

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: P916998

Luminaire Tested: DFN2DIP-PN4F0-090D120US930-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916998  
REPORT IS A COMBINATION OF REPORTS P899764 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-090D120US930-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

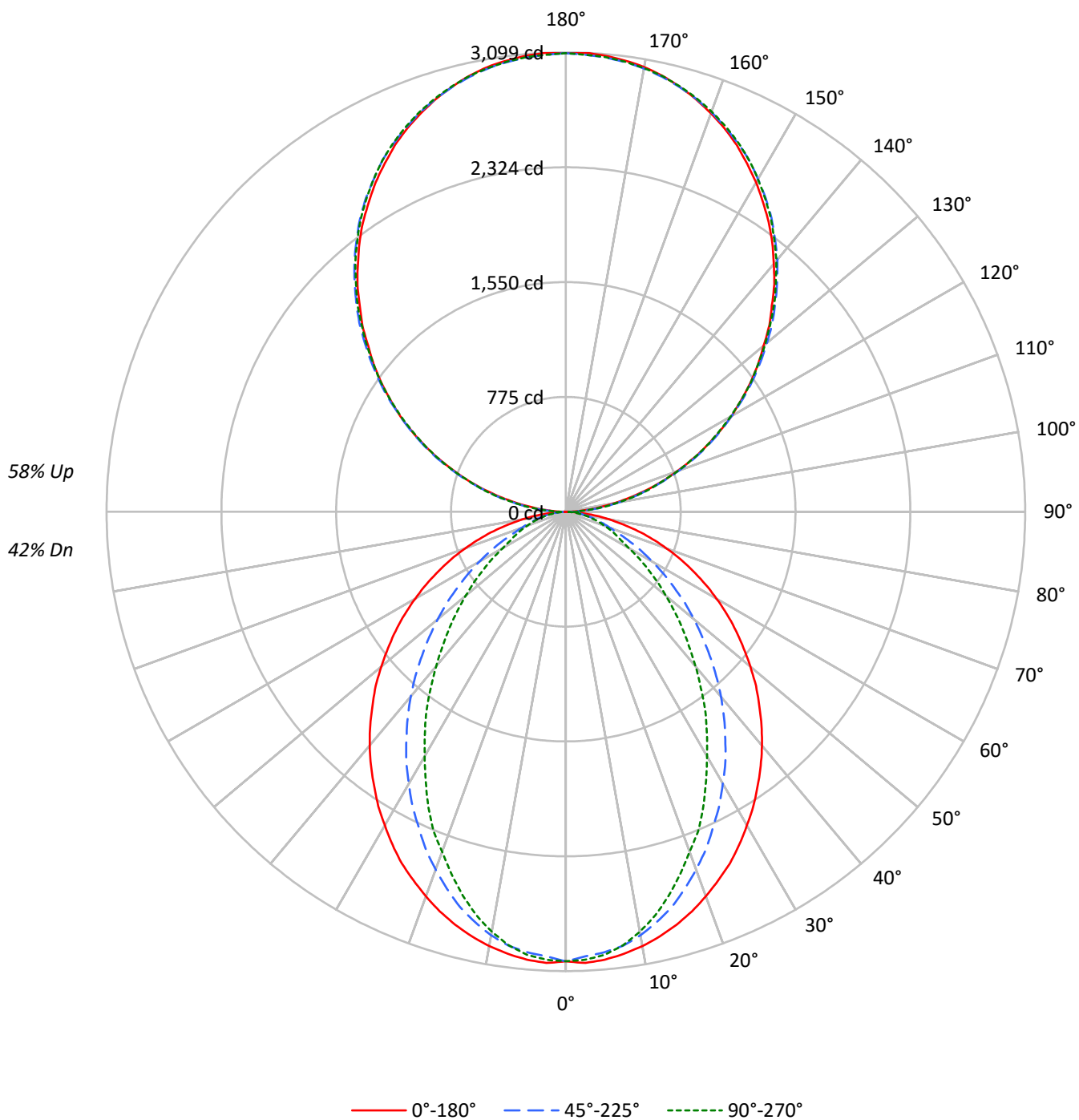
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14895.5 lumens  
Efficiency: N/A  
Efficacy: 77.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 191.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 63 | 63 | 63 | 49 | 49 | 49 |
| 1   | 96  | 92  | 89  | 85  | 88 | 84 | 81 | 78 | 70 | 67 | 65 | 56 | 55 | 53 | 44 | 43 | 42 |
| 2   | 88  | 81  | 75  | 70  | 80 | 74 | 69 | 65 | 61 | 58 | 55 | 50 | 47 | 45 | 39 | 37 | 36 |
| 3   | 81  | 72  | 65  | 59  | 73 | 66 | 60 | 55 | 55 | 50 | 47 | 44 | 41 | 39 | 35 | 33 | 31 |
| 4   | 74  | 64  | 56  | 50  | 67 | 58 | 52 | 47 | 49 | 44 | 40 | 40 | 36 | 33 | 31 | 29 | 27 |
| 5   | 68  | 57  | 49  | 43  | 62 | 52 | 45 | 40 | 44 | 39 | 35 | 36 | 32 | 29 | 28 | 26 | 24 |
| 6   | 63  | 51  | 43  | 38  | 57 | 47 | 40 | 35 | 40 | 34 | 30 | 33 | 29 | 26 | 26 | 23 | 21 |
| 7   | 58  | 46  | 38  | 33  | 53 | 43 | 36 | 31 | 36 | 31 | 27 | 30 | 26 | 23 | 24 | 21 | 19 |
| 8   | 54  | 42  | 34  | 29  | 49 | 39 | 32 | 28 | 33 | 28 | 24 | 27 | 23 | 21 | 22 | 19 | 17 |
| 9   | 50  | 38  | 31  | 26  | 46 | 36 | 29 | 25 | 30 | 25 | 22 | 25 | 21 | 19 | 20 | 18 | 16 |
| 10  | 47  | 35  | 28  | 24  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 23 | 19 | 17 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2214 | 2214 | 2214 |
| 5°  | 2217 | 2179 | 2193 |
| 10° | 2195 | 2136 | 2122 |
| 15° | 2165 | 2066 | 2012 |
| 20° | 2125 | 1969 | 1877 |
| 25° | 2084 | 1860 | 1747 |
| 30° | 2029 | 1749 | 1581 |
| 35° | 1975 | 1628 | 1436 |
| 40° | 1921 | 1504 | 1269 |
| 45° | 1857 | 1366 | 1117 |
| 50° | 1791 | 1227 | 970  |
| 55° | 1722 | 1078 | 828  |
| 60° | 1643 | 923  | 682  |
| 65° | 1551 | 764  | 614  |
| 70° | 1440 | 617  | 556  |
| 75° | 1301 | 544  | 507  |
| 80° | 1099 | 458  | 441  |
| 85° | 765  | 307  | 334  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2422 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 284.2   | 1.9       |
| 10°-20°   | 780.3   | 5.2       |
| 20°-30°   | 1095.5  | 7.4       |
| 30°-40°   | 1194.1  | 8.0       |
| 40°-50°   | 1097.5  | 7.4       |
| 50°-60°   | 861.9   | 5.8       |
| 60°-70°   | 561.0   | 3.8       |
| 70°-80°   | 288.8   | 1.9       |
| 80°-90°   | 82.5    | 0.6       |
| 90°-100°  | 191.5   | 1.3       |
| 100°-110° | 608.3   | 4.1       |
| 110°-120° | 1041.1  | 7.0       |
| 120°-130° | 1369.2  | 9.2       |
| 130°-140° | 1536.9  | 10.3      |
| 140°-150° | 1507.1  | 10.1      |
| 150°-160° | 1264.2  | 8.5       |
| 160°-170° | 838.4   | 5.6       |
| 170°-180° | 293.0   | 2.0       |
| 0°-30°    | 2159.9  | 14.5      |
| 0°-40°    | 3354.0  | 22.5      |
| 0°-60°    | 5313.5  | 35.7      |
| 0°-90°    | 6245.8  | 41.9      |
| 90°-120°  | 1840.9  | 12.4      |
| 90°-150°  | 6254.0  | 42.0      |
| 90°-180°  | 8650.0  | 58.1      |
| 0°-180°   | 14895.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3033 | 3033  | 3033 | 3033  | 3033 |      |
| 5°   | 3033 | 3019  | 2983 | 3008  | 3000 | 288  |
| 15°  | 2884 | 2854  | 2761 | 2709  | 2682 | 813  |
| 25°  | 2618 | 2530  | 2349 | 2237  | 2196 | 1204 |
| 35°  | 2256 | 2116  | 1875 | 1702  | 1641 | 1412 |
| 45°  | 1844 | 1660  | 1372 | 1177  | 1111 | 1424 |
| 55°  | 1402 | 1188  | 892  | 727   | 675  | 1253 |
| 65°  | 947  | 724   | 478  | 384   | 376  | 939  |
| 75°  | 505  | 313   | 220  | 200   | 198  | 534  |
| 85°  | 118  | 60    | 52   | 52    | 52   | 135  |
| 90°  | 3    | 34    | 91   | 86    | 89   | 15   |
| 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°     | 3032.7 | 3032.7 | 3032.7 | 3032.7 | 3032.7 |
| 2.5°   | 3046.4 | 3032.7 | 3002.3 | 3030.1 | 3024.5 |
| 5°     | 3032.7 | 3019.0 | 2983.2 | 3007.9 | 2999.7 |
| 7.5°   | 3007.9 | 2991.6 | 2953.2 | 2963.9 | 2950.2 |
| 10°    | 2975.0 | 2955.8 | 2901.1 | 2892.6 | 2876.3 |
| 12.5°  | 2933.9 | 2909.2 | 2835.0 | 2818.6 | 2788.3 |
| 15°    | 2884.4 | 2854.2 | 2761.0 | 2708.8 | 2681.5 |
| 17.5°  | 2826.8 | 2782.9 | 2667.5 | 2607.2 | 2563.3 |
| 20°    | 2761.0 | 2706.0 | 2568.8 | 2500.4 | 2439.8 |
| 22.5°  | 2689.7 | 2626.5 | 2467.2 | 2374.0 | 2333.0 |
| 25°    | 2618.3 | 2530.4 | 2349.3 | 2236.9 | 2195.5 |
| 27.5°  | 2533.3 | 2439.8 | 2239.5 | 2110.5 | 2047.3 |
| 30°    | 2442.7 | 2338.2 | 2118.6 | 1978.9 | 1904.6 |
| 32.5°  | 2354.7 | 2228.4 | 2003.6 | 1838.8 | 1770.1 |
| 35°    | 2256.1 | 2116.0 | 1874.6 | 1701.7 | 1641.1 |
| 37.5°  | 2160.0 | 2008.9 | 1753.8 | 1564.2 | 1495.8 |
| 40°    | 2058.4 | 1893.9 | 1627.4 | 1432.6 | 1361.3 |
| 42.5°  | 1954.1 | 1778.6 | 1501.3 | 1298.1 | 1229.6 |
| 45°    | 1844.4 | 1660.4 | 1372.3 | 1177.2 | 1111.4 |
| 47.5°  | 1740.1 | 1545.3 | 1248.9 | 1053.8 | 993.5  |
| 50°    | 1624.8 | 1430.0 | 1128.0 | 938.5  | 881.1  |
| 52.5°  | 1512.1 | 1306.3 | 1012.8 | 831.6  | 779.5  |
| 55°    | 1402.3 | 1188.3 | 891.9  | 727.4  | 675.2  |
| 57.5°  | 1290.0 | 1070.4 | 785.1  | 631.3  | 587.3  |
| 60°    | 1174.6 | 955.0  | 672.4  | 532.6  | 488.6  |
| 62.5°  | 1062.3 | 842.7  | 576.3  | 444.7  | 422.8  |
| 65°    | 946.9  | 724.5  | 477.5  | 384.3  | 375.9  |
| 67.5°  | 837.1  | 614.7  | 384.3  | 337.5  | 329.3  |
| 70°    | 721.9  | 507.8  | 318.3  | 290.9  | 279.8  |
| 72.5°  | 612.0  | 408.8  | 266.1  | 244.3  | 238.8  |
| 75°    | 504.9  | 312.7  | 219.6  | 200.3  | 197.7  |
| 77.5°  | 398.0  | 222.2  | 172.9  | 161.9  | 156.4  |
| 80°    | 299.1  | 159.3  | 131.6  | 120.8  | 120.8  |
| 82.5°  | 208.5  | 107.1  | 90.6   | 85.0   | 85.0   |
| 85°    | 117.9  | 60.3   | 52.1   | 52.1   | 52.1   |
| 87.5°  | 43.9   | 21.8   | 21.8   | 19.2   | 19.2   |
| 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 | 9.11             | 9.88  | 10.14 | 10.91 | 12.30 | 5.08           | 5.84 | 6.10 | 6.88  | 8.26  |
|                 | 3H   | 10.79            | 11.47 | 11.83 | 12.51 | 13.92 | 6.26           | 6.95 | 7.30 | 7.99  | 9.39  |
|                 | 4H   | 11.39            | 12.04 | 12.45 | 13.09 | 14.50 | 6.71           | 7.36 | 7.76 | 8.40  | 9.81  |
|                 | 6H   | 11.81            | 12.41 | 12.88 | 13.46 | 14.88 | 7.03           | 7.62 | 8.09 | 8.67  | 10.10 |
|                 | 8H   | 11.94            | 12.51 | 13.01 | 13.57 | 14.99 | 7.12           | 7.68 | 8.18 | 8.75  | 10.17 |
|                 | 12H  | 12.00            | 12.54 | 13.07 | 13.60 | 15.04 | 7.16           | 7.70 | 8.23 | 8.76  | 10.20 |
| 4H              | 2H   | 9.12             | 9.77  | 10.18 | 10.82 | 12.23 | 5.66           | 6.32 | 6.72 | 7.36  | 8.77  |
|                 | 3H   | 10.95            | 11.49 | 12.01 | 12.56 | 13.98 | 7.01           | 7.55 | 8.08 | 8.62  | 10.05 |
|                 | 4H   | 11.64            | 12.13 | 12.71 | 13.20 | 14.64 | 7.56           | 8.05 | 8.63 | 9.11  | 10.56 |
|                 | 6H   | 12.15            | 12.58 | 13.23 | 13.67 | 15.11 | 7.97           | 8.40 | 9.05 | 9.48  | 10.92 |
|                 | 8H   | 12.33            | 12.73 | 13.41 | 13.80 | 15.26 | 8.10           | 8.50 | 9.18 | 9.58  | 11.03 |
|                 | 12H  | 12.42            | 12.78 | 13.52 | 13.87 | 15.33 | 8.16           | 8.52 | 9.26 | 9.61  | 11.08 |
| 8H              | 4H   | 11.60            | 12.00 | 12.68 | 13.08 | 14.53 | 7.83           | 8.23 | 8.91 | 9.31  | 10.76 |
|                 | 6H   | 12.17            | 12.50 | 13.27 | 13.62 | 15.07 | 8.35           | 8.68 | 9.45 | 9.80  | 11.25 |
|                 | 8H   | 12.39            | 12.68 | 13.50 | 13.78 | 15.25 | 8.54           | 8.83 | 9.65 | 9.93  | 11.40 |
|                 | 12H  | 12.53            | 12.78 | 13.64 | 13.88 | 15.39 | 8.66           | 8.91 | 9.77 | 10.01 | 11.52 |
| 12H             | 4H   | 11.55            | 11.91 | 12.65 | 13.00 | 14.46 | 7.84           | 8.19 | 8.93 | 9.29  | 10.75 |
|                 | 6H   | 12.15            | 12.43 | 13.25 | 13.54 | 15.01 | 8.40           | 8.69 | 9.51 | 9.79  | 11.26 |
|                 | 8H   | 12.37            | 12.62 | 13.48 | 13.72 | 15.23 | 8.61           | 8.86 | 9.72 | 9.96  | 11.47 |