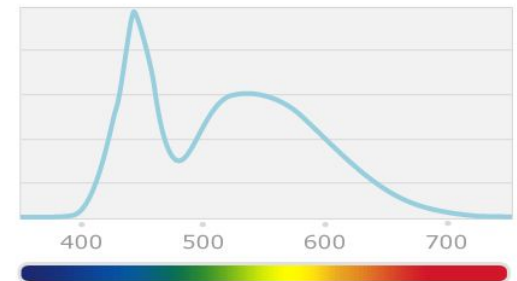
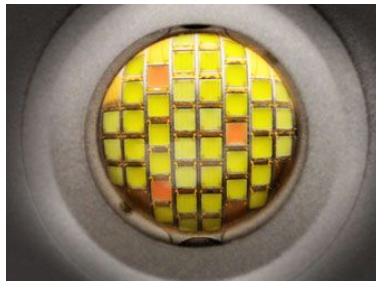


Kessil

Join The Spectral Revolution!

Project: Coates HQ Chicago [2nd Design]

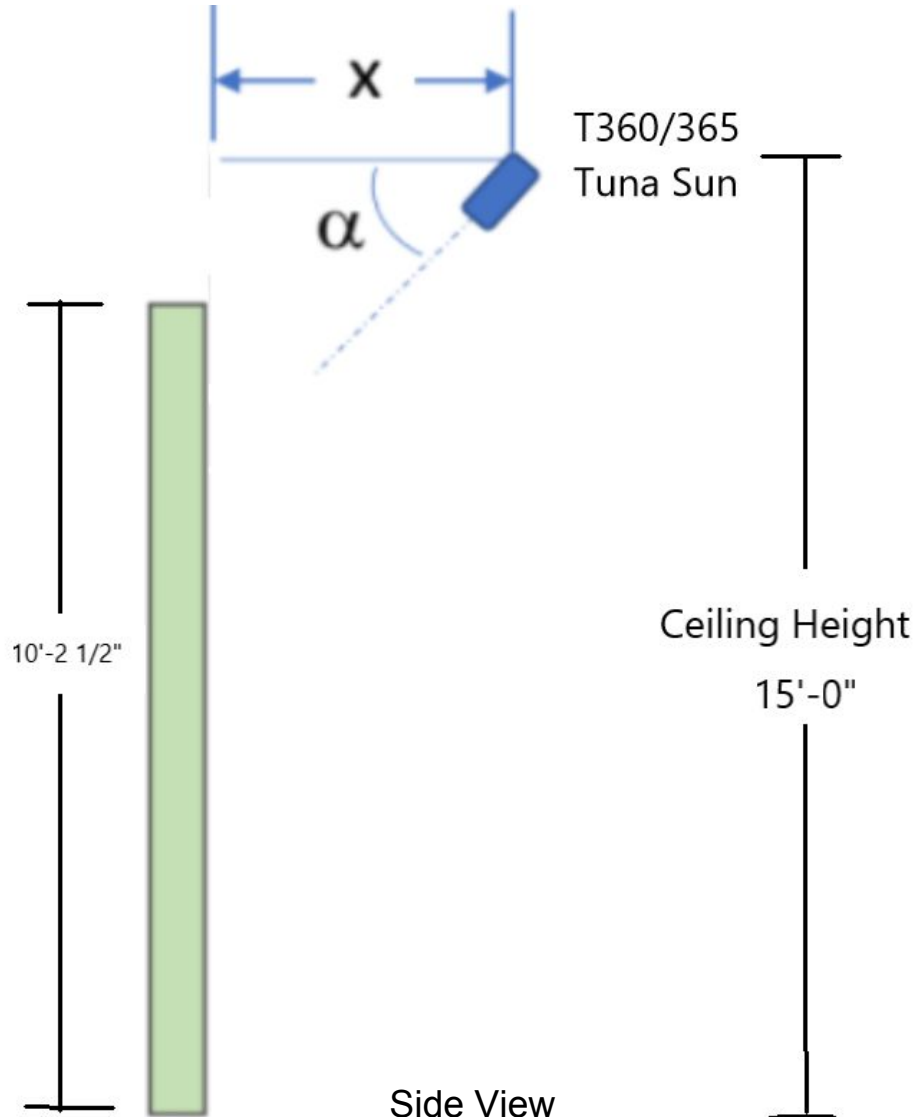
Prepared By: Franco Chan



Design Configuration - Green Wall Dimensions



Design Configuration



Green Wall Dimensions:

11'-0" W x 10'-2 1/2" H

Ceiling Height:

12'-8" (adjusted height)

Purpose:

Maintain Tropical Foliage

Lighting:

Kessil Tuna Sun Track Lights

X = Distance between T360/
T365 TS and Living Wall

α = Degree of T360/T365 TS



[2nd Design] Recommended Layout

Based on new ceiling height 12'-8"

And

Lower light requirement for budget concern

Proposed Number of Kessil Lights - Recommended Layout



4 x T365 Tuna Sun, 2 x T360 Tuna Sun

Power Consumption: 85 Watts Max. each unit

Total Power Consumption: 510 Watts Max.

* The whole lighting system comes in **BLACK** or **WHITE** color

Layout Summary

Recommended Layout

4 x T365 Tuna Sun and 2 x T360 Tuna Sun on a 12 feet long track are needed for even light distribution across **the whole green wall**. This layout is based on the fact that most of the plants in the green wall require low light, and does not take into account the accent lighting. This layout is sufficient for maintaining the plants and keeping them alive.

14 hours of operation at 100% intensity is recommended

- Track is 4'-0" away from the face of the plants, **mounted at ceiling (12'-8")**
- 6 lamps on 12 feet track: ~1'-10" apart from each lamp
- Different lamps at different angles
 - **#1 & 6 lamps - T365 at Focus - 70° angling downwards**
 - **#2 & 5 lamps - T360 - 55° angling downwards**
 - **#3 & 4 lamps - T365 at Focus - 70° angling downwards**

Recommended Layout

Maximum footcandle:
~ 163 fc ;

Average footcandle:
~ 97 fc

Min. / Average:
~ 0.63

Parameter

X = 4'-0"

Ceiling Height: 12'-8"

Lamps #1 & 6
T365 @ Focus $\alpha = 70^\circ$

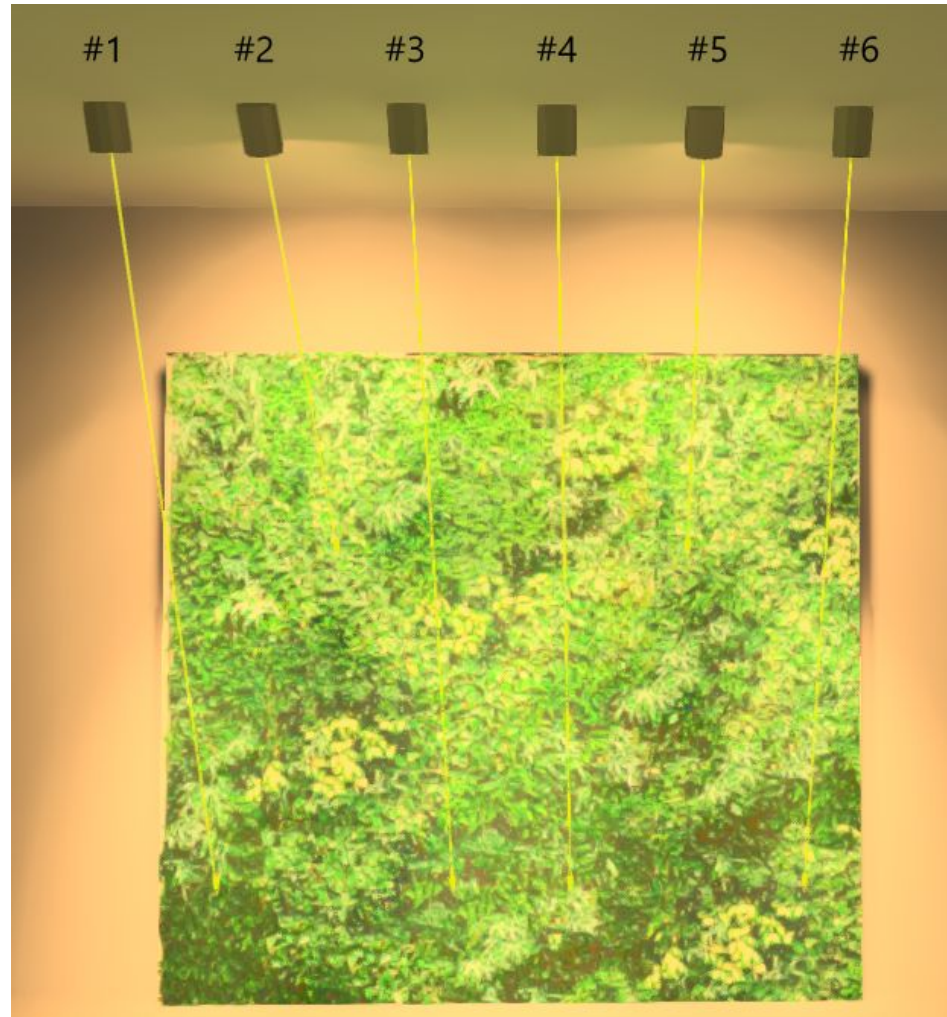
Lamps #2 & 5
T360 $\alpha = 55^\circ$

Lamps #3 & 4
T365 @ Focus $\alpha = 70^\circ$

Lamp #1 & 6: T365 @ 9,000K @ Focus

Lamp #2 & 5: T360 @ 9,000K

Lamp #3 & 4: T365 @ 9,000K @ Focus



Recommended Layout

Lamp #1 & 6: T365 @ 9,000K @ Focus

Lamp #2 & 5: T360 @ 9,000K

Lamp #3 & 4: T365 @ 9,000K @ Focus

Maximum footcandle:
~ 163 fc ;

Average footcandle:
~ 97 fc

Min. / Average:
~ 0.63

Parameter

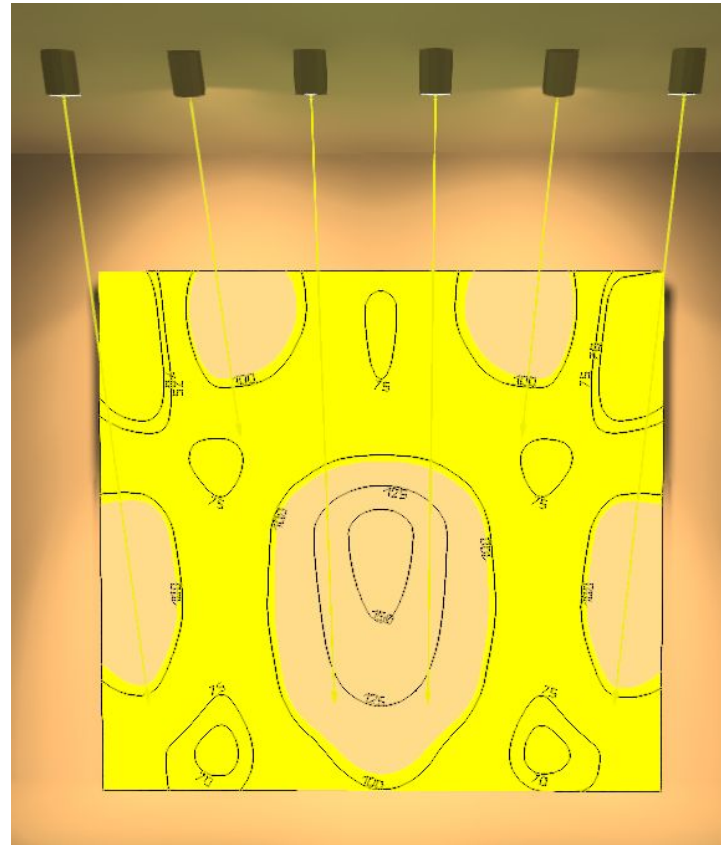
X = 4'-0"

Ceiling Height: 12'-8"

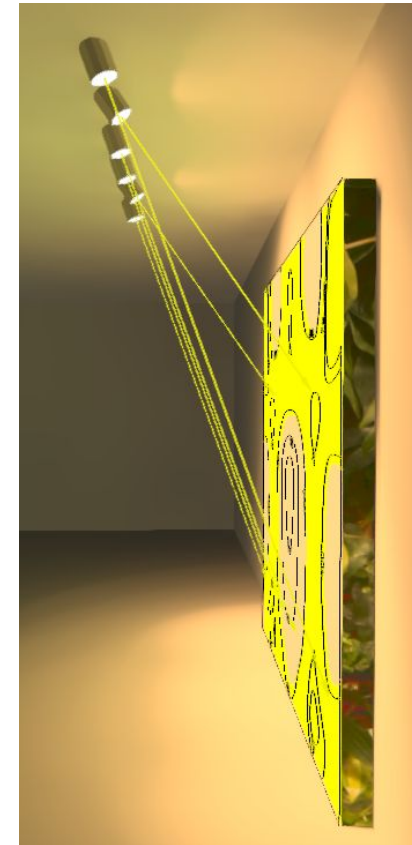
Lamps #1 & 6
T365 @ Focus $\alpha = 70^\circ$

Lamps #2 & 5
T360 $\alpha = 55^\circ$

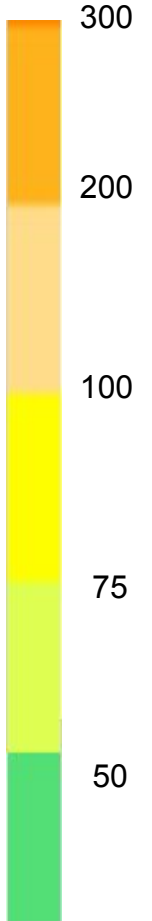
Lamps #3 & 4
T365 @ Focus $\alpha = 70^\circ$



Front View



Side View



Bill Of Material - Recommended Layout

Description	Ref.	Qty.	Extended
Kessil T365 Tuna Sun Track Light	\$1,095	4	\$4,380
Kessil T360 Tuna Sun Track Light	\$795	2	\$1,590
120V Track 8FT	\$265	1	\$265
120V Track 4FT	\$140	1	\$140
120V Track Endcap	\$7	1	\$7
Straight Coupler (For connecting 8FT & 4FT track)	\$70	1	\$70
Track Powerfeed w/ Data - Right	\$95	1	\$95
Total			\$6,547

Note: T365 = T360 Tuna Sun + 5" Fresnel Accessory w/ Barndoors

* The whole lighting system comes in **BLACK** or **WHITE** color



[2nd Design] Budgeted Layout

Based on new ceiling height 12'-8"
And
Bare minimum for budget concern

Proposed Number of Kessil Lights - Budgeted Layout



4 x T365 Tuna Sun

Power Consumption: 85 Watts Max. each unit

Total Power Consumption: 340 Watts Max.

* The whole lighting system comes in **BLACK** or **WHITE** color

Layout Summary

Budgeted Layout

4 x T365 Tuna Sun on a 12 feet long track are needed for even light distribution across the whole green wall. This layout is based on the fact that most of the plants in the green wall require low light, and will require accent lighting. This layout is sufficient for maintaining the plants and keeping them alive.

14 hours of operation at 100% intensity is recommended

- Track is 3'-6" away from the face of the plants, **mounted at ceiling (12'-8")**
- 4 x T365 on 12 feet track: ~2'-9" apart from each lamp
- Different lamps at different angles
 - **#1 & 3 lamps - T365 at Flood - 70° angling downwards**
 - **#2 & 4 lamps - T365 at Flood - 65° angling downwards**

Budgeted Layout

Maximum footcandle:
~ 150 fc ;

Average footcandle:
~ 76 fc

Min. / Average:
~ 0.36

Parameter

X = 3'-6"

Ceiling Height: 12'-8"

Lamps #1 & 3
T365 @ Flood $\alpha = 70^\circ$

Lamps #2 & 4
T365 @ Flood $\alpha = 65^\circ$

Lamp #1 & 3: T365 @ 9,000K @ Flood
Lamp #2 & 4: T365 @ 9,000K @ Flood



Budgeted Layout

Lamp #1 & 3: T365 @ 9,000K @ Flood
Lamp #2 & 4: T365 @ 9,000K @ Flood

Maximum footcandle:
~ 150 fc ;

Average footcandle:
~ 76 fc

Min. / Average:
~ 0.36

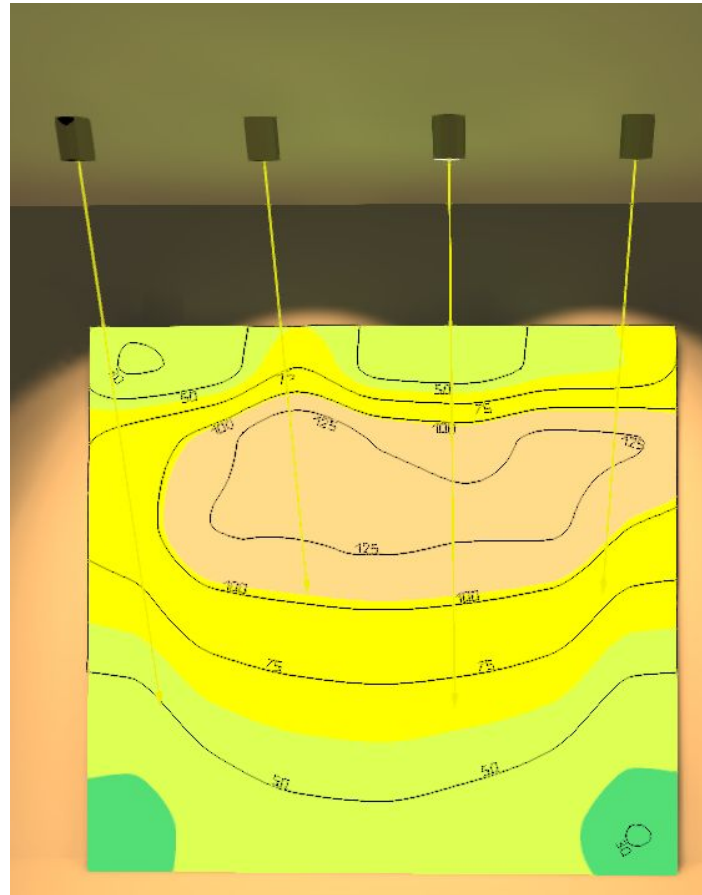
Parameter

X = 3'-6"

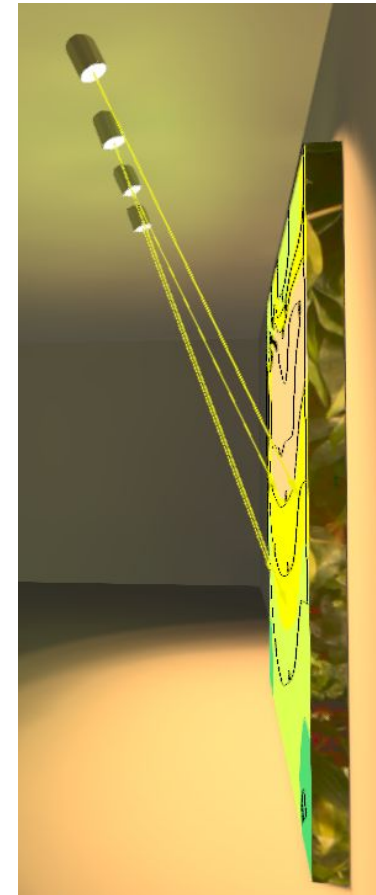
Ceiling Height: 12'-8"

Lamps #1 & 3
T365 @ Flood $\alpha = 70^\circ$

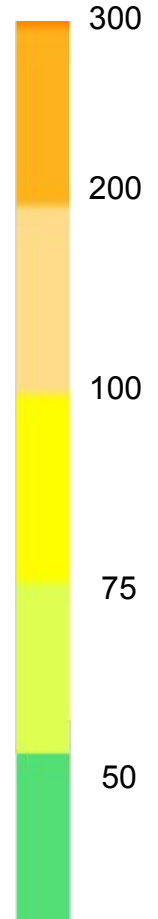
Lamps #2 & 4
T365 @ Flood $\alpha = 65^\circ$



Front View



Side View



Bill Of Material - Budgeted Layout

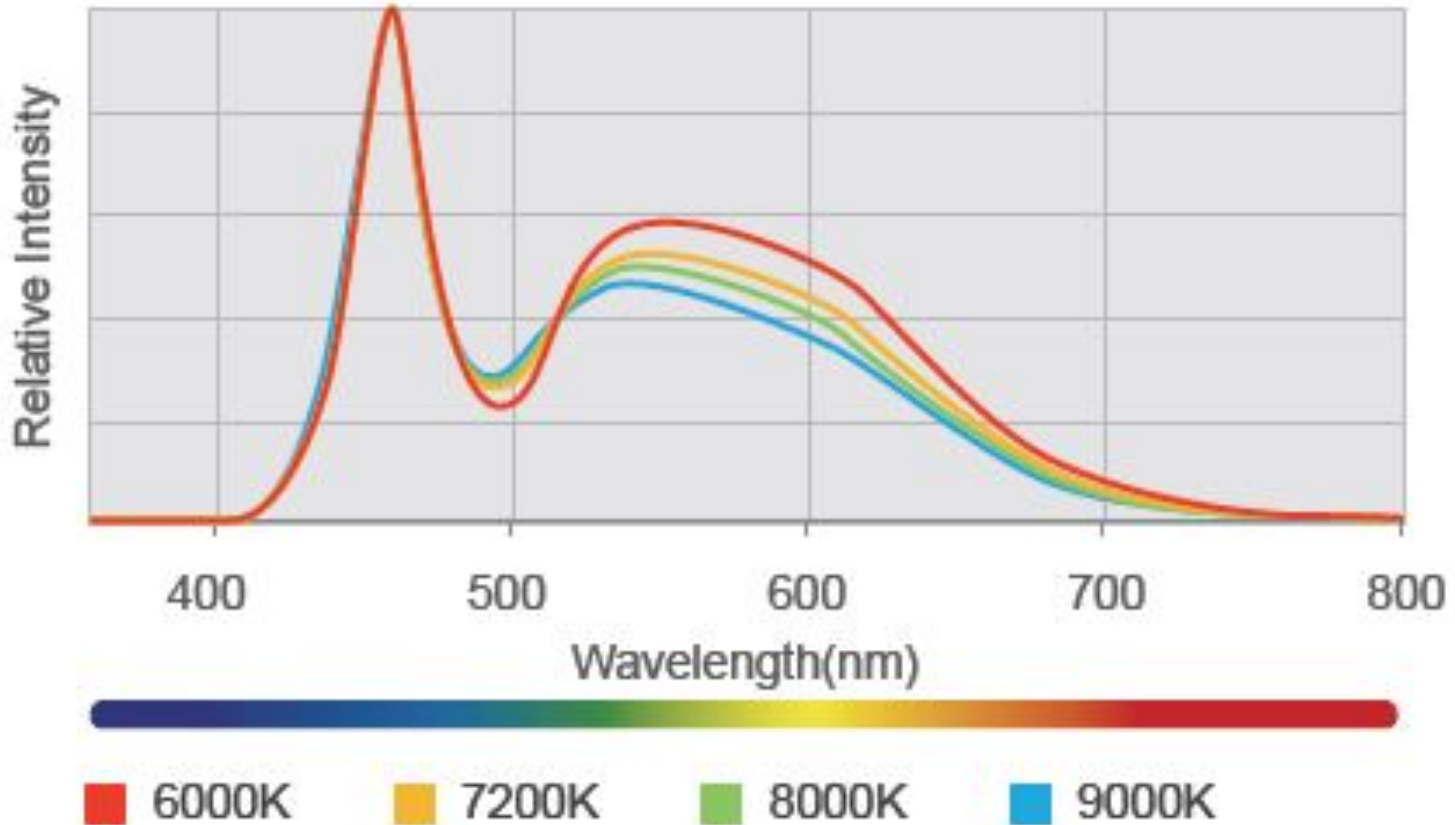
Description	Ref.	Qty.	Extended
Kessil T365 Tuna Sun Track Light	\$1,095	4	\$4,380
120V Track 8FT	\$265	1	\$265
120V Track 4FT	\$140	1	\$140
120V Track Endcap	\$7	1	\$7
Straight Coupler (For connecting 8FT & 4FT track)	\$70	1	\$70
Track Powerfeed w/ Data - Right	\$95	1	\$95
Total			\$4,957

Note: T365 = T360 Tuna Sun + 5" Fresnel Accessory w/ Barndoors

* The whole lighting system comes in **BLACK** or **WHITE** color

Spectrums

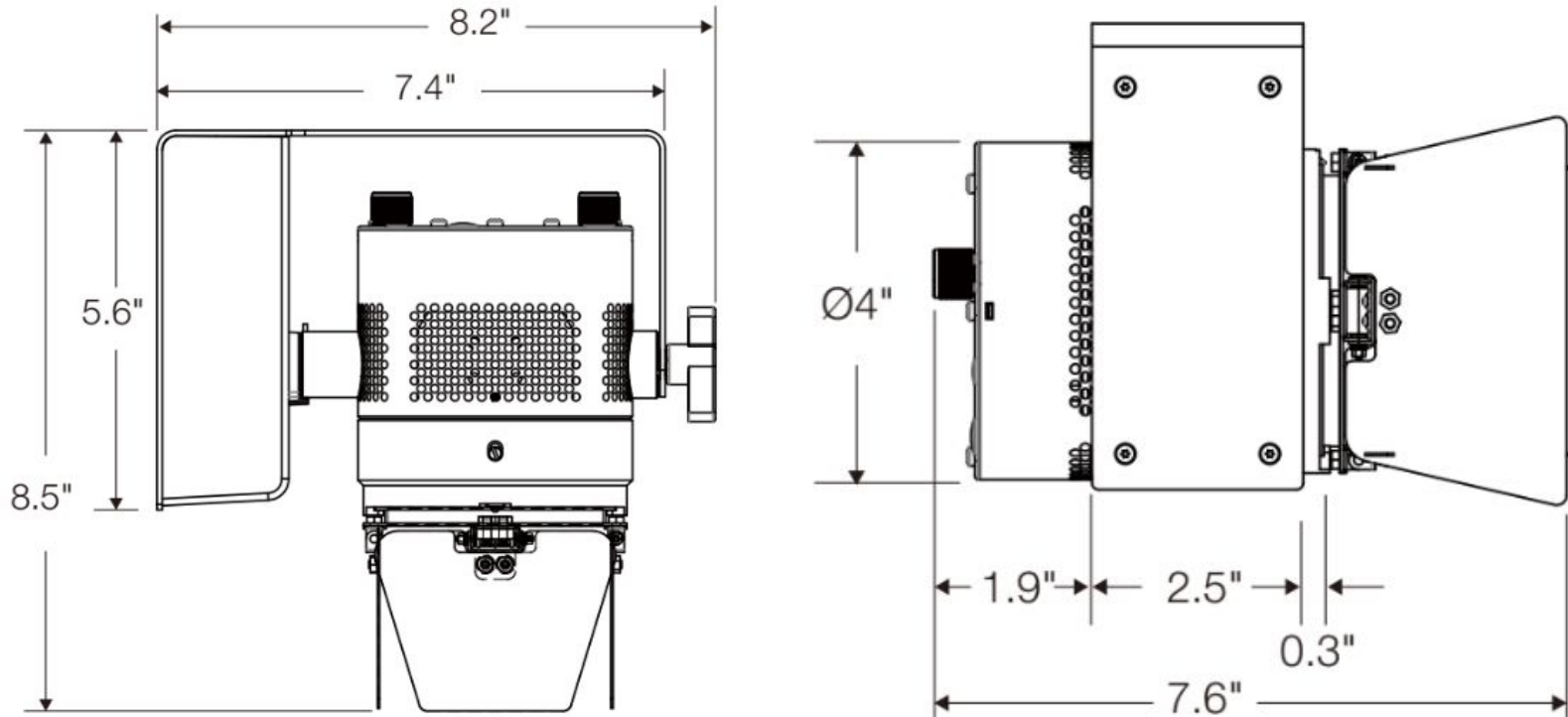
KESSIL T360 / T365 Tuna Sun



* T365 = T360 Tuna Sun + 5" Fresnel Accessory w/ Barndoors

Dimensions & Weight

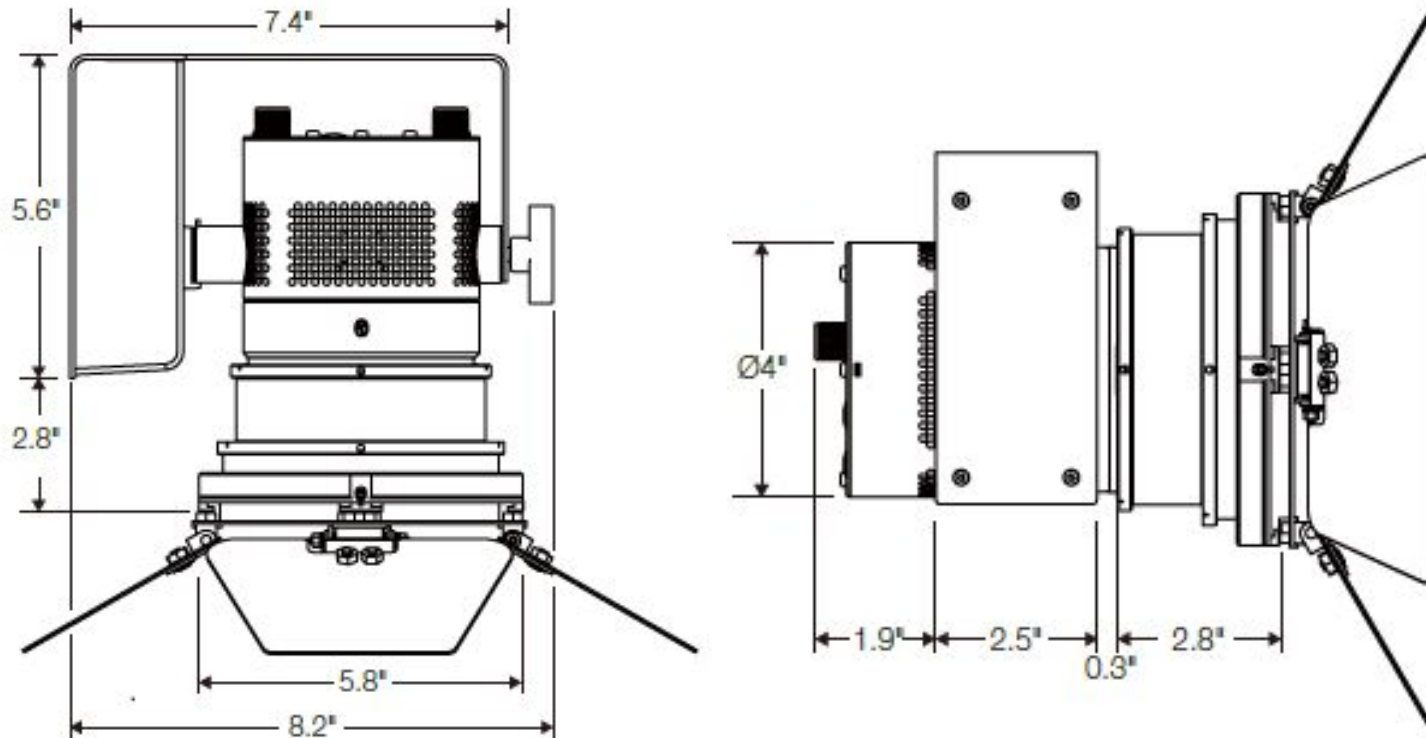
KESSIL T360 Tuna Sun



Weight: 2.98 lb / 1.35 kg

Dimensions & Weight

KESSIL T365 Tuna Sun



Weight: 4.08 lb / 1.85 kg

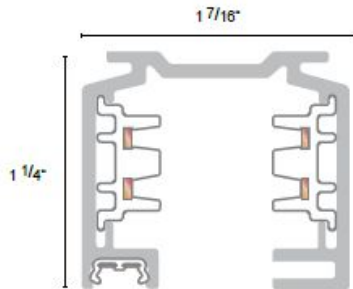
* T/C365 = T/C360 Tuna Sun + 5" Fresnel Accessory w/ Barndoors

Track System



Custom Lengths

Available in lengths of 4FT, 8FT, and 12FT lengths that can be field cut to the desired length.



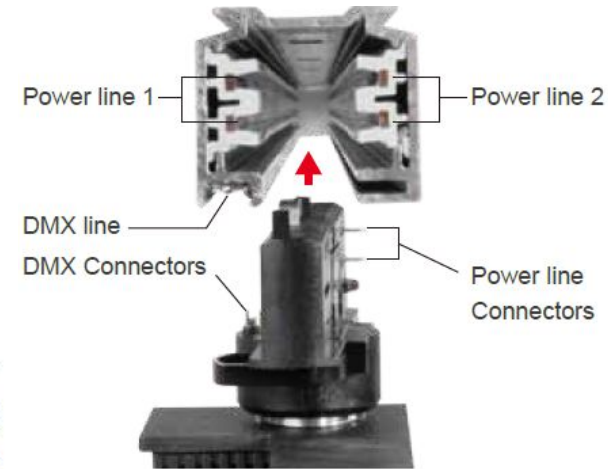
Data Bus Ready

Built in nickel plated Data Bus supports up to 30 devices per system.



Mounting Points

Pre-drilled $\frac{1}{4}$ " (6mm) x 1" (25mm) slots spaced every 8" (203mm) for easy surface mounting.



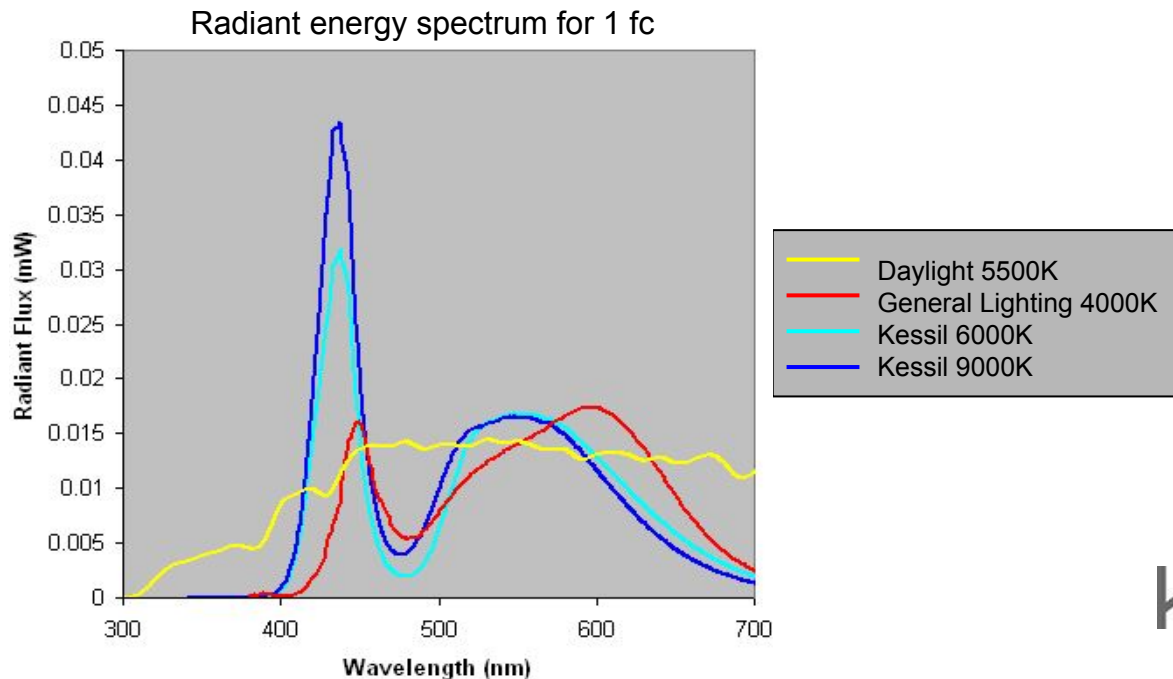
The Track System Kessil offers is an architectural grade surface mounted track consisting of seven conductors allowing for two unique power circuits. Each track features a 22 gauge nickel plated copper Data Bus providing **DMX control signals** to any connected fixture along the track.

Appendix - The Kessil Advantage

Spectrum vs Brightness

Abstract - Lumens/foot candle are still used as a common measurement of light. LED fixtures are often characterized in lumens/watt or foot candle/watt and efforts are progressing further in this direction without regard to photosynthesis

- Lumens or foot candles are fundamentally based on the wavelength sensitivity of the human eye
- Photosynthesis occurs with wavelength sensitivity different than that of the human eye
- Kessil spectrums are fundamentally based on the wavelength sensitivity of photosynthesis and can provide up to 2x effective photosynthetic energy per foot candle



Appendix - The Kessil Advantage

Spectrum vs Brightness

- The photometrics (foot-candles, lumen, etc.) of Kessil lights are lower than most LED lighting fixtures because Kessil's focus is the spectrum.
- Most commercial LED chips are made for general illumination such as household lighting and not specifically made to grow plants
- The majority of Photosynthesis occurs in the blue and red ends of the spectrum where the eye is less sensitive
- The Kessil Horticulture fixtures- like the H80 and H1200, are extreme examples of spectrum specific lighting fixtures. Intensity changes of these fixtures are harder to detect visually. The Kessil Tuna Sun series has a good balance in spectrum and visual effects.
- Because Kessil manufactures LEDs in house, we can produce unique spectrums targeted for each individual application. These spectrums have been tested and proven effective for superior plant growth health.

As stated in the first point, when comparing Kessil fixtures with other LED fixtures, spectrum should be the main focus, not photometrics. The above photometrics are only for reference.

Appendix - The Kessil Advantage

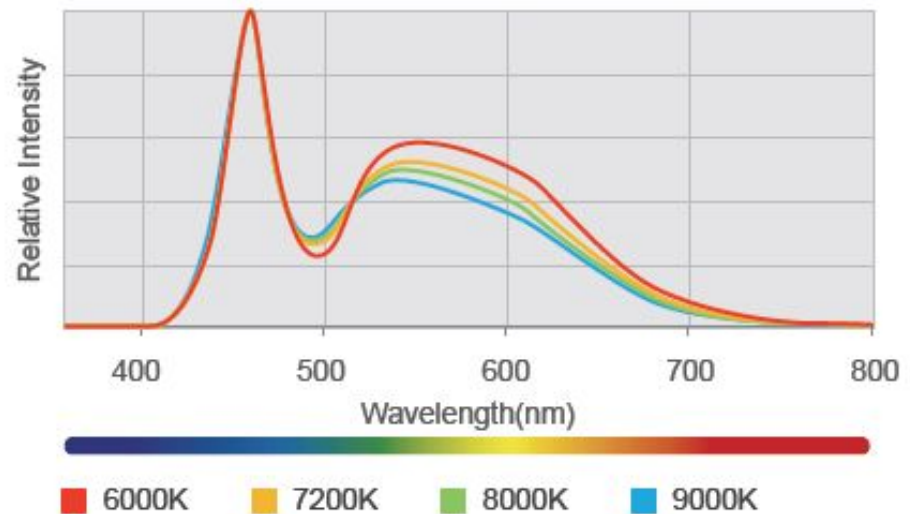
Kessil Logic

Kessil Logic: Kessil's way to simplify spectral tuning for users

Kessil Logic has two main functions

- 1) To balance the spectrum
 - Kessil Logic maintains a very **similar wavelength combination** across different colors (e.g. Tuna Sun color range). This allows the user to choose colors they like to see and not worry about balancing the wavelengths.

- 2) To balance the power
 - Kessil Logic maintains maximum output across each color, allowing highest output possible. This also means intensity is not directly tied to color tuning.



Appendix - The Kessil Advantage

Kessil Platform

Kessil Platform

- A lot of grow light manufacturers tend to make light fixtures that have higher lux/foot candle value to boost sales but sacrifice the most efficient spectrum.
- LED chips manufacturers tend to make and sell chips that cater to general lighting, which is a much bigger market for them. Kessil produces LED chips which means we have control and access to a better and more suitable bin of LED chips for each application.
- Kessil uses the original Dense Matrix LED array (multiple LEDs on a single platform). This effective point source allows better blending of wavelengths without wasting energy/output and offers deeper penetration than many other LED fixtures.
- This effective point source can be paired with additional optics that can mimic any source. This can be seen with the T360 with 5" Fresnel Accessory with barndoors.

