

TOMAR Electronics, Inc.

IES INDOOR REPORT

PHOTOMETRIC FILENAME : TLB96WNNPGR1 SERIES WIDE ANGLE NORMAL EFFICACY 480VAC.IES

DESCRIPTION INFORMATION (From Photometric File)

[IESNA]LM-63-2002

[TEST]17759-G

[TESTLAB]Cree Inc. - Durham Technology Center

[ISSUE DATE] 5/15/2015

[MANUFAC]Tomar

[LUMCAT]Highbay model TLB96WNNPGR1

[LUMINAIRE]Circular 8 LED Arrays on Heatsink with reflector and glass protective cover

[LAMP]Cree

[LAMPCAT]96 CREE XT-E. LUMINAIRE OUTPUT = 26727 LM

[OTHER]Tested at 480 VAC at 60 Hz and 329.4W.

CHARACTERISTICS

| | |
|---------------------------------|--------------------|
| Lumens Per Lamp | N.A. (absolute) |
| Total Lamp Lumens | N.A. (absolute) |
| Luminaire Lumens | 26749 |
| Total Luminaire Efficiency | N.A. |
| Luminaire Efficacy Rating (LER) | 81 |
| Total Luminaire Watts | 329.4 |
| Ballast Factor | 1.00 |
| CIE Type | Direct |
| Spacing Criterion (0-180) | 2.94 |
| Spacing Criterion (90-270) | 3.02 |
| Spacing Criterion (Diagonal) | 2.66 |
| Basic Luminous Shape | Circular |
| Luminous Length (0-180) | 1.75 ft (Diameter) |
| Luminous Width (90-270) | 1.75 ft (Diameter) |
| Luminous Height | 0.00 ft |

LUMINANCE DATA (cd/sq.m)

| Angle In Degrees | Average 0-Deg | Average 45-Deg | Average 90-Deg |
|------------------|---------------|----------------|----------------|
| 45 | 32541 | 36625 | 35412 |
| 55 | 70217 | 73027 | 74621 |
| 65 | 67303 | 60146 | 62922 |
| 75 | 10764 | 8941 | 8896 |
| 85 | 1308 | 1344 | 1257 |

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CANDELA TABULATION

| | <u>0.0</u> | <u>22.5</u> | <u>45.0</u> | <u>67.5</u> | <u>90.0</u> | <u>112.5</u> | <u>135.0</u> | <u>157.5</u> | <u>180.0</u> | <u>202.5</u> |
|-------------|------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|
| 0.0 | 3258.4 | 3258.4 | 3258.4 | 3258.4 | 3258.4 | 3258.4 | 3258.4 | 3258.4 | 3258.4 | 3258.4 |
| 2.5 | 3448.0 | 3425.3 | 3430.3 | 3422.6 | 3504.8 | 3536.1 | 3515.7 | 3486.5 | 3477.8 | 3486.5 |
| 5.0 | 4057.8 | 4035.3 | 4042.8 | 4042.7 | 4150.6 | 4220.3 | 4181.0 | 4160.5 | 4130.1 | 4160.5 |
| 7.5 | 4662.4 | 4662.7 | 4685.4 | 4726.0 | 4800.8 | 4827.8 | 4753.9 | 4753.0 | 4709.4 | 4753.0 |
| 10.0 | 5107.8 | 5106.0 | 5080.3 | 5204.6 | 5217.2 | 5227.1 | 5132.0 | 5169.2 | 5101.6 | 5169.2 |
| 12.5 | 5353.9 | 5299.1 | 5310.1 | 5420.2 | 5466.9 | 5399.6 | 5349.9 | 5353.6 | 5319.2 | 5353.6 |
| 15.0 | 5432.0 | 5368.1 | 5403.2 | 5463.2 | 5542.2 | 5435.5 | 5412.4 | 5384.8 | 5391.8 | 5384.8 |
| 17.5 | 5404.8 | 5330.1 | 5348.4 | 5439.5 | 5515.6 | 5379.4 | 5369.4 | 5322.9 | 5351.8 | 5322.9 |
| 20.0 | 5313.2 | 5243.3 | 5258.3 | 5345.1 | 5452.4 | 5288.8 | 5283.6 | 5217.0 | 5285.1 | 5217.0 |
| 22.5 | 5303.4 | 5154.9 | 5205.8 | 5261.8 | 5411.2 | 5200.6 | 5270.6 | 5155.5 | 5279.9 | 5155.5 |
| 25.0 | 5312.9 | 5072.0 | 5194.7 | 5181.9 | 5446.2 | 5170.7 | 5295.4 | 5138.8 | 5342.4 | 5138.8 |
| 27.5 | 5376.2 | 5026.6 | 5235.2 | 5126.9 | 5468.7 | 5124.2 | 5324.8 | 5069.2 | 5393.4 | 5069.2 |
| 30.0 | 5366.1 | 4967.9 | 5256.3 | 5046.2 | 5451.2 | 5037.1 | 5365.0 | 4972.6 | 5335.9 | 4972.6 |
| 32.5 | 5335.8 | 4925.9 | 5282.5 | 5005.9 | 5402.9 | 5009.8 | 5384.9 | 4955.1 | 5339.7 | 4955.1 |
| 35.0 | 5213.1 | 4827.0 | 5257.4 | 4883.0 | 5299.5 | 4879.7 | 5313.4 | 4820.1 | 5286.6 | 4820.1 |
| 37.5 | 5045.5 | 4640.8 | 5112.6 | 4736.3 | 5123.0 | 4709.7 | 5156.9 | 4669.2 | 5106.2 | 4669.2 |
| 40.0 | 4848.5 | 4493.2 | 5033.7 | 4620.7 | 5005.9 | 4633.1 | 5071.5 | 4559.1 | 4931.4 | 4559.1 |
| 42.5 | 4838.1 | 4661.1 | 5218.6 | 4815.5 | 5108.0 | 4934.2 | 5250.6 | 4727.6 | 4973.8 | 4727.6 |
| 45.0 | 5146.6 | 5342.2 | 5792.5 | 5496.7 | 5600.7 | 5765.8 | 5806.5 | 5421.9 | 5386.7 | 5421.9 |
| 47.5 | 5966.7 | 6450.0 | 6705.2 | 6597.0 | 6527.1 | 6968.8 | 6798.7 | 6616.9 | 6301.0 | 6616.9 |
| 50.0 | 7105.9 | 7704.4 | 7795.3 | 7836.3 | 7600.9 | 8265.6 | 7899.3 | 7807.2 | 7365.2 | 7807.2 |
| 52.5 | 8135.3 | 8743.5 | 8743.1 | 8813.7 | 8658.7 | 9312.7 | 9054.7 | 8885.3 | 8474.1 | 8885.3 |
| 55.0 | 9008.2 | 9354.3 | 9368.7 | 9374.7 | 9573.2 | 9895.3 | 9739.9 | 9324.4 | 9119.5 | 9324.4 |
| 57.5 | 9478.1 | 9269.9 | 9171.8 | 9153.9 | 9612.2 | 9635.9 | 9878.1 | 9279.7 | 9454.6 | 9279.7 |
| 60.0 | 9198.7 | 8406.7 | 8480.7 | 8241.7 | 8944.0 | 8366.7 | 8941.7 | 8523.7 | 8951.1 | 8523.7 |
| 62.5 | 7988.6 | 7014.8 | 7263.6 | 6943.1 | 7654.2 | 6926.6 | 7634.4 | 7187.4 | 7714.7 | 7187.4 |
| 65.0 | 6361.9 | 5494.1 | 5685.4 | 5420.7 | 5947.8 | 5376.9 | 5947.6 | 5762.7 | 6111.4 | 5762.7 |
| 67.5 | 4666.3 | 4135.2 | 4095.8 | 4045.2 | 4254.5 | 3940.7 | 4294.5 | 4296.3 | 4458.6 | 4296.3 |
| 70.0 | 3147.9 | 2713.0 | 2618.1 | 2684.7 | 2733.1 | 2486.7 | 2721.1 | 2843.5 | 2916.6 | 2843.5 |
| 72.5 | 1719.7 | 1376.1 | 1320.2 | 1377.2 | 1385.6 | 1153.6 | 1340.1 | 1437.4 | 1503.3 | 1437.4 |
| 75.0 | 623.1 | 443.4 | 517.6 | 460.8 | 515.0 | 383.0 | 506.3 | 434.4 | 528.7 | 434.4 |
| 77.5 | 226.6 | 195.9 | 222.3 | 201.4 | 219.5 | 189.0 | 218.2 | 196.8 | 213.3 | 196.8 |
| 80.0 | 102.7 | 125.8 | 103.0 | 128.2 | 102.1 | 125.4 | 104.0 | 128.2 | 98.3 | 128.2 |
| 82.5 | 50.7 | 79.5 | 53.8 | 81.4 | 50.5 | 77.3 | 56.1 | 79.9 | 51.6 | 79.9 |
| 85.0 | 25.5 | 37.5 | 26.2 | 39.3 | 24.5 | 34.0 | 26.5 | 36.8 | 24.3 | 36.8 |
| 87.5 | 6.2 | 4.8 | 5.3 | 5.3 | 5.5 | 4.4 | 5.7 | 5.7 | 5.7 | 5.7 |
| 90.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Vert. Angles Horizontal Angles

| | <u>225.0</u> | <u>247.5</u> | <u>270.0</u> | <u>292.5</u> | <u>315.0</u> | <u>337.5</u> | <u>360.0</u> |
|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 0.0 | 3258.4 | 3258.4 | 3258.4 | 3258.4 | 3258.4 | 3258.4 | 3258.4 |
| 2.5 | 3515.7 | 3536.1 | 3504.8 | 3422.6 | 3430.3 | 3425.3 | 3448.0 |
| 5.0 | 4181.0 | 4220.3 | 4150.6 | 4042.7 | 4042.8 | 4035.3 | 4057.8 |
| 7.5 | 4753.9 | 4827.8 | 4800.8 | 4726.0 | 4685.4 | 4662.7 | 4662.4 |
| 10.0 | 5132.0 | 5227.1 | 5217.2 | 5204.6 | 5080.3 | 5106.0 | 5107.8 |
| 12.5 | 5349.9 | 5399.6 | 5466.9 | 5420.2 | 5310.1 | 5299.1 | 5353.9 |
| 15.0 | 5412.4 | 5435.5 | 5542.2 | 5463.2 | 5403.2 | 5368.1 | 5432.0 |
| 17.5 | 5369.4 | 5379.4 | 5515.6 | 5439.5 | 5348.4 | 5330.1 | 5404.8 |
| 20.0 | 5283.6 | 5288.8 | 5452.4 | 5345.1 | 5258.3 | 5243.3 | 5313.2 |
| 22.5 | 5270.6 | 5200.6 | 5411.2 | 5261.8 | 5205.8 | 5154.9 | 5303.4 |
| 25.0 | 5295.4 | 5170.7 | 5446.2 | 5181.9 | 5194.7 | 5072.0 | 5312.9 |
| 27.5 | 5324.8 | 5124.2 | 5468.7 | 5126.9 | 5235.2 | 5026.6 | 5376.2 |
| 30.0 | 5365.0 | 5037.1 | 5451.2 | 5046.2 | 5256.3 | 4967.9 | 5366.1 |

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CANDELA TABULATION - (Cont.)

| | | | | | | | |
|-------------|--------|--------|--------|--------|--------|--------|--------|
| 32.5 | 5384.9 | 5009.8 | 5402.9 | 5005.9 | 5282.5 | 4925.9 | 5335.8 |
| 35.0 | 5313.4 | 4879.7 | 5299.5 | 4883.0 | 5257.4 | 4827.0 | 5213.1 |
| 37.5 | 5156.9 | 4709.7 | 5123.0 | 4736.3 | 5112.6 | 4640.8 | 5045.5 |
| 40.0 | 5071.5 | 4633.1 | 5005.9 | 4620.7 | 5033.7 | 4493.2 | 4848.5 |
| 42.5 | 5250.6 | 4934.2 | 5108.0 | 4815.5 | 5218.6 | 4661.1 | 4838.1 |
| 45.0 | 5806.5 | 5765.8 | 5600.7 | 5496.7 | 5792.5 | 5342.2 | 5146.6 |
| 47.5 | 6798.7 | 6968.8 | 6527.1 | 6597.0 | 6705.2 | 6450.0 | 5966.7 |
| 50.0 | 7899.3 | 8265.6 | 7600.9 | 7836.3 | 7795.3 | 7704.4 | 7105.9 |
| 52.5 | 9054.7 | 9312.7 | 8658.7 | 8813.7 | 8743.1 | 8743.5 | 8135.3 |
| 55.0 | 9739.9 | 9895.3 | 9573.2 | 9374.7 | 9368.7 | 9354.3 | 9008.2 |
| 57.5 | 9878.1 | 9635.9 | 9612.2 | 9153.9 | 9171.8 | 9269.9 | 9478.1 |
| 60.0 | 8941.7 | 8366.7 | 8944.0 | 8241.7 | 8480.7 | 8406.7 | 9198.7 |
| 62.5 | 7634.4 | 6926.6 | 7654.2 | 6943.1 | 7263.6 | 7014.8 | 7988.6 |
| 65.0 | 5947.6 | 5376.9 | 5947.8 | 5420.7 | 5685.4 | 5494.1 | 6361.9 |
| 67.5 | 4294.5 | 3940.7 | 4254.5 | 4045.2 | 4095.8 | 4135.2 | 4666.3 |
| 70.0 | 2721.1 | 2486.7 | 2733.1 | 2684.7 | 2618.1 | 2713.0 | 3147.9 |
| 72.5 | 1340.1 | 1153.6 | 1385.6 | 1377.2 | 1320.2 | 1376.1 | 1719.7 |
| 75.0 | 506.3 | 383.0 | 515.0 | 460.8 | 517.6 | 443.4 | 623.1 |
| 77.5 | 218.2 | 189.0 | 219.5 | 201.4 | 222.3 | 195.9 | 226.6 |
| 80.0 | 104.0 | 125.4 | 102.1 | 128.2 | 103.0 | 125.8 | 102.7 |
| 82.5 | 56.1 | 77.3 | 50.5 | 81.4 | 53.8 | 79.5 | 50.7 |
| 85.0 | 26.5 | 34.0 | 24.5 | 39.3 | 26.2 | 37.5 | 25.5 |
| 87.5 | 5.7 | 4.4 | 5.5 | 5.3 | 5.3 | 4.8 | 6.2 |
| 90.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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ZONAL LUMEN SUMMARY

| Zone | Lumens | %Lamp | %Fixt |
|---------|----------|-------|--------|
| 0-20 | 1945.03 | N.A. | 7.30 |
| 0-30 | 4366.00 | N.A. | 16.30 |
| 0-40 | 7519.96 | N.A. | 28.10 |
| 0-60 | 20143.72 | N.A. | 75.30 |
| 0-80 | 26705.65 | N.A. | 99.80 |
| 0-90 | 26749.14 | N.A. | 100.00 |
| 10-90 | 26322.62 | N.A. | 98.40 |
| 20-40 | 5574.93 | N.A. | 20.80 |
| 20-50 | 10136.62 | N.A. | 37.90 |
| 40-70 | 18274.02 | N.A. | 68.30 |
| 60-80 | 6561.92 | N.A. | 24.50 |
| 70-80 | 911.66 | N.A. | 3.40 |
| 80-90 | 43.50 | N.A. | 0.20 |
| 90-110 | 0.00 | N.A. | 0.00 |
| 90-120 | 0.00 | N.A. | 0.00 |
| 90-130 | 0.00 | N.A. | 0.00 |
| 90-150 | 0.00 | N.A. | 0.00 |
| 90-180 | 0.00 | N.A. | 0.00 |
| 110-180 | 0.00 | N.A. | 0.00 |
| 0-180 | 26749.14 | N.A. | 100.00 |

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

| Zone | Lumens |
|---------|---------|
| 0-10 | 426.52 |
| 10-20 | 1518.5 |
| 20-30 | 2420.97 |
| 30-40 | 3153.96 |
| 40-50 | 4561.68 |
| 50-60 | 8062.08 |
| 60-70 | 5650.26 |
| 70-80 | 911.66 |
| 80-90 | 43.50 |
| 90-100 | 0.00 |
| 100-110 | 0.00 |
| 110-120 | 0.00 |
| 120-130 | 0.00 |
| 130-140 | 0.00 |
| 140-150 | 0.00 |
| 150-160 | 0.00 |
| 160-170 | 0.00 |
| 170-180 | 0.00 |

IES INDOOR REPORT

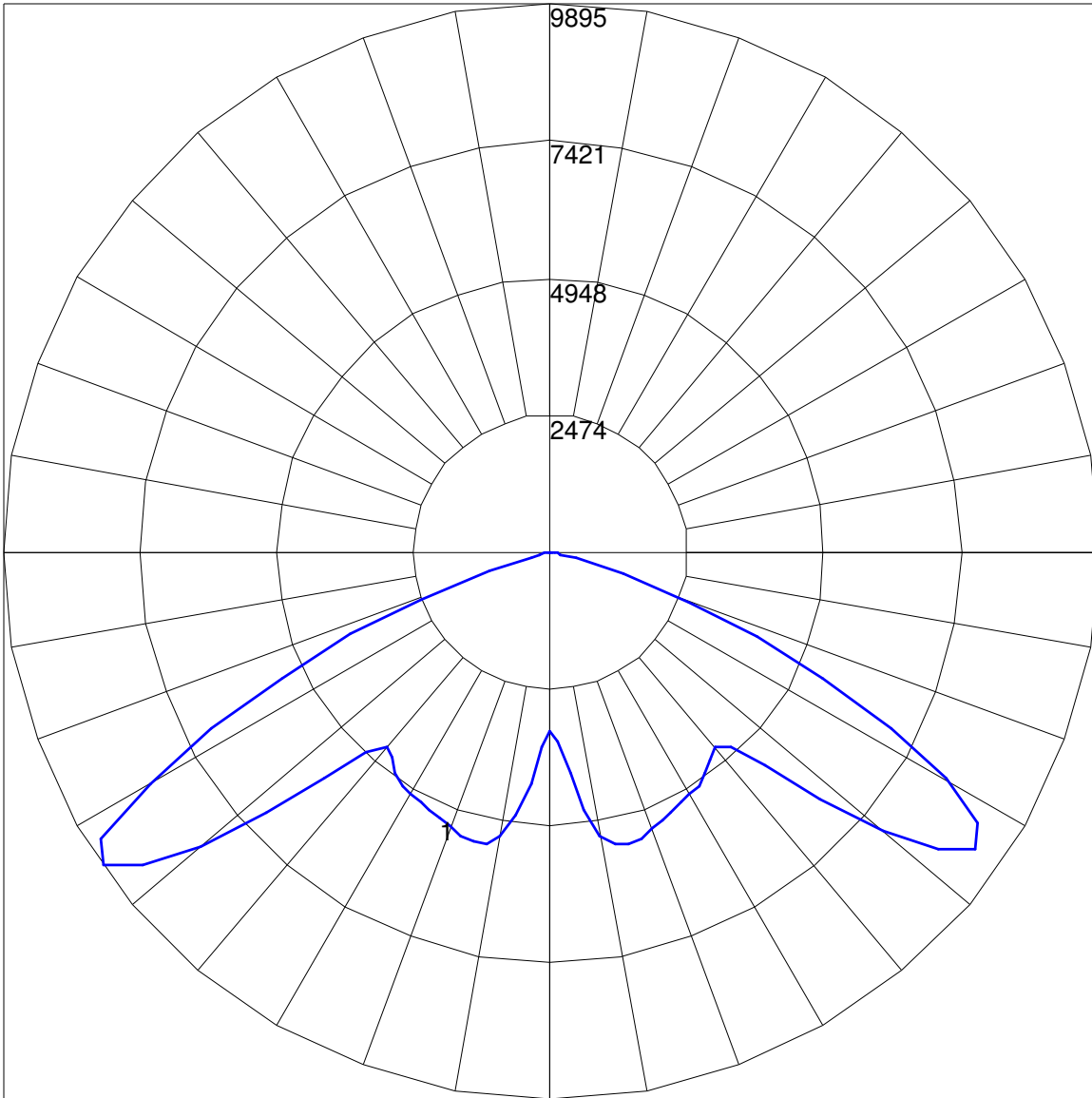
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Effective Floor Cavity Reflectance 0.20

| 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 | 0 |
| 0 | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1 | 108 | 104 | 99 | 95 | 106 | 101 | 97 | 94 | 97 | 94 | 91 | 93 | 90 | 88 | 89 | 87 | 85 | 83 |
| 2 | 97 | 88 | 81 | 75 | 95 | 86 | 80 | 74 | 83 | 77 | 72 | 79 | 75 | 71 | 76 | 72 | 69 | 67 |
| 3 | 87 | 76 | 67 | 59 | 85 | 74 | 66 | 59 | 71 | 64 | 58 | 68 | 62 | 57 | 65 | 60 | 56 | 53 |
| 4 | 78 | 65 | 55 | 48 | 76 | 64 | 55 | 48 | 61 | 53 | 47 | 59 | 52 | 46 | 56 | 50 | 45 | 43 |
| 5 | 71 | 57 | 47 | 39 | 69 | 55 | 46 | 39 | 53 | 45 | 39 | 51 | 44 | 38 | 49 | 43 | 38 | 35 |
| 6 | 65 | 50 | 40 | 33 | 62 | 49 | 39 | 33 | 47 | 38 | 32 | 45 | 38 | 32 | 43 | 37 | 32 | 29 |
| 7 | 59 | 44 | 35 | 28 | 57 | 43 | 34 | 28 | 42 | 33 | 27 | 40 | 33 | 27 | 39 | 32 | 27 | 25 |
| 8 | 55 | 40 | 30 | 24 | 53 | 39 | 30 | 24 | 38 | 29 | 24 | 36 | 29 | 23 | 35 | 28 | 23 | 21 |
| 9 | 51 | 36 | 27 | 21 | 49 | 35 | 27 | 21 | 34 | 26 | 21 | 33 | 26 | 21 | 32 | 25 | 20 | 18 |
| 10 | 47 | 33 | 24 | 19 | 46 | 32 | 24 | 18 | 31 | 24 | 18 | 30 | 23 | 18 | 29 | 23 | 18 | 16 |

POLAR GRAPH



Maximum Candela = 9895.3 Located At Horizontal Angle = 112.5, Vertical Angle = 55
1 - Vertical Plane Through Horizontal Angles (112.5 - 292.5) (Through Max. Cd.)