

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: P908221

Luminaire Tested: DFN2DIP-HX4F0-080D070US840-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908221  
REPORT IS A COMBINATION OF REPORTS P899362 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-080D070US840-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

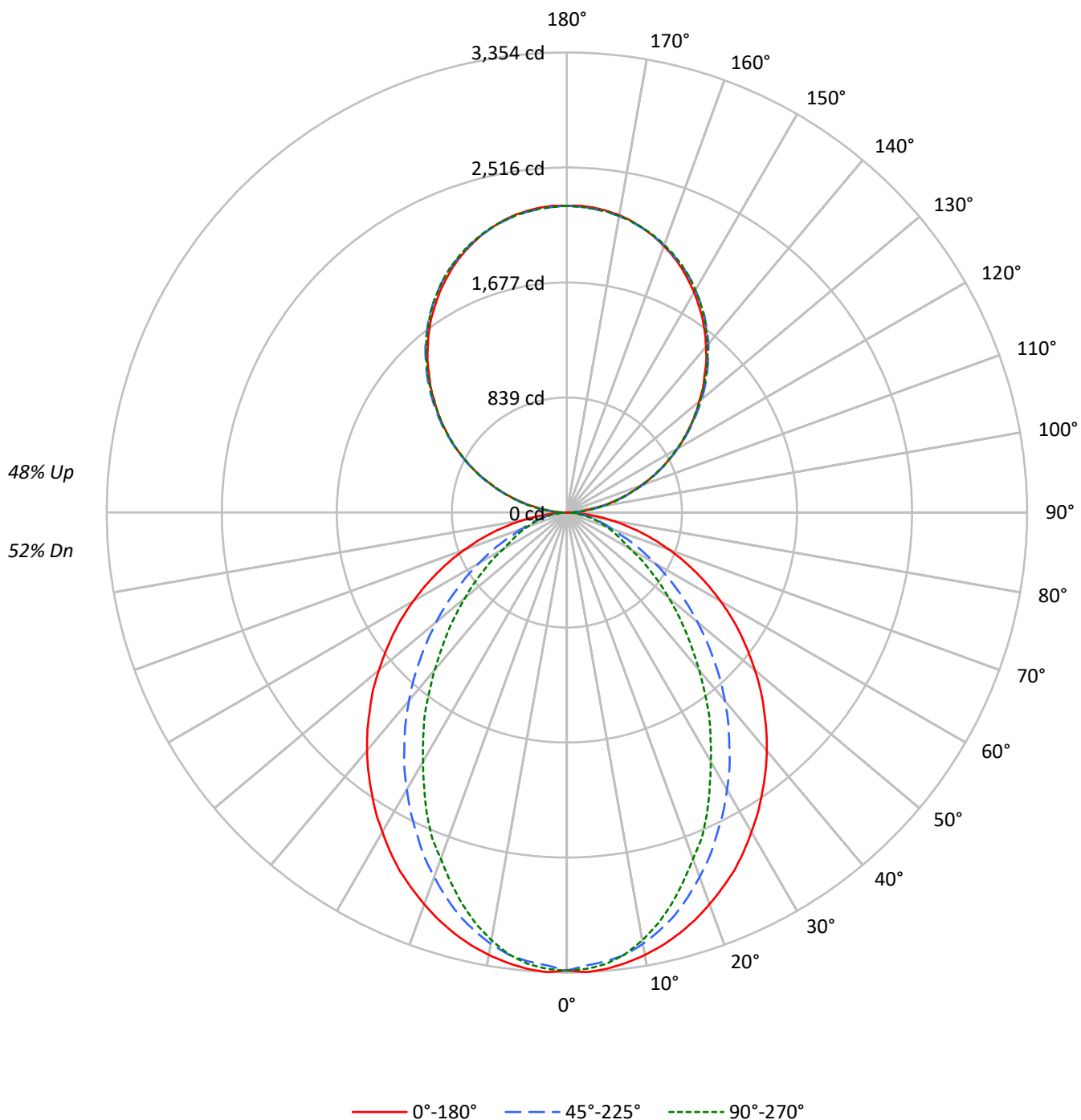
Lumens per Lamp: N/A  
Luminaire Lumens: 13123.2 lumens  
Efficiency: N/A  
Efficacy: 112.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 116.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P908221

CATALOG NUMBER: DFN2DIP-HX4F0-080D070US840-RLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P908221

CATALOG NUMBER: DFN2DIP-HX4F0-080D070US840-RLLFLL

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

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 58 | 58 | 58 |
| 1   | 99  | 95  | 91  | 88  | 91  | 88  | 85  | 82  | 75 | 73 | 71 | 63 | 62 | 60 | 52 | 51 | 50 |
| 2   | 90  | 83  | 77  | 72  | 83  | 77  | 72  | 68  | 66 | 63 | 59 | 56 | 53 | 51 | 47 | 45 | 43 |
| 3   | 83  | 74  | 67  | 61  | 76  | 69  | 62  | 57  | 59 | 54 | 50 | 50 | 47 | 44 | 42 | 39 | 37 |
| 4   | 76  | 66  | 58  | 52  | 70  | 61  | 54  | 49  | 53 | 48 | 43 | 45 | 41 | 38 | 38 | 35 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 47 | 42 | 38 | 41 | 36 | 33 | 34 | 31 | 29 |
| 6   | 65  | 53  | 45  | 39  | 60  | 49  | 42  | 37  | 43 | 37 | 33 | 37 | 33 | 29 | 31 | 28 | 25 |
| 7   | 60  | 48  | 40  | 35  | 55  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 29 | 26 | 29 | 25 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 29  | 36 | 30 | 26 | 31 | 27 | 23 | 26 | 23 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 26  | 33 | 28 | 24 | 29 | 24 | 21 | 24 | 21 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 30 | 25 | 22 | 26 | 22 | 19 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2483 | 2483 | 2483 |
| 5°  | 2487 | 2444 | 2459 |
| 10° | 2462 | 2396 | 2379 |
| 15° | 2429 | 2317 | 2256 |
| 20° | 2384 | 2208 | 2104 |
| 25° | 2338 | 2086 | 1957 |
| 30° | 2277 | 1961 | 1772 |
| 35° | 2217 | 1826 | 1608 |
| 40° | 2156 | 1686 | 1421 |
| 45° | 2084 | 1532 | 1252 |
| 50° | 2011 | 1376 | 1086 |
| 55° | 1934 | 1209 | 926  |
| 60° | 1845 | 1034 | 763  |
| 65° | 1743 | 856  | 686  |
| 70° | 1619 | 691  | 622  |
| 75° | 1463 | 610  | 566  |
| 80° | 1238 | 512  | 491  |
| 85° | 866  | 343  | 370  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2084 cd/sqm

TEST NUMBER: P908221

CATALOG NUMBER: DFN2DIP-HX4F0-080D070US840-RLFL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 312.9   | 2.4       |
| 10°-20°   | 859.1   | 6.5       |
| 20°-30°   | 1206.1  | 9.2       |
| 30°-40°   | 1314.7  | 10.0      |
| 40°-50°   | 1208.4  | 9.2       |
| 50°-60°   | 949.0   | 7.2       |
| 60°-70°   | 617.7   | 4.7       |
| 70°-80°   | 318.0   | 2.4       |
| 80°-90°   | 87.5    | 0.7       |
| 90°-100°  | 138.3   | 1.1       |
| 100°-110° | 439.6   | 3.3       |
| 110°-120° | 752.2   | 5.7       |
| 120°-130° | 989.3   | 7.5       |
| 130°-140° | 1110.5  | 8.5       |
| 140°-150° | 1088.9  | 8.3       |
| 150°-160° | 913.5   | 7.0       |
| 160°-170° | 605.8   | 4.6       |
| 170°-180° | 211.7   | 1.6       |
| 0°-30°    | 2378.1  | 18.1      |
| 0°-40°    | 3692.9  | 28.1      |
| 0°-60°    | 5850.2  | 44.6      |
| 0°-90°    | 6873.4  | 52.4      |
| 90°-120°  | 1330.1  | 10.1      |
| 90°-150°  | 4518.8  | 34.4      |
| 90°-180°  | 6250.0  | 47.6      |
| 0°-180°   | 13123.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3339 | 3339  | 3339 | 3339  | 3339 |      |
| 5°   | 3339 | 3324  | 3284 | 3312  | 3303 | 317  |
| 15°  | 3176 | 3142  | 3040 | 2982  | 2952 | 895  |
| 25°  | 2883 | 2786  | 2587 | 2463  | 2417 | 1326 |
| 35°  | 2484 | 2330  | 2064 | 1874  | 1807 | 1555 |
| 45°  | 2031 | 1828  | 1511 | 1296  | 1224 | 1568 |
| 55°  | 1544 | 1308  | 982  | 801   | 744  | 1380 |
| 65°  | 1043 | 798   | 526  | 423   | 414  | 1034 |
| 75°  | 556  | 344   | 242  | 221   | 218  | 588  |
| 85°  | 130  | 66    | 57   | 57    | 57   | 149  |
| 90°  | 2    | 24    | 66   | 62    | 64   | 13   |
| 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: P908221

CATALOG NUMBER: DFN2DIP-HX4F0-080D070US840-RLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3339.0 | 3339.0 | 3339.0 | 3339.0 | 3339.0 |
| 2.5°   | 3354.1 | 3339.0 | 3305.7 | 3336.1 | 3330.0 |
| 5°     | 3339.0 | 3324.0 | 3284.5 | 3311.8 | 3302.8 |
| 7.5°   | 3311.8 | 3293.8 | 3251.5 | 3263.4 | 3248.2 |
| 10°    | 3275.5 | 3254.4 | 3194.1 | 3184.8 | 3166.8 |
| 12.5°  | 3230.4 | 3203.1 | 3121.3 | 3103.3 | 3070.0 |
| 15°    | 3175.8 | 3142.5 | 3039.9 | 2982.5 | 2952.3 |
| 17.5°  | 3112.3 | 3063.9 | 2937.0 | 2870.6 | 2822.2 |
| 20°    | 3039.9 | 2979.3 | 2828.3 | 2753.0 | 2686.2 |
| 22.5°  | 2961.3 | 2891.7 | 2716.4 | 2613.8 | 2568.6 |
| 25°    | 2882.8 | 2786.0 | 2586.6 | 2462.9 | 2417.3 |
| 27.5°  | 2789.1 | 2686.2 | 2465.7 | 2323.7 | 2254.1 |
| 30°    | 2689.5 | 2574.3 | 2332.7 | 2178.8 | 2097.0 |
| 32.5°  | 2592.6 | 2453.6 | 2206.1 | 2024.6 | 1948.9 |
| 35°    | 2484.0 | 2329.8 | 2064.0 | 1873.6 | 1806.9 |
| 37.5°  | 2378.1 | 2211.8 | 1931.0 | 1722.2 | 1646.9 |
| 40°    | 2266.3 | 2085.2 | 1791.8 | 1577.3 | 1498.7 |
| 42.5°  | 2151.5 | 1958.2 | 1652.9 | 1429.3 | 1353.8 |
| 45°    | 2030.6 | 1828.1 | 1511.0 | 1296.2 | 1223.8 |
| 47.5°  | 1915.9 | 1701.4 | 1375.0 | 1160.2 | 1093.9 |
| 50°    | 1788.9 | 1574.5 | 1242.0 | 1033.3 | 970.1  |
| 52.5°  | 1664.9 | 1438.1 | 1115.0 | 915.6  | 858.3  |
| 55°    | 1544.0 | 1308.4 | 982.0  | 800.8  | 743.5  |
| 57.5°  | 1420.3 | 1178.5 | 864.3  | 695.1  | 646.6  |
| 60°    | 1293.2 | 1051.6 | 740.2  | 586.3  | 538.0  |
| 62.5°  | 1169.5 | 927.8  | 634.5  | 489.6  | 465.5  |
| 65°    | 1042.6 | 797.6  | 525.7  | 423.2  | 413.8  |
| 67.5°  | 921.7  | 676.8  | 423.2  | 371.5  | 362.6  |
| 70°    | 794.8  | 559.2  | 350.4  | 320.2  | 308.1  |
| 72.5°  | 673.9  | 450.1  | 293.1  | 269.0  | 262.9  |
| 75°    | 555.9  | 344.4  | 241.8  | 220.6  | 217.7  |
| 77.5°  | 438.3  | 244.6  | 190.5  | 178.2  | 172.2  |
| 80°    | 329.2  | 175.4  | 144.9  | 133.0  | 133.0  |
| 82.5°  | 229.5  | 118.0  | 99.7   | 93.6   | 93.6   |
| 85°    | 129.9  | 66.3   | 57.4   | 57.4   | 57.4   |
| 87.5°  | 48.4   | 24.0   | 24.0   | 21.2   | 21.2   |
| 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  |

TEST NUMBER: P908221

CATALOG NUMBER: DFN2DIP-HX4F0-080D070US840-RLFL

**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 |

TEST NUMBER: P908221

CATALOG NUMBER: DFN2DIP-HX4F0-080D070US840-RLLFLL

**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 | 10.53            | 11.38 | 11.47 | 12.33 | 13.57 | 6.50           | 7.35  | 7.44  | 8.30  | 9.54  |
|                 | 3H   | 12.21            | 12.97 | 13.16 | 13.93 | 15.19 | 7.69           | 8.45  | 8.65  | 9.42  | 10.68 |
|                 | 4H   | 12.82            | 13.53 | 13.79 | 14.50 | 15.77 | 8.14           | 8.86  | 9.11  | 9.83  | 11.10 |
|                 | 6H   | 13.24            | 13.90 | 14.22 | 14.87 | 16.16 | 8.47           | 9.13  | 9.45  | 10.10 | 11.39 |
|                 | 8H   | 13.37            | 14.00 | 14.35 | 14.99 | 16.27 | 8.56           | 9.19  | 9.55  | 10.18 | 11.46 |
|                 | 12H  | 13.43            | 14.03 | 14.42 | 15.01 | 16.32 | 8.60           | 9.20  | 9.60  | 10.19 | 11.49 |
| 4H              | 2H   | 10.55            | 11.26 | 11.52 | 12.23 | 13.51 | 7.10           | 7.82  | 8.07  | 8.78  | 10.06 |
|                 | 3H   | 12.38            | 12.98 | 13.36 | 13.97 | 15.26 | 8.45           | 9.05  | 9.43  | 10.05 | 11.33 |
|                 | 4H   | 13.07            | 13.62 | 14.07 | 14.61 | 15.92 | 9.00           | 9.55  | 9.99  | 10.54 | 11.85 |
|                 | 6H   | 13.59            | 14.06 | 14.59 | 15.07 | 16.38 | 9.42           | 9.89  | 10.43 | 10.91 | 12.21 |
|                 | 8H   | 13.77            | 14.20 | 14.77 | 15.21 | 16.53 | 9.55           | 9.99  | 10.56 | 11.00 | 12.32 |
|                 | 12H  | 13.86            | 14.26 | 14.89 | 15.28 | 16.61 | 9.62           | 10.02 | 10.64 | 11.04 | 12.37 |
| 8H              | 4H   | 13.04            | 13.48 | 14.05 | 14.49 | 15.81 | 9.28           | 9.72  | 10.29 | 10.73 | 12.05 |
|                 | 6H   | 13.61            | 13.97 | 14.64 | 15.02 | 16.34 | 9.80           | 10.17 | 10.83 | 11.22 | 12.54 |
|                 | 8H   | 13.83            | 14.15 | 14.87 | 15.18 | 16.52 | 10.00          | 10.32 | 11.04 | 11.35 | 12.69 |
|                 | 12H  | 13.97            | 14.25 | 15.01 | 15.28 | 16.66 | 10.12          | 10.40 | 11.16 | 11.43 | 12.81 |
| 12H             | 4H   | 13.00            | 13.39 | 14.02 | 14.41 | 15.74 | 9.29           | 9.68  | 10.31 | 10.71 | 12.03 |
|                 | 6H   | 13.59            | 13.90 | 14.62 | 14.94 | 16.28 | 9.85           | 10.17 | 10.89 | 11.21 | 12.55 |
|                 | 8H   | 13.81            | 14.09 | 14.85 | 15.12 | 16.50 | 10.07          | 10.35 | 11.11 | 11.38 | 12.76 |