LED Customer Questions

1. A question for the manufacturer of your LED product: "How were light output, color, and wattage determined for your product? Are the light output, color, and wattage for your product equal to the light output, color, and wattage of the LED's in your product?"

   (Some manufacturers of LED replacement bulbs or fixtures publish the light output, color, and wattage information provided by their LED chip manufacturers / suppliers as their own information. This practice does not account for changes in light output, color, and wattage which may result when LED chips are encased in LED replacement bulbs or fixtures. Increased heat will result in lower light output and reduced life.)

2. If colors change over time, how will color change?

   ("LED's may also undergo gradual shifts in the emitted spectra over time that may result in unacceptable appearance or color rendering. These changes may affect the lumen maintenance due to changes in the lumen output resulting from a varying spectral power distribution." - IES LM-80-08: IESNA Approved Method for Lumen Maintenance Testing of LED Light Sources, page 1.)

3. Will color shift if the product is dimmed?

   ("According to the Lighting Research Center, dimming causes LED's to experience a shift in spectral power distribution similar to what happens in an incandescent lamp." - "Introducing the LED Driver" by Craig DiLouie as appears in EC&M, September 2004, page 30.)

4. How were life ratings determined?
5. How will air flow around the product, orientation, and mounting affect light output?

   (Air flow or a lack thereof can impact LED heat. A base down orientation for an LED replacement bulb may increase LED heat as heat from the electrical components rises through the LED's. Metal mounting components may remove heat from the LED's. - IES LM-80-08: IESNA Approved Method for Lumen Maintenance Testing of LED Light Sources, page 3; IES LM-79-08: IES LM-79-08: IESNA Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products, page 2.)

6. What are the minimum and maximum ambient temperatures for the product (and driver, if required - see Question 11 below)?

   ("While LED's have the ability to start at temperatures as low as -40 degrees Centigrade (-40 degrees Fahrenheit), operating them at cold temperatures can cause operating problems. 'LED's draw higher power at cold temperatures, the opposite of what happens with fluorescent lamps, and this can lead to system malfunction,' he warns. For outdoor applications where the power supply is mounted remotely, the maximum LED load on the driver should be de-rated by

10% to 20% to avoid system conflicts during cold temperatures.'" Sameer Sodhi, product marketing manager for LED power supplies and controls at Osram Sylvania as quoted in "Introducing the LED Driver" by Craig DiLouie as appears in EC&M, September 2004, page 30.)

7. Is the LED product you're considering designed to work well in your application? For example:

   LED replacement PAR lamps mounted in enclosed landscape bullets will likely fail prematurely due to excess heat.

   LED replacement MR16's mounted in recessed lighting or enclosed track heads may blink due to excess heat.

   Will your LED replacement MR16 physically fit in your fixture?

   Low voltage LED replacement MR16's may not work with low voltage electronic transformers.

8. Does the manufacturer of the LED product you're considering offer a product warranty?
9. Is the LED product (and driver, if required) rated for dry, damp, or wet locations?

   ("Most drivers are ódry location only' in type and must be installed in a weatherproof electrical enclosure if used outdoors. Damp location type drivers should be used in signs or raceways where some moisture is expected, and wet location type drivers are typically supplied in a pre-assembled, sealed enclosure for mounting outdoors." - "Introducing the LED Driver" by Craig DiLouie as appears in EC&M, September 2004, page 32.)

10. How many LED products can be connected in series before the "end of the line" products dim or do not work?

    ("Introducing the LED Driver" by Craig DiLouie as appears in EC&M, September 2004, page 30.)

11. If the product you're considering requires a separate driver to convert AC voltage to DC voltage,
    - Does the driver you're considering provide the correct voltage (ie: 10V DC driver output with 10V LED input)?
    - Does the driver provide constant DC voltage to the LED product?
    - What is the maximum remote mounting distance for the driver?

    ("é the light source must be protected from line-voltage fluctuations during operation. Changes in voltage can produce a disproportionate change in current, which in turn can change light output to vary, as LED light output is proportionate to current and is rated for a current range." - "Introducing the LED Driver" by Craig DiLouie as appears in EC&M, September 2004, pages 28, 30, and 32.)