

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: P918439

Luminaire Tested: DFN2DIP-TR4F0-110D050US930-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P918439  
REPORT IS A COMBINATION OF REPORTS P901921 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-110D050US930-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

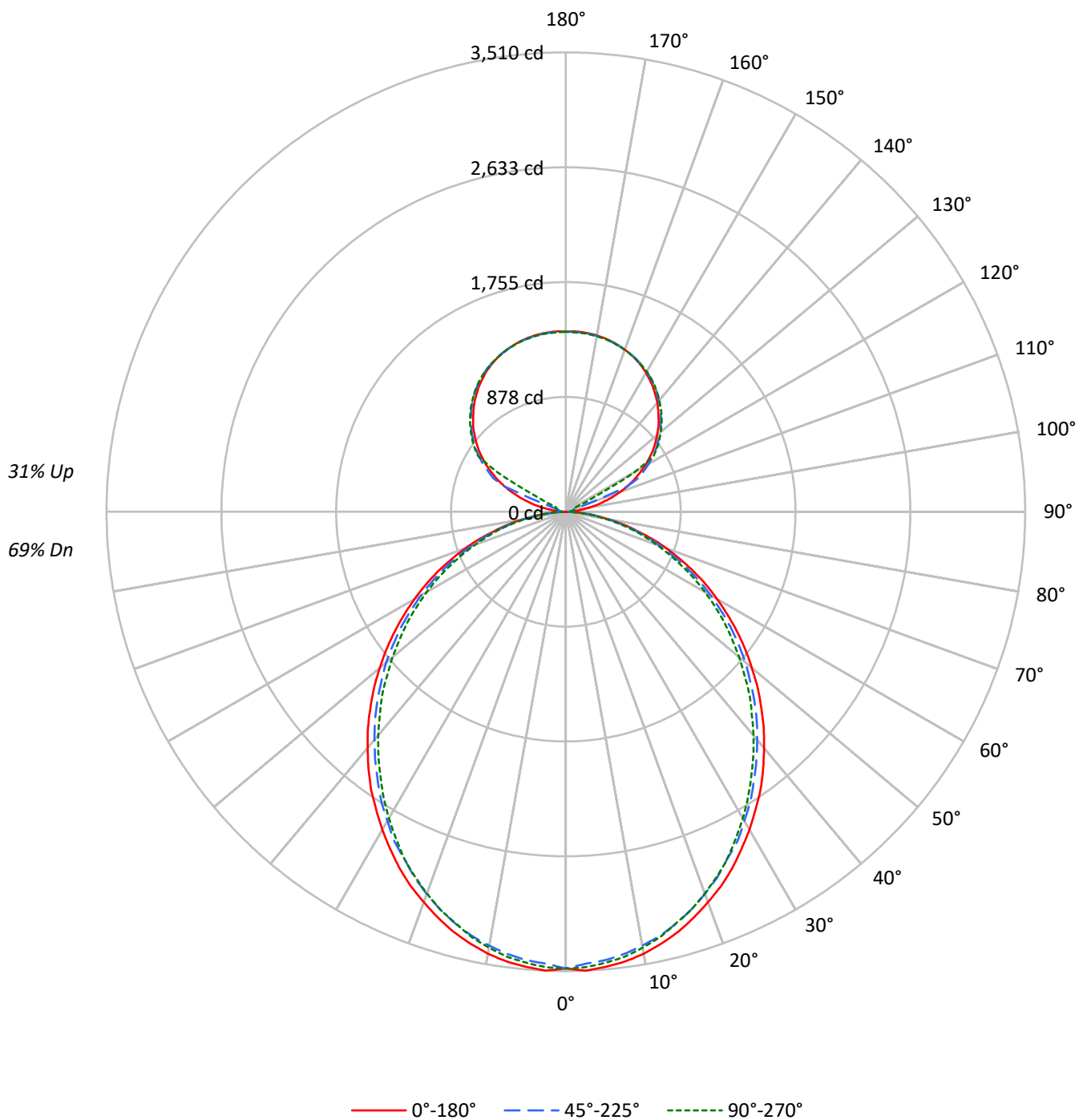
Lumens per Lamp: N/A  
Luminaire Lumens: 12914.3 lumens  
Efficiency: N/A  
Efficacy: 85.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 150.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P918439

CATALOG NUMBER: DFN2DIP-TR4F0-110D050US930-FLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P918439

CATALOG NUMBER: DFN2DIP-TR4F0-110D050US930-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   | 112 | 112 | 112 | 112 | 105 | 105 | 105 | 105 | 94 | 94 | 94 | 83 | 83 | 83 | 73 | 73 | 73 |
| 1   | 102 | 98  | 94  | 90  | 96  | 92  | 89  | 86  | 82 | 80 | 77 | 73 | 71 | 69 | 65 | 63 | 62 |
| 2   | 93  | 85  | 79  | 74  | 87  | 81  | 75  | 70  | 72 | 68 | 64 | 64 | 61 | 58 | 57 | 55 | 52 |
| 3   | 85  | 75  | 67  | 61  | 80  | 71  | 64  | 59  | 64 | 58 | 54 | 57 | 53 | 49 | 51 | 47 | 45 |
| 4   | 78  | 66  | 58  | 52  | 73  | 63  | 56  | 50  | 57 | 51 | 46 | 51 | 46 | 42 | 45 | 42 | 38 |
| 5   | 71  | 59  | 51  | 45  | 67  | 56  | 49  | 43  | 51 | 45 | 40 | 46 | 41 | 37 | 41 | 37 | 33 |
| 6   | 66  | 53  | 45  | 39  | 62  | 51  | 43  | 38  | 46 | 40 | 35 | 41 | 36 | 32 | 37 | 33 | 30 |
| 7   | 61  | 48  | 40  | 34  | 57  | 46  | 38  | 33  | 42 | 35 | 31 | 38 | 32 | 29 | 34 | 30 | 26 |
| 8   | 57  | 44  | 36  | 30  | 53  | 42  | 35  | 29  | 38 | 32 | 27 | 35 | 29 | 26 | 31 | 27 | 24 |
| 9   | 53  | 40  | 33  | 27  | 50  | 38  | 31  | 26  | 35 | 29 | 25 | 32 | 27 | 23 | 29 | 24 | 21 |
| 10  | 50  | 37  | 30  | 25  | 47  | 35  | 29  | 24  | 32 | 26 | 22 | 29 | 24 | 21 | 27 | 22 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2772 | 2772 | 2772 |
| 5°  | 2777 | 2734 | 2752 |
| 10° | 2754 | 2697 | 2715 |
| 15° | 2714 | 2652 | 2656 |
| 20° | 2659 | 2591 | 2597 |
| 25° | 2605 | 2517 | 2528 |
| 30° | 2536 | 2448 | 2440 |
| 35° | 2472 | 2367 | 2347 |
| 40° | 2392 | 2285 | 2259 |
| 45° | 2313 | 2203 | 2169 |
| 50° | 2226 | 2117 | 2064 |
| 55° | 2135 | 2018 | 1968 |
| 60° | 2033 | 1899 | 1858 |
| 65° | 1921 | 1777 | 1728 |
| 70° | 1778 | 1628 | 1588 |
| 75° | 1580 | 1449 | 1458 |
| 80° | 1343 | 1222 | 1212 |
| 85° | 972  | 829  | 803  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2313 cd/sqm

TEST NUMBER: P918439

CATALOG NUMBER: DFN2DIP-TR4F0-110D050US930-FLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 328.4   | 2.5       |
| 10°-20°   | 924.1   | 7.2       |
| 20°-30°   | 1358.1  | 10.5      |
| 30°-40°   | 1577.3  | 12.2      |
| 40°-50°   | 1575.4  | 12.2      |
| 50°-60°   | 1373.7  | 10.6      |
| 60°-70°   | 1015.5  | 7.9       |
| 70°-80°   | 574.5   | 4.4       |
| 80°-90°   | 154.1   | 1.2       |
| 90°-100°  | 45.4    | 0.4       |
| 100°-110° | 169.1   | 1.3       |
| 110°-120° | 448.5   | 3.5       |
| 120°-130° | 743.9   | 5.8       |
| 130°-140° | 790.2   | 6.1       |
| 140°-150° | 734.4   | 5.7       |
| 150°-160° | 590.4   | 4.6       |
| 160°-170° | 380.5   | 2.9       |
| 170°-180° | 130.9   | 1.0       |
| 0°-30°    | 2610.6  | 20.2      |
| 0°-40°    | 4187.9  | 32.4      |
| 0°-60°    | 7137.0  | 55.3      |
| 0°-90°    | 8881.0  | 68.8      |
| 90°-120°  | 663.0   | 5.1       |
| 90°-150°  | 2931.5  | 22.7      |
| 90°-180°  | 4033.0  | 31.2      |
| 0°-180°   | 12914.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3490 | 3490  | 3490 | 3490  | 3490 |      |
| 5°   | 3490 | 3476  | 3439 | 3466  | 3460 | 331  |
| 15°  | 3322 | 3302  | 3258 | 3272  | 3255 | 936  |
| 25°  | 3006 | 2980  | 2923 | 2929  | 2923 | 1383 |
| 35°  | 2594 | 2560  | 2507 | 2486  | 2470 | 1620 |
| 45°  | 2111 | 2087  | 2037 | 2000  | 1987 | 1629 |
| 55°  | 1597 | 1577  | 1537 | 1497  | 1480 | 1428 |
| 65°  | 1077 | 1057  | 1024 | 993   | 977  | 1065 |
| 75°  | 564  | 557   | 540  | 520   | 527  | 602  |
| 85°  | 138  | 134   | 131  | 121   | 118  | 153  |
| 90°  | 1    | 12    | 20   | 25    | 27   | 12   |
| 95°  | 65   | 32    | 39   | 44    | 43   | 77   |
| 105° | 303  | 333   | 61   | 72    | 76   | 323  |
| 115° | 572  | 589   | 614  | 153   | 82   | 564  |
| 125° | 809  | 822   | 841  | 848   | 851  | 722  |
| 135° | 1002 | 1018  | 1026 | 1036  | 1034 | 774  |
| 145° | 1162 | 1161  | 1178 | 1185  | 1180 | 727  |
| 155° | 1279 | 1270  | 1282 | 1288  | 1280 | 589  |
| 165° | 1348 | 1342  | 1345 | 1352  | 1345 | 381  |
| 175° | 1379 | 1372  | 1374 | 1381  | 1371 | 131  |
| 180° | 1376 | 1376  | 1376 | 1376  | 1376 |      |

TEST NUMBER: P918439

CATALOG NUMBER: DFN2DIP-TR4F0-110D050US930-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3489.6 | 3489.6 | 3489.6 | 3489.6 | 3489.6 |
| 2.5°   | 3509.9 | 3493.1 | 3456.1 | 3489.6 | 3483.2 |
| 5°     | 3489.6 | 3476.4 | 3439.4 | 3466.1 | 3459.7 |
| 7.5°   | 3466.1 | 3446.2 | 3409.2 | 3436.2 | 3429.5 |
| 10°    | 3429.5 | 3405.9 | 3365.7 | 3392.4 | 3382.4 |
| 12.5°  | 3378.9 | 3358.9 | 3318.8 | 3335.5 | 3328.7 |
| 15°    | 3321.9 | 3302.0 | 3258.2 | 3271.7 | 3255.0 |
| 17.5°  | 3251.4 | 3231.5 | 3187.7 | 3204.4 | 3187.7 |
| 20°    | 3174.2 | 3154.2 | 3107.3 | 3117.2 | 3104.1 |
| 22.5°  | 3097.3 | 3067.0 | 3023.2 | 3023.2 | 3016.4 |
| 25°    | 3006.5 | 2979.8 | 2922.8 | 2929.3 | 2922.8 |
| 27.5°  | 2905.7 | 2882.2 | 2838.8 | 2828.8 | 2812.1 |
| 30°    | 2805.4 | 2778.3 | 2728.1 | 2718.1 | 2704.6 |
| 32.5°  | 2697.8 | 2677.9 | 2624.1 | 2603.8 | 2590.3 |
| 35°    | 2593.9 | 2560.4 | 2506.6 | 2486.3 | 2469.6 |
| 37.5°  | 2476.4 | 2446.1 | 2392.4 | 2368.8 | 2352.1 |
| 40°    | 2355.7 | 2328.7 | 2274.9 | 2245.0 | 2231.5 |
| 42.5°  | 2238.2 | 2211.2 | 2157.8 | 2123.9 | 2104.0 |
| 45°    | 2110.8 | 2087.2 | 2036.7 | 2000.1 | 1986.6 |
| 47.5°  | 1986.6 | 1963.1 | 1909.3 | 1872.3 | 1852.3 |
| 50°    | 1855.5 | 1838.8 | 1791.8 | 1744.8 | 1728.1 |
| 52.5°  | 1728.1 | 1704.5 | 1661.2 | 1624.1 | 1600.6 |
| 55°    | 1597.4 | 1577.1 | 1536.9 | 1496.6 | 1479.9 |
| 57.5°  | 1466.4 | 1449.7 | 1405.9 | 1365.6 | 1352.1 |
| 60°    | 1335.4 | 1322.3 | 1275.2 | 1238.2 | 1228.2 |
| 62.5°  | 1207.9 | 1184.5 | 1151.0 | 1117.5 | 1104.0 |
| 65°    | 1077.3 | 1057.0 | 1023.5 | 993.3  | 976.6  |
| 67.5°  | 943.1  | 926.0  | 896.1  | 872.6  | 859.1  |
| 70°    | 818.8  | 805.3  | 775.0  | 751.5  | 738.3  |
| 72.5°  | 691.4  | 677.8  | 661.1  | 637.6  | 627.6  |
| 75°    | 563.5  | 557.2  | 540.1  | 520.2  | 526.9  |
| 77.5°  | 449.6  | 436.1  | 429.3  | 419.4  | 409.4  |
| 80°    | 335.7  | 332.2  | 325.4  | 315.4  | 308.7  |
| 82.5°  | 228.2  | 228.2  | 225.0  | 211.5  | 211.5  |
| 85°    | 137.5  | 134.2  | 131.0  | 120.7  | 117.5  |
| 87.5°  | 60.5   | 53.7   | 47.0   | 37.0   | 33.4   |
| 90°    | 1.0    | 11.9   | 19.9   | 24.9   | 26.8   |
| 92.5°  | 24.9   | 21.0   | 23.9   | 25.9   | 26.8   |
| 95°    | 64.7   | 31.8   | 38.8   | 43.9   | 42.8   |
| 97.5°  | 116.4  | 34.9   | 50.7   | 53.8   | 54.7   |
| 100°   | 176.3  | 39.9   | 56.7   | 64.7   | 66.7   |
| 102.5° | 241.9  | 239.9  | 58.8   | 69.6   | 72.7   |
| 105°   | 302.6  | 332.6  | 60.7   | 71.7   | 75.7   |
| 107.5° | 373.3  | 398.1  | 62.8   | 73.6   | 77.7   |
| 110°   | 441.1  | 461.9  | 174.2  | 74.7   | 78.6   |

TEST NUMBER: P918439

CATALOG NUMBER: DFN2DIP-TR4F0-110D050US930-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 504.8  | 522.6  | 505.7  | 76.6   | 79.7   |
| 115°   | 572.4  | 589.3  | 614.2  | 153.4  | 81.7   |
| 117.5° | 631.1  | 651.0  | 668.1  | 525.5  | 264.8  |
| 120°   | 696.8  | 711.8  | 729.7  | 741.7  | 607.2  |
| 122.5° | 752.5  | 768.5  | 788.5  | 794.4  | 795.5  |
| 125°   | 809.3  | 822.3  | 841.2  | 848.2  | 851.2  |
| 127.5° | 861.0  | 875.0  | 890.1  | 899.9  | 900.9  |
| 130°   | 909.9  | 925.9  | 936.7  | 947.7  | 946.8  |
| 132.5° | 959.7  | 972.7  | 983.5  | 992.5  | 991.6  |
| 135°   | 1001.5 | 1017.5 | 1026.3 | 1036.4 | 1034.4 |
| 137.5° | 1045.2 | 1057.2 | 1067.2 | 1077.2 | 1074.2 |
| 140°   | 1088.0 | 1096.1 | 1106.9 | 1115.9 | 1111.0 |
| 142.5° | 1124.0 | 1131.0 | 1143.9 | 1151.8 | 1146.8 |
| 145°   | 1161.8 | 1160.7 | 1177.6 | 1184.6 | 1179.7 |
| 147.5° | 1194.6 | 1191.6 | 1208.5 | 1213.5 | 1209.6 |
| 150°   | 1226.5 | 1219.5 | 1235.4 | 1241.4 | 1236.4 |
| 152.5° | 1253.3 | 1245.4 | 1260.3 | 1266.3 | 1259.3 |
| 155°   | 1279.2 | 1270.3 | 1282.2 | 1288.2 | 1280.3 |
| 157.5° | 1300.1 | 1292.2 | 1301.1 | 1308.1 | 1300.1 |
| 160°   | 1318.1 | 1312.1 | 1318.1 | 1324.0 | 1317.0 |
| 162.5° | 1333.9 | 1328.0 | 1332.9 | 1339.9 | 1331.0 |
| 165°   | 1347.9 | 1342.0 | 1344.9 | 1351.8 | 1344.9 |
| 167.5° | 1358.9 | 1352.8 | 1355.9 | 1362.9 | 1353.9 |
| 170°   | 1367.8 | 1361.8 | 1363.8 | 1370.8 | 1361.8 |
| 172.5° | 1373.8 | 1367.8 | 1369.9 | 1376.8 | 1367.8 |
| 175°   | 1378.8 | 1371.7 | 1373.8 | 1380.7 | 1370.8 |
| 177.5° | 1380.7 | 1373.8 | 1374.8 | 1381.8 | 1372.8 |
| 180°   | 1375.7 | 1375.7 | 1375.7 | 1375.7 | 1375.7 |

TEST NUMBER: P918439

CATALOG NUMBER: DFN2DIP-TR4F0-110D050US930-FLLONL

**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 | 12.38            | 13.44 | 13.16 | 14.24 | 15.22 | 11.95          | 13.01 | 12.73 | 13.81 | 14.79 |
|                 | 3H   | 14.06            | 15.01 | 14.85 | 15.82 | 16.83 | 13.59          | 14.54 | 14.38 | 15.35 | 16.35 |
|                 | 4H   | 14.66            | 15.55 | 15.46 | 16.37 | 17.39 | 14.18          | 15.08 | 14.99 | 15.90 | 16.91 |
|                 | 6H   | 15.06            | 15.89 | 15.89 | 16.72 | 17.75 | 14.59          | 15.42 | 15.41 | 16.25 | 17.28 |
|                 | 8H   | 15.18            | 15.97 | 16.01 | 16.81 | 17.84 | 14.70          | 15.49 | 15.53 | 16.34 | 17.37 |
|                 | 12H  | 15.23            | 15.98 | 16.07 | 16.82 | 17.88 | 14.75          | 15.50 | 15.59 | 16.34 | 17.40 |
| 4H              | 2H   | 12.87            | 13.77 | 13.68 | 14.59 | 15.60 | 12.52          | 13.42 | 13.34 | 14.24 | 15.26 |
|                 | 3H   | 14.75            | 15.50 | 15.58 | 16.36 | 17.39 | 14.36          | 15.11 | 15.18 | 15.96 | 16.99 |
|                 | 4H   | 15.48            | 16.16 | 16.31 | 17.01 | 18.07 | 15.07          | 15.75 | 15.91 | 16.60 | 17.66 |
|                 | 6H   | 16.00            | 16.59 | 16.86 | 17.47 | 18.53 | 15.59          | 16.18 | 16.45 | 17.06 | 18.12 |
|                 | 8H   | 16.16            | 16.71 | 17.01 | 17.58 | 18.65 | 15.74          | 16.30 | 16.60 | 17.17 | 18.24 |
|                 | 12H  | 16.24            | 16.74 | 17.12 | 17.63 | 18.71 | 15.82          | 16.31 | 16.69 | 17.20 | 18.29 |
| 8H              | 4H   | 15.69            | 16.24 | 16.55 | 17.11 | 18.19 | 15.33          | 15.88 | 16.18 | 16.75 | 17.83 |
|                 | 6H   | 16.33            | 16.79 | 17.21 | 17.70 | 18.77 | 15.96          | 16.42 | 16.85 | 17.33 | 18.41 |
|                 | 8H   | 16.55            | 16.96 | 17.45 | 17.86 | 18.96 | 16.18          | 16.59 | 17.08 | 17.49 | 18.59 |
|                 | 12H  | 16.69            | 17.05 | 17.59 | 17.95 | 19.09 | 16.31          | 16.66 | 17.21 | 17.56 | 18.71 |
| 12H             | 4H   | 15.68            | 16.18 | 16.56 | 17.07 | 18.15 | 15.33          | 15.83 | 16.21 | 16.72 | 17.80 |
|                 | 6H   | 16.36            | 16.77 | 17.25 | 17.67 | 18.76 | 16.01          | 16.41 | 16.90 | 17.32 | 18.41 |
|                 | 8H   | 16.61            | 16.97 | 17.51 | 17.87 | 19.01 | 16.25          | 16.61 | 17.15 | 17.51 | 18.66 |

END OF REPORT