

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: P908963

Luminaire Tested: DFN2DIP-SQ2F0-040D060US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908963  
REPORT IS A COMBINATION OF REPORTS P901330 AND P898215  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-040D060US840-RLLONL  
Description: 2 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

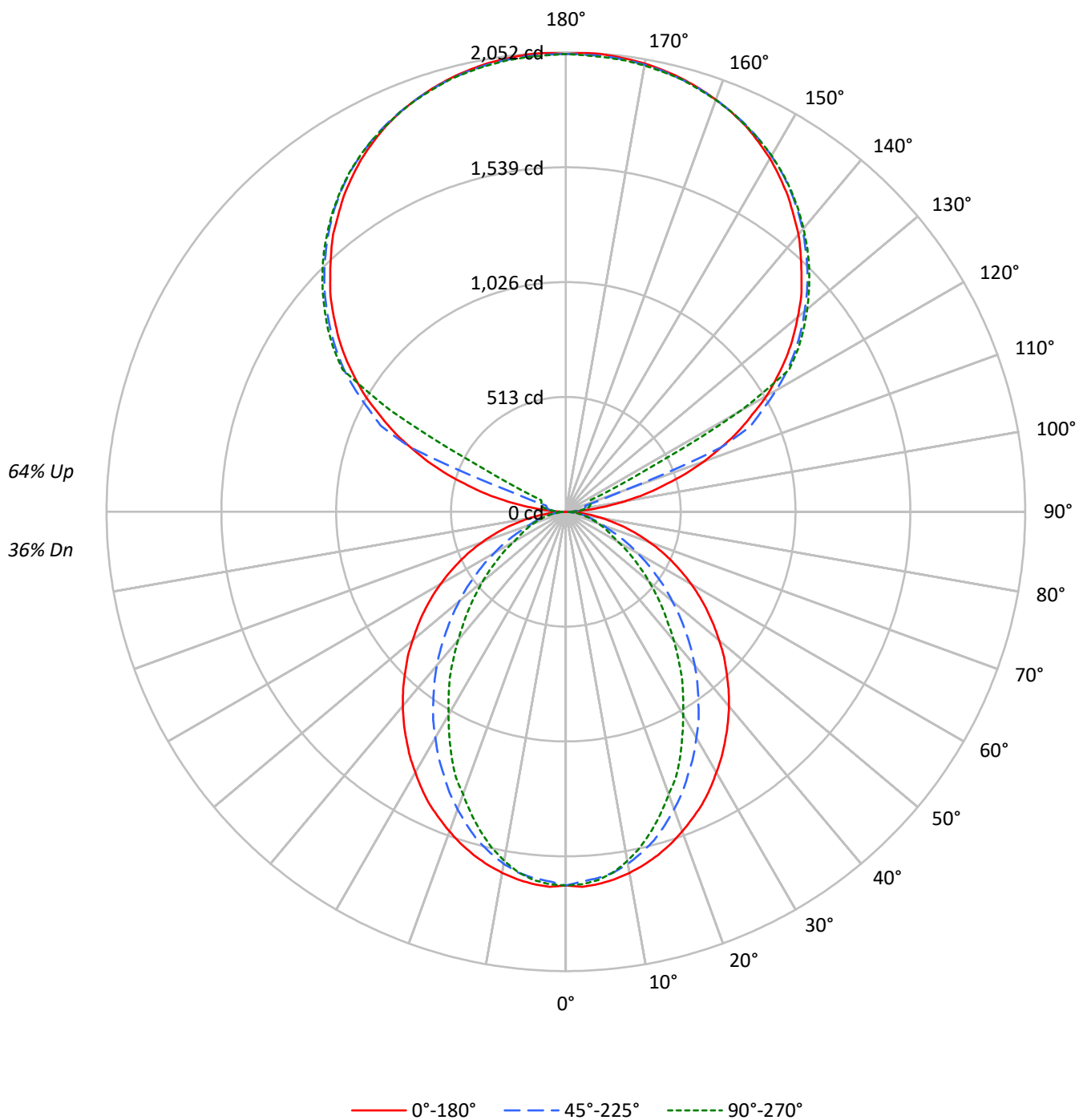
Lumens per Lamp: N/A  
Luminaire Lumens: 9432.1 lumens  
Efficiency: N/A  
Efficacy: 118.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 79.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P908963

CATALOG NUMBER: DFN2DIP-SQ2F0-040D060US840-RLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P908963

CATALOG NUMBER: DFN2DIP-SQ2F0-040D060US840-RLLONL

**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 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 59 | 59 | 59 | 44 | 44 | 44 |
| 1   | 95  | 91  | 87  | 84  | 86 | 83 | 80 | 77 | 67 | 65 | 63 | 52 | 51 | 50 | 39 | 38 | 38 |
| 2   | 87  | 80  | 74  | 69  | 78 | 73 | 68 | 63 | 59 | 56 | 53 | 46 | 44 | 42 | 35 | 33 | 32 |
| 3   | 79  | 70  | 63  | 58  | 72 | 64 | 58 | 53 | 52 | 48 | 45 | 41 | 38 | 36 | 31 | 29 | 28 |
| 4   | 73  | 63  | 55  | 49  | 66 | 57 | 51 | 46 | 47 | 42 | 38 | 37 | 34 | 31 | 28 | 26 | 24 |
| 5   | 67  | 56  | 48  | 42  | 60 | 51 | 44 | 39 | 42 | 37 | 33 | 33 | 30 | 27 | 25 | 23 | 21 |
| 6   | 62  | 50  | 42  | 37  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 30 | 27 | 24 | 23 | 21 | 19 |
| 7   | 57  | 45  | 38  | 32  | 52 | 41 | 35 | 30 | 34 | 29 | 26 | 28 | 24 | 21 | 21 | 19 | 17 |
| 8   | 53  | 41  | 34  | 29  | 48 | 38 | 31 | 27 | 31 | 26 | 23 | 25 | 22 | 19 | 20 | 17 | 15 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 24 | 29 | 24 | 20 | 23 | 20 | 17 | 18 | 16 | 14 |
| 10  | 46  | 34  | 27  | 23  | 42 | 32 | 25 | 21 | 26 | 22 | 18 | 22 | 18 | 15 | 17 | 14 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3671 | 3671 | 3671 |
| 5°  | 3671 | 3605 | 3631 |
| 10° | 3628 | 3526 | 3508 |
| 15° | 3572 | 3402 | 3320 |
| 20° | 3499 | 3234 | 3092 |
| 25° | 3425 | 3047 | 2872 |
| 30° | 3327 | 2856 | 2595 |
| 35° | 3232 | 2652 | 2351 |
| 40° | 3134 | 2441 | 2073 |
| 45° | 3021 | 2208 | 1821 |
| 50° | 2903 | 1974 | 1574 |
| 55° | 2780 | 1725 | 1339 |
| 60° | 2637 | 1465 | 1097 |
| 65° | 2473 | 1203 | 981  |
| 70° | 2273 | 958  | 881  |
| 75° | 2020 | 829  | 792  |
| 80° | 1659 | 673  | 671  |
| 85° | 1080 | 418  | 477  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3021 cd/sqm

TEST NUMBER: P908963

CATALOG NUMBER: DFN2DIP-SQ2F0-040D060US840-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 156.5  | 1.7       |
| 10°-20°   | 429.5  | 4.6       |
| 20°-30°   | 603.0  | 6.4       |
| 30°-40°   | 657.4  | 7.0       |
| 40°-50°   | 604.2  | 6.4       |
| 50°-60°   | 474.5  | 5.0       |
| 60°-70°   | 308.9  | 3.3       |
| 70°-80°   | 159.0  | 1.7       |
| 80°-90°   | 44.2   | 0.5       |
| 90°-100°  | 67.4   | 0.7       |
| 100°-110° | 251.4  | 2.7       |
| 110°-120° | 666.7  | 7.1       |
| 120°-130° | 1105.7 | 11.7      |
| 130°-140° | 1174.5 | 12.5      |
| 140°-150° | 1091.6 | 11.6      |
| 150°-160° | 877.6  | 9.3       |
| 160°-170° | 565.5  | 6.0       |
| 170°-180° | 194.6  | 2.1       |
| 0°-30°    | 1189.0 | 12.6      |
| 0°-40°    | 1846.4 | 19.6      |
| 0°-60°    | 2925.1 | 31.0      |
| 0°-90°    | 3437.1 | 36.4      |
| 90°-120°  | 985.5  | 10.4      |
| 90°-150°  | 4357.2 | 46.2      |
| 90°-180°  | 5995.0 | 63.6      |
| 0°-180°   | 9432.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1670 | 1670  | 1670 | 1670  | 1670 |      |
| 5°   | 1670 | 1662  | 1642 | 1656  | 1651 | 158  |
| 15°  | 1588 | 1571  | 1520 | 1491  | 1476 | 447  |
| 25°  | 1441 | 1393  | 1293 | 1231  | 1209 | 663  |
| 35°  | 1242 | 1165  | 1032 | 937   | 903  | 777  |
| 45°  | 1015 | 914   | 756  | 648   | 612  | 784  |
| 55°  | 772  | 654   | 491  | 400   | 372  | 690  |
| 65°  | 521  | 399   | 263  | 212   | 207  | 517  |
| 75°  | 278  | 172   | 121  | 110   | 109  | 294  |
| 85°  | 65   | 33    | 29   | 29    | 29   | 75   |
| 90°  | 1    | 18    | 30   | 37    | 40   | 9    |
| 95°  | 96   | 47    | 58   | 65    | 64   | 114  |
| 105° | 450  | 494   | 90   | 106   | 112  | 481  |
| 115° | 851  | 876   | 913  | 228   | 121  | 838  |
| 125° | 1203 | 1222  | 1250 | 1261  | 1265 | 1073 |
| 135° | 1489 | 1512  | 1526 | 1540  | 1537 | 1150 |
| 145° | 1727 | 1725  | 1750 | 1761  | 1753 | 1080 |
| 155° | 1901 | 1888  | 1906 | 1915  | 1903 | 876  |
| 165° | 2004 | 1995  | 1999 | 2009  | 1999 | 566  |
| 175° | 2049 | 2039  | 2042 | 2052  | 2038 | 195  |
| 180° | 2045 | 2045  | 2045 | 2045  | 2045 |      |

TEST NUMBER: P908963

CATALOG NUMBER: DFN2DIP-SQ2F0-040D060US840-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1669.5 | 1669.5 | 1669.5 | 1669.5 | 1669.5 |
| 2.5°   | 1677.1 | 1669.5 | 1652.8 | 1668.1 | 1665.0 |
| 5°     | 1669.5 | 1661.9 | 1642.2 | 1655.9 | 1651.4 |
| 7.5°   | 1655.9 | 1646.9 | 1625.8 | 1631.6 | 1624.2 |
| 10°    | 1637.8 | 1627.2 | 1597.0 | 1592.4 | 1583.5 |
| 12.5°  | 1615.2 | 1601.5 | 1560.6 | 1551.7 | 1535.0 |
| 15°    | 1587.9 | 1571.2 | 1519.9 | 1491.3 | 1476.2 |
| 17.5°  | 1556.2 | 1532.0 | 1468.4 | 1435.3 | 1411.1 |
| 20°    | 1519.9 | 1489.7 | 1414.1 | 1376.4 | 1343.1 |
| 22.5°  | 1480.7 | 1445.9 | 1358.2 | 1306.9 | 1284.3 |
| 25°    | 1441.4 | 1393.0 | 1293.2 | 1231.4 | 1208.6 |
| 27.5°  | 1394.6 | 1343.1 | 1232.8 | 1161.9 | 1127.0 |
| 30°    | 1344.7 | 1287.2 | 1166.3 | 1089.3 | 1048.5 |
| 32.5°  | 1296.4 | 1226.8 | 1103.0 | 1012.3 | 974.4  |
| 35°    | 1242.0 | 1164.9 | 1032.0 | 936.8  | 903.4  |
| 37.5°  | 1189.1 | 1105.9 | 965.4  | 861.1  | 823.4  |
| 40°    | 1133.2 | 1042.6 | 896.0  | 788.7  | 749.4  |
| 42.5°  | 1075.7 | 979.1  | 826.5  | 714.6  | 676.9  |
| 45°    | 1015.3 | 914.0  | 755.5  | 648.1  | 611.9  |
| 47.5°  | 958.0  | 850.7  | 687.5  | 580.2  | 546.9  |
| 50°    | 894.4  | 787.2  | 621.0  | 516.6  | 485.0  |
| 52.5°  | 832.4  | 719.1  | 557.5  | 457.8  | 429.1  |
| 55°    | 772.0  | 654.2  | 491.0  | 400.4  | 371.7  |
| 57.5°  | 710.1  | 589.3  | 432.1  | 347.5  | 323.4  |
| 60°    | 646.6  | 525.7  | 370.1  | 293.2  | 269.0  |
| 62.5°  | 584.8  | 463.9  | 317.2  | 244.8  | 232.8  |
| 65°    | 521.3  | 398.8  | 262.9  | 211.6  | 206.9  |
| 67.5°  | 460.9  | 338.4  | 211.6  | 185.8  | 181.3  |
| 70°    | 397.4  | 279.5  | 175.2  | 160.2  | 154.0  |
| 72.5°  | 337.0  | 225.1  | 146.5  | 134.5  | 131.5  |
| 75°    | 277.9  | 172.2  | 120.9  | 110.3  | 108.9  |
| 77.5°  | 219.1  | 122.3  | 95.2   | 89.2   | 86.0   |
| 80°    | 164.6  | 87.7   | 72.4   | 66.6   | 66.6   |
| 82.5°  | 114.8  | 59.0   | 49.9   | 46.8   | 46.8   |
| 85°    | 64.9   | 33.2   | 28.7   | 28.7   | 28.7   |
| 87.5°  | 24.2   | 12.0   | 12.0   | 10.6   | 10.6   |
| 90°    | 1.4    | 17.8   | 29.5   | 37.1   | 39.9   |
| 92.5°  | 37.1   | 31.1   | 35.4   | 38.5   | 39.9   |
| 95°    | 96.1   | 47.3   | 57.7   | 65.2   | 63.6   |
| 97.5°  | 173.1  | 51.8   | 75.3   | 80.0   | 81.4   |
| 100°   | 262.0  | 59.2   | 84.3   | 96.1   | 99.1   |
| 102.5° | 359.5  | 356.7  | 87.4   | 103.5  | 108.1  |
| 105°   | 449.8  | 494.2  | 90.3   | 106.4  | 112.5  |
| 107.5° | 554.9  | 591.8  | 93.3   | 109.5  | 115.4  |
| 110°   | 655.6  | 686.5  | 259.0  | 111.1  | 116.8  |

TEST NUMBER: P908963

CATALOG NUMBER: DFN2DIP-SQ2F0-040D060US840-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 750.2  | 776.8  | 751.6  | 113.8  | 118.5  |
| 115°   | 850.8  | 876.0  | 913.0  | 227.9  | 121.4  |
| 117.5° | 938.1  | 967.7  | 992.9  | 781.2  | 393.5  |
| 120°   | 1035.8 | 1057.9 | 1084.7 | 1102.4 | 902.6  |
| 122.5° | 1118.5 | 1142.3 | 1171.9 | 1180.7 | 1182.4 |
| 125°   | 1203.0 | 1222.2 | 1250.3 | 1260.7 | 1265.1 |
| 127.5° | 1279.9 | 1300.6 | 1322.9 | 1337.7 | 1339.1 |
| 130°   | 1352.4 | 1376.1 | 1392.3 | 1408.7 | 1407.2 |
| 132.5° | 1426.4 | 1445.7 | 1461.9 | 1475.2 | 1473.8 |
| 135°   | 1488.6 | 1512.4 | 1525.5 | 1540.4 | 1537.4 |
| 137.5° | 1553.6 | 1571.4 | 1586.3 | 1601.0 | 1596.7 |
| 140°   | 1617.2 | 1629.2 | 1645.4 | 1658.7 | 1651.3 |
| 142.5° | 1670.6 | 1681.0 | 1700.2 | 1711.9 | 1704.6 |
| 145°   | 1726.9 | 1725.3 | 1750.4 | 1760.8 | 1753.4 |
| 147.5° | 1775.5 | 1771.1 | 1796.2 | 1803.6 | 1797.9 |
| 150°   | 1823.0 | 1812.6 | 1836.3 | 1845.1 | 1837.8 |
| 152.5° | 1862.9 | 1851.1 | 1873.2 | 1882.2 | 1871.8 |
| 155°   | 1901.4 | 1888.1 | 1905.9 | 1914.7 | 1902.9 |
| 157.5° | 1932.5 | 1920.7 | 1934.0 | 1944.4 | 1932.5 |
| 160°   | 1959.1 | 1950.2 | 1959.1 | 1967.9 | 1957.6 |
| 162.5° | 1982.7 | 1973.9 | 1981.3 | 1991.7 | 1978.3 |
| 165°   | 2003.5 | 1994.7 | 1999.0 | 2009.4 | 1999.0 |
| 167.5° | 2019.7 | 2010.8 | 2015.4 | 2025.8 | 2012.4 |
| 170°   | 2033.2 | 2024.2 | 2027.2 | 2037.5 | 2024.2 |
| 172.5° | 2041.9 | 2033.2 | 2036.1 | 2046.5 | 2033.2 |
| 175°   | 2049.3 | 2038.9 | 2041.9 | 2052.2 | 2037.5 |
| 177.5° | 2052.2 | 2041.9 | 2043.5 | 2053.9 | 2040.5 |
| 180°   | 2044.9 | 2044.9 | 2044.9 | 2044.9 | 2044.9 |

TEST NUMBER: P908963

CATALOG NUMBER: DFN2DIP-SQ2F0-040D060US840-RLONL

**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 | 10.14            | 10.87 | 11.21 | 11.93 | 13.39 | 6.10           | 6.83 | 7.17  | 7.90  | 9.35  |
|                 | 3H   | 11.79            | 12.44 | 12.87 | 13.52 | 14.99 | 7.26           | 7.91 | 8.34  | 8.99  | 10.46 |
|                 | 4H   | 12.38            | 13.00 | 13.47 | 14.07 | 15.55 | 7.69           | 8.31 | 8.78  | 9.39  | 10.87 |
|                 | 6H   | 12.78            | 13.35 | 13.88 | 14.43 | 15.92 | 7.99           | 8.56 | 9.09  | 9.64  | 11.13 |
|                 | 8H   | 12.89            | 13.43 | 14.00 | 14.53 | 16.02 | 8.07           | 8.61 | 9.18  | 9.71  | 11.20 |
|                 | 12H  | 12.94            | 13.46 | 14.05 | 14.55 | 16.06 | 8.10           | 8.62 | 9.21  | 9.71  | 11.22 |
| 4H              | 2H   | 10.14            | 10.76 | 11.24 | 11.83 | 13.31 | 6.67           | 7.29 | 7.77  | 8.37  | 9.85  |
|                 | 3H   | 11.93            | 12.45 | 13.04 | 13.56 | 15.05 | 7.99           | 8.50 | 9.09  | 9.61  | 11.10 |
|                 | 4H   | 12.61            | 13.08 | 13.72 | 14.18 | 15.69 | 8.52           | 8.99 | 9.63  | 10.09 | 11.60 |
|                 | 6H   | 13.10            | 13.50 | 14.21 | 14.62 | 16.13 | 8.91           | 9.32 | 10.03 | 10.44 | 11.94 |
|                 | 8H   | 13.26            | 13.64 | 14.38 | 14.75 | 16.27 | 9.03           | 9.41 | 10.14 | 10.52 | 12.04 |
|                 | 12H  | 13.34            | 13.68 | 14.47 | 14.81 | 16.33 | 9.08           | 9.42 | 10.21 | 10.54 | 12.07 |
| 8H              | 4H   | 12.56            | 12.94 | 13.68 | 14.05 | 15.57 | 8.78           | 9.16 | 9.89  | 10.27 | 11.79 |
|                 | 6H   | 13.10            | 13.42 | 14.24 | 14.57 | 16.09 | 9.27           | 9.58 | 10.41 | 10.73 | 12.25 |
|                 | 8H   | 13.31            | 13.58 | 14.45 | 14.71 | 16.25 | 9.45           | 9.72 | 10.59 | 10.85 | 12.39 |
|                 | 12H  | 13.43            | 13.67 | 14.57 | 14.80 | 16.37 | 9.55           | 9.79 | 10.69 | 10.92 | 12.49 |
| 12H             | 4H   | 12.51            | 12.85 | 13.64 | 13.97 | 15.50 | 8.78           | 9.12 | 9.91  | 10.24 | 11.77 |
|                 | 6H   | 13.08            | 13.35 | 14.22 | 14.48 | 16.02 | 9.31           | 9.59 | 10.46 | 10.72 | 12.26 |
|                 | 8H   | 13.28            | 13.52 | 14.43 | 14.65 | 16.22 | 9.50           | 9.74 | 10.65 | 10.87 | 12.45 |