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## Nata

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|                         |                     |
|-------------------------|---------------------|
| LumCAT: 1405-N          |                     |
| Luminaire: 92.70.064.00 |                     |
| Report No: NATA0100     | Voltage(V): 36.0000 |
| Test No: GC2018072817   | Current(A): 0.3000  |
| LampCAT: BRIDGELUX V6HD | Power (W): 10.8000  |
| Lamp flux(lm): 1137.0   | PF: 0.0000          |
| Number of Lamps: 1      | Ballast type: DC    |
| Length(mm): 39          | Width(mm): 39       |
| Phm Type: C             | Height(mm): 0       |

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## Photometric Results

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Lumens(lm): 955.66  
Efficiency(%): 84.05%  
Lumens(lm)/Power(W): 88.71  
Central intensity(cd): 2658.811  
Maximum intensity(cd): 2658.811  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=20.5  
[C90/270]Total=20.5  
Field angle(10%Imax): [C0/180]Total=70.1  
[C90/270]Total=70.1  
Maximum s/h(1/2): C0\_180=0.35 C90\_270=0.35  
Maximum s/h(1/4): C0\_180=0.40 C90\_270=0.40  
Up flux rate of lamp(%): 0.00%  
Down flux rate of lamp(%): 84.26%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 95.101%

| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0                | 2658.811      | 2.544       | 2.544     | .224%       | .266%      |
| 2.0                | 2575.263      | 19.711      | 22.255    | 1.734%      | 2.329%     |
| 4.0                | 2355.038      | 36.029      | 58.284    | 3.169%      | 6.099%     |
| 6.0                | 2034.265      | 46.634      | 104.918   | 4.102%      | 10.979%    |
| 8.0                | 1683.005      | 51.370      | 156.288   | 4.518%      | 16.354%    |
| 10.0               | 1361.669      | 51.857      | 208.145   | 4.561%      | 21.780%    |
| 12.0               | 1076.311      | 49.077      | 257.222   | 4.316%      | 26.916%    |
| 14.0               | 869.506       | 46.133      | 303.355   | 4.057%      | 31.743%    |
| 16.0               | 713.765       | 43.148      | 346.503   | 3.795%      | 36.258%    |
| 18.0               | 598.670       | 40.573      | 387.076   | 3.568%      | 40.504%    |
| 20.0               | 517.971       | 38.853      | 425.929   | 3.417%      | 44.569%    |
| 22.0               | 461.297       | 37.898      | 463.827   | 3.333%      | 48.535%    |
| 24.0               | 416.261       | 37.132      | 500.959   | 3.266%      | 52.420%    |
| 26.0               | 382.835       | 36.806      | 537.765   | 3.237%      | 56.272%    |
| 28.0               | 354.109       | 36.460      | 574.224   | 3.207%      | 60.087%    |
| 30.0               | 328.308       | 36.001      | 610.226   | 3.166%      | 63.854%    |
| 32.0               | 303.478       | 35.270      | 645.495   | 3.102%      | 67.544%    |
| 34.0               | 280.691       | 34.424      | 679.919   | 3.028%      | 71.146%    |
| 36.0               | 251.821       | 32.462      | 712.381   | 2.855%      | 74.543%    |
| 38.0               | 225.057       | 30.388      | 742.769   | 2.673%      | 77.723%    |
| 40.0               | 197.191       | 27.798      | 770.567   | 2.445%      | 80.632%    |
| 42.0               | 168.658       | 24.751      | 795.318   | 2.177%      | 83.222%    |
| 44.0               | 142.981       | 21.783      | 817.101   | 1.916%      | 85.501%    |
| 46.0               | 118.956       | 18.767      | 835.867   | 1.651%      | 87.465%    |
| 48.0               | 98.090        | 15.987      | 851.854   | 1.406%      | 89.138%    |
| 50.0               | 81.497        | 13.692      | 865.546   | 1.204%      | 90.570%    |
| 52.0               | 68.242        | 11.794      | 877.34    | 1.037%      | 91.805%    |
| 54.0               | 57.052        | 10.123      | 887.462   | .890%       | 92.864%    |
| 56.0               | 48.842        | 8.880       | 896.343   | .781%       | 93.793%    |
| 58.0               | 42.166        | 7.842       | 904.185   | .690%       | 94.614%    |
| 60.0               | 36.537        | 6.939       | 911.125   | .610%       | 95.340%    |
| 62.0               | 32.036        | 6.204       | 917.328   | .546%       | 95.989%    |
| 64.0               | 28.134        | 5.546       | 922.874   | .488%       | 96.569%    |
| 66.0               | 24.741        | 4.957       | 927.831   | .436%       | 97.088%    |
| 68.0               | 21.857        | 4.445       | 932.275   | .391%       | 97.553%    |
| 70.0               | 19.235        | 3.964       | 936.239   | .349%       | 97.968%    |
| 72.0               | 16.737        | 3.491       | 939.73    | .307%       | 98.333%    |
| 74.0               | 14.714        | 3.102       | 942.832   | .273%       | 98.658%    |

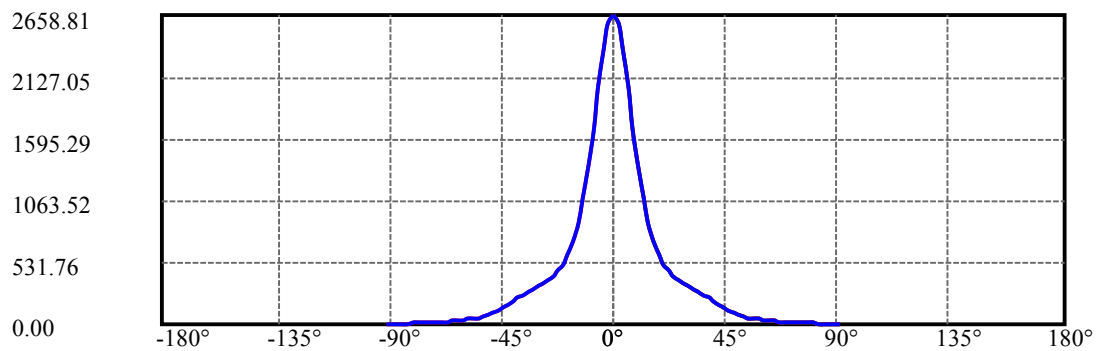
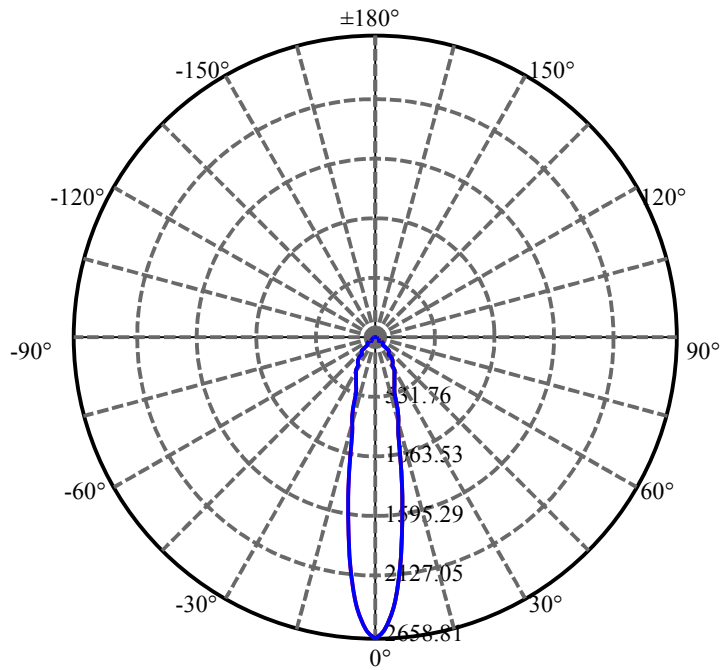
| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 76.0               | 12.670        | 2.696       | 945.529   | .237%       | 98.940%    |
| 78.0               | 10.846        | 2.327       | 947.855   | .205%       | 99.183%    |
| 80.0               | 9.270         | 2.002       | 949.857   | .176%       | 99.393%    |
| 82.0               | 7.846         | 1.704       | 951.561   | .150%       | 99.571%    |
| 84.0               | 6.579         | 1.435       | 952.996   | .126%       | 99.721%    |
| 86.0               | 5.513         | 1.206       | 954.202   | .106%       | 99.847%    |
| 88.0               | 4.577         | 1.003       | 955.205   | .088%       | 99.952%    |
| 90.0               | 4.150         | 0.455       | 955.66    | .040%       | 100.000%   |

## ZONAL LUMEN SUMMARY

| Zone    | Lumens | %Lamp  | %Fixt   |
|---------|--------|--------|---------|
| 0-30    | 610.23 | 53.67% | 63.85%  |
| 0-40    | 770.57 | 67.77% | 80.63%  |
| 0-60    | 911.12 | 80.13% | 95.34%  |
| 0-90    | 955.21 | 84.01% | 99.95%  |
| 0-120   | 955.21 | 84.01% | 99.95%  |
| 0-180   | 955.66 | 84.05% | 100.00% |
| 60-90   | 51.02  | 4.49%  | 5.34%   |
| 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%   |
| 0-39.57 | 764.53 | 67.24% | 80.00%  |

## ZONAL LUMEN SUMMARY

|         |        |
|---------|--------|
| 0-10    | 208.14 |
| 10-20   | 217.78 |
| 20-30   | 184.30 |
| 30-40   | 160.34 |
| 40-50   | 94.98  |
| 50-60   | 45.58  |
| 60-70   | 25.11  |
| 70-80   | 13.62  |
| 80-90   | 5.35   |
| 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:

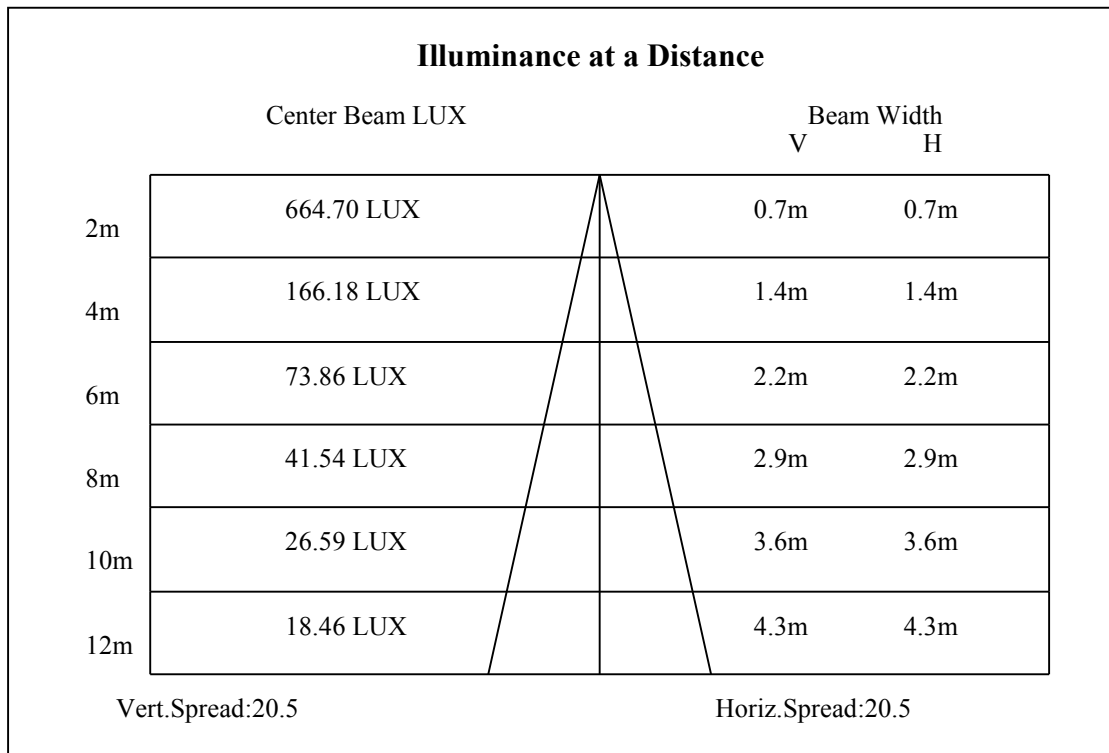
C90/C270:

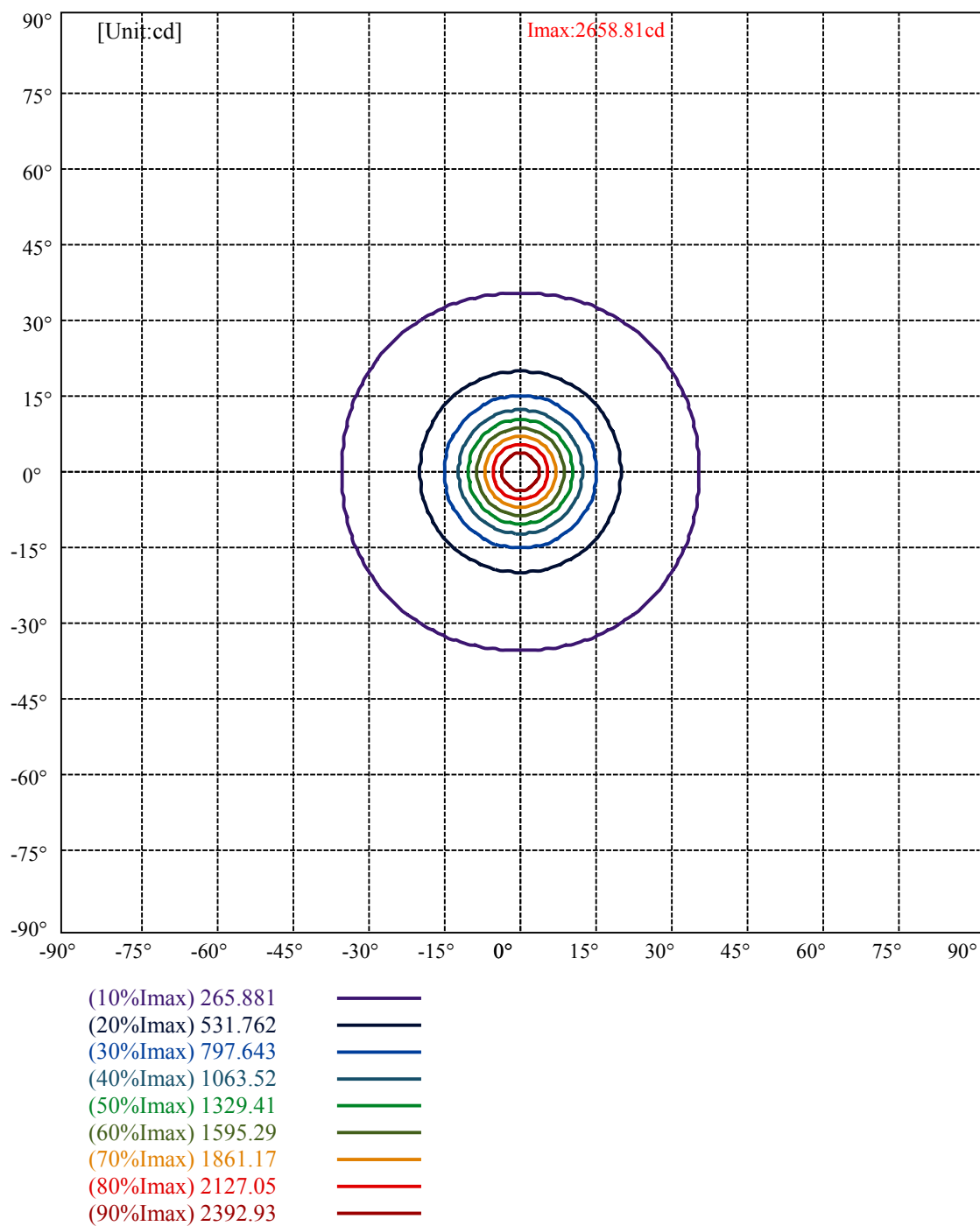
Field angle(10%Imax):C0/180Left:35.0 Right:35.0

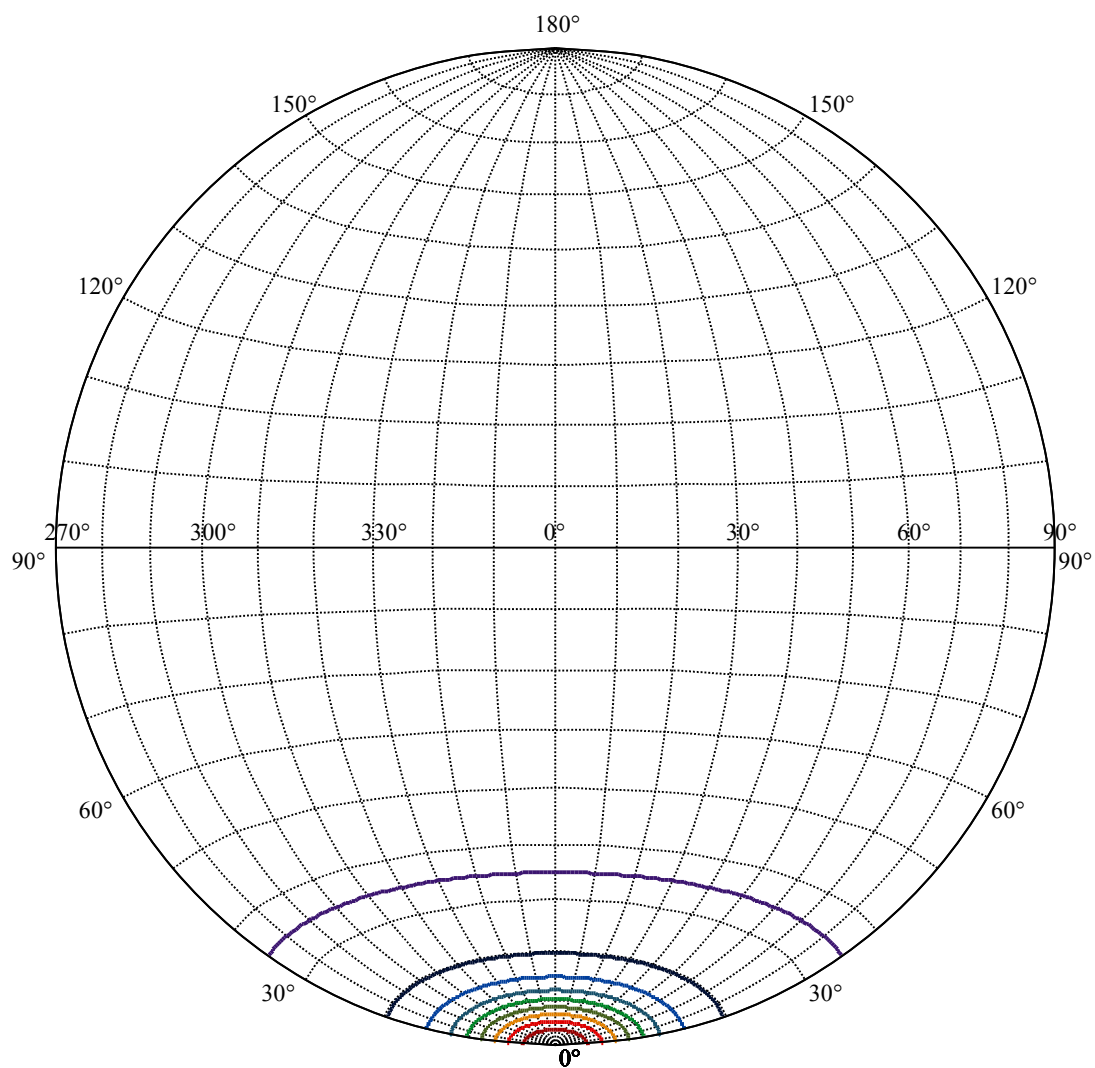
:C90/270Left:35.0 Right:35.0

Beam Angle(50%Imax):C0/180Left:10.2 Right:10.2

:C90/270Left:10.2 Right:10.2







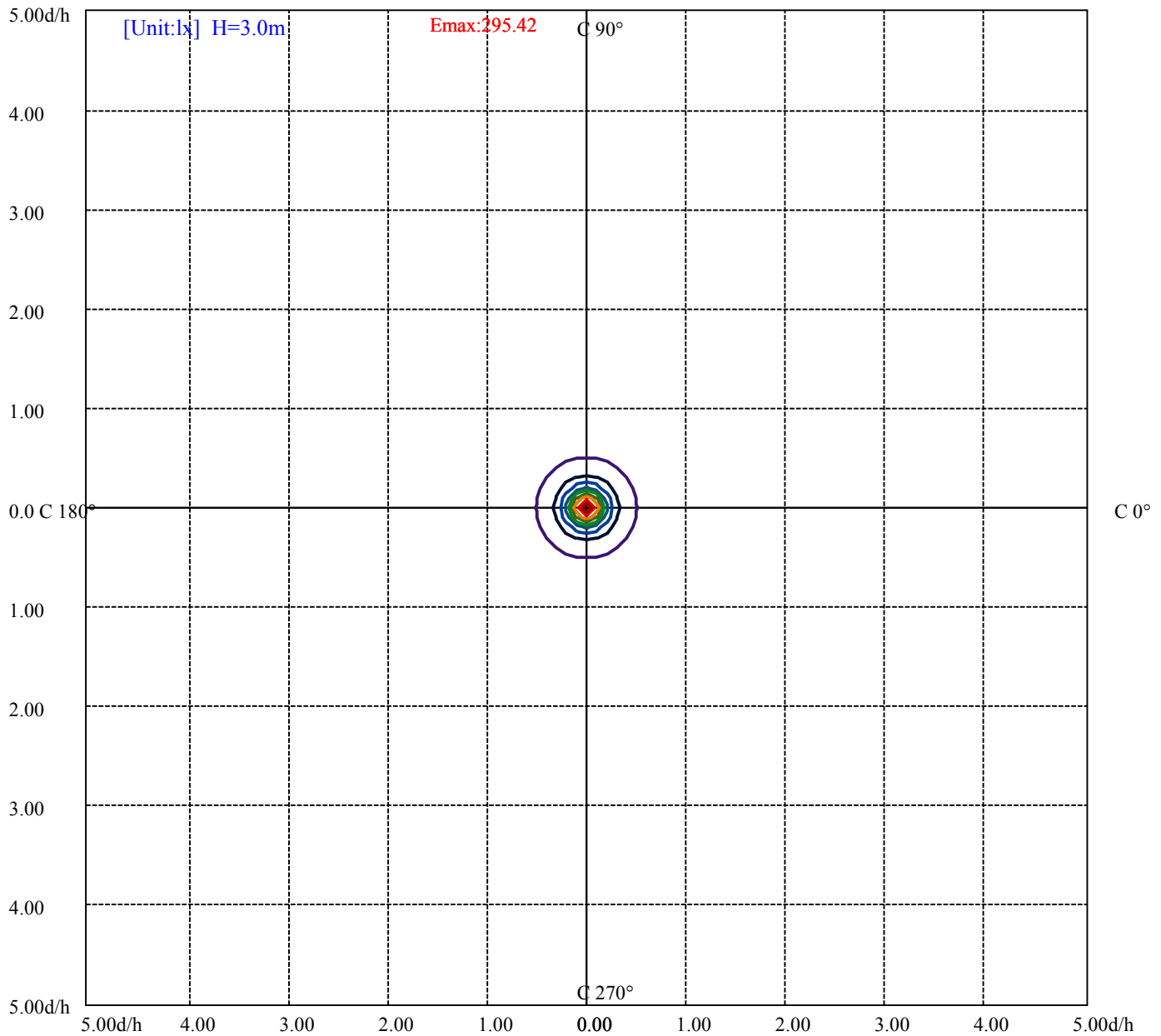
House

[Unit:cd]

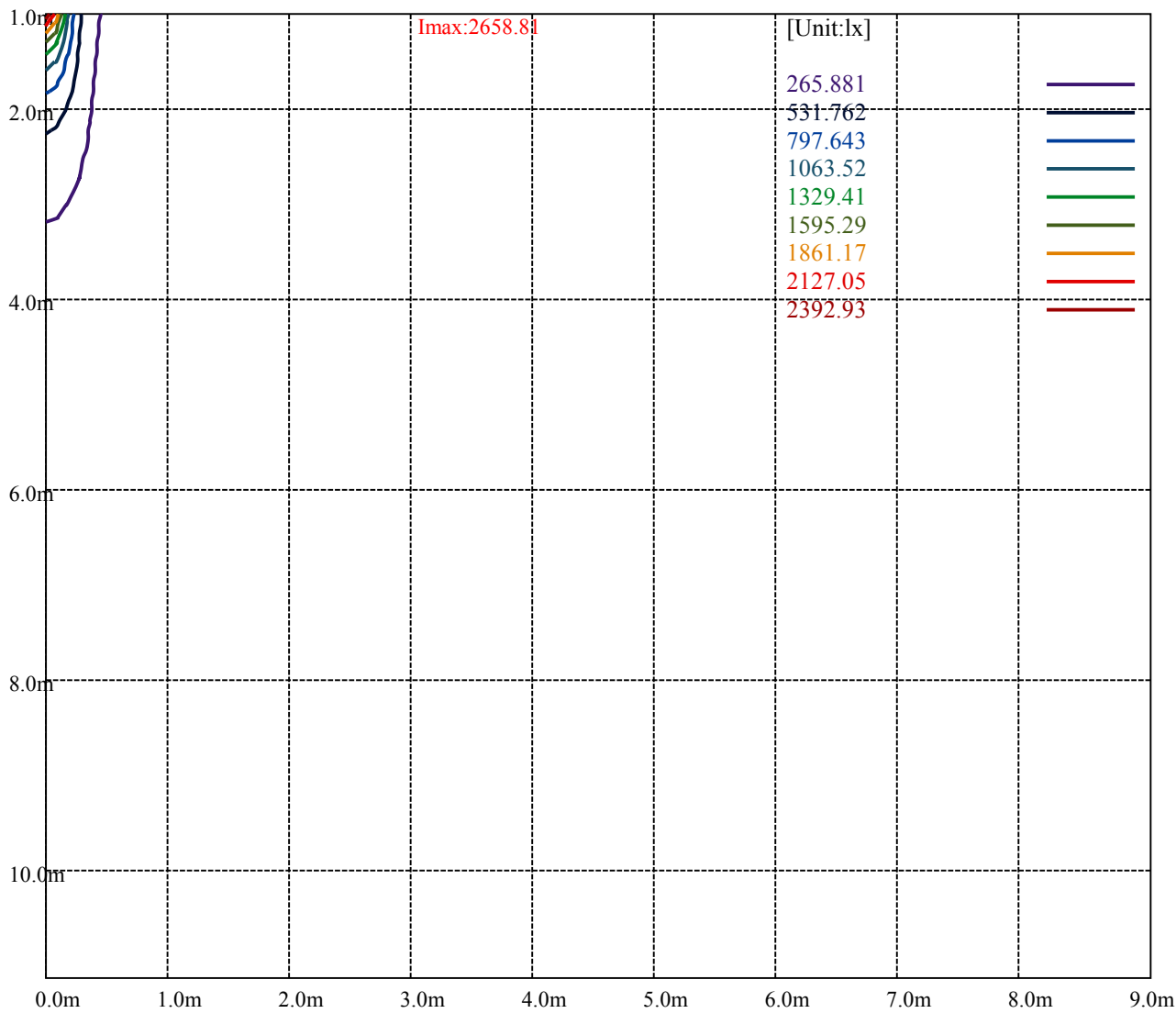
Road

**Imax:2658.81**

|           |         |   |
|-----------|---------|---|
| (10%Imax) | 265.881 | — |
| (20%Imax) | 531.762 | — |
| (30%Imax) | 797.643 | — |
| (40%Imax) | 1063.52 | — |
| (50%Imax) | 1329.41 | — |
| (60%Imax) | 1595.29 | — |
| (70%Imax) | 1861.17 | — |
| (80%Imax) | 2127.05 | — |
| (90%Imax) | 2392.93 | — |



|           |          |                                                                                     |
|-----------|----------|-------------------------------------------------------------------------------------|
| (10%Emax) | 29.54222 |  |
| (20%Emax) | 59.08455 |  |
| (30%Emax) | 88.62678 |  |
| (40%Emax) | 118.1689 |  |
| (50%Emax) | 147.7111 |  |
| (60%Emax) | 177.2533 |  |
| (70%Emax) | 206.7956 |  |
| (80%Emax) | 236.3378 |  |
| (90%Emax) | 265.88   |  |



Luminance Table

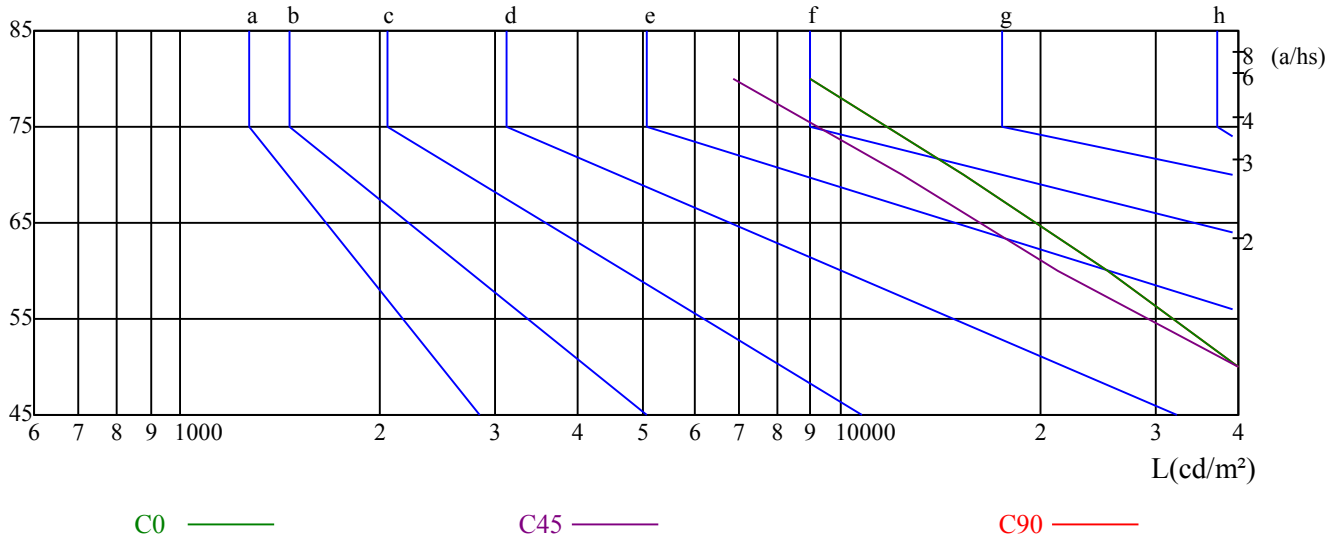
| $\gamma$ | 45 | 50    | 55 | 60    | 65 | 70    | 75 | 80   | 85 |
|----------|----|-------|----|-------|----|-------|----|------|----|
| C0       | 0  | 51738 | 0  | 25443 | 0  | 15349 | 0  | 8980 | 0  |
| C45      | 0  | 44713 | 0  | 21294 | 0  | 12356 | 0  | 6864 | 0  |
| C90      | 0  | 51738 | 0  | 25443 | 0  | 15349 | 0  | 8980 | 0  |

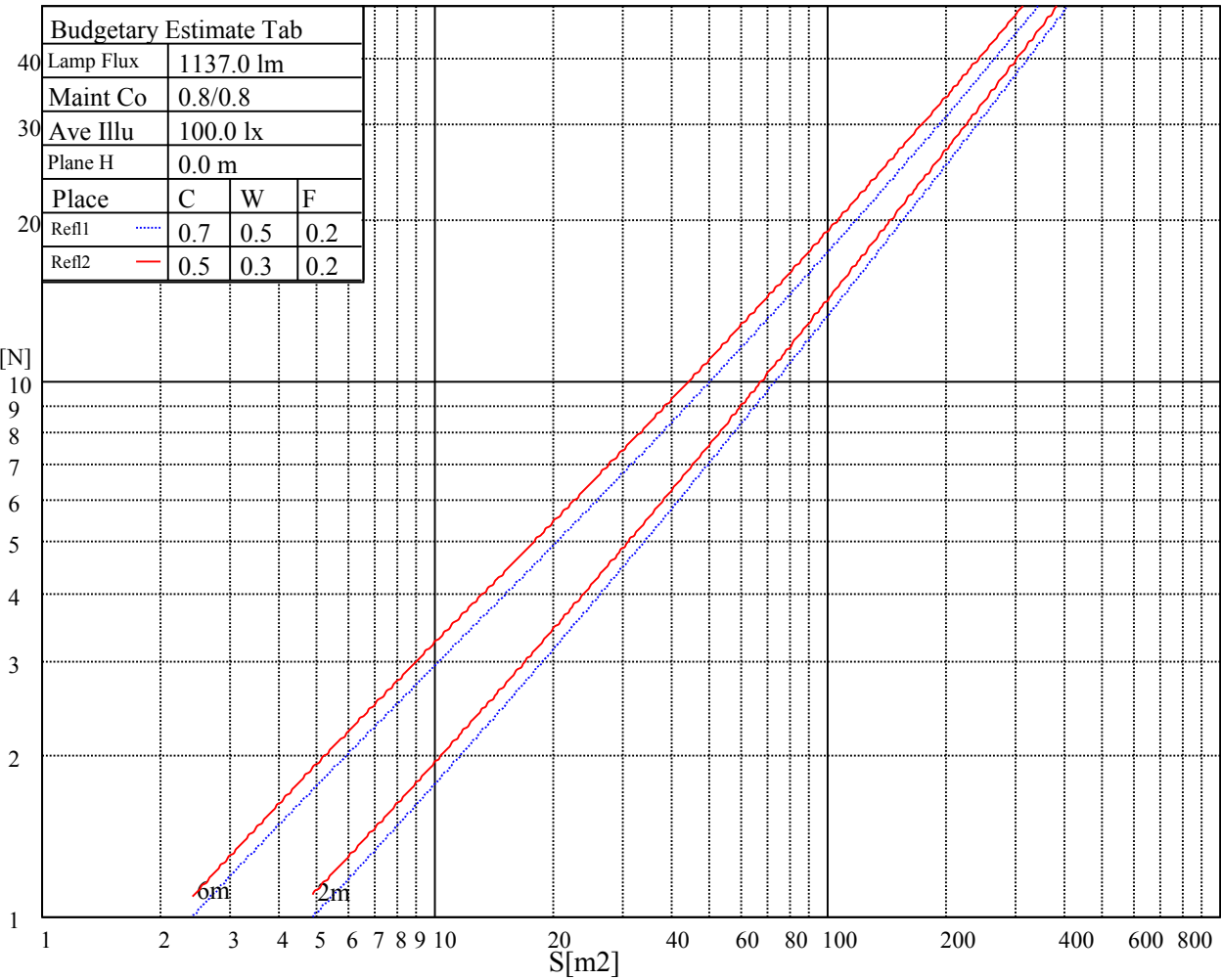
| L(Hor)(65) | L(Ver)(65) | L45(65) | L(Hor)(75) | L(Ver)(75) | L45(75) | L(Hor)(85) | L(Ver)(85) | L45(85) |
|------------|------------|---------|------------|------------|---------|------------|------------|---------|
| 217809     | 214897     | 217424  | 65383      | 45663      | 67760   | 56483      | 50669      | 58560   |

Glare Table

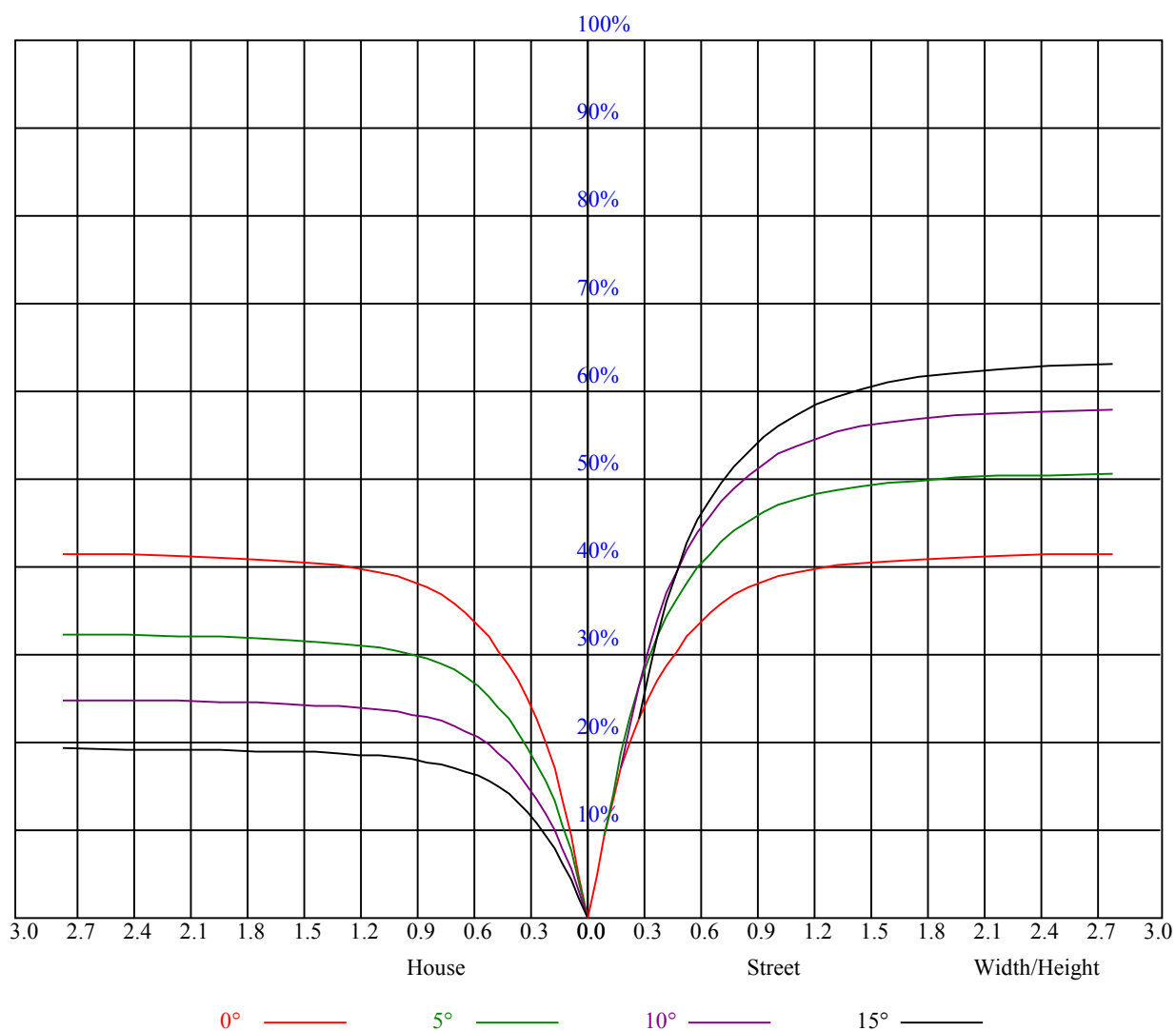
| Glare | Quality | Service Values Illuminance(lx) |      |      |            |            |            |            |            |
|-------|---------|--------------------------------|------|------|------------|------------|------------|------------|------------|
| 1.15  | A       | 2000                           | 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

 $\gamma(^{\circ})$ 



| 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     | 1.00                                    | 1.00 | 1.00 | 0.98 | 0.98 | 0.98 | 0.94 | 0.94 | 0.94 | 0.90 | 0.90 | 0.90 | 0.86 | 0.86 | 0.86 | 0.84 |
| 1     | 0.92                                    | 0.90 | 0.88 | 0.90 | 0.88 | 0.86 | 0.87 | 0.85 | 0.84 | 0.84 | 0.82 | 0.81 | 0.81 | 0.80 | 0.79 | 0.77 |
| 2     | 0.85                                    | 0.82 | 0.78 | 0.84 | 0.80 | 0.78 | 0.81 | 0.78 | 0.76 | 0.79 | 0.76 | 0.74 | 0.76 | 0.74 | 0.73 | 0.71 |
| 3     | 0.79                                    | 0.75 | 0.71 | 0.78 | 0.74 | 0.71 | 0.76 | 0.72 | 0.69 | 0.74 | 0.71 | 0.68 | 0.72 | 0.69 | 0.67 | 0.66 |
| 4     | 0.74                                    | 0.69 | 0.65 | 0.73 | 0.68 | 0.65 | 0.71 | 0.67 | 0.64 | 0.69 | 0.66 | 0.63 | 0.68 | 0.65 | 0.63 | 0.61 |
| 5     | 0.69                                    | 0.64 | 0.60 | 0.69 | 0.64 | 0.60 | 0.67 | 0.63 | 0.60 | 0.66 | 0.62 | 0.59 | 0.64 | 0.61 | 0.59 | 0.57 |
| 6     | 0.65                                    | 0.60 | 0.56 | 0.65 | 0.60 | 0.56 | 0.63 | 0.59 | 0.56 | 0.62 | 0.58 | 0.55 | 0.61 | 0.58 | 0.55 | 0.54 |
| 7     | 0.62                                    | 0.57 | 0.53 | 0.61 | 0.56 | 0.53 | 0.60 | 0.56 | 0.52 | 0.59 | 0.55 | 0.52 | 0.58 | 0.55 | 0.52 | 0.51 |
| 8     | 0.58                                    | 0.53 | 0.50 | 0.58 | 0.53 | 0.50 | 0.57 | 0.53 | 0.50 | 0.56 | 0.52 | 0.49 | 0.55 | 0.52 | 0.49 | 0.48 |
| 9     | 0.56                                    | 0.51 | 0.47 | 0.55 | 0.50 | 0.47 | 0.54 | 0.50 | 0.47 | 0.54 | 0.50 | 0.47 | 0.53 | 0.49 | 0.47 | 0.46 |
| 10    | 0.53                                    | 0.48 | 0.45 | 0.53 | 0.48 | 0.45 | 0.52 | 0.48 | 0.45 | 0.51 | 0.47 | 0.45 | 0.51 | 0.47 | 0.45 | 0.44 |



## Nata 1405-N

| Intensity data(cd)         |         |         |         |         |         |         |         |        |        |
|----------------------------|---------|---------|---------|---------|---------|---------|---------|--------|--------|
| Appendix Page: 15 Total:16 |         |         |         |         |         |         |         |        |        |
| C/γ(°)                     | 0.0     | 2.0     | 4.0     | 6.0     | 8.0     | 10.0    | 12.0    | 14.0   | 16.0   |
| 0.0                        | 2655.37 | 2636.65 | 2455.52 | 2175.28 | 1852.65 | 1506.89 | 1234.36 | 980.00 | 785.10 |
| 45.0                       | 2658.12 | 2531.49 | 2292.55 | 1939.64 | 1589.48 | 1270.70 | 1004.23 | 793.36 | 653.52 |
| 90.0                       | 2647.66 | 2461.02 | 2154.36 | 1788.78 | 1405.59 | 1097.16 | 865.93  | 682.42 | 580.79 |
| 135.0                      | 2674.09 | 2533.70 | 2273.83 | 1902.20 | 1538.28 | 1216.20 | 956.33  | 758.68 | 628.19 |
| 180.0                      | 2655.37 | 2532.04 | 2268.32 | 1944.59 | 1603.79 | 1279.51 | 1027.90 | 836.36 | 695.58 |
| 225.0                      | 2658.12 | 2626.19 | 2452.21 | 2165.37 | 1822.37 | 1500.84 | 1173.25 | 962.22 | 794.30 |
| 270.0                      | 2647.66 | 2655.37 | 2507.82 | 2218.22 | 1886.23 | 1558.65 | 1260.79 | 999.82 | 807.68 |
| 315.0                      | 2674.09 | 2625.64 | 2435.70 | 2140.04 | 1765.66 | 1463.40 | 1087.69 | 943.17 | 764.95 |
| 360.0                      | 2655.37 | 2636.65 | 2455.52 | 2175.28 | 1852.65 | 1506.89 | 1234.36 | 980.00 | 785.10 |
| C/γ(°)                     | 18.0    | 20.0    | 22.0    | 24.0    | 26.0    | 28.0    | 30.0    | 32.0   | 34.0   |
| 0.0                        | 657.37  | 560.47  | 498.26  | 447.61  | 412.37  | 382.64  | 356.21  | 330.89 | 305.56 |
| 45.0                       | 554.42  | 482.29  | 434.95  | 394.20  | 367.23  | 339.70  | 317.12  | 294.55 | 278.03 |
| 90.0                       | 496.77  | 439.85  | 397.29  | 364.64  | 335.73  | 313.27  | 287.61  | 263.28 | 240.82 |
| 135.0                      | 541.20  | 476.79  | 434.39  | 396.41  | 369.43  | 344.65  | 320.98  | 297.86 | 279.69 |
| 180.0                      | 589.05  | 518.58  | 460.44  | 417.60  | 383.91  | 354.07  | 325.49  | 299.07 | 273.52 |
| 225.0                      | 657.48  | 565.65  | 499.31  | 450.47  | 410.72  | 378.62  | 352.80  | 325.38 | 300.94 |
| 270.0                      | 665.63  | 559.92  | 493.31  | 435.50  | 394.75  | 361.17  | 332.54  | 304.46 | 278.59 |
| 315.0                      | 627.42  | 540.21  | 472.44  | 423.66  | 388.53  | 358.75  | 333.70  | 312.33 | 288.39 |
| 360.0                      | 657.37  | 560.47  | 498.26  | 447.61  | 412.37  | 382.64  | 356.21  | 330.89 | 305.56 |
| C/γ(°)                     | 36.0    | 38.0    | 40.0    | 42.0    | 44.0    | 46.0    | 48.0    | 50.0   | 52.0   |
| 0.0                        | 279.14  | 247.37  | 219.84  | 189.17  | 161.54  | 135.77  | 113.36  | 92.88  | 78.29  |
| 45.0                       | 245.22  | 218.90  | 190.94  | 162.31  | 136.21  | 111.21  | 91.39   | 75.59  | 63.26  |
| 90.0                       | 215.33  | 190.55  | 165.22  | 140.01  | 115.73  | 97.56   | 80.11   | 67.11  | 56.71  |
| 135.0                      | 246.43  | 218.68  | 192.53  | 164.01  | 137.31  | 113.86  | 94.53   | 78.13  | 66.01  |
| 180.0                      | 244.23  | 217.86  | 187.14  | 157.13  | 132.63  | 110.22  | 88.97   | 75.15  | 62.87  |
| 225.0                      | 272.64  | 244.89  | 216.48  | 186.97  | 158.84  | 132.41  | 108.57  | 89.25  | 74.88  |
| 270.0                      | 250.34  | 223.20  | 195.34  | 167.81  | 145.84  | 120.90  | 101.08  | 85.39  | 70.53  |
| 315.0                      | 261.24  | 239.00  | 210.04  | 181.85  | 155.75  | 129.71  | 106.70  | 88.48  | 73.39  |
| 360.0                      | 279.14  | 247.37  | 219.84  | 189.17  | 161.54  | 135.77  | 113.36  | 92.88  | 78.29  |
| C/γ(°)                     | 54.0    | 56.0    | 58.0    | 60.0    | 62.0    | 64.0    | 66.0    | 68.0   | 70.0   |
| 0.0                        | 64.86   | 54.51   | 47.07   | 40.30   | 35.07   | 30.72   | 27.03   | 23.67  | 20.98  |
| 45.0                       | 53.24   | 45.59   | 39.70   | 34.41   | 30.72   | 26.81   | 23.73   | 20.98  | 18.50  |
| 90.0                       | 48.50   | 42.45   | 36.89   | 32.48   | 28.74   | 25.49   | 22.30   | 19.88  | 17.34  |
| 135.0                      | 55.55   | 47.40   | 41.46   | 35.95   | 31.66   | 27.64   | 24.45   | 21.31  | 18.94  |
| 180.0                      | 52.36   | 45.70   | 39.37   | 34.36   | 30.12   | 26.59   | 23.29   | 20.59  | 18.06  |
| 225.0                      | 61.83   | 51.70   | 44.43   | 38.15   | 32.81   | 28.96   | 25.27   | 22.41  | 19.60  |
| 270.0                      | 59.30   | 51.37   | 44.21   | 38.32   | 33.75   | 29.51   | 26.15   | 23.12  | 20.43  |
| 315.0                      | 60.78   | 52.03   | 44.21   | 38.32   | 33.42   | 29.35   | 25.71   | 22.90  | 20.04  |
| 360.0                      | 64.86   | 54.51   | 47.07   | 40.30   | 35.07   | 30.72   | 27.03   | 23.67  | 20.98  |
| C/γ(°)                     | 72.0    | 74.0    | 76.0    | 78.0    | 80.0    | 82.0    | 84.0    | 86.0   | 88.0   |
| 0.0                        | 18.28   | 16.02   | 13.98   | 12.06   | 10.41   | 8.86    | 7.49    | 6.33   | 5.12   |
| 45.0                       | 16.08   | 14.15   | 12.17   | 10.30   | 8.86    | 7.43    | 6.22    | 5.01   | 4.35   |
| 90.0                       | 15.03   | 13.05   | 11.01   | 9.25    | 7.76    | 6.50    | 5.40    | 4.46   | 4.02   |
| 135.0                      | 16.41   | 14.42   | 12.22   | 10.30   | 8.70    | 7.21    | 6.00    | 5.07   | 4.24   |
| 180.0                      | 15.75   | 13.87   | 11.84   | 10.24   | 8.64    | 7.32    | 6.17    | 5.23   | 4.35   |
| 225.0                      | 17.07   | 15.03   | 13.10   | 11.40   | 9.74    | 8.48    | 7.16    | 6.06   | 4.84   |
| 270.0                      | 17.73   | 15.64   | 13.54   | 11.56   | 10.02   | 8.37    | 6.99    | 5.84   | 4.62   |
| 315.0                      | 17.56   | 15.53   | 13.49   | 11.67   | 10.02   | 8.59    | 7.21    | 6.11   | 5.07   |
| 360.0                      | 18.28   | 16.02   | 13.98   | 12.06   | 10.41   | 8.86    | 7.49    | 6.33   | 5.12   |

## Intensity data(cd)

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|                       |      |
|-----------------------|------|
| C/ $\gamma(^{\circ})$ | 90.0 |
| 0.0                   | 4.40 |
| 45.0                  | 4.13 |
| 90.0                  | 4.02 |
| 135.0                 | 3.96 |
| 180.0                 | 3.91 |
| 225.0                 | 4.29 |
| 270.0                 | 4.07 |
| 315.0                 | 4.40 |
| 360.0                 | 4.40 |