

THE LAST V FRONTIER

ROLEX DEEPSEA



COOL UNDER PRESSURE

The last trickle of light from the surface disappears into the abyss. This is the underwater twilight zone, where deep blue fades to pitch black and the ocean sinks into a realm less known to man than the surface of the moon. This threshold to the ocean's fathomless reaches inspired the blue to black gradient dial of the newest version of the Rolex Deepsea, the professional divers' watch waterproof to the extreme depth of 3,900 metres (12,800 feet).

The new Rolex Deepsea celebrates the partnership between Rolex and the historic 2012 DEEPSEA CHALLENGE expedition to the deepest point in the ocean. This scientific endeavour was undertaken by explorer and film-maker James Cameron, who wore his trusted Rolex Deepsea as he became the first person to reach the Challenger Deep as a solo pilot. He successfully navigated the unique DEEPSEA CHALLENGER submersible he co-designed to a depth of 10,908 metres (35,787 feet), where he explored the ocean trench, took samples and captured the first-ever high-resolution images of the deepest sea floor.

On the outside of the submersible, affixed to the robotic arm and the hull, were three experimental Rolex Deepsea Challenge watches, specially engineered by Rolex to withstand the most colossal water pressure on the planet. These watches, designed with the exact same architecture as the Rolex Deepsea, only much larger, provided the ultimate proof of the model's waterproofness and resistance to extreme pressure.

A few weeks earlier, as Cameron was putting his submersible through a trial run off the coast of Papua New Guinea, a standard Rolex Deepsea was attached to the sub's hydraulic arm for a real-life dive to 4,000 metres (13,120 feet). Under pressure that would crush a nuclear submarine like a can of soda, Rolex's professional divers' watch kept its cool.

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THE ROLEX DEEPSEA

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No other watch is engineered like the Rolex Deepsea. Waterproof to an extreme depth of 3,900 metres (12,800 feet), this new-generation divers' watch benefits from exclusive innovations developed by Rolex to exceed the most exacting demands of professional divers. The Rolex Deepsea defines new standards of robustness, precision, functionality and reliability. In essence, the Rolex Deepsea is the ultimate Oyster: a watch that defies the elements. Its 44 mm Oyster case, reinforced with the patented Ringlock System, was designed to provide the highest degree of resistance in a size that remains wearable and practical. It could be called overengineering. At Rolex, we call it ultimate reliability.













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Waterproof to an extreme depth of 3,900 metres (12,800 feet), the Rolex Deepsea illustrates the supremacy of Rolex in mastering waterproofness and pressure resistance.

> R D L E X E E S E E

FEATURES



NEW GRADIENT DIAL

The new version of the Rolex Deepsea sports a deep blue to pitch-black gradient dial, reminiscent of the ocean's twilight zone where the last trickle of light from the surface disappears into the abyss. This new "D-blue" dial echoes the journey to the deepest point in the ocean undertaken by film-maker and explorer James Cameron in 2012 with his DEEPSEA CHALLENGE expedition, partnered by Rolex and National Geographic. As a tribute to this partnership, the "DEEPSEA" marking on the new dial adopts the colour of James Cameron's green submersible as it is perceived underwater.



OYSTER CASE

The Rolex Deepsea's waterproof Oyster case is hewn from a solid block of 904L stainless steel superalloy. This particularly corrosion-resistant grade of steel is greatly valued in the chemical and aerospace industry for its high performance. The Oyster case holds the three components of the Ringlock System. The Triplock winding crown, equipped with three seals, screws down securely against the case, completing the waterproofness system and offering watertight security akin to a submarine's hatch.



RINGLOCK SYSTEM

The Rolex Deepsea owes its exceptional strength, waterproofness and pressure resistance to the exclusive Ringlock System. This innovative case architecture patented by Rolex enables the watch to resist the massive pressure exerted by water at the depth of 3,900 metres (12,800 feet), equivalent to a weight of approximately 3 tonnes on the watch. Its construction is based on three elements:

► A nearly indestructible nitrogen-alloyed stainless steel compression ring is positioned inside the watch case, around the movement, to provide support for the crystal and the case back. The backbone of the watch, it can withstand pressure that would crush a submarine. The watch face is protected by a dense, 5 mm dome-shaped sapphire crystal, made of high-purity aluminium oxide.

► Finally, the case back in grade 5 titanium is held tight against the high-performance compression ring by a screw-down ring in 904L stainless steel. The almost imperceptible flexibility of grade 5 titanium allows the water pressure to strengthen the hermetic seal of the case as depth increases, by forcing the components tighter and tighter together.



CERACHROM BEZEL INSERT

The unidirectional rotatable bezel of the Rolex Deepsea is fitted with a 60-minute graduated black Cerachrom insert that allows divers to safely monitor their time underwater and their decompression stops. The insert, made of an extremely hard and corrosion-resistant ceramic, is virtually scratchproof and its colour never fades. The numerals and the graduations are engraved in the ceramic and coated with platinum using a PVD (Physical Vapour Deposition) process patented by Rolex, for optimal legibility and durability. The bezel's knurled edge offers excellent grip when setting dive time, even with diving gloves.



CHROMALIGHT DISPLAY

Great attention was paid to the legibility of this Professional divers' watch. The Chromalight hour markers and hands are filled with a luminescent material emitting a long-lasting blue glow – lasting up to twice as long as traditional materials. On the bezel, the zero marker of the graduation, in the form of a triangle, is visible in the dark thanks to a capsule containing the same luminescent material.

SAFETY CLASP AND EXTENSION SYSTEM

The Rolex Deepsea's Oyster bracelet is equipped with an Oysterlock safety clasp that prevents accidental opening, and with a double extension system that allows the watch to be worn comfortably over a diving suit up to 7 mm thick. The Fliplock extension link extends the bracelet by 26 mm, while the Rolex Glidelock system allows fine adjustments of the bracelet length in 2 mm increments for a total of approximately 20 mm. Neither of them requires the use of any tools.

HELIUM ESCAPE VALVE

The Rolex Deepsea's Oyster case is equipped with a helium escape valve. Patented by Rolex in 1967, this safety valve acts as a miniature decompression chamber for the watch and is essential for deep-sea saturation diving. During the decompression phases that professional divers undergo in hyperbaric chambers, the helium valve automatically regulates the excess pressure trapped inside the watch case without compromising the waterproofness of the watch.



CALIBRE 3135, A SUPERLATIVE CHRONOMETER

The Rolex Deepsea is powered by calibre 3135, a self-winding mechanical movement entirely developed and manufactured by Rolex. Like all Rolex Perpetual movements, the 3135 is a certified Swiss chronometer, a designation reserved for high-precision watches that have successfully passed the Swiss Official Chronometer Testing Institute (COSC) tests. Its architecture, like that of all Oyster watch movements, makes it singularly reliable.

The oscillator, the true heart of the watch, has a large balance wheel with variable inertia regulated extremely precisely with gold Microstella nuts. It is held firmly in place by a height-adjustable traversing bridge enabling very stable positioning to increase shock resistance. The oscillator features a blue Parachrom hairspring patented and manufactured by Rolex in an exclusive alloy. Insensitive to magnetic fields, the Parachrom hairspring offers great stability when exposed to temperature variations and remains up to 10 times more precise than a traditional hairspring in case of shocks. It has a Breguet overcoil, enhancing the isochronism of the oscillations in all positions.

Calibre 3135 is fitted with a self-winding module featuring a Perpetual rotor, which ensures continuous winding of the mainspring by harnessing the movements of the wrist to provide a constant source of energy.

The Rolex Deepsea's movement will be seen only by certified Rolex watchmakers, yet it is beautifully finished and decorated, in keeping with the brand's uncompromising quality standards.

HYPERBARIC TEST TANK

In deep-sea diving, reliability and security are paramount. Each Rolex Deepsea therefore undergoes stringent waterproofness and pressure-resistance tests. To this end, Rolex uses a specifically designed piece of equipment: a high-performance, stainless steel hyperbaric tank, which is cast in a single piece and weighs 1.3 tonnes. It simulates the pressure at 4,875 metres (16,000 feet) below sea level, 25 per cent greater than the depth indicated on the watch dial. This test is destructive, meaning that the slightest weakness in a watch would cause it to implode. Obviously, all Rolex Deepsea watches offered for sale have survived this test.

This high-tech equipment was developed and manufactured by Comex (Compagnie Maritime d'Expertises), an internationally renowned company specializing in underwater engineering and hyperbaric technology. Rolex has been collaborating with Comex for decades and supplied watches to equip the French firm's elite divers on deep-sea engineering missions. Comex's professional divers set the world records for the deepest saturation dives, and still hold them to this day.



SCALABLE PERFORMANCE

In 2012, the innovative case architecture of the Rolex Deepsea and its Ringlock System served as the blueprint for the design of the Rolex Deepsea Challenge, an experimental divers' watch guaranteed waterproof to a depth of 12,000 metres (39,370 feet). Entirely engineered and manufactured by Rolex, it was custom-made to resist the extreme pressure found in the deepest reaches of the oceans. On 26 March 2012, it accompanied explorer and filmmaker *(Titanic, Avatar)* James Cameron on his record-breaking solo submersible dive to the bottom of the Mariana Trench in the Pacific Ocean. Cameron reached a depth of 10,908 metres (35,787 feet) in the Challenger Deep, the ocean's deepest point. The Rolex Deepsea Challenge emerged unscathed.

To achieve this level of performance, Rolex engineers only had to scale up the dimensions of the commercial Rolex Deepsea, from 44 to 51.4 mm, trading wearability for ultimate pressure resistance. Because the only practical limit to the Rolex Deepsea's performance is the requirement that it fit on a human wrist.





TYPE

CASE

DIAMETER

THICKNESS

MATERIALS

CRYSTAL

MOVEMENT

WINDING CROWN

WATERPROOFNESS



ROLEX DEEPSEA

Professional watch 3,900 m | 12,800 ft 3.1 tonnes 44 mm 17.7 mm Oyster + Ringlock System 904L steel (middle case) Nitrogen-alloyed steel Grade 5 titanium (case back) Sapphire | 5.5 mm thick Triplock (triple waterproofness) 3135, self-winding mechanical



ROLEX DEEPSEA CHALLENGE

Experimental watch 12,000 m | 39,370 ft 13.6 tonnes 51.4 mm 28.5 mm Oyster + Ringlock System 904L steel (middle case) Nitrogen-alloyed steel Grade 5 titanium (case back) Sapphire | 14.3 mm thick Triplock (triple waterproofness) 3135, self-winding mechanical



TECHNICAL SPECIFICATIONS

OYSTER PERPETUAL ROLEX DEEPSEA

CATEGORY	Professional watch
CASE	Oyster (monobloc middle case, screw-down
	case back and winding crown)
	Ringlock System case architecture with
	nitrogen-alloyed steel ring
	Helium escape valve
DIAMETER	44 mm
MATERIALS	904L steel, case back in grade 5 titanium
WINDING CROWN	Screw-down, Triplock triple water-
	proofness system
CROWN GUARD	Integral part of the middle case
CRYSTAL	Domed, 5.5 mm-thick, scratch-resistant
	synthetic sapphire
BEZEL	Unidirectional rotatable 60-minute graduated;
	Cerachrom insert made of ceramic, numerals
	and graduations coated in platinum via PVD
WATERPROOFNESS	3,900 m (12,800 ft)
MOVEMENT	Calibre 3135, Manufacture Rolex
	Mechanical movement, bidirectional self-wind-
	ing via Perpetual rotor
PRECISION	Officially certified Swiss chronometer (COSC)
FUNCTIONS	Centre hour, minute and seconds hands
	Instantaneous date with rapid setting
	Stop-seconds for precise time setting
OSCILLATOR	Frequency: 28,800 beats/hour (4 Hz)
	Paramagnetic blue Parachrom hairspring with
	Breguet overcoil
	Large balance wheel with variable inertia,
	high-precision regulating via gold Microstella nuts
POWER RESERVE	Approximately 48 hours
BRACELET	Oyster; folding Oysterlock safety clasp with
	Rolex Glidelock system for fine adjustment of
	bracelet length, and Fliplock extension link

JAMES CAMERON'S DEEPSEA CHALLENGE

On 26 March 2012, film-maker and explorer James Cameron made a record-breaking solo dive 10,908 metres (35,787 feet) below the surface of the Pacific Ocean in the *DEEPSEA CHALLENGER* submersible, a robust science platform, reaching the world's deepest frontier. The inspirational *DEEPSEA CHALLENGE* expedition paved the way for a new era in scientific exploration of the ocean floor, the least known area of the planet. No human being had returned to such depths since 23 January 1960, the date of the first manned dive to the bottom of the Mariana Trench by the bathyscaphe *Trieste*. And whenever humanity ventures to new frontiers on Earth, so does Rolex.

THE DIVE

26 MARCH 2012

05:00

"Release, Release, Release!" Twenty minutes after the DEEPSEA CHALLENGER is lowered into the water, James Cameron gives the signal



-0-50m

90% of ocean life lives here Limit for recreational scuba divers on air



_ Rolex Submariner



534 m
Deepest saturation dive by Comex

_____ ____ 600*m* ____ Maximum dive

depth of a nuclear submarine



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3800m
The Titanic's final resting place





"Just arrived at ocean's deepest point. Hitting bottom never felt so good. Can't wait to share what I'm seeing with you." James Cameron

7700m

the deepest-living



The experimental Rolex Deepsea Challenge watch accompanied James Cameron's green submersible to the deepest point in the ocean.



EXPLORING THE WORLD'S DEEPEST FRONTIER

DEEPSEA CHALLENGE was a joint scientific expedition led by James Cameron in partnership with Rolex and National Geographic that pushed the limits of human endeavour in underwater exploration, science and innovation. In the deepest marine trenches, the water pressure is more than 1,000 times greater than at sea level – over 7 tonnes per square inch – and sunlight is completely blacked out, making this environment the most unwelcoming on Earth.

The expedition paved the way for more scientific research of the great depths. Scientists estimate that 95 per cent of the oceans remain unexplored and hold hidden clues to life on Earth. "It was very lunar, a very desolate place," Cameron said after the historic dive. "My feeling was one of complete isolation from all of humanity. I felt like, literally in the space of one day, I had gone to another planet and come back."

The *DEEPSEA CHALLENGE* dives off the coast of Papua New Guinea and in the Mariana Trench shed new light on the deep, providing high-resolution 3D images and collecting valuable samples for the scientific community that have led to the identification of at least 68 new species.

They include shrimp-like creatures called amphipods, sea cucumbers, tens of thousands of microbes, and stringy rock coatings known as microbial mats which contain organisms that can survive in the dark. The expedition included a team of scientists aboard the support vessel who helped to collect and analyse the samples and imagery that Cameron collected on his dives. These assets continue to be analysed by biologists, geologists and marine specialists at research institutions around the world.

In August 2014, James Cameron released a feature documentary, *DEEPSEA CHALLENGE 3D*, tracing the expedition from its beginnings until the last of its 13 dives in the Pacific. Mankind knows less about the oceans' greatest depths than about the surface of the moon, and the film, like the expedition, reminds us how much of this planet remains to be explored.



THE MARIANA TRENCH

The Mariana Trench in the Pacific Ocean is the deepest part of the world's oceans and one of a global network of deep troughs on the sea floor. The deepest point in the trench, known as Challenger Deep, lies some 11,000 metres (nearly 7 miles) below the surface and about 320 kilometres (about 200 miles) southwest of the nearest inhabited territory, the island of Guam. If Mount Everest, the world's tallest peak, were set in the trench, there would still be approximately 2,000 metres (1.3 miles) of water above it. The trench was created by subduction, the downward movement of the Pacific tectonic plate beneath the Mariana Plate.

Challenger Deep was named after the 1858 British Royal Navy ship, HMS Challenger, the first vessel to sound the depths of the trench. In January 1960, Swiss oceanographer Jacques Piccard and U.S. Navy Lieutenant Don Walsh manned the 150-tonne bathyscaphe Trieste for the first journey to Challenger Deep. James Cameron's DEEPSEA CHALLENGE expedition marked the first time in 52 years – and only the second time in history – that another human made the trip to the world's deepest known point.





HIGH TECHNOLOGY TO SERVE SCIENCE

The DEEPSEA CHALLENGER submersible is 7.3 metres (24 feet) tall and shaped like a vertical torpedo. But, throughout the nearly seven hours he spent underwater, Cameron could barely move from a near-foetal position in the 109-centimetre-wide (43 inches), pressure-resistant metal sphere that formed his life-sustaining cockpit. To cope with the extreme conditions in the deepest parts of the ocean, the DEEPSEA CHALLENGER incorporated innovative, cutting-edge features and materials that have helped advance the field of submersible design, including Isofloat[®] syntactic foam for the buoyant hull, pressure-resistant battery packs and a dedicated compact video system capable of capturing High-Definition 3D footage of the world's deepest sea floor.

Unlike the *Trieste*, which spent only 20 minutes on the ocean floor and had no research or camera equipment, the *DEEPSEA CHALLENGER* was designed as a science platform and was able to remain at the bottom of the Mariana Trench for three hours to explore, take samples and capture the first-ever high-resolution images of the trench, an ability which remains unprecedented.

A WATCH FOR THE DEEPEST CHALLENGE

James Cameron's submersible was carrying a specially made experimental Rolex Deepsea Challenge watch on its hydraulic manipulator arm and two others attached to its hull.

By scaling up the technology developed for the Rolex Deepsea divers' watch, waterproof to 3,900 metres (12,800 feet), Rolex engineers created an experimental model capable of withstanding the crushing pressure of about 12 tonnes on the crystal which occurs in this cold, dark and barren world some 11 kilometres (7 miles) below the surface of the Pacific Ocean.

The watches emerged unharmed and kept time perfectly throughout nearly seven hours beneath the water, as Cameron demonstrated by looking at the Rolex Deepsea Challenge on the manipulator arm at the bottom of the Mariana Trench. W



"The Rolex Deepsea Challenge was visible on the sub's manipulator arm and working precisely at the bottom of Challenger Deep." James Cameron

ROLEX AND THE DEEP

In 1960 – 52 years before the *DEEPSEA CHALLENGE* expedition – Rolex made watchmaking history when it joined the bathyscaphe *Trieste* on an unprecedented dive to the deepest known point in the world's oceans. Crewed by Swiss oceanographer Jacques Piccard and U.S. Navy Lieutenant Don Walsh, the *Trieste* was carrying an experimental Rolex Deep Sea Special wristwatch when it reached the bottom of the Mariana Trench in the Pacific Ocean on 23 January 1960, at a record depth of 10,916 metres (35,814 feet).

The bathyscaphe and the watch attached to its exterior successfully withstood crushing, deep-sea water pressure that no submersible, let alone timepiece, had confronted before and that no human could ever survive. After the *Trieste* surfaced from its record dive, a cable was received at Rolex headquarters in Geneva: *"Happy to announce your watch as precise at 11,000 metres down as on surface. Best regards Jacques Piccard."*

The historic dive of the Rolex Deep Sea Special was the fruit of decades of unrelenting development of the Oyster, the world's first waterproof wristwatch, invented by Rolex in 1926.



LIKE AN OYSTER

Rolex has for many decades been associated with exploration of the planet's most extreme frontiers and with pushing the limits of human endeavour, in keeping with the spirit instilled by its founder, Hans Wilsdorf. The company grew through the most adventurous decades of the 20th century, a period marked not only by some of history's most daunting challenges in exploration, but also by great technological advances.

Rolex nurtured in particular a special relationship with the sea after creating the waterproof Oyster wristwatch in 1926. Waterproofness was a fundamental feature that helped make watches reliable and accurate. The Oyster innovated with its screw-down case back, bezel and winding crown, forming the essence of the modern-day sealed case that protects a highprecision movement. Such reliable waterproofness is today inherent in every Rolex Oyster Perpetual model.

The Rolex Oyster is in its element in water, and the name chosen for this iconic collection is no accident. Rolex provided a real-life demonstration of its waterproofness in 1927, when a young English distance swimmer, Mercedes Gleitze, was equipped with an Oyster as she swam the English Channel.

Robust, precise and highly reliable, Rolex Oyster watches have since then proven themselves in real-life conditions during a series of iconic endeavours, including the *Trieste's* dive and the expedition by Sir John Hunt, Sir Edmund Hillary and Tenzing Norgay to the top of the world in 1953 – the first successful ascent of Mount Everest. Exploits of this kind have helped build the Rolex Oyster's reputation of utmost reliability and capability. Sisters of the deep: the experimental Rolex Deep Sea Special (1960) and Rolex Deepsea Challenge (2012).



DIVERS' WATCHES

Rolex has sustained and extended its position at the forefront of watchmaking for divers with ground-breaking innovations. During the 1950s, developments in diving technology paved the way for a boom in underwater exploration. The exacting professional divers' community came to treasure Rolex watches as essential tools of the trade and even helped in their development.

The iconic Oyster Perpetual Submariner, first unveiled in 1953, is today waterproof to a depth of 300 metres (1,000 feet). The Sea-Dweller model, first presented in 1967, extended the depth limit for Rolex waterproof watches to 610 metres (2,000 feet), then 1,220 metres (4,000 feet) in 1978. And ultimately the Rolex Deepsea, introduced in 2008, illustrates the supremacy of Rolex in mastering waterproofness. This new-generation divers' watch is rated waterproof to a depth of 3,900 metres (12,800 feet), providing a substantial safety margin for those working in open water at great depth. Each Rolex Deepsea watch is individually tested 25 per cent beyond the guaranteed depth in a specially built hyperbaric tank at the company's final assembly site in Geneva.

Timepieces such as the state-of-the-art Rolex Deepsea are the product of nearly a century of finely tuned know-how and innovation based on real-life experience of the exacting conditions underwater. They attest to the pursuit of perfection and the finest engineering.



CARING FOR THE DEEP

Rolex's affinity with the deep extends to active and sustained sponsorship of renowned marine researchers and ocean exploration, supporting excellence in the advancement of human knowledge and science.

Don Walsh, co-pilot of the *Trieste* in 1960, remains part of the Rolex family, while Rolex Testimonees include renowned oceanographer and explorer Sylvia Earle, as well as underwater photographer and marine naturalist David Doubilet. For 40 years Rolex has partnered with the Our World–Underwater Scholarship Society[®]. The brand notably funds young Rolex Scholars from North America, Europe and Australasia to gain hands-on experience with leaders in marine-related research, including on scientific expeditions, nurturing new generations of marine scientists.

Rolex was associated with *The Deep*, an exceptional exhibition of deep-sea creatures conceived by film-maker Claire Nouvian in collaboration with scientific researchers, providing visitors with a unique opportunity to discover some of the mysteries of the Earth's largest reservoir of life. James Cameron's *DEEPSEA CHALLENGE*, with Rolex and the National Geographic Society as partners, took us on a new journey to mankind's deepest frontier, for the first time since the *Trieste* touched the bottom, helping to shed light on an ocean floor that had remained hidden from science for centuries. All paving the way for renewed exploration of the 95 per cent of the oceans that remains unexplored to this day, sparking interest in our vital marine environment.



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