

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: P904700

Luminaire Tested: DFN2DIP-TR4F0-080D070US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904700  
REPORT IS A COMBINATION OF REPORTS P900432 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-080D070US830-RLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

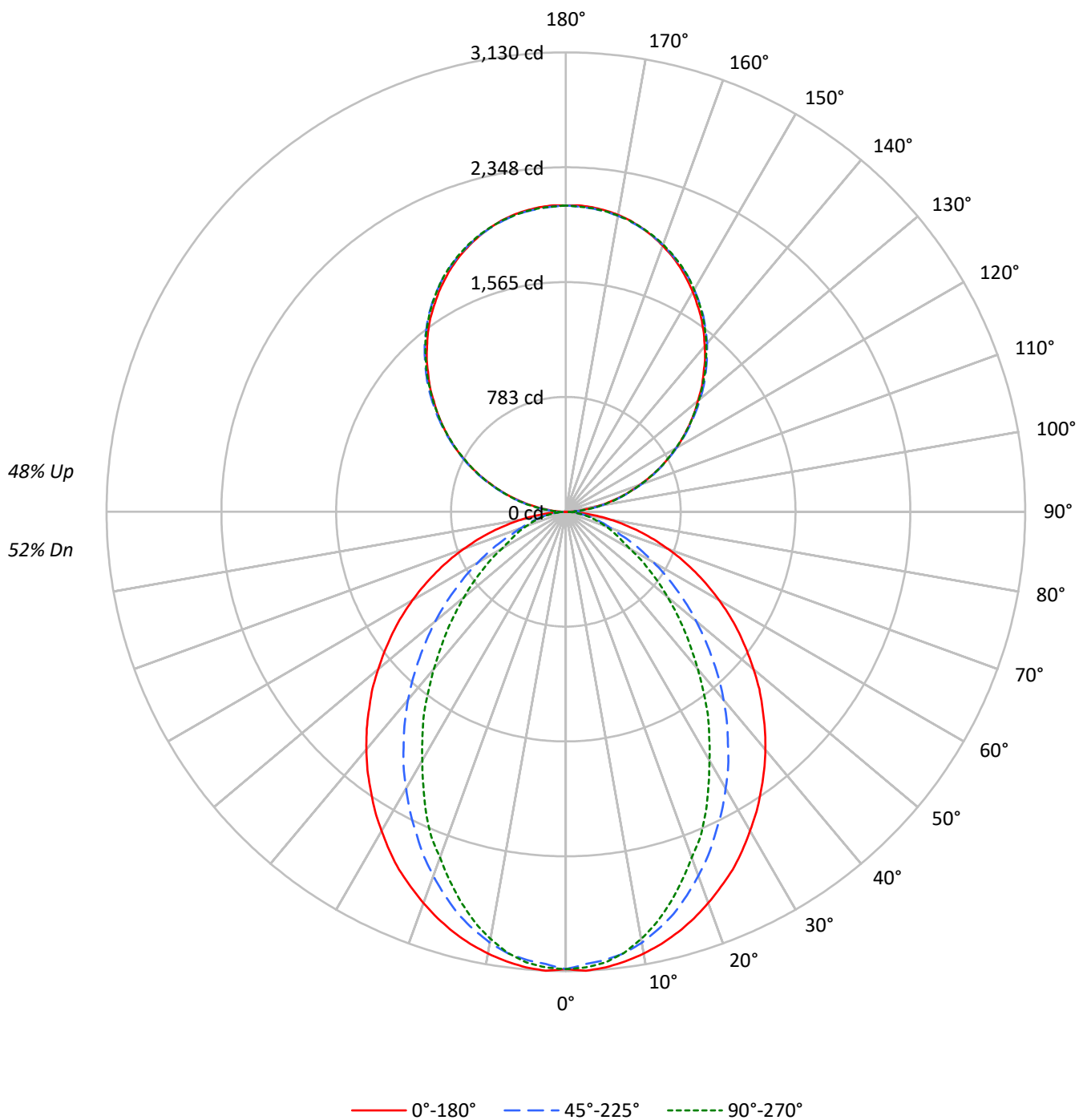
Lumens per Lamp: N/A  
Luminaire Lumens: 12248.4 lumens  
Efficiency: N/A  
Efficacy: 96.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 127.2  
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: P904700

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### Luminous Intensity Polar Plot



TEST NUMBER: P904700

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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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 58 | 58 | 58 |
| 1   | 99  | 95  | 91  | 88  | 91  | 88  | 85  | 82  | 75 | 73 | 71 | 63 | 62 | 60 | 52 | 51 | 50 |
| 2   | 90  | 83  | 77  | 72  | 83  | 77  | 72  | 68  | 66 | 63 | 59 | 56 | 53 | 51 | 47 | 45 | 43 |
| 3   | 83  | 74  | 67  | 61  | 76  | 69  | 62  | 57  | 59 | 54 | 50 | 50 | 47 | 44 | 42 | 39 | 37 |
| 4   | 76  | 66  | 58  | 52  | 70  | 61  | 54  | 49  | 53 | 48 | 43 | 45 | 41 | 38 | 38 | 35 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 47 | 42 | 38 | 41 | 36 | 33 | 34 | 31 | 29 |
| 6   | 65  | 53  | 45  | 39  | 60  | 49  | 42  | 37  | 43 | 37 | 33 | 37 | 33 | 29 | 31 | 28 | 25 |
| 7   | 60  | 48  | 40  | 35  | 55  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 29 | 26 | 29 | 25 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 29  | 36 | 30 | 26 | 31 | 27 | 23 | 26 | 23 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 26  | 33 | 28 | 24 | 29 | 24 | 21 | 24 | 21 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 30 | 25 | 22 | 26 | 22 | 19 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2476 | 2476 | 2476 |
| 5°  | 2480 | 2436 | 2452 |
| 10° | 2455 | 2389 | 2372 |
| 15° | 2421 | 2310 | 2249 |
| 20° | 2377 | 2201 | 2097 |
| 25° | 2331 | 2079 | 1951 |
| 30° | 2270 | 1954 | 1766 |
| 35° | 2209 | 1819 | 1603 |
| 40° | 2148 | 1680 | 1416 |
| 45° | 2077 | 1526 | 1247 |
| 50° | 2003 | 1370 | 1081 |
| 55° | 1926 | 1203 | 923  |
| 60° | 1837 | 1029 | 759  |
| 65° | 1735 | 852  | 683  |
| 70° | 1611 | 687  | 618  |
| 75° | 1455 | 605  | 562  |
| 80° | 1230 | 508  | 487  |
| 85° | 857  | 339  | 366  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2077 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 292.1   | 2.4       |
| 10°-20°   | 801.8   | 6.5       |
| 20°-30°   | 1125.7  | 9.2       |
| 30°-40°   | 1227.1  | 10.0      |
| 40°-50°   | 1127.8  | 9.2       |
| 50°-60°   | 885.7   | 7.2       |
| 60°-70°   | 576.5   | 4.7       |
| 70°-80°   | 296.8   | 2.4       |
| 80°-90°   | 81.7    | 0.7       |
| 90°-100°  | 129.1   | 1.1       |
| 100°-110° | 410.3   | 3.3       |
| 110°-120° | 702.1   | 5.7       |
| 120°-130° | 923.3   | 7.5       |
| 130°-140° | 1036.4  | 8.5       |
| 140°-150° | 1016.3  | 8.3       |
| 150°-160° | 852.6   | 7.0       |
| 160°-170° | 565.4   | 4.6       |
| 170°-180° | 197.6   | 1.6       |
| 0°-30°    | 2219.6  | 18.1      |
| 0°-40°    | 3446.7  | 28.1      |
| 0°-60°    | 5460.2  | 44.6      |
| 0°-90°    | 6415.2  | 52.4      |
| 90°-120°  | 1241.5  | 10.1      |
| 90°-150°  | 4217.6  | 34.4      |
| 90°-180°  | 5833.0  | 47.6      |
| 0°-180°   | 12248.4 | 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    | 23    | 62   | 58    | 60   | 12   |
| 95°  | 92   | 109   | 113  | 113   | 109  | 102  |
| 105° | 379  | 384   | 388  | 391   | 391  | 400  |
| 115° | 705  | 715   | 712  | 710   | 705  | 697  |
| 125° | 1025 | 1040  | 1036 | 1030  | 1028 | 916  |
| 135° | 1326 | 1345  | 1349 | 1347  | 1342 | 1025 |
| 145° | 1609 | 1622  | 1632 | 1634  | 1627 | 1005 |
| 155° | 1840 | 1845  | 1851 | 1860  | 1854 | 847  |
| 165° | 2002 | 2000  | 2000 | 2012  | 2004 | 565  |
| 175° | 2083 | 2078  | 2074 | 2087  | 2076 | 198  |
| 180° | 2087 | 2087  | 2087 | 2087  | 2087 |      |

TEST NUMBER: P904700

CATALOG NUMBER: DFN2DIP-TR4F0-080D070US830-RLLFLL

**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°    | 1.9    | 22.6   | 61.6   | 57.9   | 59.8   |
| 92.5°  | 39.0   | 52.9   | 54.8   | 56.6   | 56.6   |
| 95°    | 91.8   | 109.4  | 112.6  | 112.6  | 109.4  |
| 97.5°  | 152.9  | 169.2  | 176.2  | 176.2  | 176.2  |
| 100°   | 223.3  | 237.8  | 242.8  | 242.8  | 240.9  |
| 102.5° | 297.6  | 308.2  | 315.2  | 317.1  | 315.2  |
| 105°   | 378.7  | 383.7  | 387.5  | 390.7  | 390.7  |
| 107.5° | 459.2  | 466.7  | 466.7  | 468.1  | 459.2  |
| 110°   | 537.2  | 547.3  | 547.3  | 547.3  | 542.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 621.5  | 632.3  | 630.4  | 625.3  | 621.5  |
| 115°   | 704.6  | 714.6  | 711.5  | 709.6  | 704.6  |
| 117.5° | 786.9  | 800.8  | 792.0  | 786.9  | 781.9  |
| 120°   | 870.0  | 883.8  | 870.0  | 870.0  | 864.3  |
| 122.5° | 945.5  | 963.1  | 954.3  | 949.2  | 945.5  |
| 125°   | 1024.7 | 1040.5 | 1035.5 | 1029.8 | 1027.9 |
| 127.5° | 1102.1 | 1121.6 | 1114.7 | 1107.2 | 1102.1 |
| 130°   | 1174.5 | 1197.1 | 1194.0 | 1190.2 | 1183.3 |
| 132.5° | 1255.7 | 1273.3 | 1274.5 | 1265.7 | 1260.7 |
| 135°   | 1325.5 | 1344.9 | 1348.8 | 1346.8 | 1341.8 |
| 137.5° | 1403.4 | 1419.2 | 1422.3 | 1421.1 | 1413.5 |
| 140°   | 1472.1 | 1487.8 | 1496.6 | 1496.6 | 1489.7 |
| 142.5° | 1542.5 | 1558.2 | 1563.2 | 1565.1 | 1558.2 |
| 145°   | 1609.2 | 1621.7 | 1631.8 | 1633.7 | 1626.8 |
| 147.5° | 1669.0 | 1684.7 | 1692.2 | 1695.4 | 1688.5 |
| 150°   | 1730.6 | 1741.3 | 1748.2 | 1753.9 | 1748.2 |
| 152.5° | 1785.3 | 1796.0 | 1804.8 | 1811.8 | 1804.8 |
| 155°   | 1840.0 | 1845.0 | 1850.8 | 1859.5 | 1853.9 |
| 157.5° | 1887.3 | 1891.0 | 1894.1 | 1906.8 | 1897.9 |
| 160°   | 1929.4 | 1933.2 | 1935.0 | 1945.7 | 1938.1 |
| 162.5° | 1968.4 | 1968.4 | 1970.3 | 1982.2 | 1973.4 |
| 165°   | 2001.7 | 1999.8 | 1999.8 | 2012.4 | 2003.6 |
| 167.5° | 2031.9 | 2026.3 | 2026.3 | 2038.8 | 2030.0 |
| 170°   | 2054.6 | 2049.6 | 2047.7 | 2060.2 | 2049.6 |
| 172.5° | 2070.3 | 2065.2 | 2063.3 | 2075.9 | 2065.2 |
| 175°   | 2082.8 | 2077.8 | 2074.1 | 2086.6 | 2075.9 |
| 177.5° | 2089.8 | 2084.7 | 2080.9 | 2091.7 | 2080.9 |
| 180°   | 2086.6 | 2086.6 | 2086.6 | 2086.6 | 2086.6 |

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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 | 10.51            | 11.36 | 11.45 | 12.31 | 13.55 | 6.48           | 7.33  | 7.43  | 8.29  | 9.53  |
|                 | 3H   | 12.19            | 12.95 | 13.14 | 13.91 | 15.18 | 7.67           | 8.44  | 8.63  | 9.40  | 10.66 |
|                 | 4H   | 12.80            | 13.52 | 13.77 | 14.48 | 15.76 | 8.13           | 8.85  | 9.10  | 9.81  | 11.09 |
|                 | 6H   | 13.22            | 13.88 | 14.20 | 14.86 | 16.14 | 8.45           | 9.11  | 9.43  | 10.08 | 11.37 |
|                 | 8H   | 13.35            | 13.98 | 14.33 | 14.97 | 16.25 | 8.54           | 9.17  | 9.53  | 10.16 | 11.44 |
|                 | 12H  | 13.41            | 14.01 | 14.40 | 14.99 | 16.30 | 8.59           | 9.18  | 9.58  | 10.17 | 11.47 |
| 4H              | 2H   | 10.53            | 11.25 | 11.51 | 12.22 | 13.49 | 7.08           | 7.80  | 8.06  | 8.77  | 10.04 |
|                 | 3H   | 12.36            | 12.96 | 13.35 | 13.96 | 15.24 | 8.43           | 9.03  | 9.42  | 10.03 | 11.32 |
|                 | 4H   | 13.05            | 13.60 | 14.05 | 14.59 | 15.90 | 8.98           | 9.53  | 9.98  | 10.52 | 11.83 |
|                 | 6H   | 13.57            | 14.04 | 14.57 | 15.05 | 16.36 | 9.41           | 9.87  | 10.41 | 10.89 | 12.20 |
|                 | 8H   | 13.75            | 14.18 | 14.75 | 15.19 | 16.51 | 9.53           | 9.97  | 10.54 | 10.98 | 12.30 |
|                 | 12H  | 13.84            | 14.24 | 14.87 | 15.26 | 16.59 | 9.60           | 10.00 | 10.62 | 11.02 | 12.35 |
| 8H              | 4H   | 13.02            | 13.46 | 14.03 | 14.47 | 15.79 | 9.27           | 9.70  | 10.27 | 10.71 | 12.03 |
|                 | 6H   | 13.59            | 13.95 | 14.62 | 15.00 | 16.32 | 9.79           | 10.15 | 10.82 | 11.20 | 12.52 |
|                 | 8H   | 13.81            | 14.13 | 14.85 | 15.16 | 16.50 | 9.98           | 10.30 | 11.02 | 11.33 | 12.67 |
|                 | 12H  | 13.95            | 14.23 | 14.99 | 15.26 | 16.64 | 10.10          | 10.38 | 11.14 | 11.41 | 12.79 |
| 12H             | 4H   | 12.98            | 13.37 | 14.00 | 14.40 | 15.72 | 9.27           | 9.67  | 10.29 | 10.69 | 12.02 |
|                 | 6H   | 13.57            | 13.88 | 14.60 | 14.92 | 16.26 | 9.83           | 10.15 | 10.87 | 11.19 | 12.53 |
|                 | 8H   | 13.79            | 14.07 | 14.83 | 15.10 | 16.48 | 10.05          | 10.33 | 11.09 | 11.36 | 12.74 |