

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: P911801

Luminaire Tested: DFN2DIP-SQ3F0-040D050US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911801  
REPORT IS A COMBINATION OF REPORTS P901399 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-040D050US850-FLLONL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

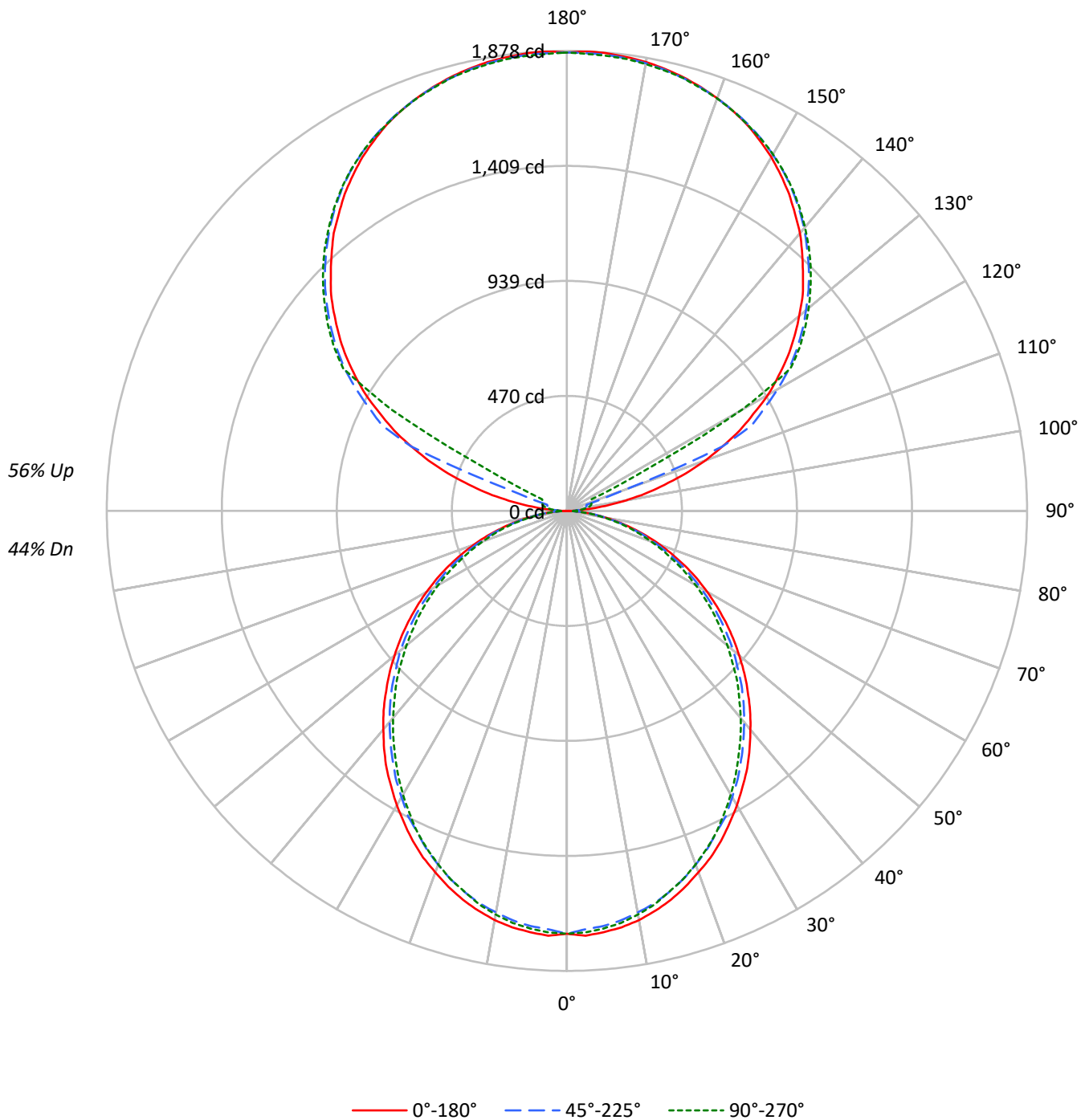
Lumens per Lamp: N/A  
Luminaire Lumens: 9881.2 lumens  
Efficiency: N/A  
Efficacy: 142.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 69.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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 |    |    |    | 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 | 80 | 80 | 80 | 65 | 65 | 65 | 51 | 51 | 51 |
| 1   | 97  | 92  | 88  | 85  | 88 | 85 | 81 | 78 | 70 | 68 | 66 | 57 | 56 | 54 | 45 | 44 | 43 |
| 2   | 88  | 81  | 74  | 69  | 80 | 74 | 69 | 64 | 62 | 58 | 55 | 50 | 48 | 45 | 40 | 38 | 36 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 54 | 50 | 46 | 44 | 41 | 38 | 35 | 33 | 31 |
| 4   | 73  | 63  | 55  | 49  | 67 | 58 | 51 | 46 | 48 | 43 | 39 | 40 | 36 | 33 | 31 | 29 | 27 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 43 | 38 | 34 | 35 | 31 | 28 | 28 | 25 | 23 |
| 6   | 62  | 50  | 42  | 36  | 57 | 46 | 39 | 34 | 39 | 33 | 29 | 32 | 28 | 25 | 26 | 23 | 20 |
| 7   | 57  | 45  | 37  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 49 | 38 | 31 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 22 | 19 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 35 | 28 | 23 | 29 | 24 | 20 | 25 | 20 | 18 | 20 | 17 | 15 |
| 10  | 46  | 34  | 27  | 22  | 42 | 32 | 25 | 21 | 27 | 22 | 18 | 23 | 19 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1978 | 1978 | 1978 |
| 5°  | 1980 | 1949 | 1963 |
| 10° | 1962 | 1921 | 1935 |
| 15° | 1932 | 1888 | 1893 |
| 20° | 1892 | 1843 | 1850 |
| 25° | 1852 | 1789 | 1800 |
| 30° | 1802 | 1739 | 1737 |
| 35° | 1755 | 1680 | 1671 |
| 40° | 1696 | 1620 | 1607 |
| 45° | 1638 | 1560 | 1542 |
| 50° | 1575 | 1498 | 1467 |
| 55° | 1508 | 1425 | 1397 |
| 60° | 1433 | 1339 | 1318 |
| 65° | 1350 | 1249 | 1224 |
| 70° | 1245 | 1140 | 1123 |
| 75° | 1100 | 1009 | 1028 |
| 80° | 924  | 841  | 850  |
| 85° | 651  | 558  | 556  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1638 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 162.5  | 1.6       |
| 10°-20°   | 457.1  | 4.6       |
| 20°-30°   | 671.7  | 6.8       |
| 30°-40°   | 780.2  | 7.9       |
| 40°-50°   | 779.2  | 7.9       |
| 50°-60°   | 679.5  | 6.9       |
| 60°-70°   | 502.3  | 5.1       |
| 70°-80°   | 284.2  | 2.9       |
| 80°-90°   | 78.3   | 0.8       |
| 90°-100°  | 61.7   | 0.6       |
| 100°-110° | 230.0  | 2.3       |
| 110°-120° | 610.1  | 6.2       |
| 120°-130° | 1011.9 | 10.2      |
| 130°-140° | 1074.8 | 10.9      |
| 140°-150° | 999.0  | 10.1      |
| 150°-160° | 803.1  | 8.1       |
| 160°-170° | 517.5  | 5.2       |
| 170°-180° | 178.1  | 1.8       |
| 0°-30°    | 1291.3 | 13.1      |
| 0°-40°    | 2071.5 | 21.0      |
| 0°-60°    | 3530.2 | 35.7      |
| 0°-90°    | 4394.9 | 44.5      |
| 90°-120°  | 901.9  | 9.1       |
| 90°-150°  | 3987.5 | 40.4      |
| 90°-180°  | 5486.0 | 55.5      |
| 0°-180°   | 9881.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1726 | 1726  | 1726 | 1726  | 1726 |      |
| 5°   | 1726 | 1720  | 1701 | 1714  | 1711 | 164  |
| 15°  | 1643 | 1633  | 1612 | 1618  | 1610 | 463  |
| 25°  | 1487 | 1474  | 1446 | 1449  | 1446 | 684  |
| 35°  | 1283 | 1266  | 1240 | 1230  | 1222 | 801  |
| 45°  | 1044 | 1032  | 1007 | 989   | 983  | 806  |
| 55°  | 790  | 780   | 760  | 740   | 732  | 706  |
| 65°  | 533  | 523   | 506  | 491   | 483  | 527  |
| 75°  | 279  | 276   | 267  | 257   | 261  | 298  |
| 85°  | 68   | 66    | 65   | 60    | 58   | 76   |
| 90°  | 1    | 16    | 27   | 34    | 36   | 9    |
| 95°  | 88   | 43    | 53   | 60    | 58   | 104  |
| 105° | 412  | 452   | 83   | 98    | 103  | 440  |
| 115° | 779  | 802   | 836  | 209   | 111  | 767  |
| 125° | 1101 | 1118  | 1144 | 1154  | 1158 | 982  |
| 135° | 1362 | 1384  | 1396 | 1410  | 1407 | 1052 |
| 145° | 1580 | 1579  | 1602 | 1611  | 1605 | 988  |
| 155° | 1740 | 1728  | 1744 | 1752  | 1742 | 802  |
| 165° | 1833 | 1825  | 1829 | 1839  | 1829 | 518  |
| 175° | 1875 | 1866  | 1869 | 1878  | 1865 | 178  |
| 180° | 1871 | 1871  | 1871 | 1871  | 1871 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1726.0 | 1726.0 | 1726.0 | 1726.0 | 1726.0 |
| 2.5°   | 1736.1 | 1727.8 | 1709.5 | 1726.0 | 1722.9 |
| 5°     | 1726.0 | 1719.5 | 1701.2 | 1714.4 | 1711.3 |
| 7.5°   | 1714.4 | 1704.5 | 1686.2 | 1699.7 | 1696.3 |
| 10°    | 1696.3 | 1684.7 | 1664.8 | 1678.0 | 1673.0 |
| 12.5°  | 1671.3 | 1661.4 | 1641.5 | 1649.9 | 1646.4 |
| 15°    | 1643.1 | 1633.2 | 1611.6 | 1618.3 | 1610.0 |
| 17.5°  | 1608.3 | 1598.4 | 1576.8 | 1585.0 | 1576.8 |
| 20°    | 1570.0 | 1560.1 | 1537.0 | 1541.8 | 1535.4 |
| 22.5°  | 1532.0 | 1517.0 | 1495.4 | 1495.4 | 1492.0 |
| 25°    | 1487.1 | 1473.9 | 1445.7 | 1448.9 | 1445.7 |
| 27.5°  | 1437.3 | 1425.6 | 1404.2 | 1399.2 | 1391.0 |
| 30°    | 1387.6 | 1374.3 | 1349.4 | 1344.4 | 1337.8 |
| 32.5°  | 1334.5 | 1324.6 | 1298.0 | 1288.0 | 1281.2 |
| 35°    | 1283.0 | 1266.5 | 1239.9 | 1229.9 | 1221.6 |
| 37.5°  | 1224.9 | 1209.9 | 1183.3 | 1171.8 | 1163.5 |
| 40°    | 1165.2 | 1151.8 | 1125.2 | 1110.4 | 1103.8 |
| 42.5°  | 1107.1 | 1093.7 | 1067.3 | 1050.6 | 1040.7 |
| 45°    | 1044.0 | 1032.5 | 1007.4 | 989.3  | 982.6  |
| 47.5°  | 982.6  | 970.9  | 944.4  | 926.1  | 916.3  |
| 50°    | 917.8  | 909.5  | 886.3  | 863.0  | 854.7  |
| 52.5°  | 854.7  | 843.2  | 821.7  | 803.4  | 791.7  |
| 55°    | 790.2  | 780.1  | 760.2  | 740.3  | 732.1  |
| 57.5°  | 725.3  | 717.1  | 695.3  | 675.5  | 668.8  |
| 60°    | 660.5  | 654.0  | 630.8  | 612.5  | 607.5  |
| 62.5°  | 597.5  | 585.9  | 569.4  | 552.7  | 546.1  |
| 65°    | 532.9  | 522.8  | 506.3  | 491.3  | 483.1  |
| 67.5°  | 466.4  | 458.0  | 443.3  | 431.6  | 425.0  |
| 70°    | 405.0  | 398.4  | 383.4  | 371.7  | 365.2  |
| 72.5°  | 342.0  | 335.3  | 327.0  | 315.4  | 310.4  |
| 75°    | 278.8  | 275.6  | 267.2  | 257.3  | 260.6  |
| 77.5°  | 222.4  | 215.7  | 212.4  | 207.4  | 202.5  |
| 80°    | 166.0  | 164.2  | 160.9  | 156.0  | 152.7  |
| 82.5°  | 112.9  | 112.9  | 111.3  | 104.6  | 104.6  |
| 85°    | 68.0   | 66.4   | 64.8   | 59.7   | 58.1   |
| 87.5°  | 29.9   | 26.6   | 23.3   | 18.3   | 16.5   |
| 90°    | 1.3    | 16.2   | 27.1   | 33.9   | 36.5   |
| 92.5°  | 33.9   | 28.5   | 32.5   | 35.3   | 36.5   |
| 95°    | 87.9   | 43.3   | 52.8   | 59.7   | 58.2   |
| 97.5°  | 158.4  | 47.5   | 69.0   | 73.2   | 74.4   |
| 100°   | 239.8  | 54.2   | 77.2   | 87.9   | 90.7   |
| 102.5° | 329.0  | 326.4  | 80.0   | 94.7   | 98.9   |
| 105°   | 411.7  | 452.4  | 82.6   | 97.5   | 102.9  |
| 107.5° | 507.8  | 541.5  | 85.4   | 100.1  | 105.7  |
| 110°   | 600.0  | 628.2  | 237.0  | 101.6  | 106.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 686.6  | 710.9  | 687.9  | 104.2  | 108.3  |
| 115°   | 778.6  | 801.6  | 835.5  | 208.6  | 111.1  |
| 117.5° | 858.5  | 885.5  | 908.7  | 714.9  | 360.2  |
| 120°   | 947.9  | 968.2  | 992.6  | 1008.9 | 826.0  |
| 122.5° | 1023.6 | 1045.3 | 1072.5 | 1080.6 | 1082.1 |
| 125°   | 1100.8 | 1118.5 | 1144.3 | 1153.7 | 1157.8 |
| 127.5° | 1171.2 | 1190.2 | 1210.7 | 1224.1 | 1225.4 |
| 130°   | 1237.6 | 1259.4 | 1274.1 | 1289.1 | 1287.9 |
| 132.5° | 1305.4 | 1323.0 | 1337.8 | 1350.1 | 1348.8 |
| 135°   | 1362.3 | 1384.0 | 1396.0 | 1409.8 | 1407.0 |
| 137.5° | 1421.7 | 1438.0 | 1451.7 | 1465.2 | 1461.2 |
| 140°   | 1480.0 | 1490.9 | 1505.7 | 1517.9 | 1511.2 |
| 142.5° | 1528.9 | 1538.4 | 1555.9 | 1566.7 | 1559.9 |
| 145°   | 1580.3 | 1578.9 | 1601.8 | 1611.4 | 1604.6 |
| 147.5° | 1624.9 | 1620.8 | 1643.9 | 1650.6 | 1645.3 |
| 150°   | 1668.3 | 1658.8 | 1680.5 | 1688.6 | 1681.8 |
| 152.5° | 1704.8 | 1694.0 | 1714.3 | 1722.5 | 1713.0 |
| 155°   | 1740.0 | 1727.9 | 1744.1 | 1752.2 | 1741.5 |
| 157.5° | 1768.4 | 1757.7 | 1769.9 | 1779.4 | 1768.4 |
| 160°   | 1792.9 | 1784.7 | 1792.9 | 1800.9 | 1791.5 |
| 162.5° | 1814.4 | 1806.5 | 1813.1 | 1822.6 | 1810.4 |
| 165°   | 1833.4 | 1825.4 | 1829.4 | 1838.8 | 1829.4 |
| 167.5° | 1848.4 | 1840.2 | 1844.4 | 1853.8 | 1841.6 |
| 170°   | 1860.6 | 1852.4 | 1855.1 | 1864.6 | 1852.4 |
| 172.5° | 1868.7 | 1860.6 | 1863.3 | 1872.8 | 1860.6 |
| 175°   | 1875.4 | 1865.9 | 1868.7 | 1878.1 | 1864.6 |
| 177.5° | 1878.1 | 1868.7 | 1870.1 | 1879.5 | 1867.3 |
| 180°   | 1871.3 | 1871.3 | 1871.3 | 1871.3 | 1871.3 |

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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 | 9.07             | 9.89  | 10.08 | 10.90 | 12.25 | 8.63           | 9.44  | 9.63  | 10.46 | 11.81 |
|                 | 3H   | 10.73            | 11.46 | 11.74 | 12.48 | 13.85 | 10.24          | 10.97 | 11.25 | 11.99 | 13.36 |
|                 | 4H   | 11.31            | 12.00 | 12.34 | 13.03 | 14.40 | 10.81          | 11.51 | 11.84 | 12.53 | 13.91 |
|                 | 6H   | 11.70            | 12.34 | 12.74 | 13.37 | 14.76 | 11.20          | 11.84 | 12.24 | 12.87 | 14.26 |
|                 | 8H   | 11.80            | 12.41 | 12.85 | 13.46 | 14.84 | 11.30          | 11.91 | 12.34 | 12.96 | 14.34 |
|                 | 12H  | 11.85            | 12.43 | 12.90 | 13.47 | 14.87 | 11.34          | 11.92 | 12.39 | 12.96 | 14.36 |
| 4H              | 2H   | 9.53             | 10.22 | 10.56 | 11.24 | 12.62 | 9.17           | 9.86  | 10.20 | 10.89 | 12.26 |
|                 | 3H   | 11.38            | 11.96 | 12.42 | 13.01 | 14.40 | 10.97          | 11.55 | 12.02 | 12.60 | 13.99 |
|                 | 4H   | 12.09            | 12.62 | 13.14 | 13.66 | 15.08 | 11.67          | 12.19 | 12.71 | 13.24 | 14.65 |
|                 | 6H   | 12.60            | 13.05 | 13.66 | 14.12 | 15.53 | 12.17          | 12.62 | 13.22 | 13.69 | 15.10 |
|                 | 8H   | 12.74            | 13.17 | 13.80 | 14.23 | 15.65 | 12.31          | 12.73 | 13.37 | 13.79 | 15.22 |
|                 | 12H  | 12.81            | 13.20 | 13.89 | 14.27 | 15.70 | 12.36          | 12.75 | 13.44 | 13.82 | 15.25 |
| 8H              | 4H   | 12.28            | 12.70 | 13.34 | 13.76 | 15.19 | 11.90          | 12.33 | 12.96 | 13.39 | 14.81 |
|                 | 6H   | 12.90            | 13.25 | 13.98 | 14.36 | 15.78 | 12.52          | 12.87 | 13.60 | 13.97 | 15.39 |
|                 | 8H   | 13.12            | 13.43 | 14.21 | 14.51 | 15.95 | 12.73          | 13.03 | 13.81 | 14.12 | 15.56 |
|                 | 12H  | 13.24            | 13.52 | 14.34 | 14.60 | 16.08 | 12.83          | 13.11 | 13.93 | 14.19 | 15.67 |
| 12H             | 4H   | 12.26            | 12.65 | 13.34 | 13.72 | 15.15 | 11.89          | 12.28 | 12.97 | 13.35 | 14.78 |
|                 | 6H   | 12.93            | 13.24 | 14.02 | 14.32 | 15.76 | 12.56          | 12.87 | 13.65 | 13.95 | 15.39 |
|                 | 8H   | 13.17            | 13.44 | 14.26 | 14.52 | 16.00 | 12.78          | 13.06 | 13.88 | 14.14 | 15.62 |