

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: P910671

Luminaire Tested: DFN2DIP-HX2F0-050D040US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P910671  
REPORT IS A COMBINATION OF REPORTS P900697 AND P897595  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-050D040US850-FLLONL  
Description: 2 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

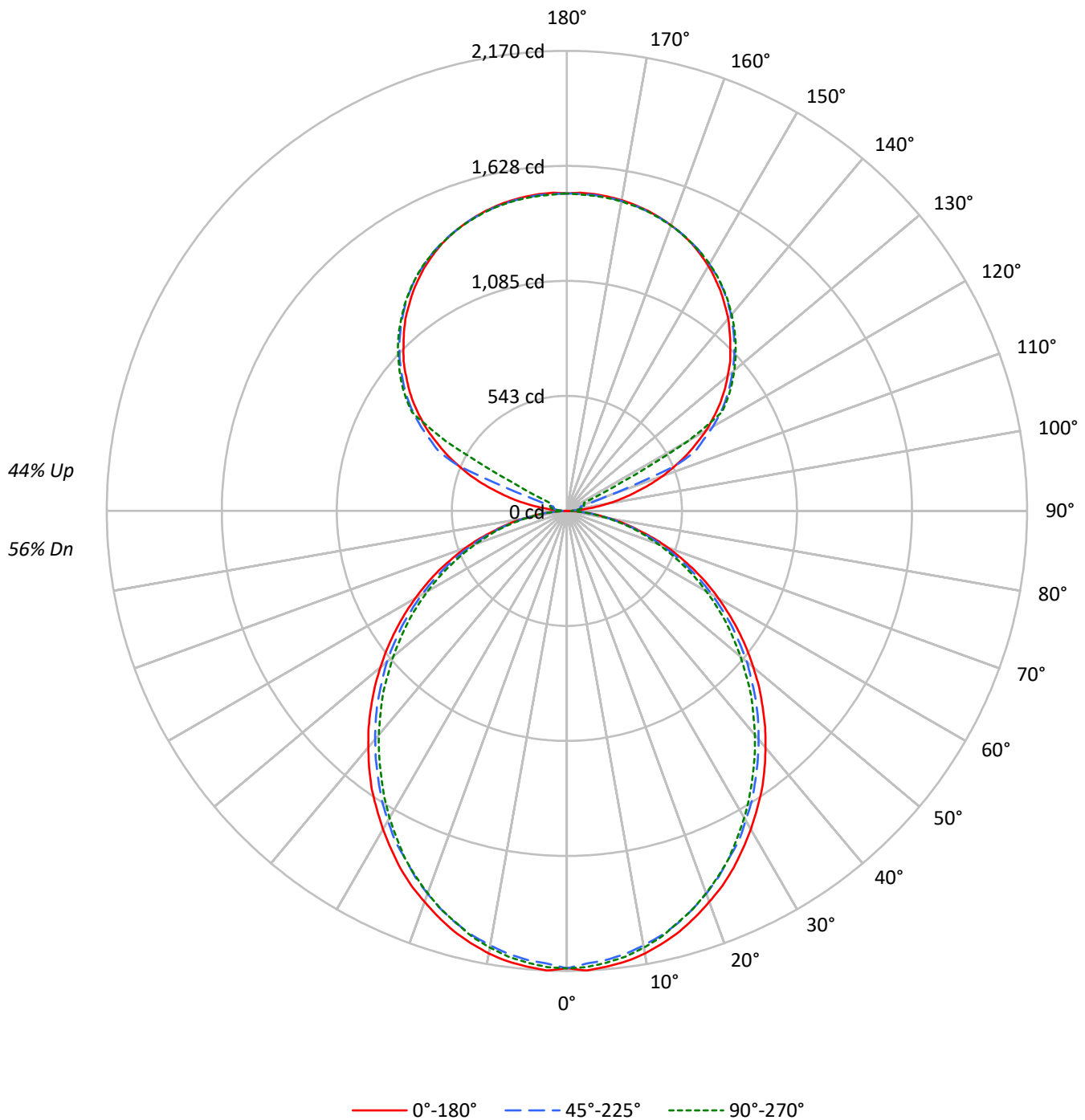
Lumens per Lamp: N/A  
Luminaire Lumens: 9881.2 lumens  
Efficiency: N/A  
Efficacy: 128.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 1.99' x L: 2.3' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 76.9  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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   | 108 | 108 | 108 | 108 | 101 | 101 | 101 | 101 | 86 | 86 | 86 | 73 | 73 | 73 | 61 | 61 | 61 |
| 1   | 99  | 95  | 91  | 87  | 92  | 88  | 85  | 82  | 76 | 73 | 71 | 65 | 63 | 61 | 54 | 53 | 52 |
| 2   | 90  | 83  | 76  | 71  | 84  | 77  | 72  | 67  | 66 | 62 | 59 | 57 | 54 | 51 | 48 | 46 | 44 |
| 3   | 82  | 73  | 65  | 59  | 76  | 68  | 61  | 56  | 59 | 54 | 50 | 50 | 46 | 43 | 42 | 39 | 37 |
| 4   | 75  | 64  | 56  | 50  | 70  | 60  | 53  | 48  | 52 | 47 | 42 | 45 | 40 | 37 | 38 | 35 | 32 |
| 5   | 69  | 57  | 49  | 43  | 64  | 54  | 46  | 41  | 47 | 41 | 36 | 40 | 36 | 32 | 34 | 31 | 28 |
| 6   | 64  | 52  | 43  | 37  | 59  | 48  | 41  | 36  | 42 | 36 | 32 | 36 | 32 | 28 | 31 | 27 | 25 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 36  | 31  | 38 | 32 | 28 | 33 | 28 | 25 | 28 | 25 | 22 |
| 8   | 55  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 30 | 26 | 22 | 26 | 22 | 20 |
| 9   | 51  | 39  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 26 | 22 | 28 | 23 | 20 | 24 | 20 | 18 |
| 10  | 48  | 35  | 28  | 23  | 44  | 33  | 27  | 22  | 29 | 24 | 20 | 26 | 21 | 18 | 22 | 19 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 5084 | 5084 | 5084 |
| 5°  | 5084 | 5000 | 5037 |
| 10° | 5034 | 4921 | 4960 |
| 15° | 4952 | 4828 | 4844 |
| 20° | 4844 | 4704 | 4726 |
| 25° | 4736 | 4557 | 4590 |
| 30° | 4603 | 4420 | 4421 |
| 35° | 4476 | 4260 | 4243 |
| 40° | 4322 | 4098 | 4072 |
| 45° | 4167 | 3935 | 3897 |
| 50° | 3998 | 3763 | 3695 |
| 55° | 3820 | 3565 | 3507 |
| 60° | 3618 | 3333 | 3292 |
| 65° | 3396 | 3089 | 3038 |
| 70° | 3115 | 2792 | 2764 |
| 75° | 2728 | 2436 | 2497 |
| 80° | 2259 | 1984 | 2016 |
| 85° | 1532 | 1245 | 1246 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 4167 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 203.1  | 2.1       |
| 10°-20°   | 571.4  | 5.8       |
| 20°-30°   | 839.7  | 8.5       |
| 30°-40°   | 975.2  | 9.9       |
| 40°-50°   | 974.0  | 9.9       |
| 50°-60°   | 849.3  | 8.6       |
| 60°-70°   | 627.9  | 6.4       |
| 70°-80°   | 355.2  | 3.6       |
| 80°-90°   | 96.4   | 1.0       |
| 90°-100°  | 49.4   | 0.5       |
| 100°-110° | 184.0  | 1.9       |
| 110°-120° | 488.1  | 4.9       |
| 120°-130° | 809.5  | 8.2       |
| 130°-140° | 859.9  | 8.7       |
| 140°-150° | 799.2  | 8.1       |
| 150°-160° | 642.5  | 6.5       |
| 160°-170° | 414.0  | 4.2       |
| 170°-180° | 142.5  | 1.4       |
| 0°-30°    | 1614.1 | 16.3      |
| 0°-40°    | 2589.4 | 26.2      |
| 0°-60°    | 4412.7 | 44.7      |
| 0°-90°    | 5492.2 | 55.6      |
| 90°-120°  | 721.5  | 7.3       |
| 90°-150°  | 3190.0 | 32.3      |
| 90°-180°  | 4389.0 | 44.4      |
| 0°-180°   | 9881.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2158 | 2158  | 2158 | 2158  | 2158 |      |
| 5°   | 2158 | 2150  | 2126 | 2143  | 2139 | 205  |
| 15°  | 2054 | 2042  | 2014 | 2023  | 2012 | 578  |
| 25°  | 1859 | 1842  | 1807 | 1811  | 1807 | 855  |
| 35°  | 1604 | 1583  | 1550 | 1537  | 1527 | 1001 |
| 45°  | 1305 | 1290  | 1259 | 1237  | 1228 | 1007 |
| 55°  | 988  | 975   | 950  | 925   | 915  | 883  |
| 65°  | 666  | 654   | 633  | 614   | 604  | 659  |
| 75°  | 348  | 344   | 334  | 322   | 326  | 372  |
| 85°  | 85   | 83    | 81   | 75    | 73   | 95   |
| 90°  | 1    | 13    | 22   | 27    | 29   | 9    |
| 95°  | 70   | 35    | 42   | 48    | 47   | 83   |
| 105° | 329  | 362   | 66   | 78    | 82   | 352  |
| 115° | 623  | 641   | 668  | 167   | 89   | 613  |
| 125° | 881  | 895   | 915  | 923   | 926  | 785  |
| 135° | 1090 | 1107  | 1117 | 1128  | 1126 | 842  |
| 145° | 1264 | 1263  | 1281 | 1289  | 1284 | 791  |
| 155° | 1392 | 1382  | 1395 | 1402  | 1393 | 641  |
| 165° | 1467 | 1460  | 1464 | 1471  | 1464 | 414  |
| 175° | 1500 | 1493  | 1495 | 1502  | 1492 | 143  |
| 180° | 1497 | 1497  | 1497 | 1497  | 1497 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2157.6 | 2157.6 | 2157.6 | 2157.6 | 2157.6 |
| 2.5°   | 2170.1 | 2159.8 | 2136.9 | 2157.6 | 2153.7 |
| 5°     | 2157.6 | 2149.5 | 2126.5 | 2143.0 | 2139.2 |
| 7.5°   | 2143.0 | 2130.7 | 2107.9 | 2124.6 | 2120.4 |
| 10°    | 2120.4 | 2105.9 | 2081.0 | 2097.5 | 2091.4 |
| 12.5°  | 2089.1 | 2076.8 | 2052.0 | 2062.3 | 2058.1 |
| 15°    | 2053.9 | 2041.6 | 2014.5 | 2022.9 | 2012.5 |
| 17.5°  | 2010.3 | 1998.0 | 1970.9 | 1981.2 | 1970.9 |
| 20°    | 1962.6 | 1950.3 | 1921.2 | 1927.3 | 1919.2 |
| 22.5°  | 1915.0 | 1896.3 | 1869.2 | 1869.2 | 1865.0 |
| 25°    | 1858.9 | 1842.4 | 1807.1 | 1811.1 | 1807.1 |
| 27.5°  | 1796.6 | 1782.1 | 1755.2 | 1749.0 | 1738.7 |
| 30°    | 1734.5 | 1717.8 | 1686.8 | 1680.6 | 1672.3 |
| 32.5°  | 1668.0 | 1655.7 | 1622.5 | 1609.9 | 1601.6 |
| 35°    | 1603.7 | 1583.1 | 1549.8 | 1537.3 | 1527.0 |
| 37.5°  | 1531.1 | 1512.5 | 1479.2 | 1464.7 | 1454.3 |
| 40°    | 1456.6 | 1439.8 | 1406.5 | 1388.0 | 1379.7 |
| 42.5°  | 1383.9 | 1367.2 | 1334.1 | 1313.2 | 1300.9 |
| 45°    | 1305.1 | 1290.5 | 1259.3 | 1236.6 | 1228.2 |
| 47.5°  | 1228.2 | 1213.7 | 1180.5 | 1157.6 | 1145.3 |
| 50°    | 1147.3 | 1136.9 | 1107.9 | 1078.8 | 1068.4 |
| 52.5°  | 1068.4 | 1053.9 | 1027.0 | 1004.2 | 989.7  |
| 55°    | 987.7  | 975.1  | 950.2  | 925.3  | 915.0  |
| 57.5°  | 906.6  | 896.3  | 869.2  | 844.4  | 836.0  |
| 60°    | 825.7  | 817.6  | 788.5  | 765.5  | 759.4  |
| 62.5°  | 746.9  | 732.4  | 711.6  | 690.9  | 682.6  |
| 65°    | 666.1  | 653.5  | 632.8  | 614.2  | 603.7  |
| 67.5°  | 583.1  | 572.6  | 554.1  | 539.5  | 531.1  |
| 70°    | 506.3  | 497.9  | 479.2  | 464.7  | 456.6  |
| 72.5°  | 427.5  | 419.1  | 408.8  | 394.2  | 388.0  |
| 75°    | 348.4  | 344.5  | 333.9  | 321.6  | 325.8  |
| 77.5°  | 278.0  | 269.6  | 265.5  | 259.3  | 253.2  |
| 80°    | 207.6  | 205.4  | 201.2  | 195.1  | 190.9  |
| 82.5°  | 141.1  | 141.1  | 139.1  | 130.8  | 130.8  |
| 85°    | 84.9   | 83.0   | 81.0   | 74.6   | 72.6   |
| 87.5°  | 37.4   | 33.3   | 29.1   | 22.8   | 20.7   |
| 90°    | 1.0    | 13.0   | 21.6   | 27.2   | 29.2   |
| 92.5°  | 27.2   | 22.7   | 26.0   | 28.2   | 29.2   |
| 95°    | 70.3   | 34.6   | 42.1   | 47.7   | 46.6   |
| 97.5°  | 126.8  | 37.9   | 55.2   | 58.6   | 59.6   |
| 100°   | 191.7  | 43.4   | 61.8   | 70.3   | 72.5   |
| 102.5° | 263.2  | 261.2  | 63.9   | 75.7   | 79.1   |
| 105°   | 329.3  | 361.9  | 66.1   | 78.0   | 82.3   |
| 107.5° | 406.2  | 433.3  | 68.3   | 80.2   | 84.5   |
| 110°   | 480.0  | 502.6  | 189.6  | 81.3   | 85.5   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 549.3  | 568.7  | 550.3  | 83.4   | 86.7   |
| 115°   | 622.8  | 641.2  | 668.4  | 166.8  | 88.9   |
| 117.5° | 686.8  | 708.4  | 726.9  | 571.9  | 288.1  |
| 120°   | 758.3  | 774.5  | 794.0  | 807.1  | 660.9  |
| 122.5° | 818.9  | 836.3  | 858.0  | 864.5  | 865.6  |
| 125°   | 880.7  | 894.9  | 915.4  | 923.0  | 926.2  |
| 127.5° | 937.0  | 952.2  | 968.5  | 979.4  | 980.4  |
| 130°   | 990.1  | 1007.5 | 1019.3 | 1031.3 | 1030.3 |
| 132.5° | 1044.2 | 1058.4 | 1070.3 | 1080.1 | 1079.1 |
| 135°   | 1089.8 | 1107.2 | 1116.9 | 1127.7 | 1125.6 |
| 137.5° | 1137.4 | 1150.4 | 1161.3 | 1172.1 | 1168.9 |
| 140°   | 1184.0 | 1192.7 | 1204.6 | 1214.4 | 1208.9 |
| 142.5° | 1223.1 | 1230.7 | 1244.7 | 1253.3 | 1248.0 |
| 145°   | 1264.3 | 1263.2 | 1281.4 | 1289.1 | 1283.7 |
| 147.5° | 1299.9 | 1296.6 | 1315.1 | 1320.5 | 1316.3 |
| 150°   | 1334.6 | 1327.0 | 1344.4 | 1350.9 | 1345.4 |
| 152.5° | 1363.8 | 1355.2 | 1371.4 | 1377.9 | 1370.4 |
| 155°   | 1392.0 | 1382.4 | 1395.3 | 1401.8 | 1393.1 |
| 157.5° | 1414.8 | 1406.1 | 1416.0 | 1423.5 | 1414.8 |
| 160°   | 1434.3 | 1427.7 | 1434.3 | 1440.7 | 1433.2 |
| 162.5° | 1451.6 | 1445.1 | 1450.6 | 1458.1 | 1448.4 |
| 165°   | 1466.8 | 1460.3 | 1463.5 | 1471.1 | 1463.5 |
| 167.5° | 1478.7 | 1472.1 | 1475.5 | 1483.1 | 1473.3 |
| 170°   | 1488.5 | 1482.0 | 1484.1 | 1491.7 | 1482.0 |
| 172.5° | 1494.9 | 1488.5 | 1490.7 | 1498.3 | 1488.5 |
| 175°   | 1500.3 | 1492.7 | 1494.9 | 1502.5 | 1491.7 |
| 177.5° | 1502.5 | 1494.9 | 1496.0 | 1503.7 | 1493.9 |
| 180°   | 1497.2 | 1497.2 | 1497.2 | 1497.2 | 1497.2 |

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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 | 13.28            | 14.20 | 14.19 | 15.13 | 16.31 | 12.86          | 13.78 | 13.77 | 14.70 | 15.89 |
|                 | 3H   | 14.92            | 15.74 | 15.84 | 16.68 | 17.89 | 14.46          | 15.28 | 15.38 | 16.22 | 17.43 |
|                 | 4H   | 15.50            | 16.27 | 16.43 | 17.21 | 18.44 | 15.04          | 15.81 | 15.97 | 16.76 | 17.98 |
|                 | 6H   | 15.88            | 16.60 | 16.83 | 17.54 | 18.78 | 15.42          | 16.14 | 16.37 | 17.08 | 18.32 |
|                 | 8H   | 15.98            | 16.66 | 16.93 | 17.62 | 18.86 | 15.52          | 16.20 | 16.47 | 17.17 | 18.40 |
|                 | 12H  | 16.02            | 16.67 | 16.98 | 17.62 | 18.88 | 15.56          | 16.20 | 16.51 | 17.16 | 18.42 |
| 4H              | 2H   | 13.74            | 14.52 | 14.68 | 15.46 | 16.68 | 13.40          | 14.18 | 14.34 | 15.12 | 16.34 |
|                 | 3H   | 15.58            | 16.23 | 16.53 | 17.20 | 18.44 | 15.20          | 15.85 | 16.15 | 16.82 | 18.06 |
|                 | 4H   | 16.28            | 16.87 | 17.24 | 17.84 | 19.10 | 15.89          | 16.48 | 16.85 | 17.44 | 18.71 |
|                 | 6H   | 16.78            | 17.29 | 17.75 | 18.28 | 19.54 | 16.38          | 16.89 | 17.35 | 17.88 | 19.14 |
|                 | 8H   | 16.91            | 17.39 | 17.89 | 18.37 | 19.65 | 16.52          | 16.99 | 17.49 | 17.98 | 19.25 |
|                 | 12H  | 16.98            | 17.41 | 17.97 | 18.41 | 19.69 | 16.57          | 17.00 | 17.57 | 18.00 | 19.28 |
| 8H              | 4H   | 16.47            | 16.95 | 17.45 | 17.93 | 19.21 | 16.12          | 16.60 | 17.09 | 17.58 | 18.85 |
|                 | 6H   | 17.08            | 17.47 | 18.08 | 18.49 | 19.77 | 16.72          | 17.12 | 17.72 | 18.14 | 19.42 |
|                 | 8H   | 17.28            | 17.63 | 18.29 | 18.64 | 19.93 | 16.92          | 17.27 | 17.93 | 18.28 | 19.58 |
|                 | 12H  | 17.40            | 17.70 | 18.41 | 18.71 | 20.05 | 17.03          | 17.34 | 18.04 | 18.34 | 19.68 |
| 12H             | 4H   | 16.46            | 16.89 | 17.45 | 17.89 | 19.17 | 16.11          | 16.54 | 17.11 | 17.54 | 18.82 |
|                 | 6H   | 17.10            | 17.45 | 18.11 | 18.46 | 19.75 | 16.76          | 17.11 | 17.77 | 18.12 | 19.41 |
|                 | 8H   | 17.33            | 17.63 | 18.34 | 18.64 | 19.98 | 16.98          | 17.29 | 17.99 | 18.29 | 19.63 |