

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: P914880

Luminaire Tested: DFN2DIP-SQ4F0-060D160US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914880  
REPORT IS A COMBINATION OF REPORTS P900203 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-060D160US927-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

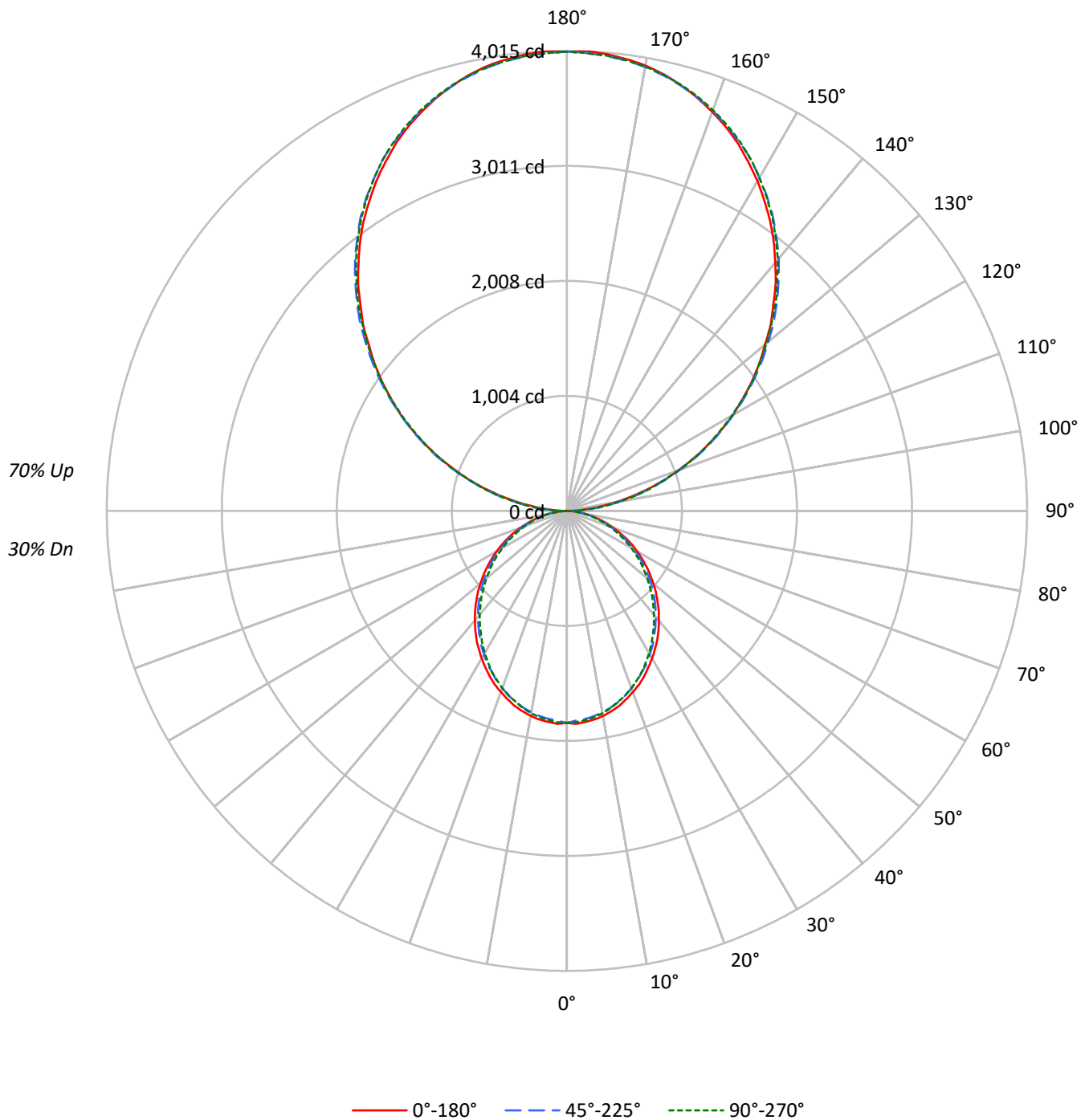
Lumens per Lamp: N/A  
Luminaire Lumens: 15923.6 lumens  
Efficiency: N/A  
Efficacy: 92.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 172.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.946  
Total Harmonic Distortion (THDi): 0.132  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P914880

CATALOG NUMBER: DFN2DIP-SQ4F0-060D160US927-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P914880

CATALOG NUMBER: DFN2DIP-SQ4F0-060D160US927-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   | 102 | 102 | 102 | 102 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 54 | 54 | 54 | 37 | 37 | 37 |
| 1   | 93  | 89  | 85  | 82  | 83 | 80 | 77 | 74 | 63 | 61 | 59 | 47 | 46 | 45 | 33 | 32 | 32 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 55 | 52 | 49 | 42 | 39 | 37 | 29 | 28 | 27 |
| 3   | 77  | 68  | 61  | 56  | 69 | 61 | 55 | 51 | 49 | 44 | 41 | 37 | 34 | 32 | 26 | 24 | 23 |
| 4   | 71  | 60  | 53  | 47  | 63 | 54 | 48 | 43 | 43 | 38 | 35 | 33 | 30 | 27 | 23 | 21 | 19 |
| 5   | 65  | 54  | 46  | 40  | 58 | 48 | 42 | 37 | 38 | 34 | 30 | 29 | 26 | 23 | 21 | 19 | 17 |
| 6   | 60  | 48  | 40  | 34  | 53 | 43 | 37 | 32 | 35 | 30 | 26 | 26 | 23 | 20 | 19 | 17 | 15 |
| 7   | 55  | 43  | 35  | 30  | 49 | 39 | 32 | 28 | 31 | 26 | 23 | 24 | 20 | 18 | 17 | 15 | 13 |
| 8   | 51  | 39  | 32  | 26  | 46 | 35 | 29 | 24 | 28 | 24 | 20 | 22 | 18 | 16 | 16 | 13 | 12 |
| 9   | 47  | 35  | 28  | 23  | 42 | 32 | 26 | 22 | 26 | 21 | 18 | 20 | 17 | 14 | 14 | 12 | 11 |
| 10  | 44  | 32  | 25  | 21  | 40 | 29 | 23 | 19 | 24 | 19 | 16 | 18 | 15 | 13 | 13 | 11 | 10 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1298 | 1298 | 1298 |
| 5°  | 1300 | 1280 | 1289 |
| 10° | 1289 | 1263 | 1272 |
| 15° | 1270 | 1242 | 1245 |
| 20° | 1245 | 1214 | 1217 |
| 25° | 1219 | 1179 | 1185 |
| 30° | 1187 | 1148 | 1145 |
| 35° | 1157 | 1110 | 1101 |
| 40° | 1120 | 1072 | 1061 |
| 45° | 1082 | 1034 | 1019 |
| 50° | 1042 | 994  | 970  |
| 55° | 999  | 948  | 926  |
| 60° | 951  | 893  | 875  |
| 65° | 899  | 836  | 815  |
| 70° | 832  | 767  | 750  |
| 75° | 739  | 684  | 691  |
| 80° | 628  | 579  | 577  |
| 85° | 454  | 396  | 388  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3155 cd/sqm

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CATALOG NUMBER: DFN2DIP-SQ4F0-060D160US927-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 174.1   | 1.1       |
| 10°-20°   | 489.8   | 3.1       |
| 20°-30°   | 719.8   | 4.5       |
| 30°-40°   | 836.0   | 5.2       |
| 40°-50°   | 834.9   | 5.2       |
| 50°-60°   | 728.0   | 4.6       |
| 60°-70°   | 538.2   | 3.4       |
| 70°-80°   | 304.5   | 1.9       |
| 80°-90°   | 91.7    | 0.6       |
| 90°-100°  | 248.1   | 1.6       |
| 100°-110° | 788.2   | 4.9       |
| 110°-120° | 1348.9  | 8.5       |
| 120°-130° | 1774.0  | 11.1      |
| 130°-140° | 1991.2  | 12.5      |
| 140°-150° | 1952.6  | 12.3      |
| 150°-160° | 1637.9  | 10.3      |
| 160°-170° | 1086.2  | 6.8       |
| 170°-180° | 379.7   | 2.4       |
| 0°-30°    | 1383.6  | 8.7       |
| 0°-40°    | 2219.6  | 13.9      |
| 0°-60°    | 3782.5  | 23.8      |
| 0°-90°    | 4716.9  | 29.6      |
| 90°-120°  | 2385.1  | 15.0      |
| 90°-150°  | 8102.8  | 50.9      |
| 90°-180°  | 11207.0 | 70.4      |
| 0°-180°   | 15923.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1849 | 1849  | 1849 | 1849  | 1849 |      |
| 5°   | 1849 | 1842  | 1823 | 1837  | 1834 | 176  |
| 15°  | 1760 | 1750  | 1727 | 1734  | 1725 | 496  |
| 25°  | 1593 | 1579  | 1549 | 1552  | 1549 | 733  |
| 35°  | 1375 | 1357  | 1328 | 1318  | 1309 | 858  |
| 45°  | 1119 | 1106  | 1079 | 1060  | 1053 | 863  |
| 55°  | 847  | 836   | 814  | 793   | 784  | 757  |
| 65°  | 571  | 560   | 542  | 526   | 518  | 564  |
| 75°  | 299  | 295   | 286  | 276   | 279  | 319  |
| 85°  | 73   | 71    | 69   | 64    | 62   | 81   |
| 90°  | 4    | 44    | 118  | 111   | 115  | 16   |
| 95°  | 176  | 210   | 216  | 216   | 210  | 196  |
| 105° | 728  | 737   | 744  | 750   | 750  | 768  |
| 115° | 1354 | 1373  | 1367 | 1363  | 1354 | 1339 |
| 125° | 1969 | 1999  | 1989 | 1978  | 1975 | 1759 |
| 135° | 2546 | 2584  | 2591 | 2588  | 2578 | 1968 |
| 145° | 3092 | 3116  | 3135 | 3139  | 3125 | 1932 |
| 155° | 3535 | 3545  | 3556 | 3573  | 3562 | 1627 |
| 165° | 3846 | 3842  | 3842 | 3866  | 3849 | 1085 |
| 175° | 4002 | 3992  | 3985 | 4009  | 3988 | 380  |
| 180° | 4009 | 4009  | 4009 | 4009  | 4009 |      |

TEST NUMBER: P914880

CATALOG NUMBER: DFN2DIP-SQ4F0-060D160US927-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1849.4 | 1849.4 | 1849.4 | 1849.4 | 1849.4 |
| 2.5°   | 1860.2 | 1851.3 | 1831.7 | 1849.4 | 1846.0 |
| 5°     | 1849.4 | 1842.5 | 1822.8 | 1837.0 | 1833.6 |
| 7.5°   | 1837.0 | 1826.5 | 1806.8 | 1821.1 | 1817.6 |
| 10°    | 1817.6 | 1805.1 | 1783.8 | 1797.9 | 1792.6 |
| 12.5°  | 1790.8 | 1780.2 | 1758.9 | 1767.8 | 1764.2 |
| 15°    | 1760.5 | 1750.0 | 1726.8 | 1734.0 | 1725.1 |
| 17.5°  | 1723.2 | 1712.7 | 1689.5 | 1698.3 | 1689.5 |
| 20°    | 1682.3 | 1671.7 | 1646.8 | 1652.1 | 1645.1 |
| 22.5°  | 1641.6 | 1625.5 | 1602.3 | 1602.3 | 1598.7 |
| 25°    | 1593.4 | 1579.3 | 1549.0 | 1552.4 | 1549.0 |
| 27.5°  | 1540.0 | 1527.6 | 1504.5 | 1499.3 | 1490.4 |
| 30°    | 1486.8 | 1472.4 | 1445.9 | 1440.6 | 1433.4 |
| 32.5°  | 1429.8 | 1419.3 | 1390.8 | 1380.0 | 1372.8 |
| 35°    | 1374.8 | 1357.0 | 1328.5 | 1317.7 | 1308.8 |
| 37.5°  | 1312.5 | 1296.4 | 1268.0 | 1255.4 | 1246.6 |
| 40°    | 1248.5 | 1234.1 | 1205.7 | 1189.9 | 1182.6 |
| 42.5°  | 1186.2 | 1171.9 | 1143.6 | 1125.7 | 1115.1 |
| 45°    | 1118.7 | 1106.2 | 1079.4 | 1060.0 | 1052.8 |
| 47.5°  | 1052.8 | 1040.4 | 1011.9 | 992.3  | 981.7  |
| 50°    | 983.4  | 974.5  | 949.7  | 924.7  | 915.8  |
| 52.5°  | 915.8  | 903.4  | 880.4  | 860.8  | 848.3  |
| 55°    | 846.6  | 835.8  | 814.5  | 793.2  | 784.3  |
| 57.5°  | 777.2  | 768.3  | 745.1  | 723.8  | 716.6  |
| 60°    | 707.7  | 700.8  | 675.9  | 656.2  | 650.9  |
| 62.5°  | 640.2  | 627.7  | 610.0  | 592.2  | 585.1  |
| 65°    | 570.9  | 560.2  | 542.5  | 526.4  | 517.5  |
| 67.5°  | 499.8  | 490.8  | 474.9  | 462.5  | 455.3  |
| 70°    | 434.0  | 426.8  | 410.7  | 398.3  | 391.3  |
| 72.5°  | 366.4  | 359.3  | 350.4  | 337.9  | 332.6  |
| 75°    | 298.7  | 295.3  | 286.2  | 275.7  | 279.2  |
| 77.5°  | 238.3  | 231.2  | 227.5  | 222.3  | 217.0  |
| 80°    | 177.9  | 176.0  | 172.5  | 167.2  | 163.6  |
| 82.5°  | 121.0  | 121.0  | 119.2  | 112.1  | 112.1  |
| 85°    | 72.8   | 71.1   | 69.4   | 63.9   | 62.3   |
| 87.5°  | 32.1   | 28.5   | 24.9   | 19.6   | 17.7   |
| 90°    | 3.6    | 43.5   | 118.4  | 111.2  | 114.8  |
| 92.5°  | 74.9   | 101.6  | 105.1  | 108.8  | 108.8  |
| 95°    | 176.4  | 210.3  | 216.3  | 216.3  | 210.3  |
| 97.5°  | 293.7  | 325.1  | 338.4  | 338.4  | 338.4  |
| 100°   | 429.0  | 456.9  | 466.5  | 466.5  | 462.9  |
| 102.5° | 571.6  | 592.2  | 605.5  | 609.1  | 605.5  |
| 105°   | 727.5  | 737.2  | 744.5  | 750.5  | 750.5  |
| 107.5° | 882.3  | 896.7  | 896.7  | 899.2  | 882.3  |
| 110°   | 1032.1 | 1051.5 | 1051.5 | 1051.5 | 1041.8 |

TEST NUMBER: P914880

CATALOG NUMBER: DFN2DIP-SQ4F0-060D160US927-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1194.1 | 1214.7 | 1211.0 | 1201.3 | 1194.1 |
| 115°   | 1353.6 | 1372.9 | 1366.9 | 1363.3 | 1353.6 |
| 117.5° | 1512.0 | 1538.5 | 1521.6 | 1512.0 | 1502.3 |
| 120°   | 1671.5 | 1698.0 | 1671.5 | 1671.5 | 1660.6 |
| 122.5° | 1816.5 | 1850.4 | 1833.4 | 1823.8 | 1816.5 |
| 125°   | 1968.8 | 1999.0 | 1989.3 | 1978.5 | 1974.8 |
| 127.5° | 2117.4 | 2154.9 | 2141.6 | 2127.1 | 2117.4 |
| 130°   | 2256.4 | 2299.9 | 2293.9 | 2286.6 | 2273.3 |
| 132.5° | 2412.4 | 2446.2 | 2448.6 | 2431.7 | 2422.0 |
| 135°   | 2546.5 | 2583.9 | 2591.2 | 2587.6 | 2577.9 |
| 137.5° | 2696.3 | 2726.5 | 2732.6 | 2730.2 | 2715.7 |
| 140°   | 2828.1 | 2858.3 | 2875.2 | 2875.2 | 2861.9 |
| 142.5° | 2963.5 | 2993.7 | 3003.3 | 3007.0 | 2993.7 |
| 145°   | 3091.6 | 3115.7 | 3135.1 | 3138.7 | 3125.4 |
| 147.5° | 3206.4 | 3236.6 | 3251.1 | 3257.1 | 3243.8 |
| 150°   | 3324.8 | 3345.4 | 3358.7 | 3369.5 | 3358.7 |
| 152.5° | 3430.0 | 3450.5 | 3467.5 | 3480.7 | 3467.5 |
| 155°   | 3535.1 | 3544.8 | 3555.6 | 3572.6 | 3561.7 |
| 157.5° | 3625.7 | 3633.0 | 3639.0 | 3663.2 | 3646.3 |
| 160°   | 3706.7 | 3714.0 | 3717.6 | 3738.1 | 3723.6 |
| 162.5° | 3781.6 | 3781.6 | 3785.3 | 3808.3 | 3791.3 |
| 165°   | 3845.7 | 3842.1 | 3842.1 | 3866.2 | 3849.4 |
| 167.5° | 3903.7 | 3892.9 | 3892.9 | 3917.0 | 3900.1 |
| 170°   | 3947.2 | 3937.5 | 3934.0 | 3958.1 | 3937.5 |
| 172.5° | 3977.5 | 3967.8 | 3964.2 | 3988.3 | 3967.8 |
| 175°   | 4001.6 | 3992.0 | 3984.7 | 4008.9 | 3988.3 |
| 177.5° | 4014.9 | 4005.3 | 3998.0 | 4018.6 | 3998.0 |
| 180°   | 4008.9 | 4008.9 | 4008.9 | 4008.9 | 4008.9 |

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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 | 5.92             | 6.62  | 7.04  | 7.73  | 9.27  | 5.48           | 6.18 | 6.59  | 7.29  | 8.82  |
|                 | 3H   | 7.57             | 8.20  | 8.70  | 9.32  | 10.87 | 7.08           | 7.71 | 8.21  | 8.83  | 10.38 |
|                 | 4H   | 8.16             | 8.76  | 9.29  | 9.87  | 11.43 | 7.66           | 8.26 | 8.79  | 9.38  | 10.94 |
|                 | 6H   | 8.55             | 9.10  | 9.69  | 10.22 | 11.79 | 8.05           | 8.60 | 9.19  | 9.72  | 11.29 |
|                 | 8H   | 8.65             | 9.18  | 9.80  | 10.31 | 11.88 | 8.15           | 8.68 | 9.30  | 9.81  | 11.37 |
|                 | 12H  | 8.70             | 9.20  | 9.85  | 10.33 | 11.91 | 8.19           | 8.69 | 9.34  | 9.82  | 11.40 |
| 4H              | 2H   | 6.36             | 6.96  | 7.50  | 8.08  | 9.64  | 6.01           | 6.61 | 7.15  | 7.73  | 9.28  |
|                 | 3H   | 8.22             | 8.72  | 9.36  | 9.86  | 11.43 | 7.81           | 8.31 | 8.96  | 9.46  | 11.02 |
|                 | 4H   | 8.93             | 9.39  | 10.08 | 10.52 | 12.11 | 8.51           | 8.97 | 9.65  | 10.10 | 11.69 |
|                 | 6H   | 9.44             | 9.83  | 10.59 | 10.99 | 12.57 | 9.01           | 9.40 | 10.16 | 10.56 | 12.14 |
|                 | 8H   | 9.59             | 9.96  | 10.74 | 11.10 | 12.70 | 9.15           | 9.52 | 10.31 | 10.67 | 12.26 |
|                 | 12H  | 9.66             | 9.99  | 10.83 | 11.15 | 12.75 | 9.21           | 9.54 | 10.38 | 10.70 | 12.30 |
| 8H              | 4H   | 9.11             | 9.48  | 10.27 | 10.63 | 12.23 | 8.74           | 9.11 | 9.89  | 10.25 | 11.85 |
|                 | 6H   | 9.74             | 10.05 | 10.92 | 11.24 | 12.83 | 9.36           | 9.66 | 10.53 | 10.85 | 12.45 |
|                 | 8H   | 9.97             | 10.23 | 11.15 | 11.40 | 13.01 | 9.57           | 9.84 | 10.75 | 11.01 | 12.62 |
|                 | 12H  | 10.09            | 10.33 | 11.28 | 11.49 | 13.14 | 9.68           | 9.91 | 10.87 | 11.08 | 12.73 |
| 12H             | 4H   | 9.09             | 9.43  | 10.26 | 10.58 | 12.19 | 8.72           | 9.06 | 9.89  | 10.22 | 11.82 |
|                 | 6H   | 9.77             | 10.04 | 10.95 | 11.21 | 12.82 | 9.40           | 9.67 | 10.58 | 10.83 | 12.45 |
|                 | 8H   | 10.01            | 10.24 | 11.19 | 11.41 | 13.06 | 9.63           | 9.86 | 10.81 | 11.03 | 12.68 |