

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: P917888

Luminaire Tested: DFN2DIP-SQ4F0-160D120US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917888  
REPORT IS A COMBINATION OF REPORTS P900183 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-160D120US930-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

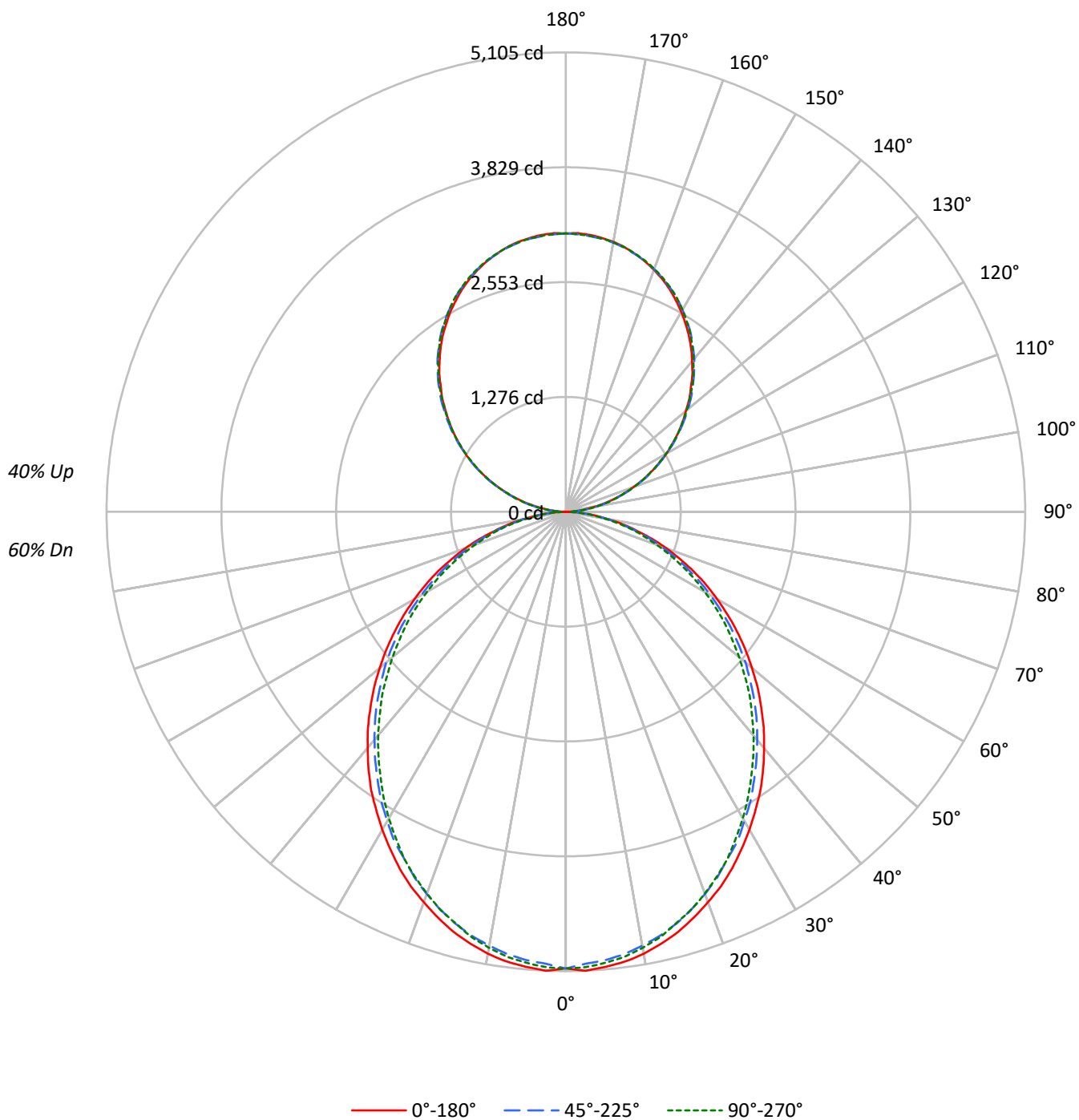
Lumens per Lamp: N/A  
Luminaire Lumens: 21572.8 lumens  
Efficiency: N/A  
Efficacy: 84.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 256.8  
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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### Luminous Intensity Polar Plot



TEST NUMBER: P917888

CATALOG NUMBER: DFN2DIP-SQ4F0-160D120US930-FLLFLL

**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   | 110 | 110 | 110 | 110 | 102 | 102 | 102 | 102 | 89 | 89 | 89 | 77 | 77 | 77 | 65 | 65 | 65 |
| 1   | 100 | 96  | 92  | 88  | 93  | 89  | 86  | 83  | 78 | 75 | 73 | 67 | 66 | 64 | 58 | 56 | 55 |
| 2   | 91  | 84  | 77  | 72  | 85  | 78  | 73  | 68  | 68 | 64 | 61 | 59 | 56 | 53 | 51 | 48 | 46 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 51 | 52 | 48 | 45 | 45 | 42 | 40 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 48  | 54 | 48 | 43 | 47 | 42 | 39 | 40 | 37 | 34 |
| 5   | 70  | 58  | 50  | 44  | 65  | 55  | 47  | 42  | 48 | 42 | 38 | 42 | 37 | 34 | 36 | 33 | 30 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 42  | 36  | 43 | 37 | 33 | 38 | 33 | 29 | 33 | 29 | 26 |
| 7   | 60  | 47  | 39  | 33  | 56  | 44  | 37  | 32  | 39 | 33 | 29 | 35 | 30 | 26 | 30 | 26 | 23 |
| 8   | 55  | 43  | 35  | 30  | 52  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 23 | 28 | 24 | 21 |
| 9   | 52  | 39  | 32  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 29 | 24 | 21 | 26 | 22 | 19 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 | 27 | 22 | 19 | 24 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3562 | 3562 | 3562 |
| 5°  | 3567 | 3513 | 3537 |
| 10° | 3538 | 3466 | 3490 |
| 15° | 3486 | 3410 | 3416 |
| 20° | 3416 | 3331 | 3340 |
| 25° | 3346 | 3237 | 3253 |
| 30° | 3258 | 3149 | 3141 |
| 35° | 3175 | 3046 | 3023 |
| 40° | 3073 | 2942 | 2911 |
| 45° | 2971 | 2837 | 2796 |
| 50° | 2859 | 2728 | 2663 |
| 55° | 2742 | 2601 | 2541 |
| 60° | 2610 | 2450 | 2401 |
| 65° | 2466 | 2294 | 2236 |
| 70° | 2283 | 2104 | 2059 |
| 75° | 2029 | 1877 | 1897 |
| 80° | 1724 | 1587 | 1585 |
| 85° | 1246 | 1086 | 1065 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2971 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 477.7   | 2.2       |
| 10°-20°   | 1344.2  | 6.2       |
| 20°-30°   | 1975.4  | 9.2       |
| 30°-40°   | 2294.3  | 10.6      |
| 40°-50°   | 2291.5  | 10.6      |
| 50°-60°   | 1998.1  | 9.3       |
| 60°-70°   | 1477.0  | 6.8       |
| 70°-80°   | 835.6   | 3.9       |
| 80°-90°   | 229.3   | 1.1       |
| 90°-100°  | 191.5   | 0.9       |
| 100°-110° | 608.3   | 2.8       |
| 110°-120° | 1041.1  | 4.8       |
| 120°-130° | 1369.2  | 6.3       |
| 130°-140° | 1536.9  | 7.1       |
| 140°-150° | 1507.1  | 7.0       |
| 150°-160° | 1264.2  | 5.9       |
| 160°-170° | 838.4   | 3.9       |
| 170°-180° | 293.0   | 1.4       |
| 0°-30°    | 3797.3  | 17.6      |
| 0°-40°    | 6091.6  | 28.2      |
| 0°-60°    | 10381.1 | 48.1      |
| 0°-90°    | 12923.1 | 59.9      |
| 90°-120°  | 1840.9  | 8.5       |
| 90°-150°  | 6254.0  | 29.0      |
| 90°-180°  | 8650.0  | 40.1      |
| 0°-180°   | 21572.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5076 | 5076  | 5076 | 5076  | 5076 |      |
| 5°   | 5076 | 5057  | 5003 | 5042  | 5032 | 482  |
| 15°  | 4832 | 4803  | 4739 | 4759  | 4734 | 1361 |
| 25°  | 4373 | 4334  | 4251 | 4261  | 4251 | 2012 |
| 35°  | 3773 | 3724  | 3646 | 3616  | 3592 | 2356 |
| 45°  | 3070 | 3036  | 2962 | 2909  | 2890 | 2369 |
| 55°  | 2324 | 2294  | 2236 | 2177  | 2153 | 2077 |
| 65°  | 1567 | 1537  | 1489 | 1445  | 1420 | 1549 |
| 75°  | 820  | 810   | 786  | 756   | 766  | 875  |
| 85°  | 200  | 195   | 190  | 176   | 171  | 223  |
| 90°  | 3    | 34    | 91   | 86    | 89   | 21   |
| 95°  | 136  | 162   | 167  | 167   | 162  | 152  |
| 105° | 562  | 569   | 575  | 579   | 579  | 593  |
| 115° | 1045 | 1060  | 1055 | 1052  | 1045 | 1033 |
| 125° | 1520 | 1543  | 1536 | 1527  | 1524 | 1358 |
| 135° | 1965 | 1994  | 2000 | 1997  | 1990 | 1519 |
| 145° | 2386 | 2405  | 2420 | 2423  | 2412 | 1491 |
| 155° | 2728 | 2736  | 2744 | 2757  | 2749 | 1256 |
| 165° | 2968 | 2966  | 2966 | 2984  | 2971 | 837  |
| 175° | 3089 | 3081  | 3076 | 3094  | 3078 | 293  |
| 180° | 3094 | 3094  | 3094 | 3094  | 3094 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5075.8 | 5075.8 | 5075.8 | 5075.8 | 5075.8 |
| 2.5°   | 5105.3 | 5080.9 | 5027.1 | 5075.8 | 5066.4 |
| 5°     | 5075.8 | 5056.6 | 5002.8 | 5041.6 | 5032.3 |
| 7.5°   | 5041.6 | 5012.6 | 4958.7 | 4998.1 | 4988.2 |
| 10°    | 4988.2 | 4954.1 | 4895.6 | 4934.4 | 4919.9 |
| 12.5°  | 4914.8 | 4885.8 | 4827.2 | 4851.6 | 4841.7 |
| 15°    | 4831.9 | 4802.9 | 4739.2 | 4758.9 | 4734.5 |
| 17.5°  | 4729.4 | 4700.4 | 4636.7 | 4661.0 | 4636.7 |
| 20°    | 4617.0 | 4588.0 | 4519.6 | 4534.1 | 4515.0 |
| 22.5°  | 4505.2 | 4461.1 | 4397.4 | 4397.4 | 4387.6 |
| 25°    | 4373.1 | 4334.3 | 4251.4 | 4260.7 | 4251.4 |
| 27.5°  | 4226.5 | 4192.3 | 4129.2 | 4114.7 | 4090.4 |
| 30°    | 4080.5 | 4041.2 | 3968.1 | 3953.6 | 3934.0 |
| 32.5°  | 3924.1 | 3895.2 | 3816.9 | 3787.4 | 3767.7 |
| 35°    | 3773.0 | 3724.3 | 3646.0 | 3616.5 | 3592.2 |
| 37.5°  | 3602.1 | 3558.0 | 3479.9 | 3445.6 | 3421.3 |
| 40°    | 3426.5 | 3387.2 | 3309.0 | 3265.4 | 3245.8 |
| 42.5°  | 3255.6 | 3216.3 | 3138.6 | 3089.4 | 3060.4 |
| 45°    | 3070.3 | 3036.0 | 2962.5 | 2909.1 | 2889.5 |
| 47.5°  | 2889.5 | 2855.3 | 2777.2 | 2723.3 | 2694.3 |
| 50°    | 2699.0 | 2674.6 | 2606.3 | 2537.9 | 2513.6 |
| 52.5°  | 2513.6 | 2479.4 | 2416.2 | 2362.3 | 2328.2 |
| 55°    | 2323.5 | 2294.0 | 2235.5 | 2176.9 | 2152.6 |
| 57.5°  | 2133.0 | 2108.6 | 2044.9 | 1986.4 | 1966.7 |
| 60°    | 1942.4 | 1923.2 | 1854.9 | 1801.0 | 1786.5 |
| 62.5°  | 1757.0 | 1722.8 | 1674.1 | 1625.5 | 1605.8 |
| 65°    | 1566.9 | 1537.4 | 1488.7 | 1444.8 | 1420.4 |
| 67.5°  | 1371.7 | 1346.9 | 1303.4 | 1269.2 | 1249.5 |
| 70°    | 1191.0 | 1171.3 | 1127.3 | 1093.2 | 1074.0 |
| 72.5°  | 1005.6 | 985.9  | 961.6  | 927.4  | 913.0  |
| 75°    | 819.7  | 810.4  | 785.5  | 756.5  | 766.4  |
| 77.5°  | 654.0  | 634.4  | 624.5  | 610.0  | 595.5  |
| 80°    | 488.3  | 483.1  | 473.3  | 458.8  | 449.0  |
| 82.5°  | 331.9  | 331.9  | 327.3  | 307.6  | 307.6  |
| 85°    | 199.9  | 195.2  | 190.5  | 175.5  | 170.9  |
| 87.5°  | 88.1   | 78.2   | 68.3   | 53.9   | 48.7   |
| 90°    | 2.8    | 33.6   | 91.4   | 85.9   | 88.6   |
| 92.5°  | 57.8   | 78.4   | 81.1   | 84.0   | 84.0   |
| 95°    | 136.2  | 162.3  | 167.0  | 167.0  | 162.3  |
| 97.5°  | 226.7  | 250.9  | 261.2  | 261.2  | 261.2  |
| 100°   | 331.2  | 352.6  | 360.0  | 360.0  | 357.3  |
| 102.5° | 441.2  | 457.1  | 467.3  | 470.2  | 467.3  |
| 105°   | 561.6  | 569.0  | 574.6  | 579.3  | 579.3  |
| 107.5° | 680.9  | 692.2  | 692.2  | 694.0  | 680.9  |
| 110°   | 796.6  | 811.5  | 811.5  | 811.5  | 804.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 921.6  | 937.5  | 934.7  | 927.2  | 921.6  |
| 115°   | 1044.7 | 1059.7 | 1055.0 | 1052.2 | 1044.7 |
| 117.5° | 1166.9 | 1187.5 | 1174.4 | 1166.9 | 1159.5 |
| 120°   | 1290.1 | 1310.6 | 1290.1 | 1290.1 | 1281.7 |
| 122.5° | 1402.1 | 1428.2 | 1415.1 | 1407.6 | 1402.1 |
| 125°   | 1519.6 | 1542.9 | 1535.5 | 1527.1 | 1524.2 |
| 127.5° | 1634.3 | 1663.2 | 1652.9 | 1641.8 | 1634.3 |
| 130°   | 1741.6 | 1775.1 | 1770.5 | 1764.9 | 1754.6 |
| 132.5° | 1861.9 | 1888.1 | 1889.9 | 1876.8 | 1869.4 |
| 135°   | 1965.4 | 1994.4 | 2000.0 | 1997.2 | 1989.7 |
| 137.5° | 2081.1 | 2104.4 | 2109.1 | 2107.2 | 2096.1 |
| 140°   | 2182.8 | 2206.1 | 2219.2 | 2219.2 | 2208.9 |
| 142.5° | 2287.3 | 2310.6 | 2318.1 | 2320.8 | 2310.6 |
| 145°   | 2386.1 | 2404.8 | 2419.7 | 2422.6 | 2412.3 |
| 147.5° | 2474.8 | 2498.1 | 2509.3 | 2514.0 | 2503.7 |
| 150°   | 2566.2 | 2582.0 | 2592.3 | 2600.7 | 2592.3 |
| 152.5° | 2647.4 | 2663.2 | 2676.3 | 2686.6 | 2676.3 |
| 155°   | 2728.5 | 2736.0 | 2744.4 | 2757.4 | 2749.0 |
| 157.5° | 2798.5 | 2804.1 | 2808.7 | 2827.4 | 2814.3 |
| 160°   | 2861.0 | 2866.6 | 2869.4 | 2885.3 | 2874.0 |
| 162.5° | 2918.8 | 2918.8 | 2921.6 | 2939.3 | 2926.3 |
| 165°   | 2968.3 | 2965.5 | 2965.5 | 2984.1 | 2971.0 |
| 167.5° | 3013.0 | 3004.6 | 3004.6 | 3023.3 | 3010.2 |
| 170°   | 3046.6 | 3039.1 | 3036.3 | 3055.0 | 3039.1 |
| 172.5° | 3069.9 | 3062.4 | 3059.7 | 3078.3 | 3062.4 |
| 175°   | 3088.6 | 3081.1 | 3075.5 | 3094.1 | 3078.3 |
| 177.5° | 3098.9 | 3091.4 | 3085.7 | 3101.6 | 3085.7 |
| 180°   | 3094.1 | 3094.1 | 3094.1 | 3094.1 | 3094.1 |

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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 | 12.56            | 13.52 | 13.43 | 14.41 | 15.53 | 12.12          | 13.08 | 12.99 | 13.97 | 15.09 |
|                 | 3H   | 14.24            | 15.10 | 15.11 | 15.99 | 17.14 | 13.74          | 14.60 | 14.62 | 15.50 | 16.65 |
|                 | 4H   | 14.83            | 15.64 | 15.73 | 16.55 | 17.71 | 14.34          | 15.15 | 15.23 | 16.05 | 17.21 |
|                 | 6H   | 15.24            | 15.99 | 16.15 | 16.90 | 18.07 | 14.74          | 15.49 | 15.65 | 16.40 | 17.57 |
|                 | 8H   | 15.35            | 16.06 | 16.26 | 16.99 | 18.16 | 14.85          | 15.56 | 15.76 | 16.49 | 17.66 |
|                 | 12H  | 15.40            | 16.08 | 16.32 | 17.00 | 18.20 | 14.89          | 15.57 | 15.81 | 16.49 | 17.69 |
| 4H              | 2H   | 13.04            | 13.85 | 13.94 | 14.75 | 15.91 | 12.68          | 13.49 | 13.58 | 14.40 | 15.56 |
|                 | 3H   | 14.92            | 15.59 | 15.83 | 16.53 | 17.70 | 14.51          | 15.19 | 15.42 | 16.12 | 17.30 |
|                 | 4H   | 15.64            | 16.26 | 16.56 | 17.19 | 18.39 | 15.21          | 15.83 | 16.14 | 16.76 | 17.96 |
|                 | 6H   | 16.16            | 16.70 | 17.10 | 17.65 | 18.85 | 15.73          | 16.26 | 16.67 | 17.22 | 18.42 |
|                 | 8H   | 16.32            | 16.82 | 17.26 | 17.76 | 18.98 | 15.88          | 16.38 | 16.82 | 17.33 | 18.54 |
|                 | 12H  | 16.40            | 16.85 | 17.35 | 17.81 | 19.03 | 15.95          | 16.40 | 16.90 | 17.36 | 18.58 |
| 8H              | 4H   | 15.84            | 16.34 | 16.78 | 17.29 | 18.50 | 15.47          | 15.97 | 16.40 | 16.91 | 18.13 |
|                 | 6H   | 16.48            | 16.90 | 17.45 | 17.89 | 19.10 | 16.10          | 16.51 | 17.06 | 17.50 | 18.71 |
|                 | 8H   | 16.71            | 17.07 | 17.68 | 18.05 | 19.28 | 16.31          | 16.68 | 17.29 | 17.66 | 18.89 |
|                 | 12H  | 16.85            | 17.17 | 17.82 | 18.14 | 19.42 | 16.44          | 16.76 | 17.41 | 17.73 | 19.01 |
| 12H             | 4H   | 15.83            | 16.28 | 16.79 | 17.25 | 18.47 | 15.46          | 15.92 | 16.42 | 16.88 | 18.10 |
|                 | 6H   | 16.51            | 16.88 | 17.49 | 17.86 | 19.09 | 16.14          | 16.51 | 17.12 | 17.49 | 18.72 |
|                 | 8H   | 16.76            | 17.09 | 17.74 | 18.06 | 19.34 | 16.38          | 16.71 | 17.36 | 17.68 | 18.96 |