

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: P924059

Luminaire Tested: DFN2DIP-4P3F0-050D020US950-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924059  
REPORT IS A COMBINATION OF REPORTS P900555 AND P897473  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-050D020US950-FLLONL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

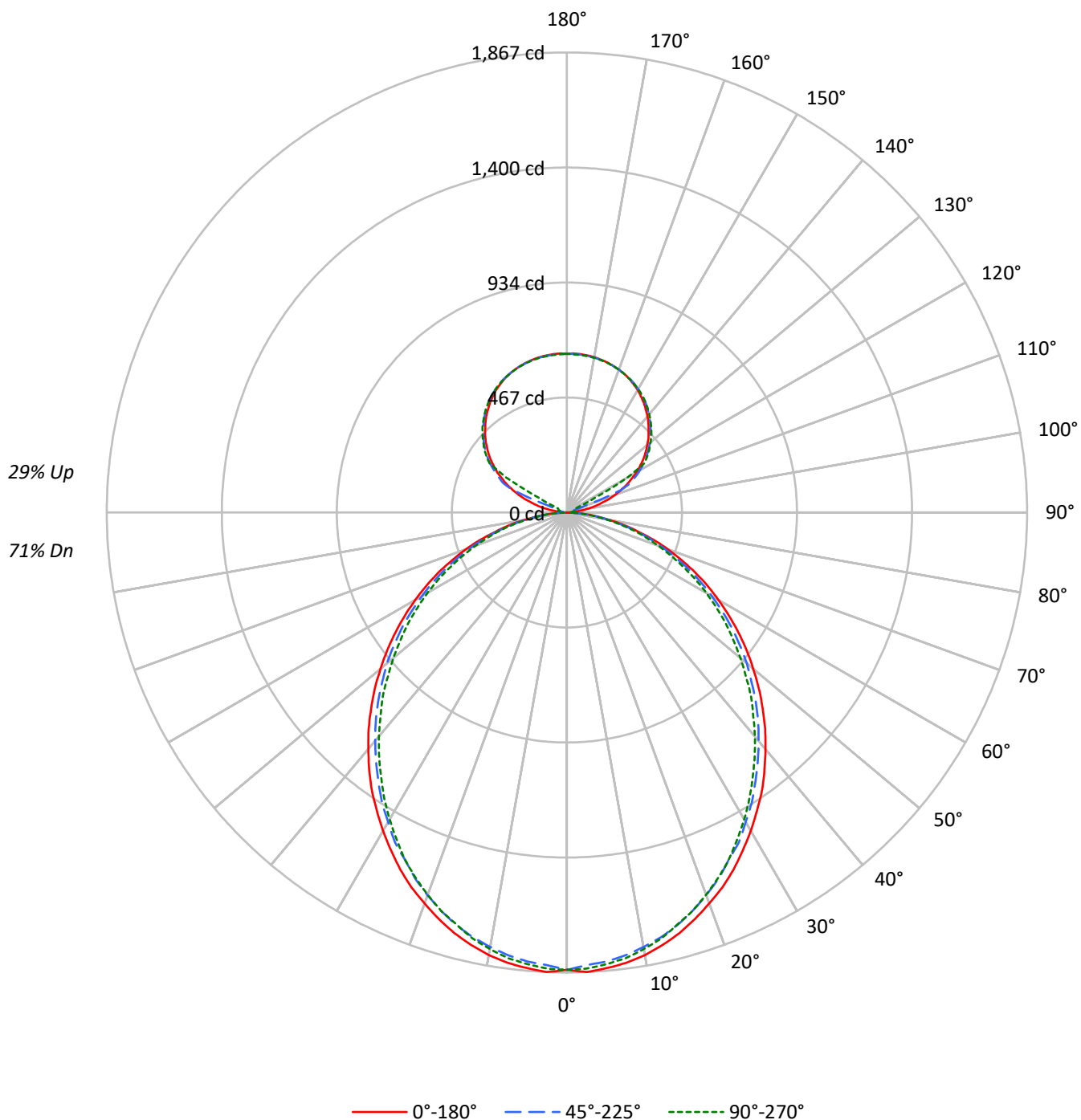
Lumens per Lamp: N/A  
Luminaire Lumens: 6611.2 lumens  
Efficiency: N/A  
Efficacy: 103.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 64.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
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   | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 95 | 95 | 95 | 85 | 85 | 85 | 76 | 76 | 76 |
| 1   | 103 | 98  | 94  | 90  | 97  | 93  | 90  | 86  | 84 | 81 | 78 | 75 | 73 | 71 | 67 | 66 | 64 |
| 2   | 93  | 86  | 79  | 74  | 88  | 81  | 76  | 71  | 73 | 69 | 65 | 66 | 62 | 59 | 59 | 56 | 54 |
| 3   | 85  | 75  | 68  | 62  | 80  | 72  | 65  | 59  | 65 | 59 | 55 | 58 | 54 | 50 | 52 | 49 | 46 |
| 4   | 78  | 67  | 59  | 52  | 74  | 64  | 56  | 50  | 58 | 52 | 47 | 52 | 47 | 43 | 47 | 43 | 40 |
| 5   | 72  | 60  | 51  | 45  | 68  | 57  | 49  | 44  | 52 | 45 | 40 | 47 | 42 | 38 | 42 | 38 | 35 |
| 6   | 66  | 54  | 45  | 39  | 63  | 51  | 44  | 38  | 47 | 40 | 35 | 42 | 37 | 33 | 38 | 34 | 31 |
| 7   | 61  | 49  | 40  | 35  | 58  | 47  | 39  | 34  | 42 | 36 | 31 | 39 | 33 | 29 | 35 | 31 | 27 |
| 8   | 57  | 44  | 36  | 31  | 54  | 42  | 35  | 30  | 39 | 33 | 28 | 35 | 30 | 26 | 32 | 28 | 24 |
| 9   | 53  | 41  | 33  | 28  | 50  | 39  | 32  | 27  | 36 | 30 | 25 | 33 | 27 | 24 | 30 | 25 | 22 |
| 10  | 50  | 37  | 30  | 25  | 47  | 36  | 29  | 24  | 33 | 27 | 23 | 30 | 25 | 21 | 28 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2115 | 2115 | 2115 |
| 5°  | 2117 | 2084 | 2099 |
| 10° | 2099 | 2055 | 2070 |
| 15° | 2066 | 2020 | 2025 |
| 20° | 2023 | 1971 | 1979 |
| 25° | 1981 | 1914 | 1925 |
| 30° | 1927 | 1860 | 1858 |
| 35° | 1877 | 1797 | 1787 |
| 40° | 1814 | 1733 | 1719 |
| 45° | 1752 | 1669 | 1649 |
| 50° | 1684 | 1602 | 1569 |
| 55° | 1613 | 1524 | 1494 |
| 60° | 1533 | 1432 | 1410 |
| 65° | 1444 | 1336 | 1309 |
| 70° | 1332 | 1219 | 1201 |
| 75° | 1177 | 1079 | 1101 |
| 80° | 989  | 901  | 910  |
| 85° | 697  | 596  | 596  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1752 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 174.7  | 2.6       |
| 10°-20°   | 491.5  | 7.4       |
| 20°-30°   | 722.3  | 10.9      |
| 30°-40°   | 838.9  | 12.7      |
| 40°-50°   | 837.9  | 12.7      |
| 50°-60°   | 730.6  | 11.1      |
| 60°-70°   | 540.1  | 8.2       |
| 70°-80°   | 305.6  | 4.6       |
| 80°-90°   | 81.8   | 1.2       |
| 90°-100°  | 21.2   | 0.3       |
| 100°-110° | 79.1   | 1.2       |
| 110°-120° | 209.9  | 3.2       |
| 120°-130° | 348.2  | 5.3       |
| 130°-140° | 369.8  | 5.6       |
| 140°-150° | 343.7  | 5.2       |
| 150°-160° | 276.4  | 4.2       |
| 160°-170° | 178.1  | 2.7       |
| 170°-180° | 61.3   | 0.9       |
| 0°-30°    | 1388.5 | 21.0      |
| 0°-40°    | 2227.5 | 33.7      |
| 0°-60°    | 3796.0 | 57.4      |
| 0°-90°    | 4723.4 | 71.4      |
| 90°-120°  | 310.3  | 4.7       |
| 90°-150°  | 1372.0 | 20.8      |
| 90°-180°  | 1888.0 | 28.6      |
| 0°-180°   | 6611.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1856 | 1856  | 1856 | 1856  | 1856 |      |
| 5°   | 1856 | 1849  | 1829 | 1844  | 1840 | 176  |
| 15°  | 1767 | 1756  | 1733 | 1740  | 1731 | 498  |
| 25°  | 1599 | 1585  | 1554 | 1558  | 1554 | 736  |
| 35°  | 1380 | 1362  | 1333 | 1322  | 1314 | 862  |
| 45°  | 1123 | 1110  | 1083 | 1064  | 1057 | 866  |
| 55°  | 850  | 839   | 817  | 796   | 787  | 760  |
| 65°  | 573  | 562   | 544  | 528   | 519  | 567  |
| 75°  | 300  | 296   | 287  | 277   | 280  | 320  |
| 85°  | 73   | 71    | 70   | 64    | 62   | 82   |
| 90°  | 0    | 6     | 9    | 12    | 13   | 6    |
| 95°  | 30   | 15    | 18   | 20    | 20   | 36   |
| 105° | 142  | 156   | 28   | 34    | 35   | 151  |
| 115° | 268  | 276   | 288  | 72    | 38   | 264  |
| 125° | 379  | 385   | 394  | 397   | 398  | 338  |
| 135° | 469  | 476   | 480  | 485   | 484  | 362  |
| 145° | 544  | 543   | 551  | 554   | 552  | 340  |
| 155° | 599  | 594   | 600  | 603   | 599  | 276  |
| 165° | 631  | 628   | 629  | 633   | 629  | 178  |
| 175° | 645  | 642   | 643  | 646   | 642  | 61   |
| 180° | 644  | 644   | 644  | 644   | 644  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1856.0 | 1856.0 | 1856.0 | 1856.0 | 1856.0 |
| 2.5°   | 1866.8 | 1857.9 | 1838.3 | 1856.0 | 1852.7 |
| 5°     | 1856.0 | 1849.0 | 1829.3 | 1843.5 | 1840.2 |
| 7.5°   | 1843.5 | 1832.9 | 1813.3 | 1827.7 | 1824.0 |
| 10°    | 1824.0 | 1811.6 | 1790.2 | 1804.3 | 1799.1 |
| 12.5°  | 1797.1 | 1786.6 | 1765.2 | 1774.1 | 1770.4 |
| 15°    | 1766.8 | 1756.2 | 1732.9 | 1740.2 | 1731.2 |
| 17.5°  | 1729.3 | 1718.7 | 1695.4 | 1704.3 | 1695.4 |
| 20°    | 1688.3 | 1677.7 | 1652.7 | 1658.0 | 1651.0 |
| 22.5°  | 1647.4 | 1631.2 | 1608.0 | 1608.0 | 1604.3 |
| 25°    | 1599.1 | 1584.9 | 1554.5 | 1558.0 | 1554.5 |
| 27.5°  | 1545.5 | 1533.0 | 1509.9 | 1504.6 | 1495.7 |
| 30°    | 1492.1 | 1477.7 | 1451.0 | 1445.7 | 1438.5 |
| 32.5°  | 1434.9 | 1424.3 | 1395.7 | 1384.9 | 1377.8 |
| 35°    | 1379.6 | 1361.8 | 1333.2 | 1322.4 | 1313.6 |
| 37.5°  | 1317.1 | 1301.1 | 1272.4 | 1259.9 | 1251.1 |
| 40°    | 1253.0 | 1238.6 | 1210.0 | 1194.0 | 1186.9 |
| 42.5°  | 1190.5 | 1176.1 | 1147.7 | 1129.6 | 1119.0 |
| 45°    | 1122.7 | 1110.2 | 1083.3 | 1063.8 | 1056.6 |
| 47.5°  | 1056.6 | 1044.1 | 1015.5 | 995.8  | 985.2  |
| 50°    | 986.9  | 978.0  | 953.0  | 928.1  | 919.1  |
| 52.5°  | 919.1  | 906.6  | 883.5  | 863.8  | 851.3  |
| 55°    | 849.6  | 838.9  | 817.4  | 796.0  | 787.1  |
| 57.5°  | 779.9  | 771.0  | 747.7  | 726.4  | 719.1  |
| 60°    | 710.3  | 703.3  | 678.3  | 658.5  | 653.3  |
| 62.5°  | 642.5  | 630.0  | 612.2  | 594.3  | 587.2  |
| 65°    | 573.0  | 562.2  | 544.4  | 528.3  | 519.4  |
| 67.5°  | 501.6  | 492.6  | 476.6  | 464.1  | 456.9  |
| 70°    | 435.5  | 428.3  | 412.2  | 399.7  | 392.8  |
| 72.5°  | 367.8  | 360.5  | 351.6  | 339.1  | 333.8  |
| 75°    | 299.7  | 296.3  | 287.2  | 276.7  | 280.3  |
| 77.5°  | 239.2  | 231.9  | 228.4  | 223.0  | 217.8  |
| 80°    | 178.6  | 176.7  | 173.1  | 167.8  | 164.2  |
| 82.5°  | 121.3  | 121.3  | 119.6  | 112.5  | 112.5  |
| 85°    | 73.1   | 71.4   | 69.6   | 64.2   | 62.5   |
| 87.5°  | 32.1   | 28.6   | 25.0   | 19.7   | 17.8   |
| 90°    | 0.5    | 5.6    | 9.3    | 11.6   | 12.6   |
| 92.5°  | 11.6   | 9.8    | 11.2   | 12.1   | 12.6   |
| 95°    | 30.2   | 14.9   | 18.1   | 20.5   | 20.0   |
| 97.5°  | 54.5   | 16.3   | 23.8   | 25.2   | 25.7   |
| 100°   | 82.5   | 18.6   | 26.5   | 30.2   | 31.2   |
| 102.5° | 113.2  | 112.3  | 27.5   | 32.6   | 34.1   |
| 105°   | 141.7  | 155.6  | 28.4   | 33.5   | 35.4   |
| 107.5° | 174.8  | 186.3  | 29.4   | 34.4   | 36.3   |
| 110°   | 206.4  | 216.2  | 81.6   | 35.0   | 36.8   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 236.2 | 244.6 | 236.7 | 35.9  | 37.3  |
| 115°   | 267.9 | 275.8 | 287.5 | 71.7  | 38.3  |
| 117.5° | 295.4 | 304.7 | 312.6 | 246.0 | 123.9 |
| 120°   | 326.2 | 333.1 | 341.5 | 347.2 | 284.2 |
| 122.5° | 352.2 | 359.7 | 369.0 | 371.8 | 372.3 |
| 125°   | 378.8 | 384.8 | 393.7 | 397.0 | 398.4 |
| 127.5° | 403.1 | 409.6 | 416.6 | 421.2 | 421.7 |
| 130°   | 425.9 | 433.3 | 438.5 | 443.6 | 443.1 |
| 132.5° | 449.1 | 455.2 | 460.3 | 464.5 | 464.1 |
| 135°   | 468.8 | 476.2 | 480.3 | 485.1 | 484.2 |
| 137.5° | 489.2 | 494.8 | 499.5 | 504.2 | 502.8 |
| 140°   | 509.2 | 513.1 | 518.1 | 522.3 | 520.0 |
| 142.5° | 526.0 | 529.4 | 535.4 | 539.1 | 536.7 |
| 145°   | 543.8 | 543.3 | 551.2 | 554.5 | 552.2 |
| 147.5° | 559.1 | 557.7 | 565.6 | 567.9 | 566.1 |
| 150°   | 574.0 | 570.8 | 578.2 | 581.0 | 578.7 |
| 152.5° | 586.6 | 582.9 | 589.9 | 592.7 | 589.4 |
| 155°   | 598.7 | 594.5 | 600.2 | 602.9 | 599.2 |
| 157.5° | 608.6 | 604.8 | 609.0 | 612.3 | 608.6 |
| 160°   | 617.0 | 614.1 | 617.0 | 619.7 | 616.5 |
| 162.5° | 624.3 | 621.5 | 623.9 | 627.2 | 623.0 |
| 165°   | 630.9 | 628.1 | 629.4 | 632.8 | 629.4 |
| 167.5° | 636.0 | 633.2 | 634.6 | 637.9 | 633.6 |
| 170°   | 640.2 | 637.4 | 638.3 | 641.6 | 637.4 |
| 172.5° | 643.0 | 640.2 | 641.2 | 644.4 | 640.2 |
| 175°   | 645.3 | 642.0 | 643.0 | 646.2 | 641.6 |
| 177.5° | 646.2 | 643.0 | 643.5 | 646.7 | 642.5 |
| 180°   | 643.9 | 643.9 | 643.9 | 643.9 | 643.9 |

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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 | 11.62            | 12.71 | 12.37 | 13.48 | 14.41 | 11.18          | 12.27 | 11.92 | 13.04 | 13.97 |
|                 | 3H   | 13.29            | 14.28 | 14.06 | 15.06 | 16.02 | 12.80          | 13.79 | 13.57 | 14.57 | 15.53 |
|                 | 4H   | 13.89            | 14.82 | 14.67 | 15.61 | 16.58 | 13.39          | 14.32 | 14.17 | 15.11 | 16.08 |
|                 | 6H   | 14.30            | 15.15 | 15.09 | 15.95 | 16.94 | 13.80          | 14.65 | 14.59 | 15.45 | 16.44 |
|                 | 8H   | 14.41            | 15.22 | 15.21 | 16.04 | 17.02 | 13.91          | 14.72 | 14.71 | 15.54 | 16.52 |
|                 | 12H  | 14.46            | 15.24 | 15.27 | 16.05 | 17.06 | 13.95          | 14.73 | 14.76 | 15.54 | 16.55 |
| 4H              | 2H   | 12.11            | 13.03 | 12.89 | 13.82 | 14.79 | 11.75          | 12.68 | 12.53 | 13.47 | 14.44 |
|                 | 3H   | 13.99            | 14.76 | 14.78 | 15.58 | 16.57 | 13.58          | 14.35 | 14.37 | 15.18 | 16.16 |
|                 | 4H   | 14.71            | 15.41 | 15.52 | 16.23 | 17.25 | 14.28          | 14.99 | 15.09 | 15.81 | 16.83 |
|                 | 6H   | 15.23            | 15.84 | 16.06 | 16.69 | 17.71 | 14.80          | 15.41 | 15.63 | 16.26 | 17.28 |
|                 | 8H   | 15.38            | 15.95 | 16.21 | 16.80 | 17.83 | 14.95          | 15.52 | 15.78 | 16.36 | 17.39 |
|                 | 12H  | 15.47            | 15.98 | 16.32 | 16.84 | 17.88 | 15.02          | 15.53 | 15.87 | 16.39 | 17.43 |
| 8H              | 4H   | 14.92            | 15.49 | 15.75 | 16.33 | 17.36 | 14.54          | 15.11 | 15.37 | 15.95 | 16.99 |
|                 | 6H   | 15.55            | 16.03 | 16.41 | 16.91 | 17.94 | 15.17          | 15.64 | 16.03 | 16.53 | 17.56 |
|                 | 8H   | 15.77            | 16.19 | 16.64 | 17.07 | 18.12 | 15.38          | 15.80 | 16.25 | 16.68 | 17.73 |
|                 | 12H  | 15.91            | 16.28 | 16.78 | 17.15 | 18.26 | 15.50          | 15.87 | 16.37 | 16.74 | 17.85 |
| 12H             | 4H   | 14.91            | 15.43 | 15.76 | 16.29 | 17.33 | 14.55          | 15.06 | 15.40 | 15.92 | 16.96 |
|                 | 6H   | 15.58            | 16.00 | 16.45 | 16.88 | 17.93 | 15.21          | 15.63 | 16.08 | 16.51 | 17.56 |
|                 | 8H   | 15.83            | 16.20 | 16.70 | 17.07 | 18.18 | 15.45          | 15.82 | 16.32 | 16.69 | 17.80 |