

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: P919798

Luminaire Tested: DFN2DIP-PN4F0-110D120US935-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919798  
REPORT IS A COMBINATION OF REPORTS P899768 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D120US935-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

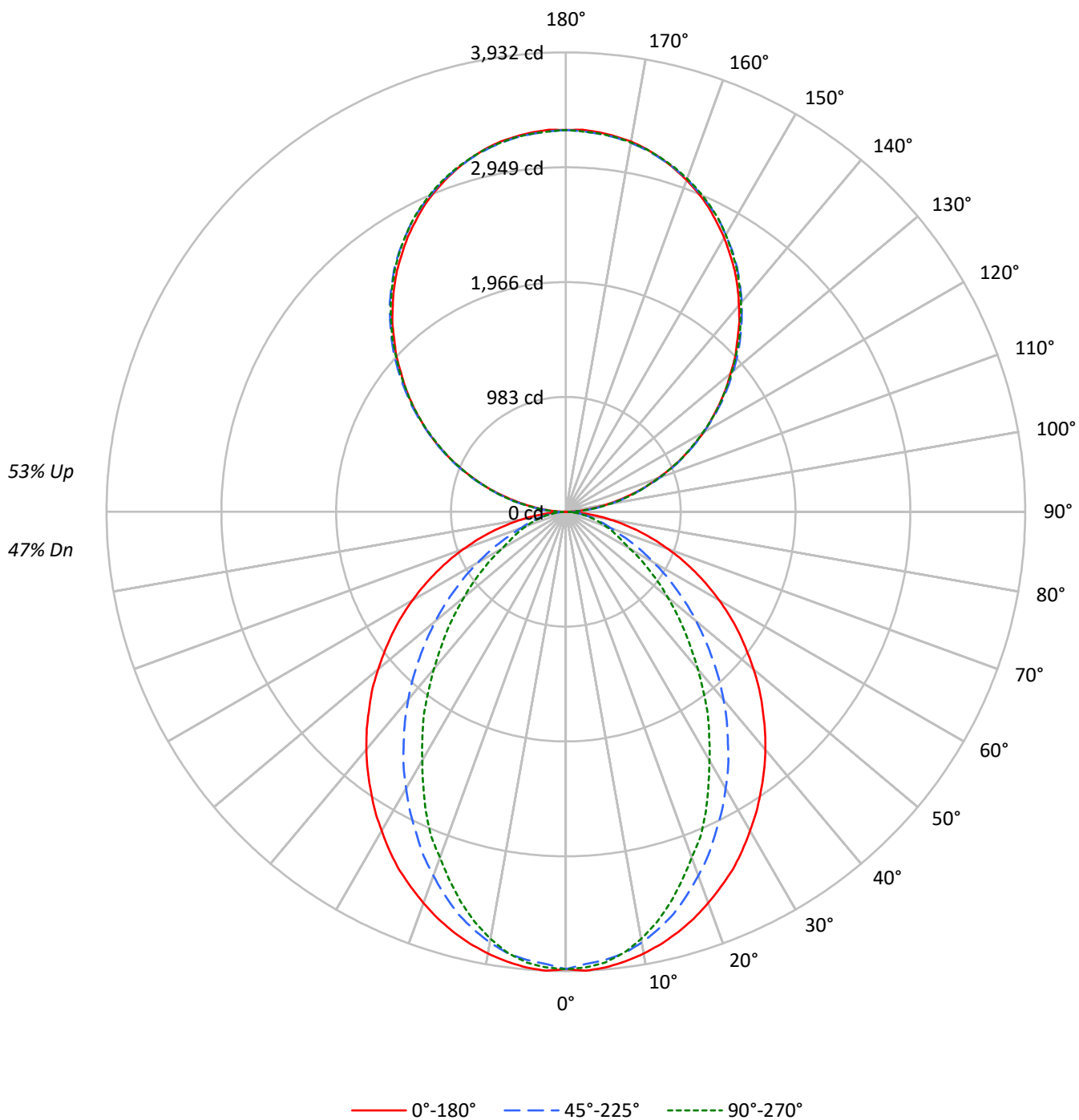
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17194.1 lumens  
Efficiency: N/A  
Efficacy: 78.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 217.8  
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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CATALOG NUMBER: DFN2DIP-PN4F0-110D120US935-RLLFLL

### Luminous Intensity Polar Plot



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

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20 |    |    |    |    | 20 |    |    |    |    | 20 |    |    |    |    | 20 |
| RC  | 80  |     |     |     | 70 |    |    |    |    | 50 |    |    |    |    | 30 |    |    |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 67 | 67 | 67 | 53 | 53 | 53 | 47 | 47 | 47 |
| 1   | 98  | 93  | 90  | 86  | 90 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 57 | 48 | 47 | 46 | 40 | 40 | 40 |
| 2   | 89  | 82  | 76  | 71  | 82 | 76 | 71 | 66 | 64 | 60 | 57 | 53 | 50 | 48 | 43 | 41 | 39 | 35 | 35 | 35 |
| 3   | 82  | 73  | 65  | 60  | 75 | 67 | 61 | 56 | 57 | 52 | 48 | 47 | 44 | 41 | 38 | 36 | 34 | 30 | 30 | 30 |
| 4   | 75  | 64  | 57  | 51  | 69 | 60 | 53 | 48 | 51 | 46 | 42 | 42 | 39 | 36 | 34 | 32 | 30 | 26 | 26 | 26 |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 47 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 | 23 | 23 | 23 |
| 6   | 64  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 35 | 31 | 27 | 28 | 26 | 23 | 20 | 20 | 20 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 32 | 27 | 24 | 26 | 23 | 21 | 18 | 18 | 18 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 | 16 | 16 | 16 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 23 | 27 | 23 | 20 | 22 | 19 | 17 | 15 | 15 | 15 |
| 10  | 48  | 36  | 29  | 24  | 44 | 34 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 21 | 18 | 16 | 14 | 14 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2857 | 2857 | 2857 |
| 5°  | 2862 | 2812 | 2831 |
| 10° | 2834 | 2758 | 2739 |
| 15° | 2794 | 2667 | 2597 |
| 20° | 2743 | 2541 | 2423 |
| 25° | 2690 | 2401 | 2254 |
| 30° | 2619 | 2257 | 2041 |
| 35° | 2550 | 2102 | 1853 |
| 40° | 2479 | 1942 | 1638 |
| 45° | 2397 | 1764 | 1442 |
| 50° | 2312 | 1584 | 1252 |
| 55° | 2223 | 1392 | 1068 |
| 60° | 2120 | 1191 | 880  |
| 65° | 2002 | 987  | 793  |
| 70° | 1859 | 796  | 718  |
| 75° | 1679 | 703  | 655  |
| 80° | 1418 | 591  | 570  |
| 85° | 988  | 396  | 431  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2559 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 366.9   | 2.1       |
| 10°-20°   | 1007.1  | 5.9       |
| 20°-30°   | 1413.9  | 8.2       |
| 30°-40°   | 1541.3  | 9.0       |
| 40°-50°   | 1416.6  | 8.2       |
| 50°-60°   | 1112.5  | 6.5       |
| 60°-70°   | 724.2   | 4.2       |
| 70°-80°   | 372.8   | 2.2       |
| 80°-90°   | 104.4   | 0.6       |
| 90°-100°  | 202.2   | 1.2       |
| 100°-110° | 642.4   | 3.7       |
| 110°-120° | 1099.4  | 6.4       |
| 120°-130° | 1445.9  | 8.4       |
| 130°-140° | 1623.0  | 9.4       |
| 140°-150° | 1591.6  | 9.3       |
| 150°-160° | 1335.1  | 7.8       |
| 160°-170° | 885.4   | 5.1       |
| 170°-180° | 309.5   | 1.8       |
| 0°-30°    | 2787.9  | 16.2      |
| 0°-40°    | 4329.1  | 25.2      |
| 0°-60°    | 6858.3  | 39.9      |
| 0°-90°    | 8059.6  | 46.9      |
| 90°-120°  | 1944.1  | 11.3      |
| 90°-150°  | 6604.6  | 38.4      |
| 90°-180°  | 9134.0  | 53.1      |
| 0°-180°   | 17194.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3914 | 3914  | 3914 | 3914  | 3914 |      |
| 5°   | 3914 | 3897  | 3850 | 3882  | 3872 | 371  |
| 15°  | 3723 | 3684  | 3564 | 3496  | 3461 | 1049 |
| 25°  | 3380 | 3266  | 3032 | 2887  | 2834 | 1554 |
| 35°  | 2912 | 2731  | 2420 | 2196  | 2118 | 1823 |
| 45°  | 2381 | 2143  | 1771 | 1520  | 1435 | 1838 |
| 55°  | 1810 | 1534  | 1151 | 939   | 872  | 1617 |
| 65°  | 1222 | 935   | 616  | 496   | 485  | 1212 |
| 75°  | 652  | 404   | 283  | 259   | 255  | 689  |
| 85°  | 152  | 78    | 67   | 67    | 67   | 175  |
| 90°  | 3    | 36    | 96   | 91    | 94   | 17   |
| 95°  | 144  | 171   | 176  | 176   | 171  | 160  |
| 105° | 593  | 601   | 607  | 612   | 612  | 626  |
| 115° | 1103 | 1119  | 1114 | 1111  | 1103 | 1091 |
| 125° | 1605 | 1629  | 1622 | 1613  | 1610 | 1434 |
| 135° | 2076 | 2106  | 2112 | 2109  | 2101 | 1604 |
| 145° | 2520 | 2540  | 2555 | 2558  | 2548 | 1574 |
| 155° | 2881 | 2889  | 2898 | 2912  | 2903 | 1326 |
| 165° | 3135 | 3132  | 3132 | 3151  | 3138 | 884  |
| 175° | 3262 | 3254  | 3248 | 3268  | 3251 | 310  |
| 180° | 3268 | 3268  | 3268 | 3268  | 3268 |      |



TEST NUMBER: P919798

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3914.4 | 3914.4 | 3914.4 | 3914.4 | 3914.4 |
| 2.5°   | 3932.0 | 3914.4 | 3875.3 | 3911.0 | 3903.9 |
| 5°     | 3914.4 | 3896.7 | 3850.5 | 3882.4 | 3871.9 |
| 7.5°   | 3882.4 | 3861.3 | 3811.7 | 3825.7 | 3807.9 |
| 10°    | 3840.0 | 3815.1 | 3744.5 | 3733.5 | 3712.5 |
| 12.5°  | 3786.9 | 3755.0 | 3659.2 | 3638.1 | 3599.0 |
| 15°    | 3723.0 | 3684.0 | 3563.7 | 3496.4 | 3461.0 |
| 17.5°  | 3648.7 | 3591.9 | 3443.0 | 3365.2 | 3308.5 |
| 20°    | 3563.7 | 3492.6 | 3315.6 | 3227.3 | 3149.1 |
| 22.5°  | 3471.6 | 3390.0 | 3184.5 | 3064.2 | 3011.2 |
| 25°    | 3379.5 | 3266.0 | 3032.3 | 2887.2 | 2833.8 |
| 27.5°  | 3269.8 | 3149.1 | 2890.5 | 2724.0 | 2642.5 |
| 30°    | 3152.9 | 3018.0 | 2734.6 | 2554.2 | 2458.3 |
| 32.5°  | 3039.4 | 2876.2 | 2586.1 | 2373.4 | 2284.7 |
| 35°    | 2912.0 | 2731.2 | 2419.7 | 2196.4 | 2118.2 |
| 37.5°  | 2788.0 | 2592.9 | 2263.6 | 2019.0 | 1930.7 |
| 40°    | 2656.8 | 2444.5 | 2100.6 | 1849.1 | 1757.0 |
| 42.5°  | 2522.2 | 2295.6 | 1937.8 | 1675.5 | 1587.2 |
| 45°    | 2380.6 | 2143.0 | 1771.3 | 1519.5 | 1434.6 |
| 47.5°  | 2246.0 | 1994.6 | 1612.0 | 1360.1 | 1282.4 |
| 50°    | 2097.1 | 1845.7 | 1456.0 | 1211.3 | 1137.3 |
| 52.5°  | 1951.7 | 1686.0 | 1307.2 | 1073.4 | 1006.1 |
| 55°    | 1810.0 | 1533.8 | 1151.2 | 938.8  | 871.6  |
| 57.5°  | 1665.0 | 1381.6 | 1013.2 | 814.8  | 758.0  |
| 60°    | 1516.1 | 1232.8 | 867.8  | 687.4  | 630.7  |
| 62.5°  | 1371.1 | 1087.7 | 743.8  | 573.9  | 545.7  |
| 65°    | 1222.2 | 935.0  | 616.4  | 496.1  | 485.2  |
| 67.5°  | 1080.6 | 793.4  | 496.1  | 435.6  | 425.1  |
| 70°    | 931.7  | 655.5  | 410.8  | 375.5  | 361.2  |
| 72.5°  | 790.0  | 527.7  | 343.5  | 315.3  | 308.2  |
| 75°    | 651.7  | 403.6  | 283.4  | 258.6  | 255.2  |
| 77.5°  | 513.8  | 286.8  | 223.3  | 209.0  | 201.8  |
| 80°    | 386.0  | 205.6  | 169.9  | 156.0  | 156.0  |
| 82.5°  | 269.1  | 138.3  | 116.9  | 109.8  | 109.8  |
| 85°    | 152.2  | 77.8   | 67.2   | 67.2   | 67.2   |
| 87.5°  | 56.7   | 28.2   | 28.2   | 24.8   | 24.8   |
| 90°    | 2.9    | 35.5   | 96.5   | 90.7   | 93.6   |
| 92.5°  | 61.0   | 82.7   | 85.7   | 88.7   | 88.7   |
| 95°    | 143.8  | 171.4  | 176.3  | 176.3  | 171.4  |
| 97.5°  | 239.4  | 265.0  | 275.9  | 275.9  | 275.9  |
| 100°   | 349.7  | 372.4  | 380.2  | 380.2  | 377.3  |
| 102.5° | 466.0  | 482.7  | 493.5  | 496.5  | 493.5  |
| 105°   | 593.1  | 600.9  | 606.8  | 611.7  | 611.7  |
| 107.5° | 719.1  | 731.0  | 731.0  | 732.9  | 719.1  |
| 110°   | 841.3  | 857.0  | 857.0  | 857.0  | 849.2  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 973.3  | 990.1  | 987.0  | 979.2  | 973.3  |
| 115°   | 1103.3 | 1119.1 | 1114.1 | 1111.2 | 1103.3 |
| 117.5° | 1232.3 | 1254.0 | 1240.3 | 1232.3 | 1224.5 |
| 120°   | 1362.4 | 1384.1 | 1362.4 | 1362.4 | 1353.6 |
| 122.5° | 1480.7 | 1508.2 | 1494.4 | 1486.5 | 1480.7 |
| 125°   | 1604.7 | 1629.4 | 1621.5 | 1612.6 | 1609.6 |
| 127.5° | 1726.0 | 1756.4 | 1745.6 | 1733.8 | 1726.0 |
| 130°   | 1839.2 | 1874.7 | 1869.7 | 1863.8 | 1853.0 |
| 132.5° | 1966.3 | 1993.9 | 1995.8 | 1982.0 | 1974.2 |
| 135°   | 2075.6 | 2106.2 | 2112.1 | 2109.1 | 2101.3 |
| 137.5° | 2197.8 | 2222.4 | 2227.3 | 2225.3 | 2213.5 |
| 140°   | 2305.1 | 2329.8 | 2343.6 | 2343.6 | 2332.7 |
| 142.5° | 2415.5 | 2440.2 | 2448.0 | 2450.9 | 2440.2 |
| 145°   | 2519.9 | 2539.6 | 2555.4 | 2558.4 | 2547.5 |
| 147.5° | 2613.5 | 2638.1 | 2650.0 | 2654.9 | 2644.0 |
| 150°   | 2710.1 | 2726.8 | 2737.6 | 2746.5 | 2737.6 |
| 152.5° | 2795.7 | 2812.4 | 2826.3 | 2837.2 | 2826.3 |
| 155°   | 2881.4 | 2889.3 | 2898.2 | 2912.0 | 2903.1 |
| 157.5° | 2955.4 | 2961.2 | 2966.1 | 2985.9 | 2972.1 |
| 160°   | 3021.3 | 3027.3 | 3030.2 | 3047.0 | 3035.1 |
| 162.5° | 3082.4 | 3082.4 | 3085.4 | 3104.1 | 3090.3 |
| 165°   | 3134.6 | 3131.7 | 3131.7 | 3151.3 | 3137.6 |
| 167.5° | 3181.9 | 3173.0 | 3173.0 | 3192.8 | 3179.0 |
| 170°   | 3217.4 | 3209.5 | 3206.5 | 3226.2 | 3209.5 |
| 172.5° | 3242.0 | 3234.1 | 3231.2 | 3250.9 | 3234.1 |
| 175°   | 3261.7 | 3253.8 | 3247.9 | 3267.6 | 3250.9 |
| 177.5° | 3272.6 | 3264.6 | 3258.7 | 3275.5 | 3258.7 |
| 180°   | 3267.6 | 3267.6 | 3267.6 | 3267.6 | 3267.6 |

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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 | 10.50            | 11.31 | 11.49 | 12.30 | 13.62 | 6.46           | 7.27  | 7.46  | 8.27  | 9.59  |
|                 | 3H   | 12.18            | 12.90 | 13.18 | 13.91 | 15.25 | 7.65           | 8.37  | 8.65  | 9.38  | 10.72 |
|                 | 4H   | 12.79            | 13.47 | 13.80 | 14.48 | 15.83 | 8.10           | 8.78  | 9.12  | 9.79  | 11.14 |
|                 | 6H   | 13.21            | 13.84 | 14.24 | 14.85 | 16.21 | 8.42           | 9.05  | 9.45  | 10.06 | 11.42 |
|                 | 8H   | 13.34            | 13.93 | 14.37 | 14.97 | 16.32 | 8.51           | 9.11  | 9.54  | 10.14 | 11.50 |
|                 | 12H  | 13.40            | 13.97 | 14.43 | 14.99 | 16.37 | 8.56           | 9.12  | 9.59  | 10.15 | 11.53 |
| 4H              | 2H   | 10.52            | 11.20 | 11.54 | 12.21 | 13.55 | 7.06           | 7.74  | 8.08  | 8.75  | 10.10 |
|                 | 3H   | 12.35            | 12.91 | 13.37 | 13.95 | 15.31 | 8.41           | 8.97  | 9.44  | 10.01 | 11.37 |
|                 | 4H   | 13.04            | 13.56 | 14.07 | 14.59 | 15.97 | 8.96           | 9.47  | 9.99  | 10.50 | 11.89 |
|                 | 6H   | 13.56            | 14.00 | 14.60 | 15.05 | 16.43 | 9.38           | 9.82  | 10.42 | 10.87 | 12.25 |
|                 | 8H   | 13.73            | 14.15 | 14.78 | 15.19 | 16.59 | 9.50           | 9.92  | 10.55 | 10.97 | 12.36 |
|                 | 12H  | 13.83            | 14.20 | 14.89 | 15.26 | 16.66 | 9.57           | 9.94  | 10.63 | 11.00 | 12.40 |
| 8H              | 4H   | 13.01            | 13.42 | 14.05 | 14.47 | 15.86 | 9.24           | 9.65  | 10.28 | 10.70 | 12.09 |
|                 | 6H   | 13.57            | 13.92 | 14.64 | 15.00 | 16.40 | 9.76           | 10.10 | 10.82 | 11.19 | 12.58 |
|                 | 8H   | 13.79            | 14.09 | 14.87 | 15.17 | 16.58 | 9.95           | 10.25 | 11.02 | 11.32 | 12.73 |
|                 | 12H  | 13.93            | 14.20 | 15.01 | 15.26 | 16.72 | 10.07          | 10.33 | 11.15 | 11.40 | 12.85 |
| 12H             | 4H   | 12.96            | 13.33 | 14.02 | 14.39 | 15.79 | 9.24           | 9.62  | 10.30 | 10.68 | 12.08 |
|                 | 6H   | 13.55            | 13.85 | 14.63 | 14.92 | 16.33 | 9.80           | 10.11 | 10.88 | 11.18 | 12.59 |
|                 | 8H   | 13.77            | 14.04 | 14.85 | 15.10 | 16.56 | 10.02          | 10.28 | 11.10 | 11.35 | 12.80 |