

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: P922392

Luminaire Tested: DFN2DIP-PN4F0-080D060US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922392  
REPORT IS A COMBINATION OF REPORTS P899653 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-080D060US940-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

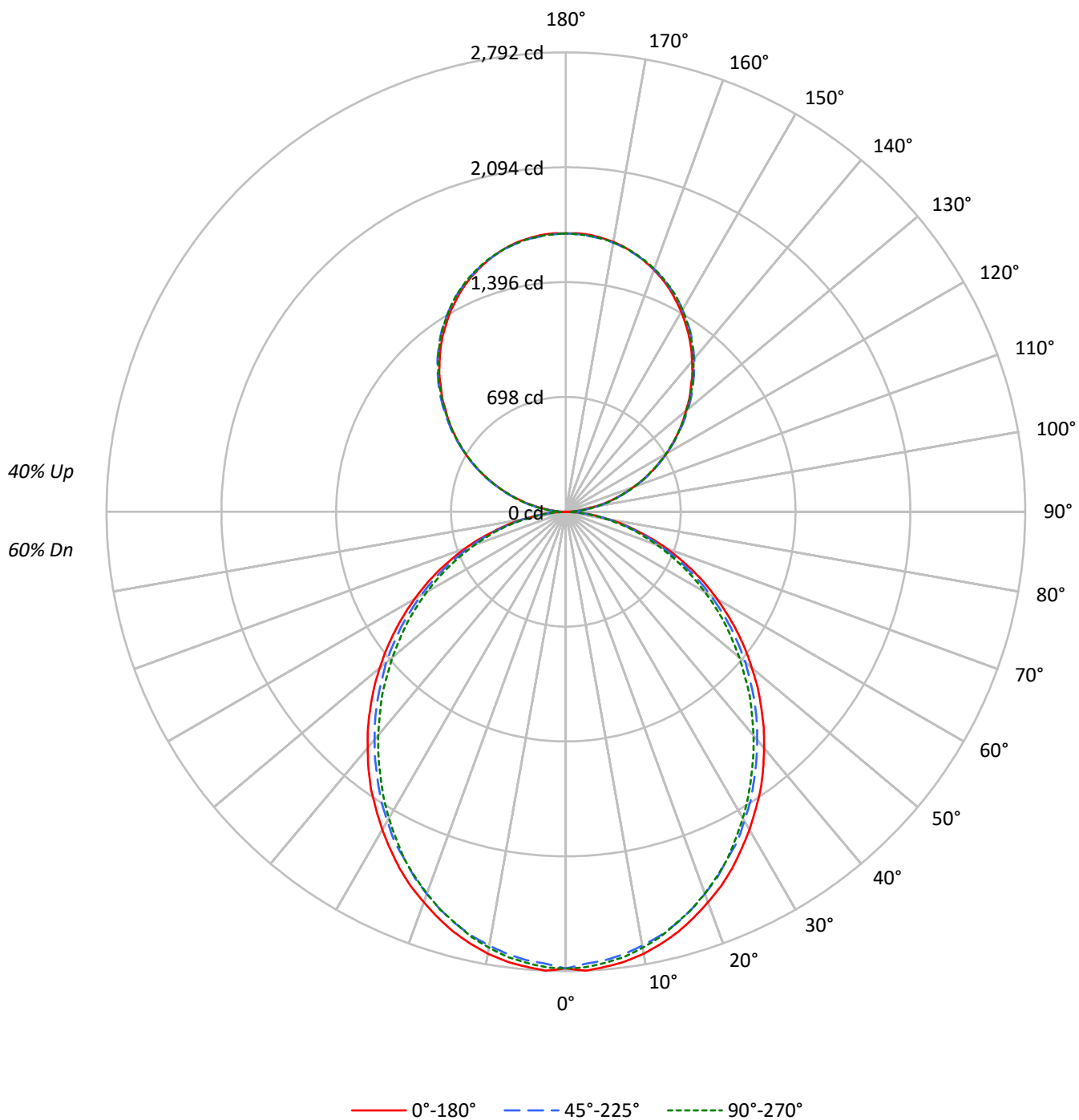
Lumens per Lamp: N/A  
Luminaire Lumens: 11797.4 lumens  
Efficiency: N/A  
Efficacy: 96.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 122.3  
Input Voltage (V):  
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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CATALOG NUMBER: DFN2DIP-PN4F0-080D060US940-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P922392

CATALOG NUMBER: DFN2DIP-PN4F0-080D060US940-FLLFL

**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   | 110 | 110 | 110 | 110 | 102 | 102 | 102 | 102 | 89 | 89 | 89 | 77 | 77 | 77 | 65 | 65 | 65 |
| 1   | 100 | 96  | 92  | 88  | 93  | 89  | 86  | 83  | 78 | 75 | 73 | 67 | 66 | 64 | 58 | 56 | 55 |
| 2   | 91  | 84  | 77  | 72  | 85  | 78  | 73  | 68  | 68 | 64 | 61 | 59 | 56 | 53 | 51 | 48 | 46 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 51 | 52 | 48 | 45 | 45 | 42 | 40 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 48  | 54 | 48 | 43 | 47 | 42 | 39 | 40 | 37 | 34 |
| 5   | 70  | 58  | 50  | 44  | 65  | 55  | 47  | 42  | 48 | 42 | 38 | 42 | 37 | 34 | 36 | 33 | 30 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 42  | 36  | 43 | 37 | 33 | 38 | 33 | 29 | 33 | 29 | 26 |
| 7   | 60  | 47  | 39  | 33  | 56  | 44  | 37  | 32  | 39 | 33 | 29 | 35 | 30 | 26 | 30 | 26 | 23 |
| 8   | 55  | 43  | 35  | 30  | 52  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 23 | 28 | 24 | 21 |
| 9   | 52  | 39  | 32  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 29 | 24 | 21 | 26 | 22 | 19 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 | 27 | 22 | 19 | 24 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2026 | 2026 | 2026 |
| 5°  | 2029 | 1998 | 2012 |
| 10° | 2013 | 1972 | 1985 |
| 15° | 1983 | 1939 | 1943 |
| 20° | 1943 | 1895 | 1900 |
| 25° | 1904 | 1841 | 1850 |
| 30° | 1854 | 1791 | 1786 |
| 35° | 1806 | 1732 | 1718 |
| 40° | 1748 | 1673 | 1654 |
| 45° | 1690 | 1613 | 1589 |
| 50° | 1627 | 1550 | 1513 |
| 55° | 1560 | 1478 | 1443 |
| 60° | 1485 | 1392 | 1363 |
| 65° | 1404 | 1303 | 1269 |
| 70° | 1299 | 1195 | 1168 |
| 75° | 1155 | 1065 | 1075 |
| 80° | 981  | 900  | 896  |
| 85° | 709  | 614  | 600  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1690 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 261.3   | 2.2       |
| 10°-20°   | 735.1   | 6.2       |
| 20°-30°   | 1080.3  | 9.2       |
| 30°-40°   | 1254.7  | 10.6      |
| 40°-50°   | 1253.1  | 10.6      |
| 50°-60°   | 1092.7  | 9.3       |
| 60°-70°   | 807.7   | 6.8       |
| 70°-80°   | 457.0   | 3.9       |
| 80°-90°   | 125.4   | 1.1       |
| 90°-100°  | 104.7   | 0.9       |
| 100°-110° | 332.7   | 2.8       |
| 110°-120° | 569.3   | 4.8       |
| 120°-130° | 748.8   | 6.3       |
| 130°-140° | 840.5   | 7.1       |
| 140°-150° | 824.2   | 7.0       |
| 150°-160° | 691.4   | 5.9       |
| 160°-170° | 458.5   | 3.9       |
| 170°-180° | 160.3   | 1.4       |
| 0°-30°    | 2076.6  | 17.6      |
| 0°-40°    | 3331.3  | 28.2      |
| 0°-60°    | 5677.0  | 48.1      |
| 0°-90°    | 7067.2  | 59.9      |
| 90°-120°  | 1006.7  | 8.5       |
| 90°-150°  | 3420.1  | 29.0      |
| 90°-180°  | 4730.0  | 40.1      |
| 0°-180°   | 11797.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2776 | 2776  | 2776 | 2776  | 2776 |      |
| 5°   | 2776 | 2765  | 2736 | 2757  | 2752 | 263  |
| 15°  | 2642 | 2626  | 2592 | 2602  | 2589 | 744  |
| 25°  | 2392 | 2370  | 2325 | 2330  | 2325 | 1100 |
| 35°  | 2063 | 2037  | 1994 | 1978  | 1964 | 1288 |
| 45°  | 1679 | 1660  | 1620 | 1591  | 1580 | 1296 |
| 55°  | 1271 | 1254  | 1222 | 1190  | 1177 | 1136 |
| 65°  | 857  | 841   | 814  | 790   | 777  | 847  |
| 75°  | 448  | 443   | 430  | 414   | 419  | 479  |
| 85°  | 109  | 107   | 104  | 96    | 94   | 122  |
| 90°  | 2    | 18    | 50   | 47    | 48   | 11   |
| 95°  | 74   | 89    | 91   | 91    | 89   | 83   |
| 105° | 307  | 311   | 314  | 317   | 317  | 324  |
| 115° | 571  | 580   | 577  | 575   | 571  | 565  |
| 125° | 831  | 844   | 840  | 835   | 834  | 743  |
| 135° | 1075 | 1091  | 1094 | 1092  | 1088 | 831  |
| 145° | 1305 | 1315  | 1323 | 1325  | 1319 | 815  |
| 155° | 1492 | 1496  | 1501 | 1508  | 1503 | 687  |
| 165° | 1623 | 1622  | 1622 | 1632  | 1625 | 458  |
| 175° | 1689 | 1685  | 1682 | 1692  | 1683 | 160  |
| 180° | 1692 | 1692  | 1692 | 1692  | 1692 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2775.7 | 2775.7 | 2775.7 | 2775.7 | 2775.7 |
| 2.5°   | 2791.9 | 2778.6 | 2749.1 | 2775.7 | 2770.6 |
| 5°     | 2775.7 | 2765.3 | 2735.9 | 2757.1 | 2752.0 |
| 7.5°   | 2757.1 | 2741.2 | 2711.8 | 2733.3 | 2727.9 |
| 10°    | 2727.9 | 2709.2 | 2677.2 | 2698.4 | 2690.6 |
| 12.5°  | 2687.7 | 2671.8 | 2639.8 | 2653.1 | 2647.8 |
| 15°    | 2642.4 | 2626.5 | 2591.7 | 2602.5 | 2589.2 |
| 17.5°  | 2586.3 | 2570.4 | 2535.6 | 2549.0 | 2535.6 |
| 20°    | 2524.9 | 2509.0 | 2471.6 | 2479.6 | 2469.1 |
| 22.5°  | 2463.7 | 2439.6 | 2404.8 | 2404.8 | 2399.4 |
| 25°    | 2391.5 | 2370.3 | 2325.0 | 2330.0 | 2325.0 |
| 27.5°  | 2311.3 | 2292.7 | 2258.1 | 2250.1 | 2236.9 |
| 30°    | 2231.5 | 2209.9 | 2170.1 | 2162.1 | 2151.3 |
| 32.5°  | 2146.0 | 2130.1 | 2087.3 | 2071.2 | 2060.5 |
| 35°    | 2063.2 | 2036.7 | 1993.9 | 1977.7 | 1964.4 |
| 37.5°  | 1969.8 | 1945.7 | 1903.0 | 1884.3 | 1871.0 |
| 40°    | 1873.8 | 1852.3 | 1809.5 | 1785.7 | 1774.9 |
| 42.5°  | 1780.4 | 1758.8 | 1716.4 | 1689.4 | 1673.7 |
| 45°    | 1679.0 | 1660.3 | 1620.1 | 1590.9 | 1580.2 |
| 47.5°  | 1580.2 | 1561.5 | 1518.7 | 1489.2 | 1473.4 |
| 50°    | 1476.0 | 1462.7 | 1425.2 | 1387.9 | 1374.6 |
| 52.5°  | 1374.6 | 1355.8 | 1321.3 | 1291.9 | 1273.2 |
| 55°    | 1270.6 | 1254.5 | 1222.5 | 1190.5 | 1177.1 |
| 57.5°  | 1166.4 | 1153.2 | 1118.3 | 1086.3 | 1075.5 |
| 60°    | 1062.2 | 1051.8 | 1014.3 | 984.9  | 977.0  |
| 62.5°  | 960.8  | 942.2  | 915.5  | 888.9  | 878.2  |
| 65°    | 856.9  | 840.8  | 814.1  | 790.1  | 776.8  |
| 67.5°  | 750.1  | 736.6  | 712.7  | 694.1  | 683.3  |
| 70°    | 651.3  | 640.5  | 616.5  | 597.8  | 587.3  |
| 72.5°  | 549.9  | 539.2  | 525.8  | 507.2  | 499.3  |
| 75°    | 448.3  | 443.2  | 429.6  | 413.8  | 419.1  |
| 77.5°  | 357.7  | 346.9  | 341.5  | 333.6  | 325.7  |
| 80°    | 267.1  | 264.2  | 258.9  | 250.9  | 245.5  |
| 82.5°  | 181.6  | 181.6  | 179.0  | 168.2  | 168.2  |
| 85°    | 109.3  | 106.7  | 104.2  | 96.0   | 93.5   |
| 87.5°  | 48.2   | 42.8   | 37.4   | 29.4   | 26.7   |
| 90°    | 1.5    | 18.4   | 50.0   | 46.9   | 48.4   |
| 92.5°  | 31.7   | 42.9   | 44.4   | 45.9   | 45.9   |
| 95°    | 74.5   | 88.7   | 91.3   | 91.3   | 88.7   |
| 97.5°  | 123.9  | 137.2  | 142.9  | 142.9  | 142.9  |
| 100°   | 181.1  | 192.8  | 196.9  | 196.9  | 195.4  |
| 102.5° | 241.3  | 249.9  | 255.6  | 257.1  | 255.6  |
| 105°   | 307.1  | 311.2  | 314.2  | 316.8  | 316.8  |
| 107.5° | 372.4  | 378.5  | 378.5  | 379.5  | 372.4  |
| 110°   | 435.7  | 443.8  | 443.8  | 443.8  | 439.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 504.0  | 512.6  | 511.1  | 507.0  | 504.0  |
| 115°   | 571.3  | 579.5  | 576.9  | 575.4  | 571.3  |
| 117.5° | 638.2  | 649.4  | 642.2  | 638.2  | 634.1  |
| 120°   | 705.5  | 716.8  | 705.5  | 705.5  | 700.9  |
| 122.5° | 766.7  | 781.0  | 773.8  | 769.8  | 766.7  |
| 125°   | 831.0  | 843.7  | 839.6  | 835.1  | 833.6  |
| 127.5° | 893.8  | 909.5  | 903.9  | 897.9  | 893.8  |
| 130°   | 952.4  | 970.8  | 968.2  | 965.2  | 959.6  |
| 132.5° | 1018.2 | 1032.5 | 1033.5 | 1026.4 | 1022.3 |
| 135°   | 1074.9 | 1090.7 | 1093.7 | 1092.2 | 1088.1 |
| 137.5° | 1138.1 | 1150.8 | 1153.4 | 1152.4 | 1146.3 |
| 140°   | 1193.7 | 1206.5 | 1213.6 | 1213.6 | 1208.0 |
| 142.5° | 1250.8 | 1263.6 | 1267.7 | 1269.2 | 1263.6 |
| 145°   | 1304.9 | 1315.1 | 1323.3 | 1324.8 | 1319.2 |
| 147.5° | 1353.3 | 1366.1 | 1372.3 | 1374.7 | 1369.1 |
| 150°   | 1403.4 | 1412.0 | 1417.6 | 1422.2 | 1417.6 |
| 152.5° | 1447.7 | 1456.4 | 1463.6 | 1469.2 | 1463.6 |
| 155°   | 1492.1 | 1496.2 | 1500.7 | 1508.0 | 1503.3 |
| 157.5° | 1530.4 | 1533.5 | 1536.0 | 1546.2 | 1539.1 |
| 160°   | 1564.6 | 1567.6 | 1569.1 | 1577.8 | 1571.7 |
| 162.5° | 1596.2 | 1596.2 | 1597.7 | 1607.4 | 1600.3 |
| 165°   | 1623.2 | 1621.7 | 1621.7 | 1631.9 | 1624.8 |
| 167.5° | 1647.7 | 1643.2 | 1643.2 | 1653.3 | 1646.2 |
| 170°   | 1666.1 | 1662.0 | 1660.5 | 1670.6 | 1662.0 |
| 172.5° | 1678.8 | 1674.7 | 1673.2 | 1683.4 | 1674.7 |
| 175°   | 1689.0 | 1685.0 | 1681.9 | 1692.1 | 1683.4 |
| 177.5° | 1694.6 | 1690.6 | 1687.5 | 1696.1 | 1687.5 |
| 180°   | 1692.1 | 1692.1 | 1692.1 | 1692.1 | 1692.1 |

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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 | 10.60            | 11.56 | 11.47 | 12.45 | 13.57 | 10.16          | 11.12 | 11.03 | 12.00 | 13.13 |
|                 | 3H   | 12.27            | 13.13 | 13.15 | 14.03 | 15.17 | 11.78          | 12.64 | 12.66 | 13.54 | 14.69 |
|                 | 4H   | 12.86            | 13.68 | 13.76 | 14.58 | 15.74 | 12.38          | 13.19 | 13.27 | 14.09 | 15.25 |
|                 | 6H   | 13.27            | 14.02 | 14.18 | 14.93 | 16.10 | 12.78          | 13.53 | 13.68 | 14.44 | 15.61 |
|                 | 8H   | 13.38            | 14.09 | 14.29 | 15.02 | 16.19 | 12.89          | 13.60 | 13.80 | 14.53 | 15.70 |
|                 | 12H  | 13.43            | 14.11 | 14.35 | 15.03 | 16.23 | 12.93          | 13.61 | 13.85 | 14.53 | 15.73 |
| 4H              | 2H   | 11.07            | 11.88 | 11.97 | 12.79 | 13.95 | 10.72          | 11.53 | 11.62 | 12.44 | 13.60 |
|                 | 3H   | 12.95            | 13.63 | 13.86 | 14.56 | 15.74 | 12.55          | 13.23 | 13.46 | 14.16 | 15.33 |
|                 | 4H   | 13.67            | 14.29 | 14.59 | 15.22 | 16.42 | 13.25          | 13.87 | 14.17 | 14.80 | 16.00 |
|                 | 6H   | 14.19            | 14.73 | 15.13 | 15.68 | 16.88 | 13.77          | 14.30 | 14.70 | 15.26 | 16.46 |
|                 | 8H   | 14.35            | 14.85 | 15.29 | 15.79 | 17.01 | 13.92          | 14.42 | 14.86 | 15.37 | 16.58 |
|                 | 12H  | 14.43            | 14.88 | 15.38 | 15.84 | 17.06 | 13.99          | 14.44 | 14.94 | 15.40 | 16.62 |
| 8H              | 4H   | 13.87            | 14.37 | 14.81 | 15.32 | 16.54 | 13.50          | 14.00 | 14.44 | 14.95 | 16.16 |
|                 | 6H   | 14.51            | 14.93 | 15.48 | 15.92 | 17.13 | 14.14          | 14.55 | 15.10 | 15.54 | 16.75 |
|                 | 8H   | 14.74            | 15.10 | 15.71 | 16.08 | 17.31 | 14.35          | 14.72 | 15.33 | 15.70 | 16.93 |
|                 | 12H  | 14.87            | 15.20 | 15.85 | 16.17 | 17.45 | 14.47          | 14.79 | 15.45 | 15.77 | 17.05 |
| 12H             | 4H   | 13.86            | 14.32 | 14.82 | 15.28 | 16.50 | 13.50          | 13.95 | 14.46 | 14.92 | 16.14 |
|                 | 6H   | 14.54            | 14.91 | 15.52 | 15.89 | 17.12 | 14.18          | 14.55 | 15.15 | 15.53 | 16.76 |
|                 | 8H   | 14.79            | 15.12 | 15.77 | 16.09 | 17.37 | 14.42          | 14.74 | 15.40 | 15.72 | 16.99 |