

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: P912080

Luminaire Tested: DFN2DIP-SQ3F0-110D120US850-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912080  
REPORT IS A COMBINATION OF REPORTS P900019 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-110D120US850-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

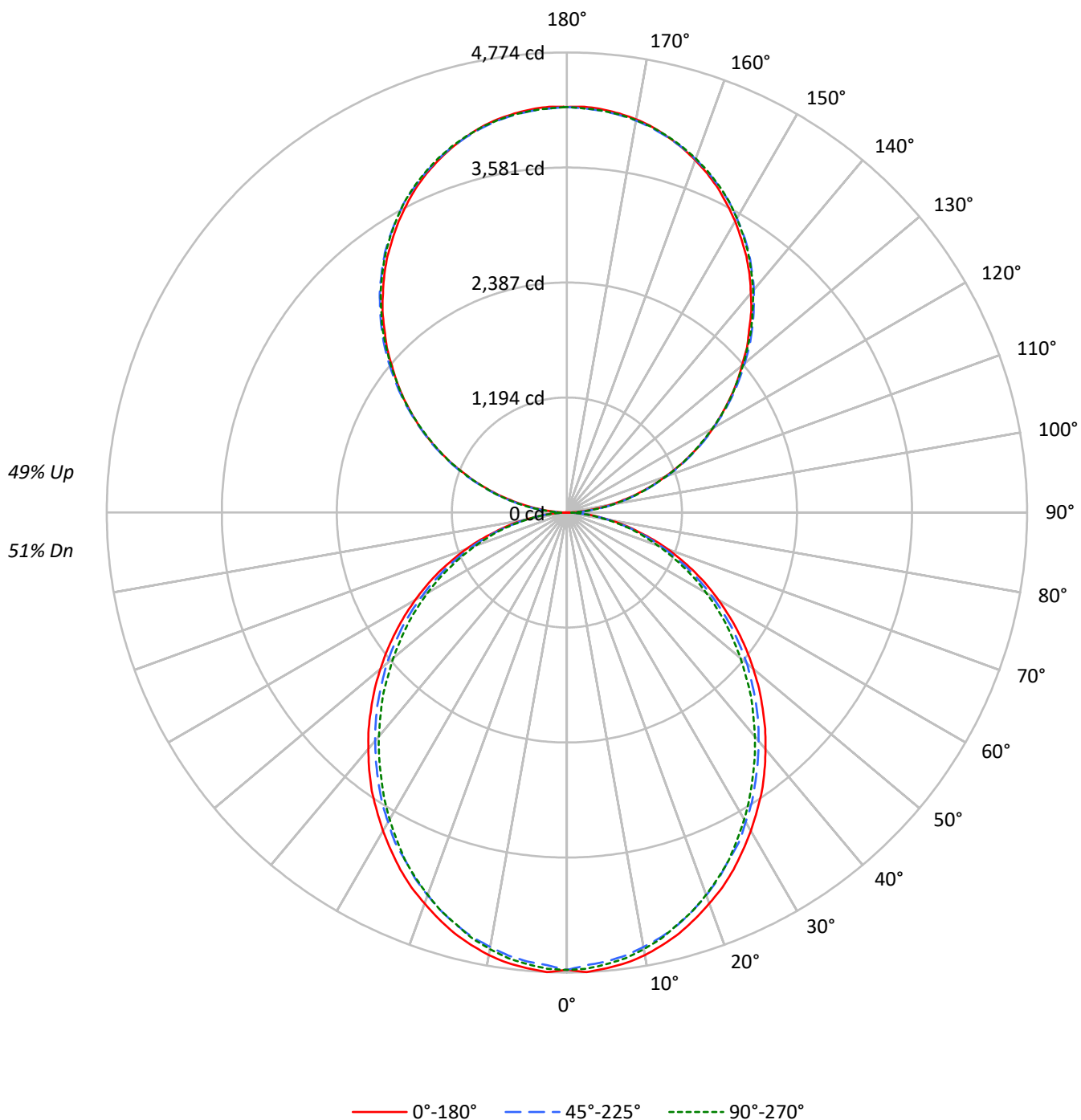
Lumens per Lamp: N/A  
Luminaire Lumens: 23854.6 lumens  
Efficiency: N/A  
Efficacy: 115.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 206  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P912080

CATALOG NUMBER: DFN2DIP-SQ3F0-110D120US850-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P912080

CATALOG NUMBER: DFN2DIP-SQ3F0-110D120US850-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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 84 | 84 | 84 | 70 | 70 | 70 | 57 | 57 | 57 |
| 1   | 98  | 94  | 90  | 86  | 90 | 87 | 83 | 80 | 73 | 71 | 69 | 61 | 60 | 58 | 50 | 49 | 48 |
| 2   | 89  | 82  | 76  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 54 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 65  | 59  | 75 | 67 | 60 | 55 | 57 | 52 | 48 | 48 | 44 | 41 | 39 | 37 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 30 |
| 5   | 68  | 57  | 49  | 43  | 63 | 53 | 45 | 40 | 45 | 40 | 35 | 38 | 34 | 30 | 32 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 41 | 35 | 31 | 34 | 30 | 27 | 29 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 54 | 43 | 36 | 31 | 37 | 31 | 27 | 31 | 27 | 24 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 34 | 28 | 24 | 29 | 24 | 21 | 24 | 21 | 18 |
| 9   | 50  | 38  | 31  | 25  | 46 | 36 | 29 | 24 | 31 | 25 | 22 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 21 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 5439 | 5439 | 5439 |
| 5°  | 5444 | 5359 | 5397 |
| 10° | 5396 | 5284 | 5322 |
| 15° | 5314 | 5193 | 5207 |
| 20° | 5203 | 5069 | 5088 |
| 25° | 5093 | 4921 | 4951 |
| 30° | 4955 | 4782 | 4777 |
| 35° | 4825 | 4620 | 4594 |
| 40° | 4665 | 4456 | 4419 |
| 45° | 4506 | 4291 | 4240 |
| 50° | 4331 | 4118 | 4033 |
| 55° | 4147 | 3918 | 3842 |
| 60° | 3940 | 3681 | 3624 |
| 65° | 3713 | 3435 | 3366 |
| 70° | 3424 | 3134 | 3088 |
| 75° | 3025 | 2774 | 2828 |
| 80° | 2543 | 2315 | 2338 |
| 85° | 1791 | 1534 | 1530 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 4506 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 446.8   | 1.9       |
| 10°-20°   | 1257.0  | 5.3       |
| 20°-30°   | 1847.3  | 7.7       |
| 30°-40°   | 2145.5  | 9.0       |
| 40°-50°   | 2142.9  | 9.0       |
| 50°-60°   | 1868.5  | 7.8       |
| 60°-70°   | 1381.3  | 5.8       |
| 70°-80°   | 781.5   | 3.3       |
| 80°-90°   | 218.2   | 0.9       |
| 90°-100°  | 260.4   | 1.1       |
| 100°-110° | 827.5   | 3.5       |
| 110°-120° | 1416.1  | 5.9       |
| 120°-130° | 1862.4  | 7.8       |
| 130°-140° | 2090.5  | 8.8       |
| 140°-150° | 2050.0  | 8.6       |
| 150°-160° | 1719.6  | 7.2       |
| 160°-170° | 1140.4  | 4.8       |
| 170°-180° | 398.6   | 1.7       |
| 0°-30°    | 3551.1  | 14.9      |
| 0°-40°    | 5696.6  | 23.9      |
| 0°-60°    | 9708.0  | 40.7      |
| 0°-90°    | 12089.0 | 50.7      |
| 90°-120°  | 2504.0  | 10.5      |
| 90°-150°  | 8506.9  | 35.7      |
| 90°-180°  | 11766.0 | 49.3      |
| 0°-180°   | 23854.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4747 | 4747  | 4747 | 4747  | 4747 |      |
| 5°   | 4747 | 4729  | 4678 | 4715  | 4706 | 451  |
| 15°  | 4519 | 4491  | 4432 | 4450  | 4428 | 1273 |
| 25°  | 4090 | 4053  | 3976 | 3984  | 3976 | 1882 |
| 35°  | 3528 | 3483  | 3410 | 3382  | 3359 | 2203 |
| 45°  | 2871 | 2839  | 2770 | 2721  | 2702 | 2216 |
| 55°  | 2173 | 2145  | 2091 | 2036  | 2013 | 1943 |
| 65°  | 1465 | 1438  | 1392 | 1351  | 1328 | 1449 |
| 75°  | 766  | 758   | 735  | 708   | 717  | 818  |
| 85°  | 187  | 182   | 178  | 164   | 160  | 209  |
| 90°  | 4    | 46    | 124  | 117   | 120  | 23   |
| 95°  | 185  | 221   | 227  | 227   | 221  | 206  |
| 105° | 764  | 774   | 782  | 788   | 788  | 806  |
| 115° | 1421 | 1442  | 1435 | 1431  | 1421 | 1406 |
| 125° | 2067 | 2099  | 2089 | 2077  | 2073 | 1847 |
| 135° | 2674 | 2713  | 2720 | 2717  | 2706 | 2066 |
| 145° | 3246 | 3271  | 3291 | 3295  | 3281 | 2028 |
| 155° | 3711 | 3722  | 3733 | 3751  | 3739 | 1708 |
| 165° | 4038 | 4034  | 4034 | 4059  | 4041 | 1139 |
| 175° | 4201 | 4191  | 4184 | 4209  | 4187 | 399  |
| 180° | 4209 | 4209  | 4209 | 4209  | 4209 |      |

TEST NUMBER: P912080

CATALOG NUMBER: DFN2DIP-SQ3F0-110D120US850-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4746.7 | 4746.7 | 4746.7 | 4746.7 | 4746.7 |
| 2.5°   | 4774.2 | 4751.5 | 4701.2 | 4746.7 | 4738.0 |
| 5°     | 4746.7 | 4728.8 | 4678.4 | 4714.7 | 4706.0 |
| 7.5°   | 4714.7 | 4687.6 | 4637.3 | 4674.1 | 4664.9 |
| 10°    | 4664.9 | 4632.8 | 4578.2 | 4614.4 | 4600.9 |
| 12.5°  | 4596.1 | 4569.0 | 4514.3 | 4537.0 | 4527.8 |
| 15°    | 4518.6 | 4491.4 | 4431.9 | 4450.3 | 4427.6 |
| 17.5°  | 4422.7 | 4395.6 | 4336.1 | 4358.8 | 4336.1 |
| 20°    | 4317.7 | 4290.5 | 4226.6 | 4240.2 | 4222.3 |
| 22.5°  | 4213.1 | 4171.8 | 4112.3 | 4112.3 | 4103.1 |
| 25°    | 4089.5 | 4053.3 | 3975.8 | 3984.5 | 3975.8 |
| 27.5°  | 3952.5 | 3920.5 | 3861.4 | 3847.9 | 3825.2 |
| 30°    | 3816.0 | 3779.1 | 3710.8 | 3697.3 | 3678.9 |
| 32.5°  | 3669.7 | 3642.6 | 3569.4 | 3541.8 | 3523.4 |
| 35°    | 3528.3 | 3482.8 | 3409.6 | 3382.0 | 3359.3 |
| 37.5°  | 3368.5 | 3327.3 | 3254.2 | 3222.2 | 3199.5 |
| 40°    | 3204.3 | 3167.5 | 3094.4 | 3053.7 | 3035.3 |
| 42.5°  | 3044.5 | 3007.7 | 2935.1 | 2889.1 | 2862.0 |
| 45°    | 2871.2 | 2839.2 | 2770.4 | 2720.6 | 2702.2 |
| 47.5°  | 2702.2 | 2670.3 | 2597.1 | 2546.7 | 2519.5 |
| 50°    | 2524.0 | 2501.2 | 2437.2 | 2373.4 | 2350.6 |
| 52.5°  | 2350.6 | 2318.6 | 2259.6 | 2209.1 | 2177.2 |
| 55°    | 2172.9 | 2145.2 | 2090.6 | 2035.8 | 2013.1 |
| 57.5°  | 1994.6 | 1971.9 | 1912.4 | 1857.6 | 1839.2 |
| 60°    | 1816.4 | 1798.6 | 1734.6 | 1684.2 | 1670.7 |
| 62.5°  | 1643.1 | 1611.2 | 1565.6 | 1520.1 | 1501.7 |
| 65°    | 1465.3 | 1437.7 | 1392.2 | 1351.1 | 1328.4 |
| 67.5°  | 1282.8 | 1259.6 | 1218.9 | 1187.0 | 1168.6 |
| 70°    | 1113.8 | 1095.4 | 1054.2 | 1022.3 | 1004.3 |
| 72.5°  | 940.4  | 922.0  | 899.3  | 867.3  | 853.7  |
| 75°    | 766.5  | 757.9  | 734.6  | 707.5  | 716.7  |
| 77.5°  | 611.6  | 593.2  | 584.0  | 570.5  | 556.9  |
| 80°    | 456.7  | 451.8  | 442.6  | 429.1  | 419.9  |
| 82.5°  | 310.4  | 310.4  | 306.1  | 287.7  | 287.7  |
| 85°    | 187.0  | 182.5  | 178.2  | 164.1  | 159.8  |
| 87.5°  | 82.3   | 73.1   | 63.9   | 50.3   | 45.5   |
| 90°    | 3.8    | 45.7   | 124.3  | 116.8  | 120.5  |
| 92.5°  | 78.6   | 106.6  | 110.3  | 114.2  | 114.2  |
| 95°    | 185.2  | 220.8  | 227.1  | 227.1  | 220.8  |
| 97.5°  | 308.3  | 341.4  | 355.3  | 355.3  | 355.3  |
| 100°   | 450.5  | 479.6  | 489.7  | 489.7  | 486.0  |
| 102.5° | 600.2  | 621.7  | 635.7  | 639.6  | 635.7  |
| 105°   | 763.9  | 774.0  | 781.6  | 787.9  | 787.9  |
| 107.5° | 926.2  | 941.5  | 941.5  | 944.0  | 926.2  |
| 110°   | 1083.6 | 1103.9 | 1103.9 | 1103.9 | 1093.8 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1253.6 | 1275.2 | 1271.4 | 1261.3 | 1253.6 |
| 115°   | 1421.1 | 1441.5 | 1435.0 | 1431.3 | 1421.1 |
| 117.5° | 1587.3 | 1615.3 | 1597.5 | 1587.3 | 1577.2 |
| 120°   | 1754.9 | 1782.7 | 1754.9 | 1754.9 | 1743.5 |
| 122.5° | 1907.1 | 1942.6 | 1924.9 | 1914.7 | 1907.1 |
| 125°   | 2067.0 | 2098.7 | 2088.6 | 2077.2 | 2073.3 |
| 127.5° | 2223.1 | 2262.4 | 2248.4 | 2233.2 | 2223.1 |
| 130°   | 2368.9 | 2414.6 | 2408.3 | 2400.7 | 2386.7 |
| 132.5° | 2532.6 | 2568.2 | 2570.7 | 2552.9 | 2542.8 |
| 135°   | 2673.5 | 2712.8 | 2720.5 | 2716.6 | 2706.5 |
| 137.5° | 2830.8 | 2862.6 | 2868.9 | 2866.3 | 2851.1 |
| 140°   | 2969.1 | 3000.8 | 3018.6 | 3018.6 | 3004.6 |
| 142.5° | 3111.3 | 3143.0 | 3153.1 | 3156.9 | 3143.0 |
| 145°   | 3245.7 | 3271.1 | 3291.4 | 3295.3 | 3281.3 |
| 147.5° | 3366.3 | 3398.0 | 3413.3 | 3419.6 | 3405.6 |
| 150°   | 3490.7 | 3512.2 | 3526.2 | 3537.6 | 3526.2 |
| 152.5° | 3601.0 | 3622.5 | 3640.4 | 3654.4 | 3640.4 |
| 155°   | 3711.4 | 3721.6 | 3733.0 | 3750.7 | 3739.3 |
| 157.5° | 3806.6 | 3814.2 | 3820.5 | 3845.9 | 3828.2 |
| 160°   | 3891.6 | 3899.2 | 3903.0 | 3924.6 | 3909.3 |
| 162.5° | 3970.2 | 3970.2 | 3974.1 | 3998.2 | 3980.4 |
| 165°   | 4037.5 | 4033.8 | 4033.8 | 4059.1 | 4041.3 |
| 167.5° | 4098.4 | 4087.0 | 4087.0 | 4112.4 | 4094.6 |
| 170°   | 4144.1 | 4133.9 | 4130.1 | 4155.5 | 4133.9 |
| 172.5° | 4175.8 | 4165.6 | 4161.9 | 4187.3 | 4165.6 |
| 175°   | 4201.2 | 4191.0 | 4183.5 | 4208.8 | 4187.3 |
| 177.5° | 4215.2 | 4205.0 | 4197.3 | 4219.0 | 4197.3 |
| 180°   | 4208.8 | 4208.8 | 4208.8 | 4208.8 | 4208.8 |

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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 | 13.18            | 14.05 | 14.13 | 15.02 | 16.28 | 12.74          | 13.61 | 13.69 | 14.57 | 15.83 |
|                 | 3H   | 14.84            | 15.62 | 15.80 | 16.59 | 17.88 | 14.35          | 15.13 | 15.31 | 16.10 | 17.39 |
|                 | 4H   | 15.42            | 16.16 | 16.40 | 17.14 | 18.43 | 14.93          | 15.67 | 15.91 | 16.65 | 17.94 |
|                 | 6H   | 15.82            | 16.50 | 16.81 | 17.49 | 18.79 | 15.32          | 16.00 | 16.31 | 16.99 | 18.29 |
|                 | 8H   | 15.92            | 16.57 | 16.92 | 17.57 | 18.88 | 15.42          | 16.07 | 16.42 | 17.07 | 18.37 |
|                 | 12H  | 15.97            | 16.59 | 16.97 | 17.58 | 18.91 | 15.46          | 16.08 | 16.46 | 17.07 | 18.40 |
| 4H              | 2H   | 13.64            | 14.38 | 14.62 | 15.36 | 16.65 | 13.29          | 14.02 | 14.27 | 15.00 | 16.30 |
|                 | 3H   | 15.50            | 16.12 | 16.49 | 17.13 | 18.43 | 15.09          | 15.71 | 16.09 | 16.72 | 18.03 |
|                 | 4H   | 16.21            | 16.78 | 17.21 | 17.78 | 19.11 | 15.79          | 16.35 | 16.79 | 17.35 | 18.68 |
|                 | 6H   | 16.72            | 17.21 | 17.74 | 18.23 | 19.56 | 16.29          | 16.78 | 17.30 | 17.80 | 19.13 |
|                 | 8H   | 16.87            | 17.32 | 17.88 | 18.34 | 19.69 | 16.43          | 16.89 | 17.45 | 17.91 | 19.25 |
|                 | 12H  | 16.94            | 17.35 | 17.97 | 18.39 | 19.73 | 16.49          | 16.90 | 17.53 | 17.94 | 19.28 |
| 8H              | 4H   | 16.41            | 16.86 | 17.42 | 17.88 | 19.22 | 16.03          | 16.48 | 17.04 | 17.50 | 18.84 |
|                 | 6H   | 17.03            | 17.41 | 18.07 | 18.47 | 19.81 | 16.65          | 17.02 | 17.68 | 18.08 | 19.42 |
|                 | 8H   | 17.25            | 17.58 | 18.29 | 18.62 | 19.98 | 16.86          | 17.19 | 17.90 | 18.23 | 19.59 |
|                 | 12H  | 17.38            | 17.67 | 18.43 | 18.71 | 20.11 | 16.97          | 17.26 | 18.02 | 18.30 | 19.70 |
| 12H             | 4H   | 16.39            | 16.80 | 17.42 | 17.83 | 19.18 | 16.02          | 16.43 | 17.05 | 17.47 | 18.81 |
|                 | 6H   | 17.06            | 17.39 | 18.10 | 18.44 | 19.79 | 16.69          | 17.02 | 17.73 | 18.06 | 19.42 |
|                 | 8H   | 17.30            | 17.59 | 18.35 | 18.63 | 20.03 | 16.92          | 17.21 | 17.97 | 18.25 | 19.65 |