

Quantum[®] X LED Systems

Frequently Asked Questions



Explore our LED solutions.
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Confidence in
Fly Control

ILT LED Technology

Frequently Asked Questions

Q: What is an LED?

A: Semiconductor or light emitting diode (LED).
See Fig. 1

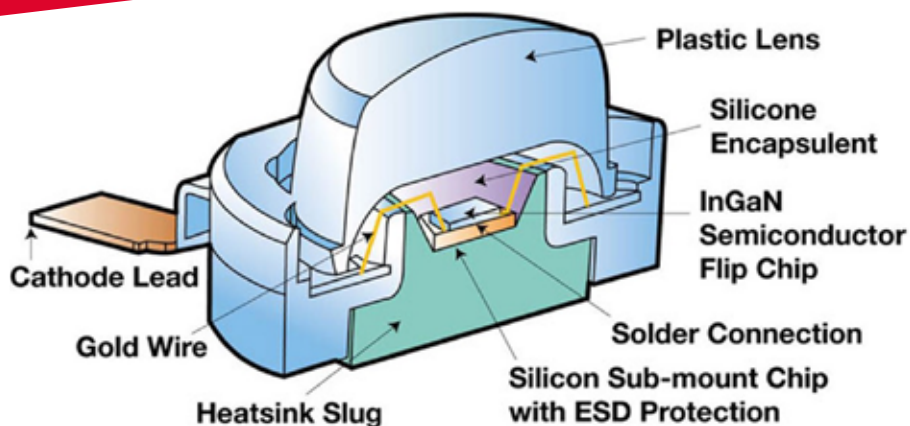


Fig. 1 SMD LED construction

Q: How does a light-emitting diode work?

A: Electroluminescence or light is produced by electrical current flow.
See Fig. 2

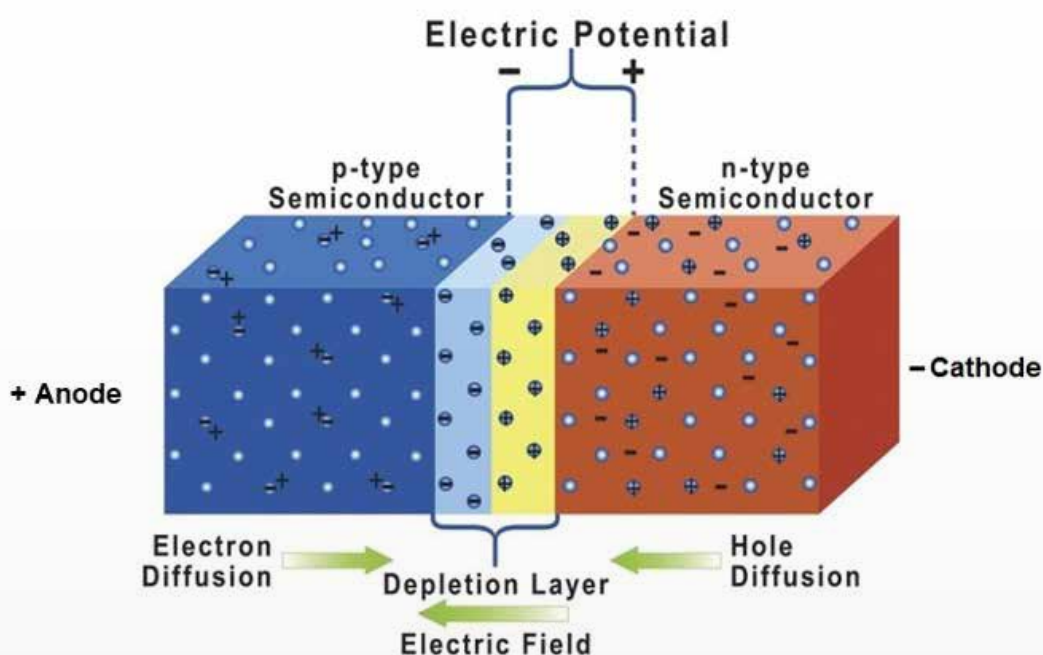
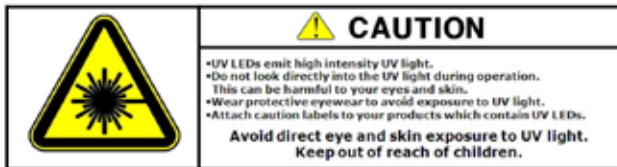


Fig. 2 How an LED works

Q: Are light-emitting diodes (LEDs) powered by alternating current (AC) or direct current (DC)?

A: The Quantum[®] X lamp operates using a constant current DC driver, which supplies the necessary direct current (DC) power to the filament LEDs. This means that the lamp itself does not perform the AC to DC conversion; instead, an LED driver converts AC from the power source into a stable DC output that powers the LED lamp.



UVA LED Precautions

Q: What are the benefits of LEDs?

- Electricity is converted directly into light
- Very energy efficient
- Instant on and off
- Long-life or thousands of hours of service
- Very small and do not require much space within a device
- Produce a single wavelength or color of light

Q: Are there additional hazards associated with LED UVA lamps?

A: LED UVA lamps are more environmentally friendly than conventional fluorescent UVA lamps as they consume far less energy, last up to 3 times as long, and do not contain Lead or Mercury. For safety and proper operation, and before using LED UVA insect light traps, be sure to read and follow instructions for use.

Q: Will this LED light trap burn my eyeballs if I stare at it all day?

A: Warning: do not stare into an LED insect light trap as this could result in eye injury. Always shut-off and unplug an insect light trap prior to servicing. However, the recommended UVA insect trap industrial hygiene value is ~10W/m²@1m/8 hours, while the Mantis[®] Qualis LED system is ~0.06W/m²@1m or ~166x less than the recommended value. See Caution illustration above.

Q: Are LED UVA lamps more effective in capturing flying insects?

A: PestWest single peak wavelength retrofit LED and Quantum[®] X LED filament lamps provide flying insect attraction and capture that both meets and exceeds (respectively) that of conventional fluorescent UVA lamps. Additionally, LED lamps provide up to a 3-year insect attraction life vs. about 1 year for conventional fluorescent UVA lamps. See Quantum[®] X LED lamp image above.

Q: Will the LED light traps catch Fruit flies?

A: The opsin (light sensitive) protein R4 (Rh4), in Fruit fly, *Drosophila melanogaster*, is sensitive to the UVA light range, particularly around 370 nm. Opsin proteins are key in photoreception, contributing to the ability of *Drosophila* to respond to different light wavelengths.

ILT LED Technology

Frequently Asked Questions

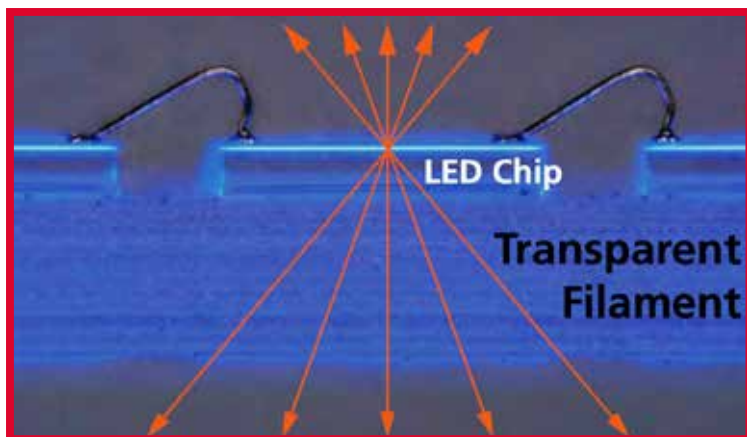


Fig. 1

Q: What is an LED filament?

A: Small LEDs are integrated onto a filament and the filament is mounted onto a transparent ceramic substrate or layer.
See Fig. 1

Q: What is the difference between surface mounted device (SMD) LEDs and LED filaments?

A: LED filaments emit light at 360° while first generation, higher-power Surface Mounted Device LEDs emit light at 120°.
See Fig. 2

Q: Do these LED lamps work like my Christmas lights, if one burns out, they all go out?

A: In traditional Christmas light strings, if one LED burns out, it can cause the entire string to go out. This is because these LEDs are typically connected in series, and a failure in one bulb (like an open circuit) breaks the circuit, preventing electricity from flowing through the rest of the bulbs. For UVA LEDs, it depends upon how the LED fails (open circuit or short circuit).

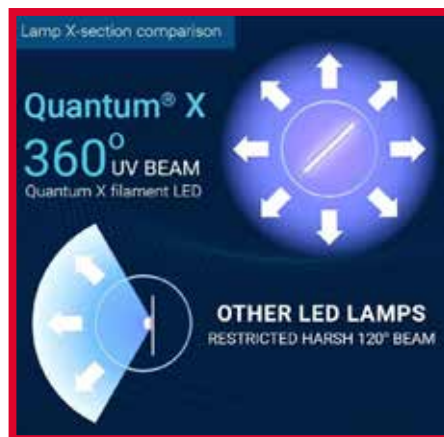


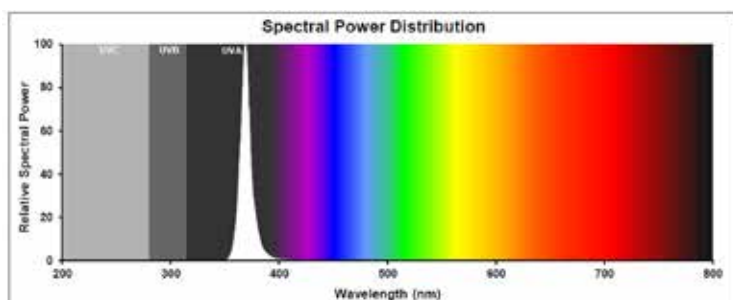
Fig. 2

Discover more:

1. Open circuit failure: If an LED in a filament of 24 LEDs fails in an open circuit condition, it acts like a switch turning off. As a result, none of the LEDs in that filament will function.

2. Short circuit failure: If an LED fails in a short circuit condition, the total voltage across the LED string decreases by the forward voltage of the failed LED. If the LED strings are not connected in parallel, an imbalance occurs, directing more current to the filament with the shorted LED. This causes it to run hotter and eventually fail completely. Once this happens, the remaining filaments redistribute the current, running slightly hotter. Since the LED driver maintains a constant current, this process repeats, leading to sequential filament failures until all LEDs burn out.

3. Quality control measures: During production, LEDs are sorted by forward voltage to ensure uniformity. Each lamp contains LEDs with closely matched forward voltages to minimize imbalances, extending the LEDs' lifespan.



Quantum® X lamp 370 nm spectral peak

Q: Does LED light intensity or lux effect flying insect capture?

A: The Quantum® X lamp (see above) contains 432 filament LEDs, which provides superior flying insect capture efficacy through 360° of 370 nm UVA light emission coupled with lower visible light intensity or an inoffensive lux (avoids negative phototaxis or repelling flying insect pests). See spectral illustration above.

Q: What is the lux of the Quantum® X lamp?

A: At 1 meter, the Quantum® X lamp emits 10 to 15 lumens, resulting in 0.8 to 1.2 lux. This indicates very low visible light output, while maintaining a strong UVA emission at 370 nm. This further supports the concept of "inoffensive lux," where the Quantum® X lamp effectively stimulates insect attraction without creating glare points or aversion responses in House flies (model testing species).

Q: Does the Quantum® X LED UVA lamp emit bright points of light like Surface Mounted Device (SMD) LEDs?

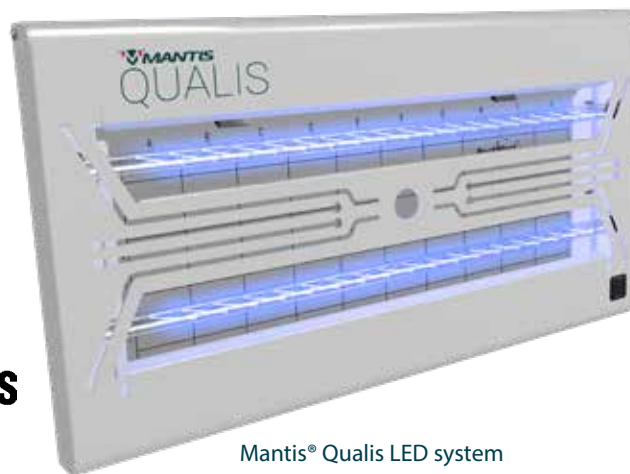
A: The emitted UVA light does not dazzle and will not disturb people within the vicinity of the system. The softer visible light intensity results in improved flying insect captures (high light intensity = ineffective trapping). Additionally, comparatively high hertz frequency (cycles/second) or a nonflickering of the lamp, optimally increases flying insect attraction and capture.

Q: If one LED burns out, do the other LEDs help by glowing a little brighter?

A: If an LED short circuit fails in a string of LEDs that are connected with other strings in parallel, the overall effect on the brightness of the other LEDs is a bit nuanced. Since the strings are connected in parallel, an imbalance is created. The string with the short-circuited LED now has a lower resistance, leading to more current flowing through it. This increased current causes the remaining LEDs in this string to run hotter, potentially leading to premature failure.

1. LEDs in the affected string: The increased current in the string with the short-circuited LED might initially cause the remaining LEDs in that string to appear brighter. However, this is not sustainable as it leads to overheating and potential failure of LEDs.

2. LEDs in other strings: The LEDs in the other parallel strings should not be significantly affected in terms of brightness. They continue to receive normal operating voltage and current (brightness remains consistent).



Mantis® Qualis LED system

Q: UVA LED lamps are not as bright blue as fluorescent BL UVA lamps, so do LED UVA lamps attract flies?

A: Yes, UVA LED lamps attract flies even though they are not as bright blue as fluorescent BL UVA lamps. Flies are attracted to the specific wavelength of UVA light from LED lamps, not their visible brightness. You see only a soft brightness from LED lamps, but you can't see the specific UVA light that strongly attracts flies.

Q: Does the Quantum® X LED UVA lamp get hot?

A: As LEDs convert 80% to 90% of energy directly into light, very little heat is produced. However, the Quantum® X LED lamp is engineered with a state-of-the-art Argon gas cooling system (far superior to traditional LED lamp metal heat sinks).

Q: Do Quantum® X LED UVA lamps offer as much flying insect attraction as fluorescent UVA lamps?

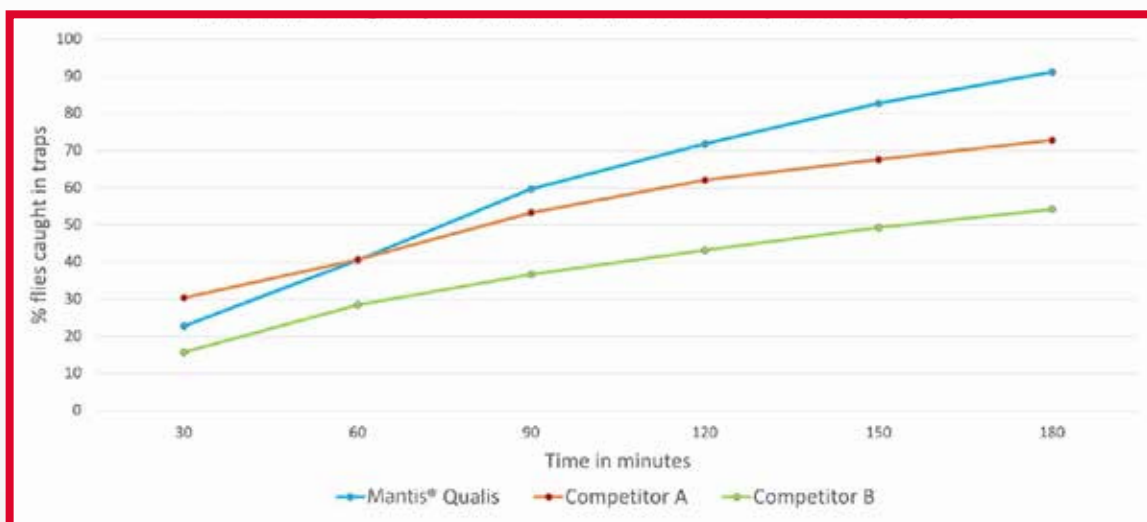
A: With novel LED filament technology, PestWest has succeeded in keeping the attraction effect of emitted 370 nm (single peak wavelength) UVA light competitive with conventional fluorescent UVA lamps.

Q: I just picked up a new account that has one of these new LED light traps named Qualis, so how do I know that these lamps are able to attract flies?

A: The Mantis® Qualis with Quantum® X LED technology will reliably continue to attract filth flies effectively over the long-term as long as maintained per PestWest Instructions for Use.

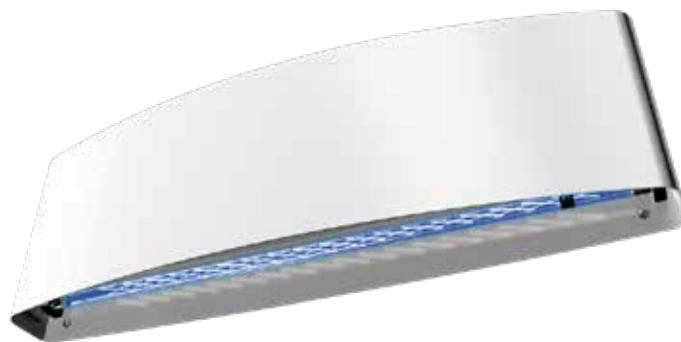
Q: How effective are the two Quantum® X lamps within the Mantis® Qualis LED system?

A: Through independent testing, the Mantis® Qualis LED system caught an average of 91.2 House flies (out of 100 released) over a 3-hour experimental period. See illustration below.





Scan to discover the key factors of AOC.



Mantis[®] Sirius X LED system

Q: How is the area of coverage (AOC) determined?

A: Area of coverage guidance is available through our Entomoment.

Q: How often do Quantum[®] X LED lamps need to be replaced?

A: Replace once every three years. Regular replacement ensures optimal flying insect attraction, monitoring, and control.

Q: Why don't I change my LED lamps every year like fluorescent lamps?

A: Unlike fluorescent UVA lamps, LED UVA lamps work efficiently through electroluminescence (electricity to light) and have a much longer lifespan. Quantum[®] X LED lamps and PestWest retrofit LED lamps only need to be replaced once every three years due operational service life and reliable performance.

Q: Are Quantum[®] X lamps shatter-resistant?

A: Quantum[®] X lamps feature quality FEP shatter-resistant coating, which is heat-tolerant, while allowing maximum LED UVA light emission.

Q: Can any replacement lamp or glue board be used in PestWest Quantum[®] X LED systems?

A: To ensure optimum performance of Quantum[®] X LED systems, install only Quantum[®] X LED lamps and PestWest LED glue boards. The specially formulated glue board adhesive is for use with LED systems and has been developed in combination with the Quantum[®] X lamp. Using any other glue board will negatively impact flying insect capture.

Q: You state that the LED board is 10.7% larger than the Universal board, so how many more flies can I expect to catch?

A: Let's use the House fly for an example. It is important to note that this calculation assumes that House flies will interact almost perfectly with the insect light trap, will land on the adhesive board without overlapping, and the entire adhesive area of the board will be used. This is unlikely in a real life. However, if a House fly has an area of about 0.025 in² and the PestWest LED glue board possesses 16 in² more glue area than the Universal glue board, then the PestWest LED glue board would capture ~640 more House flies. See illustration below.



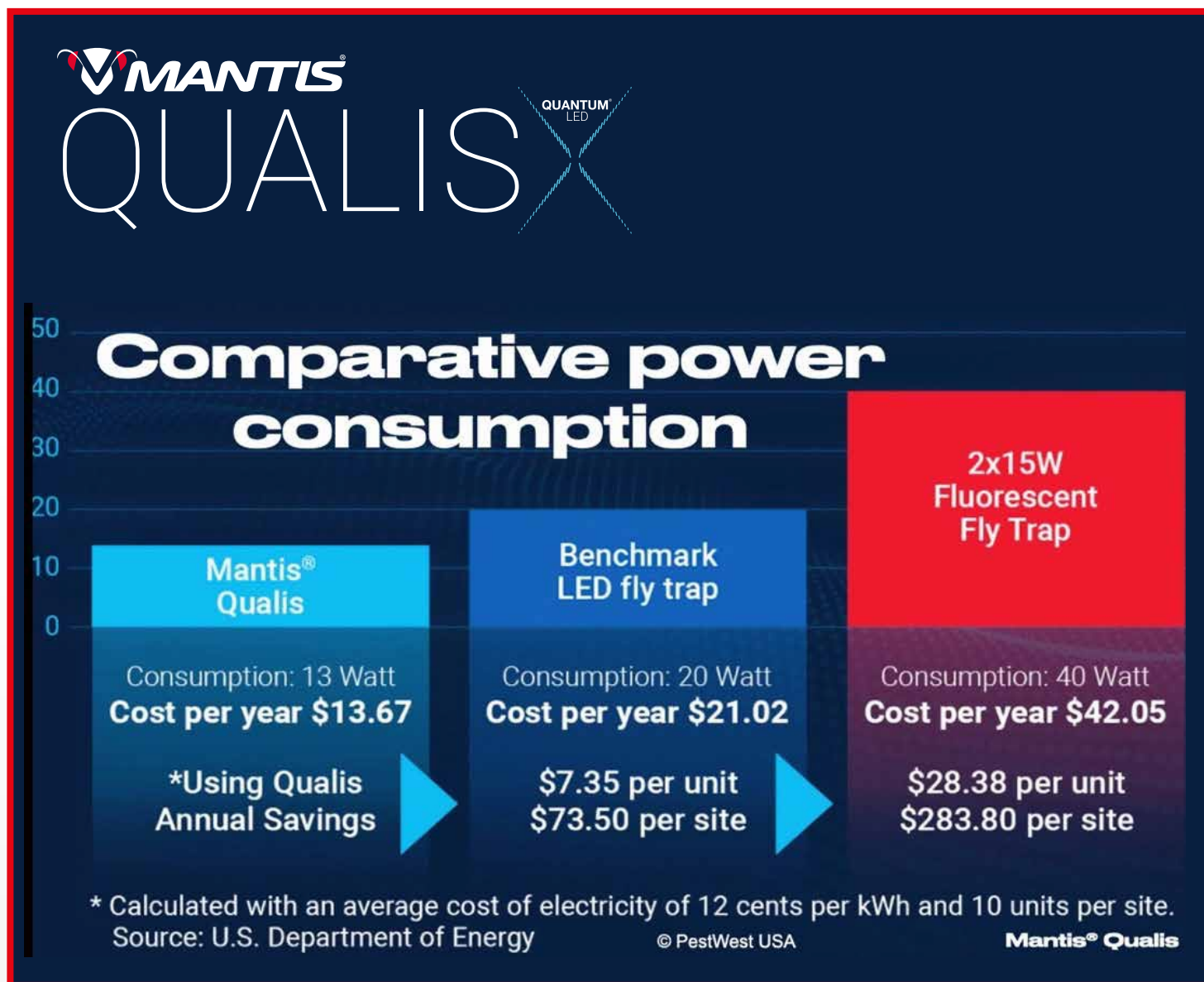
PestWest LED glue board



Mantis® Qualis LED system

Q: How energy efficient is the Mantis® Qualis system versus a Surface Mounted Device LED light trap and fluorescent lamp light trap?

A: See illustration below.





Mantis® On-Top Pro 2 X LED system

Q: How much money can I save versus fluorescent lamps, if I pay \$0.11 per kWh (such as comparing Qualis to my 36-Watt Spectra)?

A: Based upon \$0.11/kWh, The Genus® Spectra Compact 36 W magnetic ballast light trap would have an annual energy cost of about \$48.00, while the Mantis® Qualis LED system would have an annual energy cost of about \$12.50. You would save about \$35.50 in annual energy cost.

Q: Under HACCP, and pest control as a cGMP, are Quantum® X LED systems compliant?

A: Quantum® X LED systems are compliant and assist in the identification and monitoring of flying insects.

Q: I use fly strips or will set off a bug bomb in the back of my place to kill flies, so why should I use an LED light trap?

A: Quantum® X LED technology lamps and PestWest Retrofit LED lamps provide cost-effective, environmentally friendly, reduced risk, and targeted monitoring and capture of filthy-flying insect pests. Fly strips (fly paper) bring significant potential for biological and physical contamination within sensitive kitchen environments. "Bug bombs" or aerosol generators release insecticides through aerosol dispersion or the process of air current aerosol particle spread into a space or environment. Aerosols are tiny particles or droplets (many of which never contact an insect pest) suspended in air or another gas. Indiscriminate use of aerosols could result in health risks of involuntary insecticide exposures, poor indoor air quality (IAQ), compromised food safety, oil-type residues on surfaces, both an explosion and fire hazard, and insecticide resistance.

Q: Do Quantum® X LED systems capture only flies?

A: Many other insect pests are capable of flight and will be attracted and captured. Therefore, pursuant to pest control best practices, trend analyses, and root cause analyses, it is important to assess LED glue board insect captures.

Q: Should Quantum® X LED systems be periodically turned-off?

A: Since some insect pests fly at night, and for optimum results, Quantum® X LED systems should remain-on 24/7/365.

Q: Can the Mantis® Qualis and On-Top Pro2 X be placed within kitchens or food area(s)?

A: Yes, within food areas, place the Mantis® Qualis and On-Top Pro2 X greater than 10 feet from food preparation surfaces or exposed food. See image of On-Top Pro2 X above.

Q: Can LED UVA insect light traps be used outdoors?

A: PestWest LED UVA insect light traps are for indoor use only.



Mantis® Stellaris X LED system

Q: Do Mantis® and Chameleon® systems have a warranty?

A: These novel systems come with a 3-year warranty (excludes Quantum® X LED lamps and LED glue boards).

Q: If I intentionally break an LED lamp, does your 3-year warranty get me a free one?

A: PestWest does not assume liability, either expressed or implied, for the misuse or misapplication of its products. The 3-year warranty applies to PestWest fluorescent UVA and LED UVA insect light traps, but not lamps or glue boards. However, a PestWest lamp may be replaced due to manufacturer defect.

Q: Are Mantis® and Chameleon® systems ready-to-use out of the box?

A: All Mantis® and Chameleon® systems come complete. For optimum results, and warranty assurance, please follow the enclosed Instructions for Use.

Q: Is the Quantum® X LED lamp cGMP compliant?

A: Yes, complaint per FDA regulations and 3rd-party auditors (especially Glass, Brittle Plastics, and Ceramics Programs). See image of Stellaris X above.

Q: The price for these LED lamps is 3x more than my fluorescent lamps, so how am I supposed to make money?

A: Despite the higher initial investment, LED UVA lamps offer significant long-term savings in energy consumption, longer operational efficacy, less service time, and reliable filth fly attraction, capture, and adhesive entombment.

Q: How do I register my LED light trap for the warranty?

A: To register your PestWest Warranty, scan the QR code.



Q: Which replacement lamps and glue boards are used?

A: See below.

- Glue Board: 135-000226 (LED 21" Glue Board - 6/pk)
- LED Lamp: 130-000321 (Quantum® X LED 370nm 21" (550mm) T5 Shatter-Resistant)

Discover more:

1. One LUX equals the visible illumination of one lumen over 1 m² at 1 m distance (one lumen equals one birthday candle at 1 ft. distance).

2. Reference: Efficacy evaluation of the Qualis fly trap against houseflies, *Musca domestica*, under laboratory conditions, i2L, September 2021.



Q: What is “hot swapping?”

A: “Hot swapping” refers to installing Quantum® X lamps while the Quantum® X system is powered-on. This practice can irreparably damage LED lamps. Switch off the system before servicing. Quantum® X lamps are not fluorescent lamps, failure to disconnect the system from power when removing or inserting an LED lamp could permanently damage the LEDs.

When inserting a Quantum® X lamp into the system, ensure the correct polarity to avoid permanent LED lamp damage. The Quantum® X lamp has a + & - symbol located near the silver end cap. Each PestWest LED range system possesses a + & - symbol within the metal work to indicate the correct orientation of the Quantum® X lamp. See illustration below.



Q: What is “color binning,” and why is it used?

A: Color binning is a standard practice in the LED industry to categorize LED lamps into groups (e.g., A, B, C...). This is based upon slight variations in blue color, which naturally occur during manufacturing. Color binning ensures LED lamp consistency.

Q: How are Quantum® X lamps color-grouped, and how is the group identified?

- Quantum® X lamps are grouped into categories (e.g., A, B, C...) to ensure similar shades are used together.
- The color group is indicated on the Quantum® X silver end cap (middle line of printing).
- The color group is indicated on the box label (box of 25 lamps).

Q: What happens if the blue shades of Quantum® X lamps in the Quantum® X LED system do not match?

A: If the blue shades differ, it is a normal result of manufacturing variations. This does not affect Quantum® X lamp UVA output nor insect attraction performance.



Scan to discover the key factors of (AOC).



Q: Are slight differences in the blue color of Quantum® X lamps a cause for concern?

A: No, slight differences in the blue color of Quantum® X lamps do not affect ultraviolet (UVA) light output nor effectiveness in attracting flying insects.

Q: Why does the blue color of Quantum® X lamps change over time?

A: The visible blue color of Quantum® X lamps may appear lighter over time. This is a normal process and does not affect the UVA output, which remains optimal for up to 3 years.

Q: What should I look for if a Quantum® X lamp appears to be working less optimally?

- Nonfunctional filaments inside the Quantum® X lamp
- Yellowing filaments inside the Quantum® X lamp
- All strips should be blue, if pink, there has been a gas leak from cracks in the lamp tube

Q: What is the cause of yellowing filaments in Quantum® X lamps?

A: Over time, some filaments may yellow, reducing the UVA intensity of those specific filaments. However, the remaining filaments within the Quantum® X lamp continue to function optimally. This may occur after prolonged use.



PestWest Retrofit LED Lamp and starter/driver
Underwriters Laboratory (UL) listed

Q: What is the purpose of the PestWest retrofit LED lamp?

A: To convert Mantis® range magnetic ballast 15W T8 18" fluorescent UVA lamp systems to LED. Additionally, easily convert any other manufacturers' magnetic ballast 15W T8 18" fluorescent UVA lamp system.

Q: Is the retrofit LED lamp UL listed?

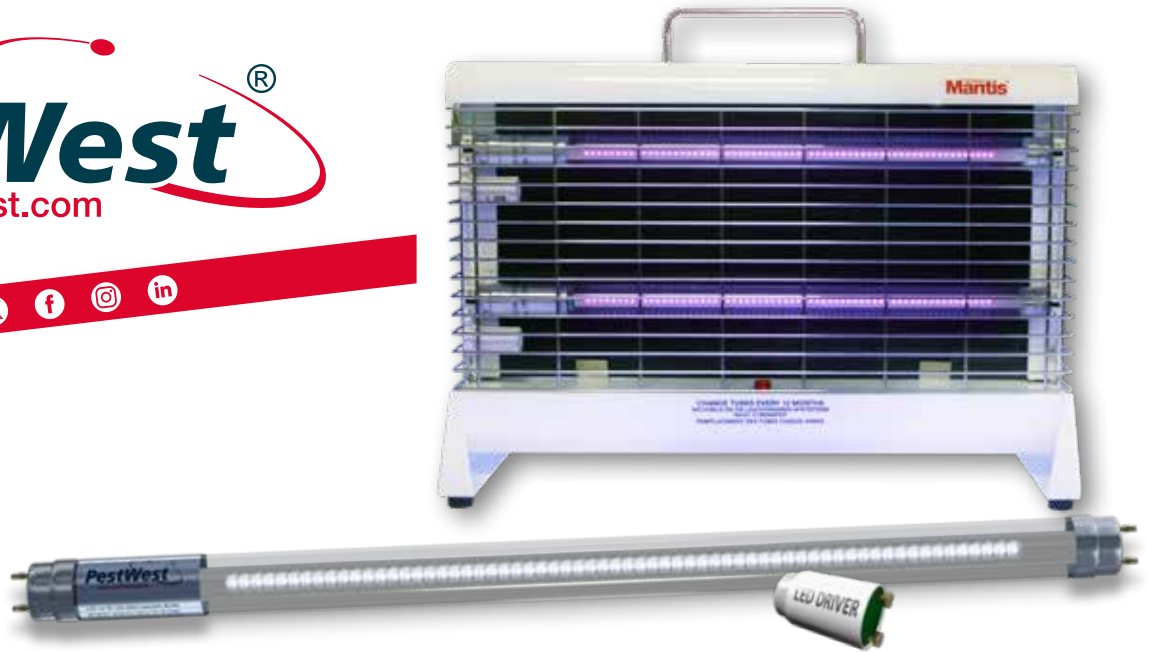
A: Yes, the PestWest Retrofit LED lamp is Underwriters Laboratory (UL) listed, indicating it meets specific safety testing standards.

Q: What other light traps does this LED lamp fit?

A: The PestWest Retrofit LED lamp fits Mantis® 1x2, 2x2, Mantis® Uplight 15W, and the Titan® 300 electrocutor, along with other compatible magnetic ballast 15W T8 18" fluorescent UVA lamp light traps.

Q: What is the purpose of the 365nm UVA light output and what is the intensity?

A: The 365 nm (single peak wavelength) provides optimal flying insect line-of-sight attraction and light trap engagement. The UVA light intensity is 0.22 W/m² at 1 meter.



PestWest Retrofit LED Lamp and starter/driver
Underwriters Laboratory (UL) listed

Q: UVA LED lamps are not as bright blue as fluorescent BL UVA lamps, so do LED UVA lamps attract flies?

A: Yes, UVA LED lamps attract flies even though they are not as bright blue as fluorescent BL UVA lamps. Flies are attracted to the specific wavelength of UVA light from LED lamps, not their visible brightness. You see only a soft brightness from LED lamps, but you can't see the specific UVA light that strongly attracts flies.

Q: I've got flies everywhere, so what kind of flies will the LED light trap catch?

A: Small (endophilic) indoor and large (synanthropic) outdoor filth flies.

Q: What is the input voltage requirement for the PestWest retrofit LED lamp?

A: The input voltage range is 120-277 V.

Q: What is the power consumption of the PestWest retrofit LED lamp?

A: 7 W per lamp.

Q: What is the beam angle of the light emitted by the PestWest retrofit LED lamp?

A: 120°

Q: What is the IP rating of the PestWest retrofit LED lamp?

A: IP20

Q: Is the PestWest Retrofit LED lamp shatter-resistant?

A: No, the lamp tube is transparent glass.

Q: What are the working environment values for the PestWest LED retrofit lamp?

A: Working temperature: -4°F to 113°F, storage: -4°F to 149°F, relative humidity: ≤80%, and rated operational life ~3 years.

Q: Should PestWest LED retrofit lamps be periodically turned-off?

A: Since some insect pests fly at night, and for optimum results, PestWest LED retrofit lamps should remain-on 24/7/365.

Q: Can the PestWest retrofit LED lamp be used with an electronic ballast light trap?

A: No, only magnetic ballast 15W T8 18" fluorescent UVA lamp systems.



Chameleon® EXG X LED system

Q: Can I put an LED lamp in any light trap, and it will work?

A: It's essential to use LED UVA lamps that are light trap model compatible. For example, the PestWest retrofit LED Lamp is specifically designed to convert magnetic ballast 15W T8 18" fluorescent UVA lamp light traps to LED. Using LED lamps within incompatible systems will lead to negative results.

Q: I'm replacing my explosion proof fluorescent lamp with this retrofit LED lamp, so is there anything I need to know beforehand?

A: The Chameleon® EXG uses a electronic ballast with fluorescent 18W 24" T8 lamps, therefore, the PestWest retrofit LED lamp will not operate within this light trap. PestWest now offers the exclusive Chameleon® EXG X with Quantum® X LED lamp technology. See image of Chameleon® EXG X above.

Q: Is a starter required for each PestWest retrofit LED lamp?

A: Yes, each retrofit lamp comes complete with an LED starter/driver.

Q: I see the Quantum® X LED lamp goes into the socket a special way, so does the LED retrofit have to go in a certain way too?

A: The PestWest retrofit LED lamp is designed for magnetic ballasts only. If the fluorescent UVA lamp light trap does not operate with removable starters, do not install PestWest retrofit LED lamps. Remove the old starter and lamp by turning each ¼ turn (until they release). Place the new LED lamp starter (driver) into the starter holder and turn ¼ until it clicks. Insert the new retrofit LED lamp into the lamp holder with the color side closest the starter (driver). Turn ¼ turn, until it clicks. Plug-in the light trap.



Scan to discover easy upgrading with our Retrofit LED Lamp tutorial.



PestWest Retrofit LED Lamp and starter/driver
Underwriters Laboratory (UL) listed

Q: I took out my fluorescent lamp and replaced it with the LED lamp, so why doesn't it work?

A: Be sure the retrofit LED lamp is compatible with your fluorescent light trap. For example, the PestWest retrofit LED lamp is compatible with only magnetic ballast light traps. If your light trap uses fluorescent 15W 18" T8 lamps with a magnetic ballast and starters, then check to be sure the LED starters (drivers) and LED lamps are installed per manufacturer Instructions for Use.

Q: What is the energy efficiency of the PestWest retrofit LED lamp?

A: 60% reduction in energy consumption compared to traditional fluorescent UVA lamps.

Q: How much labor-time am I saving by not changing this LED lamp every year?

A: Your labor-time savings would be based upon specific rate card. However, for example, assuming a lamp and starter change service labor time of 5 minutes per light trap once every three years vs. annually, you would save 67% in labor-time per light trap.

Q: What is the PestWest product code for the PestWest retrofit LED lamp?

A: Product code: 130-000328



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Scan to discover the science of Nemesis[®] X.



Mantis[®] Nemesis X LED Electrocutation system

Nemesis[®] X Frequently Asked Questions

Q: How often do Quantum[®] X LED lamps need to be replaced?

A: Every three years, compared to the one-year lifespan of conventional fluorescent UVA (FUVA) lamps.

Q: Are Quantum[®] X lamps shatter-resistant?

A: Quantum[®] X lamps feature FEP shatter-resistant coating (suitable for areas with glass exclusion requirements).

Q: Can Nemesis[®] X be used outdoors?

A: Nemesis[®] X possesses an IP20 rating and is for indoor use only and must not be exposed to moisture or outdoor environments.

Q: Should Nemesis[®] X systems be periodically turned off?

A: The Nemesis[®] X should remain on 24/7/365 to ensure optimum insect attraction, capture, assessment, monitoring, and control.

Q: What is the recommended suspension height for the Nemesis[®] X?

A: 8.2 feet (2.5 m) above floor level to optimize line-of-sight, insect attraction, and avoid interference from competing light sources.

Q: Can any LED replacement lamp be used in the Nemesis[®] X?

A: Only Quantum[®] X LED 370 nm shatter-resistant lamps (Part No. 130-000321) can be used.

Q: What is the best way to clean Quantum[®] X LED lamps?

A: Routinely wipe with a damp cloth and mild detergent.

Q: What is the difference between Nemesis[®] X and glue board ILTs?

A: Nemesis[®] X uses an electrocution grid to kill insects on contact, whereas glue board ILTs capture insects passively using adhesive boards.

Q: How energy-efficient is the Nemesis[®] X?

A: Nemesis[®] X operates on 19 Watts, significantly reducing energy consumption compared to traditional fluorescent UVA (FUVA) electrocution systems.

Q: Under HACCP and cGMP, are Quantum[®] X LED systems compliant?

A: Nemesis[®] X meets FDA and USDA facility requirements when installed in non-food, non-feed areas.

Q: Does the Nemesis[®] X come with a warranty?

A: Yes, a 3-year warranty (excludes Quantum[®] X LED lamps).



Find us on:



All PestWest flying insect systems include a 3-Year Warranty
(excludes LED lamps and glue boards).



Scan the QR code to register your 3-year Warranty, or visit
<https://support.pestwest.com/pestwest-warranty/>

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