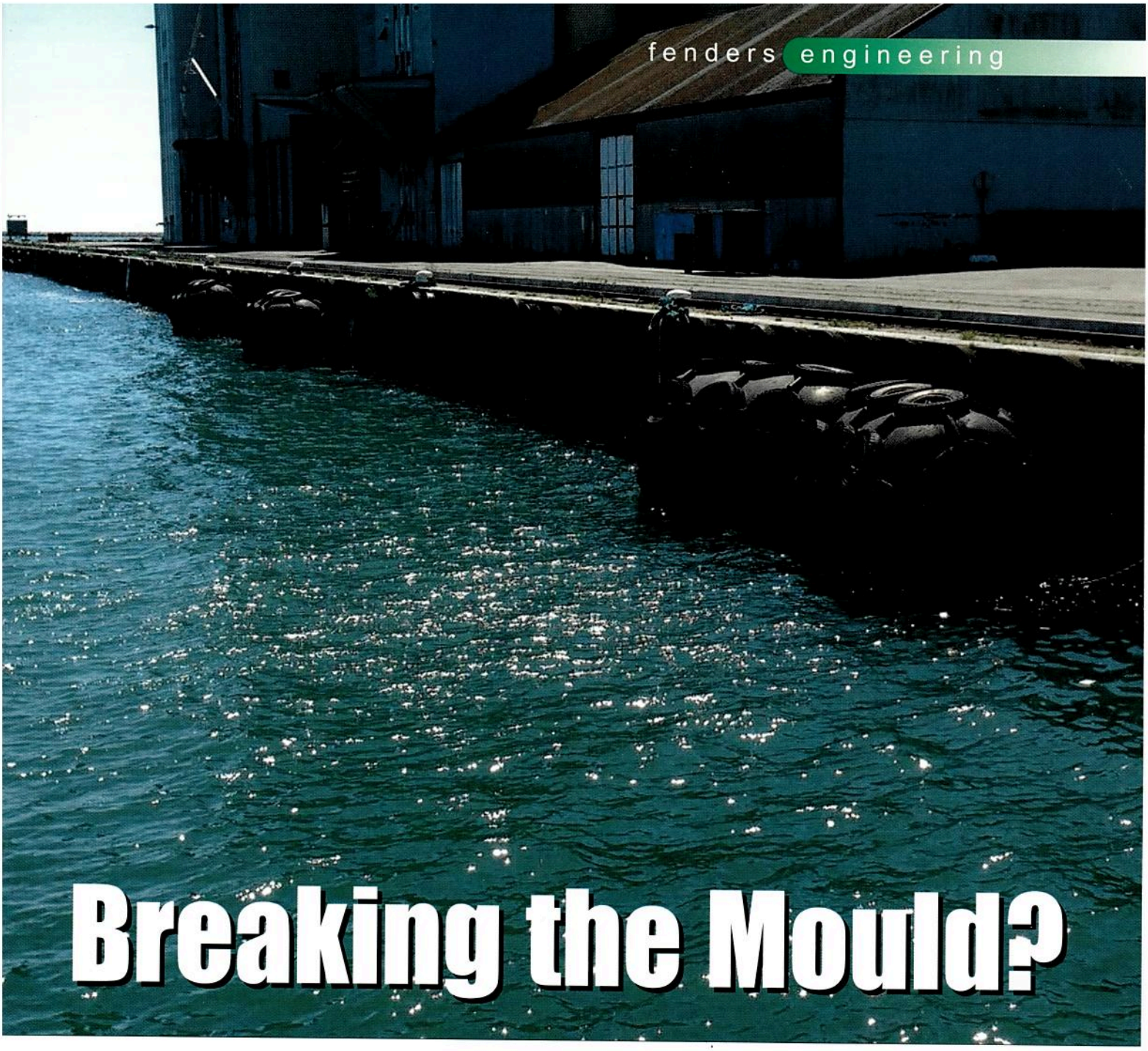

Breaking the Mould?

World Port Development reports on why fender quality and correct manufacturing methods are crucial to success in a market that is not only fiercely competitive but also diverse.

In recent times, pneumatic fenders (commonly known as floating fenders) have seen a change in the way they are manufactured from the traditional way of using a mould to adopting an airbag manufacturing process. This change of process has raised concerns within the industry as floating fenders are being supplied for use in many critical applications including ship-to-ship transfers.

According to a recently published whitepaper by Trelleborg, these pneumatic fenders do not usually comply with all of the recommended manufacturing process guidelines and compound properties, as specified under the ISO 17357-1:2014 standard, as the airbag production method is unable to attain the quality of fenders that can be achieved by using a typical moulding process.

And herein lies the problem when we write about safety, as these fenders need to perform effectively even under the harshest environmental conditions. It is therefore extremely crucial for each and every pneumatic fender to comply with the ISO 17357-1:2014 standard that ensures that they are being manufactured according to the correct process.

"Pneumatic fenders are extensively used for ship-to-ship transfers mid sea, double banking operations, and as vessel-to-berth at dock/jetties. Therefore it is vital that they are not only of high quality, but are extremely reliable, to guarantee effective performance in even the harshest environmental conditions," says Mishra Kumar, Global Technical Director for Marine Fenders at Trelleborg's Marine Systems Operation.

"The major concern for the industry is that there is an influx of manufacturers employing airbag production methods resulting in fenders that don't usually comply with all of the recommended manufacturing process guidelines or compound properties as specified under the ISO 17357-1:2014 standard. By using the conventional method, whereby the entire fender is built inside a mould and vulcanised with it in an autoclave, a clear positive impact is seen on the appearance, dimensional stability and the bonding between layers, leading to a

more reliable and long lasting fender." Trelleborg's whitepaper looks at the difference in pneumatic fenders manufactured using the airbag manufacturing method without employing a mould and fenders manufactured conventionally using a mould to highlight the impact of the manufacturing process on the performance, safety, and longevity of these pneumatic fenders.

In the whitepaper they explain that "pneumatic fenders are widely used as protection elements from collision between two vessels in the offshore transfer of oil and other chemicals. It's critical that while this transfer takes place, the highest levels of safety are maintained. When fenders are made up of lower quality materials and are not manufactured to the highest standards, they may fail at critical moments such as during the transfer of crude oil in mid-sea exposed locations.

Accidents like these can lead to environmental damage and risk the health and safety of working personnel. The new influx of manufacturers employing airbag production methods for their pneumatic fenders is a concern for the industry due to the questionable quality levels of their products."

The whitepaper also highlights some of the differences in manufacturing and raises some concerns including the appearance of the fender body, the location and size of the safety valve, the inner flange, the bonding strength between different layers and the outer and inner rubber compound physical properties and thickness.

It concludes that it is evident from the test results and the field performance of the actual fenders that the deficiencies in the airbag way of manufacturing process have severe impact on the rigidity and reliability of a fender leading to poor endurance life, fatigue resistance and pressure holding performance.

As the bead rings (that are associated with the use of mould) and the inner layer rubber tear strength are requirements of ISO 17357-1:2014 accreditation, their omission from the airbag manufacturing method makes the fenders non-compliant with the industry standard. In conclusion, such fenders that are not optimally designed may be considered as unreliable for use in critical applications where safety should not be compromised.

Customer focused

Hence, the need to inform (potential) customers about product developments in the fender market will not only keep reputable fender manufacturers busy, they also want to protect the industry from getting a 'bad reputation' due to quality issues from less reputable fender companies.

"There will be some interesting development within the fender market, where quality requirements will be more severe, lead times will be stricter and the contractors are looking for a higher service level combined with a competitive price," comments Niels van Houtum at QuayQuip, A Eurotech Benelux Company in the Netherlands. van Houtum explains that "due to the fact that QuayQuip has everything under one roof, from engineering to production, we (QuayQuip) can meet customer expectations and are ready for the future."

According to van Houtum QuayQuip's focus is still on the high-end of the industry, where complex fender systems together with a creative approach helps port authorities and consultants in designing the right fender system for every solution. "As we have our own steel construction facility, we can offer a full range of quay furniture not limited to fenders, but also safety ladders and cope edge protection," van Houtum added.

Another leading fender manufacturer, Germany-based ShibataFenderTeam, also focuses on customer support. "We have noticed that there is an increased need for our clients to have a competent contact person within reach and with five offices and a large agent network we ensure regular and direct communication in all corners of the world," said Anna-Lena Georg, Marketing Manager at ShibataFenderTeam (SFT). "We also offer a detailed and extensive design input and support at an early project stage."

The company has also recognised that their clients search for reliability, in terms of in-house production or the latest testing equipment. But it doesn't stop there, according to Georg. After Sales Service is an often neglected issue, but is all the more important in, for example, creating customised maintenance plans or global assistance during installation or maintenance works, or site assessment to assess the condition of the marine furniture. "These services are actively handled at SFT and with the many services we already offer our clients this will further intensify," said Georg.

Back in November 2017, SFT announced it would build an advanced new rubber compound mixing and fender production facility in Malaysia. Shibata Industrial, the Japan-based majority shareholder of SFT, invested heavily in the cutting edge, fully owned mixing plant in Klang, Malaysia.

"The steep growth in demand for SFT's high quality rubber fenders was the catalyst for this far-reaching investment decision, which will further strengthen our global position as a leading fender manufacturer," explains Hiroto Suzuki, Director at Shibata Industrial in Japan and Managing Director of the SFT office in Malaysia.

Shibata Industrial will invest around USD 7 million in predominantly Japanese-made rubber mixing equipment for the new factory. The factory building is a new three storey complex which hosts the mixing facilities, office space, a thermal insulation room, a comprehensive laboratory, and additional fender production. The new factory is scheduled to begin production in the summer 2018.

2018 outlook

Apart from educating (future) customers it seems that all manufacturers are quite positive about 2018 and even have some new technology developed. According to van Houtum QuayQuip is still positive about the future. "The global economic growth and the ever increasing size of ships would suggest heavier and more engineered fenders systems," he said. "However we would not be surprised to see in the coming years more offshore ports and more carbon neutral ports."

To assist QuayQuip in its sales for the coming year, the company developed the 3rd generation floating bollard system, used in locks and structures with a high tidal range difference. Such a system was used for a lock upgrade in the Netherlands and complied with the high demands of the Dutch Department of Waterways and Public works. QuayQuip engineered and designed an up-to-date floating bollard system which can be used for bigger barges entering the new lock. In addition, it also developed a Motion Analysis for their Connected Fender System, which is helpful for the design of large approach fender systems for locks.

More recently, Quayquip provided 20 sets of QME 800 x 1000 element fender systems for the Newton Barge project in New York, USA. For this project there was an additional contract requirement to test the fenders performance at an independent testing facility within the USA. In close collaboration with the University of Washington, QuayQuip underook performance tests on the element fender according to the PIANC protocols, of which the results were satisfactory.

The company will also supply various quay equipment for a newly constructed liquid bulk terminal at the Port of Rotterdam in the Netherlands. Here, QuayQuip will supply 189 pieces of QCY Cylindrical fenders to be tested on durability witnessed by a 3rd party, over 2km of steel cope edge protection, 8 pieces of Tricron Bollards between 60 and 240 tonne working load, all steel sliding fenders and access ladders.

According to Georg, the ShibataFenderTeam Group with their global approach will continue to grow and to develop an even closer contact with their clients in 2018. A positive outlook is further supported by the first full year for their Spanish office, which secured several orders with some of the fenders already being installed.

Last year, the U.S. office of SFT delivered 55 CSS 1450 Cell Fender Systems (G2.0), 8 nos. CSS 630 Cell Fender Systems and several Bollards to the new APM container terminal in the Caribbean port of Moin, Cost Rica. The construction of the new container terminal is the most important infrastructure project for Costa Rica, helping the country to reposition itself as the most efficient port in Central America. The terminal is designed to serve the largest vessels entering the Latin American trades, and is focusing on reefer container traffic transported to North America and Europe. The scheduled opening is February 2019.

Another project SFT got involved in was at the Port of Lazaro Cardenas in Mexico, one of the largest and most important ports in the country, and located between the Californian U.S. border and Panama. SFT's office in the U.S. successfully handled the order of 28 SPC 1600 Cone Fender systems (G2.6) and 52 T Head Bollards with a capacity of 200 tonnes. The fender system were equipped with a steel panel of 6.3 x 3.1m size. The Lazaro Cardenas container terminal is operated by APM Terminals and is the first semi-automated terminal in Latin America. SFT also delivered the largest single Parallel Motion Fender ever made to a RoRo Ferry Terminal in Dunkirk, France. The fender was produced in 2017 at the company's production facility in Rechlin, Germany, and had an impressive total weight of 72 tonnes. The engineering work spanned over a period of 2 years including numerous site and factory visits.

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The steel fender panel measures an impressive 11m x 3.05m and weighs over 29 tonnes occupying one full special heavy weight truck. It will be equipped with 4 double SPC 1000 Fender assemblies. A second truck will carry the torsion arm to Dunkirk. The overall width of the arm is 3.75m which exceeds the maximum width of a standard truck by more than 1m thus requiring special permission and escorting.

Conclusion

The new Panama Canal has seen transit of larger vessels calling at U.S. East Coast ports, and with the introduction of (much) larger vessels calling at ports around the globe, there will be the need to have a closer look at fender systems. There are enough ports that need modernisation, upgrading and perhaps replacement of their total fender system. The question is how do you decide which fender manufacturer to opt for? Here, the leading fender manufacturers provide a clear message - keep your customers informed and work together to find a solution.