SUBMERSIBLE CAGES FOR OFFSHORE FISH FARMING

DOWN - UP

WHY A TECHNOCAGE' SUBMERSIBLE CAGE FOR FISH FARMING?

In Italy, like in many other countries, the current development of marine fish farming is linked to the possibility to dislocate the farming activities from sheltered sea areas to more unsheltered ones and even off shore. This is due to:

· **Lack of appropriate areas;**

· **Pollution;**

· **Impact on the environment.**

"The development of the offshore fish farming will then have to count on the use of reliable and appropriate structures for offshore activities".

HOW DOES THE TECHNOCAGE' SUBMERSIBLE CAGE WORK?

The technology applied to the manufacture of submersible cages best combines the typical features of floating cages, such as the easy access and management during the farming cycle, wit safety in terms of resistance to wave-motion allowed by a totaly submerged cage.

This submersible cage come from a special design furtherly implemented by TECHNOCAGE srl thanks to the experience made in the last 15 years in offshore fish farming installations.

The outcome is then a "submersible" cage that can function both on surface and in depth according to the farmers' needs. The structure has been willingly designed without any metallic component in order to eliminate any chance of deterioration or clash with other plastic components.

The cage is immersed by opening the air and water valves. The water pressure pushes the air contained in the HDPE pipes out. To make the structure emerge it is necessary to carry out the reverse procedure. The inflow of air through the valves in the pipes pushes water out, which was inside the HDPE pipes.

The air pressure can be supplied with underwater bottles and or low pressure compressor of at least 300 lt/min. in outflow, with tank of at least 100 lt approx.
The cage is kept floating by closing of all air valves. It is important to highlight that when the cage is emerged it has the same characteristics of a plastic floating cage.

The submersion or emersion of cages can be carried out in about 10 minutes, but in order to avoid stressing out the farmed fish, the emersion times in particular
can be extended up to about 20-30 minutes. However it is possible to determine, according to the features of the farmed fish and on the installation site, the correct emersion times.

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HOW IS TECHNOCAGE' SUBMERSIBLE CAGE MADE?

The submersible cage presents the following characteristics:

· the main structure used as a support to the farming nets is composed of a TechnoCAGE plastic round cage with variable circumference formed by 2 HDPE pipes with varying diameters (see technical details) without the usual filling of expanded polyethylene typical of floating cages but presenting an additional pneumatic system;

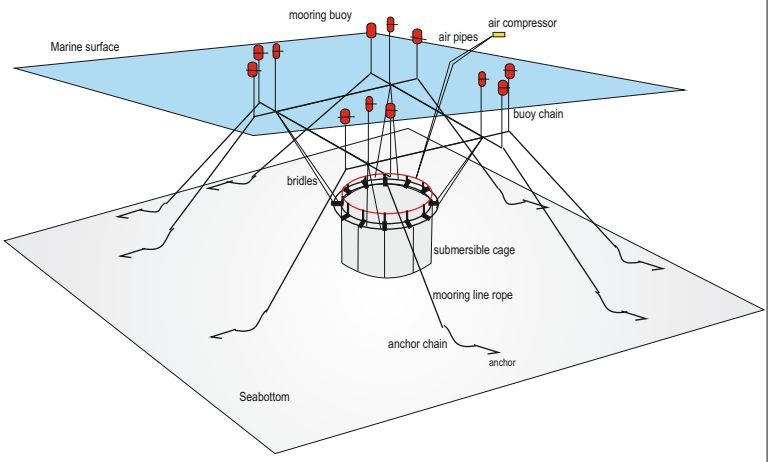
· the perimetric welded supports are of the reinforced type and are more resistant to typical offshore weather conditions. These support the braid which is also made of HDPE pipes.

A farming net is applied below the HDPE structure, which is normally made with full strength nylon. The net, which contains fish in a limited space, is one of the most important components of submersible cages. The size of the mesh varies according to the size of fish and are manufactures in ranges from 2 to 80 mm and 210/300.

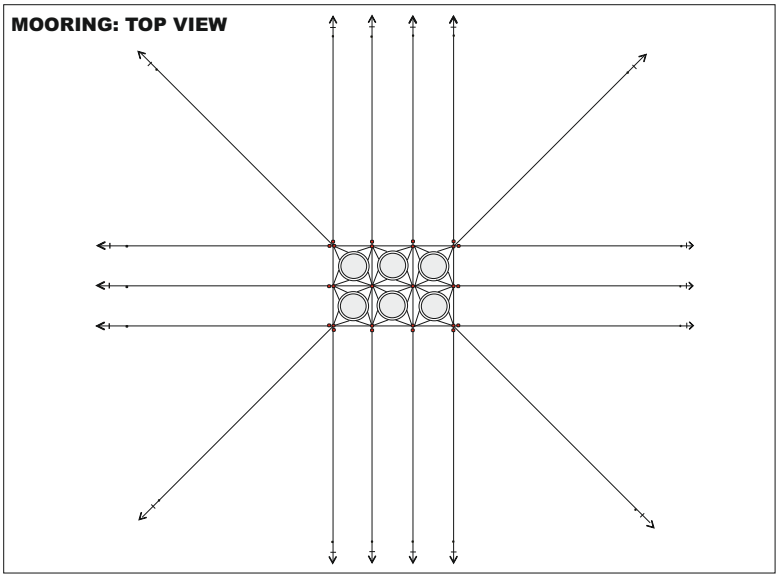
All the activities involved in the ordinary running of farms, like fishing, sampling for biometric measurements and any other rescue related actions are carried out, thanks to the size of TechnoCAGE submersible cages, on surface. That's why the net is fitted with a "removable" lid in the upper part of the cage.

The net roof, made with nylon nets, has a fixing system with hand stitch and a plastic marine zip-fastener (ultimate load= 2000 kg/m) and can be therefore removed easily.
It is possible to insert perimetric ballast rings into the fishing net. These further tense the net in case it is installed in areas of very intense marine currents.

GRID MOORING SYSTEM



MOORING: TOP VIEW

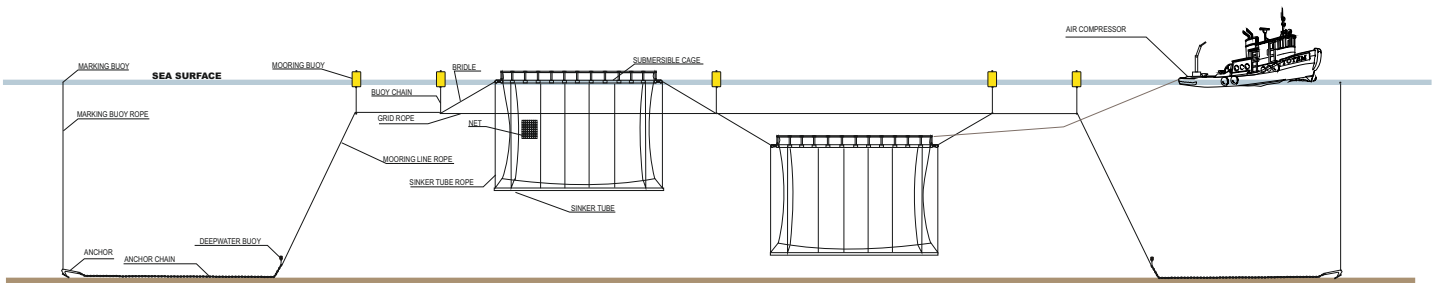


HOW IS THE TECHNOCAGE' SUBMERSIBLE CAGE MOORED?

The mooring system used is called "RETICULAR" .or "GRID SYSTEM".

This particular mooring scheme has been long used by a number of manufacturers of floating cages for fish farming.
The characteristic of the submersible cage TechnoCAGE is instead to use this mooring system also for submersible structures.
The reticular system is the one that offers the best cost-effective ratio among all those used within the specific sector.

The calculations of the mooring is carried out by TECHNOCAGE' engineers and determined through a specific computer program.



Side view of a mooring gris system: "UNDERWATER AND FLOATING POSITION OF A SUBMERSIBLE CAGE"

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