

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: P902635

Luminaire Tested: DFN2DIP-HX3F0-070D080US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902635  
REPORT IS A COMBINATION OF REPORTS P899280 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-070D080US830-RLLFLL  
Description: 3 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

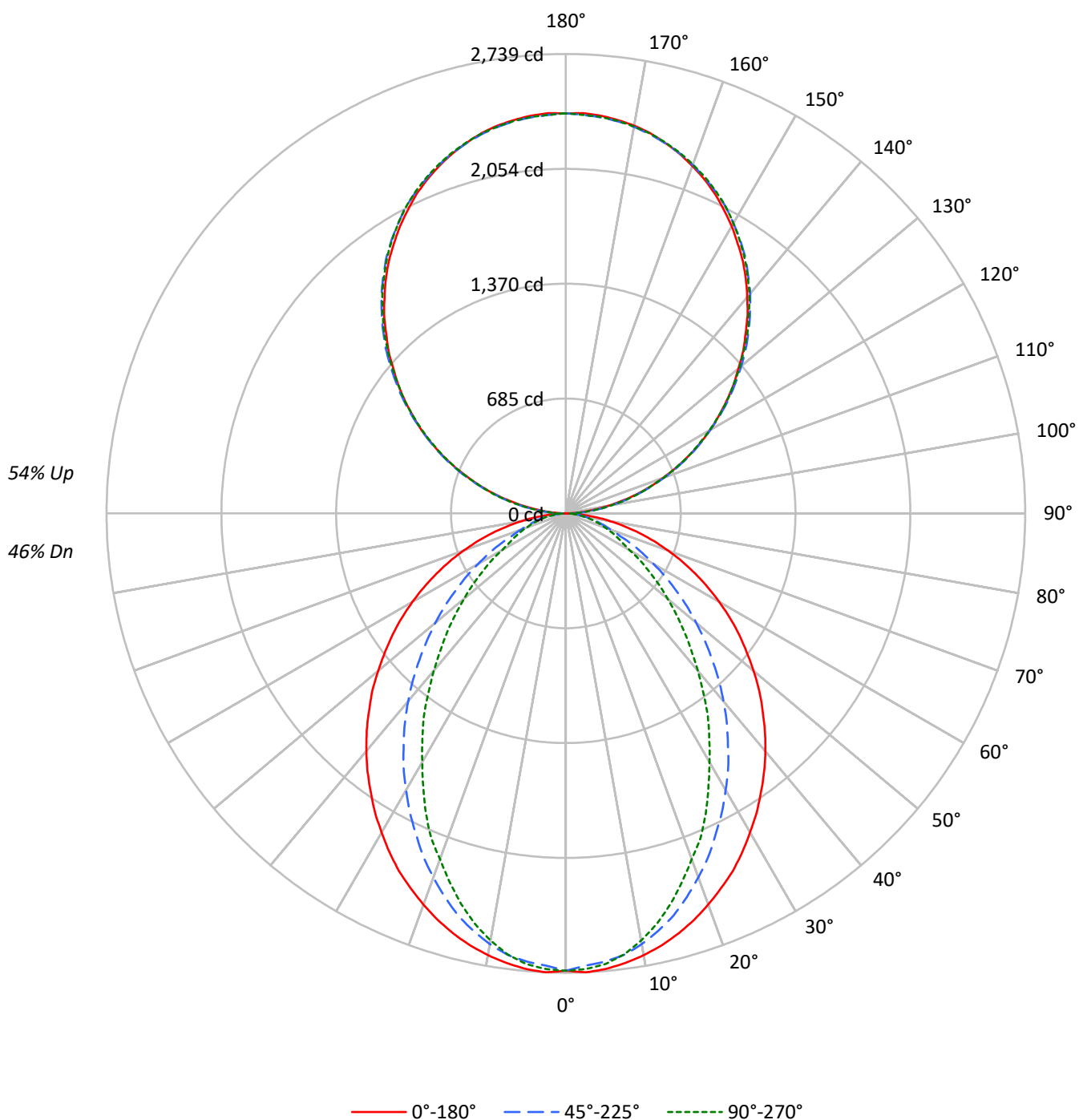
Lumens per Lamp: N/A  
Luminaire Lumens: 12281.3 lumens  
Efficiency: N/A  
Efficacy: 94.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 130.5  
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



TEST NUMBER: P902635

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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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 81 | 81 | 81 | 66 | 66 | 66 | 52 | 52 | 52 |
| 1   | 97  | 93  | 89  | 86  | 89 | 86 | 82 | 80 | 72 | 69 | 67 | 59 | 57 | 56 | 47 | 46 | 45 |
| 2   | 89  | 82  | 76  | 71  | 81 | 75 | 70 | 66 | 63 | 60 | 56 | 52 | 49 | 47 | 42 | 40 | 38 |
| 3   | 81  | 72  | 65  | 60  | 74 | 67 | 61 | 56 | 56 | 52 | 48 | 46 | 43 | 40 | 37 | 35 | 33 |
| 4   | 75  | 64  | 57  | 51  | 68 | 59 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 |
| 5   | 69  | 57  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 59  | 47  | 39  | 34  | 54 | 43 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 20 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 18 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 26 | 22 | 20 | 22 | 19 | 17 |
| 10  | 47  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 24 | 20 | 18 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3159 | 3159 | 3159 |
| 5°  | 3162 | 3106 | 3127 |
| 10° | 3130 | 3043 | 3023 |
| 15° | 3085 | 2941 | 2864 |
| 20° | 3027 | 2800 | 2670 |
| 25° | 2967 | 2642 | 2482 |
| 30° | 2887 | 2481 | 2245 |
| 35° | 2808 | 2308 | 2036 |
| 40° | 2729 | 2130 | 1798 |
| 45° | 2636 | 1932 | 1581 |
| 50° | 2540 | 1732 | 1370 |
| 55° | 2440 | 1519 | 1167 |
| 60° | 2324 | 1296 | 959  |
| 65° | 2190 | 1070 | 861  |
| 70° | 2028 | 859  | 777  |
| 75° | 1824 | 753  | 703  |
| 80° | 1529 | 625  | 604  |
| 85° | 1044 | 406  | 443  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2636 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 255.6   | 2.1       |
| 10°-20°   | 701.6   | 5.7       |
| 20°-30°   | 985.0   | 8.0       |
| 30°-40°   | 1073.7  | 8.7       |
| 40°-50°   | 986.9   | 8.0       |
| 50°-60°   | 775.0   | 6.3       |
| 60°-70°   | 504.5   | 4.1       |
| 70°-80°   | 259.7   | 2.1       |
| 80°-90°   | 73.0    | 0.6       |
| 90°-100°  | 147.6   | 1.2       |
| 100°-110° | 468.9   | 3.8       |
| 110°-120° | 802.4   | 6.5       |
| 120°-130° | 1055.3  | 8.6       |
| 130°-140° | 1184.5  | 9.6       |
| 140°-150° | 1161.5  | 9.5       |
| 150°-160° | 974.4   | 7.9       |
| 160°-170° | 646.2   | 5.3       |
| 170°-180° | 225.9   | 1.8       |
| 0°-30°    | 1942.1  | 15.8      |
| 0°-40°    | 3015.8  | 24.6      |
| 0°-60°    | 4777.7  | 38.9      |
| 0°-90°    | 5614.9  | 45.7      |
| 90°-120°  | 1418.8  | 11.6      |
| 90°-150°  | 4820.1  | 39.2      |
| 90°-180°  | 6666.0  | 54.3      |
| 0°-180°   | 12281.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2727 | 2727  | 2727 | 2727  | 2727 |      |
| 5°   | 2727 | 2714  | 2682 | 2705  | 2697 | 259  |
| 15°  | 2594 | 2566  | 2483 | 2436  | 2411 | 731  |
| 25°  | 2354 | 2275  | 2112 | 2011  | 1974 | 1083 |
| 35°  | 2028 | 1903  | 1686 | 1530  | 1476 | 1270 |
| 45°  | 1658 | 1493  | 1234 | 1059  | 999  | 1281 |
| 55°  | 1261 | 1068  | 802  | 654   | 607  | 1127 |
| 65°  | 851  | 651   | 429  | 346   | 338  | 844  |
| 75°  | 454  | 281   | 197  | 180   | 178  | 480  |
| 85°  | 106  | 54    | 47   | 47    | 47   | 122  |
| 90°  | 2    | 26    | 70   | 66    | 68   | 12   |
| 95°  | 105  | 125   | 129  | 129   | 125  | 117  |
| 105° | 433  | 439   | 443  | 446   | 446  | 457  |
| 115° | 805  | 817   | 813  | 811   | 805  | 796  |
| 125° | 1171 | 1189  | 1183 | 1177  | 1175 | 1047 |
| 135° | 1515 | 1537  | 1541 | 1539  | 1534 | 1171 |
| 145° | 1839 | 1853  | 1865 | 1867  | 1859 | 1149 |
| 155° | 2103 | 2109  | 2115 | 2125  | 2119 | 968  |
| 165° | 2288 | 2286  | 2286 | 2300  | 2290 | 645  |
| 175° | 2380 | 2375  | 2370 | 2385  | 2372 | 226  |
| 180° | 2385 | 2385  | 2385 | 2385  | 2385 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2726.9 | 2726.9 | 2726.9 | 2726.9 | 2726.9 |
| 2.5°   | 2739.1 | 2726.9 | 2699.6 | 2724.5 | 2719.5 |
| 5°     | 2726.9 | 2714.5 | 2682.4 | 2704.6 | 2697.3 |
| 7.5°   | 2704.6 | 2689.9 | 2655.4 | 2665.0 | 2652.8 |
| 10°    | 2675.0 | 2657.8 | 2608.5 | 2600.9 | 2586.2 |
| 12.5°  | 2638.1 | 2615.8 | 2549.1 | 2534.4 | 2507.2 |
| 15°    | 2593.6 | 2566.4 | 2482.6 | 2435.7 | 2411.1 |
| 17.5°  | 2541.8 | 2502.3 | 2398.6 | 2344.3 | 2304.8 |
| 20°    | 2482.6 | 2433.1 | 2309.8 | 2248.2 | 2193.8 |
| 22.5°  | 2418.5 | 2361.6 | 2218.4 | 2134.6 | 2097.7 |
| 25°    | 2354.3 | 2275.2 | 2112.3 | 2011.3 | 1974.2 |
| 27.5°  | 2277.8 | 2193.8 | 2013.6 | 1897.7 | 1840.9 |
| 30°    | 2196.4 | 2102.4 | 1905.0 | 1779.3 | 1712.6 |
| 32.5°  | 2117.3 | 2003.8 | 1801.6 | 1653.4 | 1591.6 |
| 35°    | 2028.5 | 1902.6 | 1685.6 | 1530.1 | 1475.6 |
| 37.5°  | 1942.2 | 1806.3 | 1577.0 | 1406.5 | 1345.0 |
| 40°    | 1850.8 | 1702.9 | 1463.3 | 1288.2 | 1224.0 |
| 42.5°  | 1757.1 | 1599.2 | 1349.9 | 1167.2 | 1105.7 |
| 45°    | 1658.4 | 1492.9 | 1234.0 | 1058.6 | 999.4  |
| 47.5°  | 1564.6 | 1389.5 | 1122.9 | 947.5  | 893.3  |
| 50°    | 1460.9 | 1285.8 | 1014.3 | 843.9  | 792.3  |
| 52.5°  | 1359.6 | 1174.5 | 910.6  | 747.7  | 700.9  |
| 55°    | 1260.9 | 1068.5 | 801.9  | 654.0  | 607.2  |
| 57.5°  | 1159.9 | 962.4  | 705.9  | 567.6  | 528.1  |
| 60°    | 1056.2 | 858.8  | 604.5  | 478.9  | 439.3  |
| 62.5°  | 955.1  | 757.7  | 518.1  | 399.8  | 380.1  |
| 65°    | 851.4  | 651.4  | 429.4  | 345.6  | 338.0  |
| 67.5°  | 752.7  | 552.7  | 345.6  | 303.4  | 296.1  |
| 70°    | 649.0  | 456.6  | 286.2  | 261.6  | 251.6  |
| 72.5°  | 550.4  | 367.6  | 239.3  | 219.7  | 214.7  |
| 75°    | 454.0  | 281.2  | 197.4  | 180.1  | 177.8  |
| 77.5°  | 357.9  | 199.7  | 155.5  | 145.5  | 140.6  |
| 80°    | 268.9  | 143.2  | 118.4  | 108.7  | 108.7  |
| 82.5°  | 187.5  | 96.3   | 81.4   | 76.4   | 76.4   |
| 85°    | 106.0  | 54.2   | 46.8   | 46.8   | 46.8   |
| 87.5°  | 39.5   | 19.6   | 19.6   | 17.2   | 17.2   |
| 90°    | 2.2    | 25.9   | 70.5   | 66.2   | 68.3   |
| 92.5°  | 44.6   | 60.4   | 62.6   | 64.7   | 64.7   |
| 95°    | 105.0  | 125.1  | 128.7  | 128.7  | 125.1  |
| 97.5°  | 174.7  | 193.4  | 201.3  | 201.3  | 201.3  |
| 100°   | 255.2  | 271.7  | 277.5  | 277.5  | 275.3  |
| 102.5° | 340.1  | 352.3  | 360.1  | 362.3  | 360.1  |
| 105°   | 432.8  | 438.6  | 442.9  | 446.5  | 446.5  |
| 107.5° | 524.8  | 533.5  | 533.5  | 534.9  | 524.8  |
| 110°   | 614.0  | 625.5  | 625.5  | 625.5  | 619.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 710.3  | 722.6  | 720.4  | 714.6  | 710.3  |
| 115°   | 805.2  | 816.7  | 813.1  | 811.0  | 805.2  |
| 117.5° | 899.4  | 915.2  | 905.1  | 899.4  | 893.6  |
| 120°   | 994.3  | 1010.1 | 994.3  | 994.3  | 987.8  |
| 122.5° | 1080.5 | 1100.7 | 1090.6 | 1084.9 | 1080.5 |
| 125°   | 1171.1 | 1189.1 | 1183.4 | 1176.9 | 1174.8 |
| 127.5° | 1259.6 | 1281.9 | 1273.9 | 1265.4 | 1259.6 |
| 130°   | 1342.3 | 1368.1 | 1364.5 | 1360.3 | 1352.4 |
| 132.5° | 1435.0 | 1455.1 | 1456.6 | 1446.5 | 1440.8 |
| 135°   | 1514.8 | 1537.1 | 1541.4 | 1539.3 | 1533.5 |
| 137.5° | 1603.9 | 1621.9 | 1625.5 | 1624.1 | 1615.4 |
| 140°   | 1682.3 | 1700.3 | 1710.3 | 1710.3 | 1702.4 |
| 142.5° | 1762.8 | 1780.8 | 1786.6 | 1788.8 | 1780.8 |
| 145°   | 1839.1 | 1853.4 | 1864.9 | 1867.1 | 1859.2 |
| 147.5° | 1907.3 | 1925.3 | 1933.9 | 1937.6 | 1929.7 |
| 150°   | 1977.8 | 1990.0 | 1997.9 | 2004.4 | 1997.9 |
| 152.5° | 2040.3 | 2052.6 | 2062.7 | 2070.6 | 2062.7 |
| 155°   | 2102.9 | 2108.7 | 2115.2 | 2125.2 | 2118.7 |
| 157.5° | 2156.8 | 2161.2 | 2164.7 | 2179.1 | 2169.1 |
| 160°   | 2205.0 | 2209.3 | 2211.5 | 2223.6 | 2215.1 |
| 162.5° | 2249.6 | 2249.6 | 2251.7 | 2265.4 | 2255.3 |
| 165°   | 2287.6 | 2285.5 | 2285.5 | 2299.9 | 2289.8 |
| 167.5° | 2322.1 | 2315.7 | 2315.7 | 2330.1 | 2320.0 |
| 170°   | 2348.1 | 2342.3 | 2340.1 | 2354.6 | 2342.3 |
| 172.5° | 2366.1 | 2360.3 | 2358.1 | 2372.5 | 2360.3 |
| 175°   | 2380.4 | 2374.6 | 2370.3 | 2384.7 | 2372.5 |
| 177.5° | 2388.3 | 2382.6 | 2378.2 | 2390.5 | 2378.2 |
| 180°   | 2384.7 | 2384.7 | 2384.7 | 2384.7 | 2384.7 |

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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 | 10.68            | 11.48 | 11.68 | 12.49 | 13.82 | 6.66           | 7.46  | 7.66  | 8.46  | 9.80  |
|                 | 3H   | 12.35            | 13.06 | 13.36 | 14.08 | 15.43 | 7.84           | 8.55  | 8.85  | 9.57  | 10.92 |
|                 | 4H   | 12.95            | 13.63 | 13.98 | 14.64 | 16.01 | 8.29           | 8.96  | 9.31  | 9.98  | 11.34 |
|                 | 6H   | 13.37            | 13.99 | 14.40 | 15.01 | 16.38 | 8.60           | 9.22  | 9.64  | 10.25 | 11.62 |
|                 | 8H   | 13.49            | 14.08 | 14.53 | 15.12 | 16.49 | 8.69           | 9.28  | 9.73  | 10.32 | 11.69 |
|                 | 12H  | 13.55            | 14.11 | 14.59 | 15.14 | 16.53 | 8.73           | 9.29  | 9.77  | 10.32 | 11.72 |
| 4H              | 2H   | 10.70            | 11.37 | 11.73 | 12.39 | 13.75 | 7.25           | 7.92  | 8.28  | 8.94  | 10.30 |
|                 | 3H   | 12.51            | 13.07 | 13.55 | 14.12 | 15.50 | 8.59           | 9.15  | 9.63  | 10.20 | 11.57 |
|                 | 4H   | 13.20            | 13.71 | 14.24 | 14.75 | 16.15 | 9.13           | 9.64  | 10.18 | 10.68 | 12.08 |
|                 | 6H   | 13.70            | 14.14 | 14.76 | 15.21 | 16.60 | 9.54           | 9.98  | 10.60 | 11.05 | 12.44 |
|                 | 8H   | 13.88            | 14.29 | 14.93 | 15.34 | 16.75 | 9.67           | 10.08 | 10.72 | 11.13 | 12.54 |
|                 | 12H  | 13.96            | 14.33 | 15.04 | 15.40 | 16.82 | 9.73           | 10.10 | 10.80 | 11.17 | 12.58 |
| 8H              | 4H   | 13.16            | 13.57 | 14.22 | 14.63 | 16.04 | 9.40           | 9.82  | 10.46 | 10.87 | 12.28 |
|                 | 6H   | 13.72            | 14.06 | 14.80 | 15.15 | 16.56 | 9.92           | 10.25 | 10.99 | 11.35 | 12.76 |
|                 | 8H   | 13.93            | 14.23 | 15.02 | 15.31 | 16.73 | 10.10          | 10.40 | 11.19 | 11.48 | 12.91 |
|                 | 12H  | 14.06            | 14.32 | 15.15 | 15.40 | 16.87 | 10.22          | 10.48 | 11.30 | 11.55 | 13.02 |
| 12H             | 4H   | 13.11            | 13.48 | 14.19 | 14.55 | 15.97 | 9.41           | 9.78  | 10.48 | 10.85 | 12.26 |
|                 | 6H   | 13.69            | 13.99 | 14.78 | 15.07 | 16.50 | 9.96           | 10.26 | 11.05 | 11.34 | 12.77 |
|                 | 8H   | 13.91            | 14.17 | 15.00 | 15.24 | 16.71 | 10.17          | 10.43 | 11.25 | 11.50 | 12.97 |