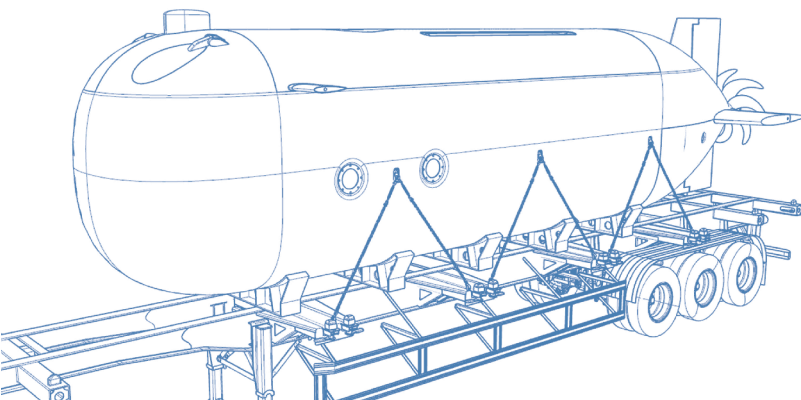


## DATUM MULTI PURPOSE MINI SUBMARINE



### THE PROJECT TO DEVELOP A MULTIPURPOSE MINI SUBMARINE (or Çok Amaçlı Mini Denizaltı – ÇAMD)

is being carried out by Sefine Shipyard and Datum Submarine Engineering Inc, a subsidiary of Istanbul Technical University. Within the scope of the project, the design, construction, equipping and testing of a multi-purpose mini submarine that can dive to a depth of 300 meters, has a crew of four and can be easily transported by land thanks to its length of 12 meters will be carried out. With ÇAMD, Türkiye will contribute to some extent to the accumulation of knowledge and development for all submarine design/production/integration processes. In this context, the ÇAMD development R&D Project to be delivered has three main objectives;

Enabling the theoretical studies of commercial/military submarine design and verification/improvement activities to be applied on a vehicle that can be manufactured and tested in a short time

Providing Türk Loydu with experience in submarine plan approval, material certification and classification activities for national military submarine projects,



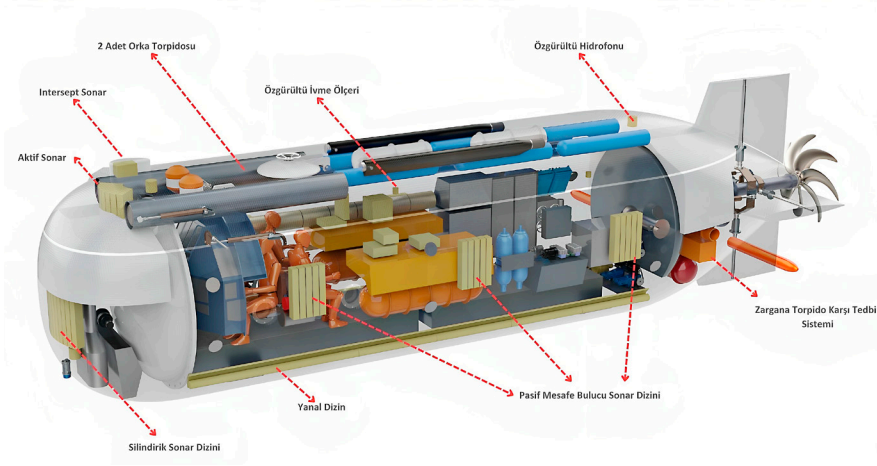
Bringing the systems developed by Turkish defence industry companies for submarines into inventory as a platform that can be integrated for testing purposes or as a test aid in its entirety.

The detailed design phase of ÇAMD, which has already gone through the requirements, preliminary design and critical design activities, was completed in October 2023. This is the first time Türk Loydu has carried out plan approval for an indigenous submarine design.

The configuration of ÇAMD includes a seven-blade submarine propeller and hydraulically controlled steering gear arranged in a plus shape. The submarine is equipped with main diving, trim and tuning cistern systems and associated pumps and compressed air circuits. There is a specially

designed electrical and control system and type approved control systems connected to this system, as well as pressure, various gas, level and fire systems, especially sensor groups. The navigation of the mini-submarine, which has forward-looking sonar, altimeter and radar

systems, is ensured by a special inertial navigation system with integrated GPS on the surface and Doppler speedometer underwater. ÇAMD has two collapsible masts with antennas for various communication and navigation systems and an electro-optical camera with a 360-degree view. There are emergency rescue systems, a life buoy and an anchor winch.



Within the scope of the project, a water-cooled electric motor, which will also be used in manned/unmanned submarine studies to be developed indigenously in Turkey, was developed indigenously and nationally by Femsan DC motor factory and certified by Türk Loydu. Preliminary studies have been carried out for the integration of submarine sonars developed by Aselsan, light torpedoes developed by Roketsan and hydrogen fuel cell developed by Aspilsan into the Multi-Purpose Mini Submarine.

Before the fabrication of the 2 m diameter and 8 m long pressure hull of the Mini Submarine, a 2 m long and 1.5 m diameter strong hull test piece was fabricated under the control of Türk Loydu surveyors, where the production

methods on the ÇAMD were tested. The test piece, which was completed in July 2023, was lowered to a depth of 400 m off the Island of Democracy and Freedom and completed the test. During the test, flanges, fairings, portholes, cable connectors and various sensors of the mini submarine were also tested.

As a result of the successful performance of the strength hull test piece test, the production of the strength hull of the ÇAMD has started and the production of the strength hull has been completed in October 2023. On the other hand, the tank systems and compressed air systems of the ÇAMD are being manufactured. The Harbour Acceptance Tests (HAT) is projected to start in the end of 2024.

## GENERAL SPECIFICATIONS (\*)

\*: A tailor made design for Navy's requirements are possible

<b>Length (L<sub>OA</sub>)</b>	12 m	<b>Max Speed</b>	10 knot
<b>Beam (B)</b>	2.3 m	<b>Range</b>	100 nm (battery)
<b>Height (D)</b>	2.9 m	<b>Crew</b>	2 operator + 2 Personel
<b>Displacement (▽)</b>	36 tonnes	<b>Communications</b>	VHF, Underwater Audio
<b>Diving Depth</b>	300m	<b>Navigation</b>	GNSS (Surface) INS+DVL (Underwater)
<b>Operation Speed</b>	4 knot	<b>Propulsion</b>	22kW electric motor GEL Batteries