

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: P903145

Luminaire Tested: DFN2DIP-PN4F0-040D040US830-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903145  
REPORT IS A COMBINATION OF REPORTS P901129 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-040D040US830-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

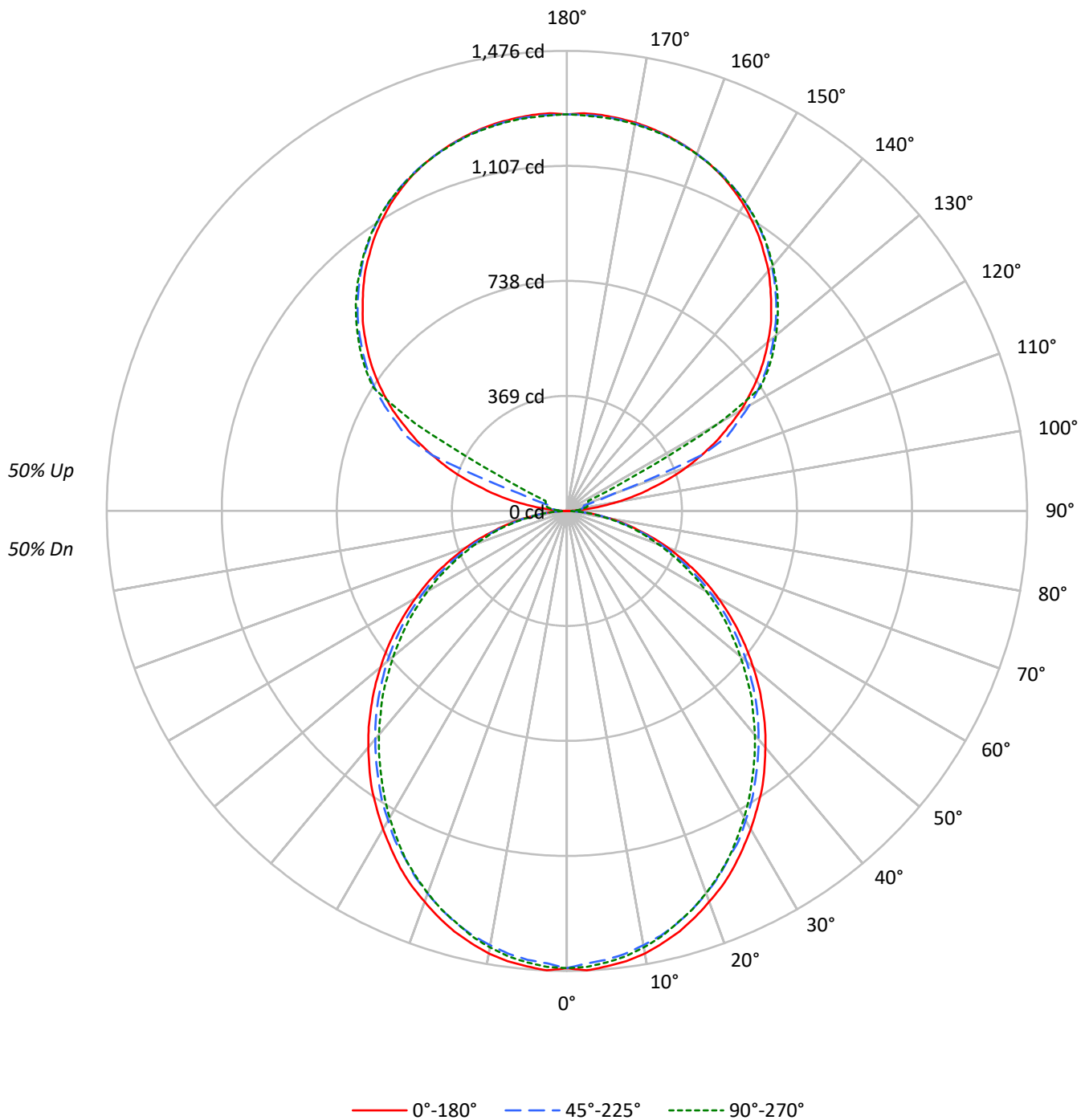
Lumens per Lamp: N/A  
Luminaire Lumens: 7464.9 lumens  
Efficiency: N/A  
Efficacy: 117.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 63.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-PN4F0-040D040US830-FLLONL

### 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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 | 56 | 56 | 56 |
| 1   | 98  | 93  | 90  | 86  | 90 | 86 | 83 | 80 | 73 | 71 | 68 | 61 | 59 | 58 | 50 | 48 | 47 | 47 | 47 | 42 |
| 2   | 89  | 82  | 75  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 53 | 51 | 48 | 44 | 42 | 40 | 40 | 40 | 35 |
| 3   | 81  | 72  | 64  | 59  | 75 | 66 | 60 | 55 | 56 | 52 | 48 | 47 | 44 | 41 | 39 | 36 | 34 | 34 | 34 | 30 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 29 | 29 | 29 | 26 |
| 5   | 68  | 57  | 48  | 42  | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 26 | 26 | 26 | 22 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 | 23 | 23 | 20 |
| 7   | 58  | 46  | 38  | 32  | 53 | 43 | 36 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 23 | 20 | 20 | 20 | 17 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 24 | 20 | 18 | 18 | 18 | 16 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 31 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 16 | 16 | 16 | 14 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 | 15 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1071 | 1071 | 1071 |
| 5°  | 1073 | 1056 | 1063 |
| 10° | 1064 | 1042 | 1049 |
| 15° | 1048 | 1025 | 1027 |
| 20° | 1027 | 1001 | 1004 |
| 25° | 1006 | 973  | 977  |
| 30° | 980  | 947  | 944  |
| 35° | 955  | 915  | 908  |
| 40° | 924  | 884  | 874  |
| 45° | 893  | 852  | 840  |
| 50° | 860  | 819  | 799  |
| 55° | 825  | 781  | 763  |
| 60° | 785  | 736  | 720  |
| 65° | 742  | 689  | 671  |
| 70° | 687  | 631  | 617  |
| 75° | 611  | 563  | 568  |
| 80° | 518  | 476  | 474  |
| 85° | 375  | 324  | 317  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 893 cd/sqm

TEST NUMBER: P903145

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 138.1  | 1.8       |
| 10°-20°   | 388.5  | 5.2       |
| 20°-30°   | 570.9  | 7.6       |
| 30°-40°   | 663.1  | 8.9       |
| 40°-50°   | 662.3  | 8.9       |
| 50°-60°   | 577.5  | 7.7       |
| 60°-70°   | 426.9  | 5.7       |
| 70°-80°   | 241.5  | 3.2       |
| 80°-90°   | 66.0   | 0.9       |
| 90°-100°  | 41.9   | 0.6       |
| 100°-110° | 156.4  | 2.1       |
| 110°-120° | 414.8  | 5.6       |
| 120°-130° | 688.0  | 9.2       |
| 130°-140° | 730.8  | 9.8       |
| 140°-150° | 679.2  | 9.1       |
| 150°-160° | 546.1  | 7.3       |
| 160°-170° | 351.9  | 4.7       |
| 170°-180° | 121.1  | 1.6       |
| 0°-30°    | 1097.5 | 14.7      |
| 0°-40°    | 1760.6 | 23.6      |
| 0°-60°    | 3000.3 | 40.2      |
| 0°-90°    | 3734.7 | 50.0      |
| 90°-120°  | 613.2  | 8.2       |
| 90°-150°  | 2711.2 | 36.3      |
| 90°-180°  | 3730.0 | 50.0      |
| 0°-180°   | 7464.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1467 | 1467  | 1467 | 1467  | 1467 |      |
| 5°   | 1467 | 1461  | 1446 | 1457  | 1454 | 139  |
| 15°  | 1396 | 1388  | 1370 | 1375  | 1368 | 393  |
| 25°  | 1264 | 1253  | 1229 | 1231  | 1229 | 582  |
| 35°  | 1090 | 1076  | 1054 | 1045  | 1038 | 681  |
| 45°  | 887  | 878   | 856  | 841   | 835  | 685  |
| 55°  | 672  | 663   | 646  | 629   | 622  | 600  |
| 65°  | 453  | 444   | 430  | 418   | 411  | 448  |
| 75°  | 237  | 234   | 227  | 219   | 222  | 253  |
| 85°  | 58   | 56    | 55   | 51    | 49   | 64   |
| 90°  | 1    | 11    | 18   | 23    | 25   | 7    |
| 95°  | 60   | 29    | 36   | 40    | 40   | 71   |
| 105° | 280  | 308   | 56   | 66    | 70   | 299  |
| 115° | 529  | 545   | 568  | 142   | 76   | 521  |
| 125° | 748  | 760   | 778  | 784   | 787  | 668  |
| 135° | 926  | 941   | 949  | 958   | 957  | 715  |
| 145° | 1074 | 1074  | 1089 | 1096  | 1091 | 672  |
| 155° | 1183 | 1175  | 1186 | 1191  | 1184 | 545  |
| 165° | 1247 | 1241  | 1244 | 1250  | 1244 | 352  |
| 175° | 1275 | 1269  | 1270 | 1277  | 1268 | 121  |
| 180° | 1272 | 1272  | 1272 | 1272  | 1272 |      |

TEST NUMBER: P903145

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1467.0 | 1467.0 | 1467.0 | 1467.0 | 1467.0 |
| 2.5°   | 1475.5 | 1468.5 | 1452.9 | 1467.0 | 1464.3 |
| 5°     | 1467.0 | 1461.4 | 1445.9 | 1457.1 | 1454.4 |
| 7.5°   | 1457.1 | 1448.7 | 1433.1 | 1444.5 | 1441.7 |
| 10°    | 1441.7 | 1431.8 | 1414.9 | 1426.2 | 1421.9 |
| 12.5°  | 1420.4 | 1412.0 | 1395.2 | 1402.2 | 1399.3 |
| 15°    | 1396.5 | 1388.1 | 1369.7 | 1375.4 | 1368.4 |
| 17.5°  | 1366.9 | 1358.5 | 1340.1 | 1347.1 | 1340.1 |
| 20°    | 1334.4 | 1326.0 | 1306.3 | 1310.4 | 1304.9 |
| 22.5°  | 1302.0 | 1289.3 | 1270.9 | 1270.9 | 1268.1 |
| 25°    | 1263.9 | 1252.6 | 1228.7 | 1231.4 | 1228.7 |
| 27.5°  | 1221.5 | 1211.6 | 1193.4 | 1189.2 | 1182.2 |
| 30°    | 1179.3 | 1168.0 | 1146.9 | 1142.6 | 1137.0 |
| 32.5°  | 1134.2 | 1125.8 | 1103.2 | 1094.7 | 1088.9 |
| 35°    | 1090.4 | 1076.4 | 1053.8 | 1045.3 | 1038.2 |
| 37.5°  | 1041.0 | 1028.3 | 1005.7 | 995.9  | 988.8  |
| 40°    | 990.3  | 978.9  | 956.3  | 943.8  | 938.1  |
| 42.5°  | 940.9  | 929.5  | 907.1  | 892.9  | 884.5  |
| 45°    | 887.3  | 877.5  | 856.2  | 840.8  | 835.1  |
| 47.5°  | 835.1  | 825.2  | 802.7  | 787.1  | 778.7  |
| 50°    | 780.0  | 773.0  | 753.3  | 733.5  | 726.4  |
| 52.5°  | 726.4  | 716.6  | 698.3  | 682.8  | 672.9  |
| 55°    | 671.6  | 663.0  | 646.1  | 629.1  | 622.2  |
| 57.5°  | 616.4  | 609.4  | 591.0  | 574.1  | 568.4  |
| 60°    | 561.4  | 555.8  | 536.1  | 520.6  | 516.3  |
| 62.5°  | 507.8  | 497.9  | 483.9  | 469.8  | 464.1  |
| 65°    | 452.9  | 444.3  | 430.3  | 417.5  | 410.6  |
| 67.5°  | 396.4  | 389.3  | 376.7  | 366.8  | 361.2  |
| 70°    | 344.2  | 338.6  | 325.8  | 315.9  | 310.4  |
| 72.5°  | 290.7  | 284.9  | 278.0  | 268.1  | 263.8  |
| 75°    | 237.0  | 234.2  | 227.1  | 218.7  | 221.5  |
| 77.5°  | 189.0  | 183.3  | 180.5  | 176.3  | 172.1  |
| 80°    | 141.1  | 139.6  | 136.8  | 132.6  | 129.8  |
| 82.5°  | 96.0   | 96.0   | 94.6   | 88.9   | 88.9   |
| 85°    | 57.8   | 56.5   | 55.0   | 50.7   | 49.4   |
| 87.5°  | 25.4   | 22.6   | 19.8   | 15.6   | 14.0   |
| 90°    | 0.8    | 11.0   | 18.4   | 23.1   | 24.8   |
| 92.5°  | 23.1   | 19.3   | 22.1   | 23.9   | 24.8   |
| 95°    | 59.8   | 29.4   | 35.8   | 40.5   | 39.6   |
| 97.5°  | 107.7  | 32.2   | 46.9   | 49.8   | 50.6   |
| 100°   | 163.0  | 36.9   | 52.5   | 59.8   | 61.6   |
| 102.5° | 223.7  | 222.0  | 54.3   | 64.4   | 67.2   |
| 105°   | 279.8  | 307.6  | 56.2   | 66.3   | 69.9   |
| 107.5° | 345.3  | 368.3  | 58.1   | 68.1   | 71.8   |
| 110°   | 407.9  | 427.2  | 161.2  | 69.1   | 72.7   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 466.8  | 483.3  | 467.7  | 70.9   | 73.7   |
| 115°   | 529.3  | 545.0  | 568.1  | 141.8  | 75.6   |
| 117.5° | 583.7  | 602.1  | 617.8  | 486.1  | 244.9  |
| 120°   | 644.5  | 658.3  | 674.9  | 686.0  | 561.7  |
| 122.5° | 696.0  | 710.8  | 729.2  | 734.7  | 735.7  |
| 125°   | 748.5  | 760.5  | 778.0  | 784.5  | 787.2  |
| 127.5° | 796.4  | 809.3  | 823.1  | 832.4  | 833.2  |
| 130°   | 841.5  | 856.3  | 866.3  | 876.5  | 875.6  |
| 132.5° | 887.5  | 899.6  | 909.6  | 917.9  | 917.1  |
| 135°   | 926.2  | 941.0  | 949.2  | 958.5  | 956.7  |
| 137.5° | 966.7  | 977.7  | 987.0  | 996.2  | 993.4  |
| 140°   | 1006.3 | 1013.7 | 1023.8 | 1032.1 | 1027.5 |
| 142.5° | 1039.5 | 1045.9 | 1057.9 | 1065.2 | 1060.6 |
| 145°   | 1074.5 | 1073.6 | 1089.1 | 1095.6 | 1091.0 |
| 147.5° | 1104.8 | 1102.0 | 1117.7 | 1122.3 | 1118.7 |
| 150°   | 1134.3 | 1127.8 | 1142.6 | 1148.1 | 1143.5 |
| 152.5° | 1159.1 | 1151.8 | 1165.5 | 1171.1 | 1164.7 |
| 155°   | 1183.1 | 1174.9 | 1185.9 | 1191.4 | 1184.0 |
| 157.5° | 1202.4 | 1195.0 | 1203.4 | 1209.8 | 1202.4 |
| 160°   | 1219.0 | 1213.4 | 1219.0 | 1224.5 | 1218.0 |
| 162.5° | 1233.7 | 1228.2 | 1232.8 | 1239.3 | 1231.0 |
| 165°   | 1246.6 | 1241.1 | 1243.9 | 1250.3 | 1243.9 |
| 167.5° | 1256.8 | 1251.1 | 1254.1 | 1260.5 | 1252.2 |
| 170°   | 1265.1 | 1259.5 | 1261.3 | 1267.8 | 1259.5 |
| 172.5° | 1270.5 | 1265.1 | 1267.0 | 1273.4 | 1265.1 |
| 175°   | 1275.1 | 1268.7 | 1270.5 | 1277.0 | 1267.8 |
| 177.5° | 1277.0 | 1270.5 | 1271.5 | 1278.0 | 1269.7 |
| 180°   | 1272.4 | 1272.4 | 1272.4 | 1272.4 | 1272.4 |

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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 | 7.52             | 8.38  | 8.48  | 9.35  | 10.62 | 7.08           | 7.94  | 8.04  | 8.91  | 10.18 |
|                 | 3H   | 9.18             | 9.96  | 10.15 | 10.94 | 12.23 | 8.70           | 9.47  | 9.67  | 10.45 | 11.75 |
|                 | 4H   | 9.77             | 10.50 | 10.75 | 11.49 | 12.79 | 9.29           | 10.02 | 10.27 | 11.00 | 12.30 |
|                 | 6H   | 10.17            | 10.85 | 11.17 | 11.84 | 13.15 | 9.68           | 10.36 | 10.68 | 11.35 | 12.66 |
|                 | 8H   | 10.28            | 10.92 | 11.28 | 11.93 | 13.24 | 9.79           | 10.43 | 10.79 | 11.44 | 12.75 |
|                 | 12H  | 10.33            | 10.94 | 11.33 | 11.94 | 13.28 | 9.83           | 10.44 | 10.83 | 11.44 | 12.78 |
| 4H              | 2H   | 7.98             | 8.71  | 8.97  | 9.70  | 11.00 | 7.63           | 8.36  | 8.62  | 9.35  | 10.65 |
|                 | 3H   | 9.85             | 10.46 | 10.85 | 11.48 | 12.79 | 9.45           | 10.06 | 10.44 | 11.07 | 12.39 |
|                 | 4H   | 10.57            | 11.13 | 11.57 | 12.13 | 13.47 | 10.15          | 10.71 | 11.15 | 11.72 | 13.05 |
|                 | 6H   | 11.08            | 11.57 | 12.10 | 12.60 | 13.93 | 10.66          | 11.14 | 11.68 | 12.17 | 13.51 |
|                 | 8H   | 11.24            | 11.69 | 12.25 | 12.71 | 14.06 | 10.81          | 11.26 | 11.83 | 12.28 | 13.63 |
|                 | 12H  | 11.31            | 11.72 | 12.35 | 12.76 | 14.11 | 10.87          | 11.28 | 11.91 | 12.32 | 13.67 |
| 8H              | 4H   | 10.76            | 11.21 | 11.78 | 12.24 | 13.59 | 10.39          | 10.84 | 11.41 | 11.87 | 13.22 |
|                 | 6H   | 11.40            | 11.77 | 12.44 | 12.84 | 14.18 | 11.02          | 11.39 | 12.06 | 12.46 | 13.81 |
|                 | 8H   | 11.62            | 11.95 | 12.67 | 13.00 | 14.37 | 11.24          | 11.56 | 12.29 | 12.62 | 13.98 |
|                 | 12H  | 11.76            | 12.04 | 12.81 | 13.09 | 14.50 | 11.35          | 11.64 | 12.41 | 12.69 | 14.10 |
| 12H             | 4H   | 10.75            | 11.16 | 11.79 | 12.19 | 13.55 | 10.39          | 10.79 | 11.42 | 11.83 | 13.19 |
|                 | 6H   | 11.43            | 11.76 | 12.48 | 12.81 | 14.17 | 11.06          | 11.39 | 12.11 | 12.44 | 13.81 |
|                 | 8H   | 11.67            | 11.96 | 12.73 | 13.01 | 14.42 | 11.30          | 11.59 | 12.35 | 12.63 | 14.04 |