

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: P919297

Luminaire Tested: DFN2DIP-PN2F0-060D020US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919297  
REPORT IS A COMBINATION OF REPORTS P900989 AND P897905  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN2F0-060D020US935-FLLONL  
Description: 2 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

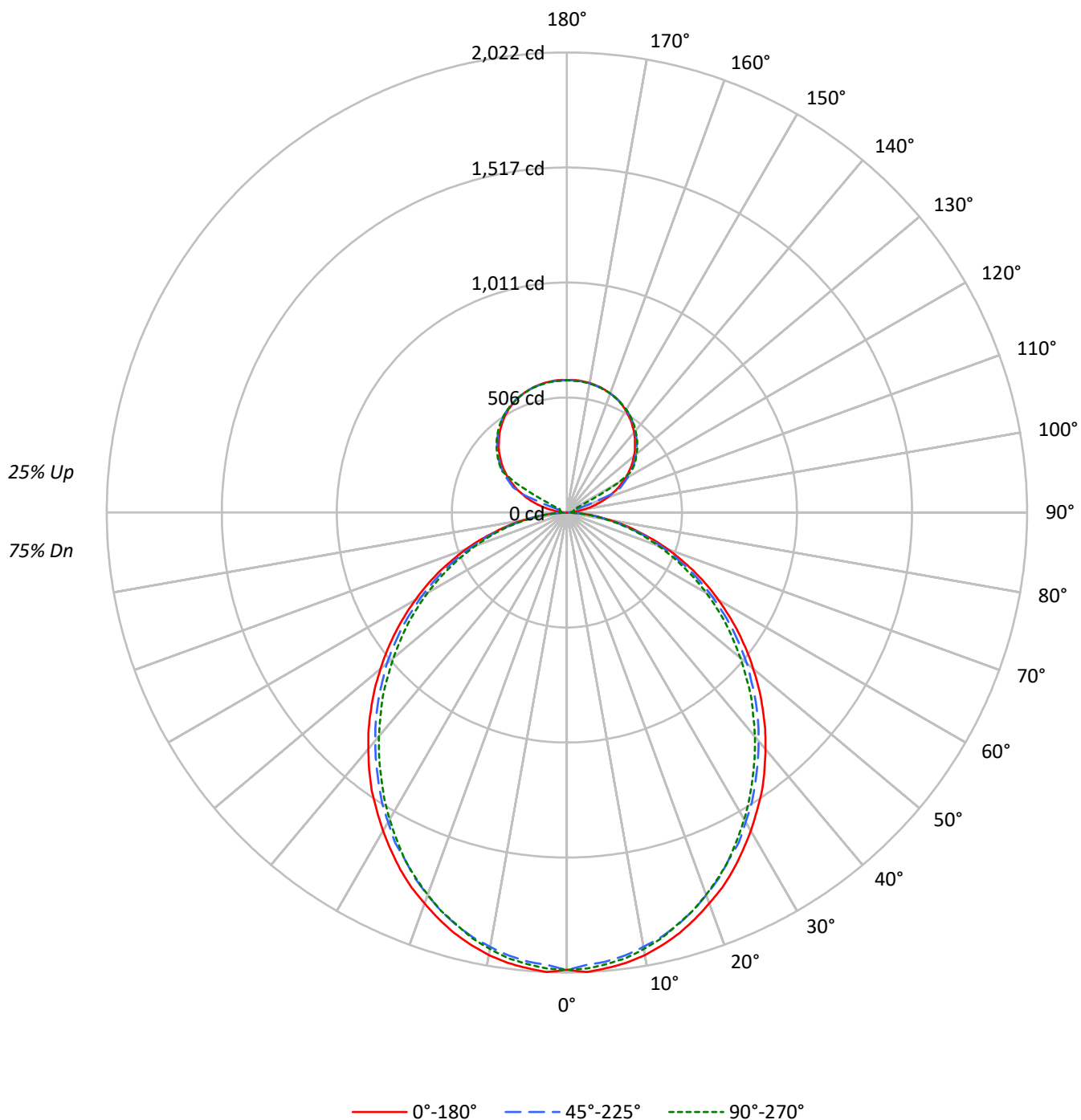
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6819.1 lumens  
Efficiency: N/A  
Efficacy: 84.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.17' x L: 2.29' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 80.6  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.946  
Total Harmonic Distortion (THDi): 0.132  
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   | 113 | 113 | 113 | 113 | 108 | 108 | 108 | 108 | 97 | 97 | 97 | 88 | 88 | 88 | 79 | 79 | 79 |
| 1   | 103 | 99  | 95  | 91  | 98  | 94  | 91  | 87  | 85 | 83 | 80 | 77 | 75 | 73 | 70 | 68 | 67 |
| 2   | 94  | 86  | 80  | 75  | 89  | 82  | 77  | 72  | 75 | 70 | 66 | 68 | 64 | 61 | 62 | 59 | 56 |
| 3   | 86  | 76  | 68  | 62  | 81  | 73  | 66  | 60  | 66 | 61 | 56 | 60 | 56 | 52 | 55 | 51 | 48 |
| 4   | 79  | 67  | 59  | 53  | 75  | 64  | 57  | 51  | 59 | 53 | 48 | 54 | 49 | 45 | 49 | 45 | 41 |
| 5   | 72  | 60  | 52  | 46  | 69  | 58  | 50  | 44  | 53 | 46 | 41 | 48 | 43 | 39 | 44 | 40 | 36 |
| 6   | 67  | 54  | 46  | 40  | 63  | 52  | 44  | 39  | 48 | 41 | 36 | 44 | 38 | 34 | 40 | 35 | 32 |
| 7   | 62  | 49  | 41  | 35  | 59  | 47  | 39  | 34  | 43 | 37 | 32 | 40 | 34 | 30 | 37 | 32 | 28 |
| 8   | 58  | 45  | 37  | 31  | 55  | 43  | 36  | 30  | 40 | 33 | 29 | 37 | 31 | 27 | 34 | 29 | 25 |
| 9   | 54  | 41  | 33  | 28  | 51  | 39  | 32  | 27  | 37 | 30 | 26 | 34 | 28 | 24 | 31 | 26 | 23 |
| 10  | 50  | 38  | 30  | 25  | 48  | 36  | 29  | 25  | 34 | 28 | 23 | 31 | 26 | 22 | 29 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4354 | 4354 | 4354 |
| 5°  | 4354 | 4284 | 4315 |
| 10° | 4311 | 4217 | 4251 |
| 15° | 4241 | 4138 | 4153 |
| 20° | 4148 | 4032 | 4053 |
| 25° | 4056 | 3908 | 3939 |
| 30° | 3942 | 3791 | 3795 |
| 35° | 3833 | 3655 | 3644 |
| 40° | 3701 | 3518 | 3499 |
| 45° | 3568 | 3379 | 3351 |
| 50° | 3423 | 3233 | 3180 |
| 55° | 3270 | 3065 | 3021 |
| 60° | 3097 | 2867 | 2839 |
| 65° | 2907 | 2660 | 2624 |
| 70° | 2667 | 2407 | 2391 |
| 75° | 2335 | 2105 | 2168 |
| 80° | 1933 | 1719 | 1759 |
| 85° | 1310 | 1086 | 1103 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3568 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 189.2  | 2.8       |
| 10°-20°   | 532.3  | 7.8       |
| 20°-30°   | 782.3  | 11.5      |
| 30°-40°   | 908.6  | 13.3      |
| 40°-50°   | 907.5  | 13.3      |
| 50°-60°   | 791.3  | 11.6      |
| 60°-70°   | 584.9  | 8.6       |
| 70°-80°   | 330.9  | 4.9       |
| 80°-90°   | 88.4   | 1.3       |
| 90°-100°  | 19.2   | 0.3       |
| 100°-110° | 71.4   | 1.0       |
| 110°-120° | 189.5  | 2.8       |
| 120°-130° | 314.2  | 4.6       |
| 130°-140° | 333.8  | 4.9       |
| 140°-150° | 310.2  | 4.5       |
| 150°-160° | 249.4  | 3.7       |
| 160°-170° | 160.7  | 2.4       |
| 170°-180° | 55.3   | 0.8       |
| 0°-30°    | 1503.8 | 22.1      |
| 0°-40°    | 2412.4 | 35.4      |
| 0°-60°    | 4111.1 | 60.3      |
| 0°-90°    | 5115.4 | 75.0      |
| 90°-120°  | 280.0  | 4.1       |
| 90°-150°  | 1238.3 | 18.2      |
| 90°-180°  | 1704.0 | 25.0      |
| 0°-180°   | 6819.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2010 | 2010  | 2010 | 2010  | 2010 |      |
| 5°   | 2010 | 2002  | 1981 | 1997  | 1993 | 191  |
| 15°  | 1914 | 1902  | 1877 | 1885  | 1875 | 539  |
| 25°  | 1732 | 1716  | 1684 | 1687  | 1684 | 797  |
| 35°  | 1494 | 1475  | 1444 | 1432  | 1422 | 933  |
| 45°  | 1216 | 1202  | 1173 | 1152  | 1144 | 938  |
| 55°  | 920  | 908   | 885  | 862   | 852  | 823  |
| 65°  | 620  | 609   | 590  | 572   | 562  | 614  |
| 75°  | 325  | 321   | 311  | 300   | 304  | 347  |
| 85°  | 79   | 77    | 75   | 70    | 68   | 88   |
| 90°  | 0    | 5     | 8    | 10    | 11   | 6    |
| 95°  | 27   | 13    | 16   | 18    | 18   | 32   |
| 105° | 128  | 140   | 26   | 30    | 32   | 137  |
| 115° | 242  | 249   | 260  | 65    | 34   | 238  |
| 125° | 342  | 347   | 355  | 358   | 360  | 305  |
| 135° | 423  | 430   | 434  | 438   | 437  | 327  |
| 145° | 491  | 490   | 498  | 500   | 498  | 307  |
| 155° | 540  | 537   | 542  | 544   | 541  | 249  |
| 165° | 569  | 567   | 568  | 571   | 568  | 161  |
| 175° | 582  | 580   | 580  | 583   | 579  | 55   |
| 180° | 581  | 581   | 581  | 581   | 581  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2010.1 | 2010.1 | 2010.1 | 2010.1 | 2010.1 |
| 2.5°   | 2021.8 | 2012.2 | 1990.8 | 2010.1 | 2006.4 |
| 5°     | 2010.1 | 2002.5 | 1981.2 | 1996.6 | 1992.9 |
| 7.5°   | 1996.6 | 1985.1 | 1963.8 | 1979.3 | 1975.5 |
| 10°    | 1975.5 | 1962.0 | 1938.7 | 1954.1 | 1948.4 |
| 12.5°  | 1946.4 | 1934.8 | 1911.7 | 1921.3 | 1917.4 |
| 15°    | 1913.5 | 1902.0 | 1876.8 | 1884.6 | 1875.0 |
| 17.5°  | 1872.9 | 1861.5 | 1836.3 | 1845.8 | 1836.3 |
| 20°    | 1828.4 | 1817.0 | 1789.8 | 1795.6 | 1788.0 |
| 22.5°  | 1784.2 | 1766.7 | 1741.5 | 1741.5 | 1737.6 |
| 25°    | 1731.8 | 1716.5 | 1683.6 | 1687.3 | 1683.6 |
| 27.5°  | 1673.8 | 1660.3 | 1635.2 | 1629.5 | 1619.9 |
| 30°    | 1616.0 | 1600.3 | 1571.5 | 1565.7 | 1557.9 |
| 32.5°  | 1554.0 | 1542.6 | 1511.6 | 1499.9 | 1492.1 |
| 35°    | 1494.2 | 1474.9 | 1443.9 | 1432.2 | 1422.5 |
| 37.5°  | 1426.5 | 1409.0 | 1378.1 | 1364.5 | 1354.9 |
| 40°    | 1356.9 | 1341.3 | 1310.4 | 1293.2 | 1285.4 |
| 42.5°  | 1289.3 | 1273.7 | 1242.9 | 1223.5 | 1211.9 |
| 45°    | 1215.9 | 1202.3 | 1173.2 | 1152.1 | 1144.3 |
| 47.5°  | 1144.3 | 1130.7 | 1099.8 | 1078.5 | 1066.9 |
| 50°    | 1068.8 | 1059.2 | 1032.2 | 1005.0 | 995.4  |
| 52.5°  | 995.4  | 981.9  | 956.8  | 935.6  | 922.0  |
| 55°    | 920.1  | 908.4  | 885.3  | 862.1  | 852.5  |
| 57.5°  | 844.7  | 835.1  | 809.9  | 786.7  | 778.9  |
| 60°    | 769.2  | 761.6  | 734.6  | 713.3  | 707.5  |
| 62.5°  | 695.8  | 682.3  | 663.0  | 643.7  | 635.9  |
| 65°    | 620.5  | 608.9  | 589.6  | 572.1  | 562.5  |
| 67.5°  | 543.2  | 533.4  | 516.2  | 502.7  | 494.8  |
| 70°    | 471.7  | 463.9  | 446.4  | 432.9  | 425.3  |
| 72.5°  | 398.2  | 390.5  | 380.8  | 367.3  | 361.5  |
| 75°    | 324.6  | 321.0  | 311.1  | 299.6  | 303.5  |
| 77.5°  | 259.0  | 251.2  | 247.3  | 241.6  | 235.8  |
| 80°    | 193.4  | 191.3  | 187.4  | 181.7  | 177.8  |
| 82.5°  | 131.5  | 131.5  | 129.6  | 121.8  | 121.8  |
| 85°    | 79.1   | 77.3   | 75.4   | 69.5   | 67.7   |
| 87.5°  | 34.9   | 31.0   | 27.0   | 21.4   | 19.3   |
| 90°    | 0.4    | 5.1    | 8.4    | 10.5   | 11.4   |
| 92.5°  | 10.5   | 8.9    | 10.1   | 10.9   | 11.4   |
| 95°    | 27.3   | 13.4   | 16.4   | 18.5   | 18.1   |
| 97.5°  | 49.2   | 14.7   | 21.4   | 22.7   | 23.2   |
| 100°   | 74.5   | 16.8   | 23.9   | 27.3   | 28.2   |
| 102.5° | 102.2  | 101.3  | 24.8   | 29.4   | 30.7   |
| 105°   | 127.9  | 140.4  | 25.7   | 30.2   | 31.9   |
| 107.5° | 157.7  | 168.2  | 26.5   | 31.1   | 32.8   |
| 110°   | 186.3  | 195.1  | 73.6   | 31.6   | 33.2   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 213.2 | 220.8 | 213.6 | 32.4  | 33.7  |
| 115°   | 241.8 | 248.9 | 259.5 | 64.7  | 34.5  |
| 117.5° | 266.6 | 275.0 | 282.1 | 222.1 | 111.8 |
| 120°   | 294.4 | 300.7 | 308.2 | 313.3 | 256.5 |
| 122.5° | 317.9 | 324.6 | 333.0 | 335.5 | 336.0 |
| 125°   | 341.9 | 347.3 | 355.3 | 358.3 | 359.6 |
| 127.5° | 363.8 | 369.6 | 376.0 | 380.1 | 380.6 |
| 130°   | 384.3 | 391.1 | 395.7 | 400.4 | 399.9 |
| 132.5° | 405.4 | 410.9 | 415.4 | 419.2 | 418.9 |
| 135°   | 423.1 | 429.8 | 433.5 | 437.8 | 437.0 |
| 137.5° | 441.5 | 446.6 | 450.8 | 455.0 | 453.7 |
| 140°   | 459.6 | 463.0 | 467.6 | 471.4 | 469.3 |
| 142.5° | 474.8 | 477.8 | 483.2 | 486.5 | 484.4 |
| 145°   | 490.8 | 490.3 | 497.5 | 500.4 | 498.3 |
| 147.5° | 504.6 | 503.3 | 510.5 | 512.6 | 510.9 |
| 150°   | 518.1 | 515.1 | 521.9 | 524.3 | 522.3 |
| 152.5° | 529.4 | 526.1 | 532.4 | 534.9 | 531.9 |
| 155°   | 540.4 | 536.6 | 541.7 | 544.2 | 540.8 |
| 157.5° | 549.2 | 545.9 | 549.7 | 552.6 | 549.2 |
| 160°   | 556.8 | 554.2 | 556.8 | 559.3 | 556.4 |
| 162.5° | 563.4 | 560.9 | 563.1 | 566.0 | 562.2 |
| 165°   | 569.4 | 566.9 | 568.1 | 571.1 | 568.1 |
| 167.5° | 574.0 | 571.4 | 572.7 | 575.7 | 571.9 |
| 170°   | 577.8 | 575.2 | 576.1 | 579.0 | 575.2 |
| 172.5° | 580.3 | 577.8 | 578.7 | 581.6 | 577.8 |
| 175°   | 582.4 | 579.5 | 580.3 | 583.2 | 579.0 |
| 177.5° | 583.2 | 580.3 | 580.7 | 583.7 | 579.9 |
| 180°   | 581.2 | 581.2 | 581.2 | 581.2 | 581.2 |

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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 | 14.31            | 15.46 | 15.02 | 16.18 | 17.05 | 13.88          | 15.02 | 14.58 | 15.75 | 16.61 |
|                 | 3H   | 15.97            | 17.00 | 16.70 | 17.74 | 18.63 | 15.49          | 16.52 | 16.22 | 17.26 | 18.15 |
|                 | 4H   | 16.56            | 17.53 | 17.30 | 18.28 | 19.18 | 16.08          | 17.05 | 16.82 | 17.80 | 18.70 |
|                 | 6H   | 16.96            | 17.85 | 17.71 | 18.61 | 19.53 | 16.47          | 17.37 | 17.23 | 18.12 | 19.05 |
|                 | 8H   | 17.06            | 17.92 | 17.83 | 18.69 | 19.62 | 16.58          | 17.43 | 17.34 | 18.21 | 19.13 |
|                 | 12H  | 17.11            | 17.93 | 17.88 | 18.70 | 19.65 | 16.62          | 17.43 | 17.39 | 18.21 | 19.16 |
| 4H              | 2H   | 14.80            | 15.77 | 15.54 | 16.51 | 17.42 | 14.45          | 15.42 | 15.19 | 16.16 | 17.07 |
|                 | 3H   | 16.66            | 17.47 | 17.42 | 18.26 | 19.18 | 16.26          | 17.07 | 17.02 | 17.86 | 18.78 |
|                 | 4H   | 17.37            | 18.11 | 18.15 | 18.89 | 19.85 | 16.96          | 17.70 | 17.73 | 18.48 | 19.43 |
|                 | 6H   | 17.89            | 18.52 | 18.68 | 19.33 | 20.29 | 17.47          | 18.10 | 18.26 | 18.91 | 19.87 |
|                 | 8H   | 18.03            | 18.63 | 18.83 | 19.43 | 20.41 | 17.61          | 18.20 | 18.40 | 19.01 | 19.98 |
|                 | 12H  | 18.11            | 18.65 | 18.92 | 19.47 | 20.45 | 17.68          | 18.21 | 18.49 | 19.04 | 20.02 |
| 8H              | 4H   | 17.58            | 18.18 | 18.38 | 18.98 | 19.96 | 17.21          | 17.81 | 18.01 | 18.61 | 19.59 |
|                 | 6H   | 18.20            | 18.69 | 19.02 | 19.54 | 20.52 | 17.83          | 18.32 | 18.65 | 19.17 | 20.14 |
|                 | 8H   | 18.41            | 18.85 | 19.24 | 19.69 | 20.68 | 18.03          | 18.47 | 18.86 | 19.31 | 20.30 |
|                 | 12H  | 18.54            | 18.93 | 19.38 | 19.76 | 20.81 | 18.14          | 18.53 | 18.98 | 19.37 | 20.41 |
| 12H             | 4H   | 17.58            | 18.12 | 18.39 | 18.94 | 19.92 | 17.22          | 17.75 | 18.03 | 18.58 | 19.56 |
|                 | 6H   | 18.23            | 18.67 | 19.06 | 19.51 | 20.50 | 17.87          | 18.31 | 18.70 | 19.15 | 20.14 |
|                 | 8H   | 18.47            | 18.86 | 19.30 | 19.69 | 20.74 | 18.10          | 18.49 | 18.93 | 19.32 | 20.37 |