

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: P916262

Luminaire Tested: DFN2DIP-HX3F0-070D050US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916262  
REPORT IS A COMBINATION OF REPORTS P899237 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-070D050US930-FLLFLL  
Description: 3 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

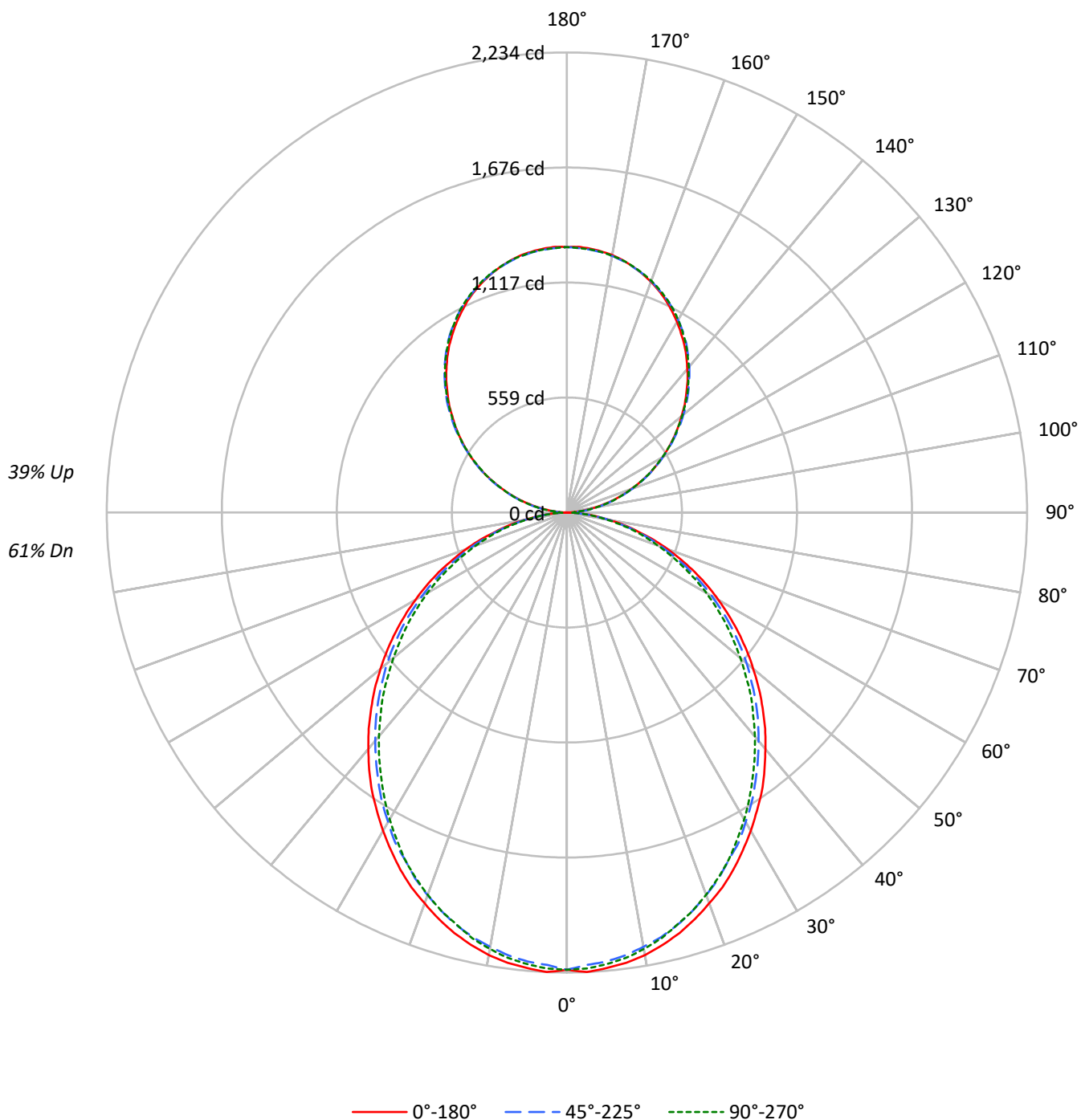
Lumens per Lamp: N/A  
Luminaire Lumens: 9257.7 lumens  
Efficiency: N/A  
Efficacy: 87.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 105.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 89 | 89 | 89 | 77 | 77 | 77 | 66 | 66 | 66 |
| 1   | 100 | 96  | 92  | 88  | 94  | 90  | 86  | 83  | 79 | 76 | 74 | 68 | 66 | 65 | 59 | 57 | 56 |
| 2   | 91  | 84  | 77  | 72  | 85  | 79  | 73  | 68  | 69 | 65 | 61 | 60 | 57 | 54 | 52 | 49 | 47 |
| 3   | 83  | 74  | 66  | 60  | 78  | 69  | 63  | 57  | 61 | 56 | 51 | 53 | 49 | 46 | 46 | 43 | 40 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 49  | 54 | 48 | 44 | 47 | 43 | 39 | 41 | 37 | 35 |
| 5   | 70  | 58  | 50  | 44  | 65  | 55  | 47  | 42  | 48 | 42 | 38 | 42 | 38 | 34 | 37 | 33 | 30 |
| 6   | 65  | 52  | 44  | 38  | 60  | 49  | 42  | 36  | 44 | 38 | 33 | 38 | 34 | 30 | 33 | 30 | 27 |
| 7   | 60  | 47  | 39  | 33  | 56  | 45  | 37  | 32  | 40 | 34 | 29 | 35 | 30 | 26 | 31 | 27 | 24 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 24 | 28 | 24 | 21 |
| 9   | 52  | 39  | 32  | 27  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 30 | 25 | 21 | 26 | 22 | 19 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 28  | 23  | 31 | 25 | 21 | 27 | 23 | 19 | 24 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2572 | 2572 | 2572 |
| 5°  | 2575 | 2535 | 2552 |
| 10° | 2553 | 2499 | 2516 |
| 15° | 2515 | 2456 | 2461 |
| 20° | 2463 | 2397 | 2404 |
| 25° | 2411 | 2327 | 2339 |
| 30° | 2347 | 2261 | 2256 |
| 35° | 2285 | 2184 | 2169 |
| 40° | 2210 | 2107 | 2086 |
| 45° | 2135 | 2029 | 2000 |
| 50° | 2053 | 1947 | 1902 |
| 55° | 1967 | 1852 | 1811 |
| 60° | 1870 | 1740 | 1707 |
| 65° | 1764 | 1623 | 1583 |
| 70° | 1628 | 1481 | 1451 |
| 75° | 1441 | 1310 | 1326 |
| 80° | 1215 | 1093 | 1092 |
| 85° | 862  | 724  | 709  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2135 cd/sqm

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CATALOG NUMBER: DFN2DIP-HX3F0-070D050US930-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 209.0  | 2.3       |
| 10°-20°   | 588.1  | 6.4       |
| 20°-30°   | 864.2  | 9.3       |
| 30°-40°   | 1003.7 | 10.8      |
| 40°-50°   | 1002.5 | 10.8      |
| 50°-60°   | 874.2  | 9.4       |
| 60°-70°   | 646.2  | 7.0       |
| 70°-80°   | 365.6  | 3.9       |
| 80°-90°   | 100.2  | 1.1       |
| 90°-100°  | 79.8   | 0.9       |
| 100°-110° | 253.5  | 2.7       |
| 110°-120° | 433.8  | 4.7       |
| 120°-130° | 570.5  | 6.2       |
| 130°-140° | 640.4  | 6.9       |
| 140°-150° | 627.9  | 6.8       |
| 150°-160° | 526.8  | 5.7       |
| 160°-170° | 349.3  | 3.8       |
| 170°-180° | 122.1  | 1.3       |
| 0°-30°    | 1661.3 | 17.9      |
| 0°-40°    | 2665.1 | 28.8      |
| 0°-60°    | 4541.7 | 49.1      |
| 0°-90°    | 5653.7 | 61.1      |
| 90°-120°  | 767.0  | 8.3       |
| 90°-150°  | 2605.8 | 28.1      |
| 90°-180°  | 3604.0 | 38.9      |
| 0°-180°   | 9257.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2221 | 2221  | 2221 | 2221  | 2221 |      |
| 5°   | 2221 | 2212  | 2189 | 2206  | 2202 | 211  |
| 15°  | 2114 | 2101  | 2073 | 2082  | 2071 | 595  |
| 25°  | 1913 | 1896  | 1860 | 1864  | 1860 | 880  |
| 35°  | 1651 | 1629  | 1595 | 1582  | 1572 | 1031 |
| 45°  | 1343 | 1328  | 1296 | 1273  | 1264 | 1037 |
| 55°  | 1016 | 1004  | 978  | 952   | 942  | 909  |
| 65°  | 686  | 673   | 651  | 632   | 621  | 678  |
| 75°  | 359  | 355   | 344  | 331   | 335  | 383  |
| 85°  | 88   | 85    | 83   | 77    | 75   | 98   |
| 90°  | 1    | 14    | 38   | 36    | 37   | 9    |
| 95°  | 57   | 68    | 70   | 70    | 68   | 63   |
| 105° | 234  | 237   | 240  | 241   | 241  | 247  |
| 115° | 435  | 442   | 440  | 438   | 435  | 431  |
| 125° | 633  | 643   | 640  | 636   | 635  | 566  |
| 135° | 819  | 831   | 833  | 832   | 829  | 633  |
| 145° | 994  | 1002  | 1008 | 1009  | 1005 | 621  |
| 155° | 1137 | 1140  | 1144 | 1149  | 1145 | 523  |
| 165° | 1237 | 1236  | 1236 | 1243  | 1238 | 349  |
| 175° | 1287 | 1284  | 1282 | 1289  | 1283 | 122  |
| 180° | 1289 | 1289  | 1289 | 1289  | 1289 |      |

TEST NUMBER: P916262

CATALOG NUMBER: DFN2DIP-HX3F0-070D050US930-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2220.6 | 2220.6 | 2220.6 | 2220.6 | 2220.6 |
| 2.5°   | 2233.6 | 2222.9 | 2199.3 | 2220.6 | 2216.6 |
| 5°     | 2220.6 | 2212.3 | 2188.7 | 2205.7 | 2201.6 |
| 7.5°   | 2205.7 | 2193.0 | 2169.4 | 2186.7 | 2182.4 |
| 10°    | 2182.4 | 2167.4 | 2141.8 | 2158.8 | 2152.5 |
| 12.5°  | 2150.2 | 2137.5 | 2111.9 | 2122.5 | 2118.2 |
| 15°    | 2114.0 | 2101.3 | 2073.4 | 2082.0 | 2071.3 |
| 17.5°  | 2069.1 | 2056.4 | 2028.5 | 2039.2 | 2028.5 |
| 20°    | 2019.9 | 2007.3 | 1977.3 | 1983.7 | 1975.3 |
| 22.5°  | 1971.0 | 1951.7 | 1923.9 | 1923.9 | 1919.5 |
| 25°    | 1913.3 | 1896.2 | 1860.0 | 1864.1 | 1860.0 |
| 27.5°  | 1849.1 | 1834.2 | 1806.5 | 1800.2 | 1789.5 |
| 30°    | 1785.3 | 1768.0 | 1736.1 | 1729.7 | 1721.1 |
| 32.5°  | 1716.8 | 1704.1 | 1669.9 | 1657.0 | 1648.4 |
| 35°    | 1650.7 | 1629.4 | 1595.1 | 1582.2 | 1571.6 |
| 37.5°  | 1575.9 | 1556.6 | 1522.4 | 1507.5 | 1496.8 |
| 40°    | 1499.1 | 1481.9 | 1447.6 | 1428.6 | 1420.0 |
| 42.5°  | 1424.3 | 1407.1 | 1373.1 | 1351.6 | 1338.9 |
| 45°    | 1343.2 | 1328.3 | 1296.1 | 1272.8 | 1264.1 |
| 47.5°  | 1264.1 | 1249.2 | 1215.0 | 1191.4 | 1178.8 |
| 50°    | 1180.8 | 1170.1 | 1140.2 | 1110.4 | 1099.7 |
| 52.5°  | 1099.7 | 1084.8 | 1057.1 | 1033.6 | 1018.6 |
| 55°    | 1016.5 | 1003.6 | 978.0  | 952.4  | 941.8  |
| 57.5°  | 933.2  | 922.5  | 894.6  | 869.0  | 860.5  |
| 60°    | 849.8  | 841.4  | 811.5  | 788.0  | 781.6  |
| 62.5°  | 768.7  | 753.7  | 732.5  | 711.2  | 702.5  |
| 65°    | 685.6  | 672.6  | 651.3  | 632.1  | 621.4  |
| 67.5°  | 600.1  | 589.3  | 570.2  | 555.3  | 546.7  |
| 70°    | 521.1  | 512.5  | 493.2  | 478.3  | 469.9  |
| 72.5°  | 439.9  | 431.4  | 420.7  | 405.8  | 399.4  |
| 75°    | 358.6  | 354.6  | 343.6  | 331.0  | 335.3  |
| 77.5°  | 286.2  | 277.5  | 273.2  | 266.8  | 260.6  |
| 80°    | 213.6  | 211.4  | 207.1  | 200.7  | 196.4  |
| 82.5°  | 145.2  | 145.2  | 143.2  | 134.6  | 134.6  |
| 85°    | 87.5   | 85.4   | 83.4   | 76.8   | 74.8   |
| 87.5°  | 38.5   | 34.2   | 29.9   | 23.6   | 21.3   |
| 90°    | 1.1    | 14.0   | 38.1   | 35.8   | 36.9   |
| 92.5°  | 24.1   | 32.6   | 33.8   | 35.0   | 35.0   |
| 95°    | 56.7   | 67.7   | 69.5   | 69.5   | 67.7   |
| 97.5°  | 94.4   | 104.5  | 108.8  | 108.8  | 108.8  |
| 100°   | 137.9  | 146.9  | 150.0  | 150.0  | 148.9  |
| 102.5° | 183.8  | 190.5  | 194.7  | 195.9  | 194.7  |
| 105°   | 234.0  | 237.1  | 239.5  | 241.3  | 241.3  |
| 107.5° | 283.7  | 288.4  | 288.4  | 289.2  | 283.7  |
| 110°   | 331.9  | 338.2  | 338.2  | 338.2  | 335.0  |

TEST NUMBER: P916262

CATALOG NUMBER: DFN2DIP-HX3F0-070D050US930-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 384.0  | 390.6  | 389.5  | 386.4  | 384.0  |
| 115°   | 435.3  | 441.6  | 439.6  | 438.5  | 435.3  |
| 117.5° | 486.2  | 494.8  | 489.3  | 486.2  | 483.1  |
| 120°   | 537.5  | 546.1  | 537.5  | 537.5  | 534.0  |
| 122.5° | 584.2  | 595.1  | 589.6  | 586.5  | 584.2  |
| 125°   | 633.2  | 642.9  | 639.8  | 636.3  | 635.1  |
| 127.5° | 680.9  | 693.0  | 688.8  | 684.0  | 680.9  |
| 130°   | 725.7  | 739.6  | 737.7  | 735.4  | 731.1  |
| 132.5° | 775.8  | 786.7  | 787.5  | 782.0  | 778.9  |
| 135°   | 819.0  | 831.0  | 833.3  | 832.2  | 829.1  |
| 137.5° | 867.2  | 876.9  | 878.8  | 878.0  | 873.3  |
| 140°   | 909.5  | 919.2  | 924.6  | 924.6  | 920.4  |
| 142.5° | 953.0  | 962.8  | 965.9  | 967.0  | 962.8  |
| 145°   | 994.3  | 1002.0 | 1008.2 | 1009.4 | 1005.1 |
| 147.5° | 1031.2 | 1040.9 | 1045.5 | 1047.5 | 1043.2 |
| 150°   | 1069.3 | 1075.9 | 1080.1 | 1083.6 | 1080.1 |
| 152.5° | 1103.1 | 1109.7 | 1115.1 | 1119.4 | 1115.1 |
| 155°   | 1136.9 | 1140.0 | 1143.5 | 1148.9 | 1145.4 |
| 157.5° | 1166.0 | 1168.3 | 1170.3 | 1178.1 | 1172.6 |
| 160°   | 1192.0 | 1194.4 | 1195.6 | 1202.2 | 1197.5 |
| 162.5° | 1216.2 | 1216.2 | 1217.3 | 1224.7 | 1219.3 |
| 165°   | 1236.8 | 1235.6 | 1235.6 | 1243.4 | 1237.9 |
| 167.5° | 1255.4 | 1251.9 | 1251.9 | 1259.7 | 1254.3 |
| 170°   | 1269.4 | 1266.3 | 1265.2 | 1272.9 | 1266.3 |
| 172.5° | 1279.1 | 1276.0 | 1274.9 | 1282.6 | 1276.0 |
| 175°   | 1286.9 | 1283.8 | 1281.5 | 1289.2 | 1282.6 |
| 177.5° | 1291.2 | 1288.1 | 1285.7 | 1292.3 | 1285.7 |
| 180°   | 1289.2 | 1289.2 | 1289.2 | 1289.2 | 1289.2 |

TEST NUMBER: P916262

CATALOG NUMBER: DFN2DIP-HX3F0-070D050US930-FLLFLL

**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 | 11.47            | 12.44 | 12.33 | 13.32 | 14.43 | 11.04          | 12.01 | 11.90 | 12.89 | 14.00 |
|                 | 3H   | 13.13            | 14.01 | 14.00 | 14.89 | 16.02 | 12.66          | 13.54 | 13.53 | 14.42 | 15.55 |
|                 | 4H   | 13.72            | 14.54 | 14.61 | 15.44 | 16.58 | 13.25          | 14.08 | 14.14 | 14.97 | 16.11 |
|                 | 6H   | 14.12            | 14.88 | 15.02 | 15.78 | 16.93 | 13.65          | 14.41 | 14.55 | 15.31 | 16.46 |
|                 | 8H   | 14.23            | 14.95 | 15.13 | 15.87 | 17.02 | 13.76          | 14.48 | 14.66 | 15.40 | 16.55 |
|                 | 12H  | 14.27            | 14.96 | 15.18 | 15.88 | 17.05 | 13.80          | 14.49 | 14.71 | 15.40 | 16.58 |
| 4H              | 2H   | 11.94            | 12.77 | 12.83 | 13.66 | 14.80 | 11.60          | 12.43 | 12.49 | 13.32 | 14.46 |
|                 | 3H   | 13.81            | 14.50 | 14.71 | 15.42 | 16.58 | 13.42          | 14.11 | 14.32 | 15.03 | 16.19 |
|                 | 4H   | 14.52            | 15.15 | 15.44 | 16.07 | 17.25 | 14.12          | 14.75 | 15.03 | 15.67 | 16.85 |
|                 | 6H   | 15.04            | 15.58 | 15.96 | 16.52 | 17.71 | 14.63          | 15.18 | 15.56 | 16.12 | 17.30 |
|                 | 8H   | 15.19            | 15.69 | 16.12 | 16.63 | 17.83 | 14.78          | 15.29 | 15.71 | 16.22 | 17.42 |
|                 | 12H  | 15.26            | 15.72 | 16.21 | 16.67 | 17.88 | 14.85          | 15.30 | 15.79 | 16.26 | 17.46 |
| 8H              | 4H   | 14.73            | 15.23 | 15.65 | 16.17 | 17.37 | 14.37          | 14.88 | 15.30 | 15.81 | 17.01 |
|                 | 6H   | 15.35            | 15.77 | 16.31 | 16.75 | 17.95 | 14.99          | 15.41 | 15.95 | 16.39 | 17.59 |
|                 | 8H   | 15.57            | 15.94 | 16.53 | 16.91 | 18.12 | 15.20          | 15.58 | 16.17 | 16.55 | 17.76 |
|                 | 12H  | 15.70            | 16.03 | 16.67 | 16.99 | 18.25 | 15.32          | 15.65 | 16.29 | 16.61 | 17.87 |
| 12H             | 4H   | 14.72            | 15.17 | 15.66 | 16.13 | 17.33 | 14.37          | 14.82 | 15.32 | 15.78 | 16.98 |
|                 | 6H   | 15.38            | 15.75 | 16.35 | 16.72 | 17.94 | 15.03          | 15.41 | 16.00 | 16.38 | 17.59 |
|                 | 8H   | 15.62            | 15.95 | 16.59 | 16.91 | 18.18 | 15.27          | 15.60 | 16.24 | 16.56 | 17.82 |