

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: P928358

Luminaire Tested: DFN2DIP-HX4F0-090D060US927-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P928358  
REPORT IS A COMBINATION OF REPORTS P900866 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-090D060US927-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

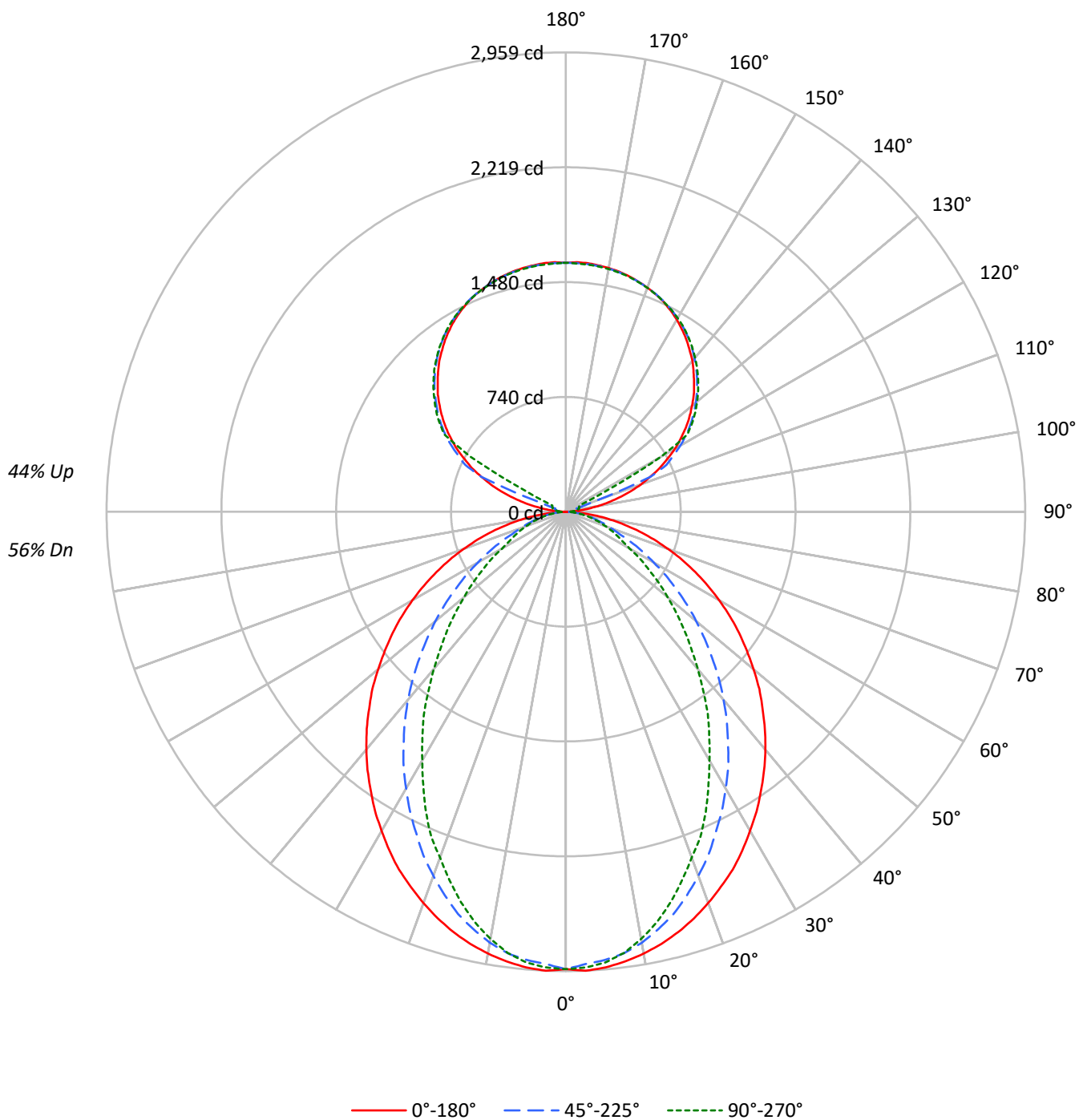
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10763.3 lumens  
Efficiency: N/A  
Efficacy: 81.1 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): 132.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### 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 |    |  |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  |  | 70  | 50  | 30  | 10  |  | 50 | 30 | 10 |  | 50 | 30 | 10 |  | 50 | 30 | 10 |
| RCR |     |     |     |     |  |     |     |     |     |  |    |    |    |  |    |    |    |  |    |    |    |
| 0   | 109 | 109 | 109 | 109 |  | 101 | 101 | 101 | 101 |  | 87 | 87 | 87 |  | 74 | 74 | 74 |  | 62 | 62 | 62 |
| 1   | 100 | 96  | 92  | 88  |  | 93  | 89  | 86  | 83  |  | 77 | 75 | 72 |  | 66 | 64 | 63 |  | 56 | 54 | 53 |
| 2   | 91  | 84  | 78  | 73  |  | 85  | 79  | 73  | 69  |  | 68 | 64 | 61 |  | 58 | 56 | 53 |  | 50 | 48 | 46 |
| 3   | 84  | 74  | 67  | 62  |  | 78  | 70  | 63  | 58  |  | 61 | 56 | 52 |  | 52 | 49 | 46 |  | 44 | 42 | 40 |
| 4   | 77  | 66  | 59  | 53  |  | 71  | 62  | 55  | 50  |  | 54 | 49 | 45 |  | 47 | 43 | 40 |  | 40 | 37 | 35 |
| 5   | 71  | 59  | 51  | 46  |  | 66  | 56  | 49  | 43  |  | 49 | 43 | 39 |  | 42 | 38 | 35 |  | 36 | 33 | 31 |
| 6   | 65  | 54  | 46  | 40  |  | 61  | 50  | 43  | 38  |  | 44 | 39 | 34 |  | 39 | 34 | 31 |  | 33 | 30 | 27 |
| 7   | 61  | 49  | 41  | 35  |  | 56  | 46  | 39  | 34  |  | 40 | 35 | 30 |  | 35 | 31 | 27 |  | 30 | 27 | 24 |
| 8   | 56  | 44  | 37  | 31  |  | 52  | 42  | 35  | 30  |  | 37 | 31 | 27 |  | 32 | 28 | 25 |  | 28 | 25 | 22 |
| 9   | 53  | 41  | 33  | 28  |  | 49  | 38  | 32  | 27  |  | 34 | 28 | 25 |  | 30 | 25 | 22 |  | 26 | 23 | 20 |
| 10  | 49  | 37  | 30  | 25  |  | 46  | 35  | 29  | 24  |  | 31 | 26 | 22 |  | 28 | 23 | 20 |  | 24 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2191 | 2191 | 2191 |
| 5°  | 2194 | 2156 | 2170 |
| 10° | 2173 | 2114 | 2099 |
| 15° | 2143 | 2044 | 1990 |
| 20° | 2104 | 1948 | 1856 |
| 25° | 2063 | 1840 | 1727 |
| 30° | 2009 | 1730 | 1563 |
| 35° | 1956 | 1611 | 1419 |
| 40° | 1902 | 1488 | 1254 |
| 45° | 1839 | 1351 | 1104 |
| 50° | 1774 | 1214 | 958  |
| 55° | 1706 | 1066 | 817  |
| 60° | 1628 | 912  | 673  |
| 65° | 1538 | 756  | 606  |
| 70° | 1428 | 610  | 548  |
| 75° | 1291 | 538  | 499  |
| 80° | 1092 | 452  | 433  |
| 85° | 763  | 303  | 326  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1839 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 276.1   | 2.6       |
| 10°-20°   | 758.0   | 7.0       |
| 20°-30°   | 1064.1  | 9.9       |
| 30°-40°   | 1160.0  | 10.8      |
| 40°-50°   | 1066.2  | 9.9       |
| 50°-60°   | 837.3   | 7.8       |
| 60°-70°   | 545.0   | 5.1       |
| 70°-80°   | 280.5   | 2.6       |
| 80°-90°   | 74.4    | 0.7       |
| 90°-100°  | 52.9    | 0.5       |
| 100°-110° | 197.1   | 1.8       |
| 110°-120° | 522.8   | 4.9       |
| 120°-130° | 867.2   | 8.1       |
| 130°-140° | 921.1   | 8.6       |
| 140°-150° | 856.1   | 8.0       |
| 150°-160° | 688.3   | 6.4       |
| 160°-170° | 443.5   | 4.1       |
| 170°-180° | 152.6   | 1.4       |
| 0°-30°    | 2098.2  | 19.5      |
| 0°-40°    | 3258.2  | 30.3      |
| 0°-60°    | 5161.6  | 48.0      |
| 0°-90°    | 6061.6  | 56.3      |
| 90°-120°  | 772.9   | 7.2       |
| 90°-150°  | 3417.2  | 31.7      |
| 90°-180°  | 4702.0  | 43.7      |
| 0°-180°   | 10763.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2946 | 2946  | 2946 | 2946  | 2946 |      |
| 5°   | 2946 | 2933  | 2898 | 2922  | 2914 | 279  |
| 15°  | 2802 | 2773  | 2682 | 2631  | 2605 | 790  |
| 25°  | 2544 | 2458  | 2282 | 2173  | 2133 | 1170 |
| 35°  | 2192 | 2056  | 1821 | 1653  | 1594 | 1372 |
| 45°  | 1792 | 1613  | 1333 | 1144  | 1080 | 1384 |
| 55°  | 1362 | 1154  | 866  | 707   | 656  | 1217 |
| 65°  | 920  | 704   | 464  | 373   | 365  | 912  |
| 75°  | 490  | 304   | 213  | 195   | 192  | 519  |
| 85°  | 114  | 58    | 51   | 51    | 51   | 131  |
| 90°  | 1    | 14    | 23   | 29    | 31   | 10   |
| 95°  | 75   | 37    | 45   | 51    | 50   | 89   |
| 105° | 353  | 388   | 71   | 84    | 88   | 377  |
| 115° | 667  | 687   | 716  | 179   | 95   | 657  |
| 125° | 943  | 959   | 981  | 989   | 992  | 841  |
| 135° | 1168 | 1186  | 1196 | 1208  | 1206 | 902  |
| 145° | 1354 | 1353  | 1373 | 1381  | 1375 | 847  |
| 155° | 1491 | 1481  | 1495 | 1502  | 1492 | 687  |
| 165° | 1571 | 1564  | 1568 | 1576  | 1568 | 444  |
| 175° | 1607 | 1599  | 1601 | 1610  | 1598 | 153  |
| 180° | 1604 | 1604  | 1604 | 1604  | 1604 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2946.0 | 2946.0 | 2946.0 | 2946.0 | 2946.0 |
| 2.5°   | 2959.3 | 2946.0 | 2916.5 | 2943.5 | 2938.1 |
| 5°     | 2946.0 | 2932.7 | 2897.9 | 2921.9 | 2914.0 |
| 7.5°   | 2921.9 | 2906.1 | 2868.8 | 2879.2 | 2865.9 |
| 10°    | 2890.0 | 2871.3 | 2818.2 | 2809.9 | 2794.1 |
| 12.5°  | 2850.1 | 2826.1 | 2753.9 | 2738.1 | 2708.6 |
| 15°    | 2802.0 | 2772.6 | 2682.1 | 2631.4 | 2604.9 |
| 17.5°  | 2746.0 | 2703.3 | 2591.3 | 2532.7 | 2490.0 |
| 20°    | 2682.1 | 2628.6 | 2495.4 | 2428.9 | 2370.1 |
| 22.5°  | 2612.8 | 2551.4 | 2396.7 | 2306.1 | 2266.3 |
| 25°    | 2543.5 | 2458.1 | 2282.1 | 2172.9 | 2132.8 |
| 27.5°  | 2460.9 | 2370.1 | 2175.5 | 2050.2 | 1988.8 |
| 30°    | 2372.9 | 2271.4 | 2058.1 | 1922.3 | 1850.2 |
| 32.5°  | 2287.5 | 2164.7 | 1946.3 | 1786.3 | 1719.5 |
| 35°    | 2191.6 | 2055.6 | 1821.0 | 1653.1 | 1594.2 |
| 37.5°  | 2098.2 | 1951.5 | 1703.7 | 1519.5 | 1453.1 |
| 40°    | 1999.6 | 1839.7 | 1580.9 | 1391.7 | 1322.4 |
| 42.5°  | 1898.3 | 1727.7 | 1458.4 | 1261.0 | 1194.5 |
| 45°    | 1791.7 | 1612.9 | 1333.1 | 1143.6 | 1079.7 |
| 47.5°  | 1690.4 | 1501.2 | 1213.2 | 1023.7 | 965.1  |
| 50°    | 1578.4 | 1389.1 | 1095.8 | 911.7  | 855.9  |
| 52.5°  | 1468.9 | 1268.9 | 983.8  | 807.8  | 757.2  |
| 55°    | 1362.2 | 1154.3 | 866.4  | 706.6  | 655.9  |
| 57.5°  | 1253.1 | 1039.8 | 762.6  | 613.2  | 570.6  |
| 60°    | 1141.0 | 927.7  | 653.2  | 517.3  | 474.6  |
| 62.5°  | 1031.9 | 818.6  | 559.8  | 432.0  | 410.7  |
| 65°    | 919.8  | 703.8  | 463.9  | 373.3  | 365.2  |
| 67.5°  | 813.2  | 597.1  | 373.3  | 327.8  | 319.9  |
| 70°    | 701.2  | 493.3  | 309.2  | 282.6  | 271.8  |
| 72.5°  | 594.6  | 397.1  | 258.5  | 237.3  | 232.0  |
| 75°    | 490.5  | 303.8  | 213.3  | 194.6  | 192.1  |
| 77.5°  | 386.7  | 215.8  | 168.0  | 157.3  | 151.9  |
| 80°    | 290.5  | 154.8  | 127.8  | 117.4  | 117.4  |
| 82.5°  | 202.5  | 104.1  | 88.0   | 82.6   | 82.6   |
| 85°    | 114.5  | 58.5   | 50.6   | 50.6   | 50.6   |
| 87.5°  | 42.7   | 21.2   | 21.2   | 18.7   | 18.7   |
| 90°    | 1.1    | 13.9   | 23.1   | 29.1   | 31.3   |
| 92.5°  | 29.1   | 24.4   | 27.8   | 30.2   | 31.3   |
| 95°    | 75.4   | 37.1   | 45.2   | 51.2   | 49.9   |
| 97.5°  | 135.7  | 40.6   | 59.1   | 62.7   | 63.8   |
| 100°   | 205.4  | 46.4   | 66.1   | 75.4   | 77.7   |
| 102.5° | 282.0  | 279.7  | 68.5   | 81.2   | 84.7   |
| 105°   | 352.8  | 387.6  | 70.8   | 83.5   | 88.2   |
| 107.5° | 435.2  | 464.1  | 73.2   | 85.9   | 90.5   |
| 110°   | 514.2  | 538.4  | 203.1  | 87.1   | 91.6   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 588.4  | 609.2  | 589.5  | 89.3   | 92.9   |
| 115°   | 667.3  | 687.0  | 716.0  | 178.8  | 95.2   |
| 117.5° | 735.7  | 758.9  | 778.7  | 612.7  | 308.6  |
| 120°   | 812.4  | 829.7  | 850.7  | 864.5  | 707.9  |
| 122.5° | 877.2  | 895.8  | 919.1  | 926.0  | 927.3  |
| 125°   | 943.4  | 958.6  | 980.6  | 988.7  | 992.1  |
| 127.5° | 1003.8 | 1020.0 | 1037.5 | 1049.1 | 1050.2 |
| 130°   | 1060.6 | 1079.3 | 1091.9 | 1104.8 | 1103.7 |
| 132.5° | 1118.7 | 1133.8 | 1146.5 | 1157.0 | 1155.8 |
| 135°   | 1167.5 | 1186.1 | 1196.4 | 1208.1 | 1205.7 |
| 137.5° | 1218.4 | 1232.4 | 1244.1 | 1255.6 | 1252.2 |
| 140°   | 1268.3 | 1277.7 | 1290.4 | 1300.9 | 1295.1 |
| 142.5° | 1310.2 | 1318.4 | 1333.4 | 1342.6 | 1336.8 |
| 145°   | 1354.3 | 1353.1 | 1372.8 | 1380.9 | 1375.1 |
| 147.5° | 1392.5 | 1389.0 | 1408.7 | 1414.5 | 1410.0 |
| 150°   | 1429.7 | 1421.6 | 1440.2 | 1447.1 | 1441.3 |
| 152.5° | 1461.0 | 1451.7 | 1469.1 | 1476.1 | 1468.0 |
| 155°   | 1491.2 | 1480.8 | 1494.7 | 1501.6 | 1492.4 |
| 157.5° | 1515.6 | 1506.3 | 1516.8 | 1524.9 | 1515.6 |
| 160°   | 1536.5 | 1529.4 | 1536.5 | 1543.4 | 1535.3 |
| 162.5° | 1554.9 | 1548.0 | 1553.8 | 1562.0 | 1551.5 |
| 165°   | 1571.2 | 1564.4 | 1567.8 | 1575.9 | 1567.8 |
| 167.5° | 1584.0 | 1577.0 | 1580.6 | 1588.8 | 1578.2 |
| 170°   | 1594.5 | 1587.5 | 1589.9 | 1597.9 | 1587.5 |
| 172.5° | 1601.4 | 1594.5 | 1596.8 | 1605.0 | 1594.5 |
| 175°   | 1607.2 | 1599.0 | 1601.4 | 1609.5 | 1597.9 |
| 177.5° | 1609.5 | 1601.4 | 1602.6 | 1610.8 | 1600.3 |
| 180°   | 1603.7 | 1603.7 | 1603.7 | 1603.7 | 1603.7 |

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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 | 10.44            | 11.33 | 11.35 | 12.25 | 13.43 | 6.42           | 7.30  | 7.32  | 8.22  | 9.40  |
|                 | 3H   | 12.13            | 12.92 | 13.05 | 13.85 | 15.05 | 7.61           | 8.40  | 8.53  | 9.33  | 10.54 |
|                 | 4H   | 12.74            | 13.48 | 13.67 | 14.42 | 15.64 | 8.06           | 8.81  | 9.00  | 9.75  | 10.96 |
|                 | 6H   | 13.16            | 13.85 | 14.11 | 14.79 | 16.02 | 8.39           | 9.08  | 9.34  | 10.02 | 11.25 |
|                 | 8H   | 13.29            | 13.94 | 14.24 | 14.90 | 16.13 | 8.48           | 9.14  | 9.44  | 10.10 | 11.32 |
|                 | 12H  | 13.35            | 13.98 | 14.31 | 14.93 | 16.18 | 8.53           | 9.15  | 9.49  | 10.10 | 11.36 |
| 4H              | 2H   | 10.47            | 11.22 | 11.41 | 12.15 | 13.37 | 7.02           | 7.77  | 7.96  | 8.70  | 9.92  |
|                 | 3H   | 12.30            | 12.92 | 13.25 | 13.89 | 15.12 | 8.38           | 9.00  | 9.33  | 9.96  | 11.19 |
|                 | 4H   | 13.00            | 13.56 | 13.96 | 14.53 | 15.78 | 8.93           | 9.49  | 9.89  | 10.45 | 11.71 |
|                 | 6H   | 13.52            | 14.00 | 14.49 | 14.99 | 16.24 | 9.35           | 9.84  | 10.32 | 10.82 | 12.08 |
|                 | 8H   | 13.69            | 14.15 | 14.67 | 15.13 | 16.40 | 9.48           | 9.94  | 10.46 | 10.92 | 12.18 |
|                 | 12H  | 13.79            | 14.20 | 14.79 | 15.20 | 16.47 | 9.55           | 9.96  | 10.54 | 10.96 | 12.23 |
| 8H              | 4H   | 12.97            | 13.43 | 13.95 | 14.40 | 15.67 | 9.21           | 9.67  | 10.19 | 10.65 | 11.91 |
|                 | 6H   | 13.54            | 13.92 | 14.54 | 14.94 | 16.20 | 9.73           | 10.11 | 10.73 | 11.13 | 12.40 |
|                 | 8H   | 13.76            | 14.09 | 14.77 | 15.10 | 16.38 | 9.93           | 10.26 | 10.94 | 11.27 | 12.55 |
|                 | 12H  | 13.90            | 14.19 | 14.91 | 15.19 | 16.52 | 10.05          | 10.34 | 11.06 | 11.34 | 12.67 |
| 12H             | 4H   | 12.93            | 13.33 | 13.92 | 14.33 | 15.60 | 9.22           | 9.63  | 10.21 | 10.62 | 11.90 |
|                 | 6H   | 13.52            | 13.85 | 14.52 | 14.86 | 16.14 | 9.78           | 10.12 | 10.79 | 11.12 | 12.41 |
|                 | 8H   | 13.74            | 14.03 | 14.75 | 15.03 | 16.36 | 10.00          | 10.29 | 11.01 | 11.29 | 12.62 |