

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: P904947

Luminaire Tested: DFN2DIP-4P3F0-040D030US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904947  
REPORT IS A COMBINATION OF REPORTS P900563 AND P897473  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-040D030US835-FLLONL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

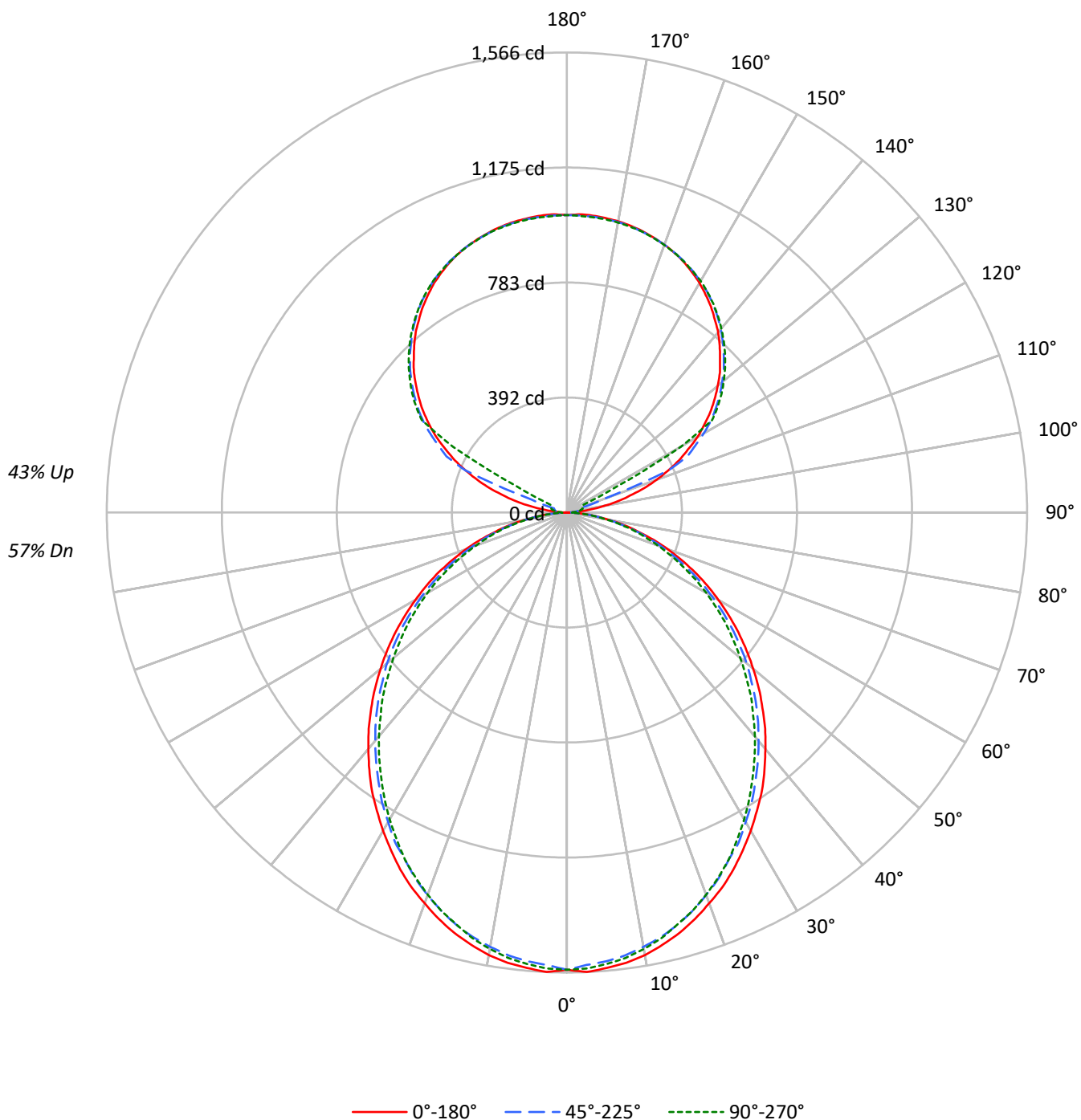
Lumens per Lamp: N/A  
Luminaire Lumens: 6930.0 lumens  
Efficiency: N/A  
Efficacy: 115.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 59.9  
Input Voltage (V):  
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   | 109 | 109 | 109 | 109 | 101 | 101 | 101 | 101 | 87 | 87 | 87 | 74 | 74 | 74 | 63 | 63 | 63 |
| 1   | 99  | 95  | 91  | 88  | 92  | 89  | 85  | 82  | 77 | 74 | 72 | 66 | 64 | 62 | 55 | 54 | 53 |
| 2   | 91  | 83  | 77  | 72  | 84  | 77  | 72  | 67  | 67 | 63 | 59 | 58 | 55 | 52 | 49 | 47 | 45 |
| 3   | 83  | 73  | 66  | 60  | 77  | 68  | 62  | 56  | 59 | 54 | 50 | 51 | 47 | 44 | 43 | 40 | 38 |
| 4   | 76  | 65  | 57  | 50  | 70  | 61  | 53  | 48  | 53 | 47 | 43 | 45 | 41 | 38 | 39 | 35 | 33 |
| 5   | 69  | 58  | 49  | 43  | 64  | 54  | 47  | 41  | 47 | 41 | 37 | 41 | 36 | 33 | 35 | 31 | 29 |
| 6   | 64  | 52  | 44  | 38  | 59  | 49  | 41  | 36  | 43 | 37 | 32 | 37 | 32 | 29 | 32 | 28 | 25 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 31  | 39 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 |
| 8   | 55  | 43  | 35  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 31 | 26 | 23 | 27 | 23 | 20 |
| 9   | 51  | 39  | 31  | 26  | 48  | 37  | 30  | 25  | 32 | 27 | 23 | 28 | 24 | 20 | 25 | 21 | 18 |
| 10  | 48  | 36  | 28  | 24  | 45  | 34  | 27  | 22  | 30 | 24 | 20 | 26 | 22 | 18 | 23 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1774 | 1774 | 1774 |
| 5°  | 1775 | 1748 | 1760 |
| 10° | 1760 | 1723 | 1736 |
| 15° | 1733 | 1694 | 1698 |
| 20° | 1697 | 1653 | 1659 |
| 25° | 1661 | 1605 | 1615 |
| 30° | 1616 | 1560 | 1558 |
| 35° | 1574 | 1507 | 1498 |
| 40° | 1522 | 1453 | 1441 |
| 45° | 1469 | 1400 | 1383 |
| 50° | 1412 | 1343 | 1315 |
| 55° | 1353 | 1278 | 1253 |
| 60° | 1285 | 1201 | 1182 |
| 65° | 1211 | 1120 | 1098 |
| 70° | 1117 | 1023 | 1007 |
| 75° | 987  | 905  | 923  |
| 80° | 829  | 755  | 763  |
| 85° | 584  | 500  | 499  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1469 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 146.5  | 2.1       |
| 10°-20°   | 412.2  | 5.9       |
| 20°-30°   | 605.7  | 8.7       |
| 30°-40°   | 703.5  | 10.2      |
| 40°-50°   | 702.6  | 10.1      |
| 50°-60°   | 612.7  | 8.8       |
| 60°-70°   | 452.9  | 6.5       |
| 70°-80°   | 256.2  | 3.7       |
| 80°-90°   | 69.4   | 1.0       |
| 90°-100°  | 33.4   | 0.5       |
| 100°-110° | 124.4  | 1.8       |
| 110°-120° | 330.1  | 4.8       |
| 120°-130° | 547.5  | 7.9       |
| 130°-140° | 581.5  | 8.4       |
| 140°-150° | 540.5  | 7.8       |
| 150°-160° | 434.5  | 6.3       |
| 160°-170° | 280.0  | 4.0       |
| 170°-180° | 96.4   | 1.4       |
| 0°-30°    | 1164.4 | 16.8      |
| 0°-40°    | 1867.9 | 27.0      |
| 0°-60°    | 3183.2 | 45.9      |
| 0°-90°    | 3961.8 | 57.2      |
| 90°-120°  | 487.9  | 7.0       |
| 90°-150°  | 2157.3 | 31.1      |
| 90°-180°  | 2968.0 | 42.8      |
| 0°-180°   | 6930.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1556 | 1556  | 1556 | 1556  | 1556 |      |
| 5°   | 1556 | 1550  | 1534 | 1546  | 1543 | 148  |
| 15°  | 1482 | 1473  | 1453 | 1459  | 1452 | 417  |
| 25°  | 1341 | 1329  | 1304 | 1306  | 1304 | 617  |
| 35°  | 1157 | 1142  | 1118 | 1109  | 1102 | 722  |
| 45°  | 941  | 931   | 908  | 892   | 886  | 727  |
| 55°  | 712  | 703   | 686  | 668   | 660  | 637  |
| 65°  | 480  | 471   | 456  | 443   | 436  | 475  |
| 75°  | 251  | 248   | 241  | 232   | 235  | 268  |
| 85°  | 61   | 60    | 58   | 54    | 52   | 68   |
| 90°  | 1    | 9     | 15   | 18    | 20   | 6    |
| 95°  | 48   | 23    | 28   | 32    | 32   | 56   |
| 105° | 223  | 245   | 45   | 53    | 56   | 238  |
| 115° | 421  | 434   | 452  | 113   | 60   | 415  |
| 125° | 596  | 605   | 619  | 624   | 626  | 531  |
| 135° | 737  | 749   | 755  | 763   | 761  | 569  |
| 145° | 855  | 854   | 867  | 872   | 868  | 535  |
| 155° | 941  | 935   | 944  | 948   | 942  | 434  |
| 165° | 992  | 988   | 990  | 995   | 990  | 280  |
| 175° | 1015 | 1010  | 1011 | 1016  | 1009 | 97   |
| 180° | 1012 | 1012  | 1012 | 1012  | 1012 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1556.4 | 1556.4 | 1556.4 | 1556.4 | 1556.4 |
| 2.5°   | 1565.5 | 1558.0 | 1541.5 | 1556.4 | 1553.6 |
| 5°     | 1556.4 | 1550.5 | 1534.0 | 1545.9 | 1543.1 |
| 7.5°   | 1545.9 | 1537.0 | 1520.5 | 1532.6 | 1529.6 |
| 10°    | 1529.6 | 1519.1 | 1501.2 | 1513.1 | 1508.6 |
| 12.5°  | 1507.0 | 1498.1 | 1480.2 | 1487.7 | 1484.6 |
| 15°    | 1481.6 | 1472.7 | 1453.2 | 1459.2 | 1451.8 |
| 17.5°  | 1450.2 | 1441.3 | 1421.8 | 1429.2 | 1421.8 |
| 20°    | 1415.7 | 1406.8 | 1385.9 | 1390.3 | 1384.5 |
| 22.5°  | 1381.4 | 1367.9 | 1348.4 | 1348.4 | 1345.4 |
| 25°    | 1340.9 | 1329.0 | 1303.6 | 1306.5 | 1303.6 |
| 27.5°  | 1296.0 | 1285.5 | 1266.2 | 1261.7 | 1254.3 |
| 30°    | 1251.2 | 1239.2 | 1216.8 | 1212.3 | 1206.3 |
| 32.5°  | 1203.3 | 1194.4 | 1170.4 | 1161.4 | 1155.3 |
| 35°    | 1156.9 | 1142.0 | 1118.0 | 1109.0 | 1101.5 |
| 37.5°  | 1104.5 | 1091.0 | 1067.0 | 1056.6 | 1049.1 |
| 40°    | 1050.7 | 1038.6 | 1014.6 | 1001.3 | 995.3  |
| 42.5°  | 998.3  | 986.2  | 962.4  | 947.3  | 938.4  |
| 45°    | 941.4  | 931.0  | 908.4  | 892.1  | 886.0  |
| 47.5°  | 886.0  | 875.5  | 851.6  | 835.1  | 826.2  |
| 50°    | 827.6  | 820.1  | 799.2  | 778.2  | 770.7  |
| 52.5°  | 770.7  | 760.3  | 740.9  | 724.4  | 713.9  |
| 55°    | 712.5  | 703.4  | 685.5  | 667.5  | 660.1  |
| 57.5°  | 654.0  | 646.6  | 627.0  | 609.1  | 603.1  |
| 60°    | 595.6  | 589.7  | 568.8  | 552.3  | 547.8  |
| 62.5°  | 538.8  | 528.3  | 513.4  | 498.4  | 492.4  |
| 65°    | 480.5  | 471.4  | 456.5  | 443.0  | 435.6  |
| 67.5°  | 420.6  | 413.0  | 399.7  | 389.2  | 383.2  |
| 70°    | 365.2  | 359.2  | 345.7  | 335.2  | 329.3  |
| 72.5°  | 308.4  | 302.3  | 294.9  | 284.4  | 279.9  |
| 75°    | 251.4  | 248.5  | 240.9  | 232.0  | 235.0  |
| 77.5°  | 200.5  | 194.5  | 191.5  | 187.0  | 182.6  |
| 80°    | 149.7  | 148.1  | 145.1  | 140.7  | 137.7  |
| 82.5°  | 101.8  | 101.8  | 100.4  | 94.3   | 94.3   |
| 85°    | 61.3   | 59.9   | 58.4   | 53.8   | 52.4   |
| 87.5°  | 27.0   | 24.0   | 21.0   | 16.5   | 14.9   |
| 90°    | 0.7    | 8.8    | 14.6   | 18.4   | 19.7   |
| 92.5°  | 18.4   | 15.4   | 17.6   | 19.1   | 19.7   |
| 95°    | 47.6   | 23.4   | 28.5   | 32.3   | 31.5   |
| 97.5°  | 85.7   | 25.7   | 37.3   | 39.6   | 40.3   |
| 100°   | 129.7  | 29.3   | 41.8   | 47.6   | 49.1   |
| 102.5° | 178.0  | 176.6  | 43.2   | 51.2   | 53.5   |
| 105°   | 222.7  | 244.7  | 44.7   | 52.7   | 55.7   |
| 107.5° | 274.7  | 293.0  | 46.2   | 54.2   | 57.2   |
| 110°   | 324.6  | 339.9  | 128.2  | 55.0   | 57.9   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 371.5  | 384.6  | 372.2  | 56.4   | 58.6   |
| 115°   | 421.2  | 433.7  | 452.0  | 112.8  | 60.1   |
| 117.5° | 464.5  | 479.1  | 491.6  | 386.8  | 194.9  |
| 120°   | 512.8  | 523.8  | 537.0  | 545.8  | 446.9  |
| 122.5° | 553.8  | 565.6  | 580.3  | 584.6  | 585.4  |
| 125°   | 595.6  | 605.1  | 619.1  | 624.2  | 626.4  |
| 127.5° | 633.7  | 643.9  | 655.0  | 662.3  | 663.0  |
| 130°   | 669.6  | 681.4  | 689.4  | 697.4  | 696.8  |
| 132.5° | 706.2  | 715.8  | 723.8  | 730.4  | 729.7  |
| 135°   | 737.0  | 748.8  | 755.3  | 762.7  | 761.2  |
| 137.5° | 769.2  | 778.0  | 785.4  | 792.7  | 790.5  |
| 140°   | 800.7  | 806.6  | 814.6  | 821.2  | 817.6  |
| 142.5° | 827.2  | 832.3  | 841.8  | 847.6  | 844.0  |
| 145°   | 855.0  | 854.2  | 866.7  | 871.8  | 868.1  |
| 147.5° | 879.1  | 876.9  | 889.4  | 893.0  | 890.1  |
| 150°   | 902.6  | 897.5  | 909.2  | 913.5  | 909.9  |
| 152.5° | 922.3  | 916.5  | 927.5  | 931.9  | 926.8  |
| 155°   | 941.4  | 934.9  | 943.6  | 948.0  | 942.2  |
| 157.5° | 956.8  | 951.0  | 957.6  | 962.7  | 956.8  |
| 160°   | 970.0  | 965.6  | 970.0  | 974.4  | 969.2  |
| 162.5° | 981.7  | 977.3  | 981.0  | 986.1  | 979.5  |
| 165°   | 991.9  | 987.6  | 989.8  | 994.9  | 989.8  |
| 167.5° | 1000.0 | 995.6  | 997.8  | 1003.0 | 996.4  |
| 170°   | 1006.6 | 1002.2 | 1003.7 | 1008.8 | 1002.2 |
| 172.5° | 1011.0 | 1006.6 | 1008.1 | 1013.2 | 1006.6 |
| 175°   | 1014.6 | 1009.5 | 1011.0 | 1016.1 | 1008.8 |
| 177.5° | 1016.1 | 1011.0 | 1011.8 | 1016.9 | 1010.3 |
| 180°   | 1012.5 | 1012.5 | 1012.5 | 1012.5 | 1012.5 |

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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 | 9.87             | 10.80 | 10.76 | 11.71 | 12.87 | 9.42           | 10.35 | 10.31 | 11.26 | 12.43 |
|                 | 3H   | 11.53            | 12.36 | 12.43 | 13.28 | 14.47 | 11.04          | 11.87 | 11.94 | 12.79 | 13.98 |
|                 | 4H   | 12.12            | 12.90 | 13.04 | 13.83 | 15.03 | 11.62          | 12.41 | 12.54 | 13.34 | 14.54 |
|                 | 6H   | 12.52            | 13.24 | 13.45 | 14.18 | 15.39 | 12.02          | 12.74 | 12.95 | 13.68 | 14.89 |
|                 | 8H   | 12.62            | 13.31 | 13.56 | 14.26 | 15.48 | 12.12          | 12.81 | 13.06 | 13.76 | 14.97 |
|                 | 12H  | 12.67            | 13.33 | 13.61 | 14.27 | 15.51 | 12.16          | 12.82 | 13.10 | 13.76 | 15.00 |
| 4H              | 2H   | 10.33            | 11.12 | 11.26 | 12.05 | 13.25 | 9.98           | 10.77 | 10.90 | 11.69 | 12.89 |
|                 | 3H   | 12.20            | 12.86 | 13.13 | 13.82 | 15.03 | 11.79          | 12.45 | 12.73 | 13.41 | 14.62 |
|                 | 4H   | 12.91            | 13.51 | 13.86 | 14.47 | 15.71 | 12.49          | 13.09 | 13.43 | 14.04 | 15.28 |
|                 | 6H   | 13.43            | 13.95 | 14.39 | 14.92 | 16.16 | 12.99          | 13.51 | 13.95 | 14.49 | 15.73 |
|                 | 8H   | 13.58            | 14.06 | 14.54 | 15.03 | 16.28 | 13.14          | 13.62 | 14.10 | 14.59 | 15.85 |
|                 | 12H  | 13.65            | 14.09 | 14.63 | 15.07 | 16.33 | 13.20          | 13.64 | 14.18 | 14.63 | 15.88 |
| 8H              | 4H   | 13.11            | 13.59 | 14.07 | 14.57 | 15.82 | 12.73          | 13.22 | 13.69 | 14.19 | 15.44 |
|                 | 6H   | 13.74            | 14.14 | 14.73 | 15.15 | 16.40 | 13.35          | 13.76 | 14.34 | 14.77 | 16.02 |
|                 | 8H   | 13.96            | 14.31 | 14.95 | 15.31 | 16.58 | 13.56          | 13.92 | 14.56 | 14.92 | 16.19 |
|                 | 12H  | 14.09            | 14.40 | 15.09 | 15.39 | 16.71 | 13.68          | 13.99 | 14.68 | 14.98 | 16.30 |
| 12H             | 4H   | 13.10            | 13.54 | 14.08 | 14.52 | 15.78 | 12.73          | 13.17 | 13.71 | 14.15 | 15.41 |
|                 | 6H   | 13.77            | 14.12 | 14.76 | 15.12 | 16.39 | 13.39          | 13.75 | 14.39 | 14.75 | 16.02 |
|                 | 8H   | 14.01            | 14.32 | 15.01 | 15.31 | 16.63 | 13.63          | 13.94 | 14.63 | 14.93 | 16.25 |