

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: P907741

Luminaire Tested: DFN2DIP-4P4F0-030D050US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P907741  
REPORT IS A COMBINATION OF REPORTS P900624 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-030D050US840-RLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

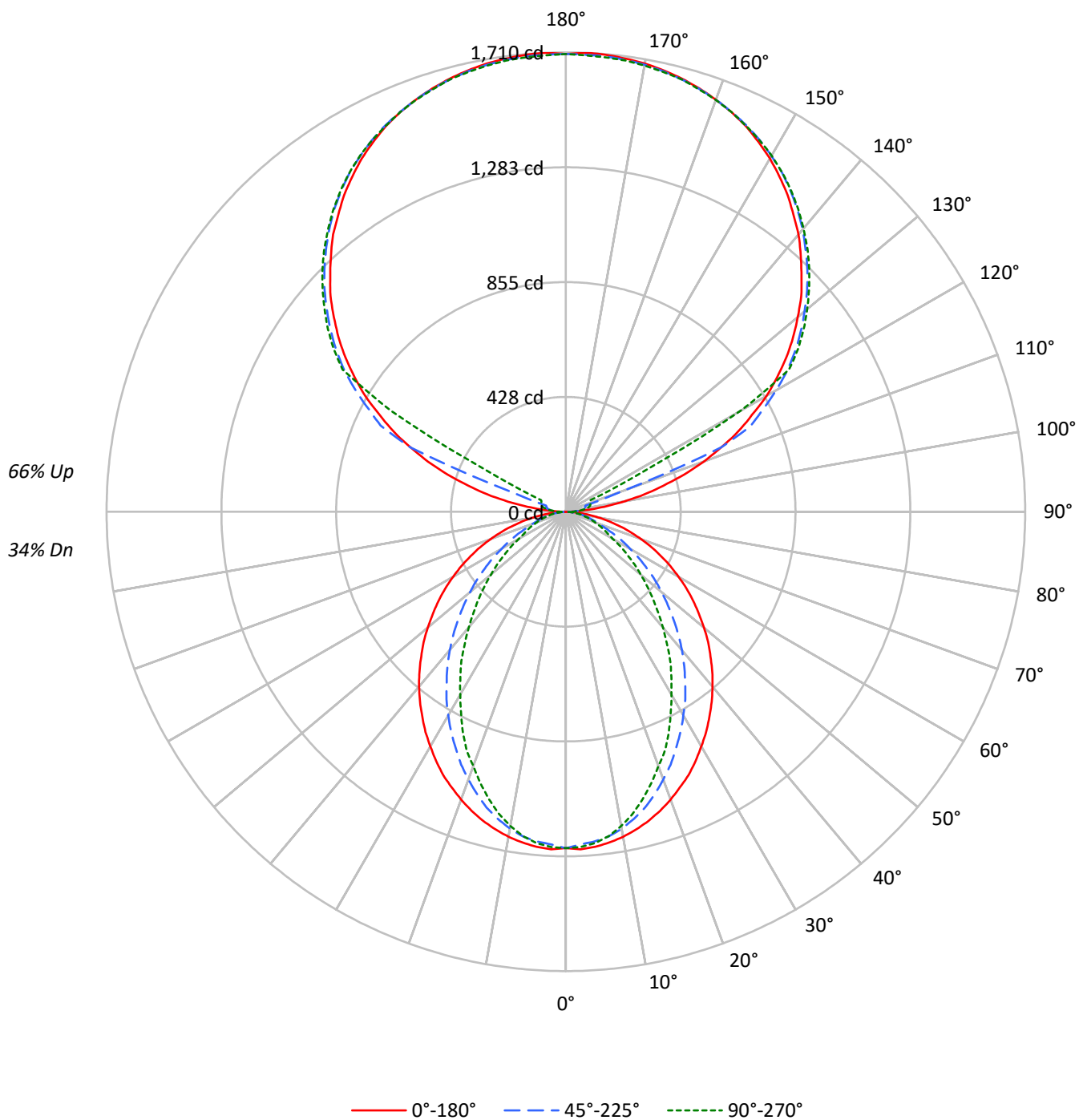
Lumens per Lamp: N/A  
Luminaire Lumens: 7573.9 lumens  
Efficiency: N/A  
Efficacy: 111.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 67.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 57 | 57 | 57 | 41 | 41 | 41 |
| 1   | 95  | 90  | 87  | 83  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 51 | 49 | 48 | 37 | 36 | 36 |
| 2   | 86  | 79  | 74  | 69  | 78 | 72 | 67 | 63 | 58 | 54 | 52 | 45 | 43 | 41 | 33 | 32 | 30 |
| 3   | 79  | 70  | 63  | 58  | 71 | 63 | 58 | 53 | 51 | 47 | 44 | 40 | 37 | 35 | 30 | 28 | 26 |
| 4   | 72  | 62  | 55  | 49  | 65 | 56 | 50 | 45 | 46 | 41 | 37 | 36 | 33 | 30 | 27 | 25 | 23 |
| 5   | 66  | 55  | 48  | 42  | 60 | 50 | 44 | 39 | 41 | 36 | 32 | 32 | 29 | 26 | 24 | 22 | 20 |
| 6   | 61  | 50  | 42  | 36  | 55 | 45 | 39 | 34 | 37 | 32 | 28 | 29 | 26 | 23 | 22 | 20 | 18 |
| 7   | 57  | 45  | 37  | 32  | 51 | 41 | 34 | 30 | 34 | 29 | 25 | 27 | 23 | 20 | 20 | 18 | 16 |
| 8   | 52  | 41  | 33  | 28  | 47 | 37 | 31 | 26 | 31 | 26 | 22 | 24 | 21 | 18 | 19 | 16 | 14 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 28 | 23 | 28 | 23 | 20 | 22 | 19 | 16 | 17 | 15 | 13 |
| 10  | 46  | 34  | 27  | 22  | 41 | 31 | 25 | 21 | 26 | 21 | 18 | 21 | 17 | 15 | 16 | 14 | 12 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 812 | 812 | 812 |
| 5°  | 814 | 800 | 805 |
| 10° | 806 | 784 | 779 |
| 15° | 795 | 759 | 739 |
| 20° | 780 | 723 | 689 |
| 25° | 765 | 683 | 642 |
| 30° | 745 | 642 | 581 |
| 35° | 725 | 598 | 528 |
| 40° | 705 | 553 | 466 |
| 45° | 682 | 502 | 411 |
| 50° | 658 | 451 | 357 |
| 55° | 633 | 397 | 305 |
| 60° | 603 | 340 | 251 |
| 65° | 570 | 282 | 226 |
| 70° | 530 | 228 | 205 |
| 75° | 479 | 201 | 187 |
| 80° | 405 | 169 | 164 |
| 85° | 283 | 115 | 125 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 877 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 117.4  | 1.5       |
| 10°-20°   | 322.1  | 4.3       |
| 20°-30°   | 452.3  | 6.0       |
| 30°-40°   | 493.0  | 6.5       |
| 40°-50°   | 453.1  | 6.0       |
| 50°-60°   | 355.9  | 4.7       |
| 60°-70°   | 231.6  | 3.1       |
| 70°-80°   | 119.2  | 1.6       |
| 80°-90°   | 33.4   | 0.4       |
| 90°-100°  | 56.2   | 0.7       |
| 100°-110° | 209.5  | 2.8       |
| 110°-120° | 555.6  | 7.3       |
| 120°-130° | 921.4  | 12.2      |
| 130°-140° | 978.8  | 12.9      |
| 140°-150° | 909.7  | 12.0      |
| 150°-160° | 731.3  | 9.7       |
| 160°-170° | 471.2  | 6.2       |
| 170°-180° | 162.2  | 2.1       |
| 0°-30°    | 891.8  | 11.8      |
| 0°-40°    | 1384.8 | 18.3      |
| 0°-60°    | 2193.8 | 29.0      |
| 0°-90°    | 2578.1 | 34.0      |
| 90°-120°  | 821.2  | 10.8      |
| 90°-150°  | 3631.1 | 47.9      |
| 90°-180°  | 4996.0 | 66.0      |
| 0°-180°   | 7573.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1252 | 1252  | 1252 | 1252  | 1252 |      |
| 5°   | 1252 | 1246  | 1232 | 1242  | 1238 | 119  |
| 15°  | 1191 | 1178  | 1140 | 1118  | 1107 | 336  |
| 25°  | 1081 | 1045  | 970  | 924   | 906  | 497  |
| 35°  | 932  | 874   | 774  | 703   | 678  | 583  |
| 45°  | 762  | 686   | 567  | 486   | 459  | 588  |
| 55°  | 579  | 491   | 368  | 300   | 279  | 517  |
| 65°  | 391  | 299   | 197  | 159   | 155  | 388  |
| 75°  | 208  | 129   | 91   | 83    | 82   | 220  |
| 85°  | 49   | 25    | 22   | 22    | 22   | 56   |
| 90°  | 1    | 15    | 25   | 31    | 33   | 7    |
| 95°  | 80   | 39    | 48   | 54    | 53   | 95   |
| 105° | 375  | 412   | 75   | 89    | 94   | 401  |
| 115° | 709  | 730   | 761  | 190   | 101  | 698  |
| 125° | 1002 | 1019  | 1042 | 1051  | 1054 | 894  |
| 135° | 1240 | 1260  | 1271 | 1284  | 1281 | 958  |
| 145° | 1439 | 1438  | 1459 | 1467  | 1461 | 900  |
| 155° | 1584 | 1574  | 1588 | 1596  | 1586 | 730  |
| 165° | 1670 | 1662  | 1666 | 1674  | 1666 | 472  |
| 175° | 1708 | 1699  | 1702 | 1710  | 1698 | 163  |
| 180° | 1704 | 1704  | 1704 | 1704  | 1704 |      |

TEST NUMBER: P907741

CATALOG NUMBER: DFN2DIP-4P4F0-030D050US840-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1252.1 | 1252.1 | 1252.1 | 1252.1 | 1252.1 |
| 2.5°   | 1257.8 | 1252.1 | 1239.6 | 1251.0 | 1248.8 |
| 5°     | 1252.1 | 1246.5 | 1231.7 | 1241.9 | 1238.5 |
| 7.5°   | 1241.9 | 1235.2 | 1219.3 | 1223.8 | 1218.1 |
| 10°    | 1228.3 | 1220.4 | 1197.8 | 1194.3 | 1187.6 |
| 12.5°  | 1211.3 | 1201.1 | 1170.5 | 1163.8 | 1151.2 |
| 15°    | 1190.9 | 1178.4 | 1139.9 | 1118.4 | 1107.1 |
| 17.5°  | 1167.1 | 1149.0 | 1101.4 | 1076.5 | 1058.3 |
| 20°    | 1139.9 | 1117.2 | 1060.6 | 1032.4 | 1007.3 |
| 22.5°  | 1110.5 | 1084.4 | 1018.7 | 980.2  | 963.2  |
| 25°    | 1081.1 | 1044.7 | 970.0  | 923.5  | 906.5  |
| 27.5°  | 1045.9 | 1007.3 | 924.6  | 871.4  | 845.3  |
| 30°    | 1008.6 | 965.4  | 874.7  | 817.1  | 786.4  |
| 32.5°  | 972.2  | 920.1  | 827.3  | 759.2  | 730.8  |
| 35°    | 931.5  | 873.6  | 774.0  | 702.6  | 677.6  |
| 37.5°  | 891.8  | 829.4  | 724.1  | 645.8  | 617.6  |
| 40°    | 849.9  | 781.9  | 672.0  | 591.5  | 562.1  |
| 42.5°  | 806.8  | 734.4  | 619.9  | 535.9  | 507.7  |
| 45°    | 761.5  | 685.5  | 566.6  | 486.0  | 458.9  |
| 47.5°  | 718.4  | 638.0  | 515.6  | 435.1  | 410.2  |
| 50°    | 670.9  | 590.4  | 465.7  | 387.5  | 363.8  |
| 52.5°  | 624.3  | 539.4  | 418.2  | 343.4  | 321.8  |
| 55°    | 579.0  | 490.6  | 368.2  | 300.3  | 278.8  |
| 57.5°  | 532.6  | 441.9  | 324.2  | 260.6  | 242.5  |
| 60°    | 484.9  | 394.4  | 277.6  | 219.8  | 201.8  |
| 62.5°  | 438.6  | 347.9  | 237.9  | 183.6  | 174.6  |
| 65°    | 390.9  | 299.1  | 197.1  | 158.6  | 155.2  |
| 67.5°  | 345.7  | 253.8  | 158.6  | 139.4  | 135.9  |
| 70°    | 298.0  | 209.6  | 131.4  | 120.1  | 115.5  |
| 72.5°  | 252.7  | 168.7  | 109.9  | 100.9  | 98.6   |
| 75°    | 208.4  | 129.2  | 90.7   | 82.7   | 81.6   |
| 77.5°  | 164.3  | 91.7   | 71.4   | 66.9   | 64.5   |
| 80°    | 123.5  | 65.7   | 54.3   | 49.9   | 49.9   |
| 82.5°  | 86.0   | 44.2   | 37.4   | 35.1   | 35.1   |
| 85°    | 48.7   | 24.8   | 21.5   | 21.5   | 21.5   |
| 87.5°  | 18.2   | 9.0    | 9.0    | 8.0    | 8.0    |
| 90°    | 1.2    | 14.7   | 24.6   | 30.9   | 33.2   |
| 92.5°  | 30.9   | 26.0   | 29.6   | 32.1   | 33.2   |
| 95°    | 80.1   | 39.4   | 48.1   | 54.3   | 53.0   |
| 97.5°  | 144.2  | 43.2   | 62.8   | 66.7   | 67.8   |
| 100°   | 218.3  | 49.4   | 70.3   | 80.1   | 82.6   |
| 102.5° | 299.6  | 297.2  | 72.8   | 86.2   | 90.1   |
| 105°   | 374.9  | 411.9  | 75.2   | 88.8   | 93.7   |
| 107.5° | 462.4  | 493.1  | 77.8   | 91.2   | 96.2   |
| 110°   | 546.3  | 572.1  | 215.8  | 92.5   | 97.4   |

TEST NUMBER: P907741

CATALOG NUMBER: DFN2DIP-4P4F0-030D050US840-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 625.2  | 647.3  | 626.4  | 94.9   | 98.7   |
| 115°   | 709.0  | 729.9  | 760.8  | 190.0  | 101.2  |
| 117.5° | 781.7  | 806.4  | 827.5  | 651.0  | 328.0  |
| 120°   | 863.1  | 881.6  | 903.8  | 918.7  | 752.1  |
| 122.5° | 932.1  | 951.9  | 976.6  | 984.0  | 985.3  |
| 125°   | 1002.4 | 1018.6 | 1042.0 | 1050.6 | 1054.3 |
| 127.5° | 1066.5 | 1083.8 | 1102.5 | 1114.7 | 1115.9 |
| 130°   | 1127.0 | 1146.8 | 1160.2 | 1173.9 | 1172.8 |
| 132.5° | 1188.7 | 1204.8 | 1218.2 | 1229.4 | 1228.2 |
| 135°   | 1240.5 | 1260.3 | 1271.2 | 1283.7 | 1281.2 |
| 137.5° | 1294.6 | 1309.5 | 1321.9 | 1334.2 | 1330.6 |
| 140°   | 1347.7 | 1357.7 | 1371.1 | 1382.2 | 1376.1 |
| 142.5° | 1392.2 | 1400.9 | 1416.8 | 1426.6 | 1420.5 |
| 145°   | 1439.1 | 1437.7 | 1458.6 | 1467.3 | 1461.2 |
| 147.5° | 1479.7 | 1475.9 | 1496.9 | 1503.1 | 1498.2 |
| 150°   | 1519.1 | 1510.6 | 1530.2 | 1537.6 | 1531.5 |
| 152.5° | 1552.4 | 1542.6 | 1561.1 | 1568.5 | 1559.8 |
| 155°   | 1584.5 | 1573.5 | 1588.2 | 1595.6 | 1585.8 |
| 157.5° | 1610.3 | 1600.5 | 1611.6 | 1620.3 | 1610.3 |
| 160°   | 1632.6 | 1625.2 | 1632.6 | 1639.9 | 1631.3 |
| 162.5° | 1652.2 | 1645.0 | 1651.0 | 1659.7 | 1648.6 |
| 165°   | 1669.5 | 1662.2 | 1665.9 | 1674.5 | 1665.9 |
| 167.5° | 1683.1 | 1675.7 | 1679.5 | 1688.1 | 1677.0 |
| 170°   | 1694.3 | 1686.8 | 1689.3 | 1697.9 | 1686.8 |
| 172.5° | 1701.6 | 1694.3 | 1696.8 | 1705.4 | 1694.3 |
| 175°   | 1707.8 | 1699.1 | 1701.6 | 1710.2 | 1697.9 |
| 177.5° | 1710.2 | 1701.6 | 1702.9 | 1711.5 | 1700.4 |
| 180°   | 1704.0 | 1704.0 | 1704.0 | 1704.0 | 1704.0 |



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CATALOG NUMBER: DFN2DIP-4P4F0-030D050US840-RLONL

**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 | 4.74             | 5.45 | 5.83 | 6.54 | 8.02  | 0.70           | 1.41 | 1.79 | 2.50 | 3.98 |
|                 | 3H   | 6.41             | 7.05 | 7.51 | 8.14 | 9.65  | 1.88           | 2.52 | 2.98 | 3.61 | 5.11 |
|                 | 4H   | 7.02             | 7.63 | 8.13 | 8.72 | 10.23 | 2.33           | 2.93 | 3.43 | 4.03 | 5.53 |
|                 | 6H   | 7.44             | 8.00 | 8.56 | 9.09 | 10.61 | 2.64           | 3.20 | 3.76 | 4.30 | 5.82 |
|                 | 8H   | 7.57             | 8.10 | 8.69 | 9.21 | 10.72 | 2.73           | 3.26 | 3.85 | 4.37 | 5.89 |
|                 | 12H  | 7.63             | 8.13 | 8.75 | 9.23 | 10.77 | 2.77           | 3.27 | 3.90 | 4.38 | 5.92 |
| 4H              | 2H   | 4.74             | 5.35 | 5.86 | 6.44 | 7.95  | 1.28           | 1.89 | 2.40 | 2.98 | 4.49 |
|                 | 3H   | 6.57             | 7.07 | 7.69 | 8.19 | 9.71  | 2.62           | 3.13 | 3.75 | 4.25 | 5.77 |
|                 | 4H   | 7.26             | 7.72 | 8.38 | 8.83 | 10.37 | 3.17           | 3.63 | 4.29 | 4.74 | 6.28 |
|                 | 6H   | 7.77             | 8.17 | 8.91 | 9.30 | 10.84 | 3.58           | 3.98 | 4.72 | 5.11 | 6.65 |
|                 | 8H   | 7.95             | 8.32 | 9.08 | 9.44 | 10.99 | 3.71           | 4.08 | 4.84 | 5.21 | 6.76 |
|                 | 12H  | 8.04             | 8.38 | 9.19 | 9.51 | 11.07 | 3.77           | 4.11 | 4.92 | 5.24 | 6.80 |
| 8H              | 4H   | 7.22             | 7.59 | 8.35 | 8.71 | 10.26 | 3.44           | 3.81 | 4.58 | 4.94 | 6.49 |
|                 | 6H   | 7.79             | 8.09 | 8.94 | 9.26 | 10.80 | 3.96           | 4.27 | 5.11 | 5.43 | 6.98 |
|                 | 8H   | 8.01             | 8.27 | 9.16 | 9.42 | 10.99 | 4.15           | 4.42 | 5.31 | 5.57 | 7.13 |
|                 | 12H  | 8.14             | 8.38 | 9.31 | 9.52 | 11.12 | 4.27           | 4.50 | 5.43 | 5.65 | 7.25 |
| 12H             | 4H   | 7.17             | 7.50 | 8.31 | 8.64 | 10.19 | 3.45           | 3.78 | 4.59 | 4.92 | 6.47 |
|                 | 6H   | 7.76             | 8.03 | 8.92 | 9.18 | 10.74 | 4.01           | 4.28 | 5.17 | 5.43 | 6.99 |
|                 | 8H   | 7.98             | 8.22 | 9.14 | 9.36 | 10.96 | 4.22           | 4.45 | 5.38 | 5.60 | 7.20 |