

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: P904877

Luminaire Tested: DFN2DIP-4P2F0-020D040US835-RLONL

Issue Date: 11/21/2024

**Test Information**

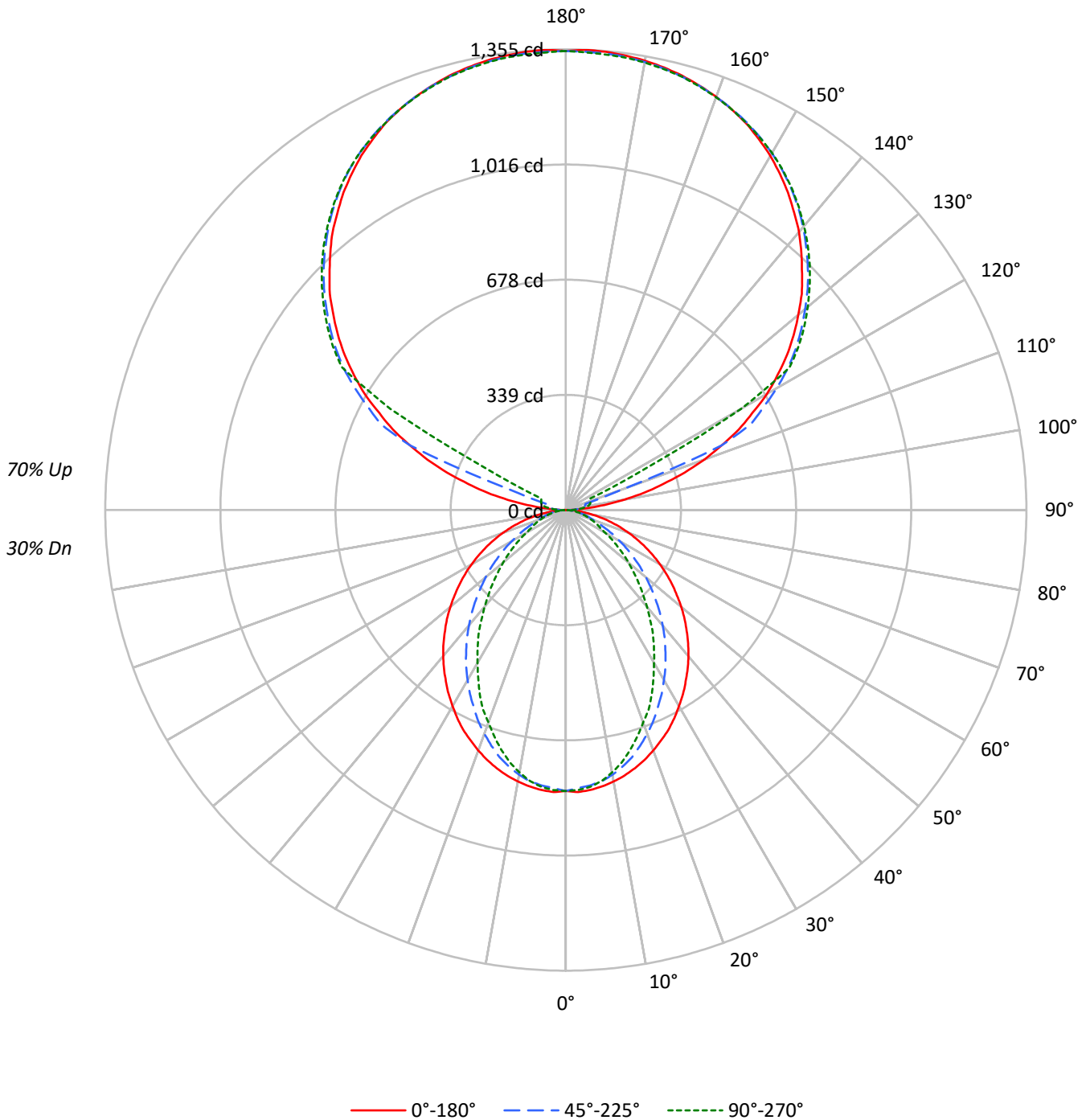
Test Method: LM-79-2019  
Report Number: P904877  
REPORT IS A COMBINATION OF REPORTS P900544 AND P897455  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P2F0-020D040US835-RLLONL  
Description: 2 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 5660.0 lumens  
Efficiency: N/A  
Efficacy: 114.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.07' x L: 2.07' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 49.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
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 |    |    |    | 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   | 102 | 102 | 102 | 102 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 54 | 54 | 54 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 30 |
| 1   | 94  | 90  | 86  | 83  | 84 | 81 | 77 | 75 | 64 | 62 | 60 | 48 | 47 | 46 | 34 | 33 | 32 | 34 | 33 | 32 | 26 |    |
| 2   | 85  | 78  | 73  | 68  | 76 | 71 | 66 | 62 | 56 | 53 | 50 | 43 | 40 | 39 | 30 | 29 | 28 | 30 | 29 | 28 | 22 |    |
| 3   | 78  | 69  | 62  | 57  | 70 | 62 | 57 | 52 | 50 | 46 | 42 | 38 | 35 | 33 | 27 | 25 | 24 | 27 | 25 | 24 | 19 |    |
| 4   | 71  | 61  | 54  | 48  | 64 | 55 | 49 | 44 | 44 | 40 | 36 | 34 | 31 | 28 | 24 | 22 | 21 | 24 | 22 | 21 | 17 |    |
| 5   | 66  | 55  | 47  | 41  | 59 | 49 | 43 | 38 | 40 | 35 | 31 | 30 | 27 | 25 | 22 | 20 | 18 | 22 | 20 | 18 | 15 |    |
| 6   | 60  | 49  | 41  | 36  | 54 | 44 | 38 | 33 | 36 | 31 | 27 | 28 | 24 | 22 | 20 | 18 | 16 | 20 | 18 | 16 | 13 |    |
| 7   | 56  | 44  | 37  | 31  | 50 | 40 | 34 | 29 | 32 | 28 | 24 | 25 | 22 | 19 | 18 | 16 | 15 | 18 | 16 | 15 | 12 |    |
| 8   | 52  | 40  | 33  | 28  | 46 | 36 | 30 | 25 | 29 | 25 | 21 | 23 | 20 | 17 | 17 | 15 | 13 | 17 | 15 | 13 | 11 |    |
| 9   | 48  | 37  | 29  | 25  | 43 | 33 | 27 | 23 | 27 | 22 | 19 | 21 | 18 | 15 | 16 | 13 | 12 | 16 | 13 | 12 | 10 |    |
| 10  | 45  | 33  | 27  | 22  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 16 | 14 | 14 | 12 | 11 | 14 | 12 | 11 | 9  |    |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2070 | 2070 | 2070 |
| 5°  | 2069 | 2032 | 2046 |
| 10° | 2044 | 1987 | 1977 |
| 15° | 2012 | 1916 | 1871 |
| 20° | 1971 | 1821 | 1741 |
| 25° | 1928 | 1715 | 1617 |
| 30° | 1873 | 1606 | 1460 |
| 35° | 1818 | 1491 | 1323 |
| 40° | 1762 | 1372 | 1166 |
| 45° | 1698 | 1240 | 1023 |
| 50° | 1632 | 1108 | 885  |
| 55° | 1561 | 967  | 751  |
| 60° | 1480 | 821  | 616  |
| 65° | 1386 | 673  | 550  |
| 70° | 1272 | 535  | 493  |
| 75° | 1128 | 461  | 442  |
| 80° | 923  | 373  | 373  |
| 85° | 594  | 229  | 263  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 1698 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 77.5   | 1.4       |
| 10°-20°   | 212.7  | 3.8       |
| 20°-30°   | 298.6  | 5.3       |
| 30°-40°   | 325.5  | 5.8       |
| 40°-50°   | 299.1  | 5.3       |
| 50°-60°   | 234.9  | 4.2       |
| 60°-70°   | 152.9  | 2.7       |
| 70°-80°   | 78.7   | 1.4       |
| 80°-90°   | 22.5   | 0.4       |
| 90°-100°  | 44.5   | 0.8       |
| 100°-110° | 165.9  | 2.9       |
| 110°-120° | 440.1  | 7.8       |
| 120°-130° | 729.9  | 12.9      |
| 130°-140° | 775.4  | 13.7      |
| 140°-150° | 720.6  | 12.7      |
| 150°-160° | 579.4  | 10.2      |
| 160°-170° | 373.3  | 6.6       |
| 170°-180° | 128.5  | 2.3       |
| 0°-30°    | 588.7  | 10.4      |
| 0°-40°    | 914.2  | 16.2      |
| 0°-60°    | 1448.3 | 25.6      |
| 0°-90°    | 1702.4 | 30.1      |
| 90°-120°  | 650.5  | 11.5      |
| 90°-150°  | 2876.4 | 50.8      |
| 90°-180°  | 3958.0 | 69.9      |
| 0°-180°   | 5660.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 827  | 827   | 827  | 827   | 827  |      |
| 5°   | 827  | 823   | 813  | 820   | 818  | 78   |
| 15°  | 786  | 778   | 752  | 738   | 731  | 222  |
| 25°  | 714  | 690   | 640  | 610   | 598  | 328  |
| 35°  | 615  | 577   | 511  | 464   | 447  | 385  |
| 45°  | 503  | 452   | 374  | 321   | 303  | 388  |
| 55°  | 382  | 324   | 243  | 198   | 184  | 342  |
| 65°  | 258  | 198   | 130  | 105   | 102  | 256  |
| 75°  | 138  | 85    | 60   | 55    | 54   | 146  |
| 85°  | 32   | 16    | 14   | 14    | 14   | 37   |
| 90°  | 1    | 12    | 20   | 24    | 26   | 5    |
| 95°  | 63   | 31    | 38   | 43    | 42   | 75   |
| 105° | 297  | 326   | 60   | 70    | 74   | 317  |
| 115° | 562  | 578   | 603  | 150   | 80   | 553  |
| 125° | 794  | 807   | 825  | 832   | 835  | 708  |
| 135° | 983  | 998   | 1007 | 1017  | 1015 | 759  |
| 145° | 1140 | 1139  | 1156 | 1162  | 1158 | 713  |
| 155° | 1255 | 1246  | 1258 | 1264  | 1256 | 578  |
| 165° | 1323 | 1317  | 1320 | 1326  | 1320 | 374  |
| 175° | 1353 | 1346  | 1348 | 1355  | 1345 | 129  |
| 180° | 1350 | 1350  | 1350 | 1350  | 1350 |      |



TEST NUMBER: P904877

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 826.6 | 826.6 | 826.6 | 826.6 | 826.6 |
| 2.5°   | 830.3 | 826.6 | 818.3 | 825.9 | 824.4 |
| 5°     | 826.6 | 822.9 | 813.1 | 819.9 | 817.6 |
| 7.5°   | 819.9 | 815.4 | 804.9 | 807.9 | 804.1 |
| 10°    | 810.9 | 805.6 | 790.7 | 788.4 | 784.0 |
| 12.5°  | 799.7 | 792.9 | 772.7 | 768.3 | 760.0 |
| 15°    | 786.2 | 777.9 | 752.5 | 738.3 | 730.9 |
| 17.5°  | 770.5 | 758.5 | 727.1 | 710.6 | 698.7 |
| 20°    | 752.5 | 737.5 | 700.2 | 681.5 | 665.0 |
| 22.5°  | 733.1 | 715.9 | 672.5 | 647.1 | 635.9 |
| 25°    | 713.7 | 689.7 | 640.3 | 609.7 | 598.4 |
| 27.5°  | 690.5 | 665.0 | 610.4 | 575.2 | 558.0 |
| 30°    | 665.8 | 637.3 | 577.5 | 539.4 | 519.1 |
| 32.5°  | 641.8 | 607.4 | 546.1 | 501.2 | 482.5 |
| 35°    | 614.9 | 576.8 | 511.0 | 463.8 | 447.3 |
| 37.5°  | 588.7 | 547.5 | 478.0 | 426.4 | 407.7 |
| 40°    | 561.0 | 516.2 | 443.6 | 390.5 | 371.0 |
| 42.5°  | 532.6 | 484.8 | 409.2 | 353.8 | 335.2 |
| 45°    | 502.7 | 452.5 | 374.1 | 320.9 | 302.9 |
| 47.5°  | 474.3 | 421.2 | 340.4 | 287.2 | 270.8 |
| 50°    | 442.9 | 389.8 | 307.5 | 255.8 | 240.2 |
| 52.5°  | 412.1 | 356.0 | 276.0 | 226.7 | 212.5 |
| 55°    | 382.2 | 323.9 | 243.1 | 198.3 | 184.0 |
| 57.5°  | 351.6 | 291.7 | 214.0 | 172.1 | 160.1 |
| 60°    | 320.2 | 260.3 | 183.3 | 145.2 | 133.2 |
| 62.5°  | 289.5 | 229.7 | 157.1 | 121.2 | 115.2 |
| 65°    | 258.1 | 197.5 | 130.2 | 104.8 | 102.5 |
| 67.5°  | 228.2 | 167.5 | 104.8 | 92.0  | 89.8  |
| 70°    | 196.7 | 138.4 | 86.7  | 79.3  | 76.3  |
| 72.5°  | 166.8 | 111.4 | 72.5  | 66.6  | 65.1  |
| 75°    | 137.6 | 85.2  | 59.8  | 54.6  | 53.9  |
| 77.5°  | 108.5 | 60.6  | 47.1  | 44.1  | 42.6  |
| 80°    | 81.5  | 43.4  | 35.9  | 32.9  | 32.9  |
| 82.5°  | 56.8  | 29.2  | 24.7  | 23.2  | 23.2  |
| 85°    | 32.1  | 16.4  | 14.2  | 14.2  | 14.2  |
| 87.5°  | 12.0  | 6.0   | 6.0   | 5.2   | 5.2   |
| 90°    | 0.9   | 11.7  | 19.5  | 24.5  | 26.3  |
| 92.5°  | 24.5  | 20.5  | 23.4  | 25.4  | 26.3  |
| 95°    | 63.4  | 31.2  | 38.0  | 43.0  | 42.0  |
| 97.5°  | 114.3 | 34.2  | 49.8  | 52.8  | 53.7  |
| 100°   | 172.9 | 39.1  | 55.7  | 63.4  | 65.4  |
| 102.5° | 237.3 | 235.5 | 57.6  | 68.3  | 71.3  |
| 105°   | 296.9 | 326.3 | 59.6  | 70.3  | 74.2  |
| 107.5° | 366.3 | 390.7 | 61.6  | 72.3  | 76.2  |
| 110°   | 432.8 | 453.2 | 171.0 | 73.3  | 77.1  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 495.3  | 512.8  | 496.2  | 75.2   | 78.2   |
| 115°   | 561.6  | 578.2  | 602.7  | 150.4  | 80.2   |
| 117.5° | 619.3  | 638.8  | 655.5  | 515.7  | 259.8  |
| 120°   | 683.8  | 698.4  | 716.0  | 727.8  | 595.9  |
| 122.5° | 738.4  | 754.1  | 773.7  | 779.5  | 780.5  |
| 125°   | 794.1  | 806.9  | 825.4  | 832.3  | 835.2  |
| 127.5° | 844.9  | 858.6  | 873.3  | 883.1  | 884.0  |
| 130°   | 892.8  | 908.5  | 919.1  | 929.9  | 929.0  |
| 132.5° | 941.6  | 954.4  | 965.1  | 973.9  | 973.0  |
| 135°   | 982.7  | 998.4  | 1007.1 | 1016.9 | 1015.0 |
| 137.5° | 1025.6 | 1037.3 | 1047.2 | 1056.9 | 1054.0 |
| 140°   | 1067.6 | 1075.5 | 1086.2 | 1095.0 | 1090.1 |
| 142.5° | 1102.9 | 1109.7 | 1122.4 | 1130.1 | 1125.3 |
| 145°   | 1140.0 | 1139.0 | 1155.5 | 1162.4 | 1157.5 |
| 147.5° | 1172.1 | 1169.2 | 1185.8 | 1190.7 | 1186.9 |
| 150°   | 1203.4 | 1196.6 | 1212.3 | 1218.1 | 1213.2 |
| 152.5° | 1229.8 | 1222.0 | 1236.6 | 1242.5 | 1235.7 |
| 155°   | 1255.2 | 1246.5 | 1258.2 | 1264.0 | 1256.2 |
| 157.5° | 1275.7 | 1267.9 | 1276.8 | 1283.6 | 1275.7 |
| 160°   | 1293.3 | 1287.4 | 1293.3 | 1299.1 | 1292.3 |
| 162.5° | 1308.9 | 1303.1 | 1308.0 | 1314.8 | 1306.0 |
| 165°   | 1322.6 | 1316.8 | 1319.7 | 1326.5 | 1319.7 |
| 167.5° | 1333.4 | 1327.4 | 1330.5 | 1337.3 | 1328.5 |
| 170°   | 1342.2 | 1336.3 | 1338.2 | 1345.1 | 1336.3 |
| 172.5° | 1348.0 | 1342.2 | 1344.2 | 1351.0 | 1342.2 |
| 175°   | 1352.8 | 1346.0 | 1348.0 | 1354.8 | 1345.1 |
| 177.5° | 1354.8 | 1348.0 | 1349.0 | 1355.9 | 1347.1 |
| 180°   | 1350.0 | 1350.0 | 1350.0 | 1350.0 | 1350.0 |



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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 | 7.32             | 8.01  | 8.43  | 9.12  | 10.65 | 3.28           | 3.97 | 4.40 | 5.08 | 6.61 |
|                 | 3H   | 8.96             | 9.58  | 10.09 | 10.69 | 12.24 | 4.44           | 5.05 | 5.56 | 6.17 | 7.72 |
|                 | 4H   | 9.55             | 10.13 | 10.68 | 11.25 | 12.80 | 4.87           | 5.45 | 6.00 | 6.57 | 8.12 |
|                 | 6H   | 9.94             | 10.48 | 11.09 | 11.60 | 13.17 | 5.16           | 5.70 | 6.30 | 6.82 | 8.38 |
|                 | 8H   | 10.06            | 10.57 | 11.20 | 11.70 | 13.26 | 5.24           | 5.75 | 6.38 | 6.88 | 8.44 |
|                 | 12H  | 10.10            | 10.59 | 11.25 | 11.72 | 13.30 | 5.27           | 5.75 | 6.42 | 6.88 | 8.46 |
| 4H              | 2H   | 7.31             | 7.90  | 8.46  | 9.02  | 10.57 | 3.85           | 4.43 | 4.99 | 5.55 | 7.10 |
|                 | 3H   | 9.10             | 9.59  | 10.25 | 10.73 | 12.30 | 5.16           | 5.65 | 6.31 | 6.79 | 8.36 |
|                 | 4H   | 9.77             | 10.22 | 10.92 | 11.35 | 12.94 | 5.68           | 6.13 | 6.83 | 7.26 | 8.85 |
|                 | 6H   | 10.26            | 10.64 | 11.41 | 11.80 | 13.37 | 6.07           | 6.46 | 7.23 | 7.61 | 9.19 |
|                 | 8H   | 10.42            | 10.77 | 11.57 | 11.92 | 13.51 | 6.19           | 6.54 | 7.34 | 7.69 | 9.28 |
|                 | 12H  | 10.49            | 10.82 | 11.66 | 11.97 | 13.57 | 6.23           | 6.56 | 7.40 | 7.71 | 9.31 |
| 8H              | 4H   | 9.72             | 10.08 | 10.88 | 11.23 | 12.82 | 5.94           | 6.30 | 7.09 | 7.44 | 9.04 |
|                 | 6H   | 10.26            | 10.55 | 11.43 | 11.74 | 13.33 | 6.42           | 6.72 | 7.60 | 7.91 | 9.50 |
|                 | 8H   | 10.46            | 10.72 | 11.64 | 11.88 | 13.49 | 6.60           | 6.86 | 7.78 | 8.02 | 9.63 |
|                 | 12H  | 10.58            | 10.80 | 11.76 | 11.97 | 13.61 | 6.69           | 6.92 | 7.88 | 8.08 | 9.73 |
| 12H             | 4H   | 9.67             | 9.99  | 10.84 | 11.15 | 12.75 | 5.93           | 6.26 | 7.10 | 7.42 | 9.01 |
|                 | 6H   | 10.23            | 10.49 | 11.41 | 11.66 | 13.27 | 6.47           | 6.72 | 7.65 | 7.89 | 9.50 |
|                 | 8H   | 10.43            | 10.66 | 11.61 | 11.82 | 13.46 | 6.65           | 6.88 | 7.84 | 8.04 | 9.69 |