

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: P927218

Luminaire Tested: DFN2DIP-HX4F0-040D090US835-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927218  
REPORT IS A COMBINATION OF REPORTS P900910 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-040D090US835-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

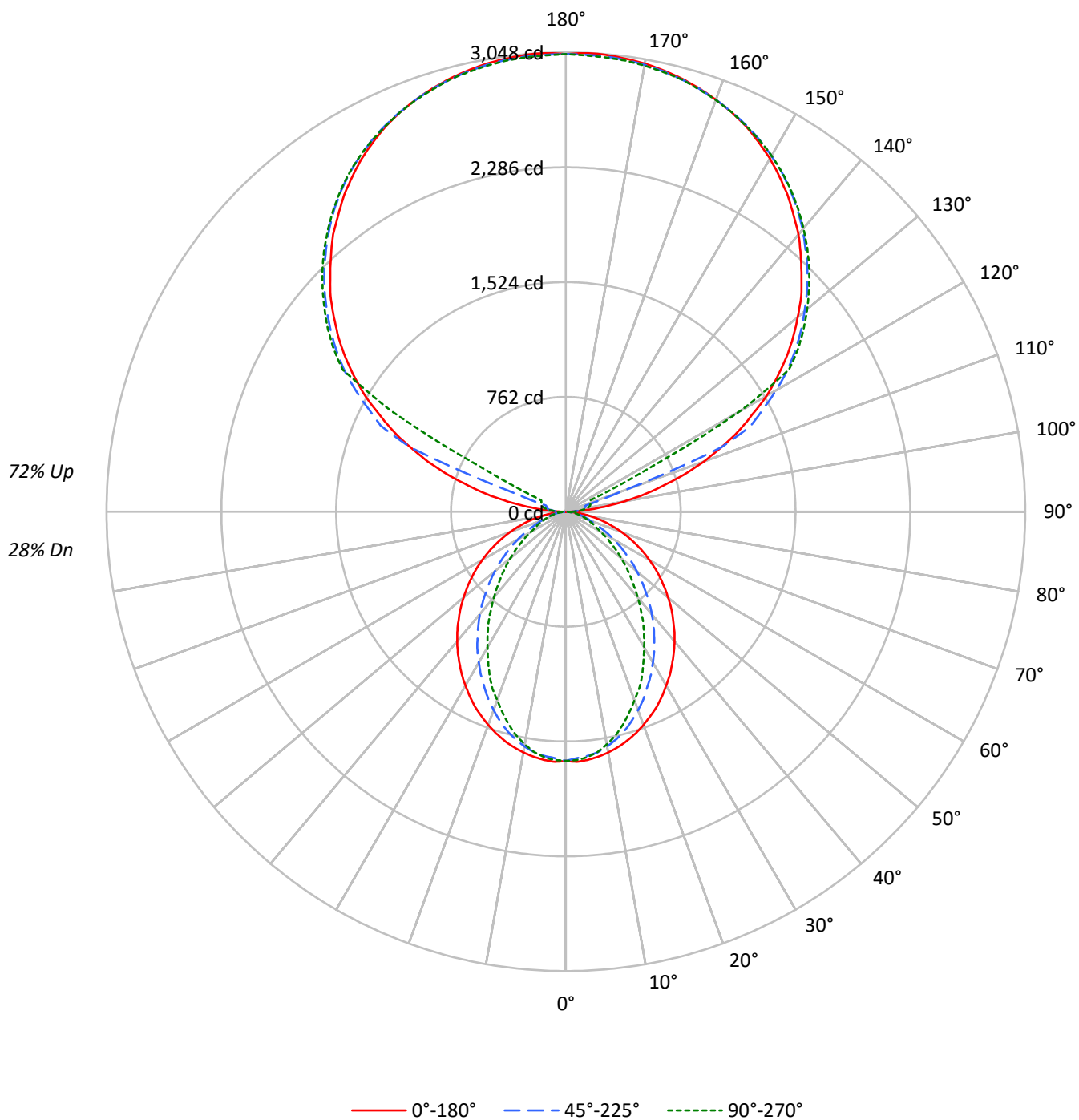
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12310.0 lumens  
Efficiency: N/A  
Efficacy: 121.6 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: Semi-Indirect  
  
Input Watts (W): 101.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
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   | 102 | 102 | 102 | 102 | 91 | 91 | 91 | 91 | 71 | 71 | 71 | 53 | 53 | 53 | 36 | 36 | 36 |
| 1   | 93  | 89  | 85  | 82  | 83 | 80 | 77 | 74 | 62 | 60 | 59 | 46 | 45 | 44 | 32 | 31 | 31 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 55 | 52 | 49 | 41 | 39 | 37 | 28 | 27 | 26 |
| 3   | 78  | 69  | 62  | 56  | 69 | 62 | 56 | 51 | 49 | 45 | 41 | 37 | 34 | 32 | 25 | 24 | 22 |
| 4   | 71  | 61  | 53  | 48  | 63 | 55 | 48 | 44 | 43 | 39 | 35 | 33 | 30 | 27 | 23 | 21 | 20 |
| 5   | 65  | 54  | 47  | 41  | 58 | 49 | 42 | 37 | 39 | 34 | 30 | 29 | 26 | 24 | 21 | 19 | 17 |
| 6   | 60  | 49  | 41  | 35  | 54 | 44 | 37 | 32 | 35 | 30 | 27 | 27 | 23 | 21 | 19 | 17 | 15 |
| 7   | 55  | 44  | 36  | 31  | 49 | 40 | 33 | 28 | 32 | 27 | 23 | 24 | 21 | 18 | 17 | 15 | 14 |
| 8   | 51  | 40  | 32  | 27  | 46 | 36 | 30 | 25 | 29 | 24 | 21 | 22 | 19 | 16 | 16 | 14 | 12 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 27 | 22 | 26 | 22 | 19 | 20 | 17 | 15 | 15 | 13 | 11 |
| 10  | 45  | 33  | 26  | 22  | 40 | 30 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 13 | 14 | 12 | 10 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1229 | 1229 | 1229 |
| 5°  | 1231 | 1210 | 1218 |
| 10° | 1219 | 1186 | 1178 |
| 15° | 1203 | 1147 | 1117 |
| 20° | 1180 | 1093 | 1042 |
| 25° | 1158 | 1033 | 969  |
| 30° | 1127 | 971  | 877  |
| 35° | 1098 | 904  | 796  |
| 40° | 1067 | 835  | 704  |
| 45° | 1032 | 758  | 620  |
| 50° | 996  | 681  | 538  |
| 55° | 958  | 598  | 459  |
| 60° | 914  | 512  | 378  |
| 65° | 863  | 424  | 340  |
| 70° | 802  | 342  | 308  |
| 75° | 724  | 302  | 280  |
| 80° | 613  | 253  | 243  |
| 85° | 429  | 170  | 183  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1559 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 154.9   | 1.3       |
| 10°-20°   | 425.3   | 3.5       |
| 20°-30°   | 597.2   | 4.9       |
| 30°-40°   | 650.9   | 5.3       |
| 40°-50°   | 598.3   | 4.9       |
| 50°-60°   | 469.9   | 3.8       |
| 60°-70°   | 305.8   | 2.5       |
| 70°-80°   | 157.4   | 1.3       |
| 80°-90°   | 45.5    | 0.4       |
| 90°-100°  | 100.2   | 0.8       |
| 100°-110° | 373.4   | 3.0       |
| 110°-120° | 990.2   | 8.0       |
| 120°-130° | 1642.4  | 13.3      |
| 130°-140° | 1744.6  | 14.2      |
| 140°-150° | 1621.4  | 13.2      |
| 150°-160° | 1303.5  | 10.6      |
| 160°-170° | 840.0   | 6.8       |
| 170°-180° | 289.1   | 2.3       |
| 0°-30°    | 1177.4  | 9.6       |
| 0°-40°    | 1828.4  | 14.9      |
| 0°-60°    | 2896.5  | 23.5      |
| 0°-90°    | 3405.3  | 27.7      |
| 90°-120°  | 1463.7  | 11.9      |
| 90°-150°  | 6472.0  | 52.6      |
| 90°-180°  | 8905.0  | 72.3      |
| 0°-180°   | 12310.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1653 | 1653  | 1653 | 1653  | 1653 |      |
| 5°   | 1653 | 1646  | 1626 | 1640  | 1635 | 157  |
| 15°  | 1572 | 1556  | 1505 | 1477  | 1462 | 443  |
| 25°  | 1427 | 1379  | 1281 | 1219  | 1197 | 656  |
| 35°  | 1230 | 1154  | 1022 | 928   | 895  | 770  |
| 45°  | 1005 | 905   | 748  | 642   | 606  | 776  |
| 55°  | 764  | 648   | 486  | 396   | 368  | 683  |
| 65°  | 516  | 395   | 260  | 210   | 205  | 512  |
| 75°  | 275  | 170   | 120  | 109   | 108  | 291  |
| 85°  | 64   | 33    | 28   | 28    | 28   | 74   |
| 90°  | 2    | 26    | 44   | 55    | 59   | 11   |
| 95°  | 143  | 70    | 86   | 97    | 94   | 169  |
| 105° | 668  | 734   | 134  | 158   | 167  | 714  |
| 115° | 1264 | 1301  | 1356 | 338   | 180  | 1244 |
| 125° | 1787 | 1815  | 1857 | 1873  | 1879 | 1594 |
| 135° | 2211 | 2246  | 2266 | 2288  | 2284 | 1708 |
| 145° | 2565 | 2563  | 2600 | 2615  | 2604 | 1604 |
| 155° | 2824 | 2805  | 2831 | 2844  | 2826 | 1301 |
| 165° | 2976 | 2963  | 2969 | 2985  | 2969 | 841  |
| 175° | 3044 | 3028  | 3033 | 3048  | 3026 | 290  |
| 180° | 3037 | 3037  | 3037 | 3037  | 3037 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1653.2 | 1653.2 | 1653.2 | 1653.2 | 1653.2 |
| 2.5°   | 1660.7 | 1653.2 | 1636.7 | 1651.8 | 1648.7 |
| 5°     | 1653.2 | 1645.7 | 1626.2 | 1639.7 | 1635.3 |
| 7.5°   | 1639.7 | 1630.8 | 1609.9 | 1615.7 | 1608.3 |
| 10°    | 1621.8 | 1611.3 | 1581.4 | 1576.8 | 1568.0 |
| 12.5°  | 1599.4 | 1585.9 | 1545.4 | 1536.5 | 1520.0 |
| 15°    | 1572.4 | 1555.9 | 1505.1 | 1476.7 | 1461.8 |
| 17.5°  | 1541.0 | 1517.0 | 1454.1 | 1421.3 | 1397.3 |
| 20°    | 1505.1 | 1475.1 | 1400.3 | 1363.0 | 1330.0 |
| 22.5°  | 1466.2 | 1431.8 | 1344.9 | 1294.1 | 1271.8 |
| 25°    | 1427.3 | 1379.4 | 1280.6 | 1219.4 | 1196.8 |
| 27.5°  | 1381.0 | 1330.0 | 1220.8 | 1150.5 | 1116.0 |
| 30°    | 1331.6 | 1274.6 | 1154.9 | 1078.7 | 1038.3 |
| 32.5°  | 1283.7 | 1214.8 | 1092.2 | 1002.4 | 964.9  |
| 35°    | 1229.9 | 1153.5 | 1021.9 | 927.6  | 894.6  |
| 37.5°  | 1177.5 | 1095.1 | 956.0  | 852.7  | 815.4  |
| 40°    | 1122.1 | 1032.4 | 887.2  | 781.0  | 742.1  |
| 42.5°  | 1065.2 | 969.5  | 818.4  | 707.6  | 670.3  |
| 45°    | 1005.4 | 905.1  | 748.1  | 641.8  | 605.9  |
| 47.5°  | 948.6  | 842.4  | 680.8  | 574.5  | 541.6  |
| 50°    | 885.7  | 779.5  | 614.9  | 511.6  | 480.3  |
| 52.5°  | 824.3  | 712.1  | 552.1  | 453.3  | 424.9  |
| 55°    | 764.5  | 647.8  | 486.2  | 396.5  | 368.1  |
| 57.5°  | 703.2  | 583.5  | 427.9  | 344.1  | 320.2  |
| 60°    | 640.3  | 520.6  | 366.5  | 290.3  | 266.4  |
| 62.5°  | 579.1  | 459.4  | 314.1  | 242.4  | 230.5  |
| 65°    | 516.2  | 394.9  | 260.3  | 209.5  | 204.9  |
| 67.5°  | 456.4  | 335.1  | 209.5  | 184.0  | 179.5  |
| 70°    | 393.5  | 276.8  | 173.5  | 158.6  | 152.5  |
| 72.5°  | 333.7  | 222.9  | 145.1  | 133.2  | 130.2  |
| 75°    | 275.2  | 170.5  | 119.7  | 109.2  | 107.8  |
| 77.5°  | 217.0  | 121.1  | 94.3   | 88.3   | 85.2   |
| 80°    | 163.0  | 86.8   | 71.7   | 65.9   | 65.9   |
| 82.5°  | 113.7  | 58.4   | 49.4   | 46.3   | 46.3   |
| 85°    | 64.3   | 32.9   | 28.4   | 28.4   | 28.4   |
| 87.5°  | 24.0   | 11.9   | 11.9   | 10.5   | 10.5   |
| 90°    | 2.1    | 26.4   | 43.8   | 55.1   | 59.2   |
| 92.5°  | 55.1   | 46.2   | 52.7   | 57.2   | 59.2   |
| 95°    | 142.8  | 70.2   | 85.6   | 96.8   | 94.5   |
| 97.5°  | 257.1  | 77.0   | 112.0  | 118.7  | 120.8  |
| 100°   | 389.1  | 88.0   | 125.3  | 142.8  | 147.2  |
| 102.5° | 534.0  | 529.8  | 129.7  | 153.7  | 160.5  |
| 105°   | 668.1  | 734.2  | 134.1  | 158.2  | 167.0  |
| 107.5° | 824.2  | 879.0  | 138.6  | 162.6  | 171.5  |
| 110°   | 973.7  | 1019.7 | 384.7  | 164.9  | 173.6  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1114.4 | 1153.8 | 1116.5 | 169.1  | 175.9  |
| 115°   | 1263.7 | 1301.0 | 1356.1 | 338.5  | 180.3  |
| 117.5° | 1393.4 | 1437.3 | 1474.8 | 1160.4 | 584.6  |
| 120°   | 1538.5 | 1571.4 | 1611.1 | 1637.4 | 1340.7 |
| 122.5° | 1661.5 | 1696.7 | 1740.8 | 1753.8 | 1756.2 |
| 125°   | 1786.7 | 1815.4 | 1857.2 | 1872.6 | 1879.1 |
| 127.5° | 1901.0 | 1931.8 | 1965.0 | 1986.9 | 1989.0 |
| 130°   | 2008.8 | 2044.1 | 2068.1 | 2092.3 | 2090.3 |
| 132.5° | 2118.7 | 2147.4 | 2171.4 | 2191.3 | 2189.2 |
| 135°   | 2211.1 | 2246.3 | 2265.9 | 2288.1 | 2283.7 |
| 137.5° | 2307.7 | 2334.0 | 2356.2 | 2378.1 | 2371.6 |
| 140°   | 2402.1 | 2419.9 | 2443.9 | 2463.7 | 2452.8 |
| 142.5° | 2481.5 | 2496.9 | 2525.3 | 2542.8 | 2531.9 |
| 145°   | 2565.0 | 2562.6 | 2600.0 | 2615.4 | 2604.4 |
| 147.5° | 2637.3 | 2630.8 | 2668.1 | 2679.1 | 2670.4 |
| 150°   | 2707.8 | 2692.4 | 2727.6 | 2740.6 | 2729.7 |
| 152.5° | 2767.0 | 2749.5 | 2782.4 | 2795.7 | 2780.3 |
| 155°   | 2824.2 | 2804.6 | 2830.9 | 2844.0 | 2826.5 |
| 157.5° | 2870.4 | 2852.9 | 2872.7 | 2888.1 | 2870.4 |
| 160°   | 2910.0 | 2896.7 | 2910.0 | 2923.1 | 2907.7 |
| 162.5° | 2945.0 | 2931.9 | 2942.9 | 2958.3 | 2938.5 |
| 165°   | 2975.8 | 2962.7 | 2969.3 | 2984.7 | 2969.3 |
| 167.5° | 3000.1 | 2986.8 | 2993.5 | 3008.9 | 2989.1 |
| 170°   | 3019.9 | 3006.6 | 3011.0 | 3026.4 | 3006.6 |
| 172.5° | 3033.0 | 3019.9 | 3024.3 | 3039.7 | 3019.9 |
| 175°   | 3043.9 | 3028.5 | 3033.0 | 3048.3 | 3026.4 |
| 177.5° | 3048.3 | 3033.0 | 3035.3 | 3050.7 | 3030.9 |
| 180°   | 3037.4 | 3037.4 | 3037.4 | 3037.4 | 3037.4 |

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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 | 5.30             | 5.98 | 6.43 | 7.10  | 8.66  | 1.27           | 1.95 | 2.41 | 3.07 | 4.63 |
|                 | 3H   | 6.97             | 7.57 | 8.11 | 8.70  | 10.28 | 2.45           | 3.06 | 3.59 | 4.19 | 5.76 |
|                 | 4H   | 7.57             | 8.14 | 8.72 | 9.27  | 10.85 | 2.90           | 3.47 | 4.05 | 4.60 | 6.18 |
|                 | 6H   | 7.98             | 8.51 | 9.14 | 9.64  | 11.24 | 3.21           | 3.74 | 4.37 | 4.87 | 6.46 |
|                 | 8H   | 8.11             | 8.61 | 9.27 | 9.76  | 11.34 | 3.30           | 3.80 | 4.46 | 4.95 | 6.53 |
|                 | 12H  | 8.16             | 8.64 | 9.33 | 9.78  | 11.39 | 3.34           | 3.81 | 4.50 | 4.95 | 6.56 |
| 4H              | 2H   | 5.30             | 5.87 | 6.46 | 7.00  | 8.58  | 1.85           | 2.42 | 3.01 | 3.55 | 5.14 |
|                 | 3H   | 7.12             | 7.59 | 8.28 | 8.75  | 10.34 | 3.19           | 3.67 | 4.35 | 4.82 | 6.41 |
|                 | 4H   | 7.80             | 8.24 | 8.97 | 9.39  | 11.00 | 3.73           | 4.17 | 4.90 | 5.32 | 6.93 |
|                 | 6H   | 8.31             | 8.69 | 9.48 | 9.85  | 11.46 | 4.15           | 4.52 | 5.31 | 5.69 | 7.29 |
|                 | 8H   | 8.48             | 8.84 | 9.65 | 9.99  | 11.61 | 4.27           | 4.62 | 5.44 | 5.78 | 7.40 |
|                 | 12H  | 8.57             | 8.89 | 9.76 | 10.06 | 11.68 | 4.33           | 4.65 | 5.52 | 5.82 | 7.44 |
| 8H              | 4H   | 7.76             | 8.11 | 8.93 | 9.27  | 10.89 | 4.00           | 4.35 | 5.17 | 5.51 | 7.13 |
|                 | 6H   | 8.32             | 8.61 | 9.51 | 9.81  | 11.43 | 4.52           | 4.81 | 5.71 | 6.01 | 7.62 |
|                 | 8H   | 8.54             | 8.79 | 9.73 | 9.97  | 11.61 | 4.71           | 4.96 | 5.90 | 6.14 | 7.77 |
|                 | 12H  | 8.67             | 8.89 | 9.87 | 10.07 | 11.74 | 4.82           | 5.04 | 6.02 | 6.22 | 7.89 |
| 12H             | 4H   | 7.71             | 8.02 | 8.89 | 9.19  | 10.82 | 4.00           | 4.32 | 5.18 | 5.49 | 7.11 |
|                 | 6H   | 8.30             | 8.55 | 9.49 | 9.73  | 11.36 | 4.57           | 4.82 | 5.76 | 6.00 | 7.63 |
|                 | 8H   | 8.51             | 8.73 | 9.71 | 9.91  | 11.58 | 4.77           | 4.99 | 5.97 | 6.17 | 7.84 |

END OF REPORT