

KESSIL PROFESSIONAL SPECIFICATION SHEET

W500BD

Full-spectrum LED (Light Emitting Diode) Product

1.01 GENERAL

- A. The product shall be a Kessil W500BD manufactured by DiCon Fiberoptics Inc.
 - 1. Kessil, a DiCon Fiberoptics Inc. brand, shall provide all LED products to ensure color consistency.
 - 2. The product shall be a high-intensity LED illuminator utilizing a Dense Matrix 3D LED Array System comprised of at least 6 different LED chip colors
- B. Each LED fixture shall be tested and optimized for photometric performance.

1.02 PHYSICAL

- A. The dimensions of the fixture shall be 8.0" W x 7.9" L x 8.4" H (20.5 x 20.1 x 21.4 cm) and weigh approximately 1.9 lbs (0.9 kg). The following shall be provided:
 - a. Kessil W500BD fixture, consisting of
 - 1. W500BD Head Unit
 - 2. 175W, 24V, Clamp Mount PSU
- B. The housing shall have a black or white finish.
- C. The housing material shall be PC (polycarbonate) + ABS (acrylonitrile-butadiene-styrene).
- D. Mounting Type shall have Track, Clamp, or Monopoint Adapter selection.
- E. Cooling and electronic control systems shall be fully integrated within the fixture housing.

1.03 ENVIRONMENTAL AND AGENCY COMPLIANCE

- A. The product shall comply with UL 1574 (Track Lighting Systems) and CSA C22.2 standards.
- B. Compliance shall be verified through ETL testing and certification; the product shall bear both ETLus and cETL markings.
- C. The product shall comply with FCC 47 CFR Part 15 Subpart B requirements, as verified by ANSI C63.4 testing.
- D. The fixture shall carry the CE mark and comply with RoHS (Restriction of Hazardous Substances) and TAA (Trade Agreements Act) regulations.
- E. The product shall be rated for IP-25 and must sustain operation at full intensity while being actively sprayed with light water.

KESSIL PROFESSIONAL SPECIFICATION SHEET
W500BD

1.04 THERMAL

- A. Product heat management shall be achieved through forced cooling.
- B. The cooling fans shall be rated for a minimum operational lifespan of 50,000 hours.
- C. The product shall utilize advanced thermal management systems to maintain LED life to an average of 70% intensity after 50,000 hours of use.
- D. The product shall operate in an ambient temperature range of 32°F (0°C) minimum to 104°F (40°C) maximum.

1.05 ELETRICAL

- A. The product shall have an auto-ranging 100 V to 240 V 50/60 Hz power supply unit.
- B. The product shall have a maximum draw of 175W.
- C. DC input Voltage shall be 14-30V.
- D. The product requires power from a non-dimming source.
- E. Products shall have dynamic thermal monitoring at multiple locations in the LED array, control board, and other electronics to prevent thermal shift of color or intensity.
- F. Product power input shall have current-limiting fuse protection.
- G. The power supply shall have power factor correction.

1.06 OPTICAL DATA

- A. The product shall contain a patented Dense Matrix LED Light Source manufactured by DiCon Fiberoptics, Inc.
 - 1. The fixture shall have a 55-degree native beam angle, with a barndoor to control light spill.
- B. DiCon Fiberoptics, Inc. shall utilize an advanced production LED binning process to maintain color consistency.
- C. All LED products (100% of each lot) shall undergo a minimum three-hour burn-in test during manufacturing.
- D. The LED system shall comply with all relevant patents.

1.07 SPECTRUM

- A. Photosynthetically Active Radiation (PAR)
 - a. The fixture shall deliver full-spectrum light with spectral peaks aligned with chlorophyll A and B absorption maxima (425 nm, 455 nm, 640 nm, and 660 nm), critical for efficient photosynthesis.
 - b. The fixture will output a spectrum low in green light (no more than 32% of the total PPFD output shall fall in the 500-600nm range when set at 4000K, and no more than 36% at 6500K), as plants utilize green light less efficiently.

KESSIL PROFESSIONAL SPECIFICATION SHEET
W500BD

B. AMZ (Amazon Sun)

- a. Fixture shall have a tunable CCT between 4000K–6500K
- b. Adjusting the CCT shall maintain the spectral peaks for chlorophyll A and B

C. TB (Tuna Blue)

- a. Fixture shall have a tunable CCT between 10000K and 20000K
- b. Adjusting the CCT shall maintain the spectral peaks for chlorophyll A and C
- c. Fixture shall have spectral peaks at 425 nm and 455 nm to support zooxanthellae photosynthesis and coral fluorescence
- d. Fixture shall have an additional 390–400 nm UVA range enhances coral and invertebrate pigmentation and overall health
- e. Fixture shall have a broadband blue spectrum with no spectral gaps between 390nm and 500nm

1.08 INTENSITY MEASUREMENTS

A. The fixture shall emit a luminous flux of approximately 7,515 lumens in Amazon Sun and 3,006 lumens in Tuna Blue.

B. High PPFD Output:

- a. At 4000K distance 3' (0.9m):
 - i. Measured illuminance: 733 footcandles (fc) = 7886 lux
 - ii. Conversion factor (fc to PPFD): 0.26
 - iii. Average PPFD: $733 \text{ fc} \times 0.26 = 190.6 \mu\text{mol}/\text{m}^2/\text{s}$
- b. At 6500K distance 3' (0.9m):
 - i. Measured illuminance: 734 footcandles (fc) = 7899 lux
 - ii. Conversion factor (fc to PPFD): 0.23
 - iii. Average PPFD: $734 \text{ fc} \times 0.23 = 168.8 \mu\text{mol}/\text{m}^2/\text{s}$
- c. At 10,000K distance 3' (0.9m):
 - i. Measured illuminance: 443 footcandles (fc) = 4758 lux
 - ii. Average PPFD: $443 \text{ fc} \times 0.007375 = 3.267 \mu\text{mol}/\text{m}^2/\text{s}$
- d. At 20,000K distance 3' (0.9m):
 - i. Measured illuminance: 105 footcandles (fc) = 1128 lux
 - ii. Average PPFD: $105 \text{ fc} \times 0.002126 = 0.223 \mu\text{mol}/\text{m}^2/\text{s}$

KESSIL PROFESSIONAL SPECIFICATION SHEET
W500BD

- C. The fixture must produce a uniform light distribution without intense brightness in the center. When measuring light output, the center intensity should be no more than 2x that measured at 30 degrees from the center.
- D. Amazon Sun
- a. Color output @4000k distance 3' (0.9m) at 733fc/7886lux, distance 5' (1.5m) at 373fc/4012lux, distance 10' (3.0m) at 73fc/776lux.
 - b. Color output @6500k distance 3' (0.9m) at 734fc/7889lux, distance 5' (1.5m) at 373fc/4012lux, distance 10' (3.0m) at 73fc/776lux.
 - c. At 3 feet (0.9 meters), the beam spreads to 2.6 feet (0.8 meters) in diameter.
 - d. At 5 feet (1.5 meters), the beam spreads to 4.3 feet (1.3 meters) in diameter.
 - e. At 10 feet (3.0 meters), the beam spreads to 8.7 feet (2.6 meters) in diameter.
- E. Tuna Blue
- a. Color output @10,000k distance 3' (0.9m) at 443fc/4758lux, distance 5' (1.5m) at 159fc/1711lux, distance 10' (3.0m) at 42fc/450lux.
 - b. Color output @20,000k distance 3' (0.9m) at 105fc/1128lux, distance 5' (1.5m) at 41fc/441lux, distance 10' (3.0m) at 20fc/209lux.
 - c. At 3 feet (0.9 meters), the beam spreads to 2.6 feet (0.8 meters) in diameter.
 - d. At 5 feet (1.5 meters), the beam spreads to 4.3 feet (1.3 meters) in diameter.
 - e. At 10 feet (3.0 meters), the beam spreads to 8.7 feet (2.6 meters) in diameter.

1.09 DIMMING AND CONTROL

- A. The product shall provide LED dimming from 0% to 100% using a 0–255 scale, where values between 0 and 255 control the light's brightness.
- B. The product shall use analog dimming and be flicker-free at all refresh rates/measurements when run above 6% intensity.
- C. The product shall be equipped with a 2-knob user interface and can be DMX controlled when used with a DMX-compatible driver labeled "PSX" in the ordering guides and part numbers.
- D. Fixture shall have a toggleable "RAMP" setting for adjusting intensity slowly over a period of time, in order to avoid harming sensitive animals. When enabled, the ramp setting shall make all changes over a period of 1% intensity per second, without the need for an external controller.

KESSIL PROFESSIONAL SPECIFICATION SHEET
W500BD

E. DMX Footprint

a. Amazon Sun

- i. Channel 1: Intensity (0–255)
- ii. Channel 2: CCT (2,000K–10,000K mapped across 0–255)

b. Tuna Blue

- i. Channel 1: Intensity (0–255)
- ii. Channel 2: CCT (10,000K–20,000K mapped across 0–255)
- iii. Channel 3: Violet Control
- iv. Channel 4: Red Control
- v. Channel 5: Green Control

1.10 REQUIRED FEATURE SET

- A. The product shall offer user-selectable Color Temperature settings.
- B. The product shall offer user-selectable dimming settings.
- C. The product shall contain a direct power connection.
- D. The product shall contain two manual knobs on the back of the fixture to control all fixture parameters.
- E. All provided products will contain the above feature set.

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