

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: P902589

Luminaire Tested: DFN2DIP-HX3F0-050D090US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902589  
REPORT IS A COMBINATION OF REPORTS P899290 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-050D090US830-RLLFLL  
Description: 3 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

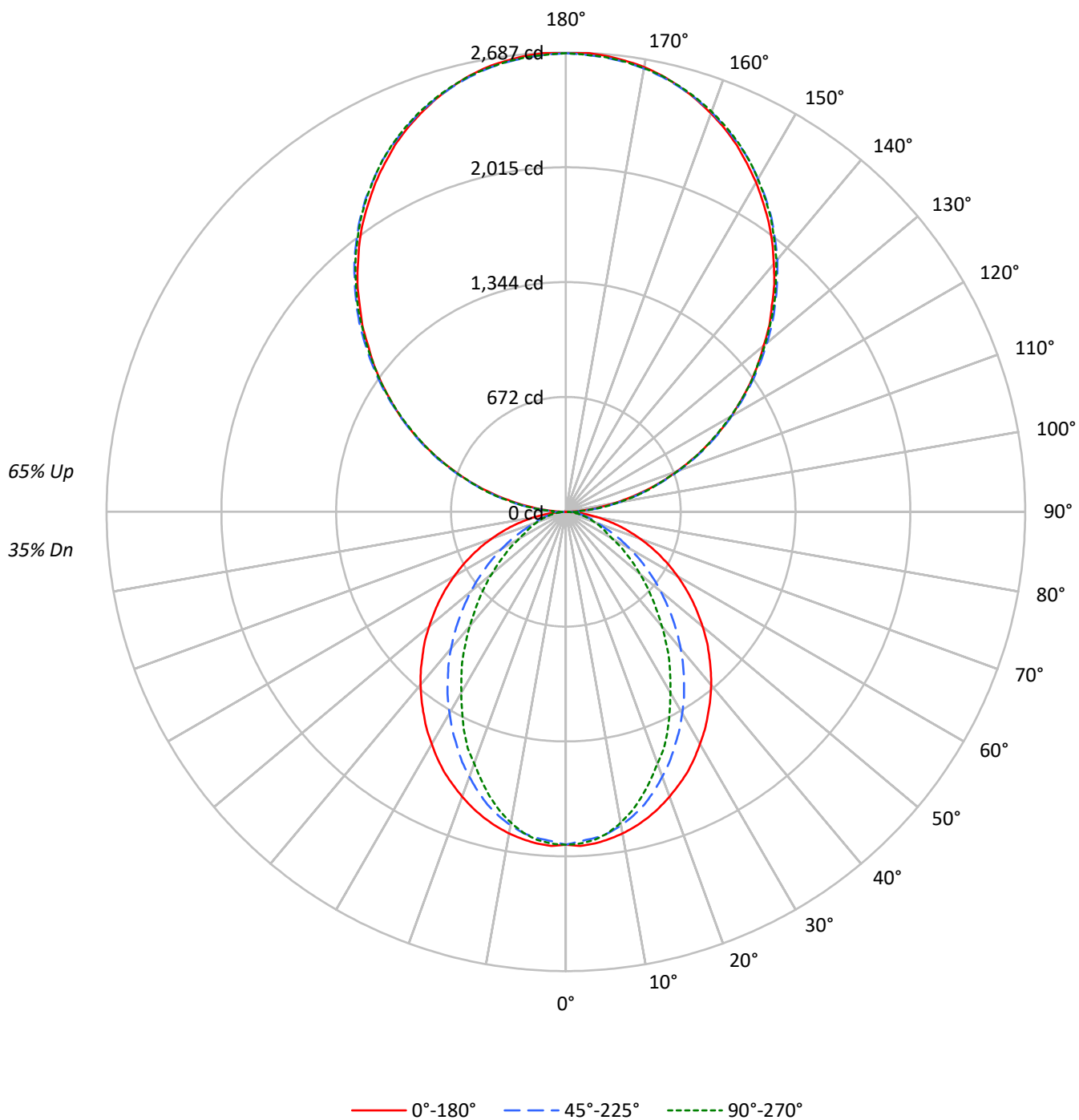
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11513.2 lumens  
Efficiency: N/A  
Efficacy: 99.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 115.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P902589

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### Luminous Intensity Polar Plot



TEST NUMBER: P902589

CATALOG NUMBER: DFN2DIP-HX3F0-050D090US830-RLFL

**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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 75 | 75 | 75 | 58 | 58 | 58 | 42 | 42 | 42 |
| 1   | 95  | 91  | 87  | 84  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 51 | 50 | 49 | 38 | 37 | 36 |
| 2   | 86  | 79  | 74  | 69  | 78 | 72 | 67 | 63 | 58 | 55 | 52 | 45 | 43 | 41 | 34 | 32 | 31 |
| 3   | 79  | 70  | 63  | 58  | 71 | 64 | 58 | 53 | 52 | 47 | 44 | 40 | 38 | 35 | 30 | 28 | 27 |
| 4   | 72  | 62  | 55  | 49  | 65 | 57 | 50 | 45 | 46 | 41 | 38 | 36 | 33 | 30 | 27 | 25 | 23 |
| 5   | 67  | 55  | 48  | 42  | 60 | 51 | 44 | 39 | 41 | 36 | 33 | 33 | 29 | 26 | 25 | 22 | 21 |
| 6   | 61  | 50  | 42  | 37  | 55 | 45 | 39 | 34 | 37 | 32 | 29 | 30 | 26 | 23 | 22 | 20 | 18 |
| 7   | 57  | 45  | 37  | 32  | 51 | 41 | 34 | 30 | 34 | 29 | 25 | 27 | 23 | 21 | 21 | 18 | 16 |
| 8   | 53  | 41  | 33  | 28  | 48 | 37 | 31 | 26 | 31 | 26 | 22 | 25 | 21 | 19 | 19 | 16 | 15 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 28 | 23 | 28 | 23 | 20 | 23 | 19 | 17 | 17 | 15 | 13 |
| 10  | 46  | 34  | 27  | 23  | 41 | 31 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 15 | 16 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2256 | 2256 | 2256 |
| 5°  | 2259 | 2219 | 2233 |
| 10° | 2235 | 2174 | 2159 |
| 15° | 2204 | 2100 | 2046 |
| 20° | 2162 | 2000 | 1907 |
| 25° | 2119 | 1887 | 1773 |
| 30° | 2062 | 1772 | 1603 |
| 35° | 2006 | 1649 | 1455 |
| 40° | 1949 | 1521 | 1284 |
| 45° | 1883 | 1380 | 1129 |
| 50° | 1815 | 1237 | 979  |
| 55° | 1743 | 1085 | 834  |
| 60° | 1660 | 926  | 685  |
| 65° | 1564 | 764  | 615  |
| 70° | 1449 | 614  | 555  |
| 75° | 1303 | 538  | 502  |
| 80° | 1092 | 446  | 431  |
| 85° | 747  | 291  | 317  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2524 cd/sqm

TEST NUMBER: P902589

CATALOG NUMBER: DFN2DIP-HX3F0-050D090US830-RLFL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 182.5   | 1.6       |
| 10°-20°   | 501.1   | 4.4       |
| 20°-30°   | 703.6   | 6.1       |
| 30°-40°   | 766.9   | 6.7       |
| 40°-50°   | 704.9   | 6.1       |
| 50°-60°   | 553.6   | 4.8       |
| 60°-70°   | 360.3   | 3.1       |
| 70°-80°   | 185.5   | 1.6       |
| 80°-90°   | 55.0    | 0.5       |
| 90°-100°  | 166.0   | 1.4       |
| 100°-110° | 527.5   | 4.6       |
| 110°-120° | 902.7   | 7.8       |
| 120°-130° | 1187.2  | 10.3      |
| 130°-140° | 1332.5  | 11.6      |
| 140°-150° | 1306.7  | 11.3      |
| 150°-160° | 1096.1  | 9.5       |
| 160°-170° | 726.9   | 6.3       |
| 170°-180° | 254.1   | 2.2       |
| 0°-30°    | 1387.2  | 12.0      |
| 0°-40°    | 2154.2  | 18.7      |
| 0°-60°    | 3412.7  | 29.6      |
| 0°-90°    | 4013.5  | 34.9      |
| 90°-120°  | 1596.2  | 13.9      |
| 90°-150°  | 5422.6  | 47.1      |
| 90°-180°  | 7500.0  | 65.1      |
| 0°-180°   | 11513.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1948 | 1948  | 1948 | 1948  | 1948 |      |
| 5°   | 1948 | 1939  | 1916 | 1932  | 1927 | 185  |
| 15°  | 1853 | 1833  | 1773 | 1740  | 1722 | 522  |
| 25°  | 1682 | 1625  | 1509 | 1437  | 1410 | 773  |
| 35°  | 1449 | 1359  | 1204 | 1093  | 1054 | 907  |
| 45°  | 1185 | 1066  | 881  | 756   | 714  | 915  |
| 55°  | 901  | 763   | 573  | 467   | 434  | 805  |
| 65°  | 608  | 465   | 307  | 247   | 242  | 603  |
| 75°  | 324  | 201   | 141  | 129   | 127  | 343  |
| 85°  | 76   | 39    | 34   | 34    | 34   | 87   |
| 90°  | 2    | 29    | 79   | 74    | 77   | 11   |
| 95°  | 118  | 141   | 145  | 145   | 141  | 131  |
| 105° | 487  | 493   | 498  | 502   | 502  | 514  |
| 115° | 906  | 919   | 915  | 912   | 906  | 896  |
| 125° | 1318 | 1338  | 1331 | 1324  | 1322 | 1177 |
| 135° | 1704 | 1729  | 1734 | 1732  | 1725 | 1317 |
| 145° | 2069 | 2085  | 2098 | 2100  | 2092 | 1293 |
| 155° | 2366 | 2372  | 2380 | 2391  | 2384 | 1089 |
| 165° | 2574 | 2571  | 2571 | 2587  | 2576 | 726  |
| 175° | 2678 | 2671  | 2667 | 2683  | 2669 | 254  |
| 180° | 2683 | 2683  | 2683 | 2683  | 2683 |      |

TEST NUMBER: P902589

CATALOG NUMBER: DFN2DIP-HX3F0-050D090US830-RLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1947.8 | 1947.8 | 1947.8 | 1947.8 | 1947.8 |
| 2.5°   | 1956.5 | 1947.8 | 1928.3 | 1946.1 | 1942.5 |
| 5°     | 1947.8 | 1939.0 | 1916.0 | 1931.8 | 1926.7 |
| 7.5°   | 1931.8 | 1921.4 | 1896.7 | 1903.7 | 1894.8 |
| 10°    | 1910.7 | 1898.4 | 1863.2 | 1857.8 | 1847.3 |
| 12.5°  | 1884.3 | 1868.5 | 1820.8 | 1810.3 | 1790.8 |
| 15°    | 1852.6 | 1833.2 | 1773.3 | 1739.8 | 1722.2 |
| 17.5°  | 1815.5 | 1787.3 | 1713.3 | 1674.5 | 1646.2 |
| 20°    | 1773.3 | 1738.0 | 1649.8 | 1605.9 | 1567.0 |
| 22.5°  | 1727.5 | 1686.9 | 1584.6 | 1524.8 | 1498.4 |
| 25°    | 1681.6 | 1625.1 | 1508.8 | 1436.6 | 1410.0 |
| 27.5°  | 1627.0 | 1567.0 | 1438.3 | 1355.5 | 1314.9 |
| 30°    | 1568.9 | 1501.8 | 1360.7 | 1270.9 | 1223.2 |
| 32.5°  | 1512.4 | 1431.3 | 1286.9 | 1181.0 | 1136.9 |
| 35°    | 1449.0 | 1359.1 | 1204.0 | 1092.9 | 1054.0 |
| 37.5°  | 1387.2 | 1290.2 | 1126.4 | 1004.7 | 960.7  |
| 40°    | 1322.0 | 1216.4 | 1045.2 | 920.1  | 874.3  |
| 42.5°  | 1255.1 | 1142.3 | 964.2  | 833.7  | 789.8  |
| 45°    | 1184.6 | 1066.4 | 881.4  | 756.1  | 713.8  |
| 47.5°  | 1117.6 | 992.5  | 802.1  | 676.8  | 638.1  |
| 50°    | 1043.6 | 918.4  | 724.5  | 602.8  | 565.9  |
| 52.5°  | 971.2  | 839.0  | 650.4  | 534.1  | 500.7  |
| 55°    | 900.7  | 763.2  | 572.8  | 467.1  | 433.7  |
| 57.5°  | 828.5  | 687.5  | 504.2  | 405.5  | 377.2  |
| 60°    | 754.4  | 613.4  | 431.8  | 342.0  | 313.8  |
| 62.5°  | 682.2  | 541.2  | 370.1  | 285.6  | 271.5  |
| 65°    | 608.1  | 465.3  | 306.7  | 246.9  | 241.5  |
| 67.5°  | 537.6  | 394.8  | 246.9  | 216.8  | 211.5  |
| 70°    | 463.6  | 326.1  | 204.4  | 186.8  | 179.7  |
| 72.5°  | 393.1  | 262.6  | 171.0  | 156.9  | 153.4  |
| 75°    | 324.3  | 200.9  | 141.0  | 128.7  | 127.0  |
| 77.5°  | 255.6  | 142.7  | 111.1  | 104.0  | 100.4  |
| 80°    | 192.1  | 102.3  | 84.5   | 77.6   | 77.6   |
| 82.5°  | 133.9  | 68.8   | 58.2   | 54.6   | 54.6   |
| 85°    | 75.8   | 38.7   | 33.5   | 33.5   | 33.5   |
| 87.5°  | 28.3   | 14.0   | 14.0   | 12.3   | 12.3   |
| 90°    | 2.5    | 29.1   | 79.3   | 74.4   | 76.8   |
| 92.5°  | 50.1   | 68.0   | 70.4   | 72.8   | 72.8   |
| 95°    | 118.1  | 140.7  | 144.8  | 144.8  | 140.7  |
| 97.5°  | 196.5  | 217.5  | 226.5  | 226.5  | 226.5  |
| 100°   | 287.1  | 305.8  | 312.2  | 312.2  | 309.8  |
| 102.5° | 382.6  | 396.3  | 405.2  | 407.6  | 405.2  |
| 105°   | 486.9  | 493.3  | 498.2  | 502.3  | 502.3  |
| 107.5° | 590.4  | 600.1  | 600.1  | 601.7  | 590.4  |
| 110°   | 690.7  | 703.7  | 703.7  | 703.7  | 697.2  |

TEST NUMBER: P902589

CATALOG NUMBER: DFN2DIP-HX3F0-050D090US830-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 799.1  | 812.8  | 810.4  | 804.0  | 799.1  |
| 115°   | 905.9  | 918.8  | 914.7  | 912.4  | 905.9  |
| 117.5° | 1011.8 | 1029.6 | 1018.3 | 1011.8 | 1005.3 |
| 120°   | 1118.6 | 1136.3 | 1118.6 | 1118.6 | 1111.3 |
| 122.5° | 1215.6 | 1238.3 | 1227.0 | 1220.5 | 1215.6 |
| 125°   | 1317.6 | 1337.8 | 1331.3 | 1324.0 | 1321.6 |
| 127.5° | 1417.0 | 1442.1 | 1433.2 | 1423.5 | 1417.0 |
| 130°   | 1510.0 | 1539.2 | 1535.1 | 1530.2 | 1521.4 |
| 132.5° | 1614.4 | 1637.0 | 1638.6 | 1627.3 | 1620.9 |
| 135°   | 1704.1 | 1729.2 | 1734.1 | 1731.6 | 1725.2 |
| 137.5° | 1804.4 | 1824.7 | 1828.7 | 1827.1 | 1817.4 |
| 140°   | 1892.6 | 1912.8 | 1924.1 | 1924.1 | 1915.2 |
| 142.5° | 1983.2 | 2003.4 | 2009.9 | 2012.3 | 2003.4 |
| 145°   | 2069.0 | 2085.1 | 2098.0 | 2100.5 | 2091.6 |
| 147.5° | 2145.8 | 2166.0 | 2175.7 | 2179.7 | 2170.9 |
| 150°   | 2225.1 | 2238.8 | 2247.7 | 2254.9 | 2247.7 |
| 152.5° | 2295.4 | 2309.1 | 2320.4 | 2329.4 | 2320.4 |
| 155°   | 2365.8 | 2372.2 | 2379.5 | 2390.9 | 2383.6 |
| 157.5° | 2426.4 | 2431.3 | 2435.3 | 2451.5 | 2440.1 |
| 160°   | 2480.6 | 2485.5 | 2487.9 | 2501.6 | 2491.9 |
| 162.5° | 2530.7 | 2530.7 | 2533.2 | 2548.5 | 2537.2 |
| 165°   | 2573.6 | 2571.2 | 2571.2 | 2587.4 | 2576.1 |
| 167.5° | 2612.4 | 2605.2 | 2605.2 | 2621.3 | 2610.0 |
| 170°   | 2641.6 | 2635.1 | 2632.7 | 2648.8 | 2635.1 |
| 172.5° | 2661.7 | 2655.3 | 2652.9 | 2669.1 | 2655.3 |
| 175°   | 2678.0 | 2671.4 | 2666.6 | 2682.9 | 2669.1 |
| 177.5° | 2686.8 | 2680.4 | 2675.5 | 2689.3 | 2675.5 |
| 180°   | 2682.9 | 2682.9 | 2682.9 | 2682.9 | 2682.9 |

TEST NUMBER: P902589

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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 | 8.32             | 9.04  | 9.41  | 10.12 | 11.60 | 4.30           | 5.02 | 5.38 | 6.10 | 7.57  |
|                 | 3H   | 9.98             | 10.63 | 11.08 | 11.72 | 13.21 | 5.48           | 6.12 | 6.57 | 7.21 | 8.70  |
|                 | 4H   | 10.58            | 11.19 | 11.69 | 12.28 | 13.78 | 5.92           | 6.53 | 7.02 | 7.62 | 9.12  |
|                 | 6H   | 10.99            | 11.55 | 12.10 | 12.65 | 14.16 | 6.23           | 6.79 | 7.34 | 7.88 | 9.39  |
|                 | 8H   | 11.11            | 11.65 | 12.23 | 12.75 | 14.26 | 6.31           | 6.85 | 7.43 | 7.96 | 9.46  |
|                 | 12H  | 11.17            | 11.67 | 12.29 | 12.78 | 14.30 | 6.35           | 6.86 | 7.47 | 7.96 | 9.49  |
| 4H              | 2H   | 8.33             | 8.94  | 9.44  | 10.03 | 11.52 | 4.88           | 5.49 | 5.99 | 6.58 | 8.07  |
|                 | 3H   | 10.14            | 10.65 | 11.25 | 11.76 | 13.27 | 6.21           | 6.72 | 7.33 | 7.84 | 9.35  |
|                 | 4H   | 10.82            | 11.29 | 11.94 | 12.39 | 13.92 | 6.75           | 7.22 | 7.87 | 8.32 | 9.85  |
|                 | 6H   | 11.32            | 11.72 | 12.45 | 12.85 | 14.37 | 7.16           | 7.56 | 8.29 | 8.69 | 10.21 |
|                 | 8H   | 11.49            | 11.86 | 12.62 | 12.98 | 14.52 | 7.28           | 7.66 | 8.41 | 8.78 | 10.32 |
|                 | 12H  | 11.58            | 11.91 | 12.72 | 13.04 | 14.59 | 7.34           | 7.68 | 8.48 | 8.81 | 10.36 |
| 8H              | 4H   | 10.78            | 11.15 | 11.90 | 12.27 | 13.81 | 7.02           | 7.39 | 8.15 | 8.51 | 10.05 |
|                 | 6H   | 11.33            | 11.64 | 12.48 | 12.80 | 14.34 | 7.53           | 7.83 | 8.67 | 9.00 | 10.53 |
|                 | 8H   | 11.54            | 11.81 | 12.70 | 12.95 | 14.51 | 7.71           | 7.98 | 8.87 | 9.13 | 10.68 |
|                 | 12H  | 11.67            | 11.91 | 12.83 | 13.05 | 14.64 | 7.82           | 8.06 | 8.98 | 9.20 | 10.79 |
| 12H             | 4H   | 10.72            | 11.06 | 11.87 | 12.19 | 13.74 | 7.02           | 7.36 | 8.16 | 8.49 | 10.03 |
|                 | 6H   | 11.31            | 11.57 | 12.46 | 12.72 | 14.27 | 7.57           | 7.84 | 8.73 | 8.99 | 10.54 |
|                 | 8H   | 11.52            | 11.75 | 12.67 | 12.89 | 14.48 | 7.78           | 8.01 | 8.93 | 9.15 | 10.74 |