

# currents

NEW DEVELOPMENTS IN SYNTHETIC ROPE TECHNOLOGY

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### THE SAMSON ADVANTAGE FROM THE INSIDE OUT

*The Samson team shares experiences while delivering legendary service.*

### QUANTUM-12 GOES TO DRYDOCK

*The U.S. Navy uses Samson lines to pull caisson.*

### MOORING LINE SELECTION EXPLAINED

*Following mooring line basics will extend the service life of the rope.*



**samson**

THE STRONGEST NAME IN ROPE

# The Samson Advantage: All in a Day's Work

We talk a lot about The Samson Advantage and it may become cliché to many. While many of our customers have firsthand experience as recipients of the services we offer, others may think it's just a marketing campaign. The reality is that our field-service representatives are a group of professionals, from application engineers to technical sales managers, dedicated to ensuring that the rope you rely on everyday performs at its best for the long term. In this two-part article, we'll share with you what The Samson Advantage looks like from the inside. We travel to all corners of the globe to deliver our service and as glamorous as world travel sounds, it has its challenges. The narratives below are true stories that attest to the willingness of Samson as a team to go the distance to deliver The Samson Advantage.

*"On January 2, 2010, I was flying to China via Vancouver, BC. My destination was Dalian, located in Northern China. The flight left Vancouver four hours late due to a snowstorm in Beijing, so I missed my connecting flight to Dalian. After spending the night in a room without heat and fighting other passengers to get on a bus to the airport the next morning, I made it to the airport and eventually onto my flight to Dalian. My plan to rest on the flight was changed when the man in the seat across the aisle had an apparent heart attack. I spent most of the flight doing CPR with two other passengers. Once the plane landed, I rushed to conduct a line inspection, where I did the job in -26°C (-15°F) weather."*



*Captain Martin Wallace checks a roller to make sure it turns in Dalian, China.*

## **John Morton, International Project Specialist**

*"I spent 14 hours on a trawl vessel in the Bering Sea in January...We left under the impression that it was going to be a 5 to 8 hour trip and naturally the installation wasn't quite as quick as we had hoped. At the end of the day, everything went fine, but anything I tried to eat was a no-go. Funny thing was, conditions were about as ideal as you could ever ask for on a January day out there (2 to 4 meter seas)..."*

## **Kris Volpenhein, Technical Manager**

*"I was repairing a 10" double braid nylon grommet in a Jacksonville, Florida, warehouse on an August afternoon. The heat index was about 120°. The rope was used and hard as a rock. We wrestled with that thing all day long and finally got the job done. We went to pack it up and realized it that we had spliced it around one of the support poles in the warehouse. We had to unsplice and redo the entire line."*



*Sunrise in the Bering Sea, January 2010.*

*"And there was the time I spliced 16 AmSteel®Blue mooring lines on the deck of a roll on/roll off vessel. When I finally finished the last mooring line on the ship, I was 35 miles off Charleston, South Carolina, with a storm blowing in. I had to take the pilot boat back to Charleston in seas that were about three meters. I was on the pilot ladder with my backpack full of splicing tools trying to time my jump to the pilot boat as the crests and troughs of the swells rolled by. Needless to say I was nervous and cautious. The bad thing was I was about 30 years old at the time and once I made my jump, the 75-year-old tech that was calibrating the compass ran down the ladder as nimble as a monkey and timed his jump just right. I caught a lot of flac about that on the three-hour ride back to shore."*

## **Dennis Sherman, Sales Director, Offshore Division**

Samson on-site training...  
**LEARNING THE ROPES  
JUST GOT EASIER**



**Samson sales and engineering team—  
on your deck, not behind a desk**

- > Rope inspections
- > Deck hardware prep
- > Field splicing techniques
- > Retirement criteria

*The Samson Advantage—it's a lot more than innovative products, it's service and information to keep you outperforming the competition.*

**SamsonRope.com**

WITH

**Dyneema®**

Dyneema® is a registered trademark of Royal DSM N.V. Dyneema is DSM's high performance polyethylene product.



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THE STRONGEST NAME IN ROPE

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## Mooring Line Selection: Not an Off-the-Shelf Decision

It's true. Not all HMPE ropes are the same and they are not a one-size-fits-all proposition. A number of factors should be considered when selecting a Dyneema® mooring line: intended use or application, potential abrasion issues, surface preparation, rope design/construction, chafe protection, proper installation procedures, inspection schedule, and retirement criteria. The rope manufacturer should work together with the owner/operator to ensure that there is a comprehensive understanding of each of these considerations. This is the best approach to ensuring a long service life and mitigating unnecessary failure.

**UNDERSTANDING ABRASION** Abrasion is one of the biggest culprits of line destruction. There are two types of abrasion: internal abrasion caused by the relative movement of internal and external yarns; and external abrasion caused by contact with external surfaces, such as roller and panama leads. External abrasion is usually easy to see on any rope, while internal abrasion is easier to inspect with a 12-strand rope. When a rope moves over an abrasive surface, both factors contribute to causing the outer surface to move slower, while the internal fibers continue along their original path. Heat results from this type of friction and heat is an enemy of synthetic fibers.

**MITIGATING THE EFFECTS OF ABRASION** Vessels and equipment that have traditionally used wire rope often have sustained significant damaged caused by fishhooks, broken strands, etc., which come in contact with the deck and other equipment. These conditions can damage or significantly reduce the life expectancy of Dyneema® ropes. However, an owner/operator can take preventative measures to mitigate these issues by repairing all rope contact points to a smooth and consistent surface.



*Adding chafe protection will greatly lengthen the service life of HMPE lines.*

The addition of chafe protection utilized on the areas of the line most likely to suffer from abrasion is critical for the rope's longevity. These are either sleeves that slide on the rope or spliced into a line, depending on the construction of the rope.



*Maintain a minimum of 8-10 wraps on the tension side of split drum winches at full extension.*

**LINE INSTALLATION** After surfaces have been prepped, the working line should be installed on the winch with significant back tension. The device used to create the tension should have a smooth and consistent surface, and the installation speed or tension applied should not generate excessive heat build-up on the rope.

As the line is wound onto the winch, it should be closely packed to minimize areas where the rope may "dive" or bury into the layers of the winch. Install each layer in the valleys of the previous layers or crossed over each other to support each subsequent layer. Never stack the layers on top of each other. *CONTINUED...*

When the line is used, eight to ten wraps must always remain on the tension side of the split-drum winch at the line's full extension. Furthermore, every precaution needs to be taken to prevent twist from being introduced into the line as it is used. Twist is often overlooked as a contributing factor in the reduced life of Dyneema® line.

**ROPE DESIGN AND CONSTRUCTION** One of the best ways to ensure a long service life, combat unforeseen situations, and prevent line failure is to select the mooring line and tail, or pendant, appropriate for your vessel. Many ship owners, managers, and terminal operators are aware of the advantages of Dyneema® and have become accustomed to asking for jacketed mooring lines. However, the advantages of nonjacketed lines are numerous: they are stronger than jacketed lines size for size and they are easy to inspect and repair. Unlike jacketed lines, which rupture in the areas that suffer the greatest abrasion and have to be replaced, only the chafe protection on a nonjacketed rope has to be replaced, saving time and money. A 12-strand mooring line system such as AmSteel® Blue with Dynalene chafe protection provides the ultimate in cut and abrasion resistance, and the rope maintains its strength for the long-term.

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Proper selection of the mooring pendant also affects the performance of the mooring line. Recent studies have included the effects of tail length with varying materials. Depending on their application, there has been some success with increased tail lengths of 72 feet (22 metres), and nylon pendants have been found to be beneficial due to their increased elastic elongation.

**INSPECTION SCHEDULES AND RESIDUAL STRENGTH TESTING** For the longest and safest life of a Dyneema® line, it is essential that crewmembers be trained on rope handling and safety procedures, rope inspection, the use of chafe gear, rope repair, and splicing techniques.

Samson is the only rope manufacturer to provide this service. We call it The Samson Advantage, which includes training conducted by qualified technicians, periodic in-field inspections of the line and associated equipment, and a program of residual strength testing to help determine inspection and retirement criteria.



*The Samson Advantage includes training conducted by qualified technicians, periodic in-field inspections, and residual strength testing.*

Samson is serious about guiding the proper line selection and educating owners and operators on proper surface preparation and crew training; however, the daily handling of Dyneema® lines is left to the crew, ship owners, and operators. With proper, consistent care, along with a robust line inspection and retirement program, Samson lines made with Dyneema® will give you a long service life and provide a great value over time.



## Quantum-12 has Pull with the U.S. Navy

Graving docks, also known as drydocks, have been around almost as long as rope has. Wikipedia gives credit to the Greek author Athenaeus of Naucratis for documenting the first drydock in Ptolemaic Egypt around 205 BC. Graving docks haven't changed that much since ancient times: a ship is positioned inside a box-shaped basin while divers place blocks under the keel to support the vessel when the water is removed. The horizontal sliding gate called a "caisson" is pulled shut to close the drydock, and the seawater is pumped out, exposing the entire hull of the ship.

Rope is a necessary tool in the operations of a graving dock, as the U.S. Naval Base San Diego (USNBSD) knows. For many years, USNBSD used a 3-inch diameter 3-strand nylon rope to pull the graving dock caisson. In this application, the rope is attached to the caisson and then run through a pulley and wrapped around a capstan that turns, which pulls the line around it and moves the caisson. The Navy had encountered several problems with the traditional nylon line: it was difficult to maneuver because it was stiff and heavy when wet, it did not float, and it slipped on the capstan.

### Quantum-12: A Technology Upgrade

In 2008, Samson and Samson distributor American Rigging presented Quantum-12 as a solution to the problems the Navy faced with the nylon caisson line. Quantum-12 is a 12-strand construction that is well suited to this application because it is light in weight, it floats, and, because it incorporates Samson's patented DPX™ fiber technology, it grips the capstan. In the spring of 2009, USNBSD chose 1-5/16 inch Quantum-12 to replace the problematic nylon caisson line.

The entire crew is very satisfied with the Quantum-12 caisson line, and they are impressed with Quantum-12's strength-to-weight ratio, given that the line is a little more than half the size in diameter of the original nylon rope and doing the same job. Furthermore, USNBSD expects that the use of Quantum-12 will lower incidents of line-handling injuries because it requires only one member to manage the line.

### Stable Braid Doing What It Does Best

Once a vessel is positioned in the drydock and the water has been removed, the ship must be held in a steady state. For this application, USNBSD had also been using a 3-strand nylon line, but with limited success. Upon the recommendation of American Rigging, the Navy changed these "steady lines" to Samson Stable Braid.



*Samson Stable Braid replaced the 3-strand nylon lines previously used to hold the ship "steady" in drydock.*

*The entire crew is impressed with Quantum-12's strength-to-weight ratio and USNBSD expects that the use of Quantum-12 will lower incidents of line-handling injuries because it requires only one member to manage the line.*



*1-5/16" Quantum-12 replaces a problematic 3" diameter 3-strand nylon caisson line.*

Stable Braid, a double braid with a polyester core and cover, is a great steady line because of its flexibility and elongation factors, which work in the crew's favor as they constantly monitor the lines and make hands-on adjustments to them.

### The Samson Advantage Makes the Difference

Feedback from USNBSD about the Samson products has been positive, but these customers understand that, with The Samson Advantage, more than a rope was purchased. Follow up visits to the base by Samson and American Rigging have addressed concerns and answered technical questions, which has built a good relationship. USNBSD is impressed that they can count on either American Rigging or Samson to always respond to and support their needs. Based on the success of The Samson Advantage, USNBSD will turn to Samson again.



## SAMSON IN ACTION *UPCOMING EVENTS*

### OFFSHORE

#### > Australasian Oil & Gas

Perth, Australia: March 24–26, 2010  
Booth #P29

#### > Offshore Technology Conference

Houston, Texas, USA: May 3–6, 2010

### TUG

#### > International Tug and Salvage

Vancouver BC, Canada: May 14–21, 2010

### RECREATIONAL MARINE

#### > Strictly Sail Pacific

Oakland, California, USA: April 15–18, 2010

## NEWS FROM ANOTHER DIVISION

### Samson Introduces Innegra™S and MLX

In January 2010, Samson introduced Innegra™S to the rope industry. Available exclusively at Samson, the use of Innegra™S has enabled Samson to develop a line of products that bridge the gap in performance characteristics between traditional synthetic fibers, such as nylon and polyester, and high-performance synthetic fibers, such as high modulus polyethylene (HMPE), liquid crystal polymer (LCP), and aramids.

Developed for the sailing industry, MLX is the first product incorporating Innegra™S to be introduced by Samson. It is intended for sailors who want to upgrade from traditional synthetic fibers but do not require the performance characteristics of high-performance synthetic fibers. MLX is designed for the club racer but is also suitable for the performance-oriented cruiser. For more information and product specifications visit [SamsonRope.com](http://SamsonRope.com).



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## BEHIND THE LION

### Samson Moves Toward Zero Waste

In 1991, Samson was the first Whatcom County business to receive recognition for recycling efforts when we were presented with the Waste Wise Business Award.

In keeping with the desire to reduce our impact on our environment, Samson recently joined the Toward Zero Waste (TWZ) program, which has helped dozens of Whatcom County businesses dramatically reduce their solid waste. To be effective in this program, Samson formed a Recycling Team to evaluate where we were doing well and where we could improve.

In October of 2009, Samson put in place a more formal recycling program. The first stage of the new program began with taking clear plastic stretch wrap and bags, cardboard tubes, paper, and wood out of the waste stream. The second stage placed receptacles in key locations around the Ferndale plant and offices for collecting cans, bottles, plastics, and other food containers.

Samson's initial goal was to reduce the amount of solid waste by 50% in the first year of the program. This goal was achieved in the first four months. In the first two months of the program alone, Samson kept the equivalent weight of 12.5 cars or 201,834 feet of 1-inch AmSteel®Blue out of the landfill.

The success of the program is credited to the support and enthusiasm of all employees, from management to the janitorial service who cleans the offices every night. Everyone's efforts are making a difference and moving us toward zero waste.

