

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: P906933

Luminaire Tested: DFN2DIP-SQ4F0-140D100US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906933  
REPORT IS A COMBINATION OF REPORTS P901665 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-140D100US835-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

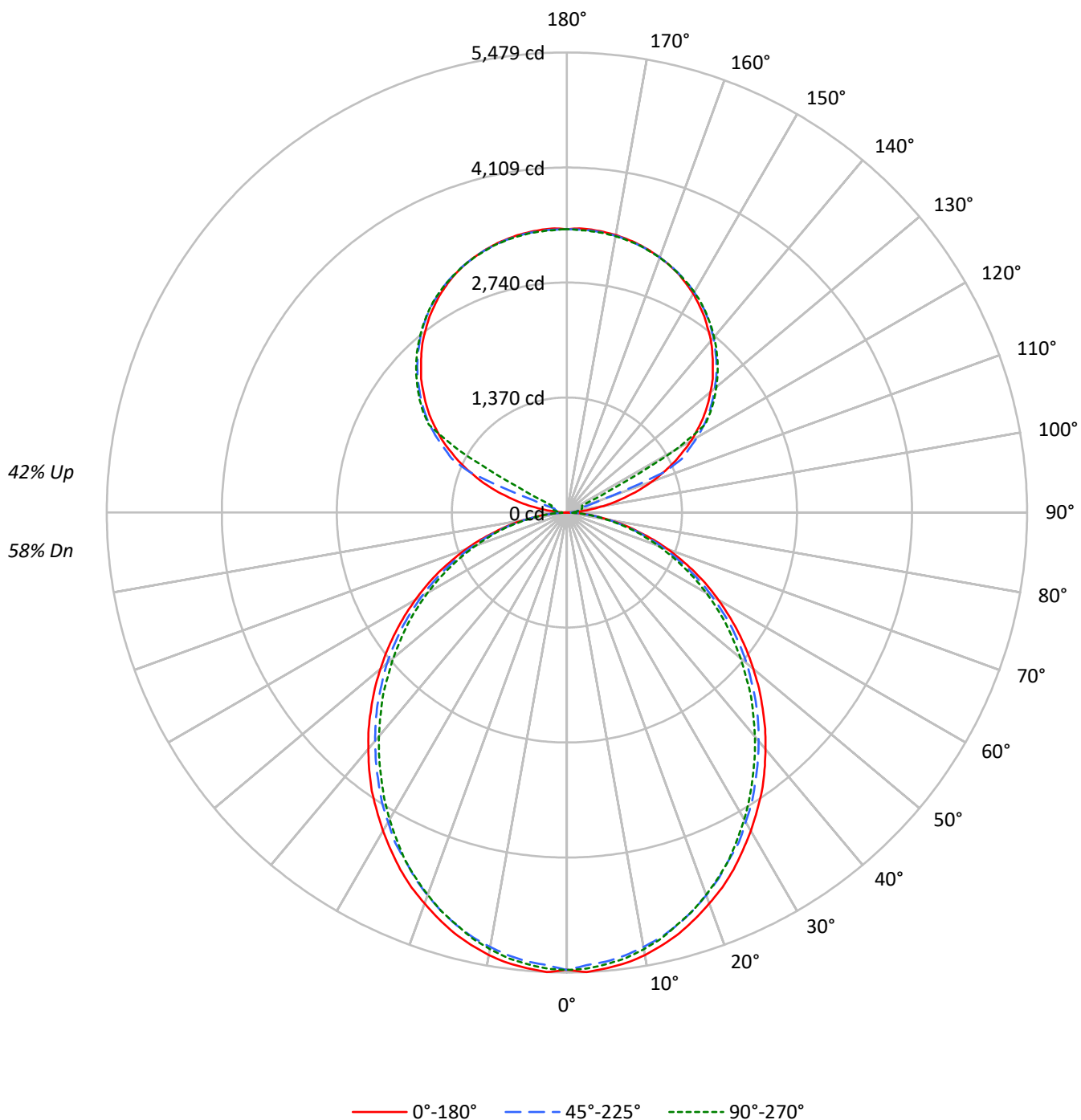
Lumens per Lamp: N/A  
Luminaire Lumens: 23760.0 lumens  
Efficiency: N/A  
Efficacy: 108.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 218.5  
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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### 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 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 75 | 75 | 75 | 64 | 64 | 64 |
| 1   | 100 | 95  | 91  | 88  | 93  | 89  | 86  | 82  | 77 | 75 | 72 | 66 | 65 | 63 | 56 | 55 | 54 |
| 2   | 91  | 83  | 77  | 72  | 84  | 78  | 72  | 68  | 68 | 64 | 60 | 58 | 55 | 53 | 50 | 47 | 45 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 50 | 52 | 48 | 44 | 44 | 41 | 39 |
| 4   | 76  | 65  | 57  | 51  | 70  | 61  | 54  | 48  | 53 | 47 | 43 | 46 | 42 | 38 | 39 | 36 | 33 |
| 5   | 70  | 58  | 50  | 43  | 65  | 54  | 47  | 41  | 48 | 42 | 37 | 41 | 37 | 33 | 35 | 32 | 29 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 41  | 36  | 43 | 37 | 32 | 37 | 33 | 29 | 32 | 29 | 26 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 32  | 39 | 33 | 29 | 34 | 29 | 26 | 29 | 26 | 23 |
| 8   | 55  | 43  | 35  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 31 | 26 | 23 | 27 | 23 | 20 |
| 9   | 51  | 39  | 31  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 29 | 24 | 21 | 25 | 21 | 18 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 | 27 | 22 | 19 | 23 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3822 | 3822 | 3822 |
| 5°  | 3828 | 3770 | 3796 |
| 10° | 3797 | 3720 | 3745 |
| 15° | 3741 | 3659 | 3666 |
| 20° | 3666 | 3575 | 3585 |
| 25° | 3591 | 3474 | 3491 |
| 30° | 3497 | 3380 | 3371 |
| 35° | 3408 | 3269 | 3244 |
| 40° | 3298 | 3157 | 3124 |
| 45° | 3188 | 3045 | 3001 |
| 50° | 3069 | 2927 | 2858 |
| 55° | 2943 | 2791 | 2727 |
| 60° | 2802 | 2629 | 2577 |
| 65° | 2647 | 2462 | 2400 |
| 70° | 2450 | 2258 | 2210 |
| 75° | 2178 | 2014 | 2036 |
| 80° | 1850 | 1704 | 1701 |
| 85° | 1337 | 1165 | 1143 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3188 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 512.7   | 2.2       |
| 10°-20°   | 1442.6  | 6.1       |
| 20°-30°   | 2120.0  | 8.9       |
| 30°-40°   | 2462.3  | 10.4      |
| 40°-50°   | 2459.3  | 10.4      |
| 50°-60°   | 2144.4  | 9.0       |
| 60°-70°   | 1585.2  | 6.7       |
| 70°-80°   | 896.9   | 3.8       |
| 80°-90°   | 242.6   | 1.0       |
| 90°-100°  | 111.3   | 0.5       |
| 100°-110° | 414.9   | 1.7       |
| 110°-120° | 1100.3  | 4.6       |
| 120°-130° | 1824.9  | 7.7       |
| 130°-140° | 1938.4  | 8.2       |
| 140°-150° | 1801.5  | 7.6       |
| 150°-160° | 1448.4  | 6.1       |
| 160°-170° | 933.3   | 3.9       |
| 170°-180° | 321.2   | 1.4       |
| 0°-30°    | 4075.3  | 17.2      |
| 0°-40°    | 6537.6  | 27.5      |
| 0°-60°    | 11141.3 | 46.9      |
| 0°-90°    | 13865.9 | 58.4      |
| 90°-120°  | 1626.4  | 6.8       |
| 90°-150°  | 7191.2  | 30.3      |
| 90°-180°  | 9894.0  | 41.6      |
| 0°-180°   | 23760.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5448 | 5448  | 5448 | 5448  | 5448 |      |
| 5°   | 5448 | 5427  | 5369 | 5411  | 5401 | 517  |
| 15°  | 5186 | 5155  | 5086 | 5107  | 5081 | 1461 |
| 25°  | 4693 | 4652  | 4563 | 4573  | 4563 | 2160 |
| 35°  | 4049 | 3997  | 3913 | 3881  | 3855 | 2529 |
| 45°  | 3295 | 3258  | 3180 | 3122  | 3101 | 2543 |
| 55°  | 2494 | 2462  | 2399 | 2336  | 2310 | 2229 |
| 65°  | 1682 | 1650  | 1598 | 1550  | 1524 | 1663 |
| 75°  | 880  | 870   | 843  | 812   | 822  | 939  |
| 85°  | 214  | 210   | 204  | 188   | 183  | 239  |
| 90°  | 2    | 29    | 49   | 61    | 66   | 22   |
| 95°  | 159  | 78    | 95   | 108   | 105  | 188  |
| 105° | 742  | 816   | 149  | 176   | 186  | 793  |
| 115° | 1404 | 1446  | 1507 | 376   | 200  | 1382 |
| 125° | 1985 | 2017  | 2064 | 2081  | 2088 | 1771 |
| 135° | 2457 | 2496  | 2518 | 2542  | 2537 | 1898 |
| 145° | 2850 | 2847  | 2889 | 2906  | 2894 | 1782 |
| 155° | 3138 | 3116  | 3146 | 3160  | 3141 | 1446 |
| 165° | 3306 | 3292  | 3299 | 3316  | 3299 | 934  |
| 175° | 3382 | 3365  | 3370 | 3387  | 3363 | 322  |
| 180° | 3375 | 3375  | 3375 | 3375  | 3375 |      |

TEST NUMBER: P906933

CATALOG NUMBER: DFN2DIP-SQ4F0-140D100US835-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5447.5 | 5447.5 | 5447.5 | 5447.5 | 5447.5 |
| 2.5°   | 5479.1 | 5453.0 | 5395.2 | 5447.5 | 5437.5 |
| 5°     | 5447.5 | 5426.9 | 5369.1 | 5410.8 | 5400.8 |
| 7.5°   | 5410.8 | 5379.7 | 5321.9 | 5364.1 | 5353.5 |
| 10°    | 5353.5 | 5316.9 | 5254.1 | 5295.8 | 5280.2 |
| 12.5°  | 5274.6 | 5243.5 | 5180.7 | 5206.8 | 5196.3 |
| 15°    | 5185.7 | 5154.6 | 5086.2 | 5107.4 | 5081.2 |
| 17.5°  | 5075.7 | 5044.6 | 4976.2 | 5002.3 | 4976.2 |
| 20°    | 4955.1 | 4924.0 | 4850.6 | 4866.2 | 4845.6 |
| 22.5°  | 4835.0 | 4787.8 | 4719.4 | 4719.4 | 4708.9 |
| 25°    | 4693.3 | 4651.6 | 4562.7 | 4572.7 | 4562.7 |
| 27.5°  | 4536.0 | 4499.4 | 4431.6 | 4416.0 | 4389.9 |
| 30°    | 4379.3 | 4337.1 | 4258.7 | 4243.2 | 4222.0 |
| 32.5°  | 4211.5 | 4180.4 | 4096.4 | 4064.8 | 4043.6 |
| 35°    | 4049.2 | 3997.0 | 3913.0 | 3881.4 | 3855.2 |
| 37.5°  | 3865.8 | 3818.6 | 3734.6 | 3698.0 | 3671.8 |
| 40°    | 3677.4 | 3635.2 | 3551.2 | 3504.6 | 3483.4 |
| 42.5°  | 3494.0 | 3451.8 | 3368.4 | 3315.6 | 3284.5 |
| 45°    | 3295.0 | 3258.4 | 3179.5 | 3122.2 | 3101.1 |
| 47.5°  | 3101.1 | 3064.4 | 2980.5 | 2922.7 | 2891.6 |
| 50°    | 2896.6 | 2870.5 | 2797.1 | 2723.7 | 2697.6 |
| 52.5°  | 2697.6 | 2660.9 | 2593.1 | 2535.3 | 2498.7 |
| 55°    | 2493.7 | 2462.0 | 2399.2 | 2336.4 | 2310.3 |
| 57.5°  | 2289.1 | 2263.0 | 2194.7 | 2131.9 | 2110.7 |
| 60°    | 2084.6 | 2064.1 | 1990.7 | 1932.9 | 1917.3 |
| 62.5°  | 1885.7 | 1849.0 | 1796.7 | 1744.5 | 1723.4 |
| 65°    | 1681.7 | 1650.0 | 1597.8 | 1550.5 | 1524.4 |
| 67.5°  | 1472.2 | 1445.5 | 1398.8 | 1362.1 | 1341.0 |
| 70°    | 1278.2 | 1257.1 | 1209.9 | 1173.2 | 1152.6 |
| 72.5°  | 1079.3 | 1058.1 | 1032.0 | 995.4  | 979.8  |
| 75°    | 879.8  | 869.8  | 843.1  | 812.0  | 822.5  |
| 77.5°  | 701.9  | 680.8  | 670.2  | 654.7  | 639.1  |
| 80°    | 524.1  | 518.5  | 508.0  | 492.4  | 481.8  |
| 82.5°  | 356.2  | 356.2  | 351.2  | 330.1  | 330.1  |
| 85°    | 214.5  | 209.5  | 204.5  | 188.4  | 183.4  |
| 87.5°  | 94.5   | 83.9   | 73.4   | 57.8   | 52.2   |
| 90°    | 2.3    | 29.3   | 48.7   | 61.2   | 65.8   |
| 92.5°  | 61.2   | 51.3   | 58.6   | 63.5   | 65.8   |
| 95°    | 158.6  | 78.0   | 95.1   | 107.6  | 105.0  |
| 97.5°  | 285.6  | 85.5   | 124.4  | 131.9  | 134.3  |
| 100°   | 432.4  | 97.7   | 139.2  | 158.6  | 163.6  |
| 102.5° | 593.3  | 588.7  | 144.1  | 170.8  | 178.3  |
| 105°   | 742.4  | 815.7  | 149.1  | 175.7  | 185.6  |
| 107.5° | 915.8  | 976.7  | 154.0  | 180.7  | 190.5  |
| 110°   | 1081.9 | 1133.0 | 427.4  | 183.3  | 192.8  |



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CATALOG NUMBER: DFN2DIP-SQ4F0-140D100US835-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1238.2 | 1282.0 | 1240.6 | 187.9  | 195.5  |
| 115°   | 1404.1 | 1445.6 | 1506.8 | 376.1  | 200.4  |
| 117.5° | 1548.2 | 1597.0 | 1638.7 | 1289.3 | 649.6  |
| 120°   | 1709.5 | 1746.0 | 1790.1 | 1819.4 | 1489.7 |
| 122.5° | 1846.1 | 1885.2 | 1934.2 | 1948.7 | 1951.3 |
| 125°   | 1985.3 | 2017.2 | 2063.6 | 2080.7 | 2087.9 |
| 127.5° | 2112.3 | 2146.5 | 2183.3 | 2207.7 | 2210.0 |
| 130°   | 2232.0 | 2271.2 | 2297.9 | 2324.8 | 2322.5 |
| 132.5° | 2354.1 | 2386.0 | 2412.7 | 2434.7 | 2432.4 |
| 135°   | 2456.8 | 2495.9 | 2517.7 | 2542.3 | 2537.4 |
| 137.5° | 2564.1 | 2593.4 | 2618.0 | 2642.4 | 2635.1 |
| 140°   | 2669.0 | 2688.8 | 2715.4 | 2737.5 | 2725.3 |
| 142.5° | 2757.2 | 2774.3 | 2805.9 | 2825.3 | 2813.2 |
| 145°   | 2850.0 | 2847.4 | 2888.9 | 2906.0 | 2893.8 |
| 147.5° | 2930.3 | 2923.1 | 2964.5 | 2976.7 | 2967.2 |
| 150°   | 3008.6 | 2991.5 | 3030.7 | 3045.2 | 3033.0 |
| 152.5° | 3074.4 | 3055.0 | 3091.6 | 3106.3 | 3089.2 |
| 155°   | 3138.0 | 3116.2 | 3145.5 | 3160.0 | 3140.6 |
| 157.5° | 3189.3 | 3169.9 | 3191.9 | 3209.0 | 3189.3 |
| 160°   | 3233.4 | 3218.6 | 3233.4 | 3247.9 | 3230.8 |
| 162.5° | 3272.2 | 3257.7 | 3269.9 | 3287.0 | 3265.0 |
| 165°   | 3306.4 | 3291.9 | 3299.2 | 3316.3 | 3299.2 |
| 167.5° | 3333.4 | 3318.6 | 3326.2 | 3343.3 | 3321.2 |
| 170°   | 3355.4 | 3340.7 | 3345.6 | 3362.7 | 3340.7 |
| 172.5° | 3369.9 | 3355.4 | 3360.4 | 3377.5 | 3355.4 |
| 175°   | 3382.1 | 3365.0 | 3369.9 | 3387.1 | 3362.7 |
| 177.5° | 3387.1 | 3369.9 | 3372.6 | 3389.7 | 3367.6 |
| 180°   | 3374.9 | 3374.9 | 3374.9 | 3374.9 | 3374.9 |

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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 | 12.68            | 13.62 | 13.56 | 14.53 | 15.67 | 12.24          | 13.18 | 13.12 | 14.08 | 15.23 |
|                 | 3H   | 14.35            | 15.20 | 15.25 | 16.11 | 17.28 | 13.86          | 14.71 | 14.76 | 15.62 | 16.79 |
|                 | 4H   | 14.95            | 15.74 | 15.86 | 16.66 | 17.84 | 14.45          | 15.25 | 15.36 | 16.17 | 17.35 |
|                 | 6H   | 15.35            | 16.09 | 16.27 | 17.01 | 18.21 | 14.85          | 15.59 | 15.77 | 16.51 | 17.71 |
|                 | 8H   | 15.46            | 16.16 | 16.39 | 17.11 | 18.30 | 14.96          | 15.66 | 15.89 | 16.60 | 17.80 |
|                 | 12H  | 15.52            | 16.18 | 16.45 | 17.12 | 18.34 | 15.01          | 15.67 | 15.94 | 16.61 | 17.83 |
| 4H              | 2H   | 13.15            | 13.95 | 14.07 | 14.87 | 16.05 | 12.80          | 13.60 | 13.71 | 14.51 | 15.70 |
|                 | 3H   | 15.03            | 15.70 | 15.96 | 16.65 | 17.84 | 14.62          | 15.29 | 15.55 | 16.24 | 17.43 |
|                 | 4H   | 15.75            | 16.36 | 16.69 | 17.30 | 18.53 | 15.33          | 15.94 | 16.26 | 16.88 | 18.10 |
|                 | 6H   | 16.27            | 16.80 | 17.22 | 17.77 | 18.99 | 15.84          | 16.37 | 16.79 | 17.34 | 18.56 |
|                 | 8H   | 16.43            | 16.92 | 17.38 | 17.88 | 19.12 | 15.99          | 16.48 | 16.94 | 17.44 | 18.68 |
|                 | 12H  | 16.51            | 16.95 | 17.48 | 17.93 | 19.17 | 16.06          | 16.50 | 17.03 | 17.48 | 18.72 |
| 8H              | 4H   | 15.95            | 16.45 | 16.91 | 17.41 | 18.64 | 15.58          | 16.07 | 16.53 | 17.03 | 18.27 |
|                 | 6H   | 16.59            | 17.00 | 17.57 | 18.00 | 19.24 | 16.21          | 16.62 | 17.19 | 17.62 | 18.85 |
|                 | 8H   | 16.82            | 17.18 | 17.81 | 18.17 | 19.42 | 16.43          | 16.78 | 17.41 | 17.78 | 19.03 |
|                 | 12H  | 16.96            | 17.27 | 17.95 | 18.26 | 19.56 | 16.55          | 16.86 | 17.54 | 17.85 | 19.15 |
| 12H             | 4H   | 15.94            | 16.39 | 16.92 | 17.37 | 18.61 | 15.58          | 16.02 | 16.55 | 17.00 | 18.24 |
|                 | 6H   | 16.62            | 16.98 | 17.61 | 17.98 | 19.23 | 16.25          | 16.61 | 17.24 | 17.60 | 18.86 |
|                 | 8H   | 16.87            | 17.19 | 17.86 | 18.18 | 19.47 | 16.49          | 16.81 | 17.48 | 17.80 | 19.09 |