

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: P922284

Luminaire Tested: DFN2DIP-PN4F0-050D060US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922284  
REPORT IS A COMBINATION OF REPORTS P899647 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-050D060US940-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

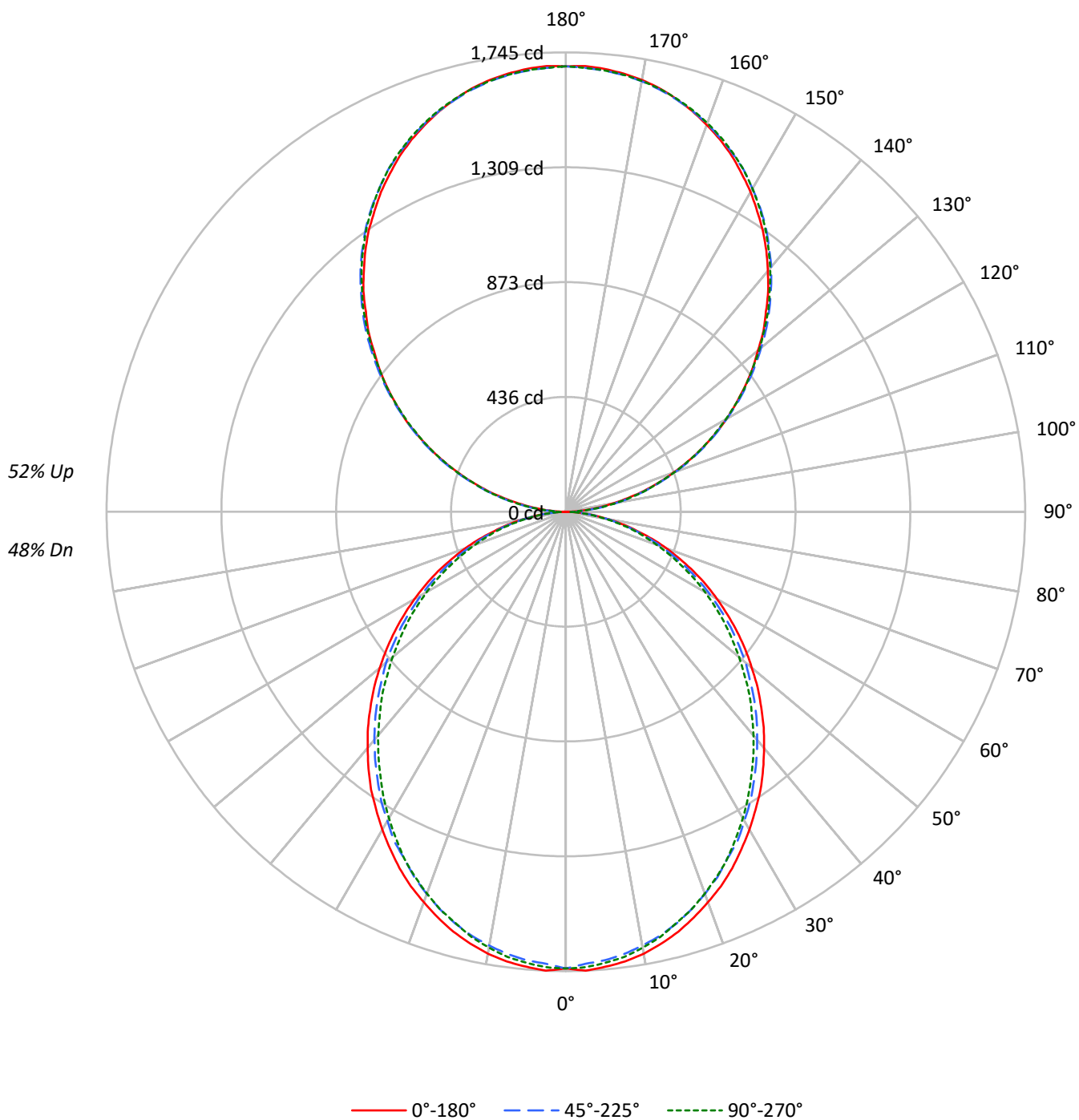
Lumens per Lamp: N/A  
Luminaire Lumens: 9149.0 lumens  
Efficiency: N/A  
Efficacy: 102.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 89.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-PN4F0-050D060US940-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P922284

CATALOG NUMBER: DFN2DIP-PN4F0-050D060US940-FLLFL

**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 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 97  | 93  | 89  | 86  | 89 | 86 | 82 | 79 | 72 | 70 | 68 | 60 | 58 | 57 | 48 | 47 | 46 |
| 2   | 89  | 81  | 75  | 70  | 81 | 75 | 70 | 65 | 63 | 59 | 56 | 52 | 50 | 47 | 42 | 41 | 39 |
| 3   | 81  | 71  | 64  | 58  | 74 | 66 | 60 | 54 | 56 | 51 | 47 | 46 | 43 | 40 | 38 | 35 | 33 |
| 4   | 74  | 63  | 55  | 49  | 68 | 59 | 52 | 46 | 50 | 44 | 40 | 41 | 37 | 34 | 34 | 31 | 28 |
| 5   | 68  | 56  | 48  | 42  | 62 | 52 | 45 | 40 | 44 | 39 | 35 | 37 | 33 | 30 | 30 | 27 | 25 |
| 6   | 63  | 51  | 42  | 37  | 57 | 47 | 40 | 34 | 40 | 34 | 30 | 34 | 29 | 26 | 27 | 24 | 22 |
| 7   | 58  | 46  | 38  | 32  | 53 | 42 | 35 | 30 | 36 | 31 | 27 | 30 | 26 | 23 | 25 | 22 | 19 |
| 8   | 54  | 41  | 34  | 28  | 49 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 20 | 23 | 20 | 17 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 28 | 24 | 30 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 16 |
| 10  | 47  | 35  | 27  | 23  | 43 | 32 | 26 | 21 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1266 | 1266 | 1266 |
| 5°  | 1268 | 1249 | 1257 |
| 10° | 1258 | 1232 | 1241 |
| 15° | 1240 | 1212 | 1214 |
| 20° | 1215 | 1184 | 1187 |
| 25° | 1190 | 1151 | 1156 |
| 30° | 1158 | 1119 | 1116 |
| 35° | 1129 | 1083 | 1074 |
| 40° | 1093 | 1045 | 1034 |
| 45° | 1056 | 1008 | 993  |
| 50° | 1017 | 969  | 946  |
| 55° | 975  | 924  | 902  |
| 60° | 928  | 870  | 852  |
| 65° | 877  | 814  | 793  |
| 70° | 812  | 747  | 730  |
| 75° | 722  | 666  | 672  |
| 80° | 613  | 563  | 560  |
| 85° | 443  | 384  | 375  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1323 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 163.3  | 1.8       |
| 10°-20°   | 459.4  | 5.0       |
| 20°-30°   | 675.2  | 7.4       |
| 30°-40°   | 784.2  | 8.6       |
| 40°-50°   | 783.2  | 8.6       |
| 50°-60°   | 682.9  | 7.5       |
| 60°-70°   | 504.8  | 5.5       |
| 70°-80°   | 285.6  | 3.1       |
| 80°-90°   | 80.2   | 0.9       |
| 90°-100°  | 104.7  | 1.1       |
| 100°-110° | 332.7  | 3.6       |
| 110°-120° | 569.3  | 6.2       |
| 120°-130° | 748.8  | 8.2       |
| 130°-140° | 840.5  | 9.2       |
| 140°-150° | 824.2  | 9.0       |
| 150°-160° | 691.4  | 7.6       |
| 160°-170° | 458.5  | 5.0       |
| 170°-180° | 160.3  | 1.8       |
| 0°-30°    | 1297.9 | 14.2      |
| 0°-40°    | 2082.0 | 22.8      |
| 0°-60°    | 3548.1 | 38.8      |
| 0°-90°    | 4418.8 | 48.3      |
| 90°-120°  | 1006.7 | 11.0      |
| 90°-150°  | 3420.1 | 37.4      |
| 90°-180°  | 4730.0 | 51.7      |
| 0°-180°   | 9149.0 | 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°  | 2    | 18    | 50   | 47    | 48   | 9    |
| 95°  | 74   | 89    | 91   | 91    | 89   | 83   |
| 105° | 307  | 311   | 314  | 317   | 317  | 324  |
| 115° | 571  | 580   | 577  | 575   | 571  | 565  |
| 125° | 831  | 844   | 840  | 835   | 834  | 743  |
| 135° | 1075 | 1091  | 1094 | 1092  | 1088 | 831  |
| 145° | 1305 | 1315  | 1323 | 1325  | 1319 | 815  |
| 155° | 1492 | 1496  | 1501 | 1508  | 1503 | 687  |
| 165° | 1623 | 1622  | 1622 | 1632  | 1625 | 458  |
| 175° | 1689 | 1685  | 1682 | 1692  | 1683 | 160  |
| 180° | 1692 | 1692  | 1692 | 1692  | 1692 |      |

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**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°    | 1.5    | 18.4   | 50.0   | 46.9   | 48.4   |
| 92.5°  | 31.7   | 42.9   | 44.4   | 45.9   | 45.9   |
| 95°    | 74.5   | 88.7   | 91.3   | 91.3   | 88.7   |
| 97.5°  | 123.9  | 137.2  | 142.9  | 142.9  | 142.9  |
| 100°   | 181.1  | 192.8  | 196.9  | 196.9  | 195.4  |
| 102.5° | 241.3  | 249.9  | 255.6  | 257.1  | 255.6  |
| 105°   | 307.1  | 311.2  | 314.2  | 316.8  | 316.8  |
| 107.5° | 372.4  | 378.5  | 378.5  | 379.5  | 372.4  |
| 110°   | 435.7  | 443.8  | 443.8  | 443.8  | 439.7  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 504.0  | 512.6  | 511.1  | 507.0  | 504.0  |
| 115°   | 571.3  | 579.5  | 576.9  | 575.4  | 571.3  |
| 117.5° | 638.2  | 649.4  | 642.2  | 638.2  | 634.1  |
| 120°   | 705.5  | 716.8  | 705.5  | 705.5  | 700.9  |
| 122.5° | 766.7  | 781.0  | 773.8  | 769.8  | 766.7  |
| 125°   | 831.0  | 843.7  | 839.6  | 835.1  | 833.6  |
| 127.5° | 893.8  | 909.5  | 903.9  | 897.9  | 893.8  |
| 130°   | 952.4  | 970.8  | 968.2  | 965.2  | 959.6  |
| 132.5° | 1018.2 | 1032.5 | 1033.5 | 1026.4 | 1022.3 |
| 135°   | 1074.9 | 1090.7 | 1093.7 | 1092.2 | 1088.1 |
| 137.5° | 1138.1 | 1150.8 | 1153.4 | 1152.4 | 1146.3 |
| 140°   | 1193.7 | 1206.5 | 1213.6 | 1213.6 | 1208.0 |
| 142.5° | 1250.8 | 1263.6 | 1267.7 | 1269.2 | 1263.6 |
| 145°   | 1304.9 | 1315.1 | 1323.3 | 1324.8 | 1319.2 |
| 147.5° | 1353.3 | 1366.1 | 1372.3 | 1374.7 | 1369.1 |
| 150°   | 1403.4 | 1412.0 | 1417.6 | 1422.2 | 1417.6 |
| 152.5° | 1447.7 | 1456.4 | 1463.6 | 1469.2 | 1463.6 |
| 155°   | 1492.1 | 1496.2 | 1500.7 | 1508.0 | 1503.3 |
| 157.5° | 1530.4 | 1533.5 | 1536.0 | 1546.2 | 1539.1 |
| 160°   | 1564.6 | 1567.6 | 1569.1 | 1577.8 | 1571.7 |
| 162.5° | 1596.2 | 1596.2 | 1597.7 | 1607.4 | 1600.3 |
| 165°   | 1623.2 | 1621.7 | 1621.7 | 1631.9 | 1624.8 |
| 167.5° | 1647.7 | 1643.2 | 1643.2 | 1653.3 | 1646.2 |
| 170°   | 1666.1 | 1662.0 | 1660.5 | 1670.6 | 1662.0 |
| 172.5° | 1678.8 | 1674.7 | 1673.2 | 1683.4 | 1674.7 |
| 175°   | 1689.0 | 1685.0 | 1681.9 | 1692.1 | 1683.4 |
| 177.5° | 1694.6 | 1690.6 | 1687.5 | 1696.1 | 1687.5 |
| 180°   | 1692.1 | 1692.1 | 1692.1 | 1692.1 | 1692.1 |

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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 | 7.94             | 8.78  | 8.91  | 9.77  | 11.07 | 7.50           | 8.34  | 8.47  | 9.33  | 10.62 |
|                 | 3H   | 9.60             | 10.36 | 10.58 | 11.35 | 12.67 | 9.12           | 9.87  | 10.10 | 10.87 | 12.19 |
|                 | 4H   | 10.19            | 10.91 | 11.19 | 11.91 | 13.23 | 9.70           | 10.42 | 10.70 | 11.42 | 12.74 |
|                 | 6H   | 10.59            | 11.25 | 11.60 | 12.26 | 13.59 | 10.10          | 10.76 | 11.11 | 11.76 | 13.10 |
|                 | 8H   | 10.70            | 11.33 | 11.71 | 12.35 | 13.68 | 10.20          | 10.83 | 11.22 | 11.85 | 13.19 |
|                 | 12H  | 10.75            | 11.34 | 11.76 | 12.36 | 13.72 | 10.24          | 10.84 | 11.26 | 11.86 | 13.22 |
| 4H              | 2H   | 8.40             | 9.12  | 9.40  | 10.11 | 11.44 | 8.05           | 8.76  | 9.05  | 9.76  | 11.09 |
|                 | 3H   | 10.27            | 10.87 | 11.28 | 11.89 | 13.23 | 9.86           | 10.46 | 10.87 | 11.49 | 12.83 |
|                 | 4H   | 10.98            | 11.53 | 12.00 | 12.55 | 13.91 | 10.56          | 11.11 | 11.58 | 12.13 | 13.49 |
|                 | 6H   | 11.50            | 11.97 | 12.53 | 13.01 | 14.37 | 11.07          | 11.55 | 12.10 | 12.59 | 13.95 |
|                 | 8H   | 11.65            | 12.09 | 12.68 | 13.13 | 14.50 | 11.22          | 11.66 | 12.25 | 12.70 | 14.07 |
|                 | 12H  | 11.72            | 12.12 | 12.77 | 13.17 | 14.55 | 11.28          | 11.68 | 12.33 | 12.73 | 14.11 |
| 8H              | 4H   | 11.18            | 11.62 | 12.21 | 12.65 | 14.03 | 10.81          | 11.25 | 11.84 | 12.28 | 13.66 |
|                 | 6H   | 11.81            | 12.18 | 12.87 | 13.25 | 14.63 | 11.43          | 11.80 | 12.49 | 12.88 | 14.25 |
|                 | 8H   | 12.03            | 12.35 | 13.10 | 13.42 | 14.81 | 11.65          | 11.97 | 12.71 | 13.03 | 14.42 |
|                 | 12H  | 12.17            | 12.45 | 13.23 | 13.51 | 14.94 | 11.76          | 12.05 | 12.83 | 13.10 | 14.54 |
| 12H             | 4H   | 11.16            | 11.56 | 12.21 | 12.61 | 13.99 | 10.80          | 11.20 | 11.85 | 12.25 | 13.63 |
|                 | 6H   | 11.84            | 12.16 | 12.90 | 13.23 | 14.62 | 11.48          | 11.80 | 12.54 | 12.86 | 14.25 |
|                 | 8H   | 12.08            | 12.37 | 13.15 | 13.42 | 14.86 | 11.71          | 11.99 | 12.78 | 13.05 | 14.48 |