

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: P922138

Luminaire Tested: DFN2DIP-PN3F0-060D050US940-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922138  
REPORT IS A COMBINATION OF REPORTS P899546 AND P896399  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-060D050US940-RLLFLL  
Description: 3 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

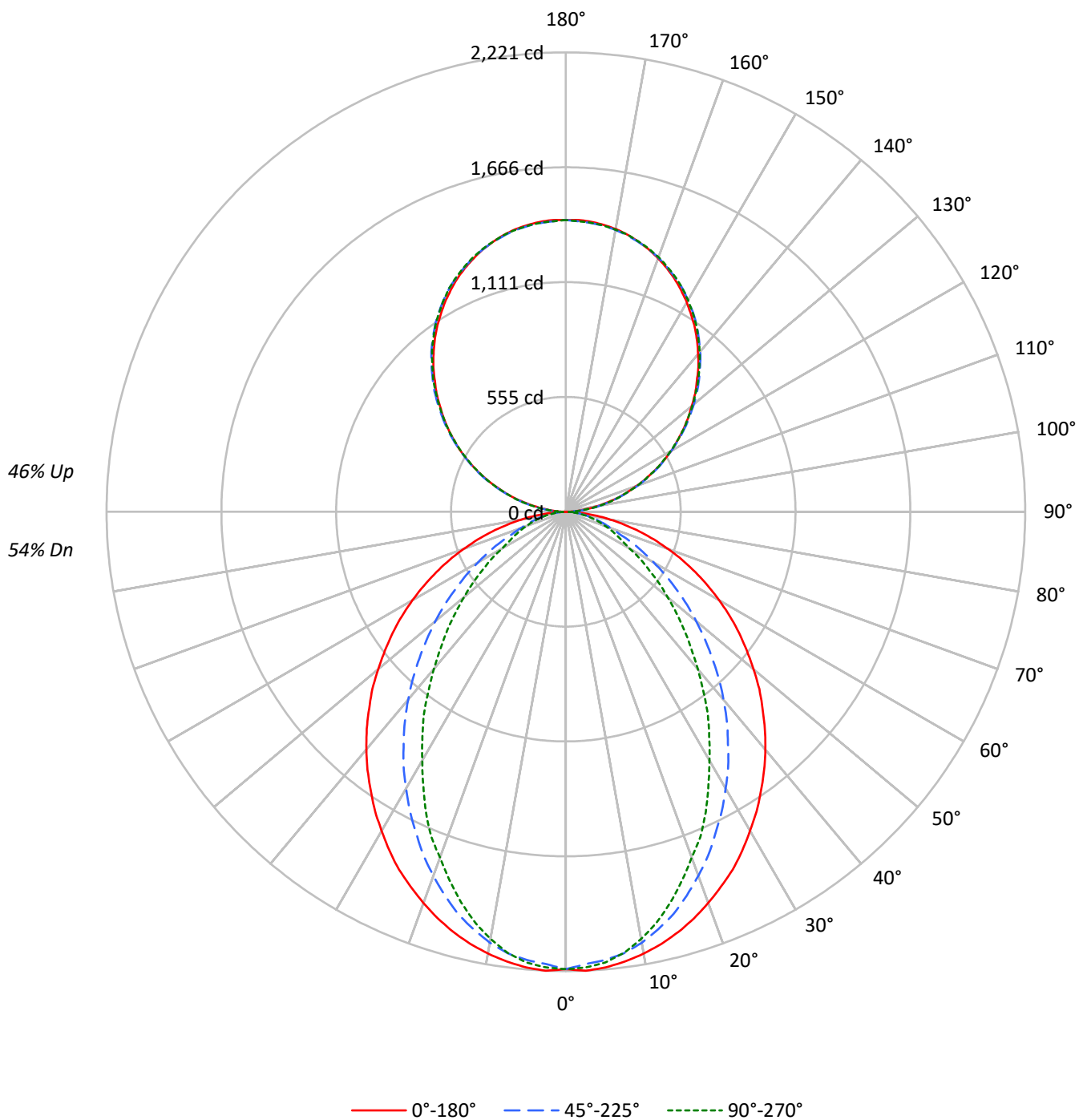
Lumens per Lamp: N/A  
Luminaire Lumens: 8493.6 lumens  
Efficiency: N/A  
Efficacy: 89.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 94.7  
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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 72 | 72 | 72 | 59 | 59 | 59 |
| 1   | 99  | 95  | 91  | 88  | 92  | 88  | 85  | 82  | 76 | 73 | 71 | 64 | 62 | 61 | 53 | 52 | 51 |
| 2   | 91  | 84  | 78  | 73  | 84  | 78  | 73  | 68  | 67 | 63 | 60 | 57 | 54 | 52 | 48 | 46 | 44 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 59 | 55 | 51 | 51 | 47 | 44 | 43 | 40 | 38 |
| 4   | 76  | 66  | 58  | 52  | 71  | 61  | 55  | 49  | 53 | 48 | 44 | 46 | 42 | 38 | 38 | 36 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 42 | 38 | 41 | 37 | 34 | 35 | 32 | 29 |
| 6   | 65  | 53  | 45  | 39  | 60  | 50  | 43  | 37  | 43 | 38 | 34 | 37 | 33 | 30 | 32 | 29 | 26 |
| 7   | 60  | 48  | 40  | 35  | 56  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 30 | 27 | 29 | 26 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 30  | 36 | 31 | 27 | 31 | 27 | 24 | 27 | 24 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 27  | 33 | 28 | 24 | 29 | 25 | 22 | 25 | 22 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 31 | 25 | 22 | 27 | 23 | 20 | 23 | 20 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2585 | 2585 | 2585 |
| 5°  | 2588 | 2542 | 2559 |
| 10° | 2560 | 2490 | 2475 |
| 15° | 2524 | 2406 | 2345 |
| 20° | 2475 | 2291 | 2186 |
| 25° | 2426 | 2162 | 2033 |
| 30° | 2360 | 2031 | 1839 |
| 35° | 2296 | 1889 | 1668 |
| 40° | 2230 | 1743 | 1473 |
| 45° | 2154 | 1581 | 1296 |
| 50° | 2075 | 1417 | 1123 |
| 55° | 1992 | 1243 | 957  |
| 60° | 1897 | 1061 | 787  |
| 65° | 1787 | 876  | 707  |
| 70° | 1653 | 703  | 638  |
| 75° | 1485 | 616  | 578  |
| 80° | 1241 | 511  | 498  |
| 85° | 844  | 332  | 368  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2154 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 207.2  | 2.4       |
| 10°-20°   | 568.9  | 6.7       |
| 20°-30°   | 798.7  | 9.4       |
| 30°-40°   | 870.7  | 10.3      |
| 40°-50°   | 800.3  | 9.4       |
| 50°-60°   | 628.5  | 7.4       |
| 60°-70°   | 409.1  | 4.8       |
| 70°-80°   | 210.6  | 2.5       |
| 80°-90°   | 57.8   | 0.7       |
| 90°-100°  | 87.3   | 1.0       |
| 100°-110° | 277.2  | 3.3       |
| 110°-120° | 474.5  | 5.6       |
| 120°-130° | 624.0  | 7.3       |
| 130°-140° | 700.4  | 8.2       |
| 140°-150° | 686.8  | 8.1       |
| 150°-160° | 576.1  | 6.8       |
| 160°-170° | 382.1  | 4.5       |
| 170°-180° | 133.5  | 1.6       |
| 0°-30°    | 1574.9 | 18.5      |
| 0°-40°    | 2445.6 | 28.8      |
| 0°-60°    | 3874.3 | 45.6      |
| 0°-90°    | 4551.7 | 53.6      |
| 90°-120°  | 838.9  | 9.9       |
| 90°-150°  | 2850.1 | 33.6      |
| 90°-180°  | 3942.0 | 46.4      |
| 0°-180°   | 8493.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2211 | 2211  | 2211 | 2211  | 2211 |      |
| 5°   | 2211 | 2201  | 2175 | 2193  | 2187 | 210  |
| 15°  | 2103 | 2081  | 2013 | 1975  | 1955 | 593  |
| 25°  | 1909 | 1845  | 1713 | 1631  | 1601 | 878  |
| 35°  | 1645 | 1543  | 1367 | 1241  | 1197 | 1030 |
| 45°  | 1345 | 1211  | 1001 | 858   | 810  | 1039 |
| 55°  | 1022 | 866   | 650  | 530   | 492  | 914  |
| 65°  | 690  | 528   | 348  | 280   | 274  | 685  |
| 75°  | 368  | 228   | 160  | 146   | 144  | 389  |
| 85°  | 86   | 44    | 38   | 38    | 38   | 99   |
| 90°  | 1    | 15    | 42   | 39    | 40   | 8    |
| 95°  | 62   | 74    | 76   | 76    | 74   | 69   |
| 105° | 256  | 259   | 262  | 264   | 264  | 270  |
| 115° | 476  | 483   | 481  | 480   | 476  | 471  |
| 125° | 692  | 703   | 700  | 696   | 695  | 619  |
| 135° | 896  | 909   | 911  | 910   | 907  | 692  |
| 145° | 1087 | 1096  | 1103 | 1104  | 1099 | 679  |
| 155° | 1243 | 1247  | 1251 | 1257  | 1253 | 572  |
| 165° | 1353 | 1351  | 1351 | 1360  | 1354 | 382  |
| 175° | 1408 | 1404  | 1402 | 1410  | 1403 | 134  |
| 180° | 1410 | 1410  | 1410 | 1410  | 1410 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2211.3 | 2211.3 | 2211.3 | 2211.3 | 2211.3 |
| 2.5°   | 2221.3 | 2211.3 | 2189.1 | 2209.3 | 2205.3 |
| 5°     | 2211.3 | 2201.3 | 2175.1 | 2193.3 | 2187.3 |
| 7.5°   | 2193.3 | 2181.3 | 2153.3 | 2161.1 | 2151.2 |
| 10°    | 2169.2 | 2155.2 | 2115.3 | 2109.2 | 2097.2 |
| 12.5°  | 2139.3 | 2121.2 | 2067.1 | 2055.2 | 2033.1 |
| 15°    | 2103.2 | 2081.1 | 2013.1 | 1975.1 | 1955.2 |
| 17.5°  | 2061.2 | 2029.1 | 1945.0 | 1901.0 | 1869.0 |
| 20°    | 2013.1 | 1973.0 | 1873.0 | 1823.1 | 1779.0 |
| 22.5°  | 1961.1 | 1915.0 | 1798.9 | 1731.0 | 1701.0 |
| 25°    | 1909.2 | 1845.0 | 1713.0 | 1631.0 | 1600.9 |
| 27.5°  | 1847.2 | 1779.0 | 1632.9 | 1538.8 | 1492.8 |
| 30°    | 1781.1 | 1704.9 | 1544.8 | 1442.9 | 1388.7 |
| 32.5°  | 1717.0 | 1624.9 | 1461.0 | 1340.8 | 1290.7 |
| 35°    | 1645.0 | 1542.9 | 1366.9 | 1240.7 | 1196.6 |
| 37.5°  | 1574.9 | 1464.7 | 1278.8 | 1140.6 | 1090.7 |
| 40°    | 1500.8 | 1380.9 | 1186.6 | 1044.5 | 992.6  |
| 42.5°  | 1424.9 | 1296.8 | 1094.7 | 946.5  | 896.6  |
| 45°    | 1344.8 | 1210.6 | 1000.7 | 858.4  | 810.4  |
| 47.5°  | 1268.8 | 1126.8 | 910.6  | 768.4  | 724.4  |
| 50°    | 1184.7 | 1042.7 | 822.5  | 684.3  | 642.5  |
| 52.5°  | 1102.5 | 952.4  | 738.4  | 606.4  | 568.4  |
| 55°    | 1022.5 | 866.5  | 650.3  | 530.4  | 492.3  |
| 57.5°  | 940.6  | 780.4  | 572.4  | 460.3  | 428.2  |
| 60°    | 856.5  | 696.4  | 490.3  | 388.3  | 356.2  |
| 62.5°  | 774.5  | 614.5  | 420.2  | 324.2  | 308.3  |
| 65°    | 690.5  | 528.2  | 348.2  | 280.3  | 274.1  |
| 67.5°  | 610.4  | 448.2  | 280.3  | 246.1  | 240.1  |
| 70°    | 526.3  | 370.2  | 232.0  | 212.1  | 204.0  |
| 72.5°  | 446.3  | 298.1  | 194.0  | 178.2  | 174.1  |
| 75°    | 368.2  | 228.0  | 160.1  | 146.1  | 144.2  |
| 77.5°  | 290.3  | 162.0  | 126.1  | 118.1  | 114.0  |
| 80°    | 218.0  | 116.1  | 95.9   | 88.1   | 88.1   |
| 82.5°  | 152.0  | 78.1   | 66.0   | 62.0   | 62.0   |
| 85°    | 86.0   | 44.0   | 38.0   | 38.0   | 38.0   |
| 87.5°  | 32.1   | 16.0   | 16.0   | 14.0   | 14.0   |
| 90°    | 1.2    | 15.3   | 41.6   | 39.1   | 40.4   |
| 92.5°  | 26.4   | 35.7   | 37.0   | 38.3   | 38.3   |
| 95°    | 62.1   | 74.0   | 76.1   | 76.1   | 74.0   |
| 97.5°  | 103.3  | 114.3  | 119.0  | 119.0  | 119.0  |
| 100°   | 150.9  | 160.7  | 164.1  | 164.1  | 162.8  |
| 102.5° | 201.1  | 208.3  | 212.9  | 214.3  | 212.9  |
| 105°   | 255.9  | 259.3  | 261.9  | 263.9  | 263.9  |
| 107.5° | 310.3  | 315.4  | 315.4  | 316.3  | 310.3  |
| 110°   | 363.0  | 369.9  | 369.9  | 369.9  | 366.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 420.0  | 427.2  | 426.0  | 422.6  | 420.0  |
| 115°   | 476.1  | 483.0  | 480.8  | 479.6  | 476.1  |
| 117.5° | 531.8  | 541.2  | 535.2  | 531.8  | 528.4  |
| 120°   | 587.9  | 597.3  | 587.9  | 587.9  | 584.1  |
| 122.5° | 638.9  | 650.9  | 644.9  | 641.5  | 638.9  |
| 125°   | 692.5  | 703.1  | 699.7  | 695.9  | 694.6  |
| 127.5° | 744.8  | 758.0  | 753.3  | 748.1  | 744.8  |
| 130°   | 793.7  | 809.0  | 806.8  | 804.3  | 799.6  |
| 132.5° | 848.6  | 860.4  | 861.3  | 855.3  | 851.9  |
| 135°   | 895.7  | 908.8  | 911.4  | 910.2  | 906.8  |
| 137.5° | 948.4  | 959.0  | 961.2  | 960.3  | 955.2  |
| 140°   | 994.7  | 1005.4 | 1011.3 | 1011.3 | 1006.7 |
| 142.5° | 1042.3 | 1053.0 | 1056.4 | 1057.7 | 1053.0 |
| 145°   | 1087.4 | 1095.9 | 1102.7 | 1104.0 | 1099.3 |
| 147.5° | 1127.8 | 1138.4 | 1143.5 | 1145.7 | 1140.9 |
| 150°   | 1169.5 | 1176.7 | 1181.3 | 1185.2 | 1181.3 |
| 152.5° | 1206.5 | 1213.7 | 1219.6 | 1224.3 | 1219.6 |
| 155°   | 1243.4 | 1246.8 | 1250.6 | 1256.6 | 1252.8 |
| 157.5° | 1275.3 | 1277.8 | 1280.0 | 1288.5 | 1282.5 |
| 160°   | 1303.8 | 1306.4 | 1307.6 | 1314.8 | 1309.7 |
| 162.5° | 1330.2 | 1330.2 | 1331.4 | 1339.5 | 1333.6 |
| 165°   | 1352.7 | 1351.4 | 1351.4 | 1359.9 | 1354.0 |
| 167.5° | 1373.1 | 1369.2 | 1369.2 | 1377.8 | 1371.8 |
| 170°   | 1388.4 | 1385.0 | 1383.8 | 1392.2 | 1385.0 |
| 172.5° | 1399.0 | 1395.6 | 1394.4 | 1402.8 | 1395.6 |
| 175°   | 1407.6 | 1404.1 | 1401.6 | 1410.1 | 1402.8 |
| 177.5° | 1412.2 | 1408.8 | 1406.2 | 1413.5 | 1406.2 |
| 180°   | 1410.1 | 1410.1 | 1410.1 | 1410.1 | 1410.1 |

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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 | 10.74            | 11.60 | 11.67 | 12.54 | 13.76 | 6.70           | 7.56  | 7.63  | 8.51  | 9.73  |
|                 | 3H   | 12.41            | 13.18 | 13.35 | 14.13 | 15.38 | 7.89           | 8.66  | 8.83  | 9.61  | 10.86 |
|                 | 4H   | 13.02            | 13.74 | 13.97 | 14.70 | 15.96 | 8.33           | 9.06  | 9.29  | 10.02 | 11.28 |
|                 | 6H   | 13.43            | 14.10 | 14.40 | 15.07 | 16.33 | 8.65           | 9.32  | 9.62  | 10.29 | 11.55 |
|                 | 8H   | 13.56            | 14.19 | 14.53 | 15.18 | 16.44 | 8.74           | 9.38  | 9.72  | 10.36 | 11.62 |
|                 | 12H  | 13.62            | 14.22 | 14.60 | 15.20 | 16.49 | 8.78           | 9.39  | 9.76  | 10.36 | 11.65 |
| 4H              | 2H   | 10.76            | 11.48 | 11.72 | 12.44 | 13.70 | 7.30           | 8.02  | 8.26  | 8.98  | 10.24 |
|                 | 3H   | 12.58            | 13.18 | 13.55 | 14.17 | 15.44 | 8.64           | 9.25  | 9.62  | 10.24 | 11.51 |
|                 | 4H   | 13.27            | 13.82 | 14.25 | 14.80 | 16.10 | 9.19           | 9.74  | 10.17 | 10.72 | 12.01 |
|                 | 6H   | 13.78            | 14.25 | 14.78 | 15.26 | 16.55 | 9.60           | 10.08 | 10.60 | 11.08 | 12.37 |
|                 | 8H   | 13.95            | 14.40 | 14.95 | 15.39 | 16.70 | 9.73           | 10.17 | 10.72 | 11.17 | 12.48 |
|                 | 12H  | 14.05            | 14.44 | 15.06 | 15.46 | 16.77 | 9.79           | 10.19 | 10.81 | 11.21 | 12.52 |
| 8H              | 4H   | 13.24            | 13.68 | 14.23 | 14.68 | 15.98 | 9.47           | 9.91  | 10.46 | 10.91 | 12.21 |
|                 | 6H   | 13.80            | 14.16 | 14.82 | 15.21 | 16.51 | 9.98           | 10.34 | 11.00 | 11.38 | 12.69 |
|                 | 8H   | 14.01            | 14.33 | 15.04 | 15.36 | 16.68 | 10.16          | 10.49 | 11.19 | 11.51 | 12.84 |
|                 | 12H  | 14.15            | 14.43 | 15.18 | 15.45 | 16.82 | 10.28          | 10.56 | 11.31 | 11.59 | 12.95 |
| 12H             | 4H   | 13.19            | 13.59 | 14.21 | 14.61 | 15.92 | 9.47           | 9.87  | 10.49 | 10.89 | 12.20 |
|                 | 6H   | 13.77            | 14.10 | 14.80 | 15.12 | 16.45 | 10.03          | 10.35 | 11.05 | 11.38 | 12.70 |
|                 | 8H   | 13.99            | 14.27 | 15.02 | 15.30 | 16.66 | 10.23          | 10.52 | 11.26 | 11.54 | 12.90 |