

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: P926055

Luminaire Tested: DFN2DIP-SQ4F0-160D070US950-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926055  
REPORT IS A COMBINATION OF REPORTS P901614 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-160D070US950-RLLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

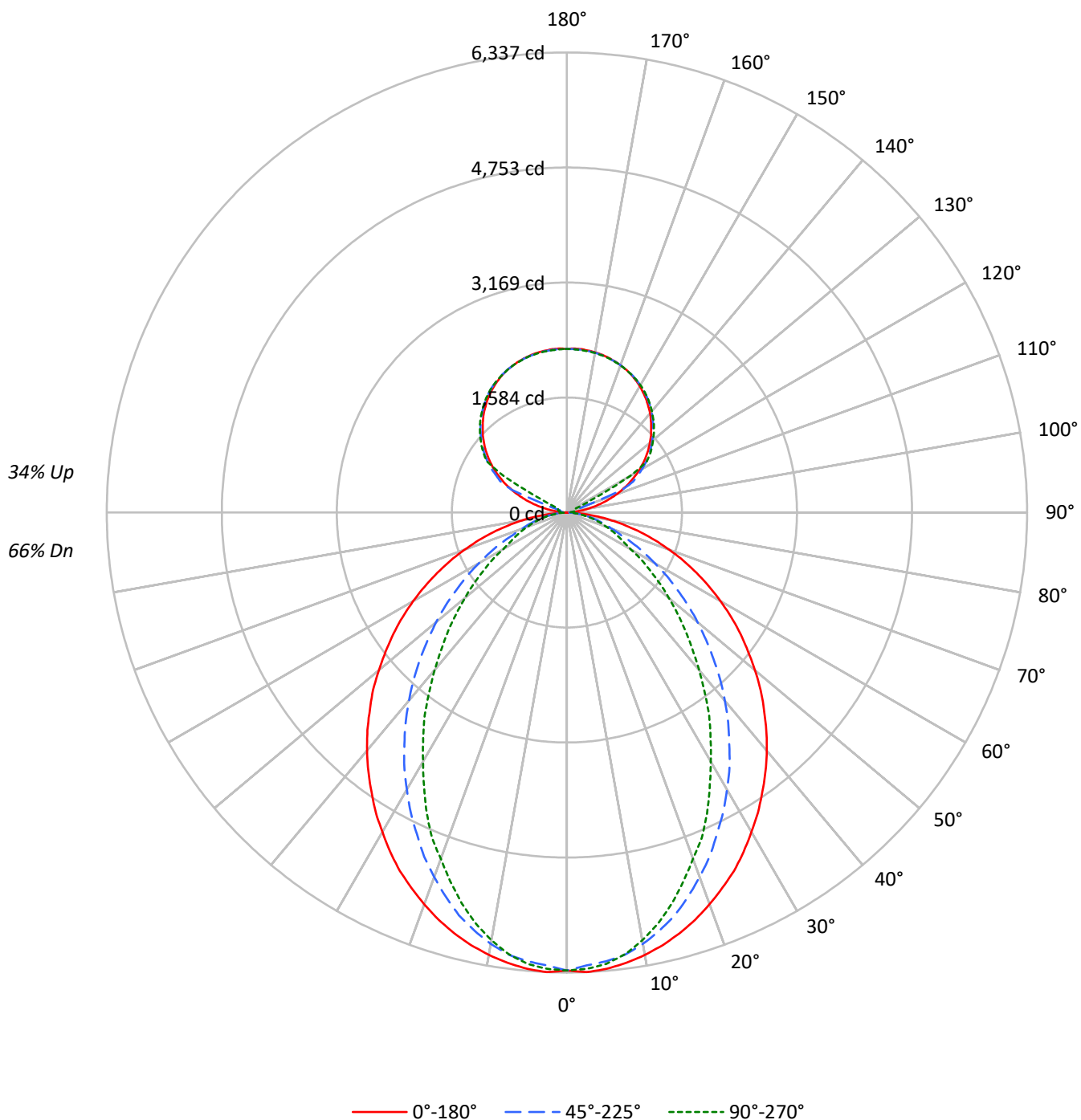
Lumens per Lamp: N/A  
Luminaire Lumens: 19585.6 lumens  
Efficiency: N/A  
Efficacy: 89.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 218.9  
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 | 92 | 92 | 92 | 81 | 81 | 81 | 71 | 71 | 71 |
| 1   | 102 | 98  | 94  | 91  | 96  | 92  | 89  | 86  | 82 | 80 | 77 | 73 | 71 | 69 | 64 | 63 | 61 |
| 2   | 93  | 86  | 80  | 75  | 88  | 82  | 76  | 72  | 73 | 69 | 65 | 65 | 61 | 59 | 57 | 55 | 53 |
| 3   | 86  | 76  | 69  | 64  | 81  | 72  | 66  | 61  | 65 | 60 | 56 | 58 | 54 | 50 | 51 | 48 | 46 |
| 4   | 79  | 68  | 60  | 54  | 74  | 65  | 58  | 52  | 58 | 52 | 48 | 52 | 47 | 44 | 46 | 43 | 40 |
| 5   | 73  | 61  | 53  | 47  | 68  | 58  | 51  | 45  | 52 | 46 | 42 | 47 | 42 | 38 | 42 | 38 | 35 |
| 6   | 67  | 55  | 47  | 41  | 63  | 53  | 45  | 40  | 47 | 41 | 37 | 43 | 38 | 34 | 38 | 34 | 31 |
| 7   | 62  | 50  | 42  | 37  | 59  | 48  | 41  | 35  | 43 | 37 | 33 | 39 | 34 | 30 | 35 | 31 | 28 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 30 | 36 | 31 | 27 | 32 | 28 | 25 |
| 9   | 54  | 42  | 35  | 30  | 51  | 40  | 33  | 29  | 37 | 31 | 27 | 33 | 28 | 25 | 30 | 26 | 23 |
| 10  | 51  | 39  | 32  | 27  | 48  | 37  | 30  | 26  | 34 | 28 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4427 | 4427 | 4427 |
| 5°  | 4434 | 4357 | 4385 |
| 10° | 4390 | 4273 | 4244 |
| 15° | 4329 | 4132 | 4024 |
| 20° | 4249 | 3938 | 3755 |
| 25° | 4167 | 3721 | 3494 |
| 30° | 4057 | 3498 | 3164 |
| 35° | 3949 | 3258 | 2873 |
| 40° | 3840 | 3010 | 2539 |
| 45° | 3712 | 2734 | 2237 |
| 50° | 3581 | 2456 | 1942 |
| 55° | 3443 | 2158 | 1658 |
| 60° | 3284 | 1847 | 1366 |
| 65° | 3101 | 1531 | 1231 |
| 70° | 2879 | 1236 | 1116 |
| 75° | 2600 | 1091 | 1018 |
| 80° | 2196 | 918  | 887  |
| 85° | 1529 | 618  | 676  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3712 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 591.2   | 3.0       |
| 10°-20°   | 1623.1  | 8.3       |
| 20°-30°   | 2278.8  | 11.6      |
| 30°-40°   | 2484.0  | 12.7      |
| 40°-50°   | 2283.1  | 11.7      |
| 50°-60°   | 1793.0  | 9.2       |
| 60°-70°   | 1167.1  | 6.0       |
| 70°-80°   | 600.8   | 3.1       |
| 80°-90°   | 157.4   | 0.8       |
| 90°-100°  | 74.3    | 0.4       |
| 100°-110° | 277.0   | 1.4       |
| 110°-120° | 734.8   | 3.8       |
| 120°-130° | 1218.6  | 6.2       |
| 130°-140° | 1294.5  | 6.6       |
| 140°-150° | 1203.1  | 6.1       |
| 150°-160° | 967.2   | 4.9       |
| 160°-170° | 623.3   | 3.2       |
| 170°-180° | 214.5   | 1.1       |
| 0°-30°    | 4493.1  | 22.9      |
| 0°-40°    | 6977.1  | 35.6      |
| 0°-60°    | 11053.2 | 56.4      |
| 0°-90°    | 12978.4 | 66.3      |
| 90°-120°  | 1086.1  | 5.5       |
| 90°-150°  | 4802.2  | 24.5      |
| 90°-180°  | 6607.0  | 33.7      |
| 0°-180°   | 19585.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 6309 | 6309  | 6309 | 6309  | 6309 |      |
| 5°   | 6309 | 6280  | 6206 | 6257  | 6240 | 598  |
| 15°  | 6000 | 5937  | 5744 | 5635  | 5578 | 1691 |
| 25°  | 5447 | 5264  | 4887 | 4653  | 4567 | 2505 |
| 35°  | 4693 | 4402  | 3900 | 3540  | 3414 | 2937 |
| 45°  | 3837 | 3454  | 2855 | 2449  | 2312 | 2963 |
| 55°  | 2917 | 2472  | 1855 | 1513  | 1405 | 2607 |
| 65°  | 1970 | 1507  | 993  | 800   | 782  | 1953 |
| 75°  | 1050 | 650   | 457  | 417   | 411  | 1111 |
| 85°  | 245  | 125   | 108  | 108   | 108  | 282  |
| 90°  | 2    | 20    | 32   | 41    | 44   | 19   |
| 95°  | 106  | 52    | 64   | 72    | 70   | 125  |
| 105° | 496  | 545   | 100  | 117   | 124  | 530  |
| 115° | 938  | 965   | 1006 | 251   | 134  | 923  |
| 125° | 1326 | 1347  | 1378 | 1390  | 1394 | 1182 |
| 135° | 1641 | 1667  | 1681 | 1698  | 1694 | 1267 |
| 145° | 1903 | 1902  | 1929 | 1941  | 1932 | 1190 |
| 155° | 2096 | 2081  | 2100 | 2110  | 2097 | 966  |
| 165° | 2208 | 2198  | 2203 | 2215  | 2203 | 624  |
| 175° | 2259 | 2247  | 2250 | 2262  | 2246 | 215  |
| 180° | 2254 | 2254  | 2254 | 2254  | 2254 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 6308.6 | 6308.6 | 6308.6 | 6308.6 | 6308.6 |
| 2.5°   | 6337.0 | 6308.6 | 6245.6 | 6303.2 | 6291.6 |
| 5°     | 6308.6 | 6280.1 | 6205.6 | 6257.1 | 6240.1 |
| 7.5°   | 6257.1 | 6223.1 | 6143.2 | 6165.6 | 6137.2 |
| 10°    | 6188.7 | 6148.7 | 6034.8 | 6017.3 | 5983.3 |
| 12.5°  | 6103.2 | 6051.8 | 5897.3 | 5863.4 | 5800.4 |
| 15°    | 6000.3 | 5937.3 | 5743.5 | 5635.0 | 5578.0 |
| 17.5°  | 5880.4 | 5788.9 | 5549.0 | 5423.6 | 5332.2 |
| 20°    | 5743.5 | 5629.0 | 5343.6 | 5201.3 | 5075.4 |
| 22.5°  | 5595.0 | 5463.6 | 5132.2 | 4938.5 | 4853.0 |
| 25°    | 5446.7 | 5263.7 | 4887.0 | 4653.1 | 4567.2 |
| 27.5°  | 5269.8 | 5075.4 | 4658.6 | 4390.3 | 4258.8 |
| 30°    | 5081.4 | 4864.0 | 4407.2 | 4116.5 | 3962.1 |
| 32.5°  | 4898.5 | 4635.6 | 4167.9 | 3825.2 | 3682.2 |
| 35°    | 4693.1 | 4401.8 | 3899.7 | 3539.8 | 3413.9 |
| 37.5°  | 4493.2 | 4178.9 | 3648.3 | 3253.9 | 3111.6 |
| 40°    | 4281.8 | 3939.6 | 3385.4 | 2980.1 | 2831.8 |
| 42.5°  | 4065.0 | 3699.7 | 3123.1 | 2700.3 | 2558.0 |
| 45°    | 3836.6 | 3453.9 | 2854.7 | 2448.9 | 2312.0 |
| 47.5°  | 3619.8 | 3214.6 | 2597.9 | 2192.1 | 2066.7 |
| 50°    | 3379.9 | 2974.7 | 2346.6 | 1952.3 | 1832.9 |
| 52.5°  | 3145.5 | 2717.3 | 2106.7 | 1730.0 | 1621.5 |
| 55°    | 2917.1 | 2471.9 | 1855.3 | 1513.0 | 1404.7 |
| 57.5°  | 2683.3 | 2226.6 | 1633.1 | 1313.2 | 1221.7 |
| 60°    | 2443.5 | 1986.8 | 1398.6 | 1107.9 | 1016.4 |
| 62.5°  | 2209.7 | 1753.0 | 1198.7 | 924.9  | 879.5  |
| 65°    | 1969.8 | 1507.0 | 993.4  | 799.5  | 782.0  |
| 67.5°  | 1741.4 | 1278.6 | 799.5  | 702.0  | 685.1  |
| 70°    | 1501.6 | 1056.4 | 662.1  | 605.1  | 582.1  |
| 72.5°  | 1273.2 | 850.4  | 553.6  | 508.2  | 496.7  |
| 75°    | 1050.4 | 650.5  | 456.7  | 416.7  | 411.3  |
| 77.5°  | 828.0  | 462.1  | 359.8  | 336.8  | 325.3  |
| 80°    | 622.1  | 331.3  | 273.8  | 251.4  | 251.4  |
| 82.5°  | 433.7  | 222.9  | 188.4  | 176.9  | 176.9  |
| 85°    | 245.3  | 125.4  | 108.5  | 108.5  | 108.5  |
| 87.5°  | 91.5   | 45.4   | 45.4   | 40.0   | 40.0   |
| 90°    | 1.5    | 19.6   | 32.5   | 40.8   | 44.0   |
| 92.5°  | 40.8   | 34.2   | 39.1   | 42.5   | 44.0   |
| 95°    | 105.9  | 52.1   | 63.5   | 71.8   | 70.1   |
| 97.5°  | 190.7  | 57.1   | 83.1   | 88.1   | 89.7   |
| 100°   | 288.8  | 65.3   | 92.9   | 105.9  | 109.2  |
| 102.5° | 396.2  | 393.1  | 96.3   | 114.1  | 119.1  |
| 105°   | 495.8  | 544.7  | 99.5   | 117.3  | 123.9  |
| 107.5° | 611.5  | 652.2  | 102.8  | 120.7  | 127.3  |
| 110°   | 722.6  | 756.6  | 285.4  | 122.4  | 128.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 826.9  | 856.1  | 828.5  | 125.5  | 130.5  |
| 115°   | 937.7  | 965.4  | 1006.2 | 251.2  | 133.8  |
| 117.5° | 1033.9 | 1066.5 | 1094.3 | 861.0  | 433.8  |
| 120°   | 1141.6 | 1166.0 | 1195.5 | 1215.0 | 994.8  |
| 122.5° | 1232.8 | 1258.9 | 1291.7 | 1301.4 | 1303.1 |
| 125°   | 1325.8 | 1347.0 | 1378.1 | 1389.5 | 1394.3 |
| 127.5° | 1410.6 | 1433.4 | 1458.0 | 1474.3 | 1475.8 |
| 130°   | 1490.5 | 1516.7 | 1534.5 | 1552.5 | 1551.0 |
| 132.5° | 1572.1 | 1593.4 | 1611.2 | 1625.9 | 1624.4 |
| 135°   | 1640.6 | 1666.7 | 1681.3 | 1697.7 | 1694.5 |
| 137.5° | 1712.2 | 1731.9 | 1748.3 | 1764.6 | 1759.7 |
| 140°   | 1782.4 | 1795.5 | 1813.4 | 1828.1 | 1819.9 |
| 142.5° | 1841.2 | 1852.7 | 1873.8 | 1886.7 | 1878.6 |
| 145°   | 1903.2 | 1901.5 | 1929.2 | 1940.6 | 1932.5 |
| 147.5° | 1956.8 | 1952.1 | 1979.7 | 1987.8 | 1981.5 |
| 150°   | 2009.1 | 1997.8 | 2023.9 | 2033.5 | 2025.4 |
| 152.5° | 2053.1 | 2040.1 | 2064.6 | 2074.4 | 2063.0 |
| 155°   | 2095.6 | 2081.0 | 2100.5 | 2110.2 | 2097.3 |
| 157.5° | 2129.8 | 2116.8 | 2131.5 | 2143.0 | 2129.8 |
| 160°   | 2159.3 | 2149.4 | 2159.3 | 2168.9 | 2157.5 |
| 162.5° | 2185.2 | 2175.5 | 2183.6 | 2195.1 | 2180.4 |
| 165°   | 2208.0 | 2198.4 | 2203.2 | 2214.6 | 2203.2 |
| 167.5° | 2226.1 | 2216.1 | 2221.2 | 2232.6 | 2218.0 |
| 170°   | 2240.8 | 2230.9 | 2234.2 | 2245.6 | 2230.9 |
| 172.5° | 2250.5 | 2240.8 | 2244.1 | 2255.4 | 2240.8 |
| 175°   | 2258.6 | 2247.1 | 2250.5 | 2261.8 | 2245.6 |
| 177.5° | 2261.8 | 2250.5 | 2252.2 | 2263.7 | 2248.9 |
| 180°   | 2253.7 | 2253.7 | 2253.7 | 2253.7 | 2253.7 |

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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 | 13.73            | 14.71 | 14.54 | 15.54 | 16.56 | 9.69           | 10.67 | 10.50 | 11.50 | 12.52 |
|                 | 3H   | 15.42            | 16.30 | 16.24 | 17.14 | 18.19 | 10.89          | 11.77 | 11.71 | 12.61 | 13.66 |
|                 | 4H   | 16.04            | 16.87 | 16.88 | 17.71 | 18.77 | 11.35          | 12.18 | 12.19 | 13.02 | 14.08 |
|                 | 6H   | 16.47            | 17.24 | 17.32 | 18.09 | 19.16 | 11.68          | 12.44 | 12.53 | 13.29 | 14.37 |
|                 | 8H   | 16.60            | 17.33 | 17.47 | 18.20 | 19.28 | 11.77          | 12.50 | 12.63 | 13.37 | 14.44 |
|                 | 12H  | 16.67            | 17.37 | 17.54 | 18.23 | 19.33 | 11.82          | 12.51 | 12.69 | 13.38 | 14.48 |
| 4H              | 2H   | 13.76            | 14.59 | 14.61 | 15.44 | 16.50 | 10.30          | 11.13 | 11.15 | 11.98 | 13.04 |
|                 | 3H   | 15.61            | 16.30 | 16.47 | 17.18 | 18.25 | 11.67          | 12.36 | 12.53 | 13.24 | 14.31 |
|                 | 4H   | 16.31            | 16.94 | 17.18 | 17.81 | 18.92 | 12.22          | 12.85 | 13.09 | 13.73 | 14.83 |
|                 | 6H   | 16.84            | 17.38 | 17.73 | 18.28 | 19.39 | 12.65          | 13.19 | 13.54 | 14.09 | 15.20 |
|                 | 8H   | 17.02            | 17.52 | 17.91 | 18.42 | 19.54 | 12.78          | 13.29 | 13.67 | 14.18 | 15.30 |
|                 | 12H  | 17.13            | 17.58 | 18.03 | 18.49 | 19.62 | 12.86          | 13.31 | 13.76 | 14.22 | 15.35 |
| 8H              | 4H   | 16.29            | 16.80 | 17.18 | 17.69 | 18.81 | 12.52          | 13.02 | 13.40 | 13.92 | 15.03 |
|                 | 6H   | 16.87            | 17.28 | 17.78 | 18.22 | 19.34 | 13.04          | 13.46 | 13.96 | 14.40 | 15.51 |
|                 | 8H   | 17.09            | 17.46 | 18.01 | 18.39 | 19.52 | 13.24          | 13.60 | 14.16 | 14.53 | 15.67 |
|                 | 12H  | 17.24            | 17.56 | 18.16 | 18.48 | 19.67 | 13.36          | 13.69 | 14.29 | 14.61 | 15.80 |
| 12H             | 4H   | 16.25            | 16.70 | 17.16 | 17.62 | 18.74 | 12.53          | 12.98 | 13.44 | 13.90 | 15.02 |
|                 | 6H   | 16.84            | 17.21 | 17.77 | 18.14 | 19.28 | 13.09          | 13.46 | 14.02 | 14.39 | 15.53 |
|                 | 8H   | 17.07            | 17.40 | 18.00 | 18.32 | 19.51 | 13.31          | 13.64 | 14.24 | 14.56 | 15.75 |

END OF REPORT