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The annual listing of 5 companies in UK that are at the forefront of providing Photonics solutions and transforming businesses in the region

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Catalysts of LED Revolution

From powering up festive lights and laptop and mobile smart screens to illuminating traffic lights, HUDs, and display panels of the fighter jets, LED technology is everywhere. As a matter of fact, LEDs are often referred to as the most sought-after lighting technologies of the 21st century as these tiny lighting devices are successfully surpassing all their counterparts (incandescent bulbs, fluorescents, and metal halides) on every possible parameter, such as cost, energy efficiency, lighting quality, and durability.

However, a discourse around the popularity of LED will remain incomplete without highlighting the critical role modern-day LED solution producers are playing in this revolution. It is the innovative LED design and manufacturing capability of these solution providers that are sparking the lighting revolution and taking the world by storm.

A perfect case in point is UK-based PRP Optoelectronics. With over 30 years of experience in the LED industry, PRP fosters an innovator mindset and out-of-box thinking, and is considered one of the key catalysts of the ongoing LED revolution. What underpins PRP's role as an industry leader is the company's team of engineers, who are highly experienced in different aspects of customised, high-performance microLED and LED light engines development. This gives PRP the ability to tackle every production aspect internally—be it designing the optics and the electronics of the LED bulb or developing the software to manage the finished LED product. A recent testament to this robust in-house innovation capacity is PRP's Aegina—an intelligent UVC LED water purification system that delivers 99.99 percent clean, Class A (NSF 55 Standards) pure water.

Aegina is a groundbreaking innovation against the backdrop of an impending water crisis. According to WHO, access to drinkable clean water is one of the most pertinent challenges of modern societies, and by 2025, more than half of the world's population will be living in water-stressed areas. Even though existing UV-enabled water purification systems might be present as the first

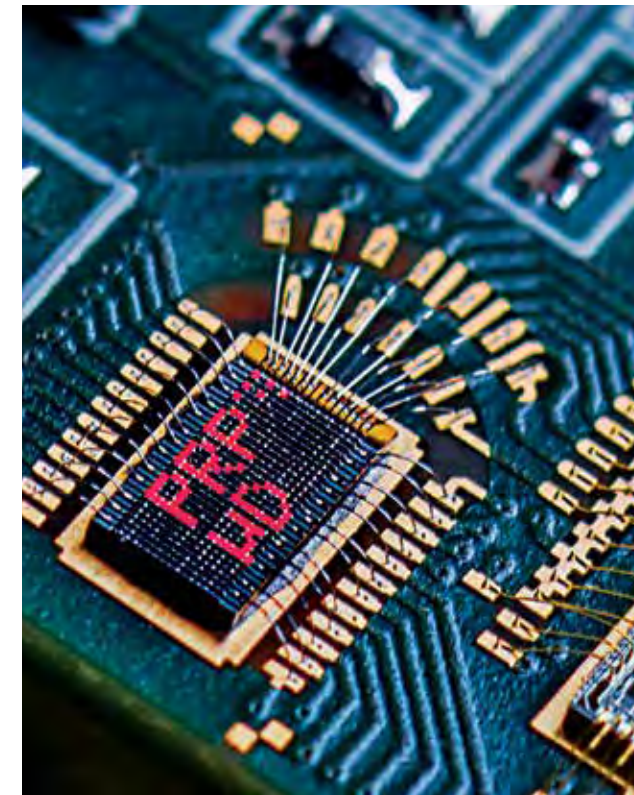


Kevin Peart

line of defence for solving this impending crisis, these solutions are more harmful than good for the environment. This is because traditional UV water purifiers use mercury lamps as a source of UV, making them not only expensive but also bad for the environment in the long run. To overcome these detrimental environmental effects of traditional mercury lamps, PRP has developed Aegina using safer UV LED sources. The LEDs emit a specific wavelength of UV light, which affects the wall of the pathogen's cells, causing irreversible damage to their DNA—rendering them ineffective and making the water readily drinkable.

Aegina's sophisticated technology is currently available in a variety of sizes, from treating 3-18 litres of water per minute to even larger volume of water. As a result, Aegina's water purification is perfectly suitable for off-grid living, such as motor homes, recreational vehicles, boats, and yachts on the one hand, and industry-scale complexes like hotels, medical facilities, and workspaces on the other—making it a widely accepted solution. "You can even set up Aegina in a remote village with a standpipe. It will always deliver virus-free, drinkable water for the local people," underscores Kevin Peart, managing director of PRP.

It is also important to note that PRP's uniqueness is not restricted to Aegina alone. The complete in-house capability bestows PRP with enough flexibility to bring the same level of novelty for other organisations looking to innovate different defence, industrial, and consumer LED applications or offer custom solutions that are not readily available in the market. Be it designing the LED circuits or developing the software module to power and manage a range of applications like LED print heads, rangefinders, and LED UV curing devices, PRP supports its clients for every unique need. "We also cover the entire LED illumination spectrum, from infrared (IR) to ultraviolet (UV), which makes us an all-encompassing LED production facility," says Peart. PRP's clients are thus benefited by not having to coordinate with multiple vendors or getting caught up in a complex production whirlwind.



“What underpins PRP's role as an industry leader is the company's team of engineers, who are highly experienced in different aspects of customised, high-performance microLED and LED light engines development”

Besides, these extensive internal capabilities also allow PRP to be highly flexible in its production volume. While many contemporaries of PRP usually don't work on low-volume production, PRP can produce from a mere 10 to hundreds of thousands of LED units as per clients' necessities. This is a huge benefit for industrial LED users who want to develop only small volumes of LED devices at the initial stage of their journey.

To better understand PRP's capability as a one-stop LED manufacturer, let's look at a recent client engagement. A defence industry client recently approached PRP to develop a LED-powered gunsight with five individual components. The main challenge in this project was powering the LEDs that can emit light of 5-6 nanometres wavelength but through a 10 microns LED dot sight (for target visualisation). The market available LED power sources that could support the production of light rays within the desired wavelength range were larger than the intended size. Nevertheless, PRP was able to leverage its innovative design thinking to live up to this challenge and develop an LED-on-ribbon PCB circuit that could power the tiny LED emitters. PRP also developed the necessary software solution to manage the LEDs and PCBs. The company then performed full-fledged product testing to ensure the client received an unparalleled gunsight. Not only did PRP's partnership save the client's time and money as they didn't have to deal with multiple suppliers, but it also minimised every design and manufacturing hassle the client would have had to face otherwise.

Moving ahead with many such success stories under its hood, PRP is poised to continue supporting its defence, industrial, and consumer LED clients. At the same time, the success of Aegina is now making the PRP work towards a similar air purifier device. "Our future roadmap is not only about helping other businesses bring forth more LED innovation. It is also about finding newer applications of LED technology like air purification. And we will continue to support and grow our existing clientele while pursuing more humanitarian innovations in the coming years," concludes Peart. ⁵⁸