

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: P910872

Luminaire Tested: DFN2DIP-HX4F0-040D050US850-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P910872  
REPORT IS A COMBINATION OF REPORTS P899317 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-040D050US850-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

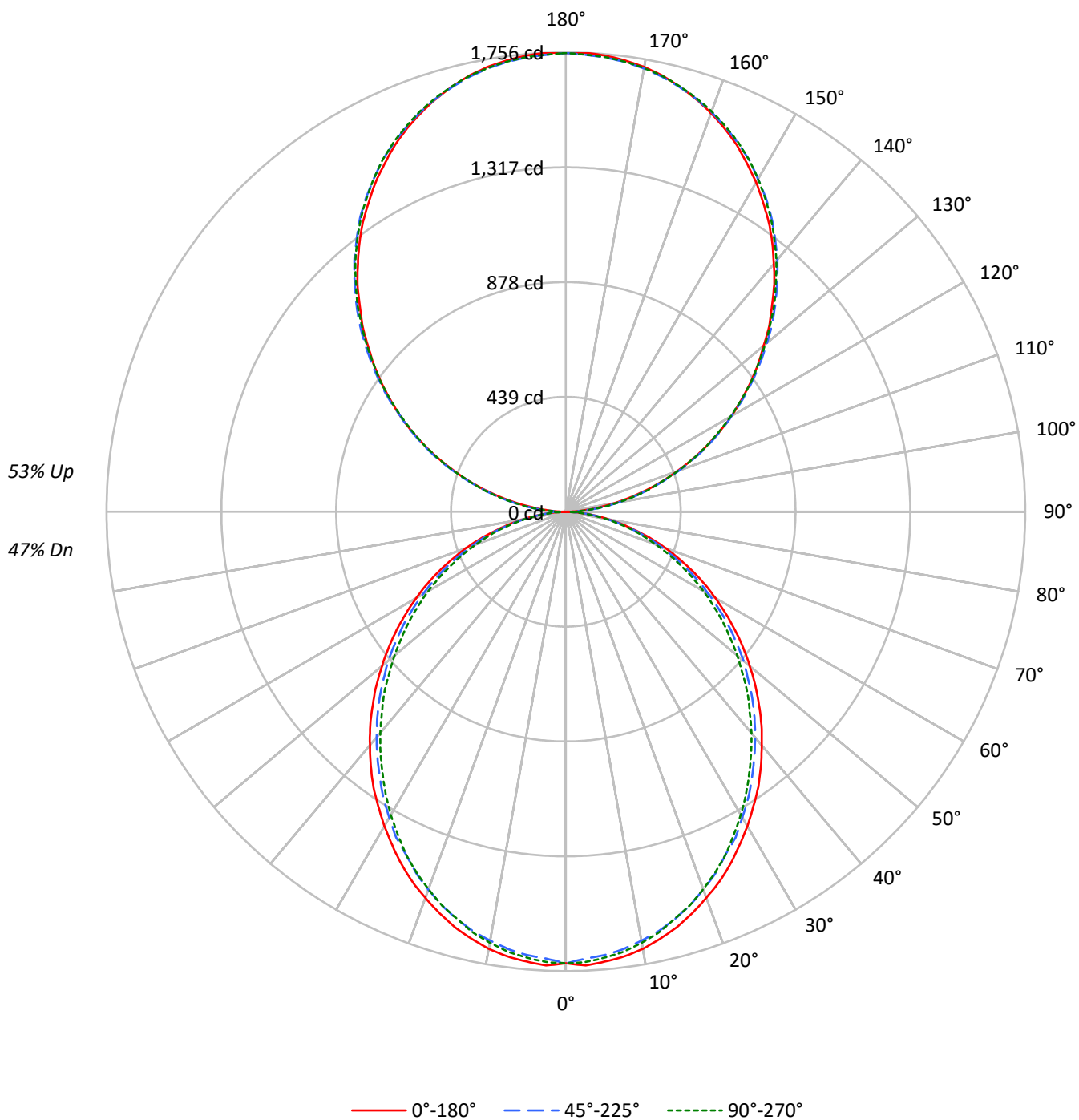
Lumens per Lamp: N/A  
Luminaire Lumens: 9299.0 lumens  
Efficiency: N/A  
Efficacy: 150.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 61.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-HX4F0-040D050US850-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P910872

CATALOG NUMBER: DFN2DIP-HX4F0-040D050US850-FLLFL

**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 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 67 | 67 | 67 | 54 | 54 | 54 |
| 1   | 97  | 93  | 89  | 85  | 89 | 85 | 82 | 79 | 72 | 69 | 67 | 59 | 57 | 56 | 47 | 46 | 45 |
| 2   | 88  | 81  | 75  | 70  | 81 | 75 | 69 | 65 | 63 | 59 | 56 | 52 | 49 | 47 | 42 | 40 | 38 |
| 3   | 81  | 71  | 64  | 58  | 74 | 66 | 59 | 54 | 55 | 51 | 47 | 46 | 42 | 39 | 37 | 35 | 32 |
| 4   | 74  | 63  | 55  | 49  | 68 | 58 | 51 | 46 | 49 | 44 | 40 | 41 | 37 | 34 | 33 | 30 | 28 |
| 5   | 68  | 56  | 48  | 42  | 62 | 52 | 45 | 39 | 44 | 39 | 34 | 37 | 33 | 29 | 30 | 27 | 24 |
| 6   | 62  | 50  | 42  | 37  | 57 | 47 | 40 | 34 | 40 | 34 | 30 | 33 | 29 | 26 | 27 | 24 | 21 |
| 7   | 58  | 45  | 38  | 32  | 53 | 42 | 35 | 30 | 36 | 30 | 26 | 30 | 26 | 23 | 25 | 21 | 19 |
| 8   | 54  | 41  | 34  | 28  | 49 | 38 | 31 | 27 | 33 | 27 | 23 | 28 | 23 | 20 | 23 | 19 | 17 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 28 | 24 | 30 | 25 | 21 | 25 | 21 | 18 | 21 | 18 | 15 |
| 10  | 47  | 35  | 27  | 23  | 43 | 32 | 26 | 21 | 28 | 22 | 19 | 23 | 19 | 16 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1283 | 1283 | 1283 |
| 5°  | 1286 | 1266 | 1274 |
| 10° | 1275 | 1249 | 1257 |
| 15° | 1257 | 1228 | 1230 |
| 20° | 1231 | 1200 | 1203 |
| 25° | 1206 | 1166 | 1171 |
| 30° | 1175 | 1134 | 1130 |
| 35° | 1145 | 1097 | 1087 |
| 40° | 1108 | 1059 | 1047 |
| 45° | 1072 | 1021 | 1005 |
| 50° | 1032 | 982  | 957  |
| 55° | 990  | 936  | 912  |
| 60° | 942  | 881  | 861  |
| 65° | 891  | 825  | 801  |
| 70° | 825  | 756  | 737  |
| 75° | 734  | 674  | 677  |
| 80° | 624  | 569  | 564  |
| 85° | 453  | 388  | 375  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1322 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 162.5  | 1.7       |
| 10°-20°   | 457.1  | 4.9       |
| 20°-30°   | 671.7  | 7.2       |
| 30°-40°   | 780.2  | 8.4       |
| 40°-50°   | 779.2  | 8.4       |
| 50°-60°   | 679.5  | 7.3       |
| 60°-70°   | 502.3  | 5.4       |
| 70°-80°   | 284.2  | 3.1       |
| 80°-90°   | 80.0   | 0.9       |
| 90°-100°  | 108.5  | 1.2       |
| 100°-110° | 344.8  | 3.7       |
| 110°-120° | 590.1  | 6.3       |
| 120°-130° | 776.0  | 8.3       |
| 130°-140° | 871.0  | 9.4       |
| 140°-150° | 854.2  | 9.2       |
| 150°-160° | 716.5  | 7.7       |
| 160°-170° | 475.2  | 5.1       |
| 170°-180° | 166.1  | 1.8       |
| 0°-30°    | 1291.3 | 13.9      |
| 0°-40°    | 2071.5 | 22.3      |
| 0°-60°    | 3530.2 | 38.0      |
| 0°-90°    | 4396.6 | 47.3      |
| 90°-120°  | 1043.4 | 11.2      |
| 90°-150°  | 3544.6 | 38.1      |
| 90°-180°  | 4902.0 | 52.7      |
| 0°-180°   | 9299.0 | 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°  | 2    | 19    | 52   | 49    | 50   | 9    |
| 95°  | 77   | 92    | 95   | 95    | 92   | 86   |
| 105° | 318  | 322   | 326  | 328   | 328  | 336  |
| 115° | 592  | 601   | 598  | 596   | 592  | 586  |
| 125° | 861  | 874   | 870  | 866   | 864  | 770  |
| 135° | 1114 | 1130  | 1134 | 1132  | 1128 | 861  |
| 145° | 1352 | 1363  | 1371 | 1373  | 1367 | 845  |
| 155° | 1546 | 1551  | 1555 | 1563  | 1558 | 712  |
| 165° | 1682 | 1681  | 1681 | 1691  | 1684 | 475  |
| 175° | 1751 | 1746  | 1743 | 1754  | 1745 | 166  |
| 180° | 1754 | 1754  | 1754 | 1754  | 1754 |      |

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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°    | 1.6    | 19.1   | 51.8   | 48.7   | 50.2   |
| 92.5°  | 32.8   | 44.4   | 46.0   | 47.6   | 47.6   |
| 95°    | 77.2   | 92.0   | 94.6   | 94.6   | 92.0   |
| 97.5°  | 128.4  | 142.2  | 148.1  | 148.1  | 148.1  |
| 100°   | 187.6  | 199.8  | 204.1  | 204.1  | 202.5  |
| 102.5° | 250.1  | 259.1  | 264.8  | 266.5  | 264.8  |
| 105°   | 318.3  | 322.5  | 325.7  | 328.3  | 328.3  |
| 107.5° | 385.9  | 392.3  | 392.3  | 393.4  | 385.9  |
| 110°   | 451.5  | 460.0  | 460.0  | 460.0  | 455.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 522.3  | 531.3  | 529.8  | 525.6  | 522.3  |
| 115°   | 592.1  | 600.6  | 598.0  | 596.4  | 592.1  |
| 117.5° | 661.4  | 673.1  | 665.6  | 661.4  | 657.2  |
| 120°   | 731.2  | 742.8  | 731.2  | 731.2  | 726.4  |
| 122.5° | 794.6  | 809.5  | 802.0  | 797.8  | 794.6  |
| 125°   | 861.2  | 874.4  | 870.2  | 865.5  | 863.9  |
| 127.5° | 926.2  | 942.6  | 936.9  | 930.5  | 926.2  |
| 130°   | 987.1  | 1006.1 | 1003.4 | 1000.3 | 994.4  |
| 132.5° | 1055.3 | 1070.1 | 1071.2 | 1063.8 | 1059.5 |
| 135°   | 1114.0 | 1130.3 | 1133.5 | 1132.0 | 1127.7 |
| 137.5° | 1179.5 | 1192.7 | 1195.4 | 1194.3 | 1188.0 |
| 140°   | 1237.1 | 1250.4 | 1257.7 | 1257.7 | 1252.0 |
| 142.5° | 1296.3 | 1309.6 | 1313.8 | 1315.4 | 1309.6 |
| 145°   | 1352.4 | 1363.0 | 1371.4 | 1373.1 | 1367.2 |
| 147.5° | 1402.7 | 1415.9 | 1422.2 | 1424.8 | 1419.0 |
| 150°   | 1454.5 | 1463.4 | 1469.2 | 1474.0 | 1469.2 |
| 152.5° | 1500.5 | 1509.5 | 1516.8 | 1522.7 | 1516.8 |
| 155°   | 1546.4 | 1550.6 | 1555.4 | 1562.8 | 1558.0 |
| 157.5° | 1586.1 | 1589.2 | 1591.9 | 1602.5 | 1595.1 |
| 160°   | 1621.5 | 1624.7 | 1626.2 | 1635.2 | 1628.9 |
| 162.5° | 1654.3 | 1654.3 | 1655.8 | 1665.9 | 1658.5 |
| 165°   | 1682.4 | 1680.7 | 1680.7 | 1691.3 | 1683.9 |
| 167.5° | 1707.6 | 1702.9 | 1702.9 | 1713.5 | 1706.1 |
| 170°   | 1726.7 | 1722.5 | 1720.9 | 1731.5 | 1722.5 |
| 172.5° | 1739.9 | 1735.7 | 1734.1 | 1744.7 | 1735.7 |
| 175°   | 1750.6 | 1746.2 | 1743.1 | 1753.7 | 1744.7 |
| 177.5° | 1756.3 | 1752.1 | 1748.9 | 1757.9 | 1748.9 |
| 180°   | 1753.7 | 1753.7 | 1753.7 | 1753.7 | 1753.7 |

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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 | 7.88             | 8.72  | 8.86  | 9.71  | 11.02 | 7.45           | 8.29  | 8.43  | 9.28  | 10.59 |
|                 | 3H   | 9.54             | 10.29 | 10.53 | 11.29 | 12.62 | 9.07           | 9.82  | 10.06 | 10.82 | 12.15 |
|                 | 4H   | 10.13            | 10.84 | 11.13 | 11.84 | 13.18 | 9.65           | 10.37 | 10.66 | 11.37 | 12.71 |
|                 | 6H   | 10.53            | 11.18 | 11.54 | 12.19 | 13.54 | 10.05          | 10.71 | 11.07 | 11.72 | 13.07 |
|                 | 8H   | 10.63            | 11.26 | 11.65 | 12.28 | 13.63 | 10.16          | 10.78 | 11.18 | 11.81 | 13.15 |
|                 | 12H  | 10.68            | 11.27 | 11.70 | 12.29 | 13.67 | 10.20          | 10.79 | 11.22 | 11.81 | 13.18 |
| 4H              | 2H   | 8.34             | 9.05  | 9.35  | 10.06 | 11.40 | 8.00           | 8.71  | 9.01  | 9.71  | 11.05 |
|                 | 3H   | 10.21            | 10.80 | 11.22 | 11.83 | 13.19 | 9.81           | 10.41 | 10.83 | 11.44 | 12.79 |
|                 | 4H   | 10.92            | 11.46 | 11.95 | 12.49 | 13.87 | 10.51          | 11.06 | 11.54 | 12.08 | 13.46 |
|                 | 6H   | 11.43            | 11.90 | 12.47 | 12.95 | 14.32 | 11.02          | 11.49 | 12.06 | 12.54 | 13.91 |
|                 | 8H   | 11.58            | 12.02 | 12.62 | 13.06 | 14.45 | 11.17          | 11.61 | 12.21 | 12.65 | 14.04 |
|                 | 12H  | 11.66            | 12.05 | 12.71 | 13.11 | 14.50 | 11.23          | 11.63 | 12.29 | 12.69 | 14.08 |
| 8H              | 4H   | 11.12            | 11.55 | 12.15 | 12.59 | 13.98 | 10.75          | 11.19 | 11.79 | 12.23 | 13.62 |
|                 | 6H   | 11.75            | 12.11 | 12.81 | 13.19 | 14.58 | 11.38          | 11.74 | 12.45 | 12.83 | 14.21 |
|                 | 8H   | 11.97            | 12.29 | 13.04 | 13.35 | 14.76 | 11.60          | 11.92 | 12.67 | 12.98 | 14.39 |
|                 | 12H  | 12.10            | 12.38 | 13.17 | 13.44 | 14.89 | 11.71          | 11.99 | 12.79 | 13.06 | 14.50 |
| 12H             | 4H   | 11.10            | 11.49 | 12.16 | 12.55 | 13.94 | 10.75          | 11.14 | 11.80 | 12.20 | 13.59 |
|                 | 6H   | 11.78            | 12.09 | 12.85 | 13.16 | 14.57 | 11.42          | 11.74 | 12.49 | 12.81 | 14.21 |
|                 | 8H   | 12.02            | 12.30 | 13.09 | 13.36 | 14.81 | 11.66          | 11.94 | 12.73 | 13.00 | 14.45 |