

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: P924537

Luminaire Tested: DFN2DIP-HX4F0-050D080US950-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924537  
REPORT IS A COMBINATION OF REPORTS P899374 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-050D080US950-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

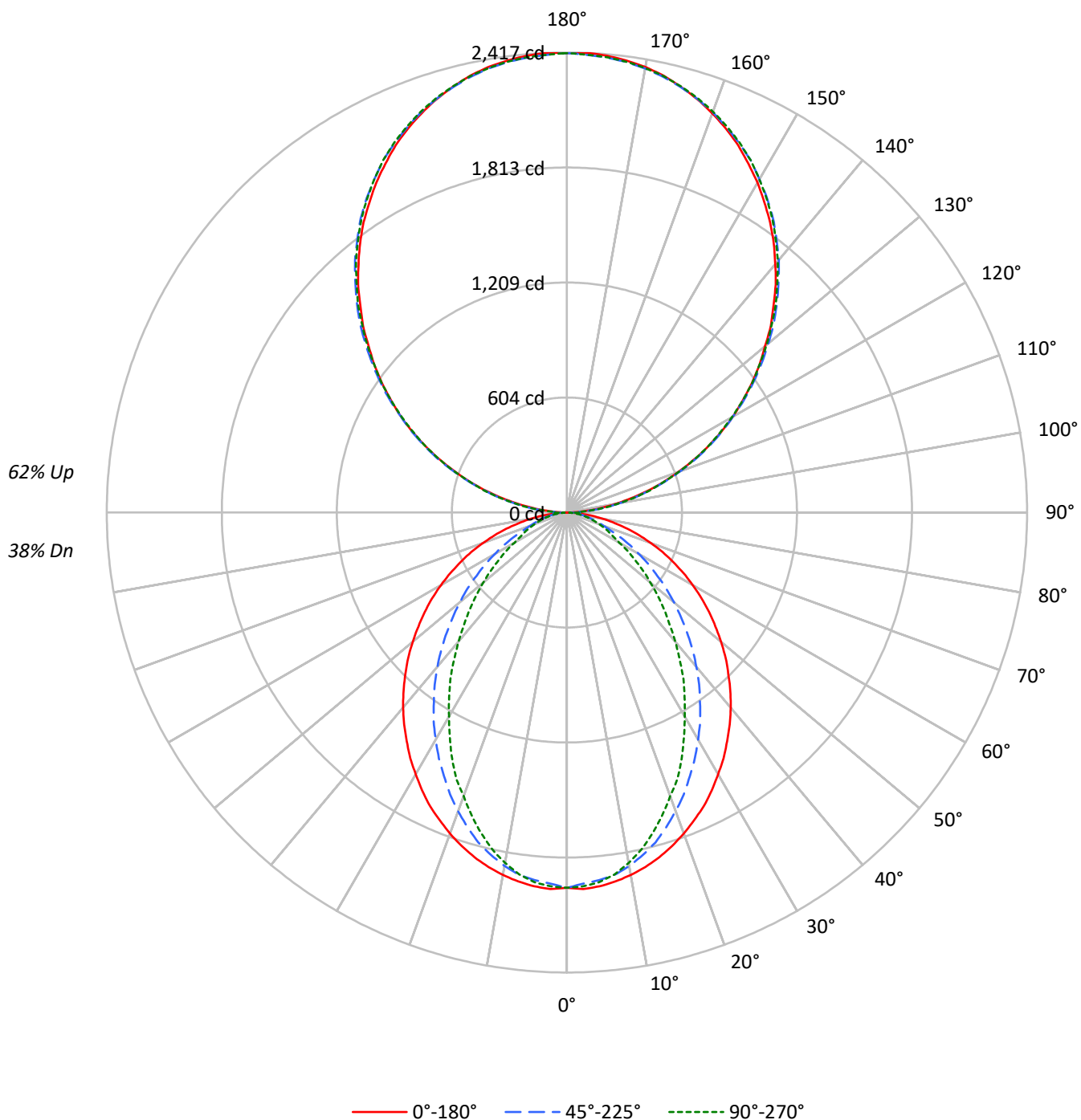
Lumens per Lamp: N/A  
Luminaire Lumens: 10808.9 lumens  
Efficiency: N/A  
Efficacy: 121.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 89  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P924537

CATALOG NUMBER: DFN2DIP-HX4F0-050D080US950-RLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P924537

CATALOG NUMBER: DFN2DIP-HX4F0-050D080US950-RLLFLL

**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   | 104 | 104 | 104 | 104 | 95 | 95 | 95 | 95 | 76 | 76 | 76 | 60 | 60 | 60 | 45 | 45 | 45 |
| 1   | 95  | 91  | 88  | 84  | 86 | 83 | 80 | 77 | 67 | 65 | 63 | 53 | 52 | 50 | 40 | 39 | 38 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 64 | 59 | 56 | 53 | 47 | 45 | 43 | 36 | 34 | 33 |
| 3   | 80  | 71  | 64  | 58  | 72 | 64 | 58 | 54 | 53 | 48 | 45 | 42 | 39 | 37 | 32 | 30 | 28 |
| 4   | 73  | 63  | 55  | 49  | 66 | 57 | 51 | 46 | 47 | 42 | 39 | 38 | 34 | 32 | 29 | 27 | 25 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 42 | 37 | 33 | 34 | 30 | 28 | 26 | 24 | 22 |
| 6   | 62  | 50  | 42  | 37  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 24 | 21 | 19 |
| 7   | 57  | 45  | 38  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 28 | 24 | 22 | 22 | 19 | 17 |
| 8   | 53  | 41  | 34  | 29  | 48 | 38 | 31 | 27 | 32 | 27 | 23 | 26 | 22 | 19 | 20 | 18 | 16 |
| 9   | 49  | 38  | 30  | 26  | 45 | 35 | 28 | 24 | 29 | 24 | 21 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 35  | 28  | 23  | 42 | 32 | 26 | 21 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1466 | 1466 | 1466 |
| 5°  | 1468 | 1443 | 1452 |
| 10° | 1454 | 1415 | 1405 |
| 15° | 1434 | 1368 | 1332 |
| 20° | 1408 | 1304 | 1242 |
| 25° | 1381 | 1232 | 1156 |
| 30° | 1344 | 1158 | 1046 |
| 35° | 1309 | 1078 | 950  |
| 40° | 1273 | 996  | 839  |
| 45° | 1231 | 904  | 739  |
| 50° | 1187 | 812  | 641  |
| 55° | 1142 | 714  | 547  |
| 60° | 1089 | 610  | 450  |
| 65° | 1029 | 506  | 405  |
| 70° | 956  | 408  | 367  |
| 75° | 864  | 360  | 334  |
| 80° | 731  | 303  | 290  |
| 85° | 511  | 203  | 219  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1822 cd/sqm

TEST NUMBER: P924537

CATALOG NUMBER: DFN2DIP-HX4F0-050D080US950-RLFL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 184.8   | 1.7       |
| 10°-20°   | 507.2   | 4.7       |
| 20°-30°   | 712.1   | 6.6       |
| 30°-40°   | 776.3   | 7.2       |
| 40°-50°   | 713.5   | 6.6       |
| 50°-60°   | 560.3   | 5.2       |
| 60°-70°   | 364.7   | 3.4       |
| 70°-80°   | 187.7   | 1.7       |
| 80°-90°   | 54.8    | 0.5       |
| 90°-100°  | 149.4   | 1.4       |
| 100°-110° | 474.6   | 4.4       |
| 110°-120° | 812.1   | 7.5       |
| 120°-130° | 1068.1  | 9.9       |
| 130°-140° | 1198.9  | 11.1      |
| 140°-150° | 1175.6  | 10.9      |
| 150°-160° | 986.2   | 9.1       |
| 160°-170° | 654.0   | 6.1       |
| 170°-180° | 228.6   | 2.1       |
| 0°-30°    | 1404.1  | 13.0      |
| 0°-40°    | 2180.4  | 20.2      |
| 0°-60°    | 3454.1  | 32.0      |
| 0°-90°    | 4061.4  | 37.6      |
| 90°-120°  | 1436.1  | 13.3      |
| 90°-150°  | 4878.6  | 45.1      |
| 90°-180°  | 6747.0  | 62.4      |
| 0°-180°   | 10808.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1971 | 1971  | 1971 | 1971  | 1971 |      |
| 5°   | 1971 | 1963  | 1939 | 1955  | 1950 | 187  |
| 15°  | 1875 | 1855  | 1795 | 1761  | 1743 | 528  |
| 25°  | 1702 | 1645  | 1527 | 1454  | 1427 | 783  |
| 35°  | 1467 | 1376  | 1219 | 1106  | 1067 | 918  |
| 45°  | 1199 | 1079  | 892  | 765   | 722  | 926  |
| 55°  | 912  | 772   | 580  | 473   | 439  | 815  |
| 65°  | 616  | 471   | 310  | 250   | 244  | 610  |
| 75°  | 328  | 203   | 143  | 130   | 128  | 347  |
| 85°  | 77   | 39    | 34   | 34    | 34   | 88   |
| 90°  | 2    | 26    | 71   | 67    | 69   | 11   |
| 95°  | 106  | 127   | 130  | 130   | 127  | 118  |
| 105° | 438  | 444   | 448  | 452   | 452  | 462  |
| 115° | 815  | 827   | 823  | 821   | 815  | 806  |
| 125° | 1185 | 1204  | 1198 | 1191  | 1189 | 1059 |
| 135° | 1533 | 1556  | 1560 | 1558  | 1552 | 1185 |
| 145° | 1861 | 1876  | 1888 | 1890  | 1882 | 1163 |
| 155° | 2128 | 2134  | 2141 | 2151  | 2144 | 980  |
| 165° | 2316 | 2313  | 2313 | 2328  | 2318 | 653  |
| 175° | 2409 | 2404  | 2399 | 2414  | 2401 | 229  |
| 180° | 2414 | 2414  | 2414 | 2414  | 2414 |      |

TEST NUMBER: P924537

CATALOG NUMBER: DFN2DIP-HX4F0-050D080US950-RLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1971.4 | 1971.4 | 1971.4 | 1971.4 | 1971.4 |
| 2.5°   | 1980.3 | 1971.4 | 1951.8 | 1969.7 | 1966.1 |
| 5°     | 1971.4 | 1962.6 | 1939.3 | 1955.3 | 1950.1 |
| 7.5°   | 1955.3 | 1944.7 | 1919.7 | 1926.8 | 1917.8 |
| 10°    | 1933.9 | 1921.5 | 1885.9 | 1880.4 | 1869.7 |
| 12.5°  | 1907.2 | 1891.2 | 1842.9 | 1832.3 | 1812.6 |
| 15°    | 1875.1 | 1855.4 | 1794.9 | 1761.0 | 1743.1 |
| 17.5°  | 1837.6 | 1809.1 | 1734.1 | 1694.9 | 1666.3 |
| 20°    | 1794.9 | 1759.1 | 1669.9 | 1625.4 | 1586.0 |
| 22.5°  | 1748.5 | 1707.4 | 1603.9 | 1543.3 | 1516.6 |
| 25°    | 1702.0 | 1644.9 | 1527.2 | 1454.1 | 1427.2 |
| 27.5°  | 1646.8 | 1586.0 | 1455.8 | 1371.9 | 1330.9 |
| 30°    | 1587.9 | 1520.0 | 1377.3 | 1286.4 | 1238.1 |
| 32.5°  | 1530.8 | 1448.6 | 1302.5 | 1195.4 | 1150.7 |
| 35°    | 1466.6 | 1375.6 | 1218.6 | 1106.2 | 1066.9 |
| 37.5°  | 1404.1 | 1305.9 | 1140.1 | 1016.9 | 972.4  |
| 40°    | 1338.1 | 1231.1 | 1057.9 | 931.3  | 884.9  |
| 42.5°  | 1270.3 | 1156.2 | 975.9  | 843.8  | 799.4  |
| 45°    | 1199.0 | 1079.4 | 892.1  | 765.3  | 722.5  |
| 47.5°  | 1131.2 | 1004.6 | 811.9  | 685.1  | 645.9  |
| 50°    | 1056.3 | 929.6  | 733.3  | 610.1  | 572.8  |
| 52.5°  | 983.0  | 849.2  | 658.4  | 540.6  | 506.8  |
| 55°    | 911.6  | 772.5  | 579.7  | 472.8  | 438.9  |
| 57.5°  | 838.6  | 695.8  | 510.3  | 410.4  | 381.8  |
| 60°    | 763.6  | 620.9  | 437.0  | 346.2  | 317.6  |
| 62.5°  | 690.5  | 547.8  | 374.6  | 289.1  | 274.8  |
| 65°    | 615.5  | 471.0  | 310.4  | 249.9  | 244.4  |
| 67.5°  | 544.2  | 399.6  | 249.9  | 219.4  | 214.1  |
| 70°    | 469.3  | 330.1  | 206.9  | 189.1  | 181.9  |
| 72.5°  | 397.9  | 265.8  | 173.1  | 158.8  | 155.2  |
| 75°    | 328.3  | 203.3  | 142.7  | 130.2  | 128.5  |
| 77.5°  | 258.7  | 144.4  | 112.5  | 105.2  | 101.6  |
| 80°    | 194.4  | 103.5  | 85.6   | 78.5   | 78.5   |
| 82.5°  | 135.6  | 69.6   | 58.9   | 55.2   | 55.2   |
| 85°    | 76.7   | 39.2   | 33.9   | 33.9   | 33.9   |
| 87.5°  | 28.6   | 14.2   | 14.2   | 12.5   | 12.5   |
| 90°    | 2.2    | 26.2   | 71.4   | 67.0   | 69.2   |
| 92.5°  | 45.1   | 61.2   | 63.3   | 65.4   | 65.4   |
| 95°    | 106.3  | 126.6  | 130.2  | 130.2  | 126.6  |
| 97.5°  | 176.9  | 195.8  | 203.8  | 203.8  | 203.8  |
| 100°   | 258.3  | 275.0  | 280.9  | 280.9  | 278.7  |
| 102.5° | 344.2  | 356.6  | 364.5  | 366.7  | 364.5  |
| 105°   | 438.1  | 443.9  | 448.3  | 451.9  | 451.9  |
| 107.5° | 531.2  | 540.0  | 540.0  | 541.4  | 531.2  |
| 110°   | 621.4  | 633.1  | 633.1  | 633.1  | 627.3  |

TEST NUMBER: P924537

CATALOG NUMBER: DFN2DIP-HX4F0-050D080US950-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 718.9  | 731.3  | 729.1  | 723.3  | 718.9  |
| 115°   | 815.0  | 826.6  | 823.0  | 820.8  | 815.0  |
| 117.5° | 910.3  | 926.3  | 916.1  | 910.3  | 904.5  |
| 120°   | 1006.4 | 1022.4 | 1006.4 | 1006.4 | 999.8  |
| 122.5° | 1093.7 | 1114.1 | 1103.9 | 1098.1 | 1093.7 |
| 125°   | 1185.3 | 1203.6 | 1197.7 | 1191.2 | 1189.1 |
| 127.5° | 1274.9 | 1297.4 | 1289.4 | 1280.7 | 1274.9 |
| 130°   | 1358.6 | 1384.7 | 1381.1 | 1376.8 | 1368.8 |
| 132.5° | 1452.5 | 1472.8 | 1474.3 | 1464.1 | 1458.3 |
| 135°   | 1533.2 | 1555.8 | 1560.2 | 1558.0 | 1552.2 |
| 137.5° | 1623.4 | 1641.6 | 1645.3 | 1643.8 | 1635.1 |
| 140°   | 1702.8 | 1720.9 | 1731.1 | 1731.1 | 1723.1 |
| 142.5° | 1784.3 | 1802.5 | 1808.3 | 1810.5 | 1802.5 |
| 145°   | 1861.4 | 1875.9 | 1887.6 | 1889.8 | 1881.8 |
| 147.5° | 1930.5 | 1948.7 | 1957.4 | 1961.1 | 1953.1 |
| 150°   | 2001.9 | 2014.2 | 2022.2 | 2028.8 | 2022.2 |
| 152.5° | 2065.1 | 2077.5 | 2087.7 | 2095.7 | 2087.7 |
| 155°   | 2128.5 | 2134.3 | 2140.9 | 2151.0 | 2144.5 |
| 157.5° | 2183.0 | 2187.4 | 2191.1 | 2205.6 | 2195.4 |
| 160°   | 2231.8 | 2236.2 | 2238.4 | 2250.7 | 2242.0 |
| 162.5° | 2276.9 | 2276.9 | 2279.1 | 2292.9 | 2282.7 |
| 165°   | 2315.5 | 2313.3 | 2313.3 | 2327.9 | 2317.6 |
| 167.5° | 2350.4 | 2343.9 | 2343.9 | 2358.4 | 2348.2 |
| 170°   | 2376.6 | 2370.8 | 2368.6 | 2383.2 | 2370.8 |
| 172.5° | 2394.8 | 2389.0 | 2386.8 | 2401.3 | 2389.0 |
| 175°   | 2409.3 | 2403.5 | 2399.1 | 2413.7 | 2401.3 |
| 177.5° | 2417.3 | 2411.5 | 2407.1 | 2419.5 | 2407.1 |
| 180°   | 2413.7 | 2413.7 | 2413.7 | 2413.7 | 2413.7 |

TEST NUMBER: P924537

CATALOG NUMBER: DFN2DIP-HX4F0-050D080US950-RLLFLL

**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 | 7.19             | 7.93  | 8.25  | 8.99  | 10.43 | 3.16           | 3.90 | 4.23 | 4.96 | 6.40 |
|                 | 3H   | 8.86             | 9.52  | 9.93  | 10.59 | 12.05 | 4.35           | 5.01 | 5.42 | 6.08 | 7.54 |
|                 | 4H   | 9.47             | 10.09 | 10.55 | 11.16 | 12.63 | 4.79           | 5.42 | 5.88 | 6.49 | 7.96 |
|                 | 6H   | 9.89             | 10.46 | 10.98 | 11.54 | 13.01 | 5.11           | 5.69 | 6.20 | 6.76 | 8.24 |
|                 | 8H   | 10.01            | 10.56 | 11.11 | 11.65 | 13.12 | 5.20           | 5.75 | 6.30 | 6.84 | 8.31 |
|                 | 12H  | 10.07            | 10.59 | 11.17 | 11.67 | 13.17 | 5.24           | 5.76 | 6.34 | 6.85 | 8.34 |
| 4H              | 2H   | 7.20             | 7.82  | 8.29  | 8.90  | 10.36 | 3.75           | 4.37 | 4.84 | 5.45 | 6.91 |
|                 | 3H   | 9.02             | 9.54  | 10.12 | 10.64 | 12.12 | 5.09           | 5.61 | 6.19 | 6.71 | 8.19 |
|                 | 4H   | 9.71             | 10.19 | 10.81 | 11.28 | 12.78 | 5.64           | 6.12 | 6.74 | 7.20 | 8.70 |
|                 | 6H   | 10.22            | 10.63 | 11.33 | 11.74 | 13.23 | 6.05           | 6.46 | 7.16 | 7.58 | 9.07 |
|                 | 8H   | 10.39            | 10.78 | 11.50 | 11.88 | 13.39 | 6.18           | 6.56 | 7.29 | 7.67 | 9.18 |
|                 | 12H  | 10.49            | 10.83 | 11.61 | 11.95 | 13.46 | 6.24           | 6.59 | 7.37 | 7.71 | 9.22 |
| 8H              | 4H   | 9.67             | 10.05 | 10.78 | 11.16 | 12.67 | 5.91           | 6.29 | 7.02 | 7.40 | 8.91 |
|                 | 6H   | 10.23            | 10.55 | 11.37 | 11.70 | 13.20 | 6.43           | 6.74 | 7.56 | 7.89 | 9.40 |
|                 | 8H   | 10.45            | 10.73 | 11.59 | 11.85 | 13.38 | 6.62           | 6.90 | 7.76 | 8.02 | 9.55 |
|                 | 12H  | 10.59            | 10.83 | 11.73 | 11.95 | 13.51 | 6.74           | 6.98 | 7.88 | 8.10 | 9.66 |
| 12H             | 4H   | 9.62             | 9.96  | 10.74 | 11.08 | 12.59 | 5.91           | 6.26 | 7.04 | 7.38 | 8.89 |
|                 | 6H   | 10.21            | 10.49 | 11.35 | 11.61 | 13.14 | 6.48           | 6.75 | 7.61 | 7.88 | 9.41 |
|                 | 8H   | 10.43            | 10.67 | 11.57 | 11.79 | 13.36 | 6.69           | 6.93 | 7.83 | 8.05 | 9.61 |