

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: P911670

Luminaire Tested: DFN2DIP-SQ2F0-030D070US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911670  
REPORT IS A COMBINATION OF REPORTS P899820 AND P896659  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-030D070US850-RLLFLL  
Description: 2 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

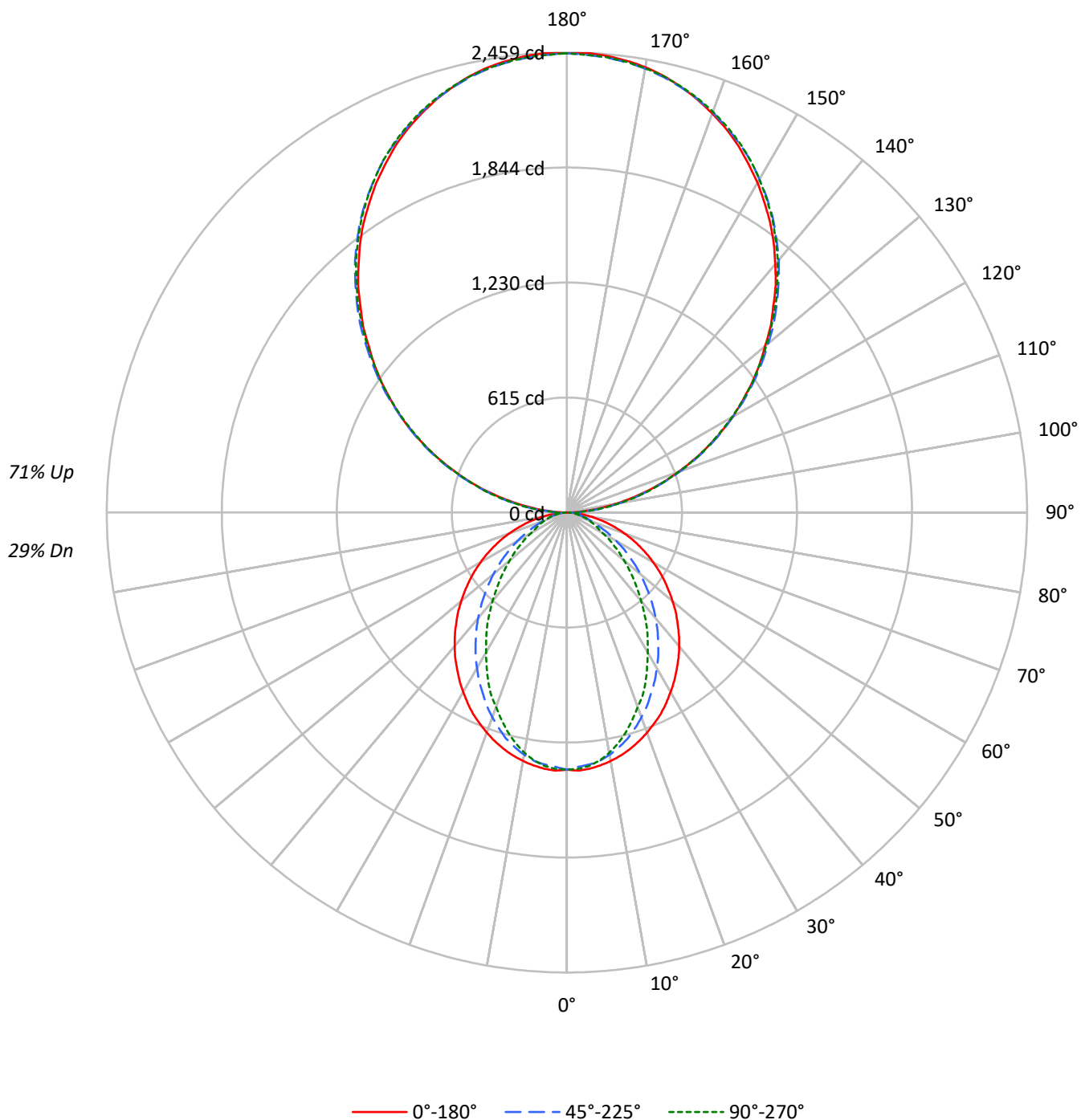
Lumens per Lamp: N/A  
Luminaire Lumens: 9698.2 lumens  
Efficiency: N/A  
Efficacy: 125.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 77.5  
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



TEST NUMBER: P911670

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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   | 102 | 102 | 102 | 102 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 54 | 54 | 54 | 37 | 37 | 37 |
| 1   | 93  | 89  | 86  | 82  | 84 | 80 | 77 | 74 | 63 | 61 | 59 | 48 | 46 | 45 | 33 | 32 | 32 |
| 2   | 85  | 78  | 72  | 68  | 76 | 70 | 66 | 61 | 56 | 52 | 49 | 42 | 40 | 38 | 29 | 28 | 27 |
| 3   | 78  | 69  | 62  | 57  | 70 | 62 | 56 | 52 | 49 | 45 | 42 | 37 | 35 | 32 | 26 | 25 | 23 |
| 4   | 71  | 61  | 54  | 48  | 64 | 55 | 49 | 44 | 44 | 39 | 36 | 33 | 30 | 28 | 24 | 22 | 20 |
| 5   | 65  | 54  | 47  | 41  | 59 | 49 | 43 | 38 | 39 | 35 | 31 | 30 | 27 | 24 | 21 | 19 | 18 |
| 6   | 60  | 49  | 41  | 36  | 54 | 44 | 38 | 33 | 35 | 31 | 27 | 27 | 24 | 21 | 20 | 17 | 16 |
| 7   | 56  | 44  | 36  | 31  | 50 | 40 | 33 | 29 | 32 | 27 | 24 | 25 | 21 | 19 | 18 | 16 | 14 |
| 8   | 52  | 40  | 33  | 27  | 46 | 36 | 30 | 25 | 29 | 24 | 21 | 23 | 19 | 17 | 16 | 14 | 13 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 27 | 23 | 27 | 22 | 19 | 21 | 18 | 15 | 15 | 13 | 12 |
| 10  | 45  | 33  | 26  | 22  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 19 | 16 | 14 | 14 | 12 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3023 | 3023 | 3023 |
| 5°  | 3023 | 2969 | 2990 |
| 10° | 2988 | 2904 | 2889 |
| 15° | 2942 | 2802 | 2735 |
| 20° | 2882 | 2663 | 2547 |
| 25° | 2821 | 2510 | 2365 |
| 30° | 2741 | 2352 | 2137 |
| 35° | 2662 | 2184 | 1936 |
| 40° | 2581 | 2010 | 1707 |
| 45° | 2488 | 1819 | 1499 |
| 50° | 2391 | 1626 | 1297 |
| 55° | 2290 | 1420 | 1103 |
| 60° | 2172 | 1207 | 904  |
| 65° | 2036 | 991  | 809  |
| 70° | 1872 | 789  | 726  |
| 75° | 1664 | 683  | 651  |
| 80° | 1367 | 555  | 552  |
| 85° | 890  | 344  | 393  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3420 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 128.9  | 1.3       |
| 10°-20°   | 353.8  | 3.6       |
| 20°-30°   | 496.7  | 5.1       |
| 30°-40°   | 541.4  | 5.6       |
| 40°-50°   | 497.6  | 5.1       |
| 50°-60°   | 390.8  | 4.0       |
| 60°-70°   | 254.4  | 2.6       |
| 70°-80°   | 130.9  | 1.4       |
| 80°-90°   | 40.4   | 0.4       |
| 90°-100°  | 151.9  | 1.6       |
| 100°-110° | 482.7  | 5.0       |
| 110°-120° | 826.1  | 8.5       |
| 120°-130° | 1086.4 | 11.2      |
| 130°-140° | 1219.5 | 12.6      |
| 140°-150° | 1195.8 | 12.3      |
| 150°-160° | 1003.1 | 10.3      |
| 160°-170° | 665.3  | 6.9       |
| 170°-180° | 232.5  | 2.4       |
| 0°-30°    | 979.3  | 10.1      |
| 0°-40°    | 1520.7 | 15.7      |
| 0°-60°    | 2409.2 | 24.8      |
| 0°-90°    | 2834.9 | 29.2      |
| 90°-120°  | 1460.7 | 15.1      |
| 90°-150°  | 4962.4 | 51.2      |
| 90°-180°  | 6863.0 | 70.8      |
| 0°-180°   | 9698.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1375 | 1375  | 1375 | 1375  | 1375 |      |
| 5°   | 1375 | 1369  | 1353 | 1364  | 1360 | 130  |
| 15°  | 1308 | 1294  | 1252 | 1228  | 1216 | 369  |
| 25°  | 1187 | 1147  | 1065 | 1014  | 995  | 546  |
| 35°  | 1023 | 959   | 850  | 772   | 744  | 640  |
| 45°  | 836  | 753   | 622  | 534   | 504  | 646  |
| 55°  | 636  | 539   | 404  | 330   | 306  | 568  |
| 65°  | 429  | 328   | 216  | 174   | 170  | 426  |
| 75°  | 229  | 142   | 100  | 91    | 90   | 242  |
| 85°  | 54   | 27    | 24   | 24    | 24   | 61   |
| 90°  | 2    | 27    | 72   | 68    | 70   | 10   |
| 95°  | 108  | 129   | 132  | 132   | 129  | 120  |
| 105° | 446  | 452   | 456  | 460   | 460  | 470  |
| 115° | 829  | 841   | 837  | 835   | 829  | 820  |
| 125° | 1206 | 1224  | 1218 | 1212  | 1210 | 1077 |
| 135° | 1560 | 1582  | 1587 | 1585  | 1579 | 1205 |
| 145° | 1893 | 1908  | 1920 | 1922  | 1914 | 1183 |
| 155° | 2165 | 2171  | 2178 | 2188  | 2181 | 997  |
| 165° | 2355 | 2353  | 2353 | 2368  | 2357 | 664  |
| 175° | 2451 | 2445  | 2440 | 2455  | 2443 | 233  |
| 180° | 2455 | 2455  | 2455 | 2455  | 2455 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1375.0 | 1375.0 | 1375.0 | 1375.0 | 1375.0 |
| 2.5°   | 1381.3 | 1375.0 | 1361.3 | 1373.8 | 1371.4 |
| 5°     | 1375.0 | 1368.8 | 1352.6 | 1363.8 | 1360.1 |
| 7.5°   | 1363.8 | 1356.4 | 1339.0 | 1343.9 | 1337.7 |
| 10°    | 1348.9 | 1340.2 | 1315.4 | 1311.5 | 1304.2 |
| 12.5°  | 1330.2 | 1319.0 | 1285.4 | 1278.0 | 1264.3 |
| 15°    | 1307.8 | 1294.1 | 1251.8 | 1228.2 | 1215.8 |
| 17.5°  | 1281.7 | 1261.8 | 1209.5 | 1182.2 | 1162.2 |
| 20°    | 1251.8 | 1226.9 | 1164.7 | 1133.7 | 1106.2 |
| 22.5°  | 1219.6 | 1190.8 | 1118.6 | 1076.4 | 1057.8 |
| 25°    | 1187.2 | 1147.3 | 1065.2 | 1014.2 | 995.4  |
| 27.5°  | 1148.6 | 1106.2 | 1015.4 | 957.0  | 928.2  |
| 30°    | 1107.6 | 1060.2 | 960.6  | 897.3  | 863.6  |
| 32.5°  | 1067.6 | 1010.4 | 908.5  | 833.7  | 802.6  |
| 35°    | 1022.9 | 959.4  | 849.9  | 771.5  | 744.1  |
| 37.5°  | 979.4  | 910.8  | 795.2  | 709.2  | 678.3  |
| 40°    | 933.3  | 858.7  | 737.9  | 649.5  | 617.3  |
| 42.5°  | 886.0  | 806.5  | 680.7  | 588.5  | 557.5  |
| 45°    | 836.3  | 752.8  | 622.3  | 533.8  | 503.9  |
| 47.5°  | 788.9  | 700.7  | 566.3  | 477.8  | 450.5  |
| 50°    | 736.7  | 648.3  | 511.5  | 425.5  | 399.5  |
| 52.5°  | 685.6  | 592.3  | 459.2  | 377.1  | 353.4  |
| 55°    | 635.8  | 538.8  | 404.3  | 329.8  | 306.2  |
| 57.5°  | 584.9  | 485.3  | 356.0  | 286.2  | 266.3  |
| 60°    | 532.5  | 433.1  | 304.9  | 241.4  | 221.6  |
| 62.5°  | 481.6  | 382.1  | 261.3  | 201.6  | 191.7  |
| 65°    | 429.3  | 328.5  | 216.5  | 174.2  | 170.5  |
| 67.5°  | 379.6  | 278.7  | 174.2  | 153.0  | 149.3  |
| 70°    | 327.3  | 230.2  | 144.3  | 131.9  | 126.9  |
| 72.5°  | 277.5  | 185.3  | 120.7  | 110.8  | 108.2  |
| 75°    | 228.9  | 141.8  | 99.6   | 90.8   | 89.6   |
| 77.5°  | 180.4  | 100.7  | 78.4   | 73.4   | 70.9   |
| 80°    | 135.6  | 72.2   | 59.7   | 54.8   | 54.8   |
| 82.5°  | 94.5   | 48.6   | 41.0   | 38.6   | 38.6   |
| 85°    | 53.5   | 27.3   | 23.6   | 23.6   | 23.6   |
| 87.5°  | 20.0   | 9.9    | 9.9    | 8.8    | 8.8    |
| 90°    | 2.2    | 26.6   | 72.5   | 68.1   | 70.3   |
| 92.5°  | 45.9   | 62.2   | 64.4   | 66.7   | 66.7   |
| 95°    | 108.0  | 128.8  | 132.5  | 132.5  | 128.8  |
| 97.5°  | 179.9  | 199.1  | 207.3  | 207.3  | 207.3  |
| 100°   | 262.7  | 279.8  | 285.7  | 285.7  | 283.5  |
| 102.5° | 350.1  | 362.6  | 370.8  | 373.1  | 370.8  |
| 105°   | 445.6  | 451.5  | 455.9  | 459.7  | 459.7  |
| 107.5° | 540.3  | 549.2  | 549.2  | 550.7  | 540.3  |
| 110°   | 632.1  | 644.0  | 644.0  | 644.0  | 638.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 731.3  | 743.9  | 741.7  | 735.7  | 731.3  |
| 115°   | 829.0  | 840.8  | 837.2  | 835.0  | 829.0  |
| 117.5° | 925.9  | 942.2  | 931.9  | 925.9  | 920.0  |
| 120°   | 1023.6 | 1039.9 | 1023.6 | 1023.6 | 1017.0 |
| 122.5° | 1112.4 | 1133.2 | 1122.9 | 1116.9 | 1112.4 |
| 125°   | 1205.7 | 1224.2 | 1218.3 | 1211.7 | 1209.5 |
| 127.5° | 1296.8 | 1319.7 | 1311.6 | 1302.7 | 1296.8 |
| 130°   | 1381.9 | 1408.5 | 1404.9 | 1400.4 | 1392.2 |
| 132.5° | 1477.4 | 1498.1 | 1499.6 | 1489.3 | 1483.3 |
| 135°   | 1559.6 | 1582.4 | 1587.0 | 1584.7 | 1578.8 |
| 137.5° | 1651.3 | 1669.8 | 1673.5 | 1672.0 | 1663.2 |
| 140°   | 1732.0 | 1750.6 | 1760.9 | 1760.9 | 1752.8 |
| 142.5° | 1814.9 | 1833.4 | 1839.3 | 1841.5 | 1833.4 |
| 145°   | 1893.4 | 1908.1 | 1920.0 | 1922.2 | 1914.1 |
| 147.5° | 1963.7 | 1982.2 | 1991.1 | 1994.8 | 1986.7 |
| 150°   | 2036.2 | 2048.8 | 2057.0 | 2063.6 | 2057.0 |
| 152.5° | 2100.6 | 2113.2 | 2123.5 | 2131.7 | 2123.5 |
| 155°   | 2165.0 | 2170.9 | 2177.6 | 2187.9 | 2181.3 |
| 157.5° | 2220.6 | 2225.0 | 2228.6 | 2243.5 | 2233.1 |
| 160°   | 2270.1 | 2274.6 | 2276.8 | 2289.3 | 2280.4 |
| 162.5° | 2316.0 | 2316.0 | 2318.3 | 2332.2 | 2321.9 |
| 165°   | 2355.2 | 2353.0 | 2353.0 | 2367.8 | 2357.4 |
| 167.5° | 2390.8 | 2384.1 | 2384.1 | 2398.9 | 2388.6 |
| 170°   | 2417.4 | 2411.5 | 2409.3 | 2424.1 | 2411.5 |
| 172.5° | 2435.9 | 2429.9 | 2427.7 | 2442.6 | 2429.9 |
| 175°   | 2450.7 | 2444.8 | 2440.4 | 2455.1 | 2442.6 |
| 177.5° | 2458.9 | 2452.9 | 2448.5 | 2461.1 | 2448.5 |
| 180°   | 2455.1 | 2455.1 | 2455.1 | 2455.1 | 2455.1 |

TEST NUMBER: P911670

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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 | 8.53             | 9.22  | 9.66  | 10.33 | 11.87 | 4.49           | 5.18 | 5.62 | 6.29 | 7.83  |
|                 | 3H   | 10.18            | 10.79 | 11.31 | 11.91 | 13.47 | 5.65           | 6.27 | 6.78 | 7.39 | 8.94  |
|                 | 4H   | 10.77            | 11.35 | 11.91 | 12.47 | 14.03 | 6.08           | 6.67 | 7.22 | 7.79 | 9.35  |
|                 | 6H   | 11.17            | 11.70 | 12.31 | 12.83 | 14.40 | 6.38           | 6.92 | 7.53 | 8.04 | 9.61  |
|                 | 8H   | 11.28            | 11.79 | 12.43 | 12.93 | 14.50 | 6.46           | 6.97 | 7.61 | 8.11 | 9.67  |
|                 | 12H  | 11.33            | 11.81 | 12.48 | 12.94 | 14.53 | 6.49           | 6.97 | 7.64 | 8.10 | 9.69  |
| 4H              | 2H   | 8.53             | 9.11  | 9.68  | 10.23 | 11.79 | 5.06           | 5.64 | 6.21 | 6.76 | 8.33  |
|                 | 3H   | 10.32            | 10.81 | 11.47 | 11.95 | 13.53 | 6.38           | 6.86 | 7.53 | 8.01 | 9.58  |
|                 | 4H   | 10.99            | 11.44 | 12.15 | 12.57 | 14.17 | 6.90           | 7.35 | 8.06 | 8.48 | 10.08 |
|                 | 6H   | 11.48            | 11.86 | 12.64 | 13.02 | 14.61 | 7.30           | 7.68 | 8.46 | 8.83 | 10.42 |
|                 | 8H   | 11.64            | 12.00 | 12.80 | 13.15 | 14.75 | 7.41           | 7.77 | 8.57 | 8.92 | 10.52 |
|                 | 12H  | 11.72            | 12.04 | 12.90 | 13.20 | 14.81 | 7.46           | 7.78 | 8.63 | 8.94 | 10.55 |
| 8H              | 4H   | 10.95            | 11.30 | 12.11 | 12.45 | 14.05 | 7.16           | 7.52 | 8.32 | 8.67 | 10.27 |
|                 | 6H   | 11.48            | 11.78 | 12.66 | 12.97 | 14.57 | 7.65           | 7.94 | 8.83 | 9.14 | 10.73 |
|                 | 8H   | 11.69            | 11.94 | 12.87 | 13.11 | 14.73 | 7.83           | 8.08 | 9.01 | 9.25 | 10.87 |
|                 | 12H  | 11.81            | 12.03 | 12.99 | 13.20 | 14.85 | 7.92           | 8.15 | 9.11 | 9.32 | 10.97 |
| 12H             | 4H   | 10.89            | 11.21 | 12.07 | 12.37 | 13.98 | 7.16           | 7.48 | 8.33 | 8.64 | 10.25 |
|                 | 6H   | 11.46            | 11.71 | 12.64 | 12.88 | 14.50 | 7.69           | 7.95 | 8.88 | 9.12 | 10.74 |
|                 | 8H   | 11.66            | 11.88 | 12.85 | 13.05 | 14.70 | 7.88           | 8.11 | 9.07 | 9.27 | 10.93 |