

Nylon; the Invisible Plastic

Nylon is a material used in many things we walk on, wear and utilize in our everyday lives. Because it was designed to be so similar to natural fibers, we don't even recognize it as the fume emitting and potentially toxic petroleum-based plastic product that it is. It has become almost invisible to those who think of themselves as health conscious and aware stewards of our planet. Yet, because it is produced from petroleum, nylon is not compatible with our body's metabolic functions, has adverse effects on the environment as waste and has the potential to contribute to the toxicity of our homes.

When we replaced the carpet in our home 7 years ago, we continued to get handfuls of the loose carpet fibers in the vacuum canister for nearly 3 years. Fortunately, we use a vacuum which employs a water filtration canister to capture the minute fibers and dirt. Imagine your vacuum blowing these potentially toxic fibers through the air for everyone to inhale directly into their lungs or into the intestinal tract. So, the combination of nylon carpet and regular vacuuming, rather than keeping your family healthy, only increases the health risks due to the volume of fibers your family ingests into their bodies as well as the fumes that the curing/aging nylon emits.

Nylon's History / Background

- Nylon was introduced as the first synthetic fiber at the 1939 World's Fair in New York by DuPont Corporation.
- In the 1940s cotton represented 80% of the U.S. mill fiber consumption; by the 1980s that had fallen to just over 25%.¹
- Nylon's commercial target market was as a replacement to silk in stockings used by women in the early 20th century.
- First introduced in tooth brushes (yes, let's put petroleum in our mouth!).
- Nylon is classified in the chemical group name of petroleum-based synthetics called polyesters; a polyamide.
- Production of Nylon consumes 1.1 % of world petroleum production (2722 barrels of oil per day). Plastics (of which nylon is a subgroup) accumulates nearly 30 million tons of waste in landfills each year in the U.S. alone.²

When nylon was first introduced, it was a homemakers dream; from durable carpets and rugs to reduced ironing of clothes. What's not to like about nylon? Little did we know it was a Trojan horse for an increasingly convenient parade of toxic chemicals and poisonous products in the home and places of business. Did you know that some tea bags and coffee filters today are made of nylon?

Nylon Products

Carpets and rugs, electrical and reinforced plastics, fabrics, tires, miscellaneous industrial-type products, rope, cordage, fishing line, underwear, nightwear, retail piece goods, drapery, upholstery, industrial narrow fabrics and sheer hosiery.

Chemicals used in the production of Nylon: Hexamethylene adipamide, adipic acid, diamine, dicarboxylic acid salt, hexamethylene diamine, isophenylene diamine, paraphenylene diamine, isophthalic acid, terephthalic acid, homopolyamides, liquid hydrogen and aminocarboxylic acids.

Alternatives to Nylon; Bio-plastic Nylon

The next time you purchase clothing, curtains, carpet, nylon belted tires, etc., research the product manufacturers to find the one paralleling your own pathway to sustainability.

There are several manufacturers developing Bio-plastic nylon and new manufacturing processes. As these alternatives are made from biological sources and not from petroleum, there is hope that testing will reveal it to have less health/toxic impact to humans and the environment. That being said, further research and active commercial support of the manufactures of the best products is the key to seeing more in the market. Bioplasticsnews.com estimates a current market value of \$18billion for the three primary chemical molecular structures for nylon. ³

Companies Developing Bio-plastic Nylon

- In China, *Suzhou Hipro Polymers* reports launching a line of nylon products made with castor oil. ⁴
- *Verdezyne* has opened its first pilot plant to produce adipic acid, a key component of nylon 6,6. ⁵
- *Rennovia* announced that it has produced, and shipped to a prospective partner, samples of what it believes to be the world's first 100% bio-based nylon-6,6 polymers, under Renovia's RENNILON brand. ⁶
- *Genomatica* is going public with its third development program, entering into the world of biobased nylon intermediates. ⁷

Natural Fiber Product Alternatives

Organic Cotton:

It's vital that you read labels when buying cotton. My research found this excerpt with a shocking truth about "non-organic" cotton. "Conventionally grown cotton uses more insecticides than any other single crop. Nearly \$2.6 billion dollars' worth of pesticide is sprayed on cotton fields each year — accounting for more than 10% of total pesticide use and nearly 25% of insecticides use worldwide." ⁸

Aldicarb, cotton's second best-selling insecticide and most acutely poisonous to humans, can kill a man with just one drop absorbed through the skin, yet it is still used in 25 countries and the US, where 16 states have reported it in their groundwater. ⁹ In addition to the primary risk of Aldicarb touching our skin via the fabrics we wear, it also ends up in our food chain as cotton seed oil for cooking and in cattle grazing nearby or through groundwater or aerial crop spraying.

Fortunately, the story on organic cotton is encouraging with the "Organic Trade Association" stating that, "Turkey and the United States are the largest organic cotton producers. Demand is being driven by apparel and textile companies that are expanding their 100% organic cotton programs." ¹¹ This means consumers are having a positive effect on corporate policies and product lines by demanding and purchasing organic cotton.

Organic Hemp:

From the sails of Christopher Columbus's ships, Thomas Jefferson's farms, the first U.S. flag and Levi Strauss's first pair of their famous jeans, hemp has been a trusted fabric. It is a renewable and sustainable plant with a farmer having the opportunity to produce 250% more fiber than cotton and 600% more fiber than flax using the same acreage. Hemp has also been tested for its antibacterial effect on *Staphylococcus aureus* resulting in a 99.0% reduction in the spread of the bacteria thus having an adjunct capability for the human immune system. ¹²

Conclusion:

Nylon is a petroleum-based, toxin laden fabric which consumes a large and growing percentage of the world's oil reserves and contributes to human disease. We should be intelligent enough to research and select alternative products for use in our everyday lives.

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