

## Mouldless Production of Modular, Recyclable Hulls for Small Series

**Sector:** Other - Circular blue economy / Marine manufacturing & shipbuilding

### Short description of the needs:

Carvelab aims to develop a circular design-to-production workflow for small/medium boat hulls and marine components, based on modular architecture and recyclable materials. Today, low-volume shipbuilding relies on expensive moulds and fragmented processes, leading to long lead times, high waste, and limited repairability.

The project needs: (i) material qualification for marine exposure (UV, salt water, fatigue), (ii) structural validation (FEM + testing) of modular hull sections and joints, (iii) design-for-disassembly interfaces and repairability strategies, (iv) an end-of-life recycling/remanufacturing pathway, and (v) definition of circular KPIs and a realistic route toward standards/certification.

We seek Adriatic partners (shipyards, material suppliers, recyclers, labs, end-users) to co-design demonstrators, run pilots and validate the solution in real operational contexts.

The project targets mouldless, modular hull modules suitable for small-series production and circular lifecycle management (repair, disassembly, take-back, recycling). Collaboration opportunities include: co-development of recyclable thermoplastic composite recipes and process parameters; marine durability testing; integration of circular design rules and LCA; and pilot demonstrators with Adriatic shipyards and end-users.

CarveLab S.r.l. is an innovative startup developing advanced manufacturing solutions for the marine sector. The enabling platform is CarveHUB: a robotic hybrid additive-subtractive system integrating pellet extrusion (including recycled polymers), fibre reinforcement options, in-line 3D scanning and closed-loop toolpath correction, enabling printing, machining and quality checks in a single setup. CarveLab develops proprietary hybrid manufacturing technology (hardware + software) and delivers end-to-end design-for-circularity and production services (pilot builds, prototyping, small series and repair/remanufacturing) for marine OEMs and shipyards, enabled by in-line metrology and closed-loop process control.

**More info:** For more information apply to [d.francia@unibo.it](mailto:d.francia@unibo.it)

**Company:** CarveLab S.r.l.

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**Point of contact for the brief/challenge:** Unibo

**Company position in the value chain:** Technology Developer + Tier 1 Advanced  
Manufacturing Service Provider (OEM/Tier 1).