



Varamix®

How do you define performance?

Polymer products are used in widely diverse industries, environments and applications. From thousands of feet under the surface to thousands of miles above it. From stifling heat to bitter cold - some changes even within a single use. There is no single polymer formula that meets all criteria.

Responding to the performance properties that deal directly with your specific demands is why we are considered by many to be the leading supplier of engineered cut fibers in the industry.

While there is no single polymer formula, there is Varamix® - a single engineered fiber additive that makes your polymer product excel at whatever application you are challenged with.

We can say this with confidence because it is not a single product. It is a patented, customizable 100% fiber blend. Varamix® has an almost infinite number of variable blends that enhance the specific property(ies) that will maximize performance as you define it.

The most complete, most effective, easily dispersed aramid fiber product

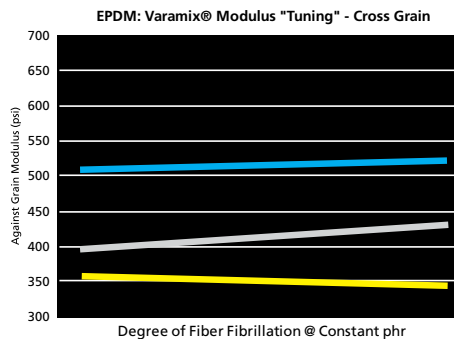
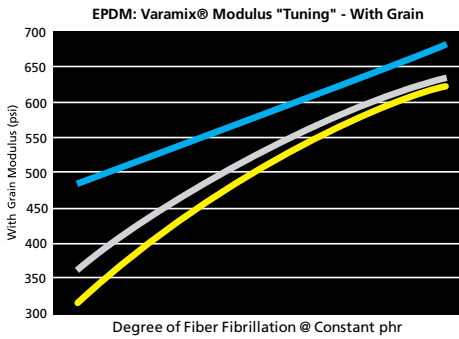
| | Varamix® | Aramid Fiber/Silica Blend | Aramid Masterbatch | Aramid Fiber |
|--|----------|---------------------------|--------------------|--------------|
| Increase Modulus of Compound | X | X | X | X |
| Increase Tear Resistance | X | X | X | X |
| Increase Wear / Abrasion Resistance | X | X | X | X |
| High Temperature Resistance | X | X | X | X |
| Easy to Disperse in Polymer Compound | X | X | X | |
| Polymer Independence - Functional Across All Polymer Classes | X | X | | X |
| Customizable - Fine Tune Physical Properties | X | | | |
| No Extraneous Ingredients | X | | | X |
| Chemical Compatibility | X | | | X |
| Antistat Agent | X | | | |

This study demonstrates how Finite Fiber's Varamix® aramid fiber blends can be customized to meet your specific polymer compound property requirements. Our ability to adjust the degree of fiber fibrillation during the proprietary blending process, enables our technical team to work with the compounder to develop a unique balance of cured compound performance properties.

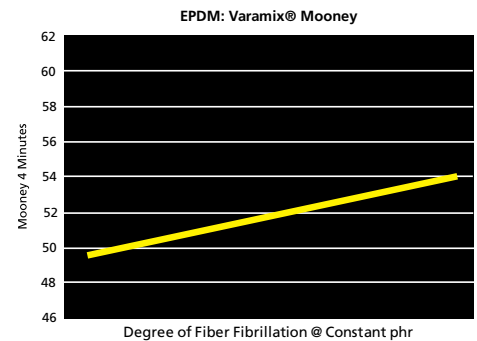
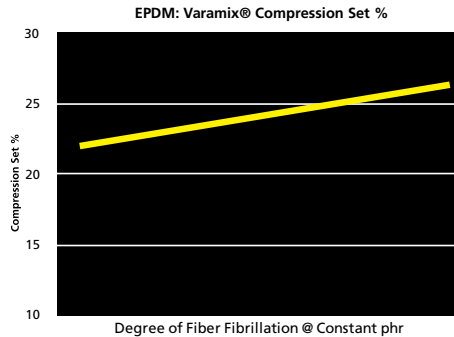
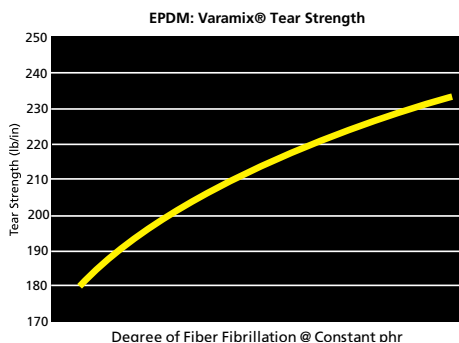
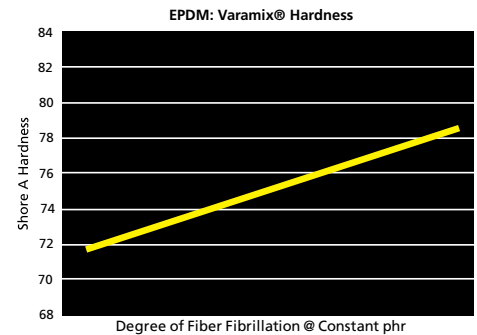
Previously polymer compounders were limited to only altering the concentration of single fiber structure. With a customized Varamix® product properties can be optimized to a much greater degree.

Depending on what properties are most important, we have a balanced reinforcement solution for you. The following graphs are for an EPDM compound with a constant 12 phr loading of Varamix®. The x-axis represents the various fiber blends or the degree of fiber fibrillation. The "with grain" orientation was set on a mill at a 2 minute run time to simulate fiber orientation in the various polymer processing technologies.

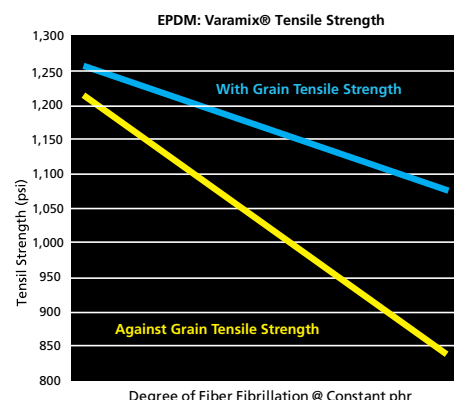
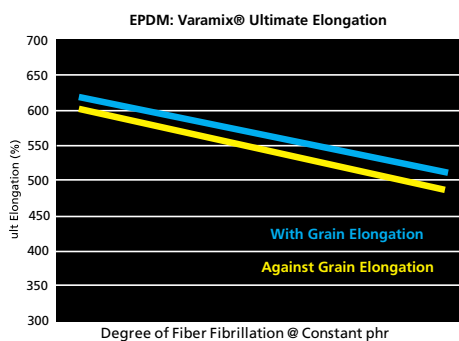
Legend: Modulus at 300% Elongation
Modulus at 200% Elongation
Modulus at 100% Elongation



From the "tuning" graphs, the compound's modulus and amount of anisotropy can be greatly manipulated by choosing the right Varamix® blend.



Corresponding tear strength and compression set values



This is accomplished with minimal impact on the hardness and viscosity of the compound while maintaining improved wear and abrasion resistance.

Where ultimate elongation and tensile strength is important, a lower degree of fibrillation will be needed.

In Closing!

There are two factors in achieving the maximum benefit from Varamix®. First is proper mixing to insure complete fiber dispersion. As an expanded 100% fiber product, Varamix® is designed to be directly added to typical internal mixers. Proper mix time and work energy is needed to insure good dispersion. The second is proper compound formulation adjustment. This typically just involves reducing the amount of carbon black or other reinforcing fillers when adding fiber. Finite Fiber has developed a proprietary equal hardness calculator to assist with formulation development. Poor dispersion and / or unbalanced fiber reinforcement addition can produce erroneous and miss-leading cured compound performance results.

FINITE FIBER

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