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NATA

| | |
|-------------------------|---------------------|
| LumCAT: 1320-E | |
| Luminaire: 92.70.046.00 | |
| Report No: NATA0100 | Voltage(V): 35.5000 |
| Test No: GC20190110 | Current(A): 0.3000 |
| LampCAT: CREE CXA1512 | Power (W): 10.6500 |
| Lamp flux(lm): 1552.0 | PF: 0.0000 |
| Number of Lamps: 1 | Ballast type: DC |
| Length(mm): 40 | Width(mm): 40 |
| Phm Type: C | Height(mm): 0 |

Photometric Results

Lumens(lm): 1298.99
Efficiency(%): 83.70%
Lumens(lm)/Power(W): 123.20
Central intensity(cd): 2387.531
Maximum intensity(cd): 2387.531
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=44.0
 [C90/270]Total=44.0
Field angle(10%Imax): [C0/180]Total=64.9
 [C90/270]Total=64.9
Maximum s/h(1/2): C0_180=0.73 C90_270=0.73
Maximum s/h(1/4): C0_180=0.67 C90_270=0.67
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 84.54%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 97.223%

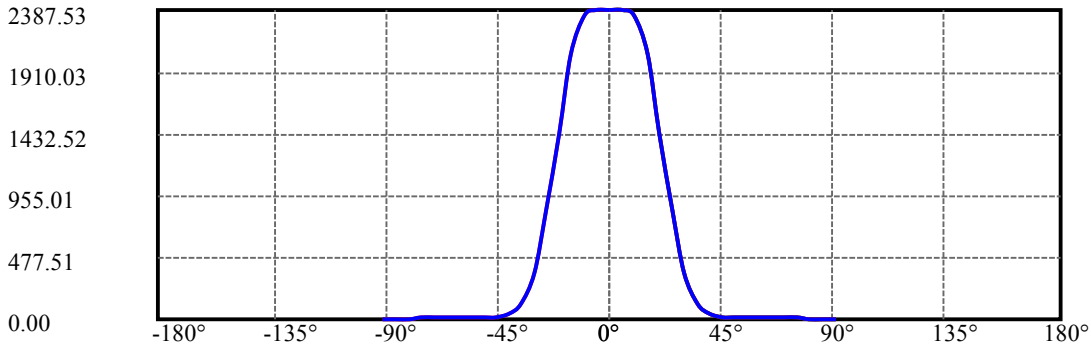
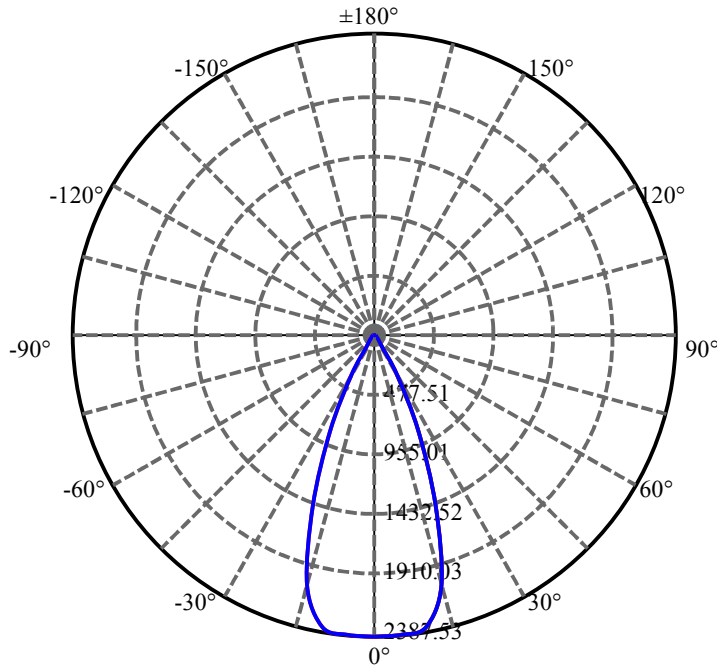
| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0 | 2387.531 | 14.278 | 14.278 | .920% | 1.099% |
| 5.0 | 2387.531 | 114.060 | 128.338 | 7.349% | 9.880% |
| 10.0 | 2339.719 | 222.702 | 351.04 | 14.349% | 27.024% |
| 15.0 | 2050.031 | 290.835 | 641.874 | 18.739% | 49.413% |
| 20.0 | 1439.339 | 269.839 | 911.713 | 17.387% | 70.186% |
| 25.0 | 831.642 | 192.652 | 1104.365 | 12.413% | 85.017% |
| 30.0 | 361.406 | 99.050 | 1203.416 | 6.382% | 92.643% |
| 35.0 | 113.189 | 35.586 | 1239.002 | 2.293% | 95.382% |
| 40.0 | 39.741 | 14.002 | 1253.004 | .902% | 96.460% |
| 45.0 | 15.764 | 6.110 | 1259.114 | .394% | 96.930% |
| 50.0 | 13.043 | 5.477 | 1264.591 | .353% | 97.352% |
| 55.0 | 12.115 | 5.440 | 1270.031 | .350% | 97.771% |
| 60.0 | 11.714 | 5.561 | 1275.591 | .358% | 98.199% |
| 65.0 | 11.032 | 5.481 | 1281.072 | .353% | 98.621% |
| 70.0 | 9.563 | 4.925 | 1285.997 | .317% | 99.000% |
| 75.0 | 8.234 | 4.359 | 1290.357 | .281% | 99.336% |
| 80.0 | 6.518 | 3.518 | 1293.875 | .227% | 99.606% |
| 85.0 | 6.363 | 3.475 | 1297.35 | .224% | 99.874% |
| 90.0 | 5.977 | 1.638 | 1298.988 | .106% | 100.000% |

ZONAL LUMEN SUMMARY

| Zone | Lumens | %Lamp | %Fixt |
|---------|---------|--------|---------|
| 0-30 | 1203.42 | 77.54% | 92.64% |
| 0-40 | 1253.00 | 80.73% | 96.46% |
| 0-60 | 1275.59 | 82.19% | 98.20% |
| 0-90 | 1297.35 | 83.59% | 99.87% |
| 0-120 | 1297.35 | 83.59% | 99.87% |
| 0-180 | 1298.99 | 83.70% | 100.00% |
| 60-90 | 27.32 | 1.76% | 2.10% |
| 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% |
| 0-23.31 | 1039.19 | 66.96% | 80.00% |

ZONAL LUMEN SUMMARY

| | |
|---------|--------|
| 0-10 | 351.04 |
| 10-20 | 560.67 |
| 20-30 | 291.70 |
| 30-40 | 49.59 |
| 40-50 | 11.59 |
| 50-60 | 11.00 |
| 60-70 | 10.41 |
| 70-80 | 7.88 |
| 80-90 | 3.47 |
| 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: —————

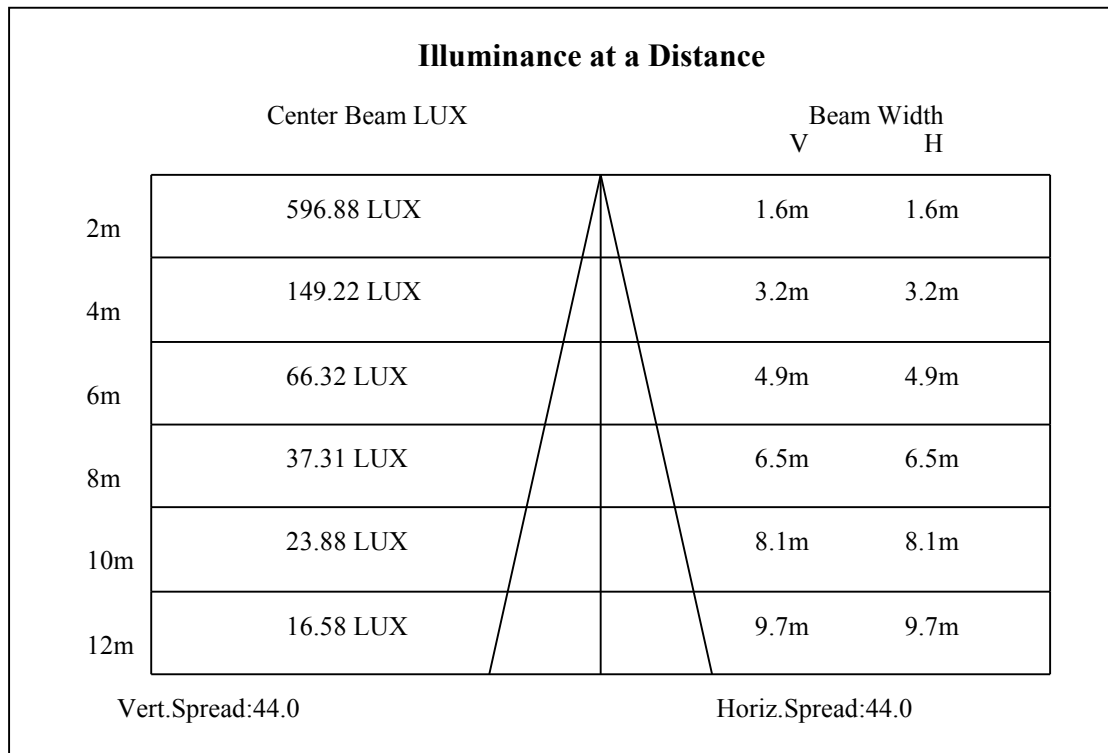
C90/C270: —————

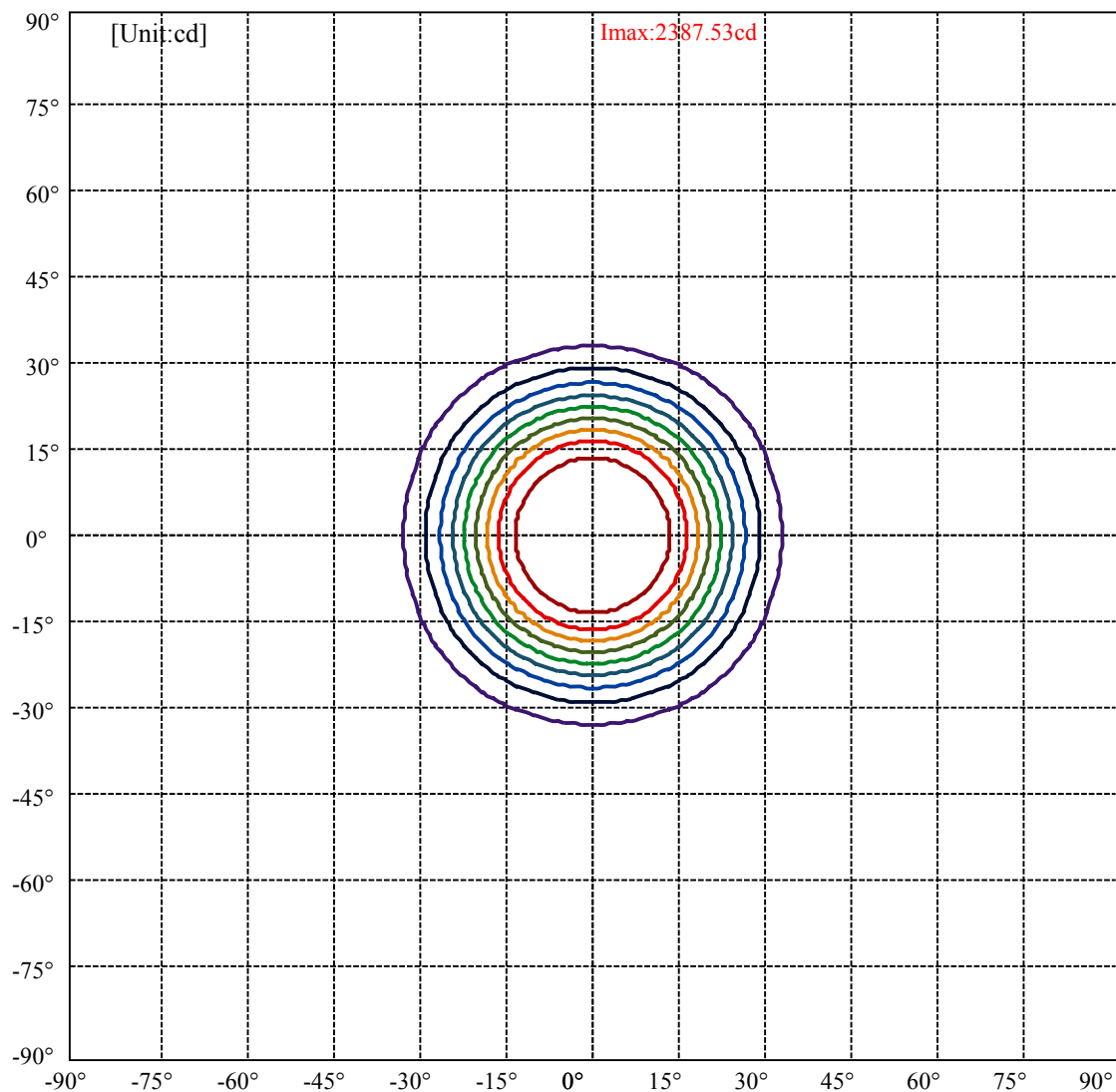
Field angle(10%Imax):C0/180Left:37.5 Right:27.5

:C90/270Left:37.5 Right:27.5

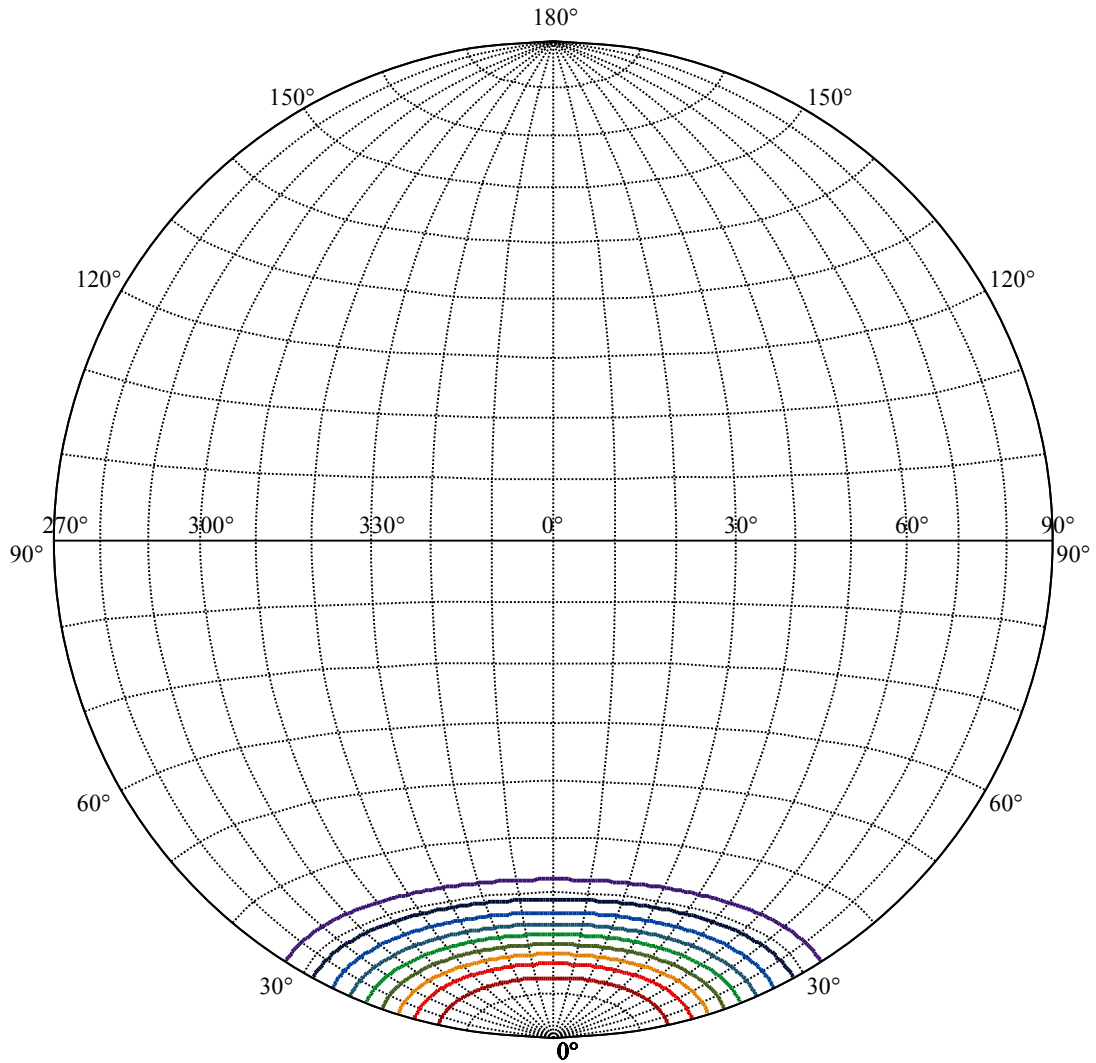
Beam Angle(50%Imax):C0/180Left:27.0 Right:17.0

:C90/270Left:27.0 Right:17.0





| | |
|-------------------|---|
| (10%Imax) 238.753 | — |
| (20%Imax) 477.506 | — |
| (30%Imax) 716.259 | — |
| (40%Imax) 955.013 | — |
| (50%Imax) 1193.77 | — |
| (60%Imax) 1432.52 | — |
| (70%Imax) 1671.27 | — |
| (80%Imax) 1910.03 | — |
| (90%Imax) 2148.78 | — |



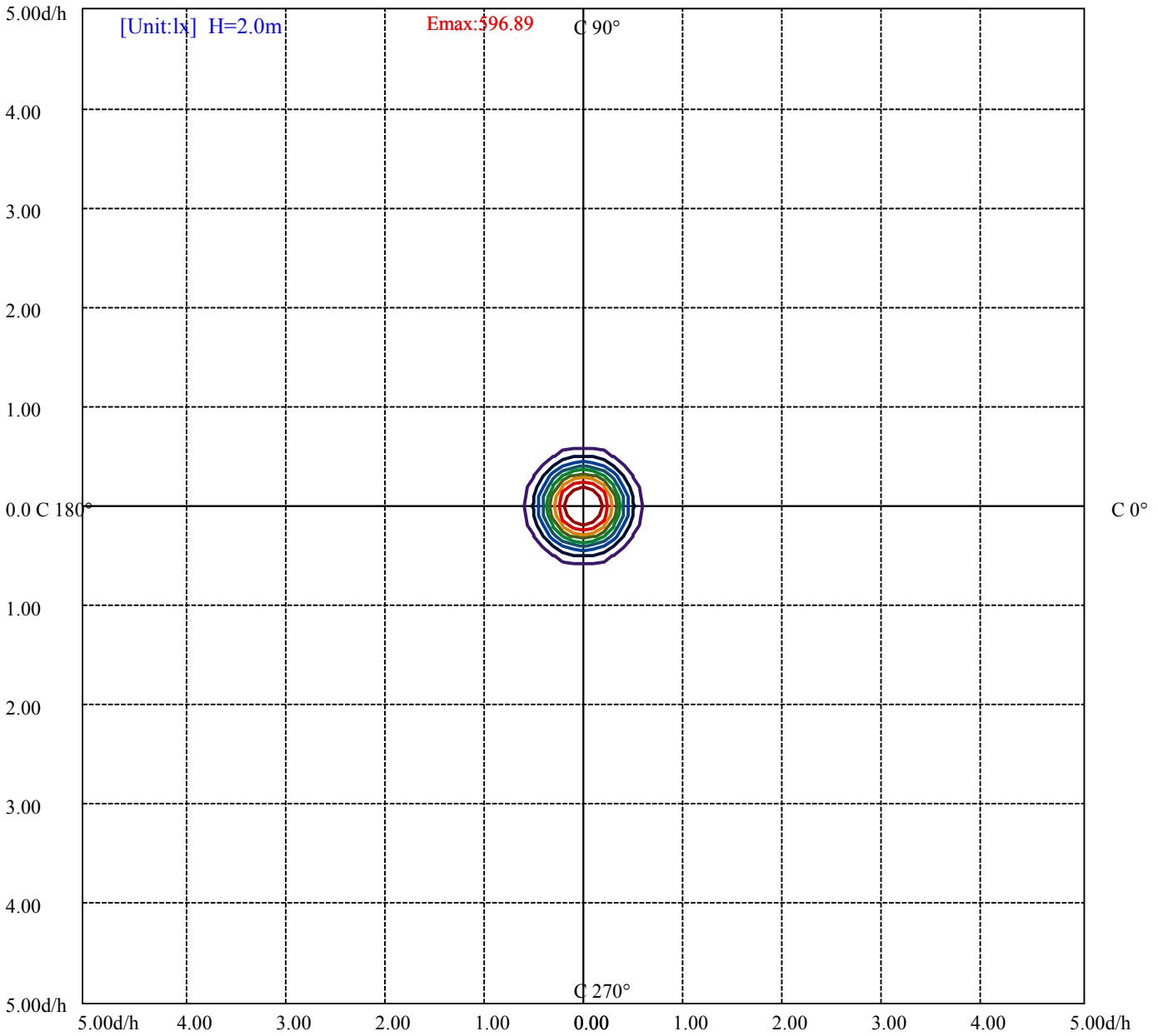
House

[Unit:cd]

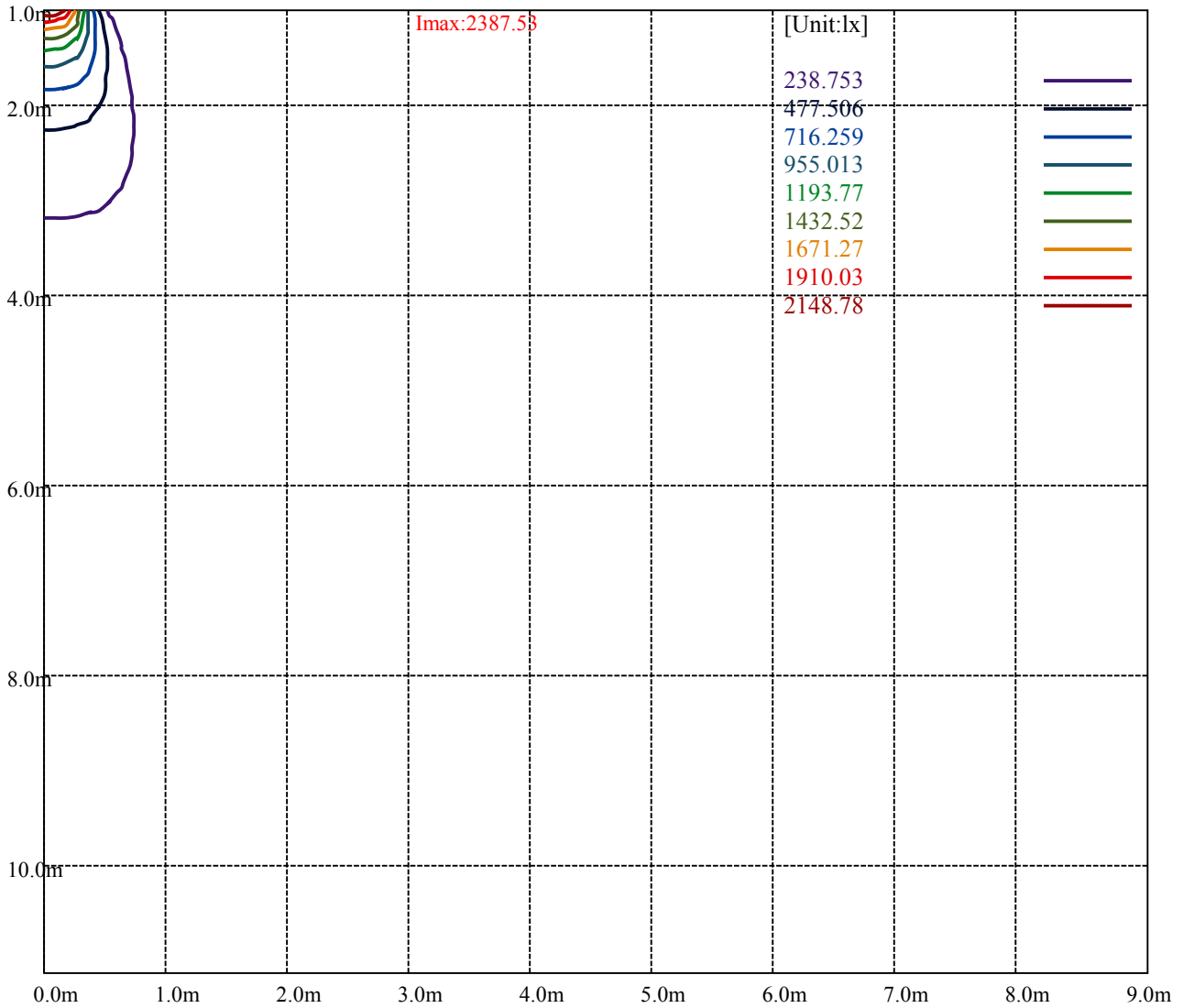
Road

Imax:2387.53

| | |
|-------------------|---|
| (10%Imax) 238.753 | — |
| (20%Imax) 477.506 | — |
| (30%Imax) 716.259 | — |
| (40%Imax) 955.013 | — |
| (50%Imax) 1193.77 | — |
| (60%Imax) 1432.52 | — |
| (70%Imax) 1671.27 | — |
| (80%Imax) 1910.03 | — |
| (90%Imax) 2148.78 | — |



| | |
|--------------------|---|
| (10%Emax) 59.68825 | — |
| (20%Emax) 119.3765 | — |
| (30%Emax) 179.0647 | — |
| (40%Emax) 238.7533 | — |
| (50%Emax) 298.4425 | — |
| (60%Emax) 358.13 | — |
| (70%Emax) 417.8175 | — |
| (80%Emax) 477.5075 | — |
| (90%Emax) 537.195 | — |



Luminance Table

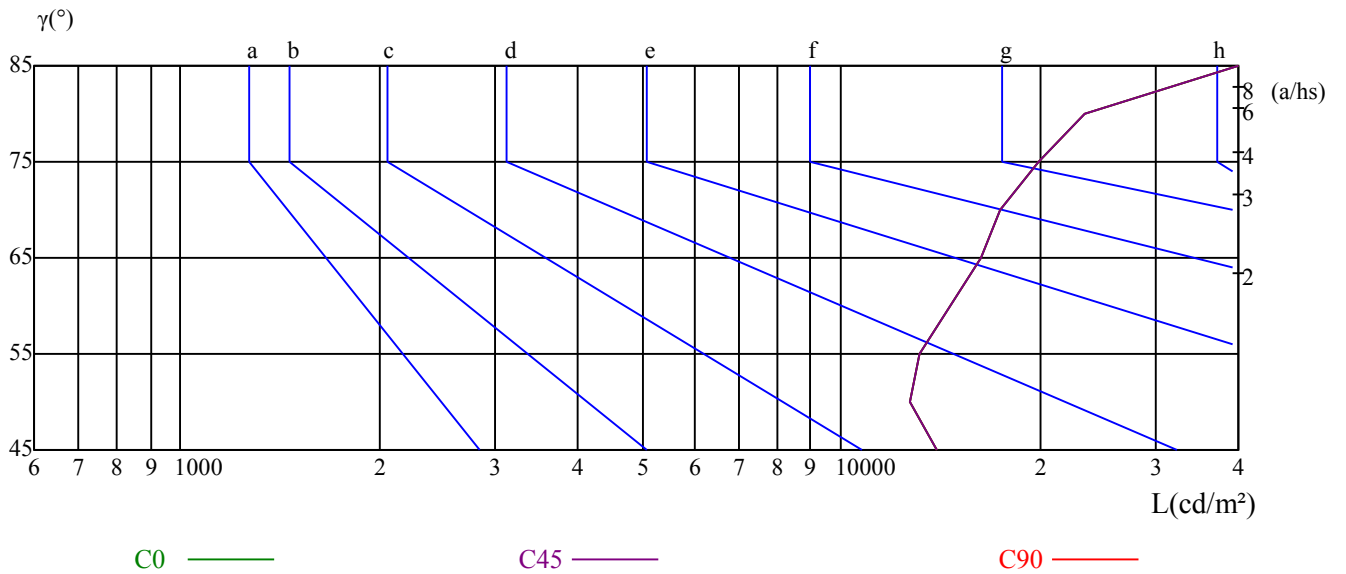
| γ | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C0 | 13934 | 12682 | 13201 | 14643 | 16315 | 17474 | 19883 | 23460 | 45632 |
| C45 | 13934 | 12682 | 13201 | 14643 | 16315 | 17474 | 19883 | 23460 | 45632 |
| C90 | 13934 | 12682 | 13201 | 14643 | 16315 | 17474 | 19883 | 23460 | 45632 |

| L(Hor)(65) | L(Ver)(65) | L45(65) | L(Hor)(75) | L(Ver)(75) | L45(75) | L(Hor)(85) | L(Ver)(85) | L45(85) |
|------------|------------|---------|------------|------------|---------|------------|------------|---------|
| 16315 | 16315 | 16315 | 19883 | 19883 | 19883 | 45632 | 45632 | 45632 |

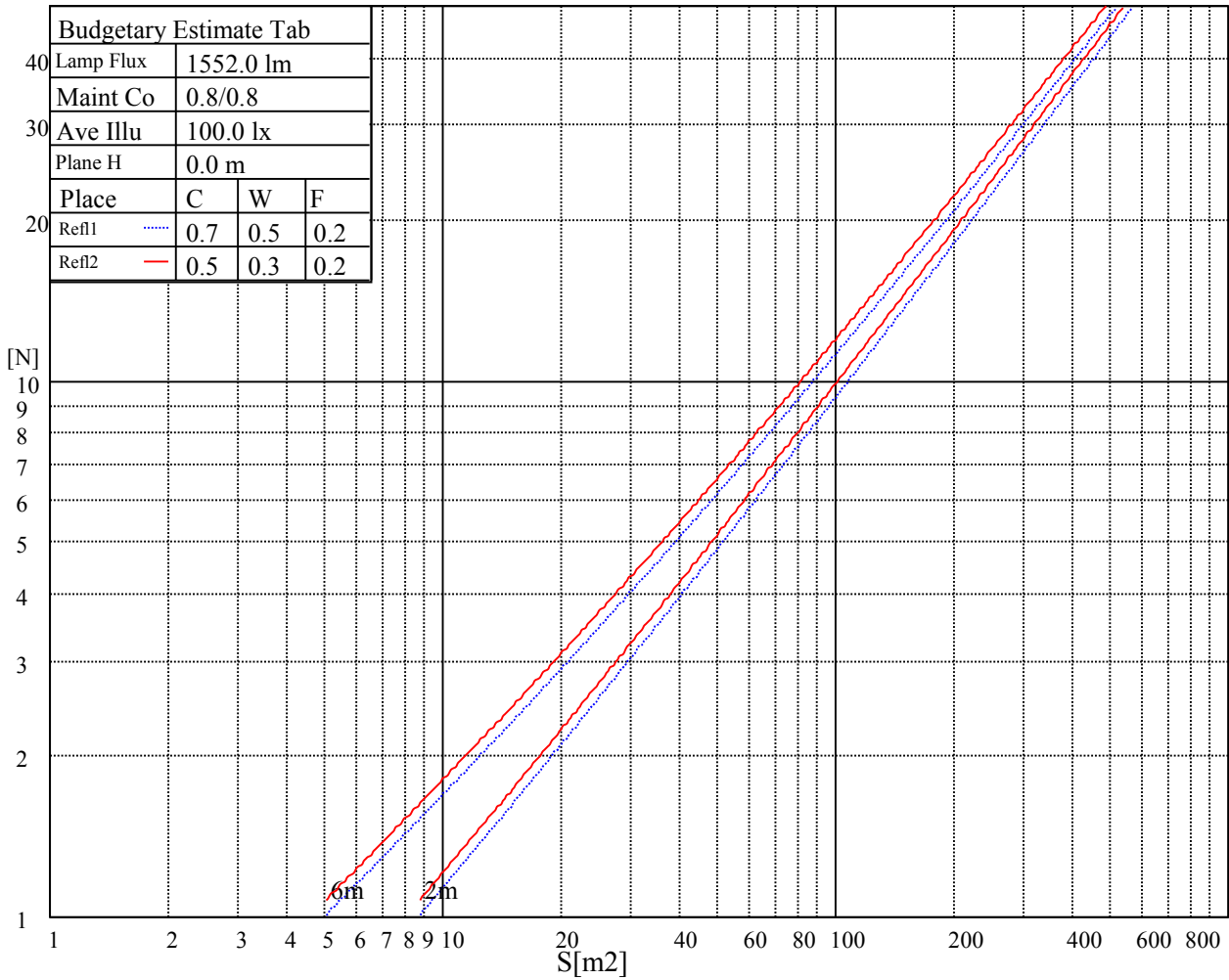
Glare Table

| 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 |

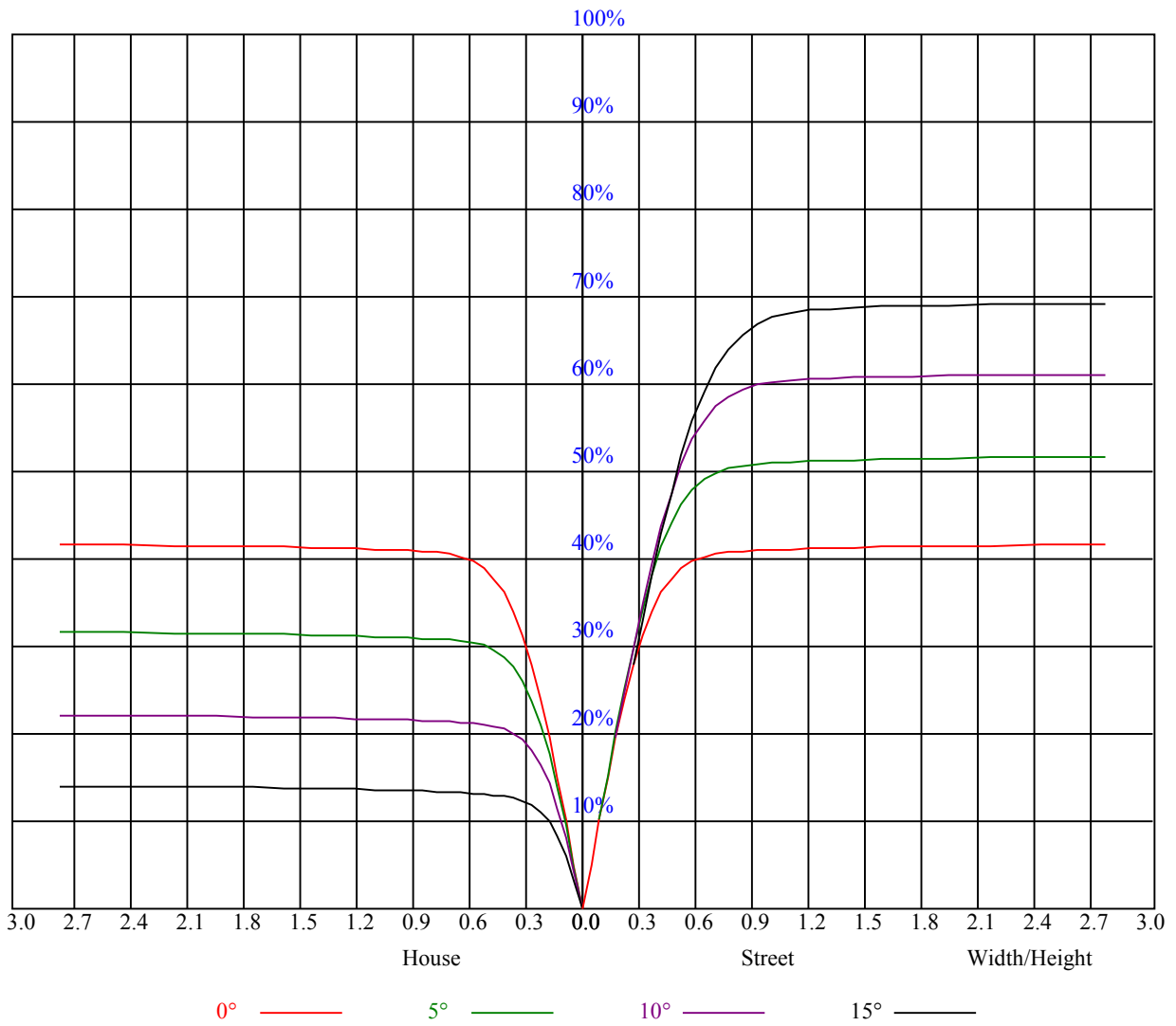
Luminance Limiting Curve



| 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 | 12.08 | 13.01 | 12.44 | 13.32 | 13.64 | 10.45 | 11.39 | 10.82 | 11.70 | 12.01 |
| | 3H | 14.87 | 15.70 | 15.26 | 16.04 | 16.40 | 13.04 | 13.86 | 13.42 | 14.20 | 14.57 |
| | 4H | 16.02 | 16.79 | 16.43 | 17.14 | 17.53 | 14.33 | 15.09 | 14.73 | 15.45 | 15.84 |
| | 6H | 17.02 | 17.72 | 17.44 | 18.10 | 18.50 | 15.77 | 16.47 | 16.19 | 16.85 | 17.25 |
| | 8H | 17.58 | 18.24 | 18.02 | 18.63 | 19.05 | 16.62 | 17.28 | 17.06 | 17.67 | 18.08 |
| | 12H | 18.67 | 19.30 | 19.11 | 19.69 | 20.12 | 18.10 | 18.73 | 18.54 | 19.12 | 19.55 |
| 4H | 2H | 12.70 | 13.47 | 13.11 | 13.82 | 14.21 | 11.54 | 12.31 | 11.95 | 12.66 | 13.05 |
| | 3H | 15.71 | 16.34 | 16.13 | 16.75 | 17.16 | 14.33 | 14.96 | 14.75 | 15.37 | 15.77 |
| | 4H | 17.03 | 17.59 | 17.47 | 18.02 | 18.47 | 15.75 | 16.31 | 16.19 | 16.74 | 17.19 |
| | 6H | 18.17 | 18.65 | 18.64 | 19.10 | 19.57 | 17.25 | 17.73 | 17.72 | 18.18 | 18.66 |
| | 8H | 18.84 | 19.29 | 19.32 | 19.74 | 20.22 | 18.18 | 18.62 | 18.65 | 19.08 | 19.55 |
| | 12H | 19.95 | 20.33 | 20.44 | 20.82 | 21.30 | 19.57 | 19.96 | 20.06 | 20.45 | 20.93 |
| 8H | 4H | 17.44 | 17.89 | 17.92 | 18.34 | 18.82 | 16.41 | 16.86 | 16.89 | 17.31 | 17.79 |
| | 6H | 18.82 | 19.18 | 19.33 | 19.68 | 20.17 | 18.14 | 18.49 | 18.65 | 19.00 | 19.48 |
| | 8H | 19.70 | 20.01 | 20.23 | 20.54 | 21.03 | 19.24 | 19.55 | 19.77 | 20.08 | 20.58 |
| | 12H | 21.15 | 21.42 | 21.68 | 21.92 | 22.50 | 20.86 | 21.13 | 21.38 | 21.63 | 22.21 |
| 12H | 4H | 17.51 | 17.89 | 18.00 | 18.38 | 18.86 | 16.53 | 16.91 | 17.02 | 17.40 | 17.88 |
| | 6H | 19.22 | 19.31 | 19.53 | 19.79 | 20.34 | 18.59 | 18.68 | 18.90 | 19.15 | 19.70 |
| | 8H | 20.01 | 20.28 | 20.53 | 20.78 | 21.36 | 19.60 | 19.87 | 20.13 | 20.37 | 20.95 |
| Variation with the observer position at spacings: | | | | | | | | | | | |
| S = 1.0H | 3.9/-2.3 | | | | | 3.9/-2.3 | | | | | |
| S = 1.5H | 5.1/-1.9 | | | | | 5.1/-1.9 | | | | | |
| S = 2.0H | 5.9/-1.5 | | | | | 5.9/-1.5 | | | | | |
| Standard tables: | BKBF | | | | | BKBF | | | | | |
| Uncorrected UGR | 5.5 | | | | | 5.5 | | | | | |



| 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 | 1.01 | 1.01 | 1.01 | 0.98 | 0.98 | 0.98 | 0.94 | 0.94 | 0.94 | 0.90 | 0.90 | 0.90 | 0.86 | 0.86 | 0.86 | 0.85 |
| 1 | 0.93 | 0.91 | 0.89 | 0.92 | 0.90 | 0.88 | 0.88 | 0.87 | 0.85 | 0.85 | 0.84 | 0.83 | 0.82 | 0.81 | 0.80 | 0.79 |
| 2 | 0.88 | 0.85 | 0.83 | 0.87 | 0.84 | 0.82 | 0.84 | 0.82 | 0.80 | 0.82 | 0.80 | 0.78 | 0.79 | 0.78 | 0.77 | 0.75 |
| 3 | 0.84 | 0.80 | 0.77 | 0.83 | 0.79 | 0.77 | 0.81 | 0.78 | 0.76 | 0.79 | 0.76 | 0.74 | 0.77 | 0.75 | 0.73 | 0.72 |
| 4 | 0.80 | 0.76 | 0.73 | 0.79 | 0.76 | 0.73 | 0.77 | 0.74 | 0.72 | 0.76 | 0.73 | 0.71 | 0.74 | 0.72 | 0.70 | 0.69 |
| 5 | 0.77 | 0.73 | 0.70 | 0.76 | 0.72 | 0.69 | 0.74 | 0.71 | 0.69 | 0.73 | 0.70 | 0.68 | 0.72 | 0.69 | 0.68 | 0.66 |
| 6 | 0.74 | 0.69 | 0.66 | 0.73 | 0.69 | 0.66 | 0.72 | 0.68 | 0.66 | 0.71 | 0.68 | 0.65 | 0.70 | 0.67 | 0.65 | 0.64 |
| 7 | 0.71 | 0.67 | 0.64 | 0.70 | 0.66 | 0.64 | 0.69 | 0.66 | 0.63 | 0.68 | 0.65 | 0.63 | 0.67 | 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 | 0.61 | 0.65 | 0.63 | 0.60 | 0.60 |
| 9 | 0.66 | 0.62 | 0.59 | 0.65 | 0.62 | 0.59 | 0.65 | 0.61 | 0.59 | 0.64 | 0.61 | 0.59 | 0.63 | 0.61 | 0.58 | 0.58 |
| 10 | 0.63 | 0.60 | 0.57 | 0.63 | 0.59 | 0.57 | 0.63 | 0.59 | 0.57 | 0.62 | 0.59 | 0.57 | 0.61 | 0.59 | 0.57 | 0.56 |



NATA 1320-E

Intensity data(cd)

| | | | | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|--------|--------|-------|
| C/ γ (°) | 0.0 | 5.0 | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 |
| 0.0 | 2395.69 | 2365.31 | 2333.25 | 2106.00 | 1691.44 | 1032.75 | 469.13 | 159.98 | 62.04 |
| 45.0 | 2388.94 | 2350.69 | 2300.06 | 2080.13 | 1622.25 | 932.63 | 457.88 | 139.28 | 49.16 |
| 90.0 | 2385.00 | 2361.38 | 2293.88 | 1972.13 | 1309.50 | 764.33 | 315.11 | 99.06 | 29.14 |
| 135.0 | 2380.50 | 2400.19 | 2362.50 | 2068.31 | 1548.56 | 815.06 | 341.44 | 104.91 | 36.34 |
| 180.0 | 2395.69 | 2427.19 | 2355.19 | 1970.44 | 1093.50 | 663.64 | 262.52 | 85.89 | 27.62 |
| 225.0 | 2388.94 | 2422.69 | 2376.00 | 2018.81 | 1110.71 | 706.39 | 285.30 | 83.53 | 29.36 |
| 270.0 | 2385.00 | 2399.06 | 2370.38 | 2130.75 | 1596.38 | 900.56 | 384.75 | 119.03 | 42.30 |
| 315.0 | 2380.50 | 2373.75 | 2326.50 | 2053.69 | 1542.38 | 837.79 | 375.13 | 113.85 | 41.96 |
| 360.0 | 2395.69 | 2365.31 | 2333.25 | 2106.00 | 1691.44 | 1032.75 | 469.13 | 159.98 | 62.04 |
| C/ γ (°) | 45.0 | 50.0 | 55.0 | 60.0 | 65.0 | 70.0 | 75.0 | 80.0 | 85.0 |
| 0.0 | 16.03 | 12.77 | 10.74 | 9.28 | 8.16 | 7.54 | 7.14 | 6.86 | 6.64 |
| 45.0 | 15.64 | 12.09 | 10.01 | 8.49 | 7.59 | 7.03 | 6.64 | 6.41 | 6.30 |
| 90.0 | 15.02 | 14.51 | 17.16 | 18.79 | 17.44 | 13.28 | 10.13 | 6.47 | 6.13 |
| 135.0 | 15.30 | 12.32 | 11.36 | 11.31 | 11.25 | 10.24 | 8.94 | 6.30 | 6.41 |
| 180.0 | 15.41 | 12.15 | 10.24 | 9.45 | 9.17 | 7.82 | 6.86 | 6.53 | 6.41 |
| 225.0 | 16.03 | 14.46 | 15.41 | 16.76 | 16.93 | 14.79 | 11.98 | 6.47 | 6.13 |
| 270.0 | 17.16 | 13.56 | 11.70 | 10.91 | 9.96 | 8.66 | 7.43 | 6.53 | 6.36 |
| 315.0 | 15.53 | 12.49 | 10.29 | 8.72 | 7.76 | 7.14 | 6.75 | 6.58 | 6.53 |
| 360.0 | 16.03 | 12.77 | 10.74 | 9.28 | 8.16 | 7.54 | 7.14 | 6.86 | 6.64 |
| C/ γ (°) | 90.0 | | | | | | | | |
| 0.0 | 6.08 | | | | | | | | |
| 45.0 | 5.85 | | | | | | | | |
| 90.0 | 5.68 | | | | | | | | |
| 135.0 | 6.30 | | | | | | | | |
| 180.0 | 6.13 | | | | | | | | |
| 225.0 | 6.13 | | | | | | | | |
| 270.0 | 5.74 | | | | | | | | |
| 315.0 | 5.91 | | | | | | | | |
| 360.0 | 6.08 | | | | | | | | |