

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: P902658

Luminaire Tested: DFN2DIP-HX3F0-080D080US830-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902658  
REPORT IS A COMBINATION OF REPORTS P899281 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-080D080US830-FLLFLL  
Description: 3 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

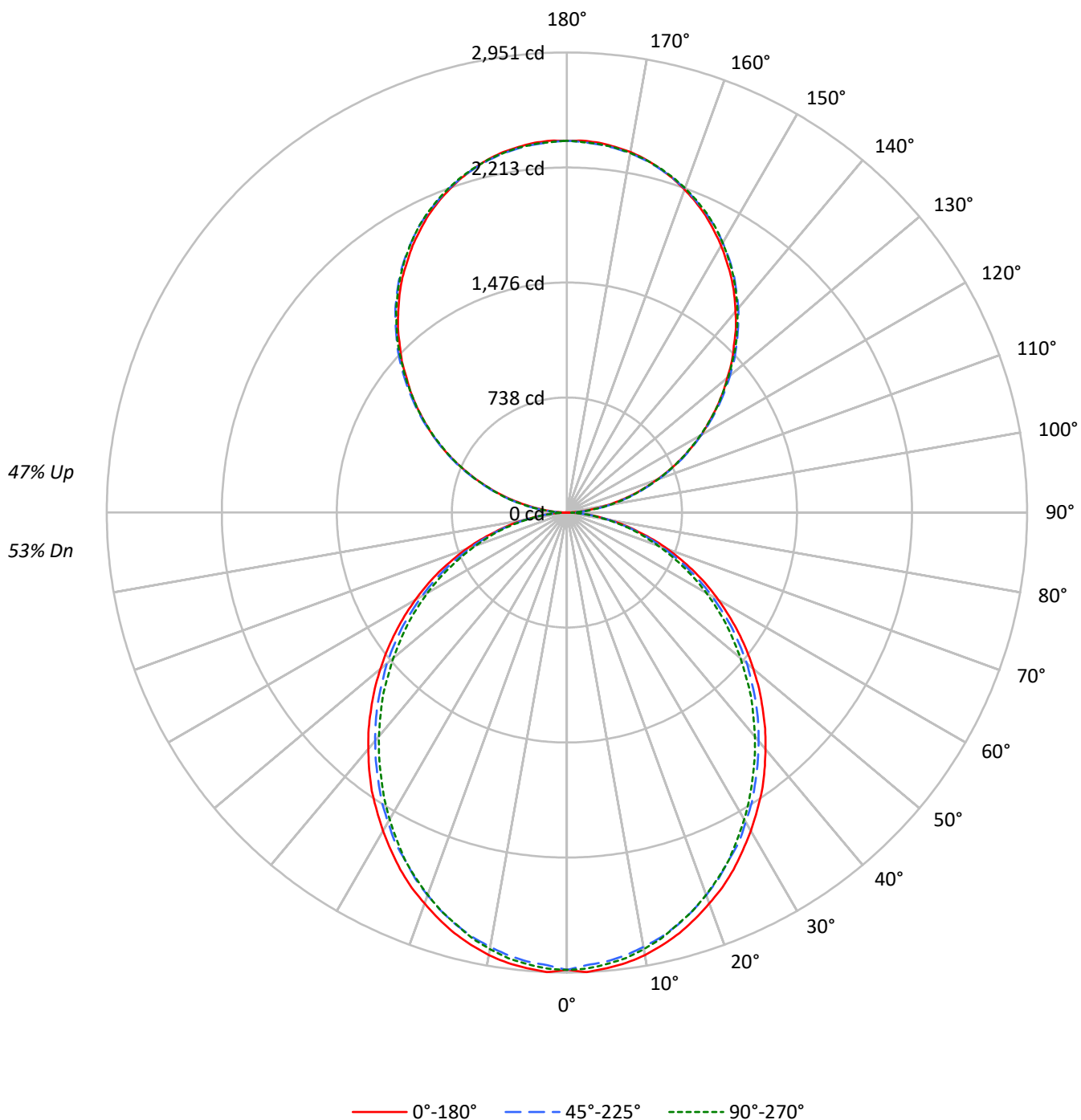
Lumens per Lamp: N/A  
Luminaire Lumens: 14138.1 lumens  
Efficiency: N/A  
Efficacy: 100.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 141.3  
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-HX3F0-080D080US830-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P902658

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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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 59 | 59 | 59 |
| 1   | 98  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 74 | 72 | 70 | 63 | 61 | 59 | 52 | 51 | 50 |
| 2   | 90  | 82  | 76  | 71  | 83  | 76  | 71  | 66  | 65 | 61 | 58 | 55 | 52 | 50 | 46 | 44 | 42 |
| 3   | 82  | 72  | 65  | 59  | 75  | 67  | 61  | 55  | 58 | 53 | 49 | 49 | 45 | 42 | 41 | 38 | 36 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 52  | 47  | 51 | 46 | 41 | 43 | 39 | 36 | 36 | 33 | 31 |
| 5   | 69  | 57  | 49  | 43  | 63  | 53  | 46  | 40  | 46 | 40 | 36 | 39 | 35 | 31 | 33 | 29 | 27 |
| 6   | 63  | 51  | 43  | 37  | 58  | 48  | 40  | 35  | 41 | 36 | 31 | 35 | 31 | 27 | 30 | 26 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 37 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 29 | 24 | 29 | 25 | 22 | 25 | 21 | 19 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 19 | 23 | 20 | 17 |
| 10  | 47  | 35  | 28  | 23  | 44  | 33  | 26  | 22  | 29 | 23 | 20 | 25 | 21 | 18 | 21 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3398 | 3398 | 3398 |
| 5°  | 3402 | 3349 | 3372 |
| 10° | 3373 | 3301 | 3324 |
| 15° | 3322 | 3245 | 3251 |
| 20° | 3254 | 3167 | 3176 |
| 25° | 3185 | 3074 | 3090 |
| 30° | 3100 | 2988 | 2981 |
| 35° | 3019 | 2886 | 2865 |
| 40° | 2920 | 2784 | 2755 |
| 45° | 2821 | 2680 | 2643 |
| 50° | 2713 | 2572 | 2513 |
| 55° | 2599 | 2447 | 2392 |
| 60° | 2471 | 2299 | 2255 |
| 65° | 2330 | 2145 | 2092 |
| 70° | 2151 | 1957 | 1917 |
| 75° | 1904 | 1732 | 1752 |
| 80° | 1605 | 1444 | 1443 |
| 85° | 1139 | 956  | 936  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2821 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 276.1   | 2.0       |
| 10°-20°   | 777.0   | 5.5       |
| 20°-30°   | 1141.8  | 8.1       |
| 30°-40°   | 1326.2  | 9.4       |
| 40°-50°   | 1324.5  | 9.4       |
| 50°-60°   | 1155.0  | 8.2       |
| 60°-70°   | 853.8   | 6.0       |
| 70°-80°   | 483.0   | 3.4       |
| 80°-90°   | 134.3   | 0.9       |
| 90°-100°  | 147.6   | 1.0       |
| 100°-110° | 468.9   | 3.3       |
| 110°-120° | 802.4   | 5.7       |
| 120°-130° | 1055.3  | 7.5       |
| 130°-140° | 1184.5  | 8.4       |
| 140°-150° | 1161.5  | 8.2       |
| 150°-160° | 974.4   | 6.9       |
| 160°-170° | 646.2   | 4.6       |
| 170°-180° | 225.9   | 1.6       |
| 0°-30°    | 2195.0  | 15.5      |
| 0°-40°    | 3521.1  | 24.9      |
| 0°-60°    | 6000.6  | 42.4      |
| 0°-90°    | 7471.7  | 52.8      |
| 90°-120°  | 1418.8  | 10.0      |
| 90°-150°  | 4820.1  | 34.1      |
| 90°-180°  | 6666.0  | 47.1      |
| 0°-180°   | 14138.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2934 | 2934  | 2934 | 2934  | 2934 |      |
| 5°   | 2934 | 2923  | 2892 | 2914  | 2909 | 279  |
| 15°  | 2793 | 2776  | 2739 | 2751  | 2737 | 787  |
| 25°  | 2528 | 2505  | 2458 | 2463  | 2458 | 1163 |
| 35°  | 2181 | 2153  | 2108 | 2090  | 2076 | 1362 |
| 45°  | 1775 | 1755  | 1712 | 1682  | 1670 | 1370 |
| 55°  | 1343 | 1326  | 1292 | 1258  | 1244 | 1201 |
| 65°  | 906  | 889   | 860  | 835   | 821  | 896  |
| 75°  | 474  | 468   | 454  | 437   | 443  | 506  |
| 85°  | 116  | 113   | 110  | 102   | 99   | 129  |
| 90°  | 2    | 26    | 70   | 66    | 68   | 14   |
| 95°  | 105  | 125   | 129  | 129   | 125  | 117  |
| 105° | 433  | 439   | 443  | 446   | 446  | 457  |
| 115° | 805  | 817   | 813  | 811   | 805  | 796  |
| 125° | 1171 | 1189  | 1183 | 1177  | 1175 | 1047 |
| 135° | 1515 | 1537  | 1541 | 1539  | 1534 | 1171 |
| 145° | 1839 | 1853  | 1865 | 1867  | 1859 | 1149 |
| 155° | 2103 | 2109  | 2115 | 2125  | 2119 | 968  |
| 165° | 2288 | 2286  | 2286 | 2300  | 2290 | 645  |
| 175° | 2380 | 2375  | 2370 | 2385  | 2372 | 226  |
| 180° | 2385 | 2385  | 2385 | 2385  | 2385 |      |

TEST NUMBER: P902658

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2933.9 | 2933.9 | 2933.9 | 2933.9 | 2933.9 |
| 2.5°   | 2951.0 | 2937.0 | 2905.9 | 2933.9 | 2928.6 |
| 5°     | 2933.9 | 2922.9 | 2891.8 | 2914.2 | 2908.9 |
| 7.5°   | 2914.2 | 2897.5 | 2866.4 | 2889.1 | 2883.4 |
| 10°    | 2883.4 | 2863.6 | 2829.8 | 2852.2 | 2843.9 |
| 12.5°  | 2840.9 | 2824.1 | 2790.3 | 2804.3 | 2798.7 |
| 15°    | 2793.0 | 2776.3 | 2739.4 | 2750.8 | 2736.8 |
| 17.5°  | 2733.7 | 2717.0 | 2680.1 | 2694.3 | 2680.1 |
| 20°    | 2668.8 | 2652.0 | 2612.5 | 2620.9 | 2609.8 |
| 22.5°  | 2604.2 | 2578.7 | 2541.8 | 2541.8 | 2536.2 |
| 25°    | 2527.8 | 2505.4 | 2457.5 | 2462.9 | 2457.5 |
| 27.5°  | 2443.1 | 2423.4 | 2386.8 | 2378.4 | 2364.4 |
| 30°    | 2358.7 | 2335.9 | 2293.8 | 2285.4 | 2274.0 |
| 32.5°  | 2268.3 | 2251.5 | 2206.3 | 2189.2 | 2177.9 |
| 35°    | 2180.9 | 2152.8 | 2107.5 | 2090.5 | 2076.4 |
| 37.5°  | 2082.1 | 2056.6 | 2011.5 | 1991.7 | 1977.6 |
| 40°    | 1980.7 | 1957.8 | 1912.7 | 1887.5 | 1876.1 |
| 42.5°  | 1881.9 | 1859.1 | 1814.2 | 1785.7 | 1769.1 |
| 45°    | 1774.7 | 1754.9 | 1712.4 | 1681.6 | 1670.3 |
| 47.5°  | 1670.3 | 1650.5 | 1605.2 | 1574.1 | 1557.4 |
| 50°    | 1560.1 | 1546.1 | 1506.5 | 1467.0 | 1452.9 |
| 52.5°  | 1452.9 | 1433.1 | 1396.7 | 1365.6 | 1345.8 |
| 55°    | 1343.0 | 1326.0 | 1292.2 | 1258.4 | 1244.3 |
| 57.5°  | 1232.9 | 1218.9 | 1182.0 | 1148.2 | 1136.8 |
| 60°    | 1122.8 | 1111.7 | 1072.1 | 1041.0 | 1032.6 |
| 62.5°  | 1015.6 | 995.9  | 967.7  | 939.6  | 928.2  |
| 65°    | 905.8  | 888.7  | 860.5  | 835.1  | 821.0  |
| 67.5°  | 792.9  | 778.5  | 753.4  | 733.7  | 722.3  |
| 70°    | 688.4  | 677.0  | 651.7  | 631.9  | 620.8  |
| 72.5°  | 581.3  | 570.0  | 555.8  | 536.1  | 527.7  |
| 75°    | 473.8  | 468.4  | 454.1  | 437.3  | 443.0  |
| 77.5°  | 378.1  | 366.6  | 361.0  | 352.6  | 344.2  |
| 80°    | 282.3  | 279.3  | 273.6  | 265.2  | 259.5  |
| 82.5°  | 191.9  | 191.9  | 189.2  | 177.8  | 177.8  |
| 85°    | 115.6  | 112.8  | 110.2  | 101.5  | 98.8   |
| 87.5°  | 50.9   | 45.2   | 39.5   | 31.1   | 28.2   |
| 90°    | 2.2    | 25.9   | 70.5   | 66.2   | 68.3   |
| 92.5°  | 44.6   | 60.4   | 62.6   | 64.7   | 64.7   |
| 95°    | 105.0  | 125.1  | 128.7  | 128.7  | 125.1  |
| 97.5°  | 174.7  | 193.4  | 201.3  | 201.3  | 201.3  |
| 100°   | 255.2  | 271.7  | 277.5  | 277.5  | 275.3  |
| 102.5° | 340.1  | 352.3  | 360.1  | 362.3  | 360.1  |
| 105°   | 432.8  | 438.6  | 442.9  | 446.5  | 446.5  |
| 107.5° | 524.8  | 533.5  | 533.5  | 534.9  | 524.8  |
| 110°   | 614.0  | 625.5  | 625.5  | 625.5  | 619.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 710.3  | 722.6  | 720.4  | 714.6  | 710.3  |
| 115°   | 805.2  | 816.7  | 813.1  | 811.0  | 805.2  |
| 117.5° | 899.4  | 915.2  | 905.1  | 899.4  | 893.6  |
| 120°   | 994.3  | 1010.1 | 994.3  | 994.3  | 987.8  |
| 122.5° | 1080.5 | 1100.7 | 1090.6 | 1084.9 | 1080.5 |
| 125°   | 1171.1 | 1189.1 | 1183.4 | 1176.9 | 1174.8 |
| 127.5° | 1259.6 | 1281.9 | 1273.9 | 1265.4 | 1259.6 |
| 130°   | 1342.3 | 1368.1 | 1364.5 | 1360.3 | 1352.4 |
| 132.5° | 1435.0 | 1455.1 | 1456.6 | 1446.5 | 1440.8 |
| 135°   | 1514.8 | 1537.1 | 1541.4 | 1539.3 | 1533.5 |
| 137.5° | 1603.9 | 1621.9 | 1625.5 | 1624.1 | 1615.4 |
| 140°   | 1682.3 | 1700.3 | 1710.3 | 1710.3 | 1702.4 |
| 142.5° | 1762.8 | 1780.8 | 1786.6 | 1788.8 | 1780.8 |
| 145°   | 1839.1 | 1853.4 | 1864.9 | 1867.1 | 1859.2 |
| 147.5° | 1907.3 | 1925.3 | 1933.9 | 1937.6 | 1929.7 |
| 150°   | 1977.8 | 1990.0 | 1997.9 | 2004.4 | 1997.9 |
| 152.5° | 2040.3 | 2052.6 | 2062.7 | 2070.6 | 2062.7 |
| 155°   | 2102.9 | 2108.7 | 2115.2 | 2125.2 | 2118.7 |
| 157.5° | 2156.8 | 2161.2 | 2164.7 | 2179.1 | 2169.1 |
| 160°   | 2205.0 | 2209.3 | 2211.5 | 2223.6 | 2215.1 |
| 162.5° | 2249.6 | 2249.6 | 2251.7 | 2265.4 | 2255.3 |
| 165°   | 2287.6 | 2285.5 | 2285.5 | 2299.9 | 2289.8 |
| 167.5° | 2322.1 | 2315.7 | 2315.7 | 2330.1 | 2320.0 |
| 170°   | 2348.1 | 2342.3 | 2340.1 | 2354.6 | 2342.3 |
| 172.5° | 2366.1 | 2360.3 | 2358.1 | 2372.5 | 2360.3 |
| 175°   | 2380.4 | 2374.6 | 2370.3 | 2384.7 | 2372.5 |
| 177.5° | 2388.3 | 2382.6 | 2378.2 | 2390.5 | 2378.2 |
| 180°   | 2384.7 | 2384.7 | 2384.7 | 2384.7 | 2384.7 |

TEST NUMBER: P902658

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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 | 11.74            | 12.62 | 12.67 | 13.57 | 14.80 | 11.31          | 12.20 | 12.24 | 13.15 | 14.38 |
|                 | 3H   | 13.39            | 14.19 | 14.34 | 15.15 | 16.40 | 12.92          | 13.72 | 13.87 | 14.68 | 15.93 |
|                 | 4H   | 13.98            | 14.73 | 14.93 | 15.69 | 16.95 | 13.51          | 14.26 | 14.46 | 15.22 | 16.49 |
|                 | 6H   | 14.37            | 15.06 | 15.34 | 16.03 | 17.31 | 13.90          | 14.59 | 14.87 | 15.56 | 16.84 |
|                 | 8H   | 14.47            | 15.13 | 15.45 | 16.12 | 17.39 | 14.00          | 14.66 | 14.98 | 15.65 | 16.92 |
|                 | 12H  | 14.52            | 15.15 | 15.50 | 16.13 | 17.43 | 14.04          | 14.67 | 15.03 | 15.65 | 16.95 |
| 4H              | 2H   | 12.20            | 12.95 | 13.16 | 13.92 | 15.18 | 11.86          | 12.61 | 12.82 | 13.57 | 14.83 |
|                 | 3H   | 14.06            | 14.69 | 15.03 | 15.68 | 16.96 | 13.67          | 14.30 | 14.64 | 15.29 | 16.57 |
|                 | 4H   | 14.77            | 15.34 | 15.75 | 16.33 | 17.63 | 14.37          | 14.94 | 15.35 | 15.93 | 17.23 |
|                 | 6H   | 15.28            | 15.77 | 16.27 | 16.78 | 18.08 | 14.87          | 15.37 | 15.87 | 16.38 | 17.68 |
|                 | 8H   | 15.42            | 15.89 | 16.42 | 16.89 | 18.20 | 15.02          | 15.48 | 16.01 | 16.48 | 17.80 |
|                 | 12H  | 15.49            | 15.91 | 16.51 | 16.93 | 18.25 | 15.08          | 15.50 | 16.09 | 16.52 | 17.83 |
| 8H              | 4H   | 14.96            | 15.43 | 15.96 | 16.43 | 17.74 | 14.61          | 15.07 | 15.60 | 16.07 | 17.39 |
|                 | 6H   | 15.59            | 15.97 | 16.61 | 17.01 | 18.33 | 15.23          | 15.61 | 16.25 | 16.66 | 17.97 |
|                 | 8H   | 15.80            | 16.14 | 16.83 | 17.17 | 18.50 | 15.44          | 15.77 | 16.47 | 16.81 | 18.14 |
|                 | 12H  | 15.93            | 16.23 | 16.96 | 17.25 | 18.63 | 15.55          | 15.85 | 16.58 | 16.87 | 18.25 |
| 12H             | 4H   | 14.95            | 15.37 | 15.96 | 16.39 | 17.71 | 14.60          | 15.02 | 15.62 | 16.04 | 17.36 |
|                 | 6H   | 15.61            | 15.95 | 16.64 | 16.98 | 18.31 | 15.27          | 15.60 | 16.30 | 16.64 | 17.97 |
|                 | 8H   | 15.85            | 16.15 | 16.89 | 17.18 | 18.55 | 15.50          | 15.80 | 16.53 | 16.82 | 18.20 |