## FIELD TRIAL RESULTS:

# Saturn-12

THE STRONGEST NAME IN ROPE

# Leveraging innovation, increased safety and efficiency

**THE PROOF IS IN THE NUMBERS**

**SATURN-12 *LASTS* 15–20% *LONGER***


## Making the best even better—Saturn-12

*When you already offer a product (AmSteel®-Blue) with the highest residual strength of any high-performance high modulus polyethylene (HMPE) rope in the tug industry, why invest time and money to make it even better? Because continuous product improvement is in our genes—it's been part of our DNA since our founding over 130 years ago.*

## SATURN-12 FIELD TRIALS:

### Reduced abrasion + longer service life = increased value

With many years of experience in providing high performance ropes to the ship assist industry, Samson's research and development department looked for ways to lengthen the working life of their products. Abrasion is one of the leading mechanisms of rope failure in this industry.

EXTERNAL ABRASION:

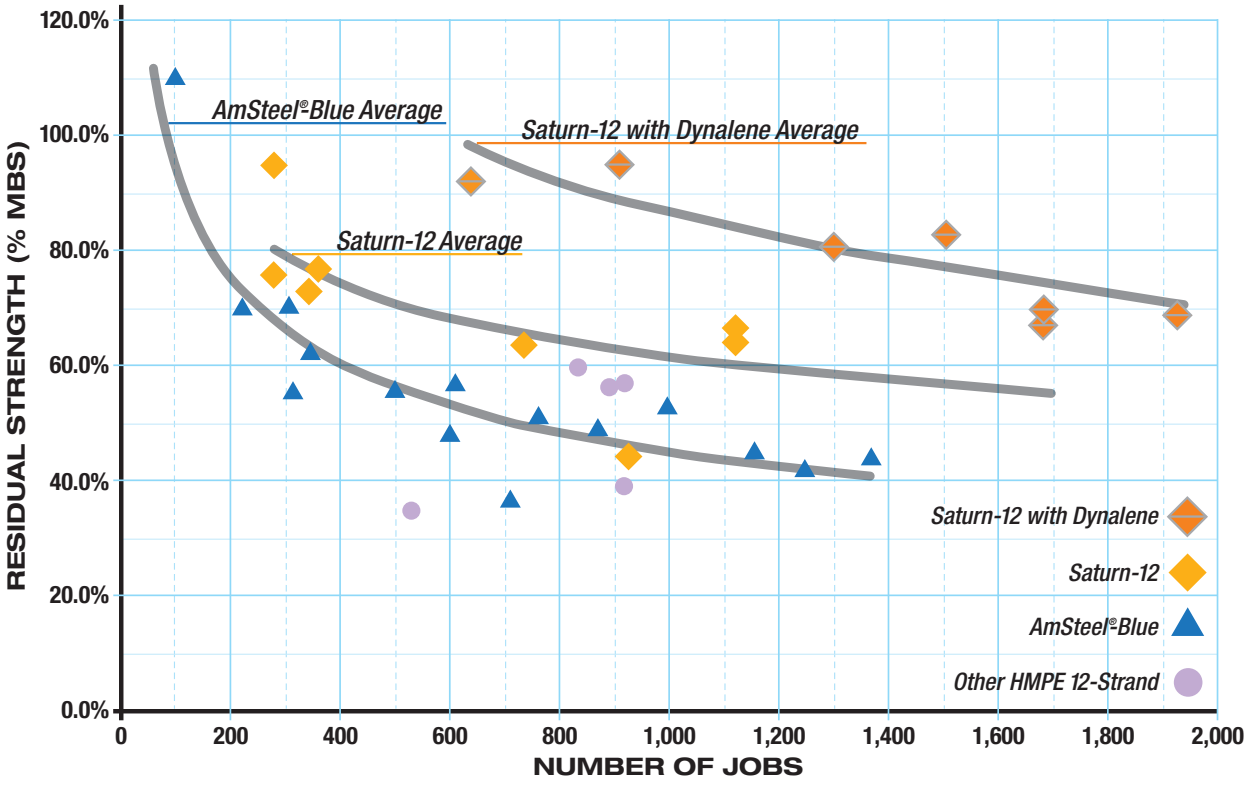
- Caused by working ropes over surfaces that are not properly prepared and/or maintained.
- Caused by fiber-on-fiber movement during use or by repeated bending at fairleads and chocks.

Saturn-12 was developed using a proprietary coating formula applied to the rope's yarns during stranding combined with the proven performance of a 100% Dyneema® 12-strand working rope.

Starting in 2009, Samson partnered with long-time customer G&H Towing Company of Texas to fully document the field testing of this new rope. G&H committed 11 tractor tugs outfitted with Saturn-12 pendants, some with Dynalene chafe gear. Data was logged throughout the field trials.

**The result—a significant increase in the residual strength of the rope measured throughout its service life. That means more pulls and safer pulls with longer periods before retirement.**

**TABLE 1: Residual Strengths of Tug Pendants**




*Residual strength based on testing 35 HMPE ropes from two manufacturers, after more than 27,000 combined pulls.*

# y to reduce the total cost of ownership



## FIELD TRIALS: Where innovation meets reality

At Samson, innovation doesn't live in a vacuum—to be successful, products need to perform in the real world. During development, the rigorous testing, evaluations and computer modeling can only simulate what these products will encounter in actual use. These tests are designed to ensure they perform as expected. It's during field testing—with real crews performing actual work—that the true measure of performance can be properly evaluated.

Partnering with key customers for field trials of new products provides the most reliable data to assess how new technologies, constructions or fibers will impact the end user. It leads directly to safer, longer-lasting, more efficient products that bring real value to both the customer and the manufacturer.

Testing doesn't stop when a new product is released. Samson's program of customer support for the life of the product includes periodic inspections and residual strength testing of its ropes while still in use. This data allows us to work with the user to set appropriate retirement schedules based on how they use the product and the situations they encounter in the normal course of their work. It also helps build a knowledge-base of experience that allows us to continuously evaluate the product and its design. Essentially, field trials never end.

The result is that the customer gets the maximum service life from their investment while maintaining a safer, more efficient work place for both crew and vessel. It's truly added value, and mutually beneficial to both our customers and ourselves.

**We think of it as part of The Samson Advantage, our customers think of it as peace of mind.**

*The Samson Advantage includes residual strength testing as a part of the retirement guidelines for the safety of your rope.*

A TYPICAL TEST SHOWED
**SATURN-12**
proved to have
**95% RESIDUAL STRENGTH**
after **990 ASSISTS**
over 7 months of service

*Steve Huttman of G&H Towing (left), Edward Lee of Lee Engineering Supply (middle), and John Glaser of Samson (right) were witnesses to the residual strength testing conducted on Saturn-12 and another brand HMPE line at the Samson Ferndale facility in early 2010. Huttman, Lee and Glaser were also present in 2011 for the next round of testing.*

## THE SAMSON ADVANTAGE: Longer service life

Based on data starting in 2008, by the end of 2011 the incidents of rope failures had been reduced to roughly 25% of the levels recorded before Saturn-12 trials began.

The reduction demonstrated here is due to a number of changes made by G&H. In addition to upgrading the product offering from rope made with traditional fibers and ropes made with low-grade HMPE, a comprehensive, multi-faceted, long-term plan was incorporated. The following standard operating procedures were put in place:

- Deck and hardware preparation to mitigate abrasion
- Crew training in splicing, handling, and inspection
- Twist management program—to identify and avoid the effects of twisted lines
- Scheduled line inspections and end-for-ending
- Residual strength testing to determine retirement criteria

This approach turned the practice of line replacement into a fact-based and systematic process that ultimately—and most significantly—extended the service life of the towing system.

**TABLE 2: Fewer Rope Failures**

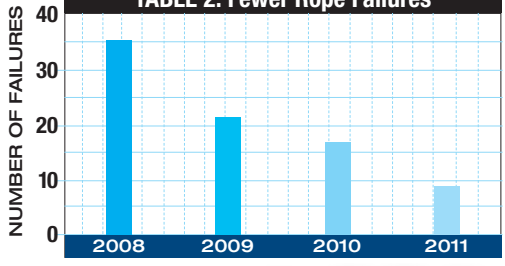



Photo © Brian Gauvin

## CHAFE PROTECTION: Improving the numbers even more

Table 1 (left) significantly increased performance when chafe protection is integrated with these new ropes. When the rope disappears through the bulwarks of your customer vessel, you've just lost control over the conditions your line will encounter. Fairleads and chocks that are worn, scaly or rusty can damage and abrade surface fibers while also increasing the risk of internal abrasion, which can result in cut yarns with a single contact.

Adding chafe protection, especially Samson's Dynalene made with 100% Dyneema,® results in even further lengthening of service life.

**Quantum-12 Backer Line**
*Provides the increased coefficient of friction (COF) necessary for maximum performance on winch drums.*

**Saturn-12 Mainline**
*It's our longest lasting tug line, specifically designed for the ultimate in abrasion resistance for longest service life.*

**Saturn-12 Pendant with Saturn Dynalene Chafe Protection**
*100% Dyneema® braid adds maximum abrasion and cut resistance while retaining the ability to easily inspect the line for damage and wear.*

## HIGH-PERFORMANCE PRODUCT HIGHLIGHTS

### Saturn-12

**Product Code: 882**

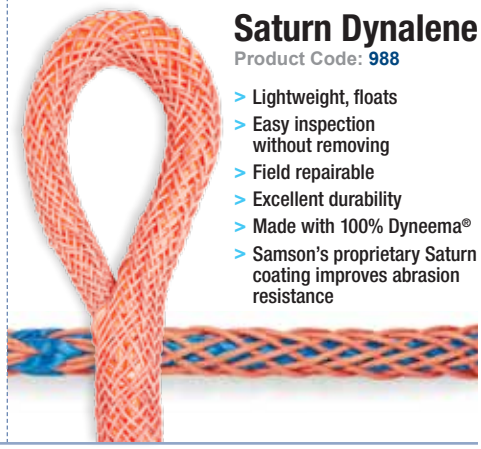
- Made with 100% Dyneema® fiber
- A size-for-size strength replacement for wire rope at only 1/7th the weight
- Torque-free, very flexible, easy to handle
- Similar elastic elongation to wire rope
- Easily inspected or field spliced
- Floats

### Quantum-12

**Product Code: 873**

- Utilizes Samson's patented DPX™ fiber technology yarns in its surface strands for higher coefficient of friction (better grip)
- Excellent abrasion resistance
- Easily inspected or field spliced
- Floats

SAMSON PATENTED TECHNOLOGY



### Saturn Dynalene

**Product Code: 988**

- Lightweight, floats
- Easy inspection without removing
- Field repairable
- Excellent durability
- Made with 100% Dyneema®
- Samson's proprietary Saturn coating improves abrasion resistance

Photo © Brian Gauvin

## G&H Towing, the fourth largest ship-assist harbor towing company in the U.S., knows the value of The Samson Advantage

"What The Samson Advantage means to me is the partnership of our companies," said Captain Steve Huttman of G&H Towing. "The relationship between G&H and Samson is built on long-term experiences, not just the money we spend today. Not only do I get great products, I also have access to Samson's distributor Lee Engineering, who gets me what I need when I need it. I have the support of the Samson regional sales manager, who recommends the best products and comes out to our tugs to make sure we are doing things right. I have also worked with Samson's sales director, application engineers, technical managers and field service technicians who have all come out to provide training to our crew for proper handling of the lines. It's all of these things together that I call The Samson Advantage."

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WITH Dyneema®



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