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esTENDER

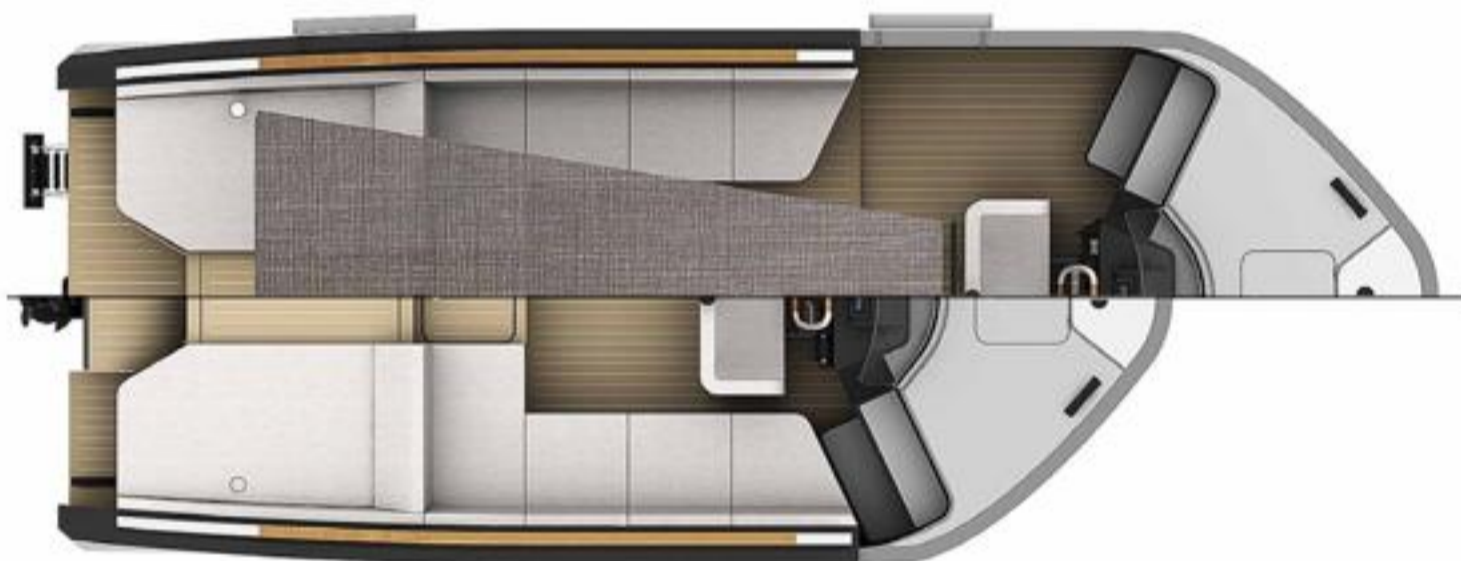
Giacomo Gori

esTENDER is an original auxiliary boat with variable geometry which, through a telescopic mechanism, offers generous dimensions when underway but is compact when stowed.

esTENDER comes from an idea by engineer Emanuele Bresciani on how to respond to two contrasting requirements of yacht design: reducing the volume for stowing tenders and not penalising cabins while having tenders of large dimensions to allow owners to accommodate their guests in comfort. It must also be considered that the size of the garage considerably influences the exterior lines of the yacht and often the exploitability of exterior spaces is heavily conditioned by this indispensable volume.

The concept

In recent years, various strategies have been proposed for reducing spaces for stowing tenders. Some have suggested recovering volumes below the garage floor (for example installing there infrequently used machinery); others, for inflatable tenders, suggested partly deflating the tubes (an operation that is neither rapid nor simple, especially considering the daily usage of tenders). Recently an Italian company proposed a system for compacting



General plan of esTENDER. The two possible configurations, extended and compact, permit a reduction in length of more than 1.5 m (LOA respectively of 7.33 m and 5.80 m). In the extended configuration views the rapid hooking/unhooking system with two flat fenders on each side is visible. (Bresciani and PGYD Archive)

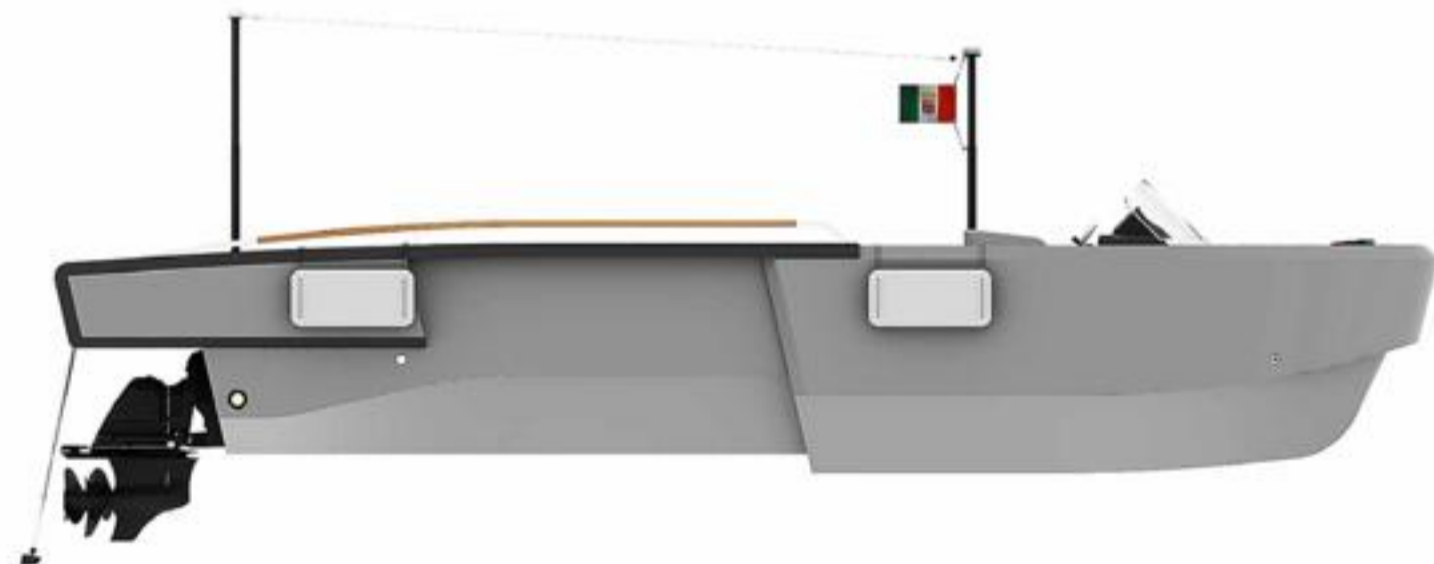
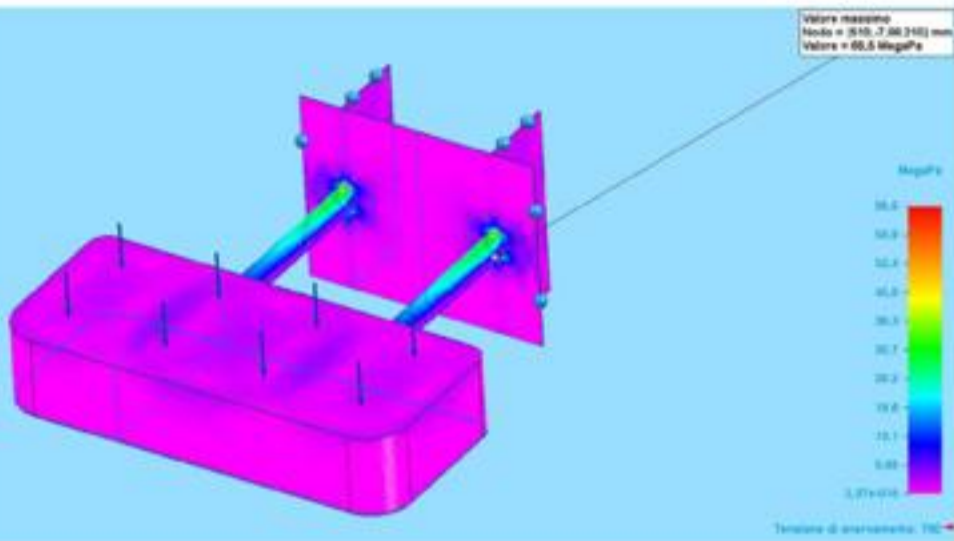




Fig. 2: Perspective view in longitudinal section with the telescopic rack mechanism that makes it possible to lengthen or shorten the boat (Bresciani and PGYD Archive)



FEM study. The suspended pilot seat allows the after deck to slide underneath when esTENDER is shortened. (Bresciani Archive)

the tender, but because the mechanism was particularly complex, costly and difficult to handle the system did not catch on. “esTENDER uses a rack and pinion method that permits reciprocal movement between the after and fore parts,” says Bresciani enthusiastically. “This linear mechanism makes it possible to compact the hull along the longitudinal axis, reducing the length by about 153 cm.” Watertightness is guaranteed by three rows of hydraulic seals located inside the step. “The maintenance programme,” says Bresciani, “is to substitute them every five years using an extra 100 mm length of rack that uncovers all three of them.” The system has been registered and patented by Bresciani as a “Mechanism for extending/compacting boats”.

The bottom: perfect integration between engineering aspects and hull geometry

The larger transverse section of the fore part compared with the after part has the beneficial effect of creating in a natural way a step in the bottom. This redan, at high speeds, creates a strong local depression that sucks in air: the water thus “detaches” from the hull and reduces resistance to forward movement.

The stepped hull geometry has been optimised using CFD studies to improve performance, consumption and seakeeping qualities generally. Thinking also of the use for which esTENDER is destined CFD was used, together with an in-depth study on weight distribution, also to optimise trim and guarantee reduced spray on board to maximise comfort for passengers, perhaps already dressed for an evening out, during trips. To protect the hull when alongside the mother vessel a rapid hooking/unhooking system has been designed with four flat fenders, two on each side.



The esTENDER team: Federico Calistri next to the control panel of a numerically controlled milling machine, Emanuele Bresciani in the centre and Paolo Giordano on the right. (Bresciani Archive)

Highly sustainable build technology

The construction material chosen was Ti6Al4V titanium alloy. This alloy is well known in the aeronautical field for its mechanical characteristics that combine strength and lightness. As well as offering undoubted aesthetic value, this material guarantees a high intrinsic level of sustainability.

Titanium is a metal that is not aggressive for the environment and, unlike other materials used to make many tenders currently on the market, can be recycled. “The extraordinary corrosion resistance of the alloy and the lack of need for sacrificial anodes for cathodic protection are other advantages,” says Bresciani. “The hull in titanium alloy has no need for painting cycles or antifouling paint with obvious advantages for maintenance costs as well as the environment.”

Design of esTENDER

The exterior, designed by Paolo Giordano, has a sunbathing area astern, two facing L-shaped seats amidships and the pilot’s seat forward. The whole deck is clad in teak (synthetic or natural, as

The esTENDER team

Emanuele Bresciani created the concept and handled engineering of the project (bottom, systems, mechanisms etc). Bresciani is an aerospace engineer. He began his career in the design office of the Sanlorenzo yard as project engineer and 10 years later became technical manager of the Dynamiq yard. Later he became technical manager at Calistri Giacinto SNC and then project manager with the Persico Marine yard. He is currently on the staff of the Benetti yard in the new projects department and is following a degree course in nautical engineering at the La Spezia University Pole: the esTENDER project was initially developed for a thesis during this course.

Paolo Giordano handled the overall design and the ergonomics of the deck.

Giordano began his training in the Pescara architecture faculty. Frequently on the sea as a skipper and racing crew member, he designed and produced his first boat even before finishing his university studies. After graduating he moved to La Spezia in Liguria where he gained a specialist degree in Yacht Design at the Polo Marconi. He works with the Vismara yard in Viareggio, as a designer of sailing and motor yachts. In 2012 he

founded the PGYD studio in Viareggio to develop and promote new ideas in design, seeking to cultivate "out-of-the-box" thinking.

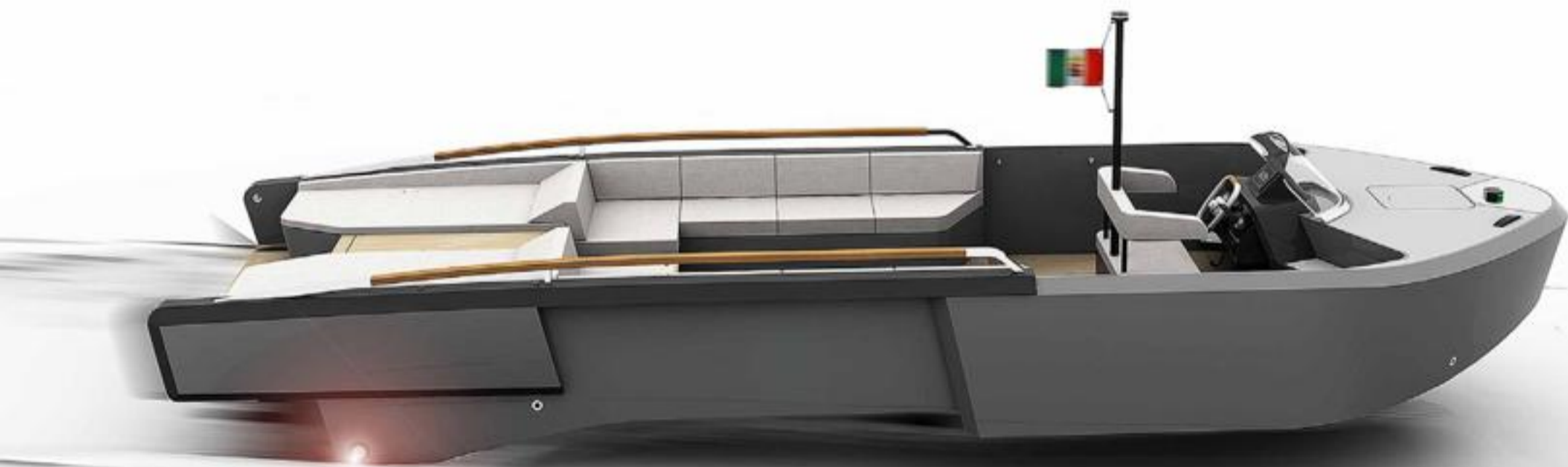
Calistri Giacinto SNC is a partner in the operation for boat construction material.

Handling the esTENDER project for the yard is Federico Calistri. The company was founded in 1950 by Giacinto Calistri to produce systems for the mechanical textiles industry. His sons, Claudio, Sauro and Roberto, broadened the company's activities working for third parties in the railway

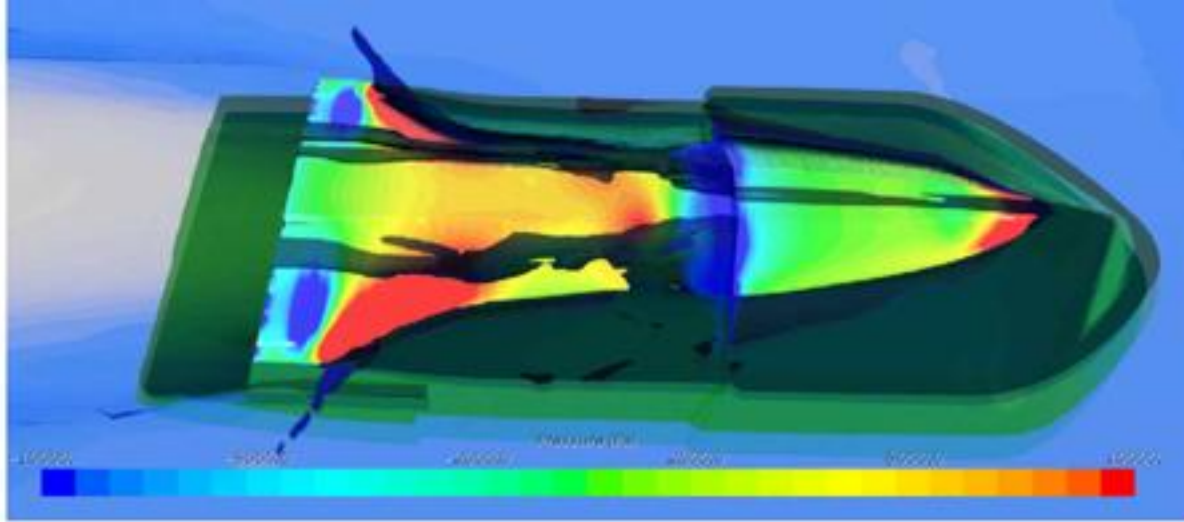
sector for the Ansaldo-Breda group, now Hitachi. With the third generation, consisting of Federico and Paolo, the company entered the yachting sector, initially producing small components and later designing and manufacturing complex products. Today the company has its headquarters in a large industrial area in the province of Pistoia, in a building of more than 1000 m². The Calistri team is made up of 24 people in the various departments. Constant updating of numerically controlled machines and the level of specialisation of the staff allow the company to produce custom products of very high quality.

esTENDER specifics:

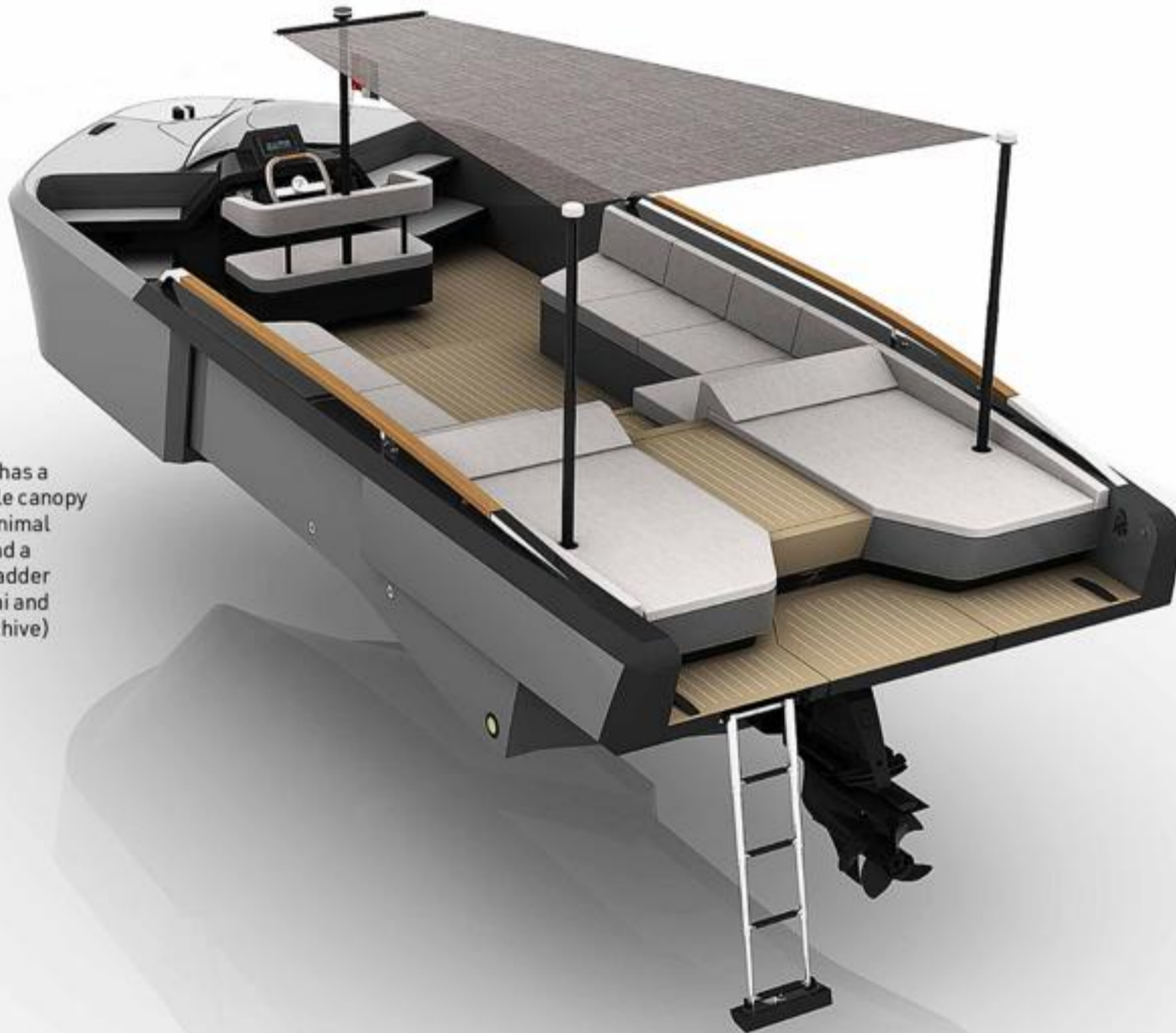
LOA:	7.33 m (extended) / 5.80 m (stowed)
BOA:	2.85 m
HOA:	1.55 m
Dry displacement:	1,800 kg
Material:	Titanium alloy
Propulsion type / Max power allowed / Max speed:	Sterndrive / 164 kW / 30 kts
Fuel type / Fuel tank:	Diesel / 144 L
Guest capacity:	9 pax
Lifting points:	4
CE certification:	C



The boat on a plane.
(Bresciani and PGYD
Archive)



CFD study of the hull. Where the section of the hull changes (telescopic mechanism) the step creates the effect of a redan with a deep local depression (blue area) that sucks in air: the water thus detaches from the bottom and reduces resistance to forward motion. (CFD E. Bresciani)



The boat has a removable canopy with a minimal design and a bathing ladder (Bresciani and PGYD Archive)

the owner wishes). The helm dashboard includes a 9 inch chart plotter that also includes signals from the propulsion system, a multifunction instrument, a VHF, a sound control instrument and obviously the wheel and throttle. The engine room houses the 72 L fresh water tank that feeds the shower integrated in the side at the stern. The sunshade is mounted on telescopic rods. The stern bathing ladder is retractable and can be housed in the stern platform. There are also a pair of underwater lights at the stern and a pair of speakers.

Propulsion system

The boat uses a Volvo Penta D3 DPS inboard/outboard engine with counterrotating duoprop propellers and its own starter bat-

tery. This solution gives a top speed of 30 kn which, with a 144 L diesel tank, gives a range of 120 nautical miles or, at a maximum range speed of 15 kn, 220 nautical miles. For passenger comfort a soundproofing study was carried out to define the installation package. The safety of the boat is ensured by a firefighting system in the engine room and three watertight internal compartments (engine room, central section, forward locker), each with a semiautomatic bilge. Says Bresciani: "I would like to thank, for their help and support in drawing up the project, Marco Ferrando, Giacomo Gori and Diego Villa of the Genoa Università degli Studi / Polo Marconi in La Spezia, Alex Bergamini of MAP, Armando Villa of Be Positive, Luigi Laura of Osculati and the companies Bertacchi e Filippi, Marinefire, Raymarine and Volvo Penta".