

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: P917644

Luminaire Tested: DFN2DIP-SQ4F0-070D160US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917644  
REPORT IS A COMBINATION OF REPORTS P900205 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-070D160US930-FLLFL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

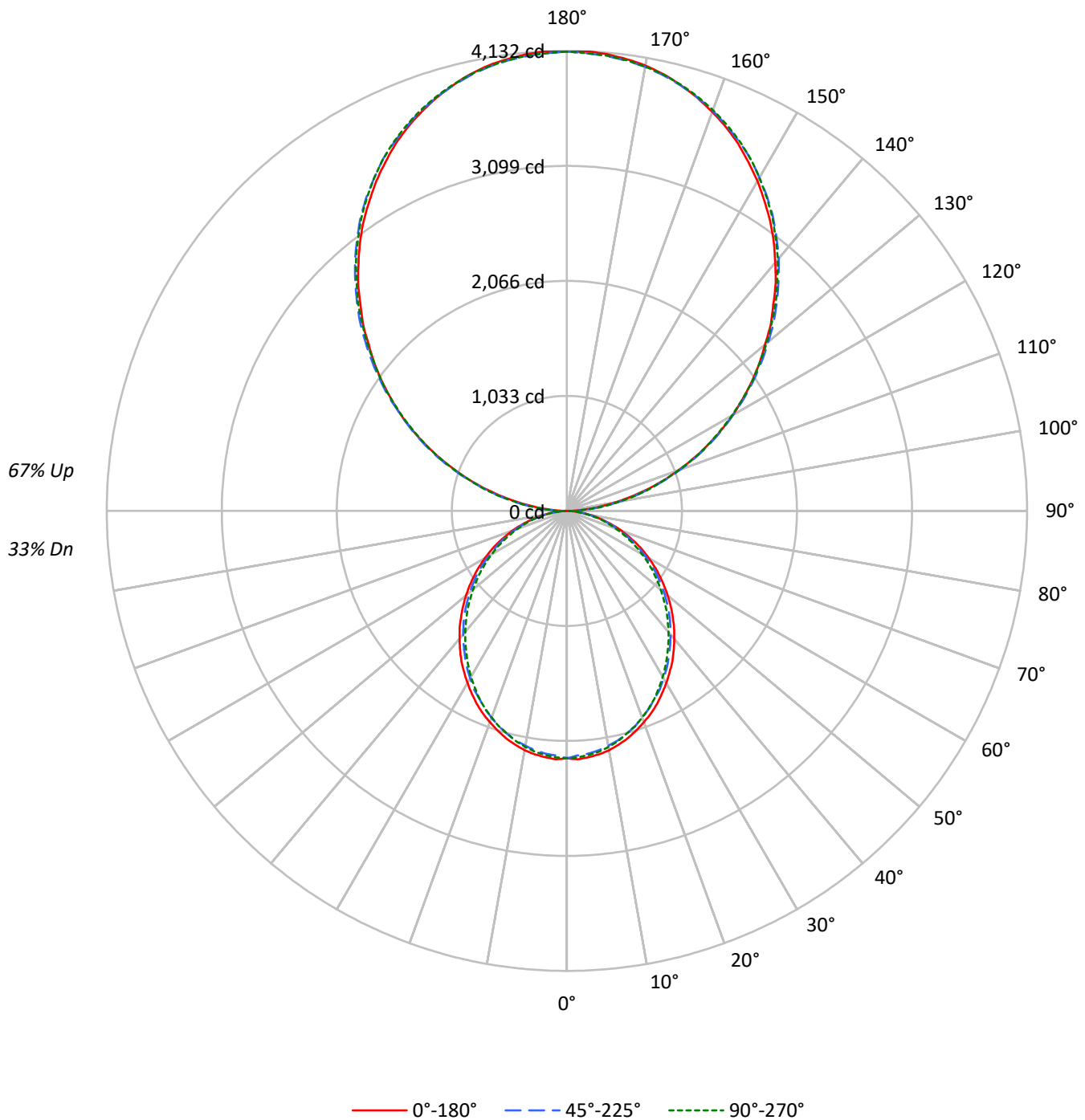
Lumens per Lamp: N/A  
Luminaire Lumens: 17195.4 lumens  
Efficiency: N/A  
Efficacy: 93.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 183.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
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 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |  |    |    |    |  |    |
| 0   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 |  | 56 | 56 | 56 |  | 40 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 62 | 60 |  | 50 | 48 | 47 |  | 36 |
| 2   | 86  | 78  | 72  | 67  | 77 | 71 | 66 | 61 | 57 | 53 | 50 |  | 43 | 41 | 39 |  | 31 |
| 3   | 78  | 69  | 62  | 56  | 70 | 62 | 56 | 51 | 50 | 46 | 42 |  | 38 | 36 | 33 |  | 28 |
| 4   | 71  | 61  | 53  | 47  | 64 | 55 | 48 | 43 | 44 | 39 | 36 |  | 34 | 31 | 28 |  | 25 |
| 5   | 65  | 54  | 46  | 40  | 59 | 49 | 42 | 37 | 39 | 35 | 31 |  | 31 | 27 | 24 |  | 22 |
| 6   | 60  | 48  | 40  | 35  | 54 | 44 | 37 | 32 | 36 | 30 | 27 |  | 28 | 24 | 21 |  | 20 |
| 7   | 55  | 44  | 36  | 30  | 50 | 40 | 33 | 28 | 32 | 27 | 23 |  | 25 | 21 | 19 |  | 18 |
| 8   | 51  | 39  | 32  | 27  | 46 | 36 | 29 | 25 | 29 | 24 | 21 |  | 23 | 19 | 17 |  | 17 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 26 | 22 | 27 | 22 | 18 |  | 21 | 17 | 15 |  | 16 |
| 10  | 45  | 33  | 26  | 21  | 40 | 30 | 24 | 20 | 25 | 20 | 17 |  | 19 | 16 | 13 |  | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1558 | 1558 | 1558 |
| 5°  | 1561 | 1537 | 1547 |
| 10° | 1548 | 1516 | 1527 |
| 15° | 1525 | 1492 | 1494 |
| 20° | 1494 | 1457 | 1461 |
| 25° | 1464 | 1416 | 1423 |
| 30° | 1425 | 1378 | 1374 |
| 35° | 1389 | 1333 | 1323 |
| 40° | 1344 | 1287 | 1273 |
| 45° | 1300 | 1241 | 1223 |
| 50° | 1251 | 1193 | 1165 |
| 55° | 1200 | 1138 | 1112 |
| 60° | 1142 | 1072 | 1050 |
| 65° | 1079 | 1004 | 978  |
| 70° | 999  | 921  | 901  |
| 75° | 888  | 821  | 830  |
| 80° | 754  | 695  | 693  |
| 85° | 545  | 475  | 466  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3246 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 209.0   | 1.2       |
| 10°-20°   | 588.1   | 3.4       |
| 20°-30°   | 864.2   | 5.0       |
| 30°-40°   | 1003.7  | 5.8       |
| 40°-50°   | 1002.5  | 5.8       |
| 50°-60°   | 874.2   | 5.1       |
| 60°-70°   | 646.2   | 3.8       |
| 70°-80°   | 365.6   | 2.1       |
| 80°-90°   | 108.2   | 0.6       |
| 90°-100°  | 255.3   | 1.5       |
| 100°-110° | 811.2   | 4.7       |
| 110°-120° | 1388.2  | 8.1       |
| 120°-130° | 1825.7  | 10.6      |
| 130°-140° | 2049.3  | 11.9      |
| 140°-150° | 2009.6  | 11.7      |
| 150°-160° | 1685.7  | 9.8       |
| 160°-170° | 1117.9  | 6.5       |
| 170°-180° | 390.8   | 2.3       |
| 0°-30°    | 1661.3  | 9.7       |
| 0°-40°    | 2665.1  | 15.5      |
| 0°-60°    | 4541.7  | 26.4      |
| 0°-90°    | 5661.7  | 32.9      |
| 90°-120°  | 2454.7  | 14.3      |
| 90°-150°  | 8339.3  | 48.5      |
| 90°-180°  | 11534.0 | 67.1      |
| 0°-180°   | 17195.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2221 | 2221  | 2221 | 2221  | 2221 |      |
| 5°   | 2221 | 2212  | 2189 | 2206  | 2202 | 211  |
| 15°  | 2114 | 2101  | 2073 | 2082  | 2071 | 595  |
| 25°  | 1913 | 1896  | 1860 | 1864  | 1860 | 880  |
| 35°  | 1651 | 1629  | 1595 | 1582  | 1572 | 1031 |
| 45°  | 1343 | 1328  | 1296 | 1273  | 1264 | 1037 |
| 55°  | 1016 | 1004  | 978  | 952   | 942  | 909  |
| 65°  | 686  | 673   | 651  | 632   | 621  | 678  |
| 75°  | 359  | 355   | 344  | 331   | 335  | 383  |
| 85°  | 88   | 85    | 83   | 77    | 75   | 98   |
| 90°  | 4    | 45    | 122  | 114   | 118  | 17   |
| 95°  | 182  | 216   | 223  | 223   | 216  | 202  |
| 105° | 749  | 759   | 766  | 772   | 772  | 790  |
| 115° | 1393 | 1413  | 1407 | 1403  | 1393 | 1378 |
| 125° | 2026 | 2057  | 2047 | 2036  | 2032 | 1811 |
| 135° | 2621 | 2659  | 2667 | 2663  | 2653 | 2026 |
| 145° | 3182 | 3207  | 3226 | 3230  | 3217 | 1988 |
| 155° | 3638 | 3648  | 3659 | 3677  | 3666 | 1675 |
| 165° | 3958 | 3954  | 3954 | 3979  | 3962 | 1117 |
| 175° | 4118 | 4108  | 4101 | 4126  | 4105 | 391  |
| 180° | 4126 | 4126  | 4126 | 4126  | 4126 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2220.6 | 2220.6 | 2220.6 | 2220.6 | 2220.6 |
| 2.5°   | 2233.6 | 2222.9 | 2199.3 | 2220.6 | 2216.6 |
| 5°     | 2220.6 | 2212.3 | 2188.7 | 2205.7 | 2201.6 |
| 7.5°   | 2205.7 | 2193.0 | 2169.4 | 2186.7 | 2182.4 |
| 10°    | 2182.4 | 2167.4 | 2141.8 | 2158.8 | 2152.5 |
| 12.5°  | 2150.2 | 2137.5 | 2111.9 | 2122.5 | 2118.2 |
| 15°    | 2114.0 | 2101.3 | 2073.4 | 2082.0 | 2071.3 |
| 17.5°  | 2069.1 | 2056.4 | 2028.5 | 2039.2 | 2028.5 |
| 20°    | 2019.9 | 2007.3 | 1977.3 | 1983.7 | 1975.3 |
| 22.5°  | 1971.0 | 1951.7 | 1923.9 | 1923.9 | 1919.5 |
| 25°    | 1913.3 | 1896.2 | 1860.0 | 1864.1 | 1860.0 |
| 27.5°  | 1849.1 | 1834.2 | 1806.5 | 1800.2 | 1789.5 |
| 30°    | 1785.3 | 1768.0 | 1736.1 | 1729.7 | 1721.1 |
| 32.5°  | 1716.8 | 1704.1 | 1669.9 | 1657.0 | 1648.4 |
| 35°    | 1650.7 | 1629.4 | 1595.1 | 1582.2 | 1571.6 |
| 37.5°  | 1575.9 | 1556.6 | 1522.4 | 1507.5 | 1496.8 |
| 40°    | 1499.1 | 1481.9 | 1447.6 | 1428.6 | 1420.0 |
| 42.5°  | 1424.3 | 1407.1 | 1373.1 | 1351.6 | 1338.9 |
| 45°    | 1343.2 | 1328.3 | 1296.1 | 1272.8 | 1264.1 |
| 47.5°  | 1264.1 | 1249.2 | 1215.0 | 1191.4 | 1178.8 |
| 50°    | 1180.8 | 1170.1 | 1140.2 | 1110.4 | 1099.7 |
| 52.5°  | 1099.7 | 1084.8 | 1057.1 | 1033.6 | 1018.6 |
| 55°    | 1016.5 | 1003.6 | 978.0  | 952.4  | 941.8  |
| 57.5°  | 933.2  | 922.5  | 894.6  | 869.0  | 860.5  |
| 60°    | 849.8  | 841.4  | 811.5  | 788.0  | 781.6  |
| 62.5°  | 768.7  | 753.7  | 732.5  | 711.2  | 702.5  |
| 65°    | 685.6  | 672.6  | 651.3  | 632.1  | 621.4  |
| 67.5°  | 600.1  | 589.3  | 570.2  | 555.3  | 546.7  |
| 70°    | 521.1  | 512.5  | 493.2  | 478.3  | 469.9  |
| 72.5°  | 439.9  | 431.4  | 420.7  | 405.8  | 399.4  |
| 75°    | 358.6  | 354.6  | 343.6  | 331.0  | 335.3  |
| 77.5°  | 286.2  | 277.5  | 273.2  | 266.8  | 260.6  |
| 80°    | 213.6  | 211.4  | 207.1  | 200.7  | 196.4  |
| 82.5°  | 145.2  | 145.2  | 143.2  | 134.6  | 134.6  |
| 85°    | 87.5   | 85.4   | 83.4   | 76.8   | 74.8   |
| 87.5°  | 38.5   | 34.2   | 29.9   | 23.6   | 21.3   |
| 90°    | 3.8    | 44.8   | 121.9  | 114.5  | 118.1  |
| 92.5°  | 77.1   | 104.5  | 108.2  | 111.9  | 111.9  |
| 95°    | 181.6  | 216.5  | 222.7  | 222.7  | 216.5  |
| 97.5°  | 302.2  | 334.6  | 348.3  | 348.3  | 348.3  |
| 100°   | 441.6  | 470.2  | 480.1  | 480.1  | 476.4  |
| 102.5° | 588.3  | 609.5  | 623.1  | 626.9  | 623.1  |
| 105°   | 748.8  | 758.7  | 766.2  | 772.4  | 772.4  |
| 107.5° | 908.0  | 922.9  | 922.9  | 925.4  | 908.0  |
| 110°   | 1062.3 | 1082.1 | 1082.1 | 1082.1 | 1072.2 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1228.9 | 1250.1 | 1246.3 | 1236.4 | 1228.9 |
| 115°   | 1393.1 | 1413.0 | 1406.8 | 1403.0 | 1393.1 |
| 117.5° | 1556.1 | 1583.4 | 1566.0 | 1556.1 | 1546.1 |
| 120°   | 1720.3 | 1747.6 | 1720.3 | 1720.3 | 1709.0 |
| 122.5° | 1869.5 | 1904.4 | 1886.9 | 1877.0 | 1869.5 |
| 125°   | 2026.3 | 2057.3 | 2047.4 | 2036.2 | 2032.5 |
| 127.5° | 2179.2 | 2217.8 | 2204.1 | 2189.2 | 2179.2 |
| 130°   | 2322.3 | 2367.1 | 2360.9 | 2353.4 | 2339.7 |
| 132.5° | 2482.7 | 2517.6 | 2520.0 | 2502.6 | 2492.7 |
| 135°   | 2620.8 | 2659.3 | 2666.8 | 2663.1 | 2653.1 |
| 137.5° | 2775.0 | 2806.1 | 2812.4 | 2809.8 | 2794.9 |
| 140°   | 2910.6 | 2941.7 | 2959.1 | 2959.1 | 2945.4 |
| 142.5° | 3049.9 | 3081.0 | 3091.0 | 3094.7 | 3081.0 |
| 145°   | 3181.8 | 3206.6 | 3226.5 | 3230.3 | 3216.6 |
| 147.5° | 3299.9 | 3331.1 | 3346.0 | 3352.2 | 3338.5 |
| 150°   | 3421.8 | 3443.0 | 3456.7 | 3467.9 | 3456.7 |
| 152.5° | 3530.1 | 3551.2 | 3568.6 | 3582.3 | 3568.6 |
| 155°   | 3638.3 | 3648.2 | 3659.4 | 3676.8 | 3665.7 |
| 157.5° | 3731.5 | 3739.0 | 3745.2 | 3770.1 | 3752.7 |
| 160°   | 3814.9 | 3822.4 | 3826.1 | 3847.2 | 3832.3 |
| 162.5° | 3892.0 | 3892.0 | 3895.7 | 3919.4 | 3901.9 |
| 165°   | 3957.9 | 3954.2 | 3954.2 | 3979.1 | 3961.7 |
| 167.5° | 4017.6 | 4006.5 | 4006.5 | 4031.3 | 4013.9 |
| 170°   | 4062.4 | 4052.4 | 4048.8 | 4073.6 | 4052.4 |
| 172.5° | 4093.5 | 4083.6 | 4079.8 | 4104.7 | 4083.6 |
| 175°   | 4118.4 | 4108.5 | 4101.0 | 4125.9 | 4104.7 |
| 177.5° | 4132.1 | 4122.1 | 4114.6 | 4135.8 | 4114.6 |
| 180°   | 4125.9 | 4125.9 | 4125.9 | 4125.9 | 4125.9 |

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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 | 6.99             | 7.72  | 8.08  | 8.81  | 10.30 | 6.55           | 7.27  | 7.64  | 8.36  | 9.86  |
|                 | 3H   | 8.65             | 9.30  | 9.75  | 10.40 | 11.91 | 8.16           | 8.81  | 9.26  | 9.91  | 11.42 |
|                 | 4H   | 9.23             | 9.85  | 10.34 | 10.95 | 12.47 | 8.74           | 9.36  | 9.85  | 10.45 | 11.97 |
|                 | 6H   | 9.63             | 10.20 | 10.75 | 11.30 | 12.83 | 9.13           | 9.70  | 10.25 | 10.80 | 12.33 |
|                 | 8H   | 9.73             | 10.27 | 10.85 | 11.39 | 12.91 | 9.23           | 9.77  | 10.35 | 10.89 | 12.41 |
|                 | 12H  | 9.78             | 10.29 | 10.90 | 11.40 | 12.95 | 9.27           | 9.78  | 10.39 | 10.89 | 12.44 |
| 4H              | 2H   | 7.44             | 8.06  | 8.56  | 9.15  | 10.67 | 7.08           | 7.70  | 8.20  | 8.80  | 10.32 |
|                 | 3H   | 9.30             | 9.81  | 10.42 | 10.94 | 12.47 | 8.89           | 9.40  | 10.01 | 10.53 | 12.06 |
|                 | 4H   | 10.01            | 10.48 | 11.14 | 11.60 | 13.15 | 9.58           | 10.06 | 10.71 | 11.17 | 12.72 |
|                 | 6H   | 10.52            | 10.93 | 11.65 | 12.06 | 13.61 | 10.09          | 10.49 | 11.22 | 11.63 | 13.17 |
|                 | 8H   | 10.67            | 11.05 | 11.80 | 12.18 | 13.74 | 10.23          | 10.61 | 11.37 | 11.74 | 13.30 |
|                 | 12H  | 10.74            | 11.08 | 11.89 | 12.22 | 13.79 | 10.29          | 10.63 | 11.44 | 11.77 | 13.34 |
| 8H              | 4H   | 10.19            | 10.57 | 11.33 | 11.70 | 13.26 | 9.82           | 10.20 | 10.95 | 11.33 | 12.89 |
|                 | 6H   | 10.82            | 11.14 | 11.98 | 12.31 | 13.87 | 10.44          | 10.75 | 11.60 | 11.93 | 13.48 |
|                 | 8H   | 11.05            | 11.32 | 12.21 | 12.47 | 14.05 | 10.65          | 10.93 | 11.82 | 12.08 | 13.66 |
|                 | 12H  | 11.18            | 11.42 | 12.34 | 12.56 | 14.18 | 10.76          | 11.00 | 11.93 | 12.15 | 13.76 |
| 12H             | 4H   | 10.17            | 10.52 | 11.32 | 11.66 | 13.22 | 9.81           | 10.15 | 10.96 | 11.29 | 12.86 |
|                 | 6H   | 10.85            | 11.13 | 12.01 | 12.28 | 13.86 | 10.48          | 10.76 | 11.64 | 11.91 | 13.48 |
|                 | 8H   | 11.09            | 11.33 | 12.26 | 12.48 | 14.09 | 10.71          | 10.95 | 11.88 | 12.10 | 13.71 |