

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: P913179

Luminaire Tested: DFN2DIP-4P3F0-060D050US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913179  
REPORT IS A COMBINATION OF REPORTS P900587 AND P897473  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-060D050US927-FLLONL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

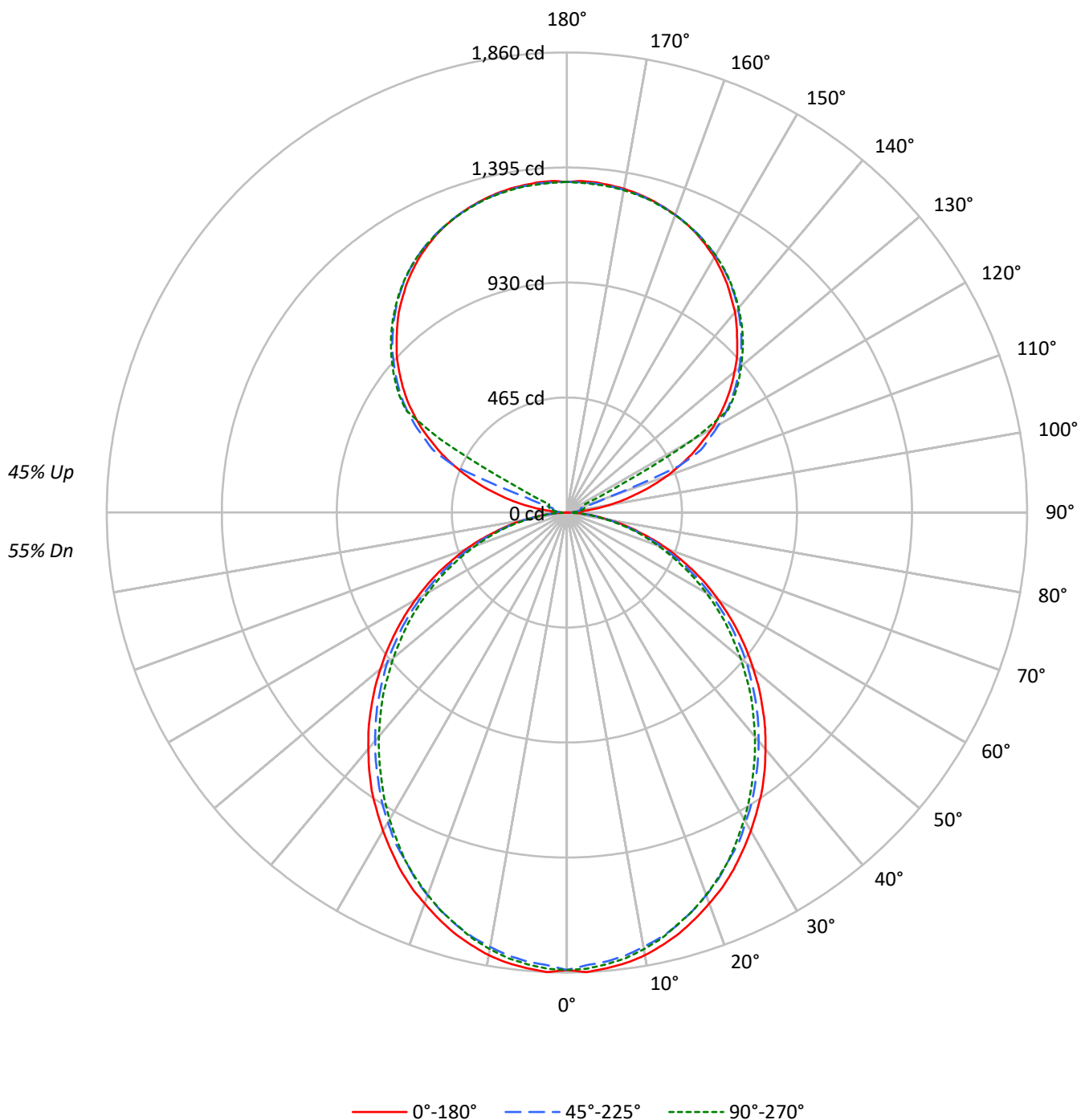
Lumens per Lamp: N/A  
Luminaire Lumens: 8626.8 lumens  
Efficiency: N/A  
Efficacy: 86.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 100.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P913179

CATALOG NUMBER: DFN2DIP-4P3F0-060D050US927-FLLONL

### 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 | 100 | 100 | 100 | 100 | 86 | 86 | 86 | 73 | 73 | 73 | 60 | 60 | 60 |
| 1   | 99  | 94  | 91  | 87  | 92  | 88  | 84  | 81  | 75 | 73 | 71 | 64 | 62 | 60 | 53 | 52 | 51 |
| 2   | 90  | 82  | 76  | 71  | 83  | 77  | 71  | 67  | 66 | 62 | 58 | 56 | 53 | 51 | 47 | 45 | 43 |
| 3   | 82  | 73  | 65  | 59  | 76  | 68  | 61  | 56  | 58 | 53 | 49 | 50 | 46 | 43 | 42 | 39 | 37 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 53  | 47  | 52 | 46 | 42 | 44 | 40 | 37 | 37 | 34 | 32 |
| 5   | 69  | 57  | 49  | 43  | 64  | 53  | 46  | 41  | 46 | 41 | 36 | 40 | 35 | 32 | 34 | 30 | 27 |
| 6   | 64  | 51  | 43  | 37  | 59  | 48  | 41  | 35  | 42 | 36 | 32 | 36 | 31 | 28 | 30 | 27 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 38 | 32 | 28 | 33 | 28 | 25 | 28 | 24 | 22 |
| 8   | 55  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 30 | 25 | 22 | 26 | 22 | 19 |
| 9   | 51  | 39  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 26 | 22 | 28 | 23 | 20 | 24 | 20 | 17 |
| 10  | 48  | 35  | 28  | 23  | 44  | 33  | 27  | 22  | 29 | 24 | 20 | 25 | 21 | 18 | 22 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2108 | 2108 | 2108 |
| 5°  | 2110 | 2077 | 2092 |
| 10° | 2091 | 2048 | 2063 |
| 15° | 2059 | 2012 | 2018 |
| 20° | 2016 | 1964 | 1972 |
| 25° | 1974 | 1907 | 1919 |
| 30° | 1920 | 1853 | 1851 |
| 35° | 1870 | 1791 | 1780 |
| 40° | 1808 | 1727 | 1713 |
| 45° | 1746 | 1663 | 1643 |
| 50° | 1678 | 1596 | 1563 |
| 55° | 1607 | 1518 | 1489 |
| 60° | 1527 | 1427 | 1404 |
| 65° | 1439 | 1331 | 1304 |
| 70° | 1327 | 1215 | 1197 |
| 75° | 1173 | 1075 | 1096 |
| 80° | 986  | 898  | 906  |
| 85° | 694  | 595  | 594  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1746 cd/sqm

TEST NUMBER: P913179

CATALOG NUMBER: DFN2DIP-4P3F0-060D050US927-FLLONL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 174.1  | 2.0       |
| 10°-20°   | 489.8  | 5.7       |
| 20°-30°   | 719.8  | 8.3       |
| 30°-40°   | 836.0  | 9.7       |
| 40°-50°   | 834.9  | 9.7       |
| 50°-60°   | 728.0  | 8.4       |
| 60°-70°   | 538.2  | 6.2       |
| 70°-80°   | 304.5  | 3.5       |
| 80°-90°   | 82.7   | 1.0       |
| 90°-100°  | 44.1   | 0.5       |
| 100°-110° | 164.3  | 1.9       |
| 110°-120° | 435.8  | 5.1       |
| 120°-130° | 722.8  | 8.4       |
| 130°-140° | 767.8  | 8.9       |
| 140°-150° | 713.6  | 8.3       |
| 150°-160° | 573.7  | 6.7       |
| 160°-170° | 369.7  | 4.3       |
| 170°-180° | 127.2  | 1.5       |
| 0°-30°    | 1383.6 | 16.0      |
| 0°-40°    | 2219.6 | 25.7      |
| 0°-60°    | 3782.5 | 43.8      |
| 0°-90°    | 4707.9 | 54.6      |
| 90°-120°  | 644.2  | 7.5       |
| 90°-150°  | 2848.4 | 33.0      |
| 90°-180°  | 3919.0 | 45.4      |
| 0°-180°   | 8626.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1849 | 1849  | 1849 | 1849  | 1849 |      |
| 5°   | 1849 | 1842  | 1823 | 1837  | 1834 | 176  |
| 15°  | 1760 | 1750  | 1727 | 1734  | 1725 | 496  |
| 25°  | 1593 | 1579  | 1549 | 1552  | 1549 | 733  |
| 35°  | 1375 | 1357  | 1328 | 1318  | 1309 | 858  |
| 45°  | 1119 | 1106  | 1079 | 1060  | 1053 | 863  |
| 55°  | 847  | 836   | 814  | 793   | 784  | 757  |
| 65°  | 571  | 560   | 542  | 526   | 518  | 564  |
| 75°  | 299  | 295   | 286  | 276   | 279  | 319  |
| 85°  | 73   | 71    | 69   | 64    | 62   | 81   |
| 90°  | 1    | 12    | 19   | 24    | 26   | 8    |
| 95°  | 63   | 31    | 38   | 43    | 42   | 74   |
| 105° | 294  | 323   | 59   | 70    | 74   | 314  |
| 115° | 556  | 573   | 597  | 149   | 79   | 548  |
| 125° | 786  | 799   | 817  | 824   | 827  | 701  |
| 135° | 973  | 989   | 997  | 1007  | 1005 | 752  |
| 145° | 1129 | 1128  | 1144 | 1151  | 1146 | 706  |
| 155° | 1243 | 1234  | 1246 | 1252  | 1244 | 573  |
| 165° | 1310 | 1304  | 1307 | 1314  | 1307 | 370  |
| 175° | 1340 | 1333  | 1335 | 1342  | 1332 | 127  |
| 180° | 1337 | 1337  | 1337 | 1337  | 1337 |      |

TEST NUMBER: P913179

CATALOG NUMBER: DFN2DIP-4P3F0-060D050US927-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1849.4 | 1849.4 | 1849.4 | 1849.4 | 1849.4 |
| 2.5°   | 1860.2 | 1851.3 | 1831.7 | 1849.4 | 1846.0 |
| 5°     | 1849.4 | 1842.5 | 1822.8 | 1837.0 | 1833.6 |
| 7.5°   | 1837.0 | 1826.5 | 1806.8 | 1821.1 | 1817.6 |
| 10°    | 1817.6 | 1805.1 | 1783.8 | 1797.9 | 1792.6 |
| 12.5°  | 1790.8 | 1780.2 | 1758.9 | 1767.8 | 1764.2 |
| 15°    | 1760.5 | 1750.0 | 1726.8 | 1734.0 | 1725.1 |
| 17.5°  | 1723.2 | 1712.7 | 1689.5 | 1698.3 | 1689.5 |
| 20°    | 1682.3 | 1671.7 | 1646.8 | 1652.1 | 1645.1 |
| 22.5°  | 1641.6 | 1625.5 | 1602.3 | 1602.3 | 1598.7 |
| 25°    | 1593.4 | 1579.3 | 1549.0 | 1552.4 | 1549.0 |
| 27.5°  | 1540.0 | 1527.6 | 1504.5 | 1499.3 | 1490.4 |
| 30°    | 1486.8 | 1472.4 | 1445.9 | 1440.6 | 1433.4 |
| 32.5°  | 1429.8 | 1419.3 | 1390.8 | 1380.0 | 1372.8 |
| 35°    | 1374.8 | 1357.0 | 1328.5 | 1317.7 | 1308.8 |
| 37.5°  | 1312.5 | 1296.4 | 1268.0 | 1255.4 | 1246.6 |
| 40°    | 1248.5 | 1234.1 | 1205.7 | 1189.9 | 1182.6 |
| 42.5°  | 1186.2 | 1171.9 | 1143.6 | 1125.7 | 1115.1 |
| 45°    | 1118.7 | 1106.2 | 1079.4 | 1060.0 | 1052.8 |
| 47.5°  | 1052.8 | 1040.4 | 1011.9 | 992.3  | 981.7  |
| 50°    | 983.4  | 974.5  | 949.7  | 924.7  | 915.8  |
| 52.5°  | 915.8  | 903.4  | 880.4  | 860.8  | 848.3  |
| 55°    | 846.6  | 835.8  | 814.5  | 793.2  | 784.3  |
| 57.5°  | 777.2  | 768.3  | 745.1  | 723.8  | 716.6  |
| 60°    | 707.7  | 700.8  | 675.9  | 656.2  | 650.9  |
| 62.5°  | 640.2  | 627.7  | 610.0  | 592.2  | 585.1  |
| 65°    | 570.9  | 560.2  | 542.5  | 526.4  | 517.5  |
| 67.5°  | 499.8  | 490.8  | 474.9  | 462.5  | 455.3  |
| 70°    | 434.0  | 426.8  | 410.7  | 398.3  | 391.3  |
| 72.5°  | 366.4  | 359.3  | 350.4  | 337.9  | 332.6  |
| 75°    | 298.7  | 295.3  | 286.2  | 275.7  | 279.2  |
| 77.5°  | 238.3  | 231.2  | 227.5  | 222.3  | 217.0  |
| 80°    | 177.9  | 176.0  | 172.5  | 167.2  | 163.6  |
| 82.5°  | 121.0  | 121.0  | 119.2  | 112.1  | 112.1  |
| 85°    | 72.8   | 71.1   | 69.4   | 63.9   | 62.3   |
| 87.5°  | 32.1   | 28.5   | 24.9   | 19.6   | 17.7   |
| 90°    | 1.0    | 11.6   | 19.3   | 24.2   | 26.1   |
| 92.5°  | 24.2   | 20.4   | 23.2   | 25.2   | 26.1   |
| 95°    | 62.8   | 30.9   | 37.7   | 42.6   | 41.6   |
| 97.5°  | 113.1  | 33.9   | 49.3   | 52.3   | 53.2   |
| 100°   | 171.3  | 38.7   | 55.1   | 62.8   | 64.8   |
| 102.5° | 235.0  | 233.1  | 57.1   | 67.7   | 70.7   |
| 105°   | 294.1  | 323.1  | 59.0   | 69.6   | 73.5   |
| 107.5° | 362.7  | 386.8  | 61.0   | 71.5   | 75.5   |
| 110°   | 428.6  | 448.8  | 169.3  | 72.6   | 76.4   |



TEST NUMBER: P913179

CATALOG NUMBER: DFN2DIP-4P3F0-060D050US927-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 490.4  | 507.8  | 491.4  | 74.5   | 77.4   |
| 115°   | 556.2  | 572.6  | 596.8  | 149.0  | 79.4   |
| 117.5° | 613.2  | 632.6  | 649.1  | 510.6  | 257.3  |
| 120°   | 677.1  | 691.6  | 709.0  | 720.6  | 590.0  |
| 122.5° | 731.2  | 746.7  | 766.1  | 771.9  | 772.9  |
| 125°   | 786.3  | 799.0  | 817.4  | 824.1  | 827.0  |
| 127.5° | 836.6  | 850.2  | 864.8  | 874.4  | 875.4  |
| 130°   | 884.1  | 899.6  | 910.1  | 920.8  | 920.0  |
| 132.5° | 932.5  | 945.1  | 955.6  | 964.4  | 963.5  |
| 135°   | 973.1  | 988.6  | 997.2  | 1007.0 | 1005.0 |
| 137.5° | 1015.6 | 1027.2 | 1037.0 | 1046.6 | 1043.8 |
| 140°   | 1057.2 | 1065.0 | 1075.5 | 1084.3 | 1079.5 |
| 142.5° | 1092.1 | 1098.9 | 1111.4 | 1119.1 | 1114.3 |
| 145°   | 1128.9 | 1127.8 | 1144.2 | 1151.0 | 1146.2 |
| 147.5° | 1160.7 | 1157.8 | 1174.3 | 1179.1 | 1175.3 |
| 150°   | 1191.7 | 1184.9 | 1200.4 | 1206.2 | 1201.3 |
| 152.5° | 1217.7 | 1210.1 | 1224.6 | 1230.4 | 1223.6 |
| 155°   | 1242.9 | 1234.3 | 1245.9 | 1251.6 | 1244.0 |
| 157.5° | 1263.2 | 1255.5 | 1264.2 | 1271.1 | 1263.2 |
| 160°   | 1280.7 | 1274.9 | 1280.7 | 1286.4 | 1279.7 |
| 162.5° | 1296.1 | 1290.4 | 1295.1 | 1301.9 | 1293.2 |
| 165°   | 1309.6 | 1303.9 | 1306.8 | 1313.5 | 1306.8 |
| 167.5° | 1320.3 | 1314.5 | 1317.5 | 1324.2 | 1315.5 |
| 170°   | 1329.0 | 1323.2 | 1325.2 | 1331.9 | 1323.2 |
| 172.5° | 1334.8 | 1329.0 | 1331.0 | 1337.8 | 1329.0 |
| 175°   | 1339.7 | 1332.8 | 1334.8 | 1341.6 | 1331.9 |
| 177.5° | 1341.6 | 1334.8 | 1335.9 | 1342.6 | 1333.9 |
| 180°   | 1336.7 | 1336.7 | 1336.7 | 1336.7 | 1336.7 |

TEST NUMBER: P913179

CATALOG NUMBER: DFN2DIP-4P3F0-060D050US927-FLLONL

**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 | 10.24            | 11.15 | 11.16 | 12.08 | 13.29 | 9.80           | 10.70 | 10.71 | 11.64 | 12.84 |
|                 | 3H   | 11.90            | 12.71 | 12.83 | 13.66 | 14.88 | 11.41          | 12.22 | 12.34 | 13.17 | 14.39 |
|                 | 4H   | 12.49            | 13.25 | 13.43 | 14.20 | 15.44 | 11.99          | 12.76 | 12.94 | 13.71 | 14.95 |
|                 | 6H   | 12.89            | 13.59 | 13.84 | 14.55 | 15.80 | 12.39          | 13.09 | 13.34 | 14.05 | 15.30 |
|                 | 8H   | 12.99            | 13.66 | 13.95 | 14.64 | 15.88 | 12.49          | 13.16 | 13.45 | 14.13 | 15.38 |
|                 | 12H  | 13.04            | 13.68 | 14.01 | 14.65 | 15.92 | 12.53          | 13.17 | 13.50 | 14.14 | 15.41 |
| 4H              | 2H   | 10.70            | 11.47 | 11.65 | 12.42 | 13.66 | 10.35          | 11.12 | 11.30 | 12.07 | 13.30 |
|                 | 3H   | 12.57            | 13.21 | 13.53 | 14.19 | 15.44 | 12.16          | 12.80 | 13.12 | 13.78 | 15.03 |
|                 | 4H   | 13.28            | 13.87 | 14.25 | 14.84 | 16.12 | 12.86          | 13.44 | 13.83 | 14.42 | 15.69 |
|                 | 6H   | 13.79            | 14.30 | 14.77 | 15.30 | 16.57 | 13.36          | 13.87 | 14.34 | 14.86 | 16.14 |
|                 | 8H   | 13.94            | 14.41 | 14.93 | 15.40 | 16.69 | 13.51          | 13.98 | 14.49 | 14.97 | 16.26 |
|                 | 12H  | 14.02            | 14.44 | 15.02 | 15.45 | 16.74 | 13.57          | 13.99 | 14.57 | 15.00 | 16.29 |
| 8H              | 4H   | 13.48            | 13.95 | 14.46 | 14.94 | 16.23 | 13.10          | 13.57 | 14.08 | 14.56 | 15.85 |
|                 | 6H   | 14.10            | 14.49 | 15.11 | 15.53 | 16.81 | 13.72          | 14.11 | 14.73 | 15.14 | 16.43 |
|                 | 8H   | 14.32            | 14.67 | 15.34 | 15.69 | 16.99 | 13.93          | 14.27 | 14.95 | 15.29 | 16.60 |
|                 | 12H  | 14.45            | 14.75 | 15.47 | 15.77 | 17.12 | 14.04          | 14.34 | 15.06 | 15.36 | 16.71 |
| 12H             | 4H   | 13.46            | 13.89 | 14.47 | 14.90 | 16.19 | 13.09          | 13.52 | 14.10 | 14.53 | 15.82 |
|                 | 6H   | 14.13            | 14.48 | 15.15 | 15.50 | 16.80 | 13.76          | 14.10 | 14.78 | 15.12 | 16.43 |
|                 | 8H   | 14.37            | 14.68 | 15.39 | 15.69 | 17.04 | 13.99          | 14.29 | 15.01 | 15.31 | 16.66 |