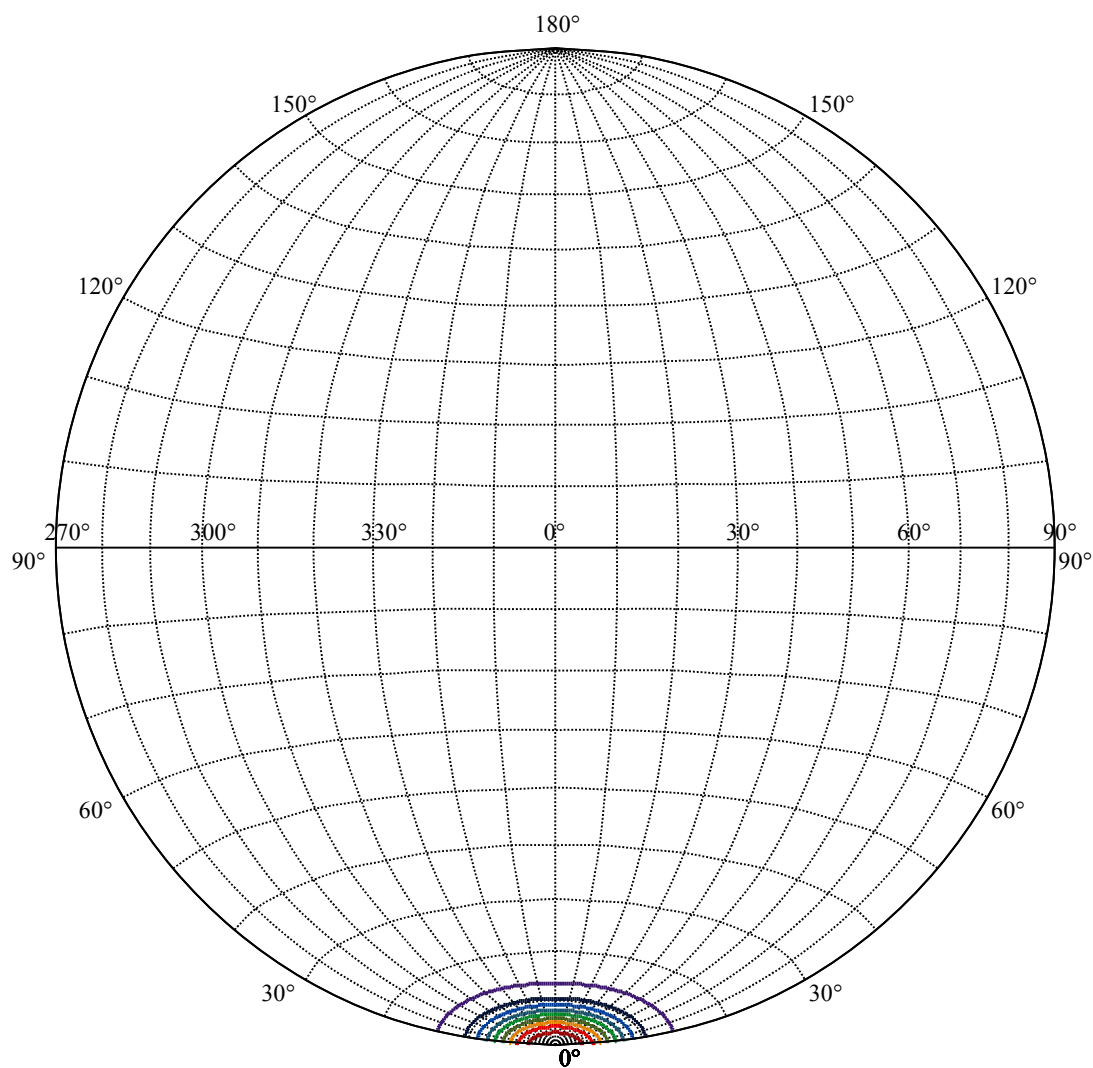
## ZONAL LUMEN SUMMARY

|         |        |
|---------|--------|
| 0-10    | 984.70 |
| 10-20   | 411.59 |
| 20-30   | 364.83 |
| 30-40   | 213.89 |
| 40-50   | 9.80   |
| 50-60   | 8.59   |
| 60-70   | 8.87   |
| 70-80   | 9.15   |
| 80-90   | 7.44   |
| 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   |









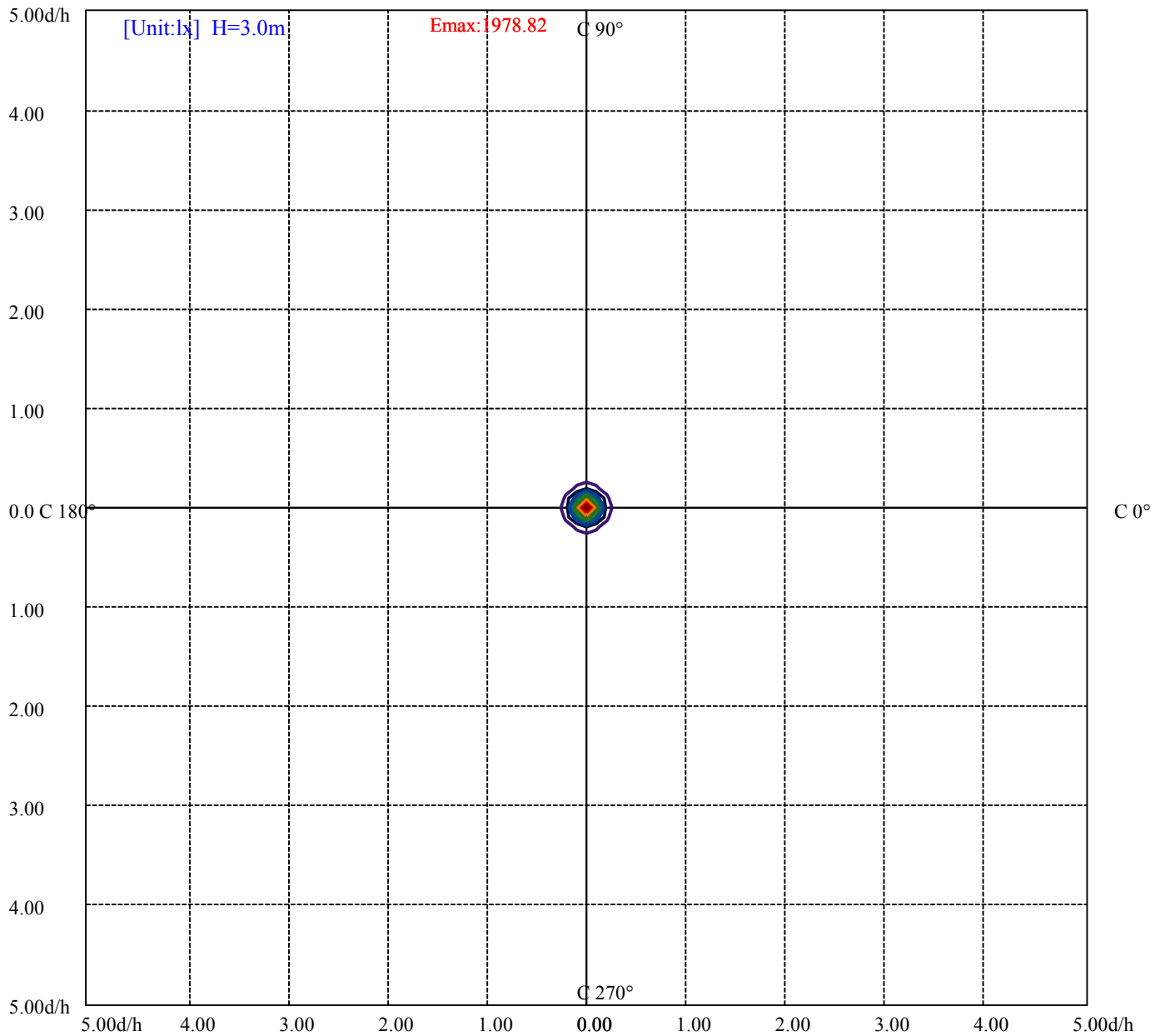
House

[Unit:cd]

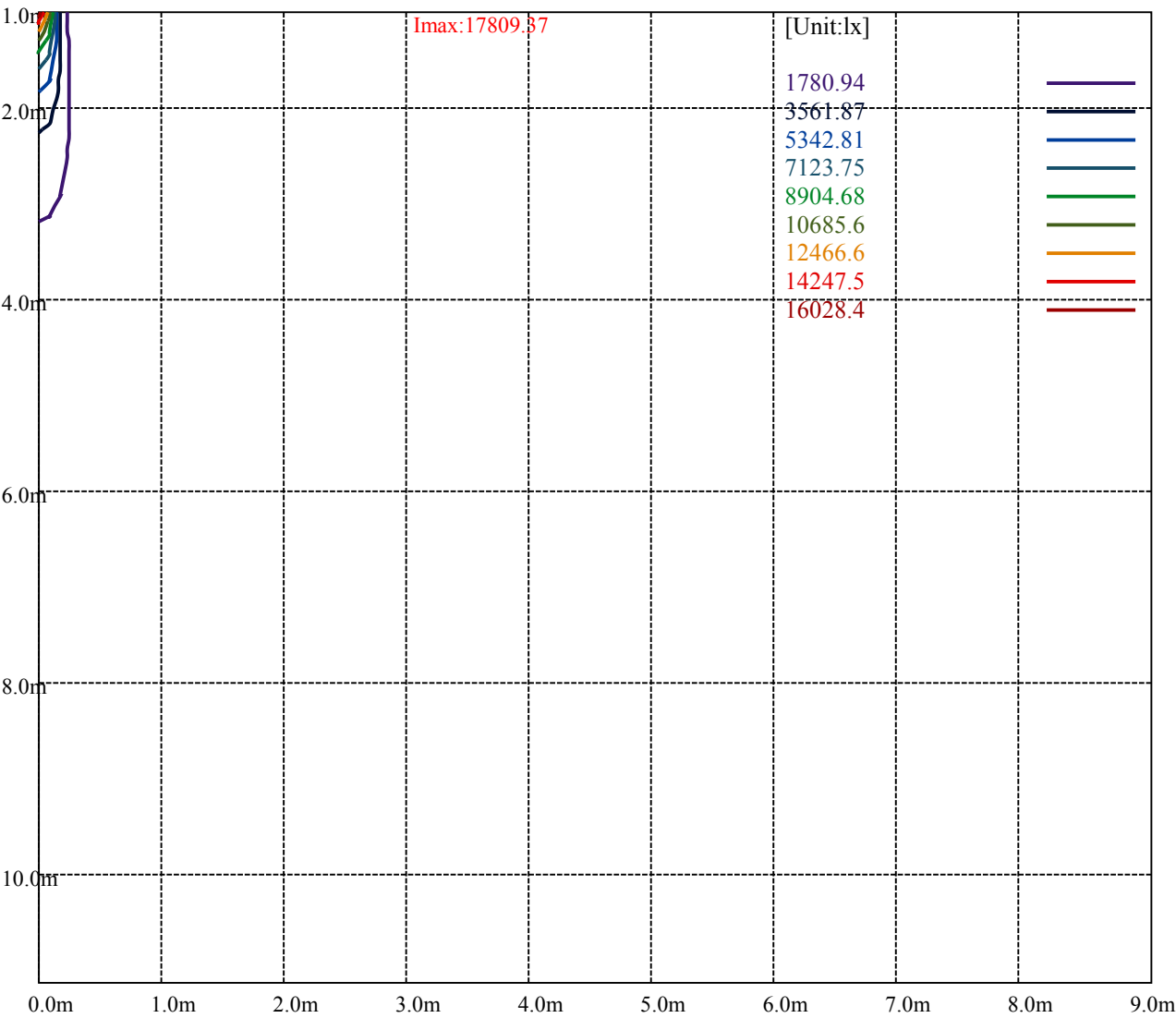
Road

**Imax:17809.37**

|           |         |   |
|-----------|---------|---|
| (10%Imax) | 1780.94 | — |
| (20%Imax) | 3561.87 | — |
| (30%Imax) | 5342.81 | — |
| (40%Imax) | 7123.75 | — |
| (50%Imax) | 8904.68 | — |
| (60%Imax) | 10685.6 | — |
| (70%Imax) | 12466.6 | — |
| (80%Imax) | 14247.5 | — |
| (90%Imax) | 16028.4 | — |



|                    |   |
|--------------------|---|
| (10%Emax) 197.8811 | — |
| (20%Emax) 395.7622 | — |
| (30%Emax) 593.6444 | — |
| (40%Emax) 791.5256 | — |
| (50%Emax) 989.4067 | — |
| (60%Emax) 1187.289 | — |
| (70%Emax) 1385.167 | — |
| (80%Emax) 1583.056 | — |
| (90%Emax) 1780.933 | — |



Luminance Table

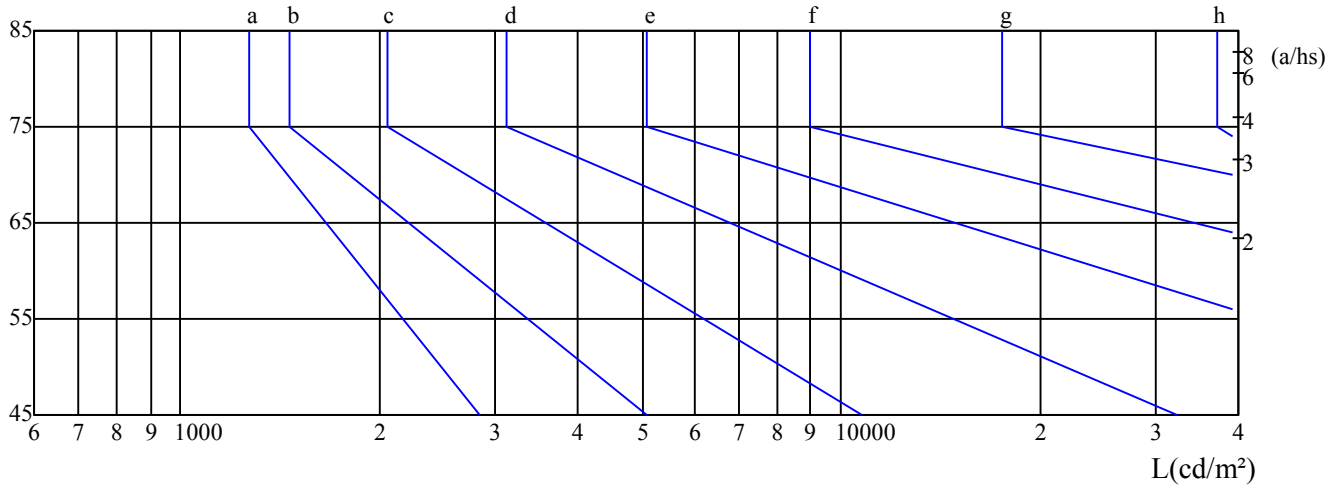
| $\gamma$ | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 |
|----------|----|----|----|----|----|----|----|----|----|
| C0       | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| C45      | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| C90      | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |

| L(Hor)(65) | L(Ver)(65) | L45(65) | L(Hor)(75) | L(Ver)(75) | L45(75) | L(Hor)(85) | L(Ver)(85) | L45(85) |
|------------|------------|---------|------------|------------|---------|------------|------------|---------|
| 0          | 0          | 0       | 0          | 0          | 0       | 0          | 0          | 0       |

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          |

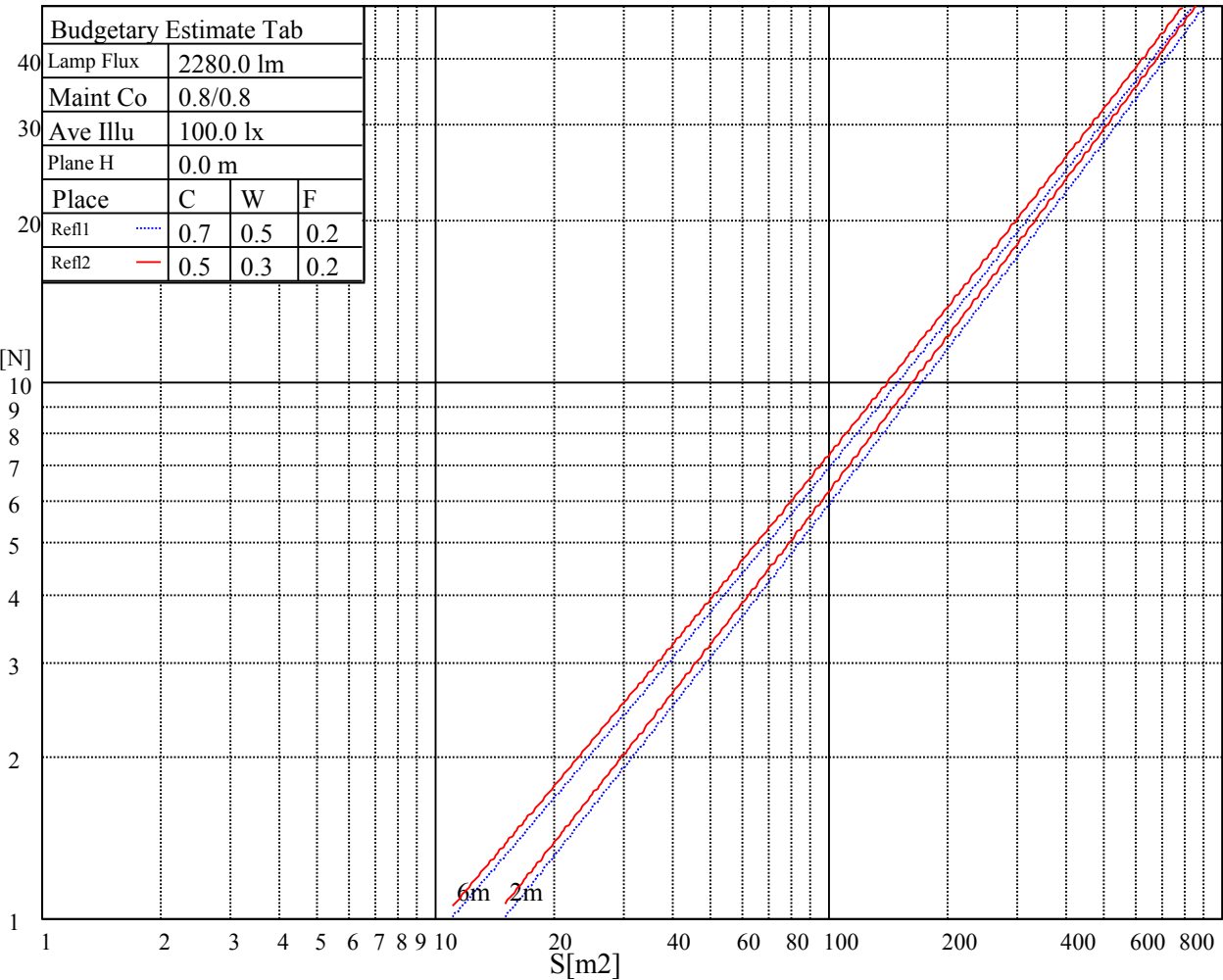
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

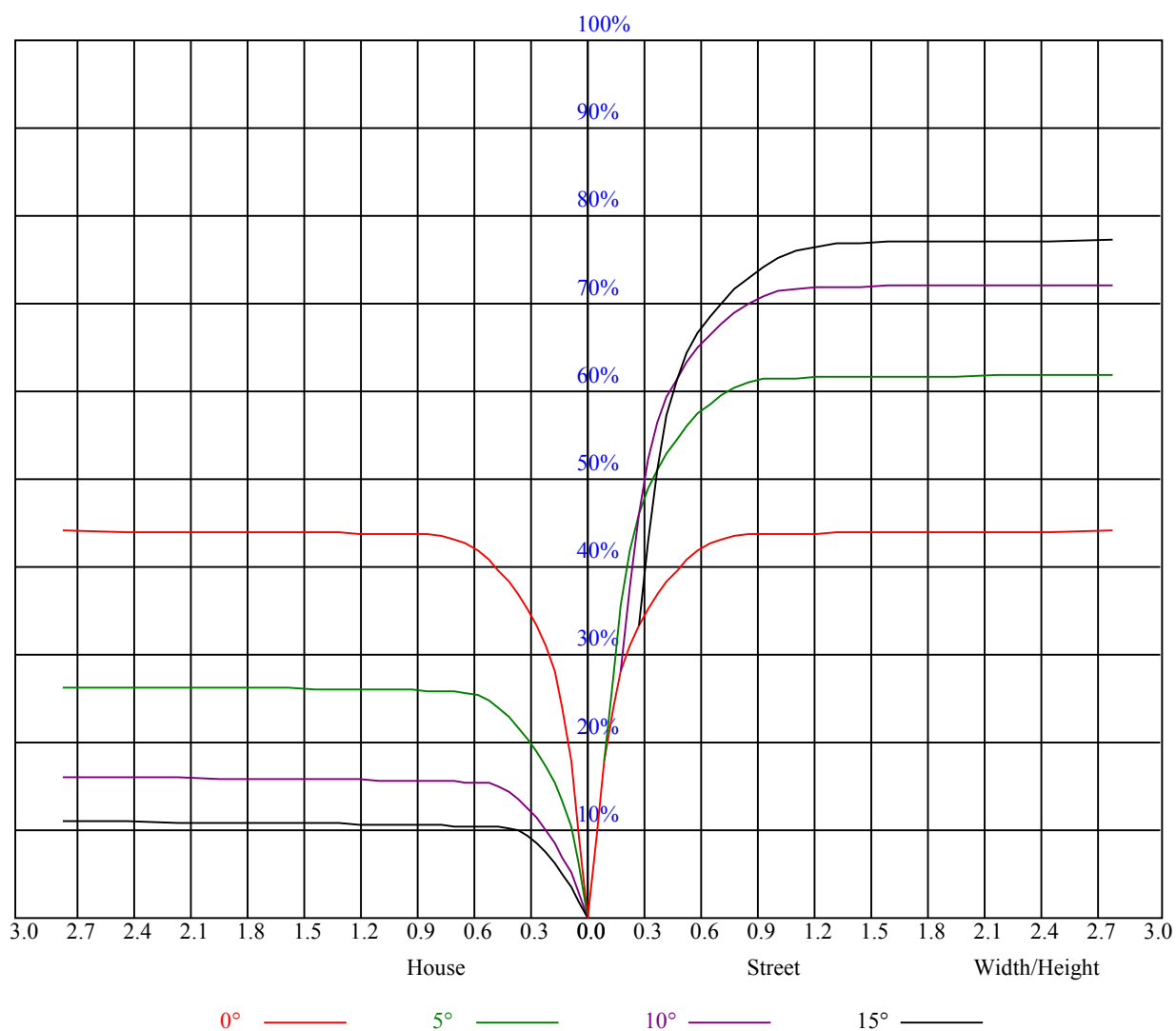
C0 ———

C45 ———

C90 ———



| 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     | 1.06                                    | 1.06 | 1.06 | 1.04 | 1.04 | 1.04 | 0.99 | 0.99 | 0.99 | 0.95 | 0.95 | 0.95 | 0.91 | 0.91 | 0.91 | 0.89 |
| 1     | 1.00                                    | 0.97 | 0.96 | 0.98 | 0.96 | 0.94 | 0.94 | 0.93 | 0.91 | 0.91 | 0.90 | 0.89 | 0.88 | 0.87 | 0.86 | 0.84 |
| 2     | 0.95                                    | 0.92 | 0.89 | 0.93 | 0.90 | 0.88 | 0.90 | 0.88 | 0.86 | 0.88 | 0.86 | 0.84 | 0.85 | 0.84 | 0.83 | 0.81 |
| 3     | 0.90                                    | 0.87 | 0.84 | 0.89 | 0.86 | 0.83 | 0.87 | 0.84 | 0.82 | 0.85 | 0.83 | 0.81 | 0.83 | 0.81 | 0.80 | 0.79 |
| 4     | 0.87                                    | 0.83 | 0.80 | 0.86 | 0.82 | 0.80 | 0.84 | 0.81 | 0.79 | 0.82 | 0.80 | 0.78 | 0.81 | 0.79 | 0.77 | 0.76 |
| 5     | 0.84                                    | 0.80 | 0.77 | 0.83 | 0.79 | 0.77 | 0.81 | 0.78 | 0.76 | 0.80 | 0.77 | 0.75 | 0.79 | 0.77 | 0.75 | 0.74 |
| 6     | 0.81                                    | 0.77 | 0.74 | 0.80 | 0.77 | 0.74 | 0.79 | 0.76 | 0.73 | 0.78 | 0.75 | 0.73 | 0.77 | 0.74 | 0.72 | 0.71 |
| 7     | 0.78                                    | 0.74 | 0.72 | 0.78 | 0.74 | 0.71 | 0.77 | 0.73 | 0.71 | 0.76 | 0.73 | 0.71 | 0.75 | 0.72 | 0.70 | 0.70 |
| 8     | 0.76                                    | 0.72 | 0.70 | 0.76 | 0.72 | 0.69 | 0.75 | 0.71 | 0.69 | 0.74 | 0.71 | 0.69 | 0.73 | 0.71 | 0.69 | 0.68 |
| 9     | 0.74                                    | 0.70 | 0.68 | 0.73 | 0.70 | 0.67 | 0.73 | 0.70 | 0.67 | 0.72 | 0.69 | 0.67 | 0.71 | 0.69 | 0.67 | 0.66 |
| 10    | 0.72                                    | 0.68 | 0.66 | 0.72 | 0.68 | 0.66 | 0.71 | 0.68 | 0.66 | 0.70 | 0.68 | 0.65 | 0.70 | 0.67 | 0.65 | 0.65 |



## 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    | 17794.23 | 17001.42 | 14501.86 | 10466.22 | 6480.14 | 3606.19 | 2524.34 | 1559.20 | 1191.42 |
| 45.0   | 17882.32 | 17012.43 | 14441.29 | 10427.68 | 6359.01 | 3545.63 | 2489.10 | 1554.24 | 1196.38 |
| 90.0   | 17761.19 | 16726.13 | 13648.48 | 9746.63  | 5602.54 | 3141.52 | 2076.73 | 1456.79 | 1094.85 |
| 135.0  | 17799.73 | 17232.65 | 15118.49 | 11336.11 | 7168.34 | 3980.58 | 2851.92 | 1666.01 | 1244.27 |
| 180.0  | 17794.23 | 17342.77 | 15267.14 | 10747.56 | 7294.42 | 4029.58 | 2452.21 | 1651.69 | 1239.87 |
| 225.0  | 17882.32 | 17447.37 | 15454.33 | 10985.40 | 7586.77 | 4249.80 | 2622.89 | 1688.58 | 1250.88 |
| 270.0  | 17761.19 | 17601.53 | 16004.90 | 12580.39 | 8418.12 | 4795.41 | 2906.98 | 1826.22 | 1301.53 |
| 315.0  | 17799.73 | 17150.07 | 14694.55 | 10453.01 | 6660.72 | 3675.57 | 2245.75 | 1545.43 | 1161.14 |
| 360.0  | 17794.23 | 17001.42 | 14501.86 | 10466.22 | 6480.14 | 3606.19 | 2524.34 | 1559.20 | 1191.42 |
| C/γ(°) | 18.0     | 20.0     | 22.0     | 24.0     | 26.0    | 28.0    | 30.0    | 32.0    | 34.0    |
| 0.0    | 1021.85  | 913.94   | 849.52   | 798.32   | 762.53  | 732.25  | 707.47  | 654.62  | 510.92  |
| 45.0   | 1030.11  | 914.49   | 845.67   | 796.12   | 759.78  | 727.30  | 702.52  | 650.77  | 498.81  |
| 90.0   | 988.81   | 890.92   | 824.63   | 786.76   | 746.95  | 715.90  | 690.57  | 614.26  | 460.44  |
| 135.0  | 1048.27  | 918.89   | 846.77   | 795.56   | 761.98  | 725.64  | 701.97  | 659.03  | 512.58  |
| 180.0  | 1011.28  | 902.32   | 831.08   | 788.85   | 755.15  | 721.24  | 699.49  | 661.61  | 533.28  |
| 225.0  | 1023.66  | 905.29   | 829.76   | 789.56   | 756.81  | 727.52  | 705.71  | 671.80  | 541.31  |
| 270.0  | 1066.99  | 927.15   | 850.07   | 803.27   | 768.59  | 738.31  | 715.73  | 687.10  | 576.44  |
| 315.0  | 997.18   | 904.69   | 836.36   | 795.84   | 760.66  | 730.38  | 705.99  | 652.80  | 506.63  |
| 360.0  | 1021.85  | 913.94   | 849.52   | 798.32   | 762.53  | 732.25  | 707.47  | 654.62  | 510.92  |
| C/γ(°) | 36.0     | 38.0     | 40.0     | 42.0     | 44.0    | 46.0    | 48.0    | 50.0    | 52.0    |
| 0.0    | 327.04   | 137.20   | 33.91    | 17.40    | 11.84   | 10.74   | 10.30   | 9.97    | 9.74    |
| 45.0   | 326.48   | 140.56   | 34.74    | 16.74    | 11.56   | 10.74   | 10.35   | 10.08   | 9.86    |
| 90.0   | 283.21   | 120.68   | 24.45    | 15.42    | 11.34   | 10.68   | 10.30   | 10.02   | 9.80    |
| 135.0  | 349.61   | 166.60   | 45.70    | 17.89    | 12.22   | 10.90   | 10.52   | 10.19   | 9.97    |
| 180.0  | 359.79   | 187.69   | 48.72    | 19.60    | 13.10   | 10.90   | 10.52   | 10.19   | 9.91    |
| 225.0  | 378.73   | 200.07   | 49.39    | 21.53    | 14.31   | 11.01   | 10.52   | 10.19   | 9.91    |
| 270.0  | 421.18   | 278.59   | 79.12    | 22.68    | 15.36   | 11.12   | 10.57   | 10.19   | 9.91    |
| 315.0  | 324.34   | 151.07   | 33.09    | 18.55    | 12.50   | 10.68   | 10.30   | 9.97    | 9.69    |
| 360.0  | 327.04   | 137.20   | 33.91    | 17.40    | 11.84   | 10.74   | 10.30   | 9.97    | 9.74    |
| C/γ(°) | 54.0     | 56.0     | 58.0     | 60.0     | 62.0    | 64.0    | 66.0    | 68.0    | 70.0    |
| 0.0    | 9.52     | 9.36     | 9.19     | 9.08     | 8.97    | 8.86    | 8.81    | 8.75    | 8.70    |
| 45.0   | 9.63     | 9.41     | 9.25     | 9.14     | 9.03    | 8.92    | 8.86    | 8.75    | 8.70    |
| 90.0   | 9.58     | 9.41     | 9.25     | 9.14     | 9.03    | 8.92    | 8.86    | 8.81    | 8.75    |
| 135.0  | 9.69     | 9.52     | 9.36     | 9.19     | 9.14    | 9.03    | 8.92    | 8.86    | 8.75    |
| 180.0  | 9.69     | 9.52     | 9.36     | 9.25     | 9.08    | 8.97    | 8.92    | 8.81    | 8.75    |
| 225.0  | 9.63     | 9.47     | 9.30     | 9.19     | 9.03    | 8.92    | 8.86    | 8.75    | 8.70    |
| 270.0  | 9.63     | 9.47     | 9.30     | 9.14     | 9.03    | 8.97    | 8.86    | 8.81    | 8.75    |
| 315.0  | 9.52     | 9.36     | 9.14     | 9.03     | 8.92    | 8.86    | 8.75    | 8.70    | 8.70    |
| 360.0  | 9.52     | 9.36     | 9.19     | 9.08     | 8.97    | 8.86    | 8.81    | 8.75    | 8.70    |
| C/γ(°) | 72.0     | 74.0     | 76.0     | 78.0     | 80.0    | 82.0    | 84.0    | 86.0    | 88.0    |
| 0.0    | 8.64     | 8.64     | 8.59     | 8.59     | 8.53    | 8.53    | 8.53    | 8.53    | 8.48    |
| 45.0   | 8.64     | 8.64     | 8.59     | 8.59     | 8.53    | 8.53    | 8.48    | 8.48    | 8.48    |
| 90.0   | 8.70     | 8.64     | 8.64     | 8.64     | 8.59    | 8.59    | 8.59    | 8.48    | 8.48    |
| 135.0  | 8.70     | 8.70     | 8.59     | 8.59     | 8.59    | 8.59    | 8.53    | 8.48    | 8.48    |
| 180.0  | 8.70     | 8.64     | 8.59     | 8.59     | 8.53    | 8.53    | 8.53    | 8.48    | 8.48    |
| 225.0  | 8.64     | 8.64     | 8.59     | 8.59     | 8.53    | 8.53    | 8.48    | 8.48    | 8.48    |
| 270.0  | 8.70     | 8.64     | 8.64     | 8.59     | 8.59    | 8.59    | 8.59    | 8.53    | 8.48    |
| 315.0  | 8.64     | 8.59     | 8.59     | 8.53     | 8.53    | 8.53    | 8.53    | 8.48    | 8.48    |
| 360.0  | 8.64     | 8.64     | 8.59     | 8.59     | 8.53    | 8.53    | 8.53    | 8.53    | 8.48    |

## Intensity data(cd)

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|                       |      |
|-----------------------|------|
| C/ $\gamma(^{\circ})$ | 90.0 |
| 0.0                   | 8.48 |
| 45.0                  | 8.48 |
| 90.0                  | 8.48 |
| 135.0                 | 8.48 |
| 180.0                 | 8.48 |
| 225.0                 | 8.48 |
| 270.0                 | 8.48 |
| 315.0                 | 8.48 |
| 360.0                 | 8.48 |