

November 2023



Dear Club Members,

Your fibre today is inspired by a fibre. It's even a fibre you can spin if you don't like yourself or your wheel very much, every account I've heard of it as a fibre made me very determined it wasn't an experience I needed, so if you have done it, tell me how you got on!

Stephanie Kwolek was born a hundred years ago, and in November 1966 she was granted the patent for Kevlar. The fibre is five times stronger than steel, and naturally fire retardant. It's used in everything from smartphones to spacecraft, bridges, safety equipment, musical instruments, armour and hurricane safe rooms. Countless lives have been saved by her discovery.

She joined the chemical company DuPont, whose researchers were also responsible for Nylon, Neoprene and Lycra, in the 1940's. Her role was to investigate new synthetic polymers, with the aim of finding one that could replace the steel wires used in car tyres. If not for Kwolek's persistence Kevlar might never have been discovered, the solution she was working on formed crystals, at room temperature, making it have very low viscosity. It was normally thrown away before being tested on the spinneret (a very small nozzle through which the liquid polymers were pushed forming them into a continuous fibre strand), as it was thought it would clog the machine. However it didn't, and in fact the strand produced was found to be incredibly strong.

Kwolek didn't benefit financially from her discovery, as a DuPont employee all her discoveries belonged to the company. In addition her role was only limited to the process of developing the chemical, after the test run through the spinneret all further development to create a commercial fibre was passed on to a different team. She did however receive numerous awards, medals and prizes in recognition of her work. Her work wasn't just limited to Kevlar, in her lifetime she was named in 28 patents.

Many who have studied chemistry at school also benefit from her knowledge, as she devised many school classroom experiments, including the Nylon Rope trick, allowing students to see the magic of polymerisation for themselves.

She was born in Pittsburgh to Polish immigrant parents. As a child she spent hours on nature walks with her father collecting samples and observing nature. In 1946 she gained a Bachelor of Science degree with a major in chemistry from Carnegie Mellon University. Her job at DuPont was only intended to be a temporary position, an opportunity to earn enough money so she could attend medical school. In the end she found the polymer research so interesting that she never left, spending her whole working life at the company. She retired in 1986, and died in 2014.

Given the technical nature of the inspiration for the fibre this month, I decided we'd better use some technical fibres in your blend. Soyasilk is another synthesised fibre (See Model T from April 2022 for more information), and the wool is superwash treated Merino. We've then got bamboo rayon and seacell which are both another synthesised cellulose fibre, all made using the same spinneret techniques that Kwolek was very familiar with.

Happy Spinning

Katie

Fibre Content- In case your parcel is missing the label

25% Soyasilk

12.5% Seacell

12.5% Bamboo Rayon

50% Superwash Merino

Further Reading-

<https://www.acs.org/education/whatischemistry/women-scientists/stephanie-kwolek.html>

<https://sciencehistory.org/education/scientific-biographies/stephanie-l-kwolek/>

<https://www.youtube.com/watch?v=UISIOB9tnRw>

Kevlar

<https://www.explainthatstuff.com/kevlar.html>

<https://www.dupont.com/what-is-kevlar.html>

<https://www.youtube.com/watch?v=ybqMEil9j-g>

<https://www.youtube.com/watch?v=bizSWjzi4jg>

Nylon Rope Trick

[https://www.youtube.com/watch?v=3ndzkma1V\\_k](https://www.youtube.com/watch?v=3ndzkma1V_k)