

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: P919696

Luminaire Tested: DFN2DIP-PN4F0-090D050US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919696  
REPORT IS A COMBINATION OF REPORTS P899637 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-090D050US935-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

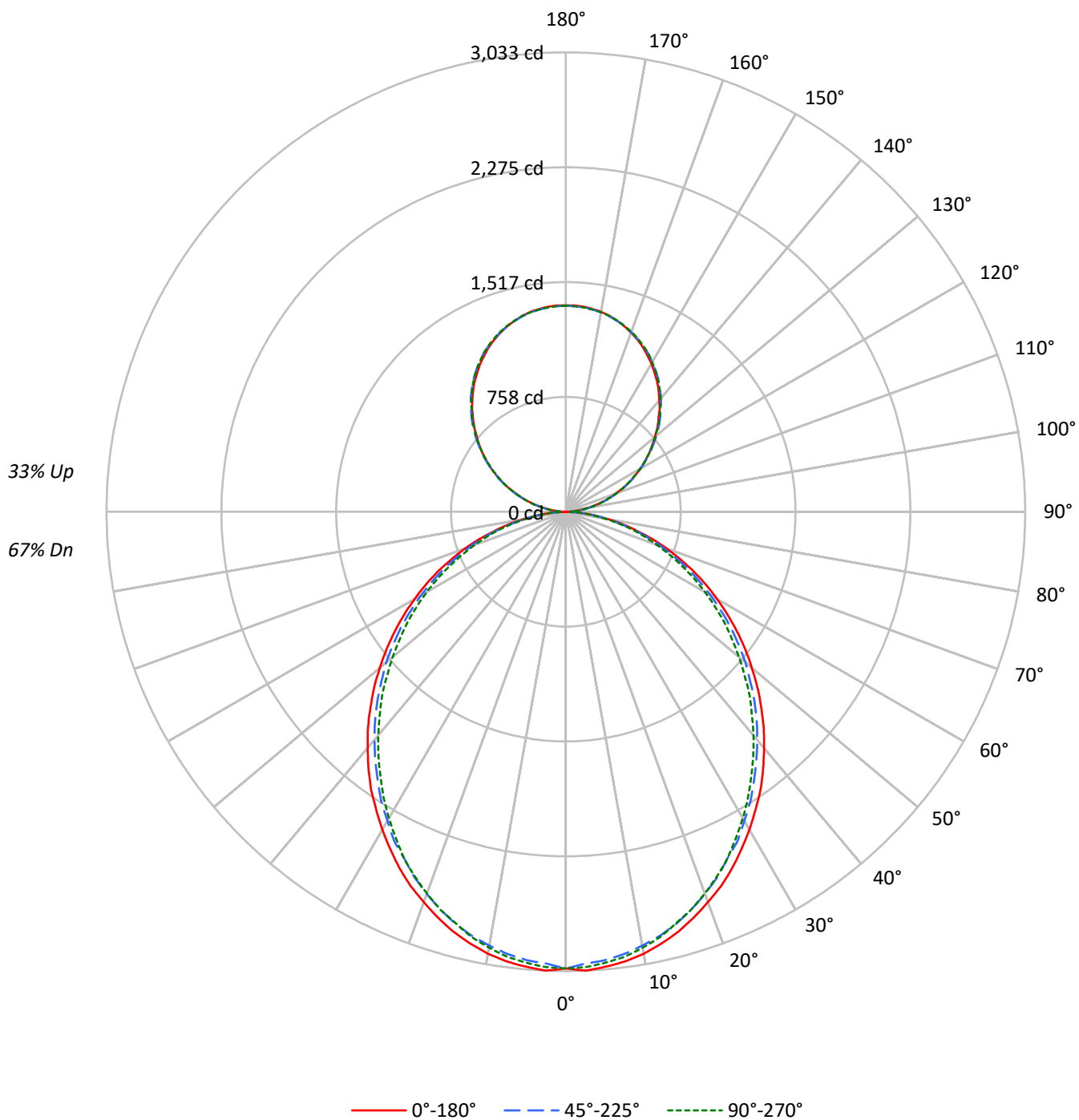
Lumens per Lamp: N/A  
Luminaire Lumens: 11481.4 lumens  
Efficiency: N/A  
Efficacy: 91.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 126  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
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



TEST NUMBER: P919696

CATALOG NUMBER: DFN2DIP-PN4F0-090D050US935-FLLFL

**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   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 | 82 | 82 | 82 | 72 | 72 | 72 |
| 1   | 102 | 97  | 93  | 90  | 96  | 92  | 88  | 85  | 81 | 79 | 76 | 72 | 70 | 68 | 63 | 62 | 61 |
| 2   | 93  | 85  | 79  | 73  | 87  | 80  | 75  | 70  | 71 | 67 | 63 | 63 | 60 | 57 | 56 | 53 | 51 |
| 3   | 84  | 75  | 67  | 61  | 79  | 71  | 64  | 58  | 63 | 58 | 53 | 56 | 52 | 48 | 49 | 46 | 43 |
| 4   | 77  | 66  | 58  | 52  | 73  | 63  | 55  | 50  | 56 | 50 | 45 | 50 | 45 | 41 | 44 | 41 | 37 |
| 5   | 71  | 59  | 51  | 45  | 67  | 56  | 48  | 43  | 50 | 44 | 39 | 45 | 40 | 36 | 40 | 36 | 33 |
| 6   | 66  | 53  | 45  | 39  | 62  | 50  | 43  | 37  | 45 | 39 | 34 | 41 | 35 | 32 | 36 | 32 | 29 |
| 7   | 61  | 48  | 40  | 34  | 57  | 46  | 38  | 33  | 41 | 35 | 30 | 37 | 32 | 28 | 33 | 29 | 26 |
| 8   | 56  | 44  | 36  | 30  | 53  | 42  | 34  | 29  | 38 | 32 | 27 | 34 | 29 | 25 | 30 | 26 | 23 |
| 9   | 53  | 40  | 32  | 27  | 50  | 38  | 31  | 26  | 35 | 29 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 24  | 32 | 26 | 22 | 29 | 24 | 20 | 26 | 22 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2201 | 2201 | 2201 |
| 5°  | 2204 | 2171 | 2185 |
| 10° | 2187 | 2142 | 2156 |
| 15° | 2154 | 2107 | 2110 |
| 20° | 2111 | 2058 | 2063 |
| 25° | 2068 | 2000 | 2009 |
| 30° | 2014 | 1945 | 1940 |
| 35° | 1962 | 1881 | 1867 |
| 40° | 1899 | 1817 | 1797 |
| 45° | 1836 | 1752 | 1726 |
| 50° | 1767 | 1684 | 1643 |
| 55° | 1695 | 1605 | 1568 |
| 60° | 1613 | 1512 | 1481 |
| 65° | 1525 | 1416 | 1378 |
| 70° | 1411 | 1298 | 1269 |
| 75° | 1255 | 1157 | 1168 |
| 80° | 1066 | 977  | 974  |
| 85° | 770  | 667  | 651  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1836 cd/sqm

TEST NUMBER: P919696

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 283.8   | 2.5       |
| 10°-20°   | 798.5   | 7.0       |
| 20°-30°   | 1173.4  | 10.2      |
| 30°-40°   | 1362.9  | 11.9      |
| 40°-50°   | 1361.2  | 11.9      |
| 50°-60°   | 1186.9  | 10.3      |
| 60°-70°   | 877.4   | 7.6       |
| 70°-80°   | 496.4   | 4.3       |
| 80°-90°   | 134.9   | 1.2       |
| 90°-100°  | 84.2    | 0.7       |
| 100°-110° | 267.7   | 2.3       |
| 110°-120° | 458.1   | 4.0       |
| 120°-130° | 602.5   | 5.2       |
| 130°-140° | 676.3   | 5.9       |
| 140°-150° | 663.1   | 5.8       |
| 150°-160° | 556.3   | 4.8       |
| 160°-170° | 368.9   | 3.2       |
| 170°-180° | 128.9   | 1.1       |
| 0°-30°    | 2255.7  | 19.6      |
| 0°-40°    | 3618.6  | 31.5      |
| 0°-60°    | 6166.7  | 53.7      |
| 0°-90°    | 7675.4  | 66.9      |
| 90°-120°  | 810.0   | 7.1       |
| 90°-150°  | 2751.9  | 24.0      |
| 90°-180°  | 3806.0  | 33.1      |
| 0°-180°   | 11481.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3015 | 3015  | 3015 | 3015  | 3015 |      |
| 5°   | 3015 | 3004  | 2972 | 2995  | 2989 | 286  |
| 15°  | 2870 | 2853  | 2815 | 2827  | 2812 | 808  |
| 25°  | 2598 | 2575  | 2526 | 2531  | 2526 | 1195 |
| 35°  | 2241 | 2212  | 2166 | 2148  | 2134 | 1400 |
| 45°  | 1824 | 1804  | 1760 | 1728  | 1716 | 1408 |
| 55°  | 1380 | 1363  | 1328 | 1293  | 1279 | 1234 |
| 65°  | 931  | 913   | 884  | 858   | 844  | 920  |
| 75°  | 487  | 481   | 467  | 449   | 455  | 520  |
| 85°  | 119  | 116   | 113  | 104   | 102  | 132  |
| 90°  | 1    | 15    | 40   | 38    | 39   | 11   |
| 95°  | 60   | 72    | 73   | 73    | 72   | 67   |
| 105° | 247  | 250   | 253  | 255   | 255  | 261  |
| 115° | 460  | 466   | 464  | 463   | 460  | 455  |
| 125° | 669  | 679   | 676  | 672   | 671  | 598  |
| 135° | 865  | 878   | 880  | 879   | 876  | 669  |
| 145° | 1050 | 1058  | 1065 | 1066  | 1061 | 656  |
| 155° | 1201 | 1204  | 1208 | 1213  | 1210 | 553  |
| 165° | 1306 | 1305  | 1305 | 1313  | 1307 | 368  |
| 175° | 1359 | 1356  | 1353 | 1362  | 1354 | 129  |
| 180° | 1362 | 1362  | 1362 | 1362  | 1362 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3015.1 | 3015.1 | 3015.1 | 3015.1 | 3015.1 |
| 2.5°   | 3032.7 | 3018.2 | 2986.3 | 3015.1 | 3009.6 |
| 5°     | 3015.1 | 3003.8 | 2971.8 | 2994.9 | 2989.3 |
| 7.5°   | 2994.9 | 2977.7 | 2945.6 | 2969.1 | 2963.2 |
| 10°    | 2963.2 | 2942.9 | 2908.1 | 2931.2 | 2922.6 |
| 12.5°  | 2919.5 | 2902.3 | 2867.6 | 2881.9 | 2876.2 |
| 15°    | 2870.3 | 2853.1 | 2815.2 | 2826.9 | 2812.4 |
| 17.5°  | 2809.3 | 2792.1 | 2754.3 | 2768.8 | 2754.3 |
| 20°    | 2742.6 | 2725.4 | 2684.8 | 2693.4 | 2682.0 |
| 22.5°  | 2676.2 | 2650.1 | 2612.2 | 2612.2 | 2606.3 |
| 25°    | 2597.7 | 2574.6 | 2525.5 | 2531.0 | 2525.5 |
| 27.5°  | 2510.7 | 2490.4 | 2452.9 | 2444.3 | 2429.8 |
| 30°    | 2424.0 | 2400.5 | 2357.2 | 2348.5 | 2336.9 |
| 32.5°  | 2331.1 | 2313.8 | 2267.4 | 2249.9 | 2238.2 |
| 35°    | 2241.3 | 2212.3 | 2165.8 | 2148.4 | 2133.9 |
| 37.5°  | 2139.8 | 2113.6 | 2067.1 | 2046.9 | 2032.4 |
| 40°    | 2035.4 | 2012.1 | 1965.6 | 1939.7 | 1928.1 |
| 42.5°  | 1933.9 | 1910.6 | 1864.4 | 1835.2 | 1818.0 |
| 45°    | 1823.8 | 1803.5 | 1759.8 | 1728.1 | 1716.5 |
| 47.5°  | 1716.5 | 1696.2 | 1649.7 | 1617.7 | 1600.5 |
| 50°    | 1603.3 | 1588.8 | 1548.2 | 1507.6 | 1493.1 |
| 52.5°  | 1493.1 | 1472.8 | 1435.3 | 1403.3 | 1383.0 |
| 55°    | 1380.3 | 1362.7 | 1327.9 | 1293.2 | 1278.8 |
| 57.5°  | 1267.0 | 1252.6 | 1214.8 | 1180.0 | 1168.3 |
| 60°    | 1153.8 | 1142.5 | 1101.8 | 1069.9 | 1061.3 |
| 62.5°  | 1043.7 | 1023.4 | 994.5  | 965.6  | 953.9  |
| 65°    | 930.8  | 913.3  | 884.3  | 858.2  | 843.8  |
| 67.5°  | 814.8  | 800.1  | 774.2  | 754.0  | 742.3  |
| 70°    | 707.5  | 695.8  | 669.7  | 649.4  | 638.0  |
| 72.5°  | 597.4  | 585.7  | 571.2  | 551.0  | 542.3  |
| 75°    | 487.0  | 481.4  | 466.7  | 449.4  | 455.3  |
| 77.5°  | 388.5  | 376.9  | 371.0  | 362.4  | 353.8  |
| 80°    | 290.1  | 287.0  | 281.1  | 272.5  | 266.7  |
| 82.5°  | 197.2  | 197.2  | 194.4  | 182.7  | 182.7  |
| 85°    | 118.7  | 116.0  | 113.2  | 104.3  | 101.5  |
| 87.5°  | 52.3   | 46.4   | 40.6   | 32.0   | 28.9   |
| 90°    | 1.2    | 14.8   | 40.2   | 37.8   | 39.0   |
| 92.5°  | 25.5   | 34.4   | 35.7   | 36.9   | 36.9   |
| 95°    | 59.9   | 71.5   | 73.4   | 73.4   | 71.5   |
| 97.5°  | 99.7   | 110.4  | 114.9  | 114.9  | 114.9  |
| 100°   | 145.7  | 155.2  | 158.4  | 158.4  | 157.2  |
| 102.5° | 194.2  | 201.1  | 205.6  | 206.9  | 205.6  |
| 105°   | 247.1  | 250.4  | 252.9  | 254.9  | 254.9  |
| 107.5° | 299.6  | 304.5  | 304.5  | 305.4  | 299.6  |
| 110°   | 350.5  | 357.1  | 357.1  | 357.1  | 353.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 405.5  | 412.5  | 411.3  | 408.0  | 405.5  |
| 115°   | 459.7  | 466.3  | 464.3  | 463.0  | 459.7  |
| 117.5° | 513.5  | 522.5  | 516.8  | 513.5  | 510.2  |
| 120°   | 567.7  | 576.7  | 567.7  | 567.7  | 564.0  |
| 122.5° | 616.9  | 628.4  | 622.7  | 619.4  | 616.9  |
| 125°   | 668.7  | 678.9  | 675.6  | 671.9  | 670.7  |
| 127.5° | 719.1  | 731.8  | 727.4  | 722.4  | 719.1  |
| 130°   | 766.4  | 781.1  | 779.0  | 776.6  | 772.1  |
| 132.5° | 819.3  | 830.8  | 831.6  | 825.9  | 822.6  |
| 135°   | 864.9  | 877.5  | 880.0  | 878.8  | 875.5  |
| 137.5° | 915.8  | 926.0  | 928.1  | 927.2  | 922.3  |
| 140°   | 960.4  | 970.8  | 976.5  | 976.5  | 972.0  |
| 142.5° | 1006.4 | 1016.8 | 1020.0 | 1021.2 | 1016.8 |
| 145°   | 1050.0 | 1058.2 | 1064.7 | 1066.0 | 1061.4 |
| 147.5° | 1089.0 | 1099.2 | 1104.1 | 1106.2 | 1101.6 |
| 150°   | 1129.2 | 1136.2 | 1140.6 | 1144.4 | 1140.6 |
| 152.5° | 1164.9 | 1171.9 | 1177.6 | 1182.2 | 1177.6 |
| 155°   | 1200.6 | 1203.8 | 1207.5 | 1213.3 | 1209.6 |
| 157.5° | 1231.4 | 1233.8 | 1235.9 | 1244.1 | 1238.4 |
| 160°   | 1258.9 | 1261.4 | 1262.6 | 1269.5 | 1264.6 |
| 162.5° | 1284.4 | 1284.4 | 1285.6 | 1293.4 | 1287.6 |
| 165°   | 1306.1 | 1304.8 | 1304.8 | 1313.1 | 1307.3 |
| 167.5° | 1325.8 | 1322.1 | 1322.1 | 1330.3 | 1324.6 |
| 170°   | 1340.6 | 1337.3 | 1336.1 | 1344.3 | 1337.3 |
| 172.5° | 1350.8 | 1347.5 | 1346.3 | 1354.5 | 1347.5 |
| 175°   | 1359.1 | 1355.7 | 1353.3 | 1361.5 | 1354.5 |
| 177.5° | 1363.6 | 1360.3 | 1357.8 | 1364.8 | 1357.8 |
| 180°   | 1361.5 | 1361.5 | 1361.5 | 1361.5 | 1361.5 |

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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 | 11.44            | 12.48 | 12.24 | 13.30 | 14.31 | 11.00          | 12.04 | 11.80 | 12.86 | 13.87 |
|                 | 3H   | 13.12            | 14.05 | 13.93 | 14.88 | 15.92 | 12.64          | 13.57 | 13.45 | 14.40 | 15.43 |
|                 | 4H   | 13.72            | 14.60 | 14.55 | 15.44 | 16.48 | 13.23          | 14.11 | 14.06 | 14.95 | 16.00 |
|                 | 6H   | 14.13            | 14.94 | 14.97 | 15.79 | 16.85 | 13.64          | 14.45 | 14.48 | 15.29 | 16.36 |
|                 | 8H   | 14.24            | 15.01 | 15.09 | 15.88 | 16.94 | 13.75          | 14.52 | 14.60 | 15.38 | 16.45 |
|                 | 12H  | 14.30            | 15.03 | 15.15 | 15.89 | 16.98 | 13.80          | 14.53 | 14.65 | 15.39 | 16.48 |
| 4H              | 2H   | 11.93            | 12.81 | 12.76 | 13.64 | 14.69 | 11.58          | 12.45 | 12.41 | 13.29 | 14.34 |
|                 | 3H   | 13.81            | 14.55 | 14.66 | 15.42 | 16.48 | 13.41          | 14.14 | 14.25 | 15.01 | 16.08 |
|                 | 4H   | 14.54            | 15.20 | 15.39 | 16.07 | 17.16 | 14.12          | 14.79 | 14.97 | 15.66 | 16.75 |
|                 | 6H   | 15.06            | 15.64 | 15.94 | 16.53 | 17.63 | 14.64          | 15.22 | 15.51 | 16.11 | 17.20 |
|                 | 8H   | 15.22            | 15.76 | 16.09 | 16.65 | 17.75 | 14.79          | 15.33 | 15.67 | 16.22 | 17.33 |
|                 | 12H  | 15.30            | 15.79 | 16.20 | 16.70 | 17.81 | 14.86          | 15.35 | 15.76 | 16.26 | 17.37 |
| 8H              | 4H   | 14.75            | 15.29 | 15.62 | 16.17 | 17.28 | 14.38          | 14.92 | 15.25 | 15.80 | 16.91 |
|                 | 6H   | 15.39            | 15.84 | 16.29 | 16.77 | 17.87 | 15.01          | 15.46 | 15.92 | 16.39 | 17.50 |
|                 | 8H   | 15.61            | 16.01 | 16.53 | 16.93 | 18.06 | 15.23          | 15.63 | 16.14 | 16.55 | 17.67 |
|                 | 12H  | 15.75            | 16.10 | 16.67 | 17.02 | 18.20 | 15.35          | 15.70 | 16.27 | 16.62 | 17.79 |
| 12H             | 4H   | 14.74            | 15.23 | 15.64 | 16.13 | 17.25 | 14.38          | 14.87 | 15.27 | 15.77 | 16.89 |
|                 | 6H   | 15.42            | 15.82 | 16.33 | 16.74 | 17.86 | 15.05          | 15.45 | 15.97 | 16.38 | 17.50 |
|                 | 8H   | 15.67            | 16.02 | 16.59 | 16.94 | 18.11 | 15.30          | 15.65 | 16.22 | 16.56 | 17.74 |