

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: P924040

Luminaire Tested: DFN2DIP-4P3F0-040D020US950-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924040  
REPORT IS A COMBINATION OF REPORTS P899034 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-040D020US950-RLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

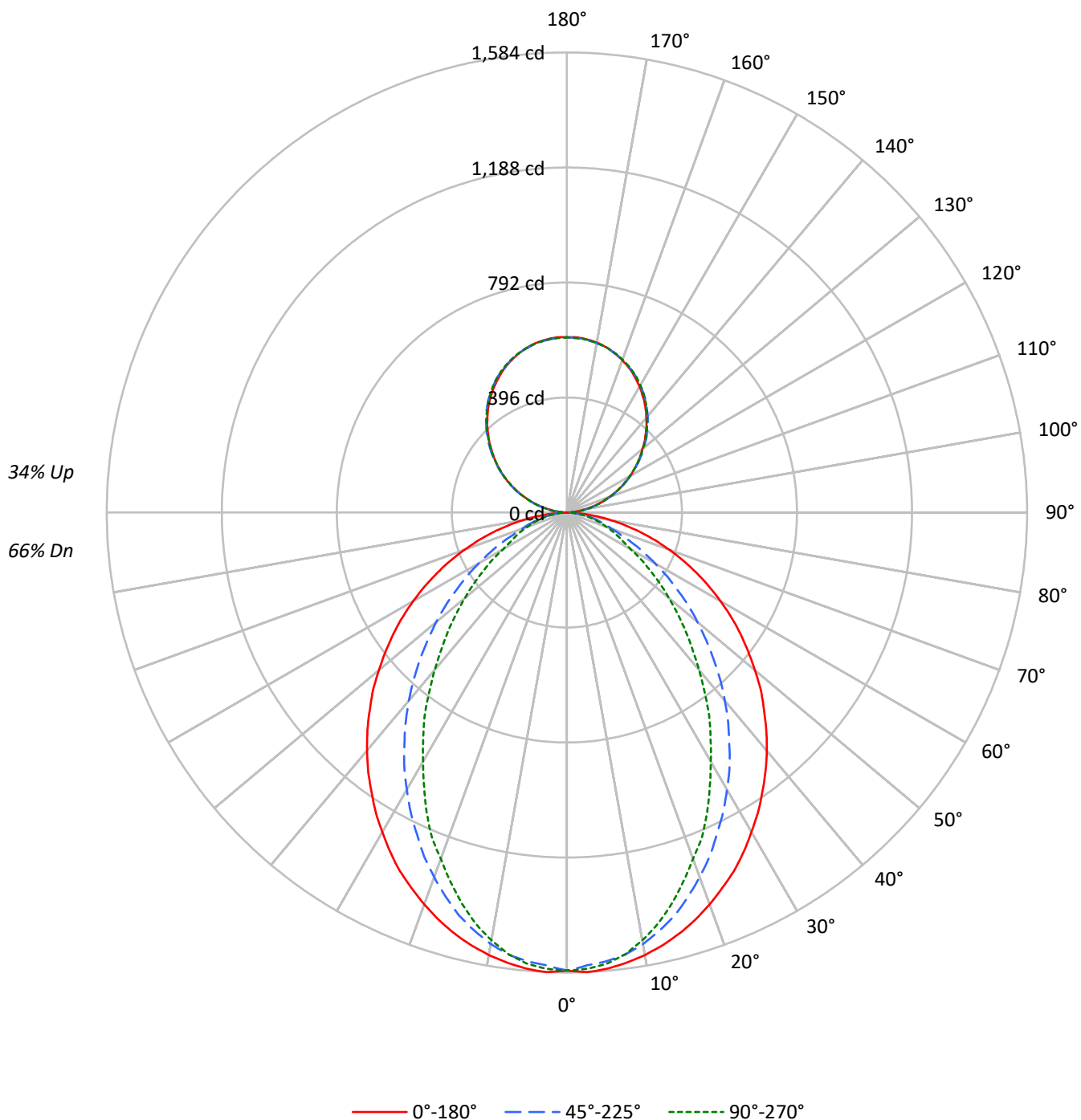
Lumens per Lamp: N/A  
Luminaire Lumens: 4932.2 lumens  
Efficiency: N/A  
Efficacy: 93.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 53  
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



TEST NUMBER: P924040

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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 | 81 | 81 | 81 | 71 | 71 | 71 |
| 1   | 102 | 98  | 94  | 91  | 96  | 92  | 89  | 86  | 82 | 79 | 77 | 72 | 70 | 69 | 63 | 62 | 61 |
| 2   | 93  | 86  | 80  | 75  | 88  | 81  | 76  | 72  | 72 | 68 | 65 | 64 | 61 | 58 | 57 | 54 | 52 |
| 3   | 86  | 76  | 69  | 63  | 80  | 72  | 66  | 61  | 65 | 59 | 55 | 57 | 53 | 50 | 51 | 48 | 45 |
| 4   | 79  | 68  | 60  | 54  | 74  | 65  | 58  | 52  | 58 | 52 | 48 | 52 | 47 | 44 | 46 | 42 | 40 |
| 5   | 73  | 61  | 53  | 47  | 68  | 58  | 51  | 45  | 52 | 46 | 42 | 47 | 42 | 38 | 42 | 38 | 35 |
| 6   | 67  | 55  | 47  | 41  | 63  | 52  | 45  | 40  | 47 | 41 | 37 | 42 | 38 | 34 | 38 | 34 | 31 |
| 7   | 62  | 50  | 42  | 37  | 59  | 48  | 40  | 35  | 43 | 37 | 33 | 39 | 34 | 30 | 35 | 31 | 28 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 29 | 36 | 31 | 27 | 32 | 28 | 25 |
| 9   | 54  | 42  | 35  | 29  | 51  | 40  | 33  | 29  | 36 | 31 | 27 | 33 | 28 | 25 | 30 | 26 | 23 |
| 10  | 51  | 39  | 31  | 27  | 48  | 37  | 30  | 26  | 34 | 28 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1797 | 1797 | 1797 |
| 5°  | 1799 | 1768 | 1780 |
| 10° | 1780 | 1732 | 1721 |
| 15° | 1755 | 1673 | 1631 |
| 20° | 1721 | 1593 | 1521 |
| 25° | 1686 | 1504 | 1414 |
| 30° | 1641 | 1412 | 1279 |
| 35° | 1596 | 1314 | 1161 |
| 40° | 1550 | 1212 | 1025 |
| 45° | 1497 | 1100 | 902  |
| 50° | 1442 | 986  | 782  |
| 55° | 1385 | 865  | 667  |
| 60° | 1318 | 738  | 548  |
| 65° | 1241 | 609  | 493  |
| 70° | 1148 | 490  | 445  |
| 75° | 1031 | 429  | 404  |
| 80° | 862  | 356  | 348  |
| 85° | 584  | 232  | 258  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1497 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 147.8  | 3.0       |
| 10°-20°   | 405.8  | 8.2       |
| 20°-30°   | 569.7  | 11.6      |
| 30°-40°   | 621.0  | 12.6      |
| 40°-50°   | 570.8  | 11.6      |
| 50°-60°   | 448.2  | 9.1       |
| 60°-70°   | 291.8  | 5.9       |
| 70°-80°   | 150.2  | 3.0       |
| 80°-90°   | 40.1   | 0.8       |
| 90°-100°  | 37.3   | 0.8       |
| 100°-110° | 118.7  | 2.4       |
| 110°-120° | 203.0  | 4.1       |
| 120°-130° | 267.0  | 5.4       |
| 130°-140° | 299.7  | 6.1       |
| 140°-150° | 293.9  | 6.0       |
| 150°-160° | 246.5  | 5.0       |
| 160°-170° | 163.5  | 3.3       |
| 170°-180° | 57.1   | 1.2       |
| 0°-30°    | 1123.3 | 22.8      |
| 0°-40°    | 1744.3 | 35.4      |
| 0°-60°    | 2763.3 | 56.0      |
| 0°-90°    | 3245.3 | 65.8      |
| 90°-120°  | 359.0  | 7.3       |
| 90°-150°  | 1219.7 | 24.7      |
| 90°-180°  | 1687.0 | 34.2      |
| 0°-180°   | 4932.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1577 | 1577  | 1577 | 1577  | 1577 |      |
| 5°   | 1577 | 1570  | 1551 | 1564  | 1560 | 150  |
| 15°  | 1500 | 1484  | 1436 | 1409  | 1395 | 423  |
| 25°  | 1362 | 1316  | 1222 | 1163  | 1142 | 626  |
| 35°  | 1173 | 1100  | 975  | 885   | 853  | 734  |
| 45°  | 959  | 864   | 714  | 612   | 578  | 741  |
| 55°  | 729  | 618   | 464  | 378   | 351  | 652  |
| 65°  | 492  | 377   | 248  | 200   | 196  | 488  |
| 75°  | 262  | 163   | 114  | 104   | 103  | 278  |
| 85°  | 61   | 31    | 27   | 27    | 27   | 70   |
| 90°  | 1    | 7     | 18   | 17    | 17   | 5    |
| 95°  | 26   | 32    | 32   | 32    | 32   | 30   |
| 105° | 110  | 111   | 112  | 113   | 113  | 116  |
| 115° | 204  | 207   | 206  | 205   | 204  | 202  |
| 125° | 296  | 301   | 300  | 298   | 297  | 265  |
| 135° | 383  | 389   | 390  | 390   | 388  | 296  |
| 145° | 465  | 469   | 472  | 472   | 470  | 291  |
| 155° | 532  | 534   | 535  | 538   | 536  | 245  |
| 165° | 579  | 578   | 578  | 582   | 580  | 163  |
| 175° | 602  | 601   | 600  | 603   | 600  | 57   |
| 180° | 603  | 603   | 603  | 603   | 603  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1577.2 | 1577.2 | 1577.2 | 1577.2 | 1577.2 |
| 2.5°   | 1584.3 | 1577.2 | 1561.4 | 1575.8 | 1572.9 |
| 5°     | 1577.2 | 1570.0 | 1551.4 | 1564.3 | 1560.1 |
| 7.5°   | 1564.3 | 1555.8 | 1535.8 | 1541.4 | 1534.3 |
| 10°    | 1547.2 | 1537.2 | 1508.7 | 1504.3 | 1495.9 |
| 12.5°  | 1525.8 | 1512.9 | 1474.3 | 1465.8 | 1450.1 |
| 15°    | 1500.1 | 1484.3 | 1435.9 | 1408.8 | 1394.6 |
| 17.5°  | 1470.1 | 1447.2 | 1387.2 | 1355.9 | 1333.0 |
| 20°    | 1435.9 | 1407.2 | 1335.9 | 1300.3 | 1268.8 |
| 22.5°  | 1398.8 | 1365.9 | 1283.0 | 1234.6 | 1213.3 |
| 25°    | 1361.6 | 1315.9 | 1221.7 | 1163.3 | 1141.7 |
| 27.5°  | 1317.5 | 1268.8 | 1164.6 | 1097.6 | 1064.7 |
| 30°    | 1270.3 | 1216.0 | 1101.8 | 1029.1 | 990.5  |
| 32.5°  | 1224.6 | 1158.9 | 1042.0 | 956.3  | 920.5  |
| 35°    | 1173.3 | 1100.4 | 974.9  | 884.9  | 853.4  |
| 37.5°  | 1123.3 | 1044.7 | 912.0  | 813.5  | 777.9  |
| 40°    | 1070.5 | 984.9  | 846.4  | 745.1  | 708.0  |
| 42.5°  | 1016.2 | 924.9  | 780.8  | 675.1  | 639.5  |
| 45°    | 959.2  | 863.5  | 713.7  | 612.3  | 578.0  |
| 47.5°  | 905.0  | 803.6  | 649.5  | 548.1  | 516.7  |
| 50°    | 845.0  | 743.6  | 586.6  | 488.1  | 458.2  |
| 52.5°  | 786.4  | 679.3  | 526.7  | 432.4  | 405.4  |
| 55°    | 729.3  | 618.0  | 463.8  | 378.3  | 351.2  |
| 57.5°  | 670.9  | 556.7  | 408.2  | 328.3  | 305.5  |
| 60°    | 610.8  | 496.7  | 349.6  | 276.9  | 254.1  |
| 62.5°  | 552.5  | 438.3  | 299.7  | 231.2  | 219.9  |
| 65°    | 492.5  | 376.7  | 248.3  | 199.9  | 195.5  |
| 67.5°  | 435.4  | 319.7  | 199.9  | 175.5  | 171.2  |
| 70°    | 375.4  | 264.1  | 165.5  | 151.3  | 145.5  |
| 72.5°  | 318.3  | 212.6  | 138.4  | 127.1  | 124.2  |
| 75°    | 262.5  | 162.7  | 114.2  | 104.2  | 102.8  |
| 77.5°  | 207.0  | 115.5  | 90.0   | 84.2   | 81.3   |
| 80°    | 155.5  | 82.8   | 68.4   | 62.9   | 62.9   |
| 82.5°  | 108.5  | 55.7   | 47.1   | 44.2   | 44.2   |
| 85°    | 61.3   | 31.4   | 27.1   | 27.1   | 27.1   |
| 87.5°  | 22.9   | 11.4   | 11.4   | 10.0   | 10.0   |
| 90°    | 0.6    | 6.6    | 17.8   | 16.7   | 17.3   |
| 92.5°  | 11.3   | 15.3   | 15.8   | 16.4   | 16.4   |
| 95°    | 26.5   | 31.7   | 32.5   | 32.5   | 31.7   |
| 97.5°  | 44.2   | 48.9   | 50.9   | 50.9   | 50.9   |
| 100°   | 64.6   | 68.8   | 70.2   | 70.2   | 69.6   |
| 102.5° | 86.1   | 89.1   | 91.1   | 91.7   | 91.1   |
| 105°   | 109.5  | 111.0  | 112.1  | 113.0  | 113.0  |
| 107.5° | 132.8  | 135.0  | 135.0  | 135.4  | 132.8  |
| 110°   | 155.4  | 158.3  | 158.3  | 158.3  | 156.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 179.7 | 182.8 | 182.3 | 180.8 | 179.7 |
| 115°   | 203.8 | 206.6 | 205.8 | 205.2 | 203.8 |
| 117.5° | 227.6 | 231.6 | 229.1 | 227.6 | 226.1 |
| 120°   | 251.6 | 255.6 | 251.6 | 251.6 | 249.9 |
| 122.5° | 273.4 | 278.5 | 276.0 | 274.6 | 273.4 |
| 125°   | 296.3 | 300.9 | 299.5 | 297.8 | 297.3 |
| 127.5° | 318.7 | 324.4 | 322.4 | 320.2 | 318.7 |
| 130°   | 339.6 | 346.2 | 345.3 | 344.2 | 342.2 |
| 132.5° | 363.1 | 368.2 | 368.5 | 366.0 | 364.5 |
| 135°   | 383.3 | 388.9 | 390.0 | 389.5 | 388.0 |
| 137.5° | 405.8 | 410.4 | 411.4 | 411.0 | 408.8 |
| 140°   | 425.7 | 430.3 | 432.8 | 432.8 | 430.8 |
| 142.5° | 446.1 | 450.6 | 452.1 | 452.6 | 450.6 |
| 145°   | 465.4 | 469.0 | 471.9 | 472.4 | 470.4 |
| 147.5° | 482.6 | 487.2 | 489.4 | 490.3 | 488.3 |
| 150°   | 500.5 | 503.5 | 505.5 | 507.1 | 505.5 |
| 152.5° | 516.3 | 519.4 | 521.9 | 523.9 | 521.9 |
| 155°   | 532.1 | 533.6 | 535.2 | 537.8 | 536.1 |
| 157.5° | 545.8 | 546.8 | 547.8 | 551.4 | 548.8 |
| 160°   | 558.0 | 559.0 | 559.6 | 562.7 | 560.5 |
| 162.5° | 569.3 | 569.3 | 569.7 | 573.3 | 570.7 |
| 165°   | 578.9 | 578.3 | 578.3 | 581.9 | 579.5 |
| 167.5° | 587.6 | 585.9 | 585.9 | 589.6 | 587.1 |
| 170°   | 594.2 | 592.7 | 592.1 | 595.8 | 592.7 |
| 172.5° | 598.7 | 597.2 | 596.7 | 600.4 | 597.2 |
| 175°   | 602.4 | 600.9 | 599.8 | 603.4 | 600.4 |
| 177.5° | 604.4 | 602.9 | 601.8 | 604.8 | 601.8 |
| 180°   | 603.4 | 603.4 | 603.4 | 603.4 | 603.4 |

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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 | 10.51            | 11.49 | 11.33 | 12.32 | 13.35 | 6.47           | 7.45  | 7.29  | 8.28  | 9.31  |
|                 | 3H   | 12.20            | 13.07 | 13.02 | 13.91 | 14.97 | 7.66           | 8.54  | 8.49  | 9.38  | 10.44 |
|                 | 4H   | 12.81            | 13.63 | 13.65 | 14.48 | 15.55 | 8.12           | 8.94  | 8.96  | 9.79  | 10.86 |
|                 | 6H   | 13.23            | 13.99 | 14.09 | 14.85 | 15.93 | 8.44           | 9.20  | 9.30  | 10.06 | 11.14 |
|                 | 8H   | 13.36            | 14.08 | 14.23 | 14.96 | 16.04 | 8.53           | 9.26  | 9.40  | 10.13 | 11.21 |
|                 | 12H  | 13.43            | 14.12 | 14.30 | 14.98 | 16.09 | 8.58           | 9.27  | 9.45  | 10.13 | 11.24 |
| 4H              | 2H   | 10.55            | 11.37 | 11.40 | 12.22 | 13.29 | 7.08           | 7.91  | 7.93  | 8.76  | 9.83  |
|                 | 3H   | 12.38            | 13.07 | 13.24 | 13.95 | 15.04 | 8.44           | 9.12  | 9.30  | 10.01 | 11.09 |
|                 | 4H   | 13.08            | 13.70 | 13.95 | 14.58 | 15.69 | 8.99           | 9.61  | 9.86  | 10.49 | 11.60 |
|                 | 6H   | 13.60            | 14.13 | 14.48 | 15.04 | 16.15 | 9.41           | 9.94  | 10.30 | 10.85 | 11.96 |
|                 | 8H   | 13.77            | 14.27 | 14.66 | 15.17 | 16.30 | 9.54           | 10.04 | 10.43 | 10.94 | 12.06 |
|                 | 12H  | 13.87            | 14.32 | 14.78 | 15.24 | 16.37 | 9.60           | 10.05 | 10.51 | 10.97 | 12.10 |
| 8H              | 4H   | 13.05            | 13.56 | 13.95 | 14.45 | 15.58 | 9.28           | 9.78  | 10.17 | 10.68 | 11.80 |
|                 | 6H   | 13.62            | 14.03 | 14.54 | 14.98 | 16.10 | 9.79           | 10.21 | 10.71 | 11.15 | 12.27 |
|                 | 8H   | 13.83            | 14.20 | 14.76 | 15.13 | 16.28 | 9.98           | 10.34 | 10.91 | 11.28 | 12.42 |
|                 | 12H  | 13.98            | 14.30 | 14.91 | 15.22 | 16.42 | 10.10          | 10.42 | 11.03 | 11.35 | 12.54 |
| 12H             | 4H   | 13.01            | 13.46 | 13.92 | 14.38 | 15.51 | 9.29           | 9.74  | 10.20 | 10.66 | 11.79 |
|                 | 6H   | 13.60            | 13.96 | 14.52 | 14.90 | 16.04 | 9.84           | 10.21 | 10.77 | 11.14 | 12.28 |
|                 | 8H   | 13.82            | 14.14 | 14.75 | 15.07 | 16.26 | 10.05          | 10.37 | 10.98 | 11.30 | 12.49 |