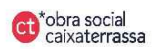


Ictineu 3

ICTINEU 3 Project



ICTINEU Submarins S.L.



C/ Llacuna 162
08018 Barcelona (SPAIN)
+34 934 019 719 www.ictineu.net

Ictineu
SUBMARINS

ICTINEU 3 is the first project of Ictineu Submarins SL. The objective of this enterprise project is to build and operate a modern and highly competitive manned submersible, suited for a wide range of tasks such as scientific works, oceanography, archaeology, underwater maintenance tasks, knowledge spreading on marine environment, and even to provide personalized diving to a touristic sector looking for innovative alternatives.

ICTINEU 3 is conceived as a modern submersible which incorporates innovative materials, efficient and environmentally friendly power systems, manipulators, intelligent management and control systems and the most advanced technologies in security, positioning, navigation, communication, sensing and data logging. It will be an extremely versatile tool conceived to be transformed and modified as newer technological solutions become available.

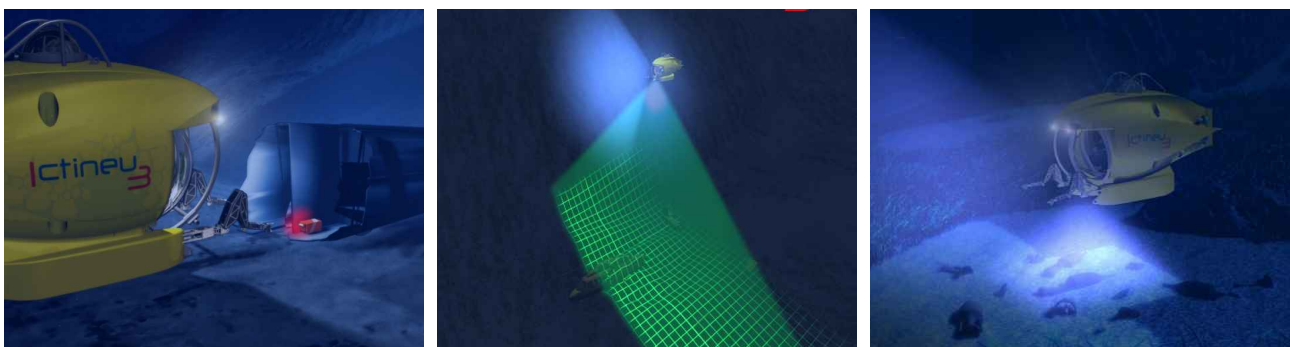
It will dive down to 1200 meters and host a crew of up to three people in missions of several hours long, making it one amongst the 10 deepest submersibles in the world. At the front, a big methacrylate viewport will provide the crew with an exceptionally wide field of view, excellent for high quality photography and video capturing. A submersible which will play a central role in any work to be imagined under-seas.

In order to enhance ICTINEU 3 capabilities, a support ship will be also constructed. This ship is conceived as a 20 m long catamaran with the main purpose to transport the submersible on surface to the mission site and to assist it in all the necessary aspects during the whole campaign: communications, security, positioning, crew assistance, catering and accommodation. It will host as well a workshop and a small laboratory for an efficient management of tools and equipment.

The company will undertake self-defined missions and customer-contracted missions. The range of potential customers is very wide and goes from public stakeholders to researchers in the areas of oceanography, biology, geology or archaeology, organizations dedicated to ocean protection, television and audio-visual producers and privates looking for different experiences.

To achieve excellence in security the submersible design and construction process are being certified and classified by Germanischer Lloyd authority.

Our goal is to be positioned in the market as a quality services and innovation company specialized in submersible technology.



Applications of ICTINEU 3: black box recovery, fine scale surveying using multibeam sonar, photomosaic of archaeological site

The state of the art

The project has obtained financial support from several institutions: Centro para el Desarrollo Tecnológico Industrial CDTI (Ministerio de Ciencia e Innovación), agència AccIÓ de la Generalitat de Catalunya, subprograma Torres y Quevedo, Fundación Española para la Ciencia y la Tecnología FECYT (Ministerio de Ciencia e Innovación), Departament de Medi Ambient i Habitatge, Obra social de la Caixa, Caja Navarra, and Caixa Terrassa, and also from private investors.

Support letters have been obtained from following institutions (original names given): Direcció General de Polítiques Ambientals i Sostenibilitat (Departament de Medi Ambient), Direcció General de Patrimoni Cultural i Direcció General de Patrimoni Arqueològic (Departament de Cultura i Mitjans de Comunicació), Instituto Español de Oceanografía IEO (Ministerio de Ciencia e Innovación), Sociedad de Salvamento y Seguridad Marítima (Ministerio de Fomento), Spanish Institute of Navigation INAVE, Autoritat Portuària de Barcelona, Museu Marítim de Barcelona; and technical and logistic support has been received from a wide group of institutions and private collaborators.

Ictineu Submarins SL. is member of the Catalan Technology Society in the Institute of Catalan Studies, and the Catalan Maritime Cluster.

At this moment the high resistance stainless steel hemispheres and the acrylic windows that will integrate the pressure hull are being manufactured, as well as the outer hull. In following months all elements and systems will be assembled.



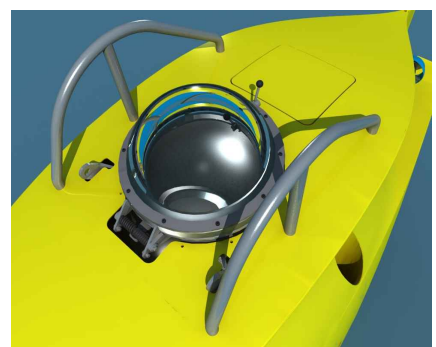
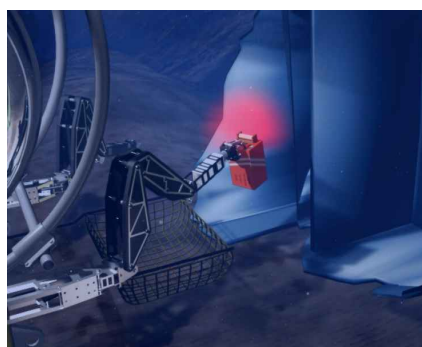
Deep drawing process of one of the hemispheres of the pressure hull



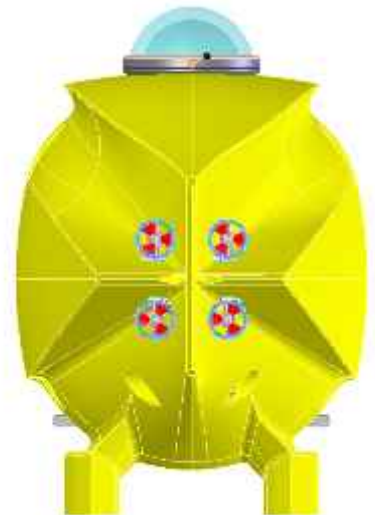
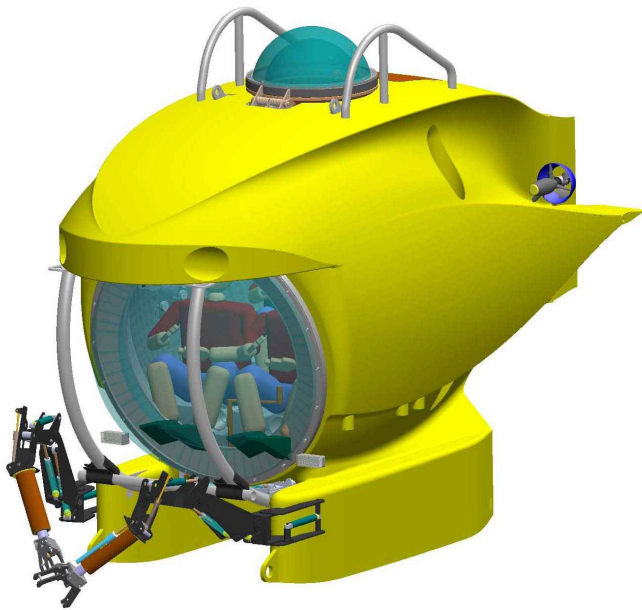
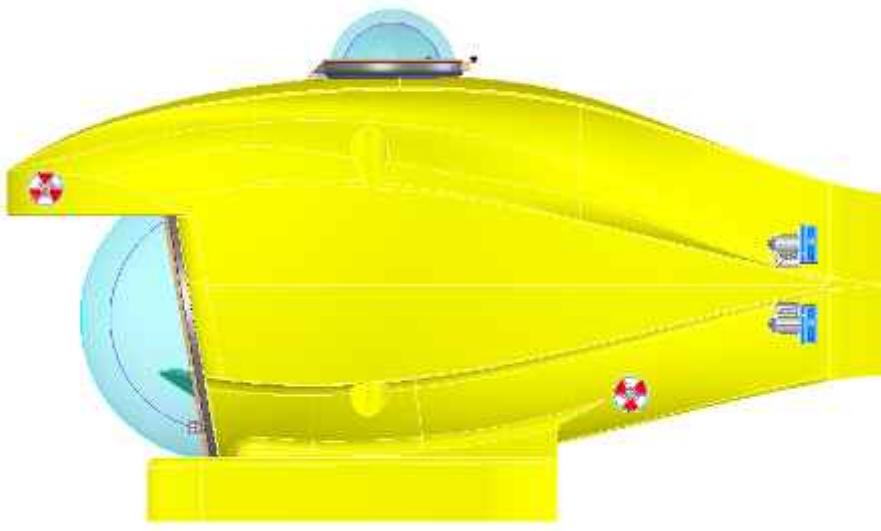
Exterior hull model. 1:1 scale model of the pressure hull. One of the built four stainless steel hemispheres of the pressure hull.

General specifications

General Specifications		Propulsion	
Operating Depth	1200 m	Stern thrusters	4 x 2,2kW, 71Kg
Test Depth	1440 m	Manouvering thrusters	4 x 2,2kW, 71Kg
Collapse Depth	2076 m		
Weight in Air	5000 kg	Batteries	
Lenght	4,8 m	Main Group 120V, 48kWh	Li-Ion 2 x 33 x 200Ah
Beam	1,9 m	24V Group	2 x Li-ION 160Ah 24V
Height	3,0 m	Emergency Group	2 x Li-ION 160Ah 24V
Pressure Hull Diameter	1700 mm	Working Autonomy	10h
Hatch Diameter	540 mm		
Main acrylic window diameter	1200 mm	Trim & drop weight	
Hatch acrylic window diameter	540 mm	Diving Tanks	600 L
Crew	1	Buoyancy tanks	240 L
Passengers	2	Drop weight	500 Kg
Payload	300 kg		
Classification authority	Germanischer Lloyd	Security devices	
		Underwater Telephone	7 miles
Air and Oxygen		Emergency Life Support	9 days
Air	4 x 40L, 700 bar	Jettisonable Weight	500 Kg
Day Oxygen	2 x 7,5L, 200 bar	Buoyancy tanks	240 L
Emergency Oxygen	2 x 40L, 200 bar	Diving Tanks	600 L
		Jettisonable Batteries	290 Kg
Life Support		Emergency Buoy	1800 m long rope
Mission Life Support	40 h/man	Total buoyancy capacity	1580 Kg
Emergency Life Support	213 h/man		
Carbon Dioxide Absorber	M.P. Sofnolime	Equipment	
Atmospheric Control	2 Dräger X-am 7000	Underwater Telephone	Bell 200 Aquacom
		Surface communication	VHF marina
Dynamic Characteristics		Depth sounder	Echo Sounders/Altimeters
Maximum Surface Speed	2,5 Knots	Sonar	Graphical sounder 360°
Maximum Submerged Speed	4,5 Knots	Light	10 x 44W Deepsea LED
Cruising Submerged Speed	1,5 Knots	Flashes	2000W
Autonomy Range	10 miles	Manipulators	2 x 6 Degrees of freedom



3D artist impressions of the ICTINEU 3 submersible.



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Headquarters

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Tel. 934 019 719
Barcelona Activa
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Ictineu Submarins office at Barcelona Activa incubator.

Workshop



Barcelona Royal Shipyards, building from XIV century, site of the Barcelona Maritime Museum.