

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: P909306

Luminaire Tested: DFN2DIP-SQ3F0-100D090US840-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909306  
REPORT IS A COMBINATION OF REPORTS P899964 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-100D090US840-RLLFLL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

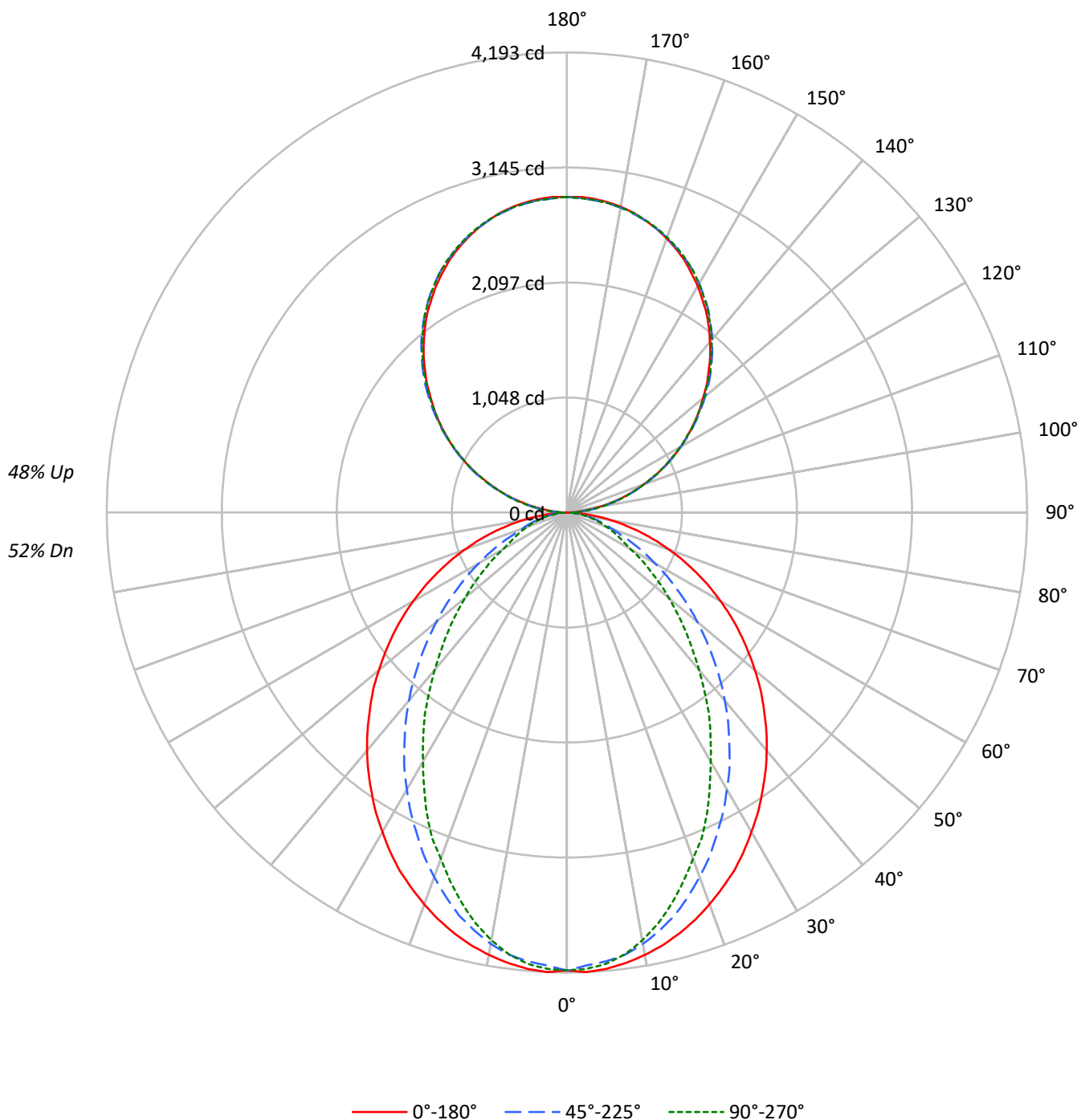
Lumens per Lamp: N/A  
Luminaire Lumens: 16627.4 lumens  
Efficiency: N/A  
Efficacy: 99.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 167  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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: P909306

CATALOG NUMBER: DFN2DIP-SQ3F0-100D090US840-RLLFLL

**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   | 108 | 108 | 108 | 108 | 99 | 99 | 99 | 99 | 84 | 84 | 84 | 70 | 70 | 70 | 58 | 58 | 58 |
| 1   | 99  | 94  | 91  | 87  | 91 | 88 | 84 | 82 | 75 | 72 | 70 | 63 | 61 | 60 | 52 | 51 | 50 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 68 | 66 | 62 | 59 | 56 | 53 | 51 | 46 | 44 | 43 |
| 3   | 83  | 73  | 66  | 61  | 76 | 68 | 62 | 57 | 59 | 54 | 50 | 50 | 46 | 43 | 41 | 39 | 37 |
| 4   | 76  | 65  | 58  | 52  | 70 | 61 | 54 | 49 | 52 | 47 | 43 | 45 | 41 | 38 | 37 | 34 | 32 |
| 5   | 70  | 59  | 51  | 45  | 64 | 55 | 48 | 42 | 47 | 42 | 38 | 40 | 36 | 33 | 34 | 31 | 28 |
| 6   | 64  | 53  | 45  | 39  | 60 | 49 | 42 | 37 | 43 | 37 | 33 | 37 | 32 | 29 | 31 | 28 | 25 |
| 7   | 60  | 48  | 40  | 35  | 55 | 45 | 38 | 33 | 39 | 33 | 29 | 33 | 29 | 26 | 28 | 25 | 23 |
| 8   | 56  | 43  | 36  | 31  | 51 | 41 | 34 | 29 | 36 | 30 | 26 | 31 | 26 | 23 | 26 | 23 | 20 |
| 9   | 52  | 40  | 32  | 28  | 48 | 37 | 31 | 26 | 33 | 27 | 24 | 28 | 24 | 21 | 24 | 21 | 19 |
| 10  | 48  | 37  | 30  | 25  | 45 | 34 | 28 | 24 | 30 | 25 | 21 | 26 | 22 | 19 | 23 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4782 | 4782 | 4782 |
| 5°  | 4787 | 4703 | 4735 |
| 10° | 4736 | 4608 | 4579 |
| 15° | 4668 | 4452 | 4340 |
| 20° | 4579 | 4240 | 4046 |
| 25° | 4487 | 4001 | 3763 |
| 30° | 4366 | 3758 | 3404 |
| 35° | 4246 | 3496 | 3089 |
| 40° | 4124 | 3225 | 2728 |
| 45° | 3983 | 2926 | 2400 |
| 50° | 3837 | 2623 | 2081 |
| 55° | 3684 | 2301 | 1774 |
| 60° | 3506 | 1964 | 1459 |
| 65° | 3302 | 1621 | 1311 |
| 70° | 3054 | 1302 | 1184 |
| 75° | 2742 | 1141 | 1074 |
| 80° | 2291 | 948  | 926  |
| 85° | 1554 | 617  | 687  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 3983 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 391.2   | 2.4       |
| 10°-20°   | 1073.8  | 6.5       |
| 20°-30°   | 1507.6  | 9.1       |
| 30°-40°   | 1643.4  | 9.9       |
| 40°-50°   | 1510.5  | 9.1       |
| 50°-60°   | 1186.3  | 7.1       |
| 60°-70°   | 772.1   | 4.6       |
| 70°-80°   | 397.5   | 2.4       |
| 80°-90°   | 109.6   | 0.7       |
| 90°-100°  | 177.9   | 1.1       |
| 100°-110° | 565.2   | 3.4       |
| 110°-120° | 967.2   | 5.8       |
| 120°-130° | 1272.0  | 7.6       |
| 130°-140° | 1427.7  | 8.6       |
| 140°-150° | 1400.0  | 8.4       |
| 150°-160° | 1174.4  | 7.1       |
| 160°-170° | 778.9   | 4.7       |
| 170°-180° | 272.2   | 1.6       |
| 0°-30°    | 2972.6  | 17.9      |
| 0°-40°    | 4616.1  | 27.8      |
| 0°-60°    | 7312.8  | 44.0      |
| 0°-90°    | 8592.0  | 51.7      |
| 90°-120°  | 1710.2  | 10.3      |
| 90°-150°  | 5809.9  | 34.9      |
| 90°-180°  | 8035.0  | 48.3      |
| 0°-180°   | 16627.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4174 | 4174  | 4174 | 4174  | 4174 |      |
| 5°   | 4174 | 4155  | 4106 | 4140  | 4128 | 396  |
| 15°  | 3970 | 3928  | 3800 | 3728  | 3690 | 1119 |
| 25°  | 3604 | 3482  | 3233 | 3078  | 3022 | 1657 |
| 35°  | 3105 | 2912  | 2580 | 2342  | 2259 | 1943 |
| 45°  | 2538 | 2285  | 1889 | 1620  | 1530 | 1960 |
| 55°  | 1930 | 1636  | 1228 | 1001  | 929  | 1725 |
| 65°  | 1303 | 997   | 657  | 529   | 517  | 1292 |
| 75°  | 695  | 430   | 302  | 276   | 272  | 735  |
| 85°  | 162  | 83    | 72   | 72    | 72   | 186  |
| 90°  | 3    | 31    | 85   | 80    | 82   | 16   |
| 95°  | 126  | 151   | 155  | 155   | 151  | 141  |
| 105° | 522  | 529   | 534  | 538   | 538  | 551  |
| 115° | 971  | 984   | 980  | 978   | 971  | 960  |
| 125° | 1412 | 1433  | 1426 | 1419  | 1416 | 1261 |
| 135° | 1826 | 1853  | 1858 | 1855  | 1848 | 1411 |
| 145° | 2217 | 2234  | 2248 | 2250  | 2241 | 1385 |
| 155° | 2535 | 2542  | 2550 | 2562  | 2554 | 1167 |
| 165° | 2757 | 2755  | 2755 | 2772  | 2760 | 778  |
| 175° | 2869 | 2862  | 2857 | 2874  | 2860 | 273  |
| 180° | 2874 | 2874  | 2874 | 2874  | 2874 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4173.8 | 4173.8 | 4173.8 | 4173.8 | 4173.8 |
| 2.5°   | 4192.6 | 4173.8 | 4132.1 | 4170.1 | 4162.6 |
| 5°     | 4173.8 | 4154.9 | 4105.6 | 4139.7 | 4128.4 |
| 7.5°   | 4139.7 | 4117.2 | 4064.3 | 4079.1 | 4060.4 |
| 10°    | 4094.4 | 4067.9 | 3992.6 | 3981.0 | 3958.6 |
| 12.5°  | 4037.9 | 4003.8 | 3901.6 | 3879.2 | 3837.5 |
| 15°    | 3969.8 | 3928.1 | 3799.8 | 3728.1 | 3690.5 |
| 17.5°  | 3890.4 | 3829.9 | 3671.3 | 3588.3 | 3527.8 |
| 20°    | 3799.8 | 3724.1 | 3535.3 | 3441.2 | 3357.8 |
| 22.5°  | 3701.7 | 3614.7 | 3395.5 | 3267.3 | 3210.8 |
| 25°    | 3603.5 | 3482.5 | 3233.2 | 3078.5 | 3021.6 |
| 27.5°  | 3486.5 | 3357.8 | 3082.1 | 2904.6 | 2817.6 |
| 30°    | 3361.8 | 3217.9 | 2915.8 | 2723.5 | 2621.3 |
| 32.5°  | 3240.9 | 3066.9 | 2757.5 | 2530.7 | 2436.1 |
| 35°    | 3104.9 | 2912.3 | 2580.0 | 2342.0 | 2258.6 |
| 37.5°  | 2972.7 | 2764.7 | 2413.7 | 2152.8 | 2058.6 |
| 40°    | 2832.9 | 2606.5 | 2239.8 | 1971.7 | 1873.5 |
| 42.5°  | 2689.4 | 2447.7 | 2066.3 | 1786.6 | 1692.3 |
| 45°    | 2538.3 | 2285.0 | 1888.8 | 1620.2 | 1529.6 |
| 47.5°  | 2394.9 | 2126.8 | 1718.8 | 1450.3 | 1367.4 |
| 50°    | 2236.1 | 1968.0 | 1552.5 | 1291.6 | 1212.6 |
| 52.5°  | 2081.0 | 1797.8 | 1393.8 | 1144.5 | 1072.8 |
| 55°    | 1930.0 | 1635.5 | 1227.5 | 1001.1 | 929.3  |
| 57.5°  | 1775.3 | 1473.1 | 1080.5 | 868.8  | 808.3  |
| 60°    | 1616.6 | 1314.4 | 925.3  | 733.0  | 672.5  |
| 62.5°  | 1461.9 | 1159.7 | 793.0  | 612.0  | 581.9  |
| 65°    | 1303.2 | 997.0  | 657.2  | 529.0  | 517.4  |
| 67.5°  | 1152.2 | 846.0  | 529.0  | 464.4  | 453.2  |
| 70°    | 993.4  | 698.9  | 438.0  | 400.3  | 385.2  |
| 72.5°  | 842.3  | 562.6  | 366.3  | 336.2  | 328.6  |
| 75°    | 694.9  | 430.4  | 302.2  | 275.7  | 272.1  |
| 77.5°  | 547.9  | 305.8  | 238.0  | 222.8  | 215.2  |
| 80°    | 411.5  | 219.2  | 181.2  | 166.3  | 166.3  |
| 82.5°  | 286.9  | 147.4  | 124.6  | 117.0  | 117.0  |
| 85°    | 162.3  | 82.9   | 71.7   | 71.7   | 71.7   |
| 87.5°  | 60.5   | 30.1   | 30.1   | 26.5   | 26.5   |
| 90°    | 2.6    | 31.2   | 84.9   | 79.7   | 82.3   |
| 92.5°  | 53.7   | 72.8   | 75.4   | 78.0   | 78.0   |
| 95°    | 126.5  | 150.8  | 155.1  | 155.1  | 150.8  |
| 97.5°  | 210.6  | 233.1  | 242.7  | 242.7  | 242.7  |
| 100°   | 307.6  | 327.6  | 334.5  | 334.5  | 331.9  |
| 102.5° | 409.9  | 424.6  | 434.1  | 436.8  | 434.1  |
| 105°   | 521.7  | 528.6  | 533.8  | 538.2  | 538.2  |
| 107.5° | 632.6  | 643.0  | 643.0  | 644.7  | 632.6  |
| 110°   | 740.0  | 754.0  | 754.0  | 754.0  | 747.0  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 856.2  | 870.9  | 868.3  | 861.4  | 856.2  |
| 115°   | 970.6  | 984.4  | 980.1  | 977.5  | 970.6  |
| 117.5° | 1084.1 | 1103.2 | 1091.1 | 1084.1 | 1077.1 |
| 120°   | 1198.5 | 1217.5 | 1198.5 | 1198.5 | 1190.6 |
| 122.5° | 1302.4 | 1326.8 | 1314.6 | 1307.7 | 1302.4 |
| 125°   | 1411.7 | 1433.3 | 1426.4 | 1418.6 | 1416.0 |
| 127.5° | 1518.2 | 1545.1 | 1535.6 | 1525.2 | 1518.2 |
| 130°   | 1617.9 | 1649.1 | 1644.8 | 1639.5 | 1630.0 |
| 132.5° | 1729.7 | 1753.9 | 1755.7 | 1743.5 | 1736.7 |
| 135°   | 1825.8 | 1852.7 | 1858.0 | 1855.3 | 1848.5 |
| 137.5° | 1933.3 | 1955.0 | 1959.3 | 1957.6 | 1947.2 |
| 140°   | 2027.8 | 2049.4 | 2061.5 | 2061.5 | 2052.0 |
| 142.5° | 2124.9 | 2146.5 | 2153.4 | 2156.1 | 2146.5 |
| 145°   | 2216.8 | 2234.0 | 2247.9 | 2250.5 | 2241.0 |
| 147.5° | 2299.1 | 2320.7 | 2331.1 | 2335.4 | 2325.9 |
| 150°   | 2384.0 | 2398.7 | 2408.2 | 2416.0 | 2408.2 |
| 152.5° | 2459.3 | 2474.1 | 2486.2 | 2495.8 | 2486.2 |
| 155°   | 2534.8 | 2541.6 | 2549.5 | 2561.6 | 2553.8 |
| 157.5° | 2599.7 | 2604.9 | 2609.3 | 2626.6 | 2614.4 |
| 160°   | 2657.8 | 2663.0 | 2665.6 | 2680.3 | 2669.9 |
| 162.5° | 2711.5 | 2711.5 | 2714.1 | 2730.6 | 2718.5 |
| 165°   | 2757.4 | 2754.8 | 2754.8 | 2772.2 | 2760.1 |
| 167.5° | 2799.0 | 2791.3 | 2791.3 | 2808.5 | 2796.4 |
| 170°   | 2830.2 | 2823.3 | 2820.8 | 2838.0 | 2823.3 |
| 172.5° | 2851.9 | 2845.0 | 2842.4 | 2859.7 | 2845.0 |
| 175°   | 2869.2 | 2862.3 | 2857.1 | 2874.5 | 2859.7 |
| 177.5° | 2878.7 | 2871.9 | 2866.6 | 2881.3 | 2866.6 |
| 180°   | 2874.5 | 2874.5 | 2874.5 | 2874.5 | 2874.5 |

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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 | 12.70            | 13.55 | 13.65 | 14.51 | 15.76 | 8.66           | 9.51  | 9.61  | 10.47 | 11.72 |
|                 | 3H   | 14.38            | 15.13 | 15.34 | 16.10 | 17.38 | 9.85           | 10.60 | 10.81 | 11.57 | 12.85 |
|                 | 4H   | 14.98            | 15.70 | 15.96 | 16.67 | 17.95 | 10.29          | 11.01 | 11.27 | 11.98 | 13.26 |
|                 | 6H   | 15.40            | 16.06 | 16.39 | 17.04 | 18.33 | 10.61          | 11.27 | 11.60 | 12.25 | 13.54 |
|                 | 8H   | 15.53            | 16.15 | 16.52 | 17.15 | 18.44 | 10.70          | 11.32 | 11.69 | 12.32 | 13.61 |
|                 | 12H  | 15.59            | 16.18 | 16.58 | 17.17 | 18.49 | 10.74          | 11.33 | 11.74 | 12.32 | 13.64 |
| 4H              | 2H   | 12.72            | 13.44 | 13.70 | 14.41 | 15.69 | 9.26           | 9.97  | 10.24 | 10.95 | 12.23 |
|                 | 3H   | 14.55            | 15.14 | 15.54 | 16.14 | 17.44 | 10.60          | 11.20 | 11.59 | 12.20 | 13.50 |
|                 | 4H   | 15.24            | 15.78 | 16.23 | 16.77 | 18.09 | 11.15          | 11.69 | 12.14 | 12.68 | 14.00 |
|                 | 6H   | 15.75            | 16.21 | 16.76 | 17.23 | 18.55 | 11.56          | 12.02 | 12.57 | 13.05 | 14.36 |
|                 | 8H   | 15.92            | 16.35 | 16.93 | 17.37 | 18.70 | 11.68          | 12.12 | 12.70 | 13.13 | 14.46 |
|                 | 12H  | 16.01            | 16.41 | 17.04 | 17.43 | 18.77 | 11.75          | 12.14 | 12.78 | 13.17 | 14.50 |
| 8H              | 4H   | 15.20            | 15.64 | 16.21 | 16.65 | 17.98 | 11.42          | 11.86 | 12.44 | 12.87 | 14.20 |
|                 | 6H   | 15.76            | 16.12 | 16.80 | 17.18 | 18.51 | 11.94          | 12.29 | 12.97 | 13.35 | 14.68 |
|                 | 8H   | 15.98            | 16.29 | 17.02 | 17.34 | 18.68 | 12.12          | 12.44 | 13.16 | 13.48 | 14.83 |
|                 | 12H  | 16.11            | 16.39 | 17.16 | 17.43 | 18.82 | 12.24          | 12.51 | 13.28 | 13.55 | 14.94 |
| 12H             | 4H   | 15.16            | 15.55 | 16.18 | 16.58 | 17.91 | 11.43          | 11.82 | 12.46 | 12.85 | 14.19 |
|                 | 6H   | 15.74            | 16.06 | 16.78 | 17.10 | 18.44 | 11.98          | 12.30 | 13.03 | 13.34 | 14.69 |
|                 | 8H   | 15.96            | 16.23 | 17.00 | 17.27 | 18.66 | 12.19          | 12.47 | 13.23 | 13.50 | 14.89 |