

Lecco Innovation Hub: a research structure that supports innovation

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with companies such as Prometeo, Sessa Marine, Azimut Benetti, Damen, DB Marine, Nautivela, Ferretti Group, PowerPlast, Tack Sistem and Barbalab thus confirming its close relationship with companies and the national production reality. Examples are the analysis of smoke back wash based on on board ergonomics and their reingestion in the HVAC plants of Benetti megayachts, the control of chemical risk exposure factors during production processes in Sessa Marine establishments, and the evaluation of the possibility of inserting bio composite

The challenge launched in 2010 by the Milan Polytechnic after winning the Fondazione Cariplo Emblematico maggiore competition led to the creation of an important territorial applied research pole that includes SMaRT lab (Sostenibile Marine Research and Technology Laboratory) concentrating on experimentation in yachting and composite materials and the Laboratory Boat, a 10 m sailing craft with special instrumentation for acquiring data on the behaviour of the boat and its equipment under way. The project, which stems from collaboration between the Mechanical Engineering and Design departments of the Milan Polytechnic, thanks to the contribution of Fondazione Cariplo and Univerlecco, is a node in the national and international research network on subjects relating to yachting and the development of composite materials. The initiative, thanks to interaction with institutions and category associations, is part of the collaborative actions designed to relaunch the economy in the territory with the aim of favouring technological transfer to and from the yachting sector, and the contamination between different professions and production approaches; hence the name “Lecco Innovation Hub”.

The laboratory

The laboratory, at the inauguration of the spaces dedicated to it, presented to companies and local institutions both its instruments and equipment and the teaching and research activities carried out in the past four years. There are two principal areas of intervention in which Lecco Innovation Hub operates: design, ergonomics and equipment for yachting and product and process innovation for innovative composite materials. The many research projects developed thanks to the contribution of the departments of Design and Mechanics of the Milan Polytechnic are the result of collaboration

materials in yacht production with Prometeo. Thanks to its use of specific equipment such as a numerically controlled five axis milling machine, an oleodynamic heated press, a composites chamber with an RTM injection machine and equipment for infusion processes, a gelcoater, a mixer for silicon membranes and a paste extruder for modelling, SMaRT lab is a true centre of innovation that supports applied research and technology transfer to companies in the territory and outside that operate in the composites sector. Completing the laboratories equipment is a biaxial traction machine for mechanical tests on samples of laminates or membranes. Like the equipment it has at its disposal, software applications used and available, both for training and professional refresher courses and for supporting research, are the result of collaboration with the companies taking part in the initiative: Delcam Power Mill for the optimised generation of tool paths for CNC mills in producing models and moulds, Design-concept by Lectra for the flat development of surfaces and nesting of fabric cutting outlines, Poly-Worx for the fluid dynamic simulation of RTM infusion and injection processes. The entire process cycle of composite materials, both for the yachting sector and related areas, can thus be supported by basic research and process activities for third parties for the development of tools for managing the phases of product and process engineering and innovation, from the creation of production tools to the control of time and methods. Synergy with the other laboratories and departments of the Milan Polytechnic has also permitted the construction of innovative prototypes, such as the single seater PRC Formula SAE of the Dynamis Polimi racing Department, the polyfoiler boats Scarliga Merlùss and Crapabusa of the Master in Yacht Design and the frame of the Malacoda bicycle developed as part of the FARB project of the Design Department, which underline the importance of this research centre in the international panorama of applied research for technology transfer to and from different production sectors.