

UV LED Market

How GaN and AlN technologies will challenge the traditional UV lamp businesses and open new markets...

UV LEDs CHALLENGE THE TRADITIONAL \$500M UV LAMP BUSINESS

UV business is a market of about \$500 million with traditional UV lamp technology.

Thanks to its compactness, lower cost of ownership and environmental friendly composition, it is expected that UV LED will replace traditional lamps and also will open the door to many new applications, especially portable ones.

In 2008, LEDs in the UV A/B spectrum were the dominant device in the sub-400nm applications.

More than 90% of the UV LED market (outside of R&D) was covered by UV curing, counterfeit detection, medical and instrumentation applications requiring UV A/B sources. The remaining 10% was allocated to Air & Water purification with again

a great portion of UV A-based LED source for photocatalytic air purification. UVA (400 – 315 nm light wavelength) business is currently the main UV LED market and will remain so for at least the next 4 years (Fig. 1):

- about 90 % of the market in 2008
- about 70 % of the market in 2012

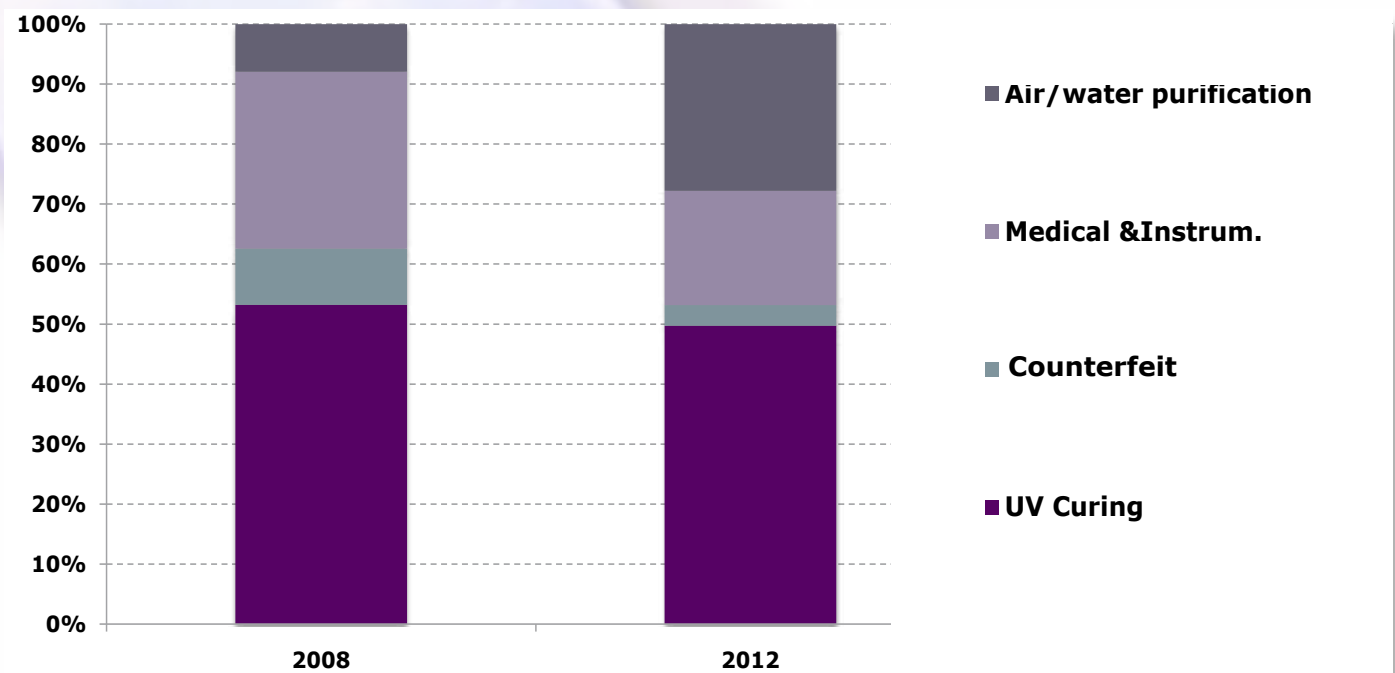


Figure 1: Relative market shares of UV LED applications 2008-2012

UVA LEDs DOMINATE TODAY BUT UVC LEDs WILL LEAD THE MARKET TOMORROW

Key applications for UVA are UV curing, document/banknote verification, photocatalyst air purifier, medical phototherapy.

Among those, the most dynamic and important UVA lamp market is the UV curing business where UV LED can definitely compete with traditional mercury lamps:

- Market size is big (\$120M) and with growth of about +10 % due to the advantage of UV curing technology over traditional technology (speed, green coating).
- Many new players have emerged over the past 5 years at the system and LED packaging level
- The power output available has greatly increased and several Watts / cm² will be available in 2009-2010.

There were high hopes about UVC applications (disinfection, purification market) two years ago but real applications are still missing due to significant technical and economic challenges for UV LEDs: power output, efficiency, lifetime and cost. Hence UVC players are now focusing on UVA (Fig. 2)

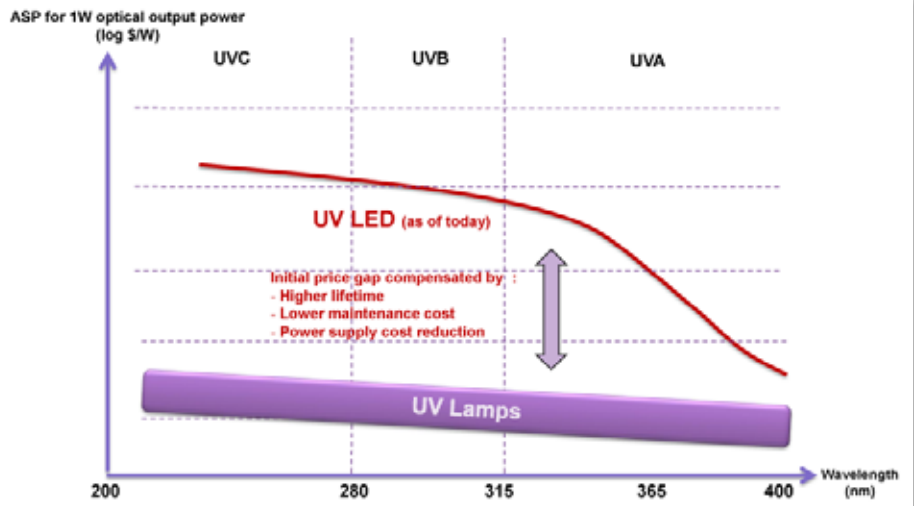


Figure 2: Traditional UV lamp pricing and current UV LED positioning in \$/W

The first UVC LED applications are mostly for scientific analytical instruments.

It is expected that the first large-scale sales for the disinfection market will appear in 2010 on existing markets and also new Point of Use or portable applications where compactness is a key issue.

Growth of the UVC market is strongly connected to the availability of AIN bulk substrates that could theoretically multiply by 100 the LED chip optical power output. Several players

expect to provide AIN wafers in volume at the end of 2009. Hence, time to market for UVC applications based on AIN would probably be in 2011-2012.

We also observe a strong trend where AIN companies are now extending their activities to UV LEDs to capture more added-value along the supply-chain.

According to the high potential UVA LED business in UV curing, augmented by the growing market demand in water & air disinfection, we forecast a cumulated \$250M UV LED market in 2015.

This report presents the detailed major market metrics of the current traditional UV lamp business, describing the targeted applications, the key players, the volumes and related market size of each segment.

It gives the possible total accessible market for UV LED, highlighting the strengths and weaknesses of this technology over the current established products.

It describes the recent progress in AIN single-crystal substrates as well as the UV LED performance roadmap.

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BIO



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 - Crystal Technology ; N-Crystals Ltd; University of South Carolina

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