Customisation, the (new) standard in the fender industry

Fender systems are the interface between ship and berth. A safety measure to protect vessels, infrastructures and people, that needs to perform for its entire service life, even in the most remote locations and under harshest conditions.

Designing good fender systems encompasses many skills and disciplines, and standards are needed to design and manufacture them. Nevertheless, even two berths for the same application might require different fender systems and a design concept that is rarely simple and never an off-the-shelf solution. Putting an extensive focus just on the rubber unit and more or less ignore the requirements of the overall project, is a dangerous one-sided approach to fender design, which unfortunately seems to become common practice in the industry by some. No two projects are alike, no two solutions are alike and customisation is the new standard when dealing with a marine infrastructure project.

Figuring out customisation

First things first. Customisation refers to the act of adapting a product or service to suit certain requirements and preferences, and also applies when modifying something to solve a specific task. Translated into business language this means, customisation is the result of putting the spotlight on the project and the customer.

We are used to seeing customisation in the retail industry, e.g. soft drink cans are customised with the buyer's name, or in the automotive industry. Now, what is the path to fender system customisation? A focus on the uniqueness of each project and of each client. This uniqueness might come in the shape of the product, the installation, sustainability, delivery and other special project and client requirements.

A customised fender system can only perform as expected if several aspects are considered, such as the project conditions, all the system components and their manufacturing. Considering them all and treating a fender system as one unit is the way to meet the project and client expectations.

Project conditions

Firstly, deeming and delivering each project as unique means taking into account the constraints of the project. These are very individual and comprise, amongst others, the local climate, vessel types and berthing energy, location, berthing approach or berthing structure. Furthermore, the review of different characteristics of the various fender types should also be incorporated in the design process.

Components

Part of the customised approach is to ensure the fender system is up to its task, the designer must keep an eye on the big picture, while paying attention to every little detail. The rubber unit is a crucial component of the system, but it is only as good as the system's overall design. A fender system is made of different components: rubber unit, steel panel, chains, anchors, fixings and PE plates. All of them and their interaction should be seen together to make sure they are all designed in the correct balance and work together properly.

Manufacturing

From a technical point of view, the road to a good rubber fender is completed with the combination of high-quality source materials and a fender manufacturer expertly skilled to guarantee the performance of the final product to the individual project requirements, and also international standards. The same applies for steel parts and PE as well.

When speaking about customisation, the focus is often on the product itself as an individual solution for the client, based on project requirements. However, customisation goes far beyond that and is valid for the entire steps of a project, from consulting to design, to manufacturing and delivery.

Such level of attention to the uniqueness of each project and of each client is only possible when relying on a company that has the resources and experience to design, engineer, manufacture and follow up the whole process until its completion.

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What it looks like: A Trajectory to Customisation

Projects that speak for themselves

The construction of a completely new port is a huge project, coming with the same project conditions, such as weather, tides and water levels, but challenged to meet many different requirements. This is the case of the international Seaport of Turkmenbashi, the largest on the Caspian Sea, customised to safely berth different types of vessels at its different terminals: general cargo, dry bulk, ferry, shipyard, passengers and containers.

On the other hand, there is a single pontoon in Singapore in an exposed location with strong currents, swell and choppy waters that needs to perform 24/7. Customisation came with extra support of the Cushion Roller to dampen the main impacts and with the addition of a roller hinge to accommodate the tilting movements.

The small passenger terminal in Stubbekoebing (Denmark) needed a curved fender system so the ferries could pivot "around" the dolphin, which serves as a turning support. The customer's requirements in this case called for customisation in the engineering, solved with a pre-bent panel that snugly fits around the dolphin, creating an energy absorbing and deflecting fender system.

A recent project in Norway came with the challenge of differently sized dolphins to which the fenders had to be installed. Additionally, the existing concrete was quite old and partly damaged, and the required stand-off distance was rather small, posing a high demand for the design and installation of fenders, panels and chains. These three challenges were overcome with a customised product that integrated special tubes into the steel panels to avoid the need of additional flanges.

Logistics can also be the focus of attention, especially if the construction site is located near the centre of a large city, where the lack of space to store materials is one of the biggest issues. In this case in Sweden, customisation comes in the shape of the delivery being done in separate shipments, simple solution but not handy for every supplier.

And what about if the construction happens in Antarctica, an "ecologically fragile and worth preserving" environment. In such environments, the short installation window (only possible during the Antarctic summer) required a customised service and a very close and individual coordination between the client, the contractor and the manufacturer: "Try to imagine all the steps they [the installation crew] have to take and under what conditions they have to do it. If you give them small bits and pieces to assemble in -50°C. Give the team something that's easy to assemble and to perform for a long time without maintenance."

To finish this trajectory, let's look ahead in the future where customisation is coming in the form of sustainability. A LNG project in Jakarta (Indonesia): "After 10 year of being exposed 24/7 to waves, wind, sun, and salt water at an offshore terminal without major maintenance, all fenders are still in good condition" and will continue to do so for at least the next 10 years.

With more than six decades of group experience, ShibataFenderTeam have always had the focus on customisation. For the past five years, we have advocated in the industry for a holistic approach to fender system design, valuing the aspects of project conditions, system components and manufacturing as being seen equally. Starting in 2021, we finally noticed an evolution within the industry and corresponding standards, and it is good to see that others finally follow.

What to expect from 2023

Sustainability will move further to the centre of the table with the goal to reduce emissions. Reducing the impact is key, like with reskinning Foam Fenders so they can be used again and do not need to be manufactured new - which we have done for the Port of Kiel (Germany). Also reduce from the beginning, which means

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working with a sustainable and green design to extend the life cycle of fenders. Following this approach, it will not be necessary to waste more raw material and other resources for early refurbishments or even new fenders in cases of damages.

The industry path in 2023 will also be influenced by the release of the updated 'Guideline for the design of fender systems', revised by PIANC Working Group 211. Being future oriented, this updated guideline will strengthen a sustainable approach and includes a holistic view to fender system design. For the market, we expect a further positive development. First with the - hopefully soon to be calmed down and solved - disruption of the supply chain (with regards to raw materials and shipment in general) and also with Governments maintaining the flow of money for infrastructure projects to work against the Corona impacts.

Finally, we have seen two applications rising lately as key in the industry. Energy diversification being the uppermost concern, has meant that LNG supply installations are a big topic in Northern Europe: new terminals are being built to help countries to become more energy independent. And, back to normal after the Corona crisis, cruise projects which had been paused due to the pandemic are flourishing as tourism starts up again.

Herein: *On a project in Singapore in an exposed location with strong currents, swell and choppy waters, customisation came with the extra support of the Cushion Roller.*
Below: *Reskinning Foam Fenders so they can be used again and do not need to be manufactured new - successfully done for the Port of Kiel.*