

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: P909773

Luminaire Tested: DFN2DIP-TR2F0-040D060US840-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909773  
REPORT IS A COMBINATION OF REPORTS P901785 AND P897145  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR2F0-040D060US840-FLLONL  
Description: 2 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

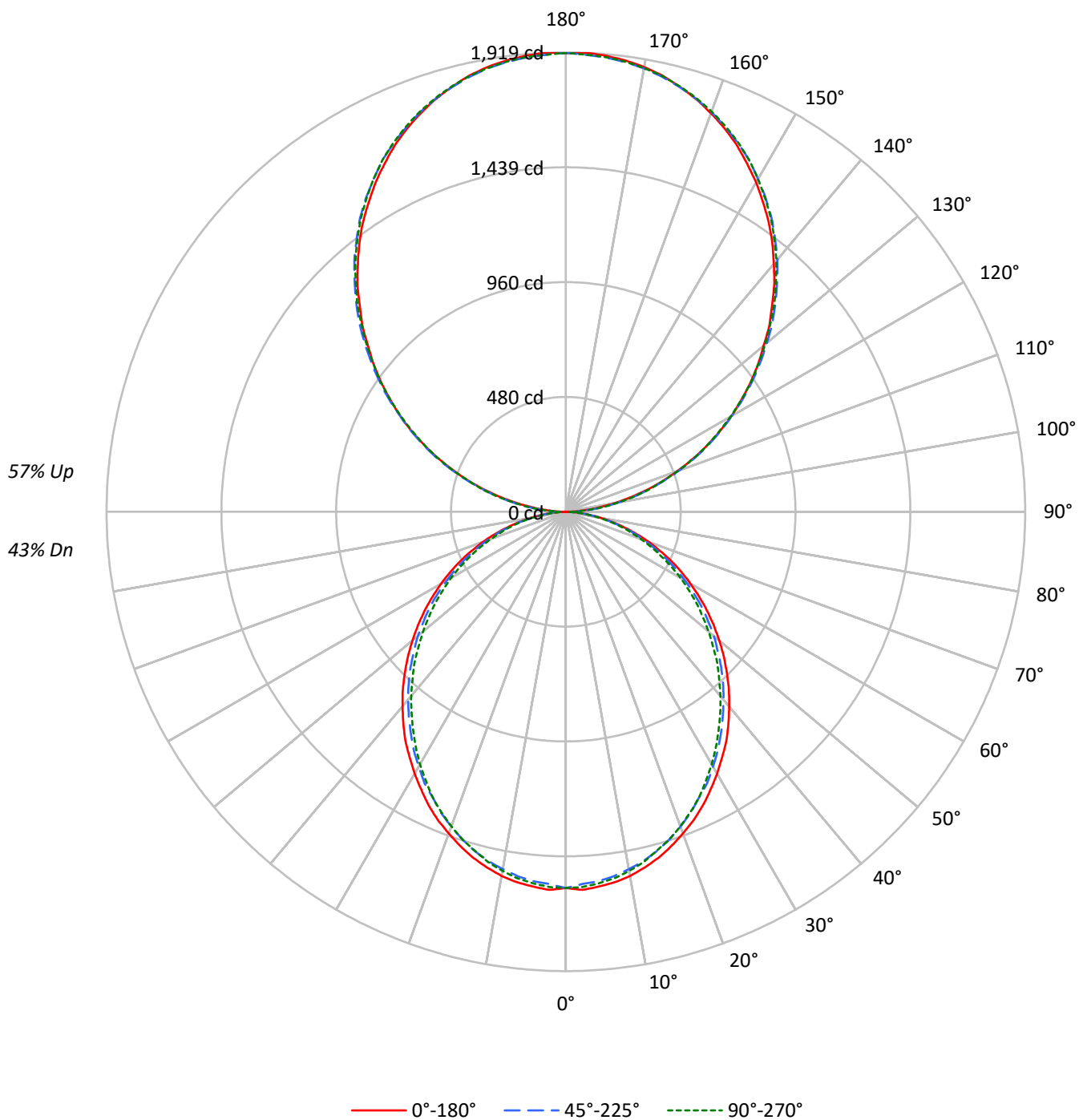
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9361.4 lumens  
Efficiency: N/A  
Efficacy: 110.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.04' x L: 2.36' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 84.4  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 64 | 64 | 64 | 49 | 49 | 49 |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 69 | 67 | 65 | 56 | 54 | 53 | 44 | 43 | 42 |
| 2   | 88  | 80  | 74  | 69  | 80 | 73 | 68 | 64 | 61 | 57 | 54 | 49 | 47 | 44 | 38 | 37 | 35 |
| 3   | 80  | 70  | 63  | 57  | 73 | 65 | 58 | 53 | 54 | 49 | 45 | 44 | 40 | 37 | 34 | 32 | 30 |
| 4   | 73  | 62  | 55  | 49  | 66 | 57 | 50 | 45 | 48 | 43 | 39 | 39 | 35 | 32 | 30 | 28 | 26 |
| 5   | 67  | 56  | 47  | 42  | 61 | 51 | 44 | 39 | 43 | 37 | 33 | 35 | 31 | 28 | 27 | 25 | 22 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 25 | 22 | 20 |
| 7   | 57  | 45  | 37  | 31  | 52 | 41 | 34 | 29 | 35 | 29 | 25 | 29 | 24 | 21 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 32 | 26 | 23 | 26 | 22 | 19 | 21 | 18 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 27 | 22 | 18 | 22 | 18 | 15 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3506 | 3506 | 3506 |
| 5°  | 3506 | 3449 | 3474 |
| 10° | 3473 | 3395 | 3421 |
| 15° | 3416 | 3331 | 3342 |
| 20° | 3342 | 3246 | 3261 |
| 25° | 3268 | 3145 | 3168 |
| 30° | 3176 | 3051 | 3051 |
| 35° | 3089 | 2941 | 2929 |
| 40° | 2983 | 2830 | 2811 |
| 45° | 2877 | 2718 | 2691 |
| 50° | 2761 | 2601 | 2552 |
| 55° | 2638 | 2465 | 2423 |
| 60° | 2500 | 2305 | 2275 |
| 65° | 2347 | 2137 | 2101 |
| 70° | 2154 | 1934 | 1911 |
| 75° | 1889 | 1690 | 1729 |
| 80° | 1566 | 1378 | 1399 |
| 85° | 1067 | 869  | 868  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2877 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 147.9  | 1.6       |
| 10°-20°   | 416.2  | 4.4       |
| 20°-30°   | 611.7  | 6.5       |
| 30°-40°   | 710.5  | 7.6       |
| 40°-50°   | 709.6  | 7.6       |
| 50°-60°   | 618.7  | 6.6       |
| 60°-70°   | 457.4  | 4.9       |
| 70°-80°   | 258.8  | 2.8       |
| 80°-90°   | 73.7   | 0.8       |
| 90°-100°  | 118.6  | 1.3       |
| 100°-110° | 376.8  | 4.0       |
| 110°-120° | 644.8  | 6.9       |
| 120°-130° | 848.0  | 9.1       |
| 130°-140° | 951.8  | 10.2      |
| 140°-150° | 933.4  | 10.0      |
| 150°-160° | 783.0  | 8.4       |
| 160°-170° | 519.2  | 5.5       |
| 170°-180° | 181.5  | 1.9       |
| 0°-30°    | 1175.9 | 12.6      |
| 0°-40°    | 1886.3 | 20.1      |
| 0°-60°    | 3214.6 | 34.3      |
| 0°-90°    | 4004.5 | 42.8      |
| 90°-120°  | 1140.1 | 12.2      |
| 90°-150°  | 3873.3 | 41.4      |
| 90°-180°  | 5357.0 | 57.2      |
| 0°-180°   | 9361.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1572 | 1572  | 1572 | 1572  | 1572 |      |
| 5°   | 1572 | 1566  | 1549 | 1561  | 1558 | 149  |
| 15°  | 1496 | 1487  | 1468 | 1474  | 1466 | 421  |
| 25°  | 1354 | 1342  | 1316 | 1319  | 1316 | 623  |
| 35°  | 1168 | 1153  | 1129 | 1120  | 1112 | 730  |
| 45°  | 951  | 940   | 917  | 901   | 895  | 734  |
| 55°  | 720  | 710   | 692  | 674   | 667  | 643  |
| 65°  | 485  | 476   | 461  | 447   | 440  | 480  |
| 75°  | 254  | 251   | 243  | 234   | 237  | 271  |
| 85°  | 62   | 60    | 59   | 54    | 53   | 69   |
| 90°  | 2    | 21    | 57   | 53    | 55   | 9    |
| 95°  | 84   | 100   | 103  | 103   | 100  | 94   |
| 105° | 348  | 352   | 356  | 359   | 359  | 367  |
| 115° | 647  | 656   | 653  | 652   | 647  | 640  |
| 125° | 941  | 956   | 951  | 946   | 944  | 841  |
| 135° | 1217 | 1235  | 1239 | 1237  | 1232 | 941  |
| 145° | 1478 | 1489  | 1499 | 1500  | 1494 | 923  |
| 155° | 1690 | 1694  | 1700 | 1708  | 1702 | 778  |
| 165° | 1838 | 1836  | 1836 | 1848  | 1840 | 519  |
| 175° | 1913 | 1908  | 1905 | 1916  | 1906 | 182  |
| 180° | 1916 | 1916  | 1916 | 1916  | 1916 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1571.8 | 1571.8 | 1571.8 | 1571.8 | 1571.8 |
| 2.5°   | 1580.9 | 1573.4 | 1556.7 | 1571.8 | 1568.9 |
| 5°     | 1571.8 | 1565.8 | 1549.1 | 1561.2 | 1558.3 |
| 7.5°   | 1561.2 | 1552.2 | 1535.5 | 1547.7 | 1544.7 |
| 10°    | 1544.7 | 1534.1 | 1516.0 | 1528.0 | 1523.5 |
| 12.5°  | 1521.9 | 1512.9 | 1494.8 | 1502.4 | 1499.2 |
| 15°    | 1496.2 | 1487.2 | 1467.5 | 1473.6 | 1466.1 |
| 17.5°  | 1464.5 | 1455.5 | 1435.8 | 1443.3 | 1435.8 |
| 20°    | 1429.7 | 1420.7 | 1399.6 | 1404.0 | 1398.2 |
| 22.5°  | 1395.0 | 1381.4 | 1361.7 | 1361.7 | 1358.7 |
| 25°    | 1354.1 | 1342.1 | 1316.5 | 1319.4 | 1316.5 |
| 27.5°  | 1308.8 | 1298.2 | 1278.7 | 1274.1 | 1266.7 |
| 30°    | 1263.5 | 1251.4 | 1228.8 | 1224.3 | 1218.2 |
| 32.5°  | 1215.2 | 1206.2 | 1181.9 | 1172.9 | 1166.7 |
| 35°    | 1168.3 | 1153.3 | 1129.0 | 1119.9 | 1112.4 |
| 37.5°  | 1115.4 | 1101.8 | 1077.5 | 1067.0 | 1059.4 |
| 40°    | 1061.1 | 1048.8 | 1024.6 | 1011.2 | 1005.1 |
| 42.5°  | 1008.1 | 995.9  | 971.9  | 956.6  | 947.7  |
| 45°    | 950.7  | 940.2  | 917.4  | 900.9  | 894.7  |
| 47.5°  | 894.7  | 884.1  | 860.0  | 843.3  | 834.4  |
| 50°    | 835.8  | 828.2  | 807.1  | 785.9  | 778.3  |
| 52.5°  | 778.3  | 767.8  | 748.2  | 731.5  | 720.9  |
| 55°    | 719.5  | 710.3  | 692.3  | 674.1  | 666.6  |
| 57.5°  | 660.5  | 653.0  | 633.2  | 615.1  | 609.0  |
| 60°    | 601.5  | 595.5  | 574.4  | 557.7  | 553.2  |
| 62.5°  | 544.1  | 533.5  | 518.5  | 503.3  | 497.3  |
| 65°    | 485.2  | 476.1  | 461.0  | 447.4  | 439.9  |
| 67.5°  | 424.7  | 417.1  | 403.6  | 393.0  | 387.0  |
| 70°    | 368.8  | 362.7  | 349.1  | 338.5  | 332.5  |
| 72.5°  | 311.4  | 305.3  | 297.8  | 287.2  | 282.7  |
| 75°    | 253.9  | 251.0  | 243.3  | 234.3  | 237.3  |
| 77.5°  | 202.5  | 196.4  | 193.4  | 188.8  | 184.4  |
| 80°    | 151.2  | 149.6  | 146.5  | 142.1  | 139.1  |
| 82.5°  | 102.8  | 102.8  | 101.4  | 95.2   | 95.2   |
| 85°    | 61.9   | 60.5   | 59.0   | 54.3   | 52.9   |
| 87.5°  | 27.3   | 24.2   | 21.2   | 16.7   | 15.0   |
| 90°    | 1.7    | 20.8   | 56.7   | 53.1   | 54.8   |
| 92.5°  | 35.9   | 48.6   | 50.3   | 52.0   | 52.0   |
| 95°    | 84.3   | 100.5  | 103.4  | 103.4  | 100.5  |
| 97.5°  | 140.4  | 155.4  | 161.8  | 161.8  | 161.8  |
| 100°   | 205.1  | 218.3  | 223.0  | 223.0  | 221.3  |
| 102.5° | 273.3  | 283.1  | 289.4  | 291.1  | 289.4  |
| 105°   | 347.8  | 352.4  | 355.9  | 358.8  | 358.8  |
| 107.5° | 421.7  | 428.7  | 428.7  | 429.8  | 421.7  |
| 110°   | 493.4  | 502.6  | 502.6  | 502.6  | 498.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 570.8  | 580.6  | 578.9  | 574.2  | 570.8  |
| 115°   | 647.0  | 656.3  | 653.4  | 651.7  | 647.0  |
| 117.5° | 722.8  | 735.5  | 727.3  | 722.8  | 718.1  |
| 120°   | 799.0  | 811.7  | 799.0  | 799.0  | 793.8  |
| 122.5° | 868.3  | 884.4  | 876.4  | 871.8  | 868.3  |
| 125°   | 941.1  | 955.5  | 950.9  | 945.7  | 944.0  |
| 127.5° | 1012.2 | 1030.1 | 1023.7 | 1016.8 | 1012.2 |
| 130°   | 1078.6 | 1099.4 | 1096.5 | 1093.1 | 1086.7 |
| 132.5° | 1153.2 | 1169.3 | 1170.4 | 1162.4 | 1157.7 |
| 135°   | 1217.3 | 1235.2 | 1238.6 | 1236.9 | 1232.2 |
| 137.5° | 1288.9 | 1303.3 | 1306.3 | 1305.0 | 1298.2 |
| 140°   | 1351.9 | 1366.3 | 1374.4 | 1374.4 | 1368.1 |
| 142.5° | 1416.5 | 1431.0 | 1435.6 | 1437.3 | 1431.0 |
| 145°   | 1477.8 | 1489.3 | 1498.6 | 1500.4 | 1494.0 |
| 147.5° | 1532.7 | 1547.1 | 1554.1 | 1556.9 | 1550.5 |
| 150°   | 1589.3 | 1599.1 | 1605.5 | 1610.6 | 1605.5 |
| 152.5° | 1639.5 | 1649.4 | 1657.5 | 1663.9 | 1657.5 |
| 155°   | 1689.8 | 1694.5 | 1699.6 | 1707.8 | 1702.5 |
| 157.5° | 1733.1 | 1736.7 | 1739.5 | 1751.1 | 1743.0 |
| 160°   | 1771.9 | 1775.3 | 1777.1 | 1786.9 | 1780.0 |
| 162.5° | 1807.7 | 1807.7 | 1809.4 | 1820.4 | 1812.3 |
| 165°   | 1838.3 | 1836.5 | 1836.5 | 1848.2 | 1840.1 |
| 167.5° | 1866.0 | 1860.9 | 1860.9 | 1872.4 | 1864.3 |
| 170°   | 1886.8 | 1882.2 | 1880.5 | 1892.0 | 1882.2 |
| 172.5° | 1901.3 | 1896.6 | 1894.9 | 1906.4 | 1896.6 |
| 175°   | 1912.8 | 1908.2 | 1904.7 | 1916.3 | 1906.4 |
| 177.5° | 1919.1 | 1914.6 | 1911.1 | 1920.9 | 1911.1 |
| 180°   | 1916.3 | 1916.3 | 1916.3 | 1916.3 | 1916.3 |

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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 | 10.79            | 11.59 | 11.81 | 12.62 | 13.99 | 10.37          | 11.17 | 11.39 | 12.20 | 13.57 |
|                 | 3H   | 12.43            | 13.14 | 13.45 | 14.18 | 15.57 | 11.96          | 12.68 | 12.99 | 13.72 | 15.11 |
|                 | 4H   | 12.99            | 13.67 | 14.03 | 14.71 | 16.11 | 12.53          | 13.21 | 13.57 | 14.25 | 15.65 |
|                 | 6H   | 13.37            | 14.00 | 14.42 | 15.04 | 16.45 | 12.91          | 13.54 | 13.96 | 14.58 | 15.99 |
|                 | 8H   | 13.47            | 14.06 | 14.52 | 15.12 | 16.53 | 13.01          | 13.60 | 14.06 | 14.66 | 16.07 |
|                 | 12H  | 13.50            | 14.07 | 14.56 | 15.12 | 16.55 | 13.04          | 13.61 | 14.10 | 14.66 | 16.09 |
| 4H              | 2H   | 11.24            | 11.92 | 12.28 | 12.96 | 14.35 | 10.90          | 11.58 | 11.94 | 12.62 | 14.01 |
|                 | 3H   | 13.07            | 13.64 | 14.12 | 14.70 | 16.11 | 12.69          | 13.25 | 13.74 | 14.32 | 15.73 |
|                 | 4H   | 13.76            | 14.28 | 14.82 | 15.34 | 16.77 | 13.37          | 13.89 | 14.43 | 14.95 | 16.38 |
|                 | 6H   | 14.25            | 14.70 | 15.32 | 15.78 | 17.21 | 13.86          | 14.30 | 14.93 | 15.38 | 16.81 |
|                 | 8H   | 14.39            | 14.81 | 15.46 | 15.88 | 17.32 | 13.99          | 14.41 | 15.06 | 15.48 | 16.93 |
|                 | 12H  | 14.45            | 14.83 | 15.54 | 15.91 | 17.36 | 14.04          | 14.42 | 15.13 | 15.51 | 16.96 |
| 8H              | 4H   | 13.95            | 14.36 | 15.02 | 15.43 | 16.88 | 13.59          | 14.01 | 14.66 | 15.08 | 16.53 |
|                 | 6H   | 14.55            | 14.89 | 15.64 | 16.01 | 17.45 | 14.19          | 14.54 | 15.29 | 15.65 | 17.09 |
|                 | 8H   | 14.75            | 15.05 | 15.85 | 16.15 | 17.61 | 14.39          | 14.70 | 15.49 | 15.79 | 17.25 |
|                 | 12H  | 14.86            | 15.13 | 15.97 | 16.22 | 17.72 | 14.49          | 14.76 | 15.60 | 15.85 | 17.35 |
| 12H             | 4H   | 13.93            | 14.30 | 15.01 | 15.39 | 16.84 | 13.58          | 13.96 | 14.67 | 15.04 | 16.49 |
|                 | 6H   | 14.57            | 14.87 | 15.67 | 15.97 | 17.43 | 14.23          | 14.53 | 15.33 | 15.63 | 17.09 |
|                 | 8H   | 14.79            | 15.06 | 15.90 | 16.15 | 17.65 | 14.45          | 14.71 | 15.55 | 15.80 | 17.30 |