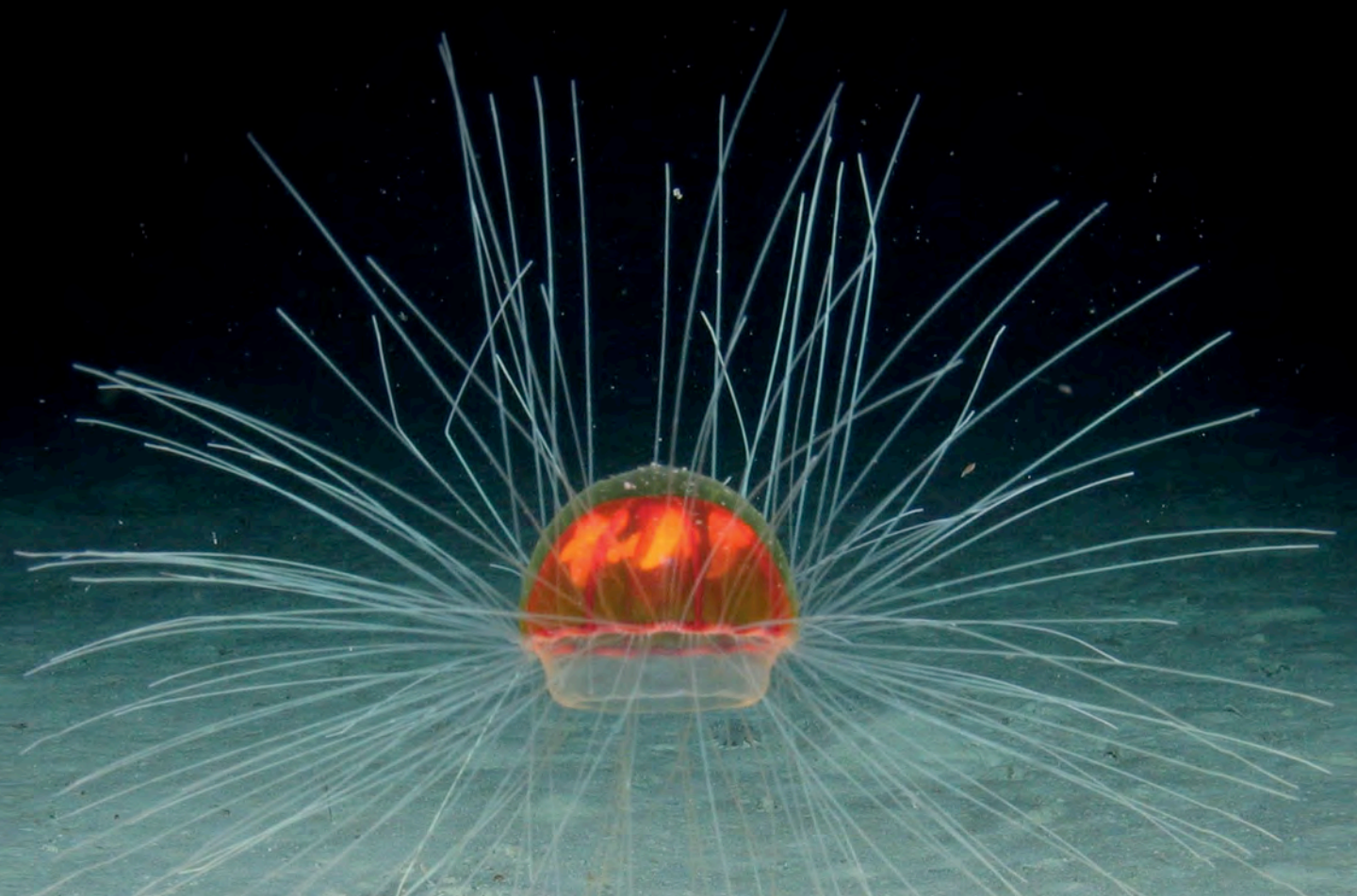


F U L L O C E A N D E P T H

by TRITON SUBMARINES





EXPLORE THE OCEAN. EXPERIENCE TRITON.

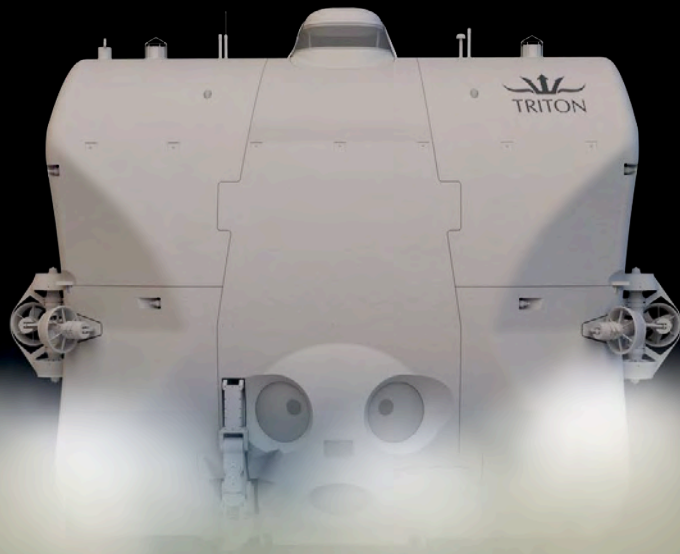
STATE-OF-THE-ART SUBMERSIBLES FOR
SUPERYACHT OWNERS, RESEARCHERS AND EXPLORERS.

FULL OCEAN DEPTH IS NO PLACE FOR COMPROMISE

Triton submersibles are designed, tested and certified to the most rigorous safety standards.

They are built from the finest materials and our clients enjoy after-sales service and technical support from the world's most experienced operations team.

Triton is committed to producing the best deep-diving submersibles on the planet.



TRITON 36000/2

FULL OCEAN DEPTH

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WHY FULL OCEAN DEPTH?

In order to protect our oceans, we must first understand them. We cannot begin to understand our oceans through observation of the relative shallows alone.

The complex interactions to which the singular environment of the ocean plays host - biological, chemical and geological - are affected dramatically by localized factors. The key to understanding their global impact lies in the gathering, interrogation and interpretation of quality, scientific data.

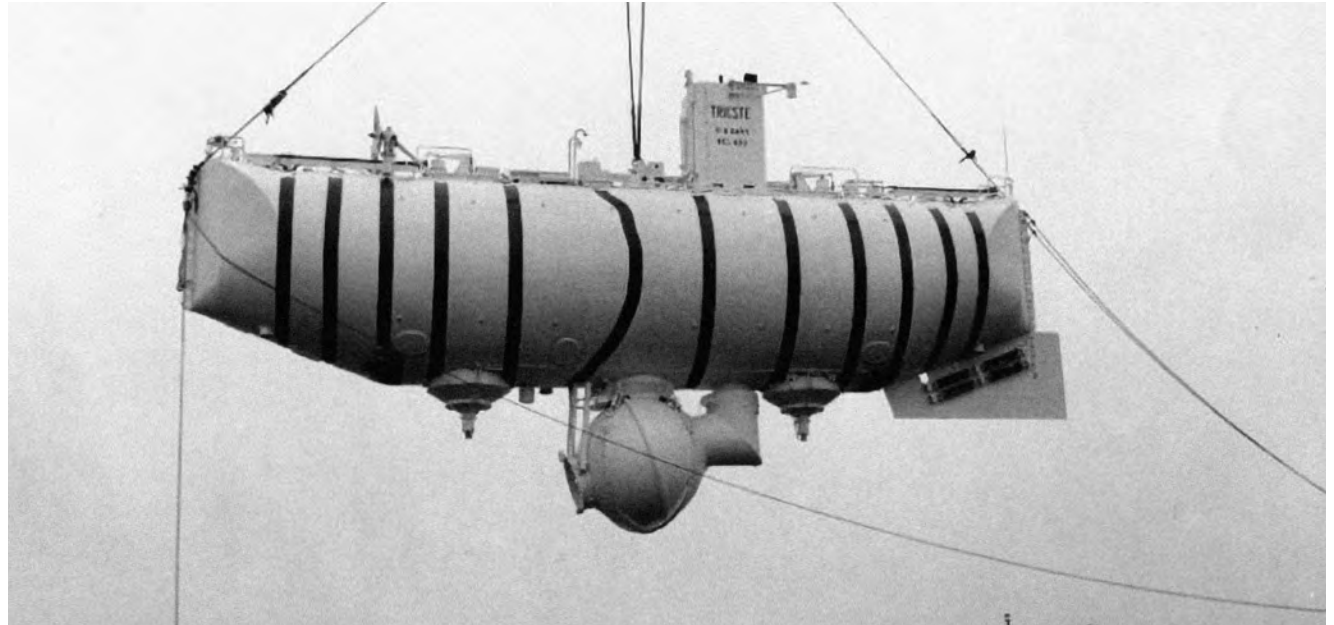
Reliable and repeatable exploration to full ocean depth affords scientists the opportunity to compare rich data-sets spanning the full gradients of depth, temperature, salinity and other factors.

The Triton 36000/2 is the world's first and only manned submersible that is certified to full ocean depth. It opens up to repeatable exploration the 70% of the world's oceans hitherto beyond the reach of mankind.

Equipped with a full science suite and 8K filming capabilities, the Triton 36000/2 has been described as "possibly the most impressive tool for human exploration and scientific endeavor since Apollo 11".



Lieutenant Don Walsh and Jacques Piccard in the Bathyscaphe Trieste



THE CHALLENGE

Only two manned submersibles had previously dived to Challenger Deep in the Mariana Trench - the deepest point on Earth. Both vessels have since been retired having performed a single full ocean depth dive each.

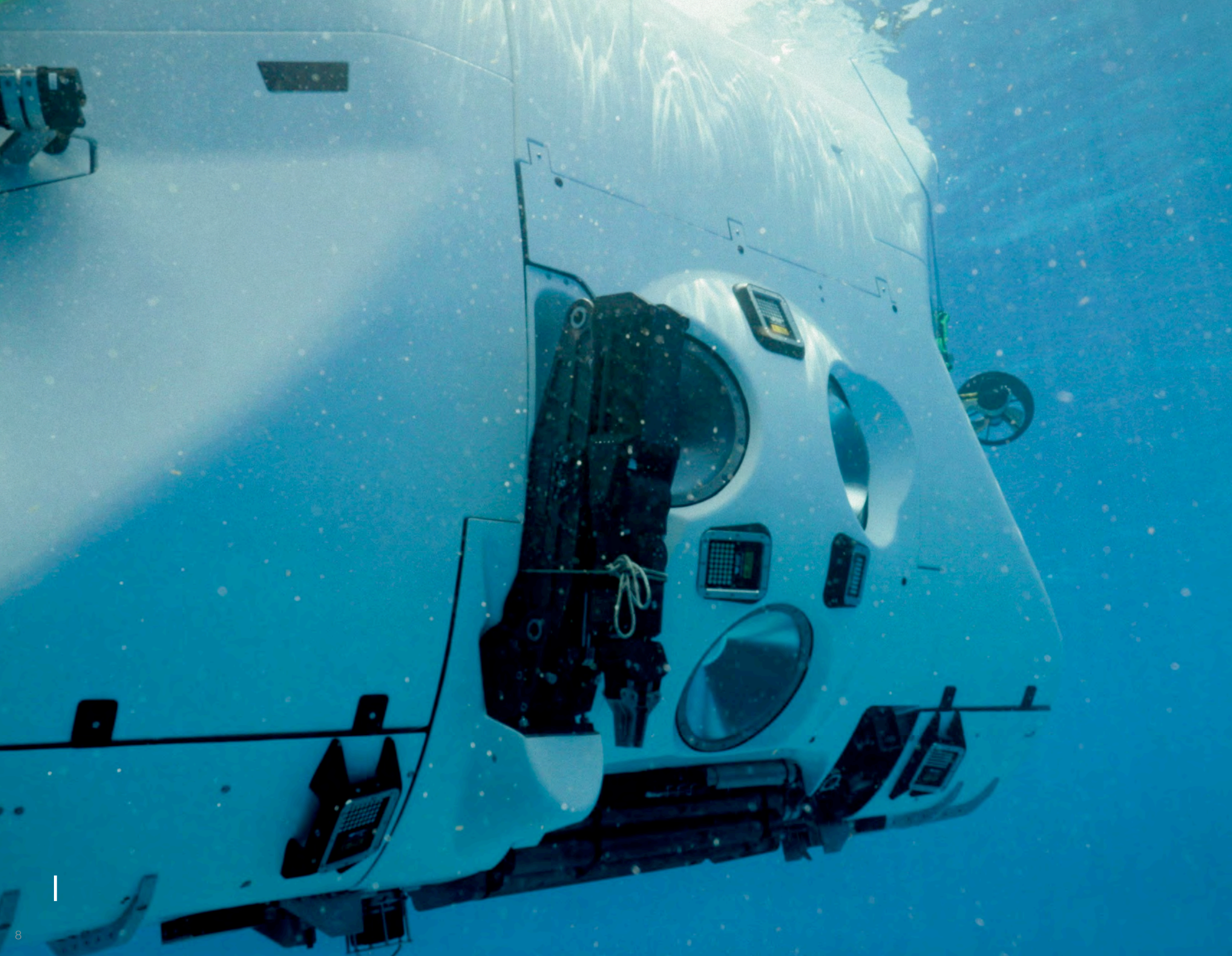
The challenge presented to Triton was to build a craft that would match these fore-bearers for depth, but be able repeat the dive hundreds, if not thousands, of times.

Such a vessel must serve a meaningful purpose; to exist not simply to set records, but to further human understanding through serious scientific research and to inspire a passion for our oceans.

Previous vessels were designed with passenger comfort as a secondary consideration to the engineering which made it possible. Such a Triton must be comfortable on long missions, offer ergonomic operation and carry multiple passengers to share the experience, and workload.

As one of our founding principles - and a feature of every Triton ever built - we would not compromise on having our design and build scrutinized by a third-party Classification Society. No other full ocean depth submersible has ever been certified.

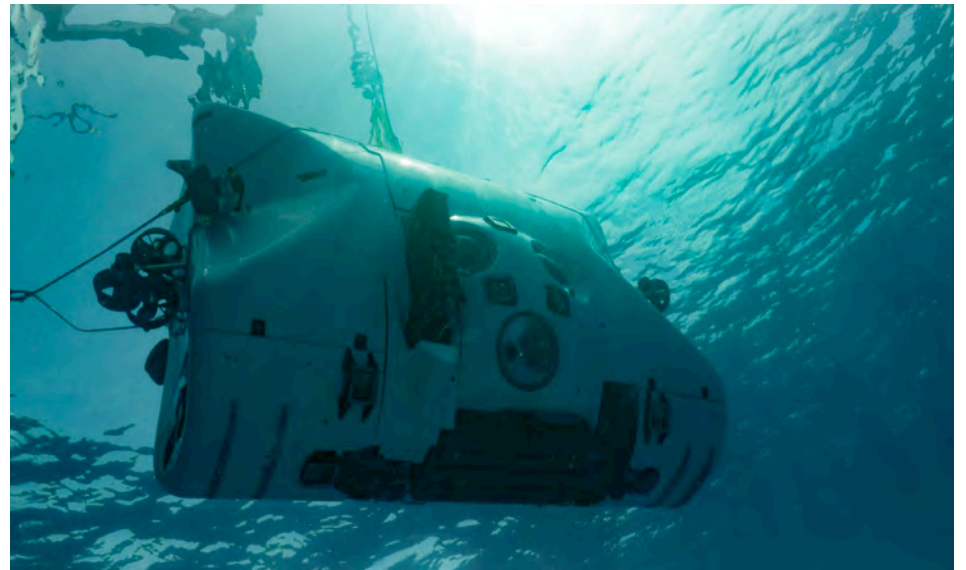
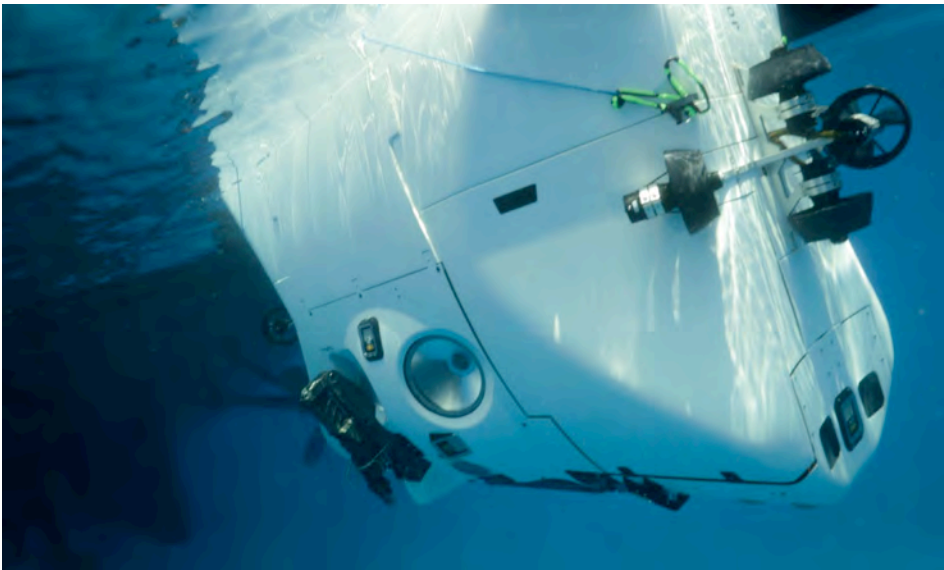
The challenge to create the ultimate, reusable, full ocean depth, certified, meaningful, science platform is one only Triton Submarines could achieve.

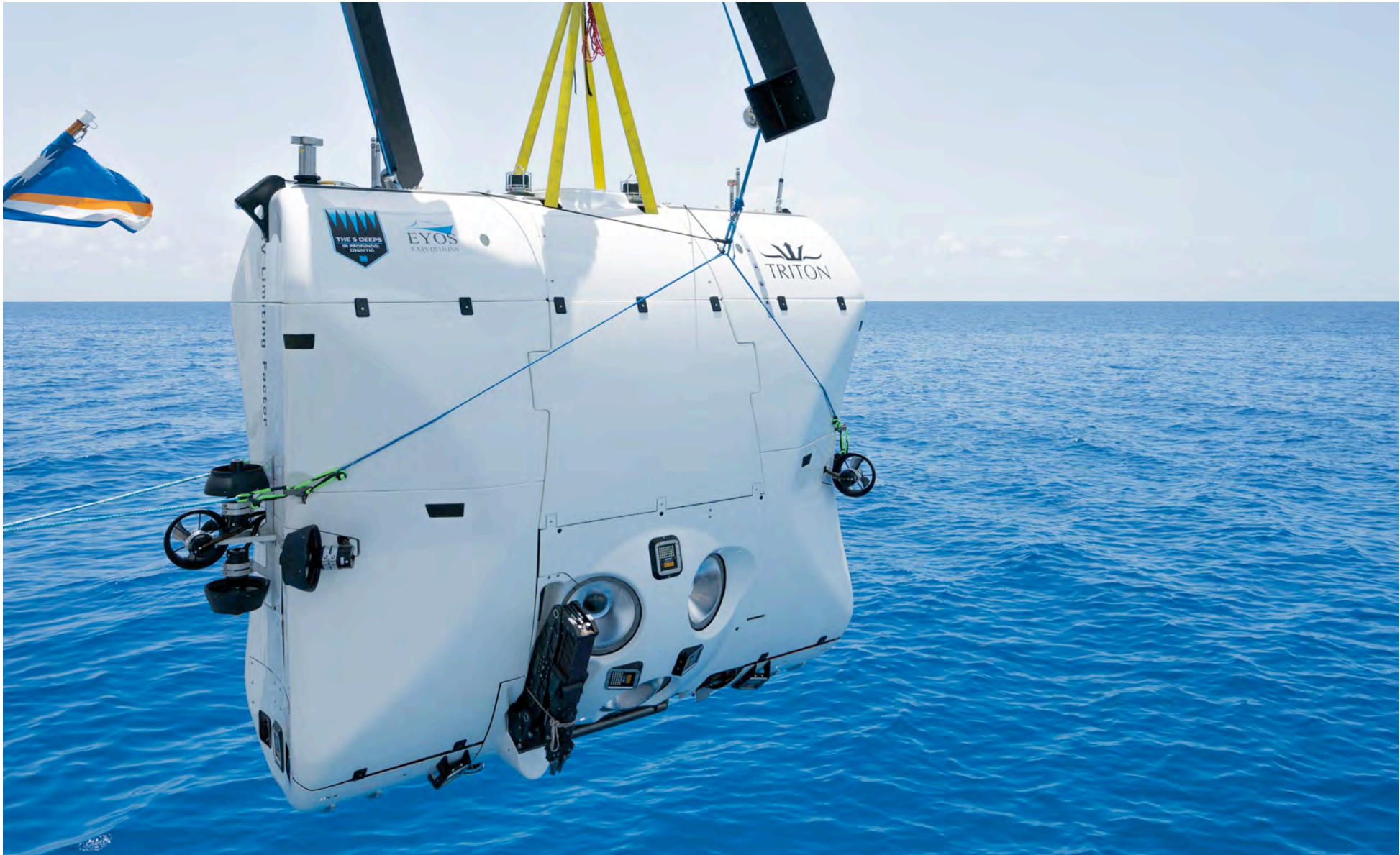


THE SUBMERSIBLE

Introducing the Triton 36000/2, the world's first and only submersible certified for repeatable exploration of the entirety of the world's oceans.

Any depth. Anywhere. Any time.





DESIGN

The Triton 36000/2 is unlike any non-military submersible ever developed. Its concept of operation, dive profiles and use scenarios differ dramatically from a typical Triton. And yet the process began, as it always has, centered around the values on which Triton was founded:

SAFETY, EXPERIENCE, SIMPLICITY, RELIABILITY VISIBILITY AND MAINTAINABILITY.

SAFETY
Every Triton submersible built shall be certified by a third-party Classification Society, offering clients the best guarantee of a carefully, thoughtfully designed and engineered, tested and demonstrated safe vessel.

EXPERIENCE
Every Triton will put the passenger experience first. They will be quiet, comfortable and designed to connect occupants, as directly as possible, to the beauty and wonder of the undersea world.

VISIBILITY
Every Triton shall be configured with Pilot situational awareness and passenger viewing as a priority. The clearest observation of the ocean will always be from a Triton submersible.

SIMPLICITY
Every Triton will be elegant in its simplicity; simple to learn, easy to handle, effortlessly maintained and to instinctive to operate. The best dives are those performed by well trained crew on a familiar and intuitively designed system.

RELIABILITY
Every Triton shall make use of high-quality, fully-tested components in a system designed for redundancy. They will inspire confidence to undertake lengthy, remote expeditions that other submersibles could not achieve.

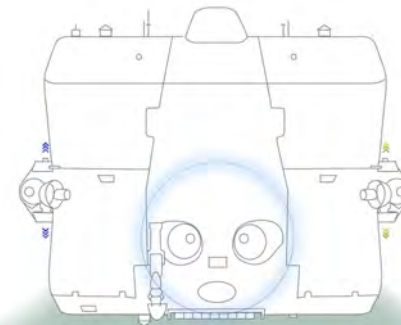
MAINTAINABILITY
Every Triton will be easily maintained by ship's crew, at sea, in remote locations, with standard tools and conventional mariner know-how. Maintenance on a Triton should not require a port call to carry out.



ERGONOMICS

The interior configuration of the Triton 36000/2 is unlike any previous full ocean depth submersible. The durable leather, bolstered seats provide two occupants with the comfort and durability required on 12-hour dive missions. The internal configuration allows three different seating positions for comfortable transit, close-range observation and surface maneuvering.

Intuitively designed, clearly laid out Pilot controls and internal systems are within easy reach and surround the Pilot without impeding on his primary sight-lines.



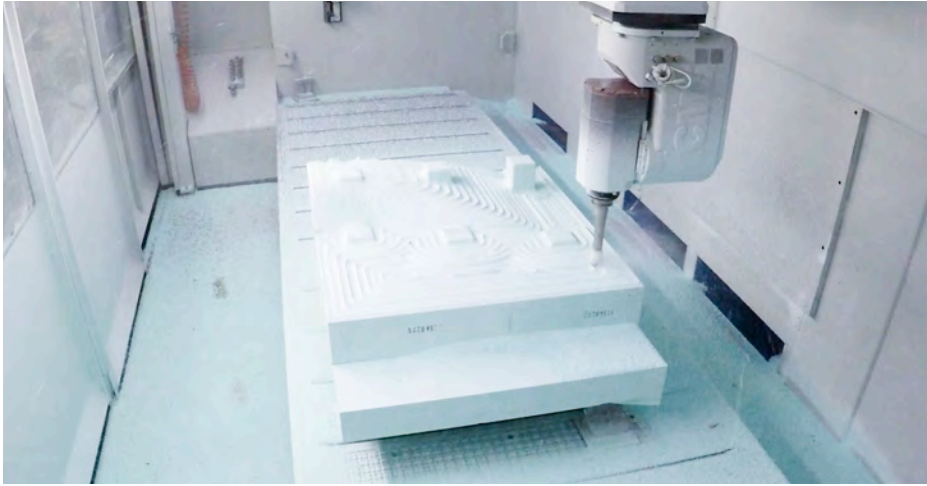
VERTICAL ORIENTATION

Unlike a typical submersible which travels forward through the water, the predominant trajectory for a full ocean depth submersible is vertically through the water column.

The new vertical configuration serves the same purpose as a traditional Triton layout; to provide maximum visibility in the direction of travel, hydrodynamic performance and maneuverability.

ENGINEERING

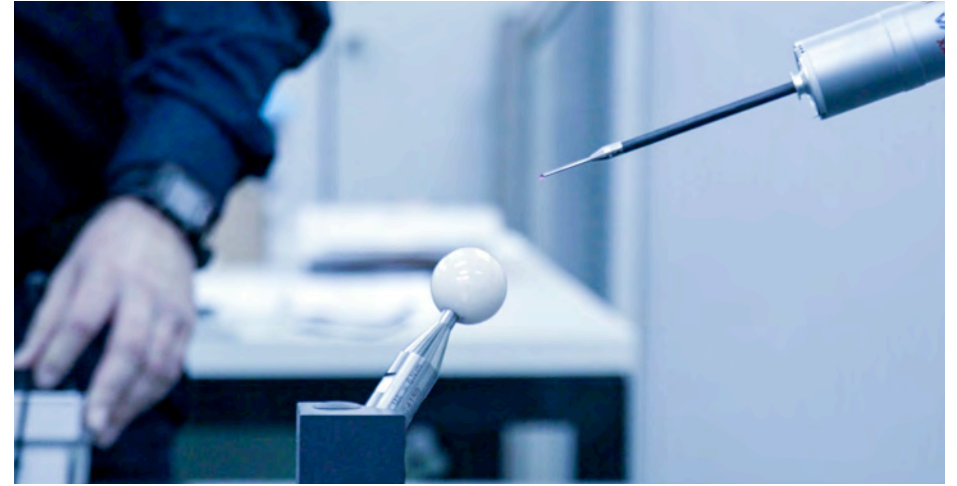
The Triton 36000/2 is absolutely the sum of its parts. For the whole to exist, and for it to perform exactly as intended, each and every component needed to be perfect. The absolute performance of every component, quality controlled to the final degree, is what has made the Triton 36000/2 possible. It is this dedication to minute detail, to absolute quality, to test, after test, after test, that means only Triton, supported by its exclusive partners, could engineer such an extremely capable submersible.



PRECISION MANUFACTURING

The Triton 36000/2 has been manufactured to tolerances no other submersible can match. In many cases we needed to re-think the technologies we used to develop weight-critical and precision-critical parts.

The Triton 36000/2 makes extensive use of computer controlled machining, 3D printing and other space age things we like to talk about.



ABSOLUTE QUALITY CONTROL

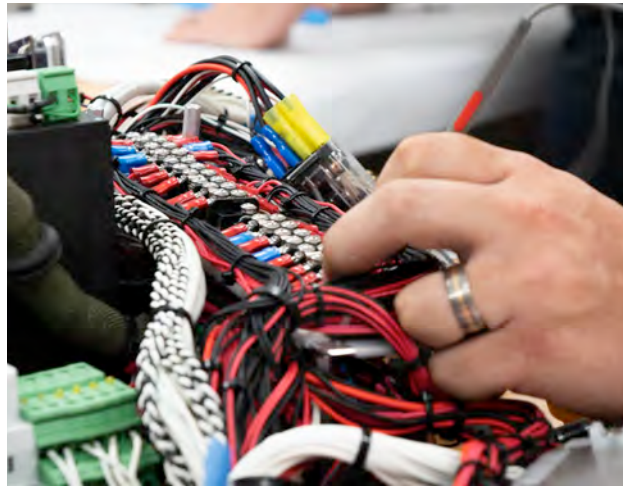
Co-ordinating over 150 suppliers from 36 different countries, and ensuring their respective contributions met our strict QA requirements is a key to delivering a full ocean depth vehicle. For many components, only a single supplier capable of producing to the quality we required, could be found.

The Triton 36000/2 is truly built of the best, by the best.



MECHANICAL ENGINEERING

Assembly of the QA-approved components to an exacting specification was carried out by Triton's team in Vero Beach, Florida. With over 350 years combined deep submersible knowledge between them, they are arguably the world's most experienced such team.



ELECTRICAL ENGINEERING

The Triton 36000/2's electrical system is a sophisticated, yet intuitive and easy to use, aid to the Pilot. It reduces Pilot workload and fatigue, making extended duration dives possible.

The systems are fully redundant, and are not required to initiate any return-to-surface functions.



GAS & HYDRAULIC ENGINEERING

Particular attention has been paid to the gas and air systems that have been installed entirely within the pressure hull for added safety. A beautiful array of gas bottles and life-support systems has been thoughtfully packaged in a dense, yet surprisingly roomy interior for safe and ergonomic operation.



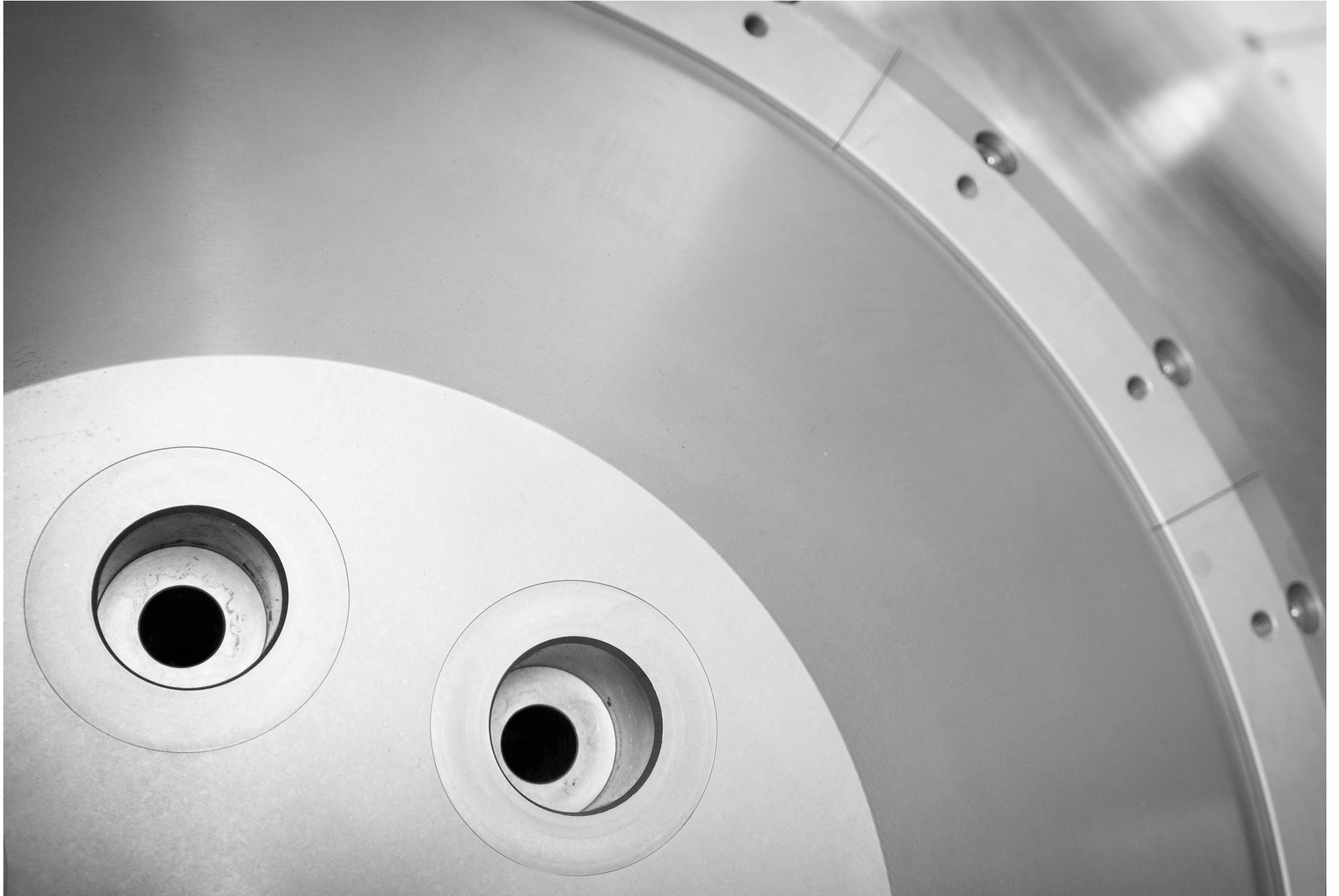
TITANIUM PRESSURE HULL

The defining feature of every Triton is its spherical pressure hull, through which the pilot navigates and passengers observe the ocean or carry-out their mission objectives. The Triton 36000/2's pressure hull, which features three wide-angle view-ports for maximum visibility, is a masterpiece of precision engineering.

New and advanced techniques were developed to ensure perfect circularity, a necessity for structural performance, and a completely weld-free construction.

The titanium pressure hull is 3.54" / 90mm thick and able to withstand pressures of in excess of full ocean depth. In the world's deepest pressure test chamber in Krylov, Russia, the completed hull was tested to a depth 20% greater than the deepest point in the ocean, some 14,000 m / 45,932 ft.

We truly believe no other forging house could reliably produce a titanium hull to such high-levels of tolerance.





Full ocean depth pressure rated parts marked following QA acceptance, ready for assembly.



The assembly, installation and inspection of the various assemblies during the build phase of the Triton 33000/2.

SAFETY

Classification Society certification is time-consuming, arduous, expensive and absolutely essential. It is a fundamental principle that all Triton submersibles complete the Certification process. It is a client's best guarantee that a vessel has been designed and engineered thoughtfully, carefully and with consideration for their safety as the primary driver behind every decision we make.

Before the first sketch, safety is top of our agenda where it remains throughout the design, manufacture, commissioning and ongoing operation of each vessel.

The Triton 36000/2 is the only submersible to ever receive an Unlimited Depth capacity certification by a third party classification society.

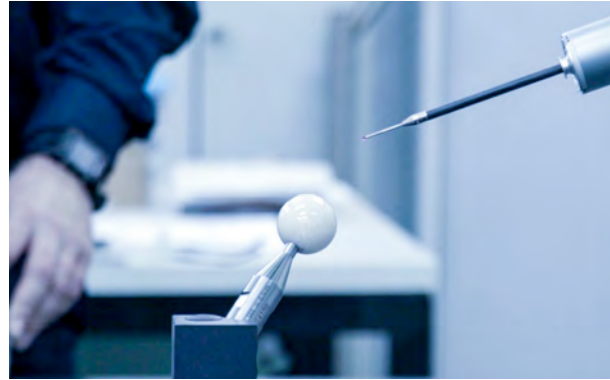
IT IS HOW WE THINK, AND HOW WE WORK. SAFETY IS TRITON.





RETURN TO SURFACE DESIGN

Safety starts with good design. The Triton 36000/2 has four independent means of returning to surface, and none of them are dependant on a functioning electrical system.



TRAINING SIMULATOR

Pilot familiarization, operational training and scenario practice may all be completed in the 1:1 replica simulator, ensuring future pilots are competent before they even step inside the vessel for the first time.



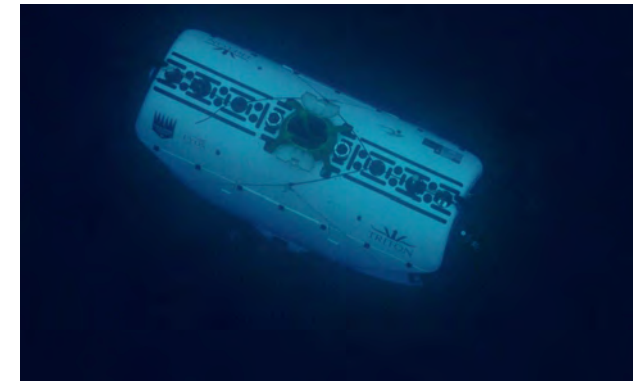
TESTING IN RUSSIA

In order to pressure-test the titanium hull to 1.2x full ocean depth, we took it to the only facility in the world that could accommodate its size: Krylov in Russia. Under DNV-GL witness, it successfully withstood the pressure at 14,000 m / 45,932 ft.



TESTING IN BARCELONA


In order to test components and smaller assemblies, we elected to build our own full ocean depth pressure test chamber. Now a part of our R&D facility in Barcelona, the chamber was used to verify the ratings of every component prior to assembly to the hull.




TESTING IN THE FIVE DEEPS


In 2018, the first Triton 36000/2 set-out on the ultimate validation; a series of dives to the deepest point in each of the five oceans. In 2019, with DNV-GL surveyor on-board, it broke the record for the deepest dive in the Mariana Trench and received its full ocean depth certification.

KEY SPECIFICATION


 2 Passengers
Capacity

 16+ Hours
Endurance

 LiFePO4
Battery Technology

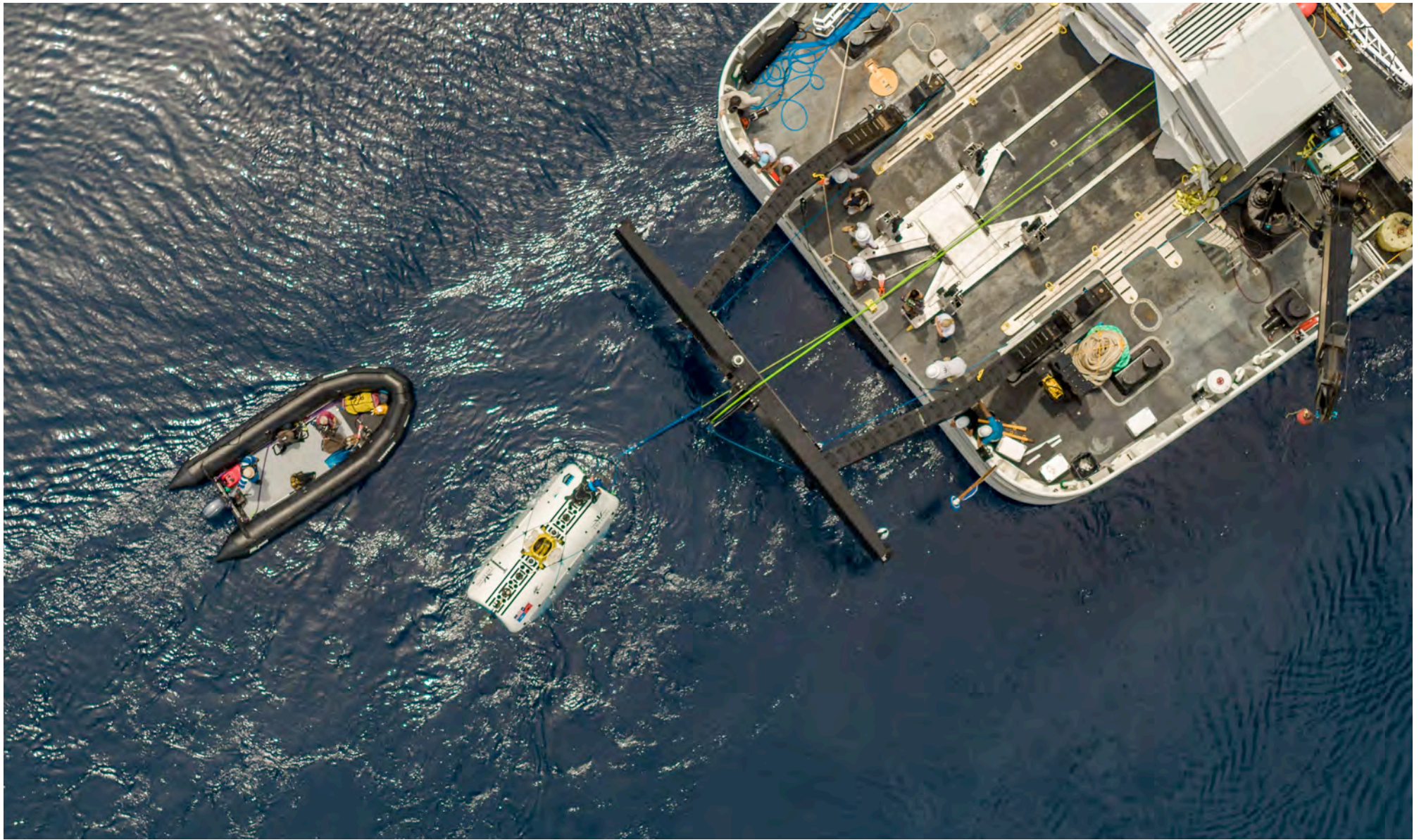
 Unlimited
Depth

 25,700 lb / 11,700 kg
Dry Weight

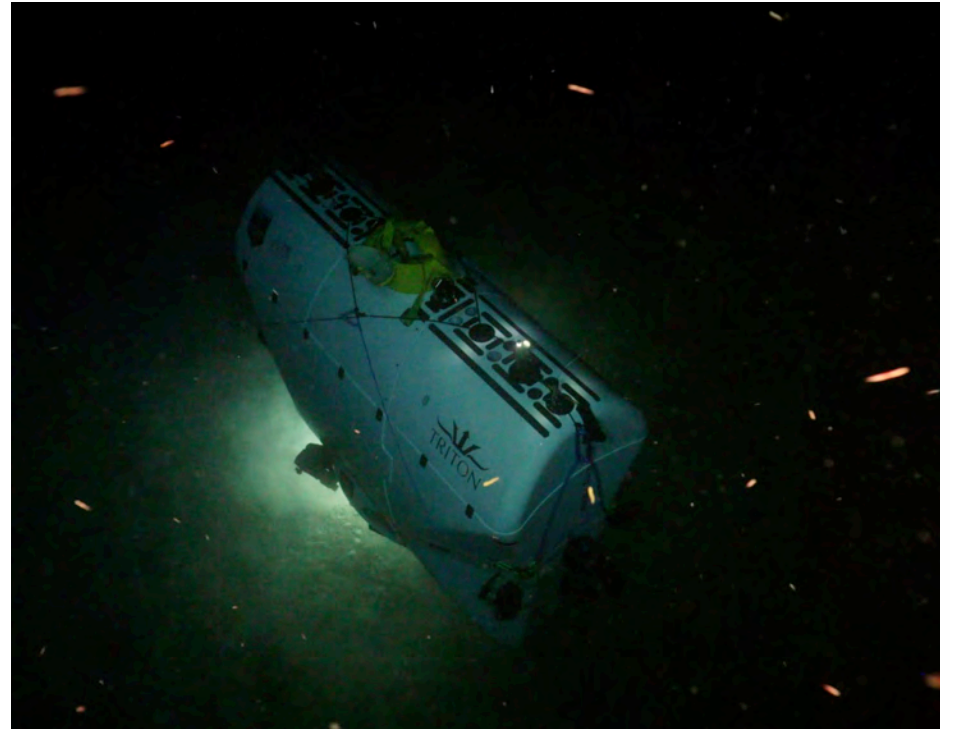
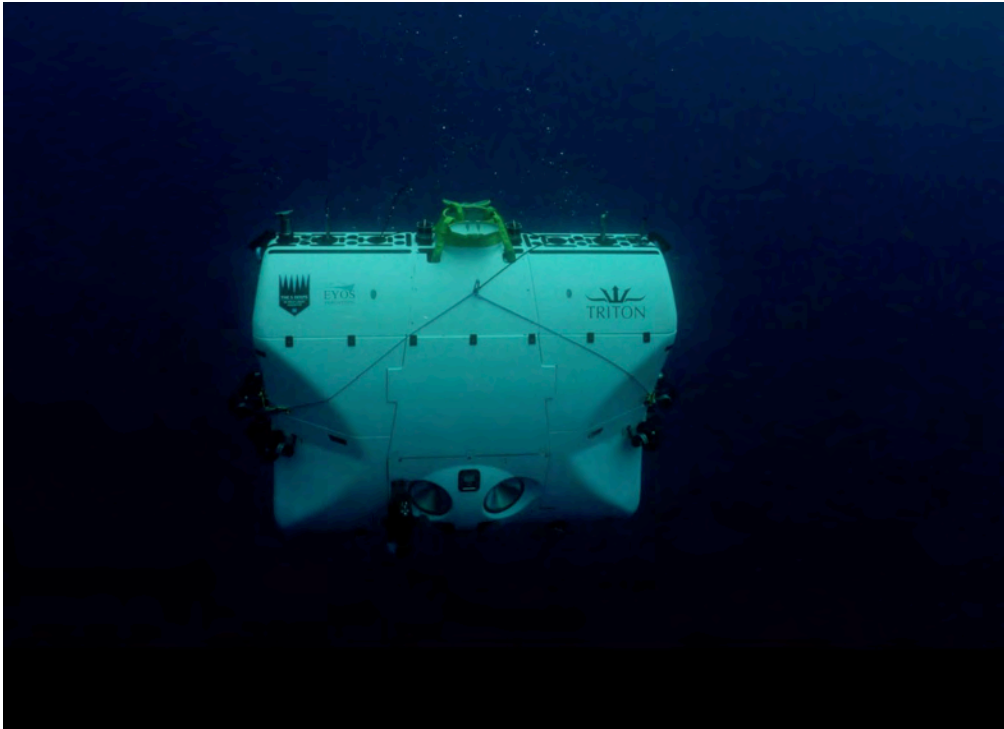
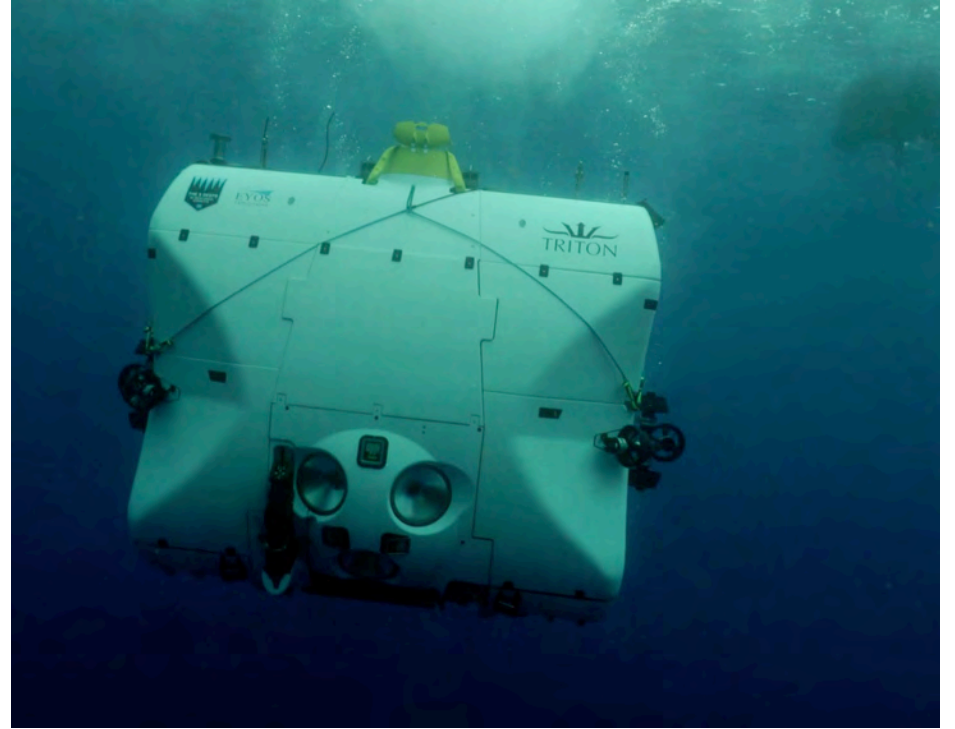
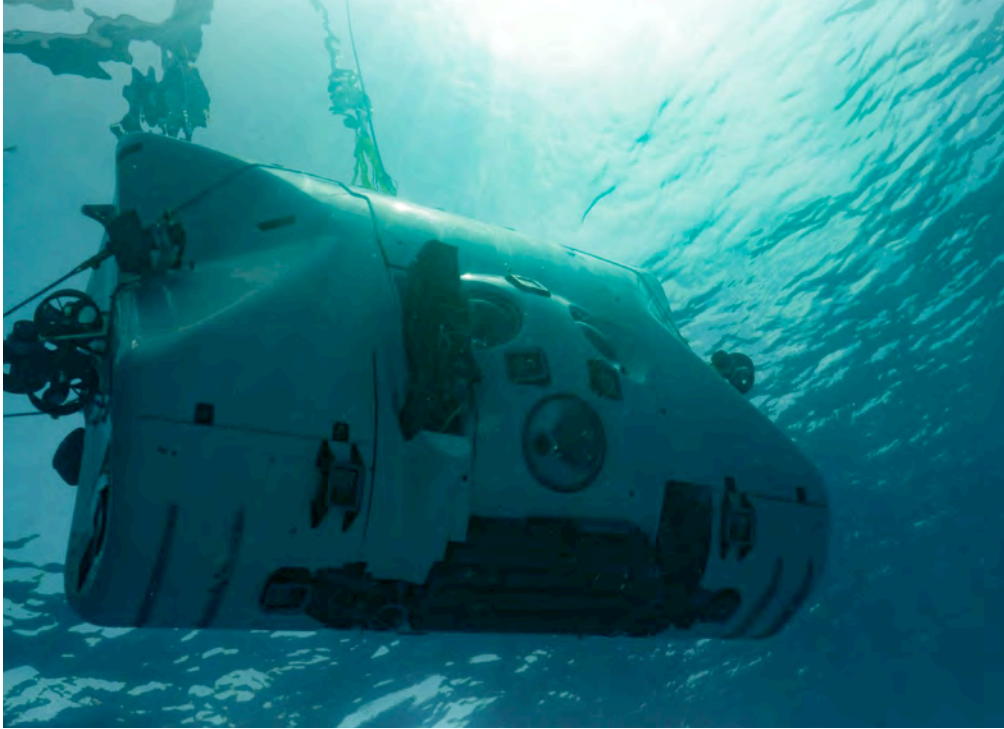
 12.2 ft / 3.7 m
Height

TECHNICAL SPECIFICATION

Depth	Full Ocean Depth 36,000 ft / 11,000 m	Length	15 ft / 4.6 m	24V Supply	Dual Supply + Emergency
Payload	485 lb / 220+ kg	Width	6.2 ft / 1.9 m	Main Battery	65 kWh
Crew	Pilot + 1 Pax	Height	12.2 ft / 3.7 m	Main Thrusters	4 x 5.5 kW
Speed	3 kn	Weight	25,700 lb / 11,700 kg	Vertical Thrusters	4 x 5.5 kW
Endurance	16+ hours	Pressure Hull Inner Ø	59 in / 1,500 mm	Manoeuvring Thrusters	2 x 5.5 kW
Surface Ballast	75.93 cu.ft / 2,150 l	Pressure Hull Thickness	3.54 in / 90 mm	Control	Joystick, Touchscreen + Manual Override
Variable Ballast	220 lb / 100 kg	Hatch Inner Ø	17.7 in / 450 mm	External Lights	10 x 20,000 lumen LED
				Life Support	Oxygen + CO2 Scrubber



Triton 36000/2 launched from A-Frame Launch & Recovery System during Sea Trials in The Bahamas





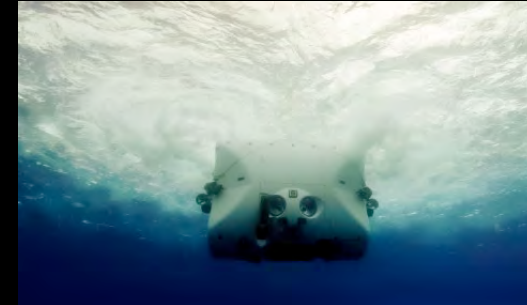


THE HADAL EXPLORATION PACKAGE

USD \$50.5 million

TRITON 36000/2 FULL OCEAN DEPTH (FOD)

The first Triton 36000/2 submersible will have proven its capabilities in over 50 manned record-breaking dives, traversing through more than 72,000m of water, prior to its availability for acquisition in 2019. It is equipped with a full science sampling suite and broadcast-quality camera array for documentary filming.



RESEARCH VESSEL 'PRESSURE DROP'

DSSV Pressure Drop is a newly refitted scientific research vessel customized specifically for the integration of the Triton 36000/2 FOD. The submersible's custom cradle resides in a retractable hangar that protects the submersible during passages, while the A-Frame is rated for manned launch and recovery operations. On the main deck, a studio and both wet- and dry-labs offer dedicated space for media and science activities. Comfortable accommodation is provided for 47 personnel.



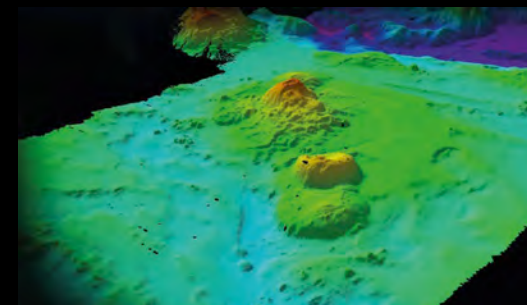
SCIENCE & NAVIGATION LANDERS

The Triton Full Ocean Depth System includes three 11,000m-rated FOD-capable Landers that will support the Triton 36000/2 and carry out additional science tasks. L3 Systems-supplied acoustic modems aid the submersible in navigation and allow scientists to communicate with the Lander. Features include video and time lapse cameras, a sample 'bio box', push core samplers, conductivity, temperature and depth sensors, and an array of other scientific instruments.



LATEST HI-DEF MULTIBEAM SONAR

DSSV Pressure Drop is outfitted with Kongsberg-Simrad's first installation of their new upgrade to the EM-124 multi-beam sonar, enabling precise, quick, high-definition topographic mapping of the ocean floor at extreme depths. This allows for both accurate surveying work and the development of a perfect dive plan for the submersible in any location.



THE FIVE DEEPS EXPEDITION

SOUTHERN | INDIAN | PACIFIC | ATLANTIC | ARCTIC

A RECORD-BREAKING VALIDATION OF THE TRITON 36000/2

In 2019, The Five Deeps Expedition completed the first manned dives to the deepest point in each of the world's five oceans.

During the year-long expedition, the team made and broke countless records, discovered dozens of new species, and revealed to a global audience the effect of human activity on these most fragile parts of our oceans. On the record-breaking dive to Challenger Deep, the Triton 36000/2 received the world's first commercial certification for repeated dives to full ocean depth.

The expedition provided the ultimate validation for the Triton 36000/2; proving its capability, reliability and safety.





LIMITING FACTOR

The first Triton 36000/2 submersible, named Limiting Factor by its commissioning owner, will be the submersible which enables the record-breaking expedition. The submersible will have proven its capabilities in over 50 manned dives, traversing through more than 72,000 m of water. It is equipped with a full science sampling suite and broadcast-quality camera ready.

PRESSURE DROP

DSSV Pressure Drop is a newly refitted scientific research vessel. Astern, the man-riding A-Frame is used to launch and recover Limiting Factor. On the main deck, both a wet- and dry-lab offer dedicated space for science activities. Onboard, comfortable accommodation is provided for 38 personnel. For more information, see fivedeeps.com/technology/vessel.

AVAILABILITY

Following completion of its 2020 expedition schedule, Limiting Factor and Pressure Drop - collectively the Triton Hadal Exploration System - will be available for purchase by government organization or research institute.

Triton Hadal Exploration System

USD \$50.5 million

Interested parties should contact Triton Submarines.



TRITON

“THE VEHICLE IS NO LONGER THE LIMITING FACTOR IN COMPREHENSIVE EXPLORATION OF THE DEEP OCEAN”

Victor Vescovo. Explorer’s Club. April 2019



DEEPEST DIVE IN HISTORY

10,928 METERS. APRIL 28, 2019



DEEPEST DIVE IN SOUTHERN OCEAN

7,192 METERS. APRIL 5, 2019



DEEPEST DIVE IN ATLANTIC OCEAN

8,376 METERS. DECEMBER 21, 2018




DEEPEST DIVE IN INDIAN OCEAN

7,192 METERS. APRIL 5, 2019

DEEPEST DIVING AMERICAN

 V. VESCOVO. 10,928 METERS

DEEPEST DIVING CANADIAN

 P. LAHEY. 10,927 METERS

DEEPEST DIVING ENGLISHMAN

 J. RAMSAY. 10,927 METERS

DEEPEST DIVING GERMAN

 J. STRUWE. 10,927 METERS

DEEPEST DIVING SCOTSMAN

 A. JAMIESON. 10,714 METERS



DEEPEST CERTIFIED SUBMERSIBLE

DNV-GL. MAY 5, 2019



MOST DIVES TO FULL OCEAN DEPTH

FIVE DIVES IN TEN DAYS



DEEPEST EVER SALVAGE OPERATION

10,927 METERS. MAY 3, 2019

CONTACT US

GLOBAL REACH

Triton's manufacturing facility and headquarters are located in Sebastian, Florida (just off Interstate 95). Triton's support facility in Barcelona offers rapid support across Europe, the Middle East and Africa.




HEADQUARTERS

Triton Submarines LLC
10055 102nd Terrace
Sebastian
Florida 32958
USA

SUBMERSIBLE SUPERCENTRE

Triton Submarines EMEA, SL
Avda. Cerdanyola 97-101
08173 Sant Cugat del Vallès
Barcelona
Spain




CONTACT

 +1 (772) 770-1995
 +1 (772) 589-1011
 info@tritonsubs.com

CONTACT

 +34 937 034 470

SOCIAL

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