



**Coordinator:**

**The Aqua-Pulse Consortium**



**Epi-Light (Ireland)**

[www.epi-light.com](http://www.epi-light.com)

Epi-Light Ltd. is a progressive and dynamic indigenous LED lighting technology company based in Cork, Ireland.

**Partners:**



**Cork Institute of Technology (Ireland)**

[www.cit.ie](http://www.cit.ie) [www.cappa.ie](http://www.cappa.ie)

The RTD work for the Aqua-Pulse project is carried out in the Centre for Advanced Photonics and Process Analysis (CAPPA). The direction of CAPPA's work is industry-led and as a result takes a direct and applied focus.



**Advanced Materials (Czech Republic)**

[www.advancedmaterials1.com](http://www.advancedmaterials1.com)

Advanced Materials-JTJ is an innovation oriented enterprise, possessing expertise in production of TiO<sub>2</sub> nanoparticles, and preparation of highly effective photocatalytic surfaces using suspensions (FN®) and by other methods.



**Technologisk Institute (Norway)**

[www.teknologisk.no](http://www.teknologisk.no)

The RTD work for the Aqua-Pulse project will be carried out by the Aquaculture Group in TI. TI participates in both consulting and the development of water treatment solutions.



**Unik Filtersystems (Norway)**

[www.unikwater.com](http://www.unikwater.com)

Unik delivers complete solutions for water treatment for reserves, aqua culture, fish farming and industry. The company is based in Os, a small town just outside Bergen, Norway. We produce products for water treatment and our main markets are fish farming and drinking water.



**University Of Ulster (Northern Ireland)**

[www.ulster.ac.uk](http://www.ulster.ac.uk)

NIBEC - the Nanotechnology and Integrated BioEngineering Centre is a well established research complex at the University of Ulster's Jordanstown campus. The group is internationally recognised for research programmes involving the preparation and characterization of photocatalytic materials.

# AQUA-PULSE

Pure Water Technology



Research on

## Photo-catalysis with efficient UV LED sources for water purification

A "Research for the Benefit of SMEs" Project

Funded by the EU Framework Programme 7



## Project Overview:

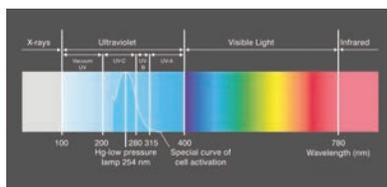
Water purification requirements feature in a wide range of applications, from residential homes, office and hotel buildings, to high-specification environments such as hospitals, laboratories and industrial production facilities, as well as municipal water supply and wastewater treatment.

UV-TiO<sub>2</sub> photocatalysis has been demonstrated to be effective for the removal of a wide range of chemical and biological contaminants in water. A major barrier to their widespread deployment is the source for the UV radiation. These sources are almost exclusively mercury-based UV lamps, which are relatively bulky, inefficient, and have health and environmental issues due to the mercury contained in them."

The AQUA-PULSE project aims to realise a **low-power, low-maintenance water purification** solution based on high-brightness UV Light Emitting Diodes (LEDs) and a photo-catalysis method. Such a system would be effective against viruses, bacteria and organic compounds, and would provide an attractive and innovative alternative to current technology utilizing mercury-based UV lamps. It brings together three European SMEs in three different, but complementary, technology areas and links them with three RTD Performers to develop new knowledge and a new water purification product which will have significant commercial benefits for all of the SME partners.

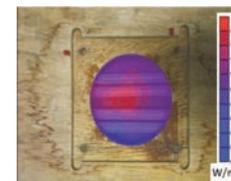
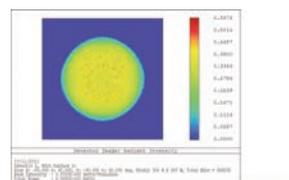
The project aims to combine technologies in two key areas, **UV LED emitters and photo catalysis**. This combination of technologies will lead to product advancement in the field of water purification by creating a low cost, more efficient system when compared with current availability.

For more information visit [www.aqua-pulse.org](http://www.aqua-pulse.org)  
Email: [info@aqua-pulse.org](mailto:info@aqua-pulse.org)



## Project Goals:

While UV photocatalysis systems have been incorporated in some water purification systems a major barrier to their widespread deployment is the source of UV radiation. Light Emitting Diodes are cheap, environmentally friendly alternatives to UV mercury lamps. Together with newly developed photo-catalytic materials Aqua-Pulse aims to deliver a low cost alternative to the water purification market.



### GOAL 1:

Realise and optimise UV LED emitters with the required brightness and wavelength tailored to the photocatalyst.

While the elimination of bacteria and viruses can be achieved by direct exposure to UV light, UV photolysis of persistent organic pollutants (and emerging contaminants) is not wholly effective, but can be achieved with UV-photocatalysis. Here, a photocatalyst material such as TiO<sub>2</sub> is illuminated with UV light, creating reactive oxygen species, which result in the complete mineralisation of chemical pollutants and the inactivation of pathogenic microorganisms.

### GOAL 2:

Optimise the photo-catalysis process using appropriate catalyst material.

AQUA-PULSE aims to produce a new purification product which will present new applications/customers for each of the SMEs involved.

### GOAL 3:

Model, design and construct a novel photocatalytic reactor utilising UV LEDs, and validate the performance of the reactor for water purification and application in key sectors

Thus, the AQUA-PULSE project brings together a well-balanced and tightly-focused consortium, in which the complementary skills of the RTD Performers will combine to provide valuable R&D results, leading to new products and markets for all the SME partners.



The Aqua-Pulse project acknowledges funding support received from the European Union's Seventh Framework program managed by: REA-Research Executive Agency. <http://ec.europa.eu/research/rea> ([FP7/2007-2013] [FP7/2007-2011]) under grant agreement no [286641].

Grant Agreement No. 286641

[www.Aqua-Pulse.org](http://www.Aqua-Pulse.org)

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