

# The Crosscut Sail

Sailrite Enterprises, Inc.

## What It Is and How it Works

### Special points of interest:

- The Crosscut panel layout is the most cost effective way to build a sail.
- It takes advantage of woven fabric's characteristic "fill" strength.
- On the negative side, crosscut sails tend to get full when stressed as a consequence of bias stretch.

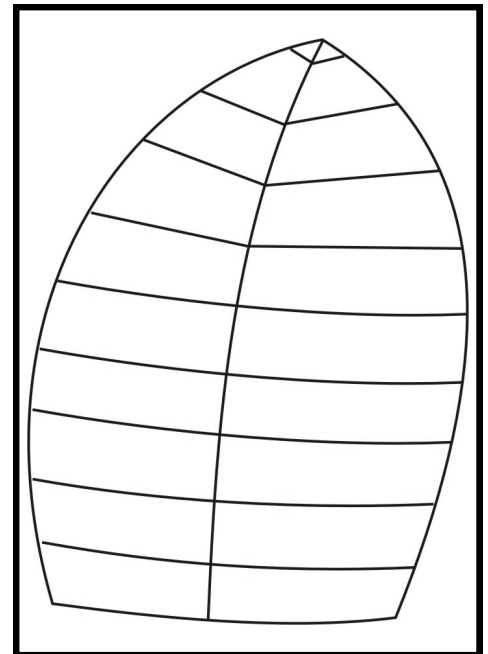
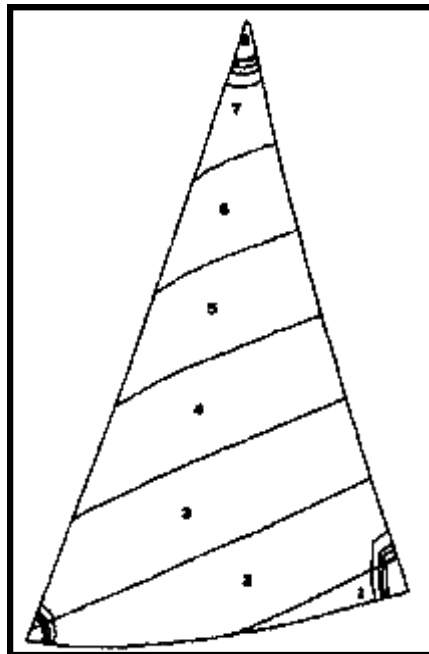
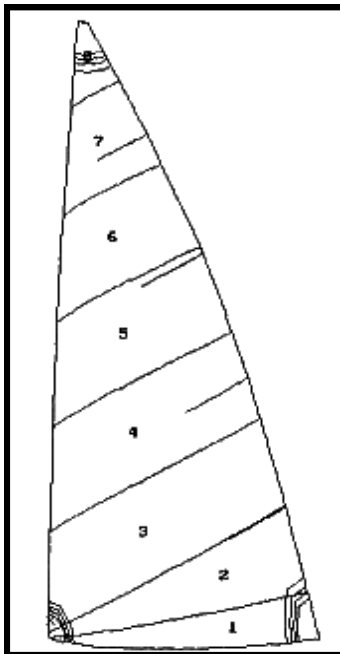
Crosscut sails (also called "Horizontal" cut) have been around for a very long while. The reasons are clear: they entail very little wasted cloth and they make use of the ease with which fabric can be made strong (and thus stretch resistant) across its width or "fill".

Panels of fabric are unrolled so they are perpendicular to the trailing (leech) edge of the sail (stay edges in the case of spinnakers). As each panel is unrolled, it is turned 180 degrees and rolled back in the other direction. In that way it is possible to cover a triangular sail plan with very little waste. At the same time, the

strength of the fabric is maximized along the primary unsupported edge of the sail — the leech (or the stays in the case of a spinnaker).

The reason for this is to be found in the way woven fabric is constructed. "Beater bars" are used to push the crossing yarns together as fabric is woven. This usually makes for more "crimp" (bends) in the warp yarns that run the length of the cloth. And crimp is one of the primary determinates of stretch. The more crimp the more stretch since the yarns can increase in length before they really begin to take on stress. Now there are many more factors that affect the

stretch characteristics of sailcloth, but it is usually safe to assume that stretch on the fill will be least or nearly so in any fabric. Unfortunately, all woven fabric stretches most on the diagonal across the 90 degree matrix formed by the warp and the fill. And this particular stretch is not well controlled by the crosscut. As stress radiates out from the clews, there tends to be a good deal of stretch into the center of the sail which, of course, has the effect of making it fuller as the wind increases. And this is just the opposite of the desired effect.



*Mainsail, Genoa, and Spinnaker Utilizing the Crosscut  
Note that the number of panels will vary with the size of the sail. The above figures are representative only.*