

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: P921583

Luminaire Tested: DFN2DIP-HX2F0-050D040US940-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921583  
REPORT IS A COMBINATION OF REPORTS P900697 AND P897595  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-050D040US940-FLLONL  
Description: 2 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

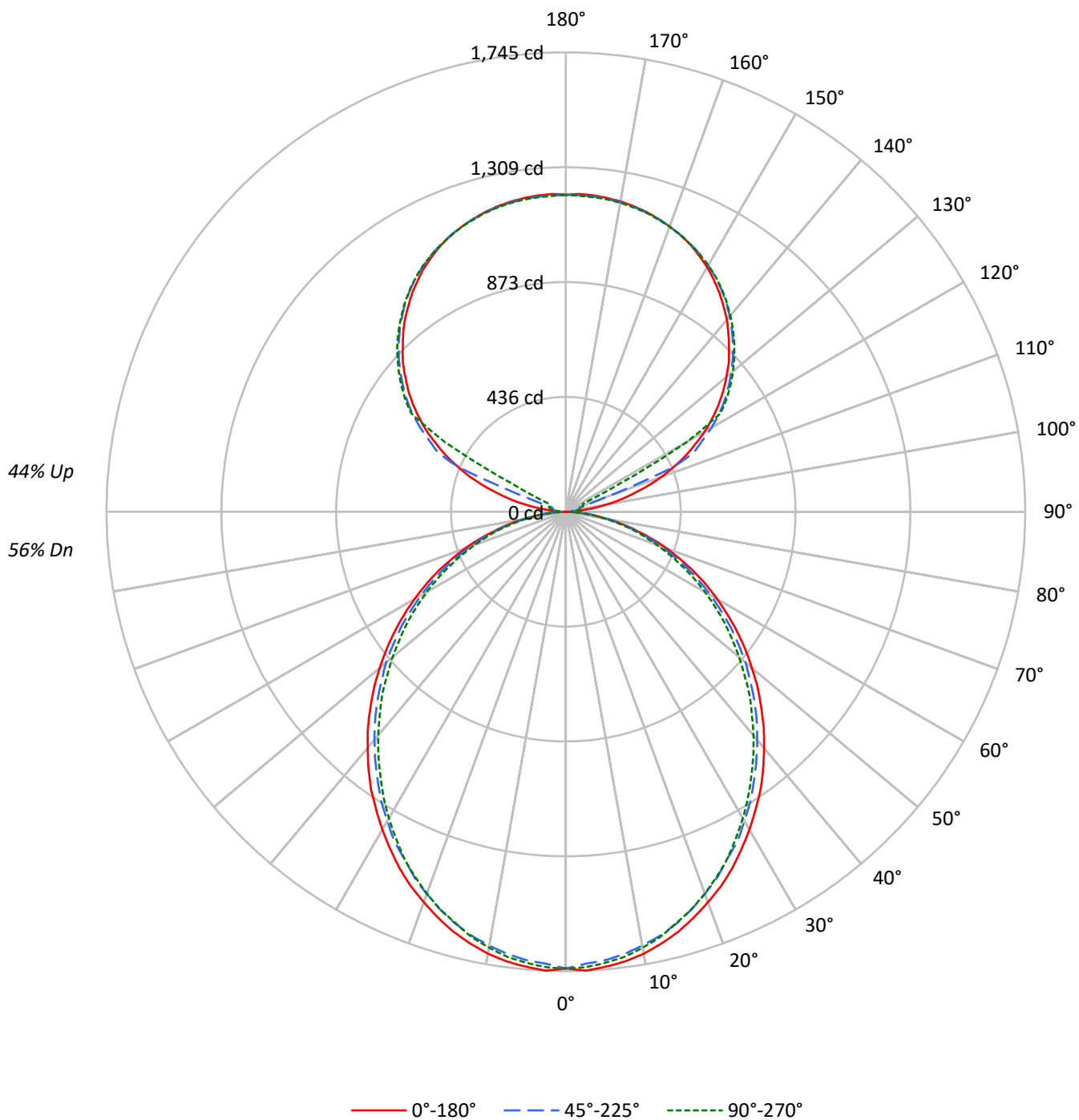
Lumens per Lamp: N/A  
Luminaire Lumens: 7945.2 lumens  
Efficiency: N/A  
Efficacy: 103.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 1.99' x L: 2.3' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 76.9  
Input Voltage (V): 120  
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

TEST NUMBER: P921583

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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   | 108 | 108 | 108 | 108 | 101 | 101 | 101 | 101 | 86 | 86 | 86 | 73 | 73 | 73 | 61 | 61 | 61 |
| 1   | 99  | 95  | 91  | 87  | 92  | 88  | 85  | 82  | 76 | 73 | 71 | 65 | 63 | 61 | 54 | 53 | 52 |
| 2   | 90  | 83  | 76  | 71  | 84  | 77  | 72  | 67  | 66 | 62 | 59 | 57 | 54 | 51 | 48 | 46 | 44 |
| 3   | 82  | 73  | 65  | 59  | 76  | 68  | 61  | 56  | 59 | 54 | 50 | 50 | 46 | 43 | 42 | 39 | 37 |
| 4   | 75  | 64  | 56  | 50  | 70  | 60  | 53  | 48  | 52 | 47 | 42 | 45 | 40 | 37 | 38 | 35 | 32 |
| 5   | 69  | 57  | 49  | 43  | 64  | 54  | 46  | 41  | 47 | 41 | 36 | 40 | 36 | 32 | 34 | 31 | 28 |
| 6   | 64  | 52  | 43  | 37  | 59  | 48  | 41  | 36  | 42 | 36 | 32 | 36 | 32 | 28 | 31 | 27 | 25 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 36  | 31  | 38 | 32 | 28 | 33 | 28 | 25 | 28 | 25 | 22 |
| 8   | 55  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 30 | 26 | 22 | 26 | 22 | 20 |
| 9   | 51  | 39  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 26 | 22 | 28 | 23 | 20 | 24 | 20 | 18 |
| 10  | 48  | 35  | 28  | 23  | 44  | 33  | 27  | 22  | 29 | 24 | 20 | 26 | 21 | 18 | 22 | 19 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4087 | 4087 | 4087 |
| 5°  | 4087 | 4021 | 4050 |
| 10° | 4048 | 3957 | 3988 |
| 15° | 3982 | 3882 | 3895 |
| 20° | 3895 | 3782 | 3800 |
| 25° | 3808 | 3664 | 3691 |
| 30° | 3701 | 3554 | 3555 |
| 35° | 3599 | 3425 | 3411 |
| 40° | 3475 | 3295 | 3274 |
| 45° | 3351 | 3164 | 3133 |
| 50° | 3215 | 3026 | 2971 |
| 55° | 3071 | 2867 | 2820 |
| 60° | 2909 | 2680 | 2647 |
| 65° | 2731 | 2483 | 2443 |
| 70° | 2505 | 2245 | 2222 |
| 75° | 2194 | 1959 | 2008 |
| 80° | 1816 | 1595 | 1621 |
| 85° | 1233 | 1001 | 1003 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3351 cd/sqm

TEST NUMBER: P921583

CATALOG NUMBER: DFN2DIP-HX2F0-050D040US940-FLONL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 163.3  | 2.1       |
| 10°-20°   | 459.4  | 5.8       |
| 20°-30°   | 675.2  | 8.5       |
| 30°-40°   | 784.2  | 9.9       |
| 40°-50°   | 783.2  | 9.9       |
| 50°-60°   | 682.9  | 8.6       |
| 60°-70°   | 504.8  | 6.4       |
| 70°-80°   | 285.6  | 3.6       |
| 80°-90°   | 77.5   | 1.0       |
| 90°-100°  | 39.7   | 0.5       |
| 100°-110° | 148.0  | 1.9       |
| 110°-120° | 392.4  | 4.9       |
| 120°-130° | 650.9  | 8.2       |
| 130°-140° | 691.4  | 8.7       |
| 140°-150° | 642.6  | 8.1       |
| 150°-160° | 516.6  | 6.5       |
| 160°-170° | 332.9  | 4.2       |
| 170°-180° | 114.6  | 1.4       |
| 0°-30°    | 1297.9 | 16.3      |
| 0°-40°    | 2082.0 | 26.2      |
| 0°-60°    | 3548.1 | 44.7      |
| 0°-90°    | 4416.1 | 55.6      |
| 90°-120°  | 580.1  | 7.3       |
| 90°-150°  | 2565.0 | 32.3      |
| 90°-180°  | 3529.0 | 44.4      |
| 0°-180°   | 7945.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1735 | 1735  | 1735 | 1735  | 1735 |      |
| 5°   | 1735 | 1728  | 1710 | 1723  | 1720 | 165  |
| 15°  | 1651 | 1642  | 1620 | 1627  | 1618 | 465  |
| 25°  | 1495 | 1481  | 1453 | 1456  | 1453 | 688  |
| 35°  | 1290 | 1273  | 1246 | 1236  | 1228 | 805  |
| 45°  | 1049 | 1038  | 1012 | 994   | 988  | 810  |
| 55°  | 794  | 784   | 764  | 744   | 736  | 710  |
| 65°  | 536  | 526   | 509  | 494   | 485  | 530  |
| 75°  | 280  | 277   | 268  | 259   | 262  | 299  |
| 85°  | 68   | 67    | 65   | 60    | 58   | 76   |
| 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 |      |

TEST NUMBER: P921583

CATALOG NUMBER: DFN2DIP-HX2F0-050D040US940-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1734.8 | 1734.8 | 1734.8 | 1734.8 | 1734.8 |
| 2.5°   | 1744.9 | 1736.6 | 1718.2 | 1734.8 | 1731.7 |
| 5°     | 1734.8 | 1728.3 | 1709.9 | 1723.1 | 1720.0 |
| 7.5°   | 1723.1 | 1713.2 | 1694.9 | 1708.3 | 1705.0 |
| 10°    | 1705.0 | 1693.3 | 1673.3 | 1686.5 | 1681.6 |
| 12.5°  | 1679.8 | 1669.9 | 1649.9 | 1658.2 | 1654.8 |
| 15°    | 1651.4 | 1641.5 | 1619.8 | 1626.6 | 1618.2 |
| 17.5°  | 1616.4 | 1606.5 | 1584.7 | 1593.0 | 1584.7 |
| 20°    | 1578.1 | 1568.2 | 1544.8 | 1549.7 | 1543.2 |
| 22.5°  | 1539.8 | 1524.7 | 1503.0 | 1503.0 | 1499.6 |
| 25°    | 1494.7 | 1481.4 | 1453.0 | 1456.3 | 1453.0 |
| 27.5°  | 1444.6 | 1432.9 | 1411.3 | 1406.3 | 1398.0 |
| 30°    | 1394.6 | 1381.3 | 1356.3 | 1351.3 | 1344.6 |
| 32.5°  | 1341.2 | 1331.3 | 1304.6 | 1294.5 | 1287.8 |
| 35°    | 1289.5 | 1272.9 | 1246.2 | 1236.1 | 1227.8 |
| 37.5°  | 1231.1 | 1216.1 | 1189.4 | 1177.7 | 1169.4 |
| 40°    | 1171.2 | 1157.7 | 1131.0 | 1116.1 | 1109.4 |
| 42.5°  | 1112.8 | 1099.3 | 1072.7 | 1055.9 | 1046.0 |
| 45°    | 1049.4 | 1037.7 | 1012.5 | 994.3  | 987.6  |
| 47.5°  | 987.6  | 975.9  | 949.2  | 930.8  | 920.9  |
| 50°    | 922.5  | 914.2  | 890.8  | 867.5  | 859.1  |
| 52.5°  | 859.1  | 847.4  | 825.8  | 807.4  | 795.8  |
| 55°    | 794.2  | 784.1  | 764.0  | 744.0  | 735.8  |
| 57.5°  | 729.0  | 720.7  | 698.9  | 678.9  | 672.2  |
| 60°    | 663.9  | 657.4  | 634.0  | 615.5  | 610.6  |
| 62.5°  | 600.6  | 588.9  | 572.2  | 555.5  | 548.8  |
| 65°    | 535.6  | 525.5  | 508.8  | 493.8  | 485.4  |
| 67.5°  | 468.9  | 460.4  | 445.5  | 433.8  | 427.0  |
| 70°    | 407.1  | 400.4  | 385.3  | 373.6  | 367.1  |
| 72.5°  | 343.8  | 337.0  | 328.7  | 317.0  | 312.0  |
| 75°    | 280.2  | 277.0  | 268.5  | 258.6  | 262.0  |
| 77.5°  | 223.6  | 216.8  | 213.5  | 208.5  | 203.6  |
| 80°    | 166.9  | 165.1  | 161.8  | 156.9  | 153.5  |
| 82.5°  | 113.4  | 113.4  | 111.8  | 105.1  | 105.1  |
| 85°    | 68.3   | 66.7   | 65.1   | 60.0   | 58.4   |
| 87.5°  | 30.1   | 26.8   | 23.4   | 18.4   | 16.7   |
| 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   |

TEST NUMBER: P921583

CATALOG NUMBER: DFN2DIP-HX2F0-050D040US940-FLONL

**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 |

TEST NUMBER: P921583

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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 | 12.53            | 13.44 | 13.43 | 14.37 | 15.56 | 12.10          | 13.02 | 13.01 | 13.94 | 15.13 |
|                 | 3H   | 14.17            | 14.99 | 15.09 | 15.92 | 17.14 | 13.71          | 14.53 | 14.63 | 15.46 | 16.68 |
|                 | 4H   | 14.74            | 15.52 | 15.67 | 16.46 | 17.68 | 14.28          | 15.06 | 15.21 | 16.00 | 17.22 |
|                 | 6H   | 15.12            | 15.84 | 16.07 | 16.79 | 18.02 | 14.66          | 15.38 | 15.61 | 16.33 | 17.56 |
|                 | 8H   | 15.22            | 15.90 | 16.17 | 16.87 | 18.10 | 14.76          | 15.44 | 15.71 | 16.41 | 17.64 |
|                 | 12H  | 15.26            | 15.91 | 16.22 | 16.87 | 18.13 | 14.80          | 15.45 | 15.76 | 16.40 | 17.66 |
| 4H              | 2H   | 12.99            | 13.76 | 13.93 | 14.70 | 15.92 | 12.65          | 13.42 | 13.59 | 14.36 | 15.59 |
|                 | 3H   | 14.83            | 15.47 | 15.78 | 16.45 | 17.68 | 14.44          | 15.09 | 15.39 | 16.06 | 17.30 |
|                 | 4H   | 15.52            | 16.12 | 16.48 | 17.08 | 18.34 | 15.13          | 15.72 | 16.09 | 16.69 | 17.95 |
|                 | 6H   | 16.02            | 16.53 | 16.99 | 17.52 | 18.78 | 15.62          | 16.13 | 16.60 | 17.12 | 18.38 |
|                 | 8H   | 16.16            | 16.63 | 17.13 | 17.62 | 18.89 | 15.76          | 16.24 | 16.73 | 17.22 | 18.49 |
|                 | 12H  | 16.22            | 16.65 | 17.21 | 17.65 | 18.93 | 15.82          | 16.25 | 16.81 | 17.25 | 18.53 |
| 8H              | 4H   | 15.71            | 16.19 | 16.69 | 17.17 | 18.45 | 15.36          | 15.84 | 16.34 | 16.82 | 18.10 |
|                 | 6H   | 16.32            | 16.71 | 17.32 | 17.74 | 19.01 | 15.97          | 16.36 | 16.97 | 17.39 | 18.66 |
|                 | 8H   | 16.52            | 16.87 | 17.53 | 17.88 | 19.17 | 16.17          | 16.51 | 17.18 | 17.53 | 18.82 |
|                 | 12H  | 16.64            | 16.95 | 17.65 | 17.95 | 19.29 | 16.27          | 16.58 | 17.28 | 17.58 | 18.92 |
| 12H             | 4H   | 15.70            | 16.13 | 16.69 | 17.13 | 18.41 | 15.36          | 15.79 | 16.35 | 16.78 | 18.07 |
|                 | 6H   | 16.34            | 16.69 | 17.35 | 17.70 | 19.00 | 16.00          | 16.35 | 17.01 | 17.36 | 18.65 |
|                 | 8H   | 16.57            | 16.88 | 17.58 | 17.88 | 19.22 | 16.22          | 16.53 | 17.24 | 17.54 | 18.87 |