

Minor Cellulosics

You've learned about cotton as the major commercial cellulosic fiber. Minor cellulosics are used for various fabrics and products—you may be familiar with some of the fibers. Minor cellulosics share characteristics as they are all plant based, but will have varying degrees of absorbency, strength, and spinnability. An advantage of these fibers is that they are biodegradable. Minor cellulosics may become more prevalent as companies are increasingly aware of the need to produce sustainable products. The yarns and fabrics made of minor cellulosics may be an attractive alternative for crafters and home sewers. Cotton is a “seed hair.” You recall from the cotton section, that the fibers are formed in a seed pod. This section describes minor cellulosics in three categories that depend on which part of the plant the fiber comes from: seed (fiber-science calls it a “hair”), bast (stem), or leaf:

Bast: flax, ramie, jute, hemp

Seed hair: kapok, coir, milkweed

Leaf: sisal, abaca, piña, henequen

Bast fibers:

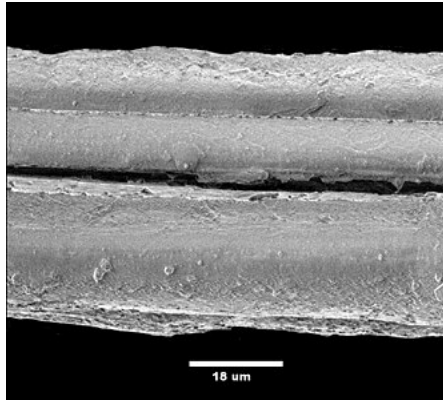
Flax is the one minor cellulosic fiber you may be familiar with as it is used in apparel and household fabrics, however it is not a major commercial fiber. When made into a fabric, it is most often called “linen.” Linen is an ancient fabric made in Egypt prior to 3000BC. Ireland was producing very fine linens by 500AD. Today most of the fiber is produced in China, with high quality linen predominately produced in Western Europe. The American colonists made a home-spun fabric called *linsey-woolsey*. They produced their own linen (linsey) and wool (wolsey), spun the fibers together and used looms to make the fabric for home use.



The photo of the harvested flax plant shows the long stalk or stem (bast) and the dried seeds).

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Flax is harvested by pulling the stem from the ground to get the longest fiber possible. There are several steps to go from the plant to a fiber—removing the hard outer shell, chemically processing the inner stalk to get to a flexible form, and combing the fibers into long parallel strands ready for spinning. The plant yields many by-products including linseed oil used in outdoor paints, linoleum and explosives. Flax seeds can be produced into flax milk.



Photomicrograph of flax fiber showing irregularities and uneven texture.

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Flax / linen: flax stem, fiber, yarn and woven and knitted linen textiles. Tray and samples of the textile cabinet in the Textielmuseum in Tilburg, Netherlands. Cabinet interior made by Simone de Waart, *Material Sense*.

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Flax Properties:

Natural colors: Natural undyed fibers range from ivory, to tan, to gray. Many linen products are not dyed lending the customary aesthetic of natural linen.

High luster for fine fibers: The highest quality and most expensive flax fibers are long and thin making linens lustrous (see damask tablecloth above). Damask may be pounded in a finishing process to flatten the yarns making them more lustrous.

Good absorbency: Used for sheets and summer clothing.

Good tensile strength: Flax fibers are strong when pulled end to end.

Low resilience and elasticity: Linen fabrics wrinkle easily due to low resilience and elasticity. This same property means that linens can maintain a sharp crease, but the fabric may eventually break at the crease. A fine linen, like a tablecloth, should be folded along a different area every time it is stored.

Damaged by sunlight: Linen fabric made of flax is not a good choice for window coverings.

Linen fabric name examples: Damask, crash, batiste and more (see more information in the Structure Section).

For more information:

The North American Linen Association (NALA) is a nonprofit trade association founded to develop the flax industry across North America. <https://northamericanlinen.org/>

The Linen Project is directed by the *Crafts Council Nederland*, working to bring attention to linen production at various scales. <https://thelinenproject.online/>

Seed Hair fibers

Kapok, coir, and milkweed are seed hair fibers that are not used for apparel or household fabrics, because fibers are not easy to spin into a yarn.

- Kapok may be used for stuffing in cushions and decorative outdoor pillows. It may be used in life preservers because it is lightweight and buoyant. It is sourced from the seeds of the Ceiba tree.
- Coir is used for potting mixes, erosion control mats, floor mats, and brushes. Coir is sourced from the outer husks of coconuts.
- Milkweed is also a seed hair but tends to be somewhat “sticky” so spinning the fiber is difficult. You may see it growing along the side of the road. Some crafters have experimented with it to produce unique products.

Leaf fibers

Sisal, abaca, piña, and henequen are sourced from different types of leaves. The fibers are used for various products. They are not soft or pliable limiting apparel and household product uses.

- Sisal is stiff and durable, used for rope, twine, carpets, and geotextiles. It is used for some craft products. The leaves of the *agave sisalana* plant.
- Abaca, sometimes called “Manila hemp” is most often used for industrial products like ropes, cables, and fishing lines. It may be used for carpets and table mats. The source is leaves of a non-edible banana produced in the Philippines.
- Piña is the most luxurious of the leaf fibers, made into what is known as the “Queen of Philippine Textiles.” It is lightweight, but stiff. The fiber is used in the Philippines for

wedding gowns and men's formal wear. It is also used for decorative household products like placemats. Piña is sourced from pineapple leaves. Products may also be produced from pineapple agricultural waste.

- Henequen is strong and coarse. It is produced in Mexico and is used for industrial products like twine. It is also used for handcrafts like handbags and baskets. Henequen is produced from the leaves of the *agave fourcroydes* plant.