



**SAMSON**  
THE STRONGEST NAME IN ROPE



*Using the ship's chocks, bits, and fairleads in the path from delivery spool to winch drum creates the 45–90 kg of back tension recommended by Samson.*

CASE STUDY

## BW FLEET MANAGEMENT FINDS SAFETY AND RELIABILITY

Samson 12-strand lines made with Dyneema® SK78 fiber replace failing jacketed mooring lines

### THE SITUATION

In 2013, BW Fleet Management was facing a persistent safety and operational issue: their jacketed HMPE mooring lines were failing. At one point, seven lines failed on a single vessel during a berthing in Spain. It was a problem also experienced by other operators within the LNG shipping industry at the time.



*The result of proper back tension and level winding is optimized spooling performance for easy payout and respooling. The combination results in more efficient mooring operations and longer service life.*





Installation that is guided and monitored by Samson's field service technicians provides a good opportunity for the ship's mooring crew to get acquainted with the new lines while learning proper care and inspection routines for these critical ropes.



“Safety and reliability were most important. With the jacketed mooring lines, we lost control over the lines’ condition—that’s a high risk for us. One of the many advantages of the 12-strand lines is that we can visually monitor them on an ongoing basis, allowing for better decision-making when lines need to be changed out or repaired, to maintain the security of our moorings.”

OLAV LYNGSTAD, HEAD OF LNG/FSRU & SUPPORTING DEPARTMENTS; BW FLEET MANAGEMENT



“The failure of jacketed mooring lines was a concern throughout the industry. When we announced our decision to switch to Samson, it was seen as a positive move. Samson has an excellent reputation in the market; everyone was comfortable with that decision right away—no more discussion.”

OLAV LYNGSTAD, HEAD OF LNG/FSRU & SUPPORTING DEPARTMENTS; BW FLEET MANAGEMENT

## THE SOLUTION

BW Fleet Management (BW FM) and Samson had been working together for several years, having outfitted 11 new-build tankers with Samson 12-strand single-braid *AmSteel®Blue*, made with Dyneema®, between 2005 and 2007. Now, for this new issue, BW FM sought Samson's technical expertise.

Because Samson understood BW FM's concern for the safety of the remaining mooring systems, they offered to assist by inspecting the mooring lines on affected vessels that were in-service. While the ships were at sea and the lines could be properly laid out, Samson inspected each one and wrote a comprehensive report on their condition. As a temporary solution, damaged lines were changed out with Samson *Turbo-EPX™* jacketed mooring lines until an assessment of the issue could be completed. Samson also supplied vessel crews with training documents for proper rope usage and handling of synthetic ropes until the full replacement could be accomplished.

After a full investigation of the situation and gaining a new understanding of the types of mooring lines available, BW FM determined the best way to ensure the safety of their fleet and their crews was to replace the jacketed mooring lines throughout the fleet. Jacketed lines, while having the advantage of their strength-member core being protected by an outer cover, have the disadvantage of being difficult to inspect. Once the decision was made to address the issue with non-jacketed lines, BW FM considered several manufacturers, and decided to proceed with Samson's non-jacketed, single-braid 12-strand mooring lines, *AmSteel®Blue*, made with Dyneema® SK78. The combination of Samson's unparalleled industry expertise and their unmatched experience using this innovative grade of Dyneema® was assuring for the customer. Dyneema® SK78 is specifically designed by DSM to withstand the long-term load bearing requirements of such extreme applications.

Olav Lyngstad, head of LNG/FSRU & Supporting Departments, commented, "Safety and reliability were most important. With the jacketed mooring lines, we lost control over the lines' condition—that's a high risk for us. One of the many advantages of the Samson 12-strand lines is that we can visually monitor them on an ongoing basis, allowing for better decision-making when lines need to be changed out or repaired, to maintain the security of our moorings.

"The failure of jacketed mooring lines was a concern throughout the industry. When we announced our decision to switch to Samson, it was seen as a positive move. Samson has an excellent reputation in the market; everyone was comfortable with that decision right away—no more discussion," Lyngstad added.





*Mooring line assembly complete with factory-installed DC Moor-Gard chafe sleeves.*

Samson and fiber partner DSM have long promoted the use of non-jacketed 12-strand lines in these critical mooring applications. Ease of inspection, both external and internal, is a prime consideration, along with simple splicing and repair that can often be accomplished by the ship's crew. Instead of a full jacket, chafe gear is placed in critical locations to protect the rope where needed.



*Installations are closely monitored and assisted by Samson's field service professionals.*

## JACKETED MOORING LINE MISCONCEPTIONS

Some vessel owners favor jacketed mooring lines because they believe the jacket provides additional protection from abrasion, cutting, and wear. While that seems a reasonable assumption, in actual practice, the jacket can hide damage to the load-bearing core that ultimately may lead to line failure under load. Additionally, inspection is difficult to do without removing the jacket and essentially destroying the rope.

Samson has more experience than any other manufacturer supplying ropes made with high modulus polyethylene (HMPE) for large vessel mooring. Together with fiber partner DSM, Samson has long promoted the use of non-jacketed 12-strand lines like *AmSteel®Blue* in these critical applications. Ease of inspection, both external and internal, is a prime consideration, along with simple splicing and repair that can often be accomplished by the ship's crew. Instead of a full jacket, chafe gear is placed in critical locations to protect the rope where needed.

## THE ULTIMATE MOORING SYSTEM

Samson was part of the decision-making process throughout — from the initial situation analysis to the implementation of the solution. For maximum performance, the entire mooring system should be considered.

**MOORING LINE** To provide the best performance and ease of handling, Robin Collett, general sales manager for Samson, proposed *AmSteel®Blue* mooring lines made with Dyneema® SK78, which offers better bend fatigue characteristics than other grades of HMPE, and improved service life in applications where creep results from long-term static loads.

**CHAFE PROTECTION** In preparation for the installations, Samson collaborated with BW FM to perform initial vessel surveys to identify potential wear areas from deck hardware that would require some remedial work. The ropes were provided with appropriate chafe protection—*DC Moor-Gard™* chafe sleeves, which were installed at the factory prior to delivery.

**SERVICE** Beyond selecting the right line for each component of the BW FM system, Samson also provided an unparalleled service package called The Samson Advantage. It includes critical pre- and post-sale services and an ongoing partnership program. This approach is driven by safety and is a proven model that cannot be duplicated by any other rope manufacturer. Samson was onboard to oversee line installations, and aided with crew training in maintaining, inspecting, and splicing the lines.



“When we considered the service level that Samson provided, along with the whole package of products, it was a true value-added situation. It all entered into the decision-making process.

“Throughout the process, logistics were among the biggest challenges.”  
TOR-EGIL GJULEM, HEAD OF GLOBAL PROCUREMENT; BW FLEET MANAGEMENT

The fleet was able to remain in operation throughout the process, with Samson staging replacement mooring systems at different ports around the globe, with field service crews deployed to assist with installations.



*A Samson field service technician inspects each line as it is installed to ensure that it meets Samson's high quality standards.*



“With eight vessels converted, and eight more on the schedule...there have been no mooring incidents in any port, any place in the world. With periodic residual strength testing as a part of the service package, we have regained control over the condition of our mooring systems.”

TOR-EGIL GJULEM,  
HEAD OF GLOBAL PROCUREMENT;  
BW FLEET MANAGEMENT

Tor-Egil Gjulem, Head of Global Procurement for BW FM, observed, “When we considered the service level that Samson provided, along with the whole package of products, it was a true value-added situation. It all factored into the decision-making process.”

Gjulem added that, “throughout the process, logistics were among the biggest challenges.” The fleet was able to remain in operation all along, with Samson staging replacement mooring systems at different ports around the globe, and field service crews deployed to assist with installations.

### **THE RESULTS: NO INCIDENTS**

The installation of Samson lines have resulted in “no incidents in any port, any place in the world.” Samson ropes have now been in service approximately two years on BW FM vessels—in excess of 1,500 hours on average—with no damage to the lines reported on any vessel.

Lyngstad says, “With eight vessels converted, and eight more on the schedule... there have been no mooring incidents in any port, any place in the world. With periodic residual strength testing as a part of the service package, we have regained control over the condition of our mooring systems.”

The situation and solution experienced by BW Fleet Management, is not unusual. Samson takes pride in the package of services that starts with pre-sales inspections and assessments, continues with full assistance through the installation of best-in-class lines, and follows through with full product documentation, crew training and support for the service life of the rope.

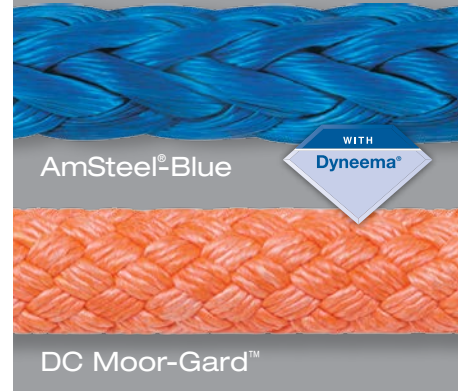
We call it The Samson Advantage. Our customers call it peace of mind.





*New-build BW Pavilion with AmSteel®-Blue mooring lines after setting sail from Hyundai Heavy Industries, South Korea in 2015.*

Samson ropes have now been in service approximately two years on these BW FM vessels—in excess of 1,500 hours on average—with no damage reported on any vessel.



**FOR ADDITIONAL INFORMATION:**  
**[SamsonRope.com](http://SamsonRope.com)**

We've put all our information here for easy downloading. We think it is the best resource for information on high-performance synthetic ropes available anywhere.

- > Rope specifications
- > Product breakdowns by application and industry
- > Technical bulletins
- > Case studies
- > Splicing instructions



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