

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: P912392

Luminaire Tested: DFN2DIP-SQ4F0-140D110US850-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912392  
REPORT IS A COMBINATION OF REPORTS P900163 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-140D110US850-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

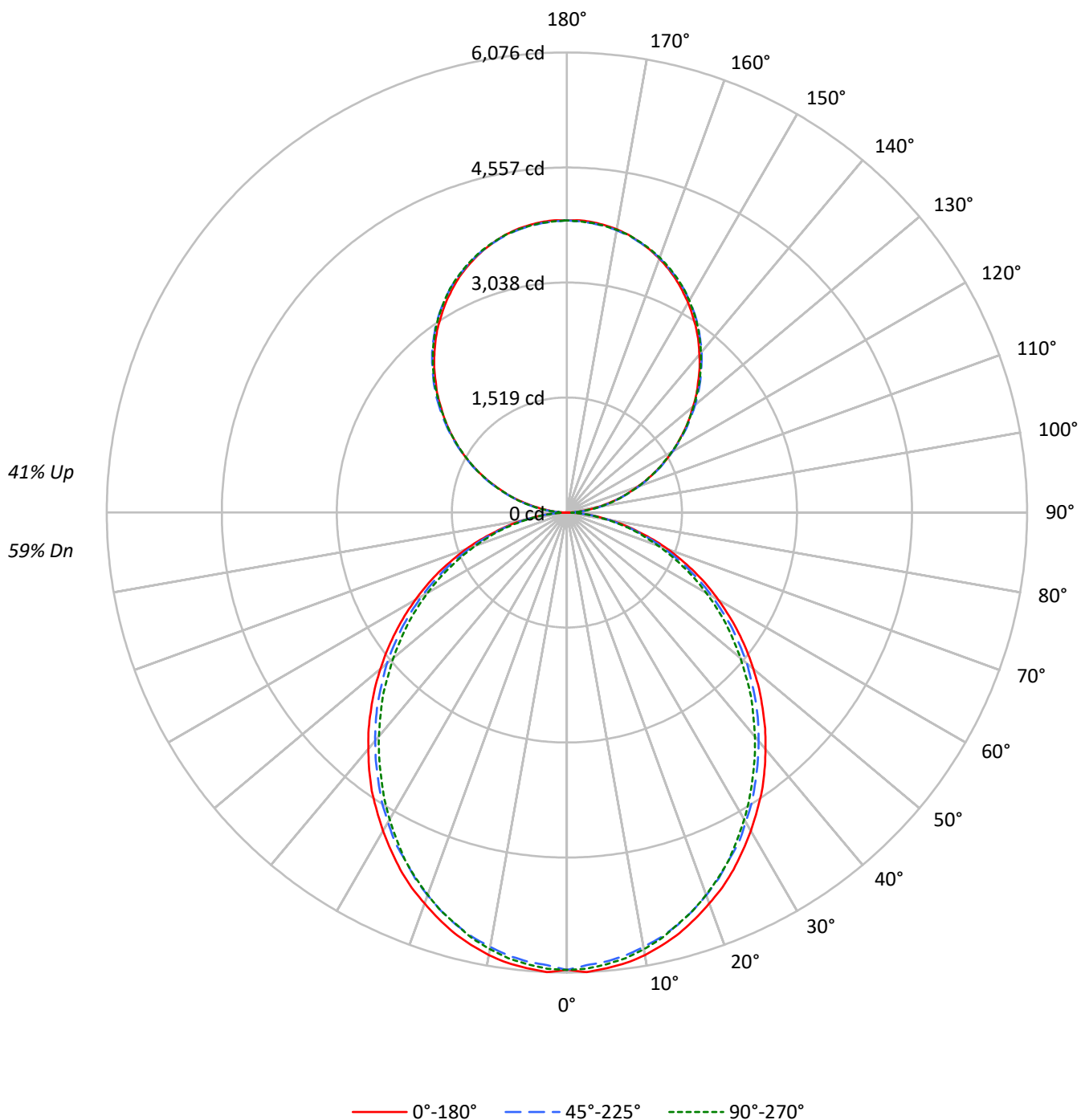
Lumens per Lamp: N/A  
Luminaire Lumens: 26166.8 lumens  
Efficiency: N/A  
Efficacy: 115.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 226.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-SQ4F0-140D110US850-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P912392

CATALOG NUMBER: DFN2DIP-SQ4F0-140D110US850-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   | 109 | 109 | 109 | 109 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 76 | 76 | 76 | 64 | 64 | 64 |
| 1   | 100 | 95  | 91  | 88  | 93  | 89  | 86  | 83  | 77 | 75 | 73 | 67 | 65 | 63 | 57 | 55 | 54 |
| 2   | 91  | 83  | 77  | 72  | 84  | 78  | 72  | 68  | 68 | 64 | 60 | 59 | 55 | 53 | 50 | 48 | 46 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 51 | 52 | 48 | 45 | 44 | 41 | 39 |
| 4   | 76  | 65  | 57  | 51  | 70  | 61  | 54  | 48  | 53 | 48 | 43 | 46 | 42 | 38 | 40 | 36 | 34 |
| 5   | 70  | 58  | 50  | 44  | 65  | 54  | 47  | 41  | 48 | 42 | 37 | 41 | 37 | 33 | 36 | 32 | 29 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 41  | 36  | 43 | 37 | 33 | 38 | 33 | 29 | 32 | 29 | 26 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 32  | 39 | 33 | 29 | 34 | 29 | 26 | 30 | 26 | 23 |
| 8   | 55  | 43  | 35  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 31 | 27 | 23 | 27 | 23 | 21 |
| 9   | 51  | 39  | 31  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 29 | 24 | 21 | 25 | 21 | 19 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 | 27 | 22 | 19 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4239 | 4239 | 4239 |
| 5°  | 4246 | 4181 | 4209 |
| 10° | 4211 | 4125 | 4153 |
| 15° | 4149 | 4058 | 4066 |
| 20° | 4066 | 3965 | 3976 |
| 25° | 3982 | 3853 | 3871 |
| 30° | 3878 | 3748 | 3739 |
| 35° | 3779 | 3626 | 3598 |
| 40° | 3657 | 3501 | 3464 |
| 45° | 3536 | 3377 | 3328 |
| 50° | 3403 | 3246 | 3169 |
| 55° | 3264 | 3095 | 3024 |
| 60° | 3107 | 2916 | 2858 |
| 65° | 2936 | 2731 | 2661 |
| 70° | 2717 | 2504 | 2450 |
| 75° | 2415 | 2234 | 2258 |
| 80° | 2051 | 1890 | 1886 |
| 85° | 1483 | 1293 | 1268 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3536 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 568.6   | 2.2       |
| 10°-20°   | 1599.8  | 6.1       |
| 20°-30°   | 2351.1  | 9.0       |
| 30°-40°   | 2730.7  | 10.4      |
| 40°-50°   | 2727.3  | 10.4      |
| 50°-60°   | 2378.1  | 9.1       |
| 60°-70°   | 1757.9  | 6.7       |
| 70°-80°   | 994.6   | 3.8       |
| 80°-90°   | 273.5   | 1.0       |
| 90°-100°  | 238.7   | 0.9       |
| 100°-110° | 758.6   | 2.9       |
| 110°-120° | 1298.1  | 5.0       |
| 120°-130° | 1707.2  | 6.5       |
| 130°-140° | 1916.3  | 7.3       |
| 140°-150° | 1879.1  | 7.2       |
| 150°-160° | 1576.3  | 6.0       |
| 160°-170° | 1045.4  | 4.0       |
| 170°-180° | 365.4   | 1.4       |
| 0°-30°    | 4519.6  | 17.3      |
| 0°-40°    | 7250.2  | 27.7      |
| 0°-60°    | 12355.7 | 47.2      |
| 0°-90°    | 15381.7 | 58.8      |
| 90°-120°  | 2295.4  | 8.8       |
| 90°-150°  | 7798.0  | 29.8      |
| 90°-180°  | 10785.0 | 41.2      |
| 0°-180°   | 26166.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 6041 | 6041  | 6041 | 6041  | 6041 |      |
| 5°   | 6041 | 6018  | 5954 | 6001  | 5990 | 573  |
| 15°  | 5751 | 5716  | 5641 | 5664  | 5635 | 1620 |
| 25°  | 5205 | 5159  | 5060 | 5071  | 5060 | 2395 |
| 35°  | 4491 | 4433  | 4340 | 4304  | 4275 | 2804 |
| 45°  | 3654 | 3614  | 3526 | 3462  | 3439 | 2820 |
| 55°  | 2766 | 2730  | 2661 | 2591  | 2562 | 2472 |
| 65°  | 1865 | 1830  | 1772 | 1720  | 1691 | 1844 |
| 75°  | 976  | 965   | 935  | 900   | 912  | 1042 |
| 85°  | 238  | 232   | 227  | 209   | 203  | 265  |
| 90°  | 3    | 42    | 114  | 107   | 110  | 25   |
| 95°  | 170  | 202   | 208  | 208   | 202  | 189  |
| 105° | 700  | 710   | 716  | 722   | 722  | 739  |
| 115° | 1303 | 1321  | 1316 | 1312  | 1303 | 1288 |
| 125° | 1895 | 1924  | 1914 | 1904  | 1900 | 1693 |
| 135° | 2451 | 2487  | 2494 | 2490  | 2481 | 1894 |
| 145° | 2975 | 2998  | 3017 | 3021  | 3008 | 1859 |
| 155° | 3402 | 3411  | 3422 | 3438  | 3428 | 1566 |
| 165° | 3701 | 3698  | 3698 | 3721  | 3704 | 1044 |
| 175° | 3851 | 3842  | 3835 | 3858  | 3838 | 366  |
| 180° | 3858 | 3858  | 3858 | 3858  | 3858 |      |

TEST NUMBER: P912392

CATALOG NUMBER: DFN2DIP-SQ4F0-140D110US850-FLLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 6041.3 | 6041.3 | 6041.3 | 6041.3 | 6041.3 |
| 2.5°   | 6076.3 | 6047.4 | 5983.3 | 6041.3 | 6030.2 |
| 5°     | 6041.3 | 6018.4 | 5954.3 | 6000.6 | 5989.5 |
| 7.5°   | 6000.6 | 5966.1 | 5902.0 | 5948.8 | 5937.0 |
| 10°    | 5937.0 | 5896.4 | 5826.8 | 5873.0 | 5855.7 |
| 12.5°  | 5849.5 | 5815.0 | 5745.4 | 5774.3 | 5762.7 |
| 15°    | 5750.9 | 5716.5 | 5640.6 | 5664.1 | 5635.1 |
| 17.5°  | 5629.0 | 5594.5 | 5518.6 | 5547.6 | 5518.6 |
| 20°    | 5495.2 | 5460.7 | 5379.3 | 5396.6 | 5373.8 |
| 22.5°  | 5362.0 | 5309.7 | 5233.8 | 5233.8 | 5222.2 |
| 25°    | 5204.9 | 5158.6 | 5060.0 | 5071.1 | 5060.0 |
| 27.5°  | 5030.4 | 4989.8 | 4914.6 | 4897.3 | 4868.4 |
| 30°    | 4856.6 | 4809.8 | 4722.9 | 4705.7 | 4682.2 |
| 32.5°  | 4670.6 | 4636.1 | 4542.9 | 4507.9 | 4484.4 |
| 35°    | 4490.6 | 4432.7 | 4339.5 | 4304.5 | 4275.4 |
| 37.5°  | 4287.2 | 4234.8 | 4141.7 | 4101.1 | 4072.0 |
| 40°    | 4078.2 | 4031.4 | 3938.3 | 3886.6 | 3863.1 |
| 42.5°  | 3874.8 | 3828.0 | 3735.6 | 3677.0 | 3642.5 |
| 45°    | 3654.2 | 3613.6 | 3526.1 | 3462.5 | 3439.1 |
| 47.5°  | 3439.1 | 3398.4 | 3305.4 | 3241.3 | 3206.8 |
| 50°    | 3212.3 | 3183.4 | 3102.0 | 3020.6 | 2991.6 |
| 52.5°  | 2991.6 | 2950.9 | 2875.7 | 2811.6 | 2771.1 |
| 55°    | 2765.5 | 2730.4 | 2660.7 | 2591.1 | 2562.1 |
| 57.5°  | 2538.6 | 2509.7 | 2433.9 | 2364.3 | 2340.8 |
| 60°    | 2311.8 | 2289.1 | 2207.7 | 2143.6 | 2126.3 |
| 62.5°  | 2091.2 | 2050.5 | 1992.5 | 1934.7 | 1911.3 |
| 65°    | 1865.0 | 1829.8 | 1772.0 | 1719.5 | 1690.6 |
| 67.5°  | 1632.7 | 1603.1 | 1551.3 | 1510.6 | 1487.2 |
| 70°    | 1417.5 | 1394.1 | 1341.8 | 1301.1 | 1278.2 |
| 72.5°  | 1196.9 | 1173.4 | 1144.5 | 1103.9 | 1086.6 |
| 75°    | 975.7  | 964.6  | 935.0  | 900.5  | 912.2  |
| 77.5°  | 778.4  | 755.0  | 743.3  | 726.1  | 708.8  |
| 80°    | 581.2  | 575.0  | 563.4  | 546.1  | 534.3  |
| 82.5°  | 395.0  | 395.0  | 389.5  | 366.1  | 366.1  |
| 85°    | 237.9  | 232.3  | 226.8  | 208.9  | 203.4  |
| 87.5°  | 104.8  | 93.0   | 81.4   | 64.1   | 57.9   |
| 90°    | 3.4    | 41.9   | 114.0  | 107.0  | 110.5  |
| 92.5°  | 72.1   | 97.7   | 101.1  | 104.7  | 104.7  |
| 95°    | 169.8  | 202.4  | 208.2  | 208.2  | 202.4  |
| 97.5°  | 282.7  | 312.8  | 325.7  | 325.7  | 325.7  |
| 100°   | 412.9  | 439.6  | 448.9  | 448.9  | 445.5  |
| 102.5° | 550.2  | 569.9  | 582.8  | 586.2  | 582.8  |
| 105°   | 700.2  | 709.5  | 716.5  | 722.3  | 722.3  |
| 107.5° | 849.1  | 863.0  | 863.0  | 865.4  | 849.1  |
| 110°   | 993.3  | 1012.0 | 1012.0 | 1012.0 | 1002.6 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1149.1 | 1168.9 | 1165.4 | 1156.1 | 1149.1 |
| 115°   | 1302.7 | 1321.3 | 1315.5 | 1312.1 | 1302.7 |
| 117.5° | 1455.1 | 1480.6 | 1464.3 | 1455.1 | 1445.8 |
| 120°   | 1608.6 | 1634.2 | 1608.6 | 1608.6 | 1598.2 |
| 122.5° | 1748.2 | 1780.7 | 1764.4 | 1755.1 | 1748.2 |
| 125°   | 1894.7 | 1923.8 | 1914.5 | 1904.0 | 1900.5 |
| 127.5° | 2037.8 | 2073.8 | 2061.1 | 2047.1 | 2037.8 |
| 130°   | 2171.5 | 2213.5 | 2207.6 | 2200.6 | 2187.8 |
| 132.5° | 2321.6 | 2354.2 | 2356.5 | 2340.2 | 2330.9 |
| 135°   | 2450.7 | 2486.7 | 2493.7 | 2490.3 | 2480.9 |
| 137.5° | 2594.9 | 2624.0 | 2629.8 | 2627.4 | 2613.6 |
| 140°   | 2721.7 | 2750.8 | 2767.1 | 2767.1 | 2754.3 |
| 142.5° | 2852.0 | 2881.1 | 2890.4 | 2893.8 | 2881.1 |
| 145°   | 2975.2 | 2998.5 | 3017.1 | 3020.6 | 3007.8 |
| 147.5° | 3085.8 | 3114.8 | 3128.8 | 3134.6 | 3121.8 |
| 150°   | 3199.8 | 3219.5 | 3232.3 | 3242.8 | 3232.3 |
| 152.5° | 3300.9 | 3320.7 | 3337.0 | 3349.8 | 3337.0 |
| 155°   | 3402.2 | 3411.4 | 3421.9 | 3438.2 | 3427.7 |
| 157.5° | 3489.4 | 3496.3 | 3502.1 | 3525.4 | 3509.1 |
| 160°   | 3567.3 | 3574.3 | 3577.7 | 3597.6 | 3583.6 |
| 162.5° | 3639.4 | 3639.4 | 3643.0 | 3665.0 | 3648.7 |
| 165°   | 3701.1 | 3697.5 | 3697.5 | 3720.8 | 3704.5 |
| 167.5° | 3756.8 | 3746.4 | 3746.4 | 3769.7 | 3753.4 |
| 170°   | 3798.8 | 3789.5 | 3786.0 | 3809.2 | 3789.5 |
| 172.5° | 3827.8 | 3818.5 | 3815.1 | 3838.4 | 3818.5 |
| 175°   | 3851.1 | 3841.8 | 3834.8 | 3858.1 | 3838.4 |
| 177.5° | 3863.9 | 3854.6 | 3847.6 | 3867.4 | 3847.6 |
| 180°   | 3858.1 | 3858.1 | 3858.1 | 3858.1 | 3858.1 |

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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 | 13.07            | 14.02 | 13.95 | 14.92 | 16.06 | 12.63          | 13.58 | 13.51 | 14.48 | 15.62 |
|                 | 3H   | 14.75            | 15.60 | 15.64 | 16.50 | 17.67 | 14.26          | 15.10 | 15.15 | 16.01 | 17.18 |
|                 | 4H   | 15.34            | 16.14 | 16.25 | 17.06 | 18.23 | 14.85          | 15.65 | 15.75 | 16.56 | 17.74 |
|                 | 6H   | 15.75            | 16.49 | 16.67 | 17.41 | 18.60 | 15.25          | 15.99 | 16.16 | 16.91 | 18.10 |
|                 | 8H   | 15.86            | 16.56 | 16.78 | 17.50 | 18.69 | 15.36          | 16.06 | 16.28 | 17.00 | 18.19 |
|                 | 12H  | 15.91            | 16.58 | 16.84 | 17.51 | 18.73 | 15.40          | 16.07 | 16.33 | 17.00 | 18.22 |
| 4H              | 2H   | 13.55            | 14.35 | 14.46 | 15.26 | 16.44 | 13.19          | 13.99 | 14.10 | 14.91 | 16.08 |
|                 | 3H   | 15.42            | 16.10 | 16.35 | 17.04 | 18.23 | 15.02          | 15.69 | 15.94 | 16.63 | 17.82 |
|                 | 4H   | 16.15            | 16.76 | 17.08 | 17.70 | 18.91 | 15.72          | 16.33 | 16.65 | 17.27 | 18.49 |
|                 | 6H   | 16.67            | 17.20 | 17.62 | 18.16 | 19.38 | 16.24          | 16.77 | 17.18 | 17.73 | 18.95 |
|                 | 8H   | 16.82            | 17.32 | 17.77 | 18.28 | 19.50 | 16.39          | 16.88 | 17.33 | 17.84 | 19.07 |
|                 | 12H  | 16.90            | 17.35 | 17.87 | 18.32 | 19.56 | 16.45          | 16.90 | 17.42 | 17.87 | 19.11 |
| 8H              | 4H   | 16.35            | 16.84 | 17.30 | 17.80 | 19.03 | 15.97          | 16.47 | 16.92 | 17.42 | 18.65 |
|                 | 6H   | 16.99            | 17.40 | 17.96 | 18.40 | 19.63 | 16.61          | 17.01 | 17.58 | 18.01 | 19.24 |
|                 | 8H   | 17.21            | 17.57 | 18.20 | 18.56 | 19.81 | 16.82          | 17.18 | 17.80 | 18.17 | 19.42 |
|                 | 12H  | 17.35            | 17.67 | 18.34 | 18.65 | 19.95 | 16.94          | 17.26 | 17.93 | 18.24 | 19.54 |
| 12H             | 4H   | 16.34            | 16.78 | 17.31 | 17.76 | 19.00 | 15.97          | 16.42 | 16.94 | 17.39 | 18.63 |
|                 | 6H   | 17.02            | 17.38 | 18.00 | 18.37 | 19.62 | 16.65          | 17.01 | 17.63 | 18.00 | 19.25 |
|                 | 8H   | 17.27            | 17.59 | 18.26 | 18.57 | 19.86 | 16.89          | 17.21 | 17.88 | 18.19 | 19.48 |