

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: P913138

Luminaire Tested: DFN2DIP-4P3F0-040D050US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913138  
REPORT IS A COMBINATION OF REPORTS P899063 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-040D050US927-FLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

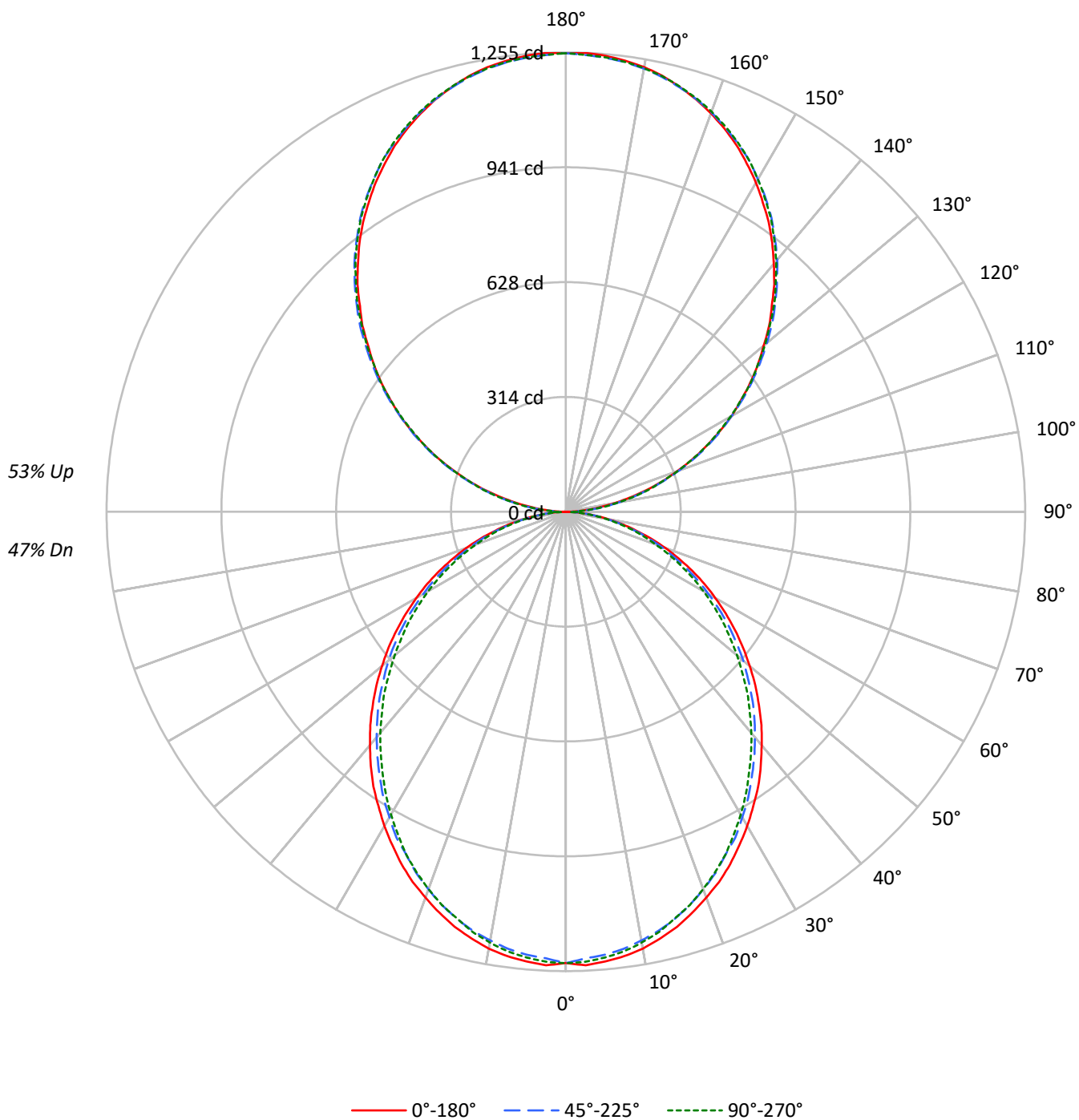
Lumens per Lamp: N/A  
Luminaire Lumens: 6642.5 lumens  
Efficiency: N/A  
Efficacy: 87.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 75.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 67 | 67 | 67 | 54 | 54 | 54 |
| 1   | 97  | 93  | 89  | 85  | 89 | 85 | 82 | 79 | 72 | 69 | 67 | 59 | 57 | 56 | 47 | 46 | 45 |
| 2   | 88  | 81  | 75  | 70  | 81 | 75 | 69 | 65 | 63 | 59 | 56 | 52 | 49 | 47 | 42 | 40 | 38 |
| 3   | 81  | 71  | 64  | 58  | 74 | 66 | 59 | 54 | 55 | 51 | 47 | 46 | 42 | 39 | 37 | 35 | 32 |
| 4   | 74  | 63  | 55  | 49  | 68 | 58 | 51 | 46 | 49 | 44 | 40 | 41 | 37 | 34 | 33 | 30 | 28 |
| 5   | 68  | 56  | 48  | 42  | 62 | 52 | 45 | 39 | 44 | 39 | 34 | 37 | 33 | 29 | 30 | 27 | 24 |
| 6   | 62  | 50  | 42  | 37  | 57 | 47 | 40 | 34 | 40 | 34 | 30 | 33 | 29 | 26 | 27 | 24 | 21 |
| 7   | 58  | 45  | 38  | 32  | 53 | 42 | 35 | 30 | 36 | 30 | 26 | 30 | 26 | 23 | 25 | 21 | 19 |
| 8   | 54  | 41  | 34  | 28  | 49 | 38 | 31 | 27 | 33 | 27 | 23 | 28 | 23 | 20 | 23 | 19 | 17 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 28 | 24 | 30 | 25 | 21 | 25 | 21 | 18 | 21 | 18 | 15 |
| 10  | 47  | 35  | 27  | 23  | 43 | 32 | 26 | 21 | 28 | 22 | 19 | 23 | 19 | 16 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1405 | 1405 | 1405 |
| 5°  | 1406 | 1385 | 1394 |
| 10° | 1394 | 1365 | 1375 |
| 15° | 1373 | 1342 | 1345 |
| 20° | 1344 | 1310 | 1315 |
| 25° | 1316 | 1271 | 1279 |
| 30° | 1280 | 1236 | 1234 |
| 35° | 1247 | 1194 | 1187 |
| 40° | 1205 | 1151 | 1142 |
| 45° | 1164 | 1109 | 1096 |
| 50° | 1119 | 1064 | 1042 |
| 55° | 1072 | 1012 | 993  |
| 60° | 1018 | 951  | 936  |
| 65° | 959  | 887  | 870  |
| 70° | 885  | 810  | 798  |
| 75° | 782  | 717  | 731  |
| 80° | 657  | 598  | 604  |
| 85° | 463  | 397  | 396  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1257 cd/sqm

TEST NUMBER: P913138

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 116.0  | 1.7       |
| 10°-20°   | 326.5  | 4.9       |
| 20°-30°   | 479.8  | 7.2       |
| 30°-40°   | 557.3  | 8.4       |
| 40°-50°   | 556.6  | 8.4       |
| 50°-60°   | 485.3  | 7.3       |
| 60°-70°   | 358.8  | 5.4       |
| 70°-80°   | 203.0  | 3.1       |
| 80°-90°   | 57.1   | 0.9       |
| 90°-100°  | 77.5   | 1.2       |
| 100°-110° | 246.3  | 3.7       |
| 110°-120° | 421.5  | 6.3       |
| 120°-130° | 554.3  | 8.3       |
| 130°-140° | 622.2  | 9.4       |
| 140°-150° | 610.1  | 9.2       |
| 150°-160° | 511.8  | 7.7       |
| 160°-170° | 339.4  | 5.1       |
| 170°-180° | 118.6  | 1.8       |
| 0°-30°    | 922.4  | 13.9      |
| 0°-40°    | 1479.7 | 22.3      |
| 0°-60°    | 2521.7 | 38.0      |
| 0°-90°    | 3140.6 | 47.3      |
| 90°-120°  | 745.3  | 11.2      |
| 90°-150°  | 2532.0 | 38.1      |
| 90°-180°  | 3502.0 | 52.7      |
| 0°-180°   | 6642.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1233 | 1233  | 1233 | 1233  | 1233 |      |
| 5°   | 1233 | 1228  | 1215 | 1225  | 1222 | 117  |
| 15°  | 1174 | 1167  | 1151 | 1156  | 1150 | 331  |
| 25°  | 1062 | 1053  | 1033 | 1035  | 1033 | 489  |
| 35°  | 916  | 905   | 886  | 878   | 873  | 572  |
| 45°  | 746  | 738   | 720  | 707   | 702  | 576  |
| 55°  | 564  | 557   | 543  | 529   | 523  | 505  |
| 65°  | 381  | 373   | 362  | 351   | 345  | 376  |
| 75°  | 199  | 197   | 191  | 184   | 186  | 213  |
| 85°  | 49   | 48    | 46   | 43    | 42   | 54   |
| 90°  | 1    | 14    | 37   | 35    | 36   | 6    |
| 95°  | 55   | 66    | 68   | 68    | 66   | 61   |
| 105° | 227  | 230   | 233  | 234   | 234  | 240  |
| 115° | 423  | 429   | 427  | 426   | 423  | 418  |
| 125° | 615  | 625   | 622  | 618   | 617  | 550  |
| 135° | 796  | 807   | 810  | 809   | 806  | 615  |
| 145° | 966  | 974   | 980  | 981   | 977  | 604  |
| 155° | 1105 | 1108  | 1111 | 1116  | 1113 | 508  |
| 165° | 1202 | 1201  | 1201 | 1208  | 1203 | 339  |
| 175° | 1250 | 1247  | 1245 | 1253  | 1246 | 119  |
| 180° | 1253 | 1253  | 1253 | 1253  | 1253 |      |

TEST NUMBER: P913138

CATALOG NUMBER: DFN2DIP-4P3F0-040D050US927-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1233.0 | 1233.0 | 1233.0 | 1233.0 | 1233.0 |
| 2.5°   | 1240.2 | 1234.2 | 1221.1 | 1233.0 | 1230.7 |
| 5°     | 1233.0 | 1228.3 | 1215.2 | 1224.6 | 1222.4 |
| 7.5°   | 1224.6 | 1217.6 | 1204.5 | 1214.1 | 1211.7 |
| 10°    | 1211.7 | 1203.4 | 1189.2 | 1198.6 | 1195.1 |
| 12.5°  | 1193.8 | 1186.8 | 1172.6 | 1178.5 | 1176.1 |
| 15°    | 1173.7 | 1166.6 | 1151.2 | 1156.0 | 1150.1 |
| 17.5°  | 1148.8 | 1141.8 | 1126.3 | 1132.2 | 1126.3 |
| 20°    | 1121.5 | 1114.4 | 1097.9 | 1101.4 | 1096.8 |
| 22.5°  | 1094.3 | 1083.6 | 1068.2 | 1068.2 | 1065.8 |
| 25°    | 1062.2 | 1052.8 | 1032.7 | 1035.0 | 1032.7 |
| 27.5°  | 1026.7 | 1018.3 | 1003.1 | 999.5  | 993.6  |
| 30°    | 991.2  | 981.7  | 963.9  | 960.4  | 955.6  |
| 32.5°  | 953.2  | 946.2  | 927.2  | 920.0  | 915.2  |
| 35°    | 916.5  | 904.7  | 885.7  | 878.5  | 872.6  |
| 37.5°  | 875.0  | 864.3  | 845.3  | 837.0  | 831.1  |
| 40°    | 832.3  | 822.8  | 803.7  | 793.2  | 788.5  |
| 42.5°  | 790.8  | 781.2  | 762.4  | 750.4  | 743.4  |
| 45°    | 745.8  | 737.5  | 719.6  | 706.7  | 701.9  |
| 47.5°  | 701.9  | 693.6  | 674.6  | 661.6  | 654.5  |
| 50°    | 655.6  | 649.7  | 633.1  | 616.5  | 610.5  |
| 52.5°  | 610.5  | 602.3  | 586.9  | 573.9  | 565.5  |
| 55°    | 564.4  | 557.2  | 543.0  | 528.8  | 522.9  |
| 57.5°  | 518.1  | 512.2  | 496.7  | 482.5  | 477.8  |
| 60°    | 471.8  | 467.1  | 450.6  | 437.5  | 434.0  |
| 62.5°  | 426.8  | 418.5  | 406.7  | 394.8  | 390.1  |
| 65°    | 380.6  | 373.4  | 361.6  | 350.9  | 345.1  |
| 67.5°  | 333.2  | 327.2  | 316.6  | 308.3  | 303.6  |
| 70°    | 289.3  | 284.6  | 273.9  | 265.5  | 260.9  |
| 72.5°  | 244.3  | 239.5  | 233.6  | 225.3  | 221.7  |
| 75°    | 199.2  | 196.9  | 190.8  | 183.8  | 186.2  |
| 77.5°  | 158.8  | 154.1  | 151.7  | 148.1  | 144.7  |
| 80°    | 118.6  | 117.3  | 114.9  | 111.5  | 109.1  |
| 82.5°  | 80.6   | 80.6   | 79.5   | 74.7   | 74.7   |
| 85°    | 48.6   | 47.5   | 46.3   | 42.6   | 41.5   |
| 87.5°  | 21.4   | 19.0   | 16.6   | 13.1   | 11.8   |
| 90°    | 1.1    | 13.6   | 37.0   | 34.8   | 35.9   |
| 92.5°  | 23.4   | 31.7   | 32.9   | 34.0   | 34.0   |
| 95°    | 55.1   | 65.8   | 67.6   | 67.6   | 65.8   |
| 97.5°  | 91.7   | 101.6  | 105.8  | 105.8  | 105.8  |
| 100°   | 134.0  | 142.8  | 145.8  | 145.8  | 144.7  |
| 102.5° | 178.6  | 185.1  | 189.2  | 190.4  | 189.2  |
| 105°   | 227.4  | 230.4  | 232.7  | 234.5  | 234.5  |
| 107.5° | 275.7  | 280.2  | 280.2  | 281.0  | 275.7  |
| 110°   | 322.5  | 328.6  | 328.6  | 328.6  | 325.5  |

TEST NUMBER: P913138

CATALOG NUMBER: DFN2DIP-4P3F0-040D050US927-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 373.1  | 379.5  | 378.4  | 375.4  | 373.1  |
| 115°   | 422.9  | 429.0  | 427.1  | 426.0  | 422.9  |
| 117.5° | 472.5  | 480.8  | 475.5  | 472.5  | 469.4  |
| 120°   | 522.3  | 530.6  | 522.3  | 522.3  | 518.9  |
| 122.5° | 567.6  | 578.2  | 572.9  | 569.9  | 567.6  |
| 125°   | 615.2  | 624.6  | 621.6  | 618.2  | 617.1  |
| 127.5° | 661.6  | 673.4  | 669.2  | 664.6  | 661.6  |
| 130°   | 705.1  | 718.7  | 716.8  | 714.5  | 710.3  |
| 132.5° | 753.8  | 764.4  | 765.2  | 759.9  | 756.8  |
| 135°   | 795.7  | 807.4  | 809.7  | 808.6  | 805.6  |
| 137.5° | 842.6  | 852.0  | 853.9  | 853.1  | 848.6  |
| 140°   | 883.7  | 893.2  | 898.4  | 898.4  | 894.3  |
| 142.5° | 926.0  | 935.5  | 938.5  | 939.6  | 935.5  |
| 145°   | 966.1  | 973.6  | 979.6  | 980.8  | 976.6  |
| 147.5° | 1002.0 | 1011.4 | 1015.9 | 1017.8 | 1013.6 |
| 150°   | 1038.9 | 1045.4 | 1049.5 | 1052.9 | 1049.5 |
| 152.5° | 1071.8 | 1078.2 | 1083.5 | 1087.7 | 1083.5 |
| 155°   | 1104.6 | 1107.6 | 1111.0 | 1116.3 | 1112.9 |
| 157.5° | 1133.0 | 1135.2 | 1137.1 | 1144.7 | 1139.4 |
| 160°   | 1158.2 | 1160.5 | 1161.7 | 1168.1 | 1163.6 |
| 162.5° | 1181.7 | 1181.7 | 1182.8 | 1190.0 | 1184.7 |
| 165°   | 1201.7 | 1200.6 | 1200.6 | 1208.2 | 1202.8 |
| 167.5° | 1219.8 | 1216.4 | 1216.4 | 1224.0 | 1218.7 |
| 170°   | 1233.4 | 1230.4 | 1229.3 | 1236.8 | 1230.4 |
| 172.5° | 1242.9 | 1239.8 | 1238.7 | 1246.3 | 1239.8 |
| 175°   | 1250.5 | 1247.4 | 1245.2 | 1252.7 | 1246.3 |
| 177.5° | 1254.6 | 1251.6 | 1249.3 | 1255.7 | 1249.3 |
| 180°   | 1252.7 | 1252.7 | 1252.7 | 1252.7 | 1252.7 |

TEST NUMBER: P913138

CATALOG NUMBER: DFN2DIP-4P3F0-040D050US927-FLLFLL

**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 | 8.16             | 9.00  | 9.14  | 9.99  | 11.30 | 7.72           | 8.55  | 8.70  | 9.55  | 10.86 |
|                 | 3H   | 9.82             | 10.57 | 10.81 | 11.57 | 12.90 | 9.33           | 10.08 | 10.32 | 11.08 | 12.41 |
|                 | 4H   | 10.40            | 11.11 | 11.40 | 12.12 | 13.46 | 9.91           | 10.62 | 10.91 | 11.62 | 12.96 |
|                 | 6H   | 10.79            | 11.45 | 11.81 | 12.46 | 13.81 | 10.29          | 10.95 | 11.31 | 11.96 | 13.31 |
|                 | 8H   | 10.90            | 11.52 | 11.92 | 12.55 | 13.90 | 10.40          | 11.02 | 11.42 | 12.05 | 13.39 |
|                 | 12H  | 10.94            | 11.54 | 11.97 | 12.56 | 13.93 | 10.43          | 11.03 | 11.46 | 12.05 | 13.42 |
| 4H              | 2H   | 8.62             | 9.33  | 9.63  | 10.33 | 11.67 | 8.26           | 8.97  | 9.27  | 9.98  | 11.32 |
|                 | 3H   | 10.47            | 11.07 | 11.49 | 12.10 | 13.45 | 10.07          | 10.66 | 11.09 | 11.69 | 13.05 |
|                 | 4H   | 11.18            | 11.73 | 12.21 | 12.75 | 14.13 | 10.76          | 11.30 | 11.79 | 12.33 | 13.71 |
|                 | 6H   | 11.69            | 12.16 | 12.73 | 13.21 | 14.58 | 11.26          | 11.73 | 12.30 | 12.78 | 14.15 |
|                 | 8H   | 11.84            | 12.28 | 12.88 | 13.32 | 14.71 | 11.40          | 11.84 | 12.44 | 12.88 | 14.27 |
|                 | 12H  | 11.91            | 12.30 | 12.97 | 13.36 | 14.75 | 11.46          | 11.86 | 12.52 | 12.91 | 14.31 |
| 8H              | 4H   | 11.37            | 11.81 | 12.41 | 12.85 | 14.24 | 11.00          | 11.43 | 12.04 | 12.48 | 13.86 |
|                 | 6H   | 12.00            | 12.36 | 13.06 | 13.44 | 14.83 | 11.61          | 11.98 | 12.68 | 13.06 | 14.44 |
|                 | 8H   | 12.22            | 12.53 | 13.28 | 13.60 | 15.01 | 11.82          | 12.14 | 12.89 | 13.21 | 14.61 |
|                 | 12H  | 12.34            | 12.62 | 13.42 | 13.69 | 15.13 | 11.93          | 12.21 | 13.01 | 13.28 | 14.72 |
| 12H             | 4H   | 11.36            | 11.75 | 12.41 | 12.81 | 14.20 | 10.99          | 11.38 | 12.05 | 12.44 | 13.83 |
|                 | 6H   | 12.03            | 12.34 | 13.10 | 13.41 | 14.82 | 11.65          | 11.97 | 12.72 | 13.04 | 14.44 |
|                 | 8H   | 12.26            | 12.54 | 13.34 | 13.61 | 15.05 | 11.88          | 12.16 | 12.96 | 13.23 | 14.67 |