

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: P903180

Luminaire Tested: DFN2DIP-PN4F0-050D040US830-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903180  
REPORT IS A COMBINATION OF REPORTS P899611 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-050D040US830-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

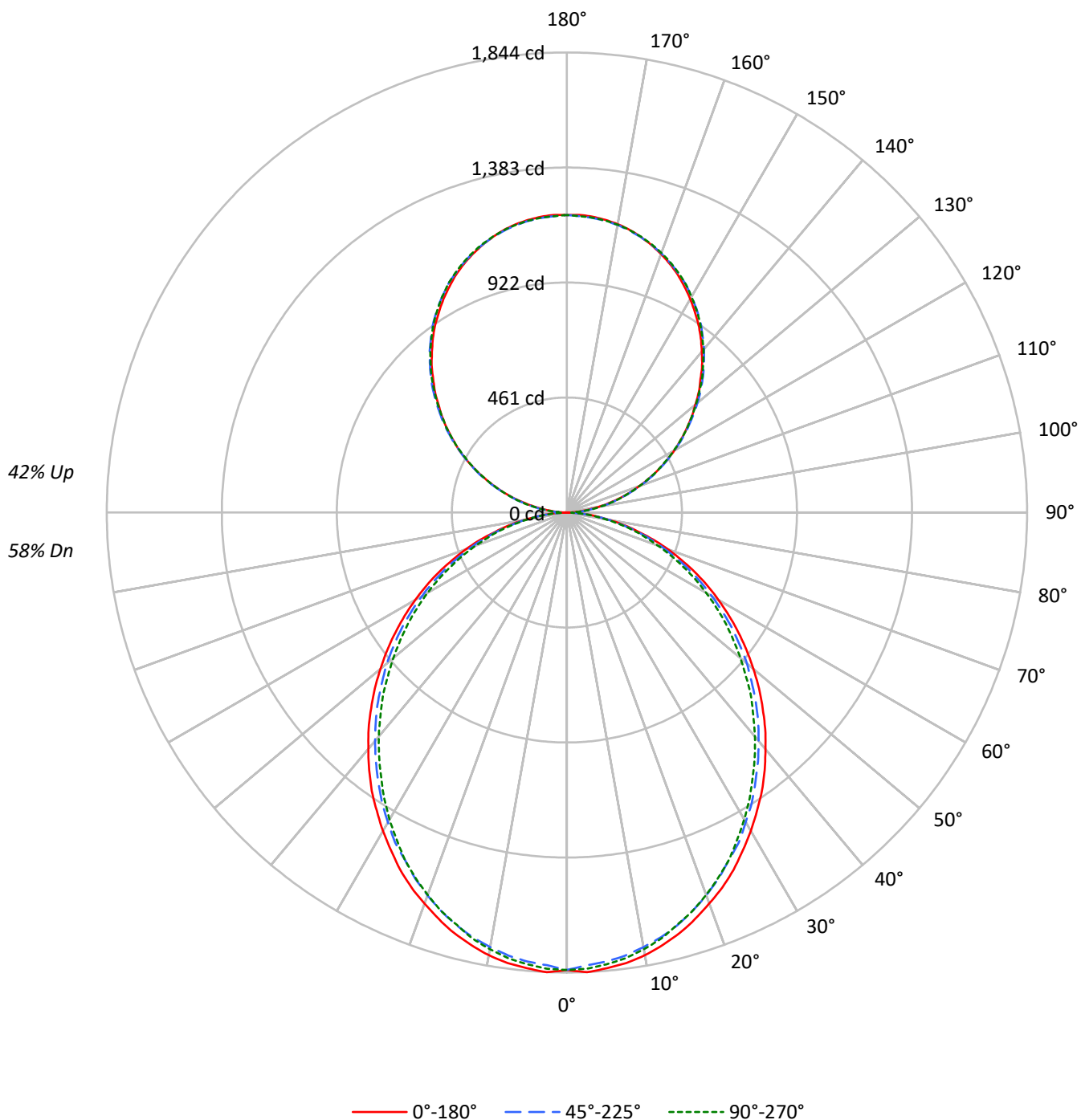
Lumens per Lamp: N/A  
Luminaire Lumens: 8002.2 lumens  
Efficiency: N/A  
Efficacy: 107.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 74.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-PN4F0-050D040US830-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P903180

CATALOG NUMBER: DFN2DIP-PN4F0-050D040US830-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   | 109 | 109 | 109 | 109 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 75 | 75 | 75 | 64 | 64 | 64 |
| 1   | 100 | 95  | 91  | 88  | 93  | 89  | 86  | 82  | 77 | 75 | 72 | 66 | 65 | 63 | 56 | 55 | 54 |
| 2   | 91  | 83  | 77  | 72  | 84  | 78  | 72  | 68  | 68 | 64 | 60 | 58 | 55 | 52 | 50 | 47 | 45 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 50 | 52 | 48 | 44 | 44 | 41 | 39 |
| 4   | 76  | 65  | 57  | 51  | 70  | 61  | 54  | 48  | 53 | 47 | 43 | 46 | 42 | 38 | 39 | 36 | 33 |
| 5   | 70  | 58  | 50  | 43  | 65  | 54  | 47  | 41  | 48 | 42 | 37 | 41 | 37 | 33 | 35 | 32 | 29 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 41  | 36  | 43 | 37 | 32 | 37 | 33 | 29 | 32 | 29 | 26 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 32  | 39 | 33 | 29 | 34 | 29 | 26 | 29 | 26 | 23 |
| 8   | 55  | 43  | 35  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 31 | 26 | 23 | 27 | 23 | 20 |
| 9   | 51  | 39  | 31  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 29 | 24 | 21 | 25 | 21 | 18 |
| 10  | 48  | 36  | 28  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 | 27 | 22 | 19 | 23 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1339 | 1339 | 1339 |
| 5°  | 1341 | 1320 | 1329 |
| 10° | 1330 | 1303 | 1311 |
| 15° | 1310 | 1281 | 1283 |
| 20° | 1284 | 1252 | 1255 |
| 25° | 1258 | 1216 | 1222 |
| 30° | 1225 | 1183 | 1180 |
| 35° | 1193 | 1144 | 1135 |
| 40° | 1155 | 1105 | 1093 |
| 45° | 1117 | 1066 | 1050 |
| 50° | 1075 | 1024 | 999  |
| 55° | 1031 | 976  | 953  |
| 60° | 981  | 920  | 901  |
| 65° | 927  | 861  | 838  |
| 70° | 858  | 789  | 771  |
| 75° | 763  | 704  | 710  |
| 80° | 648  | 595  | 592  |
| 85° | 469  | 405  | 396  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1117 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 172.6  | 2.2       |
| 10°-20°   | 485.6  | 6.1       |
| 20°-30°   | 713.7  | 8.9       |
| 30°-40°   | 828.9  | 10.4      |
| 40°-50°   | 827.8  | 10.3      |
| 50°-60°   | 721.8  | 9.0       |
| 60°-70°   | 533.6  | 6.7       |
| 70°-80°   | 301.9  | 3.8       |
| 80°-90°   | 83.1   | 1.0       |
| 90°-100°  | 73.8   | 0.9       |
| 100°-110° | 234.4  | 2.9       |
| 110°-120° | 401.2  | 5.0       |
| 120°-130° | 527.6  | 6.6       |
| 130°-140° | 592.2  | 7.4       |
| 140°-150° | 580.8  | 7.3       |
| 150°-160° | 487.2  | 6.1       |
| 160°-170° | 323.1  | 4.0       |
| 170°-180° | 112.9  | 1.4       |
| 0°-30°    | 1371.9 | 17.1      |
| 0°-40°    | 2200.7 | 27.5      |
| 0°-60°    | 3750.4 | 46.9      |
| 0°-90°    | 4669.0 | 58.3      |
| 90°-120°  | 709.4  | 8.9       |
| 90°-150°  | 2410.0 | 30.1      |
| 90°-180°  | 3333.0 | 41.7      |
| 0°-180°   | 8002.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1834 | 1834  | 1834 | 1834  | 1834 |      |
| 5°   | 1834 | 1827  | 1807 | 1821  | 1818 | 174  |
| 15°  | 1746 | 1735  | 1712 | 1719  | 1710 | 492  |
| 25°  | 1580 | 1566  | 1536 | 1539  | 1536 | 727  |
| 35°  | 1363 | 1346  | 1317 | 1307  | 1298 | 851  |
| 45°  | 1109 | 1097  | 1070 | 1051  | 1044 | 856  |
| 55°  | 839  | 829   | 808  | 786   | 778  | 750  |
| 65°  | 566  | 555   | 538  | 522   | 513  | 560  |
| 75°  | 296  | 293   | 284  | 273   | 277  | 316  |
| 85°  | 72   | 70    | 69   | 63    | 62   | 81   |
| 90°  | 1    | 13    | 35   | 33    | 34   | 8    |
| 95°  | 52   | 63    | 64   | 64    | 63   | 58   |
| 105° | 216  | 219   | 221  | 223   | 223  | 228  |
| 115° | 403  | 408   | 406  | 406   | 403  | 398  |
| 125° | 586  | 595   | 592  | 588   | 587  | 523  |
| 135° | 757  | 768   | 771  | 770   | 767  | 585  |
| 145° | 920  | 927   | 932  | 934   | 930  | 575  |
| 155° | 1051 | 1054  | 1058 | 1063  | 1059 | 484  |
| 165° | 1144 | 1143  | 1143 | 1150  | 1145 | 323  |
| 175° | 1190 | 1187  | 1185 | 1192  | 1186 | 113  |
| 180° | 1192 | 1192  | 1192 | 1192  | 1192 |      |

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CATALOG NUMBER: DFN2DIP-PN4F0-050D040US830-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1833.7 | 1833.7 | 1833.7 | 1833.7 | 1833.7 |
| 2.5°   | 1844.4 | 1835.6 | 1816.2 | 1833.7 | 1830.4 |
| 5°     | 1833.7 | 1826.8 | 1807.3 | 1821.4 | 1818.1 |
| 7.5°   | 1821.4 | 1810.9 | 1791.5 | 1805.7 | 1802.1 |
| 10°    | 1802.1 | 1789.8 | 1768.7 | 1782.6 | 1777.4 |
| 12.5°  | 1775.6 | 1765.1 | 1744.0 | 1752.8 | 1749.2 |
| 15°    | 1745.6 | 1735.1 | 1712.1 | 1719.3 | 1710.4 |
| 17.5°  | 1708.5 | 1698.1 | 1675.1 | 1683.9 | 1675.1 |
| 20°    | 1668.0 | 1657.6 | 1632.9 | 1638.0 | 1631.2 |
| 22.5°  | 1627.6 | 1611.7 | 1588.7 | 1588.7 | 1585.1 |
| 25°    | 1579.9 | 1565.8 | 1535.9 | 1539.3 | 1535.9 |
| 27.5°  | 1526.9 | 1514.6 | 1491.8 | 1486.5 | 1477.7 |
| 30°    | 1474.1 | 1460.0 | 1433.6 | 1428.3 | 1421.3 |
| 32.5°  | 1417.7 | 1407.2 | 1378.9 | 1368.3 | 1361.2 |
| 35°    | 1363.0 | 1345.5 | 1317.2 | 1306.6 | 1297.8 |
| 37.5°  | 1301.3 | 1285.4 | 1257.2 | 1244.8 | 1236.0 |
| 40°    | 1237.9 | 1223.7 | 1195.4 | 1179.7 | 1172.6 |
| 42.5°  | 1176.2 | 1162.0 | 1133.9 | 1116.1 | 1105.6 |
| 45°    | 1109.2 | 1096.8 | 1070.3 | 1051.0 | 1043.9 |
| 47.5°  | 1043.9 | 1031.5 | 1003.3 | 983.8  | 973.4  |
| 50°    | 975.1  | 966.3  | 941.6  | 916.9  | 908.0  |
| 52.5°  | 908.0  | 895.7  | 872.9  | 853.5  | 841.1  |
| 55°    | 839.4  | 828.8  | 807.6  | 786.5  | 777.7  |
| 57.5°  | 770.5  | 761.8  | 738.8  | 717.7  | 710.5  |
| 60°    | 701.7  | 694.8  | 670.1  | 650.6  | 645.5  |
| 62.5°  | 634.8  | 622.5  | 604.8  | 587.2  | 580.1  |
| 65°    | 566.1  | 555.4  | 537.8  | 522.0  | 513.1  |
| 67.5°  | 495.6  | 486.6  | 470.9  | 458.5  | 451.4  |
| 70°    | 430.3  | 423.2  | 407.3  | 394.9  | 388.0  |
| 72.5°  | 363.4  | 356.2  | 347.4  | 335.1  | 329.8  |
| 75°    | 296.1  | 292.8  | 283.8  | 273.3  | 276.9  |
| 77.5°  | 236.3  | 229.1  | 225.6  | 220.4  | 215.2  |
| 80°    | 176.4  | 174.6  | 171.0  | 165.8  | 162.2  |
| 82.5°  | 119.9  | 119.9  | 118.2  | 111.1  | 111.1  |
| 85°    | 72.2   | 70.5   | 68.8   | 63.4   | 61.7   |
| 87.5°  | 31.8   | 28.3   | 24.7   | 19.4   | 17.6   |
| 90°    | 1.0    | 12.9   | 35.3   | 33.1   | 34.1   |
| 92.5°  | 22.2   | 30.2   | 31.3   | 32.3   | 32.3   |
| 95°    | 52.5   | 62.6   | 64.4   | 64.4   | 62.6   |
| 97.5°  | 87.4   | 96.7   | 100.7  | 100.7  | 100.7  |
| 100°   | 127.6  | 135.9  | 138.7  | 138.7  | 137.7  |
| 102.5° | 170.0  | 176.2  | 180.1  | 181.2  | 180.1  |
| 105°   | 216.4  | 219.2  | 221.4  | 223.2  | 223.2  |
| 107.5° | 262.4  | 266.7  | 266.7  | 267.4  | 262.4  |
| 110°   | 307.0  | 312.7  | 312.7  | 312.7  | 309.9  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 355.1  | 361.3  | 360.1  | 357.3  | 355.1  |
| 115°   | 402.6  | 408.4  | 406.5  | 405.5  | 402.6  |
| 117.5° | 449.7  | 457.6  | 452.6  | 449.7  | 446.9  |
| 120°   | 497.2  | 505.0  | 497.2  | 497.2  | 493.9  |
| 122.5° | 540.3  | 550.4  | 545.4  | 542.4  | 540.3  |
| 125°   | 585.6  | 594.6  | 591.7  | 588.4  | 587.4  |
| 127.5° | 629.8  | 640.9  | 637.0  | 632.6  | 629.8  |
| 130°   | 671.1  | 684.1  | 682.3  | 680.1  | 676.2  |
| 132.5° | 717.5  | 727.5  | 728.3  | 723.2  | 720.4  |
| 135°   | 757.4  | 768.5  | 770.7  | 769.6  | 766.8  |
| 137.5° | 802.0  | 811.0  | 812.8  | 812.0  | 807.8  |
| 140°   | 841.1  | 850.2  | 855.2  | 855.2  | 851.2  |
| 142.5° | 881.5  | 890.4  | 893.2  | 894.4  | 890.4  |
| 145°   | 919.5  | 926.7  | 932.5  | 933.6  | 929.6  |
| 147.5° | 953.7  | 962.6  | 967.0  | 968.7  | 964.8  |
| 150°   | 988.9  | 995.0  | 999.0  | 1002.2 | 999.0  |
| 152.5° | 1020.2 | 1026.2 | 1031.3 | 1035.3 | 1031.3 |
| 155°   | 1051.4 | 1054.3 | 1057.5 | 1062.6 | 1059.3 |
| 157.5° | 1078.5 | 1080.5 | 1082.3 | 1089.6 | 1084.5 |
| 160°   | 1102.5 | 1104.7 | 1105.7 | 1111.8 | 1107.5 |
| 162.5° | 1124.7 | 1124.7 | 1125.9 | 1132.7 | 1127.7 |
| 165°   | 1143.9 | 1142.7 | 1142.7 | 1149.9 | 1144.9 |
| 167.5° | 1161.1 | 1157.8 | 1157.8 | 1165.1 | 1160.0 |
| 170°   | 1174.0 | 1171.1 | 1170.1 | 1177.2 | 1171.1 |
| 172.5° | 1183.0 | 1180.2 | 1179.0 | 1186.3 | 1180.2 |
| 175°   | 1190.2 | 1187.3 | 1185.2 | 1192.3 | 1186.3 |
| 177.5° | 1194.2 | 1191.3 | 1189.1 | 1195.2 | 1189.1 |
| 180°   | 1192.3 | 1192.3 | 1192.3 | 1192.3 | 1192.3 |

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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 | 9.03             | 9.97  | 9.91  | 10.87 | 12.02 | 8.59           | 9.53  | 9.47  | 10.43 | 11.58 |
|                 | 3H   | 10.70            | 11.54 | 11.59 | 12.45 | 13.63 | 10.21          | 11.06 | 11.11 | 11.97 | 13.14 |
|                 | 4H   | 11.29            | 12.09 | 12.20 | 13.01 | 14.19 | 10.80          | 11.60 | 11.71 | 12.52 | 13.70 |
|                 | 6H   | 11.70            | 12.43 | 12.62 | 13.36 | 14.55 | 11.20          | 11.94 | 12.13 | 12.87 | 14.06 |
|                 | 8H   | 11.80            | 12.51 | 12.73 | 13.45 | 14.64 | 11.31          | 12.01 | 12.24 | 12.96 | 14.15 |
|                 | 12H  | 11.86            | 12.52 | 12.79 | 13.46 | 14.68 | 11.36          | 12.03 | 12.29 | 12.96 | 14.18 |
| 4H              | 2H   | 9.50             | 10.30 | 10.41 | 11.22 | 12.40 | 9.15           | 9.95  | 10.06 | 10.86 | 12.05 |
|                 | 3H   | 11.38            | 12.04 | 12.30 | 12.99 | 14.19 | 10.97          | 11.64 | 11.90 | 12.59 | 13.79 |
|                 | 4H   | 12.10            | 12.70 | 13.03 | 13.65 | 14.87 | 11.68          | 12.29 | 12.61 | 13.23 | 14.45 |
|                 | 6H   | 12.62            | 13.14 | 13.57 | 14.11 | 15.33 | 12.19          | 12.72 | 13.14 | 13.69 | 14.91 |
|                 | 8H   | 12.77            | 13.26 | 13.72 | 14.22 | 15.46 | 12.34          | 12.83 | 13.29 | 13.79 | 15.03 |
|                 | 12H  | 12.85            | 13.29 | 13.82 | 14.27 | 15.51 | 12.41          | 12.85 | 13.38 | 13.83 | 15.07 |
| 8H              | 4H   | 12.30            | 12.79 | 13.25 | 13.75 | 14.99 | 11.93          | 12.42 | 12.88 | 13.38 | 14.62 |
|                 | 6H   | 12.94            | 13.34 | 13.91 | 14.35 | 15.58 | 12.56          | 12.97 | 13.54 | 13.97 | 15.20 |
|                 | 8H   | 13.16            | 13.52 | 14.15 | 14.51 | 15.76 | 12.78          | 13.13 | 13.76 | 14.13 | 15.38 |
|                 | 12H  | 13.30            | 13.61 | 14.29 | 14.60 | 15.90 | 12.90          | 13.21 | 13.89 | 14.20 | 15.50 |
| 12H             | 4H   | 12.29            | 12.73 | 13.26 | 13.71 | 14.95 | 11.93          | 12.37 | 12.90 | 13.35 | 14.59 |
|                 | 6H   | 12.97            | 13.33 | 13.95 | 14.32 | 15.57 | 12.60          | 12.96 | 13.59 | 13.95 | 15.21 |
|                 | 8H   | 13.22            | 13.53 | 14.21 | 14.52 | 15.82 | 12.84          | 13.16 | 13.83 | 14.14 | 15.44 |