

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: P902535

Luminaire Tested: DFN2DIP-HX3F0-030D070US830-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902535  
REPORT IS A COMBINATION OF REPORTS P900777 AND P897645  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-030D070US830-FLONL  
Description: 3 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

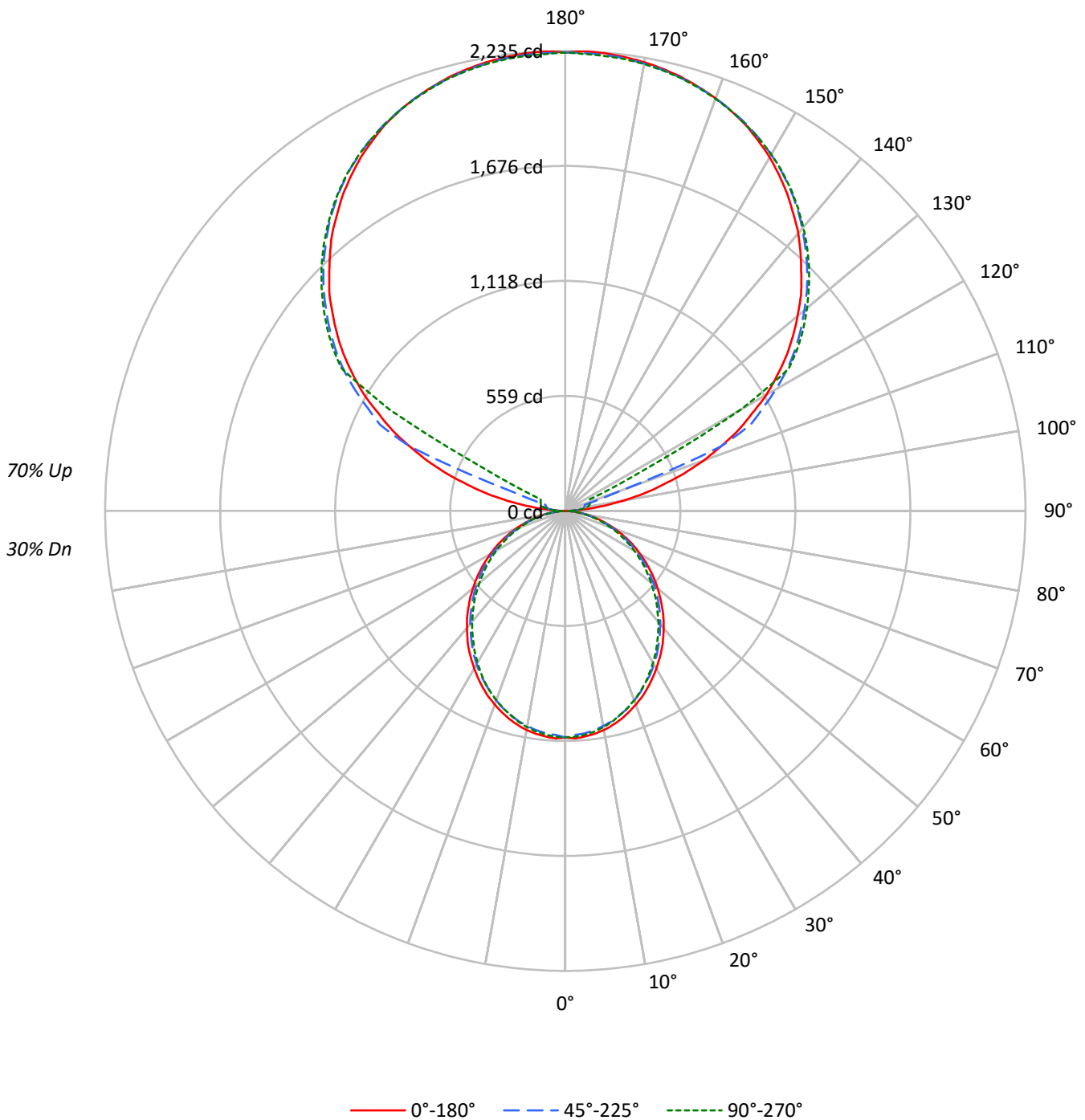
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9331.2 lumens  
Efficiency: N/A  
Efficacy: 121.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 77.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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: P902535

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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    |    |
| RC  | 80  |     |     |     | 70 |    |    |    | 50 |    |    |    | 30 |    |    |    | 10 |    |    | 0  |    |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0  |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 102 | 102 | 102 | 102 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 54 | 54 | 54 | 38 | 38 | 38 | 38 | 38 | 38 | 30 |
| 1   | 93  | 89  | 85  | 82  | 84 | 80 | 77 | 74 | 63 | 61 | 59 | 48 | 46 | 45 | 33 | 33 | 32 | 33 | 33 | 32 | 25 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 55 | 52 | 49 | 42 | 40 | 38 | 29 | 28 | 27 | 29 | 28 | 27 | 21 |
| 3   | 77  | 68  | 61  | 56  | 69 | 62 | 56 | 51 | 49 | 45 | 41 | 37 | 34 | 32 | 26 | 24 | 23 | 26 | 24 | 23 | 18 |
| 4   | 71  | 60  | 53  | 47  | 63 | 54 | 48 | 43 | 43 | 39 | 35 | 33 | 30 | 27 | 23 | 21 | 20 | 23 | 21 | 20 | 15 |
| 5   | 65  | 54  | 46  | 40  | 58 | 48 | 42 | 37 | 39 | 34 | 30 | 29 | 26 | 23 | 21 | 19 | 17 | 21 | 19 | 17 | 13 |
| 6   | 60  | 48  | 40  | 35  | 53 | 43 | 37 | 32 | 35 | 30 | 26 | 27 | 23 | 20 | 19 | 17 | 15 | 19 | 17 | 15 | 12 |
| 7   | 55  | 43  | 35  | 30  | 49 | 39 | 32 | 28 | 31 | 26 | 23 | 24 | 21 | 18 | 17 | 15 | 13 | 17 | 15 | 13 | 10 |
| 8   | 51  | 39  | 32  | 26  | 46 | 35 | 29 | 24 | 28 | 24 | 20 | 22 | 19 | 16 | 16 | 14 | 12 | 16 | 14 | 12 | 9  |
| 9   | 47  | 36  | 28  | 23  | 42 | 32 | 26 | 22 | 26 | 21 | 18 | 20 | 17 | 14 | 15 | 12 | 11 | 15 | 12 | 11 | 8  |
| 10  | 44  | 32  | 26  | 21  | 40 | 30 | 23 | 19 | 24 | 19 | 16 | 19 | 15 | 13 | 14 | 11 | 10 | 14 | 11 | 10 | 8  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1274 | 1274 | 1274 |
| 5°  | 1276 | 1256 | 1264 |
| 10° | 1265 | 1238 | 1247 |
| 15° | 1246 | 1217 | 1219 |
| 20° | 1220 | 1188 | 1191 |
| 25° | 1195 | 1153 | 1159 |
| 30° | 1163 | 1120 | 1118 |
| 35° | 1132 | 1082 | 1074 |
| 40° | 1095 | 1044 | 1033 |
| 45° | 1058 | 1005 | 991  |
| 50° | 1017 | 965  | 942  |
| 55° | 975  | 918  | 897  |
| 60° | 926  | 862  | 846  |
| 65° | 874  | 804  | 785  |
| 70° | 807  | 734  | 719  |
| 75° | 714  | 649  | 657  |
| 80° | 602  | 541  | 541  |
| 85° | 428  | 358  | 351  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 1429 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 103.6  | 1.1       |
| 10°-20°   | 291.4  | 3.1       |
| 20°-30°   | 428.2  | 4.6       |
| 30°-40°   | 497.3  | 5.3       |
| 40°-50°   | 496.7  | 5.3       |
| 50°-60°   | 433.1  | 4.6       |
| 60°-70°   | 320.2  | 3.4       |
| 70°-80°   | 181.1  | 1.9       |
| 80°-90°   | 51.7   | 0.6       |
| 90°-100°  | 73.4   | 0.8       |
| 100°-110° | 273.7  | 2.9       |
| 110°-120° | 725.9  | 7.8       |
| 120°-130° | 1204.0 | 12.9      |
| 130°-140° | 1278.9 | 13.7      |
| 140°-150° | 1188.6 | 12.7      |
| 150°-160° | 955.6  | 10.2      |
| 160°-170° | 615.8  | 6.6       |
| 170°-180° | 211.9  | 2.3       |
| 0°-30°    | 823.1  | 8.8       |
| 0°-40°    | 1320.4 | 14.2      |
| 0°-60°    | 2250.3 | 24.1      |
| 0°-90°    | 2803.3 | 30.0      |
| 90°-120°  | 1073.0 | 11.5      |
| 90°-150°  | 4744.6 | 50.8      |
| 90°-180°  | 6528.0 | 70.0      |
| 0°-180°   | 9331.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1100 | 1100  | 1100 | 1100  | 1100 |      |
| 5°   | 1100 | 1096  | 1084 | 1093  | 1091 | 104  |
| 15°  | 1047 | 1041  | 1027 | 1032  | 1026 | 295  |
| 25°  | 948  | 940   | 922  | 924   | 922  | 436  |
| 35°  | 818  | 807   | 790  | 784   | 779  | 511  |
| 45°  | 666  | 658   | 642  | 631   | 626  | 514  |
| 55°  | 504  | 497   | 485  | 472   | 467  | 450  |
| 65°  | 340  | 333   | 323  | 313   | 308  | 336  |
| 75°  | 178  | 176   | 170  | 164   | 166  | 190  |
| 85°  | 43   | 42    | 41   | 38    | 37   | 48   |
| 90°  | 2    | 19    | 32   | 40    | 44   | 9    |
| 95°  | 105  | 52    | 63   | 71    | 69   | 124  |
| 105° | 490  | 538   | 98   | 116   | 122  | 523  |
| 115° | 926  | 954   | 994  | 248   | 132  | 912  |
| 125° | 1310 | 1331  | 1362 | 1373  | 1378 | 1168 |
| 135° | 1621 | 1647  | 1661 | 1677  | 1674 | 1252 |
| 145° | 1880 | 1879  | 1906 | 1917  | 1909 | 1176 |
| 155° | 2070 | 2056  | 2075 | 2085  | 2072 | 954  |
| 165° | 2182 | 2172  | 2177 | 2188  | 2177 | 616  |
| 175° | 2232 | 2220  | 2224 | 2235  | 2219 | 212  |
| 180° | 2227 | 2227  | 2227 | 2227  | 2227 |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1100.2 | 1100.2 | 1100.2 | 1100.2 | 1100.2 |
| 2.5°   | 1106.6 | 1101.4 | 1089.7 | 1100.2 | 1098.3 |
| 5°     | 1100.2 | 1096.1 | 1084.4 | 1092.9 | 1090.8 |
| 7.5°   | 1092.9 | 1086.6 | 1074.9 | 1083.5 | 1081.3 |
| 10°    | 1081.3 | 1073.8 | 1061.2 | 1069.6 | 1066.5 |
| 12.5°  | 1065.4 | 1059.0 | 1046.4 | 1051.6 | 1049.5 |
| 15°    | 1047.4 | 1041.1 | 1027.3 | 1031.5 | 1026.2 |
| 17.5°  | 1025.1 | 1018.9 | 1005.0 | 1010.3 | 1005.0 |
| 20°    | 1000.8 | 994.5  | 979.7  | 982.8  | 978.6  |
| 22.5°  | 976.6  | 967.0  | 953.2  | 953.2  | 951.0  |
| 25°    | 947.9  | 939.5  | 921.5  | 923.6  | 921.5  |
| 27.5°  | 916.2  | 908.7  | 895.0  | 891.9  | 886.6  |
| 30°    | 884.5  | 876.0  | 860.2  | 857.0  | 852.7  |
| 32.5°  | 850.6  | 844.3  | 827.4  | 821.0  | 816.7  |
| 35°    | 817.8  | 807.3  | 790.3  | 783.9  | 778.6  |
| 37.5°  | 780.8  | 771.3  | 754.3  | 746.9  | 741.6  |
| 40°    | 742.7  | 734.2  | 717.3  | 707.8  | 703.6  |
| 42.5°  | 705.7  | 697.2  | 680.3  | 669.7  | 663.4  |
| 45°    | 665.5  | 658.1  | 642.2  | 630.6  | 626.3  |
| 47.5°  | 626.3  | 619.0  | 602.0  | 590.3  | 584.0  |
| 50°    | 585.0  | 579.8  | 565.0  | 550.2  | 544.9  |
| 52.5°  | 544.9  | 537.4  | 523.8  | 512.1  | 504.6  |
| 55°    | 503.7  | 497.3  | 484.6  | 471.9  | 466.7  |
| 57.5°  | 462.3  | 457.0  | 443.3  | 430.6  | 426.3  |
| 60°    | 421.0  | 416.9  | 402.1  | 390.4  | 387.3  |
| 62.5°  | 380.9  | 373.4  | 362.9  | 352.3  | 348.1  |
| 65°    | 339.7  | 333.3  | 322.7  | 313.2  | 307.9  |
| 67.5°  | 297.4  | 292.0  | 282.5  | 275.1  | 270.9  |
| 70°    | 258.2  | 253.9  | 244.4  | 237.0  | 232.8  |
| 72.5°  | 218.0  | 213.7  | 208.4  | 201.0  | 197.9  |
| 75°    | 177.7  | 175.7  | 170.3  | 164.0  | 166.2  |
| 77.5°  | 141.8  | 137.5  | 135.3  | 132.2  | 129.1  |
| 80°    | 105.8  | 104.7  | 102.5  | 99.4   | 97.4   |
| 82.5°  | 71.9   | 71.9   | 71.0   | 66.6   | 66.6   |
| 85°    | 43.4   | 42.3   | 41.3   | 38.1   | 37.0   |
| 87.5°  | 19.0   | 17.0   | 14.8   | 11.7   | 10.6   |
| 90°    | 1.5    | 19.3   | 32.1   | 40.3   | 43.5   |
| 92.5°  | 40.3   | 33.8   | 38.6   | 41.9   | 43.5   |
| 95°    | 104.6  | 51.5   | 62.8   | 71.0   | 69.3   |
| 97.5°  | 188.4  | 56.5   | 82.1   | 87.1   | 88.6   |
| 100°   | 285.3  | 64.5   | 91.8   | 104.6  | 107.9  |
| 102.5° | 391.4  | 388.4  | 95.1   | 112.7  | 117.6  |
| 105°   | 489.8  | 538.2  | 98.3   | 115.9  | 122.4  |
| 107.5° | 604.2  | 644.4  | 101.6  | 119.2  | 125.7  |
| 110°   | 713.9  | 747.5  | 282.0  | 120.9  | 127.2  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 817.0  | 845.8  | 818.5  | 123.9  | 128.9  |
| 115°   | 926.4  | 953.8  | 994.1  | 248.2  | 132.2  |
| 117.5° | 1021.5 | 1053.7 | 1081.2 | 850.6  | 428.6  |
| 120°   | 1127.8 | 1152.0 | 1181.1 | 1200.4 | 982.9  |
| 122.5° | 1218.0 | 1243.8 | 1276.2 | 1285.7 | 1287.4 |
| 125°   | 1309.9 | 1330.9 | 1361.5 | 1372.8 | 1377.5 |
| 127.5° | 1393.6 | 1416.2 | 1440.5 | 1456.6 | 1458.1 |
| 130°   | 1472.6 | 1498.5 | 1516.1 | 1533.9 | 1532.4 |
| 132.5° | 1553.2 | 1574.2 | 1591.9 | 1606.4 | 1604.9 |
| 135°   | 1620.9 | 1646.7 | 1661.1 | 1677.3 | 1674.1 |
| 137.5° | 1691.7 | 1711.1 | 1727.3 | 1743.4 | 1738.6 |
| 140°   | 1761.0 | 1774.0 | 1791.6 | 1806.1 | 1798.1 |
| 142.5° | 1819.1 | 1830.4 | 1851.2 | 1864.1 | 1856.1 |
| 145°   | 1880.4 | 1878.7 | 1906.0 | 1917.3 | 1909.3 |
| 147.5° | 1933.3 | 1928.6 | 1956.0 | 1964.0 | 1957.7 |
| 150°   | 1985.0 | 1973.8 | 1999.6 | 2009.1 | 2001.1 |
| 152.5° | 2028.4 | 2015.6 | 2039.8 | 2049.5 | 2038.2 |
| 155°   | 2070.4 | 2056.0 | 2075.3 | 2084.9 | 2072.1 |
| 157.5° | 2104.2 | 2091.4 | 2105.9 | 2117.2 | 2104.2 |
| 160°   | 2133.4 | 2123.5 | 2133.4 | 2142.9 | 2131.6 |
| 162.5° | 2159.0 | 2149.4 | 2157.4 | 2168.7 | 2154.2 |
| 165°   | 2181.5 | 2172.0 | 2176.7 | 2188.0 | 2176.7 |
| 167.5° | 2199.3 | 2189.5 | 2194.5 | 2205.8 | 2191.3 |
| 170°   | 2213.8 | 2204.1 | 2207.3 | 2218.7 | 2204.1 |
| 172.5° | 2223.5 | 2213.8 | 2217.1 | 2228.4 | 2213.8 |
| 175°   | 2231.5 | 2220.2 | 2223.5 | 2234.7 | 2218.7 |
| 177.5° | 2234.7 | 2223.5 | 2225.2 | 2236.5 | 2221.9 |
| 180°   | 2226.7 | 2226.7 | 2226.7 | 2226.7 | 2226.7 |



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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 | 5.86             | 6.57  | 6.97  | 7.68  | 9.21  | 5.43           | 6.14 | 6.55  | 7.25  | 8.78  |
|                 | 3H   | 7.50             | 8.14  | 8.62  | 9.25  | 10.80 | 7.04           | 7.67 | 8.16  | 8.78  | 10.33 |
|                 | 4H   | 8.08             | 8.68  | 9.21  | 9.80  | 11.35 | 7.61           | 8.21 | 8.74  | 9.33  | 10.88 |
|                 | 6H   | 8.46             | 9.02  | 9.60  | 10.14 | 11.70 | 8.00           | 8.55 | 9.13  | 9.67  | 11.23 |
|                 | 8H   | 8.56             | 9.09  | 9.70  | 10.22 | 11.78 | 8.09           | 8.62 | 9.23  | 9.75  | 11.31 |
|                 | 12H  | 8.60             | 9.10  | 9.75  | 10.23 | 11.81 | 8.13           | 8.63 | 9.27  | 9.75  | 11.33 |
| 4H              | 2H   | 6.30             | 6.90  | 7.44  | 8.02  | 9.57  | 5.96           | 6.56 | 7.10  | 7.68  | 9.23  |
|                 | 3H   | 8.15             | 8.65  | 9.29  | 9.79  | 11.35 | 7.76           | 8.26 | 8.90  | 9.40  | 10.96 |
|                 | 4H   | 8.85             | 9.31  | 9.99  | 10.44 | 12.02 | 8.45           | 8.91 | 9.59  | 10.04 | 11.62 |
|                 | 6H   | 9.35             | 9.74  | 10.50 | 10.90 | 12.47 | 8.94           | 9.34 | 10.09 | 10.49 | 12.07 |
|                 | 8H   | 9.49             | 9.86  | 10.64 | 11.00 | 12.59 | 9.08           | 9.45 | 10.23 | 10.60 | 12.19 |
|                 | 12H  | 9.55             | 9.88  | 10.72 | 11.04 | 12.64 | 9.13           | 9.47 | 10.30 | 10.63 | 12.22 |
| 8H              | 4H   | 9.03             | 9.40  | 10.18 | 10.54 | 12.13 | 8.67           | 9.04 | 9.82  | 10.19 | 11.78 |
|                 | 6H   | 9.64             | 9.95  | 10.82 | 11.14 | 12.72 | 9.28           | 9.59 | 10.46 | 10.78 | 12.36 |
|                 | 8H   | 9.86             | 10.12 | 11.03 | 11.29 | 12.90 | 9.49           | 9.76 | 10.67 | 10.92 | 12.53 |
|                 | 12H  | 9.98             | 10.21 | 11.16 | 11.37 | 13.02 | 9.60           | 9.83 | 10.78 | 10.99 | 12.64 |
| 12H             | 4H   | 9.01             | 9.34  | 10.17 | 10.50 | 12.09 | 8.66           | 8.99 | 9.82  | 10.15 | 11.74 |
|                 | 6H   | 9.67             | 9.94  | 10.85 | 11.10 | 12.71 | 9.32           | 9.59 | 10.50 | 10.75 | 12.36 |
|                 | 8H   | 9.90             | 10.13 | 11.08 | 11.30 | 12.94 | 9.55           | 9.78 | 10.73 | 10.94 | 12.58 |