

Modern demands on a high-quality UV inspection lamp

Introduction

Innovation in the chip sector continues with full force. There can be no doubt about the fact that chipsets will become more and more advanced in the coming years and that ever more chips will be needed around the globe.



The global demand for high-tech products has therefore increased sharply in recent years and will continue to increase in the future. The Dutch industry has built up a good name and reputation in this sector. In order to meet the growing demand for high-quality products, a high standard is required of the current cleanroom technology. At the same time as this growth, the requirements for the inspection of components are becoming increasingly strict.

No concessions are made to the quality of the end product.

Measuring the cleanliness level of a surface in a cleanroom is essential in any contamination control program. It enables the employee to determine the effectiveness of cleaning that has been carried out on, for example, tools, worktops, parts, but also certainly the product that is applicable at that time.

During the production phase, it is important that the amount of particles on a surface of, for example, tooling, parts and production environment is controlled.


Inspection methods have been developed for this purpose that can check the cleanliness of these surfaces during the various phases of production.


One of these control options is the use of UV-A and scatter light inspections.



For these inspections a high-quality UV-A inspection lamp is the perfect instrument.

Below are the 10 most important aspects that a such an inspection lamp must meet:

No	Item	Remark
1	Execution & Safety	The inspection lamp must be manageable, in order to work with it for a long time, it must not be too large and too heavy. Furthermore, the flashlight must comply with the applicable safety standards and of course be able to take a beating
2	Type of light	Conventional fluorescent light sources are hardly used anymore. These have a low efficiency and have a start-up time of usually 1 minute before reaching full light intensity. The alternative became available a few years ago: UV LEDs. These are much friendlier in energy use and immediately provide 100% light intensity after startup.
		
3	Finishing & Materials	Naturally, the surface must have a sleek and aesthetic finish, so that dust formation is not possible and it can be easily cleaned. The housing of an inspection lamp must be vented and made of non-porous material. A special aluminum alloy has been developed for use in cleanrooms Aluminum is not only scratch-resistant, but also has a high hardness class and density class: T6061 Type III
4	Required light	To gain insight into a surface, it is important that the inspection lamp can emit both UV light and white light
5	Brightness (white) scatter light	A white LED must be placed in such a way that the inspection lamp can radiate this grazing light well over the surface. The minimum light intensity, to get enough light on the surface at an operational working distance of 30 cm is 300 lumens
6	Luminous intensity of UV light and the wavelength	In order to properly visualize particles within a radius of 30 cm and a working height of 30 cm (distance between the inspection lamp and the surface), a minimum light intensity is required. As a guideline, 10mW/cm ² is increasingly being used here. The UV light is then defined as light with a wavelength of 365nm (+/- 5nm)
7	Decrease in UV light intensity	Inspection lamps that are powered by a battery often show a curve in which the UV light continues to decrease over time. At the end of the battery life, there is only a fraction of the initial UV light left. It is important that a good inspection lamp shows an intensity curve that hardly decays during use of the lamp. At the end of the battery's life, it should then fall back immediately and be switched off.

No	Item	Remark
8	Interference filter 	<p>Because (white) light has the property of reflecting light that falls on a surface, the prolonged use of an inspection lamp is a tiring activity. The human eye is exposed to this light and will squint (get tired) over time. For that reason, a good inspection lamp in the UV position must block all unwanted wavelengths. With an interference filter, all unwanted wave lengths can be filtered out, only UV light will pass through the filter.</p> <p>Cheaper solutions that are offered to the market are so-called color filters. These color filters show a gradient in the filter property, depending on the life of the filter and the temperature to which they are exposed. So they are inaccurate.</p> <p>So always make sure you have a lamp with a good interference filter. Then the human eye can continue to function optimally during an inspection for longer</p>
9	Temperature control	<p>LED technology generates a lot of heat, heat that can cause 2 problems:</p> <p>If the LEDs become too hot, the operator may suffer. This heat is transferred to the housing and it can heat up quickly. Even reach a temperature that can be uncomfortable or even dangerous for the user.</p>



No Item

Remark

10 Power Supply & Charging

The necessary demands are placed on the batteries: they must deliver a lot of power and be able to be used again and again, without the power decreasing. Panasonic / Sanyo have developed an industrial series of Li-ion batteries that meet the highest requirements in terms of power supply and safety. And, of course, be protected against overcharging.

When the batteries need charging, you can of course remove the batteries from the lamp. But a more modern solution is to charge the battery using an inductive charging system. The battery can remain in the shaft of the flashlight. It therefore does not have to be opened, with the risk that fine dust and wear & tear particles from the O-rings will pollute the environment (*read: Pollute the Cleanroom*)

