

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: P904014

Luminaire Tested: DFN2DIP-SQ4F0-080D070US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904014  
REPORT IS A COMBINATION OF REPORTS P900082 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-080D070US830-RLLFLL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

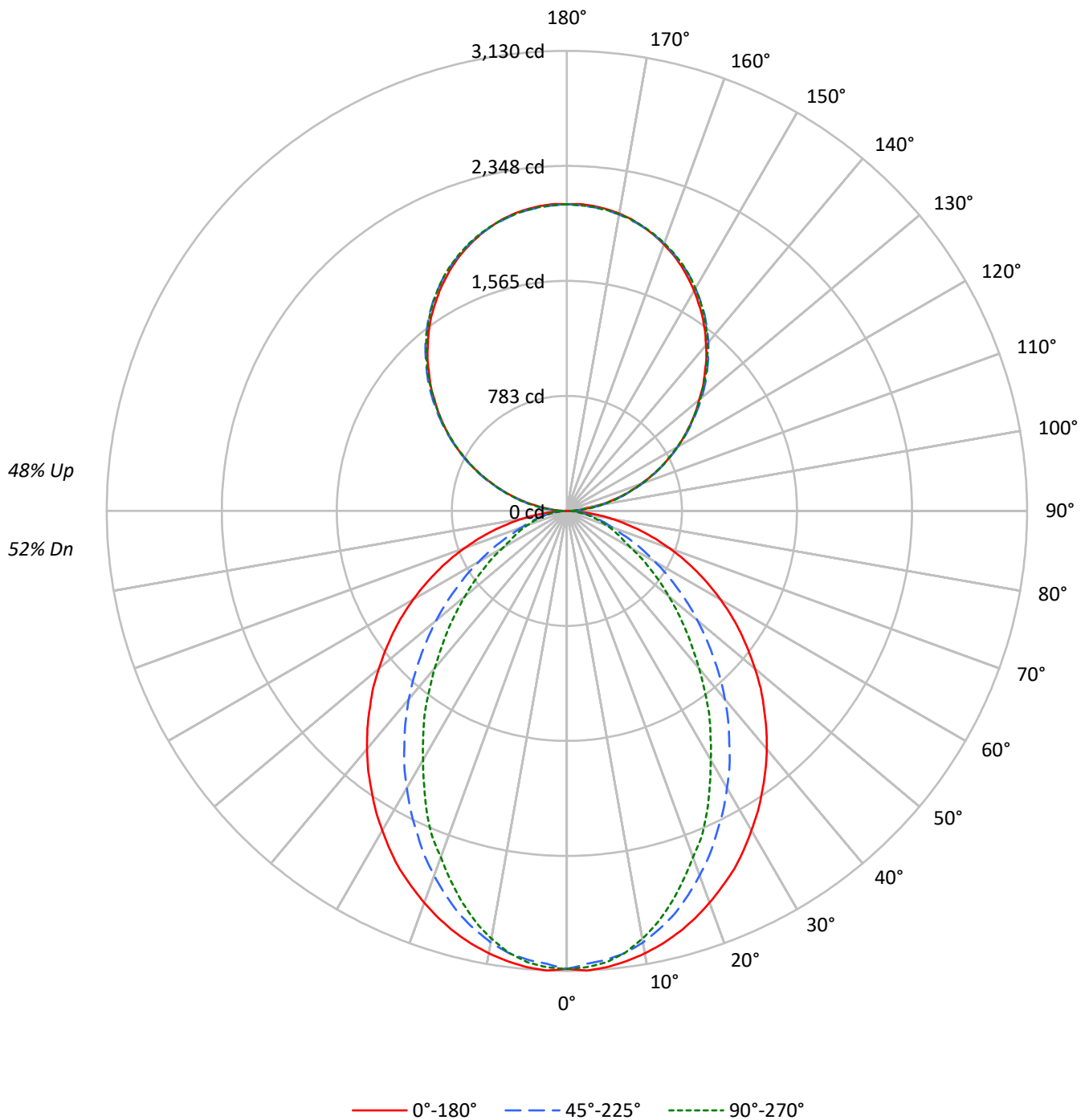
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12248.4 lumens  
Efficiency: N/A  
Efficacy: 99.1 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: General Diffuse  
  
Input Watts (W): 123.6  
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



TEST NUMBER: P904014

CATALOG NUMBER: DFN2DIP-SQ4F0-080D070US830-RLFL

**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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 58 | 58 | 58 |
| 1   | 99  | 95  | 91  | 88  | 91  | 88  | 85  | 82  | 75 | 73 | 71 | 63 | 62 | 60 | 52 | 51 | 50 |
| 2   | 90  | 83  | 77  | 72  | 83  | 77  | 72  | 68  | 66 | 63 | 59 | 56 | 53 | 51 | 47 | 45 | 43 |
| 3   | 83  | 74  | 67  | 61  | 76  | 69  | 62  | 57  | 59 | 54 | 50 | 50 | 47 | 44 | 42 | 39 | 37 |
| 4   | 76  | 66  | 58  | 52  | 70  | 61  | 54  | 49  | 53 | 48 | 43 | 45 | 41 | 38 | 38 | 35 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 47 | 42 | 38 | 41 | 36 | 33 | 34 | 31 | 29 |
| 6   | 65  | 53  | 45  | 39  | 60  | 49  | 42  | 37  | 43 | 37 | 33 | 37 | 33 | 29 | 31 | 28 | 25 |
| 7   | 60  | 48  | 40  | 35  | 55  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 29 | 26 | 29 | 25 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 29  | 36 | 30 | 26 | 31 | 27 | 23 | 26 | 23 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 26  | 33 | 28 | 24 | 29 | 24 | 21 | 24 | 21 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 30 | 25 | 22 | 26 | 22 | 19 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2187 | 2187 | 2187 |
| 5°  | 2190 | 2152 | 2166 |
| 10° | 2168 | 2111 | 2097 |
| 15° | 2139 | 2041 | 1988 |
| 20° | 2099 | 1946 | 1855 |
| 25° | 2059 | 1838 | 1726 |
| 30° | 2004 | 1728 | 1563 |
| 35° | 1951 | 1609 | 1419 |
| 40° | 1897 | 1487 | 1254 |
| 45° | 1834 | 1351 | 1105 |
| 50° | 1769 | 1213 | 959  |
| 55° | 1701 | 1066 | 819  |
| 60° | 1622 | 913  | 675  |
| 65° | 1532 | 756  | 608  |
| 70° | 1422 | 611  | 551  |
| 75° | 1284 | 539  | 503  |
| 80° | 1085 | 454  | 438  |
| 85° | 755  | 305  | 333  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1834 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 292.1   | 2.4       |
| 10°-20°   | 801.8   | 6.5       |
| 20°-30°   | 1125.7  | 9.2       |
| 30°-40°   | 1227.1  | 10.0      |
| 40°-50°   | 1127.8  | 9.2       |
| 50°-60°   | 885.7   | 7.2       |
| 60°-70°   | 576.5   | 4.7       |
| 70°-80°   | 296.8   | 2.4       |
| 80°-90°   | 81.7    | 0.7       |
| 90°-100°  | 129.1   | 1.1       |
| 100°-110° | 410.3   | 3.3       |
| 110°-120° | 702.1   | 5.7       |
| 120°-130° | 923.3   | 7.5       |
| 130°-140° | 1036.4  | 8.5       |
| 140°-150° | 1016.3  | 8.3       |
| 150°-160° | 852.6   | 7.0       |
| 160°-170° | 565.4   | 4.6       |
| 170°-180° | 197.6   | 1.6       |
| 0°-30°    | 2219.6  | 18.1      |
| 0°-40°    | 3446.7  | 28.1      |
| 0°-60°    | 5460.2  | 44.6      |
| 0°-90°    | 6415.2  | 52.4      |
| 90°-120°  | 1241.5  | 10.1      |
| 90°-150°  | 4217.6  | 34.4      |
| 90°-180°  | 5833.0  | 47.6      |
| 0°-180°   | 12248.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3116 | 3116  | 3116 | 3116  | 3116 |      |
| 5°   | 3116 | 3102  | 3066 | 3091  | 3083 | 296  |
| 15°  | 2964 | 2933  | 2837 | 2784  | 2756 | 835  |
| 25°  | 2691 | 2600  | 2414 | 2299  | 2256 | 1237 |
| 35°  | 2318 | 2174  | 1926 | 1749  | 1686 | 1451 |
| 45°  | 1895 | 1706  | 1410 | 1210  | 1142 | 1464 |
| 55°  | 1441 | 1221  | 916  | 747   | 694  | 1288 |
| 65°  | 973  | 744   | 491  | 395   | 386  | 965  |
| 75°  | 519  | 321   | 226  | 206   | 203  | 549  |
| 85°  | 121  | 62    | 54   | 54    | 54   | 139  |
| 90°  | 2    | 23    | 62   | 58    | 60   | 12   |
| 95°  | 92   | 109   | 113  | 113   | 109  | 102  |
| 105° | 379  | 384   | 388  | 391   | 391  | 400  |
| 115° | 705  | 715   | 712  | 710   | 705  | 697  |
| 125° | 1025 | 1040  | 1036 | 1030  | 1028 | 916  |
| 135° | 1326 | 1345  | 1349 | 1347  | 1342 | 1025 |
| 145° | 1609 | 1622  | 1632 | 1634  | 1627 | 1005 |
| 155° | 1840 | 1845  | 1851 | 1860  | 1854 | 847  |
| 165° | 2002 | 2000  | 2000 | 2012  | 2004 | 565  |
| 175° | 2083 | 2078  | 2074 | 2087  | 2076 | 198  |
| 180° | 2087 | 2087  | 2087 | 2087  | 2087 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3116.4 | 3116.4 | 3116.4 | 3116.4 | 3116.4 |
| 2.5°   | 3130.5 | 3116.4 | 3085.3 | 3113.7 | 3108.0 |
| 5°     | 3116.4 | 3102.4 | 3065.5 | 3091.0 | 3082.6 |
| 7.5°   | 3091.0 | 3074.2 | 3034.7 | 3045.8 | 3031.7 |
| 10°    | 3057.1 | 3037.4 | 2981.2 | 2972.5 | 2955.7 |
| 12.5°  | 3015.0 | 2989.6 | 2913.2 | 2896.4 | 2865.3 |
| 15°    | 2964.1 | 2933.0 | 2837.2 | 2783.7 | 2755.5 |
| 17.5°  | 2904.8 | 2859.7 | 2741.2 | 2679.3 | 2634.0 |
| 20°    | 2837.2 | 2780.7 | 2639.8 | 2569.5 | 2507.2 |
| 22.5°  | 2763.9 | 2699.0 | 2535.3 | 2439.6 | 2397.4 |
| 25°    | 2690.6 | 2600.3 | 2414.1 | 2298.7 | 2256.2 |
| 27.5°  | 2603.2 | 2507.2 | 2301.3 | 2168.8 | 2103.8 |
| 30°    | 2510.2 | 2402.7 | 2177.2 | 2033.5 | 1957.2 |
| 32.5°  | 2419.8 | 2290.0 | 2059.0 | 1889.6 | 1819.0 |
| 35°    | 2318.4 | 2174.4 | 1926.4 | 1748.7 | 1686.4 |
| 37.5°  | 2219.6 | 2064.4 | 1802.2 | 1607.4 | 1537.1 |
| 40°    | 2115.3 | 1946.2 | 1672.4 | 1472.2 | 1398.8 |
| 42.5°  | 2008.1 | 1827.7 | 1542.8 | 1334.0 | 1263.6 |
| 45°    | 1895.3 | 1706.2 | 1410.2 | 1209.8 | 1142.2 |
| 47.5°  | 1788.2 | 1588.0 | 1283.4 | 1082.9 | 1021.0 |
| 50°    | 1669.6 | 1469.5 | 1159.2 | 964.4  | 905.4  |
| 52.5°  | 1553.9 | 1342.3 | 1040.7 | 854.6  | 801.1  |
| 55°    | 1441.1 | 1221.2 | 916.5  | 747.4  | 693.9  |
| 57.5°  | 1325.6 | 1099.9 | 806.7  | 648.8  | 603.5  |
| 60°    | 1207.0 | 981.5  | 690.9  | 547.2  | 502.1  |
| 62.5°  | 1091.6 | 865.9  | 592.2  | 456.9  | 434.5  |
| 65°    | 973.1  | 744.4  | 490.7  | 395.0  | 386.3  |
| 67.5°  | 860.3  | 631.7  | 395.0  | 346.8  | 338.5  |
| 70°    | 741.8  | 521.9  | 327.1  | 298.9  | 287.6  |
| 72.5°  | 629.0  | 420.1  | 273.5  | 251.1  | 245.3  |
| 75°    | 518.9  | 321.4  | 225.6  | 205.9  | 203.2  |
| 77.5°  | 409.1  | 228.3  | 177.8  | 166.4  | 160.7  |
| 80°    | 307.3  | 163.7  | 135.3  | 124.1  | 124.1  |
| 82.5°  | 214.2  | 110.1  | 93.0   | 87.4   | 87.4   |
| 85°    | 121.2  | 61.9   | 53.5   | 53.5   | 53.5   |
| 87.5°  | 45.1   | 22.4   | 22.4   | 19.8   | 19.8   |
| 90°    | 1.9    | 22.6   | 61.6   | 57.9   | 59.8   |
| 92.5°  | 39.0   | 52.9   | 54.8   | 56.6   | 56.6   |
| 95°    | 91.8   | 109.4  | 112.6  | 112.6  | 109.4  |
| 97.5°  | 152.9  | 169.2  | 176.2  | 176.2  | 176.2  |
| 100°   | 223.3  | 237.8  | 242.8  | 242.8  | 240.9  |
| 102.5° | 297.6  | 308.2  | 315.2  | 317.1  | 315.2  |
| 105°   | 378.7  | 383.7  | 387.5  | 390.7  | 390.7  |
| 107.5° | 459.2  | 466.7  | 466.7  | 468.1  | 459.2  |
| 110°   | 537.2  | 547.3  | 547.3  | 547.3  | 542.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 621.5  | 632.3  | 630.4  | 625.3  | 621.5  |
| 115°   | 704.6  | 714.6  | 711.5  | 709.6  | 704.6  |
| 117.5° | 786.9  | 800.8  | 792.0  | 786.9  | 781.9  |
| 120°   | 870.0  | 883.8  | 870.0  | 870.0  | 864.3  |
| 122.5° | 945.5  | 963.1  | 954.3  | 949.2  | 945.5  |
| 125°   | 1024.7 | 1040.5 | 1035.5 | 1029.8 | 1027.9 |
| 127.5° | 1102.1 | 1121.6 | 1114.7 | 1107.2 | 1102.1 |
| 130°   | 1174.5 | 1197.1 | 1194.0 | 1190.2 | 1183.3 |
| 132.5° | 1255.7 | 1273.3 | 1274.5 | 1265.7 | 1260.7 |
| 135°   | 1325.5 | 1344.9 | 1348.8 | 1346.8 | 1341.8 |
| 137.5° | 1403.4 | 1419.2 | 1422.3 | 1421.1 | 1413.5 |
| 140°   | 1472.1 | 1487.8 | 1496.6 | 1496.6 | 1489.7 |
| 142.5° | 1542.5 | 1558.2 | 1563.2 | 1565.1 | 1558.2 |
| 145°   | 1609.2 | 1621.7 | 1631.8 | 1633.7 | 1626.8 |
| 147.5° | 1669.0 | 1684.7 | 1692.2 | 1695.4 | 1688.5 |
| 150°   | 1730.6 | 1741.3 | 1748.2 | 1753.9 | 1748.2 |
| 152.5° | 1785.3 | 1796.0 | 1804.8 | 1811.8 | 1804.8 |
| 155°   | 1840.0 | 1845.0 | 1850.8 | 1859.5 | 1853.9 |
| 157.5° | 1887.3 | 1891.0 | 1894.1 | 1906.8 | 1897.9 |
| 160°   | 1929.4 | 1933.2 | 1935.0 | 1945.7 | 1938.1 |
| 162.5° | 1968.4 | 1968.4 | 1970.3 | 1982.2 | 1973.4 |
| 165°   | 2001.7 | 1999.8 | 1999.8 | 2012.4 | 2003.6 |
| 167.5° | 2031.9 | 2026.3 | 2026.3 | 2038.8 | 2030.0 |
| 170°   | 2054.6 | 2049.6 | 2047.7 | 2060.2 | 2049.6 |
| 172.5° | 2070.3 | 2065.2 | 2063.3 | 2075.9 | 2065.2 |
| 175°   | 2082.8 | 2077.8 | 2074.1 | 2086.6 | 2075.9 |
| 177.5° | 2089.8 | 2084.7 | 2080.9 | 2091.7 | 2080.9 |
| 180°   | 2086.6 | 2086.6 | 2086.6 | 2086.6 | 2086.6 |

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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 | 10.10            | 10.95 | 11.04 | 11.90 | 13.14 | 6.06           | 6.91 | 7.00  | 7.86  | 9.10  |
|                 | 3H   | 11.78            | 12.54 | 12.73 | 13.50 | 14.77 | 7.25           | 8.01 | 8.20  | 8.97  | 10.24 |
|                 | 4H   | 12.39            | 13.11 | 13.36 | 14.08 | 15.35 | 7.70           | 8.42 | 8.67  | 9.39  | 10.66 |
|                 | 6H   | 12.82            | 13.48 | 13.80 | 14.45 | 15.74 | 8.02           | 8.68 | 9.00  | 9.66  | 10.94 |
|                 | 8H   | 12.95            | 13.58 | 13.93 | 14.57 | 15.85 | 8.11           | 8.74 | 9.10  | 9.73  | 11.01 |
|                 | 12H  | 13.01            | 13.61 | 14.00 | 14.59 | 15.90 | 8.16           | 8.76 | 9.15  | 9.74  | 11.05 |
| 4H              | 2H   | 10.12            | 10.83 | 11.09 | 11.80 | 13.08 | 6.66           | 7.38 | 7.63  | 8.34  | 9.62  |
|                 | 3H   | 11.95            | 12.55 | 12.94 | 13.55 | 14.83 | 8.01           | 8.61 | 8.99  | 9.61  | 10.89 |
|                 | 4H   | 12.65            | 13.19 | 13.64 | 14.19 | 15.50 | 8.56           | 9.10 | 9.55  | 10.10 | 11.41 |
|                 | 6H   | 13.17            | 13.64 | 14.17 | 14.65 | 15.96 | 8.98           | 9.45 | 9.99  | 10.46 | 11.77 |
|                 | 8H   | 13.35            | 13.79 | 14.35 | 14.79 | 16.11 | 9.11           | 9.55 | 10.12 | 10.56 | 11.88 |
|                 | 12H  | 13.45            | 13.84 | 14.47 | 14.86 | 16.19 | 9.18           | 9.57 | 10.20 | 10.60 | 11.92 |
| 8H              | 4H   | 12.62            | 13.06 | 13.62 | 14.06 | 15.39 | 8.84           | 9.28 | 9.85  | 10.29 | 11.61 |
|                 | 6H   | 13.19            | 13.55 | 14.22 | 14.60 | 15.92 | 9.36           | 9.73 | 10.39 | 10.78 | 12.10 |
|                 | 8H   | 13.41            | 13.73 | 14.45 | 14.76 | 16.10 | 9.56           | 9.87 | 10.59 | 10.91 | 12.25 |
|                 | 12H  | 13.55            | 13.83 | 14.59 | 14.86 | 16.25 | 9.68           | 9.96 | 10.72 | 10.99 | 12.37 |
| 12H             | 4H   | 12.57            | 12.97 | 13.60 | 13.99 | 15.32 | 8.85           | 9.25 | 9.87  | 10.27 | 11.60 |
|                 | 6H   | 13.17            | 13.48 | 14.20 | 14.52 | 15.86 | 9.41           | 9.73 | 10.45 | 10.77 | 12.11 |
|                 | 8H   | 13.39            | 13.67 | 14.43 | 14.70 | 16.08 | 9.63           | 9.91 | 10.67 | 10.94 | 12.32 |

END OF REPORT