

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: P909780

Luminaire Tested: DFN2DIP-TR2F0-050D030US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909780  
REPORT IS A COMBINATION OF REPORTS P900237 AND P897145  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR2F0-050D030US840-FLLFLL  
Description: 2 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

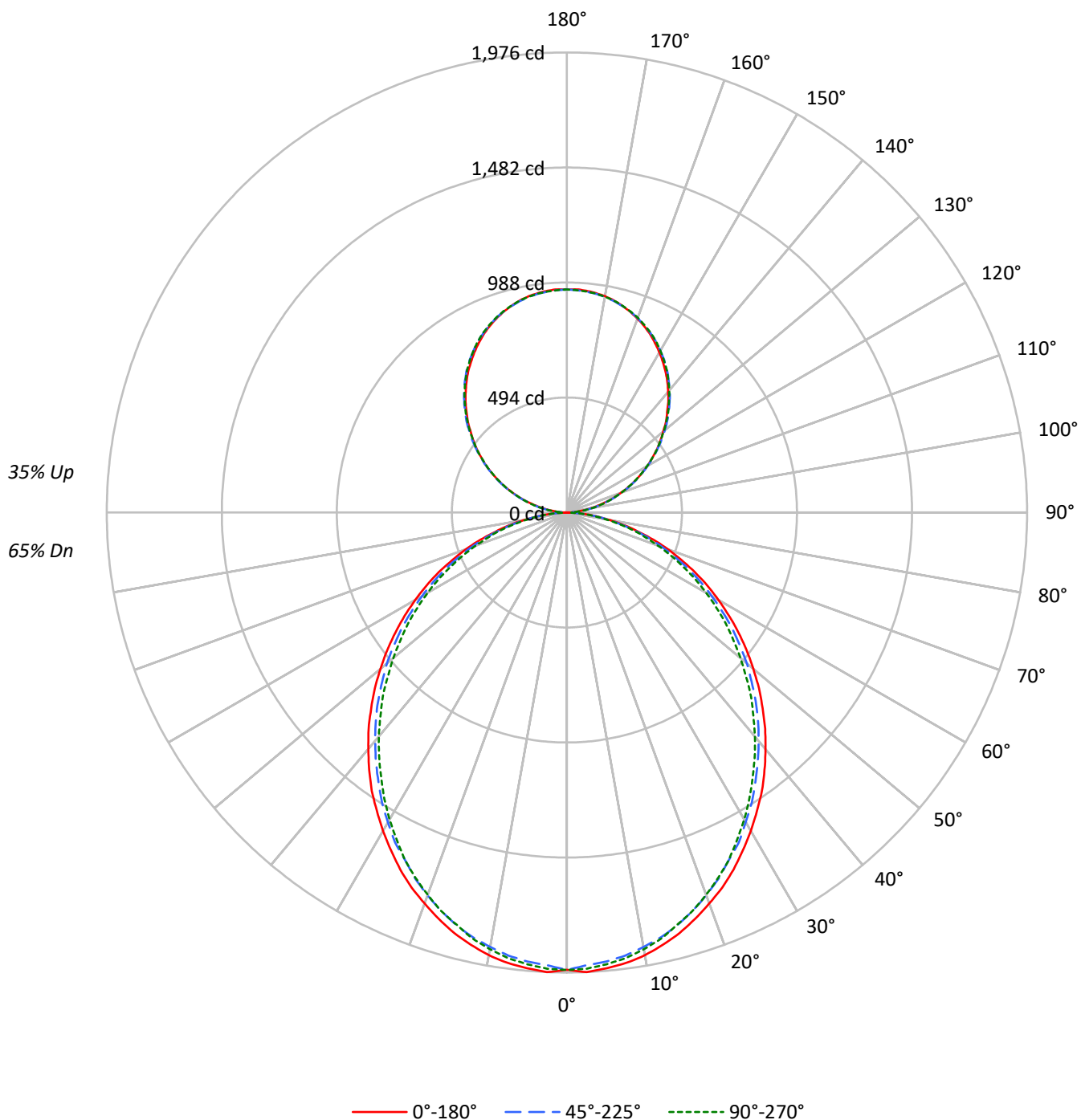
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7680.0 lumens  
Efficiency: N/A  
Efficacy: 110.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.04' x L: 2.36' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 69.3  
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   | 111 | 111 | 111 | 111 | 104 | 104 | 104 | 104 | 92 | 92 | 92 | 80 | 80 | 80 | 70 | 70 | 70 |
| 1   | 101 | 97  | 93  | 89  | 95  | 91  | 88  | 84  | 81 | 78 | 75 | 71 | 69 | 67 | 62 | 60 | 59 |
| 2   | 92  | 85  | 78  | 73  | 86  | 80  | 74  | 69  | 71 | 66 | 63 | 62 | 59 | 56 | 55 | 52 | 50 |
| 3   | 84  | 74  | 67  | 61  | 79  | 70  | 63  | 58  | 62 | 57 | 53 | 55 | 51 | 47 | 48 | 45 | 42 |
| 4   | 77  | 66  | 58  | 52  | 72  | 62  | 55  | 49  | 55 | 50 | 45 | 49 | 44 | 41 | 43 | 40 | 37 |
| 5   | 71  | 59  | 50  | 44  | 66  | 56  | 48  | 42  | 50 | 44 | 39 | 44 | 39 | 35 | 39 | 35 | 32 |
| 6   | 65  | 53  | 45  | 39  | 61  | 50  | 43  | 37  | 45 | 39 | 34 | 40 | 35 | 31 | 35 | 31 | 28 |
| 7   | 60  | 48  | 40  | 34  | 57  | 45  | 38  | 33  | 41 | 35 | 30 | 36 | 31 | 28 | 32 | 28 | 25 |
| 8   | 56  | 44  | 36  | 30  | 53  | 41  | 34  | 29  | 37 | 31 | 27 | 33 | 28 | 25 | 30 | 26 | 22 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 31  | 26  | 34 | 28 | 24 | 31 | 26 | 22 | 27 | 23 | 20 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 23  | 32 | 26 | 22 | 28 | 24 | 20 | 25 | 21 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4382 | 4382 | 4382 |
| 5°  | 4383 | 4311 | 4343 |
| 10° | 4341 | 4244 | 4276 |
| 15° | 4270 | 4164 | 4177 |
| 20° | 4178 | 4057 | 4076 |
| 25° | 4085 | 3932 | 3960 |
| 30° | 3971 | 3814 | 3814 |
| 35° | 3862 | 3677 | 3661 |
| 40° | 3729 | 3538 | 3514 |
| 45° | 3596 | 3398 | 3363 |
| 50° | 3451 | 3251 | 3190 |
| 55° | 3298 | 3081 | 3028 |
| 60° | 3124 | 2881 | 2844 |
| 65° | 2934 | 2671 | 2626 |
| 70° | 2693 | 2417 | 2390 |
| 75° | 2361 | 2112 | 2162 |
| 80° | 1957 | 1723 | 1748 |
| 85° | 1335 | 1085 | 1085 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3596 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 184.9  | 2.4       |
| 10°-20°   | 520.3  | 6.8       |
| 20°-30°   | 764.6  | 10.0      |
| 30°-40°   | 888.1  | 11.6      |
| 40°-50°   | 887.0  | 11.5      |
| 50°-60°   | 773.4  | 10.1      |
| 60°-70°   | 571.7  | 7.4       |
| 70°-80°   | 323.5  | 4.2       |
| 80°-90°   | 88.1   | 1.1       |
| 90°-100°  | 59.3   | 0.8       |
| 100°-110° | 188.4  | 2.5       |
| 110°-120° | 322.4  | 4.2       |
| 120°-130° | 424.0  | 5.5       |
| 130°-140° | 475.9  | 6.2       |
| 140°-150° | 466.7  | 6.1       |
| 150°-160° | 391.5  | 5.1       |
| 160°-170° | 259.6  | 3.4       |
| 170°-180° | 90.7   | 1.2       |
| 0°-30°    | 1469.8 | 19.1      |
| 0°-40°    | 2357.9 | 30.7      |
| 0°-60°    | 4018.3 | 52.3      |
| 0°-90°    | 5001.6 | 65.1      |
| 90°-120°  | 570.1  | 7.4       |
| 90°-150°  | 1936.6 | 25.2      |
| 90°-180°  | 2678.0 | 34.9      |
| 0°-180°   | 7680.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1965 | 1965  | 1965 | 1965  | 1965 |      |
| 5°   | 1965 | 1957  | 1936 | 1952  | 1948 | 187  |
| 15°  | 1870 | 1859  | 1834 | 1842  | 1833 | 527  |
| 25°  | 1693 | 1678  | 1646 | 1649  | 1646 | 779  |
| 35°  | 1460 | 1442  | 1411 | 1400  | 1390 | 912  |
| 45°  | 1188 | 1175  | 1147 | 1126  | 1118 | 917  |
| 55°  | 899  | 888   | 865  | 843   | 833  | 804  |
| 65°  | 606  | 595   | 576  | 559   | 550  | 600  |
| 75°  | 317  | 314   | 304  | 293   | 297  | 339  |
| 85°  | 77   | 76    | 74   | 68    | 66   | 86   |
| 90°  | 1    | 10    | 28   | 27    | 28   | 7    |
| 95°  | 42   | 50    | 52   | 52    | 50   | 47   |
| 105° | 174  | 176   | 178  | 179   | 179  | 184  |
| 115° | 324  | 328   | 327  | 326   | 324  | 320  |
| 125° | 471  | 478   | 475  | 473   | 472  | 420  |
| 135° | 609  | 618   | 619  | 618   | 616  | 470  |
| 145° | 739  | 745   | 749  | 750   | 747  | 462  |
| 155° | 845  | 847   | 850  | 854   | 851  | 389  |
| 165° | 919  | 918   | 918  | 924   | 920  | 259  |
| 175° | 956  | 954   | 952  | 958   | 953  | 91   |
| 180° | 958  | 958   | 958  | 958   | 958  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1964.7 | 1964.7 | 1964.7 | 1964.7 | 1964.7 |
| 2.5°   | 1976.1 | 1966.7 | 1945.9 | 1964.7 | 1961.2 |
| 5°     | 1964.7 | 1957.3 | 1936.4 | 1951.5 | 1947.9 |
| 7.5°   | 1951.5 | 1940.3 | 1919.5 | 1934.7 | 1930.9 |
| 10°    | 1930.9 | 1917.6 | 1895.0 | 1910.0 | 1904.4 |
| 12.5°  | 1902.4 | 1891.2 | 1868.6 | 1877.9 | 1874.1 |
| 15°    | 1870.3 | 1859.1 | 1834.4 | 1842.1 | 1832.6 |
| 17.5°  | 1830.6 | 1819.4 | 1794.7 | 1804.1 | 1794.7 |
| 20°    | 1787.2 | 1775.9 | 1749.5 | 1755.0 | 1747.7 |
| 22.5°  | 1743.8 | 1726.8 | 1702.1 | 1702.1 | 1698.3 |
| 25°    | 1692.7 | 1677.7 | 1645.6 | 1649.2 | 1645.6 |
| 27.5°  | 1636.0 | 1622.8 | 1598.3 | 1592.7 | 1583.3 |
| 30°    | 1579.4 | 1564.3 | 1536.0 | 1530.4 | 1522.8 |
| 32.5°  | 1518.9 | 1507.7 | 1477.4 | 1466.0 | 1458.4 |
| 35°    | 1460.4 | 1441.6 | 1411.3 | 1399.9 | 1390.5 |
| 37.5°  | 1394.2 | 1377.3 | 1347.0 | 1333.7 | 1324.3 |
| 40°    | 1326.4 | 1311.1 | 1280.8 | 1263.9 | 1256.4 |
| 42.5°  | 1260.2 | 1245.0 | 1214.9 | 1195.8 | 1184.6 |
| 45°    | 1188.4 | 1175.2 | 1146.7 | 1126.1 | 1118.4 |
| 47.5°  | 1118.4 | 1105.2 | 1075.0 | 1054.1 | 1042.9 |
| 50°    | 1044.7 | 1035.3 | 1008.9 | 982.4  | 972.9  |
| 52.5°  | 972.9  | 959.7  | 935.2  | 914.4  | 901.2  |
| 55°    | 899.4  | 888.0  | 865.3  | 842.6  | 833.2  |
| 57.5°  | 825.6  | 816.2  | 791.5  | 768.9  | 761.2  |
| 60°    | 751.8  | 744.5  | 718.0  | 697.1  | 691.6  |
| 62.5°  | 680.1  | 666.9  | 648.0  | 629.1  | 621.6  |
| 65°    | 606.5  | 595.1  | 576.2  | 559.3  | 549.8  |
| 67.5°  | 531.0  | 521.4  | 504.5  | 491.3  | 483.6  |
| 70°    | 461.0  | 453.4  | 436.4  | 423.1  | 415.8  |
| 72.5°  | 389.3  | 381.6  | 372.2  | 359.0  | 353.4  |
| 75°    | 317.3  | 313.7  | 304.1  | 292.9  | 296.7  |
| 77.5°  | 253.2  | 245.5  | 241.8  | 236.1  | 230.6  |
| 80°    | 189.0  | 187.0  | 183.2  | 177.6  | 173.8  |
| 82.5°  | 128.5  | 128.5  | 126.6  | 119.1  | 119.1  |
| 85°    | 77.4   | 75.5   | 73.7   | 68.0   | 66.1   |
| 87.5°  | 34.0   | 30.3   | 26.5   | 20.8   | 18.9   |
| 90°    | 0.9    | 10.4   | 28.3   | 26.6   | 27.5   |
| 92.5°  | 17.9   | 24.2   | 25.1   | 26.0   | 26.0   |
| 95°    | 42.2   | 50.3   | 51.7   | 51.7   | 50.3   |
| 97.5°  | 70.2   | 77.7   | 80.9   | 80.9   | 80.9   |
| 100°   | 102.5  | 109.2  | 111.5  | 111.5  | 110.7  |
| 102.5° | 136.6  | 141.6  | 144.7  | 145.6  | 144.7  |
| 105°   | 173.9  | 176.2  | 177.9  | 179.4  | 179.4  |
| 107.5° | 210.9  | 214.3  | 214.3  | 214.9  | 210.9  |
| 110°   | 246.7  | 251.4  | 251.4  | 251.4  | 249.0  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 285.4 | 290.3 | 289.4 | 287.1 | 285.4 |
| 115°   | 323.6 | 328.1 | 326.7 | 325.9 | 323.6 |
| 117.5° | 361.3 | 367.7 | 363.7 | 361.3 | 359.0 |
| 120°   | 399.5 | 405.9 | 399.5 | 399.5 | 396.9 |
| 122.5° | 434.1 | 442.2 | 438.2 | 435.9 | 434.1 |
| 125°   | 470.6 | 477.8 | 475.4 | 472.8 | 472.0 |
| 127.5° | 506.0 | 515.0 | 511.9 | 508.4 | 506.0 |
| 130°   | 539.3 | 549.7 | 548.3 | 546.5 | 543.3 |
| 132.5° | 576.5 | 584.6 | 585.2 | 581.2 | 578.9 |
| 135°   | 608.6 | 617.5 | 619.4 | 618.4 | 616.1 |
| 137.5° | 644.4 | 651.7 | 653.1 | 652.6 | 649.0 |
| 140°   | 675.9 | 683.2 | 687.2 | 687.2 | 684.0 |
| 142.5° | 708.3 | 715.5 | 717.8 | 718.7 | 715.5 |
| 145°   | 738.9 | 744.7 | 749.3 | 750.1 | 747.0 |
| 147.5° | 766.4 | 773.6 | 777.0 | 778.5 | 775.3 |
| 150°   | 794.7 | 799.6 | 802.7 | 805.4 | 802.7 |
| 152.5° | 819.8 | 824.7 | 828.7 | 831.9 | 828.7 |
| 155°   | 845.0 | 847.2 | 849.8 | 853.8 | 851.3 |
| 157.5° | 866.6 | 868.3 | 869.8 | 875.6 | 871.5 |
| 160°   | 886.0 | 887.7 | 888.6 | 893.4 | 890.0 |
| 162.5° | 903.8 | 903.8 | 904.7 | 910.2 | 906.2 |
| 165°   | 919.2 | 918.3 | 918.3 | 924.0 | 920.0 |
| 167.5° | 933.0 | 930.4 | 930.4 | 936.1 | 932.1 |
| 170°   | 943.4 | 941.1 | 940.3 | 946.0 | 941.1 |
| 172.5° | 950.6 | 948.4 | 947.5 | 953.2 | 948.4 |
| 175°   | 956.4 | 954.1 | 952.4 | 958.2 | 953.2 |
| 177.5° | 959.6 | 957.3 | 955.5 | 960.5 | 955.5 |
| 180°   | 958.2 | 958.2 | 958.2 | 958.2 | 958.2 |

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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 | 13.57            | 14.58 | 14.38 | 15.42 | 16.46 | 13.14          | 14.16 | 13.96 | 15.00 | 16.03 |
|                 | 3H   | 15.21            | 16.13 | 16.04 | 16.97 | 18.04 | 14.75          | 15.67 | 15.58 | 16.51 | 17.58 |
|                 | 4H   | 15.79            | 16.65 | 16.64 | 17.51 | 18.59 | 15.33          | 16.20 | 16.18 | 17.05 | 18.13 |
|                 | 6H   | 16.18            | 16.98 | 17.04 | 17.84 | 18.93 | 15.72          | 16.52 | 16.58 | 17.38 | 18.47 |
|                 | 8H   | 16.28            | 17.04 | 17.15 | 17.92 | 19.01 | 15.82          | 16.58 | 16.69 | 17.46 | 18.55 |
|                 | 12H  | 16.33            | 17.05 | 17.20 | 17.92 | 19.04 | 15.86          | 16.59 | 16.74 | 17.46 | 18.58 |
| 4H              | 2H   | 14.04            | 14.90 | 14.89 | 15.75 | 16.83 | 13.70          | 14.56 | 14.55 | 15.41 | 16.49 |
|                 | 3H   | 15.89            | 16.61 | 16.75 | 17.50 | 18.59 | 15.50          | 16.22 | 16.37 | 17.11 | 18.20 |
|                 | 4H   | 16.59            | 17.25 | 17.46 | 18.13 | 19.25 | 16.20          | 16.85 | 17.07 | 17.74 | 18.86 |
|                 | 6H   | 17.09            | 17.66 | 17.98 | 18.57 | 19.69 | 16.70          | 17.26 | 17.59 | 18.17 | 19.29 |
|                 | 8H   | 17.23            | 17.76 | 18.13 | 18.67 | 19.80 | 16.84          | 17.37 | 17.73 | 18.27 | 19.41 |
|                 | 12H  | 17.30            | 17.78 | 18.22 | 18.70 | 19.84 | 16.90          | 17.38 | 17.81 | 18.30 | 19.44 |
| 8H              | 4H   | 16.79            | 17.32 | 17.68 | 18.22 | 19.36 | 16.44          | 16.97 | 17.33 | 17.87 | 19.01 |
|                 | 6H   | 17.40            | 17.84 | 18.32 | 18.78 | 19.92 | 17.05          | 17.49 | 17.97 | 18.43 | 19.57 |
|                 | 8H   | 17.61            | 18.00 | 18.54 | 18.93 | 20.08 | 17.25          | 17.64 | 18.18 | 18.58 | 19.73 |
|                 | 12H  | 17.73            | 18.07 | 18.66 | 19.00 | 20.20 | 17.36          | 17.70 | 18.29 | 18.63 | 19.84 |
| 12H             | 4H   | 16.78            | 17.26 | 17.69 | 18.18 | 19.32 | 16.44          | 16.91 | 17.35 | 17.84 | 18.98 |
|                 | 6H   | 17.43            | 17.82 | 18.36 | 18.75 | 19.90 | 17.08          | 17.47 | 18.01 | 18.41 | 19.56 |
|                 | 8H   | 17.66            | 18.00 | 18.59 | 18.93 | 20.13 | 17.31          | 17.66 | 18.24 | 18.58 | 19.79 |