

HYDREX[®]


UNDERWATER TECHNOLOGY

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1979

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Hydrex is looking for representative agents



To support our continuous growth, we are expanding our worldwide network of Hydrex agents. This allows us to reach a much bigger public directly than would otherwise be possible.

All our offices have fully operational fast response centers where an extensive range of state-of-the-

art equipment is available at all times for immediate deployment with our skilled diver/technician teams to wherever they are needed.

The services that we offer are highly specialized underwater and in water repairs. These include bow thruster repairs and replacements, stern tube seal repairs, hull shell plating repairs and replacements, in water surveys

and various maintenance work. More information on our services can be found on our website.

Contact us if you are interested in joining our network and help us build a strong relationship with our prospects and customers. We look forward to hearing from you.



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Editorial

Large fuel savings with new propeller surface treatment technique



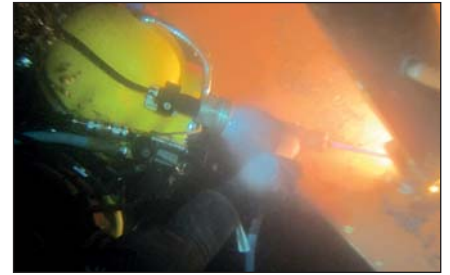
We discovered an unsophisticated but very efficient technology to enhance propeller blade surfaces. With the method that we have we can achieve surface conditions that were never seen before. This can only be done underwater.

We have four workboats equipped to deliver this service on a very short

notice in the Rhine-Scheldt delta from Antwerp to Rotterdam.

When a comparison is made between the surface condition of an average propeller, as our divers regularly see it, and the smoothness that is obtained with our cleaning technique, savings are in the 5-10% range. These results are easily achieved. The cost of such an oper-

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ation is very attractive and is very easily gained back in a matter of days (or even hours).

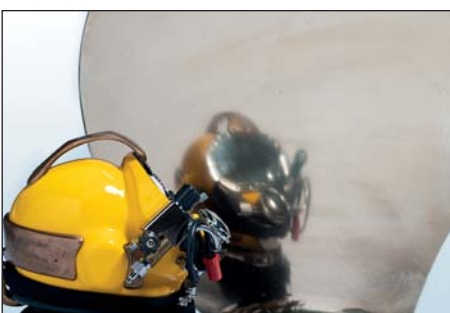
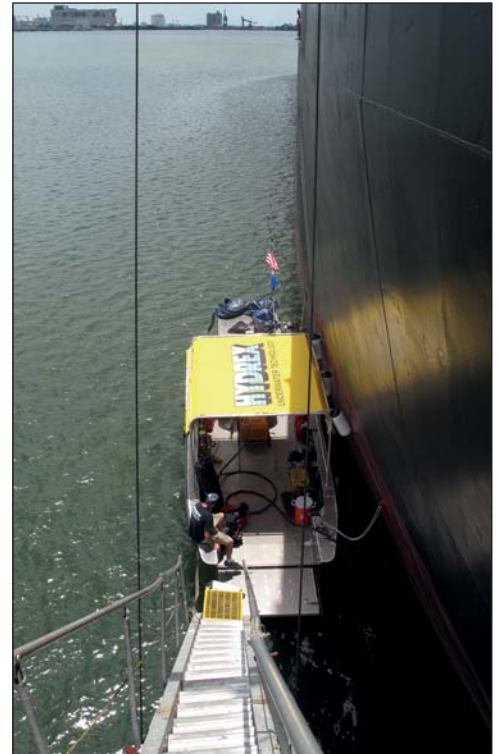
Regular maintenance is easy to schedule and results in ultra-smooth propeller surfaces. Continuous and large fuel savings are now possible.

This award-winning surface treatment technique justifies having the propeller cleaned every time it calls a port.

Please contact me for more information, I will gladly discuss the benefits of this new technology with you.



Hydrex founder
Boud Van Rompay
bvr@hydrex.be

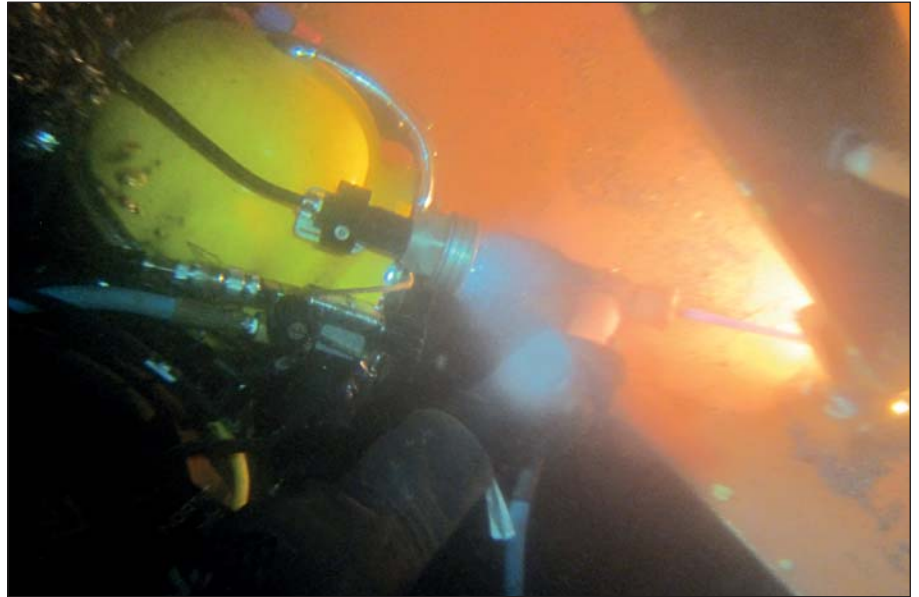


Underwater bow thruster operation in Algeciras

Last month one of our teams removed a bow thruster from a 229-meter bulk carrier. Two weeks later the overhauled unit was reinstalled. Both operations were done during stops in Algeciras, Spain and had to be carried out within the tight schedule available to the charterer.

All the necessary equipment was mobilized from our **Algeciras fast response center**. To keep the impact on the vessel's schedule to the absolute minimum the divers performed an inspection of the bow thruster unit and tunnel, followed by some preliminary work while the vessel was berthed at a lay-by.

The vessel could then shift and start cargo operations while our men performed the rest of the operation without any hindrance to the loading schedule.



Removing the thruster tunnel grids.

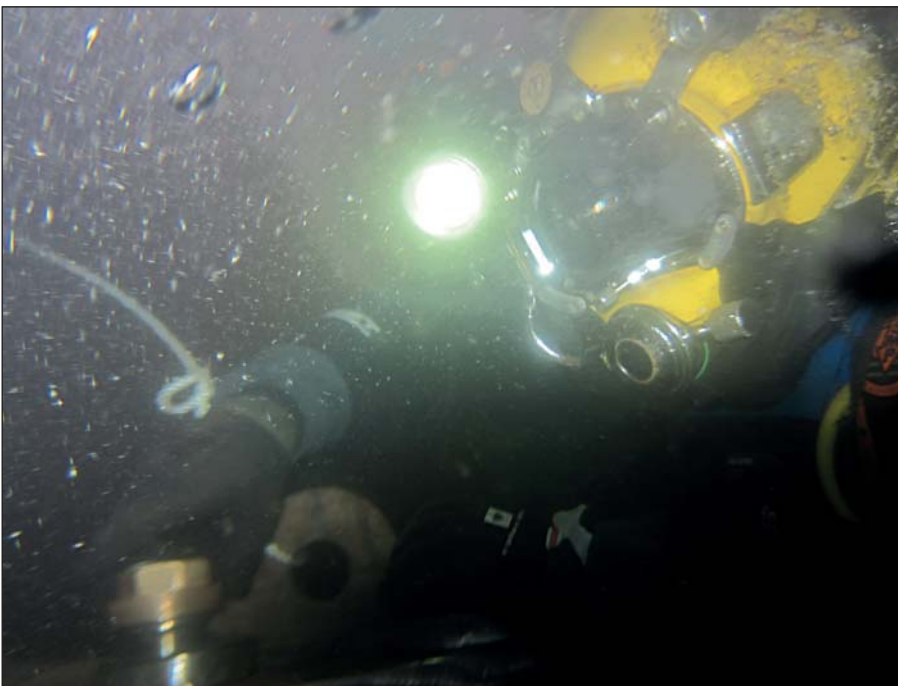
Our diver/technicians detached the blades one by one. In the meantime preparations were made in the bow thruster engine room for the removal of the unit so that there would be no ingress of water once it was taken out.

The next step was to secure the gear-box with hoisting equipment. The team then disconnected the unit from the bow thruster engine room and lowered it onto a cradle. This cradle was designed especially for such thruster operations.

Simultaneously the team sealed off the tunnel from the bow thruster room. Once the unit was lifted onto the quay it was prepared for transport to the workshop.

Creating dry underwater conditions

Two weeks after we removed the thruster unit our men once again mobilized to Algeciras. They reinstalled the overhauled unit underwater with the use of the our flexible mobdocks.



Hydrex diver removing the bolts of one of the thruster blades.



Hydrex under-water inspections

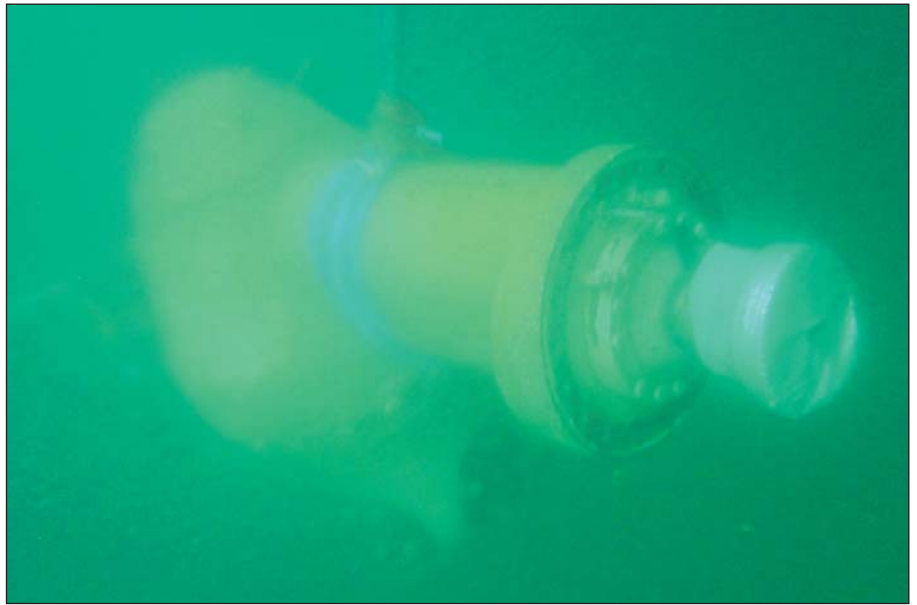


Underwater inspections are an essential aspect of ship repairs. Building upon conventional technical skills and know-how while also taking advantage of the latest technology, Hydrex offers a unique hull monitoring service to its customers. This gives ship owners total control of the underwater hull and the underwater gear of their vessels. An informed decision can then be made concerning any required follow-up action. Catching problems early can save you much money in the long run.

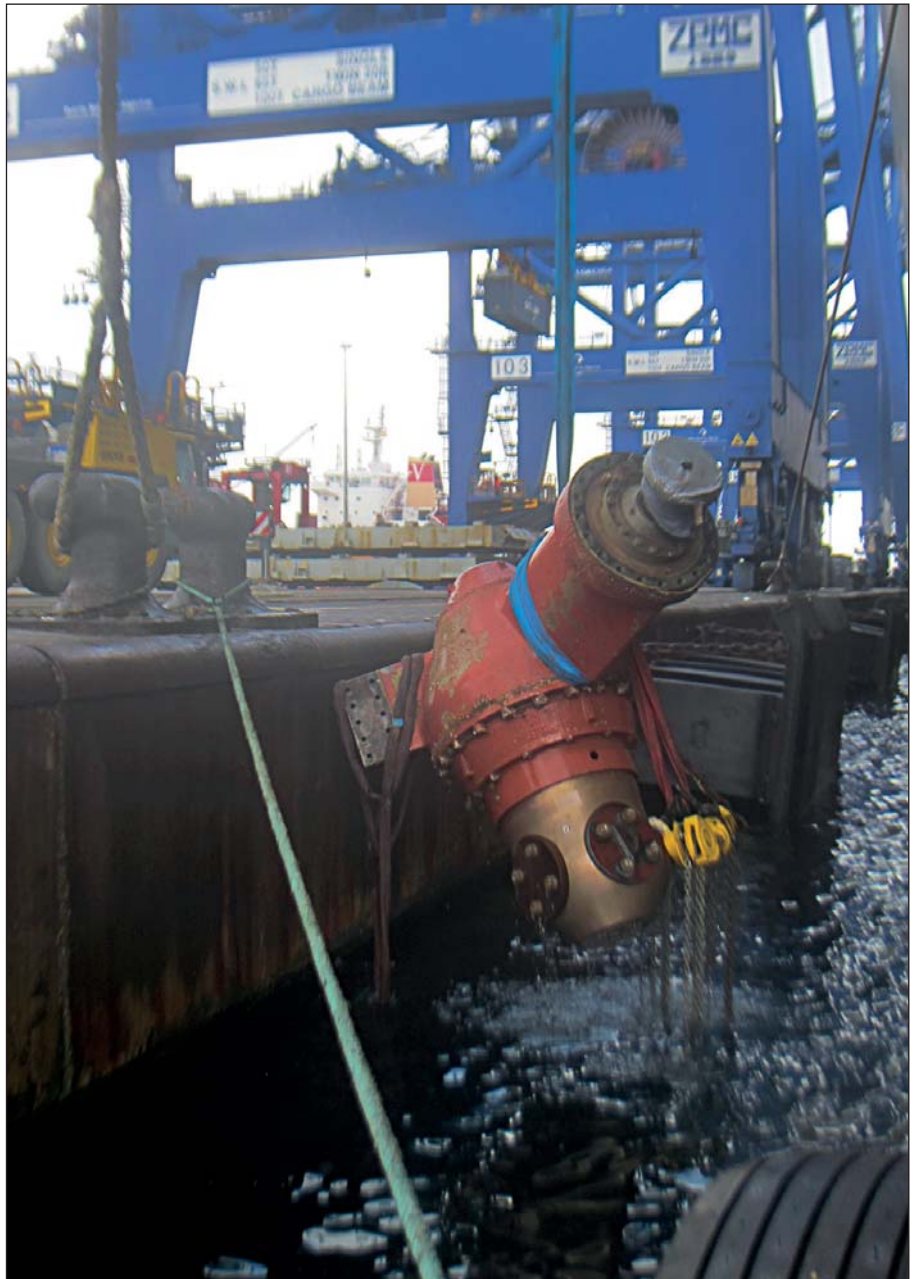
Hydrex diver/technicians can carry out inspections underwater and on-site very swiftly without disturbing the vessel's sailing schedule.

With fuel costs amounting to 40% of operational expenses and continuing to rise, reducing fuel consumption is a vital concern of ship owners. This is the reason why hull monitoring pays for itself. Underwater hull roughness, marine fouling, bent propellers and poor paint condition are all factors that will increase fuel usage due to the drag or inefficiency created by the damaged or affected area. The data gathered can then be used to see if actions are required.

Our diver/technicians are trained for a wide range of operations and they can carry out the inspections in port or at anchor anywhere in the world.



Bow thruster unit brought to the surface.



The thruster was removed while the ship stayed afloat.



Overhauled unit in closed off thruster tunnel.



Installing the seal of one of the thruster blades.

These were used to close off the thruster tunnel once the overhauled bow thruster had been brought inside. This technology has been used during thruster operations for over 20 years now and can be shipped anywhere in the world by plane.

All water was then removed from the tunnel. This created drydock like conditions for our divers despite the vessel staying afloat. Our team secured the unit and connected it to the engine room. Once this was done the thruster propeller blades were

installed one by one. With the thruster blades in position the ship was ready to sail.

Fulfilling the needs of all parties involved

By performing the thruster removal and reinstallation underwater, our divers made it possible for the owner to keep the vessel out of drydock.

We worked in shifts around the clock and finished the job within the

Permanent in-water rudder repairs now possible without drydocking



Hydrex has developed an entirely new method enabling permanent repairs of rudders without drydocking the ship. Permanent repairs were hitherto not possible and ships had to drydock in case a major defect was found. The newly designed equipment is light-weight and can be mobilized very rapidly in our special flight containers. Therefore this new service is now available world-wide.

Major defects on rudders very often cause unscheduled drydocking of ships. The new method designed by our technical department allows engineers, welders and inspectors to perform their tasks in dry conditions. Class approved permanent repairs on-site, without moving the ship, are now possible and commercial operations can continue. Steel repairs and replacements can be performed and pintle and bushing defects can be solved without the loss of time and money associated with drydocking.

The equipment can be mobilized within hours to any port in the world and is available for rapid mobilization from the Hydrex headquarters in Antwerp.

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The blades were installed underwater inside the dry thruster tunnel.



Reinstalling the bolts of one of the thruster blades.



Removing the lifting chains after the thruster was reinstalled in the tunnel.

available time frame. This allowed the ship to sail on schedule, which was a key benefit for the charterer.

Conclusion

Performing a job like this takes a lot of planning. This can only be done successfully by staff who have familiarity with such operations and have the relevant know-how and equipment.

We can assist shipowners with almost any problem they encounter with their vessel's thruster. A wide range of underwater repair or maintenance work can be carried out to all types of thrusters. An entire unit can be overhauled, propeller blades or seals can be replaced or repair work on a specific part of a thruster can be performed on-site.

Contact us for more information on any underwater problem. We are at 24/7 call.

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**KEEPING SHIPS
IN BUSINESS**

Stern tube seal repairs



Using our flexible mobdock method to create a dry underwater environment, we have carried out stern tube seal repairs and replacements underwater for some years now in cooperation with OEMs.

This technology brings drydock

conditions to the ship rather than having to take the ship to drydock, saving a considerable amount of time and money in doing so.

This class accepted method is performed by our diving teams under our warranty. It can be

used while the ship is carrying out its usual cargo or other commercial operations in port.

Visit the special stern tube seal repair section on our website for more information and examples of the many seal repairs we have performed in recent years.

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Creating a gamechanger for underwater repairs in 1979

This year marks the 45th anniversary of Hydrex. Over the last months we have looked back at some of the many key repairs our teams performed since the company was founded in 1974.

For our last trip down memory lane we go back to 1979. This was the year the Hydrex magazine was first published. Boud Van Rompay founded the company only five years earlier, but already Hydrex was making itself known on the international underwater ship repair market.

From the very beginning Boud was convinced that much more could be done in-situ and underwater than



First prefabricated cofferdam ever used for afloat repairs arriving on-site, Antwerp 1979.

most believed. When Hydrex was asked to find an on-site solution for a ship that had suffered a very large gash in its double bottom, he was

sure that the available options were not good enough and that a revolutionary new technique needed to be used. ■

The first prefabricated cofferdam

It is hard to imagine in 2019 that there was once a time when all cofferdams used for afloat repairs had to be made piece by piece on-site, but 40 years ago this was the only option. That is, until a young company from Antwerp decided there had to be a more practical way to do this. Why not use a prefabricated cofferdam that was constructed in a workshop?

In 1979 it might have looked as youthful arrogance to people in the shipping business but has with most ideas conveyed by Hydrex founder Boud Van Rompay and his team, it led to the development of a repair technique still in general use today.



Construction of prefabricated cofferdam in our workshop.



Arrival of the cofferdam on-site.

“They asked us to intervene on a general cargo ship that had backed up into a breakwater in the Persian Gulf: m/v Lunar Venture,” remembers Boud. “The vessel was sailing under the Chinese flag. It had incurred severe damage but because the damage was situated in the double bottom of the engine room it had been able to make the journey to Antwerp. We were first called to

perform an underwater inspection. This revealed a gash of four meters long and half a meter wide. The owner then asked us if we could give the ship repairers direct access to the damage safely. Even back then there was only one answer from Hydrex: Sure!”

Boud still gets a twinkle in his eyes when he looks back at this operation

and what it meant for Hydrex and the entire industry. “I had studied all the literature on cofferdams as well as the way they were used in the salvage industry and more particularly by Siebe Gorman. These were all made on a piece by piece basis. In this case what we needed to do was build a prefabricated cofferdam, one already constructed when it arrived on the vessel’s location. This had never been done. The reason for using a cofferdam was that we needed a permanent repair which could only be carried out with welding work that could be classed as permanent, so nothing could be done in the wet.”

“The idea was to have the cofferdam built in one piece and to use a neoprene gasket. This gasket had to follow the contours. Otherwise it would not seal off the cofferdam completely and there would have been water ingress.”

“The cofferdam was fabricated in our workshop. It was constructed as a tank. When it was lowered it filled with water so it could sink. When the cofferdam was in-situ, it was dewatered with compressed air. When we inspected the tightness, we got confirmation that all measurements were correct.”

“The next step was to secure the cofferdam. This was entirely done with a range of wire pullers which were attached to the bulwark at the stern of the ship. We double checked that the cofferdam was securely fixed,” says Boud. “It was the first time that such an operation was carried out and we wanted to make sure that the cofferdam would not dislocate or shift its position.”



Fast underwater propeller blade straightening



In its quest to provide cost effective services to customers, Hydrex developed procedures to address different kinds of damage to propellers. This research led to the design of the Hydrex cold straightening machines first used in 2002.

By taking advantage of this technique damaged blades can be

straightened underwater, allowing the ship to return to commercial operations without the need to drydock. Blades can be brought back close to their original form, restoring the propeller's optimum efficiency.

The cold straightening machines have been in use for quite some time now but the Hydrex research department has been looking into

ways to expand the technique even further to improve our services. A new version of the straightening machine was recently put into practice. It is compatible with the existing models and is used to restore more severely bent propeller blades to their original condition.

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Final preparations of the cofferdam prior to installation.

“As soon as the cofferdam was secured the ship repairers could go inside and had direct access to the damage in the double bottom of the engine room. All this was done over just five days, which was the time the ship had available before it had to leave Antwerp. The ship was partially loaded but no cargo had to be discharged for the operation. The owner was able to sail his vessel to China without further ado. Everything was done by our own means, which was quite remarkable considering Hydrex had only been in business for 5 years at that time.”



Lowering the cofferdam into the water.

“Later we came up with the name mobdock to avoid confusion. Mobdock is short for Mobile mini dry-dock. This is a general term for a device that creates a dry environment around a ship in order to enable permanent repairs underwater. Mobdocks consist of cofferdams and habitats. A cofferdam is defined as a dry environment in atmospheric pressure. A habitat is defined as a dry environment underwater with ambient pressure. A diving bell for example is a habitat”



Wire pullers were used to keep the cofferdam in place during the installation.

“The whole mobdock technology



Hydrex diver guiding the cofferdam to its position.



The cofferdam filled with water, allowing it to sink. Later it was dewatered with compressed air and gained positive buoyancy.



The damage in the double bottom of the engine room was severe.

has been developed in-house from our headquarters in Antwerp. It took another ten years before the technology really took off, but in the nineties mobdock repairs came very high in demand. It is still a very quick and elegant method to repair ships.”

Boud is proud of the breakthrough they have created in underwater repairs. “What was revolutionary at that time has become routine 40 years later. There is not a single shipowner that thinks of drydock when he has a gash in his ship’s hull. The first thing he thinks is: Can we do it underwater?” ■

Always on time



Hydrex offers turnkey underwater repair solutions to shipowners wherever and whenever they are needed. Hydrex's multidisciplinary team will help you find the best solution for any problem encountered with your ship below the water line. We will immediately mobilize our diver/technicians

to carry out necessary repair work without the need to dry-dock.

Hydrex performs complex permanent underwater repairs to thrusters, propellers, rudders, stern tube seals and damaged or corroded hulls. By creating drydock-like conditions around the affected area

we can carry out these operations in port or at anchor.

All the projects we undertake are engineered and carried out in close cooperation with the customer and any third party suppliers, relieving the customer of all the hassle of coordination, planning and supervision.



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