

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: P906236

Luminaire Tested: DFN2DIP-SQ2F0-040D070US835-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906236  
REPORT IS A COMBINATION OF REPORTS P899821 AND P896659  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-040D070US835-FLLFL  
Description: 2 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

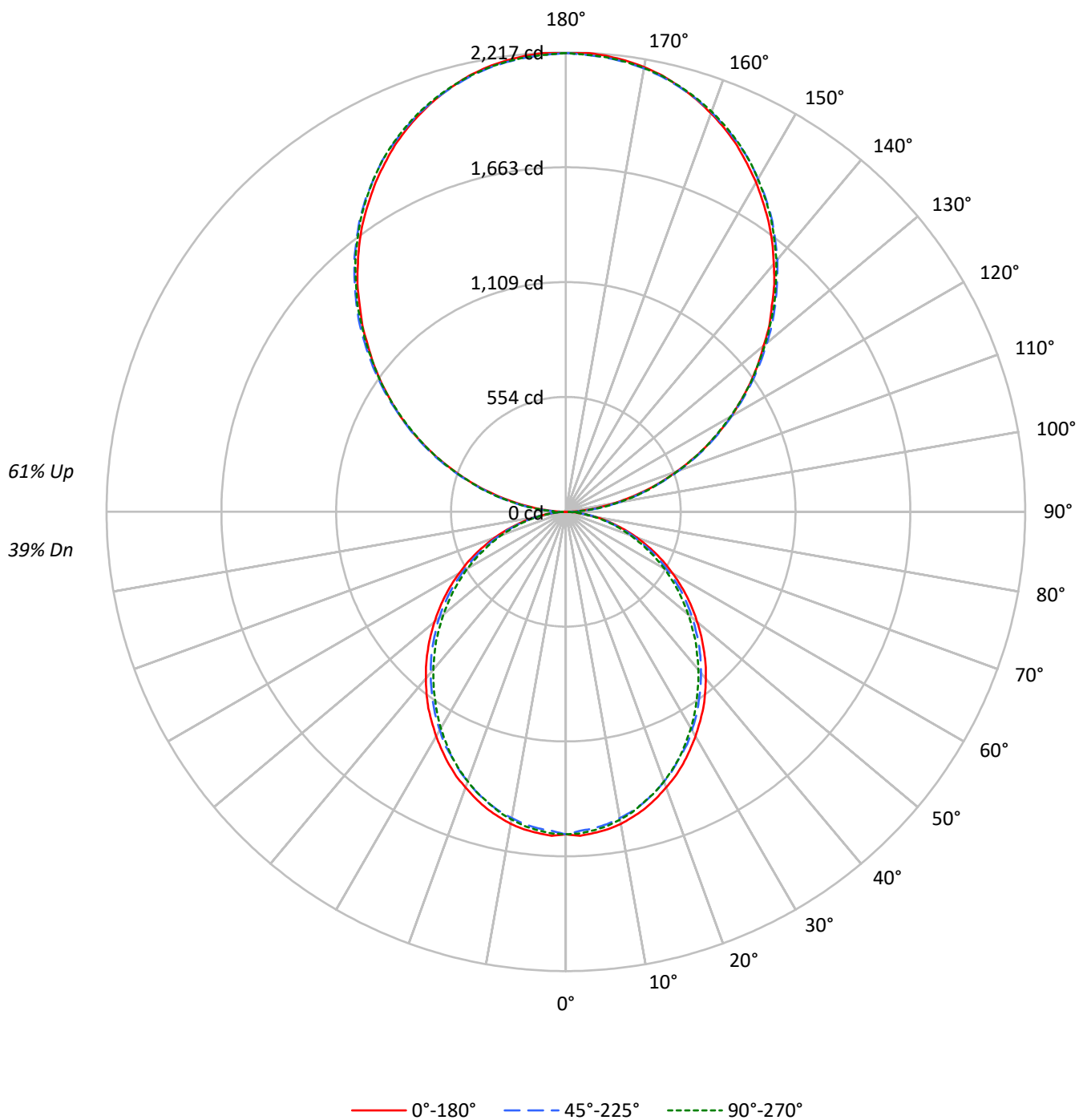
Lumens per Lamp: N/A  
Luminaire Lumens: 10155.0 lumens  
Efficiency: N/A  
Efficacy: 115.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 88.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
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   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 46 | 46 | 46 |
| 1   | 95  | 91  | 87  | 84  | 86 | 83 | 80 | 77 | 68 | 65 | 63 | 54 | 52 | 51 | 41 | 40 | 39 |
| 2   | 87  | 79  | 73  | 68  | 79 | 72 | 67 | 63 | 59 | 56 | 52 | 47 | 45 | 42 | 36 | 34 | 33 |
| 3   | 79  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 52 | 48 | 44 | 42 | 38 | 36 | 32 | 30 | 28 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 50 | 44 | 46 | 41 | 37 | 37 | 33 | 31 | 28 | 26 | 24 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 27 | 26 | 23 | 21 |
| 6   | 61  | 49  | 41  | 36  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 30 | 26 | 23 | 23 | 20 | 18 |
| 7   | 56  | 44  | 37  | 31  | 51 | 41 | 34 | 29 | 34 | 28 | 25 | 27 | 23 | 20 | 21 | 18 | 16 |
| 8   | 52  | 40  | 33  | 27  | 47 | 37 | 30 | 26 | 31 | 26 | 22 | 25 | 21 | 18 | 19 | 17 | 15 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 13 |
| 10  | 45  | 34  | 26  | 22  | 41 | 31 | 25 | 20 | 26 | 21 | 18 | 21 | 17 | 15 | 17 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3422 | 3422 | 3422 |
| 5°  | 3422 | 3367 | 3393 |
| 10° | 3388 | 3315 | 3342 |
| 15° | 3332 | 3252 | 3265 |
| 20° | 3259 | 3169 | 3187 |
| 25° | 3186 | 3071 | 3098 |
| 30° | 3096 | 2980 | 2985 |
| 35° | 3010 | 2873 | 2866 |
| 40° | 2906 | 2764 | 2753 |
| 45° | 2801 | 2655 | 2636 |
| 50° | 2686 | 2540 | 2502 |
| 55° | 2566 | 2408 | 2377 |
| 60° | 2429 | 2252 | 2234 |
| 65° | 2279 | 2089 | 2066 |
| 70° | 2089 | 1891 | 1883 |
| 75° | 1828 | 1652 | 1708 |
| 80° | 1509 | 1349 | 1388 |
| 85° | 1020 | 851  | 872  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3084 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 146.5   | 1.4       |
| 10°-20°   | 412.2   | 4.1       |
| 20°-30°   | 605.7   | 6.0       |
| 30°-40°   | 703.5   | 6.9       |
| 40°-50°   | 702.6   | 6.9       |
| 50°-60°   | 612.7   | 6.0       |
| 60°-70°   | 452.9   | 4.5       |
| 70°-80°   | 256.2   | 2.5       |
| 80°-90°   | 73.9    | 0.7       |
| 90°-100°  | 137.0   | 1.3       |
| 100°-110° | 435.3   | 4.3       |
| 110°-120° | 744.9   | 7.3       |
| 120°-130° | 979.6   | 9.6       |
| 130°-140° | 1099.6  | 10.8      |
| 140°-150° | 1078.3  | 10.6      |
| 150°-160° | 904.5   | 8.9       |
| 160°-170° | 599.9   | 5.9       |
| 170°-180° | 209.7   | 2.1       |
| 0°-30°    | 1164.4  | 11.5      |
| 0°-40°    | 1867.9  | 18.4      |
| 0°-60°    | 3183.2  | 31.3      |
| 0°-90°    | 3966.3  | 39.1      |
| 90°-120°  | 1317.2  | 13.0      |
| 90°-150°  | 4474.7  | 44.1      |
| 90°-180°  | 6189.0  | 60.9      |
| 0°-180°   | 10155.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1556 | 1556  | 1556 | 1556  | 1556 |      |
| 5°   | 1556 | 1550  | 1534 | 1546  | 1543 | 148  |
| 15°  | 1482 | 1473  | 1453 | 1459  | 1452 | 417  |
| 25°  | 1341 | 1329  | 1304 | 1306  | 1304 | 617  |
| 35°  | 1157 | 1142  | 1118 | 1109  | 1102 | 722  |
| 45°  | 941  | 931   | 908  | 892   | 886  | 727  |
| 55°  | 712  | 703   | 686  | 668   | 660  | 637  |
| 65°  | 480  | 471   | 456  | 443   | 436  | 475  |
| 75°  | 251  | 248   | 241  | 232   | 235  | 268  |
| 85°  | 61   | 60    | 58   | 54    | 52   | 68   |
| 90°  | 2    | 24    | 65   | 61    | 63   | 10   |
| 95°  | 97   | 116   | 120  | 120   | 116  | 108  |
| 105° | 402  | 407   | 411  | 414   | 414  | 424  |
| 115° | 748  | 758   | 755  | 753   | 748  | 739  |
| 125° | 1087 | 1104  | 1099 | 1093  | 1091 | 972  |
| 135° | 1406 | 1427  | 1431 | 1429  | 1424 | 1087 |
| 145° | 1707 | 1721  | 1731 | 1733  | 1726 | 1067 |
| 155° | 1952 | 1958  | 1964 | 1973  | 1967 | 899  |
| 165° | 2124 | 2122  | 2122 | 2135  | 2126 | 599  |
| 175° | 2210 | 2204  | 2200 | 2214  | 2202 | 210  |
| 180° | 2214 | 2214  | 2214 | 2214  | 2214 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1556.4 | 1556.4 | 1556.4 | 1556.4 | 1556.4 |
| 2.5°   | 1565.5 | 1558.0 | 1541.5 | 1556.4 | 1553.6 |
| 5°     | 1556.4 | 1550.5 | 1534.0 | 1545.9 | 1543.1 |
| 7.5°   | 1545.9 | 1537.0 | 1520.5 | 1532.6 | 1529.6 |
| 10°    | 1529.6 | 1519.1 | 1501.2 | 1513.1 | 1508.6 |
| 12.5°  | 1507.0 | 1498.1 | 1480.2 | 1487.7 | 1484.6 |
| 15°    | 1481.6 | 1472.7 | 1453.2 | 1459.2 | 1451.8 |
| 17.5°  | 1450.2 | 1441.3 | 1421.8 | 1429.2 | 1421.8 |
| 20°    | 1415.7 | 1406.8 | 1385.9 | 1390.3 | 1384.5 |
| 22.5°  | 1381.4 | 1367.9 | 1348.4 | 1348.4 | 1345.4 |
| 25°    | 1340.9 | 1329.0 | 1303.6 | 1306.5 | 1303.6 |
| 27.5°  | 1296.0 | 1285.5 | 1266.2 | 1261.7 | 1254.3 |
| 30°    | 1251.2 | 1239.2 | 1216.8 | 1212.3 | 1206.3 |
| 32.5°  | 1203.3 | 1194.4 | 1170.4 | 1161.4 | 1155.3 |
| 35°    | 1156.9 | 1142.0 | 1118.0 | 1109.0 | 1101.5 |
| 37.5°  | 1104.5 | 1091.0 | 1067.0 | 1056.6 | 1049.1 |
| 40°    | 1050.7 | 1038.6 | 1014.6 | 1001.3 | 995.3  |
| 42.5°  | 998.3  | 986.2  | 962.4  | 947.3  | 938.4  |
| 45°    | 941.4  | 931.0  | 908.4  | 892.1  | 886.0  |
| 47.5°  | 886.0  | 875.5  | 851.6  | 835.1  | 826.2  |
| 50°    | 827.6  | 820.1  | 799.2  | 778.2  | 770.7  |
| 52.5°  | 770.7  | 760.3  | 740.9  | 724.4  | 713.9  |
| 55°    | 712.5  | 703.4  | 685.5  | 667.5  | 660.1  |
| 57.5°  | 654.0  | 646.6  | 627.0  | 609.1  | 603.1  |
| 60°    | 595.6  | 589.7  | 568.8  | 552.3  | 547.8  |
| 62.5°  | 538.8  | 528.3  | 513.4  | 498.4  | 492.4  |
| 65°    | 480.5  | 471.4  | 456.5  | 443.0  | 435.6  |
| 67.5°  | 420.6  | 413.0  | 399.7  | 389.2  | 383.2  |
| 70°    | 365.2  | 359.2  | 345.7  | 335.2  | 329.3  |
| 72.5°  | 308.4  | 302.3  | 294.9  | 284.4  | 279.9  |
| 75°    | 251.4  | 248.5  | 240.9  | 232.0  | 235.0  |
| 77.5°  | 200.5  | 194.5  | 191.5  | 187.0  | 182.6  |
| 80°    | 149.7  | 148.1  | 145.1  | 140.7  | 137.7  |
| 82.5°  | 101.8  | 101.8  | 100.4  | 94.3   | 94.3   |
| 85°    | 61.3   | 59.9   | 58.4   | 53.8   | 52.4   |
| 87.5°  | 27.0   | 24.0   | 21.0   | 16.5   | 14.9   |
| 90°    | 2.0    | 24.0   | 65.4   | 61.4   | 63.4   |
| 92.5°  | 41.4   | 56.1   | 58.1   | 60.1   | 60.1   |
| 95°    | 97.4   | 116.1  | 119.5  | 119.5  | 116.1  |
| 97.5°  | 162.2  | 179.5  | 186.9  | 186.9  | 186.9  |
| 100°   | 236.9  | 252.3  | 257.6  | 257.6  | 255.6  |
| 102.5° | 315.7  | 327.0  | 334.4  | 336.4  | 334.4  |
| 105°   | 401.8  | 407.1  | 411.1  | 414.5  | 414.5  |
| 107.5° | 487.2  | 495.2  | 495.2  | 496.6  | 487.2  |
| 110°   | 570.0  | 580.7  | 580.7  | 580.7  | 575.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 659.4  | 670.8  | 668.8  | 663.4  | 659.4  |
| 115°   | 747.5  | 758.2  | 754.9  | 752.9  | 747.5  |
| 117.5° | 834.9  | 849.6  | 840.3  | 834.9  | 829.6  |
| 120°   | 923.0  | 937.7  | 923.0  | 923.0  | 917.0  |
| 122.5° | 1003.1 | 1021.8 | 1012.5 | 1007.1 | 1003.1 |
| 125°   | 1087.2 | 1103.9 | 1098.6 | 1092.6 | 1090.6 |
| 127.5° | 1169.3 | 1190.0 | 1182.7 | 1174.7 | 1169.3 |
| 130°   | 1246.1 | 1270.1 | 1266.8 | 1262.8 | 1255.4 |
| 132.5° | 1332.2 | 1350.9 | 1352.2 | 1342.9 | 1337.5 |
| 135°   | 1406.3 | 1426.9 | 1431.0 | 1428.9 | 1423.6 |
| 137.5° | 1489.0 | 1505.7 | 1509.0 | 1507.7 | 1499.7 |
| 140°   | 1561.8 | 1578.5 | 1587.8 | 1587.8 | 1580.5 |
| 142.5° | 1636.5 | 1653.2 | 1658.5 | 1660.5 | 1653.2 |
| 145°   | 1707.3 | 1720.6 | 1731.3 | 1733.3 | 1726.0 |
| 147.5° | 1770.7 | 1787.4 | 1795.4 | 1798.7 | 1791.4 |
| 150°   | 1836.1 | 1847.4 | 1854.8 | 1860.8 | 1854.8 |
| 152.5° | 1894.1 | 1905.5 | 1914.8 | 1922.2 | 1914.8 |
| 155°   | 1952.2 | 1957.5 | 1963.6 | 1972.9 | 1966.9 |
| 157.5° | 2002.3 | 2006.3 | 2009.6 | 2023.0 | 2013.6 |
| 160°   | 2047.0 | 2051.0 | 2053.0 | 2064.3 | 2056.3 |
| 162.5° | 2088.4 | 2088.4 | 2090.4 | 2103.0 | 2093.7 |
| 165°   | 2123.7 | 2121.7 | 2121.7 | 2135.1 | 2125.7 |
| 167.5° | 2155.8 | 2149.8 | 2149.8 | 2163.1 | 2153.8 |
| 170°   | 2179.8 | 2174.5 | 2172.5 | 2185.8 | 2174.5 |
| 172.5° | 2196.5 | 2191.1 | 2189.1 | 2202.5 | 2191.1 |
| 175°   | 2209.8 | 2204.5 | 2200.5 | 2213.8 | 2202.5 |
| 177.5° | 2217.2 | 2211.8 | 2207.8 | 2219.2 | 2207.8 |
| 180°   | 2213.8 | 2213.8 | 2213.8 | 2213.8 | 2213.8 |

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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 | 10.32            | 11.10 | 11.37 | 12.15 | 13.57 | 9.88           | 10.65 | 10.93 | 11.70 | 13.12 |
|                 | 3H   | 11.96            | 12.65 | 13.01 | 13.71 | 15.15 | 11.47          | 12.16 | 12.52 | 13.22 | 14.66 |
|                 | 4H   | 12.53            | 13.18 | 13.60 | 14.25 | 15.69 | 12.04          | 12.69 | 13.10 | 13.75 | 15.20 |
|                 | 6H   | 12.91            | 13.51 | 13.99 | 14.58 | 16.04 | 12.41          | 13.01 | 13.49 | 14.08 | 15.54 |
|                 | 8H   | 13.00            | 13.58 | 14.08 | 14.66 | 16.11 | 12.50          | 13.08 | 13.58 | 14.16 | 15.61 |
|                 | 12H  | 13.04            | 13.59 | 14.13 | 14.66 | 16.14 | 12.53          | 13.08 | 13.62 | 14.15 | 15.63 |
| 4H              | 2H   | 10.76            | 11.42 | 11.84 | 12.48 | 13.93 | 10.41          | 11.06 | 11.48 | 12.12 | 13.57 |
|                 | 3H   | 12.60            | 13.15 | 13.68 | 14.23 | 15.69 | 12.19          | 12.74 | 13.27 | 13.83 | 15.28 |
|                 | 4H   | 13.29            | 13.80 | 14.38 | 14.87 | 16.35 | 12.87          | 13.37 | 13.96 | 14.45 | 15.93 |
|                 | 6H   | 13.78            | 14.22 | 14.88 | 15.32 | 16.79 | 13.35          | 13.78 | 14.45 | 14.89 | 16.36 |
|                 | 8H   | 13.92            | 14.32 | 15.02 | 15.42 | 16.91 | 13.49          | 13.89 | 14.58 | 14.98 | 16.47 |
|                 | 12H  | 13.98            | 14.35 | 15.09 | 15.45 | 16.95 | 13.53          | 13.90 | 14.65 | 15.01 | 16.50 |
| 8H              | 4H   | 13.47            | 13.87 | 14.57 | 14.97 | 16.46 | 13.09          | 13.50 | 14.19 | 14.59 | 16.08 |
|                 | 6H   | 14.07            | 14.41 | 15.19 | 15.54 | 17.03 | 13.69          | 14.02 | 14.81 | 15.16 | 16.64 |
|                 | 8H   | 14.28            | 14.57 | 15.40 | 15.69 | 17.20 | 13.89          | 14.18 | 15.01 | 15.30 | 16.80 |
|                 | 12H  | 14.40            | 14.65 | 15.52 | 15.77 | 17.31 | 13.99          | 14.24 | 15.11 | 15.36 | 16.90 |
| 12H             | 4H   | 13.45            | 13.81 | 14.56 | 14.92 | 16.42 | 13.08          | 13.44 | 14.19 | 14.55 | 16.05 |
|                 | 6H   | 14.10            | 14.39 | 15.22 | 15.51 | 17.01 | 13.73          | 14.02 | 14.85 | 15.14 | 16.64 |
|                 | 8H   | 14.32            | 14.58 | 15.45 | 15.69 | 17.23 | 13.94          | 14.20 | 15.07 | 15.31 | 16.85 |