

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: P927522

Luminaire Tested: DFN2DIP-HX4F0-040D040US840-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927522  
REPORT IS A COMBINATION OF REPORTS P900820 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-040D040US840-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

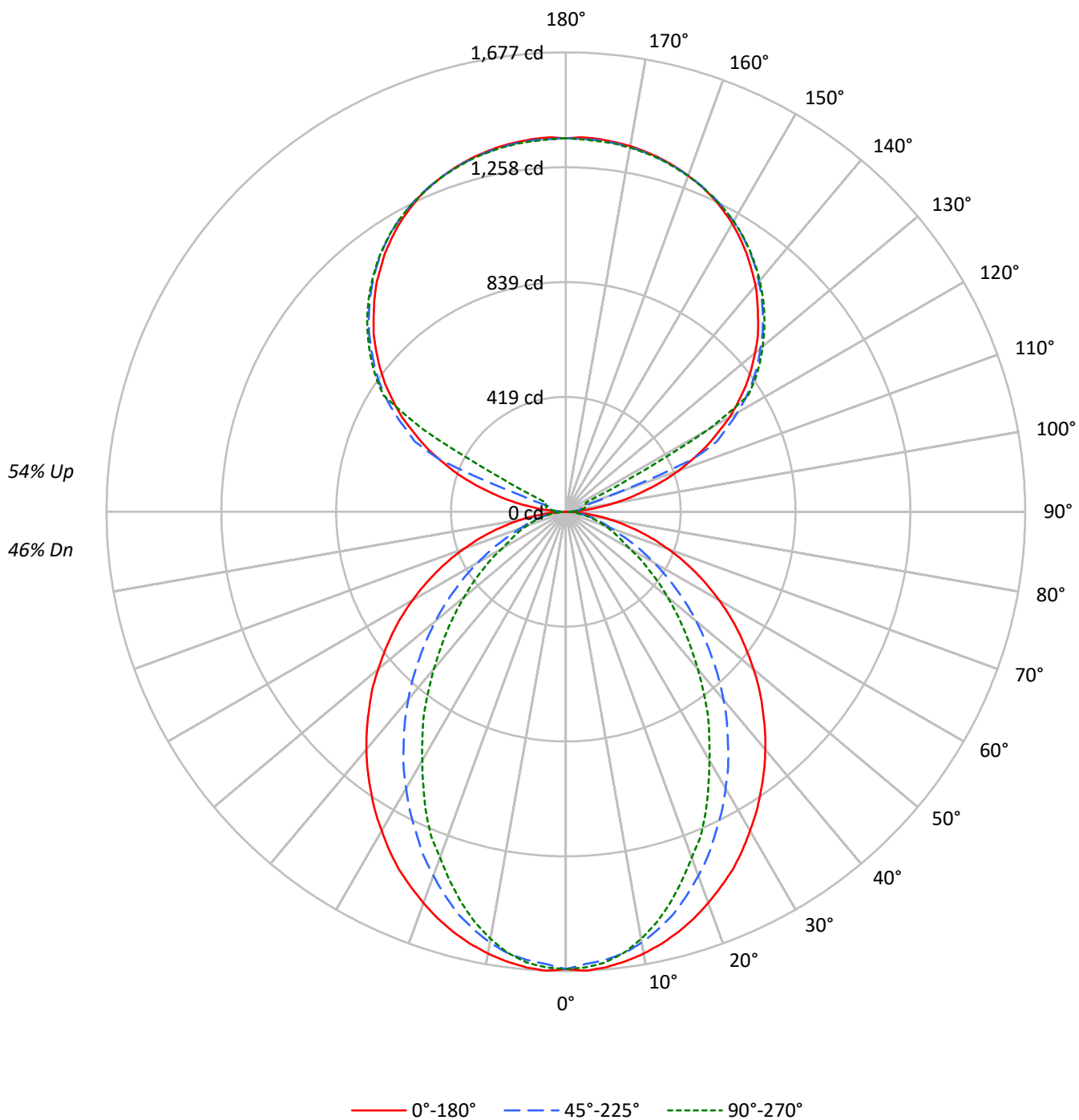
Lumens per Lamp: N/A  
Luminaire Lumens: 7432.1 lumens  
Efficiency: N/A  
Efficacy: 117.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 63.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
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 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 |    |    | 46 |
| 1   | 97  | 93  | 90  | 86  | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 |    |    | 40 |
| 2   | 89  | 82  | 76  | 71  | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 |    |    | 34 |
| 3   | 81  | 72  | 65  | 60  | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 |    |    | 29 |
| 4   | 75  | 64  | 57  | 51  | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 |    |    | 26 |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 |    |    | 23 |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 |    |    | 20 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 |    |    | 18 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 |    |    | 16 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 |    |    | 15 |
| 10  | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 |    |    | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1241 | 1241 | 1241 |
| 5°  | 1243 | 1222 | 1229 |
| 10° | 1231 | 1198 | 1190 |
| 15° | 1214 | 1158 | 1128 |
| 20° | 1192 | 1104 | 1052 |
| 25° | 1169 | 1043 | 979  |
| 30° | 1138 | 980  | 886  |
| 35° | 1108 | 913  | 804  |
| 40° | 1078 | 843  | 711  |
| 45° | 1042 | 766  | 626  |
| 50° | 1005 | 688  | 543  |
| 55° | 967  | 604  | 463  |
| 60° | 922  | 517  | 381  |
| 65° | 871  | 428  | 343  |
| 70° | 810  | 346  | 311  |
| 75° | 732  | 305  | 283  |
| 80° | 619  | 256  | 245  |
| 85° | 433  | 172  | 185  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1042 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 156.5  | 2.1       |
| 10°-20°   | 429.5  | 5.8       |
| 20°-30°   | 603.0  | 8.1       |
| 30°-40°   | 657.3  | 8.8       |
| 40°-50°   | 604.2  | 8.1       |
| 50°-60°   | 474.5  | 6.4       |
| 60°-70°   | 308.9  | 4.2       |
| 70°-80°   | 159.0  | 2.1       |
| 80°-90°   | 43.0   | 0.6       |
| 90°-100°  | 44.9   | 0.6       |
| 100°-110° | 167.6  | 2.3       |
| 110°-120° | 444.4  | 6.0       |
| 120°-130° | 737.1  | 9.9       |
| 130°-140° | 783.0  | 10.5      |
| 140°-150° | 727.7  | 9.8       |
| 150°-160° | 585.0  | 7.9       |
| 160°-170° | 377.0  | 5.1       |
| 170°-180° | 129.8  | 1.7       |
| 0°-30°    | 1189.0 | 16.0      |
| 0°-40°    | 1846.3 | 24.8      |
| 0°-60°    | 2924.9 | 39.4      |
| 0°-90°    | 3435.7 | 46.2      |
| 90°-120°  | 656.9  | 8.8       |
| 90°-150°  | 2904.6 | 39.1      |
| 90°-180°  | 3996.0 | 53.8      |
| 0°-180°   | 7432.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1669 | 1669  | 1669 | 1669  | 1669 |      |
| 5°   | 1669 | 1662  | 1642 | 1656  | 1651 | 158  |
| 15°  | 1588 | 1571  | 1520 | 1491  | 1476 | 447  |
| 25°  | 1441 | 1393  | 1293 | 1231  | 1208 | 663  |
| 35°  | 1242 | 1165  | 1032 | 937   | 903  | 777  |
| 45°  | 1015 | 914   | 755  | 648   | 612  | 784  |
| 55°  | 772  | 654   | 491  | 400   | 372  | 690  |
| 65°  | 521  | 399   | 263  | 212   | 207  | 517  |
| 75°  | 278  | 172   | 121  | 110   | 109  | 294  |
| 85°  | 65   | 33    | 29   | 29    | 29   | 75   |
| 90°  | 1    | 12    | 20   | 25    | 27   | 7    |
| 95°  | 64   | 32    | 38   | 43    | 42   | 76   |
| 105° | 300  | 330   | 60   | 71    | 75   | 320  |
| 115° | 567  | 584   | 609  | 152   | 81   | 558  |
| 125° | 802  | 815   | 834  | 840   | 843  | 715  |
| 135° | 992  | 1008  | 1017 | 1027  | 1025 | 767  |
| 145° | 1151 | 1150  | 1167 | 1174  | 1169 | 720  |
| 155° | 1268 | 1259  | 1270 | 1276  | 1268 | 584  |
| 165° | 1336 | 1330  | 1333 | 1340  | 1333 | 377  |
| 175° | 1366 | 1359  | 1361 | 1368  | 1358 | 130  |
| 180° | 1363 | 1363  | 1363 | 1363  | 1363 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1669.4 | 1669.4 | 1669.4 | 1669.4 | 1669.4 |
| 2.5°   | 1677.0 | 1669.4 | 1652.7 | 1668.0 | 1664.9 |
| 5°     | 1669.4 | 1661.8 | 1642.1 | 1655.8 | 1651.3 |
| 7.5°   | 1655.8 | 1646.8 | 1625.7 | 1631.5 | 1624.1 |
| 10°    | 1637.7 | 1627.1 | 1596.9 | 1592.3 | 1583.4 |
| 12.5°  | 1615.1 | 1601.4 | 1560.5 | 1551.6 | 1534.9 |
| 15°    | 1587.8 | 1571.1 | 1519.8 | 1491.2 | 1476.1 |
| 17.5°  | 1556.1 | 1531.9 | 1468.4 | 1435.2 | 1411.0 |
| 20°    | 1519.8 | 1489.6 | 1414.0 | 1376.4 | 1343.0 |
| 22.5°  | 1480.6 | 1445.8 | 1358.1 | 1306.8 | 1284.3 |
| 25°    | 1441.3 | 1392.9 | 1293.1 | 1231.4 | 1208.5 |
| 27.5°  | 1394.5 | 1343.0 | 1232.8 | 1161.8 | 1126.9 |
| 30°    | 1344.6 | 1287.1 | 1166.2 | 1089.3 | 1048.5 |
| 32.5°  | 1296.3 | 1226.7 | 1102.9 | 1012.2 | 974.4  |
| 35°    | 1242.0 | 1164.8 | 1031.9 | 936.7  | 903.4  |
| 37.5°  | 1189.0 | 1105.8 | 965.4  | 861.1  | 823.4  |
| 40°    | 1133.1 | 1042.5 | 895.9  | 788.7  | 749.4  |
| 42.5°  | 1075.6 | 979.0  | 826.4  | 714.5  | 676.9  |
| 45°    | 1015.3 | 914.0  | 755.4  | 648.1  | 611.8  |
| 47.5°  | 957.9  | 850.7  | 687.5  | 580.1  | 546.9  |
| 50°    | 894.4  | 787.1  | 620.9  | 516.6  | 485.0  |
| 52.5°  | 832.4  | 719.1  | 557.5  | 457.7  | 429.1  |
| 55°    | 772.0  | 654.1  | 491.0  | 400.4  | 371.7  |
| 57.5°  | 710.1  | 589.2  | 432.1  | 347.5  | 323.3  |
| 60°    | 646.6  | 525.7  | 370.1  | 293.1  | 269.0  |
| 62.5°  | 584.8  | 463.9  | 317.2  | 244.8  | 232.8  |
| 65°    | 521.3  | 398.8  | 262.9  | 211.6  | 206.9  |
| 67.5°  | 460.9  | 338.4  | 211.6  | 185.8  | 181.3  |
| 70°    | 397.4  | 279.5  | 175.2  | 160.2  | 154.0  |
| 72.5°  | 337.0  | 225.1  | 146.5  | 134.5  | 131.5  |
| 75°    | 277.9  | 172.2  | 120.9  | 110.3  | 108.9  |
| 77.5°  | 219.1  | 122.3  | 95.2   | 89.2   | 86.0   |
| 80°    | 164.6  | 87.7   | 72.4   | 66.5   | 66.5   |
| 82.5°  | 114.8  | 59.0   | 49.9   | 46.8   | 46.8   |
| 85°    | 64.9   | 33.2   | 28.7   | 28.7   | 28.7   |
| 87.5°  | 24.2   | 12.0   | 12.0   | 10.6   | 10.6   |
| 90°    | 0.9    | 11.8   | 19.7   | 24.7   | 26.6   |
| 92.5°  | 24.7   | 20.7   | 23.6   | 25.6   | 26.6   |
| 95°    | 64.0   | 31.5   | 38.4   | 43.4   | 42.4   |
| 97.5°  | 115.4  | 34.5   | 50.3   | 53.3   | 54.2   |
| 100°   | 174.6  | 39.5   | 56.2   | 64.0   | 66.0   |
| 102.5° | 239.6  | 237.8  | 58.2   | 69.0   | 72.0   |
| 105°   | 299.8  | 329.5  | 60.2   | 71.0   | 74.9   |
| 107.5° | 369.9  | 394.5  | 62.2   | 73.0   | 76.9   |
| 110°   | 437.0  | 457.6  | 172.7  | 74.0   | 77.9   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 500.2  | 517.8  | 501.1  | 75.9   | 79.0   |
| 115°   | 567.1  | 583.9  | 608.6  | 151.9  | 81.0   |
| 117.5° | 625.4  | 645.1  | 661.9  | 520.8  | 262.3  |
| 120°   | 690.5  | 705.2  | 723.0  | 734.9  | 601.7  |
| 122.5° | 745.6  | 761.5  | 781.3  | 787.1  | 788.1  |
| 125°   | 801.9  | 814.8  | 833.5  | 840.5  | 843.4  |
| 127.5° | 853.2  | 867.0  | 881.9  | 891.8  | 892.7  |
| 130°   | 901.5  | 917.4  | 928.1  | 939.0  | 938.1  |
| 132.5° | 950.8  | 963.8  | 974.6  | 983.4  | 982.5  |
| 135°   | 992.3  | 1008.2 | 1017.0 | 1026.9 | 1024.9 |
| 137.5° | 1035.7 | 1047.5 | 1057.5 | 1067.3 | 1064.3 |
| 140°   | 1078.1 | 1086.0 | 1096.8 | 1105.7 | 1100.8 |
| 142.5° | 1113.7 | 1120.6 | 1133.4 | 1141.2 | 1136.3 |
| 145°   | 1151.2 | 1150.2 | 1166.8 | 1173.8 | 1168.8 |
| 147.5° | 1183.6 | 1180.7 | 1197.4 | 1202.4 | 1198.5 |
| 150°   | 1215.2 | 1208.3 | 1224.2 | 1230.0 | 1225.1 |
| 152.5° | 1241.9 | 1234.0 | 1248.7 | 1254.7 | 1247.8 |
| 155°   | 1267.5 | 1258.7 | 1270.5 | 1276.4 | 1268.5 |
| 157.5° | 1288.2 | 1280.3 | 1289.3 | 1296.2 | 1288.2 |
| 160°   | 1306.0 | 1300.0 | 1306.0 | 1311.8 | 1305.0 |
| 162.5° | 1321.7 | 1315.9 | 1320.8 | 1327.7 | 1318.8 |
| 165°   | 1335.6 | 1329.7 | 1332.6 | 1339.5 | 1332.6 |
| 167.5° | 1346.5 | 1340.4 | 1343.5 | 1350.4 | 1341.5 |
| 170°   | 1355.4 | 1349.4 | 1351.3 | 1358.3 | 1349.4 |
| 172.5° | 1361.2 | 1355.4 | 1357.4 | 1364.2 | 1355.4 |
| 175°   | 1366.1 | 1359.2 | 1361.2 | 1368.1 | 1358.3 |
| 177.5° | 1368.1 | 1361.2 | 1362.2 | 1369.2 | 1360.3 |
| 180°   | 1363.2 | 1363.2 | 1363.2 | 1363.2 | 1363.2 |

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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 | 7.54             | 8.34  | 8.53  | 9.34  | 10.67 | 3.51           | 4.31 | 4.50 | 5.31 | 6.64 |
|                 | 3H   | 9.21             | 9.93  | 10.22 | 10.94 | 12.29 | 4.70           | 5.41 | 5.70 | 6.42 | 7.77 |
|                 | 4H   | 9.82             | 10.50 | 10.84 | 11.51 | 12.87 | 5.15           | 5.82 | 6.17 | 6.84 | 8.20 |
|                 | 6H   | 10.24            | 10.86 | 11.27 | 11.88 | 13.25 | 5.47           | 6.09 | 6.50 | 7.11 | 8.48 |
|                 | 8H   | 10.37            | 10.96 | 11.40 | 11.99 | 13.36 | 5.56           | 6.15 | 6.59 | 7.19 | 8.55 |
|                 | 12H  | 10.43            | 10.99 | 11.47 | 12.02 | 13.41 | 5.60           | 6.17 | 6.64 | 7.19 | 8.58 |
| 4H              | 2H   | 7.55             | 8.23  | 8.58  | 9.24  | 10.60 | 4.10           | 4.78 | 5.13 | 5.79 | 7.15 |
|                 | 3H   | 9.38             | 9.94  | 10.41 | 10.98 | 12.35 | 5.45           | 6.01 | 6.48 | 7.06 | 8.43 |
|                 | 4H   | 10.07            | 10.59 | 11.11 | 11.62 | 13.01 | 6.00           | 6.51 | 7.04 | 7.55 | 8.94 |
|                 | 6H   | 10.59            | 11.03 | 11.64 | 12.09 | 13.47 | 6.42           | 6.86 | 7.47 | 7.92 | 9.31 |
|                 | 8H   | 10.76            | 11.17 | 11.81 | 12.22 | 13.63 | 6.55           | 6.96 | 7.60 | 8.01 | 9.41 |
|                 | 12H  | 10.85            | 11.23 | 11.92 | 12.29 | 13.70 | 6.61           | 6.99 | 7.68 | 8.05 | 9.46 |
| 8H              | 4H   | 10.04            | 10.45 | 11.09 | 11.50 | 12.90 | 6.28           | 6.69 | 7.33 | 7.74 | 9.14 |
|                 | 6H   | 10.60            | 10.94 | 11.68 | 12.04 | 13.44 | 6.80           | 7.14 | 7.87 | 8.23 | 9.63 |
|                 | 8H   | 10.82            | 11.12 | 11.90 | 12.20 | 13.61 | 6.99           | 7.29 | 8.07 | 8.37 | 9.78 |
|                 | 12H  | 10.96            | 11.22 | 12.04 | 12.29 | 13.75 | 7.11           | 7.37 | 8.19 | 8.44 | 9.90 |
| 12H             | 4H   | 9.99             | 10.36 | 11.06 | 11.42 | 12.83 | 6.28           | 6.65 | 7.35 | 7.72 | 9.13 |
|                 | 6H   | 10.58            | 10.88 | 11.66 | 11.95 | 13.37 | 6.85           | 7.15 | 7.93 | 8.22 | 9.64 |
|                 | 8H   | 10.80            | 11.06 | 11.88 | 12.13 | 13.59 | 7.06           | 7.32 | 8.14 | 8.39 | 9.85 |