

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: P921399

Luminaire Tested: DFN2DIP-4P4F0-040D040US940-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921399  
REPORT IS A COMBINATION OF REPORTS P900613 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-040D040US940-FLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

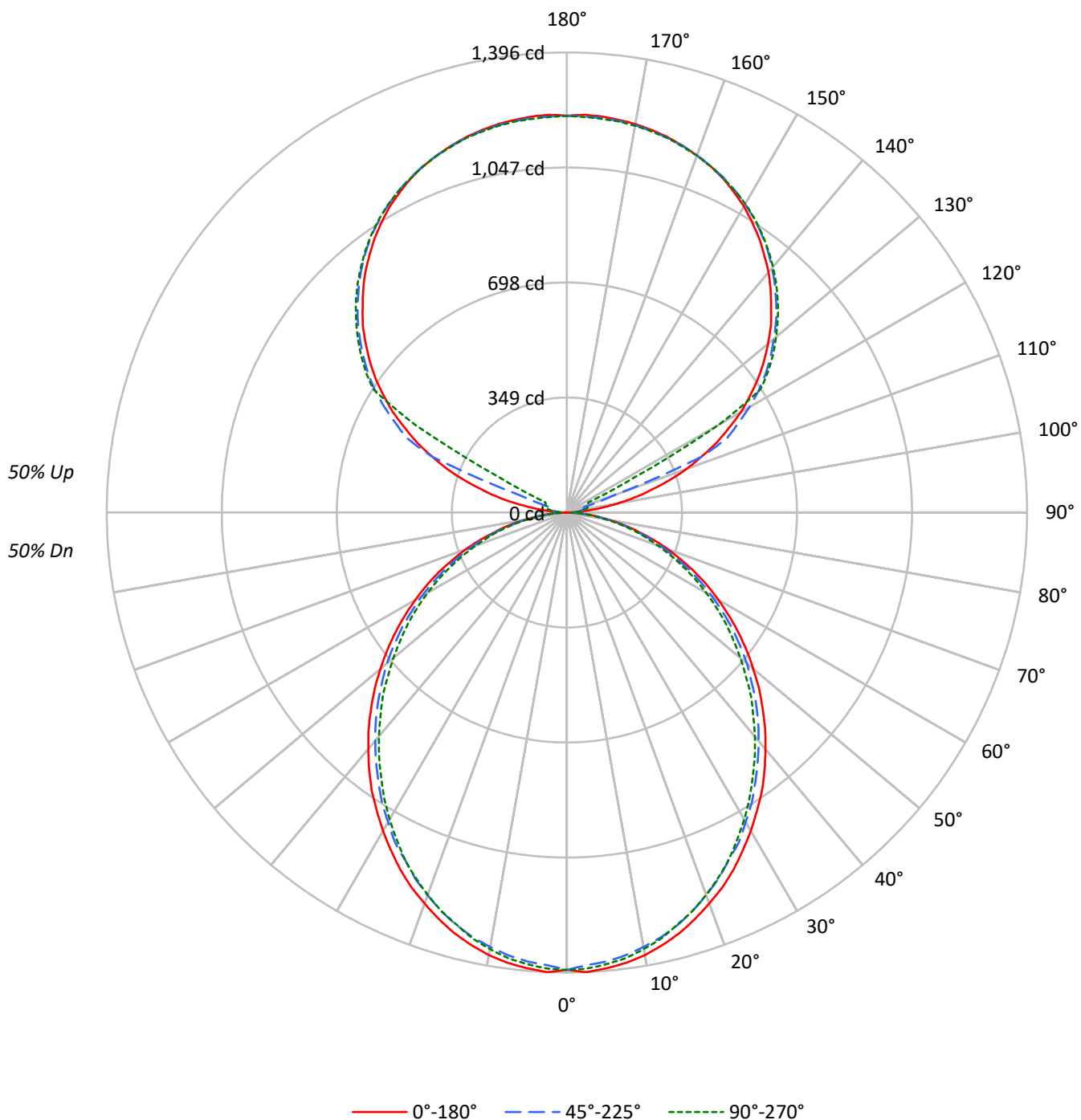
Lumens per Lamp: N/A  
Luminaire Lumens: 7062.4 lumens  
Efficiency: N/A  
Efficacy: 101.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 69.6  
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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### Luminous Intensity Polar Plot



TEST NUMBER: P921399

CATALOG NUMBER: DFN2DIP-4P4F0-040D040US940-FLONL

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

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 900 | 900 | 900 |
| 5°  | 902 | 888 | 894 |
| 10° | 895 | 876 | 882 |
| 15° | 882 | 862 | 864 |
| 20° | 864 | 843 | 845 |
| 25° | 846 | 819 | 823 |
| 30° | 824 | 797 | 795 |
| 35° | 803 | 771 | 765 |
| 40° | 777 | 744 | 736 |
| 45° | 752 | 718 | 708 |
| 50° | 724 | 691 | 674 |
| 55° | 694 | 659 | 643 |
| 60° | 661 | 621 | 608 |
| 65° | 625 | 582 | 566 |
| 70° | 579 | 534 | 522 |
| 75° | 515 | 477 | 481 |
| 80° | 438 | 404 | 403 |
| 85° | 318 | 278 | 271 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 752 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 130.6  | 1.8       |
| 10°-20°   | 367.5  | 5.2       |
| 20°-30°   | 540.1  | 7.6       |
| 30°-40°   | 627.3  | 8.9       |
| 40°-50°   | 626.6  | 8.9       |
| 50°-60°   | 546.3  | 7.7       |
| 60°-70°   | 403.9  | 5.7       |
| 70°-80°   | 228.5  | 3.2       |
| 80°-90°   | 62.4   | 0.9       |
| 90°-100°  | 39.7   | 0.6       |
| 100°-110° | 148.0  | 2.1       |
| 110°-120° | 392.4  | 5.6       |
| 120°-130° | 650.9  | 9.2       |
| 130°-140° | 691.4  | 9.8       |
| 140°-150° | 642.6  | 9.1       |
| 150°-160° | 516.6  | 7.3       |
| 160°-170° | 332.9  | 4.7       |
| 170°-180° | 114.6  | 1.6       |
| 0°-30°    | 1038.3 | 14.7      |
| 0°-40°    | 1665.6 | 23.6      |
| 0°-60°    | 2838.5 | 40.2      |
| 0°-90°    | 3533.3 | 50.0      |
| 90°-120°  | 580.1  | 8.2       |
| 90°-150°  | 2565.0 | 36.3      |
| 90°-180°  | 3529.0 | 50.0      |
| 0°-180°   | 7062.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1388 | 1388  | 1388 | 1388  | 1388 |      |
| 5°   | 1388 | 1383  | 1368 | 1378  | 1376 | 132  |
| 15°  | 1321 | 1313  | 1296 | 1301  | 1295 | 372  |
| 25°  | 1196 | 1185  | 1162 | 1165  | 1162 | 550  |
| 35°  | 1032 | 1018  | 997  | 989   | 982  | 644  |
| 45°  | 840  | 830   | 810  | 796   | 790  | 648  |
| 55°  | 635  | 627   | 611  | 595   | 589  | 568  |
| 65°  | 428  | 420   | 407  | 395   | 388  | 424  |
| 75°  | 224  | 222   | 215  | 207   | 210  | 239  |
| 85°  | 55   | 53    | 52   | 48    | 47   | 61   |
| 90°  | 1    | 10    | 17   | 22    | 24   | 7    |
| 95°  | 56   | 28    | 34   | 38    | 38   | 67   |
| 105° | 265  | 291   | 53   | 63    | 66   | 283  |
| 115° | 501  | 516   | 537  | 134   | 72   | 493  |
| 125° | 708  | 720   | 736  | 742   | 745  | 632  |
| 135° | 876  | 890   | 898  | 907   | 905  | 677  |
| 145° | 1016 | 1016  | 1030 | 1036  | 1032 | 636  |
| 155° | 1119 | 1112  | 1122 | 1127  | 1120 | 516  |
| 165° | 1179 | 1174  | 1177 | 1183  | 1177 | 333  |
| 175° | 1206 | 1200  | 1202 | 1208  | 1199 | 115  |
| 180° | 1204 | 1204  | 1204 | 1204  | 1204 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1387.9 | 1387.9 | 1387.9 | 1387.9 | 1387.9 |
| 2.5°   | 1396.0 | 1389.3 | 1374.6 | 1387.9 | 1385.4 |
| 5°     | 1387.9 | 1382.6 | 1367.9 | 1378.5 | 1376.0 |
| 7.5°   | 1378.5 | 1370.6 | 1355.8 | 1366.6 | 1364.0 |
| 10°    | 1364.0 | 1354.6 | 1338.6 | 1349.2 | 1345.2 |
| 12.5°  | 1343.8 | 1335.9 | 1319.9 | 1326.6 | 1323.8 |
| 15°    | 1321.2 | 1313.2 | 1295.8 | 1301.2 | 1294.6 |
| 17.5°  | 1293.2 | 1285.2 | 1267.8 | 1274.4 | 1267.8 |
| 20°    | 1262.4 | 1254.5 | 1235.8 | 1239.7 | 1234.6 |
| 22.5°  | 1231.8 | 1219.8 | 1202.4 | 1202.4 | 1199.7 |
| 25°    | 1195.7 | 1185.1 | 1162.4 | 1165.0 | 1162.4 |
| 27.5°  | 1155.7 | 1146.3 | 1129.1 | 1125.1 | 1118.5 |
| 30°    | 1115.7 | 1105.0 | 1085.0 | 1081.0 | 1075.7 |
| 32.5°  | 1073.0 | 1065.1 | 1043.7 | 1035.6 | 1030.2 |
| 35°    | 1031.6 | 1018.3 | 996.9  | 988.9  | 982.2  |
| 37.5°  | 984.9  | 972.9  | 951.5  | 942.2  | 935.5  |
| 40°    | 936.9  | 926.1  | 904.7  | 892.9  | 887.5  |
| 42.5°  | 890.2  | 879.4  | 858.2  | 844.7  | 836.8  |
| 45°    | 839.5  | 830.2  | 810.0  | 795.5  | 790.1  |
| 47.5°  | 790.1  | 780.7  | 759.4  | 744.7  | 736.7  |
| 50°    | 738.0  | 731.3  | 712.7  | 693.9  | 687.2  |
| 52.5°  | 687.2  | 678.0  | 660.7  | 646.0  | 636.6  |
| 55°    | 635.3  | 627.2  | 611.3  | 595.2  | 588.6  |
| 57.5°  | 583.2  | 576.6  | 559.1  | 543.1  | 537.8  |
| 60°    | 531.1  | 525.8  | 507.2  | 492.5  | 488.5  |
| 62.5°  | 480.5  | 471.1  | 457.8  | 444.4  | 439.1  |
| 65°    | 428.5  | 420.4  | 407.1  | 395.0  | 388.4  |
| 67.5°  | 375.1  | 368.3  | 356.4  | 347.1  | 341.7  |
| 70°    | 325.7  | 320.3  | 308.3  | 298.9  | 293.6  |
| 72.5°  | 275.0  | 269.6  | 263.0  | 253.6  | 249.6  |
| 75°    | 224.2  | 221.6  | 214.8  | 206.9  | 209.6  |
| 77.5°  | 178.8  | 173.4  | 170.8  | 166.7  | 162.8  |
| 80°    | 133.5  | 132.1  | 129.4  | 125.5  | 122.8  |
| 82.5°  | 90.8   | 90.8   | 89.5   | 84.1   | 84.1   |
| 85°    | 54.7   | 53.4   | 52.1   | 48.0   | 46.7   |
| 87.5°  | 24.1   | 21.4   | 18.7   | 14.7   | 13.3   |
| 90°    | 0.8    | 10.4   | 17.4   | 21.8   | 23.5   |
| 92.5°  | 21.8   | 18.3   | 20.9   | 22.6   | 23.5   |
| 95°    | 56.5   | 27.8   | 33.9   | 38.3   | 37.5   |
| 97.5°  | 101.9  | 30.5   | 44.4   | 47.1   | 47.9   |
| 100°   | 154.2  | 34.9   | 49.7   | 56.5   | 58.3   |
| 102.5° | 211.6  | 210.0  | 51.4   | 60.9   | 63.6   |
| 105°   | 264.7  | 291.0  | 53.1   | 62.7   | 66.2   |
| 107.5° | 326.6  | 348.4  | 54.9   | 64.5   | 67.9   |
| 110°   | 385.9  | 404.1  | 152.5  | 65.4   | 68.8   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 441.7  | 457.3  | 442.5  | 67.1   | 69.7   |
| 115°   | 500.8  | 515.6  | 537.4  | 134.1  | 71.5   |
| 117.5° | 552.2  | 569.6  | 584.5  | 459.9  | 231.7  |
| 120°   | 609.8  | 622.8  | 638.5  | 649.0  | 531.4  |
| 122.5° | 658.4  | 672.4  | 689.9  | 695.1  | 696.0  |
| 125°   | 708.1  | 719.5  | 736.0  | 742.2  | 744.8  |
| 127.5° | 753.4  | 765.6  | 778.7  | 787.5  | 788.3  |
| 130°   | 796.1  | 810.1  | 819.6  | 829.2  | 828.4  |
| 132.5° | 839.6  | 851.0  | 860.6  | 868.4  | 867.6  |
| 135°   | 876.3  | 890.3  | 898.0  | 906.8  | 905.1  |
| 137.5° | 914.5  | 925.0  | 933.8  | 942.4  | 939.9  |
| 140°   | 952.0  | 959.0  | 968.6  | 976.4  | 972.1  |
| 142.5° | 983.5  | 989.5  | 1000.9 | 1007.7 | 1003.4 |
| 145°   | 1016.5 | 1015.7 | 1030.4 | 1036.5 | 1032.2 |
| 147.5° | 1045.2 | 1042.6 | 1057.4 | 1061.8 | 1058.4 |
| 150°   | 1073.1 | 1067.0 | 1081.0 | 1086.2 | 1081.8 |
| 152.5° | 1096.6 | 1089.7 | 1102.7 | 1108.0 | 1101.9 |
| 155°   | 1119.3 | 1111.5 | 1121.9 | 1127.1 | 1120.2 |
| 157.5° | 1137.6 | 1130.6 | 1138.5 | 1144.6 | 1137.6 |
| 160°   | 1153.2 | 1148.0 | 1153.2 | 1158.4 | 1152.4 |
| 162.5° | 1167.2 | 1162.0 | 1166.4 | 1172.4 | 1164.6 |
| 165°   | 1179.4 | 1174.2 | 1176.8 | 1182.9 | 1176.8 |
| 167.5° | 1189.0 | 1183.7 | 1186.4 | 1192.5 | 1184.6 |
| 170°   | 1196.9 | 1191.6 | 1193.3 | 1199.4 | 1191.6 |
| 172.5° | 1202.0 | 1196.9 | 1198.6 | 1204.7 | 1196.9 |
| 175°   | 1206.3 | 1200.2 | 1202.0 | 1208.1 | 1199.4 |
| 177.5° | 1208.1 | 1202.0 | 1202.9 | 1209.1 | 1201.2 |
| 180°   | 1203.8 | 1203.8 | 1203.8 | 1203.8 | 1203.8 |

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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 | 6.93             | 7.79  | 7.89  | 8.76  | 10.03 | 6.48           | 7.35  | 7.44  | 8.32  | 9.59  |
|                 | 3H   | 8.60             | 9.37  | 9.56  | 10.35 | 11.64 | 8.10           | 8.88  | 9.07  | 9.86  | 11.15 |
|                 | 4H   | 9.19             | 9.92  | 10.17 | 10.90 | 12.21 | 8.69           | 9.42  | 9.67  | 10.41 | 11.71 |
|                 | 6H   | 9.59             | 10.27 | 10.58 | 11.26 | 12.57 | 9.09           | 9.76  | 10.08 | 10.75 | 12.07 |
|                 | 8H   | 9.70             | 10.34 | 10.70 | 11.35 | 12.66 | 9.20           | 9.84  | 10.20 | 10.85 | 12.16 |
|                 | 12H  | 9.75             | 10.36 | 10.75 | 11.36 | 12.70 | 9.24           | 9.85  | 10.24 | 10.85 | 12.19 |
| 4H              | 2H   | 7.39             | 8.12  | 8.38  | 9.11  | 10.41 | 7.04           | 7.77  | 8.02  | 8.75  | 10.05 |
|                 | 3H   | 9.26             | 9.87  | 10.26 | 10.89 | 12.20 | 8.86           | 9.47  | 9.85  | 10.48 | 11.80 |
|                 | 4H   | 9.98             | 10.54 | 10.99 | 11.55 | 12.89 | 9.56           | 10.12 | 10.56 | 11.12 | 12.46 |
|                 | 6H   | 10.50            | 10.98 | 11.52 | 12.01 | 13.35 | 10.07          | 10.55 | 11.09 | 11.58 | 12.92 |
|                 | 8H   | 10.66            | 11.11 | 11.67 | 12.13 | 13.48 | 10.22          | 10.67 | 11.24 | 11.69 | 13.04 |
|                 | 12H  | 10.73            | 11.14 | 11.77 | 12.18 | 13.53 | 10.28          | 10.69 | 11.32 | 11.73 | 13.08 |
| 8H              | 4H   | 10.18            | 10.63 | 11.20 | 11.65 | 13.00 | 9.80           | 10.25 | 10.82 | 11.28 | 12.63 |
|                 | 6H   | 10.82            | 11.19 | 11.86 | 12.26 | 13.60 | 10.43          | 10.81 | 11.48 | 11.87 | 13.22 |
|                 | 8H   | 11.04            | 11.37 | 12.09 | 12.42 | 13.79 | 10.65          | 10.98 | 11.70 | 12.03 | 13.40 |
|                 | 12H  | 11.18            | 11.47 | 12.23 | 12.51 | 13.92 | 10.77          | 11.05 | 11.82 | 12.10 | 13.51 |
| 12H             | 4H   | 10.17            | 10.57 | 11.20 | 11.61 | 12.97 | 9.80           | 10.20 | 10.83 | 11.24 | 12.60 |
|                 | 6H   | 10.85            | 11.18 | 11.90 | 12.23 | 13.59 | 10.48          | 10.80 | 11.53 | 11.86 | 13.22 |
|                 | 8H   | 11.09            | 11.38 | 12.15 | 12.43 | 13.84 | 10.71          | 11.00 | 11.77 | 12.05 | 13.46 |