FLOATING PONTOONS: BETWEEN ENGINEERING AND FUNCTION

INGEMAR'S EXPERIENCE IN DESIGNING FLOATING STRUCTURES FOR MARINAS, INDUSTRIAL AND SPECIAL PROJECTS

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In recent decades, floating structures have revolutionised the design and management of marinas. In particular, floating pontoons have established themselves as a solution capable of combining reliability, speed of installation and flexibility of use, responding effectively to changes in the nautical sector.

Among the companies that have contributed most to this evolution is Ingemar – Ingegneria Marittima, active since 1979, today an international benchmark in the construction of jetties, piers and breakwaters.

We explored this topic by interviewing engineer Lorenzo Isalberti, the company's founder, who guided us through the technologies, applications and future prospects of floating structures in contemporary marinas.

TECHNICAL EVOLUTION: FROM THE FIRST PONTOONS TO CURRENT STANDARDS

"Floating structures in marinas started to become popular about fifty years ago," says Isalberti. "They were considered temporary solutions: cheap, but unstable and not very durable." Since those uncertain beginnings, technology has made enormous progress. Today, floating docks are an integral part of every modern marina's layout. Among the main advantages:

- progressive installation, ideal for phased port construction;
- prefabrication, which reduces the time and complexity of the construction site while providing greater cost certainty;
- lower environmental impact and constancy of the freeboard at varying tide levels;
- flexibility, with the possibility to move according to operational needs.

The construction method adopted by Ingemar – modular prefabrication – had a profound effect on the efficiency of execution and the quality of the works. "Today we build structures capable of supporting distributed overloads of 150 to 400 kg/sq.m, with high stability and durability performance, able to withstand even difficult weather and sea conditions," Isalberti emphasises.

CLASSIFICATION OF FLOATING STRUCTURES

Floating structures fall into three main categories:

- floating pontoons: for mooring small and medium-sized boats;
- floating piers: larger in size, suitable for larger yachts or intense flows;
- floating breakwaters: designed to dampen wave motion in semi-protected contexts (bays, river mouths, commercial and industrial ports).

Ingemar has adapted each type to its specific requirements.

Malta - Floating berths and infrastructure for Marina di Valletta

[Above]
Floating pier and pontoons for the Genoa International Boat Show (Ingemar as technical partner)

[Center]
Lorenzo Isalberti, Ingemar founder and President

[Below]
Casale sul Sile (TV) - Ingemar production facility and outdoor storage/assembly areas

TECHNOLOGIES AND MATERIALS

The most widespread technology in Italy is the discontinuous flotation technology, which provides spaces between the floats to facilitate water exchange.
It is characterised by a light structure and a contained and harmonious environmental impact. Supported loads range from 200 to 400 kg/sq.m.
A floating pontoon of this type generally consists of:

- floating concrete units with expanded polystyrene core, which guarantee stability and unsinkability even in the event of accidental impact;
- steel or aluminium upper structure,
- walking surface and finishes in wood or composite materials.

In recent years, continuous flotation technology, based on reinforced concrete monobloc modules (again with an expanded polystyrene core) has also become established. These elements, generally with an exposed concrete top finish, integrate structural and floating functions, providing greater stability and load-bearing capacity, albeit with a more significant impact on the environment and hydraulic regime of the site.

FLOATING BREAKERS

Wave breakers are based on the reflective effect of floating bodies on the wave and are distinguished by different shapes, sizes and displacements.
Over time, size and performance have increased from 12×3 m modules to full-fledged floating maritime engineering works.
"We have realised wave breakers up to 10 m wide and 20 m long, with a weight of 185 tonnes," notes Isalberti. "Connected in series, they allow a dampening of the wave motion according to parameters such as wave height and period and, in particular areas that are already partially protected, the construction of real floating harbours."

THE INGEMAR EXPERIENCE: INNOVATION AND INTERNATIONALITY

Founded in Milan in 1979, Ingemar has its headquarters and production plant in Casale sul Sile (TV).
It operates mainly in the Mediterranean basin but has also carried out major projects in Switzerland and in and around many countries of the Red Sea and Arabian Gulf.
In addition to a comprehensive range of floating pontoons, jetties and breakwaters, Ingemar designs and builds structures for sporting events - such as the platforms installed at the Athens Olympics - as well as fixed docks and special solutions for applications in the transport, industrial and leisure sectors
"We are known for our design flexibility and ability to adapt to customer requirements," says Isalberti. "We can operate both as a supplier of standard elements and as a contractor, offering tailor-made solutions and turnkey projects."

CERTIFIED RELIABILITY AND SPECIAL USES

In addition to the tourism sector, Ingemar collaborates with important public and private entities: Enel, Edison, Pirelli, Agip Petroli, CNR, Navy.
It is the only Italian company in the sector to hold SOA OG7 class VII certification, unlimited (maritime works), and OS18-A class III-Bis (structural steel components).
It is also ISO 9001:2008 certified, a guarantee of quality in business processes.

FUTURE PROSPECTS: SUPERYACHTS AND EMERGING MARKETS

The marina sector is undergoing rapid transformation.
The size of vessels is growing, as are expectations in terms of comfort, accessibility, services and customisation.
In this scenario, Ingemar is gearing its activities towards:

- construction of piers for superyachts;
- design of special floating structures for industry, transport and defence;
- expansion into strategic areas such as the Middle East and North Africa;
- development of high-performance wave breakers;
- environmentally friendly and innovative solutions for efficient port space management.

AN ENGINEERING RESPONSE TO EVOLVING MARINAS

From the search for flexible configurations to the ability to tackle special projects, Ingemar confirms itself as a technical partner of excellence for the evolution of contemporary port engineering.
Floating pontoons have evolved from temporary solutions into stable, efficient and durable design elements – the symbol of a new engineering vision at the service of modern boating.