



Key members of the Ingemar team, l to r: Paolo Tasca, production manager; Lorenzo Isalberti, president; Sebastiano Pulina, managing director; and Andrea Padoan, project manager.

Customisation – with the help of science

With enhanced production facilities designed to meet the needs of large breakwater sections, progressive R&D, in-house hydrodynamics software and a special team, Ingemar founder and president Lorenzo Isalberti has created a leading company in the floating structures sector. *Donatella Zucca* investigated

Established in 1979 in Milan, where its headquarters remain, Ingemar has always specialised in port infrastructure and floating structures for recreational boat moorings and is now amongst the global leaders in this field. Its niche speciality is to work on a coordinated set of elements that meet the needs of both the customer and the immediate natural environment and to offer excellent after-sales service. The company prides itself on its production processes, which are the result of unique research, and ensures that all floating elements are as safe as fixed structures while being cheaper and eco-friendly.

A total of 32 employees, and four industry collaborations to give a total of nine engineers, form the core of the company. Together, over the past five years, they have generated an average annual turnover of €9 million with high spots of €11 million when orders were especially good.

The outdoor area of Ingemar's Casale sul Sile factory (above) is used for storing materials and concrete elements that are too large or heavy to be undercover. Interior space (right) is used for machining steel structures and mechanical components.

All design and manufacture of floating docks and breakwaters, fixed quays and service distribution terminals takes place in the Ingemar factory in Casale sul Sile (Veneto). The factory spans an area of 7,000m² (75,347ft²), with 2,000m² (21,528ft²) covered and the remainder available for handling and storing materials. Retractable sheds have been built for the construction of prefabricated floating breakwater

sections. "Our business in the breakwater sector is perhaps the most interesting for me," asserts Lorenzo Isalberti. "With the decrease in the availability of natural harbours where floating docks can be more easily installed or where fixed breakwaters can offer protection, we need to build berths in increasingly difficult sites," he says. "This is far more expensive so, whenever possible, we try to develop floating systems that function properly irrespective of the depth of the water. This makes for important economies."

"A traditional [fixed] marina on a seabed of, say, 6 to 8m (20 to 26ft) is too expensive but when floating structures are used, the seabed doesn't make any difference," he clarifies. "Furthermore, the wave action on a floating structure is very different from the action on a continuous and vertical barrier. Its efficiency depends heavily on the type of incidental wave, especially in terms of height, and the wave characteristics of the site in question. A floating dam in



PROFILE: PONTOONS & BREAKWATERS



An Ingemar floating pontoon system at Marina d'Arechi in Salerno, Italy.

In Saudi Arabia, Ingemar is a direct contractor for the Ministry of the Interior and builds structures for coast guard bases.

On the production line

Ingemar's FCA type breakwater is prefabricated in reinforced concrete with high displacement polystyrene core and modules can be linked end-to-end or in parallel to provide robust and reliable floating barriers similar to traditional fixed structures. Examples can be found in Lefkas Marina in Greece and Porto Montenegro in Tivat, Montenegro.

The company also offers floating pontoons and associated elements like fingers and mooring rods, and a range of products such as consumer accounting systems, fire extinguishers, systems for pump-out, desalination and boat washing.

Proven prefabrication techniques are also applied to fixed pontoons, docks and platforms as seen in Porto Mirabello in La Spezia, Cala dei Medici in Rosignano and elsewhere.

Equally important is the company's experience in building structures for lakes, quaysides for tugs and in other fields that range from building the Redeemer Bridge across the Giudecca Canal in Venice to the launching slide for the 2004 Athens Olympics.

But what makes the company different from its competitors? "Generally, they are all very industrial," Isalberti muses. "No one offers our flexibility, customisation, variety of products and bidding power. Over the years, they have constantly improved a specific product whereas we can build all product types and can offer a total mooring package and have a much appreciated after sales service."

Isalberti speaks to *Marina World* at his headquarters in the city of his birth – land-locked Milan – but the sea is always close to mind. "Milan is full of lovers of the sea, sports and recreational navigators. When I started work in prefabrication my love of boats and the sea prompted me to go to Walcon – a company that shared my passion for boating – when it set up in Italy. Three years later, I went out alone with Ingemar. I was 30 years old – and I worked a lot. Today, I work an average ten-hour day, always with the same passion and also with great pleasure."

the middle of the sea would not serve anything – it would break."

All types of Ingemar floating structure are verified in a specialist laboratory such as the Maritime Construction Laboratory at the University of Padua, where Ingemar has for many years been testing the effects of wave conditions on floating structures. Particular emphasis is placed on the incidental wave and the wave that hits the outside of the floating barrier rather than wave effect at the anchoring points and pontoon connection points.

In the factory

Manufacture is a streamlined process with parallel production of breakwater elements (up to 20m (66ft) x 4m (13ft) x 2.4m (7.8ft) weighing up to 68 tonnes) and pontoons (up to 12m (39ft) x 3m (10ft) x 1.2m (4ft)). One unit within the same complex is used for mechanical machining of steel structures and components, wood assembly, aluminium and steel parts, and another unit for casting the concrete breakwater modules.

"We have machinery for assembling metal structures and two deck wagons inside, and we have a fixed crane outside for handling the stored materials and a batching centre for the concrete elements which, due to size and weight, cannot be dealt with inside."

On the water

Ingemar has always benefited from a diverse customer base. "We sell to public entities and private companies that are involved in the construction of new marinas. In both cases we are direct contractors providing and installing products and facilities," Isalberti confirms. "As a SOA registered

company, we are able to complete work up to a designated ceiling and, depending on the size of the project, can act as either a sub-contractor or specialist supplier."

Export projects secure the largest slice of sales; over 85% in 2016 but falling this year to 60% as major contracts in Italy have come to fruition. "Our market is always nautical, especially with the new superyacht requirements which are very interesting in terms of both products and services. Then there is renovation and expansion of marinas where breakwaters are increasingly able to withstand difficult conditions and waves in excess of a metre high."

"Our hydrodynamics software is devoted to the numerical analysis of the effects of waves, wind and currents on floating structures and enables us to test the stresses on structures and size the elements, connections and functional systems far more scientifically than before," Isalberti explains.

The most profitable Ingemar work comes under the heading of 'special projects'. These include navy and coast guard contracts and manufacture of industrial structures for companies such as Enel, Agip Edison and Pirelli. "We take on projects that large companies are not interested in and local companies are unable to fulfil."

Some projects are long term. "We have been working for four years in Kuwait, for example. The investor contributes the labour and cement and purchases all other goods and we are responsible for the design, technical supervision and accessories. We have completed 25km (15.5mi) of docks."