

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: P921859

Luminaire Tested: DFN2DIP-HX4F0-080D060US940-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921859  
REPORT IS A COMBINATION OF REPORTS P899344 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-080D060US940-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

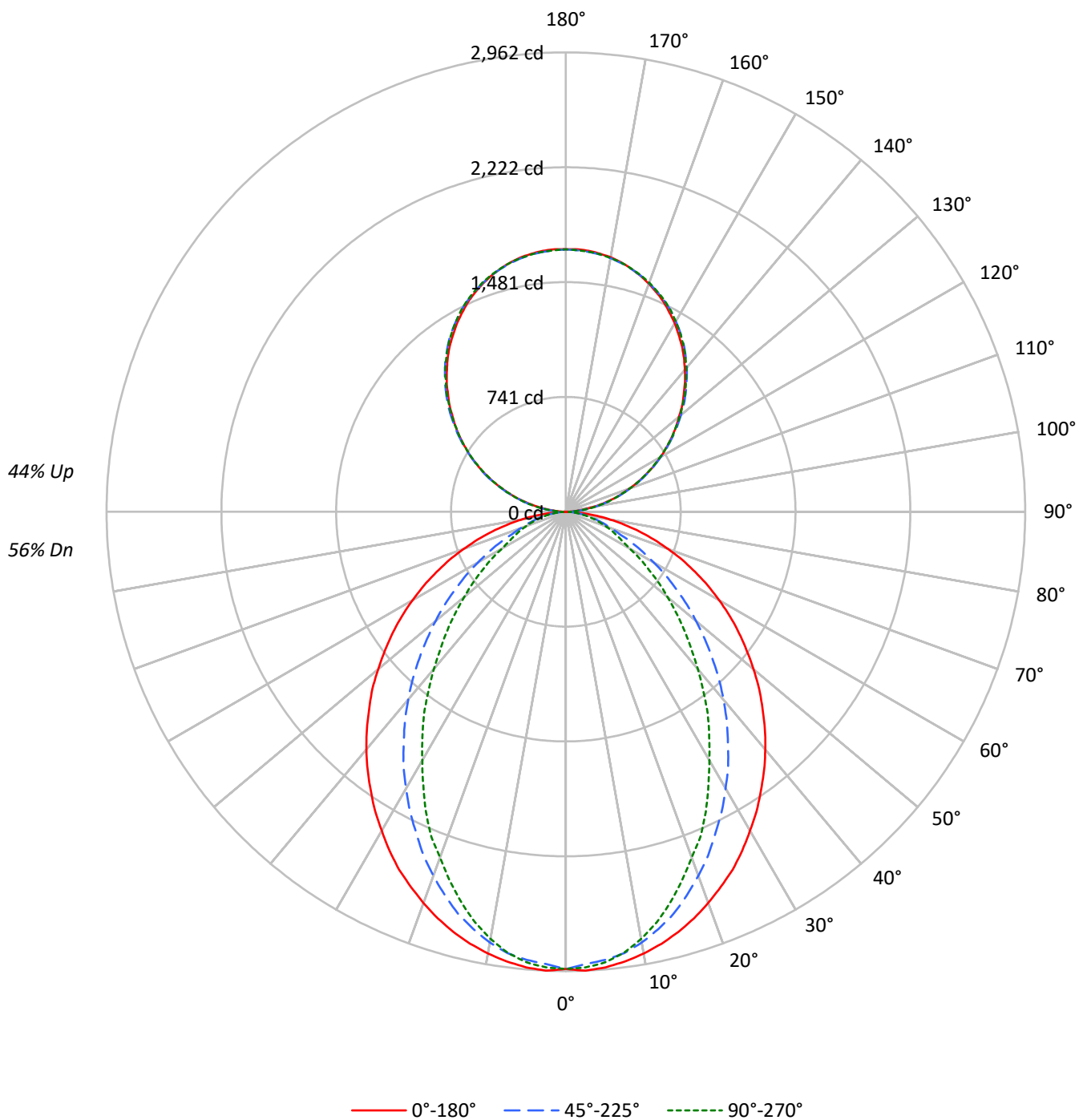
Lumens per Lamp: N/A  
Luminaire Lumens: 10798.6 lumens  
Efficiency: N/A  
Efficacy: 97.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 110.7  
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: P921859

CATALOG NUMBER: DFN2DIP-HX4F0-080D060US940-RLFL

### Luminous Intensity Polar Plot



TEST NUMBER: P921859

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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   | 109 | 109 | 109 | 109 | 101 | 101 | 101 | 101 | 87 | 87 | 87 | 74 | 74 | 74 | 62 | 62 | 62 |
| 1   | 100 | 96  | 92  | 88  | 93  | 89  | 86  | 83  | 77 | 75 | 72 | 66 | 64 | 63 | 55 | 54 | 53 |
| 2   | 91  | 84  | 78  | 73  | 85  | 79  | 73  | 69  | 68 | 64 | 61 | 58 | 56 | 53 | 49 | 47 | 46 |
| 3   | 84  | 74  | 67  | 62  | 78  | 70  | 63  | 58  | 61 | 56 | 52 | 52 | 49 | 46 | 44 | 42 | 40 |
| 4   | 77  | 66  | 59  | 53  | 71  | 62  | 55  | 50  | 54 | 49 | 45 | 47 | 43 | 40 | 40 | 37 | 35 |
| 5   | 71  | 59  | 51  | 46  | 66  | 56  | 49  | 43  | 49 | 43 | 39 | 42 | 38 | 35 | 36 | 33 | 30 |
| 6   | 65  | 53  | 46  | 40  | 61  | 50  | 43  | 38  | 44 | 38 | 34 | 38 | 34 | 31 | 33 | 30 | 27 |
| 7   | 61  | 48  | 41  | 35  | 56  | 46  | 39  | 34  | 40 | 35 | 30 | 35 | 31 | 27 | 30 | 27 | 24 |
| 8   | 56  | 44  | 37  | 31  | 52  | 42  | 35  | 30  | 37 | 31 | 27 | 32 | 28 | 25 | 28 | 25 | 22 |
| 9   | 53  | 41  | 33  | 28  | 49  | 38  | 32  | 27  | 34 | 28 | 25 | 30 | 25 | 22 | 26 | 23 | 20 |
| 10  | 49  | 37  | 30  | 25  | 46  | 35  | 29  | 24  | 31 | 26 | 22 | 28 | 23 | 20 | 24 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2192 | 2192 | 2192 |
| 5°  | 2196 | 2158 | 2171 |
| 10° | 2174 | 2116 | 2101 |
| 15° | 2145 | 2046 | 1992 |
| 20° | 2105 | 1950 | 1858 |
| 25° | 2065 | 1842 | 1728 |
| 30° | 2011 | 1731 | 1564 |
| 35° | 1957 | 1612 | 1420 |
| 40° | 1903 | 1489 | 1255 |
| 45° | 1841 | 1353 | 1105 |
| 50° | 1775 | 1215 | 959  |
| 55° | 1708 | 1067 | 818  |
| 60° | 1629 | 913  | 673  |
| 65° | 1539 | 756  | 606  |
| 70° | 1430 | 610  | 549  |
| 75° | 1292 | 538  | 500  |
| 80° | 1093 | 452  | 433  |
| 85° | 765  | 303  | 326  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1841 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 276.3   | 2.6       |
| 10°-20°   | 758.6   | 7.0       |
| 20°-30°   | 1065.0  | 9.9       |
| 30°-40°   | 1160.9  | 10.8      |
| 40°-50°   | 1067.0  | 9.9       |
| 50°-60°   | 838.0   | 7.8       |
| 60°-70°   | 545.4   | 5.1       |
| 70°-80°   | 280.8   | 2.6       |
| 80°-90°   | 76.5    | 0.7       |
| 90°-100°  | 104.7   | 1.0       |
| 100°-110° | 332.7   | 3.1       |
| 110°-120° | 569.3   | 5.3       |
| 120°-130° | 748.8   | 6.9       |
| 130°-140° | 840.5   | 7.8       |
| 140°-150° | 824.2   | 7.6       |
| 150°-160° | 691.4   | 6.4       |
| 160°-170° | 458.5   | 4.2       |
| 170°-180° | 160.3   | 1.5       |
| 0°-30°    | 2099.9  | 19.4      |
| 0°-40°    | 3260.8  | 30.2      |
| 0°-60°    | 5165.8  | 47.8      |
| 0°-90°    | 6068.5  | 56.2      |
| 90°-120°  | 1006.7  | 9.3       |
| 90°-150°  | 3420.1  | 31.7      |
| 90°-180°  | 4730.0  | 43.8      |
| 0°-180°   | 10798.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2948 | 2948  | 2948 | 2948  | 2948 |      |
| 5°   | 2948 | 2935  | 2900 | 2924  | 2916 | 280  |
| 15°  | 2804 | 2775  | 2684 | 2634  | 2607 | 790  |
| 25°  | 2546 | 2460  | 2284 | 2175  | 2134 | 1171 |
| 35°  | 2193 | 2057  | 1822 | 1654  | 1595 | 1373 |
| 45°  | 1793 | 1614  | 1334 | 1144  | 1081 | 1385 |
| 55°  | 1363 | 1155  | 867  | 707   | 656  | 1218 |
| 65°  | 921  | 704   | 464  | 374   | 365  | 913  |
| 75°  | 491  | 304   | 214  | 195   | 192  | 519  |
| 85°  | 115  | 59    | 51   | 51    | 51   | 132  |
| 90°  | 2    | 18    | 50   | 47    | 48   | 11   |
| 95°  | 74   | 89    | 91   | 91    | 89   | 83   |
| 105° | 307  | 311   | 314  | 317   | 317  | 324  |
| 115° | 571  | 580   | 577  | 575   | 571  | 565  |
| 125° | 831  | 844   | 840  | 835   | 834  | 743  |
| 135° | 1075 | 1091  | 1094 | 1092  | 1088 | 831  |
| 145° | 1305 | 1315  | 1323 | 1325  | 1319 | 815  |
| 155° | 1492 | 1496  | 1501 | 1508  | 1503 | 687  |
| 165° | 1623 | 1622  | 1622 | 1632  | 1625 | 458  |
| 175° | 1689 | 1685  | 1682 | 1692  | 1683 | 160  |
| 180° | 1692 | 1692  | 1692 | 1692  | 1692 |      |

TEST NUMBER: P921859

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2948.4 | 2948.4 | 2948.4 | 2948.4 | 2948.4 |
| 2.5°   | 2961.6 | 2948.4 | 2918.9 | 2945.8 | 2940.4 |
| 5°     | 2948.4 | 2935.1 | 2900.2 | 2924.3 | 2916.3 |
| 7.5°   | 2924.3 | 2908.4 | 2871.0 | 2881.6 | 2868.2 |
| 10°    | 2892.3 | 2873.6 | 2820.4 | 2812.2 | 2796.3 |
| 12.5°  | 2852.4 | 2828.3 | 2756.1 | 2740.2 | 2710.8 |
| 15°    | 2804.3 | 2774.8 | 2684.2 | 2633.6 | 2606.9 |
| 17.5°  | 2748.2 | 2705.4 | 2593.4 | 2534.8 | 2492.0 |
| 20°    | 2684.2 | 2630.7 | 2497.4 | 2430.9 | 2371.9 |
| 22.5°  | 2614.9 | 2553.4 | 2398.6 | 2308.0 | 2268.1 |
| 25°    | 2545.5 | 2460.1 | 2283.9 | 2174.7 | 2134.5 |
| 27.5°  | 2462.8 | 2371.9 | 2177.2 | 2051.8 | 1990.4 |
| 30°    | 2374.8 | 2273.1 | 2059.8 | 1923.9 | 1851.6 |
| 32.5°  | 2289.3 | 2166.5 | 1947.9 | 1787.7 | 1720.9 |
| 35°    | 2193.3 | 2057.2 | 1822.5 | 1654.4 | 1595.4 |
| 37.5°  | 2099.9 | 1953.0 | 1705.0 | 1520.7 | 1454.2 |
| 40°    | 2001.2 | 1841.2 | 1582.2 | 1392.8 | 1323.4 |
| 42.5°  | 1899.8 | 1729.1 | 1459.6 | 1262.0 | 1195.4 |
| 45°    | 1793.1 | 1614.2 | 1334.2 | 1144.5 | 1080.6 |
| 47.5°  | 1691.8 | 1502.4 | 1214.2 | 1024.5 | 965.9  |
| 50°    | 1579.6 | 1390.3 | 1096.7 | 912.4  | 856.6  |
| 52.5°  | 1470.1 | 1269.9 | 984.5  | 808.5  | 757.9  |
| 55°    | 1363.3 | 1155.3 | 867.1  | 707.1  | 656.5  |
| 57.5°  | 1254.1 | 1040.6 | 763.2  | 613.8  | 571.0  |
| 60°    | 1141.9 | 928.5  | 653.6  | 517.7  | 475.0  |
| 62.5°  | 1032.7 | 819.2  | 560.3  | 432.3  | 411.1  |
| 65°    | 920.6  | 704.3  | 464.2  | 373.7  | 365.4  |
| 67.5°  | 813.9  | 597.6  | 373.7  | 328.1  | 320.2  |
| 70°    | 701.8  | 493.7  | 309.4  | 282.8  | 272.1  |
| 72.5°  | 595.0  | 397.4  | 258.8  | 237.6  | 232.1  |
| 75°    | 490.9  | 304.1  | 213.5  | 194.7  | 192.3  |
| 77.5°  | 387.0  | 216.0  | 168.2  | 157.4  | 152.0  |
| 80°    | 290.7  | 154.9  | 128.0  | 117.4  | 117.4  |
| 82.5°  | 202.7  | 104.2  | 88.0   | 82.7   | 82.7   |
| 85°    | 114.7  | 58.6   | 50.6   | 50.6   | 50.6   |
| 87.5°  | 42.7   | 21.2   | 21.2   | 18.7   | 18.7   |
| 90°    | 1.5    | 18.4   | 50.0   | 46.9   | 48.4   |
| 92.5°  | 31.7   | 42.9   | 44.4   | 45.9   | 45.9   |
| 95°    | 74.5   | 88.7   | 91.3   | 91.3   | 88.7   |
| 97.5°  | 123.9  | 137.2  | 142.9  | 142.9  | 142.9  |
| 100°   | 181.1  | 192.8  | 196.9  | 196.9  | 195.4  |
| 102.5° | 241.3  | 249.9  | 255.6  | 257.1  | 255.6  |
| 105°   | 307.1  | 311.2  | 314.2  | 316.8  | 316.8  |
| 107.5° | 372.4  | 378.5  | 378.5  | 379.5  | 372.4  |
| 110°   | 435.7  | 443.8  | 443.8  | 443.8  | 439.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 504.0  | 512.6  | 511.1  | 507.0  | 504.0  |
| 115°   | 571.3  | 579.5  | 576.9  | 575.4  | 571.3  |
| 117.5° | 638.2  | 649.4  | 642.2  | 638.2  | 634.1  |
| 120°   | 705.5  | 716.8  | 705.5  | 705.5  | 700.9  |
| 122.5° | 766.7  | 781.0  | 773.8  | 769.8  | 766.7  |
| 125°   | 831.0  | 843.7  | 839.6  | 835.1  | 833.6  |
| 127.5° | 893.8  | 909.5  | 903.9  | 897.9  | 893.8  |
| 130°   | 952.4  | 970.8  | 968.2  | 965.2  | 959.6  |
| 132.5° | 1018.2 | 1032.5 | 1033.5 | 1026.4 | 1022.3 |
| 135°   | 1074.9 | 1090.7 | 1093.7 | 1092.2 | 1088.1 |
| 137.5° | 1138.1 | 1150.8 | 1153.4 | 1152.4 | 1146.3 |
| 140°   | 1193.7 | 1206.5 | 1213.6 | 1213.6 | 1208.0 |
| 142.5° | 1250.8 | 1263.6 | 1267.7 | 1269.2 | 1263.6 |
| 145°   | 1304.9 | 1315.1 | 1323.3 | 1324.8 | 1319.2 |
| 147.5° | 1353.3 | 1366.1 | 1372.3 | 1374.7 | 1369.1 |
| 150°   | 1403.4 | 1412.0 | 1417.6 | 1422.2 | 1417.6 |
| 152.5° | 1447.7 | 1456.4 | 1463.6 | 1469.2 | 1463.6 |
| 155°   | 1492.1 | 1496.2 | 1500.7 | 1508.0 | 1503.3 |
| 157.5° | 1530.4 | 1533.5 | 1536.0 | 1546.2 | 1539.1 |
| 160°   | 1564.6 | 1567.6 | 1569.1 | 1577.8 | 1571.7 |
| 162.5° | 1596.2 | 1596.2 | 1597.7 | 1607.4 | 1600.3 |
| 165°   | 1623.2 | 1621.7 | 1621.7 | 1631.9 | 1624.8 |
| 167.5° | 1647.7 | 1643.2 | 1643.2 | 1653.3 | 1646.2 |
| 170°   | 1666.1 | 1662.0 | 1660.5 | 1670.6 | 1662.0 |
| 172.5° | 1678.8 | 1674.7 | 1673.2 | 1683.4 | 1674.7 |
| 175°   | 1689.0 | 1685.0 | 1681.9 | 1692.1 | 1683.4 |
| 177.5° | 1694.6 | 1690.6 | 1687.5 | 1696.1 | 1687.5 |
| 180°   | 1692.1 | 1692.1 | 1692.1 | 1692.1 | 1692.1 |

TEST NUMBER: P921859

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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 | 10.43            | 11.32 | 11.34 | 12.24 | 13.42 | 6.41           | 7.29  | 7.32  | 8.21  | 9.40  |
|                 | 3H   | 12.12            | 12.91 | 13.04 | 13.84 | 15.05 | 7.60           | 8.39  | 8.52  | 9.32  | 10.53 |
|                 | 4H   | 12.73            | 13.47 | 13.66 | 14.41 | 15.63 | 8.06           | 8.80  | 8.99  | 9.74  | 10.96 |
|                 | 6H   | 13.15            | 13.84 | 14.10 | 14.78 | 16.01 | 8.38           | 9.07  | 9.33  | 10.01 | 11.24 |
|                 | 8H   | 13.28            | 13.94 | 14.24 | 14.90 | 16.12 | 8.47           | 9.13  | 9.43  | 10.09 | 11.32 |
|                 | 12H  | 13.35            | 13.97 | 14.30 | 14.92 | 16.17 | 8.52           | 9.14  | 9.48  | 10.10 | 11.35 |
| 4H              | 2H   | 10.46            | 11.21 | 11.40 | 12.14 | 13.36 | 7.01           | 7.76  | 7.95  | 8.69  | 9.91  |
|                 | 3H   | 12.29            | 12.91 | 13.25 | 13.88 | 15.11 | 8.37           | 8.99  | 9.32  | 9.96  | 11.19 |
|                 | 4H   | 12.99            | 13.55 | 13.95 | 14.52 | 15.77 | 8.92           | 9.48  | 9.88  | 10.45 | 11.70 |
|                 | 6H   | 13.51            | 13.99 | 14.48 | 14.98 | 16.24 | 9.34           | 9.83  | 10.32 | 10.81 | 12.07 |
|                 | 8H   | 13.69            | 14.14 | 14.66 | 15.12 | 16.39 | 9.47           | 9.93  | 10.45 | 10.91 | 12.18 |
|                 | 12H  | 13.78            | 14.19 | 14.78 | 15.19 | 16.46 | 9.54           | 9.95  | 10.54 | 10.95 | 12.22 |
| 8H              | 4H   | 12.96            | 13.42 | 13.94 | 14.40 | 15.66 | 9.20           | 9.66  | 10.18 | 10.64 | 11.91 |
|                 | 6H   | 13.53            | 13.91 | 14.53 | 14.93 | 16.19 | 9.73           | 10.10 | 10.73 | 11.12 | 12.39 |
|                 | 8H   | 13.75            | 14.08 | 14.76 | 15.09 | 16.37 | 9.92           | 10.25 | 10.93 | 11.26 | 12.54 |
|                 | 12H  | 13.89            | 14.18 | 14.90 | 15.18 | 16.52 | 10.04          | 10.33 | 11.05 | 11.33 | 12.67 |
| 12H             | 4H   | 12.92            | 13.33 | 13.91 | 14.32 | 15.60 | 9.21           | 9.62  | 10.20 | 10.62 | 11.89 |
|                 | 6H   | 13.51            | 13.84 | 14.52 | 14.85 | 16.13 | 9.77           | 10.11 | 10.78 | 11.12 | 12.40 |
|                 | 8H   | 13.73            | 14.02 | 14.74 | 15.02 | 16.36 | 9.99           | 10.28 | 11.00 | 11.28 | 12.62 |

END OF REPORT