

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: P916334

Luminaire Tested: DFN2DIP-HX4F0-040D080US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

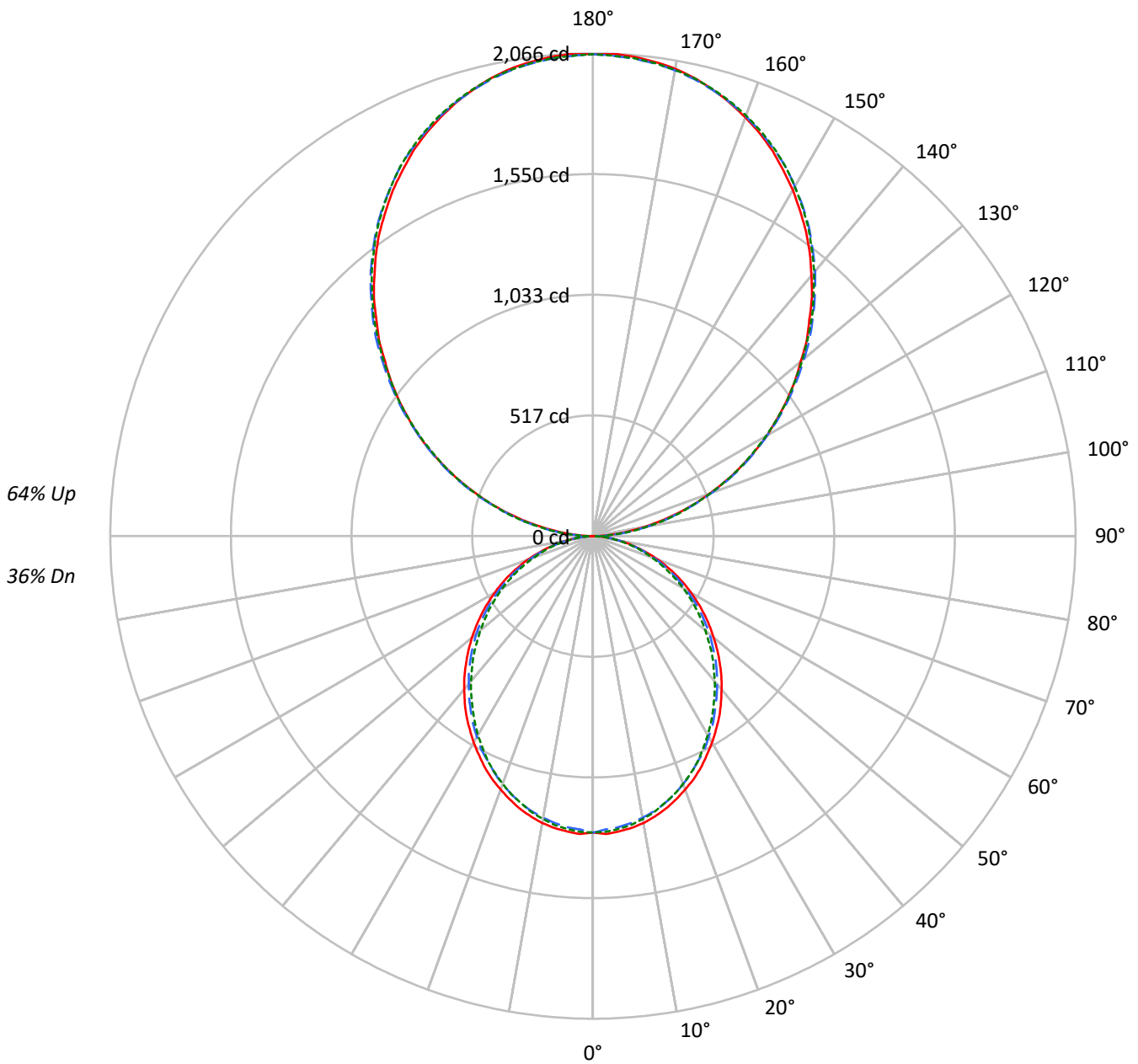
Test Method: LM-79-2019  
Report Number: P916334  
REPORT IS A COMBINATION OF REPORTS P899371 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-040D080US930-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9000.9 lumens  
Efficiency: N/A  
Efficacy: 114.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 78.6  
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: P916334  
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### Luminous Intensity Polar Plot



— 0°-180°    - - 45°-225°    - - - 90°-270°



TEST NUMBER: P916334  
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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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 59 | 59 | 59 | 43 | 43 | 43 | 36 |    |    | 36 |
| 1   | 95  | 90  | 87  | 83  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 38 | 37 | 36 | 30 |    |    | 30 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 66 | 62 | 58 | 54 | 51 | 45 | 43 | 41 | 34 | 32 | 31 | 25 |    |    | 25 |
| 3   | 79  | 69  | 62  | 56  | 71 | 63 | 57 | 52 | 51 | 47 | 43 | 40 | 37 | 34 | 30 | 28 | 26 | 21 |    |    | 21 |
| 4   | 72  | 61  | 54  | 48  | 65 | 56 | 49 | 44 | 45 | 40 | 37 | 36 | 32 | 29 | 27 | 24 | 22 | 18 |    |    | 18 |
| 5   | 66  | 54  | 47  | 41  | 59 | 50 | 43 | 38 | 40 | 35 | 31 | 32 | 28 | 25 | 24 | 22 | 20 | 16 |    |    | 16 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 36 | 31 | 27 | 29 | 25 | 22 | 22 | 19 | 17 | 14 |    |    | 14 |
| 7   | 56  | 44  | 36  | 31  | 50 | 40 | 33 | 28 | 33 | 28 | 24 | 26 | 22 | 20 | 20 | 17 | 15 | 12 |    |    | 12 |
| 8   | 52  | 40  | 32  | 27  | 47 | 36 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 17 | 18 | 16 | 14 | 11 |    |    | 11 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 22 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 14 | 12 | 10 |    |    | 10 |
| 10  | 45  | 33  | 26  | 21  | 41 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 17 | 14 | 16 | 13 | 11 | 9  |    |    | 9  |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 944 | 944 | 944 |
| 5°  | 945 | 930 | 937 |
| 10° | 938 | 918 | 924 |
| 15° | 924 | 903 | 904 |
| 20° | 905 | 882 | 884 |
| 25° | 887 | 857 | 861 |
| 30° | 864 | 834 | 831 |
| 35° | 842 | 806 | 799 |
| 40° | 815 | 779 | 769 |
| 45° | 788 | 751 | 739 |
| 50° | 758 | 722 | 703 |
| 55° | 728 | 688 | 671 |
| 60° | 693 | 648 | 633 |
| 65° | 655 | 606 | 589 |
| 70° | 606 | 556 | 542 |
| 75° | 540 | 495 | 498 |
| 80° | 459 | 418 | 414 |
| 85° | 333 | 285 | 275 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 1556 cd/sqm



TEST NUMBER: P916334

CATALOG NUMBER: DFN2DIP-HX4F0-040D080US930-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 119.4  | 1.3       |
| 10°-20°   | 336.0  | 3.7       |
| 20°-30°   | 493.8  | 5.5       |
| 30°-40°   | 573.6  | 6.4       |
| 40°-50°   | 572.9  | 6.4       |
| 50°-60°   | 499.5  | 5.5       |
| 60°-70°   | 369.3  | 4.1       |
| 70°-80°   | 208.9  | 2.3       |
| 80°-90°   | 61.0   | 0.7       |
| 90°-100°  | 127.6  | 1.4       |
| 100°-110° | 405.6  | 4.5       |
| 110°-120° | 694.1  | 7.7       |
| 120°-130° | 912.8  | 10.1      |
| 130°-140° | 1024.6 | 11.4      |
| 140°-150° | 1004.7 | 11.2      |
| 150°-160° | 842.8  | 9.4       |
| 160°-170° | 558.9  | 6.2       |
| 170°-180° | 195.4  | 2.2       |
| 0°-30°    | 949.3  | 10.5      |
| 0°-40°    | 1522.9 | 16.9      |
| 0°-60°    | 2595.3 | 28.8      |
| 0°-90°    | 3234.4 | 35.9      |
| 90°-120°  | 1227.3 | 13.6      |
| 90°-150°  | 4169.4 | 46.3      |
| 90°-180°  | 5766.0 | 64.1      |
| 0°-180°   | 9000.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1269 | 1269  | 1269 | 1269  | 1269 |      |
| 5°   | 1269 | 1264  | 1251 | 1260  | 1258 | 120  |
| 15°  | 1208 | 1201  | 1185 | 1190  | 1184 | 340  |
| 25°  | 1093 | 1084  | 1063 | 1065  | 1063 | 503  |
| 35°  | 943  | 931   | 912  | 904   | 898  | 589  |
| 45°  | 768  | 759   | 741  | 727   | 722  | 592  |
| 55°  | 581  | 574   | 559  | 544   | 538  | 519  |
| 65°  | 392  | 384   | 372  | 361   | 355  | 387  |
| 75°  | 205  | 203   | 196  | 189   | 192  | 219  |
| 85°  | 50   | 49    | 48   | 44    | 43   | 56   |
| 90°  | 2    | 22    | 61   | 57    | 59   | 9    |
| 95°  | 91   | 108   | 111  | 111   | 108  | 101  |
| 105° | 374  | 379   | 383  | 386   | 386  | 395  |
| 115° | 696  | 706   | 703  | 702   | 696  | 689  |
| 125° | 1013 | 1029  | 1024 | 1018  | 1016 | 905  |
| 135° | 1310 | 1330  | 1333 | 1332  | 1326 | 1013 |
| 145° | 1591 | 1603  | 1613 | 1615  | 1608 | 994  |
| 155° | 1819 | 1824  | 1830 | 1838  | 1833 | 837  |
| 165° | 1979 | 1977  | 1977 | 1989  | 1981 | 558  |
| 175° | 2059 | 2054  | 2050 | 2063  | 2052 | 196  |
| 180° | 2063 | 2063  | 2063 | 2063  | 2063 |      |



TEST NUMBER: P916334

CATALOG NUMBER: DFN2DIP-HX4F0-040D080US930-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1268.9 | 1268.9 | 1268.9 | 1268.9 | 1268.9 |
| 2.5°   | 1276.3 | 1270.2 | 1256.8 | 1268.9 | 1266.6 |
| 5°     | 1268.9 | 1264.1 | 1250.7 | 1260.4 | 1258.1 |
| 7.5°   | 1260.4 | 1253.1 | 1239.7 | 1249.5 | 1247.1 |
| 10°    | 1247.1 | 1238.5 | 1223.9 | 1233.6 | 1230.0 |
| 12.5°  | 1228.7 | 1221.4 | 1206.8 | 1212.9 | 1210.4 |
| 15°    | 1207.9 | 1200.7 | 1184.8 | 1189.7 | 1183.6 |
| 17.5°  | 1182.3 | 1175.1 | 1159.2 | 1165.2 | 1159.2 |
| 20°    | 1154.2 | 1147.0 | 1129.9 | 1133.5 | 1128.8 |
| 22.5°  | 1126.3 | 1115.2 | 1099.3 | 1099.3 | 1096.9 |
| 25°    | 1093.2 | 1083.5 | 1062.8 | 1065.2 | 1062.8 |
| 27.5°  | 1056.6 | 1048.1 | 1032.3 | 1028.7 | 1022.6 |
| 30°    | 1020.1 | 1010.3 | 992.1  | 988.4  | 983.5  |
| 32.5°  | 981.0  | 973.8  | 954.2  | 946.9  | 941.9  |
| 35°    | 943.2  | 931.1  | 911.5  | 904.2  | 898.1  |
| 37.5°  | 900.5  | 889.5  | 869.9  | 861.4  | 855.3  |
| 40°    | 856.6  | 846.8  | 827.2  | 816.4  | 811.5  |
| 42.5°  | 813.9  | 804.0  | 784.6  | 772.3  | 765.1  |
| 45°    | 767.5  | 759.0  | 740.6  | 727.3  | 722.4  |
| 47.5°  | 722.4  | 713.8  | 694.3  | 680.9  | 673.6  |
| 50°    | 674.7  | 668.6  | 651.6  | 634.5  | 628.4  |
| 52.5°  | 628.4  | 619.9  | 604.1  | 590.6  | 582.0  |
| 55°    | 580.9  | 573.5  | 558.9  | 544.2  | 538.2  |
| 57.5°  | 533.2  | 527.2  | 511.2  | 496.6  | 491.7  |
| 60°    | 485.6  | 480.8  | 463.7  | 450.3  | 446.6  |
| 62.5°  | 439.3  | 430.7  | 418.6  | 406.3  | 401.5  |
| 65°    | 391.8  | 384.3  | 372.2  | 361.2  | 355.1  |
| 67.5°  | 342.9  | 336.7  | 325.9  | 317.3  | 312.4  |
| 70°    | 297.7  | 292.9  | 281.8  | 273.3  | 268.5  |
| 72.5°  | 251.4  | 246.5  | 240.4  | 231.9  | 228.2  |
| 75°    | 205.0  | 202.6  | 196.4  | 189.1  | 191.6  |
| 77.5°  | 163.5  | 158.6  | 156.1  | 152.5  | 148.9  |
| 80°    | 122.1  | 120.7  | 118.3  | 114.7  | 112.3  |
| 82.5°  | 83.0   | 83.0   | 81.9   | 76.9   | 76.9   |
| 85°    | 50.0   | 48.8   | 47.6   | 43.9   | 42.7   |
| 87.5°  | 22.0   | 19.6   | 17.1   | 13.5   | 12.1   |
| 90°    | 1.9    | 22.4   | 61.0   | 57.2   | 59.1   |
| 92.5°  | 38.6   | 52.3   | 54.1   | 55.9   | 55.9   |
| 95°    | 90.8   | 108.2  | 111.3  | 111.3  | 108.2  |
| 97.5°  | 151.2  | 167.3  | 174.1  | 174.1  | 174.1  |
| 100°   | 220.8  | 235.1  | 240.0  | 240.0  | 238.1  |
| 102.5° | 294.2  | 304.8  | 311.5  | 313.4  | 311.5  |
| 105°   | 374.4  | 379.4  | 383.1  | 386.2  | 386.2  |
| 107.5° | 454.0  | 461.5  | 461.5  | 462.7  | 454.0  |
| 110°   | 531.1  | 541.0  | 541.0  | 541.0  | 536.1  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 614.4  | 625.0  | 623.1  | 618.2  | 614.4  |
| 115°   | 696.5  | 706.5  | 703.4  | 701.5  | 696.5  |
| 117.5° | 778.0  | 791.7  | 782.9  | 778.0  | 773.0  |
| 120°   | 860.1  | 873.8  | 860.1  | 860.1  | 854.4  |
| 122.5° | 934.7  | 952.1  | 943.4  | 938.4  | 934.7  |
| 125°   | 1013.0 | 1028.6 | 1023.6 | 1018.0 | 1016.2 |
| 127.5° | 1089.6 | 1108.8 | 1102.0 | 1094.5 | 1089.6 |
| 130°   | 1161.1 | 1183.4 | 1180.3 | 1176.6 | 1169.8 |
| 132.5° | 1241.3 | 1258.7 | 1260.0 | 1251.2 | 1246.3 |
| 135°   | 1310.3 | 1329.6 | 1333.3 | 1331.5 | 1326.5 |
| 137.5° | 1387.4 | 1403.0 | 1406.1 | 1404.8 | 1397.3 |
| 140°   | 1455.2 | 1470.7 | 1479.4 | 1479.4 | 1472.6 |
| 142.5° | 1524.9 | 1540.4 | 1545.4 | 1547.3 | 1540.4 |
| 145°   | 1590.8 | 1603.2 | 1613.1 | 1615.0 | 1608.2 |
| 147.5° | 1649.8 | 1665.4 | 1672.8 | 1676.0 | 1669.2 |
| 150°   | 1710.8 | 1721.3 | 1728.2 | 1733.8 | 1728.2 |
| 152.5° | 1764.9 | 1775.5 | 1784.2 | 1791.0 | 1784.2 |
| 155°   | 1819.0 | 1824.0 | 1829.6 | 1838.3 | 1832.7 |
| 157.5° | 1865.6 | 1869.4 | 1872.5 | 1884.9 | 1876.2 |
| 160°   | 1907.3 | 1911.1 | 1912.9 | 1923.5 | 1916.0 |
| 162.5° | 1945.9 | 1945.9 | 1947.7 | 1959.6 | 1950.8 |
| 165°   | 1978.8 | 1976.9 | 1976.9 | 1989.4 | 1980.7 |
| 167.5° | 2008.7 | 2003.1 | 2003.1 | 2015.5 | 2006.8 |
| 170°   | 2031.1 | 2026.1 | 2024.2 | 2036.7 | 2026.1 |
| 172.5° | 2046.6 | 2041.7 | 2039.8 | 2052.2 | 2041.7 |
| 175°   | 2059.0 | 2054.1 | 2050.3 | 2062.8 | 2052.2 |
| 177.5° | 2065.9 | 2060.9 | 2057.2 | 2067.8 | 2057.2 |
| 180°   | 2062.8 | 2062.8 | 2062.8 | 2062.8 | 2062.8 |



TEST NUMBER: P916334  
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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 | 5.61             | 6.35  | 6.68  | 7.43  | 8.88  | 5.17           | 5.92 | 6.24  | 6.99  | 8.45  |
|                 | 3H   | 7.26             | 7.93  | 8.34  | 9.01  | 10.49 | 6.79           | 7.46 | 7.86  | 8.54  | 10.01 |
|                 | 4H   | 7.84             | 8.48  | 8.93  | 9.56  | 11.04 | 7.37           | 8.00 | 8.46  | 9.09  | 10.57 |
|                 | 6H   | 8.24             | 8.82  | 9.34  | 9.91  | 11.40 | 7.76           | 8.35 | 8.86  | 9.43  | 10.93 |
|                 | 8H   | 8.34             | 8.90  | 9.44  | 10.00 | 11.49 | 7.86           | 8.42 | 8.97  | 9.52  | 11.01 |
|                 | 12H  | 8.38             | 8.91  | 9.49  | 10.01 | 11.52 | 7.90           | 8.43 | 9.01  | 9.53  | 11.04 |
| 4H              | 2H   | 6.06             | 6.69  | 7.15  | 7.77  | 9.26  | 5.71           | 6.35 | 6.81  | 7.43  | 8.91  |
|                 | 3H   | 7.91             | 8.44  | 9.01  | 9.55  | 11.05 | 7.52           | 8.05 | 8.62  | 9.16  | 10.65 |
|                 | 4H   | 8.62             | 9.11  | 9.73  | 10.21 | 11.72 | 8.22           | 8.70 | 9.32  | 9.80  | 11.32 |
|                 | 6H   | 9.13             | 9.55  | 10.25 | 10.67 | 12.18 | 8.72           | 9.14 | 9.84  | 10.26 | 11.77 |
|                 | 8H   | 9.28             | 9.67  | 10.39 | 10.78 | 12.31 | 8.87           | 9.26 | 9.98  | 10.37 | 11.90 |
|                 | 12H  | 9.35             | 9.70  | 10.48 | 10.83 | 12.36 | 8.92           | 9.28 | 10.06 | 10.40 | 11.93 |
| 8H              | 4H   | 8.81             | 9.20  | 9.93  | 10.31 | 11.84 | 8.45           | 8.84 | 9.56  | 9.95  | 11.48 |
|                 | 6H   | 9.44             | 9.76  | 10.57 | 10.92 | 12.44 | 9.07           | 9.40 | 10.21 | 10.55 | 12.07 |
|                 | 8H   | 9.66             | 9.94  | 10.80 | 11.08 | 12.62 | 9.29           | 9.57 | 10.43 | 10.71 | 12.25 |
|                 | 12H  | 9.79             | 10.03 | 10.93 | 11.17 | 12.74 | 9.40           | 9.65 | 10.55 | 10.78 | 12.36 |
| 12H             | 4H   | 8.79             | 9.14  | 9.92  | 10.27 | 11.80 | 8.44           | 8.79 | 9.57  | 9.92  | 11.45 |
|                 | 6H   | 9.47             | 9.75  | 10.61 | 10.89 | 12.43 | 9.12           | 9.40 | 10.26 | 10.53 | 12.08 |
|                 | 8H   | 9.70             | 9.95  | 10.85 | 11.08 | 12.66 | 9.35           | 9.60 | 10.49 | 10.73 | 12.31 |