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Innovative and sustainable materials for naval applications through national cooperative research: the experience of the THALASSA project

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THALASSA is a large research project, developed in the field of the naval structures. It aimed at studying innovative solutions of significant impact in increasing environmental sustainability through a weight reduction, a careful production planning and a circular approach to the entire life cycle of the parts, from design to the disposal/recycle/reuse. The project is led by NAVTEC Technological District and it is composed of a large team counting more than 300 researchers of several centres among which the CNR institutes, the Universities of Messina, Palermo, Catania, Roma "La Sapienza", and Udine. Innovative solutions for industrial processes of greatest interest for some major national shipbuilding operators such as Azimut Benetti and Fincantieri or for shipowner such as Caronte&Tourits have been investigated, and players such as ATRIA paint factory have been assisted in the formulation of innovative coatings.

The presence of NAVTEC District has allowed to concentrate the field of action on themes of strong industrial interest and at the same time to widen the research action on a number of different topics with a view on the entire product life cycle. The district allowed to network skills, laboratories and resources that individually would not have led to carry out activities on such a high number of variables, in terms of materials and joint types. Several issues have been addressed, by identifying solutions thanks to skills of the industrial players, such as: joining technologies (i.e. etching / texturing laser, clinching, self piercing riveting, co-curing, bonding, friction stir welding); eco and bio-sustainable composite reinforced by natural (i.e. vegetable or mineral) and hybrid fibres; degree of recoverability of traditional or bio-resins; corrosion of conventional metal structures and processes for increasing the useful life; and innovative coatings that are combined with the functional protection needs of the structures.

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