

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: P923029

Luminaire Tested: DFN2DIP-SQ3F0-120D120US940-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923029  
REPORT IS A COMBINATION OF REPORTS P901541 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-120D120US940-FLLONL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

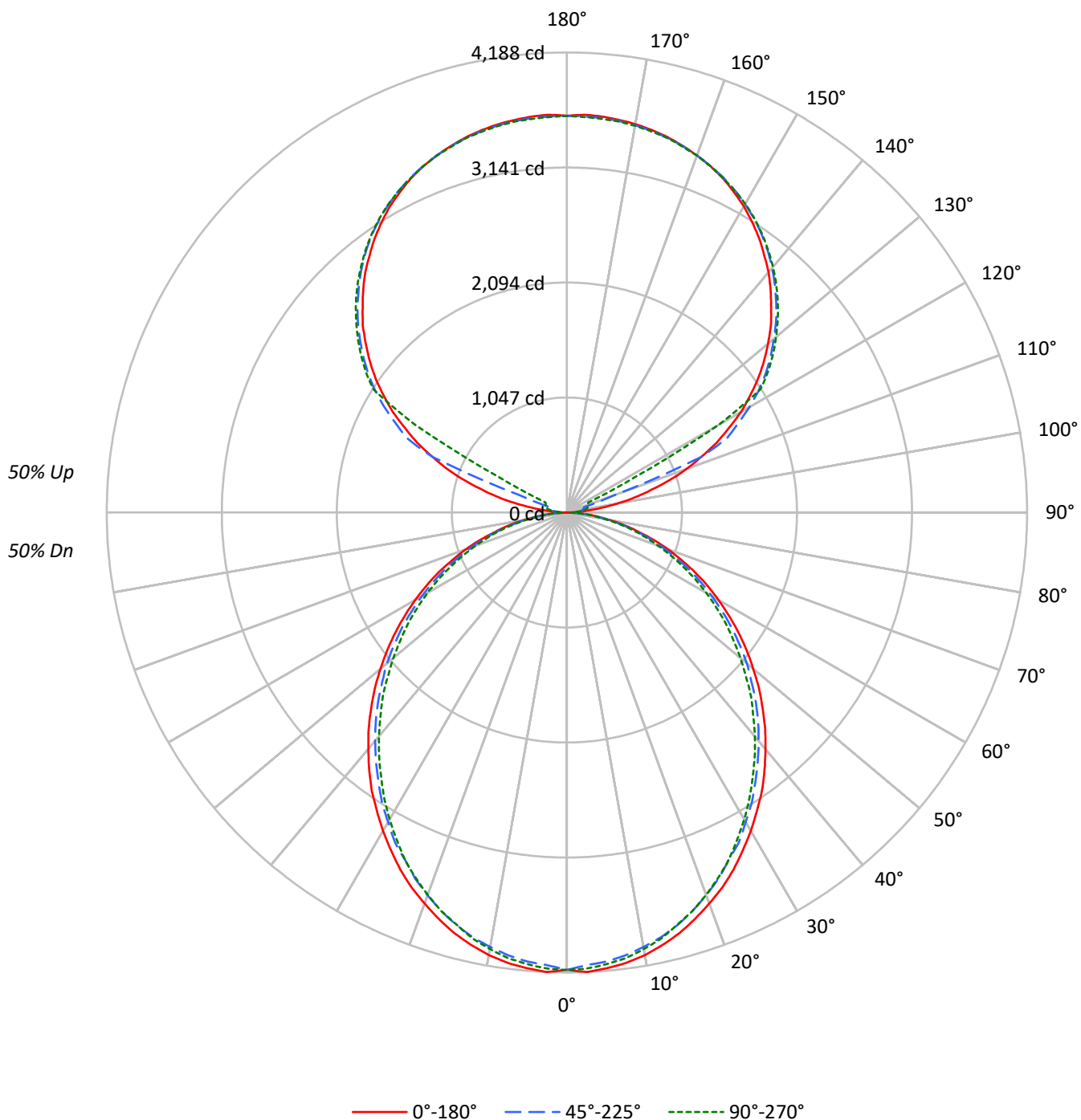
Lumens per Lamp: N/A  
Luminaire Lumens: 21187.1 lumens  
Efficiency: N/A  
Efficacy: 96.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 219.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
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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### Luminous Intensity Polar Plot



TEST NUMBER: P923029

CATALOG NUMBER: DFN2DIP-SQ3F0-120D120US940-FLONL

**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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 |
| 1   | 98  | 93  | 90  | 86  | 90 | 86 | 83 | 80 | 73 | 71 | 68 | 61 | 59 | 58 | 50 | 48 | 47 |
| 2   | 89  | 82  | 75  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 53 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 64  | 59  | 75 | 66 | 60 | 55 | 56 | 52 | 48 | 47 | 44 | 41 | 39 | 36 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 29 |
| 5   | 68  | 57  | 48  | 42  | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 53 | 43 | 36 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 24 | 20 | 18 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 31 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4771 | 4771 | 4771 |
| 5°  | 4775 | 4701 | 4734 |
| 10° | 4734 | 4635 | 4669 |
| 15° | 4661 | 4555 | 4567 |
| 20° | 4564 | 4446 | 4463 |
| 25° | 4467 | 4316 | 4343 |
| 30° | 4347 | 4195 | 4191 |
| 35° | 4232 | 4052 | 4030 |
| 40° | 4092 | 3909 | 3876 |
| 45° | 3952 | 3764 | 3719 |
| 50° | 3799 | 3612 | 3538 |
| 55° | 3638 | 3437 | 3370 |
| 60° | 3456 | 3229 | 3178 |
| 65° | 3257 | 3013 | 2953 |
| 70° | 3004 | 2749 | 2709 |
| 75° | 2654 | 2433 | 2481 |
| 80° | 2231 | 2031 | 2051 |
| 85° | 1570 | 1345 | 1343 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3952 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 391.9   | 1.8       |
| 10°-20°   | 1102.6  | 5.2       |
| 20°-30°   | 1620.4  | 7.6       |
| 30°-40°   | 1882.0  | 8.9       |
| 40°-50°   | 1879.7  | 8.9       |
| 50°-60°   | 1639.0  | 7.7       |
| 60°-70°   | 1211.6  | 5.7       |
| 70°-80°   | 685.5   | 3.2       |
| 80°-90°   | 187.3   | 0.9       |
| 90°-100°  | 119.1   | 0.6       |
| 100°-110° | 443.9   | 2.1       |
| 110°-120° | 1177.3  | 5.6       |
| 120°-130° | 1952.7  | 9.2       |
| 130°-140° | 2074.2  | 9.8       |
| 140°-150° | 1927.7  | 9.1       |
| 150°-160° | 1549.8  | 7.3       |
| 160°-170° | 998.7   | 4.7       |
| 170°-180° | 343.7   | 1.6       |
| 0°-30°    | 3114.9  | 14.7      |
| 0°-40°    | 4996.9  | 23.6      |
| 0°-60°    | 8515.5  | 40.2      |
| 0°-90°    | 10599.9 | 50.0      |
| 90°-120°  | 1740.3  | 8.2       |
| 90°-150°  | 7694.9  | 36.3      |
| 90°-180°  | 10587.0 | 50.0      |
| 0°-180°   | 21187.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4164 | 4164  | 4164 | 4164  | 4164 |      |
| 5°   | 4164 | 4148  | 4104 | 4136  | 4128 | 395  |
| 15°  | 3964 | 3940  | 3888 | 3904  | 3884 | 1116 |
| 25°  | 3587 | 3555  | 3487 | 3495  | 3487 | 1651 |
| 35°  | 3095 | 3055  | 2991 | 2967  | 2947 | 1933 |
| 45°  | 2518 | 2490  | 2430 | 2386  | 2370 | 1944 |
| 55°  | 1906 | 1882  | 1834 | 1786  | 1766 | 1704 |
| 65°  | 1285 | 1261  | 1221 | 1185  | 1165 | 1271 |
| 75°  | 672  | 665   | 644  | 621   | 629  | 718  |
| 85°  | 164  | 160   | 156  | 144   | 140  | 183  |
| 90°  | 2    | 31    | 52   | 66    | 70   | 20   |
| 95°  | 170  | 84    | 102  | 115   | 112  | 201  |
| 105° | 794  | 873   | 160  | 188   | 199  | 849  |
| 115° | 1502 | 1547  | 1612 | 402   | 214  | 1479 |
| 125° | 2124 | 2158  | 2208 | 2226  | 2234 | 1895 |
| 135° | 2629 | 2671  | 2694 | 2720  | 2715 | 2031 |
| 145° | 3050 | 3047  | 3091 | 3110  | 3096 | 1907 |
| 155° | 3358 | 3334  | 3366 | 3381  | 3361 | 1547 |
| 165° | 3538 | 3522  | 3530 | 3549  | 3530 | 1000 |
| 175° | 3619 | 3601  | 3606 | 3624  | 3598 | 344  |
| 180° | 3611 | 3611  | 3611 | 3611  | 3611 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4163.7 | 4163.7 | 4163.7 | 4163.7 | 4163.7 |
| 2.5°   | 4187.8 | 4167.9 | 4123.7 | 4163.7 | 4156.0 |
| 5°     | 4163.7 | 4147.9 | 4103.7 | 4135.6 | 4127.9 |
| 7.5°   | 4135.6 | 4111.8 | 4067.6 | 4099.9 | 4091.9 |
| 10°    | 4091.9 | 4063.8 | 4015.8 | 4047.7 | 4035.8 |
| 12.5°  | 4031.5 | 4007.7 | 3959.7 | 3979.7 | 3971.6 |
| 15°    | 3963.6 | 3939.8 | 3887.5 | 3903.6 | 3883.7 |
| 17.5°  | 3879.5 | 3855.7 | 3803.4 | 3823.4 | 3803.4 |
| 20°    | 3787.3 | 3763.5 | 3707.5 | 3719.3 | 3703.6 |
| 22.5°  | 3695.5 | 3659.4 | 3607.1 | 3607.1 | 3599.1 |
| 25°    | 3587.2 | 3555.3 | 3487.4 | 3495.1 | 3487.4 |
| 27.5°  | 3467.0 | 3439.0 | 3387.2 | 3375.2 | 3355.3 |
| 30°    | 3347.2 | 3314.9 | 3255.0 | 3243.2 | 3227.0 |
| 32.5°  | 3218.9 | 3195.2 | 3131.0 | 3106.8 | 3090.7 |
| 35°    | 3094.9 | 3055.0 | 2990.8 | 2966.6 | 2946.7 |
| 37.5°  | 2954.7 | 2918.7 | 2854.5 | 2826.5 | 2806.5 |
| 40°    | 2810.8 | 2778.5 | 2714.3 | 2678.6 | 2662.5 |
| 42.5°  | 2670.6 | 2638.3 | 2574.5 | 2534.2 | 2510.4 |
| 45°    | 2518.5 | 2490.5 | 2430.1 | 2386.4 | 2370.3 |
| 47.5°  | 2370.3 | 2342.2 | 2278.1 | 2233.9 | 2210.1 |
| 50°    | 2213.9 | 2194.0 | 2137.9 | 2081.8 | 2061.8 |
| 52.5°  | 2061.8 | 2033.8 | 1982.0 | 1937.8 | 1909.8 |
| 55°    | 1905.9 | 1881.8 | 1833.7 | 1785.7 | 1765.8 |
| 57.5°  | 1749.6 | 1729.7 | 1677.4 | 1629.4 | 1613.3 |
| 60°    | 1593.3 | 1577.6 | 1521.5 | 1477.4 | 1465.4 |
| 62.5°  | 1441.3 | 1413.2 | 1373.3 | 1333.4 | 1317.2 |
| 65°    | 1285.4 | 1261.1 | 1221.2 | 1185.1 | 1165.2 |
| 67.5°  | 1125.2 | 1104.8 | 1069.2 | 1041.2 | 1025.0 |
| 70°    | 977.0  | 960.8  | 924.7  | 896.7  | 881.0  |
| 72.5°  | 824.9  | 808.8  | 788.8  | 760.8  | 748.9  |
| 75°    | 672.4  | 664.8  | 644.3  | 620.6  | 628.7  |
| 77.5°  | 536.5  | 520.3  | 512.3  | 500.3  | 488.5  |
| 80°    | 400.6  | 396.3  | 388.3  | 376.4  | 368.3  |
| 82.5°  | 272.2  | 272.2  | 268.5  | 252.4  | 252.4  |
| 85°    | 164.0  | 160.2  | 156.3  | 144.0  | 140.2  |
| 87.5°  | 72.2   | 64.1   | 56.1   | 44.1   | 39.9   |
| 90°    | 2.5    | 31.3   | 52.2   | 65.5   | 70.4   |
| 92.5°  | 65.5   | 54.9   | 62.7   | 67.9   | 70.4   |
| 95°    | 169.7  | 83.5   | 101.7  | 115.1  | 112.4  |
| 97.5°  | 305.7  | 91.6   | 133.1  | 141.2  | 143.7  |
| 100°   | 462.6  | 104.6  | 148.9  | 169.7  | 175.0  |
| 102.5° | 634.9  | 629.9  | 154.2  | 182.8  | 190.8  |
| 105°   | 794.3  | 872.9  | 159.5  | 188.1  | 198.6  |
| 107.5° | 979.9  | 1045.1 | 164.8  | 193.3  | 203.8  |
| 110°   | 1157.7 | 1212.4 | 457.4  | 196.1  | 206.3  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1325.0 | 1371.8 | 1327.5 | 201.1  | 209.1  |
| 115°   | 1502.4 | 1546.8 | 1612.3 | 402.4  | 214.5  |
| 117.5° | 1656.7 | 1708.9 | 1753.5 | 1379.6 | 695.1  |
| 120°   | 1829.3 | 1868.3 | 1915.5 | 1946.9 | 1594.0 |
| 122.5° | 1975.4 | 2017.3 | 2069.7 | 2085.3 | 2088.0 |
| 125°   | 2124.3 | 2158.5 | 2208.1 | 2226.4 | 2234.2 |
| 127.5° | 2260.2 | 2296.9 | 2336.3 | 2362.3 | 2364.8 |
| 130°   | 2388.4 | 2430.3 | 2458.8 | 2487.7 | 2485.2 |
| 132.5° | 2519.0 | 2553.1 | 2581.7 | 2605.3 | 2602.8 |
| 135°   | 2628.9 | 2670.8 | 2694.0 | 2720.4 | 2715.2 |
| 137.5° | 2743.7 | 2775.0 | 2801.4 | 2827.4 | 2819.7 |
| 140°   | 2856.1 | 2877.1 | 2905.6 | 2929.3 | 2916.2 |
| 142.5° | 2950.3 | 2968.7 | 3002.5 | 3023.3 | 3010.2 |
| 145°   | 3049.6 | 3046.9 | 3091.2 | 3109.6 | 3096.5 |
| 147.5° | 3135.6 | 3127.9 | 3172.3 | 3185.3 | 3175.0 |
| 150°   | 3219.3 | 3201.1 | 3243.0 | 3258.5 | 3245.5 |
| 152.5° | 3289.8 | 3269.0 | 3308.2 | 3323.9 | 3305.7 |
| 155°   | 3357.7 | 3334.5 | 3365.8 | 3381.4 | 3360.6 |
| 157.5° | 3412.7 | 3391.9 | 3415.5 | 3433.8 | 3412.7 |
| 160°   | 3459.8 | 3444.1 | 3459.8 | 3475.4 | 3457.1 |
| 162.5° | 3501.5 | 3486.0 | 3499.0 | 3517.3 | 3493.7 |
| 165°   | 3538.0 | 3522.5 | 3530.3 | 3548.7 | 3530.3 |
| 167.5° | 3566.9 | 3551.1 | 3559.2 | 3577.5 | 3553.9 |
| 170°   | 3590.5 | 3574.7 | 3579.9 | 3598.2 | 3574.7 |
| 172.5° | 3606.0 | 3590.5 | 3595.8 | 3614.1 | 3590.5 |
| 175°   | 3619.0 | 3600.7 | 3606.0 | 3624.4 | 3598.2 |
| 177.5° | 3624.4 | 3606.0 | 3608.8 | 3627.1 | 3603.6 |
| 180°   | 3611.3 | 3611.3 | 3611.3 | 3611.3 | 3611.3 |

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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 | 12.67            | 13.53 | 13.63 | 14.50 | 15.77 | 12.22          | 13.09 | 13.18 | 14.06 | 15.33 |
|                 | 3H   | 14.33            | 15.10 | 15.29 | 16.08 | 17.37 | 13.84          | 14.61 | 14.80 | 15.59 | 16.88 |
|                 | 4H   | 14.91            | 15.64 | 15.89 | 16.63 | 17.93 | 14.42          | 15.15 | 15.40 | 16.13 | 17.43 |
|                 | 6H   | 15.31            | 15.98 | 16.30 | 16.97 | 18.29 | 14.81          | 15.48 | 15.80 | 16.47 | 17.78 |
|                 | 8H   | 15.41            | 16.05 | 16.41 | 17.06 | 18.37 | 14.91          | 15.55 | 15.91 | 16.56 | 17.87 |
|                 | 12H  | 15.46            | 16.07 | 16.46 | 17.07 | 18.40 | 14.95          | 15.56 | 15.95 | 16.56 | 17.89 |
| 4H              | 2H   | 13.13            | 13.86 | 14.11 | 14.84 | 16.15 | 12.77          | 13.50 | 13.76 | 14.49 | 15.79 |
|                 | 3H   | 14.99            | 15.60 | 15.98 | 16.61 | 17.93 | 14.58          | 15.19 | 15.58 | 16.20 | 17.52 |
|                 | 4H   | 15.70            | 16.26 | 16.70 | 17.26 | 18.60 | 15.27          | 15.83 | 16.28 | 16.84 | 18.18 |
|                 | 6H   | 16.21            | 16.69 | 17.23 | 17.72 | 19.06 | 15.78          | 16.26 | 16.79 | 17.29 | 18.62 |
|                 | 8H   | 16.36            | 16.80 | 17.37 | 17.83 | 19.18 | 15.92          | 16.37 | 16.94 | 17.39 | 18.74 |
|                 | 12H  | 16.43            | 16.83 | 17.46 | 17.87 | 19.23 | 15.98          | 16.38 | 17.01 | 17.42 | 18.78 |
| 8H              | 4H   | 15.89            | 16.34 | 16.91 | 17.36 | 18.71 | 15.51          | 15.96 | 16.53 | 16.99 | 18.34 |
|                 | 6H   | 16.52            | 16.89 | 17.56 | 17.95 | 19.30 | 16.13          | 16.50 | 17.17 | 17.57 | 18.92 |
|                 | 8H   | 16.73            | 17.06 | 17.78 | 18.11 | 19.48 | 16.34          | 16.67 | 17.39 | 17.72 | 19.09 |
|                 | 12H  | 16.86            | 17.15 | 17.91 | 18.19 | 19.60 | 16.45          | 16.74 | 17.50 | 17.78 | 19.19 |
| 12H             | 4H   | 15.87            | 16.28 | 16.91 | 17.32 | 18.68 | 15.51          | 15.91 | 16.54 | 16.95 | 18.31 |
|                 | 6H   | 16.54            | 16.87 | 17.59 | 17.92 | 19.29 | 16.17          | 16.50 | 17.22 | 17.55 | 18.92 |
|                 | 8H   | 16.78            | 17.07 | 17.84 | 18.11 | 19.53 | 16.40          | 16.69 | 17.45 | 17.73 | 19.14 |