

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: P913695

Luminaire Tested: DFN2DIP-HX4F0-090D070US927-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913695  
REPORT IS A COMBINATION OF REPORTS P899364 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-090D070US927-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

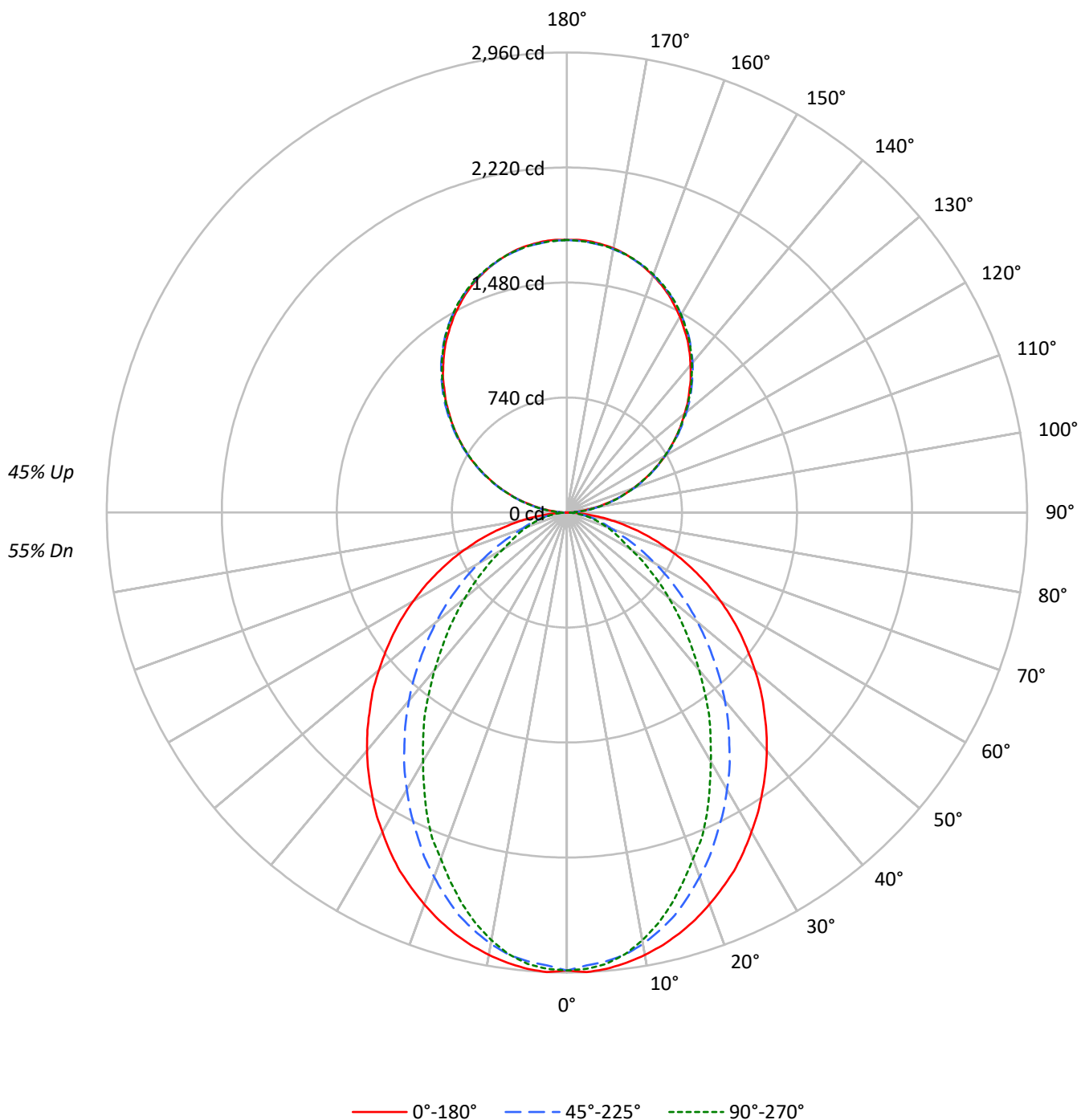
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10967.8 lumens  
Efficiency: N/A  
Efficacy: 85.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 128.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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: P913695

CATALOG NUMBER: DFN2DIP-HX4F0-090D070US927-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 | 101 | 101 | 101 | 101 | 86 | 86 | 86 | 73 | 73 | 73 | 61 | 61 | 61 |
| 1   | 99  | 95  | 92  | 88  | 92  | 89  | 86  | 83  | 76 | 74 | 72 | 65 | 63 | 62 | 55 | 54 | 53 |
| 2   | 91  | 84  | 78  | 73  | 84  | 78  | 73  | 69  | 68 | 64 | 60 | 58 | 55 | 53 | 49 | 47 | 45 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 60 | 55 | 51 | 52 | 48 | 45 | 44 | 41 | 39 |
| 4   | 77  | 66  | 58  | 52  | 71  | 62  | 55  | 50  | 54 | 49 | 44 | 46 | 42 | 39 | 39 | 36 | 34 |
| 5   | 71  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 43 | 39 | 42 | 38 | 34 | 36 | 33 | 30 |
| 6   | 65  | 53  | 45  | 40  | 60  | 50  | 43  | 38  | 44 | 38 | 34 | 38 | 34 | 30 | 33 | 29 | 27 |
| 7   | 60  | 48  | 41  | 35  | 56  | 45  | 38  | 33  | 40 | 34 | 30 | 35 | 30 | 27 | 30 | 27 | 24 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 35  | 30  | 37 | 31 | 27 | 32 | 28 | 24 | 28 | 24 | 22 |
| 9   | 52  | 40  | 33  | 28  | 49  | 38  | 31  | 27  | 34 | 28 | 24 | 30 | 25 | 22 | 26 | 22 | 20 |
| 10  | 49  | 37  | 30  | 25  | 46  | 35  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 20 | 24 | 20 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2191 | 2191 | 2191 |
| 5°  | 2195 | 2156 | 2170 |
| 10° | 2173 | 2114 | 2100 |
| 15° | 2143 | 2045 | 1991 |
| 20° | 2104 | 1949 | 1857 |
| 25° | 2064 | 1841 | 1727 |
| 30° | 2009 | 1730 | 1563 |
| 35° | 1956 | 1611 | 1419 |
| 40° | 1902 | 1488 | 1254 |
| 45° | 1840 | 1352 | 1104 |
| 50° | 1774 | 1214 | 958  |
| 55° | 1707 | 1067 | 818  |
| 60° | 1628 | 913  | 673  |
| 65° | 1538 | 756  | 606  |
| 70° | 1429 | 610  | 549  |
| 75° | 1292 | 538  | 499  |
| 80° | 1093 | 452  | 433  |
| 85° | 763  | 303  | 326  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1840 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 276.2   | 2.5       |
| 10°-20°   | 758.1   | 6.9       |
| 20°-30°   | 1064.4  | 9.7       |
| 30°-40°   | 1160.3  | 10.6      |
| 40°-50°   | 1066.4  | 9.7       |
| 50°-60°   | 837.5   | 7.6       |
| 60°-70°   | 545.1   | 5.0       |
| 70°-80°   | 280.6   | 2.6       |
| 80°-90°   | 76.6    | 0.7       |
| 90°-100°  | 108.5   | 1.0       |
| 100°-110° | 344.8   | 3.1       |
| 110°-120° | 590.1   | 5.4       |
| 120°-130° | 776.1   | 7.1       |
| 130°-140° | 871.1   | 7.9       |
| 140°-150° | 854.2   | 7.8       |
| 150°-160° | 716.6   | 6.5       |
| 160°-170° | 475.2   | 4.3       |
| 170°-180° | 166.1   | 1.5       |
| 0°-30°    | 2098.7  | 19.1      |
| 0°-40°    | 3258.9  | 29.7      |
| 0°-60°    | 5162.8  | 47.1      |
| 0°-90°    | 6065.2  | 55.3      |
| 90°-120°  | 1043.4  | 9.5       |
| 90°-150°  | 3544.8  | 32.3      |
| 90°-180°  | 4903.0  | 44.7      |
| 0°-180°   | 10967.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2947 | 2947  | 2947 | 2947  | 2947 |      |
| 5°   | 2947 | 2933  | 2899 | 2923  | 2915 | 279  |
| 15°  | 2803 | 2773  | 2683 | 2632  | 2606 | 790  |
| 25°  | 2544 | 2459  | 2283 | 2173  | 2133 | 1170 |
| 35°  | 2192 | 2056  | 1822 | 1653  | 1595 | 1372 |
| 45°  | 1792 | 1613  | 1333 | 1144  | 1080 | 1384 |
| 55°  | 1363 | 1155  | 867  | 707   | 656  | 1218 |
| 65°  | 920  | 704   | 464  | 373   | 365  | 912  |
| 75°  | 491  | 304   | 213  | 195   | 192  | 519  |
| 85°  | 114  | 58    | 51   | 51    | 51   | 132  |
| 90°  | 2    | 19    | 52   | 49    | 50   | 11   |
| 95°  | 77   | 92    | 95   | 95    | 92   | 86   |
| 105° | 318  | 322   | 326  | 328   | 328  | 336  |
| 115° | 592  | 601   | 598  | 596   | 592  | 586  |
| 125° | 861  | 874   | 870  | 866   | 864  | 770  |
| 135° | 1114 | 1130  | 1134 | 1132  | 1128 | 861  |
| 145° | 1352 | 1363  | 1372 | 1373  | 1367 | 845  |
| 155° | 1546 | 1551  | 1556 | 1563  | 1558 | 712  |
| 165° | 1682 | 1681  | 1681 | 1691  | 1684 | 475  |
| 175° | 1751 | 1746  | 1743 | 1754  | 1745 | 166  |
| 180° | 1754 | 1754  | 1754 | 1754  | 1754 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2946.7 | 2946.7 | 2946.7 | 2946.7 | 2946.7 |
| 2.5°   | 2960.0 | 2946.7 | 2917.2 | 2944.1 | 2938.8 |
| 5°     | 2946.7 | 2933.4 | 2898.6 | 2922.6 | 2914.7 |
| 7.5°   | 2922.6 | 2906.8 | 2869.4 | 2879.9 | 2866.6 |
| 10°    | 2890.7 | 2872.0 | 2818.8 | 2810.6 | 2794.7 |
| 12.5°  | 2850.7 | 2826.7 | 2754.6 | 2738.7 | 2709.3 |
| 15°    | 2802.7 | 2773.3 | 2682.7 | 2632.0 | 2605.5 |
| 17.5°  | 2746.7 | 2704.0 | 2591.9 | 2533.3 | 2490.6 |
| 20°    | 2682.7 | 2629.2 | 2495.9 | 2429.5 | 2370.6 |
| 22.5°  | 2613.4 | 2552.0 | 2397.2 | 2306.7 | 2266.8 |
| 25°    | 2544.1 | 2458.6 | 2282.7 | 2173.4 | 2133.3 |
| 27.5°  | 2461.5 | 2370.6 | 2176.0 | 2050.6 | 1989.2 |
| 30°    | 2373.5 | 2271.9 | 2058.6 | 1922.8 | 1850.6 |
| 32.5°  | 2288.0 | 2165.2 | 1946.8 | 1786.7 | 1719.9 |
| 35°    | 2192.1 | 2056.0 | 1821.5 | 1653.4 | 1594.6 |
| 37.5°  | 2098.7 | 1951.9 | 1704.1 | 1519.9 | 1453.4 |
| 40°    | 2000.0 | 1840.2 | 1581.3 | 1392.0 | 1322.7 |
| 42.5°  | 1898.7 | 1728.1 | 1458.7 | 1261.3 | 1194.8 |
| 45°    | 1792.1 | 1613.3 | 1333.4 | 1143.8 | 1079.9 |
| 47.5°  | 1690.8 | 1501.5 | 1213.5 | 1023.9 | 965.4  |
| 50°    | 1578.7 | 1389.4 | 1096.1 | 911.9  | 856.1  |
| 52.5°  | 1469.3 | 1269.2 | 984.0  | 808.0  | 757.4  |
| 55°    | 1362.6 | 1154.6 | 866.6  | 706.8  | 656.1  |
| 57.5°  | 1253.4 | 1040.1 | 762.8  | 613.4  | 570.7  |
| 60°    | 1141.3 | 928.0  | 653.3  | 517.5  | 474.8  |
| 62.5°  | 1032.1 | 818.8  | 559.9  | 432.1  | 410.8  |
| 65°    | 920.0  | 703.9  | 464.0  | 373.4  | 365.3  |
| 67.5°  | 813.4  | 597.2  | 373.4  | 327.9  | 320.0  |
| 70°    | 701.4  | 493.4  | 309.3  | 282.7  | 271.9  |
| 72.5°  | 594.7  | 397.2  | 258.6  | 237.3  | 232.0  |
| 75°    | 490.6  | 303.9  | 213.3  | 194.6  | 192.1  |
| 77.5°  | 386.7  | 215.9  | 168.0  | 157.3  | 151.9  |
| 80°    | 290.6  | 154.8  | 127.9  | 117.4  | 117.4  |
| 82.5°  | 202.6  | 104.1  | 88.0   | 82.6   | 82.6   |
| 85°    | 114.5  | 58.5   | 50.6   | 50.6   | 50.6   |
| 87.5°  | 42.7   | 21.2   | 21.2   | 18.7   | 18.7   |
| 90°    | 1.6    | 19.0   | 51.8   | 48.6   | 50.2   |
| 92.5°  | 32.8   | 44.4   | 46.0   | 47.6   | 47.6   |
| 95°    | 77.2   | 92.0   | 94.7   | 94.7   | 92.0   |
| 97.5°  | 128.5  | 142.2  | 148.1  | 148.1  | 148.1  |
| 100°   | 187.7  | 199.9  | 204.1  | 204.1  | 202.5  |
| 102.5° | 250.1  | 259.0  | 264.9  | 266.5  | 264.9  |
| 105°   | 318.3  | 322.5  | 325.7  | 328.4  | 328.4  |
| 107.5° | 386.0  | 392.3  | 392.3  | 393.4  | 386.0  |
| 110°   | 451.5  | 460.0  | 460.0  | 460.0  | 455.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 522.4  | 531.4  | 529.8  | 525.5  | 522.4  |
| 115°   | 592.2  | 600.6  | 598.0  | 596.4  | 592.2  |
| 117.5° | 661.4  | 673.0  | 665.7  | 661.4  | 657.2  |
| 120°   | 731.2  | 742.8  | 731.2  | 731.2  | 726.4  |
| 122.5° | 794.6  | 809.5  | 802.1  | 797.8  | 794.6  |
| 125°   | 861.3  | 874.5  | 870.3  | 865.5  | 864.0  |
| 127.5° | 926.3  | 942.7  | 936.9  | 930.6  | 926.3  |
| 130°   | 987.1  | 1006.1 | 1003.5 | 1000.4 | 994.5  |
| 132.5° | 1055.3 | 1070.2 | 1071.2 | 1063.8 | 1059.5 |
| 135°   | 1114.0 | 1130.4 | 1133.6 | 1131.9 | 1127.7 |
| 137.5° | 1179.6 | 1192.8 | 1195.4 | 1194.4 | 1188.0 |
| 140°   | 1237.2 | 1250.5 | 1257.8 | 1257.8 | 1252.0 |
| 142.5° | 1296.4 | 1309.6 | 1313.8 | 1315.4 | 1309.6 |
| 145°   | 1352.5 | 1363.0 | 1371.5 | 1373.1 | 1367.3 |
| 147.5° | 1402.7 | 1415.9 | 1422.3 | 1424.9 | 1419.1 |
| 150°   | 1454.5 | 1463.5 | 1469.3 | 1474.1 | 1469.3 |
| 152.5° | 1500.5 | 1509.5 | 1516.9 | 1522.7 | 1516.9 |
| 155°   | 1546.5 | 1550.7 | 1555.5 | 1562.9 | 1558.1 |
| 157.5° | 1586.2 | 1589.4 | 1592.0 | 1602.6 | 1595.1 |
| 160°   | 1621.6 | 1624.8 | 1626.3 | 1635.3 | 1629.0 |
| 162.5° | 1654.4 | 1654.4 | 1656.0 | 1666.0 | 1658.6 |
| 165°   | 1682.4 | 1680.8 | 1680.8 | 1691.4 | 1683.9 |
| 167.5° | 1707.8 | 1703.0 | 1703.0 | 1713.6 | 1706.2 |
| 170°   | 1726.8 | 1722.6 | 1721.0 | 1731.5 | 1722.6 |
| 172.5° | 1740.0 | 1735.7 | 1734.2 | 1744.8 | 1735.7 |
| 175°   | 1750.6 | 1746.4 | 1743.2 | 1753.7 | 1744.8 |
| 177.5° | 1756.4 | 1752.1 | 1749.0 | 1758.0 | 1749.0 |
| 180°   | 1753.7 | 1753.7 | 1753.7 | 1753.7 | 1753.7 |

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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 | 10.35            | 11.23 | 11.27 | 12.16 | 13.36 | 6.33           | 7.20  | 7.24  | 8.13  | 9.33  |
|                 | 3H   | 12.04            | 12.82 | 12.96 | 13.76 | 14.98 | 7.52           | 8.30  | 8.45  | 9.24  | 10.46 |
|                 | 4H   | 12.65            | 13.39 | 13.59 | 14.33 | 15.56 | 7.97           | 8.71  | 8.92  | 9.66  | 10.89 |
|                 | 6H   | 13.07            | 13.75 | 14.03 | 14.70 | 15.95 | 8.30           | 8.98  | 9.25  | 9.93  | 11.17 |
|                 | 8H   | 13.20            | 13.85 | 14.16 | 14.81 | 16.06 | 8.39           | 9.04  | 9.35  | 10.01 | 11.25 |
|                 | 12H  | 13.26            | 13.88 | 14.23 | 14.84 | 16.11 | 8.44           | 9.05  | 9.40  | 10.01 | 11.28 |
| 4H              | 2H   | 10.38            | 11.12 | 11.33 | 12.06 | 13.29 | 6.93           | 7.67  | 7.88  | 8.61  | 9.84  |
|                 | 3H   | 12.21            | 12.83 | 13.17 | 13.80 | 15.05 | 8.28           | 8.90  | 9.24  | 9.87  | 11.12 |
|                 | 4H   | 12.91            | 13.47 | 13.88 | 14.44 | 15.71 | 8.84           | 9.40  | 9.80  | 10.37 | 11.63 |
|                 | 6H   | 13.43            | 13.91 | 14.41 | 14.90 | 16.17 | 9.26           | 9.74  | 10.24 | 10.73 | 12.00 |
|                 | 8H   | 13.60            | 14.05 | 14.58 | 15.04 | 16.32 | 9.39           | 9.84  | 10.37 | 10.83 | 12.11 |
|                 | 12H  | 13.70            | 14.11 | 14.70 | 15.11 | 16.39 | 9.46           | 9.86  | 10.46 | 10.87 | 12.15 |
| 8H              | 4H   | 12.88            | 13.33 | 13.86 | 14.31 | 15.60 | 9.12           | 9.57  | 10.10 | 10.56 | 11.84 |
|                 | 6H   | 13.45            | 13.82 | 14.45 | 14.85 | 16.13 | 9.64           | 10.01 | 10.65 | 11.04 | 12.32 |
|                 | 8H   | 13.66            | 13.99 | 14.68 | 15.01 | 16.31 | 9.83           | 10.16 | 10.85 | 11.18 | 12.48 |
|                 | 12H  | 13.81            | 14.09 | 14.82 | 15.10 | 16.45 | 9.96           | 10.25 | 10.98 | 11.25 | 12.60 |
| 12H             | 4H   | 12.83            | 13.24 | 13.83 | 14.24 | 15.53 | 9.13           | 9.53  | 10.13 | 10.54 | 11.82 |
|                 | 6H   | 13.42            | 13.75 | 14.44 | 14.77 | 16.07 | 9.69           | 10.02 | 10.71 | 11.04 | 12.33 |
|                 | 8H   | 13.65            | 13.94 | 14.67 | 14.94 | 16.29 | 9.91           | 10.19 | 10.92 | 11.20 | 12.55 |

END OF REPORT