

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: P902285

Luminaire Tested: DFN2DIP-4P4F0-030D050US830-RLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902285  
REPORT IS A COMBINATION OF REPORTS P900624 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-030D050US830-RLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open  
No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

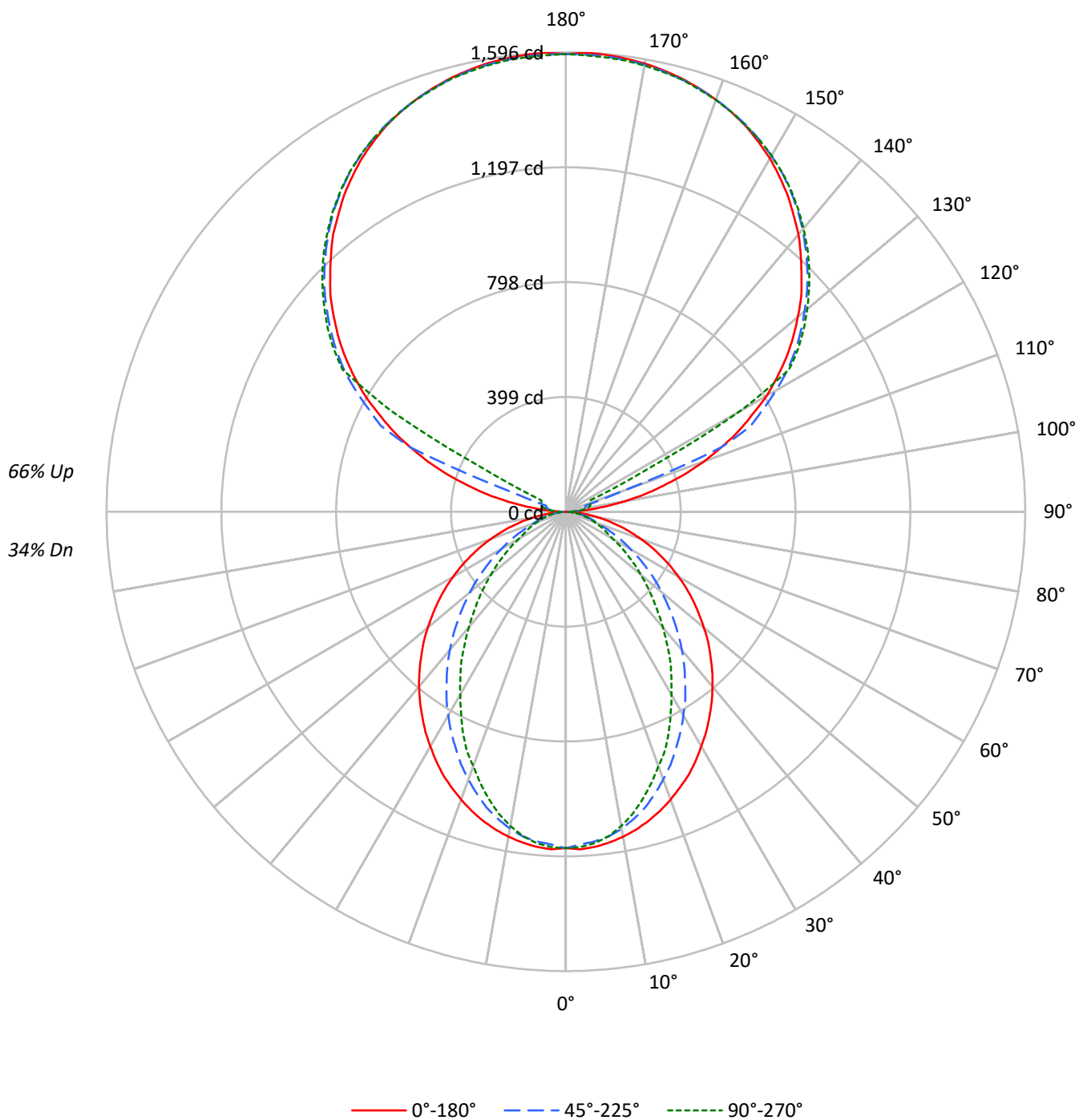
Lumens per Lamp: N/A  
Luminaire Lumens: 7069.1 lumens  
Efficiency: N/A  
Efficacy: 104.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 67.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 57 | 57 | 57 | 41 | 41 | 41 |
| 1   | 95  | 90  | 87  | 83  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 51 | 49 | 48 | 37 | 36 | 36 |
| 2   | 86  | 79  | 74  | 69  | 78 | 72 | 67 | 63 | 58 | 54 | 52 | 45 | 43 | 41 | 33 | 32 | 30 |
| 3   | 79  | 70  | 63  | 58  | 71 | 63 | 58 | 53 | 51 | 47 | 44 | 40 | 37 | 35 | 30 | 28 | 26 |
| 4   | 72  | 62  | 55  | 49  | 65 | 56 | 50 | 45 | 46 | 41 | 37 | 36 | 33 | 30 | 27 | 25 | 23 |
| 5   | 66  | 55  | 48  | 42  | 60 | 50 | 44 | 39 | 41 | 36 | 32 | 32 | 29 | 26 | 24 | 22 | 20 |
| 6   | 61  | 50  | 42  | 36  | 55 | 45 | 39 | 34 | 37 | 32 | 28 | 29 | 26 | 23 | 22 | 20 | 18 |
| 7   | 57  | 45  | 37  | 32  | 51 | 41 | 34 | 30 | 34 | 29 | 25 | 27 | 23 | 20 | 20 | 18 | 16 |
| 8   | 52  | 41  | 33  | 28  | 47 | 37 | 31 | 26 | 31 | 26 | 22 | 24 | 21 | 18 | 19 | 16 | 14 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 28 | 23 | 28 | 23 | 20 | 22 | 19 | 16 | 17 | 15 | 13 |
| 10  | 46  | 34  | 27  | 22  | 41 | 31 | 25 | 21 | 26 | 21 | 18 | 21 | 17 | 15 | 16 | 14 | 12 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 758 | 758 | 758 |
| 5°  | 759 | 746 | 751 |
| 10° | 752 | 732 | 727 |
| 15° | 742 | 708 | 689 |
| 20° | 728 | 675 | 643 |
| 25° | 714 | 638 | 599 |
| 30° | 695 | 600 | 542 |
| 35° | 677 | 559 | 492 |
| 40° | 658 | 516 | 435 |
| 45° | 637 | 469 | 384 |
| 50° | 614 | 421 | 333 |
| 55° | 591 | 370 | 284 |
| 60° | 563 | 317 | 234 |
| 65° | 532 | 263 | 211 |
| 70° | 494 | 212 | 192 |
| 75° | 447 | 188 | 175 |
| 80° | 378 | 158 | 153 |
| 85° | 264 | 107 | 117 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 819 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 109.5  | 1.5       |
| 10°-20°   | 300.7  | 4.3       |
| 20°-30°   | 422.1  | 6.0       |
| 30°-40°   | 460.2  | 6.5       |
| 40°-50°   | 422.9  | 6.0       |
| 50°-60°   | 332.2  | 4.7       |
| 60°-70°   | 216.2  | 3.1       |
| 70°-80°   | 111.3  | 1.6       |
| 80°-90°   | 31.2   | 0.4       |
| 90°-100°  | 52.5   | 0.7       |
| 100°-110° | 195.5  | 2.8       |
| 110°-120° | 518.5  | 7.3       |
| 120°-130° | 860.0  | 12.2      |
| 130°-140° | 913.5  | 12.9      |
| 140°-150° | 849.0  | 12.0      |
| 150°-160° | 682.6  | 9.7       |
| 160°-170° | 439.8  | 6.2       |
| 170°-180° | 151.4  | 2.1       |
| 0°-30°    | 832.3  | 11.8      |
| 0°-40°    | 1292.5 | 18.3      |
| 0°-60°    | 2047.6 | 29.0      |
| 0°-90°    | 2406.3 | 34.0      |
| 90°-120°  | 766.5  | 10.8      |
| 90°-150°  | 3389.0 | 47.9      |
| 90°-180°  | 4663.0 | 66.0      |
| 0°-180°   | 7069.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1169 | 1169  | 1169 | 1169  | 1169 |      |
| 5°   | 1169 | 1163  | 1150 | 1159  | 1156 | 111  |
| 15°  | 1112 | 1100  | 1064 | 1044  | 1033 | 313  |
| 25°  | 1009 | 975   | 905  | 862   | 846  | 464  |
| 35°  | 869  | 815   | 722  | 656   | 632  | 544  |
| 45°  | 711  | 640   | 529  | 454   | 428  | 549  |
| 55°  | 540  | 458   | 344  | 280   | 260  | 483  |
| 65°  | 365  | 279   | 184  | 148   | 145  | 362  |
| 75°  | 194  | 121   | 85   | 77    | 76   | 206  |
| 85°  | 45   | 23    | 20   | 20    | 20   | 52   |
| 90°  | 1    | 14    | 23   | 29    | 31   | 7    |
| 95°  | 75   | 37    | 45   | 51    | 50   | 89   |
| 105° | 350  | 384   | 70   | 83    | 88   | 374  |
| 115° | 662  | 681   | 710  | 177   | 94   | 651  |
| 125° | 936  | 951   | 972  | 980   | 984  | 834  |
| 135° | 1158 | 1176  | 1186 | 1198  | 1196 | 894  |
| 145° | 1343 | 1342  | 1361 | 1370  | 1364 | 840  |
| 155° | 1479 | 1469  | 1482 | 1489  | 1480 | 681  |
| 165° | 1558 | 1551  | 1555 | 1563  | 1555 | 440  |
| 175° | 1594 | 1586  | 1588 | 1596  | 1585 | 152  |
| 180° | 1590 | 1590  | 1590 | 1590  | 1590 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1168.7 | 1168.7 | 1168.7 | 1168.7 | 1168.7 |
| 2.5°   | 1173.9 | 1168.7 | 1157.0 | 1167.6 | 1165.5 |
| 5°     | 1168.7 | 1163.4 | 1149.6 | 1159.1 | 1155.9 |
| 7.5°   | 1159.1 | 1152.8 | 1138.0 | 1142.2 | 1136.9 |
| 10°    | 1146.4 | 1139.1 | 1117.9 | 1114.7 | 1108.4 |
| 12.5°  | 1130.6 | 1121.1 | 1092.5 | 1086.2 | 1074.5 |
| 15°    | 1111.5 | 1099.9 | 1063.9 | 1043.9 | 1033.3 |
| 17.5°  | 1089.3 | 1072.4 | 1027.9 | 1004.8 | 987.8  |
| 20°    | 1063.9 | 1042.7 | 989.9  | 963.6  | 940.2  |
| 22.5°  | 1036.5 | 1012.1 | 950.7  | 914.8  | 899.0  |
| 25°    | 1009.0 | 975.1  | 905.3  | 862.0  | 846.0  |
| 27.5°  | 976.2  | 940.2  | 863.0  | 813.3  | 788.9  |
| 30°    | 941.3  | 901.1  | 816.4  | 762.6  | 734.0  |
| 32.5°  | 907.4  | 858.8  | 772.1  | 708.6  | 682.1  |
| 35°    | 869.4  | 815.4  | 722.4  | 655.7  | 632.4  |
| 37.5°  | 832.4  | 774.1  | 675.8  | 602.8  | 576.5  |
| 40°    | 793.2  | 729.8  | 627.2  | 552.0  | 524.6  |
| 42.5°  | 753.0  | 685.4  | 578.5  | 500.2  | 473.8  |
| 45°    | 710.8  | 639.8  | 528.9  | 453.6  | 428.3  |
| 47.5°  | 670.5  | 595.5  | 481.3  | 406.0  | 382.9  |
| 50°    | 626.1  | 551.0  | 434.7  | 361.7  | 339.5  |
| 52.5°  | 582.7  | 503.4  | 390.3  | 320.5  | 300.4  |
| 55°    | 540.4  | 457.9  | 343.7  | 280.3  | 260.2  |
| 57.5°  | 497.1  | 412.5  | 302.6  | 243.3  | 226.3  |
| 60°    | 452.6  | 368.1  | 259.1  | 205.2  | 188.3  |
| 62.5°  | 409.3  | 324.7  | 222.1  | 171.4  | 163.0  |
| 65°    | 364.9  | 279.2  | 184.0  | 148.1  | 144.9  |
| 67.5°  | 322.6  | 236.9  | 148.1  | 130.1  | 126.9  |
| 70°    | 278.1  | 195.7  | 122.6  | 112.1  | 107.8  |
| 72.5°  | 235.8  | 157.5  | 102.5  | 94.2   | 92.0   |
| 75°    | 194.5  | 120.6  | 84.6   | 77.2   | 76.2   |
| 77.5°  | 153.4  | 85.6   | 66.6   | 62.4   | 60.2   |
| 80°    | 115.3  | 61.4   | 50.7   | 46.6   | 46.6   |
| 82.5°  | 80.3   | 41.3   | 34.9   | 32.8   | 32.8   |
| 85°    | 45.4   | 23.2   | 20.1   | 20.1   | 20.1   |
| 87.5°  | 17.0   | 8.4    | 8.4    | 7.4    | 7.4    |
| 90°    | 1.1    | 13.8   | 23.0   | 28.8   | 31.0   |
| 92.5°  | 28.8   | 24.2   | 27.6   | 30.0   | 31.0   |
| 95°    | 74.7   | 36.8   | 44.9   | 50.7   | 49.5   |
| 97.5°  | 134.6  | 40.3   | 58.6   | 62.2   | 63.2   |
| 100°   | 203.8  | 46.1   | 65.6   | 74.7   | 77.1   |
| 102.5° | 279.7  | 277.4  | 68.0   | 80.5   | 84.1   |
| 105°   | 349.9  | 384.5  | 70.2   | 82.8   | 87.5   |
| 107.5° | 431.6  | 460.2  | 72.6   | 85.1   | 89.8   |
| 110°   | 509.9  | 534.0  | 201.4  | 86.3   | 90.9   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 583.5  | 604.2  | 584.7  | 88.6   | 92.1   |
| 115°   | 661.8  | 681.3  | 710.1  | 177.3  | 94.4   |
| 117.5° | 729.6  | 752.6  | 772.3  | 607.6  | 306.1  |
| 120°   | 805.6  | 822.8  | 843.6  | 857.4  | 702.0  |
| 122.5° | 870.0  | 888.4  | 911.5  | 918.4  | 919.6  |
| 125°   | 935.6  | 950.6  | 972.5  | 980.5  | 984.0  |
| 127.5° | 995.4  | 1011.5 | 1029.0 | 1040.4 | 1041.5 |
| 130°   | 1051.9 | 1070.4 | 1082.9 | 1095.6 | 1094.6 |
| 132.5° | 1109.5 | 1124.5 | 1137.0 | 1147.5 | 1146.3 |
| 135°   | 1157.8 | 1176.3 | 1186.5 | 1198.2 | 1195.8 |
| 137.5° | 1208.3 | 1222.2 | 1233.8 | 1245.3 | 1241.9 |
| 140°   | 1257.8 | 1267.2 | 1279.7 | 1290.1 | 1284.4 |
| 142.5° | 1299.4 | 1307.5 | 1322.4 | 1331.5 | 1325.8 |
| 145°   | 1343.1 | 1341.9 | 1361.4 | 1369.5 | 1363.8 |
| 147.5° | 1381.0 | 1377.5 | 1397.1 | 1402.9 | 1398.4 |
| 150°   | 1417.9 | 1409.9 | 1428.2 | 1435.1 | 1429.4 |
| 152.5° | 1448.9 | 1439.7 | 1457.0 | 1464.0 | 1455.9 |
| 155°   | 1478.8 | 1468.6 | 1482.3 | 1489.2 | 1480.1 |
| 157.5° | 1503.0 | 1493.8 | 1504.2 | 1512.3 | 1503.0 |
| 160°   | 1523.8 | 1516.8 | 1523.8 | 1530.6 | 1522.6 |
| 162.5° | 1542.1 | 1535.3 | 1541.0 | 1549.1 | 1538.7 |
| 165°   | 1558.2 | 1551.4 | 1554.8 | 1562.8 | 1554.8 |
| 167.5° | 1570.9 | 1564.0 | 1567.5 | 1575.6 | 1565.2 |
| 170°   | 1581.3 | 1574.3 | 1576.7 | 1584.7 | 1574.3 |
| 172.5° | 1588.2 | 1581.3 | 1583.7 | 1591.7 | 1581.3 |
| 175°   | 1593.9 | 1585.8 | 1588.2 | 1596.2 | 1584.7 |
| 177.5° | 1596.2 | 1588.2 | 1589.4 | 1597.4 | 1587.1 |
| 180°   | 1590.4 | 1590.4 | 1590.4 | 1590.4 | 1590.4 |

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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 | 4.50             | 5.21 | 5.59 | 6.30 | 7.78  | 0.46           | 1.18 | 1.55 | 2.26 | 3.74 |
|                 | 3H   | 6.17             | 6.81 | 7.27 | 7.91 | 9.41  | 1.64           | 2.28 | 2.74 | 3.37 | 4.87 |
|                 | 4H   | 6.78             | 7.39 | 7.89 | 8.48 | 9.99  | 2.09           | 2.69 | 3.20 | 3.79 | 5.30 |
|                 | 6H   | 7.20             | 7.76 | 8.32 | 8.86 | 10.37 | 2.40           | 2.96 | 3.52 | 4.06 | 5.58 |
|                 | 8H   | 7.33             | 7.86 | 8.45 | 8.97 | 10.48 | 2.49           | 3.02 | 3.61 | 4.13 | 5.65 |
|                 | 12H  | 7.39             | 7.89 | 8.51 | 9.00 | 10.53 | 2.53           | 3.04 | 3.66 | 4.14 | 5.68 |
| 4H              | 2H   | 4.50             | 5.11 | 5.62 | 6.20 | 7.71  | 1.04           | 1.65 | 2.16 | 2.74 | 4.25 |
|                 | 3H   | 6.33             | 6.83 | 7.45 | 7.95 | 9.47  | 2.39           | 2.89 | 3.51 | 4.01 | 5.53 |
|                 | 4H   | 7.02             | 7.48 | 8.14 | 8.59 | 10.13 | 2.93           | 3.39 | 4.06 | 4.50 | 6.04 |
|                 | 6H   | 7.53             | 7.93 | 8.67 | 9.06 | 10.60 | 3.35           | 3.74 | 4.48 | 4.88 | 6.41 |
|                 | 8H   | 7.71             | 8.08 | 8.84 | 9.21 | 10.75 | 3.47           | 3.84 | 4.61 | 4.97 | 6.52 |
|                 | 12H  | 7.80             | 8.14 | 8.95 | 9.28 | 10.83 | 3.54           | 3.87 | 4.68 | 5.01 | 6.56 |
| 8H              | 4H   | 6.98             | 7.35 | 8.11 | 8.47 | 10.02 | 3.21           | 3.58 | 4.34 | 4.70 | 6.25 |
|                 | 6H   | 7.55             | 7.85 | 8.70 | 9.02 | 10.57 | 3.72           | 4.03 | 4.87 | 5.19 | 6.74 |
|                 | 8H   | 7.77             | 8.03 | 8.93 | 9.18 | 10.75 | 3.92           | 4.18 | 5.07 | 5.33 | 6.89 |
|                 | 12H  | 7.91             | 8.14 | 9.07 | 9.28 | 10.88 | 4.03           | 4.27 | 5.19 | 5.41 | 7.01 |
| 12H             | 4H   | 6.93             | 7.26 | 8.07 | 8.40 | 9.95  | 3.21           | 3.54 | 4.35 | 4.68 | 6.23 |
|                 | 6H   | 7.52             | 7.79 | 8.68 | 8.94 | 10.50 | 3.77           | 4.04 | 4.93 | 5.19 | 6.75 |
|                 | 8H   | 7.74             | 7.98 | 8.90 | 9.12 | 10.72 | 3.98           | 4.22 | 5.14 | 5.36 | 6.96 |

END OF REPORT