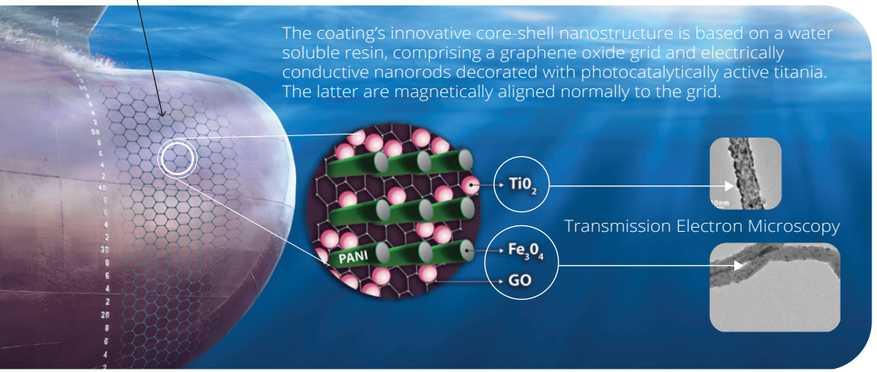
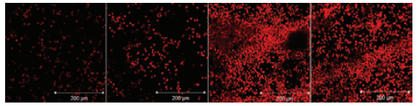
Mode of action



Real-field results

Performance evaluation through bifocal microscopy and visual inspection of coated steel samples after 9 weeks of immersion in natural seawater.



Maximum intensity projection data sets from microalgal biofilms on (a) DRAstiC coating, (b-c) commercial paints and (d) uncoated samples, recorded by confocal laser scanning microscopy.

Visual inspection of (a) DRAstiC coating, (b-c) commercial paints and (d) uncoated samples in static conditions.

Antifouling performance is enhanced due to the coating's 3-D electrical anisotropy and to synergistic antibacterial effects among its embedded components.

Fouling on uncoated leisure boat.

Coated boat's hull after 9 weeks.

BFP ADVANCED TECHNOLOGIES

ABOUT BFP

BFP bridges new dimensions to future technology. We manufacture specialty materials (e.g. glass restoration suspensions) and functional coatings (antisoiling, antimicrobial, antifog, antifingerprint, anticorrosion) with never-before-seen capabilities. Our products adhere to strict quality standards and bear official approvals from renowned organizations. Science in the service of man!

The DRAstiC Partnership

1 BFP Advanced Technologies

In less than 7 years since its founding, the Coordinator of DRAstiC has won many awards and distinctions. Two scientists with broad academic and professional experience constitute the company's management team, namely Dr. Nikolaos Papadopoulos and Mr. Sotiris Xafakis. Dr. Papadopoulos has a long history in chemical processing being expert in the development of specialty materials and nano-structured coatings with advanced techniques, while Mr. Xafakis has an extensive experience in industrial production and quality control procedures. BFP's research team is complemented by Mrs. Pinelopi Falara, an ambitious professional and PhD candidate in chemical engineering.

2 Institute of Nanoscience and Nanotechnology (INN) of the NCSR "Demokritos"

INN is one of the leading research institutes in Greece. Its skilled human capital and creative capacity supported by a collective infrastructure provide a distinctive ecosystem for fostering world-class basic and applied research. Head of the INN's team and manager of the project's scientific research is Dr. Polycarpos Falaras, an expert in the development and characterization of titania nanostructures and environmental protection processes. Key member of the team is Dr. Polyxeni Vourna. Dr. Vourna focuses on the synthesis of core-shell nanostructures and has a high level of expertise in material characterization by analytical tools and techniques.

3 Institute of Communication and Computer Systems (ICCS) of the National Technical University of Athens (NTUA)

ICCS was founded with the 'charta' to support the performance of top-quality research, development activities and the provision of scientific service to private and public bodies. Head of the DRASTIC's ICCS team is Dr. Evangelos Hristoforou, Professor of Electronic Materials at the School of Electrical and Computer Engineering (ECE). Dr. Hristoforou specializes in microstructural and magnetic characterization of shipbuilding steels and coatings.

The DRAstiC Project

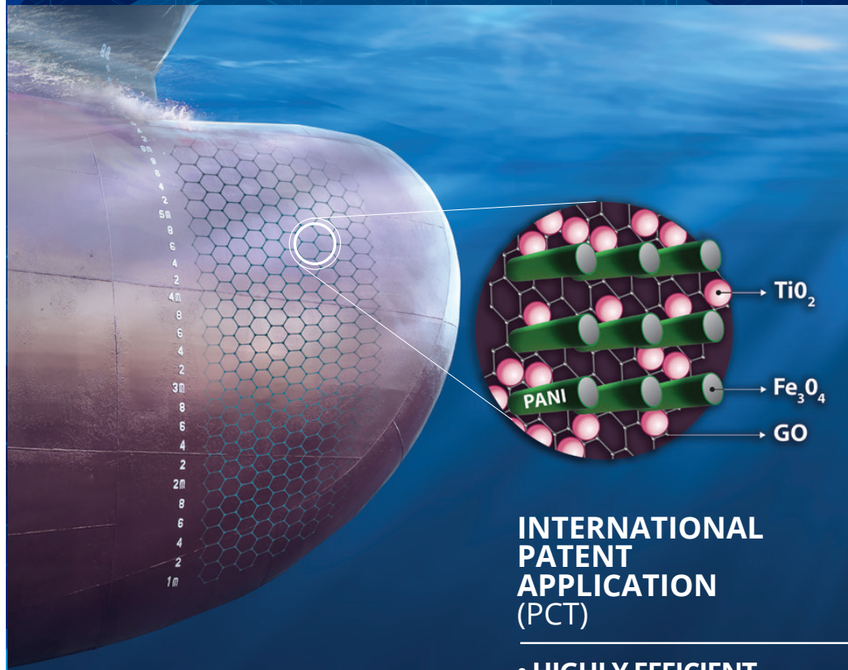
www.drasticproject.com

European Union
European Regional Development Fund
HELLENIC REPUBLIC MINISTRY OF DEVELOPMENT AND INVESTMENTS SPECIAL SECRETARIAT FOR ERDF & CF PROGRAMMES MANAGING AUTHORITY OF EPAnEK
EPAnEK 2014-2020 OPERATIONAL PROGRAMME COMPETITIVENESS ENTREPRENEURSHIP INNOVATION
ΕΣΠΑ 2014-2020 Partnership Agreement 2014 - 2020
Co-financed by Greece and the European Union

Co-financed by the European Regional Development Fund of the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE - INNOVATE (project code:T2EDK-00868)

The DRAstiC Project

Drag Reduction Antifouling Coatings



INTERNATIONAL PATENT APPLICATION (PCT)

- **HIGHLY EFFICIENT**
- **BROAD SPECTRUM PERFORMANCE**
- **DURABILITY TESTED**

www.drasticproject.com

European Union
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HELLENIC REPUBLIC MINISTRY OF DEVELOPMENT AND INVESTMENTS SPECIAL SECRETARIAT FOR ERDF & CF PROGRAMMES MANAGING AUTHORITY OF EPAnEK
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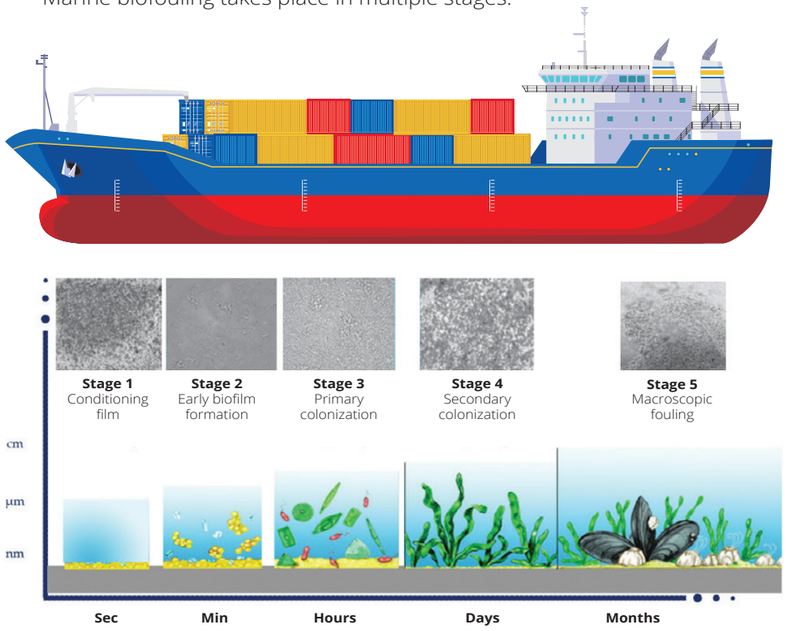
The DRAstiC Project

DRAstiC (Drag Reduction Antifouling Coatings) is an industrial research project for the development of biocide-free low drag hull coatings of high antifouling performance suitable for all kinds of boats and ships. Production methodology and mode of action are both state of the art. An international patent application is underway.

Background

Marine biofouling takes place in multiple stages.



Modern commercial antifouling coatings aim at eliminating biofouling either by slowing its growth or by facilitating detachment of subaquatic organisms. In other words, they fight fouling when the latter is **already there**.

Through a pioneering approach, the DRAstiC project tackles the problem drastically, i.e. at its root, before the onset of early biofilm formation. The antifouling coatings developed within the DRAstiC project provide a three-dimensional electrically anisotropic matrix which reduces electrostatic forces between the hull's surface and microorganisms. As a result, primary adsorption of macromolecules is eliminated.

The scientific findings of the DRAstiC project have been highlighted* in peer-reviewed journals and international conferences. The impact of the project is rather important. Being highly efficient and friendly to the underwater environment this new coating ssystem may have a broad utility. Besides hulls of boats and ships, potential applications include off-shore structures and fish farms.

Efficacy and specs:

1. Reduction of hydrodynamic resistance under simulated cruising conditions by at least 7% in the unfouled state, and by 22% in the fouled state, compared to commercial antifouling paints.

2. Dramatic reduction of static accumulation of underwater bacterial colonies.

3. Photocatalytic activity: Reduction of methylene blue concentration by more than 70%, under UV radiation.

4. Over 30% increase of tensile strength normal to the coating' surface.

5. Electrical anisotropy: recorded difference in conductivity normal to and parallel to the coating's surface of at least 50%.

6. Reduction of algae growth rate in the presence of sodium phosphate nutrients.

*1. "Microstructure and Performance of Antibiofouling Coatings on High-Strength Steel Substrates Immersed in the Marine Environment", P. Falara, N.D. Papadopoulos and P. Vourna, ***Micro***, 2022.
2. "Morphology and Magnetic Properties of Rapidly Quenched Fe-B Alloys", N. Konstantinidis, A. Fos, P. Svec, N.D. Papadopoulos, P. Vourna, E. Hristoforou, ***Journal of Magnetism and Magnetic Materials*** (accepted article)
3. "A versatile approach towards development of robust transparent antisoiling coatings with antimicrobial activity for various substrates", N.D. Papadopoulos et.al., Submitted to ***Athens Conference on Advances in Chemistry***, 2022.
4. "Evaluation of Bauschinger effect in naval steels by magnetic permeability and Barkhausen noise measurements", P.Vourna et.al., submitted to ***Magnetism***, 2022.
5. "Low drag antifouling coatings with enhanced protection against corrosion", P. Vourna, P. Falara and N.D. Papadopoulos, Submitted to ***ACAC***, 2022.