

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P909260

Luminaire Tested: DFN2DIP-SQ3F0-090D070US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

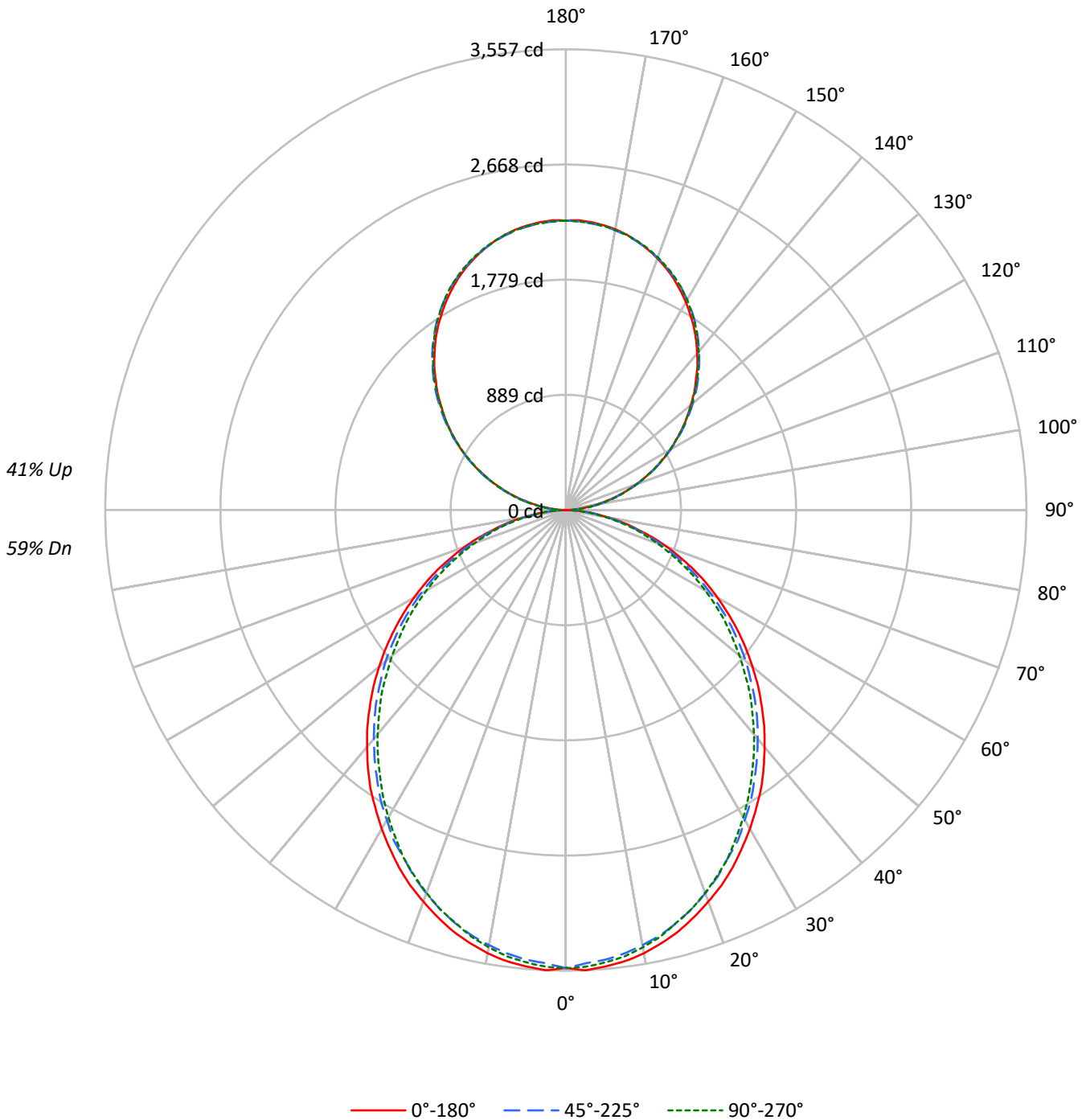
Test Method: LM-79-2019  
Report Number: P909260  
REPORT IS A COMBINATION OF REPORTS P899925 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-090D070US840-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15254.0 lumens  
Efficiency: N/A  
Efficacy: 108.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 140.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Luminous Intensity Polar Plot





TEST NUMBER: P909260

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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    |    |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 |    |    | 0  |    |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0  |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 109 | 109 | 109 | 109 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 76 | 76 | 76 | 64 | 64 | 64 | 59 |    |    | 59 |
| 1   | 100 | 95  | 91  | 88  | 93  | 89  | 86  | 83  | 78 | 75 | 73 | 67 | 65 | 63 | 57 | 56 | 54 | 50 |    |    | 50 |
| 2   | 91  | 83  | 77  | 72  | 85  | 78  | 73  | 68  | 68 | 64 | 60 | 59 | 56 | 53 | 50 | 48 | 46 | 42 |    |    | 42 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 51 | 52 | 48 | 45 | 44 | 42 | 39 | 35 |    |    | 35 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 48  | 53 | 48 | 43 | 46 | 42 | 38 | 40 | 36 | 34 | 30 |    |    | 30 |
| 5   | 70  | 58  | 50  | 44  | 65  | 54  | 47  | 41  | 48 | 42 | 37 | 42 | 37 | 33 | 36 | 32 | 29 | 26 |    |    | 26 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 41  | 36  | 43 | 37 | 33 | 38 | 33 | 29 | 33 | 29 | 26 | 23 |    |    | 23 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 32  | 39 | 33 | 29 | 34 | 29 | 26 | 30 | 26 | 23 | 21 |    |    | 21 |
| 8   | 55  | 43  | 35  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 31 | 27 | 23 | 27 | 23 | 21 | 18 |    |    | 18 |
| 9   | 51  | 39  | 31  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 29 | 24 | 21 | 25 | 21 | 19 | 17 |    |    | 17 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 | 27 | 22 | 19 | 23 | 20 | 17 | 15 |    |    | 15 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4052 | 4052 | 4052 |
| 5°  | 4056 | 3993 | 4021 |
| 10° | 4021 | 3936 | 3965 |
| 15° | 3959 | 3869 | 3879 |
| 20° | 3876 | 3776 | 3791 |
| 25° | 3794 | 3666 | 3689 |
| 30° | 3692 | 3563 | 3559 |
| 35° | 3595 | 3442 | 3423 |
| 40° | 3476 | 3320 | 3292 |
| 45° | 3357 | 3197 | 3159 |
| 50° | 3227 | 3068 | 3005 |
| 55° | 3090 | 2919 | 2863 |
| 60° | 2935 | 2742 | 2700 |
| 65° | 2767 | 2559 | 2508 |
| 70° | 2551 | 2335 | 2301 |
| 75° | 2254 | 2067 | 2107 |
| 80° | 1894 | 1724 | 1742 |
| 85° | 1334 | 1143 | 1140 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 3357 cd/sqm



TEST NUMBER: P909260

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 332.9   | 2.2       |
| 10°-20°   | 936.5   | 6.1       |
| 20°-30°   | 1376.3  | 9.0       |
| 30°-40°   | 1598.5  | 10.5      |
| 40°-50°   | 1596.5  | 10.5      |
| 50°-60°   | 1392.1  | 9.1       |
| 60°-70°   | 1029.1  | 6.7       |
| 70°-80°   | 582.2   | 3.8       |
| 80°-90°   | 160.0   | 1.0       |
| 90°-100°  | 138.3   | 0.9       |
| 100°-110° | 439.6   | 2.9       |
| 110°-120° | 752.2   | 4.9       |
| 120°-130° | 989.3   | 6.5       |
| 130°-140° | 1110.5  | 7.3       |
| 140°-150° | 1088.9  | 7.1       |
| 150°-160° | 913.5   | 6.0       |
| 160°-170° | 605.8   | 4.0       |
| 170°-180° | 211.7   | 1.4       |
| 0°-30°    | 2645.7  | 17.3      |
| 0°-40°    | 4244.2  | 27.8      |
| 0°-60°    | 7232.9  | 47.4      |
| 0°-90°    | 9004.3  | 59.0      |
| 90°-120°  | 1330.1  | 8.7       |
| 90°-150°  | 4518.8  | 29.6      |
| 90°-180°  | 6250.0  | 41.0      |
| 0°-180°   | 15254.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3536 | 3536  | 3536 | 3536  | 3536 |      |
| 5°   | 3536 | 3523  | 3486 | 3513  | 3506 | 336  |
| 15°  | 3367 | 3346  | 3302 | 3316  | 3299 | 948  |
| 25°  | 3047 | 3020  | 2962 | 2969  | 2962 | 1402 |
| 35°  | 2629 | 2595  | 2540 | 2520  | 2503 | 1642 |
| 45°  | 2139 | 2115  | 2064 | 2027  | 2013 | 1651 |
| 55°  | 1619 | 1598  | 1558 | 1517  | 1500 | 1447 |
| 65°  | 1092 | 1071  | 1037 | 1007  | 990  | 1079 |
| 75°  | 571  | 565   | 547  | 527   | 534  | 610  |
| 85°  | 139  | 136   | 133  | 122   | 119  | 155  |
| 90°  | 2    | 24    | 66   | 62    | 64   | 15   |
| 95°  | 98   | 117   | 121  | 121   | 117  | 109  |
| 105° | 406  | 411   | 415  | 419   | 419  | 428  |
| 115° | 755  | 766   | 762  | 760   | 755  | 747  |
| 125° | 1098 | 1115  | 1109 | 1103  | 1101 | 981  |
| 135° | 1420 | 1441  | 1445 | 1443  | 1438 | 1098 |
| 145° | 1724 | 1738  | 1748 | 1750  | 1743 | 1077 |
| 155° | 1972 | 1977  | 1983 | 1992  | 1986 | 907  |
| 165° | 2145 | 2143  | 2143 | 2156  | 2147 | 605  |
| 175° | 2232 | 2226  | 2222 | 2236  | 2224 | 212  |
| 180° | 2236 | 2236  | 2236 | 2236  | 2236 |      |



TEST NUMBER: P909260

CATALOG NUMBER: DFN2DIP-SQ3F0-090D070US840-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3536.4 | 3536.4 | 3536.4 | 3536.4 | 3536.4 |
| 2.5°   | 3557.0 | 3540.1 | 3502.6 | 3536.4 | 3530.0 |
| 5°     | 3536.4 | 3523.1 | 3485.7 | 3512.7 | 3506.2 |
| 7.5°   | 3512.7 | 3492.5 | 3455.0 | 3482.4 | 3475.6 |
| 10°    | 3475.6 | 3451.7 | 3410.9 | 3438.0 | 3427.9 |
| 12.5°  | 3424.3 | 3404.1 | 3363.4 | 3380.2 | 3373.5 |
| 15°    | 3366.6 | 3346.4 | 3302.0 | 3315.7 | 3298.7 |
| 17.5°  | 3295.1 | 3274.9 | 3230.6 | 3247.5 | 3230.6 |
| 20°    | 3216.8 | 3196.6 | 3149.0 | 3159.1 | 3145.7 |
| 22.5°  | 3138.9 | 3108.3 | 3063.8 | 3063.8 | 3057.0 |
| 25°    | 3046.9 | 3019.8 | 2962.1 | 2968.6 | 2962.1 |
| 27.5°  | 2944.8 | 2920.9 | 2877.0 | 2866.9 | 2849.9 |
| 30°    | 2843.1 | 2815.6 | 2764.7 | 2754.6 | 2741.0 |
| 32.5°  | 2734.1 | 2713.9 | 2659.4 | 2638.9 | 2625.1 |
| 35°    | 2628.8 | 2594.8 | 2540.3 | 2519.8 | 2502.9 |
| 37.5°  | 2509.7 | 2479.0 | 2424.5 | 2400.8 | 2383.8 |
| 40°    | 2387.3 | 2360.0 | 2305.4 | 2275.1 | 2261.5 |
| 42.5°  | 2268.3 | 2240.9 | 2186.8 | 2152.5 | 2132.3 |
| 45°    | 2139.1 | 2115.4 | 2064.1 | 2026.9 | 2013.3 |
| 47.5°  | 2013.3 | 1989.4 | 1934.9 | 1897.4 | 1877.2 |
| 50°    | 1880.5 | 1863.5 | 1815.8 | 1768.3 | 1751.3 |
| 52.5°  | 1751.3 | 1727.5 | 1683.4 | 1646.0 | 1622.1 |
| 55°    | 1618.9 | 1598.3 | 1557.5 | 1516.8 | 1499.9 |
| 57.5°  | 1486.1 | 1469.2 | 1424.8 | 1384.0 | 1370.3 |
| 60°    | 1353.3 | 1340.0 | 1292.3 | 1254.9 | 1244.8 |
| 62.5°  | 1224.2 | 1200.3 | 1166.4 | 1132.6 | 1118.8 |
| 65°    | 1091.8 | 1071.2 | 1037.2 | 1006.6 | 989.7  |
| 67.5°  | 955.7  | 938.5  | 908.1  | 884.3  | 870.6  |
| 70°    | 829.8  | 816.1  | 785.5  | 761.6  | 748.3  |
| 72.5°  | 700.6  | 686.9  | 669.9  | 646.2  | 636.1  |
| 75°    | 571.2  | 564.6  | 547.3  | 527.1  | 534.0  |
| 77.5°  | 455.7  | 442.0  | 435.2  | 425.1  | 415.0  |
| 80°    | 340.2  | 336.6  | 329.7  | 319.6  | 312.9  |
| 82.5°  | 231.3  | 231.3  | 228.0  | 214.3  | 214.3  |
| 85°    | 139.3  | 136.0  | 132.8  | 122.3  | 119.1  |
| 87.5°  | 61.3   | 54.4   | 47.7   | 37.6   | 33.9   |
| 90°    | 2.0    | 24.2   | 66.0   | 62.0   | 64.0   |
| 92.5°  | 41.8   | 56.7   | 58.7   | 60.7   | 60.7   |
| 95°    | 98.4   | 117.2  | 120.7  | 120.7  | 117.2  |
| 97.5°  | 163.8  | 181.3  | 188.7  | 188.7  | 188.7  |
| 100°   | 239.2  | 254.8  | 260.1  | 260.1  | 258.1  |
| 102.5° | 318.8  | 330.2  | 337.7  | 339.7  | 337.7  |
| 105°   | 405.8  | 411.1  | 415.2  | 418.6  | 418.6  |
| 107.5° | 492.0  | 500.1  | 500.1  | 501.5  | 492.0  |
| 110°   | 575.6  | 586.4  | 586.4  | 586.4  | 581.0  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 665.9  | 677.4  | 675.4  | 669.9  | 665.9  |
| 115°   | 754.9  | 765.7  | 762.3  | 760.3  | 754.9  |
| 117.5° | 843.1  | 858.0  | 848.6  | 843.1  | 837.8  |
| 120°   | 932.1  | 947.0  | 932.1  | 932.1  | 926.0  |
| 122.5° | 1013.0 | 1031.9 | 1022.5 | 1017.0 | 1013.0 |
| 125°   | 1097.9 | 1114.8 | 1109.4 | 1103.4 | 1101.4 |
| 127.5° | 1180.8 | 1201.7 | 1194.4 | 1186.3 | 1180.8 |
| 130°   | 1258.4 | 1282.6 | 1279.3 | 1275.3 | 1267.8 |
| 132.5° | 1345.3 | 1364.2 | 1365.5 | 1356.1 | 1350.7 |
| 135°   | 1420.2 | 1441.0 | 1445.1 | 1443.0 | 1437.6 |
| 137.5° | 1503.7 | 1520.6 | 1523.9 | 1522.6 | 1514.5 |
| 140°   | 1577.2 | 1594.1 | 1603.5 | 1603.5 | 1596.1 |
| 142.5° | 1652.6 | 1669.5 | 1674.9 | 1676.9 | 1669.5 |
| 145°   | 1724.1 | 1737.6 | 1748.4 | 1750.4 | 1743.0 |
| 147.5° | 1788.2 | 1805.0 | 1813.1 | 1816.4 | 1809.1 |
| 150°   | 1854.2 | 1865.6 | 1873.1 | 1879.2 | 1873.1 |
| 152.5° | 1912.8 | 1924.3 | 1933.7 | 1941.2 | 1933.7 |
| 155°   | 1971.5 | 1976.8 | 1983.0 | 1992.4 | 1986.3 |
| 157.5° | 2022.1 | 2026.1 | 2029.4 | 2043.0 | 2033.5 |
| 160°   | 2067.2 | 2071.2 | 2073.3 | 2084.7 | 2076.6 |
| 162.5° | 2109.0 | 2109.0 | 2111.0 | 2123.7 | 2114.4 |
| 165°   | 2144.7 | 2142.6 | 2142.6 | 2156.2 | 2146.7 |
| 167.5° | 2177.1 | 2171.0 | 2171.0 | 2184.4 | 2175.0 |
| 170°   | 2201.3 | 2196.0 | 2193.9 | 2207.4 | 2196.0 |
| 172.5° | 2218.2 | 2212.7 | 2210.7 | 2224.2 | 2212.7 |
| 175°   | 2231.6 | 2226.2 | 2222.2 | 2235.6 | 2224.2 |
| 177.5° | 2239.1 | 2233.6 | 2229.6 | 2241.1 | 2229.6 |
| 180°   | 2235.6 | 2235.6 | 2235.6 | 2235.6 | 2235.6 |



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**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 12.89            | 13.84 | 13.77 | 14.74 | 15.87 | 12.45          | 13.40 | 13.32 | 14.29 | 15.43 |
|                 | 3H   | 14.55            | 15.41 | 15.44 | 16.31 | 17.47 | 14.06          | 14.92 | 14.95 | 15.82 | 16.98 |
|                 | 4H   | 15.14            | 15.95 | 16.05 | 16.86 | 18.03 | 14.65          | 15.45 | 15.55 | 16.37 | 17.54 |
|                 | 6H   | 15.54            | 16.29 | 16.46 | 17.20 | 18.39 | 15.04          | 15.79 | 15.96 | 16.70 | 17.89 |
|                 | 8H   | 15.65            | 16.36 | 16.57 | 17.29 | 18.48 | 15.15          | 15.86 | 16.07 | 16.79 | 17.97 |
|                 | 12H  | 15.70            | 16.37 | 16.63 | 17.30 | 18.51 | 15.19          | 15.86 | 16.12 | 16.79 | 18.00 |
| 4H              | 2H   | 13.36            | 14.17 | 14.27 | 15.08 | 16.25 | 13.00          | 13.81 | 13.91 | 14.72 | 15.89 |
|                 | 3H   | 15.23            | 15.90 | 16.15 | 16.84 | 18.03 | 14.82          | 15.49 | 15.74 | 16.44 | 17.62 |
|                 | 4H   | 15.94            | 16.56 | 16.87 | 17.49 | 18.71 | 15.52          | 16.13 | 16.45 | 17.07 | 18.28 |
|                 | 6H   | 16.46            | 16.99 | 17.40 | 17.95 | 19.16 | 16.03          | 16.56 | 16.97 | 17.52 | 18.73 |
|                 | 8H   | 16.61            | 17.10 | 17.55 | 18.06 | 19.28 | 16.17          | 16.67 | 17.12 | 17.62 | 18.85 |
|                 | 12H  | 16.68            | 17.13 | 17.65 | 18.10 | 19.33 | 16.23          | 16.68 | 17.20 | 17.65 | 18.88 |
| 8H              | 4H   | 16.14            | 16.64 | 17.09 | 17.59 | 18.82 | 15.76          | 16.26 | 16.71 | 17.22 | 18.44 |
|                 | 6H   | 16.77            | 17.18 | 17.74 | 18.18 | 19.40 | 16.39          | 16.80 | 17.36 | 17.79 | 19.02 |
|                 | 8H   | 16.99            | 17.35 | 17.97 | 18.34 | 19.58 | 16.60          | 16.96 | 17.58 | 17.94 | 19.19 |
|                 | 12H  | 17.12            | 17.44 | 18.11 | 18.42 | 19.71 | 16.71          | 17.03 | 17.70 | 18.01 | 19.30 |
| 12H             | 4H   | 16.13            | 16.58 | 17.10 | 17.55 | 18.78 | 15.76          | 16.21 | 16.73 | 17.18 | 18.41 |
|                 | 6H   | 16.80            | 17.16 | 17.78 | 18.15 | 19.39 | 16.43          | 16.79 | 17.41 | 17.78 | 19.02 |
|                 | 8H   | 17.04            | 17.36 | 18.03 | 18.34 | 19.63 | 16.66          | 16.98 | 17.65 | 17.96 | 19.25 |