

## THE SOLARDETOX<sup>®</sup> TECHNOLOGY

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### ABSTRACT

A European industrial consortium, denominated SOLARDETOX, has been created to the design, manufacturing and in situ installation and set-up of turnkey plants to the treatment of hazardous and non-biodegradable water contaminants using solar light. The process is based on the solar photocatalytic mineralization of organic compounds dissolved in water and it is addressed to the treatment of persistent industrial contaminants. This Consortium, formed by CIEMAT (coordinator), ECOSYSTEM, HIDROCEN, AOSOL, SCHOTT-ROHRGLAS, DLR, CISE and the University of TORINO, has addressed and performed a comprehensive research and technological development to obtain a State of the Art technology, which has been validated with the construction of a full demonstration plant at one of the partner installations (Fig. 1).



Fig. 1. View of a SOLARDETOX treatment plant installed at Hidrocen factory (Madrid, Spain)

The SOLARDETOX<sup>®</sup> technology intends to be an important breakthrough in the implementation of solar chemistry technology, making available a specific solar technology to carry out water treatment processes that did not exist commercially. To this end, it has been designed with full automatic systems and minimum operation and maintenance requirements. The technology is based on the simple, inexpensive and efficient CPC (Compound Parabolic Concentrator) non concentrating solar collector technology, which seems one of the best technological solutions to Solar Detoxification Systems as static collectors can capture the diffuse UV sunlight as well as the direct beam. This development is based on the experiences carried out by CIEMAT at Plataforma Solar de

Almería installations. Initial market analyses show a promising number of possible applications to this remarkable environmental technology, which can destroy many of the most problematic persistent organic pollutants. These analyses also show that this technology could be fully competitive against conventional wastewater treatment processes.

The paper will be focused on the description of the main items of the developed technology and their potential applications, discussing capital and operating costs. SOLARDETOX<sup>®</sup> performance will also be compared with alternative conventional technologies.

### **Keywords**

Solar Detoxification, Solar Photocatalysis, Water Treatment, Titanium Dioxide, Compound Parabolic Concentrator, Ultraviolet Solar Radiation, Photocatalysis Applications, Cost Estimations.

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