

LIFE 15 ENV/IT/000417 PAINT-IT



Final noticeboard

A new environment-friendly manufacturing approach for marine antifouling coating

01/10/2016 -31/10/2021



BUDGET INFO: Total amount: 5.712.506 EUR

Project co-funded by the European Commission within the LIFE + Programme (2014-2020) LIFE – PAINT-IT ENV/IT/00417 (EU Co-funding on eligible costs: 59.96%)

TECHNOLOGICAL RESULTS/ ENVIRONMENTAL BENEFITS

- 1 Total absence of biocides like copper compounds, thus total reduction of their release into the environment (of any type and class), particularly the reduction of copper release after 5 years from the end of the project was calculated considering initial average release in EU seas from traditional antifouling paints of 5000 tons/year. Assuming a market penetration of 20% after 5 years, the copper release is reduced by the same rate with our ecological paint.
- 2 No toxicity demonstrated by laboratory toxicological analyzes (due to the possible release of components and/or by-products).
- 3 Total absence of fluorinated compounds, other highly toxic components, and hazardous solvents in the formulation, therefore absence of release of these compounds into the environment.
- 4 Reduction of 10% (within the expected 5 ± 20% range) in fuel consumption and corresponding CO₂ emissions (calculated on the project baseline, i.e. of an 88-foot boat with traditional antifouling paint having an average fuel consumption of 648 l/h, and assuming a CO₂ production of 3.188 kg per liter of fuel consumed).
- 5 Reduction in GHG emissions (CO₂ eq and SO₂/SO_x) compared to the use of a traditional antifouling; reduction of 9.4% for global warming GWP100 indicator and 9.5% for Acidification indicator.
- 6 Reduction of waste production linked to the possible reduction of hull maintenance activities and reduction of the frequency of maintenance cycles.
- 7 Reduction of highly toxic residuals from the waste originated from scrubbing of the solid coating from a hull.
- 8 Mechanical strength of the coating linked to the composition of the polyurethane matrix combined with the silicone component.
- 9 Simple industrial processability formulation, with a low-risk process.

TRL: 5

Validation in laboratory scale



PDMS-POLYESTER/ AMPHIPHILIC PU coating

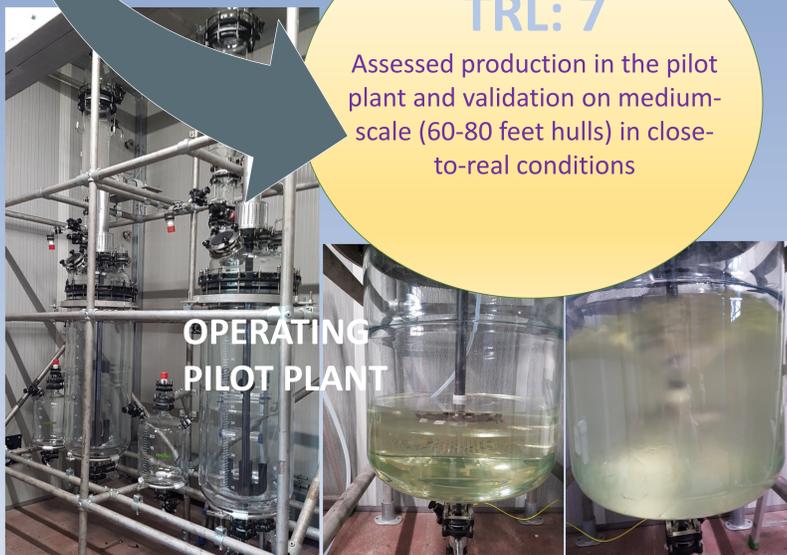
TRL: 6

Comparative validation on reduced scale (small hulls) in close-to real conditions and in controlled way: one selected Paint-it varnish, and one commercial antifouling varnish based on biocides were tested

Technology Readiness Levels

TRL: 7

Assessed production in the pilot plant and validation on medium-scale (60-80 feet hulls) in close-to-real conditions



OPERATING PILOT PLANT

Results of applied formulations suggest a wide range of customizable solutions... Towards a high replication potential!

REPLICATION POTENTIAL & SOCIO-ECONOMIC IMPACT

SWOT ANALYSIS

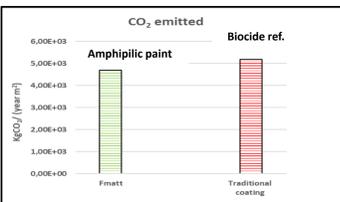
Strengths: among the major strengths of the Paint.it product are a) it does not release Biocides and therefore avoid the discharge of toxic substances, b) CO₂ savings c) Reduction of SO₂ emissions. Furthermore, the low toxicity of the organic components is a further strength compared to the closest competitor product.

Weaknesses: at the current stage of development, only one product is available and not a range and this limits the offer; furthermore, there are no comparative tests for each of the competing products on the market; finally, the product was only tested on a pilot scale.

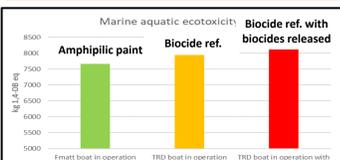
Opportunities: the product follows the EU recommendations for limiting the use of biocides: unfortunately, however, the limitation on the use of biocides exists only for Tin-based compounds. However, it is thought that in the following years the issue will be increasingly felt and having a low toxicity product represents an advantage.

Threats: the threats are represented on the one hand by new emerging technologies and on the other by the possible lack of possibility of free commercialization in case the current producers had patented a similar product. In addition, the player who is going to sell is confronted with giants in the sector for many years.

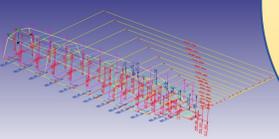
Direct CO₂ emission saving during navigation (from towing tests)



Marine Aquatic indicator from LCA



Design for 4667-1 DTMB model scale boat



Traditional coating (with biocides)



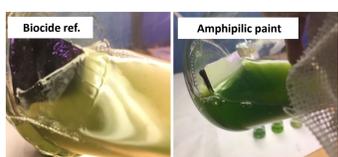
Experimental coating

TOWING TESTS on Iseo Lake (BS, Italy) - 2020 Campaigns



Application on AB 77S and AB V40 YACHTS hulls and tests in open sea

Life Cycle Assessment & ENVIRONMENTAL ANALYSIS



ECOTOCITY TEST with Chlamydomonas reinhardtii wild ALGA

