

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: P922217

Luminaire Tested: DFN2DIP-PN3F0-090D040US940-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922217  
REPORT IS A COMBINATION OF REPORTS P901057 AND P897955  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-090D040US940-FLLONL  
Description: 3 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

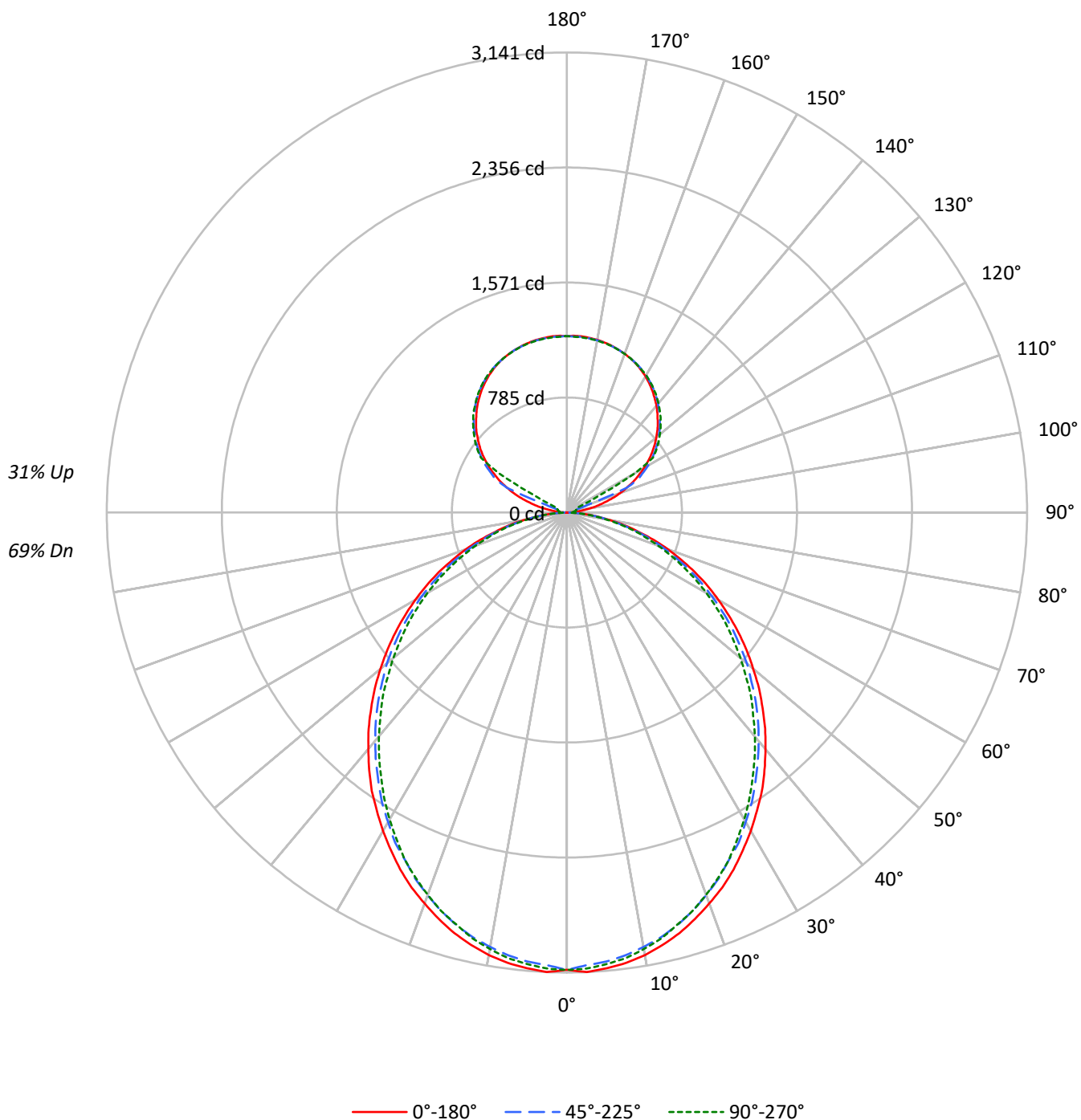
Lumens per Lamp: N/A  
Luminaire Lumens: 11476.3 lumens  
Efficiency: N/A  
Efficacy: 93.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 123  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
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   | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 94 | 94 | 94 | 83 | 83 | 83 | 74 | 74 | 74 |
| 1   | 102 | 98  | 94  | 90  | 96  | 92  | 89  | 86  | 83 | 80 | 77 | 74 | 72 | 70 | 65 | 64 | 62 |
| 2   | 93  | 85  | 79  | 74  | 88  | 81  | 75  | 70  | 72 | 68 | 64 | 65 | 61 | 58 | 57 | 55 | 53 |
| 3   | 85  | 75  | 67  | 61  | 80  | 71  | 64  | 59  | 64 | 59 | 54 | 57 | 53 | 49 | 51 | 48 | 45 |
| 4   | 78  | 67  | 58  | 52  | 73  | 63  | 56  | 50  | 57 | 51 | 46 | 51 | 46 | 42 | 46 | 42 | 39 |
| 5   | 71  | 59  | 51  | 45  | 67  | 57  | 49  | 43  | 51 | 45 | 40 | 46 | 41 | 37 | 41 | 37 | 34 |
| 6   | 66  | 53  | 45  | 39  | 62  | 51  | 43  | 38  | 46 | 40 | 35 | 42 | 36 | 32 | 37 | 33 | 30 |
| 7   | 61  | 48  | 40  | 34  | 58  | 46  | 39  | 33  | 42 | 36 | 31 | 38 | 33 | 29 | 34 | 30 | 26 |
| 8   | 57  | 44  | 36  | 31  | 54  | 42  | 35  | 30  | 38 | 32 | 28 | 35 | 29 | 26 | 31 | 27 | 24 |
| 9   | 53  | 40  | 33  | 27  | 50  | 39  | 31  | 27  | 35 | 29 | 25 | 32 | 27 | 23 | 29 | 25 | 21 |
| 10  | 50  | 37  | 30  | 25  | 47  | 36  | 29  | 24  | 32 | 27 | 22 | 30 | 25 | 21 | 27 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3650 | 3650 | 3650 |
| 5°  | 3654 | 3597 | 3622 |
| 10° | 3622 | 3546 | 3572 |
| 15° | 3567 | 3485 | 3493 |
| 20° | 3493 | 3401 | 3413 |
| 25° | 3419 | 3302 | 3321 |
| 30° | 3327 | 3209 | 3204 |
| 35° | 3240 | 3100 | 3081 |
| 40° | 3132 | 2990 | 2963 |
| 45° | 3025 | 2879 | 2843 |
| 50° | 2908 | 2762 | 2703 |
| 55° | 2786 | 2628 | 2575 |
| 60° | 2647 | 2469 | 2428 |
| 65° | 2495 | 2303 | 2254 |
| 70° | 2301 | 2101 | 2067 |
| 75° | 2034 | 1859 | 1891 |
| 80° | 1711 | 1550 | 1561 |
| 85° | 1207 | 1026 | 1017 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3025 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 293.9   | 2.6       |
| 10°-20°   | 827.0   | 7.2       |
| 20°-30°   | 1215.3  | 10.6      |
| 30°-40°   | 1411.5  | 12.3      |
| 40°-50°   | 1409.7  | 12.3      |
| 50°-60°   | 1229.3  | 10.7      |
| 60°-70°   | 908.7   | 7.9       |
| 70°-80°   | 514.1   | 4.5       |
| 80°-90°   | 137.8   | 1.2       |
| 90°-100°  | 39.7    | 0.3       |
| 100°-110° | 148.0   | 1.3       |
| 110°-120° | 392.4   | 3.4       |
| 120°-130° | 650.9   | 5.7       |
| 130°-140° | 691.4   | 6.0       |
| 140°-150° | 642.6   | 5.6       |
| 150°-160° | 516.6   | 4.5       |
| 160°-170° | 332.9   | 2.9       |
| 170°-180° | 114.6   | 1.0       |
| 0°-30°    | 2336.2  | 20.4      |
| 0°-40°    | 3747.7  | 32.7      |
| 0°-60°    | 6386.7  | 55.7      |
| 0°-90°    | 7947.3  | 69.2      |
| 90°-120°  | 580.1   | 5.1       |
| 90°-150°  | 2565.0  | 22.4      |
| 90°-180°  | 3529.0  | 30.8      |
| 0°-180°   | 11476.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3123 | 3123  | 3123 | 3123  | 3123 |      |
| 5°   | 3123 | 3111  | 3078 | 3102  | 3096 | 296  |
| 15°  | 2973 | 2955  | 2916 | 2928  | 2913 | 837  |
| 25°  | 2690 | 2666  | 2616 | 2621  | 2616 | 1238 |
| 35°  | 2321 | 2291  | 2243 | 2225  | 2210 | 1449 |
| 45°  | 1889 | 1868  | 1823 | 1790  | 1778 | 1458 |
| 55°  | 1430 | 1411  | 1375 | 1339  | 1324 | 1278 |
| 65°  | 964  | 946   | 916  | 889   | 874  | 953  |
| 75°  | 504  | 499   | 483  | 466   | 472  | 538  |
| 85°  | 123  | 120   | 117  | 108   | 105  | 137  |
| 90°  | 1    | 10    | 17   | 22    | 24   | 11   |
| 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°     | 3122.7 | 3122.7 | 3122.7 | 3122.7 | 3122.7 |
| 2.5°   | 3140.9 | 3125.9 | 3092.8 | 3122.7 | 3117.0 |
| 5°     | 3122.7 | 3110.9 | 3077.8 | 3101.7 | 3095.9 |
| 7.5°   | 3101.7 | 3083.9 | 3050.7 | 3075.0 | 3068.9 |
| 10°    | 3068.9 | 3047.9 | 3011.8 | 3035.7 | 3026.8 |
| 12.5°  | 3023.6 | 3005.8 | 2969.8 | 2984.7 | 2978.8 |
| 15°    | 2972.7 | 2954.9 | 2915.6 | 2927.8 | 2912.8 |
| 17.5°  | 2909.6 | 2891.7 | 2852.6 | 2867.6 | 2852.6 |
| 20°    | 2840.5 | 2822.6 | 2780.5 | 2789.4 | 2777.7 |
| 22.5°  | 2771.6 | 2744.6 | 2705.4 | 2705.4 | 2699.3 |
| 25°    | 2690.4 | 2666.5 | 2615.6 | 2621.3 | 2615.6 |
| 27.5°  | 2600.2 | 2579.2 | 2540.4 | 2531.5 | 2516.5 |
| 30°    | 2510.4 | 2486.2 | 2441.2 | 2432.3 | 2420.3 |
| 32.5°  | 2414.2 | 2396.4 | 2348.2 | 2330.1 | 2318.0 |
| 35°    | 2321.2 | 2291.2 | 2243.1 | 2225.0 | 2210.0 |
| 37.5°  | 2216.1 | 2189.0 | 2140.8 | 2119.9 | 2104.9 |
| 40°    | 2108.0 | 2083.8 | 2035.7 | 2008.9 | 1996.9 |
| 42.5°  | 2002.9 | 1978.7 | 1930.9 | 1900.7 | 1882.8 |
| 45°    | 1888.8 | 1867.9 | 1822.6 | 1789.8 | 1777.7 |
| 47.5°  | 1777.7 | 1756.7 | 1708.5 | 1675.4 | 1657.6 |
| 50°    | 1660.5 | 1645.5 | 1603.4 | 1561.4 | 1546.4 |
| 52.5°  | 1546.4 | 1525.4 | 1486.5 | 1453.4 | 1432.4 |
| 55°    | 1429.5 | 1411.3 | 1375.3 | 1339.3 | 1324.4 |
| 57.5°  | 1312.2 | 1297.3 | 1258.1 | 1222.1 | 1210.0 |
| 60°    | 1195.0 | 1183.2 | 1141.1 | 1108.0 | 1099.1 |
| 62.5°  | 1080.9 | 1059.9 | 1029.9 | 1000.1 | 987.9  |
| 65°    | 964.0  | 945.8  | 915.9  | 888.9  | 873.9  |
| 67.5°  | 843.9  | 828.7  | 801.8  | 780.9  | 768.7  |
| 70°    | 732.7  | 720.6  | 693.6  | 672.5  | 660.8  |
| 72.5°  | 618.7  | 606.5  | 591.6  | 570.6  | 561.7  |
| 75°    | 504.4  | 498.6  | 483.3  | 465.5  | 471.5  |
| 77.5°  | 402.3  | 390.3  | 384.2  | 375.3  | 366.4  |
| 80°    | 300.4  | 297.2  | 291.1  | 282.2  | 276.3  |
| 82.5°  | 204.2  | 204.2  | 201.3  | 189.2  | 189.2  |
| 85°    | 123.0  | 120.1  | 117.3  | 108.0  | 105.1  |
| 87.5°  | 54.1   | 48.1   | 42.1   | 33.2   | 30.0   |
| 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 | 13.34            | 14.41 | 14.12 | 15.20 | 16.17 | 12.90          | 13.97 | 13.68 | 14.76 | 15.73 |
|                 | 3H   | 15.01            | 15.97 | 15.80 | 16.77 | 17.77 | 14.53          | 15.49 | 15.32 | 16.29 | 17.29 |
|                 | 4H   | 15.61            | 16.51 | 16.41 | 17.32 | 18.33 | 15.12          | 16.02 | 15.92 | 16.84 | 17.85 |
|                 | 6H   | 16.01            | 16.85 | 16.83 | 17.67 | 18.69 | 15.52          | 16.36 | 16.34 | 17.18 | 18.20 |
|                 | 8H   | 16.12            | 16.91 | 16.94 | 17.75 | 18.78 | 15.63          | 16.42 | 16.45 | 17.26 | 18.29 |
|                 | 12H  | 16.17            | 16.93 | 17.00 | 17.76 | 18.81 | 15.68          | 16.43 | 16.51 | 17.27 | 18.32 |
| 4H              | 2H   | 13.83            | 14.73 | 14.63 | 15.54 | 16.55 | 13.47          | 14.38 | 14.28 | 15.19 | 16.20 |
|                 | 3H   | 15.70            | 16.46 | 16.52 | 17.30 | 18.33 | 15.30          | 16.06 | 16.12 | 16.90 | 17.93 |
|                 | 4H   | 16.42            | 17.11 | 17.25 | 17.95 | 19.00 | 16.00          | 16.69 | 16.84 | 17.54 | 18.59 |
|                 | 6H   | 16.94            | 17.54 | 17.79 | 18.41 | 19.46 | 16.52          | 17.11 | 17.37 | 17.98 | 19.04 |
|                 | 8H   | 17.09            | 17.65 | 17.95 | 18.51 | 19.58 | 16.67          | 17.22 | 17.52 | 18.09 | 19.16 |
|                 | 12H  | 17.17            | 17.67 | 18.05 | 18.56 | 19.63 | 16.74          | 17.24 | 17.61 | 18.12 | 19.20 |
| 8H              | 4H   | 16.63            | 17.19 | 17.48 | 18.05 | 19.12 | 16.26          | 16.81 | 17.11 | 17.68 | 18.75 |
|                 | 6H   | 17.26            | 17.72 | 18.14 | 18.63 | 19.70 | 16.89          | 17.35 | 17.77 | 18.25 | 19.32 |
|                 | 8H   | 17.48            | 17.89 | 18.37 | 18.79 | 19.88 | 17.10          | 17.51 | 17.99 | 18.41 | 19.49 |
|                 | 12H  | 17.62            | 17.98 | 18.51 | 18.87 | 20.01 | 17.22          | 17.58 | 18.11 | 18.47 | 19.61 |
| 12H             | 4H   | 16.62            | 17.12 | 17.50 | 18.01 | 19.08 | 16.26          | 16.76 | 17.13 | 17.65 | 18.72 |
|                 | 6H   | 17.29            | 17.70 | 18.18 | 18.60 | 19.69 | 16.93          | 17.34 | 17.82 | 18.24 | 19.32 |
|                 | 8H   | 17.54            | 17.90 | 18.43 | 18.79 | 19.93 | 17.17          | 17.53 | 18.06 | 18.42 | 19.56 |

END OF REPORT