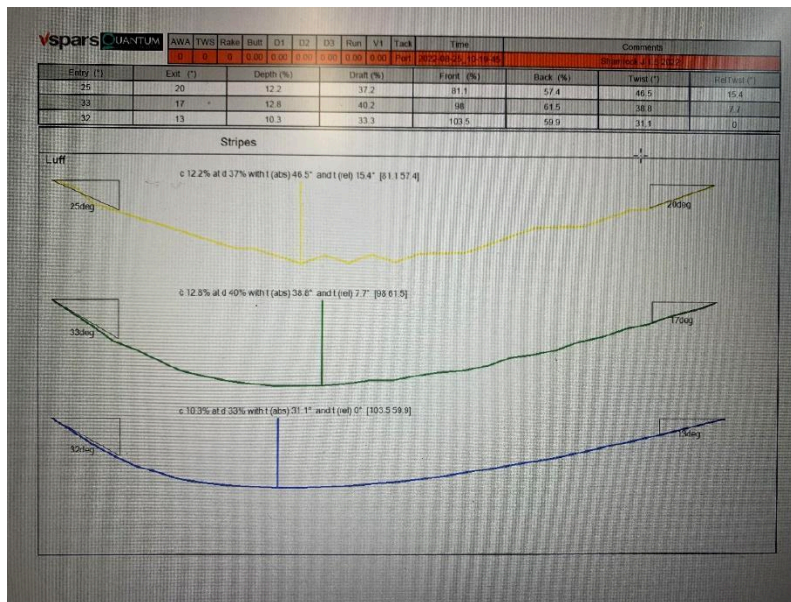


Make Your Sails Last Longer with Science

Sails are expensive and can last much longer with pictures. The images allow me to measure the shape and determine the performance value.



Picture of a J 111 new J 1.5 Jib.



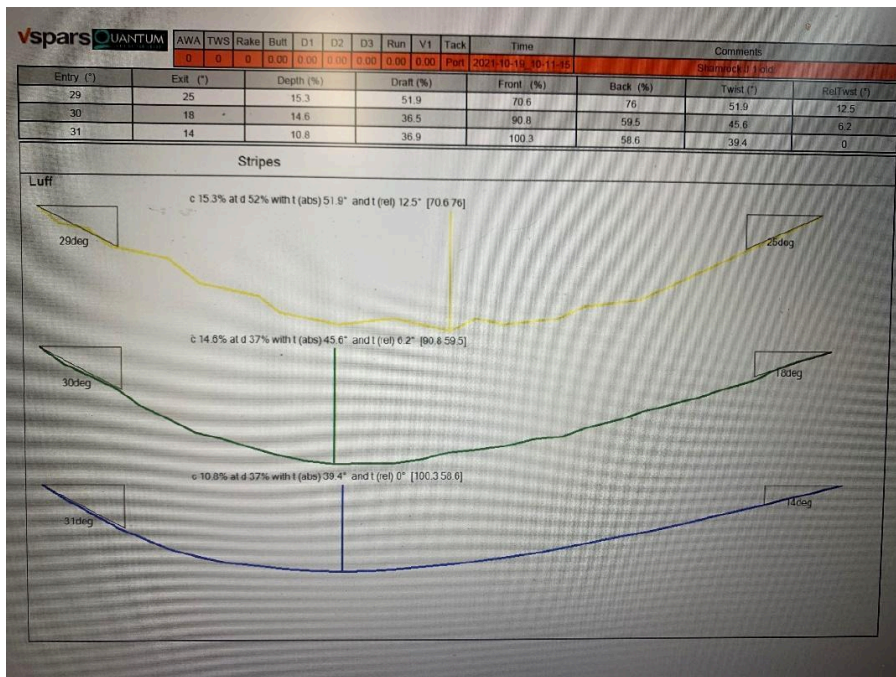
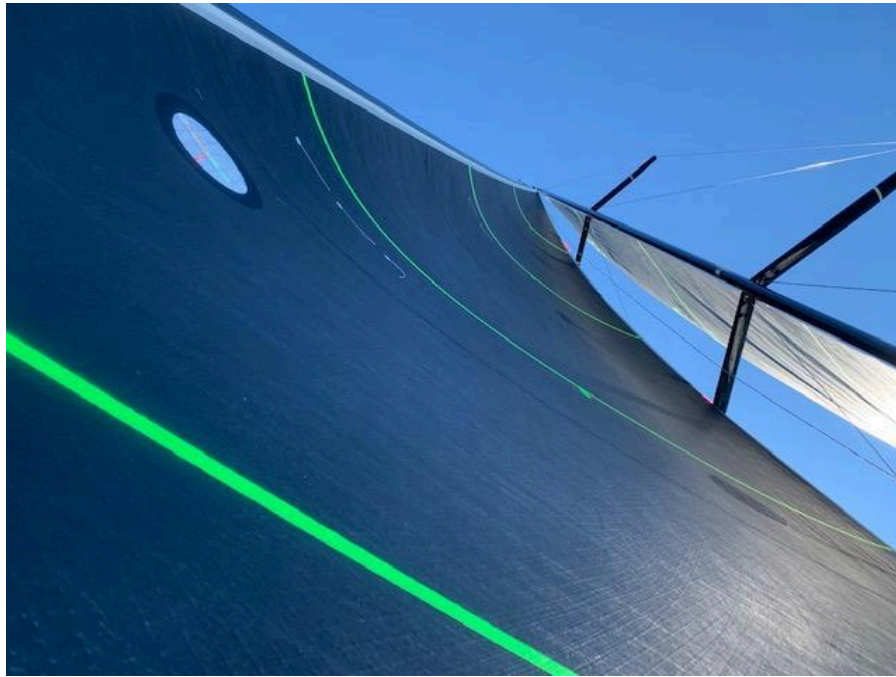
Number of new J 1.5 Jib-Top Stripe-12.2% Depth-37.2% Draft-Front%81-back%57.4

Mid Stripe-12.8% Depth-40.2% Draft-Front%98-back%61.5

Bot Stripe-10.3% Depth-33.3% Draft-Front%103-back%59.9

Make Your Sails Last Longer with Science

This jib after two seasons:



Numbers of old J 1.5Jib-Top Stripe-15.3% Depth-51.9% Draft-Front%70.6-Back%76

Mid Stripe-14.6% Depth-36.5% Draft-Front%90.8-Back%59.5

Bot Stripe-10.8% Depth-36.9% Draft-Front%100.3-Back%58.6

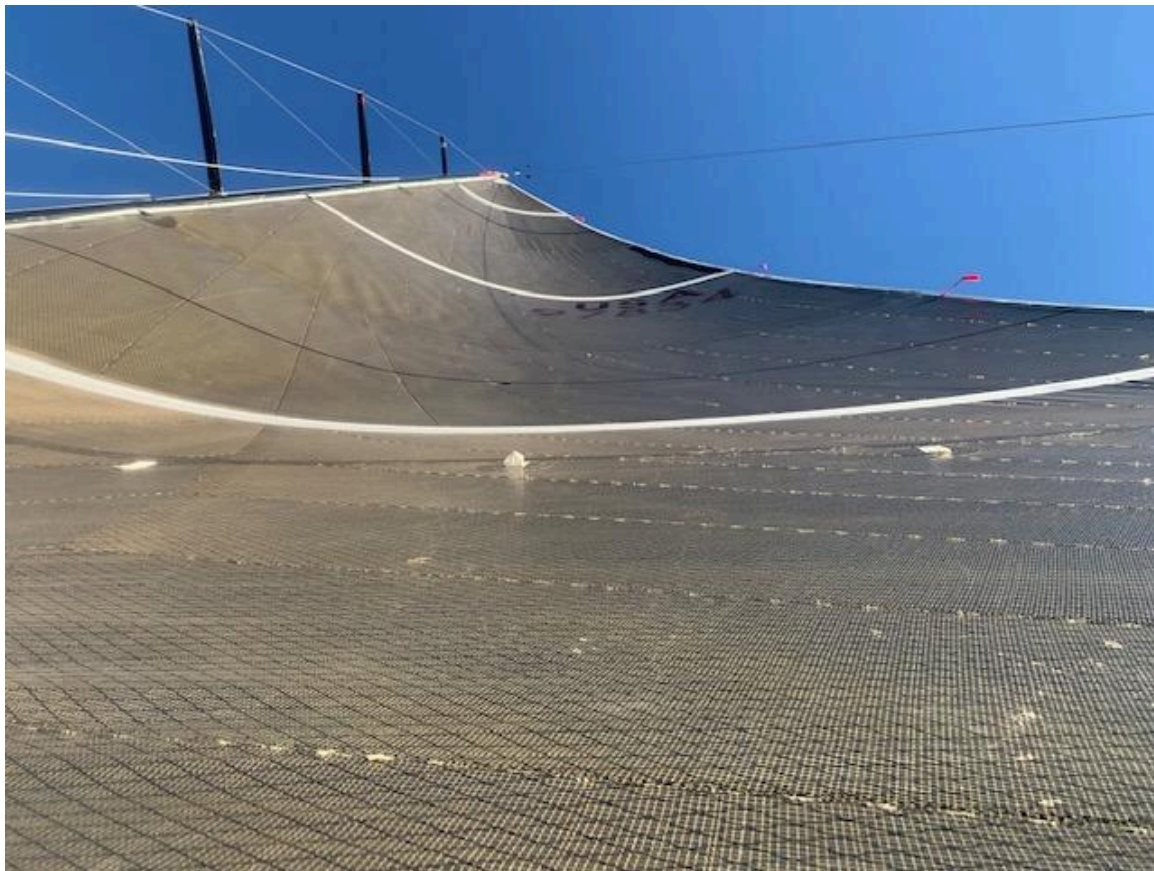
Make Your Sails Last Longer with Science

The information above allows me to make changes to the two-season-old sail to ensure another season of good performance. This sail has changed based on two sailing seasons — the entry is finer and the upper exit is rounder. The entire sail is deeper with the top enduring the most change. Based on my observations, I would:

- Remove the luff tape
- Open up the top joining seam
- Flatten the top seam
- Increase the luff round in the lower area
- Provide a tapered top batten
- Increase stiffness in bottom three battens (straighten exit)

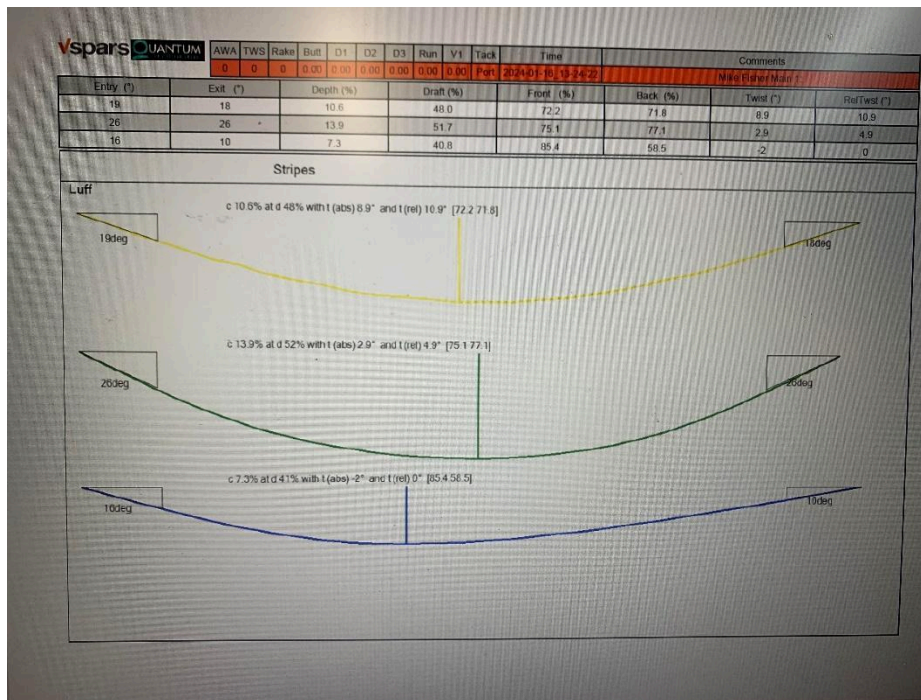
After the changes, I will take another picture to see how closely it resembles the original design. Most sails can be brought back to life with shape modifications.

Another challenge is taking a much older sail and re-shaping the sail to get a more competitive sailing life. This was my challenge two years ago when I sailed on a customer's Schock 55 and took pictures of his 10-year-old mainsail.



Make Your Sails Last Longer with Science

This sail has changed substantially from age and needed reshaping to gain more sailing life.



Numbers from old Main-Top Stripe 10.6%Depth-48% Draft-Front%72.2-Back%71.8

Mid Stripe 13.9%Depth-51.7%Draft-Front%75.1-Back%77.1

Bot Stripe 7.3%Depth-40.8%Draft-Front%85.4-Back%58.5

To make this sail competitive again, I needed to do the following:

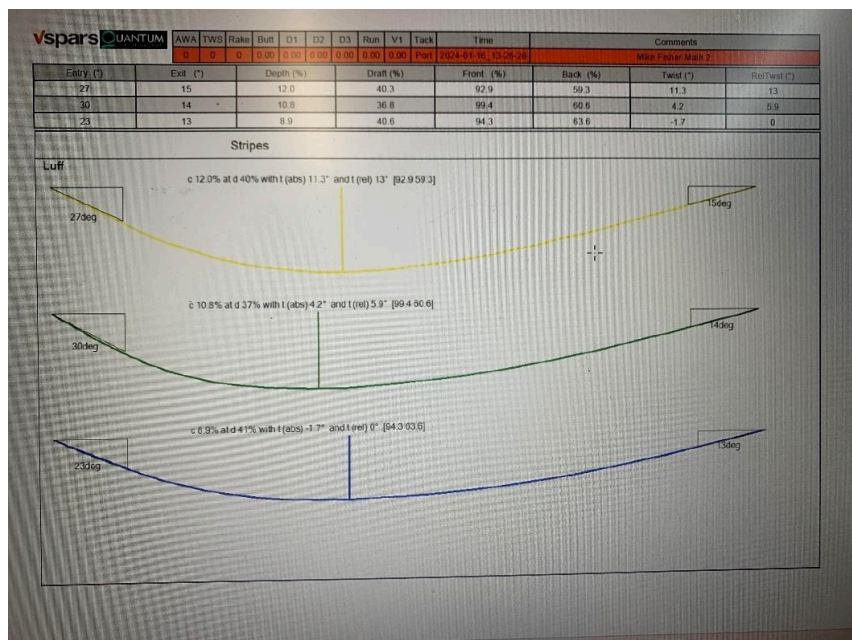
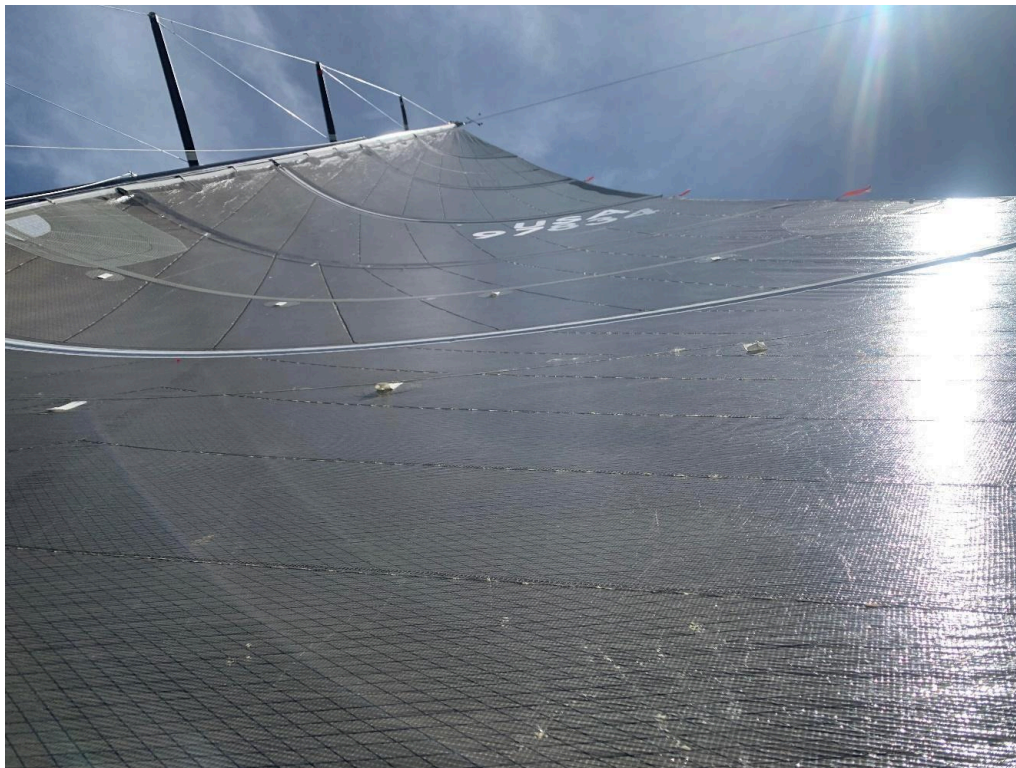
- Remove luff tape
- Open up three joining seams
- Remove shape in the seams
- Increase the luff round
- Provide stiffer top two battens

The mainsail above is a good example of an older sail that has aged with use. Over many years the draft moves aft, the entry gets flatter, and the leech becomes round. The good news is that the material in the sail was still strong and in good condition.

Pictures provide us with the information to take a sail that most owners would replace and re-shape to a usable sail for another three years. The easy solution is to buy a new sail, but they come at a cost that can break the sailing budget. This customer decided to fix the main and purchased other unsalvageable sails.

Make Your Sails Last Longer with Science

Schock 55 Mainsail Re-Shaped (we changed the numbers to white)



Numbers from old Main (Re-cut)-Top Stripe 12%Depth-40.3%Draft-Front%92.9-Back%59.3

Mid Stripe 10.8%Depth-36.8%Draft-Front%99.4-Back%60.6

Bot Stripe 8.9%Depth-40.6%Draft-Front%94.3-Back%63.6

Make Your Sails Last Longer with Science

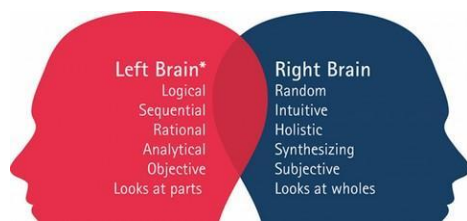
At 13 years old, this adjusted main is now competitive and will race again this summer. The new numbers are now balanced. The entry is constant, as are the exit numbers. The draft position is also balanced, and this sail will be much faster for this boat. An unstable boat needs flat mainsail exits.



Pictures of sails not only help sailmakers evaluate sail shape but also offer reasons for performance problems. Prior to the start and setup before a sail, I take a picture of the main and jib to record the wind and wave conditions. I will also take a picture of the instruments to record the wind speed.

Once the race is over, your experience of the boat's speed is fresh. You should quickly write down your thoughts on wet notes. You may continue to write down thoughts until you have a chance to look at the photos. Relate the picture to your experience and look for patterns.

It is important to separate all the factors that relate to boat speed — the sails and the shape, rig setup, and sail trim. This is under the assumption that the boat is helmed well.



A good picture of a sail digitized combined with your experience will bring both sides of your brain together and make the conclusion permanent. For example:

Make Your Sails Last Longer with Science



Comments: We were fast when the wind was over 12 true, yet once the wind dropped under 10 true, the power was gone. We were lower at the same speed.

Look at the picture and see that the headstay is straight, the entry is round, and the exit is very straight. This is a nice shape for higher wind speeds yet too flat and straight aft for the lower wind speed.

If you'd like to sail fast in all wind speeds, ensure your boat will do just that by taking a photo to analyze. Use this information and update your sailing book or Google Docs. Learn to understand what shape works in your boat in the three modes:

- **Need Power** - Finer entry angles, draft further aft, deeper with rounder exit (develop drag)
- **Perfect Power** - Balanced entry angles, draft as designed with straighter exit (less drag)
- **Too Much Power** - Round entry angles, draft more forward, straight, and twisted exit (no drag)

How to take a photo of your sails:

- Every time you go sailing take a picture of your main and jib/genoa sailing close hauled.
 - Hold the camera at mid foot close to boom on mainsail and close to sail on jib/genoa.
 - Take two pictures of each sail and then a picture of the wind speed if available.
 - After the race, write down your speed experience on wet notes.
 - Email me the photos and your speed experience to wcross@quantumsails.com
 - I will digitize your sails and provide an evaluation of the shape and how this shape relates to your speed experience.
 - Suggestions and encouragement will follow.

Sails, like cars, are expensive. Your car stays in good condition by changing the oil on a regular basis. Your sails will stay in good condition by taking pictures and making small adjustments during the life of the sail. I predict you will double the lifespan of a racing sail by taking a picture and making the necessary changes.



Wally