

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: P909996

Luminaire Tested: DFN2DIP-TR3F0-090D090US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

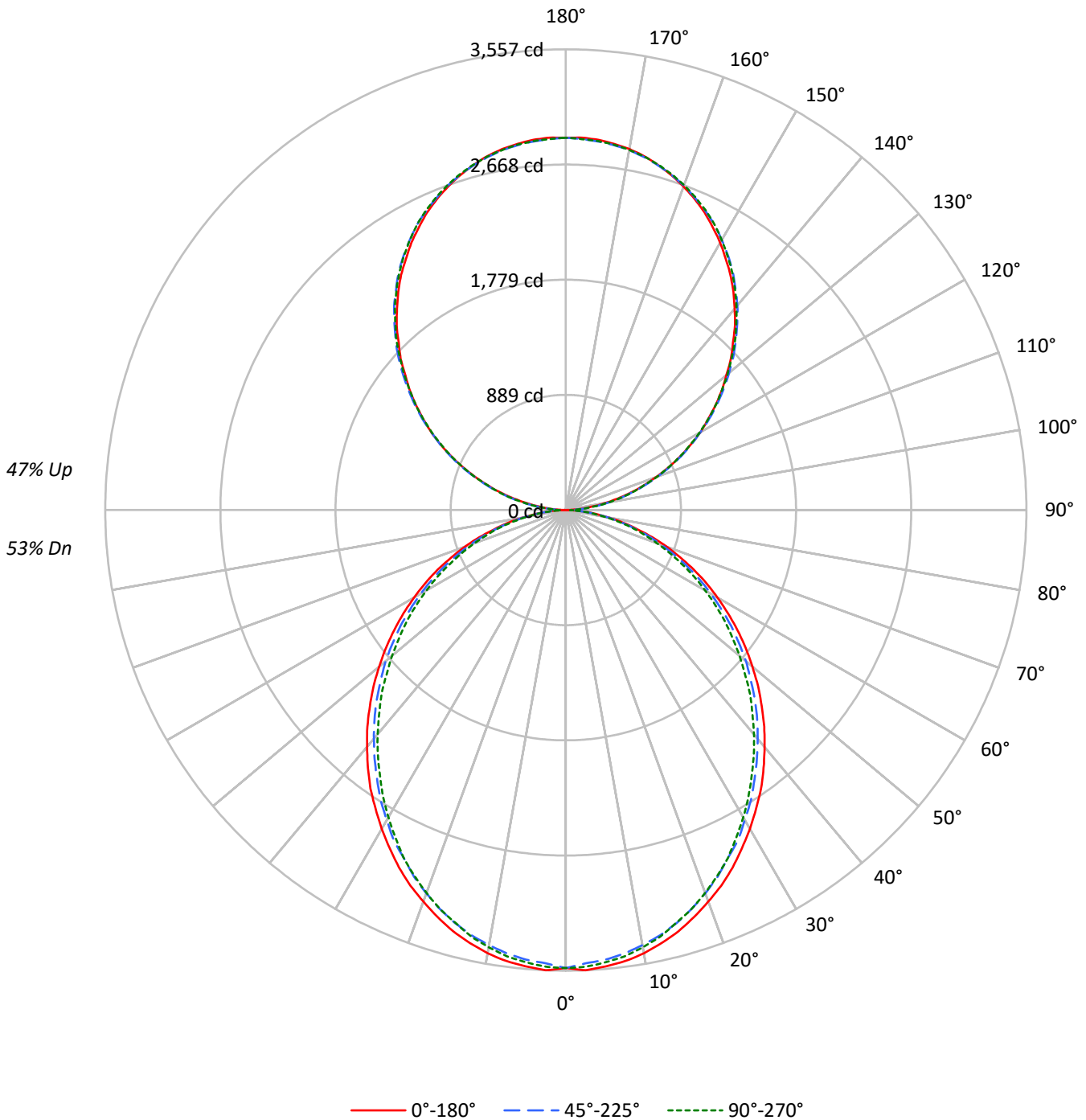
Test Method: LM-79-2019  
Report Number: P909996  
REPORT IS A COMBINATION OF REPORTS P900367 AND P897195  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR3F0-090D090US840-FLLFLL  
Description: 3 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17041.5 lumens  
Efficiency: N/A  
Efficacy: 102.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.74' x L: 3.16' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 165.8  
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





TEST NUMBER: P909996

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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    |    |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 |    |    | 0  |    |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0  |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 59 | 59 | 59 | 59 | 59 | 59 | 53 |
| 1   | 98  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 74 | 72 | 70 | 63 | 61 | 59 | 52 | 51 | 50 | 52 | 51 | 50 | 45 |
| 2   | 90  | 82  | 76  | 71  | 83  | 76  | 71  | 66  | 65 | 61 | 58 | 55 | 52 | 50 | 46 | 44 | 42 | 46 | 44 | 42 | 37 |
| 3   | 82  | 72  | 65  | 59  | 75  | 67  | 61  | 55  | 58 | 53 | 49 | 49 | 45 | 42 | 41 | 38 | 36 | 41 | 38 | 36 | 32 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 52  | 47  | 51 | 46 | 41 | 43 | 39 | 36 | 36 | 33 | 31 | 36 | 33 | 31 | 27 |
| 5   | 69  | 57  | 49  | 43  | 63  | 53  | 46  | 40  | 46 | 40 | 36 | 39 | 35 | 31 | 33 | 29 | 27 | 33 | 29 | 27 | 24 |
| 6   | 63  | 51  | 43  | 37  | 58  | 48  | 40  | 35  | 41 | 36 | 31 | 35 | 31 | 27 | 30 | 26 | 24 | 30 | 26 | 24 | 21 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 37 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 | 27 | 24 | 21 | 18 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 29 | 24 | 29 | 25 | 22 | 25 | 21 | 19 | 25 | 21 | 19 | 16 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 19 | 23 | 20 | 17 | 23 | 20 | 17 | 15 |
| 10  | 47  | 35  | 28  | 23  | 44  | 33  | 26  | 22  | 29 | 23 | 20 | 25 | 21 | 18 | 21 | 18 | 15 | 21 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4407 | 4407 | 4407 |
| 5°  | 4411 | 4342 | 4372 |
| 10° | 4373 | 4280 | 4310 |
| 15° | 4307 | 4205 | 4214 |
| 20° | 4217 | 4104 | 4117 |
| 25° | 4128 | 3983 | 4004 |
| 30° | 4017 | 3870 | 3862 |
| 35° | 3912 | 3738 | 3712 |
| 40° | 3783 | 3604 | 3569 |
| 45° | 3654 | 3470 | 3423 |
| 50° | 3513 | 3329 | 3253 |
| 55° | 3365 | 3166 | 3097 |
| 60° | 3197 | 2972 | 2918 |
| 65° | 3015 | 2771 | 2706 |
| 70° | 2781 | 2527 | 2477 |
| 75° | 2459 | 2233 | 2262 |
| 80° | 2070 | 1858 | 1860 |
| 85° | 1462 | 1224 | 1201 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 3654 cd/sqm



TEST NUMBER: P909996

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 332.9   | 2.0       |
| 10°-20°   | 936.5   | 5.5       |
| 20°-30°   | 1376.3  | 8.1       |
| 30°-40°   | 1598.5  | 9.4       |
| 40°-50°   | 1596.5  | 9.4       |
| 50°-60°   | 1392.1  | 8.2       |
| 60°-70°   | 1029.1  | 6.0       |
| 70°-80°   | 582.2   | 3.4       |
| 80°-90°   | 161.8   | 0.9       |
| 90°-100°  | 177.9   | 1.0       |
| 100°-110° | 565.2   | 3.3       |
| 110°-120° | 967.2   | 5.7       |
| 120°-130° | 1272.0  | 7.5       |
| 130°-140° | 1427.7  | 8.4       |
| 140°-150° | 1400.0  | 8.2       |
| 150°-160° | 1174.4  | 6.9       |
| 160°-170° | 778.9   | 4.6       |
| 170°-180° | 272.2   | 1.6       |
| 0°-30°    | 2645.7  | 15.5      |
| 0°-40°    | 4244.2  | 24.9      |
| 0°-60°    | 7232.9  | 42.4      |
| 0°-90°    | 9006.1  | 52.8      |
| 90°-120°  | 1710.2  | 10.0      |
| 90°-150°  | 5809.9  | 34.1      |
| 90°-180°  | 8035.0  | 47.1      |
| 0°-180°   | 17041.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3536 | 3536  | 3536 | 3536  | 3536 |      |
| 5°   | 3536 | 3523  | 3486 | 3513  | 3506 | 336  |
| 15°  | 3367 | 3346  | 3302 | 3316  | 3299 | 948  |
| 25°  | 3047 | 3020  | 2962 | 2969  | 2962 | 1402 |
| 35°  | 2629 | 2595  | 2540 | 2520  | 2503 | 1642 |
| 45°  | 2139 | 2115  | 2064 | 2027  | 2013 | 1651 |
| 55°  | 1619 | 1598  | 1558 | 1517  | 1500 | 1447 |
| 65°  | 1092 | 1071  | 1037 | 1007  | 990  | 1079 |
| 75°  | 571  | 565   | 547  | 527   | 534  | 610  |
| 85°  | 139  | 136   | 133  | 122   | 119  | 155  |
| 90°  | 3    | 31    | 85   | 80    | 82   | 16   |
| 95°  | 126  | 151   | 155  | 155   | 151  | 141  |
| 105° | 522  | 529   | 534  | 538   | 538  | 551  |
| 115° | 971  | 984   | 980  | 978   | 971  | 960  |
| 125° | 1412 | 1433  | 1426 | 1419  | 1416 | 1261 |
| 135° | 1826 | 1853  | 1858 | 1855  | 1848 | 1411 |
| 145° | 2217 | 2234  | 2248 | 2250  | 2241 | 1385 |
| 155° | 2535 | 2542  | 2550 | 2562  | 2554 | 1167 |
| 165° | 2757 | 2755  | 2755 | 2772  | 2760 | 778  |
| 175° | 2869 | 2862  | 2857 | 2874  | 2860 | 273  |
| 180° | 2874 | 2874  | 2874 | 2874  | 2874 |      |



TEST NUMBER: P909996

CATALOG NUMBER: DFN2DIP-TR3F0-090D090US840-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3536.4 | 3536.4 | 3536.4 | 3536.4 | 3536.4 |
| 2.5°   | 3557.0 | 3540.1 | 3502.6 | 3536.4 | 3530.0 |
| 5°     | 3536.4 | 3523.1 | 3485.7 | 3512.7 | 3506.2 |
| 7.5°   | 3512.7 | 3492.5 | 3455.0 | 3482.4 | 3475.6 |
| 10°    | 3475.6 | 3451.7 | 3410.9 | 3438.0 | 3427.9 |
| 12.5°  | 3424.3 | 3404.1 | 3363.4 | 3380.2 | 3373.5 |
| 15°    | 3366.6 | 3346.4 | 3302.0 | 3315.7 | 3298.7 |
| 17.5°  | 3295.1 | 3274.9 | 3230.6 | 3247.5 | 3230.6 |
| 20°    | 3216.8 | 3196.6 | 3149.0 | 3159.1 | 3145.7 |
| 22.5°  | 3138.9 | 3108.3 | 3063.8 | 3063.8 | 3057.0 |
| 25°    | 3046.9 | 3019.8 | 2962.1 | 2968.6 | 2962.1 |
| 27.5°  | 2944.8 | 2920.9 | 2877.0 | 2866.9 | 2849.9 |
| 30°    | 2843.1 | 2815.6 | 2764.7 | 2754.6 | 2741.0 |
| 32.5°  | 2734.1 | 2713.9 | 2659.4 | 2638.9 | 2625.1 |
| 35°    | 2628.8 | 2594.8 | 2540.3 | 2519.8 | 2502.9 |
| 37.5°  | 2509.7 | 2479.0 | 2424.5 | 2400.8 | 2383.8 |
| 40°    | 2387.3 | 2360.0 | 2305.4 | 2275.1 | 2261.5 |
| 42.5°  | 2268.3 | 2240.9 | 2186.8 | 2152.5 | 2132.3 |
| 45°    | 2139.1 | 2115.4 | 2064.1 | 2026.9 | 2013.3 |
| 47.5°  | 2013.3 | 1989.4 | 1934.9 | 1897.4 | 1877.2 |
| 50°    | 1880.5 | 1863.5 | 1815.8 | 1768.3 | 1751.3 |
| 52.5°  | 1751.3 | 1727.5 | 1683.4 | 1646.0 | 1622.1 |
| 55°    | 1618.9 | 1598.3 | 1557.5 | 1516.8 | 1499.9 |
| 57.5°  | 1486.1 | 1469.2 | 1424.8 | 1384.0 | 1370.3 |
| 60°    | 1353.3 | 1340.0 | 1292.3 | 1254.9 | 1244.8 |
| 62.5°  | 1224.2 | 1200.3 | 1166.4 | 1132.6 | 1118.8 |
| 65°    | 1091.8 | 1071.2 | 1037.2 | 1006.6 | 989.7  |
| 67.5°  | 955.7  | 938.5  | 908.1  | 884.3  | 870.6  |
| 70°    | 829.8  | 816.1  | 785.5  | 761.6  | 748.3  |
| 72.5°  | 700.6  | 686.9  | 669.9  | 646.2  | 636.1  |
| 75°    | 571.2  | 564.6  | 547.3  | 527.1  | 534.0  |
| 77.5°  | 455.7  | 442.0  | 435.2  | 425.1  | 415.0  |
| 80°    | 340.2  | 336.6  | 329.7  | 319.6  | 312.9  |
| 82.5°  | 231.3  | 231.3  | 228.0  | 214.3  | 214.3  |
| 85°    | 139.3  | 136.0  | 132.8  | 122.3  | 119.1  |
| 87.5°  | 61.3   | 54.4   | 47.7   | 37.6   | 33.9   |
| 90°    | 2.6    | 31.2   | 84.9   | 79.7   | 82.3   |
| 92.5°  | 53.7   | 72.8   | 75.4   | 78.0   | 78.0   |
| 95°    | 126.5  | 150.8  | 155.1  | 155.1  | 150.8  |
| 97.5°  | 210.6  | 233.1  | 242.7  | 242.7  | 242.7  |
| 100°   | 307.6  | 327.6  | 334.5  | 334.5  | 331.9  |
| 102.5° | 409.9  | 424.6  | 434.1  | 436.8  | 434.1  |
| 105°   | 521.7  | 528.6  | 533.8  | 538.2  | 538.2  |
| 107.5° | 632.6  | 643.0  | 643.0  | 644.7  | 632.6  |
| 110°   | 740.0  | 754.0  | 754.0  | 754.0  | 747.0  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 856.2  | 870.9  | 868.3  | 861.4  | 856.2  |
| 115°   | 970.6  | 984.4  | 980.1  | 977.5  | 970.6  |
| 117.5° | 1084.1 | 1103.2 | 1091.1 | 1084.1 | 1077.1 |
| 120°   | 1198.5 | 1217.5 | 1198.5 | 1198.5 | 1190.6 |
| 122.5° | 1302.4 | 1326.8 | 1314.6 | 1307.7 | 1302.4 |
| 125°   | 1411.7 | 1433.3 | 1426.4 | 1418.6 | 1416.0 |
| 127.5° | 1518.2 | 1545.1 | 1535.6 | 1525.2 | 1518.2 |
| 130°   | 1617.9 | 1649.1 | 1644.8 | 1639.5 | 1630.0 |
| 132.5° | 1729.7 | 1753.9 | 1755.7 | 1743.5 | 1736.7 |
| 135°   | 1825.8 | 1852.7 | 1858.0 | 1855.3 | 1848.5 |
| 137.5° | 1933.3 | 1955.0 | 1959.3 | 1957.6 | 1947.2 |
| 140°   | 2027.8 | 2049.4 | 2061.5 | 2061.5 | 2052.0 |
| 142.5° | 2124.9 | 2146.5 | 2153.4 | 2156.1 | 2146.5 |
| 145°   | 2216.8 | 2234.0 | 2247.9 | 2250.5 | 2241.0 |
| 147.5° | 2299.1 | 2320.7 | 2331.1 | 2335.4 | 2325.9 |
| 150°   | 2384.0 | 2398.7 | 2408.2 | 2416.0 | 2408.2 |
| 152.5° | 2459.3 | 2474.1 | 2486.2 | 2495.8 | 2486.2 |
| 155°   | 2534.8 | 2541.6 | 2549.5 | 2561.6 | 2553.8 |
| 157.5° | 2599.7 | 2604.9 | 2609.3 | 2626.6 | 2614.4 |
| 160°   | 2657.8 | 2663.0 | 2665.6 | 2680.3 | 2669.9 |
| 162.5° | 2711.5 | 2711.5 | 2714.1 | 2730.6 | 2718.5 |
| 165°   | 2757.4 | 2754.8 | 2754.8 | 2772.2 | 2760.1 |
| 167.5° | 2799.0 | 2791.3 | 2791.3 | 2808.5 | 2796.4 |
| 170°   | 2830.2 | 2823.3 | 2820.8 | 2838.0 | 2823.3 |
| 172.5° | 2851.9 | 2845.0 | 2842.4 | 2859.7 | 2845.0 |
| 175°   | 2869.2 | 2862.3 | 2857.1 | 2874.5 | 2859.7 |
| 177.5° | 2878.7 | 2871.9 | 2866.6 | 2881.3 | 2866.6 |
| 180°   | 2874.5 | 2874.5 | 2874.5 | 2874.5 | 2874.5 |



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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 | 12.63            | 13.52 | 13.56 | 14.47 | 15.70 | 12.20          | 13.09 | 13.14 | 14.04 | 15.27 |
|                 | 3H   | 14.28            | 15.08 | 15.23 | 16.04 | 17.29 | 13.82          | 14.61 | 14.76 | 15.57 | 16.82 |
|                 | 4H   | 14.87            | 15.62 | 15.83 | 16.58 | 17.85 | 14.40          | 15.15 | 15.36 | 16.12 | 17.38 |
|                 | 6H   | 15.26            | 15.96 | 16.23 | 16.92 | 18.20 | 14.79          | 15.49 | 15.76 | 16.46 | 17.73 |
|                 | 8H   | 15.36            | 16.02 | 16.34 | 17.01 | 18.28 | 14.89          | 15.56 | 15.87 | 16.54 | 17.81 |
|                 | 12H  | 15.41            | 16.04 | 16.39 | 17.02 | 18.32 | 14.94          | 15.56 | 15.92 | 16.54 | 17.84 |
| 4H              | 2H   | 13.09            | 13.85 | 14.06 | 14.81 | 16.07 | 12.75          | 13.50 | 13.71 | 14.47 | 15.73 |
|                 | 3H   | 14.95            | 15.58 | 15.92 | 16.57 | 17.85 | 14.56          | 15.19 | 15.53 | 16.18 | 17.46 |
|                 | 4H   | 15.66            | 16.23 | 16.64 | 17.22 | 18.52 | 15.26          | 15.83 | 16.24 | 16.82 | 18.12 |
|                 | 6H   | 16.17            | 16.66 | 17.16 | 17.67 | 18.97 | 15.76          | 16.26 | 16.76 | 17.27 | 18.57 |
|                 | 8H   | 16.31            | 16.77 | 17.31 | 17.78 | 19.09 | 15.91          | 16.37 | 16.90 | 17.37 | 18.69 |
|                 | 12H  | 16.38            | 16.80 | 17.40 | 17.82 | 19.14 | 15.97          | 16.38 | 16.98 | 17.40 | 18.72 |
| 8H              | 4H   | 15.85            | 16.32 | 16.85 | 17.32 | 18.63 | 15.50          | 15.96 | 16.49 | 16.96 | 18.28 |
|                 | 6H   | 16.47            | 16.86 | 17.50 | 17.90 | 19.21 | 16.12          | 16.50 | 17.14 | 17.54 | 18.86 |
|                 | 8H   | 16.69            | 17.03 | 17.72 | 18.06 | 19.39 | 16.33          | 16.66 | 17.35 | 17.69 | 19.02 |
|                 | 12H  | 16.82            | 17.11 | 17.85 | 18.14 | 19.51 | 16.44          | 16.73 | 17.47 | 17.76 | 19.13 |
| 12H             | 4H   | 15.84            | 16.26 | 16.85 | 17.28 | 18.60 | 15.49          | 15.91 | 16.51 | 16.93 | 18.25 |
|                 | 6H   | 16.50            | 16.84 | 17.53 | 17.87 | 19.20 | 16.16          | 16.49 | 17.18 | 17.52 | 18.85 |
|                 | 8H   | 16.74            | 17.04 | 17.77 | 18.06 | 19.44 | 16.39          | 16.68 | 17.42 | 17.71 | 19.08 |