

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: P902565

Luminaire Tested: DFN2DIP-HX3F0-040D090US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902565  
REPORT IS A COMBINATION OF REPORTS P899288 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-040D090US830-RLLFLL  
Description: 3 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

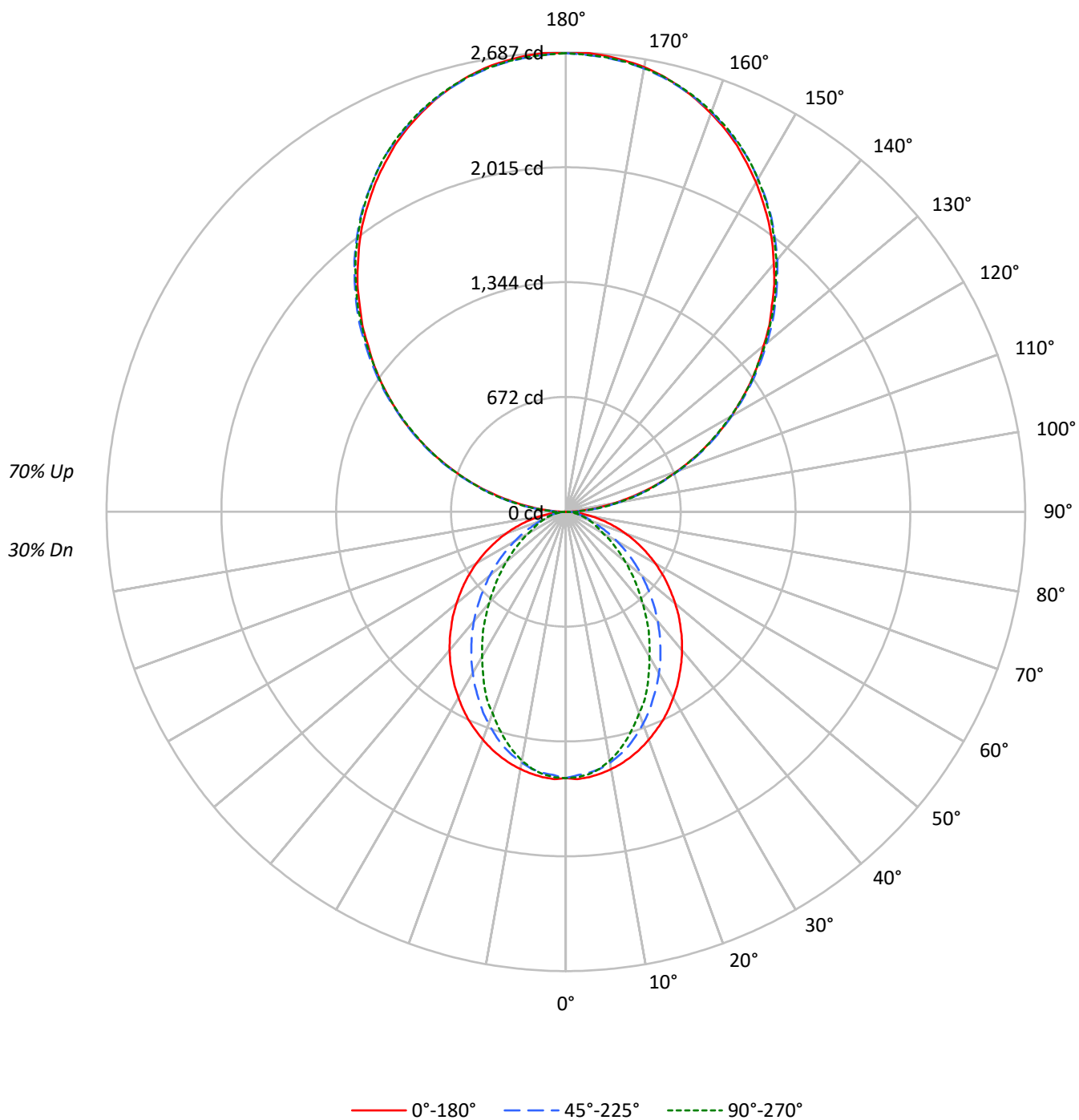
Lumens per Lamp: N/A  
Luminaire Lumens: 10712.0 lumens  
Efficiency: N/A  
Efficacy: 101.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 105.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
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: P902565

CATALOG NUMBER: DFN2DIP-HX3F0-040D090US830-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 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 54 | 54 | 54 | 38 | 38 | 38 |
| 1   | 94  | 89  | 86  | 83  | 84 | 80 | 77 | 75 | 64 | 62 | 60 | 48 | 47 | 46 | 34 | 33 | 32 |
| 2   | 85  | 78  | 73  | 68  | 76 | 71 | 66 | 62 | 56 | 53 | 50 | 43 | 40 | 38 | 30 | 29 | 28 |
| 3   | 78  | 69  | 62  | 57  | 70 | 62 | 57 | 52 | 50 | 46 | 42 | 38 | 35 | 33 | 27 | 25 | 24 |
| 4   | 71  | 61  | 54  | 48  | 64 | 55 | 49 | 44 | 44 | 40 | 36 | 34 | 31 | 28 | 24 | 22 | 21 |
| 5   | 66  | 55  | 47  | 41  | 59 | 49 | 43 | 38 | 40 | 35 | 31 | 30 | 27 | 25 | 22 | 20 | 18 |
| 6   | 60  | 49  | 41  | 36  | 54 | 44 | 38 | 33 | 36 | 31 | 27 | 28 | 24 | 22 | 20 | 18 | 16 |
| 7   | 56  | 44  | 37  | 31  | 50 | 40 | 33 | 29 | 32 | 27 | 24 | 25 | 22 | 19 | 18 | 16 | 14 |
| 8   | 52  | 40  | 33  | 28  | 46 | 36 | 30 | 25 | 29 | 25 | 21 | 23 | 20 | 17 | 17 | 15 | 13 |
| 9   | 48  | 36  | 29  | 25  | 43 | 33 | 27 | 23 | 27 | 22 | 19 | 21 | 18 | 15 | 16 | 13 | 12 |
| 10  | 45  | 33  | 27  | 22  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 19 | 16 | 14 | 14 | 12 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1805 | 1805 | 1805 |
| 5°  | 1807 | 1775 | 1787 |
| 10° | 1788 | 1739 | 1728 |
| 15° | 1763 | 1680 | 1637 |
| 20° | 1729 | 1600 | 1526 |
| 25° | 1695 | 1510 | 1418 |
| 30° | 1650 | 1418 | 1283 |
| 35° | 1605 | 1319 | 1164 |
| 40° | 1559 | 1217 | 1027 |
| 45° | 1506 | 1104 | 904  |
| 50° | 1452 | 990  | 783  |
| 55° | 1394 | 868  | 667  |
| 60° | 1328 | 741  | 548  |
| 65° | 1252 | 611  | 492  |
| 70° | 1159 | 491  | 444  |
| 75° | 1042 | 430  | 402  |
| 80° | 873  | 357  | 345  |
| 85° | 597  | 233  | 254  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2524 cd/sqm

TEST NUMBER: P902565

CATALOG NUMBER: DFN2DIP-HX3F0-040D090US830-RLFL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 146.0   | 1.4       |
| 10°-20°   | 400.9   | 3.7       |
| 20°-30°   | 562.8   | 5.3       |
| 30°-40°   | 613.5   | 5.7       |
| 40°-50°   | 563.9   | 5.3       |
| 50°-60°   | 442.9   | 4.1       |
| 60°-70°   | 288.3   | 2.7       |
| 70°-80°   | 148.4   | 1.4       |
| 80°-90°   | 45.5    | 0.4       |
| 90°-100°  | 166.0   | 1.5       |
| 100°-110° | 527.5   | 4.9       |
| 110°-120° | 902.7   | 8.4       |
| 120°-130° | 1187.2  | 11.1      |
| 130°-140° | 1332.5  | 12.4      |
| 140°-150° | 1306.7  | 12.2      |
| 150°-160° | 1096.1  | 10.2      |
| 160°-170° | 726.9   | 6.8       |
| 170°-180° | 254.1   | 2.4       |
| 0°-30°    | 1109.8  | 10.4      |
| 0°-40°    | 1723.3  | 16.1      |
| 0°-60°    | 2730.1  | 25.5      |
| 0°-90°    | 3212.2  | 30.0      |
| 90°-120°  | 1596.2  | 14.9      |
| 90°-150°  | 5422.6  | 50.6      |
| 90°-180°  | 7500.0  | 70.0      |
| 0°-180°   | 10712.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1558 | 1558  | 1558 | 1558  | 1558 |      |
| 5°   | 1558 | 1551  | 1533 | 1546  | 1541 | 148  |
| 15°  | 1482 | 1466  | 1419 | 1392  | 1378 | 418  |
| 25°  | 1345 | 1300  | 1207 | 1149  | 1128 | 619  |
| 35°  | 1159 | 1087  | 963  | 874   | 843  | 726  |
| 45°  | 948  | 853   | 705  | 605   | 571  | 732  |
| 55°  | 721  | 611   | 458  | 374   | 347  | 644  |
| 65°  | 486  | 372   | 245  | 198   | 193  | 482  |
| 75°  | 259  | 161   | 113  | 103   | 102  | 274  |
| 85°  | 61   | 31    | 27   | 27    | 27   | 70   |
| 90°  | 2    | 29    | 79   | 74    | 77   | 11   |
| 95°  | 118  | 141   | 145  | 145   | 141  | 131  |
| 105° | 487  | 493   | 498  | 502   | 502  | 514  |
| 115° | 906  | 919   | 915  | 912   | 906  | 896  |
| 125° | 1318 | 1338  | 1331 | 1324  | 1322 | 1177 |
| 135° | 1704 | 1729  | 1734 | 1732  | 1725 | 1317 |
| 145° | 2069 | 2085  | 2098 | 2100  | 2092 | 1293 |
| 155° | 2366 | 2372  | 2380 | 2391  | 2384 | 1089 |
| 165° | 2574 | 2571  | 2571 | 2587  | 2576 | 726  |
| 175° | 2678 | 2671  | 2667 | 2683  | 2669 | 254  |
| 180° | 2683 | 2683  | 2683 | 2683  | 2683 |      |

TEST NUMBER: P902565

CATALOG NUMBER: DFN2DIP-HX3F0-040D090US830-RLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1558.2 | 1558.2 | 1558.2 | 1558.2 | 1558.2 |
| 2.5°   | 1565.3 | 1558.2 | 1542.7 | 1556.9 | 1554.0 |
| 5°     | 1558.2 | 1551.1 | 1532.8 | 1545.5 | 1541.3 |
| 7.5°   | 1545.5 | 1537.1 | 1517.4 | 1522.9 | 1515.9 |
| 10°    | 1528.6 | 1518.7 | 1490.5 | 1486.2 | 1477.9 |
| 12.5°  | 1507.5 | 1494.8 | 1456.6 | 1448.2 | 1432.7 |
| 15°    | 1482.1 | 1466.5 | 1418.6 | 1391.9 | 1377.8 |
| 17.5°  | 1452.5 | 1429.8 | 1370.6 | 1339.6 | 1317.0 |
| 20°    | 1418.6 | 1390.3 | 1319.8 | 1284.7 | 1253.6 |
| 22.5°  | 1382.0 | 1349.5 | 1267.6 | 1219.7 | 1198.7 |
| 25°    | 1345.3 | 1300.1 | 1207.0 | 1149.3 | 1128.0 |
| 27.5°  | 1301.7 | 1253.6 | 1150.7 | 1084.4 | 1051.9 |
| 30°    | 1255.1 | 1201.4 | 1088.5 | 1016.7 | 978.6  |
| 32.5°  | 1209.9 | 1145.0 | 1029.4 | 944.8  | 909.5  |
| 35°    | 1159.2 | 1087.2 | 963.2  | 874.3  | 843.2  |
| 37.5°  | 1109.8 | 1032.2 | 901.1  | 803.7  | 768.5  |
| 40°    | 1057.6 | 973.1  | 836.2  | 736.1  | 699.5  |
| 42.5°  | 1004.0 | 913.8  | 771.4  | 666.9  | 631.8  |
| 45°    | 947.6  | 853.1  | 705.1  | 604.9  | 571.1  |
| 47.5°  | 894.1  | 794.0  | 641.7  | 541.5  | 510.5  |
| 50°    | 834.8  | 734.7  | 579.6  | 482.2  | 452.7  |
| 52.5°  | 776.9  | 671.2  | 520.4  | 427.3  | 400.5  |
| 55°    | 720.6  | 610.6  | 458.3  | 373.7  | 346.9  |
| 57.5°  | 662.8  | 550.0  | 403.3  | 324.3  | 301.8  |
| 60°    | 603.5  | 490.7  | 345.4  | 273.6  | 251.1  |
| 62.5°  | 545.8  | 433.0  | 296.1  | 228.5  | 217.3  |
| 65°    | 486.5  | 372.2  | 245.3  | 197.5  | 193.1  |
| 67.5°  | 430.2  | 315.8  | 197.5  | 173.4  | 169.2  |
| 70°    | 370.9  | 260.9  | 163.5  | 149.5  | 143.7  |
| 72.5°  | 314.5  | 210.1  | 136.8  | 125.5  | 122.7  |
| 75°    | 259.4  | 160.7  | 112.8  | 102.9  | 101.6  |
| 77.5°  | 204.5  | 114.1  | 88.9   | 83.2   | 80.3   |
| 80°    | 153.6  | 81.8   | 67.6   | 62.1   | 62.1   |
| 82.5°  | 107.2  | 55.0   | 46.6   | 43.6   | 43.6   |
| 85°    | 60.6   | 31.0   | 26.8   | 26.8   | 26.8   |
| 87.5°  | 22.6   | 11.2   | 11.2   | 9.9    | 9.9    |
| 90°    | 2.5    | 29.1   | 79.3   | 74.4   | 76.8   |
| 92.5°  | 50.1   | 68.0   | 70.4   | 72.8   | 72.8   |
| 95°    | 118.1  | 140.7  | 144.8  | 144.8  | 140.7  |
| 97.5°  | 196.5  | 217.5  | 226.5  | 226.5  | 226.5  |
| 100°   | 287.1  | 305.8  | 312.2  | 312.2  | 309.8  |
| 102.5° | 382.6  | 396.3  | 405.2  | 407.6  | 405.2  |
| 105°   | 486.9  | 493.3  | 498.2  | 502.3  | 502.3  |
| 107.5° | 590.4  | 600.1  | 600.1  | 601.7  | 590.4  |
| 110°   | 690.7  | 703.7  | 703.7  | 703.7  | 697.2  |

TEST NUMBER: P902565

CATALOG NUMBER: DFN2DIP-HX3F0-040D090US830-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 799.1  | 812.8  | 810.4  | 804.0  | 799.1  |
| 115°   | 905.9  | 918.8  | 914.7  | 912.4  | 905.9  |
| 117.5° | 1011.8 | 1029.6 | 1018.3 | 1011.8 | 1005.3 |
| 120°   | 1118.6 | 1136.3 | 1118.6 | 1118.6 | 1111.3 |
| 122.5° | 1215.6 | 1238.3 | 1227.0 | 1220.5 | 1215.6 |
| 125°   | 1317.6 | 1337.8 | 1331.3 | 1324.0 | 1321.6 |
| 127.5° | 1417.0 | 1442.1 | 1433.2 | 1423.5 | 1417.0 |
| 130°   | 1510.0 | 1539.2 | 1535.1 | 1530.2 | 1521.4 |
| 132.5° | 1614.4 | 1637.0 | 1638.6 | 1627.3 | 1620.9 |
| 135°   | 1704.1 | 1729.2 | 1734.1 | 1731.6 | 1725.2 |
| 137.5° | 1804.4 | 1824.7 | 1828.7 | 1827.1 | 1817.4 |
| 140°   | 1892.6 | 1912.8 | 1924.1 | 1924.1 | 1915.2 |
| 142.5° | 1983.2 | 2003.4 | 2009.9 | 2012.3 | 2003.4 |
| 145°   | 2069.0 | 2085.1 | 2098.0 | 2100.5 | 2091.6 |
| 147.5° | 2145.8 | 2166.0 | 2175.7 | 2179.7 | 2170.9 |
| 150°   | 2225.1 | 2238.8 | 2247.7 | 2254.9 | 2247.7 |
| 152.5° | 2295.4 | 2309.1 | 2320.4 | 2329.4 | 2320.4 |
| 155°   | 2365.8 | 2372.2 | 2379.5 | 2390.9 | 2383.6 |
| 157.5° | 2426.4 | 2431.3 | 2435.3 | 2451.5 | 2440.1 |
| 160°   | 2480.6 | 2485.5 | 2487.9 | 2501.6 | 2491.9 |
| 162.5° | 2530.7 | 2530.7 | 2533.2 | 2548.5 | 2537.2 |
| 165°   | 2573.6 | 2571.2 | 2571.2 | 2587.4 | 2576.1 |
| 167.5° | 2612.4 | 2605.2 | 2605.2 | 2621.3 | 2610.0 |
| 170°   | 2641.6 | 2635.1 | 2632.7 | 2648.8 | 2635.1 |
| 172.5° | 2661.7 | 2655.3 | 2652.9 | 2669.1 | 2655.3 |
| 175°   | 2678.0 | 2671.4 | 2666.6 | 2682.9 | 2669.1 |
| 177.5° | 2686.8 | 2680.4 | 2675.5 | 2689.3 | 2675.5 |
| 180°   | 2682.9 | 2682.9 | 2682.9 | 2682.9 | 2682.9 |

TEST NUMBER: P902565

CATALOG NUMBER: DFN2DIP-HX3F0-040D090US830-RLLFLL

**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 | 6.92             | 7.61  | 8.04  | 8.72  | 10.25 | 2.89           | 3.58 | 4.01 | 4.69 | 6.22 |
|                 | 3H   | 8.58             | 9.19  | 9.70  | 10.31 | 11.86 | 4.07           | 4.68 | 5.19 | 5.80 | 7.35 |
|                 | 4H   | 9.17             | 9.76  | 10.31 | 10.88 | 12.43 | 4.51           | 5.09 | 5.64 | 6.21 | 7.76 |
|                 | 6H   | 9.58             | 10.12 | 10.72 | 11.24 | 12.81 | 4.82           | 5.36 | 5.96 | 6.48 | 8.04 |
|                 | 8H   | 9.70             | 10.21 | 10.85 | 11.35 | 12.91 | 4.90           | 5.41 | 6.05 | 6.55 | 8.11 |
|                 | 12H  | 9.75             | 10.24 | 10.90 | 11.37 | 12.95 | 4.94           | 5.42 | 6.09 | 6.55 | 8.13 |
| 4H              | 2H   | 6.92             | 7.50  | 8.06  | 8.62  | 10.17 | 3.47           | 4.05 | 4.61 | 5.17 | 6.72 |
|                 | 3H   | 8.73             | 9.21  | 9.87  | 10.36 | 11.92 | 4.80           | 5.29 | 5.95 | 6.43 | 8.00 |
|                 | 4H   | 9.41             | 9.85  | 10.56 | 10.99 | 12.57 | 5.34           | 5.79 | 6.49 | 6.92 | 8.50 |
|                 | 6H   | 9.91             | 10.29 | 11.06 | 11.44 | 13.02 | 5.74           | 6.13 | 6.90 | 7.28 | 8.86 |
|                 | 8H   | 10.07            | 10.43 | 11.23 | 11.58 | 13.17 | 5.87           | 6.23 | 7.02 | 7.37 | 8.97 |
|                 | 12H  | 10.16            | 10.48 | 11.33 | 11.64 | 13.24 | 5.92           | 6.25 | 7.09 | 7.41 | 9.00 |
| 8H              | 4H   | 9.36             | 9.72  | 10.52 | 10.87 | 12.46 | 5.60           | 5.96 | 6.76 | 7.11 | 8.70 |
|                 | 6H   | 9.91             | 10.21 | 11.09 | 11.40 | 12.99 | 6.11           | 6.40 | 7.28 | 7.59 | 9.18 |
|                 | 8H   | 10.13            | 10.38 | 11.31 | 11.55 | 13.16 | 6.30           | 6.55 | 7.48 | 7.72 | 9.33 |
|                 | 12H  | 10.25            | 10.48 | 11.44 | 11.64 | 13.29 | 6.41           | 6.63 | 7.59 | 7.80 | 9.44 |
| 12H             | 4H   | 9.31             | 9.63  | 10.48 | 10.79 | 12.39 | 5.60           | 5.92 | 6.77 | 7.08 | 8.68 |
|                 | 6H   | 9.89             | 10.15 | 11.07 | 11.31 | 12.92 | 6.16           | 6.41 | 7.34 | 7.58 | 9.19 |
|                 | 8H   | 10.10            | 10.32 | 11.28 | 11.49 | 13.13 | 6.36           | 6.58 | 7.54 | 7.75 | 9.39 |