

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: P903151

Luminaire Tested: DFN2DIP-PN4F0-040D050US830-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903151  
REPORT IS A COMBINATION OF REPORTS P901148 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-040D050US830-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

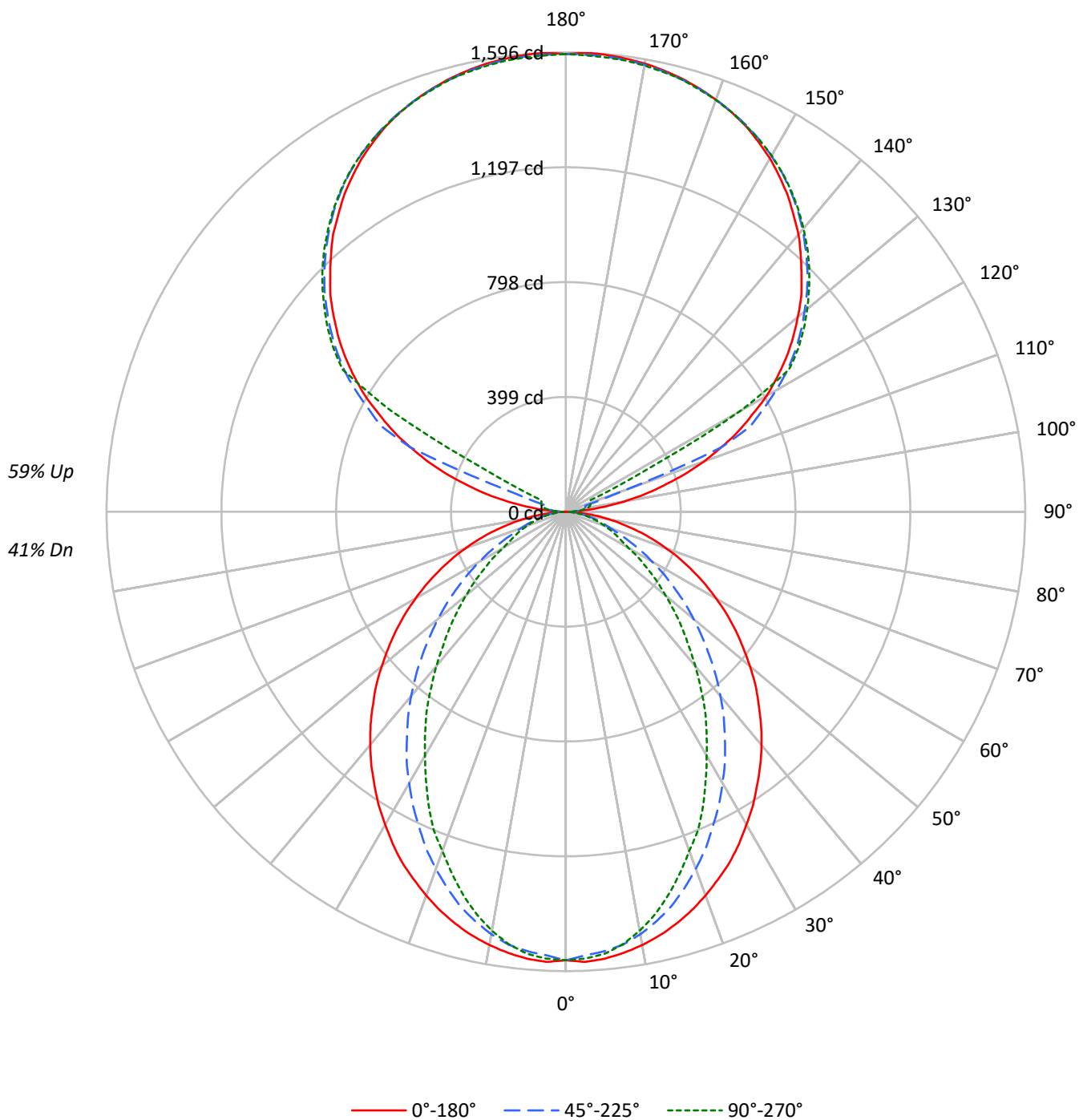
Lumens per Lamp: N/A  
Luminaire Lumens: 7870.2 lumens  
Efficiency: N/A  
Efficacy: 110.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 71  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 78 | 78 | 78 | 62 | 62 | 62 | 48 | 48 | 48 |
| 1   | 96  | 92  | 88  | 85  | 87 | 84 | 81 | 78 | 69 | 67 | 65 | 55 | 54 | 53 | 43 | 42 | 41 |
| 2   | 88  | 81  | 75  | 70  | 80 | 74 | 69 | 65 | 61 | 57 | 54 | 49 | 47 | 44 | 38 | 36 | 35 |
| 3   | 80  | 71  | 64  | 59  | 73 | 65 | 59 | 54 | 54 | 50 | 46 | 44 | 41 | 38 | 34 | 32 | 30 |
| 4   | 74  | 63  | 56  | 50  | 67 | 58 | 52 | 46 | 48 | 43 | 40 | 39 | 36 | 33 | 31 | 28 | 26 |
| 5   | 68  | 57  | 49  | 43  | 62 | 52 | 45 | 40 | 43 | 38 | 34 | 35 | 32 | 29 | 28 | 25 | 23 |
| 6   | 62  | 51  | 43  | 37  | 57 | 47 | 40 | 35 | 39 | 34 | 30 | 32 | 28 | 25 | 25 | 23 | 21 |
| 7   | 58  | 46  | 38  | 33  | 53 | 42 | 36 | 31 | 36 | 30 | 27 | 29 | 25 | 23 | 23 | 21 | 19 |
| 8   | 54  | 42  | 34  | 29  | 49 | 39 | 32 | 27 | 33 | 27 | 24 | 27 | 23 | 20 | 21 | 19 | 17 |
| 9   | 50  | 38  | 31  | 26  | 46 | 35 | 29 | 24 | 30 | 25 | 21 | 25 | 21 | 18 | 20 | 17 | 15 |
| 10  | 47  | 35  | 28  | 23  | 43 | 32 | 26 | 22 | 28 | 23 | 19 | 23 | 19 | 17 | 18 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1137 | 1137 | 1137 |
| 5°  | 1139 | 1120 | 1127 |
| 10° | 1128 | 1098 | 1090 |
| 15° | 1112 | 1062 | 1034 |
| 20° | 1092 | 1012 | 964  |
| 25° | 1071 | 956  | 897  |
| 30° | 1043 | 898  | 812  |
| 35° | 1015 | 837  | 738  |
| 40° | 987  | 773  | 652  |
| 45° | 954  | 702  | 574  |
| 50° | 920  | 631  | 498  |
| 55° | 885  | 554  | 425  |
| 60° | 844  | 474  | 350  |
| 65° | 797  | 393  | 315  |
| 70° | 740  | 317  | 286  |
| 75° | 668  | 280  | 261  |
| 80° | 564  | 235  | 227  |
| 85° | 393  | 158  | 172  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 954 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 146.0  | 1.9       |
| 10°-20°   | 400.9  | 5.1       |
| 20°-30°   | 562.8  | 7.2       |
| 30°-40°   | 613.5  | 7.8       |
| 40°-50°   | 563.9  | 7.2       |
| 50°-60°   | 442.9  | 5.6       |
| 60°-70°   | 288.3  | 3.7       |
| 70°-80°   | 148.4  | 1.9       |
| 80°-90°   | 40.7   | 0.5       |
| 90°-100°  | 52.5   | 0.7       |
| 100°-110° | 195.5  | 2.5       |
| 110°-120° | 518.5  | 6.6       |
| 120°-130° | 860.0  | 10.9      |
| 130°-140° | 913.5  | 11.6      |
| 140°-150° | 849.0  | 10.8      |
| 150°-160° | 682.6  | 8.7       |
| 160°-170° | 439.8  | 5.6       |
| 170°-180° | 151.4  | 1.9       |
| 0°-30°    | 1109.8 | 14.1      |
| 0°-40°    | 1723.3 | 21.9      |
| 0°-60°    | 2730.1 | 34.7      |
| 0°-90°    | 3207.4 | 40.8      |
| 90°-120°  | 766.5  | 9.7       |
| 90°-150°  | 3389.0 | 43.1      |
| 90°-180°  | 4663.0 | 59.2      |
| 0°-180°   | 7870.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1558 | 1558  | 1558 | 1558  | 1558 |      |
| 5°   | 1558 | 1551  | 1533 | 1546  | 1541 | 148  |
| 15°  | 1482 | 1466  | 1419 | 1392  | 1378 | 418  |
| 25°  | 1345 | 1300  | 1207 | 1149  | 1128 | 619  |
| 35°  | 1159 | 1087  | 963  | 874   | 843  | 726  |
| 45°  | 948  | 853   | 705  | 605   | 571  | 732  |
| 55°  | 721  | 611   | 458  | 374   | 347  | 644  |
| 65°  | 486  | 372   | 245  | 198   | 193  | 482  |
| 75°  | 259  | 161   | 113  | 103   | 102  | 274  |
| 85°  | 61   | 31    | 27   | 27    | 27   | 70   |
| 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°     | 1558.2 | 1558.2 | 1558.2 | 1558.2 | 1558.2 |
| 2.5°   | 1565.3 | 1558.2 | 1542.7 | 1556.9 | 1554.0 |
| 5°     | 1558.2 | 1551.1 | 1532.8 | 1545.5 | 1541.3 |
| 7.5°   | 1545.5 | 1537.1 | 1517.4 | 1522.9 | 1515.9 |
| 10°    | 1528.6 | 1518.7 | 1490.5 | 1486.2 | 1477.9 |
| 12.5°  | 1507.5 | 1494.8 | 1456.6 | 1448.2 | 1432.7 |
| 15°    | 1482.1 | 1466.5 | 1418.6 | 1391.9 | 1377.8 |
| 17.5°  | 1452.5 | 1429.8 | 1370.6 | 1339.6 | 1317.0 |
| 20°    | 1418.6 | 1390.3 | 1319.8 | 1284.7 | 1253.6 |
| 22.5°  | 1382.0 | 1349.5 | 1267.6 | 1219.7 | 1198.7 |
| 25°    | 1345.3 | 1300.1 | 1207.0 | 1149.3 | 1128.0 |
| 27.5°  | 1301.7 | 1253.6 | 1150.7 | 1084.4 | 1051.9 |
| 30°    | 1255.1 | 1201.4 | 1088.5 | 1016.7 | 978.6  |
| 32.5°  | 1209.9 | 1145.0 | 1029.4 | 944.8  | 909.5  |
| 35°    | 1159.2 | 1087.2 | 963.2  | 874.3  | 843.2  |
| 37.5°  | 1109.8 | 1032.2 | 901.1  | 803.7  | 768.5  |
| 40°    | 1057.6 | 973.1  | 836.2  | 736.1  | 699.5  |
| 42.5°  | 1004.0 | 913.8  | 771.4  | 666.9  | 631.8  |
| 45°    | 947.6  | 853.1  | 705.1  | 604.9  | 571.1  |
| 47.5°  | 894.1  | 794.0  | 641.7  | 541.5  | 510.5  |
| 50°    | 834.8  | 734.7  | 579.6  | 482.2  | 452.7  |
| 52.5°  | 776.9  | 671.2  | 520.4  | 427.3  | 400.5  |
| 55°    | 720.6  | 610.6  | 458.3  | 373.7  | 346.9  |
| 57.5°  | 662.8  | 550.0  | 403.3  | 324.3  | 301.8  |
| 60°    | 603.5  | 490.7  | 345.4  | 273.6  | 251.1  |
| 62.5°  | 545.8  | 433.0  | 296.1  | 228.5  | 217.3  |
| 65°    | 486.5  | 372.2  | 245.3  | 197.5  | 193.1  |
| 67.5°  | 430.2  | 315.8  | 197.5  | 173.4  | 169.2  |
| 70°    | 370.9  | 260.9  | 163.5  | 149.5  | 143.7  |
| 72.5°  | 314.5  | 210.1  | 136.8  | 125.5  | 122.7  |
| 75°    | 259.4  | 160.7  | 112.8  | 102.9  | 101.6  |
| 77.5°  | 204.5  | 114.1  | 88.9   | 83.2   | 80.3   |
| 80°    | 153.6  | 81.8   | 67.6   | 62.1   | 62.1   |
| 82.5°  | 107.2  | 55.0   | 46.6   | 43.6   | 43.6   |
| 85°    | 60.6   | 31.0   | 26.8   | 26.8   | 26.8   |
| 87.5°  | 22.6   | 11.2   | 11.2   | 9.9    | 9.9    |
| 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 | 6.67             | 7.43  | 7.71  | 8.47  | 9.87  | 2.64           | 3.40 | 3.68 | 4.44 | 5.84 |
|                 | 3H   | 8.35             | 9.03  | 9.40  | 10.08 | 11.50 | 3.82           | 4.50 | 4.87 | 5.55 | 6.97 |
|                 | 4H   | 8.96             | 9.60  | 10.02 | 10.65 | 12.08 | 4.27           | 4.91 | 5.33 | 5.96 | 7.39 |
|                 | 6H   | 9.38             | 9.97  | 10.45 | 11.02 | 12.46 | 4.59           | 5.18 | 5.66 | 6.23 | 7.67 |
|                 | 8H   | 9.50             | 10.06 | 10.58 | 11.14 | 12.57 | 4.68           | 5.24 | 5.75 | 6.31 | 7.74 |
|                 | 12H  | 9.56             | 10.10 | 10.64 | 11.16 | 12.62 | 4.72           | 5.25 | 5.80 | 6.32 | 7.77 |
| 4H              | 2H   | 6.68             | 7.33  | 7.75  | 8.38  | 9.80  | 3.22           | 3.87 | 4.29 | 4.92 | 6.35 |
|                 | 3H   | 8.51             | 9.04  | 9.58  | 10.12 | 11.56 | 4.57           | 5.11 | 5.64 | 6.18 | 7.62 |
|                 | 4H   | 9.20             | 9.69  | 10.28 | 10.76 | 12.22 | 5.12           | 5.61 | 6.20 | 6.68 | 8.14 |
|                 | 6H   | 9.71             | 10.13 | 10.80 | 11.23 | 12.68 | 5.53           | 5.95 | 6.62 | 7.05 | 8.50 |
|                 | 8H   | 9.89             | 10.28 | 10.98 | 11.37 | 12.84 | 5.66           | 6.05 | 6.75 | 7.14 | 8.61 |
|                 | 12H  | 9.98             | 10.34 | 11.09 | 11.44 | 12.91 | 5.72           | 6.08 | 6.83 | 7.18 | 8.65 |
| 8H              | 4H   | 9.16             | 9.56  | 10.25 | 10.64 | 12.11 | 5.39           | 5.79 | 6.48 | 6.87 | 8.34 |
|                 | 6H   | 9.73             | 10.05 | 10.84 | 11.18 | 12.65 | 5.91           | 6.23 | 7.02 | 7.36 | 8.83 |
|                 | 8H   | 9.95             | 10.23 | 11.06 | 11.34 | 12.83 | 6.10           | 6.38 | 7.22 | 7.49 | 8.98 |
|                 | 12H  | 10.09            | 10.33 | 11.21 | 11.44 | 12.97 | 6.22           | 6.47 | 7.34 | 7.57 | 9.10 |
| 12H             | 4H   | 9.11             | 9.47  | 10.22 | 10.57 | 12.04 | 5.40           | 5.75 | 6.50 | 6.85 | 8.32 |
|                 | 6H   | 9.70             | 9.99  | 10.82 | 11.10 | 12.58 | 5.96           | 6.24 | 7.08 | 7.35 | 8.84 |
|                 | 8H   | 9.92             | 10.17 | 11.04 | 11.28 | 12.80 | 6.17           | 6.42 | 7.29 | 7.52 | 9.05 |

END OF REPORT