

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: P915145

Luminaire Tested: DFN2DIP-SQ4F0-160D080US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915145  
REPORT IS A COMBINATION OF REPORTS P901631 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-160D080US927-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

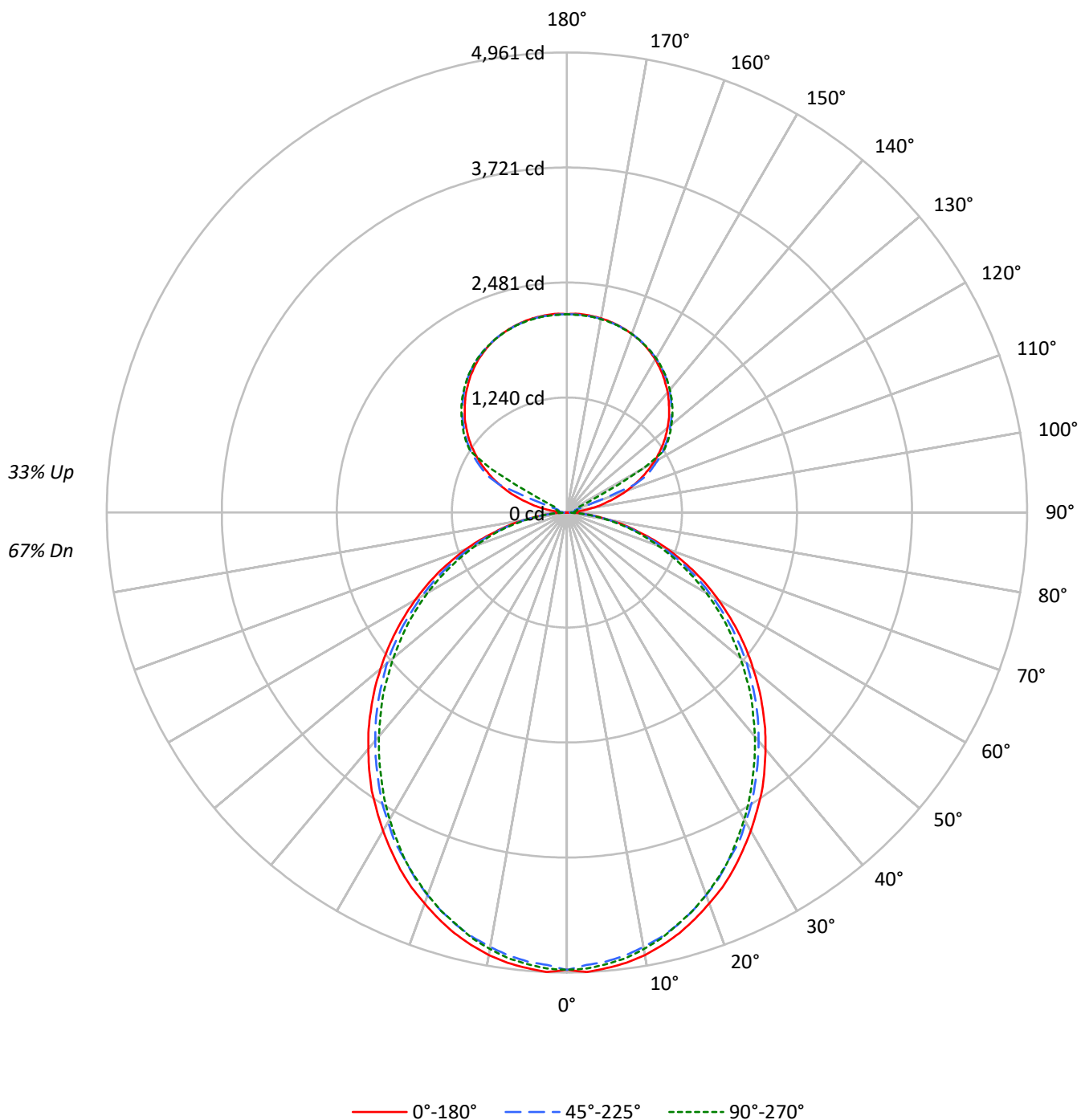
Lumens per Lamp: N/A  
Luminaire Lumens: 18822.2 lumens  
Efficiency: N/A  
Efficacy: 83.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 226.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
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   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 | 82 | 82 | 82 | 71 | 71 | 71 |
| 1   | 102 | 97  | 93  | 90  | 95  | 92  | 88  | 85  | 81 | 79 | 76 | 72 | 70 | 68 | 63 | 62 | 60 |
| 2   | 92  | 85  | 79  | 73  | 87  | 80  | 75  | 70  | 71 | 67 | 63 | 63 | 60 | 57 | 56 | 53 | 51 |
| 3   | 84  | 75  | 67  | 61  | 79  | 71  | 64  | 58  | 63 | 58 | 53 | 56 | 52 | 48 | 49 | 46 | 43 |
| 4   | 77  | 66  | 58  | 52  | 72  | 63  | 55  | 50  | 56 | 50 | 45 | 50 | 45 | 41 | 44 | 40 | 37 |
| 5   | 71  | 59  | 51  | 44  | 67  | 56  | 48  | 43  | 50 | 44 | 39 | 45 | 40 | 36 | 40 | 36 | 33 |
| 6   | 66  | 53  | 45  | 39  | 62  | 50  | 43  | 37  | 45 | 39 | 34 | 41 | 35 | 32 | 36 | 32 | 29 |
| 7   | 61  | 48  | 40  | 34  | 57  | 46  | 38  | 33  | 41 | 35 | 30 | 37 | 32 | 28 | 33 | 29 | 26 |
| 8   | 56  | 44  | 36  | 30  | 53  | 42  | 34  | 29  | 38 | 31 | 27 | 34 | 29 | 25 | 30 | 26 | 23 |
| 9   | 53  | 40  | 32  | 27  | 50  | 38  | 31  | 26  | 35 | 29 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 24  | 32 | 26 | 22 | 29 | 24 | 20 | 26 | 22 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3461 | 3461 | 3461 |
| 5°  | 3466 | 3413 | 3436 |
| 10° | 3438 | 3368 | 3391 |
| 15° | 3387 | 3313 | 3319 |
| 20° | 3319 | 3237 | 3246 |
| 25° | 3251 | 3145 | 3160 |
| 30° | 3166 | 3060 | 3052 |
| 35° | 3085 | 2960 | 2937 |
| 40° | 2986 | 2858 | 2828 |
| 45° | 2887 | 2757 | 2717 |
| 50° | 2778 | 2650 | 2587 |
| 55° | 2665 | 2527 | 2469 |
| 60° | 2536 | 2380 | 2333 |
| 65° | 2397 | 2229 | 2172 |
| 70° | 2218 | 2044 | 2000 |
| 75° | 1972 | 1824 | 1843 |
| 80° | 1674 | 1542 | 1540 |
| 85° | 1210 | 1055 | 1035 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2887 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 464.2   | 2.5       |
| 10°-20°   | 1306.0  | 6.9       |
| 20°-30°   | 1919.4  | 10.2      |
| 30°-40°   | 2229.2  | 11.8      |
| 40°-50°   | 2226.5  | 11.8      |
| 50°-60°   | 1941.4  | 10.3      |
| 60°-70°   | 1435.1  | 7.6       |
| 70°-80°   | 812.0   | 4.3       |
| 80°-90°   | 218.1   | 1.2       |
| 90°-100°  | 70.5    | 0.4       |
| 100°-110° | 262.9   | 1.4       |
| 110°-120° | 697.3   | 3.7       |
| 120°-130° | 1156.5  | 6.1       |
| 130°-140° | 1228.4  | 6.5       |
| 140°-150° | 1141.7  | 6.1       |
| 150°-160° | 917.9   | 4.9       |
| 160°-170° | 591.5   | 3.1       |
| 170°-180° | 203.6   | 1.1       |
| 0°-30°    | 3689.6  | 19.6      |
| 0°-40°    | 5918.9  | 31.4      |
| 0°-60°    | 10086.7 | 53.6      |
| 0°-90°    | 12551.9 | 66.7      |
| 90°-120°  | 1030.7  | 5.5       |
| 90°-150°  | 4557.3  | 24.2      |
| 90°-180°  | 6270.0  | 33.3      |
| 0°-180°   | 18822.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4932 | 4932  | 4932 | 4932  | 4932 |      |
| 5°   | 4932 | 4913  | 4861 | 4899  | 4890 | 468  |
| 15°  | 4695 | 4667  | 4605 | 4624  | 4600 | 1322 |
| 25°  | 4249 | 4211  | 4131 | 4140  | 4131 | 1955 |
| 35°  | 3666 | 3619  | 3543 | 3514  | 3490 | 2289 |
| 45°  | 2983 | 2950  | 2878 | 2827  | 2808 | 2302 |
| 55°  | 2258 | 2229  | 2172 | 2115  | 2092 | 2018 |
| 65°  | 1522 | 1494  | 1446 | 1404  | 1380 | 1505 |
| 75°  | 796  | 787   | 763  | 735   | 745  | 850  |
| 85°  | 194  | 190   | 185  | 171   | 166  | 217  |
| 90°  | 2    | 18    | 31   | 39    | 42   | 17   |
| 95°  | 100  | 49    | 60   | 68    | 66   | 119  |
| 105° | 470  | 517   | 94   | 111   | 118  | 503  |
| 115° | 890  | 916   | 955  | 238   | 127  | 876  |
| 125° | 1258 | 1278  | 1308 | 1319  | 1323 | 1122 |
| 135° | 1557 | 1582  | 1596 | 1611  | 1608 | 1203 |
| 145° | 1806 | 1804  | 1831 | 1842  | 1834 | 1130 |
| 155° | 1989 | 1975  | 1993 | 2003  | 1990 | 916  |
| 165° | 2096 | 2086  | 2091 | 2102  | 2091 | 592  |
| 175° | 2143 | 2133  | 2136 | 2146  | 2131 | 204  |
| 180° | 2139 | 2139  | 2139 | 2139  | 2139 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4931.9 | 4931.9 | 4931.9 | 4931.9 | 4931.9 |
| 2.5°   | 4960.6 | 4936.9 | 4884.6 | 4931.9 | 4922.8 |
| 5°     | 4931.9 | 4913.3 | 4860.9 | 4898.7 | 4889.6 |
| 7.5°   | 4898.7 | 4870.5 | 4818.1 | 4856.4 | 4846.8 |
| 10°    | 4846.8 | 4813.6 | 4756.8 | 4794.5 | 4780.4 |
| 12.5°  | 4775.4 | 4747.2 | 4690.3 | 4714.0 | 4704.4 |
| 15°    | 4694.9 | 4666.7 | 4604.8 | 4624.0 | 4600.3 |
| 17.5°  | 4595.3 | 4567.1 | 4505.2 | 4528.8 | 4505.2 |
| 20°    | 4486.0 | 4457.9 | 4391.5 | 4405.6 | 4386.9 |
| 22.5°  | 4377.4 | 4334.7 | 4272.7 | 4272.7 | 4263.2 |
| 25°    | 4249.1 | 4211.4 | 4130.8 | 4139.9 | 4130.8 |
| 27.5°  | 4106.7 | 4073.5 | 4012.1 | 3998.1 | 3974.4 |
| 30°    | 3964.8 | 3926.6 | 3855.6 | 3841.5 | 3822.4 |
| 32.5°  | 3812.8 | 3784.7 | 3708.7 | 3680.0 | 3660.9 |
| 35°    | 3666.0 | 3618.7 | 3542.6 | 3514.0 | 3490.4 |
| 37.5°  | 3499.9 | 3457.2 | 3381.2 | 3347.9 | 3324.3 |
| 40°    | 3329.3 | 3291.1 | 3215.1 | 3172.8 | 3153.8 |
| 42.5°  | 3163.3 | 3125.1 | 3049.6 | 3001.8 | 2973.6 |
| 45°    | 2983.2 | 2949.9 | 2878.5 | 2826.7 | 2807.6 |
| 47.5°  | 2807.6 | 2774.4 | 2698.4 | 2646.0 | 2617.9 |
| 50°    | 2622.4 | 2598.8 | 2532.4 | 2465.9 | 2442.3 |
| 52.5°  | 2442.3 | 2409.1 | 2347.7 | 2295.3 | 2262.2 |
| 55°    | 2257.6 | 2229.0 | 2172.1 | 2115.2 | 2091.6 |
| 57.5°  | 2072.5 | 2048.8 | 1986.9 | 1930.1 | 1911.0 |
| 60°    | 1887.3 | 1868.7 | 1802.3 | 1749.9 | 1735.8 |
| 62.5°  | 1707.2 | 1674.0 | 1626.7 | 1579.4 | 1560.3 |
| 65°    | 1522.5 | 1493.8 | 1446.5 | 1403.8 | 1380.1 |
| 67.5°  | 1332.8 | 1308.7 | 1266.5 | 1233.2 | 1214.1 |
| 70°    | 1157.2 | 1138.1 | 1095.3 | 1062.2 | 1043.5 |
| 72.5°  | 977.1  | 958.0  | 934.4  | 901.1  | 887.1  |
| 75°    | 796.5  | 787.4  | 763.3  | 735.1  | 744.7  |
| 77.5°  | 635.5  | 616.4  | 606.8  | 592.7  | 578.6  |
| 80°    | 474.4  | 469.4  | 459.9  | 445.8  | 436.3  |
| 82.5°  | 322.5  | 322.5  | 318.0  | 298.9  | 298.9  |
| 85°    | 194.2  | 189.6  | 185.1  | 170.6  | 166.0  |
| 87.5°  | 85.6   | 76.0   | 66.4   | 52.4   | 47.3   |
| 90°    | 1.5    | 18.5   | 30.9   | 38.7   | 41.7   |
| 92.5°  | 38.7   | 32.6   | 37.2   | 40.2   | 41.7   |
| 95°    | 100.5  | 49.4   | 60.3   | 68.2   | 66.5   |
| 97.5°  | 181.0  | 54.2   | 78.8   | 83.7   | 85.1   |
| 100°   | 274.0  | 61.9   | 88.2   | 100.5  | 103.6  |
| 102.5° | 376.0  | 373.0  | 91.3   | 108.2  | 113.0  |
| 105°   | 470.5  | 517.0  | 94.4   | 111.4  | 117.6  |
| 107.5° | 580.4  | 618.9  | 97.6   | 114.5  | 120.7  |
| 110°   | 685.7  | 718.0  | 270.9  | 116.1  | 122.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 784.7  | 812.5  | 786.2  | 119.1  | 123.9  |
| 115°   | 889.9  | 916.2  | 954.9  | 238.4  | 127.0  |
| 117.5° | 981.2  | 1012.1 | 1038.5 | 817.1  | 411.7  |
| 120°   | 1083.4 | 1106.5 | 1134.5 | 1153.0 | 944.0  |
| 122.5° | 1169.9 | 1194.8 | 1225.8 | 1235.0 | 1236.7 |
| 125°   | 1258.1 | 1278.3 | 1307.7 | 1318.6 | 1323.2 |
| 127.5° | 1338.6 | 1360.3 | 1383.7 | 1399.1 | 1400.6 |
| 130°   | 1414.5 | 1439.3 | 1456.3 | 1473.4 | 1471.9 |
| 132.5° | 1491.9 | 1512.1 | 1529.1 | 1543.0 | 1541.5 |
| 135°   | 1557.0 | 1581.7 | 1595.5 | 1611.2 | 1608.0 |
| 137.5° | 1625.0 | 1643.5 | 1659.1 | 1674.6 | 1670.0 |
| 140°   | 1691.5 | 1704.0 | 1720.9 | 1734.9 | 1727.1 |
| 142.5° | 1747.4 | 1758.2 | 1778.2 | 1790.6 | 1782.8 |
| 145°   | 1806.2 | 1804.5 | 1830.8 | 1841.7 | 1833.9 |
| 147.5° | 1857.1 | 1852.5 | 1878.7 | 1886.5 | 1880.4 |
| 150°   | 1906.7 | 1895.8 | 1920.6 | 1929.8 | 1922.1 |
| 152.5° | 1948.4 | 1936.1 | 1959.2 | 1968.6 | 1957.8 |
| 155°   | 1988.7 | 1974.9 | 1993.4 | 2002.6 | 1990.4 |
| 157.5° | 2021.2 | 2008.9 | 2022.8 | 2033.7 | 2021.2 |
| 160°   | 2049.1 | 2039.8 | 2049.1 | 2058.3 | 2047.5 |
| 162.5° | 2073.8 | 2064.6 | 2072.3 | 2083.1 | 2069.2 |
| 165°   | 2095.5 | 2086.3 | 2090.9 | 2101.7 | 2090.9 |
| 167.5° | 2112.5 | 2103.2 | 2107.9 | 2118.8 | 2104.8 |
| 170°   | 2126.5 | 2117.1 | 2120.3 | 2131.1 | 2117.1 |
| 172.5° | 2135.7 | 2126.5 | 2129.6 | 2140.5 | 2126.5 |
| 175°   | 2143.4 | 2132.6 | 2135.7 | 2146.5 | 2131.1 |
| 177.5° | 2146.5 | 2135.7 | 2137.3 | 2148.2 | 2134.2 |
| 180°   | 2138.8 | 2138.8 | 2138.8 | 2138.8 | 2138.8 |

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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 | 13.01            | 14.04 | 13.81 | 14.87 | 15.88 | 12.57          | 13.60 | 13.37 | 14.42 | 15.43 |
|                 | 3H   | 14.69            | 15.62 | 15.50 | 16.45 | 17.49 | 14.20          | 15.13 | 15.01 | 15.96 | 17.00 |
|                 | 4H   | 15.29            | 16.16 | 16.12 | 17.00 | 18.05 | 14.79          | 15.67 | 15.62 | 16.51 | 17.56 |
|                 | 6H   | 15.70            | 16.51 | 16.54 | 17.36 | 18.42 | 15.20          | 16.01 | 16.04 | 16.85 | 17.92 |
|                 | 8H   | 15.81            | 16.58 | 16.66 | 17.45 | 18.51 | 15.31          | 16.08 | 16.16 | 16.95 | 18.01 |
|                 | 12H  | 15.87            | 16.60 | 16.72 | 17.46 | 18.55 | 15.36          | 16.09 | 16.21 | 16.95 | 18.04 |
| 4H              | 2H   | 13.49            | 14.37 | 14.33 | 15.21 | 16.26 | 13.14          | 14.02 | 13.97 | 14.85 | 15.91 |
|                 | 3H   | 15.38            | 16.11 | 16.22 | 16.98 | 18.05 | 14.97          | 15.70 | 15.82 | 16.58 | 17.64 |
|                 | 4H   | 16.10            | 16.77 | 16.96 | 17.64 | 18.73 | 15.68          | 16.35 | 16.54 | 17.22 | 18.31 |
|                 | 6H   | 16.63            | 17.21 | 17.51 | 18.10 | 19.20 | 16.20          | 16.78 | 17.07 | 17.67 | 18.77 |
|                 | 8H   | 16.79            | 17.33 | 17.67 | 18.22 | 19.33 | 16.35          | 16.89 | 17.23 | 17.78 | 18.89 |
|                 | 12H  | 16.87            | 17.36 | 17.77 | 18.27 | 19.38 | 16.42          | 16.91 | 17.32 | 17.82 | 18.93 |
| 8H              | 4H   | 16.31            | 16.85 | 17.19 | 17.74 | 18.85 | 15.94          | 16.48 | 16.82 | 17.37 | 18.48 |
|                 | 6H   | 16.96            | 17.40 | 17.86 | 18.34 | 19.45 | 16.57          | 17.02 | 17.48 | 17.95 | 19.06 |
|                 | 8H   | 17.18            | 17.58 | 18.10 | 18.50 | 19.63 | 16.79          | 17.19 | 17.71 | 18.11 | 19.24 |
|                 | 12H  | 17.33            | 17.67 | 18.24 | 18.59 | 19.77 | 16.91          | 17.26 | 17.83 | 18.18 | 19.36 |
| 12H             | 4H   | 16.31            | 16.79 | 17.21 | 17.70 | 18.82 | 15.94          | 16.43 | 16.84 | 17.34 | 18.45 |
|                 | 6H   | 16.99            | 17.39 | 17.90 | 18.31 | 19.44 | 16.62          | 17.01 | 17.53 | 17.94 | 19.07 |
|                 | 8H   | 17.24            | 17.59 | 18.16 | 18.51 | 19.69 | 16.86          | 17.21 | 17.78 | 18.13 | 19.31 |

END OF REPORT