

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: P924397

Luminaire Tested: DFN2DIP-HX3F0-050D040US950-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924397  
REPORT IS A COMBINATION OF REPORTS P900740 AND P897645  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-050D040US950-RLLONL  
Description: 3 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

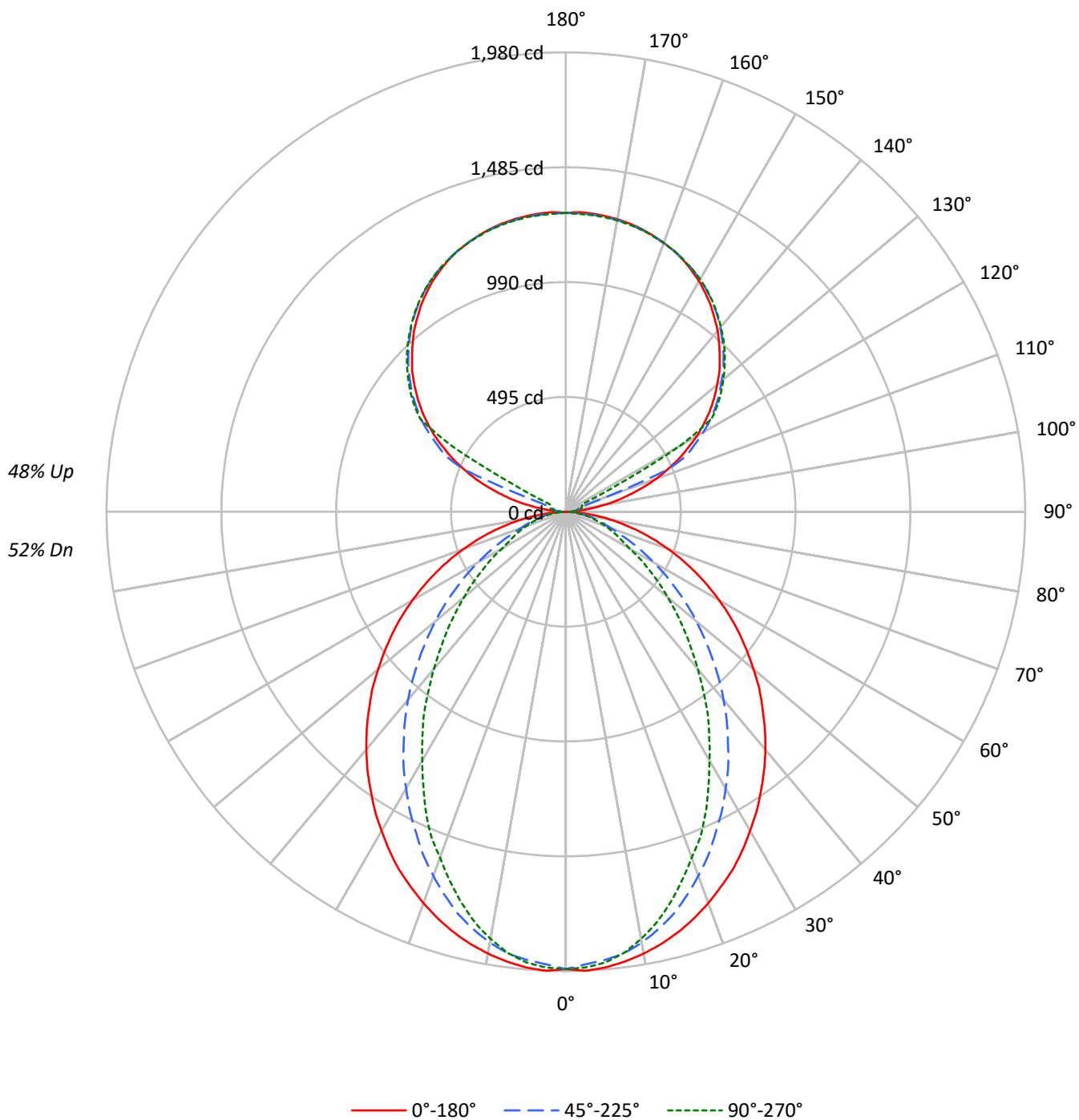
Lumens per Lamp: N/A  
Luminaire Lumens: 7832.4 lumens  
Efficiency: N/A  
Efficacy: 105.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 74.5  
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 |    |    |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 108 | 108 | 108 | 108 | 99 | 99 | 99 | 99 | 84 | 84 | 84 | 70 | 70 | 70 | 58 | 58 | 58 | 58 | 58 | 58 |
| 1   | 99  | 95  | 91  | 87  | 91 | 88 | 84 | 82 | 75 | 72 | 70 | 63 | 61 | 60 | 52 | 51 | 50 | 50 | 50 | 45 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 68 | 66 | 62 | 59 | 56 | 53 | 51 | 46 | 44 | 43 | 43 | 43 | 38 |
| 3   | 83  | 74  | 66  | 61  | 76 | 68 | 62 | 57 | 59 | 54 | 50 | 50 | 46 | 43 | 41 | 39 | 37 | 37 | 37 | 33 |
| 4   | 76  | 65  | 58  | 52  | 70 | 61 | 54 | 49 | 52 | 47 | 43 | 45 | 41 | 38 | 37 | 35 | 32 | 32 | 32 | 29 |
| 5   | 70  | 59  | 51  | 45  | 64 | 55 | 48 | 42 | 47 | 42 | 38 | 40 | 36 | 33 | 34 | 31 | 28 | 28 | 28 | 25 |
| 6   | 65  | 53  | 45  | 39  | 60 | 49 | 42 | 37 | 43 | 37 | 33 | 37 | 32 | 29 | 31 | 28 | 25 | 25 | 25 | 22 |
| 7   | 60  | 48  | 40  | 35  | 55 | 45 | 38 | 33 | 39 | 33 | 29 | 33 | 29 | 26 | 28 | 25 | 23 | 23 | 23 | 20 |
| 8   | 56  | 44  | 36  | 31  | 51 | 41 | 34 | 29 | 36 | 30 | 26 | 31 | 26 | 23 | 26 | 23 | 20 | 20 | 20 | 18 |
| 9   | 52  | 40  | 32  | 28  | 48 | 37 | 31 | 26 | 33 | 27 | 24 | 28 | 24 | 21 | 24 | 21 | 19 | 19 | 19 | 16 |
| 10  | 48  | 37  | 30  | 25  | 45 | 34 | 28 | 24 | 30 | 25 | 21 | 26 | 22 | 19 | 23 | 19 | 17 | 17 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2284 | 2284 | 2284 |
| 5°  | 2286 | 2246 | 2261 |
| 10° | 2263 | 2200 | 2186 |
| 15° | 2230 | 2126 | 2071 |
| 20° | 2188 | 2024 | 1930 |
| 25° | 2145 | 1910 | 1795 |
| 30° | 2087 | 1794 | 1623 |
| 35° | 2030 | 1669 | 1472 |
| 40° | 1973 | 1540 | 1300 |
| 45° | 1906 | 1396 | 1143 |
| 50° | 1837 | 1252 | 991  |
| 55° | 1764 | 1098 | 844  |
| 60° | 1680 | 937  | 693  |
| 65° | 1583 | 774  | 623  |
| 70° | 1466 | 621  | 562  |
| 75° | 1319 | 544  | 508  |
| 80° | 1105 | 452  | 436  |
| 85° | 756  | 294  | 321  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1906 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 184.8  | 2.4       |
| 10°-20°   | 507.2  | 6.5       |
| 20°-30°   | 712.1  | 9.1       |
| 30°-40°   | 776.3  | 9.9       |
| 40°-50°   | 713.5  | 9.1       |
| 50°-60°   | 560.3  | 7.2       |
| 60°-70°   | 364.7  | 4.7       |
| 70°-80°   | 187.7  | 2.4       |
| 80°-90°   | 50.2   | 0.6       |
| 90°-100°  | 42.5   | 0.5       |
| 100°-110° | 158.3  | 2.0       |
| 110°-120° | 419.9  | 5.4       |
| 120°-130° | 696.4  | 8.9       |
| 130°-140° | 739.7  | 9.4       |
| 140°-150° | 687.5  | 8.8       |
| 150°-160° | 552.7  | 7.1       |
| 160°-170° | 356.1  | 4.5       |
| 170°-180° | 122.6  | 1.6       |
| 0°-30°    | 1404.1 | 17.9      |
| 0°-40°    | 2180.4 | 27.8      |
| 0°-60°    | 3454.1 | 44.1      |
| 0°-90°    | 4056.8 | 51.8      |
| 90°-120°  | 620.6  | 7.9       |
| 90°-150°  | 2744.1 | 35.0      |
| 90°-180°  | 3776.0 | 48.2      |
| 0°-180°   | 7832.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1971 | 1971  | 1971 | 1971  | 1971 |      |
| 5°   | 1971 | 1963  | 1939 | 1955  | 1950 | 187  |
| 15°  | 1875 | 1855  | 1795 | 1761  | 1743 | 528  |
| 25°  | 1702 | 1645  | 1527 | 1454  | 1427 | 783  |
| 35°  | 1467 | 1376  | 1219 | 1106  | 1067 | 918  |
| 45°  | 1199 | 1079  | 892  | 765   | 722  | 926  |
| 55°  | 912  | 772   | 580  | 473   | 439  | 815  |
| 65°  | 616  | 471   | 310  | 250   | 244  | 610  |
| 75°  | 328  | 203   | 143  | 130   | 128  | 347  |
| 85°  | 77   | 39    | 34   | 34    | 34   | 88   |
| 90°  | 1    | 11    | 19   | 23    | 25   | 7    |
| 95°  | 60   | 30    | 36   | 41    | 40   | 72   |
| 105° | 283  | 311   | 57   | 67    | 71   | 303  |
| 115° | 536  | 552   | 575  | 144   | 76   | 527  |
| 125° | 758  | 770   | 787  | 794   | 797  | 676  |
| 135° | 938  | 952   | 961  | 970   | 968  | 724  |
| 145° | 1088 | 1087  | 1102 | 1109  | 1104 | 680  |
| 155° | 1198 | 1189  | 1200 | 1206  | 1198 | 552  |
| 165° | 1262 | 1256  | 1259 | 1266  | 1259 | 356  |
| 175° | 1291 | 1284  | 1286 | 1292  | 1283 | 123  |
| 180° | 1288 | 1288  | 1288 | 1288  | 1288 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1971.4 | 1971.4 | 1971.4 | 1971.4 | 1971.4 |
| 2.5°   | 1980.3 | 1971.4 | 1951.8 | 1969.7 | 1966.1 |
| 5°     | 1971.4 | 1962.6 | 1939.3 | 1955.3 | 1950.1 |
| 7.5°   | 1955.3 | 1944.7 | 1919.7 | 1926.8 | 1917.8 |
| 10°    | 1933.9 | 1921.5 | 1885.9 | 1880.4 | 1869.7 |
| 12.5°  | 1907.2 | 1891.2 | 1842.9 | 1832.3 | 1812.6 |
| 15°    | 1875.1 | 1855.4 | 1794.9 | 1761.0 | 1743.1 |
| 17.5°  | 1837.6 | 1809.1 | 1734.1 | 1694.9 | 1666.3 |
| 20°    | 1794.9 | 1759.1 | 1669.9 | 1625.4 | 1586.0 |
| 22.5°  | 1748.5 | 1707.4 | 1603.9 | 1543.3 | 1516.6 |
| 25°    | 1702.0 | 1644.9 | 1527.2 | 1454.1 | 1427.2 |
| 27.5°  | 1646.8 | 1586.0 | 1455.8 | 1371.9 | 1330.9 |
| 30°    | 1587.9 | 1520.0 | 1377.3 | 1286.4 | 1238.1 |
| 32.5°  | 1530.8 | 1448.6 | 1302.5 | 1195.4 | 1150.7 |
| 35°    | 1466.6 | 1375.6 | 1218.6 | 1106.2 | 1066.9 |
| 37.5°  | 1404.1 | 1305.9 | 1140.1 | 1016.9 | 972.4  |
| 40°    | 1338.1 | 1231.1 | 1057.9 | 931.3  | 884.9  |
| 42.5°  | 1270.3 | 1156.2 | 975.9  | 843.8  | 799.4  |
| 45°    | 1199.0 | 1079.4 | 892.1  | 765.3  | 722.5  |
| 47.5°  | 1131.2 | 1004.6 | 811.9  | 685.1  | 645.9  |
| 50°    | 1056.3 | 929.6  | 733.3  | 610.1  | 572.8  |
| 52.5°  | 983.0  | 849.2  | 658.4  | 540.6  | 506.8  |
| 55°    | 911.6  | 772.5  | 579.7  | 472.8  | 438.9  |
| 57.5°  | 838.6  | 695.8  | 510.3  | 410.4  | 381.8  |
| 60°    | 763.6  | 620.9  | 437.0  | 346.2  | 317.6  |
| 62.5°  | 690.5  | 547.8  | 374.6  | 289.1  | 274.8  |
| 65°    | 615.5  | 471.0  | 310.4  | 249.9  | 244.4  |
| 67.5°  | 544.2  | 399.6  | 249.9  | 219.4  | 214.1  |
| 70°    | 469.3  | 330.1  | 206.9  | 189.1  | 181.9  |
| 72.5°  | 397.9  | 265.8  | 173.1  | 158.8  | 155.2  |
| 75°    | 328.3  | 203.3  | 142.7  | 130.2  | 128.5  |
| 77.5°  | 258.7  | 144.4  | 112.5  | 105.2  | 101.6  |
| 80°    | 194.4  | 103.5  | 85.6   | 78.5   | 78.5   |
| 82.5°  | 135.6  | 69.6   | 58.9   | 55.2   | 55.2   |
| 85°    | 76.7   | 39.2   | 33.9   | 33.9   | 33.9   |
| 87.5°  | 28.6   | 14.2   | 14.2   | 12.5   | 12.5   |
| 90°    | 0.9    | 11.2   | 18.6   | 23.4   | 25.1   |
| 92.5°  | 23.4   | 19.6   | 22.3   | 24.2   | 25.1   |
| 95°    | 60.5   | 29.8   | 36.3   | 41.0   | 40.1   |
| 97.5°  | 109.0  | 32.6   | 47.5   | 50.4   | 51.2   |
| 100°   | 164.9  | 37.3   | 53.1   | 60.5   | 62.4   |
| 102.5° | 226.4  | 224.7  | 55.0   | 65.2   | 68.0   |
| 105°   | 283.2  | 311.3  | 56.9   | 67.1   | 70.8   |
| 107.5° | 349.5  | 372.7  | 58.8   | 69.0   | 72.7   |
| 110°   | 412.9  | 432.4  | 163.1  | 69.9   | 73.6   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 472.5  | 489.2  | 473.4  | 71.7   | 74.6   |
| 115°   | 535.8  | 551.6  | 575.0  | 143.5  | 76.5   |
| 117.5° | 590.8  | 609.4  | 625.3  | 492.0  | 247.8  |
| 120°   | 652.3  | 666.3  | 683.1  | 694.3  | 568.5  |
| 122.5° | 704.4  | 719.4  | 738.1  | 743.6  | 744.6  |
| 125°   | 757.6  | 769.8  | 787.4  | 794.0  | 796.8  |
| 127.5° | 806.0  | 819.1  | 833.1  | 842.5  | 843.3  |
| 130°   | 851.7  | 866.7  | 876.8  | 887.1  | 886.3  |
| 132.5° | 898.3  | 910.5  | 920.7  | 929.1  | 928.2  |
| 135°   | 937.5  | 952.5  | 960.8  | 970.1  | 968.3  |
| 137.5° | 978.4  | 989.6  | 999.0  | 1008.3 | 1005.5 |
| 140°   | 1018.5 | 1026.0 | 1036.2 | 1044.6 | 1040.0 |
| 142.5° | 1052.2 | 1058.7 | 1070.8 | 1078.1 | 1073.5 |
| 145°   | 1087.6 | 1086.6 | 1102.3 | 1108.9 | 1104.3 |
| 147.5° | 1118.2 | 1115.4 | 1131.3 | 1135.9 | 1132.3 |
| 150°   | 1148.0 | 1141.6 | 1156.5 | 1162.1 | 1157.4 |
| 152.5° | 1173.2 | 1165.8 | 1179.7 | 1185.3 | 1178.9 |
| 155°   | 1197.5 | 1189.2 | 1200.3 | 1205.9 | 1198.4 |
| 157.5° | 1217.0 | 1209.6 | 1218.1 | 1224.6 | 1217.0 |
| 160°   | 1233.8 | 1228.2 | 1233.8 | 1239.3 | 1232.9 |
| 162.5° | 1248.7 | 1243.2 | 1247.8 | 1254.3 | 1245.9 |
| 165°   | 1261.8 | 1256.2 | 1259.0 | 1265.5 | 1259.0 |
| 167.5° | 1272.1 | 1266.3 | 1269.3 | 1275.8 | 1267.4 |
| 170°   | 1280.5 | 1274.8 | 1276.6 | 1283.2 | 1274.8 |
| 172.5° | 1286.0 | 1280.5 | 1282.4 | 1288.9 | 1280.5 |
| 175°   | 1290.6 | 1284.1 | 1286.0 | 1292.5 | 1283.2 |
| 177.5° | 1292.5 | 1286.0 | 1286.9 | 1293.5 | 1285.1 |
| 180°   | 1287.9 | 1287.9 | 1287.9 | 1287.9 | 1287.9 |

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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 | 10.14            | 10.98 | 11.09 | 11.94 | 13.19 | 6.12           | 6.96 | 7.06  | 7.92  | 9.17  |
|                 | 3H   | 11.81            | 12.57 | 12.77 | 13.53 | 14.81 | 7.30           | 8.06 | 8.26  | 9.03  | 10.30 |
|                 | 4H   | 12.41            | 13.13 | 13.39 | 14.10 | 15.38 | 7.75           | 8.46 | 8.72  | 9.44  | 10.72 |
|                 | 6H   | 12.83            | 13.49 | 13.81 | 14.47 | 15.76 | 8.07           | 8.72 | 9.05  | 9.70  | 10.99 |
|                 | 8H   | 12.95            | 13.58 | 13.94 | 14.57 | 15.86 | 8.16           | 8.78 | 9.15  | 9.78  | 11.06 |
|                 | 12H  | 13.01            | 13.61 | 14.01 | 14.60 | 15.91 | 8.20           | 8.79 | 9.19  | 9.78  | 11.09 |
| 4H              | 2H   | 10.16            | 10.87 | 11.14 | 11.85 | 13.13 | 6.71           | 7.42 | 7.69  | 8.40  | 9.68  |
|                 | 3H   | 11.98            | 12.57 | 12.97 | 13.58 | 14.87 | 8.05           | 8.65 | 9.04  | 9.65  | 10.94 |
|                 | 4H   | 12.67            | 13.21 | 13.66 | 14.20 | 15.52 | 8.60           | 9.14 | 9.60  | 10.14 | 11.45 |
|                 | 6H   | 13.18            | 13.64 | 14.18 | 14.66 | 15.98 | 9.01           | 9.48 | 10.02 | 10.50 | 11.81 |
|                 | 8H   | 13.35            | 13.78 | 14.36 | 14.79 | 16.12 | 9.14           | 9.57 | 10.15 | 10.59 | 11.92 |
|                 | 12H  | 13.44            | 13.83 | 14.47 | 14.86 | 16.19 | 9.20           | 9.60 | 10.23 | 10.62 | 11.96 |
| 8H              | 4H   | 12.63            | 13.07 | 13.64 | 14.08 | 15.41 | 8.88           | 9.31 | 9.89  | 10.32 | 11.65 |
|                 | 6H   | 13.19            | 13.55 | 14.23 | 14.61 | 15.93 | 9.39           | 9.75 | 10.42 | 10.80 | 12.13 |
|                 | 8H   | 13.40            | 13.72 | 14.45 | 14.76 | 16.11 | 9.57           | 9.89 | 10.62 | 10.93 | 12.28 |
|                 | 12H  | 13.54            | 13.82 | 14.58 | 14.85 | 16.24 | 9.69           | 9.97 | 10.74 | 11.00 | 12.39 |
| 12H             | 4H   | 12.59            | 12.98 | 13.62 | 14.01 | 15.34 | 8.88           | 9.27 | 9.91  | 10.30 | 11.63 |
|                 | 6H   | 13.17            | 13.48 | 14.21 | 14.52 | 15.87 | 9.44           | 9.75 | 10.48 | 10.79 | 12.14 |
|                 | 8H   | 13.38            | 13.66 | 14.43 | 14.70 | 16.09 | 9.64           | 9.92 | 10.69 | 10.95 | 12.34 |