



NORTH SAILS

Choosing Your Fiber

The Aramid Vs Technora Story

Many types of fibers come in two or more styles, different styles are intended for different final applications.

Aramid fibers (Kelvar and Twaron) come as SM (standard modulus) or HM (high modulus). SM is also sometimes referred to as K29, and HM as K49 (those are the Dupont names for SM and HM).

The modulus of a fiber is a measure of its ability to resist stretch. SM fibers are less able to resist stretch and they have a higher maximum elongation under load (about 3.5%). That means they stretch 3.5% before they will break. HM fibers are more resistant to stretch, and only elongate 2.8% before they break. Carbon, for example breaks, at between .8 and 1.5% elongation, depending on the type.

This is not an accident, because some applications require higher ultimate elongations. This is true in ballistics, where the end user wants higher elongation, because energy absorption is the way a bullet is stopped in a vest or armor composite plate.

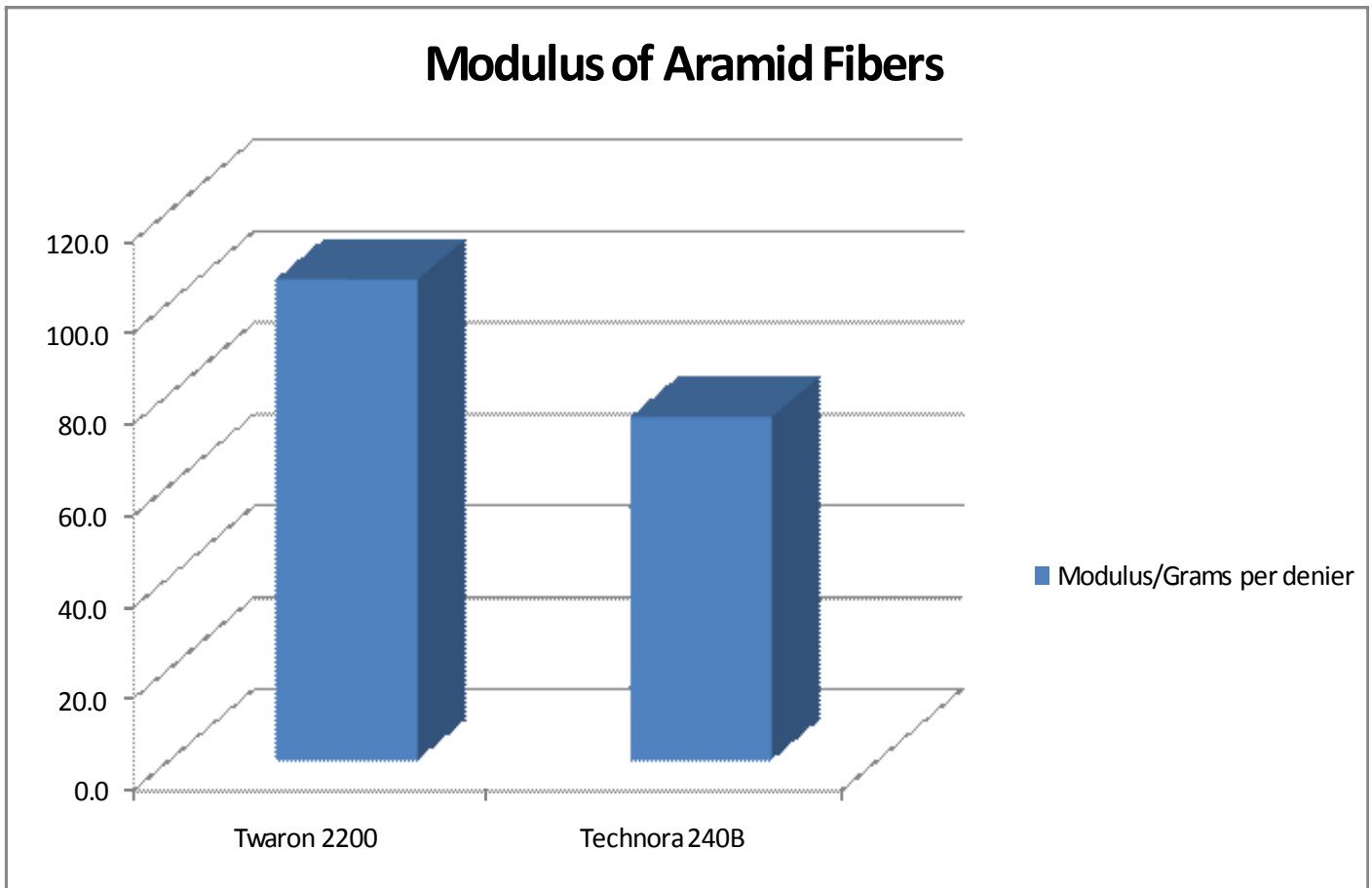
In sails, we do not want energy absorption. Quite the opposite, we want energy transmission. We want the forces the sails generate to be transmitted from the sails to the boat and keel. The less energy that is absorbed or lost, the better the performance. Therefore HM fibers, with higher modulus, are the choice for performance sails.

Technora is a standard modulus fiber that is designed to have lower modulus and higher elongation. This has nothing to do with the way the sailmaker uses the fiber, it is inherent in the fiber properties, the way it was created and the use it was intended for.

The only reason to use Technora in sailmaking is because it is black, and black is cool. When it comes to aramid fiber, yellow is fast, even if black is cool.

There is a fair amount of myth around the Technora, claiming it is better in flex and in UV than HM Aramid. It is marginally better. However, SM fibers are inherently better in flex than HM fibers, because of the above mentioned properties. You do get

somewhat better longevity if you have a lower modulus fiber. Using that logic, you should have Dacron sails, if you want the sails to last, while you go slowly.



Twaron 2200 is the HM (high modulus) fiber from Teijin-Twaron company. This same company also makes Technora.

That company, who makes both the products, provides this data. These is not something that came be disputed, it is fact.

The average modulus across the range of four sizes of Twaron 2200 fibers is 105 grams per denier. That average of the Technora styles is 74.95 grams per denier. This means that Technora is 28% more stretchy than HM aramid.