

# WARRANTY STATEMENTS

#### BINNING

It is important for TPL Vision's customers to understand the binning process used by LED manufacturers. Due to the extremely sensitive process of manufacturing an LED chip, all LED manufacturers test the wavelength/ colour and brightness characteristics of every LED chip produced, using a special machine. This machine measures the LED's characteristics and puts them into one of several "bins". Each bin will contain LEDs within one tightly controlled brightness and wavelength group. All the LEDs look the same, but the characteristics of the illumination will vary slightly between each bin.

TPL Vision closely monitors the binning of the LEDs we purchase to ensure the quality and consistency of our products, and to ensure you don't experience variations in LED colour or brightness on any one product, or product batch (on one order):

- only two or three bins which are extremely close in characteristics are used within one product range,
- the bins used on any one product purchase order will always be the same.

It is important to note that if the illumination is a repeat order at different times, then the binning may be slightly different between the orders, so there could be a small variation in colour or brightness between these orders. Typically this variation will not be visible to the vision camera. The human eye is very sensitive to colour variations (particularly in some wavelength ranges), so it is possible that you could see a small difference in colour, but it is very unlikely to affect the performance of a vision system.

Please note that TPL Vision products cannot be rejected for variations in binning, so if your application requires a particularly tight control on wavelength and/or brightness, especially compared to a previous project, please discuss this with your Sales Executive prior to ordering.

### LED LIFETIME

LEDs are chips enclosed within a casing, together with a preliminary optic. When any LED is turned on, it produces a high amount of heat which is detrimental to the lifetime and performance of the LED. TPL Vision's LED products are mounted on a metal surface (heatsink) to conduct the heat away from the LED and give the best LED lifetime possible. However, it is impossible to fully extract all the heat generated from the LED, and heat degradation will gradually reduce the power of the LED over it's lifetime. This is a normal characteristic of LEDs, and all LED chips will experience a reduction in power output as they age.

TPL Vision encourages customers to strobe our LED products whenever possible, as it reduces the heat generated within the product and increases the lifetime of the LED chip. Operating TPL Vision products in strobe mode when possible will help to give longer product lifetimes than rated in the datasheets.

Most TPL Vision products (with the exception of UV and "Expert" products) come with a 3 year warranty and rated lifetime of 50,000 hours when operated in continuous mode with ambient air temperature = maximum  $40^{\circ}$ C. This lifetime can typically be increased using strobe mode where possible.

## IP RATINGS EXPLAINED

Almost all TPL Vision products have an enclosure around the electrical components. These enclosures are tested according to the standard IEC 60529, which clearly defines Ingress Protection (IP) ratings using a code. The code rates the product enclosures for their protection against ingress of both solid particles/objects (see X below) and liquids, specifically water (see Y below).

#### **IP**XY CODE DESCRIPTIONS:



Most of the new products from TPL Vision are rated to IP65 as standard – providing dust tight protection and low-pressure water jet protection. Some older products do have a lower rating, so it is important to consider this when choosing your illumination product. Importantly, ingress protection does not mean the product can be exposed to oils and lubricants as the properties are different from water. **Oils, lubricants and other non-water liquid substances are not covered under warranty unless otherwise stated in the product datasheet**.

Please ask your TPL Vision Sales Executive for assistance if required.



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