

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: P918611

Luminaire Tested: DFN2DIP-4P3F0-050D040US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P918611  
REPORT IS A COMBINATION OF REPORTS P900575 AND P897473  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-050D040US935-FLLONL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

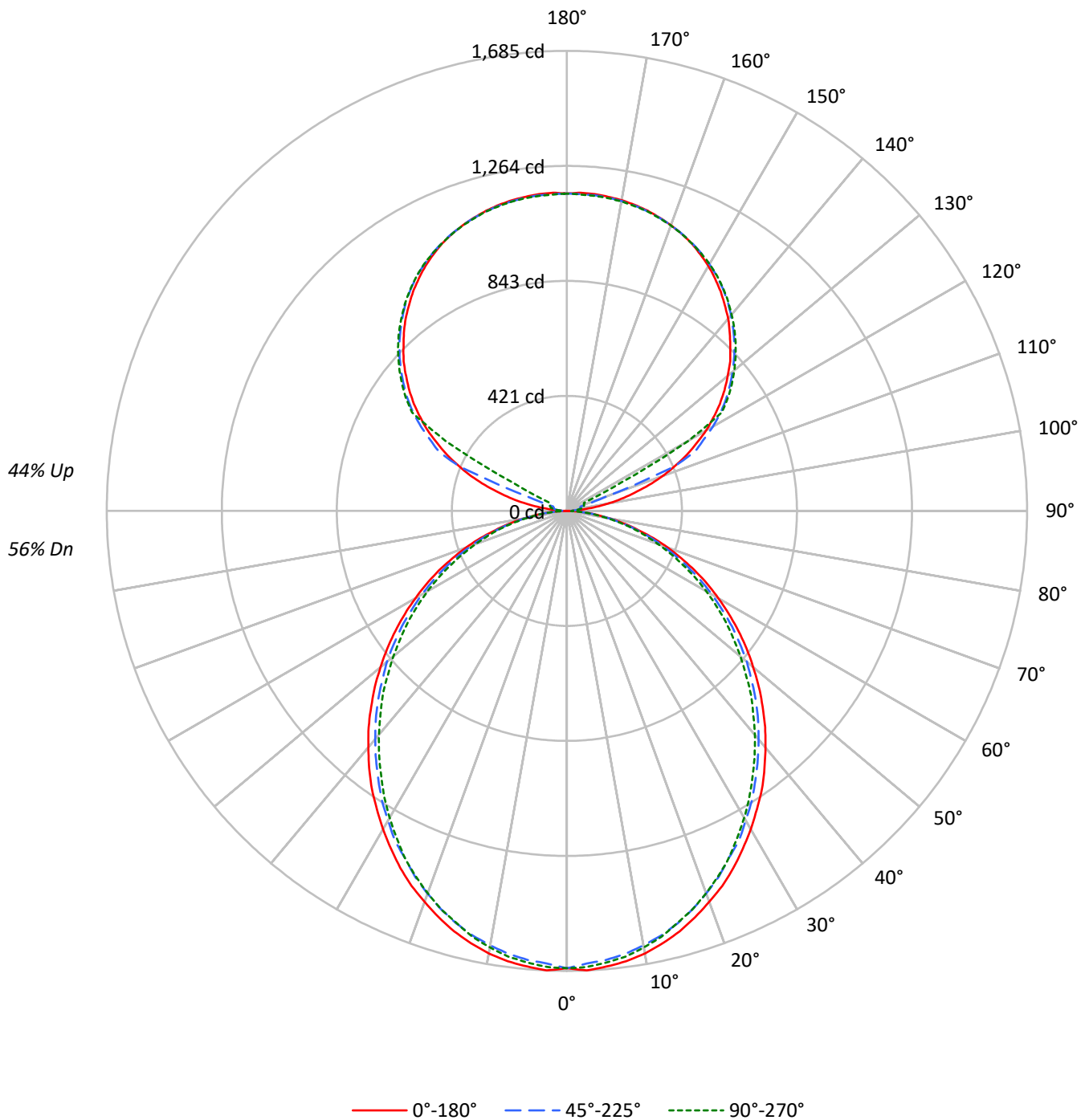
Lumens per Lamp: N/A  
Luminaire Lumens: 7671.5 lumens  
Efficiency: N/A  
Efficacy: 97.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 78.6  
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

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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°  | 1909 | 1909 | 1909 |
| 5°  | 1911 | 1881 | 1894 |
| 10° | 1894 | 1855 | 1868 |
| 15° | 1865 | 1823 | 1827 |
| 20° | 1826 | 1779 | 1786 |
| 25° | 1788 | 1727 | 1738 |
| 30° | 1739 | 1679 | 1677 |
| 35° | 1694 | 1622 | 1613 |
| 40° | 1638 | 1564 | 1551 |
| 45° | 1581 | 1506 | 1488 |
| 50° | 1520 | 1446 | 1416 |
| 55° | 1456 | 1375 | 1349 |
| 60° | 1383 | 1292 | 1272 |
| 65° | 1303 | 1206 | 1181 |
| 70° | 1202 | 1100 | 1084 |
| 75° | 1062 | 974  | 993  |
| 80° | 893  | 813  | 821  |
| 85° | 629  | 539  | 538  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1581 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 157.7  | 2.1       |
| 10°-20°   | 443.6  | 5.8       |
| 20°-30°   | 651.9  | 8.5       |
| 30°-40°   | 757.2  | 9.9       |
| 40°-50°   | 756.2  | 9.9       |
| 50°-60°   | 659.4  | 8.6       |
| 60°-70°   | 487.4  | 6.4       |
| 70°-80°   | 275.8  | 3.6       |
| 80°-90°   | 74.8   | 1.0       |
| 90°-100°  | 38.3   | 0.5       |
| 100°-110° | 142.9  | 1.9       |
| 110°-120° | 378.9  | 4.9       |
| 120°-130° | 628.5  | 8.2       |
| 130°-140° | 667.6  | 8.7       |
| 140°-150° | 620.4  | 8.1       |
| 150°-160° | 498.8  | 6.5       |
| 160°-170° | 321.4  | 4.2       |
| 170°-180° | 110.6  | 1.4       |
| 0°-30°    | 1253.2 | 16.3      |
| 0°-40°    | 2010.3 | 26.2      |
| 0°-60°    | 3425.9 | 44.7      |
| 0°-90°    | 4264.0 | 55.6      |
| 90°-120°  | 560.1  | 7.3       |
| 90°-150°  | 2476.6 | 32.3      |
| 90°-180°  | 3407.0 | 44.4      |
| 0°-180°   | 7671.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1675 | 1675  | 1675 | 1675  | 1675 |      |
| 5°   | 1675 | 1669  | 1651 | 1664  | 1661 | 159  |
| 15°  | 1595 | 1585  | 1564 | 1570  | 1562 | 449  |
| 25°  | 1443 | 1430  | 1403 | 1406  | 1403 | 664  |
| 35°  | 1245 | 1229  | 1203 | 1194  | 1186 | 778  |
| 45°  | 1013 | 1002  | 978  | 960   | 954  | 782  |
| 55°  | 767  | 757   | 738  | 718   | 710  | 686  |
| 65°  | 517  | 507   | 491  | 477   | 469  | 511  |
| 75°  | 270  | 267   | 259  | 250   | 253  | 289  |
| 85°  | 66   | 64    | 63   | 58    | 56   | 74   |
| 90°  | 1    | 10    | 17   | 21    | 23   | 7    |
| 95°  | 55   | 27    | 33   | 37    | 36   | 65   |
| 105° | 256  | 281   | 51   | 60    | 64   | 273  |
| 115° | 484  | 498   | 519  | 130   | 69   | 476  |
| 125° | 684  | 695   | 711  | 717   | 719  | 610  |
| 135° | 846  | 860   | 867  | 876   | 874  | 654  |
| 145° | 982  | 981   | 995  | 1001  | 997  | 614  |
| 155° | 1081 | 1073  | 1083 | 1088  | 1082 | 498  |
| 165° | 1139 | 1134  | 1136 | 1142  | 1136 | 322  |
| 175° | 1165 | 1159  | 1161 | 1166  | 1158 | 111  |
| 180° | 1162 | 1162  | 1162 | 1162  | 1162 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1675.1 | 1675.1 | 1675.1 | 1675.1 | 1675.1 |
| 2.5°   | 1684.8 | 1676.8 | 1659.1 | 1675.1 | 1672.1 |
| 5°     | 1675.1 | 1668.8 | 1651.0 | 1663.8 | 1660.8 |
| 7.5°   | 1663.8 | 1654.2 | 1636.5 | 1649.5 | 1646.2 |
| 10°    | 1646.2 | 1634.9 | 1615.7 | 1628.4 | 1623.7 |
| 12.5°  | 1621.9 | 1612.4 | 1593.1 | 1601.1 | 1597.8 |
| 15°    | 1594.6 | 1585.0 | 1564.0 | 1570.5 | 1562.5 |
| 17.5°  | 1560.7 | 1551.2 | 1530.2 | 1538.2 | 1530.2 |
| 20°    | 1523.7 | 1514.2 | 1491.6 | 1496.3 | 1490.0 |
| 22.5°  | 1486.8 | 1472.2 | 1451.2 | 1451.2 | 1447.9 |
| 25°    | 1443.2 | 1430.4 | 1403.0 | 1406.1 | 1403.0 |
| 27.5°  | 1394.8 | 1383.5 | 1362.7 | 1357.9 | 1349.9 |
| 30°    | 1346.6 | 1333.7 | 1309.6 | 1304.8 | 1298.3 |
| 32.5°  | 1295.0 | 1285.5 | 1259.6 | 1249.9 | 1243.5 |
| 35°    | 1245.1 | 1229.1 | 1203.2 | 1193.5 | 1185.5 |
| 37.5°  | 1188.7 | 1174.2 | 1148.4 | 1137.1 | 1129.1 |
| 40°    | 1130.8 | 1117.8 | 1092.0 | 1077.6 | 1071.2 |
| 42.5°  | 1074.4 | 1061.4 | 1035.8 | 1019.5 | 1010.0 |
| 45°    | 1013.2 | 1001.9 | 977.7  | 960.1  | 953.6  |
| 47.5°  | 953.6  | 942.3  | 916.5  | 898.7  | 889.2  |
| 50°    | 890.7  | 882.7  | 860.1  | 837.6  | 829.5  |
| 52.5°  | 829.5  | 818.2  | 797.4  | 779.6  | 768.4  |
| 55°    | 766.8  | 757.1  | 737.7  | 718.4  | 710.4  |
| 57.5°  | 703.9  | 695.9  | 674.9  | 655.6  | 649.0  |
| 60°    | 641.0  | 634.7  | 612.2  | 594.3  | 589.6  |
| 62.5°  | 579.9  | 568.6  | 552.5  | 536.4  | 529.9  |
| 65°    | 517.1  | 507.4  | 491.3  | 476.8  | 468.7  |
| 67.5°  | 452.7  | 444.5  | 430.2  | 418.9  | 412.3  |
| 70°    | 393.0  | 386.6  | 372.0  | 360.8  | 354.5  |
| 72.5°  | 331.9  | 325.4  | 317.4  | 306.1  | 301.3  |
| 75°    | 270.5  | 267.4  | 259.2  | 249.7  | 253.0  |
| 77.5°  | 215.9  | 209.3  | 206.1  | 201.3  | 196.6  |
| 80°    | 161.2  | 159.5  | 156.2  | 151.4  | 148.2  |
| 82.5°  | 109.5  | 109.5  | 108.0  | 101.5  | 101.5  |
| 85°    | 66.0   | 64.4   | 62.9   | 57.9   | 56.4   |
| 87.5°  | 29.0   | 25.8   | 22.6   | 17.7   | 16.1   |
| 90°    | 0.8    | 10.1   | 16.8   | 21.1   | 22.6   |
| 92.5°  | 21.1   | 17.7   | 20.1   | 21.9   | 22.6   |
| 95°    | 54.6   | 26.9   | 32.7   | 37.0   | 36.2   |
| 97.5°  | 98.4   | 29.4   | 42.9   | 45.5   | 46.2   |
| 100°   | 148.9  | 33.7   | 48.0   | 54.6   | 56.3   |
| 102.5° | 204.3  | 202.8  | 49.6   | 58.8   | 61.4   |
| 105°   | 255.6  | 280.9  | 51.3   | 60.5   | 63.9   |
| 107.5° | 315.4  | 336.4  | 53.0   | 62.3   | 65.6   |
| 110°   | 372.6  | 390.2  | 147.2  | 63.1   | 66.4   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 426.5  | 441.5  | 427.2  | 64.7   | 67.3   |
| 115°   | 483.5  | 497.8  | 518.9  | 129.5  | 69.1   |
| 117.5° | 533.2  | 550.0  | 564.4  | 444.0  | 223.7  |
| 120°   | 588.8  | 601.3  | 616.5  | 626.6  | 513.1  |
| 122.5° | 635.8  | 649.3  | 666.2  | 671.1  | 672.0  |
| 125°   | 683.7  | 694.7  | 710.7  | 716.6  | 719.1  |
| 127.5° | 727.5  | 739.3  | 751.9  | 760.3  | 761.1  |
| 130°   | 768.7  | 782.2  | 791.3  | 800.6  | 799.9  |
| 132.5° | 810.7  | 821.7  | 830.9  | 838.5  | 837.8  |
| 135°   | 846.1  | 859.6  | 867.1  | 875.5  | 873.9  |
| 137.5° | 883.0  | 893.1  | 901.6  | 910.0  | 907.5  |
| 140°   | 919.2  | 926.0  | 935.2  | 942.8  | 938.6  |
| 142.5° | 949.6  | 955.4  | 966.4  | 973.0  | 968.9  |
| 145°   | 981.5  | 980.7  | 994.9  | 1000.8 | 996.6  |
| 147.5° | 1009.2 | 1006.7 | 1021.0 | 1025.2 | 1021.9 |
| 150°   | 1036.1 | 1030.3 | 1043.8 | 1048.8 | 1044.6 |
| 152.5° | 1058.9 | 1052.1 | 1064.7 | 1069.8 | 1063.9 |
| 155°   | 1080.7 | 1073.2 | 1083.3 | 1088.3 | 1081.6 |
| 157.5° | 1098.4 | 1091.7 | 1099.3 | 1105.2 | 1098.4 |
| 160°   | 1113.5 | 1108.4 | 1113.5 | 1118.5 | 1112.7 |
| 162.5° | 1127.0 | 1122.0 | 1126.2 | 1132.0 | 1124.5 |
| 165°   | 1138.8 | 1133.8 | 1136.3 | 1142.1 | 1136.3 |
| 167.5° | 1148.1 | 1142.9 | 1145.6 | 1151.4 | 1143.8 |
| 170°   | 1155.6 | 1150.6 | 1152.2 | 1158.1 | 1150.6 |
| 172.5° | 1160.6 | 1155.6 | 1157.4 | 1163.2 | 1155.6 |
| 175°   | 1164.8 | 1158.9 | 1160.6 | 1166.5 | 1158.1 |
| 177.5° | 1166.5 | 1160.6 | 1161.5 | 1167.4 | 1159.9 |
| 180°   | 1162.3 | 1162.3 | 1162.3 | 1162.3 | 1162.3 |

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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 | 9.99             | 10.90 | 10.89 | 11.83 | 13.02 | 9.54           | 10.45 | 10.45 | 11.38 | 12.57 |
|                 | 3H   | 11.65            | 12.47 | 12.56 | 13.40 | 14.62 | 11.16          | 11.98 | 12.07 | 12.91 | 14.12 |
|                 | 4H   | 12.23            | 13.01 | 13.17 | 13.95 | 15.17 | 11.74          | 12.51 | 12.67 | 13.46 | 14.68 |
|                 | 6H   | 12.63            | 13.35 | 13.58 | 14.29 | 15.53 | 12.13          | 12.85 | 13.08 | 13.79 | 15.03 |
|                 | 8H   | 12.74            | 13.42 | 13.69 | 14.38 | 15.62 | 12.23          | 12.92 | 13.19 | 13.88 | 15.11 |
|                 | 12H  | 12.78            | 13.43 | 13.74 | 14.39 | 15.65 | 12.28          | 12.92 | 13.23 | 13.88 | 15.14 |
| 4H              | 2H   | 10.45            | 11.22 | 11.39 | 12.17 | 13.39 | 10.09          | 10.87 | 11.03 | 11.81 | 13.03 |
|                 | 3H   | 12.31            | 12.96 | 13.26 | 13.93 | 15.17 | 11.91          | 12.55 | 12.86 | 13.53 | 14.76 |
|                 | 4H   | 13.03            | 13.62 | 13.99 | 14.58 | 15.85 | 12.60          | 13.19 | 13.56 | 14.16 | 15.42 |
|                 | 6H   | 13.54            | 14.05 | 14.51 | 15.04 | 16.30 | 13.11          | 13.62 | 14.08 | 14.61 | 15.87 |
|                 | 8H   | 13.69            | 14.17 | 14.66 | 15.15 | 16.42 | 13.25          | 13.73 | 14.23 | 14.71 | 15.99 |
|                 | 12H  | 13.76            | 14.19 | 14.76 | 15.19 | 16.47 | 13.31          | 13.74 | 14.31 | 14.74 | 16.02 |
| 8H              | 4H   | 13.22            | 13.70 | 14.20 | 14.68 | 15.96 | 12.85          | 13.32 | 13.82 | 14.31 | 15.58 |
|                 | 6H   | 13.85            | 14.25 | 14.85 | 15.27 | 16.54 | 13.47          | 13.86 | 14.47 | 14.89 | 16.16 |
|                 | 8H   | 14.07            | 14.42 | 15.08 | 15.43 | 16.72 | 13.68          | 14.02 | 14.69 | 15.04 | 16.33 |
|                 | 12H  | 14.20            | 14.51 | 15.21 | 15.51 | 16.85 | 13.79          | 14.10 | 14.80 | 15.10 | 16.44 |
| 12H             | 4H   | 13.21            | 13.64 | 14.20 | 14.64 | 15.92 | 12.84          | 13.27 | 13.84 | 14.27 | 15.55 |
|                 | 6H   | 13.88            | 14.23 | 14.89 | 15.24 | 16.53 | 13.51          | 13.86 | 14.52 | 14.87 | 16.16 |
|                 | 8H   | 14.12            | 14.43 | 15.13 | 15.43 | 16.77 | 13.74          | 14.05 | 14.75 | 15.05 | 16.39 |