

BIONIC™

FINALLY... MOLECULAR FUSION OF NYLON AND POLYETHYLENE.

BETTER. STRONGER. BIONIC.



AstroTurf®

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Introducing the Bionic™ Fiber:

Throughout the history of the synthetic turf industry, the great quest of manufacturers has been to blend polyethylene (PE) and nylon into a single fiber.

From its earliest inception until the 1990s, nylon was used nearly across the board for its superior resilience and strength. But the downside of all-nylon fibers was well known. It was abrasive. In the 1990s, PE came into vogue and became the industry standard for tall pile face fibers.

These PE fibers were much less abrasive, but they came at a cost - they sacrificed the strength that previous generations of turf fields offered.

Until now...

AstroTurf® reinvents PE - making it better, stronger, BIONIC™.

AstroTurf now offers the BIONIC fiber. This patent-pending development is a **feat of chemical engineering** never before achieved in the history of our industry. Bionic combines player friendly PE with ultra-durable nylon, to deliver the ultimate fiber.

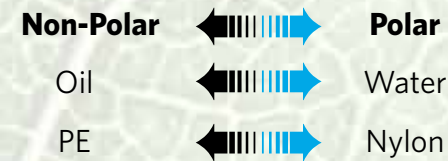
BIONIC is the new **WONDERFIBER!**

THE MOLECULAR FUSION OF NYLON AND POLYETHYLENE.

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WHY WAS IT SO DIFFICULT?

Chemically speaking, PE and nylon are like oil and water. They do not mix. The reason has to do with polarity. PE (like oil) is non-polar, while nylon (like water) is polar.



PE and nylon repel each other.

That's why efforts to mix the polymers into a single fiber have always failed - **until now.**

SO HOW DID WE DO IT?

The secret is in the **compatibilizers**. These compounds encase the nylon polymers, which are suspended within the PE to reinforce the fiber. These compatibilizers have an affinity with both the PE and the nylon. They are polar on the inside, and non-polar on the outside. In essence, the compatibilizers bridge the gap.

Five years of pre-market research and development, constant testing, and continuous tweaking have enabled us to develop the optimal compatibilizers for long term integrity and durability.

WHY IS BIONIC UNLIKE ALL OTHERS?

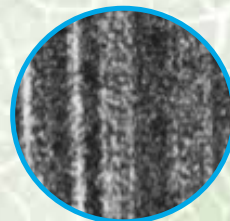
In developing the Bionic protocols we combined one layer of polyethylene over a core. Testing proved this to be unreliable and more prone to splitting than current monofilament fibers.

WHAT MAKES BIONIC SO DIFFERENT?

While some core systems may use two polyethylene compounds as a cost saving shortcut, Bionic fibers are a totally different technology.

To produce Bionic, polyethylene and nylon molecules are fused into a co-polymer and then extruded as a single fiber. This patent pending process chemically blends polyethylene with nylon, providing the softness of current fibers with the durability, strength and resilience of nylon.

Bionic is the real game changer!

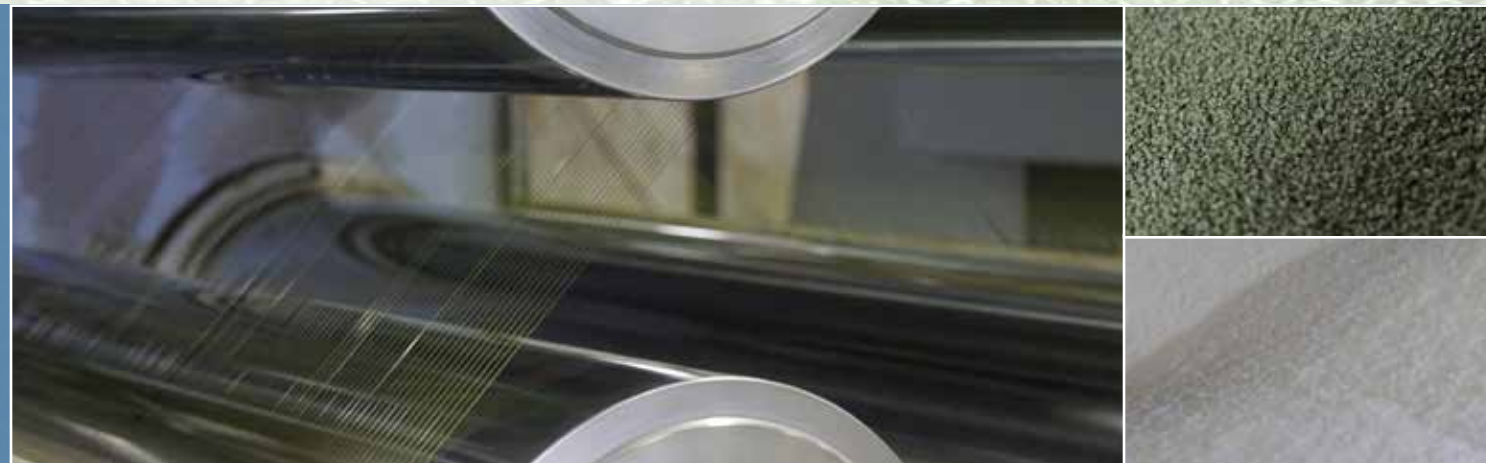


Bionic Fiber via an electron microscope



Compatibilizers bridge the gap between Nylon and Polyethylene allowing the creation of the Bionic co-polymer.

- Nylon
- Compatibilizer
- PE



REAL WORLD RESULTS = 50% MORE WEAR RESISTANCE

Our Bionic Fiber delivers a massive improvement in resistance to wear! See for yourself.

Accelerated wear tests show that Bionic performs as well at 150,000 cycles as even our own High Micron monofilament fibers at 100,000 cycles. Polyethylene fibers, regardless of how they are made, or how they may be combined, do not compare to the strength, resilience and durability of a molecularly fused Nylon and Polyethylene fiber. Period.



High Micron PE monofilament @ 100,000 cycles



Competitor PE monofilament @ 100,000 cycles



BIONIC monofilament @ 150,000 cycles

BIONIC TECHNOLOGY GOES EVEN FURTHER...

ENTANGLEMENT

Our Bionic fiber features entanglement technology for superior strength. In fact we now use this same technology in all of our PE fibers.

Every polyethylene molecular structure contains a main chain, with branches of side chains. As fibers are made, the resin and masterbatch pellets are melted down, extruded, and stretched.

As the newly made fiber is stretched, those main molecular chains are lengthened along the direction they are stretched. This creates long molecular chains that run parallel to one other along the length of the fiber. In most fibers, with UV exposure and use, this lends itself to splitting lengthwise down the shaft of the fiber.

WITHOUT ENTANGLEMENT
the main molecular chains are vulnerable to splitting



WITH ENTANGLEMENT
cross chains reinforce the main molecular chains



To prevent splitting of the fiber, we entangle the side chains to reinforce any weak spots that would form between the main molecular chains.

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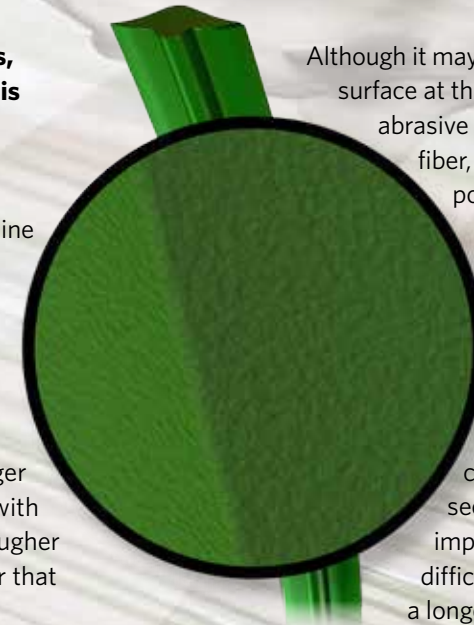
SHARKSKIN

Bionic, as well as all our extruded fibers, also utilize shark skin technology. This is what it is and how it works.

At the molecular level PE has some amorphous molecules and some crystalline molecules. Amorphous molecules are random and unstructured. Crystalline molecules are stacked and structured.

Sharkskin technology engineers the molecular structure of the PE turf fiber to increase crystallization. More and larger crystalline portions, when interspersed with smaller amorphous sections, create a rougher surface at the molecular level of the fiber that resembles the scales of a shark's skin.

Although it may seem counter-intuitive, the rougher surface at the microscopic level creates a less abrasive fiber. When a player slides across the fiber, the player is exposed to the crystalline portions and not the amorphous portions. **That means fewer contact points, which reduces friction on the skin.** (Think about sliding your hand across glass. The surface is so smooth that it creates significant friction).



Those molecular peaks and voids also create more space for polyurethane secondary coating to adhere, which improves tuft bind and makes it more difficult to pull out fibers! That translates to a longer lifespan for your turf field.



INSTALLATIONS

The Bionic Fiber is already in use! More than 700,000 square feet of the Bionic fiber have been installed at carefully selected beta sites around the country, with varying usage amounts and UV exposure.

- Bay City Baseball - MI
- Bellarmine Prep - WA
- Cabaniss Stadium, Corpus Christi - TX
- CEGEP Levis, Lauzon - QC
- Colorado Rapids Youth Soccer Academy - CO

- Quakertown Middle School - PA
- Thomasville High School - GA
- Tri-Town High School - ME
- Wide World of Sports - MI



Tri-Town High School - Freeport, ME

Thomasville High School - Thomasville, GA

Bellarmine Prep - Tacoma, WA



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powered by **sportgroup**
THE SURFACE SPECIALISTS



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