

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: P909338

Luminaire Tested: DFN2DIP-SQ3F0-110D080US840-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909338  
REPORT IS A COMBINATION OF REPORTS P899948 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-110D080US840-RLLFLL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

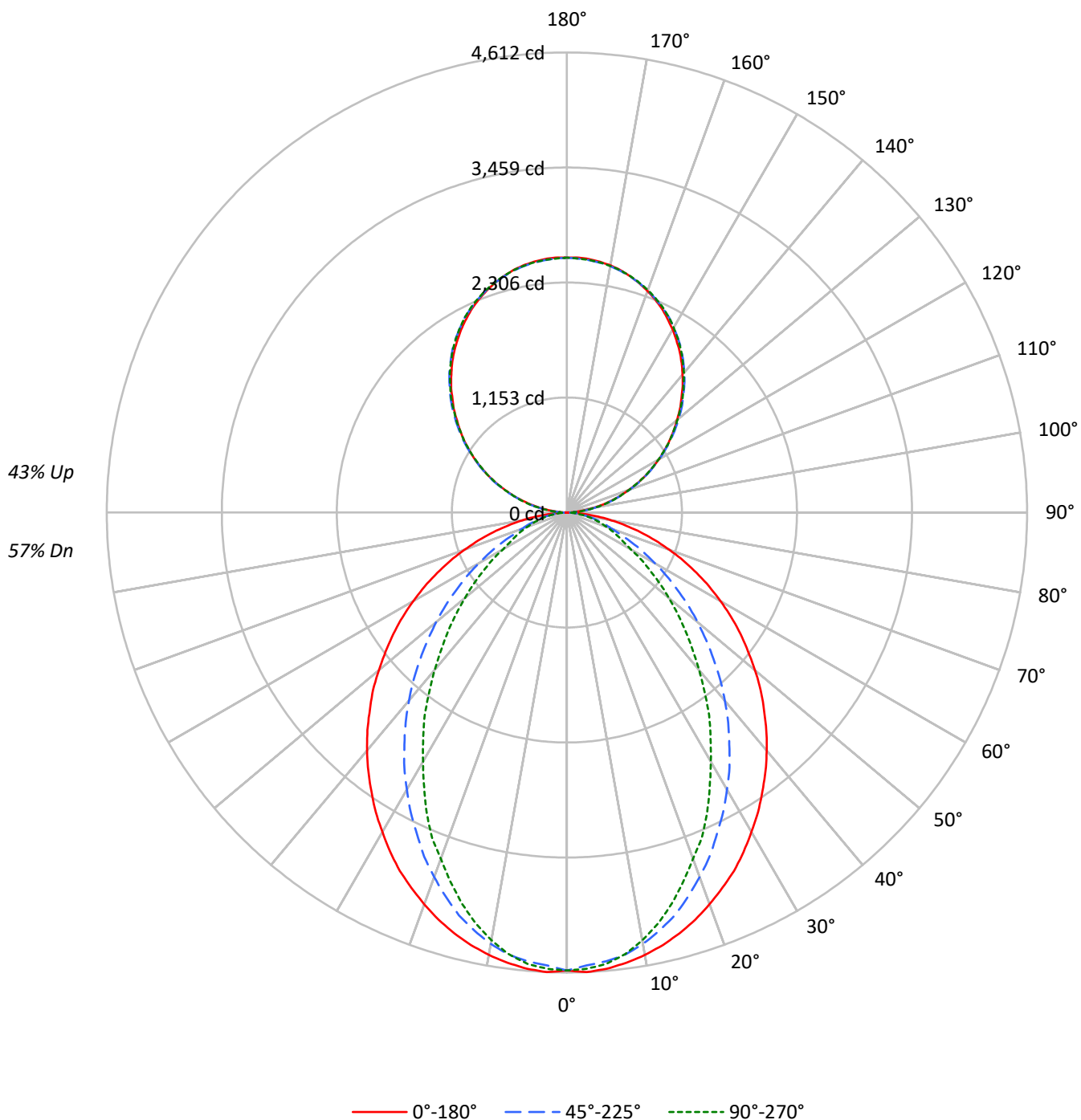
Lumens per Lamp: N/A  
Luminaire Lumens: 16592.1 lumens  
Efficiency: N/A  
Efficacy: 96.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 172.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
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-SQ3F0-110D080US840-RLFL

### 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   | 109 | 109 | 109 | 109 | 101 | 101 | 101 | 101 | 87 | 87 | 87 | 74 | 74 | 74 | 63 | 63 | 63 |
| 1   | 100 | 96  | 92  | 89  | 93  | 89  | 86  | 83  | 77 | 75 | 73 | 66 | 65 | 63 | 56 | 55 | 54 |
| 2   | 91  | 84  | 78  | 73  | 85  | 79  | 74  | 69  | 68 | 65 | 61 | 59 | 56 | 54 | 50 | 48 | 46 |
| 3   | 84  | 75  | 67  | 62  | 78  | 70  | 64  | 58  | 61 | 56 | 52 | 53 | 49 | 46 | 45 | 42 | 40 |
| 4   | 77  | 66  | 59  | 53  | 71  | 62  | 55  | 50  | 54 | 49 | 45 | 47 | 43 | 40 | 40 | 37 | 35 |
| 5   | 71  | 59  | 52  | 46  | 66  | 56  | 49  | 43  | 49 | 43 | 39 | 43 | 38 | 35 | 37 | 33 | 31 |
| 6   | 65  | 54  | 46  | 40  | 61  | 50  | 43  | 38  | 44 | 39 | 34 | 39 | 34 | 31 | 34 | 30 | 27 |
| 7   | 61  | 49  | 41  | 35  | 57  | 46  | 39  | 34  | 40 | 35 | 31 | 35 | 31 | 28 | 31 | 27 | 25 |
| 8   | 56  | 44  | 37  | 31  | 53  | 42  | 35  | 30  | 37 | 31 | 27 | 33 | 28 | 25 | 28 | 25 | 22 |
| 9   | 53  | 41  | 33  | 28  | 49  | 38  | 32  | 27  | 34 | 29 | 25 | 30 | 26 | 22 | 26 | 23 | 20 |
| 10  | 49  | 37  | 30  | 26  | 46  | 35  | 29  | 24  | 32 | 26 | 22 | 28 | 24 | 20 | 24 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 5261 | 5261 | 5261 |
| 5°  | 5266 | 5174 | 5209 |
| 10° | 5210 | 5069 | 5037 |
| 15° | 5135 | 4898 | 4774 |
| 20° | 5037 | 4664 | 4451 |
| 25° | 4936 | 4402 | 4139 |
| 30° | 4802 | 4133 | 3744 |
| 35° | 4671 | 3845 | 3398 |
| 40° | 4537 | 3548 | 3000 |
| 45° | 4382 | 3218 | 2640 |
| 50° | 4220 | 2886 | 2289 |
| 55° | 4052 | 2530 | 1951 |
| 60° | 3857 | 2160 | 1604 |
| 65° | 3632 | 1784 | 1442 |
| 70° | 3360 | 1432 | 1302 |
| 75° | 3017 | 1255 | 1181 |
| 80° | 2521 | 1042 | 1019 |
| 85° | 1709 | 679  | 756  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 4382 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 430.3   | 2.6       |
| 10°-20°   | 1181.2  | 7.1       |
| 20°-30°   | 1658.4  | 10.0      |
| 30°-40°   | 1807.8  | 10.9      |
| 40°-50°   | 1661.5  | 10.0      |
| 50°-60°   | 1304.9  | 7.9       |
| 60°-70°   | 849.4   | 5.1       |
| 70°-80°   | 437.2   | 2.6       |
| 80°-90°   | 118.9   | 0.7       |
| 90°-100°  | 158.1   | 1.0       |
| 100°-110° | 502.4   | 3.0       |
| 110°-120° | 859.7   | 5.2       |
| 120°-130° | 1130.6  | 6.8       |
| 130°-140° | 1269.1  | 7.6       |
| 140°-150° | 1244.5  | 7.5       |
| 150°-160° | 1043.9  | 6.3       |
| 160°-170° | 692.3   | 4.2       |
| 170°-180° | 242.0   | 1.5       |
| 0°-30°    | 3269.9  | 19.7      |
| 0°-40°    | 5077.7  | 30.6      |
| 0°-60°    | 8044.1  | 48.5      |
| 0°-90°    | 9449.5  | 57.0      |
| 90°-120°  | 1520.1  | 9.2       |
| 90°-150°  | 5164.3  | 31.1      |
| 90°-180°  | 7143.0  | 43.1      |
| 0°-180°   | 16592.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4591 | 4591  | 4591 | 4591  | 4591 |      |
| 5°   | 4591 | 4570  | 4516 | 4554  | 4541 | 435  |
| 15°  | 4367 | 4321  | 4180 | 4101  | 4060 | 1231 |
| 25°  | 3964 | 3831  | 3556 | 3386  | 3324 | 1823 |
| 35°  | 3416 | 3203  | 2838 | 2576  | 2484 | 2138 |
| 45°  | 2792 | 2514  | 2078 | 1782  | 1683 | 2156 |
| 55°  | 2123 | 1799  | 1350 | 1101  | 1022 | 1897 |
| 65°  | 1434 | 1097  | 723  | 582   | 569  | 1421 |
| 75°  | 764  | 473   | 332  | 303   | 299  | 808  |
| 85°  | 178  | 91    | 79   | 79    | 79   | 205  |
| 90°  | 2    | 28    | 76   | 71    | 73   | 16   |
| 95°  | 112  | 134   | 138  | 138   | 134  | 125  |
| 105° | 464  | 470   | 474  | 478   | 478  | 489  |
| 115° | 863  | 875   | 871  | 869   | 863  | 853  |
| 125° | 1255 | 1274  | 1268 | 1261  | 1259 | 1121 |
| 135° | 1623 | 1647  | 1652 | 1649  | 1643 | 1254 |
| 145° | 1970 | 1986  | 1998 | 2000  | 1992 | 1231 |
| 155° | 2253 | 2259  | 2266 | 2277  | 2270 | 1037 |
| 165° | 2451 | 2449  | 2449 | 2464  | 2453 | 691  |
| 175° | 2550 | 2544  | 2540 | 2555  | 2542 | 242  |
| 180° | 2555 | 2555  | 2555 | 2555  | 2555 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4591.2 | 4591.2 | 4591.2 | 4591.2 | 4591.2 |
| 2.5°   | 4611.9 | 4591.2 | 4545.3 | 4587.2 | 4578.8 |
| 5°     | 4591.2 | 4570.4 | 4516.2 | 4553.7 | 4541.4 |
| 7.5°   | 4553.7 | 4528.9 | 4470.8 | 4487.1 | 4466.3 |
| 10°    | 4503.9 | 4474.7 | 4391.9 | 4379.1 | 4354.4 |
| 12.5°  | 4441.7 | 4404.2 | 4291.8 | 4267.1 | 4221.2 |
| 15°    | 4366.8 | 4320.9 | 4179.8 | 4101.0 | 4059.5 |
| 17.5°  | 4279.5 | 4213.0 | 4038.4 | 3947.1 | 3880.5 |
| 20°    | 4179.8 | 4096.5 | 3888.9 | 3785.3 | 3693.6 |
| 22.5°  | 4071.9 | 3976.1 | 3735.1 | 3594.0 | 3531.8 |
| 25°    | 3963.8 | 3830.7 | 3556.5 | 3386.4 | 3323.8 |
| 27.5°  | 3835.2 | 3693.6 | 3390.3 | 3195.0 | 3099.4 |
| 30°    | 3698.0 | 3539.8 | 3207.4 | 2995.8 | 2883.4 |
| 32.5°  | 3564.9 | 3373.6 | 3033.2 | 2783.8 | 2679.8 |
| 35°    | 3415.5 | 3203.4 | 2838.0 | 2576.2 | 2484.5 |
| 37.5°  | 3270.0 | 3041.2 | 2655.0 | 2368.0 | 2264.5 |
| 40°    | 3116.1 | 2867.1 | 2463.8 | 2168.8 | 2060.8 |
| 42.5°  | 2958.3 | 2692.5 | 2272.9 | 1965.2 | 1861.6 |
| 45°    | 2792.2 | 2513.6 | 2077.6 | 1782.2 | 1682.6 |
| 47.5°  | 2634.3 | 2339.5 | 1890.7 | 1595.3 | 1504.1 |
| 50°    | 2459.7 | 2164.8 | 1707.8 | 1420.8 | 1333.9 |
| 52.5°  | 2289.2 | 1977.5 | 1533.2 | 1259.0 | 1180.0 |
| 55°    | 2122.9 | 1799.0 | 1350.2 | 1101.2 | 1022.3 |
| 57.5°  | 1952.9 | 1620.4 | 1188.4 | 955.7  | 889.1  |
| 60°    | 1778.3 | 1445.9 | 1017.8 | 806.3  | 739.7  |
| 62.5°  | 1608.1 | 1275.8 | 872.4  | 673.2  | 640.1  |
| 65°    | 1433.5 | 1096.7 | 723.0  | 581.9  | 569.1  |
| 67.5°  | 1267.4 | 930.6  | 581.9  | 510.9  | 498.6  |
| 70°    | 1092.8 | 768.8  | 481.8  | 440.4  | 423.6  |
| 72.5°  | 926.6  | 618.9  | 402.9  | 369.8  | 361.4  |
| 75°    | 764.4  | 473.4  | 332.3  | 303.3  | 299.3  |
| 77.5°  | 602.6  | 336.4  | 261.9  | 245.1  | 236.7  |
| 80°    | 452.7  | 241.2  | 199.2  | 183.0  | 183.0  |
| 82.5°  | 315.6  | 162.2  | 137.1  | 128.8  | 128.8  |
| 85°    | 178.5  | 91.3   | 78.9   | 78.9   | 78.9   |
| 87.5°  | 66.6   | 33.0   | 33.0   | 29.1   | 29.1   |
| 90°    | 2.3    | 27.8   | 75.5   | 70.9   | 73.2   |
| 92.5°  | 47.8   | 64.7   | 67.1   | 69.3   | 69.3   |
| 95°    | 112.5  | 134.0  | 137.8  | 137.8  | 134.0  |
| 97.5°  | 187.2  | 207.2  | 215.7  | 215.7  | 215.7  |
| 100°   | 273.5  | 291.1  | 297.3  | 297.3  | 295.0  |
| 102.5° | 364.4  | 377.5  | 385.9  | 388.2  | 385.9  |
| 105°   | 463.7  | 469.9  | 474.5  | 478.4  | 478.4  |
| 107.5° | 562.3  | 571.6  | 571.6  | 573.1  | 562.3  |
| 110°   | 657.8  | 670.1  | 670.1  | 670.1  | 664.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 761.0  | 774.2  | 771.8  | 765.7  | 761.0  |
| 115°   | 862.7  | 875.0  | 871.2  | 868.9  | 862.7  |
| 117.5° | 963.6  | 980.6  | 969.8  | 963.6  | 957.5  |
| 120°   | 1065.3 | 1082.3 | 1065.3 | 1065.3 | 1058.3 |
| 122.5° | 1157.7 | 1179.3 | 1168.5 | 1162.4 | 1157.7 |
| 125°   | 1254.8 | 1274.0 | 1267.9 | 1260.9 | 1258.7 |
| 127.5° | 1349.6 | 1373.4 | 1364.9 | 1355.7 | 1349.6 |
| 130°   | 1438.1 | 1465.8 | 1462.0 | 1457.4 | 1449.0 |
| 132.5° | 1537.5 | 1559.0 | 1560.6 | 1549.8 | 1543.7 |
| 135°   | 1623.0 | 1646.9 | 1651.5 | 1649.2 | 1643.1 |
| 137.5° | 1718.5 | 1737.8 | 1741.6 | 1740.1 | 1730.8 |
| 140°   | 1802.5 | 1821.7 | 1832.5 | 1832.5 | 1824.0 |
| 142.5° | 1888.8 | 1908.0 | 1914.2 | 1916.5 | 1908.0 |
| 145°   | 1970.4 | 1985.8 | 1998.1 | 2000.4 | 1992.0 |
| 147.5° | 2043.6 | 2062.9 | 2072.0 | 2076.0 | 2067.5 |
| 150°   | 2119.1 | 2132.1 | 2140.6 | 2147.6 | 2140.6 |
| 152.5° | 2186.1 | 2199.2 | 2210.0 | 2218.5 | 2210.0 |
| 155°   | 2253.1 | 2259.3 | 2266.2 | 2276.9 | 2270.1 |
| 157.5° | 2310.9 | 2315.5 | 2319.4 | 2334.7 | 2324.0 |
| 160°   | 2362.5 | 2367.1 | 2369.4 | 2382.5 | 2373.3 |
| 162.5° | 2410.2 | 2410.2 | 2412.6 | 2427.2 | 2416.4 |
| 165°   | 2451.0 | 2448.7 | 2448.7 | 2464.2 | 2453.4 |
| 167.5° | 2488.0 | 2481.1 | 2481.1 | 2496.5 | 2485.7 |
| 170°   | 2515.8 | 2509.6 | 2507.3 | 2522.7 | 2509.6 |
| 172.5° | 2535.1 | 2528.9 | 2526.6 | 2541.9 | 2528.9 |
| 175°   | 2550.4 | 2544.3 | 2539.6 | 2555.1 | 2541.9 |
| 177.5° | 2558.9 | 2552.7 | 2548.1 | 2561.2 | 2548.1 |
| 180°   | 2555.1 | 2555.1 | 2555.1 | 2555.1 | 2555.1 |

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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 | 13.51            | 14.40 | 14.41 | 15.31 | 16.48 | 9.47           | 10.36 | 10.37 | 11.27 | 12.44 |
|                 | 3H   | 15.18            | 15.98 | 16.10 | 16.91 | 18.10 | 10.65          | 11.45 | 11.57 | 12.38 | 13.57 |
|                 | 4H   | 15.79            | 16.54 | 16.72 | 17.47 | 18.68 | 11.10          | 11.85 | 12.03 | 12.79 | 13.99 |
|                 | 6H   | 16.21            | 16.90 | 17.15 | 17.84 | 19.06 | 11.42          | 12.11 | 12.36 | 13.05 | 14.27 |
|                 | 8H   | 16.34            | 17.00 | 17.29 | 17.95 | 19.17 | 11.51          | 12.17 | 12.46 | 13.12 | 14.34 |
|                 | 12H  | 16.40            | 17.03 | 17.35 | 17.97 | 19.22 | 11.55          | 12.18 | 12.50 | 13.13 | 14.37 |
| 4H              | 2H   | 13.53            | 14.28 | 14.46 | 15.21 | 16.42 | 10.07          | 10.82 | 11.00 | 11.75 | 12.96 |
|                 | 3H   | 15.36            | 15.98 | 16.30 | 16.95 | 18.17 | 11.42          | 12.04 | 12.36 | 13.00 | 14.22 |
|                 | 4H   | 16.05            | 16.62 | 17.00 | 17.58 | 18.82 | 11.96          | 12.53 | 12.91 | 13.49 | 14.73 |
|                 | 6H   | 16.56            | 17.05 | 17.53 | 18.03 | 19.28 | 12.38          | 12.87 | 13.34 | 13.85 | 15.09 |
|                 | 8H   | 16.74            | 17.19 | 17.71 | 18.17 | 19.43 | 12.50          | 12.96 | 13.47 | 13.93 | 15.19 |
|                 | 12H  | 16.83            | 17.24 | 17.82 | 18.24 | 19.50 | 12.57          | 12.98 | 13.55 | 13.97 | 15.23 |
| 8H              | 4H   | 16.02            | 16.48 | 16.99 | 17.45 | 18.71 | 12.24          | 12.70 | 13.21 | 13.67 | 14.93 |
|                 | 6H   | 16.58            | 16.96 | 17.58 | 17.98 | 19.23 | 12.75          | 13.13 | 13.75 | 14.15 | 15.40 |
|                 | 8H   | 16.80            | 17.13 | 17.80 | 18.13 | 19.41 | 12.94          | 13.27 | 13.94 | 14.28 | 15.55 |
|                 | 12H  | 16.93            | 17.23 | 17.94 | 18.23 | 19.55 | 13.06          | 13.35 | 14.06 | 14.35 | 15.67 |
| 12H             | 4H   | 15.97            | 16.39 | 16.96 | 17.38 | 18.64 | 12.25          | 12.66 | 13.24 | 13.65 | 14.91 |
|                 | 6H   | 16.56            | 16.89 | 17.56 | 17.90 | 19.17 | 12.80          | 13.14 | 13.80 | 14.14 | 15.41 |
|                 | 8H   | 16.78            | 17.07 | 17.78 | 18.07 | 19.39 | 13.01          | 13.30 | 14.02 | 14.30 | 15.62 |