

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: P908667

Luminaire Tested: DFN2DIP-PN4F0-050D110US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908667  
REPORT IS A COMBINATION OF REPORTS P901258 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-050D110US840-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

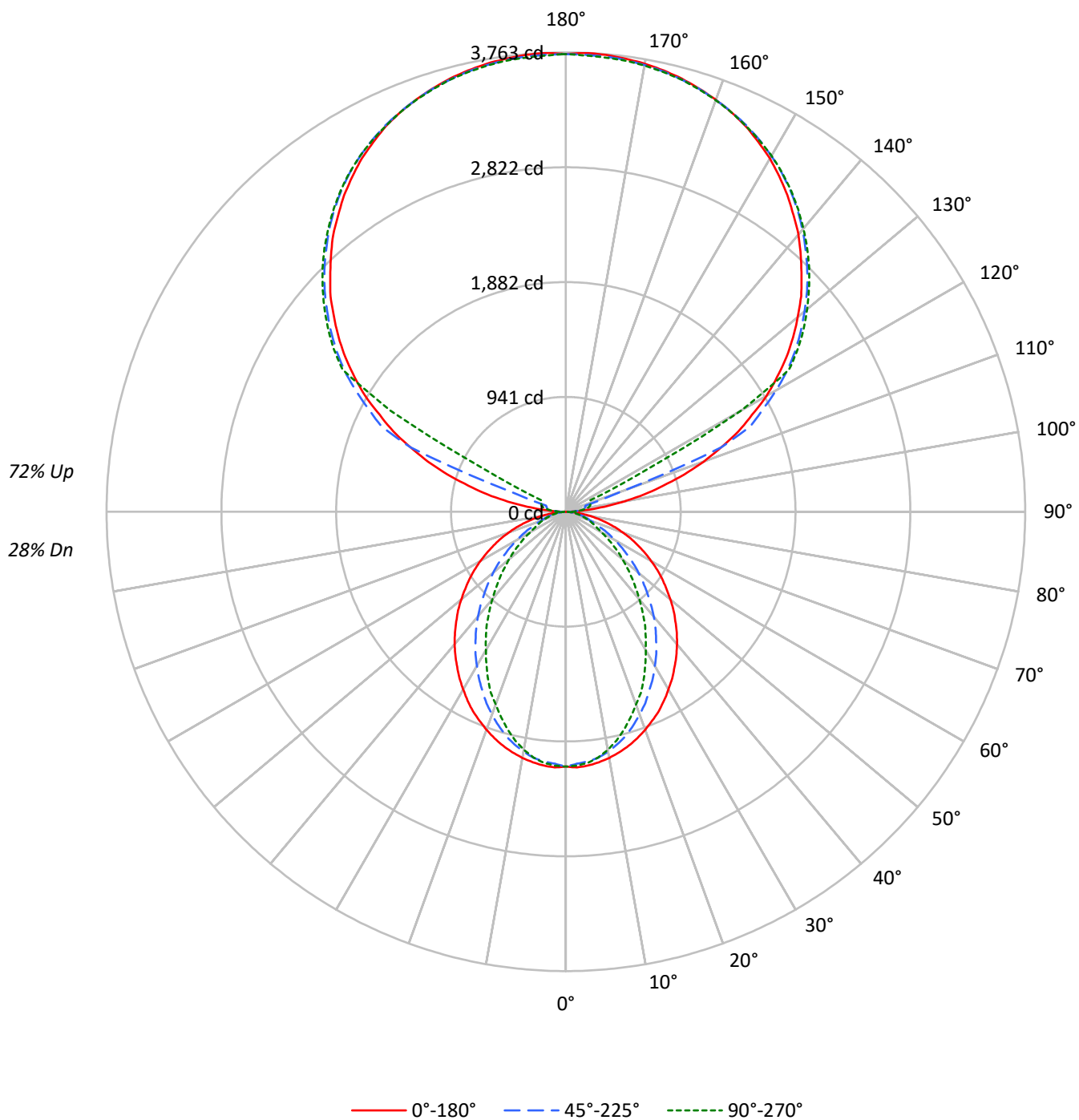
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15289.3 lumens  
Efficiency: N/A  
Efficacy: 112.7 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: Semi-Indirect  
  
Input Watts (W): 135.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
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 | 63 | 61 | 59 | 47 | 46 | 44 | 32 | 32 | 31 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 55 | 52 | 49 | 41 | 39 | 37 | 29 | 27 | 26 |
| 3   | 78  | 69  | 62  | 56  | 69 | 62 | 56 | 51 | 49 | 45 | 41 | 37 | 34 | 32 | 26 | 24 | 23 |
| 4   | 71  | 61  | 53  | 48  | 63 | 55 | 49 | 44 | 43 | 39 | 35 | 33 | 30 | 28 | 23 | 21 | 20 |
| 5   | 65  | 54  | 47  | 41  | 58 | 49 | 42 | 37 | 39 | 34 | 31 | 30 | 26 | 24 | 21 | 19 | 17 |
| 6   | 60  | 49  | 41  | 35  | 54 | 44 | 37 | 33 | 35 | 30 | 27 | 27 | 24 | 21 | 19 | 17 | 15 |
| 7   | 55  | 44  | 36  | 31  | 50 | 40 | 33 | 28 | 32 | 27 | 24 | 24 | 21 | 19 | 17 | 15 | 14 |
| 8   | 51  | 40  | 32  | 27  | 46 | 36 | 30 | 25 | 29 | 24 | 21 | 22 | 19 | 17 | 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°  | 1523 | 1523 | 1523 |
| 5°  | 1526 | 1499 | 1509 |
| 10° | 1511 | 1470 | 1460 |
| 15° | 1490 | 1422 | 1385 |
| 20° | 1462 | 1355 | 1292 |
| 25° | 1434 | 1280 | 1202 |
| 30° | 1396 | 1203 | 1088 |
| 35° | 1359 | 1121 | 988  |
| 40° | 1322 | 1035 | 873  |
| 45° | 1278 | 940  | 769  |
| 50° | 1232 | 844  | 667  |
| 55° | 1185 | 742  | 570  |
| 60° | 1130 | 635  | 469  |
| 65° | 1067 | 526  | 423  |
| 70° | 991  | 424  | 383  |
| 75° | 895  | 375  | 349  |
| 80° | 756  | 315  | 303  |
| 85° | 527  | 212  | 230  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1998 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 195.6   | 1.3       |
| 10°-20°   | 536.9   | 3.5       |
| 20°-30°   | 753.8   | 4.9       |
| 30°-40°   | 821.7   | 5.4       |
| 40°-50°   | 755.2   | 4.9       |
| 50°-60°   | 593.1   | 3.9       |
| 60°-70°   | 386.1   | 2.5       |
| 70°-80°   | 198.7   | 1.3       |
| 80°-90°   | 57.3    | 0.4       |
| 90°-100°  | 123.6   | 0.8       |
| 100°-110° | 460.8   | 3.0       |
| 110°-120° | 1222.2  | 8.0       |
| 120°-130° | 2027.1  | 13.3      |
| 130°-140° | 2153.3  | 14.1      |
| 140°-150° | 2001.2  | 13.1      |
| 150°-160° | 1608.9  | 10.5      |
| 160°-170° | 1036.7  | 6.8       |
| 170°-180° | 356.8   | 2.3       |
| 0°-30°    | 1486.3  | 9.7       |
| 0°-40°    | 2308.0  | 15.1      |
| 0°-60°    | 3656.4  | 23.9      |
| 0°-90°    | 4298.5  | 28.1      |
| 90°-120°  | 1806.7  | 11.8      |
| 90°-150°  | 7988.3  | 52.2      |
| 90°-180°  | 10991.0 | 71.9      |
| 0°-180°   | 15289.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2087 | 2087  | 2087 | 2087  | 2087 |      |
| 5°   | 2087 | 2078  | 2053 | 2070  | 2064 | 198  |
| 15°  | 1985 | 1964  | 1900 | 1864  | 1845 | 559  |
| 25°  | 1802 | 1741  | 1617 | 1539  | 1511 | 829  |
| 35°  | 1552 | 1456  | 1290 | 1171  | 1129 | 972  |
| 45°  | 1269 | 1143  | 944  | 810   | 765  | 980  |
| 55°  | 965  | 818   | 614  | 500   | 465  | 862  |
| 65°  | 652  | 499   | 329  | 264   | 259  | 646  |
| 75°  | 348  | 215   | 151  | 138   | 136  | 368  |
| 85°  | 81   | 42    | 36   | 36    | 36   | 93   |
| 90°  | 3    | 32    | 54   | 68    | 73   | 14   |
| 95°  | 176  | 87    | 106  | 120   | 117  | 209  |
| 105° | 825  | 906   | 166  | 195   | 206  | 881  |
| 115° | 1560 | 1606  | 1674 | 418   | 223  | 1536 |
| 125° | 2205 | 2241  | 2292 | 2311  | 2319 | 1967 |
| 135° | 2729 | 2773  | 2797 | 2824  | 2819 | 2108 |
| 145° | 3166 | 3163  | 3209 | 3228  | 3215 | 1980 |
| 155° | 3486 | 3462  | 3494 | 3510  | 3489 | 1606 |
| 165° | 3673 | 3657  | 3665 | 3684  | 3665 | 1038 |
| 175° | 3757 | 3738  | 3744 | 3763  | 3736 | 358  |
| 180° | 3749 | 3749  | 3749 | 3749  | 3749 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2086.9 | 2086.9 | 2086.9 | 2086.9 | 2086.9 |
| 2.5°   | 2096.3 | 2086.9 | 2066.1 | 2085.1 | 2081.2 |
| 5°     | 2086.9 | 2077.5 | 2052.9 | 2069.8 | 2064.3 |
| 7.5°   | 2069.8 | 2058.6 | 2032.2 | 2039.6 | 2030.1 |
| 10°    | 2047.2 | 2034.0 | 1996.3 | 1990.5 | 1979.2 |
| 12.5°  | 2018.9 | 2002.0 | 1950.9 | 1939.6 | 1918.7 |
| 15°    | 1984.9 | 1964.1 | 1900.0 | 1864.1 | 1845.2 |
| 17.5°  | 1945.2 | 1915.0 | 1835.6 | 1794.1 | 1763.8 |
| 20°    | 1900.0 | 1862.1 | 1767.7 | 1720.6 | 1678.9 |
| 22.5°  | 1850.9 | 1807.4 | 1697.8 | 1633.7 | 1605.4 |
| 25°    | 1801.7 | 1741.2 | 1616.6 | 1539.2 | 1510.8 |
| 27.5°  | 1743.2 | 1678.9 | 1541.1 | 1452.3 | 1408.9 |
| 30°    | 1680.9 | 1609.0 | 1457.9 | 1361.7 | 1310.6 |
| 32.5°  | 1620.4 | 1533.5 | 1378.8 | 1265.4 | 1218.1 |
| 35°    | 1552.5 | 1456.1 | 1290.0 | 1170.9 | 1129.3 |
| 37.5°  | 1486.3 | 1382.4 | 1206.9 | 1076.4 | 1029.4 |
| 40°    | 1416.4 | 1303.2 | 1119.8 | 985.8  | 936.8  |
| 42.5°  | 1344.7 | 1223.9 | 1033.1 | 893.2  | 846.2  |
| 45°    | 1269.2 | 1142.6 | 944.3  | 810.1  | 764.8  |
| 47.5°  | 1197.4 | 1063.4 | 859.4  | 725.2  | 683.7  |
| 50°    | 1118.1 | 984.0  | 776.3  | 645.8  | 606.3  |
| 52.5°  | 1040.6 | 898.9  | 696.9  | 572.3  | 536.4  |
| 55°    | 965.0  | 817.7  | 613.7  | 500.5  | 464.6  |
| 57.5°  | 887.7  | 736.6  | 540.2  | 434.4  | 404.1  |
| 60°    | 808.3  | 657.2  | 462.6  | 366.5  | 336.2  |
| 62.5°  | 730.9  | 579.9  | 396.6  | 306.0  | 290.9  |
| 65°    | 651.6  | 498.6  | 328.6  | 264.5  | 258.7  |
| 67.5°  | 576.0  | 423.0  | 264.5  | 232.3  | 226.6  |
| 70°    | 496.8  | 349.4  | 219.0  | 200.2  | 192.6  |
| 72.5°  | 421.2  | 281.3  | 183.2  | 168.1  | 164.3  |
| 75°    | 347.5  | 215.2  | 151.1  | 137.8  | 136.0  |
| 77.5°  | 273.9  | 152.9  | 119.1  | 111.4  | 107.6  |
| 80°    | 205.8  | 109.6  | 90.6   | 83.1   | 83.1   |
| 82.5°  | 143.5  | 73.7   | 62.3   | 58.5   | 58.5   |
| 85°    | 81.2   | 41.5   | 35.9   | 35.9   | 35.9   |
| 87.5°  | 30.3   | 15.0   | 15.0   | 13.2   | 13.2   |
| 90°    | 2.6    | 32.5   | 54.1   | 68.0   | 73.1   |
| 92.5°  | 68.0   | 57.1   | 65.0   | 70.6   | 73.1   |
| 95°    | 176.2  | 86.6   | 105.6  | 119.5  | 116.6  |
| 97.5°  | 317.3  | 95.0   | 138.1  | 146.5  | 149.2  |
| 100°   | 480.3  | 108.6  | 154.6  | 176.2  | 181.7  |
| 102.5° | 659.0  | 653.9  | 160.1  | 189.8  | 198.1  |
| 105°   | 824.7  | 906.2  | 165.6  | 195.2  | 206.2  |
| 107.5° | 1017.3 | 1084.9 | 171.1  | 200.7  | 211.7  |
| 110°   | 1201.8 | 1258.6 | 474.8  | 203.6  | 214.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1375.5 | 1424.1 | 1378.1 | 208.7  | 217.1  |
| 115°   | 1559.7 | 1605.8 | 1673.9 | 417.8  | 222.6  |
| 117.5° | 1719.9 | 1774.0 | 1820.4 | 1432.2 | 721.5  |
| 120°   | 1899.0 | 1939.5 | 1988.5 | 2021.0 | 1654.8 |
| 122.5° | 2050.7 | 2094.2 | 2148.6 | 2164.7 | 2167.7 |
| 125°   | 2205.3 | 2240.8 | 2292.3 | 2311.3 | 2319.4 |
| 127.5° | 2346.4 | 2384.4 | 2425.3 | 2452.4 | 2455.0 |
| 130°   | 2479.4 | 2522.9 | 2552.5 | 2582.5 | 2580.0 |
| 132.5° | 2615.0 | 2650.5 | 2680.2 | 2704.6 | 2702.1 |
| 135°   | 2729.2 | 2772.6 | 2796.7 | 2824.2 | 2818.6 |
| 137.5° | 2848.3 | 2880.8 | 2908.2 | 2935.3 | 2927.2 |
| 140°   | 2965.0 | 2986.8 | 3016.5 | 3040.9 | 3027.4 |
| 142.5° | 3062.8 | 3081.8 | 3116.9 | 3138.6 | 3125.0 |
| 145°   | 3165.9 | 3163.0 | 3209.0 | 3228.1 | 3214.6 |
| 147.5° | 3255.2 | 3247.1 | 3293.2 | 3306.7 | 3296.1 |
| 150°   | 3342.2 | 3323.2 | 3366.6 | 3382.7 | 3369.2 |
| 152.5° | 3415.3 | 3393.7 | 3434.2 | 3450.7 | 3431.7 |
| 155°   | 3485.9 | 3461.6 | 3494.1 | 3510.3 | 3488.7 |
| 157.5° | 3542.8 | 3521.2 | 3545.7 | 3564.7 | 3542.8 |
| 160°   | 3591.8 | 3575.3 | 3591.8 | 3607.8 | 3588.9 |
| 162.5° | 3634.9 | 3618.9 | 3632.4 | 3651.4 | 3626.9 |
| 165°   | 3673.0 | 3656.8 | 3664.9 | 3683.9 | 3664.9 |
| 167.5° | 3702.9 | 3686.5 | 3694.9 | 3713.9 | 3689.4 |
| 170°   | 3727.4 | 3711.0 | 3716.4 | 3735.5 | 3711.0 |
| 172.5° | 3743.5 | 3727.4 | 3732.9 | 3751.9 | 3727.4 |
| 175°   | 3757.0 | 3738.0 | 3743.5 | 3762.6 | 3735.5 |
| 177.5° | 3762.6 | 3743.5 | 3746.4 | 3765.4 | 3740.9 |
| 180°   | 3749.0 | 3749.0 | 3749.0 | 3749.0 | 3749.0 |

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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 | 6.12             | 6.80 | 7.25  | 7.92  | 9.47  | 2.08           | 2.76 | 3.21 | 3.88 | 5.44 |
|                 | 3H   | 7.79             | 8.39 | 8.92  | 9.52  | 11.09 | 3.26           | 3.87 | 4.40 | 4.99 | 6.57 |
|                 | 4H   | 8.39             | 8.97 | 9.54  | 10.09 | 11.67 | 3.70           | 4.28 | 4.85 | 5.41 | 6.98 |
|                 | 6H   | 8.81             | 9.34 | 9.96  | 10.47 | 12.05 | 4.02           | 4.55 | 5.17 | 5.68 | 7.26 |
|                 | 8H   | 8.93             | 9.43 | 10.09 | 10.58 | 12.16 | 4.11           | 4.61 | 5.26 | 5.75 | 7.33 |
|                 | 12H  | 8.99             | 9.47 | 10.15 | 10.60 | 12.21 | 4.14           | 4.62 | 5.31 | 5.76 | 7.36 |
| 4H              | 2H   | 6.12             | 6.69 | 7.27  | 7.82  | 9.40  | 2.66           | 3.24 | 3.82 | 4.36 | 5.94 |
|                 | 3H   | 7.94             | 8.42 | 9.10  | 9.57  | 11.16 | 4.00           | 4.48 | 5.16 | 5.63 | 7.22 |
|                 | 4H   | 8.62             | 9.07 | 9.79  | 10.21 | 11.81 | 4.54           | 4.98 | 5.70 | 6.12 | 7.73 |
|                 | 6H   | 9.13             | 9.51 | 10.30 | 10.68 | 12.27 | 4.95           | 5.33 | 6.12 | 6.49 | 8.09 |
|                 | 8H   | 9.31             | 9.66 | 10.47 | 10.82 | 12.43 | 5.08           | 5.43 | 6.25 | 6.59 | 8.20 |
|                 | 12H  | 9.40             | 9.72 | 10.58 | 10.88 | 12.50 | 5.14           | 5.46 | 6.32 | 6.62 | 8.24 |
| 8H              | 4H   | 8.58             | 8.93 | 9.75  | 10.09 | 11.70 | 4.81           | 5.16 | 5.98 | 6.32 | 7.93 |
|                 | 6H   | 9.15             | 9.44 | 10.33 | 10.63 | 12.24 | 5.33           | 5.62 | 6.51 | 6.81 | 8.43 |
|                 | 8H   | 9.36             | 9.62 | 10.55 | 10.79 | 12.42 | 5.52           | 5.77 | 6.71 | 6.95 | 8.58 |
|                 | 12H  | 9.50             | 9.72 | 10.69 | 10.89 | 12.56 | 5.63           | 5.85 | 6.82 | 7.03 | 8.69 |
| 12H             | 4H   | 8.53             | 8.85 | 9.71  | 10.01 | 11.63 | 4.81           | 5.13 | 5.99 | 6.30 | 7.92 |
|                 | 6H   | 9.12             | 9.37 | 10.31 | 10.55 | 12.18 | 5.38           | 5.63 | 6.57 | 6.80 | 8.44 |
|                 | 8H   | 9.34             | 9.56 | 10.53 | 10.73 | 12.40 | 5.58           | 5.80 | 6.77 | 6.98 | 8.64 |

END OF REPORT