

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: P903694

Luminaire Tested: DFN2DIP-SQ3F0-060D060US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903694  
REPORT IS A COMBINATION OF REPORTS P899902 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-060D060US830-RLLFLL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

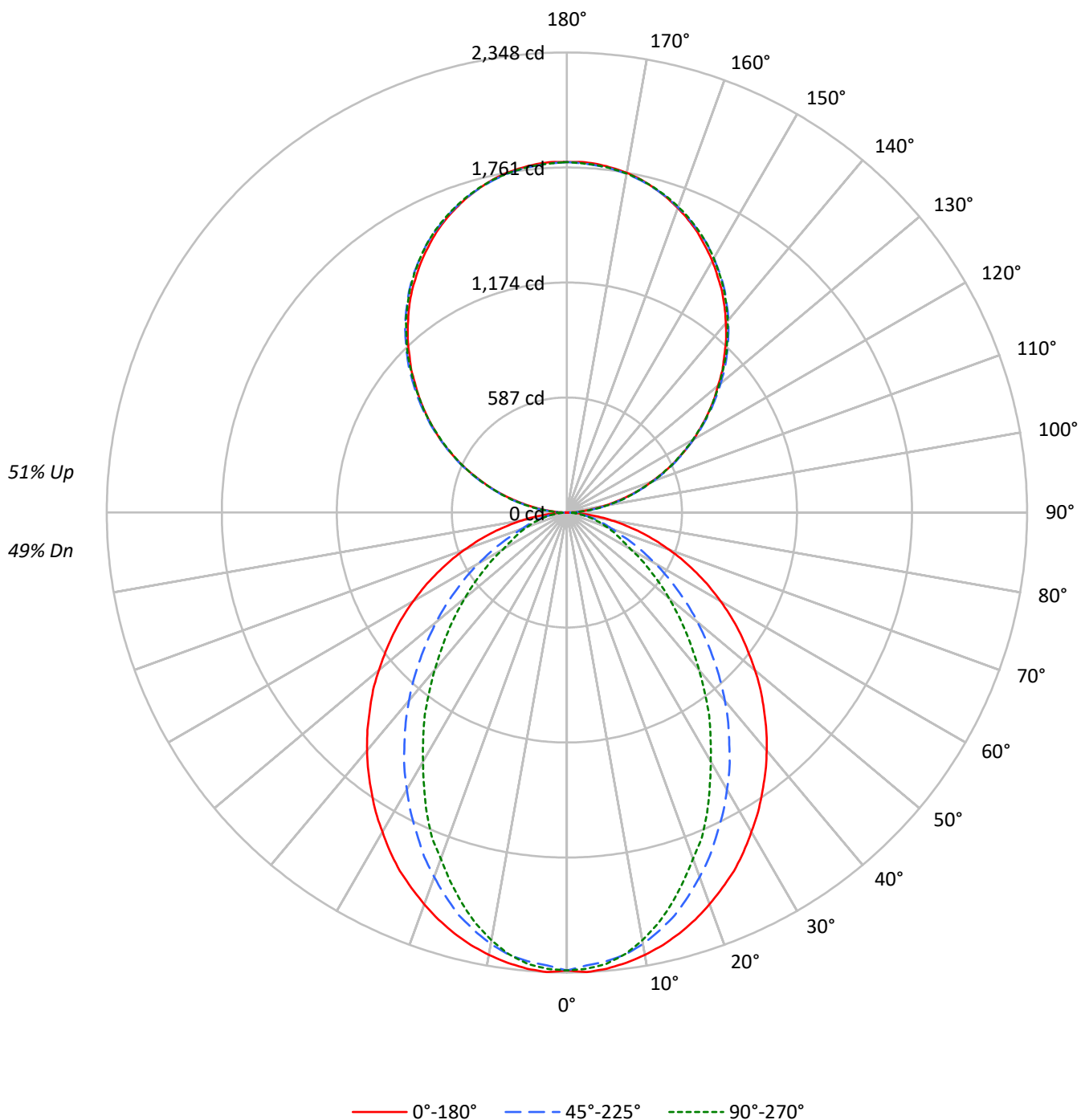
Lumens per Lamp: N/A  
Luminaire Lumens: 9811.8 lumens  
Efficiency: N/A  
Efficacy: 99.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 98.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
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: P903694

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### Luminous Intensity Polar Plot



TEST NUMBER: P903694

CATALOG NUMBER: DFN2DIP-SQ3F0-060D060US830-RLFL

**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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 84 | 81 | 73 | 71 | 69 | 61 | 59 | 58 | 50 | 49 | 48 |
| 2   | 90  | 83  | 77  | 72  | 82 | 76 | 71 | 67 | 65 | 61 | 58 | 54 | 51 | 49 | 44 | 42 | 41 |
| 3   | 82  | 73  | 66  | 60  | 75 | 68 | 61 | 57 | 58 | 53 | 49 | 48 | 45 | 42 | 40 | 37 | 35 |
| 4   | 75  | 65  | 57  | 51  | 69 | 60 | 54 | 48 | 51 | 46 | 42 | 43 | 40 | 36 | 36 | 33 | 31 |
| 5   | 69  | 58  | 50  | 44  | 64 | 54 | 47 | 42 | 46 | 41 | 37 | 39 | 35 | 32 | 32 | 29 | 27 |
| 6   | 64  | 52  | 44  | 39  | 59 | 49 | 42 | 37 | 42 | 36 | 32 | 35 | 31 | 28 | 30 | 26 | 24 |
| 7   | 59  | 47  | 40  | 34  | 55 | 44 | 37 | 32 | 38 | 33 | 29 | 32 | 28 | 25 | 27 | 24 | 22 |
| 8   | 55  | 43  | 36  | 30  | 51 | 40 | 33 | 29 | 35 | 29 | 26 | 30 | 26 | 23 | 25 | 22 | 20 |
| 9   | 51  | 39  | 32  | 27  | 47 | 37 | 30 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 23 | 20 | 18 |
| 10  | 48  | 36  | 29  | 24  | 44 | 34 | 28 | 23 | 30 | 24 | 21 | 25 | 21 | 19 | 22 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2678 | 2678 | 2678 |
| 5°  | 2681 | 2634 | 2652 |
| 10° | 2652 | 2580 | 2564 |
| 15° | 2614 | 2493 | 2430 |
| 20° | 2564 | 2374 | 2266 |
| 25° | 2513 | 2241 | 2107 |
| 30° | 2445 | 2104 | 1906 |
| 35° | 2378 | 1958 | 1730 |
| 40° | 2310 | 1806 | 1527 |
| 45° | 2230 | 1638 | 1344 |
| 50° | 2149 | 1469 | 1165 |
| 55° | 2063 | 1288 | 993  |
| 60° | 1964 | 1100 | 817  |
| 65° | 1849 | 908  | 734  |
| 70° | 1710 | 729  | 663  |
| 75° | 1536 | 639  | 601  |
| 80° | 1283 | 530  | 518  |
| 85° | 870  | 346  | 385  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2230 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 219.1  | 2.2       |
| 10°-20°   | 601.3  | 6.1       |
| 20°-30°   | 844.3  | 8.6       |
| 30°-40°   | 920.3  | 9.4       |
| 40°-50°   | 845.9  | 8.6       |
| 50°-60°   | 664.3  | 6.8       |
| 60°-70°   | 432.4  | 4.4       |
| 70°-80°   | 222.6  | 2.3       |
| 80°-90°   | 61.9   | 0.6       |
| 90°-100°  | 110.7  | 1.1       |
| 100°-110° | 351.6  | 3.6       |
| 110°-120° | 601.8  | 6.1       |
| 120°-130° | 791.4  | 8.1       |
| 130°-140° | 888.4  | 9.1       |
| 140°-150° | 871.1  | 8.9       |
| 150°-160° | 730.8  | 7.4       |
| 160°-170° | 484.6  | 4.9       |
| 170°-180° | 169.4  | 1.7       |
| 0°-30°    | 1664.7 | 17.0      |
| 0°-40°    | 2585.0 | 26.3      |
| 0°-60°    | 4095.1 | 41.7      |
| 0°-90°    | 4812.0 | 49.0      |
| 90°-120°  | 1064.1 | 10.8      |
| 90°-150°  | 3615.0 | 36.8      |
| 90°-180°  | 5000.0 | 51.0      |
| 0°-180°   | 9811.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2337 | 2337  | 2337 | 2337  | 2337 |      |
| 5°   | 2337 | 2327  | 2299 | 2318  | 2312 | 222  |
| 15°  | 2223 | 2200  | 2128 | 2088  | 2067 | 626  |
| 25°  | 2018 | 1950  | 1811 | 1724  | 1692 | 928  |
| 35°  | 1739 | 1631  | 1445 | 1312  | 1265 | 1088 |
| 45°  | 1421 | 1280  | 1058 | 907   | 857  | 1098 |
| 55°  | 1081 | 916   | 687  | 561   | 520  | 966  |
| 65°  | 730  | 558   | 368  | 296   | 290  | 724  |
| 75°  | 389  | 241   | 169  | 154   | 152  | 412  |
| 85°  | 91   | 46    | 40   | 40    | 40   | 104  |
| 90°  | 2    | 19    | 53   | 50    | 51   | 10   |
| 95°  | 79   | 94    | 96   | 96    | 94   | 88   |
| 105° | 325  | 329   | 332  | 335   | 335  | 343  |
| 115° | 604  | 613   | 610  | 608   | 604  | 597  |
| 125° | 878  | 892   | 888  | 883   | 881  | 785  |
| 135° | 1136 | 1153  | 1156 | 1154  | 1150 | 878  |
| 145° | 1379 | 1390  | 1399 | 1400  | 1394 | 862  |
| 155° | 1577 | 1582  | 1586 | 1594  | 1589 | 726  |
| 165° | 1716 | 1714  | 1714 | 1725  | 1717 | 484  |
| 175° | 1785 | 1781  | 1778 | 1789  | 1779 | 170  |
| 180° | 1789 | 1789  | 1789 | 1789  | 1789 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2337.3 | 2337.3 | 2337.3 | 2337.3 | 2337.3 |
| 2.5°   | 2347.9 | 2337.3 | 2313.9 | 2335.2 | 2331.0 |
| 5°     | 2337.3 | 2326.8 | 2299.1 | 2318.3 | 2312.0 |
| 7.5°   | 2318.3 | 2305.6 | 2276.1 | 2284.3 | 2273.8 |
| 10°    | 2292.8 | 2278.0 | 2235.9 | 2229.4 | 2216.8 |
| 12.5°  | 2261.3 | 2242.1 | 2184.9 | 2172.4 | 2149.0 |
| 15°    | 2223.1 | 2199.7 | 2127.9 | 2087.7 | 2066.6 |
| 17.5°  | 2178.7 | 2144.8 | 2055.9 | 2009.4 | 1975.6 |
| 20°    | 2127.9 | 2085.5 | 1979.8 | 1927.0 | 1880.4 |
| 22.5°  | 2072.9 | 2024.2 | 1901.5 | 1829.7 | 1798.0 |
| 25°    | 2018.0 | 1950.2 | 1810.6 | 1724.0 | 1692.1 |
| 27.5°  | 1952.5 | 1880.4 | 1726.0 | 1626.5 | 1577.9 |
| 30°    | 1882.6 | 1802.0 | 1632.9 | 1525.1 | 1467.9 |
| 32.5°  | 1814.9 | 1717.5 | 1544.3 | 1417.2 | 1364.2 |
| 35°    | 1738.8 | 1630.9 | 1444.8 | 1311.5 | 1264.8 |
| 37.5°  | 1664.7 | 1548.2 | 1351.7 | 1205.6 | 1152.8 |
| 40°    | 1586.4 | 1459.6 | 1254.2 | 1104.1 | 1049.1 |
| 42.5°  | 1506.1 | 1370.7 | 1157.1 | 1000.4 | 947.7  |
| 45°    | 1421.4 | 1279.6 | 1057.7 | 907.3  | 856.6  |
| 47.5°  | 1341.1 | 1191.0 | 962.5  | 812.2  | 765.7  |
| 50°    | 1252.3 | 1102.1 | 869.4  | 723.3  | 679.1  |
| 52.5°  | 1165.4 | 1006.7 | 780.5  | 640.9  | 600.8  |
| 55°    | 1080.8 | 915.9  | 687.4  | 560.6  | 520.4  |
| 57.5°  | 994.2  | 824.9  | 605.0  | 486.5  | 452.6  |
| 60°    | 905.3  | 736.1  | 518.2  | 410.5  | 376.5  |
| 62.5°  | 818.7  | 649.5  | 444.1  | 342.7  | 325.8  |
| 65°    | 729.8  | 558.4  | 368.1  | 296.2  | 289.7  |
| 67.5°  | 645.2  | 473.7  | 296.2  | 260.1  | 253.8  |
| 70°    | 556.3  | 391.3  | 245.2  | 224.2  | 215.7  |
| 72.5°  | 471.7  | 315.1  | 205.1  | 188.3  | 184.0  |
| 75°    | 389.2  | 241.0  | 169.2  | 154.4  | 152.4  |
| 77.5°  | 306.8  | 171.3  | 133.3  | 124.8  | 120.6  |
| 80°    | 230.5  | 122.7  | 101.4  | 93.1   | 93.1   |
| 82.5°  | 160.7  | 82.6   | 69.7   | 65.5   | 65.5   |
| 85°    | 90.9   | 46.5   | 40.2   | 40.2   | 40.2   |
| 87.5°  | 33.9   | 16.9   | 16.9   | 14.8   | 14.8   |
| 90°    | 1.6    | 19.4   | 52.9   | 49.6   | 51.2   |
| 92.5°  | 33.5   | 45.3   | 46.9   | 48.5   | 48.5   |
| 95°    | 78.7   | 93.8   | 96.5   | 96.5   | 93.8   |
| 97.5°  | 131.0  | 145.1  | 151.0  | 151.0  | 151.0  |
| 100°   | 191.4  | 203.8  | 208.1  | 208.1  | 206.5  |
| 102.5° | 255.1  | 264.2  | 270.1  | 271.7  | 270.1  |
| 105°   | 324.6  | 328.9  | 332.2  | 334.9  | 334.9  |
| 107.5° | 393.6  | 400.1  | 400.1  | 401.1  | 393.6  |
| 110°   | 460.5  | 469.1  | 469.1  | 469.1  | 464.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 532.7  | 541.9  | 540.3  | 535.9  | 532.7  |
| 115°   | 603.9  | 612.6  | 609.8  | 608.2  | 603.9  |
| 117.5° | 674.6  | 686.5  | 678.8  | 674.6  | 670.2  |
| 120°   | 745.7  | 757.6  | 745.7  | 745.7  | 740.8  |
| 122.5° | 810.4  | 825.5  | 817.9  | 813.7  | 810.4  |
| 125°   | 878.4  | 891.8  | 887.5  | 882.7  | 881.1  |
| 127.5° | 944.7  | 961.4  | 955.5  | 949.0  | 944.7  |
| 130°   | 1006.7 | 1026.1 | 1023.4 | 1020.2 | 1014.3 |
| 132.5° | 1076.3 | 1091.4 | 1092.4 | 1084.9 | 1080.5 |
| 135°   | 1136.1 | 1152.8 | 1156.0 | 1154.4 | 1150.1 |
| 137.5° | 1203.0 | 1216.4 | 1219.2 | 1218.0 | 1211.6 |
| 140°   | 1261.8 | 1275.3 | 1282.8 | 1282.8 | 1276.9 |
| 142.5° | 1322.1 | 1335.6 | 1339.9 | 1341.5 | 1335.6 |
| 145°   | 1379.3 | 1390.1 | 1398.7 | 1400.3 | 1394.4 |
| 147.5° | 1430.5 | 1444.0 | 1450.5 | 1453.1 | 1447.2 |
| 150°   | 1483.4 | 1492.5 | 1498.5 | 1503.3 | 1498.5 |
| 152.5° | 1530.2 | 1539.5 | 1547.0 | 1552.9 | 1547.0 |
| 155°   | 1577.2 | 1581.5 | 1586.3 | 1593.9 | 1589.0 |
| 157.5° | 1617.6 | 1620.9 | 1623.5 | 1634.4 | 1626.8 |
| 160°   | 1653.8 | 1657.0 | 1658.6 | 1667.7 | 1661.3 |
| 162.5° | 1687.2 | 1687.2 | 1688.8 | 1699.0 | 1691.5 |
| 165°   | 1715.7 | 1714.1 | 1714.1 | 1724.9 | 1717.4 |
| 167.5° | 1741.6 | 1736.8 | 1736.8 | 1747.6 | 1740.0 |
| 170°   | 1761.0 | 1756.7 | 1755.1 | 1765.9 | 1756.7 |
| 172.5° | 1774.5 | 1770.2 | 1768.6 | 1779.3 | 1770.2 |
| 175°   | 1785.3 | 1781.0 | 1777.7 | 1788.6 | 1779.3 |
| 177.5° | 1791.2 | 1787.0 | 1783.7 | 1792.8 | 1783.7 |
| 180°   | 1788.6 | 1788.6 | 1788.6 | 1788.6 | 1788.6 |

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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 | 10.44            | 11.27 | 11.42 | 12.25 | 13.53 | 6.40           | 7.23  | 7.38  | 8.21  | 9.50  |
|                 | 3H   | 12.12            | 12.85 | 13.10 | 13.84 | 15.15 | 7.59           | 8.32  | 8.57  | 9.31  | 10.62 |
|                 | 4H   | 12.72            | 13.42 | 13.72 | 14.41 | 15.73 | 8.03           | 8.73  | 9.03  | 9.72  | 11.04 |
|                 | 6H   | 13.14            | 13.78 | 14.15 | 14.78 | 16.11 | 8.35           | 8.99  | 9.35  | 9.99  | 11.32 |
|                 | 8H   | 13.26            | 13.87 | 14.28 | 14.89 | 16.21 | 8.43           | 9.04  | 9.45  | 10.06 | 11.38 |
|                 | 12H  | 13.32            | 13.90 | 14.34 | 14.91 | 16.26 | 8.47           | 9.05  | 9.49  | 10.06 | 11.41 |
| 4H              | 2H   | 10.46            | 11.15 | 11.46 | 12.15 | 13.47 | 7.00           | 7.69  | 8.00  | 8.69  | 10.00 |
|                 | 3H   | 12.28            | 12.86 | 13.29 | 13.88 | 15.21 | 8.34           | 8.92  | 9.35  | 9.94  | 11.27 |
|                 | 4H   | 12.97            | 13.50 | 13.99 | 14.51 | 15.87 | 8.88           | 9.41  | 9.90  | 10.42 | 11.78 |
|                 | 6H   | 13.48            | 13.93 | 14.51 | 14.97 | 16.32 | 9.29           | 9.75  | 10.32 | 10.79 | 12.14 |
|                 | 8H   | 13.65            | 14.08 | 14.68 | 15.11 | 16.47 | 9.42           | 9.84  | 10.45 | 10.87 | 12.24 |
|                 | 12H  | 13.74            | 14.13 | 14.79 | 15.17 | 16.55 | 9.48           | 9.86  | 10.53 | 10.91 | 12.28 |
| 8H              | 4H   | 12.94            | 13.36 | 13.97 | 14.39 | 15.76 | 9.16           | 9.58  | 10.19 | 10.61 | 11.98 |
|                 | 6H   | 13.50            | 13.85 | 14.55 | 14.92 | 16.28 | 9.67           | 10.02 | 10.72 | 11.09 | 12.45 |
|                 | 8H   | 13.71            | 14.02 | 14.77 | 15.08 | 16.46 | 9.85           | 10.16 | 10.91 | 11.22 | 12.60 |
|                 | 12H  | 13.84            | 14.12 | 14.91 | 15.17 | 16.59 | 9.97           | 10.24 | 11.03 | 11.29 | 12.72 |
| 12H             | 4H   | 12.89            | 13.27 | 13.94 | 14.32 | 15.69 | 9.16           | 9.54  | 10.21 | 10.59 | 11.96 |
|                 | 6H   | 13.47            | 13.78 | 14.53 | 14.84 | 16.22 | 9.71           | 10.02 | 10.78 | 11.08 | 12.46 |
|                 | 8H   | 13.69            | 13.96 | 14.75 | 15.01 | 16.44 | 9.92           | 10.19 | 10.98 | 11.24 | 12.67 |