

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: P917767

Luminaire Tested: DFN2DIP-SQ4F0-110D080US930-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917767  
REPORT IS A COMBINATION OF REPORTS P901626 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-110D080US930-RLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

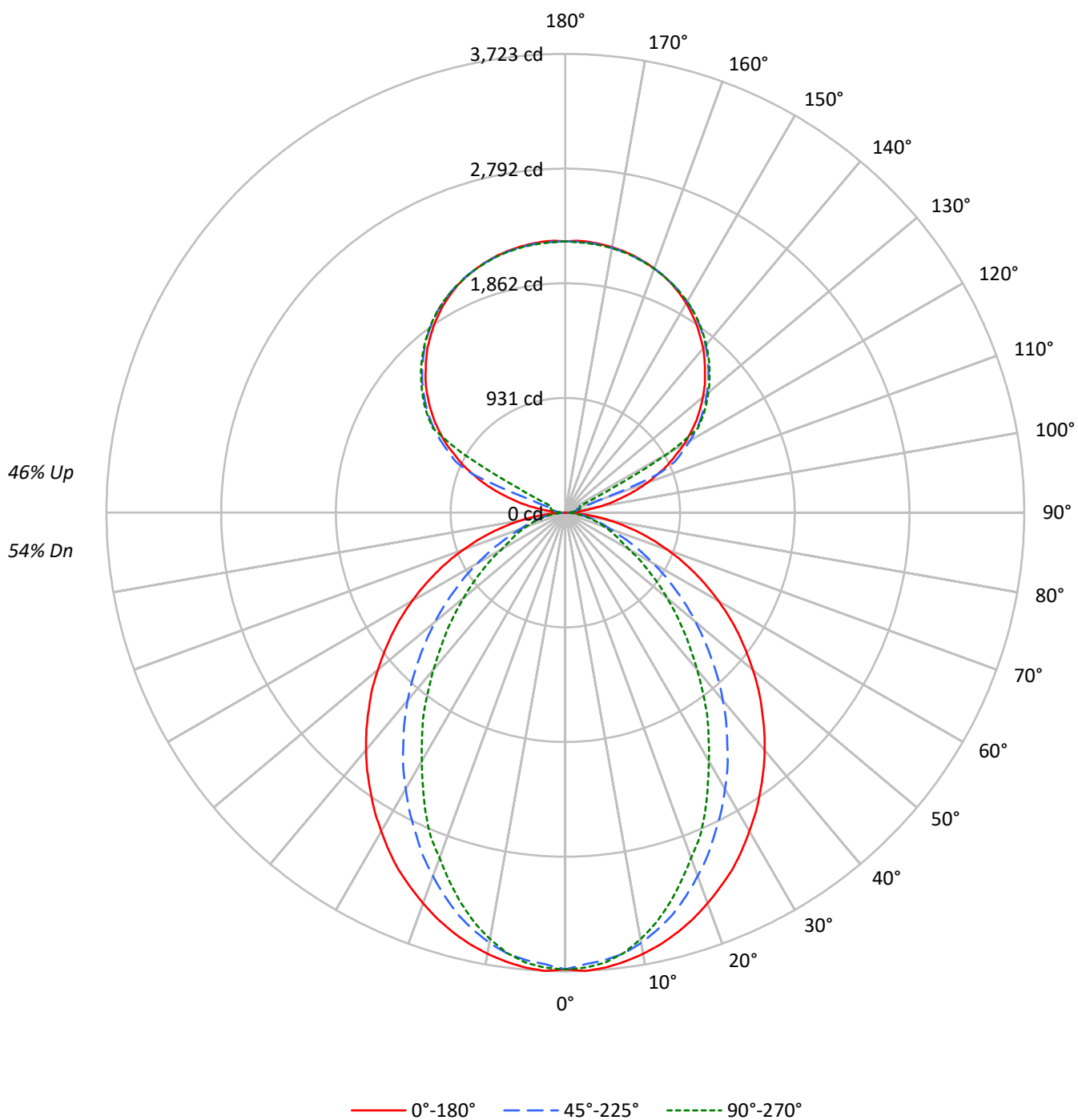
Lumens per Lamp: N/A  
Luminaire Lumens: 14080.2 lumens  
Efficiency: N/A  
Efficacy: 85.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 164.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 86 | 86 | 86 | 72 | 72 | 72 | 60 | 60 | 60 |
| 1   | 99  | 95  | 91  | 88  | 92  | 88  | 85  | 82  | 76 | 74 | 71 | 64 | 63 | 61 | 54 | 53 | 52 |
| 2   | 91  | 84  | 78  | 73  | 84  | 78  | 73  | 68  | 67 | 63 | 60 | 57 | 54 | 52 | 48 | 46 | 44 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 60 | 55 | 51 | 51 | 48 | 45 | 43 | 40 | 38 |
| 4   | 76  | 66  | 58  | 52  | 71  | 62  | 55  | 49  | 53 | 48 | 44 | 46 | 42 | 39 | 39 | 36 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 43 | 38 | 41 | 37 | 34 | 35 | 32 | 30 |
| 6   | 65  | 53  | 45  | 40  | 60  | 50  | 43  | 38  | 44 | 38 | 34 | 38 | 33 | 30 | 32 | 29 | 26 |
| 7   | 60  | 48  | 40  | 35  | 56  | 45  | 38  | 33  | 40 | 34 | 30 | 34 | 30 | 27 | 29 | 26 | 24 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 30  | 36 | 31 | 27 | 32 | 27 | 24 | 27 | 24 | 21 |
| 9   | 52  | 40  | 33  | 28  | 49  | 38  | 31  | 27  | 33 | 28 | 24 | 29 | 25 | 22 | 25 | 22 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 31 | 26 | 22 | 27 | 23 | 20 | 23 | 20 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2601 | 2601 | 2601 |
| 5°  | 2605 | 2560 | 2577 |
| 10° | 2579 | 2510 | 2494 |
| 15° | 2544 | 2428 | 2365 |
| 20° | 2497 | 2314 | 2206 |
| 25° | 2448 | 2186 | 2053 |
| 30° | 2384 | 2055 | 1859 |
| 35° | 2320 | 1914 | 1688 |
| 40° | 2256 | 1768 | 1492 |
| 45° | 2181 | 1606 | 1314 |
| 50° | 2104 | 1443 | 1141 |
| 55° | 2023 | 1268 | 974  |
| 60° | 1929 | 1085 | 803  |
| 65° | 1822 | 899  | 723  |
| 70° | 1691 | 726  | 656  |
| 75° | 1527 | 641  | 598  |
| 80° | 1290 | 540  | 521  |
| 85° | 898  | 363  | 397  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2181 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 347.4   | 2.5       |
| 10°-20°   | 953.6   | 6.8       |
| 20°-30°   | 1338.9  | 9.5       |
| 30°-40°   | 1459.5  | 10.4      |
| 40°-50°   | 1341.4  | 9.5       |
| 50°-60°   | 1053.5  | 7.5       |
| 60°-70°   | 685.7   | 4.9       |
| 70°-80°   | 353.0   | 2.5       |
| 80°-90°   | 94.0    | 0.7       |
| 90°-100°  | 72.6    | 0.5       |
| 100°-110° | 270.6   | 1.9       |
| 110°-120° | 717.6   | 5.1       |
| 120°-130° | 1190.2  | 8.5       |
| 130°-140° | 1264.3  | 9.0       |
| 140°-150° | 1175.0  | 8.3       |
| 150°-160° | 944.7   | 6.7       |
| 160°-170° | 608.7   | 4.3       |
| 170°-180° | 209.5   | 1.5       |
| 0°-30°    | 2639.9  | 18.7      |
| 0°-40°    | 4099.4  | 29.1      |
| 0°-60°    | 6494.2  | 46.1      |
| 0°-90°    | 7626.9  | 54.2      |
| 90°-120°  | 1060.8  | 7.5       |
| 90°-150°  | 4690.4  | 33.3      |
| 90°-180°  | 6453.0  | 45.8      |
| 0°-180°   | 14080.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3707 | 3707  | 3707 | 3707  | 3707 |      |
| 5°   | 3707 | 3690  | 3646 | 3676  | 3666 | 351  |
| 15°  | 3525 | 3488  | 3374 | 3311  | 3277 | 993  |
| 25°  | 3200 | 3093  | 2871 | 2734  | 2683 | 1472 |
| 35°  | 2757 | 2586  | 2291 | 2080  | 2006 | 1726 |
| 45°  | 2254 | 2029  | 1677 | 1439  | 1358 | 1741 |
| 55°  | 1714 | 1452  | 1090 | 889   | 825  | 1532 |
| 65°  | 1157 | 885   | 584  | 470   | 459  | 1147 |
| 75°  | 617  | 382   | 268  | 245   | 242  | 653  |
| 85°  | 144  | 74    | 64   | 64    | 64   | 165  |
| 90°  | 2    | 19    | 32   | 40    | 43   | 13   |
| 95°  | 104  | 51    | 62   | 70    | 68   | 123  |
| 105° | 484  | 532   | 97   | 115   | 121  | 517  |
| 115° | 916  | 943   | 983  | 245   | 131  | 902  |
| 125° | 1295 | 1316  | 1346 | 1357  | 1362 | 1155 |
| 135° | 1602 | 1628  | 1642 | 1658  | 1655 | 1238 |
| 145° | 1859 | 1857  | 1884 | 1895  | 1887 | 1163 |
| 155° | 2047 | 2032  | 2052 | 2061  | 2048 | 943  |
| 165° | 2157 | 2147  | 2152 | 2163  | 2152 | 609  |
| 175° | 2206 | 2195  | 2198 | 2209  | 2193 | 210  |
| 180° | 2201 | 2201  | 2201 | 2201  | 2201 |      |

TEST NUMBER: P917767

CATALOG NUMBER: DFN2DIP-SQ4F0-110D080US930-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3706.6 | 3706.6 | 3706.6 | 3706.6 | 3706.6 |
| 2.5°   | 3723.3 | 3706.6 | 3669.6 | 3703.4 | 3696.6 |
| 5°     | 3706.6 | 3689.9 | 3646.1 | 3676.3 | 3666.4 |
| 7.5°   | 3676.3 | 3656.4 | 3609.4 | 3622.6 | 3605.8 |
| 10°    | 3636.1 | 3612.6 | 3545.7 | 3535.4 | 3515.5 |
| 12.5°  | 3585.9 | 3555.7 | 3464.9 | 3445.0 | 3407.9 |
| 15°    | 3525.4 | 3488.4 | 3374.5 | 3310.8 | 3277.3 |
| 17.5°  | 3455.0 | 3401.3 | 3260.3 | 3186.6 | 3132.9 |
| 20°    | 3374.5 | 3307.3 | 3139.6 | 3056.0 | 2982.0 |
| 22.5°  | 3287.4 | 3210.1 | 3015.5 | 2901.6 | 2851.3 |
| 25°    | 3200.1 | 3092.7 | 2871.3 | 2733.9 | 2683.4 |
| 27.5°  | 3096.3 | 2982.0 | 2737.1 | 2579.4 | 2502.2 |
| 30°    | 2985.5 | 2857.8 | 2589.5 | 2418.6 | 2327.8 |
| 32.5°  | 2878.1 | 2723.6 | 2448.8 | 2247.5 | 2163.5 |
| 35°    | 2757.4 | 2586.2 | 2291.2 | 2079.8 | 2005.8 |
| 37.5°  | 2640.0 | 2455.3 | 2143.5 | 1911.8 | 1828.2 |
| 40°    | 2515.8 | 2314.7 | 1989.1 | 1750.9 | 1663.8 |
| 42.5°  | 2388.3 | 2173.7 | 1835.0 | 1586.6 | 1502.9 |
| 45°    | 2254.2 | 2029.3 | 1677.3 | 1438.8 | 1358.4 |
| 47.5°  | 2126.8 | 1888.7 | 1526.4 | 1287.9 | 1214.3 |
| 50°    | 1985.8 | 1747.8 | 1378.8 | 1147.0 | 1076.9 |
| 52.5°  | 1848.1 | 1596.5 | 1237.8 | 1016.4 | 952.7  |
| 55°    | 1713.9 | 1452.4 | 1090.1 | 889.0  | 825.3  |
| 57.5°  | 1576.6 | 1308.2 | 959.4  | 771.6  | 717.8  |
| 60°    | 1435.7 | 1167.3 | 821.7  | 650.9  | 597.2  |
| 62.5°  | 1298.3 | 1030.0 | 704.3  | 543.5  | 516.7  |
| 65°    | 1157.3 | 885.4  | 583.7  | 469.8  | 459.4  |
| 67.5°  | 1023.2 | 751.3  | 469.8  | 412.5  | 402.5  |
| 70°    | 882.2  | 620.7  | 389.0  | 355.6  | 342.0  |
| 72.5°  | 748.0  | 499.7  | 325.3  | 298.6  | 291.8  |
| 75°    | 617.1  | 382.2  | 268.3  | 244.8  | 241.7  |
| 77.5°  | 486.5  | 271.6  | 211.4  | 197.9  | 191.1  |
| 80°    | 365.5  | 194.7  | 160.9  | 147.7  | 147.7  |
| 82.5°  | 254.8  | 130.9  | 110.7  | 104.0  | 104.0  |
| 85°    | 144.1  | 73.7   | 63.7   | 63.7   | 63.7   |
| 87.5°  | 53.7   | 26.7   | 26.7   | 23.5   | 23.5   |
| 90°    | 1.5    | 19.1   | 31.8   | 39.9   | 43.0   |
| 92.5°  | 39.9   | 33.5   | 38.2   | 41.4   | 43.0   |
| 95°    | 103.5  | 50.9   | 62.0   | 70.2   | 68.5   |
| 97.5°  | 186.3  | 55.8   | 81.1   | 86.1   | 87.6   |
| 100°   | 282.0  | 63.8   | 90.8   | 103.5  | 106.6  |
| 102.5° | 387.0  | 383.9  | 94.0   | 111.4  | 116.3  |
| 105°   | 484.2  | 532.1  | 97.2   | 114.6  | 121.1  |
| 107.5° | 597.3  | 637.0  | 100.4  | 117.8  | 124.3  |
| 110°   | 705.7  | 739.0  | 278.8  | 119.5  | 125.8  |

TEST NUMBER: P917767

CATALOG NUMBER: DFN2DIP-SQ4F0-110D080US930-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 807.6  | 836.2  | 809.2  | 122.5  | 127.5  |
| 115°   | 915.8  | 942.9  | 982.8  | 245.3  | 130.7  |
| 117.5° | 1009.8 | 1041.6 | 1068.9 | 840.9  | 423.7  |
| 120°   | 1115.0 | 1138.8 | 1167.6 | 1186.7 | 971.6  |
| 122.5° | 1204.0 | 1229.6 | 1261.6 | 1271.0 | 1272.8 |
| 125°   | 1294.9 | 1315.6 | 1345.9 | 1357.1 | 1361.8 |
| 127.5° | 1377.7 | 1400.0 | 1424.1 | 1439.9 | 1441.4 |
| 130°   | 1455.8 | 1481.3 | 1498.8 | 1516.4 | 1514.8 |
| 132.5° | 1535.5 | 1556.2 | 1573.7 | 1588.0 | 1586.5 |
| 135°   | 1602.4 | 1627.9 | 1642.1 | 1658.2 | 1655.0 |
| 137.5° | 1672.4 | 1691.5 | 1707.6 | 1723.5 | 1718.7 |
| 140°   | 1740.8 | 1753.7 | 1771.2 | 1785.5 | 1777.5 |
| 142.5° | 1798.4 | 1809.5 | 1830.1 | 1842.8 | 1834.8 |
| 145°   | 1858.9 | 1857.2 | 1884.2 | 1895.4 | 1887.4 |
| 147.5° | 1911.3 | 1906.6 | 1933.6 | 1941.6 | 1935.3 |
| 150°   | 1962.3 | 1951.2 | 1976.7 | 1986.1 | 1978.2 |
| 152.5° | 2005.3 | 1992.6 | 2016.4 | 2026.1 | 2014.9 |
| 155°   | 2046.7 | 2032.5 | 2051.6 | 2061.1 | 2048.4 |
| 157.5° | 2080.2 | 2067.5 | 2081.9 | 2093.0 | 2080.2 |
| 160°   | 2108.9 | 2099.3 | 2108.9 | 2118.4 | 2107.2 |
| 162.5° | 2134.3 | 2124.8 | 2132.7 | 2143.9 | 2129.6 |
| 165°   | 2156.6 | 2147.2 | 2151.9 | 2163.0 | 2151.9 |
| 167.5° | 2174.2 | 2164.5 | 2169.4 | 2180.6 | 2166.2 |
| 170°   | 2188.6 | 2178.9 | 2182.1 | 2193.3 | 2178.9 |
| 172.5° | 2198.0 | 2188.6 | 2191.8 | 2202.9 | 2188.6 |
| 175°   | 2206.0 | 2194.8 | 2198.0 | 2209.1 | 2193.3 |
| 177.5° | 2209.1 | 2198.0 | 2199.7 | 2210.8 | 2196.5 |
| 180°   | 2201.2 | 2201.2 | 2201.2 | 2201.2 | 2201.2 |

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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 | 10.86            | 11.73 | 11.79 | 12.67 | 13.88 | 6.82           | 7.69  | 7.75  | 8.63  | 9.84  |
|                 | 3H   | 12.55            | 13.32 | 13.49 | 14.27 | 15.51 | 8.01           | 8.79  | 8.95  | 9.74  | 10.98 |
|                 | 4H   | 13.16            | 13.89 | 14.11 | 14.84 | 16.09 | 8.47           | 9.20  | 9.42  | 10.15 | 11.40 |
|                 | 6H   | 13.59            | 14.26 | 14.55 | 15.22 | 16.48 | 8.79           | 9.46  | 9.76  | 10.42 | 11.68 |
|                 | 8H   | 13.72            | 14.36 | 14.69 | 15.33 | 16.59 | 8.88           | 9.52  | 9.85  | 10.50 | 11.76 |
|                 | 12H  | 13.78            | 14.39 | 14.76 | 15.36 | 16.64 | 8.93           | 9.54  | 9.90  | 10.51 | 11.79 |
| 4H              | 2H   | 10.88            | 11.62 | 11.84 | 12.57 | 13.82 | 7.42           | 8.16  | 8.38  | 9.11  | 10.36 |
|                 | 3H   | 12.72            | 13.33 | 13.69 | 14.31 | 15.57 | 8.78           | 9.39  | 9.75  | 10.37 | 11.63 |
|                 | 4H   | 13.42            | 13.97 | 14.40 | 14.95 | 16.24 | 9.33           | 9.88  | 10.31 | 10.86 | 12.15 |
|                 | 6H   | 13.94            | 14.42 | 14.93 | 15.42 | 16.70 | 9.75           | 10.23 | 10.74 | 11.23 | 12.51 |
|                 | 8H   | 14.12            | 14.56 | 15.11 | 15.56 | 16.86 | 9.88           | 10.33 | 10.87 | 11.32 | 12.62 |
|                 | 12H  | 14.22            | 14.62 | 15.23 | 15.63 | 16.93 | 9.95           | 10.35 | 10.96 | 11.36 | 12.66 |
| 8H              | 4H   | 13.39            | 13.83 | 14.38 | 14.83 | 16.13 | 9.61           | 10.06 | 10.61 | 11.05 | 12.35 |
|                 | 6H   | 13.96            | 14.33 | 14.98 | 15.37 | 16.66 | 10.14          | 10.50 | 11.15 | 11.54 | 12.84 |
|                 | 8H   | 14.18            | 14.50 | 15.21 | 15.53 | 16.84 | 10.33          | 10.65 | 11.35 | 11.68 | 12.99 |
|                 | 12H  | 14.32            | 14.61 | 15.35 | 15.63 | 16.99 | 10.45          | 10.73 | 11.48 | 11.75 | 13.11 |
| 12H             | 4H   | 13.34            | 13.74 | 14.35 | 14.75 | 16.06 | 9.62           | 10.02 | 10.63 | 11.03 | 12.34 |
|                 | 6H   | 13.94            | 14.26 | 14.96 | 15.28 | 16.60 | 10.19          | 10.51 | 11.21 | 11.53 | 12.85 |
|                 | 8H   | 14.16            | 14.45 | 15.19 | 15.46 | 16.82 | 10.40          | 10.68 | 11.43 | 11.70 | 13.06 |