

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: P926946

Luminaire Tested: DFN2DIP-HX4F0-060D040US830-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926946  
REPORT IS A COMBINATION OF REPORTS P900824 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-060D040US830-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

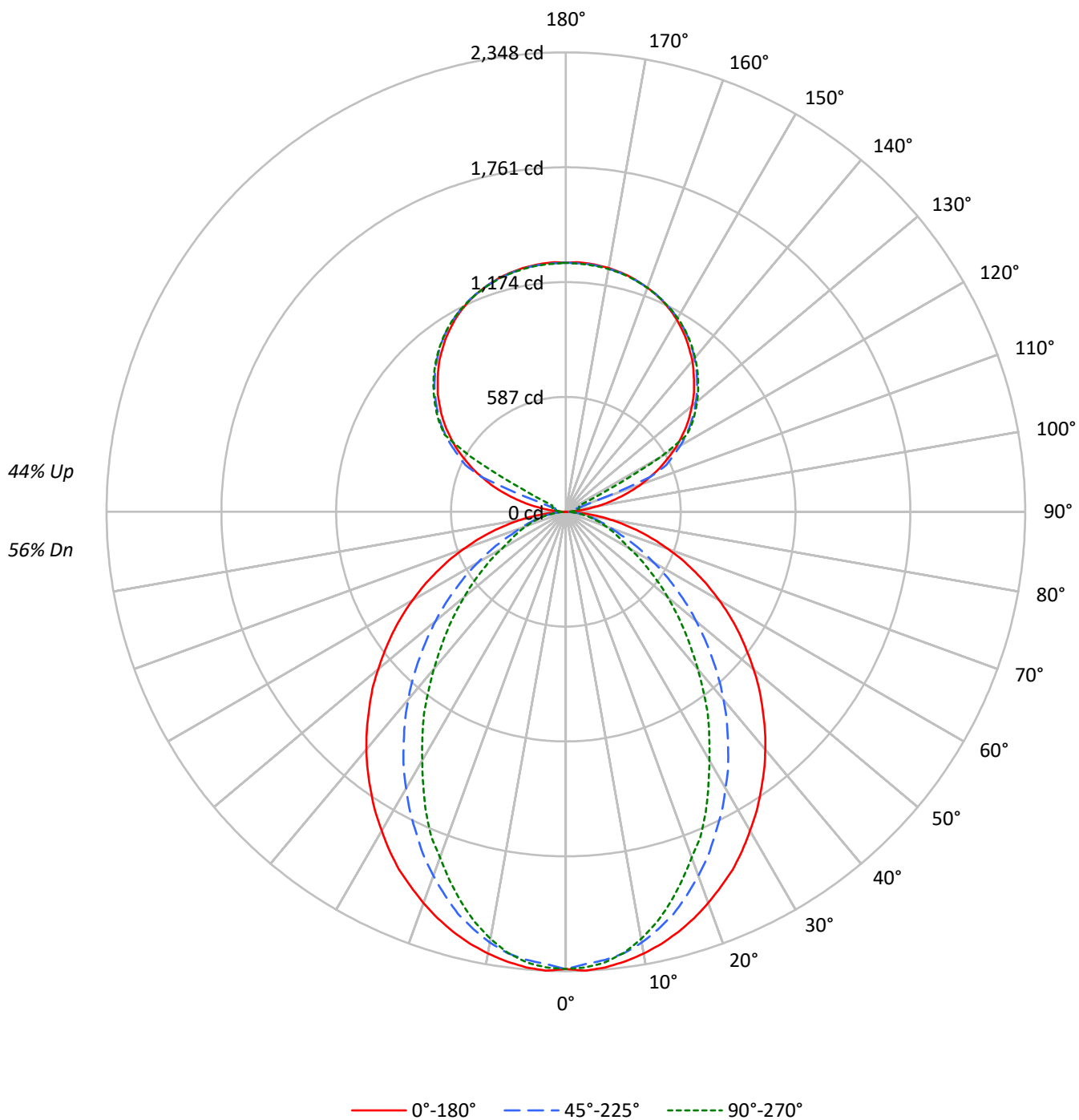
Lumens per Lamp: N/A  
Luminaire Lumens: 8539.1 lumens  
Efficiency: N/A  
Efficacy: 101.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 84.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P926946

CATALOG NUMBER: DFN2DIP-HX4F0-060D040US830-RLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P926946

CATALOG NUMBER: DFN2DIP-HX4F0-060D040US830-RLLONL

**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   | 109 | 109 | 109 | 109 | 101 | 101 | 101 | 101 | 87 | 87 | 87 | 74 | 74 | 74 | 62 | 62 | 62 |
| 1   | 100 | 96  | 92  | 88  | 93  | 89  | 86  | 83  | 77 | 75 | 72 | 66 | 64 | 63 | 56 | 54 | 53 |
| 2   | 91  | 84  | 78  | 73  | 85  | 79  | 73  | 69  | 68 | 64 | 61 | 58 | 56 | 53 | 50 | 48 | 46 |
| 3   | 84  | 74  | 67  | 62  | 78  | 70  | 63  | 58  | 61 | 56 | 52 | 52 | 49 | 46 | 44 | 42 | 40 |
| 4   | 77  | 66  | 59  | 53  | 71  | 62  | 55  | 50  | 54 | 49 | 45 | 47 | 43 | 40 | 40 | 37 | 35 |
| 5   | 71  | 59  | 51  | 46  | 66  | 56  | 49  | 43  | 49 | 43 | 39 | 42 | 38 | 35 | 36 | 33 | 31 |
| 6   | 65  | 54  | 46  | 40  | 61  | 50  | 43  | 38  | 44 | 39 | 34 | 39 | 34 | 31 | 33 | 30 | 27 |
| 7   | 61  | 49  | 41  | 35  | 56  | 46  | 39  | 34  | 40 | 35 | 30 | 35 | 31 | 27 | 30 | 27 | 24 |
| 8   | 56  | 44  | 37  | 31  | 52  | 42  | 35  | 30  | 37 | 31 | 27 | 32 | 28 | 25 | 28 | 25 | 22 |
| 9   | 53  | 41  | 33  | 28  | 49  | 38  | 32  | 27  | 34 | 28 | 25 | 30 | 25 | 22 | 26 | 23 | 20 |
| 10  | 49  | 37  | 30  | 25  | 46  | 35  | 29  | 24  | 31 | 26 | 22 | 28 | 23 | 20 | 24 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1738 | 1738 | 1738 |
| 5°  | 1741 | 1710 | 1721 |
| 10° | 1724 | 1677 | 1665 |
| 15° | 1700 | 1622 | 1579 |
| 20° | 1669 | 1546 | 1473 |
| 25° | 1637 | 1460 | 1370 |
| 30° | 1594 | 1372 | 1240 |
| 35° | 1552 | 1278 | 1126 |
| 40° | 1509 | 1180 | 995  |
| 45° | 1459 | 1072 | 876  |
| 50° | 1407 | 963  | 760  |
| 55° | 1354 | 846  | 648  |
| 60° | 1292 | 724  | 534  |
| 65° | 1220 | 600  | 481  |
| 70° | 1133 | 484  | 435  |
| 75° | 1025 | 427  | 396  |
| 80° | 866  | 358  | 344  |
| 85° | 606  | 241  | 259  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1459 cd/sqm

TEST NUMBER: P926946

CATALOG NUMBER: DFN2DIP-HX4F0-060D040US830-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 219.0  | 2.6       |
| 10°-20°   | 601.3  | 7.0       |
| 20°-30°   | 844.2  | 9.9       |
| 30°-40°   | 920.3  | 10.8      |
| 40°-50°   | 845.8  | 9.9       |
| 50°-60°   | 664.3  | 7.8       |
| 60°-70°   | 432.4  | 5.1       |
| 70°-80°   | 222.6  | 2.6       |
| 80°-90°   | 59.1   | 0.7       |
| 90°-100°  | 41.9   | 0.5       |
| 100°-110° | 156.4  | 1.8       |
| 110°-120° | 414.8  | 4.9       |
| 120°-130° | 688.0  | 8.1       |
| 130°-140° | 730.8  | 8.6       |
| 140°-150° | 679.2  | 8.0       |
| 150°-160° | 546.0  | 6.4       |
| 160°-170° | 351.9  | 4.1       |
| 170°-180° | 121.1  | 1.4       |
| 0°-30°    | 1664.6 | 19.5      |
| 0°-40°    | 2584.9 | 30.3      |
| 0°-60°    | 4095.0 | 48.0      |
| 0°-90°    | 4809.0 | 56.3      |
| 90°-120°  | 613.1  | 7.2       |
| 90°-150°  | 2711.1 | 31.7      |
| 90°-180°  | 3730.0 | 43.7      |
| 0°-180°   | 8539.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2337 | 2337  | 2337 | 2337  | 2337 |      |
| 5°   | 2337 | 2327  | 2299 | 2318  | 2312 | 222  |
| 15°  | 2223 | 2200  | 2128 | 2088  | 2066 | 626  |
| 25°  | 2018 | 1950  | 1810 | 1724  | 1692 | 928  |
| 35°  | 1739 | 1631  | 1445 | 1311  | 1265 | 1088 |
| 45°  | 1421 | 1280  | 1058 | 907   | 856  | 1098 |
| 55°  | 1081 | 916   | 687  | 561   | 520  | 966  |
| 65°  | 730  | 558   | 368  | 296   | 290  | 724  |
| 75°  | 389  | 241   | 169  | 154   | 152  | 412  |
| 85°  | 91   | 46    | 40   | 40    | 40   | 104  |
| 90°  | 1    | 11    | 18   | 23    | 25   | 8    |
| 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  | 667  |
| 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: P926946

CATALOG NUMBER: DFN2DIP-HX4F0-060D040US830-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2337.2 | 2337.2 | 2337.2 | 2337.2 | 2337.2 |
| 2.5°   | 2347.8 | 2337.2 | 2313.8 | 2335.1 | 2330.9 |
| 5°     | 2337.2 | 2326.7 | 2299.0 | 2318.2 | 2311.9 |
| 7.5°   | 2318.2 | 2305.5 | 2275.9 | 2284.2 | 2273.7 |
| 10°    | 2292.7 | 2277.9 | 2235.8 | 2229.3 | 2216.7 |
| 12.5°  | 2261.2 | 2242.0 | 2184.8 | 2172.3 | 2148.9 |
| 15°    | 2223.0 | 2199.6 | 2127.8 | 2087.6 | 2066.5 |
| 17.5°  | 2178.6 | 2144.7 | 2055.8 | 2009.3 | 1975.5 |
| 20°    | 2127.8 | 2085.4 | 1979.7 | 1926.9 | 1880.3 |
| 22.5°  | 2072.8 | 2024.1 | 1901.4 | 1829.6 | 1797.9 |
| 25°    | 2017.9 | 1950.1 | 1810.5 | 1723.9 | 1692.1 |
| 27.5°  | 1952.4 | 1880.3 | 1725.9 | 1626.5 | 1577.8 |
| 30°    | 1882.5 | 1802.0 | 1632.8 | 1525.1 | 1467.8 |
| 32.5°  | 1814.8 | 1717.4 | 1544.2 | 1417.1 | 1364.2 |
| 35°    | 1738.7 | 1630.8 | 1444.8 | 1311.4 | 1264.7 |
| 37.5°  | 1664.6 | 1548.2 | 1351.6 | 1205.6 | 1152.8 |
| 40°    | 1586.3 | 1459.6 | 1254.2 | 1104.0 | 1049.1 |
| 42.5°  | 1506.0 | 1370.7 | 1157.0 | 1000.4 | 947.7  |
| 45°    | 1421.4 | 1279.5 | 1057.7 | 907.3  | 856.5  |
| 47.5°  | 1341.1 | 1190.9 | 962.5  | 812.2  | 765.7  |
| 50°    | 1252.2 | 1102.1 | 869.4  | 723.3  | 679.1  |
| 52.5°  | 1165.3 | 1006.7 | 780.5  | 640.9  | 600.7  |
| 55°    | 1080.8 | 915.8  | 687.4  | 560.6  | 520.4  |
| 57.5°  | 994.1  | 824.9  | 605.0  | 486.5  | 452.6  |
| 60°    | 905.3  | 736.1  | 518.2  | 410.5  | 376.5  |
| 62.5°  | 818.7  | 649.5  | 444.1  | 342.7  | 325.8  |
| 65°    | 729.8  | 558.3  | 368.0  | 296.2  | 289.7  |
| 67.5°  | 645.1  | 473.7  | 296.2  | 260.1  | 253.8  |
| 70°    | 556.3  | 391.3  | 245.2  | 224.2  | 215.6  |
| 72.5°  | 471.7  | 315.1  | 205.1  | 188.3  | 184.0  |
| 75°    | 389.2  | 241.0  | 169.2  | 154.4  | 152.4  |
| 77.5°  | 306.8  | 171.3  | 133.3  | 124.8  | 120.5  |
| 80°    | 230.4  | 122.7  | 101.4  | 93.1   | 93.1   |
| 82.5°  | 160.7  | 82.6   | 69.7   | 65.5   | 65.5   |
| 85°    | 90.9   | 46.5   | 40.2   | 40.2   | 40.2   |
| 87.5°  | 33.9   | 16.9   | 16.9   | 14.8   | 14.8   |
| 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  | 307.5  | 56.2   | 66.3   | 69.9   |
| 107.5° | 345.2  | 368.2  | 58.1   | 68.1   | 71.8   |
| 110°   | 407.9  | 427.1  | 161.2  | 69.1   | 72.7   |

TEST NUMBER: P926946

CATALOG NUMBER: DFN2DIP-HX4F0-060D040US830-RLLONL

**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  | 568.0  | 141.8  | 75.6   |
| 117.5° | 583.7  | 602.1  | 617.8  | 486.0  | 244.9  |
| 120°   | 644.5  | 658.2  | 674.8  | 686.0  | 561.6  |
| 122.5° | 695.9  | 710.7  | 729.2  | 734.7  | 735.6  |
| 125°   | 748.4  | 760.5  | 777.9  | 784.4  | 787.2  |
| 127.5° | 796.3  | 809.2  | 823.1  | 832.3  | 833.2  |
| 130°   | 841.5  | 856.3  | 866.3  | 876.4  | 875.6  |
| 132.5° | 887.5  | 899.5  | 909.6  | 917.9  | 917.1  |
| 135°   | 926.2  | 941.0  | 949.2  | 958.4  | 956.6  |
| 137.5° | 966.6  | 977.7  | 987.0  | 996.1  | 993.4  |
| 140°   | 1006.2 | 1013.7 | 1023.7 | 1032.0 | 1027.4 |
| 142.5° | 1039.5 | 1045.9 | 1057.9 | 1065.1 | 1060.6 |
| 145°   | 1074.4 | 1073.5 | 1089.1 | 1095.6 | 1090.9 |
| 147.5° | 1104.7 | 1102.0 | 1117.6 | 1122.2 | 1118.7 |
| 150°   | 1134.2 | 1127.8 | 1142.6 | 1148.1 | 1143.4 |
| 152.5° | 1159.1 | 1151.7 | 1165.5 | 1171.1 | 1164.6 |
| 155°   | 1183.0 | 1174.8 | 1185.9 | 1191.3 | 1184.0 |
| 157.5° | 1202.3 | 1195.0 | 1203.4 | 1209.8 | 1202.3 |
| 160°   | 1218.9 | 1213.4 | 1218.9 | 1224.4 | 1218.0 |
| 162.5° | 1233.6 | 1228.2 | 1232.8 | 1239.2 | 1230.9 |
| 165°   | 1246.6 | 1241.1 | 1243.8 | 1250.2 | 1243.8 |
| 167.5° | 1256.7 | 1251.1 | 1254.0 | 1260.4 | 1252.1 |
| 170°   | 1265.0 | 1259.5 | 1261.3 | 1267.8 | 1259.5 |
| 172.5° | 1270.5 | 1265.0 | 1266.9 | 1273.3 | 1265.0 |
| 175°   | 1275.0 | 1268.6 | 1270.5 | 1276.9 | 1267.8 |
| 177.5° | 1276.9 | 1270.5 | 1271.4 | 1277.9 | 1269.6 |
| 180°   | 1272.4 | 1272.4 | 1272.4 | 1272.4 | 1272.4 |

TEST NUMBER: P926946

CATALOG NUMBER: DFN2DIP-HX4F0-060D040US830-RLONL

**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 | 9.64             | 10.52 | 10.55 | 11.45 | 12.63 | 5.61           | 6.50 | 6.52  | 7.42  | 8.60  |
|                 | 3H   | 11.32            | 12.11 | 12.24 | 13.04 | 14.25 | 6.81           | 7.60 | 7.73  | 8.53  | 9.73  |
|                 | 4H   | 11.93            | 12.68 | 12.87 | 13.62 | 14.83 | 7.26           | 8.01 | 8.20  | 8.94  | 10.16 |
|                 | 6H   | 12.36            | 13.05 | 13.30 | 13.99 | 15.22 | 7.59           | 8.27 | 8.53  | 9.22  | 10.44 |
|                 | 8H   | 12.49            | 13.14 | 13.44 | 14.10 | 15.33 | 7.68           | 8.33 | 8.63  | 9.29  | 10.52 |
|                 | 12H  | 12.55            | 13.17 | 13.51 | 14.13 | 15.38 | 7.73           | 8.35 | 8.68  | 9.30  | 10.55 |
| 4H              | 2H   | 9.66             | 10.41 | 10.60 | 11.35 | 12.56 | 6.21           | 6.96 | 7.15  | 7.90  | 9.11  |
|                 | 3H   | 11.50            | 12.12 | 12.45 | 13.09 | 14.32 | 7.57           | 8.19 | 8.52  | 9.16  | 10.39 |
|                 | 4H   | 12.19            | 12.76 | 13.15 | 13.72 | 14.98 | 8.12           | 8.69 | 9.08  | 9.65  | 10.90 |
|                 | 6H   | 12.71            | 13.20 | 13.69 | 14.19 | 15.44 | 8.55           | 9.03 | 9.52  | 10.02 | 11.27 |
|                 | 8H   | 12.89            | 13.34 | 13.86 | 14.32 | 15.59 | 8.68           | 9.13 | 9.65  | 10.11 | 11.38 |
|                 | 12H  | 12.99            | 13.40 | 13.98 | 14.39 | 15.67 | 8.75           | 9.16 | 9.74  | 10.15 | 11.42 |
| 8H              | 4H   | 12.17            | 12.62 | 13.14 | 13.60 | 14.87 | 8.41           | 8.86 | 9.38  | 9.84  | 11.11 |
|                 | 6H   | 12.74            | 13.11 | 13.74 | 14.13 | 15.40 | 8.93           | 9.31 | 9.93  | 10.33 | 11.59 |
|                 | 8H   | 12.95            | 13.28 | 13.96 | 14.29 | 15.58 | 9.12           | 9.45 | 10.13 | 10.46 | 11.75 |
|                 | 12H  | 13.10            | 13.39 | 14.11 | 14.39 | 15.72 | 9.25           | 9.54 | 10.26 | 10.54 | 11.87 |
| 12H             | 4H   | 12.12            | 12.53 | 13.11 | 13.53 | 14.80 | 8.42           | 8.82 | 9.41  | 9.82  | 11.09 |
|                 | 6H   | 12.71            | 13.04 | 13.72 | 14.05 | 15.34 | 8.98           | 9.31 | 9.99  | 10.32 | 11.60 |
|                 | 8H   | 12.94            | 13.23 | 13.95 | 14.23 | 15.56 | 9.19           | 9.49 | 10.21 | 10.49 | 11.82 |

END OF REPORT