

THE NEED FOR EASY AND ACCURATE INSTALLATION IN UNDERWATER CONDITIONS

Mattresses and gabions have numerous uses when it comes to river structures and coastal protection. Gabions are key solutions for both longitudinal and grade control structures in watercourses. Reno Mattresses can protect bridge abutments and piles from scouring or they can work as toe scour protection in harbour basins, during the docking and undocking manoeuvring.

Since these solutions often need an underwater installation, their implementation could become quite challenging. The idea to simplify the laying of mattresses and gabions while maintaining their excellent performances led to the development of these new solutions.

RenoMac Plus and **CubiMac** were designed to provide the highest efficacy in various resource-intensive conditions.

Discover our prefilled underwater solutions and related MACRA software to design environmentally sound hydraulic solutions.

MACRA
Maccaferri River Analysis



Our products are certified and tested by leading institutes and in accordance with the latest guidelines and standards (EN10223-3, ISO 17746, ISO 17745). Product certifications include CE mark, BBA Agrément Certificate (CubiMac), NF mark, COPRO mark, and BAFU-FOEN homologation for snow-barriers. For more information contact our certification office.



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Engineering a Better Solution

Maccaferri's motto is '**Engineering a Better Solution**'. We don't merely supply products, but work in partnership with our clients, offering technical expertise to deliver versatile, cost effective and environmentally sound solutions. We aim to build mutually beneficial relationships through the quality of our service and solutions.

GLOBAL ENGINEERS

In the second half of the 19th century we invented Gabions and dramatically changed the civil engineering landscape. We are still changing it today. We work every day to find better solutions for our clients at every degree of latitude and longitude. Our worldwide network grows through innovation and diversification of sectors of activity and through an increasing range of high quality and environmentally friendly products and applications.

OFFICINE MACCAFERRI GROUP PROFILE

Founded in 1879, our Group soon became a worldwide reference in the design and development of advanced solutions, with offices in over 70 countries and 30 factories worldwide.

Our mission is to pursue excellence through continuous improvement, while delivering to customers engineered solutions that are innovative, advanced and environmentally friendly. We are committed to outstanding safety, quality and sustainability, to create value for all stakeholders as well as our communities.

MACCAFERRI APPLICATIONS

 RETAINING WALLS & SOIL REINFORCEMENT

 HYDRAULIC WORKS

 ROCKFALL PROTECTION & SNOW BARRIERS

 EROSION CONTROL

 SOIL STABILIZATION & PAVEMENTS

 BASAL REINFORCEMENT

 COASTAL PROTECTION, MARINE STRUCTURES & PIPELINE PROTECTION

 ENVIRONMENT, DEWATERING & LANDFILLS

 DRAINAGE OF STRUCTURES

 TUNNELLING*

 LANDSCAPE & ARCHITECTURE

 SAFETY & NOISE BARRIERS

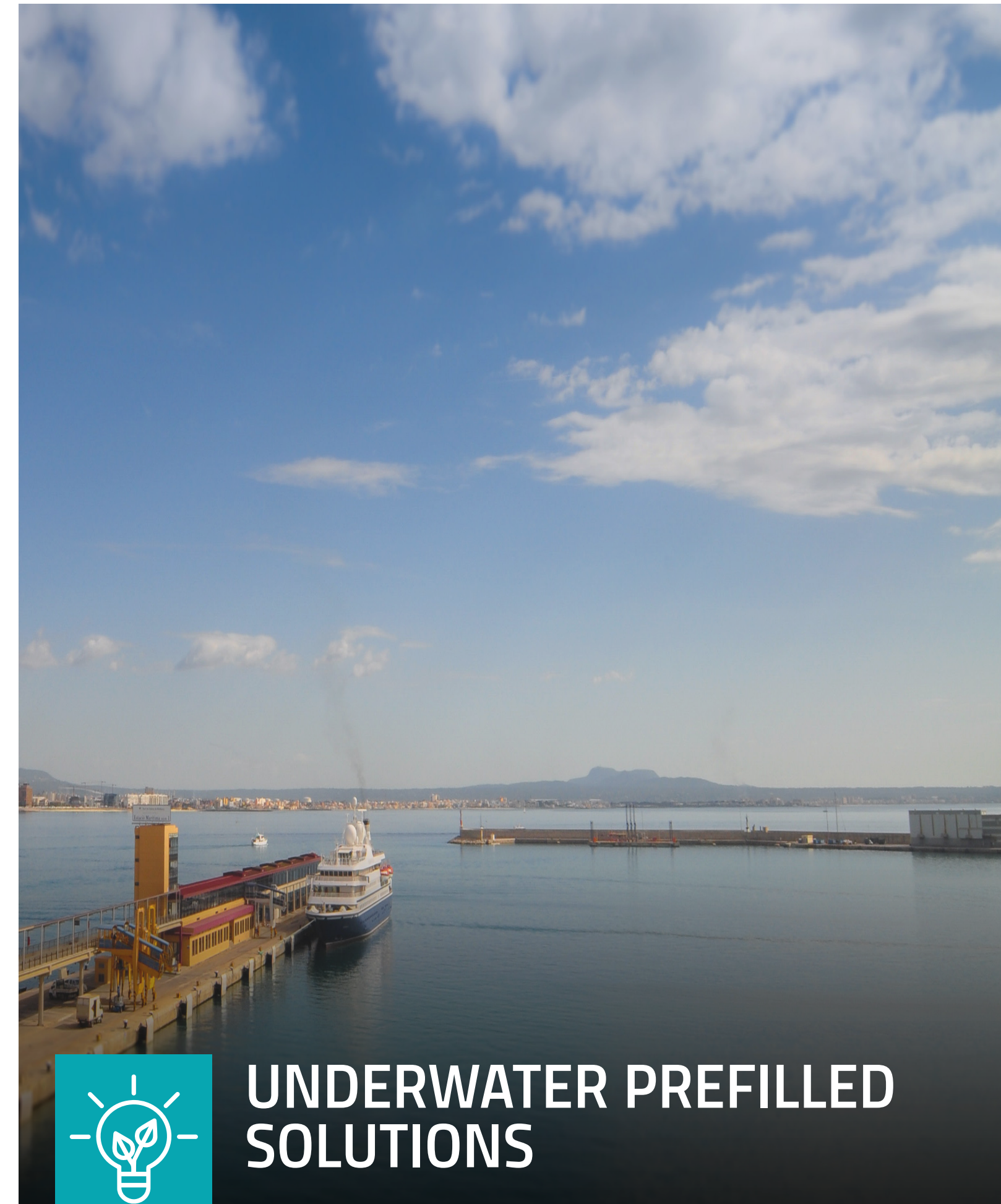
 FENCING & WIRE

 AQUACULTURE NETS/CAGES

 CONCRETE FLOORING, PRECAST & OTHER USES*

 INDUSTRIAL MANUFACTURING

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UNDERWATER PREFILLED SOLUTIONS

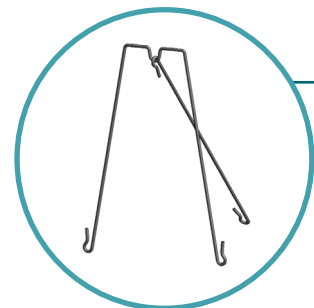
PREFILLED SOLUTIONS FOR UNDERWATER ENGINEERING APPLICATIONS

A rapidly changing world needs technological development and innovative solutions. The need for hydraulic works and erosion control applications is increasing, especially due to extreme weather events.

Underwater installation of mattresses and gabions in harbours and watercourses can be challenging, especially during filling operations. Our aim was to design environmental friendly solutions that could save time during the installation and considerably reduce material waste.

RenoMac Plus and **CubiMac** do not need to be filled on-site but they can be moved to the construction site ready for installation. With **prefilled solutions** the laying process is more accurate, avoiding unnecessary waste of time and resources, and the whole installation process becomes more sustainable.

RenoMac+



X-Tie is the experimentally developed and patented tie to maximise the structural resistance of the mattress.

PoliMac®
WIRE PROTECTION FOR A CHANGING WORLD

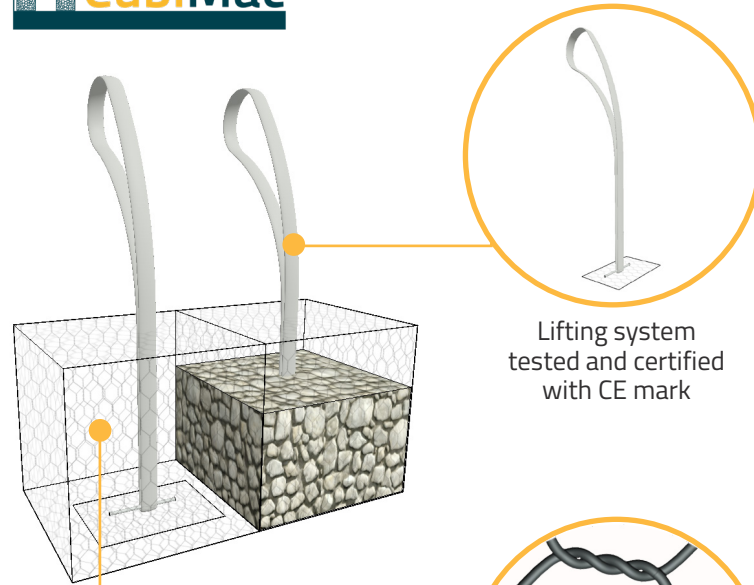
The coating gives outstanding protection against mechanical loads and chemical aggressions.

Download BIM from maccaferri.com/BIM



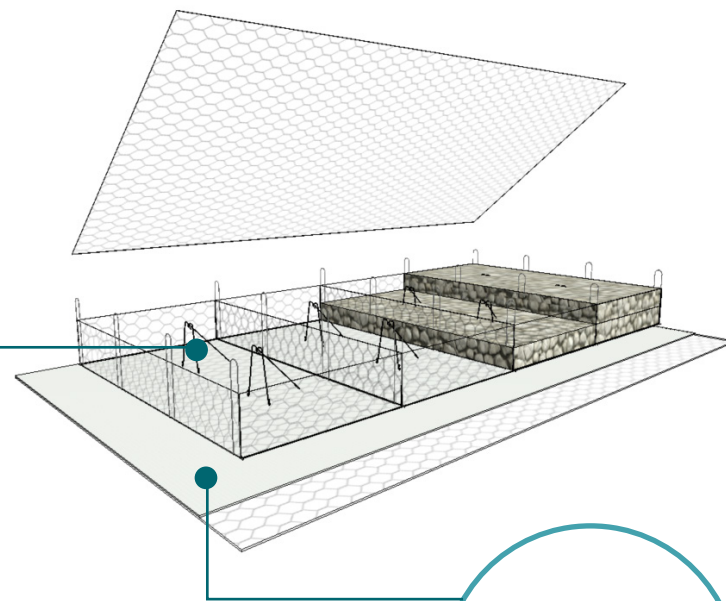
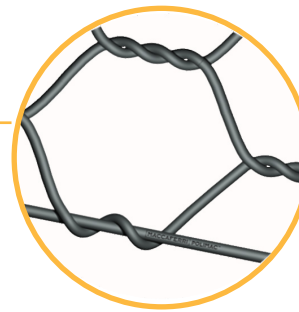
MACCAFERRI | UNDERWATER PREFILLED SOLUTIONS

CubiMac

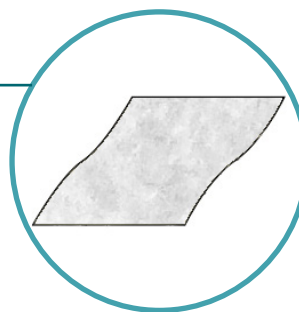


Lifting system tested and certified with CE mark

A heavy and robust grade of hexagonal double twist wire mesh was manufactured to resist deformation

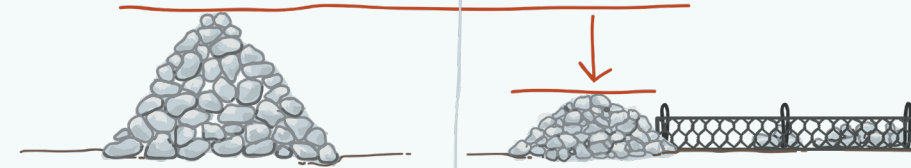


MacTex® is the high quality non-woven geotextile used for separation and fine sediments protection.

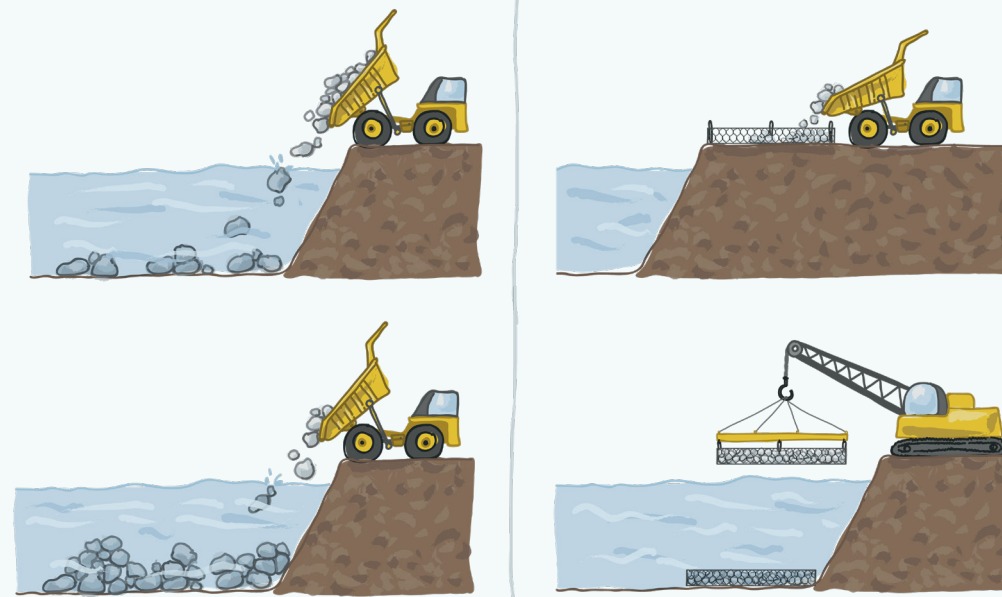


PREFILLED SOLUTIONS FOR UNDERWATER APPLICATIONS

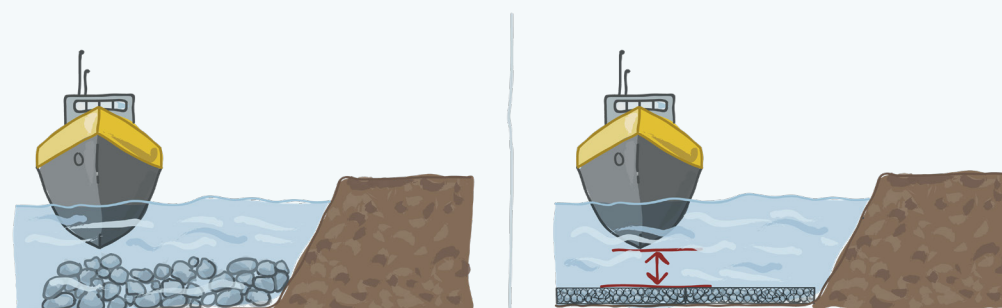
WHY CHOOSE A PREFILLED SOLUTION OVER A TRADITIONAL ONE?



OVER 70%
STONE SAVINGS
VS RIP-RAP



LESS
MATERIAL,
MORE
ACCURACY



MORE SPACE
AVAILABLE

"Starting with a great solution, developing an even better one"



TOTAL COST OF OWNERSHIP



DESIGN OPTIMIZATION

There is no need to fill the mattresses and the gabions on site and therefore the setting of stones inside the assembled cage can be carried out more accurately.



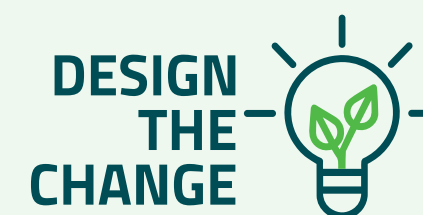
EASY & SAFE TO INSTALL

The laying and filling of the assembled cages in underwater conditions can be challenging. With prefilled solutions, the filling process can be carried out on the ground and the installation becomes a lot easier and more accurate.



EXTENDED LIFESPAN

PoliMac coated prefilled solutions are designed to face the most aggressive environmental conditions with great durability. Also, there is no need to replace stones like in rip-rap solutions.



+ ENVIRONMENTAL BENEFITS
+ BIODIVERSITY
+ DURABILITY

Less polluting emissions from mining and quarrying.

RenoMac Plus and CubiMac create a natural habitat for living species.

An outstanding durability extends the life-cycle and makes the solution more sustainable.