

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: P905449

Luminaire Tested: DFN2DIP-HX4F0-050D120US835-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P905449  
REPORT IS A COMBINATION OF REPORTS P899446 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-050D120US835-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

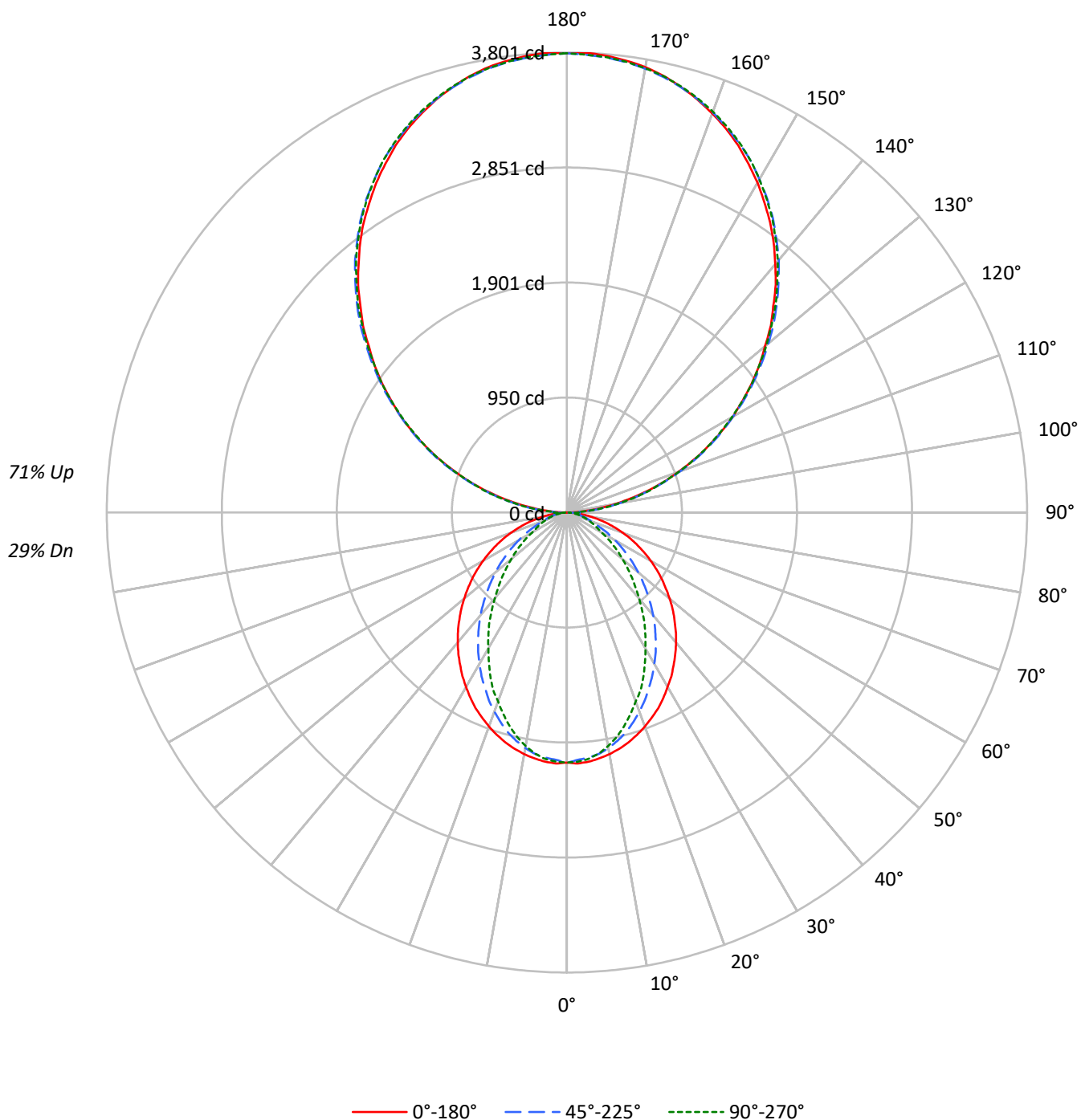
Lumens per Lamp: N/A  
Luminaire Lumens: 14870.0 lumens  
Efficiency: N/A  
Efficacy: 127.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 116.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
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: P905449

CATALOG NUMBER: DFN2DIP-HX4F0-050D120US835-RLFL

**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   | 102 | 102 | 102 | 102 | 91 | 91 | 91 | 91 | 71 | 71 | 71 | 53 | 53 | 53 | 37 | 37 | 37 |
| 1   | 93  | 89  | 86  | 82  | 83 | 80 | 77 | 74 | 63 | 61 | 59 | 47 | 46 | 45 | 33 | 32 | 31 |
| 2   | 85  | 78  | 72  | 68  | 76 | 70 | 65 | 61 | 55 | 52 | 49 | 42 | 40 | 38 | 29 | 28 | 27 |
| 3   | 78  | 69  | 62  | 56  | 69 | 62 | 56 | 51 | 49 | 45 | 42 | 37 | 34 | 32 | 26 | 24 | 23 |
| 4   | 71  | 61  | 54  | 48  | 64 | 55 | 49 | 44 | 44 | 39 | 36 | 33 | 30 | 28 | 23 | 22 | 20 |
| 5   | 65  | 54  | 47  | 41  | 58 | 49 | 42 | 38 | 39 | 34 | 31 | 30 | 27 | 24 | 21 | 19 | 18 |
| 6   | 60  | 49  | 41  | 36  | 54 | 44 | 37 | 33 | 35 | 30 | 27 | 27 | 24 | 21 | 19 | 17 | 16 |
| 7   | 56  | 44  | 36  | 31  | 50 | 40 | 33 | 29 | 32 | 27 | 24 | 25 | 21 | 19 | 18 | 16 | 14 |
| 8   | 52  | 40  | 32  | 27  | 46 | 36 | 30 | 25 | 29 | 24 | 21 | 22 | 19 | 17 | 16 | 14 | 13 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 27 | 22 | 27 | 22 | 19 | 21 | 17 | 15 | 15 | 13 | 11 |
| 10  | 45  | 33  | 26  | 22  | 40 | 30 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 | 14 | 12 | 10 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1537 | 1537 | 1537 |
| 5°  | 1539 | 1512 | 1522 |
| 10° | 1524 | 1483 | 1472 |
| 15° | 1503 | 1434 | 1396 |
| 20° | 1476 | 1367 | 1302 |
| 25° | 1447 | 1291 | 1211 |
| 30° | 1409 | 1213 | 1096 |
| 35° | 1372 | 1130 | 995  |
| 40° | 1334 | 1044 | 880  |
| 45° | 1290 | 948  | 774  |
| 50° | 1245 | 851  | 672  |
| 55° | 1197 | 748  | 573  |
| 60° | 1142 | 640  | 472  |
| 65° | 1079 | 530  | 425  |
| 70° | 1002 | 428  | 385  |
| 75° | 906  | 377  | 350  |
| 80° | 766  | 317  | 304  |
| 85° | 536  | 212  | 229  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2862 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 193.7   | 1.3       |
| 10°-20°   | 531.7   | 3.6       |
| 20°-30°   | 746.5   | 5.0       |
| 30°-40°   | 813.7   | 5.5       |
| 40°-50°   | 747.9   | 5.0       |
| 50°-60°   | 587.3   | 3.9       |
| 60°-70°   | 382.3   | 2.6       |
| 70°-80°   | 196.8   | 1.3       |
| 80°-90°   | 61.0    | 0.4       |
| 90°-100°  | 234.8   | 1.6       |
| 100°-110° | 746.2   | 5.0       |
| 110°-120° | 1276.9  | 8.6       |
| 120°-130° | 1679.4  | 11.3      |
| 130°-140° | 1885.0  | 12.7      |
| 140°-150° | 1848.5  | 12.4      |
| 150°-160° | 1550.6  | 10.4      |
| 160°-170° | 1028.3  | 6.9       |
| 170°-180° | 359.4   | 2.4       |
| 0°-30°    | 1471.8  | 9.9       |
| 0°-40°    | 2285.5  | 15.4      |
| 0°-60°    | 3620.7  | 24.3      |
| 0°-90°    | 4260.8  | 28.7      |
| 90°-120°  | 2257.9  | 15.2      |
| 90°-150°  | 7670.8  | 51.6      |
| 90°-180°  | 10609.0 | 71.3      |
| 0°-180°   | 14870.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2066 | 2066  | 2066 | 2066  | 2066 |      |
| 5°   | 2066 | 2057  | 2033 | 2050  | 2044 | 196  |
| 15°  | 1966 | 1945  | 1881 | 1846  | 1827 | 554  |
| 25°  | 1784 | 1724  | 1601 | 1524  | 1496 | 821  |
| 35°  | 1537 | 1442  | 1277 | 1160  | 1118 | 962  |
| 45°  | 1257 | 1131  | 935  | 802   | 757  | 971  |
| 55°  | 956  | 810   | 608  | 496   | 460  | 854  |
| 65°  | 645  | 494   | 325  | 262   | 256  | 640  |
| 75°  | 344  | 213   | 150  | 136   | 135  | 364  |
| 85°  | 80   | 41    | 36   | 36    | 36   | 92   |
| 90°  | 3    | 41    | 112  | 105   | 109  | 15   |
| 95°  | 167  | 199   | 205  | 205   | 199  | 186  |
| 105° | 689  | 698   | 705  | 710   | 710  | 727  |
| 115° | 1281 | 1300  | 1294 | 1291  | 1281 | 1267 |
| 125° | 1864 | 1892  | 1883 | 1873  | 1870 | 1666 |
| 135° | 2411 | 2446  | 2453 | 2450  | 2440 | 1863 |
| 145° | 2927 | 2950  | 2968 | 2971  | 2959 | 1829 |
| 155° | 3347 | 3356  | 3366 | 3382  | 3372 | 1540 |
| 165° | 3641 | 3637  | 3637 | 3660  | 3644 | 1027 |
| 175° | 3788 | 3779  | 3772 | 3795  | 3776 | 360  |
| 180° | 3795 | 3795  | 3795 | 3795  | 3795 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2066.5 | 2066.5 | 2066.5 | 2066.5 | 2066.5 |
| 2.5°   | 2075.8 | 2066.5 | 2045.9 | 2064.7 | 2060.9 |
| 5°     | 2066.5 | 2057.2 | 2032.8 | 2049.6 | 2044.1 |
| 7.5°   | 2049.6 | 2038.5 | 2012.3 | 2019.7 | 2010.3 |
| 10°    | 2027.2 | 2014.1 | 1976.8 | 1971.1 | 1959.9 |
| 12.5°  | 1999.2 | 1982.4 | 1931.8 | 1920.7 | 1900.0 |
| 15°    | 1965.5 | 1944.9 | 1881.4 | 1845.9 | 1827.2 |
| 17.5°  | 1926.2 | 1896.3 | 1817.7 | 1776.6 | 1746.6 |
| 20°    | 1881.4 | 1843.9 | 1750.4 | 1703.8 | 1662.5 |
| 22.5°  | 1832.8 | 1789.7 | 1681.2 | 1617.7 | 1589.7 |
| 25°    | 1784.1 | 1724.2 | 1600.8 | 1524.2 | 1496.0 |
| 27.5°  | 1726.2 | 1662.5 | 1526.0 | 1438.1 | 1395.1 |
| 30°    | 1664.5 | 1593.3 | 1443.7 | 1348.4 | 1297.8 |
| 32.5°  | 1604.6 | 1518.5 | 1365.3 | 1253.0 | 1206.2 |
| 35°    | 1537.3 | 1441.9 | 1277.4 | 1159.5 | 1118.3 |
| 37.5°  | 1471.8 | 1368.9 | 1195.1 | 1065.9 | 1019.3 |
| 40°    | 1402.6 | 1290.5 | 1108.9 | 976.2  | 927.6  |
| 42.5°  | 1331.6 | 1211.9 | 1023.0 | 884.5  | 837.9  |
| 45°    | 1256.8 | 1131.4 | 935.1  | 802.2  | 757.3  |
| 47.5°  | 1185.7 | 1053.0 | 851.0  | 718.1  | 677.0  |
| 50°    | 1107.2 | 974.4  | 768.7  | 639.5  | 600.4  |
| 52.5°  | 1030.4 | 890.1  | 690.1  | 566.7  | 531.2  |
| 55°    | 955.6  | 809.7  | 607.7  | 495.6  | 460.1  |
| 57.5°  | 879.0  | 729.4  | 534.9  | 430.2  | 400.2  |
| 60°    | 800.4  | 650.8  | 458.1  | 362.9  | 332.9  |
| 62.5°  | 723.8  | 574.2  | 392.7  | 303.0  | 288.1  |
| 65°    | 645.2  | 493.7  | 325.4  | 261.9  | 256.2  |
| 67.5°  | 570.4  | 418.9  | 261.9  | 230.0  | 224.4  |
| 70°    | 491.9  | 346.0  | 216.9  | 198.2  | 190.7  |
| 72.5°  | 417.1  | 278.6  | 181.4  | 166.5  | 162.7  |
| 75°    | 344.1  | 213.1  | 149.6  | 136.5  | 134.7  |
| 77.5°  | 271.2  | 151.4  | 117.9  | 110.3  | 106.5  |
| 80°    | 203.8  | 108.5  | 89.7   | 82.3   | 82.3   |
| 82.5°  | 142.1  | 73.0   | 61.7   | 57.9   | 57.9   |
| 85°    | 80.4   | 41.1   | 35.5   | 35.5   | 35.5   |
| 87.5°  | 30.0   | 14.9   | 14.9   | 13.1   | 13.1   |
| 90°    | 3.4    | 41.2   | 112.1  | 105.3  | 108.7  |
| 92.5°  | 70.9   | 96.1   | 99.5   | 103.0  | 103.0  |
| 95°    | 167.0  | 199.1  | 204.8  | 204.8  | 199.1  |
| 97.5°  | 278.0  | 307.8  | 320.4  | 320.4  | 320.4  |
| 100°   | 406.2  | 432.5  | 441.6  | 441.6  | 438.2  |
| 102.5° | 541.2  | 560.6  | 573.2  | 576.7  | 573.2  |
| 105°   | 688.8  | 697.9  | 704.8  | 710.5  | 710.5  |
| 107.5° | 835.2  | 849.0  | 849.0  | 851.2  | 835.2  |
| 110°   | 977.1  | 995.4  | 995.4  | 995.4  | 986.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1130.4 | 1149.9 | 1146.4 | 1137.3 | 1130.4 |
| 115°   | 1281.4 | 1299.8 | 1294.0 | 1290.6 | 1281.4 |
| 117.5° | 1431.3 | 1456.5 | 1440.5 | 1431.3 | 1422.2 |
| 120°   | 1582.4 | 1607.5 | 1582.4 | 1582.4 | 1572.1 |
| 122.5° | 1719.7 | 1751.7 | 1735.7 | 1726.5 | 1719.7 |
| 125°   | 1863.8 | 1892.4 | 1883.3 | 1873.0 | 1869.5 |
| 127.5° | 2004.6 | 2040.0 | 2027.4 | 2013.7 | 2004.6 |
| 130°   | 2136.1 | 2177.3 | 2171.6 | 2164.7 | 2152.1 |
| 132.5° | 2283.7 | 2315.8 | 2318.0 | 2302.0 | 2292.9 |
| 135°   | 2410.7 | 2446.2 | 2453.1 | 2449.6 | 2440.5 |
| 137.5° | 2552.6 | 2581.2 | 2586.9 | 2584.6 | 2570.9 |
| 140°   | 2677.3 | 2705.9 | 2721.9 | 2721.9 | 2709.3 |
| 142.5° | 2805.5 | 2834.1 | 2843.2 | 2846.6 | 2834.1 |
| 145°   | 2926.7 | 2949.6 | 2967.9 | 2971.4 | 2958.8 |
| 147.5° | 3035.4 | 3064.0 | 3077.8 | 3083.5 | 3070.9 |
| 150°   | 3147.6 | 3167.0 | 3179.6 | 3189.9 | 3179.6 |
| 152.5° | 3247.1 | 3266.5 | 3282.6 | 3295.2 | 3282.6 |
| 155°   | 3346.6 | 3355.8 | 3366.1 | 3382.1 | 3371.8 |
| 157.5° | 3432.5 | 3439.3 | 3445.0 | 3467.9 | 3451.9 |
| 160°   | 3509.1 | 3516.0 | 3519.4 | 3538.9 | 3525.1 |
| 162.5° | 3580.0 | 3580.0 | 3583.5 | 3605.2 | 3589.2 |
| 165°   | 3640.7 | 3637.3 | 3637.3 | 3660.1 | 3644.1 |
| 167.5° | 3695.6 | 3685.3 | 3685.3 | 3708.2 | 3692.2 |
| 170°   | 3736.8 | 3727.6 | 3724.2 | 3747.1 | 3727.6 |
| 172.5° | 3765.4 | 3756.2 | 3752.8 | 3775.7 | 3756.2 |
| 175°   | 3788.3 | 3779.1 | 3772.3 | 3795.1 | 3775.7 |
| 177.5° | 3800.9 | 3791.7 | 3784.8 | 3804.3 | 3784.8 |
| 180°   | 3795.1 | 3795.1 | 3795.1 | 3795.1 | 3795.1 |

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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 | 6.22             | 6.90 | 7.34  | 8.01  | 9.56  | 2.19           | 2.87 | 3.32 | 3.99 | 5.54 |
|                 | 3H   | 7.88             | 8.49 | 9.02  | 9.62  | 11.18 | 3.37           | 3.98 | 4.50 | 5.10 | 6.67 |
|                 | 4H   | 8.49             | 9.06 | 9.63  | 10.19 | 11.76 | 3.81           | 4.39 | 4.96 | 5.52 | 7.09 |
|                 | 6H   | 8.90             | 9.43 | 10.05 | 10.56 | 12.14 | 4.13           | 4.66 | 5.28 | 5.79 | 7.37 |
|                 | 8H   | 9.02             | 9.53 | 10.18 | 10.67 | 12.24 | 4.21           | 4.72 | 5.37 | 5.86 | 7.44 |
|                 | 12H  | 9.08             | 9.56 | 10.24 | 10.70 | 12.29 | 4.25           | 4.73 | 5.41 | 5.87 | 7.47 |
| 4H              | 2H   | 6.22             | 6.80 | 7.37  | 7.92  | 9.49  | 2.77           | 3.35 | 3.92 | 4.47 | 6.04 |
|                 | 3H   | 8.03             | 8.51 | 9.19  | 9.67  | 11.25 | 4.11           | 4.59 | 5.26 | 5.74 | 7.32 |
|                 | 4H   | 8.72             | 9.16 | 9.88  | 10.30 | 11.90 | 4.65           | 5.09 | 5.81 | 6.23 | 7.83 |
|                 | 6H   | 9.23             | 9.61 | 10.39 | 10.77 | 12.36 | 5.06           | 5.44 | 6.23 | 6.60 | 8.19 |
|                 | 8H   | 9.40             | 9.75 | 10.56 | 10.91 | 12.52 | 5.19           | 5.54 | 6.35 | 6.70 | 8.30 |
|                 | 12H  | 9.49             | 9.81 | 10.67 | 10.98 | 12.59 | 5.25           | 5.57 | 6.43 | 6.73 | 8.35 |
| 8H              | 4H   | 8.68             | 9.03 | 9.84  | 10.18 | 11.79 | 4.92           | 5.27 | 6.08 | 6.43 | 8.03 |
|                 | 6H   | 9.24             | 9.53 | 10.42 | 10.73 | 12.33 | 5.43           | 5.73 | 6.62 | 6.92 | 8.53 |
|                 | 8H   | 9.46             | 9.71 | 10.64 | 10.88 | 12.51 | 5.63           | 5.88 | 6.81 | 7.05 | 8.68 |
|                 | 12H  | 9.59             | 9.81 | 10.78 | 10.98 | 12.64 | 5.74           | 5.96 | 6.93 | 7.13 | 8.79 |
| 12H             | 4H   | 8.62             | 8.94 | 9.80  | 10.11 | 11.72 | 4.92           | 5.24 | 6.10 | 6.40 | 8.01 |
|                 | 6H   | 9.21             | 9.47 | 10.40 | 10.64 | 12.27 | 5.48           | 5.74 | 6.67 | 6.91 | 8.54 |
|                 | 8H   | 9.43             | 9.65 | 10.62 | 10.82 | 12.48 | 5.69           | 5.91 | 6.88 | 7.08 | 8.74 |