

## PROFILE

## Company profile

### Photon & Polymers: Custom Formulation to meet specialised requirements in UV-Curing

Photon & Polymers (PnP) is a spin-off from France's University of Haute Alsace, in Mulhouse in eastern France close to the Swiss and German borders, and French research agency, the National Centre for Scientific Research (CNRS). Created by Dr Khalid Zahouily, who has a PhD in photochemistry and photopolymers, in 2001, the company specialises in the research and development of photopolymer materials through the technical feasibility stage, concentrating on photopolymers materials and custom solutions in UV curable coatings.

End markets include the most prestigious companies in the luxury, automotive, electronics, optics and surface treatments. A highly competitive group of scientists and engineers are led by Professor Christian Decker, director of research at CNRS, Professor Gerard Riess, head of the polymer department at the University of Haute Alsace, and Zahouily.

Zahouily says the company's environmentally friendly technology has found a large variety of industrial applications. UV-radiation curing is increasingly used in the coatings industry for the surface protection of various materials (wood, paper, plastics and metals) by fast-drying varnishes or paints, as well as to produce quick-setting adhesives, sealants and composite and nanocomposite materials. PnP's UV-cured coatings are designed to improve the weathering resistance of different kinds of organic materials, as well as substantially enhance surface properties such as gloss, abrasion and scratch resistance.

PnP has also developed a crosslinked UV-curable high performance nanocomposite by using photoinitiated polymerisation of multifunctional monomers and oligomers, and mineral nanoparticles (such as colloidal silica, organic or carbon nanotubes). These nanocomposites are used to create high performance clear coatings for such purposes as:

- A new route for the synthesis of biphasic organic nanocomposite alloys and colloidal polymer systems;
- Biphasic polymer structures, which will include organic nanoparticles or minerals, are being used by PnP to develop materials with extraordinary properties.

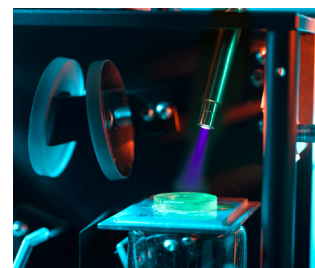
Areas of development include:

- latex magnetic cores using ferrite and steerable structures under a magnetic field
- conductive polymers, coatings and/or inkjet inks based on (PbTiO<sub>3</sub>, BiMnO<sub>3</sub>, BiCrO<sub>3</sub>, P<sub>2</sub>O<sub>5</sub> ...) in the form of nanoparticles dispersed in a matrix by photochemically polymerisable coatings.

The company has also found opportunities in the fast growing market for UV-curable inkjet inks for wide format printers and also new industrial applications, which incorporate surface functionalisation using inkjet technology. PnP is developing tailored solutions for inkjet inks based on UV hybrid systems. Cationic systems and dual-cure inkjet inks for glass applications are being developed by PnP. At the same time, PnP is exploring the usefulness of UV-cured latex and biphasic organic nanocomposites as a way to meet specialised requirements in UV inkjet applications.



Dr. Khalid Zahouily examines a UV-curable composite based on fiber glass and UV-curable resins



Kinetic studies of photopolymerisation reaction by using real time FT-IR spectroscopy

Photon & Polymers (PnP) can be found at [www.photonpolymers.com](http://www.photonpolymers.com)