

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: P903586

Luminaire Tested: DFN2DIP-SQ2F0-070D080US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

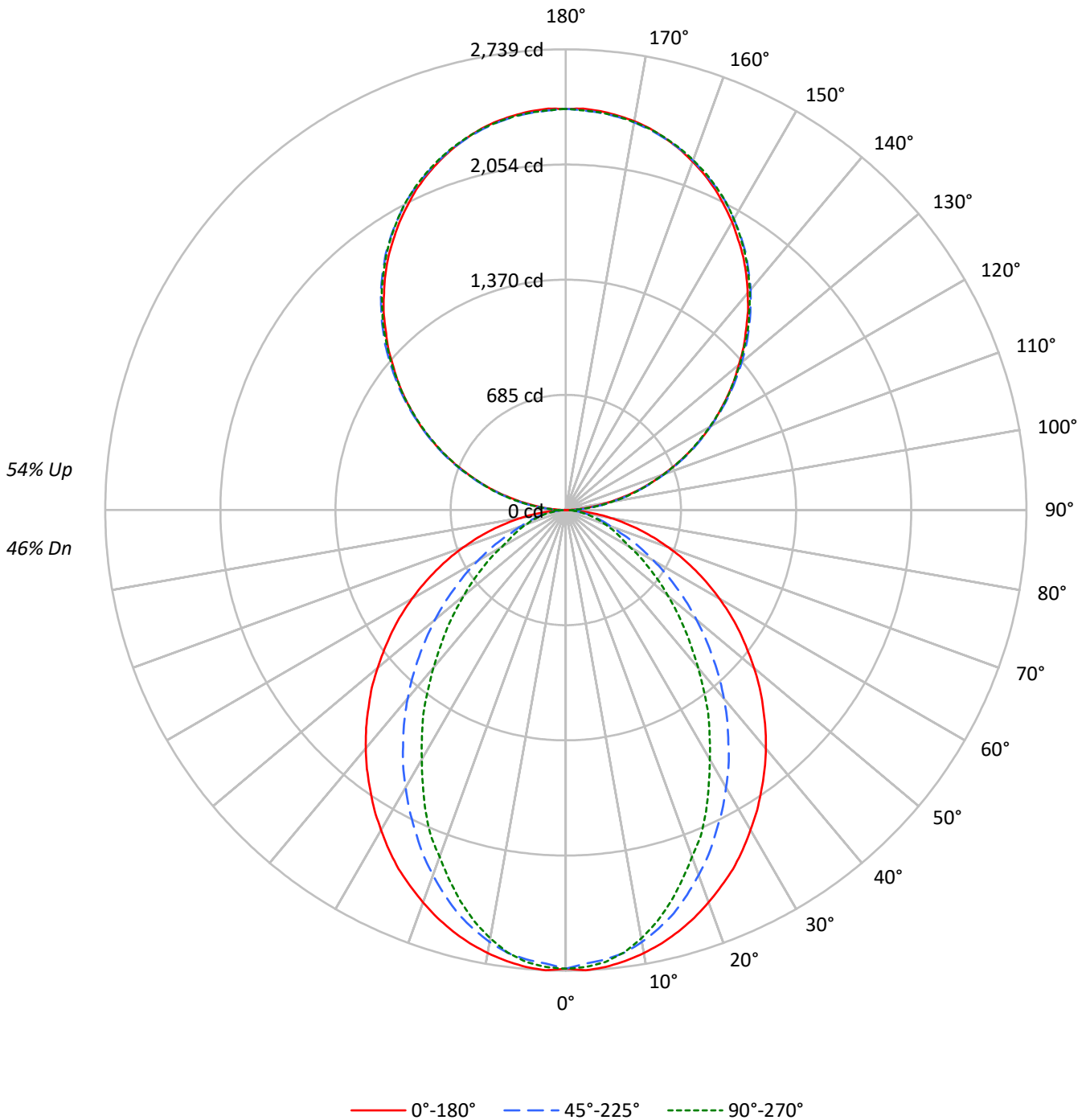
Test Method: LM-79-2019  
Report Number: P903586  
REPORT IS A COMBINATION OF REPORTS P899840 AND P896659  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-070D080US830-RLLFLL  
Description: 2 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12281.3 lumens  
Efficiency: N/A  
Efficacy: 92.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 132.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P903586  
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### Luminous Intensity Polar Plot





TEST NUMBER: P903586

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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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 81 | 81 | 81 | 66 | 66 | 66 | 52 | 52 | 52 | 46 | 46 | 46 | 46 |
| 1   | 97  | 93  | 89  | 86  | 89 | 86 | 82 | 80 | 72 | 69 | 67 | 59 | 57 | 56 | 47 | 46 | 45 | 39 | 39 | 39 | 39 |
| 2   | 89  | 82  | 76  | 71  | 81 | 75 | 70 | 66 | 63 | 60 | 56 | 52 | 49 | 47 | 42 | 40 | 38 | 34 | 34 | 34 | 34 |
| 3   | 81  | 72  | 65  | 60  | 74 | 67 | 61 | 56 | 56 | 52 | 48 | 46 | 43 | 40 | 37 | 35 | 33 | 29 | 29 | 29 | 29 |
| 4   | 75  | 64  | 57  | 51  | 68 | 59 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 | 25 | 25 | 25 | 25 |
| 5   | 69  | 57  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 | 22 | 22 | 22 | 22 |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 | 20 | 20 | 20 | 20 |
| 7   | 59  | 47  | 39  | 34  | 54 | 43 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 20 | 18 | 18 | 18 | 18 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 18 | 16 | 16 | 16 | 16 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 26 | 22 | 20 | 22 | 19 | 17 | 15 | 15 | 15 | 15 |
| 10  | 47  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 24 | 20 | 18 | 20 | 17 | 15 | 13 | 13 | 13 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 5996 | 5996 | 5996 |
| 5°  | 5995 | 5888 | 5930 |
| 10° | 5926 | 5759 | 5729 |
| 15° | 5834 | 5556 | 5423 |
| 20° | 5715 | 5282 | 5050 |
| 25° | 5594 | 4977 | 4691 |
| 30° | 5435 | 4665 | 4238 |
| 35° | 5278 | 4331 | 3840 |
| 40° | 5119 | 3987 | 3385 |
| 45° | 4934 | 3607 | 2973 |
| 50° | 4742 | 3224 | 2572 |
| 55° | 4541 | 2817 | 2187 |
| 60° | 4308 | 2393 | 1792 |
| 65° | 4038 | 1965 | 1603 |
| 70° | 3712 | 1565 | 1439 |
| 75° | 3300 | 1354 | 1293 |
| 80° | 2710 | 1100 | 1096 |
| 85° | 1763 | 682  | 779  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 4934 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 255.6   | 2.1       |
| 10°-20°   | 701.6   | 5.7       |
| 20°-30°   | 985.0   | 8.0       |
| 30°-40°   | 1073.7  | 8.7       |
| 40°-50°   | 986.9   | 8.0       |
| 50°-60°   | 775.0   | 6.3       |
| 60°-70°   | 504.5   | 4.1       |
| 70°-80°   | 259.7   | 2.1       |
| 80°-90°   | 73.0    | 0.6       |
| 90°-100°  | 147.6   | 1.2       |
| 100°-110° | 468.9   | 3.8       |
| 110°-120° | 802.4   | 6.5       |
| 120°-130° | 1055.3  | 8.6       |
| 130°-140° | 1184.5  | 9.6       |
| 140°-150° | 1161.5  | 9.5       |
| 150°-160° | 974.4   | 7.9       |
| 160°-170° | 646.2   | 5.3       |
| 170°-180° | 225.9   | 1.8       |
| 0°-30°    | 1942.1  | 15.8      |
| 0°-40°    | 3015.8  | 24.6      |
| 0°-60°    | 4777.7  | 38.9      |
| 0°-90°    | 5614.9  | 45.7      |
| 90°-120°  | 1418.8  | 11.6      |
| 90°-150°  | 4820.1  | 39.2      |
| 90°-180°  | 6666.0  | 54.3      |
| 0°-180°   | 12281.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2727 | 2727  | 2727 | 2727  | 2727 |      |
| 5°   | 2727 | 2714  | 2682 | 2705  | 2697 | 259  |
| 15°  | 2594 | 2566  | 2483 | 2436  | 2411 | 731  |
| 25°  | 2354 | 2275  | 2112 | 2011  | 1974 | 1083 |
| 35°  | 2028 | 1903  | 1686 | 1530  | 1476 | 1270 |
| 45°  | 1658 | 1493  | 1234 | 1059  | 999  | 1281 |
| 55°  | 1261 | 1068  | 802  | 654   | 607  | 1127 |
| 65°  | 851  | 651   | 429  | 346   | 338  | 844  |
| 75°  | 454  | 281   | 197  | 180   | 178  | 480  |
| 85°  | 106  | 54    | 47   | 47    | 47   | 122  |
| 90°  | 2    | 26    | 70   | 66    | 68   | 12   |
| 95°  | 105  | 125   | 129  | 129   | 125  | 117  |
| 105° | 433  | 439   | 443  | 446   | 446  | 457  |
| 115° | 805  | 817   | 813  | 811   | 805  | 796  |
| 125° | 1171 | 1189  | 1183 | 1177  | 1175 | 1047 |
| 135° | 1515 | 1537  | 1541 | 1539  | 1534 | 1171 |
| 145° | 1839 | 1853  | 1865 | 1867  | 1859 | 1149 |
| 155° | 2103 | 2109  | 2115 | 2125  | 2119 | 968  |
| 165° | 2288 | 2286  | 2286 | 2300  | 2290 | 645  |
| 175° | 2380 | 2375  | 2370 | 2385  | 2372 | 226  |
| 180° | 2385 | 2385  | 2385 | 2385  | 2385 |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2726.9 | 2726.9 | 2726.9 | 2726.9 | 2726.9 |
| 2.5°   | 2739.1 | 2726.9 | 2699.6 | 2724.5 | 2719.5 |
| 5°     | 2726.9 | 2714.5 | 2682.4 | 2704.6 | 2697.3 |
| 7.5°   | 2704.6 | 2689.9 | 2655.4 | 2665.0 | 2652.8 |
| 10°    | 2675.0 | 2657.8 | 2608.5 | 2600.9 | 2586.2 |
| 12.5°  | 2638.1 | 2615.8 | 2549.1 | 2534.4 | 2507.2 |
| 15°    | 2593.6 | 2566.4 | 2482.6 | 2435.7 | 2411.1 |
| 17.5°  | 2541.8 | 2502.3 | 2398.6 | 2344.3 | 2304.8 |
| 20°    | 2482.6 | 2433.1 | 2309.8 | 2248.2 | 2193.8 |
| 22.5°  | 2418.5 | 2361.6 | 2218.4 | 2134.6 | 2097.7 |
| 25°    | 2354.3 | 2275.2 | 2112.3 | 2011.3 | 1974.2 |
| 27.5°  | 2277.8 | 2193.8 | 2013.6 | 1897.7 | 1840.9 |
| 30°    | 2196.4 | 2102.4 | 1905.0 | 1779.3 | 1712.6 |
| 32.5°  | 2117.3 | 2003.8 | 1801.6 | 1653.4 | 1591.6 |
| 35°    | 2028.5 | 1902.6 | 1685.6 | 1530.1 | 1475.6 |
| 37.5°  | 1942.2 | 1806.3 | 1577.0 | 1406.5 | 1345.0 |
| 40°    | 1850.8 | 1702.9 | 1463.3 | 1288.2 | 1224.0 |
| 42.5°  | 1757.1 | 1599.2 | 1349.9 | 1167.2 | 1105.7 |
| 45°    | 1658.4 | 1492.9 | 1234.0 | 1058.6 | 999.4  |
| 47.5°  | 1564.6 | 1389.5 | 1122.9 | 947.5  | 893.3  |
| 50°    | 1460.9 | 1285.8 | 1014.3 | 843.9  | 792.3  |
| 52.5°  | 1359.6 | 1174.5 | 910.6  | 747.7  | 700.9  |
| 55°    | 1260.9 | 1068.5 | 801.9  | 654.0  | 607.2  |
| 57.5°  | 1159.9 | 962.4  | 705.9  | 567.6  | 528.1  |
| 60°    | 1056.2 | 858.8  | 604.5  | 478.9  | 439.3  |
| 62.5°  | 955.1  | 757.7  | 518.1  | 399.8  | 380.1  |
| 65°    | 851.4  | 651.4  | 429.4  | 345.6  | 338.0  |
| 67.5°  | 752.7  | 552.7  | 345.6  | 303.4  | 296.1  |
| 70°    | 649.0  | 456.6  | 286.2  | 261.6  | 251.6  |
| 72.5°  | 550.4  | 367.6  | 239.3  | 219.7  | 214.7  |
| 75°    | 454.0  | 281.2  | 197.4  | 180.1  | 177.8  |
| 77.5°  | 357.9  | 199.7  | 155.5  | 145.5  | 140.6  |
| 80°    | 268.9  | 143.2  | 118.4  | 108.7  | 108.7  |
| 82.5°  | 187.5  | 96.3   | 81.4   | 76.4   | 76.4   |
| 85°    | 106.0  | 54.2   | 46.8   | 46.8   | 46.8   |
| 87.5°  | 39.5   | 19.6   | 19.6   | 17.2   | 17.2   |
| 90°    | 2.2    | 25.9   | 70.5   | 66.2   | 68.3   |
| 92.5°  | 44.6   | 60.4   | 62.6   | 64.7   | 64.7   |
| 95°    | 105.0  | 125.1  | 128.7  | 128.7  | 125.1  |
| 97.5°  | 174.7  | 193.4  | 201.3  | 201.3  | 201.3  |
| 100°   | 255.2  | 271.7  | 277.5  | 277.5  | 275.3  |
| 102.5° | 340.1  | 352.3  | 360.1  | 362.3  | 360.1  |
| 105°   | 432.8  | 438.6  | 442.9  | 446.5  | 446.5  |
| 107.5° | 524.8  | 533.5  | 533.5  | 534.9  | 524.8  |
| 110°   | 614.0  | 625.5  | 625.5  | 625.5  | 619.7  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 710.3  | 722.6  | 720.4  | 714.6  | 710.3  |
| 115°   | 805.2  | 816.7  | 813.1  | 811.0  | 805.2  |
| 117.5° | 899.4  | 915.2  | 905.1  | 899.4  | 893.6  |
| 120°   | 994.3  | 1010.1 | 994.3  | 994.3  | 987.8  |
| 122.5° | 1080.5 | 1100.7 | 1090.6 | 1084.9 | 1080.5 |
| 125°   | 1171.1 | 1189.1 | 1183.4 | 1176.9 | 1174.8 |
| 127.5° | 1259.6 | 1281.9 | 1273.9 | 1265.4 | 1259.6 |
| 130°   | 1342.3 | 1368.1 | 1364.5 | 1360.3 | 1352.4 |
| 132.5° | 1435.0 | 1455.1 | 1456.6 | 1446.5 | 1440.8 |
| 135°   | 1514.8 | 1537.1 | 1541.4 | 1539.3 | 1533.5 |
| 137.5° | 1603.9 | 1621.9 | 1625.5 | 1624.1 | 1615.4 |
| 140°   | 1682.3 | 1700.3 | 1710.3 | 1710.3 | 1702.4 |
| 142.5° | 1762.8 | 1780.8 | 1786.6 | 1788.8 | 1780.8 |
| 145°   | 1839.1 | 1853.4 | 1864.9 | 1867.1 | 1859.2 |
| 147.5° | 1907.3 | 1925.3 | 1933.9 | 1937.6 | 1929.7 |
| 150°   | 1977.8 | 1990.0 | 1997.9 | 2004.4 | 1997.9 |
| 152.5° | 2040.3 | 2052.6 | 2062.7 | 2070.6 | 2062.7 |
| 155°   | 2102.9 | 2108.7 | 2115.2 | 2125.2 | 2118.7 |
| 157.5° | 2156.8 | 2161.2 | 2164.7 | 2179.1 | 2169.1 |
| 160°   | 2205.0 | 2209.3 | 2211.5 | 2223.6 | 2215.1 |
| 162.5° | 2249.6 | 2249.6 | 2251.7 | 2265.4 | 2255.3 |
| 165°   | 2287.6 | 2285.5 | 2285.5 | 2299.9 | 2289.8 |
| 167.5° | 2322.1 | 2315.7 | 2315.7 | 2330.1 | 2320.0 |
| 170°   | 2348.1 | 2342.3 | 2340.1 | 2354.6 | 2342.3 |
| 172.5° | 2366.1 | 2360.3 | 2358.1 | 2372.5 | 2360.3 |
| 175°   | 2380.4 | 2374.6 | 2370.3 | 2384.7 | 2372.5 |
| 177.5° | 2388.3 | 2382.6 | 2378.2 | 2390.5 | 2378.2 |
| 180°   | 2384.7 | 2384.7 | 2384.7 | 2384.7 | 2384.7 |



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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 | 12.84            | 13.64 | 13.84 | 14.64 | 15.98 | 8.80           | 9.60  | 9.80  | 10.60 | 11.94 |
|                 | 3H   | 14.49            | 15.21 | 15.50 | 16.22 | 17.58 | 9.97           | 10.68 | 10.98 | 11.69 | 13.05 |
|                 | 4H   | 15.09            | 15.76 | 16.11 | 16.78 | 18.14 | 10.40          | 11.08 | 11.43 | 12.10 | 13.46 |
|                 | 6H   | 15.49            | 16.11 | 16.53 | 17.14 | 18.51 | 10.71          | 11.33 | 11.74 | 12.35 | 13.72 |
|                 | 8H   | 15.61            | 16.20 | 16.65 | 17.24 | 18.61 | 10.79          | 11.38 | 11.83 | 12.42 | 13.79 |
|                 | 12H  | 15.66            | 16.22 | 16.71 | 17.26 | 18.65 | 10.82          | 11.38 | 11.86 | 12.41 | 13.81 |
| 4H              | 2H   | 12.85            | 13.52 | 13.88 | 14.54 | 15.90 | 9.38           | 10.05 | 10.41 | 11.07 | 12.44 |
|                 | 3H   | 14.65            | 15.21 | 15.69 | 16.26 | 17.63 | 10.71          | 11.27 | 11.74 | 12.31 | 13.69 |
|                 | 4H   | 15.33            | 15.84 | 16.37 | 16.88 | 18.28 | 11.24          | 11.75 | 12.28 | 12.79 | 14.19 |
|                 | 6H   | 15.82            | 16.26 | 16.88 | 17.32 | 18.72 | 11.64          | 12.08 | 12.69 | 13.14 | 14.53 |
|                 | 8H   | 15.99            | 16.40 | 17.04 | 17.45 | 18.86 | 11.75          | 12.16 | 12.81 | 13.22 | 14.63 |
|                 | 12H  | 16.07            | 16.44 | 17.14 | 17.51 | 18.92 | 11.81          | 12.18 | 12.88 | 13.25 | 14.66 |
| 8H              | 4H   | 15.29            | 15.70 | 16.34 | 16.75 | 18.16 | 11.50          | 11.91 | 12.56 | 12.97 | 14.38 |
|                 | 6H   | 15.83            | 16.17 | 16.91 | 17.27 | 18.67 | 12.00          | 12.34 | 13.07 | 13.43 | 14.84 |
|                 | 8H   | 16.03            | 16.33 | 17.12 | 17.41 | 18.84 | 12.17          | 12.47 | 13.26 | 13.55 | 14.98 |
|                 | 12H  | 16.16            | 16.42 | 17.25 | 17.49 | 18.96 | 12.28          | 12.54 | 13.36 | 13.61 | 15.08 |
| 12H             | 4H   | 15.24            | 15.61 | 16.31 | 16.68 | 18.09 | 11.50          | 11.87 | 12.58 | 12.94 | 14.36 |
|                 | 6H   | 15.81            | 16.10 | 16.89 | 17.18 | 18.61 | 12.04          | 12.34 | 13.12 | 13.42 | 14.84 |
|                 | 8H   | 16.01            | 16.27 | 17.10 | 17.35 | 18.81 | 12.23          | 12.49 | 13.32 | 13.57 | 15.04 |