

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: P923448

Luminaire Tested: DFN2DIP-TR2F0-060D050US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923448  
REPORT IS A COMBINATION OF REPORTS P900259 AND P897145  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR2F0-060D050US940-FLLFLL  
Description: 2 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

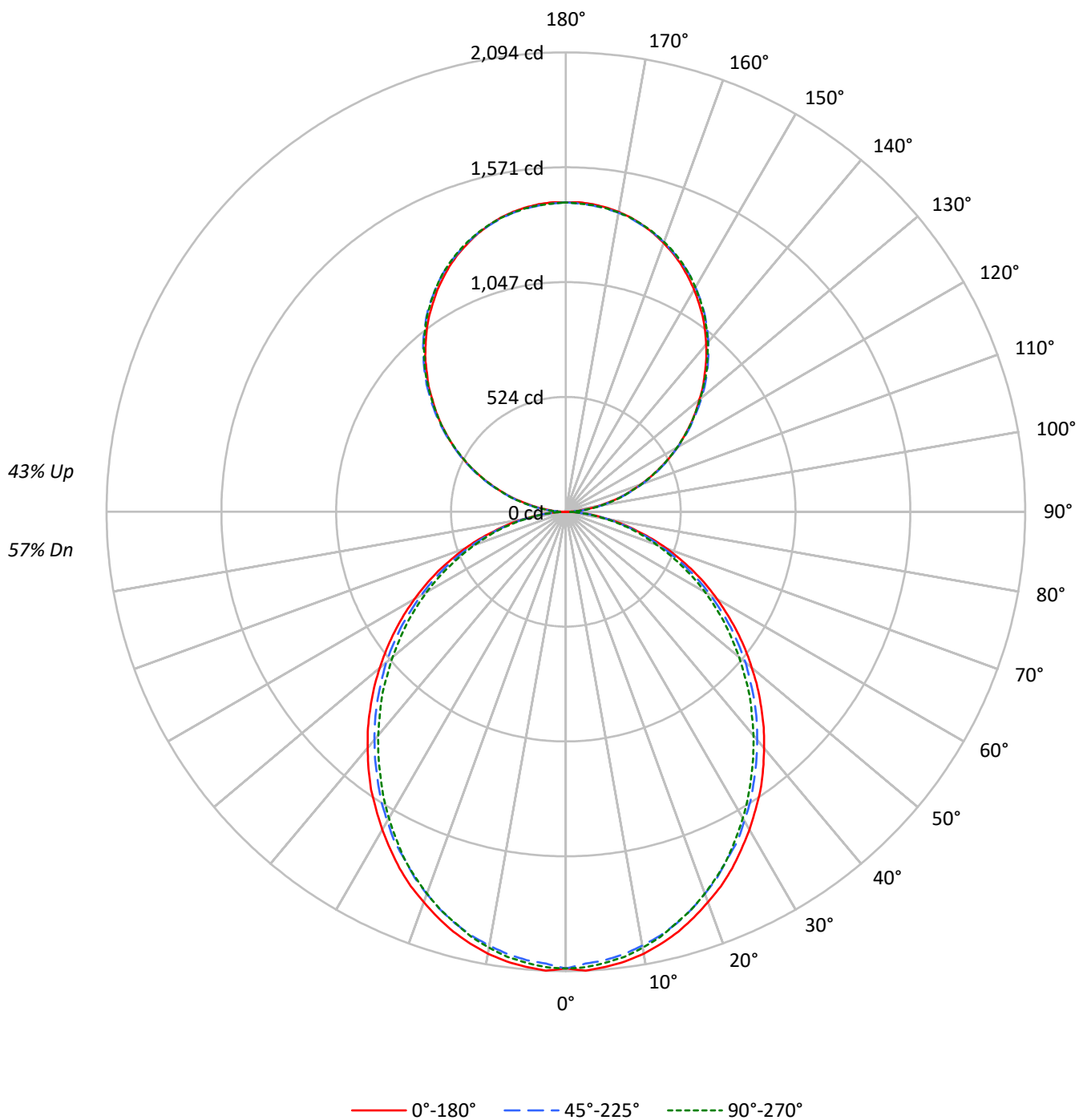
Lumens per Lamp: N/A  
Luminaire Lumens: 9242.6 lumens  
Efficiency: N/A  
Efficacy: 94.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.04' x L: 2.36' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 97.9  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
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: P923448

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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   | 109 | 109 | 109 | 109 | 101 | 101 | 101 | 101 | 87 | 87 | 87 | 75 | 75 | 75 | 63 | 63 | 63 |
| 1   | 99  | 95  | 91  | 88  | 92  | 89  | 85  | 82  | 77 | 74 | 72 | 66 | 64 | 62 | 56 | 54 | 53 |
| 2   | 91  | 83  | 77  | 72  | 84  | 78  | 72  | 67  | 67 | 63 | 60 | 58 | 55 | 52 | 49 | 47 | 45 |
| 3   | 83  | 73  | 66  | 60  | 77  | 68  | 62  | 56  | 59 | 54 | 50 | 51 | 47 | 44 | 43 | 41 | 38 |
| 4   | 76  | 65  | 57  | 51  | 70  | 61  | 53  | 48  | 53 | 47 | 43 | 46 | 41 | 38 | 39 | 36 | 33 |
| 5   | 69  | 58  | 49  | 43  | 64  | 54  | 47  | 41  | 47 | 41 | 37 | 41 | 36 | 33 | 35 | 31 | 29 |
| 6   | 64  | 52  | 44  | 38  | 59  | 49  | 41  | 36  | 43 | 37 | 32 | 37 | 32 | 29 | 32 | 28 | 25 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 32  | 39 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 |
| 8   | 55  | 43  | 35  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 31 | 26 | 23 | 27 | 23 | 20 |
| 9   | 51  | 39  | 31  | 26  | 48  | 37  | 30  | 25  | 32 | 27 | 23 | 28 | 24 | 20 | 25 | 21 | 18 |
| 10  | 48  | 36  | 28  | 24  | 45  | 34  | 27  | 23  | 30 | 24 | 21 | 26 | 22 | 19 | 23 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4643 | 4643 | 4643 |
| 5°  | 4644 | 4568 | 4601 |
| 10° | 4599 | 4496 | 4531 |
| 15° | 4525 | 4412 | 4426 |
| 20° | 4426 | 4299 | 4318 |
| 25° | 4329 | 4166 | 4196 |
| 30° | 4208 | 4041 | 4041 |
| 35° | 4092 | 3896 | 3879 |
| 40° | 3951 | 3749 | 3723 |
| 45° | 3811 | 3600 | 3564 |
| 50° | 3657 | 3444 | 3380 |
| 55° | 3494 | 3265 | 3209 |
| 60° | 3311 | 3053 | 3013 |
| 65° | 3109 | 2831 | 2783 |
| 70° | 2854 | 2561 | 2532 |
| 75° | 2502 | 2238 | 2290 |
| 80° | 2074 | 1825 | 1851 |
| 85° | 1412 | 1150 | 1151 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3811 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 195.9  | 2.1       |
| 10°-20°   | 551.3  | 6.0       |
| 20°-30°   | 810.2  | 8.8       |
| 30°-40°   | 941.0  | 10.2      |
| 40°-50°   | 939.8  | 10.2      |
| 50°-60°   | 819.5  | 8.9       |
| 60°-70°   | 605.8  | 6.6       |
| 70°-80°   | 342.7  | 3.7       |
| 80°-90°   | 94.5   | 1.0       |
| 90°-100°  | 87.3   | 0.9       |
| 100°-110° | 277.2  | 3.0       |
| 110°-120° | 474.5  | 5.1       |
| 120°-130° | 624.0  | 6.8       |
| 130°-140° | 700.4  | 7.6       |
| 140°-150° | 686.8  | 7.4       |
| 150°-160° | 576.1  | 6.2       |
| 160°-170° | 382.1  | 4.1       |
| 170°-180° | 133.5  | 1.4       |
| 0°-30°    | 1557.4 | 16.9      |
| 0°-40°    | 2498.4 | 27.0      |
| 0°-60°    | 4257.8 | 46.1      |
| 0°-90°    | 5300.8 | 57.4      |
| 90°-120°  | 838.9  | 9.1       |
| 90°-150°  | 2850.1 | 30.8      |
| 90°-180°  | 3942.0 | 42.7      |
| 0°-180°   | 9242.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2082 | 2082  | 2082 | 2082  | 2082 |      |
| 5°   | 2082 | 2074  | 2052 | 2068  | 2064 | 198  |
| 15°  | 1982 | 1970  | 1944 | 1952  | 1942 | 558  |
| 25°  | 1794 | 1778  | 1744 | 1748  | 1744 | 825  |
| 35°  | 1548 | 1528  | 1495 | 1483  | 1473 | 966  |
| 45°  | 1259 | 1245  | 1215 | 1193  | 1185 | 972  |
| 55°  | 953  | 941   | 917  | 893   | 883  | 852  |
| 65°  | 643  | 631   | 611  | 592   | 583  | 635  |
| 75°  | 336  | 332   | 322  | 310   | 314  | 359  |
| 85°  | 82   | 80    | 78   | 72    | 70   | 91   |
| 90°  | 1    | 15    | 42   | 39    | 40   | 9    |
| 95°  | 62   | 74    | 76   | 76    | 74   | 69   |
| 105° | 256  | 259   | 262  | 264   | 264  | 270  |
| 115° | 476  | 483   | 481  | 480   | 476  | 471  |
| 125° | 692  | 703   | 700  | 696   | 695  | 619  |
| 135° | 896  | 909   | 911  | 910   | 907  | 692  |
| 145° | 1087 | 1096  | 1103 | 1104  | 1099 | 679  |
| 155° | 1243 | 1247  | 1251 | 1257  | 1253 | 572  |
| 165° | 1353 | 1351  | 1351 | 1360  | 1354 | 382  |
| 175° | 1408 | 1404  | 1402 | 1410  | 1403 | 134  |
| 180° | 1410 | 1410  | 1410 | 1410  | 1410 |      |

TEST NUMBER: P923448

CATALOG NUMBER: DFN2DIP-TR2FO-060D050US940-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2081.8 | 2081.8 | 2081.8 | 2081.8 | 2081.8 |
| 2.5°   | 2093.9 | 2083.9 | 2061.8 | 2081.8 | 2078.0 |
| 5°     | 2081.8 | 2073.9 | 2051.8 | 2067.8 | 2064.0 |
| 7.5°   | 2067.8 | 2055.9 | 2033.8 | 2050.0 | 2045.9 |
| 10°    | 2045.9 | 2031.9 | 2007.9 | 2023.8 | 2017.9 |
| 12.5°  | 2015.8 | 2003.9 | 1979.9 | 1989.9 | 1985.8 |
| 15°    | 1981.7 | 1969.9 | 1943.8 | 1951.9 | 1941.9 |
| 17.5°  | 1939.7 | 1927.9 | 1901.8 | 1911.6 | 1901.8 |
| 20°    | 1893.6 | 1881.8 | 1853.7 | 1859.7 | 1851.8 |
| 22.5°  | 1847.8 | 1829.7 | 1803.6 | 1803.6 | 1799.6 |
| 25°    | 1793.6 | 1777.7 | 1743.7 | 1747.5 | 1743.7 |
| 27.5°  | 1733.5 | 1719.5 | 1693.5 | 1687.7 | 1677.7 |
| 30°    | 1673.7 | 1657.4 | 1627.5 | 1621.6 | 1613.5 |
| 32.5°  | 1609.4 | 1597.6 | 1565.5 | 1553.4 | 1545.3 |
| 35°    | 1547.5 | 1527.5 | 1495.4 | 1483.3 | 1473.3 |
| 37.5°  | 1477.4 | 1459.3 | 1427.3 | 1413.2 | 1403.2 |
| 40°    | 1405.3 | 1389.2 | 1357.2 | 1339.3 | 1331.2 |
| 42.5°  | 1335.2 | 1319.1 | 1287.3 | 1267.1 | 1255.2 |
| 45°    | 1259.3 | 1245.2 | 1215.0 | 1193.2 | 1185.1 |
| 47.5°  | 1185.1 | 1171.1 | 1139.1 | 1117.0 | 1105.0 |
| 50°    | 1107.0 | 1097.0 | 1069.0 | 1040.9 | 1030.9 |
| 52.5°  | 1030.9 | 1016.9 | 991.0  | 968.9  | 954.9  |
| 55°    | 953.0  | 940.8  | 916.9  | 892.9  | 882.9  |
| 57.5°  | 874.9  | 864.9  | 838.7  | 814.8  | 806.6  |
| 60°    | 796.7  | 788.8  | 760.8  | 738.7  | 732.7  |
| 62.5°  | 720.6  | 706.6  | 686.6  | 666.6  | 658.6  |
| 65°    | 642.7  | 630.6  | 610.6  | 592.5  | 582.6  |
| 67.5°  | 562.6  | 552.4  | 534.6  | 520.6  | 512.5  |
| 70°    | 488.5  | 480.5  | 462.4  | 448.4  | 440.5  |
| 72.5°  | 412.4  | 404.4  | 394.4  | 380.4  | 374.4  |
| 75°    | 336.2  | 332.4  | 322.2  | 310.3  | 314.3  |
| 77.5°  | 268.2  | 260.2  | 256.1  | 250.2  | 244.2  |
| 80°    | 200.3  | 198.1  | 194.1  | 188.2  | 184.1  |
| 82.5°  | 136.2  | 136.2  | 134.2  | 126.2  | 126.2  |
| 85°    | 81.9   | 80.1   | 78.1   | 72.0   | 70.1   |
| 87.5°  | 36.1   | 32.1   | 28.0   | 22.1   | 20.0   |
| 90°    | 1.2    | 15.3   | 41.6   | 39.1   | 40.4   |
| 92.5°  | 26.4   | 35.7   | 37.0   | 38.3   | 38.3   |
| 95°    | 62.1   | 74.0   | 76.1   | 76.1   | 74.0   |
| 97.5°  | 103.3  | 114.3  | 119.0  | 119.0  | 119.0  |
| 100°   | 150.9  | 160.7  | 164.1  | 164.1  | 162.8  |
| 102.5° | 201.1  | 208.3  | 212.9  | 214.3  | 212.9  |
| 105°   | 255.9  | 259.3  | 261.9  | 263.9  | 263.9  |
| 107.5° | 310.3  | 315.4  | 315.4  | 316.3  | 310.3  |
| 110°   | 363.0  | 369.9  | 369.9  | 369.9  | 366.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 420.0  | 427.2  | 426.0  | 422.6  | 420.0  |
| 115°   | 476.1  | 483.0  | 480.8  | 479.6  | 476.1  |
| 117.5° | 531.8  | 541.2  | 535.2  | 531.8  | 528.4  |
| 120°   | 587.9  | 597.3  | 587.9  | 587.9  | 584.1  |
| 122.5° | 638.9  | 650.9  | 644.9  | 641.5  | 638.9  |
| 125°   | 692.5  | 703.1  | 699.7  | 695.9  | 694.6  |
| 127.5° | 744.8  | 758.0  | 753.3  | 748.1  | 744.8  |
| 130°   | 793.7  | 809.0  | 806.8  | 804.3  | 799.6  |
| 132.5° | 848.6  | 860.4  | 861.3  | 855.3  | 851.9  |
| 135°   | 895.7  | 908.8  | 911.4  | 910.2  | 906.8  |
| 137.5° | 948.4  | 959.0  | 961.2  | 960.3  | 955.2  |
| 140°   | 994.7  | 1005.4 | 1011.3 | 1011.3 | 1006.7 |
| 142.5° | 1042.3 | 1053.0 | 1056.4 | 1057.7 | 1053.0 |
| 145°   | 1087.4 | 1095.9 | 1102.7 | 1104.0 | 1099.3 |
| 147.5° | 1127.8 | 1138.4 | 1143.5 | 1145.7 | 1140.9 |
| 150°   | 1169.5 | 1176.7 | 1181.3 | 1185.2 | 1181.3 |
| 152.5° | 1206.5 | 1213.7 | 1219.6 | 1224.3 | 1219.6 |
| 155°   | 1243.4 | 1246.8 | 1250.6 | 1256.6 | 1252.8 |
| 157.5° | 1275.3 | 1277.8 | 1280.0 | 1288.5 | 1282.5 |
| 160°   | 1303.8 | 1306.4 | 1307.6 | 1314.8 | 1309.7 |
| 162.5° | 1330.2 | 1330.2 | 1331.4 | 1339.5 | 1333.6 |
| 165°   | 1352.7 | 1351.4 | 1351.4 | 1359.9 | 1354.0 |
| 167.5° | 1373.1 | 1369.2 | 1369.2 | 1377.8 | 1371.8 |
| 170°   | 1388.4 | 1385.0 | 1383.8 | 1392.2 | 1385.0 |
| 172.5° | 1399.0 | 1395.6 | 1394.4 | 1402.8 | 1395.6 |
| 175°   | 1407.6 | 1404.1 | 1401.6 | 1410.1 | 1402.8 |
| 177.5° | 1412.2 | 1408.8 | 1406.2 | 1413.5 | 1406.2 |
| 180°   | 1410.1 | 1410.1 | 1410.1 | 1410.1 | 1410.1 |

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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 | 13.13            | 14.06 | 14.02 | 14.97 | 16.14 | 12.71          | 13.64 | 13.60 | 14.55 | 15.71 |
|                 | 3H   | 14.77            | 15.61 | 15.68 | 16.53 | 17.72 | 14.31          | 15.15 | 15.21 | 16.07 | 17.25 |
|                 | 4H   | 15.35            | 16.14 | 16.27 | 17.06 | 18.26 | 14.89          | 15.68 | 15.81 | 16.60 | 17.80 |
|                 | 6H   | 15.73            | 16.46 | 16.66 | 17.39 | 18.60 | 15.27          | 16.00 | 16.20 | 16.93 | 18.14 |
|                 | 8H   | 15.83            | 16.52 | 16.77 | 17.47 | 18.68 | 15.37          | 16.06 | 16.31 | 17.01 | 18.22 |
|                 | 12H  | 15.87            | 16.53 | 16.81 | 17.48 | 18.71 | 15.41          | 16.07 | 16.35 | 17.01 | 18.25 |
| 4H              | 2H   | 13.59            | 14.38 | 14.51 | 15.31 | 16.50 | 13.25          | 14.04 | 14.18 | 14.97 | 16.16 |
|                 | 3H   | 15.44            | 16.10 | 16.37 | 17.05 | 18.26 | 15.05          | 15.71 | 15.99 | 16.67 | 17.88 |
|                 | 4H   | 16.13            | 16.74 | 17.08 | 17.69 | 18.92 | 15.74          | 16.34 | 16.68 | 17.29 | 18.53 |
|                 | 6H   | 16.63            | 17.15 | 17.59 | 18.13 | 19.36 | 16.23          | 16.75 | 17.19 | 17.73 | 18.97 |
|                 | 8H   | 16.77            | 17.26 | 17.73 | 18.23 | 19.48 | 16.37          | 16.86 | 17.33 | 17.83 | 19.08 |
|                 | 12H  | 16.84            | 17.27 | 17.82 | 18.26 | 19.52 | 16.43          | 16.87 | 17.41 | 17.86 | 19.11 |
| 8H              | 4H   | 16.33            | 16.81 | 17.29 | 17.78 | 19.03 | 15.97          | 16.46 | 16.93 | 17.43 | 18.68 |
|                 | 6H   | 16.93            | 17.33 | 17.92 | 18.34 | 19.59 | 16.58          | 16.98 | 17.57 | 17.99 | 19.24 |
|                 | 8H   | 17.14            | 17.49 | 18.13 | 18.49 | 19.76 | 16.78          | 17.14 | 17.78 | 18.14 | 19.40 |
|                 | 12H  | 17.26            | 17.57 | 18.26 | 18.56 | 19.88 | 16.89          | 17.20 | 17.89 | 18.19 | 19.51 |
| 12H             | 4H   | 16.31            | 16.75 | 17.29 | 17.74 | 18.99 | 15.97          | 16.41 | 16.95 | 17.39 | 18.65 |
|                 | 6H   | 16.96            | 17.31 | 17.95 | 18.31 | 19.58 | 16.62          | 16.97 | 17.61 | 17.97 | 19.24 |
|                 | 8H   | 17.19            | 17.50 | 18.18 | 18.49 | 19.80 | 16.84          | 17.15 | 17.84 | 18.15 | 19.46 |