

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: P904015

Luminaire Tested: DFN2DIP-SQ4F0-080D070US830-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904015  
REPORT IS A COMBINATION OF REPORTS P901602 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-080D070US830-RLLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

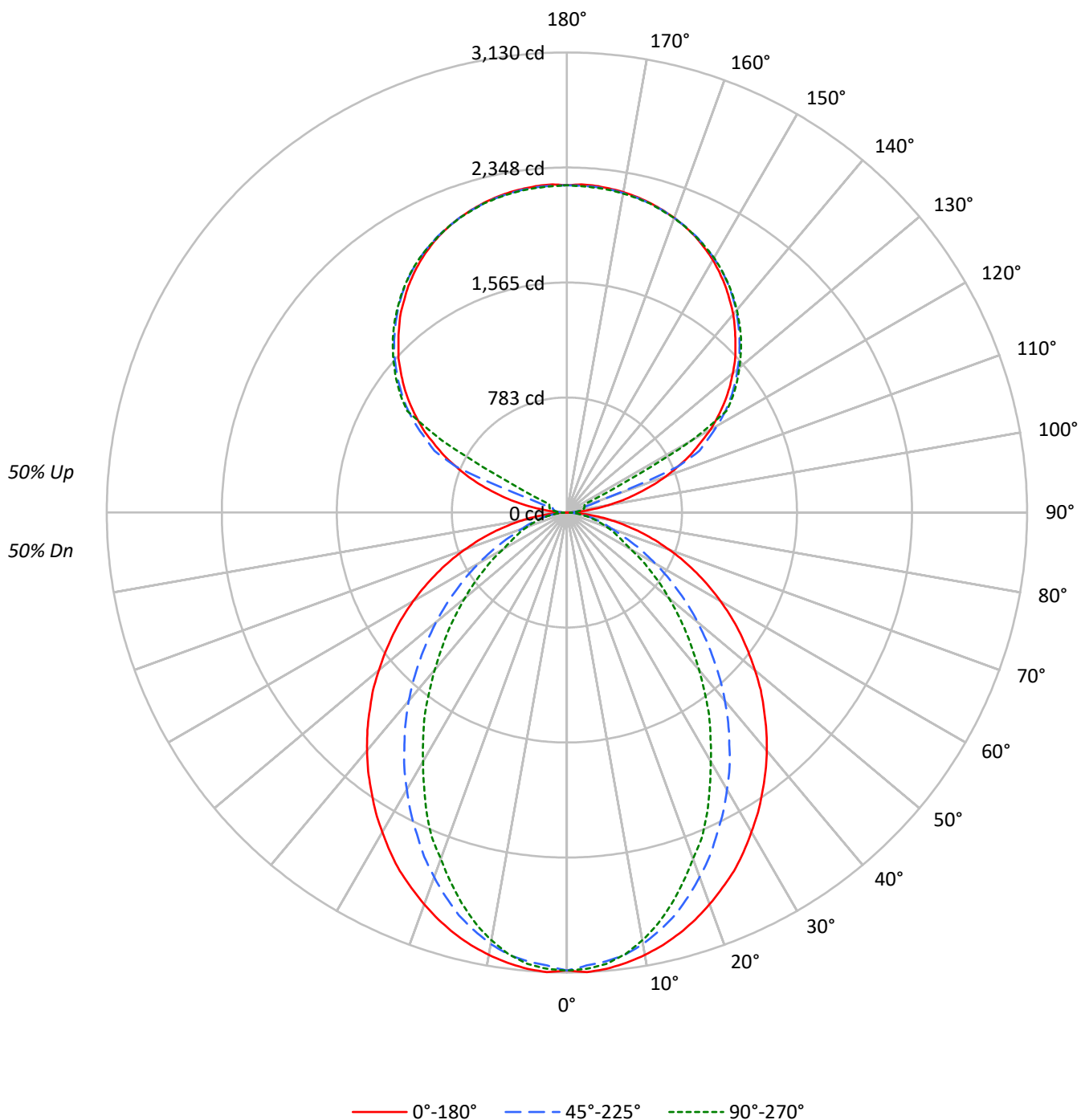
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12941.1 lumens  
Efficiency: N/A  
Efficacy: 104.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 123.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
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 |    |    |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 | 56 | 56 | 50 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 84 | 81 | 74 | 71 | 69 | 61 | 60 | 58 | 50 | 49 | 48 | 48 | 48 | 43 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 71 | 67 | 65 | 61 | 58 | 54 | 52 | 49 | 45 | 43 | 41 | 41 | 41 | 37 |
| 3   | 82  | 73  | 66  | 60  | 76 | 68 | 62 | 57 | 58 | 53 | 49 | 49 | 45 | 42 | 40 | 38 | 36 | 36 | 36 | 32 |
| 4   | 75  | 65  | 57  | 52  | 69 | 60 | 54 | 48 | 52 | 47 | 42 | 44 | 40 | 37 | 36 | 33 | 31 | 31 | 31 | 27 |
| 5   | 69  | 58  | 50  | 44  | 64 | 54 | 47 | 42 | 46 | 41 | 37 | 39 | 35 | 32 | 33 | 30 | 27 | 27 | 27 | 24 |
| 6   | 64  | 52  | 44  | 39  | 59 | 49 | 42 | 37 | 42 | 37 | 32 | 36 | 32 | 28 | 30 | 27 | 24 | 24 | 24 | 21 |
| 7   | 59  | 47  | 40  | 34  | 55 | 44 | 37 | 32 | 38 | 33 | 29 | 33 | 28 | 25 | 27 | 24 | 22 | 22 | 22 | 19 |
| 8   | 55  | 43  | 36  | 30  | 51 | 40 | 34 | 29 | 35 | 30 | 26 | 30 | 26 | 23 | 25 | 22 | 20 | 20 | 20 | 17 |
| 9   | 51  | 39  | 32  | 27  | 48 | 37 | 30 | 26 | 32 | 27 | 23 | 28 | 23 | 21 | 23 | 20 | 18 | 18 | 18 | 16 |
| 10  | 48  | 36  | 29  | 25  | 45 | 34 | 28 | 23 | 30 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 16 | 16 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2187 | 2187 | 2187 |
| 5°  | 2190 | 2152 | 2166 |
| 10° | 2168 | 2111 | 2097 |
| 15° | 2139 | 2041 | 1988 |
| 20° | 2099 | 1946 | 1855 |
| 25° | 2059 | 1838 | 1726 |
| 30° | 2004 | 1728 | 1563 |
| 35° | 1951 | 1609 | 1419 |
| 40° | 1897 | 1487 | 1254 |
| 45° | 1834 | 1351 | 1105 |
| 50° | 1769 | 1213 | 959  |
| 55° | 1701 | 1066 | 819  |
| 60° | 1622 | 913  | 675  |
| 65° | 1532 | 756  | 608  |
| 70° | 1422 | 611  | 551  |
| 75° | 1284 | 539  | 503  |
| 80° | 1085 | 454  | 438  |
| 85° | 755  | 305  | 333  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1834 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 292.1   | 2.3       |
| 10°-20°   | 801.8   | 6.2       |
| 20°-30°   | 1125.7  | 8.7       |
| 30°-40°   | 1227.1  | 9.5       |
| 40°-50°   | 1127.8  | 8.7       |
| 50°-60°   | 885.7   | 6.8       |
| 60°-70°   | 576.5   | 4.5       |
| 70°-80°   | 296.8   | 2.3       |
| 80°-90°   | 79.7    | 0.6       |
| 90°-100°  | 73.4    | 0.6       |
| 100°-110° | 273.7   | 2.1       |
| 110°-120° | 725.9   | 5.6       |
| 120°-130° | 1204.0  | 9.3       |
| 130°-140° | 1278.9  | 9.9       |
| 140°-150° | 1188.6  | 9.2       |
| 150°-160° | 955.6   | 7.4       |
| 160°-170° | 615.8   | 4.8       |
| 170°-180° | 211.9   | 1.6       |
| 0°-30°    | 2219.6  | 17.2      |
| 0°-40°    | 3446.7  | 26.6      |
| 0°-60°    | 5460.2  | 42.2      |
| 0°-90°    | 6413.2  | 49.6      |
| 90°-120°  | 1073.0  | 8.3       |
| 90°-150°  | 4744.6  | 36.7      |
| 90°-180°  | 6528.0  | 50.4      |
| 0°-180°   | 12941.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3116 | 3116  | 3116 | 3116  | 3116 |      |
| 5°   | 3116 | 3102  | 3066 | 3091  | 3083 | 296  |
| 15°  | 2964 | 2933  | 2837 | 2784  | 2756 | 835  |
| 25°  | 2691 | 2600  | 2414 | 2299  | 2256 | 1237 |
| 35°  | 2318 | 2174  | 1926 | 1749  | 1686 | 1451 |
| 45°  | 1895 | 1706  | 1410 | 1210  | 1142 | 1464 |
| 55°  | 1441 | 1221  | 916  | 747   | 694  | 1288 |
| 65°  | 973  | 744   | 491  | 395   | 386  | 965  |
| 75°  | 519  | 321   | 226  | 206   | 203  | 549  |
| 85°  | 121  | 62    | 54   | 54    | 54   | 139  |
| 90°  | 2    | 19    | 32   | 40    | 44   | 12   |
| 95°  | 105  | 52    | 63   | 71    | 69   | 124  |
| 105° | 490  | 538   | 98   | 116   | 122  | 523  |
| 115° | 926  | 954   | 994  | 248   | 132  | 912  |
| 125° | 1310 | 1331  | 1362 | 1373  | 1378 | 1168 |
| 135° | 1621 | 1647  | 1661 | 1677  | 1674 | 1252 |
| 145° | 1880 | 1879  | 1906 | 1917  | 1909 | 1176 |
| 155° | 2070 | 2056  | 2075 | 2085  | 2072 | 954  |
| 165° | 2182 | 2172  | 2177 | 2188  | 2177 | 616  |
| 175° | 2232 | 2220  | 2224 | 2235  | 2219 | 212  |
| 180° | 2227 | 2227  | 2227 | 2227  | 2227 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3116.4 | 3116.4 | 3116.4 | 3116.4 | 3116.4 |
| 2.5°   | 3130.5 | 3116.4 | 3085.3 | 3113.7 | 3108.0 |
| 5°     | 3116.4 | 3102.4 | 3065.5 | 3091.0 | 3082.6 |
| 7.5°   | 3091.0 | 3074.2 | 3034.7 | 3045.8 | 3031.7 |
| 10°    | 3057.1 | 3037.4 | 2981.2 | 2972.5 | 2955.7 |
| 12.5°  | 3015.0 | 2989.6 | 2913.2 | 2896.4 | 2865.3 |
| 15°    | 2964.1 | 2933.0 | 2837.2 | 2783.7 | 2755.5 |
| 17.5°  | 2904.8 | 2859.7 | 2741.2 | 2679.3 | 2634.0 |
| 20°    | 2837.2 | 2780.7 | 2639.8 | 2569.5 | 2507.2 |
| 22.5°  | 2763.9 | 2699.0 | 2535.3 | 2439.6 | 2397.4 |
| 25°    | 2690.6 | 2600.3 | 2414.1 | 2298.7 | 2256.2 |
| 27.5°  | 2603.2 | 2507.2 | 2301.3 | 2168.8 | 2103.8 |
| 30°    | 2510.2 | 2402.7 | 2177.2 | 2033.5 | 1957.2 |
| 32.5°  | 2419.8 | 2290.0 | 2059.0 | 1889.6 | 1819.0 |
| 35°    | 2318.4 | 2174.4 | 1926.4 | 1748.7 | 1686.4 |
| 37.5°  | 2219.6 | 2064.4 | 1802.2 | 1607.4 | 1537.1 |
| 40°    | 2115.3 | 1946.2 | 1672.4 | 1472.2 | 1398.8 |
| 42.5°  | 2008.1 | 1827.7 | 1542.8 | 1334.0 | 1263.6 |
| 45°    | 1895.3 | 1706.2 | 1410.2 | 1209.8 | 1142.2 |
| 47.5°  | 1788.2 | 1588.0 | 1283.4 | 1082.9 | 1021.0 |
| 50°    | 1669.6 | 1469.5 | 1159.2 | 964.4  | 905.4  |
| 52.5°  | 1553.9 | 1342.3 | 1040.7 | 854.6  | 801.1  |
| 55°    | 1441.1 | 1221.2 | 916.5  | 747.4  | 693.9  |
| 57.5°  | 1325.6 | 1099.9 | 806.7  | 648.8  | 603.5  |
| 60°    | 1207.0 | 981.5  | 690.9  | 547.2  | 502.1  |
| 62.5°  | 1091.6 | 865.9  | 592.2  | 456.9  | 434.5  |
| 65°    | 973.1  | 744.4  | 490.7  | 395.0  | 386.3  |
| 67.5°  | 860.3  | 631.7  | 395.0  | 346.8  | 338.5  |
| 70°    | 741.8  | 521.9  | 327.1  | 298.9  | 287.6  |
| 72.5°  | 629.0  | 420.1  | 273.5  | 251.1  | 245.3  |
| 75°    | 518.9  | 321.4  | 225.6  | 205.9  | 203.2  |
| 77.5°  | 409.1  | 228.3  | 177.8  | 166.4  | 160.7  |
| 80°    | 307.3  | 163.7  | 135.3  | 124.1  | 124.1  |
| 82.5°  | 214.2  | 110.1  | 93.0   | 87.4   | 87.4   |
| 85°    | 121.2  | 61.9   | 53.5   | 53.5   | 53.5   |
| 87.5°  | 45.1   | 22.4   | 22.4   | 19.8   | 19.8   |
| 90°    | 1.5    | 19.3   | 32.1   | 40.3   | 43.5   |
| 92.5°  | 40.3   | 33.8   | 38.6   | 41.9   | 43.5   |
| 95°    | 104.6  | 51.5   | 62.8   | 71.0   | 69.3   |
| 97.5°  | 188.4  | 56.5   | 82.1   | 87.1   | 88.6   |
| 100°   | 285.3  | 64.5   | 91.8   | 104.6  | 107.9  |
| 102.5° | 391.4  | 388.4  | 95.1   | 112.7  | 117.6  |
| 105°   | 489.8  | 538.2  | 98.3   | 115.9  | 122.4  |
| 107.5° | 604.2  | 644.4  | 101.6  | 119.2  | 125.7  |
| 110°   | 713.9  | 747.5  | 282.0  | 120.9  | 127.2  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 817.0  | 845.8  | 818.5  | 123.9  | 128.9  |
| 115°   | 926.4  | 953.8  | 994.1  | 248.2  | 132.2  |
| 117.5° | 1021.5 | 1053.7 | 1081.2 | 850.6  | 428.6  |
| 120°   | 1127.8 | 1152.0 | 1181.1 | 1200.4 | 982.9  |
| 122.5° | 1218.0 | 1243.8 | 1276.2 | 1285.7 | 1287.4 |
| 125°   | 1309.9 | 1330.9 | 1361.5 | 1372.8 | 1377.5 |
| 127.5° | 1393.6 | 1416.2 | 1440.5 | 1456.6 | 1458.1 |
| 130°   | 1472.6 | 1498.5 | 1516.1 | 1533.9 | 1532.4 |
| 132.5° | 1553.2 | 1574.2 | 1591.9 | 1606.4 | 1604.9 |
| 135°   | 1620.9 | 1646.7 | 1661.1 | 1677.3 | 1674.1 |
| 137.5° | 1691.7 | 1711.1 | 1727.3 | 1743.4 | 1738.6 |
| 140°   | 1761.0 | 1774.0 | 1791.6 | 1806.1 | 1798.1 |
| 142.5° | 1819.1 | 1830.4 | 1851.2 | 1864.1 | 1856.1 |
| 145°   | 1880.4 | 1878.7 | 1906.0 | 1917.3 | 1909.3 |
| 147.5° | 1933.3 | 1928.6 | 1956.0 | 1964.0 | 1957.7 |
| 150°   | 1985.0 | 1973.8 | 1999.6 | 2009.1 | 2001.1 |
| 152.5° | 2028.4 | 2015.6 | 2039.8 | 2049.5 | 2038.2 |
| 155°   | 2070.4 | 2056.0 | 2075.3 | 2084.9 | 2072.1 |
| 157.5° | 2104.2 | 2091.4 | 2105.9 | 2117.2 | 2104.2 |
| 160°   | 2133.4 | 2123.5 | 2133.4 | 2142.9 | 2131.6 |
| 162.5° | 2159.0 | 2149.4 | 2157.4 | 2168.7 | 2154.2 |
| 165°   | 2181.5 | 2172.0 | 2176.7 | 2188.0 | 2176.7 |
| 167.5° | 2199.3 | 2189.5 | 2194.5 | 2205.8 | 2191.3 |
| 170°   | 2213.8 | 2204.1 | 2207.3 | 2218.7 | 2204.1 |
| 172.5° | 2223.5 | 2213.8 | 2217.1 | 2228.4 | 2213.8 |
| 175°   | 2231.5 | 2220.2 | 2223.5 | 2234.7 | 2218.7 |
| 177.5° | 2234.7 | 2223.5 | 2225.2 | 2236.5 | 2221.9 |
| 180°   | 2226.7 | 2226.7 | 2226.7 | 2226.7 | 2226.7 |

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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 | 9.84             | 10.66 | 10.80 | 11.64 | 12.92 | 5.80           | 6.62 | 6.77  | 7.60  | 8.88  |
|                 | 3H   | 11.52            | 12.26 | 12.50 | 13.24 | 14.55 | 6.99           | 7.73 | 7.97  | 8.71  | 10.01 |
|                 | 4H   | 12.13            | 12.83 | 13.12 | 13.82 | 15.13 | 7.44           | 8.14 | 8.43  | 9.13  | 10.44 |
|                 | 6H   | 12.55            | 13.20 | 13.56 | 14.19 | 15.52 | 7.76           | 8.40 | 8.76  | 9.40  | 10.72 |
|                 | 8H   | 12.68            | 13.29 | 13.69 | 14.31 | 15.63 | 7.85           | 8.46 | 8.86  | 9.47  | 10.79 |
|                 | 12H  | 12.75            | 13.33 | 13.76 | 14.33 | 15.68 | 7.89           | 8.47 | 8.91  | 9.48  | 10.82 |
| 4H              | 2H   | 9.85             | 10.55 | 10.85 | 11.54 | 12.85 | 6.39           | 7.09 | 7.39  | 8.08  | 9.39  |
|                 | 3H   | 11.69            | 12.27 | 12.70 | 13.29 | 14.61 | 7.75           | 8.33 | 8.75  | 9.35  | 10.67 |
|                 | 4H   | 12.38            | 12.91 | 13.40 | 13.93 | 15.27 | 8.29           | 8.82 | 9.31  | 9.84  | 11.18 |
|                 | 6H   | 12.90            | 13.36 | 13.93 | 14.39 | 15.74 | 8.71           | 9.17 | 9.74  | 10.21 | 11.55 |
|                 | 8H   | 13.08            | 13.51 | 14.11 | 14.53 | 15.89 | 8.84           | 9.27 | 9.87  | 10.30 | 11.66 |
|                 | 12H  | 13.18            | 13.56 | 14.22 | 14.61 | 15.97 | 8.91           | 9.29 | 9.95  | 10.34 | 11.70 |
| 8H              | 4H   | 12.35            | 12.78 | 13.38 | 13.80 | 15.16 | 8.58           | 9.00 | 9.60  | 10.03 | 11.39 |
|                 | 6H   | 12.92            | 13.27 | 13.97 | 14.34 | 15.70 | 9.10           | 9.45 | 10.15 | 10.52 | 11.87 |
|                 | 8H   | 13.14            | 13.45 | 14.20 | 14.51 | 15.88 | 9.29           | 9.60 | 10.35 | 10.65 | 12.03 |
|                 | 12H  | 13.28            | 13.55 | 14.34 | 14.60 | 16.02 | 9.41           | 9.68 | 10.47 | 10.73 | 12.15 |
| 12H             | 4H   | 12.30            | 12.69 | 13.35 | 13.73 | 15.09 | 8.58           | 8.97 | 9.63  | 10.01 | 11.37 |
|                 | 6H   | 12.90            | 13.21 | 13.96 | 14.26 | 15.64 | 9.15           | 9.46 | 10.20 | 10.51 | 11.89 |
|                 | 8H   | 13.12            | 13.39 | 14.18 | 14.44 | 15.86 | 9.36           | 9.63 | 10.42 | 10.68 | 12.10 |