

THE NEXT STEPS

STARTING POINT

The Netherlands is known worldwide for its ornamental cultivation of cut flowers. But most people don't give much thought to the amount of flowers thrown into the garbage without ever being shown for sale. This project investigated how rather than being wasted, these flowers could become a raw material for textile.

FlowerTextile proposes a counterversion to the amount of pollution that permeates the fashion industry. This textile product comes entirely from Dutch soil and is fully biodegradable.

CELLULOSE PRODUCTIONS

Viscose is the the most used man-made cellulosic production method. 80% of the current man-made cellulose is produced with the viscose process.

Modal is a modified viscose fibre with improved properties compared to viscose. The quantities of chemicals used are reduced compared to viscose.

Cupro makes use of cuprammonium as dissolving agent. This process requires really high quality dissolving pulp and is therefore not much used anymore.

CA as cellulose-derived fibre is almost only used for the production of cigarette filters, because of its low quality fibre.

Lyocell production is different from other man-made cellulosic methods. N-Methylmorpholine N-oxide (NMMO), a non-toxic organic solvent, is used to dissolve the cellulose into a cellulose solution by heating.

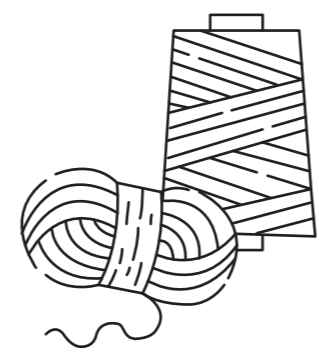
LYOCELL PRODUCTION

Lyocell production is totally different compared to other man-made cellulosic methods. N-Methylmorpholine N-oxide (NMMO), a non-toxic organic solvent, is used to dissolve the cellulose into a cellulose solution by heating.

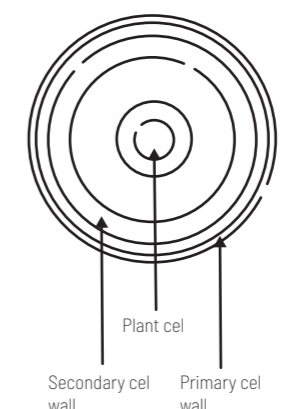
The dissolved cellulose is called "dope". The dope is led through a spin bath with a technique called dry-jet spinning. When the dope is let through the spin bath, NMMO is dissolved in the spin bath and the cellulose is formed into a cellulose polymer. The formed polymer is water washed, treated with lubricant and dried into a fibre. 95% of the dissolved NMMO can be won back and is used again. Lyocell based yarn is soft, colorfast and has a high wearing comfort.



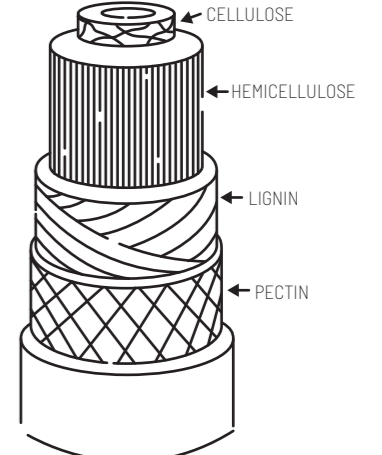
FLOWER WASTE



CREATING JARN

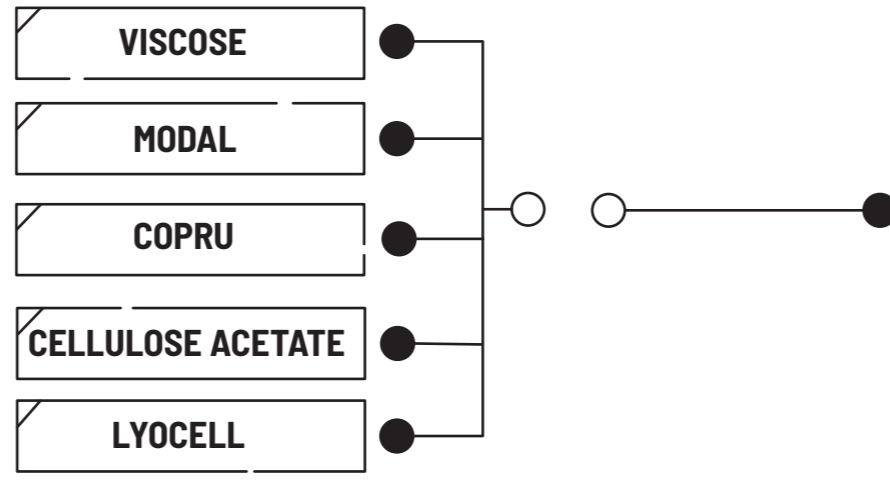


Plant cell
Secondary cell wall
Primary cell wall



FLOWER CELLULOSE

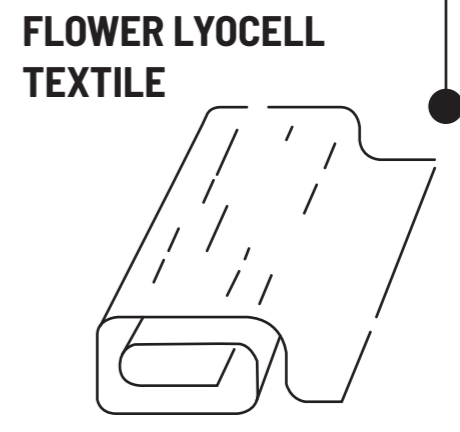
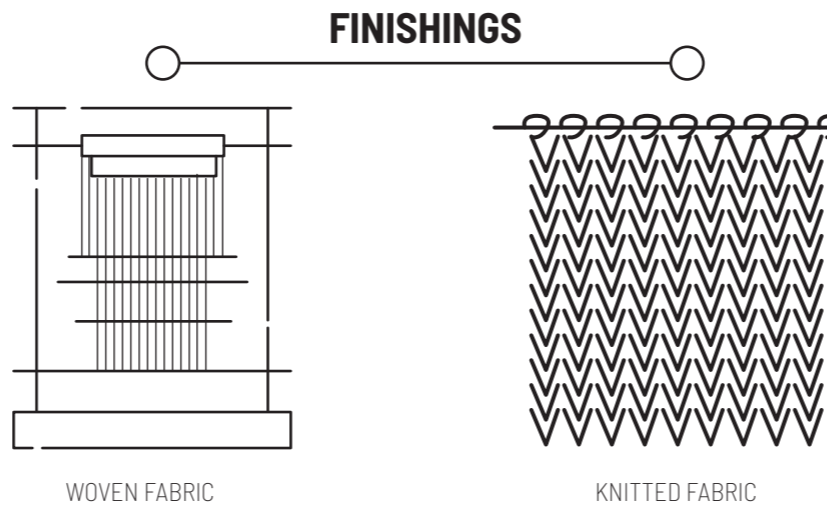
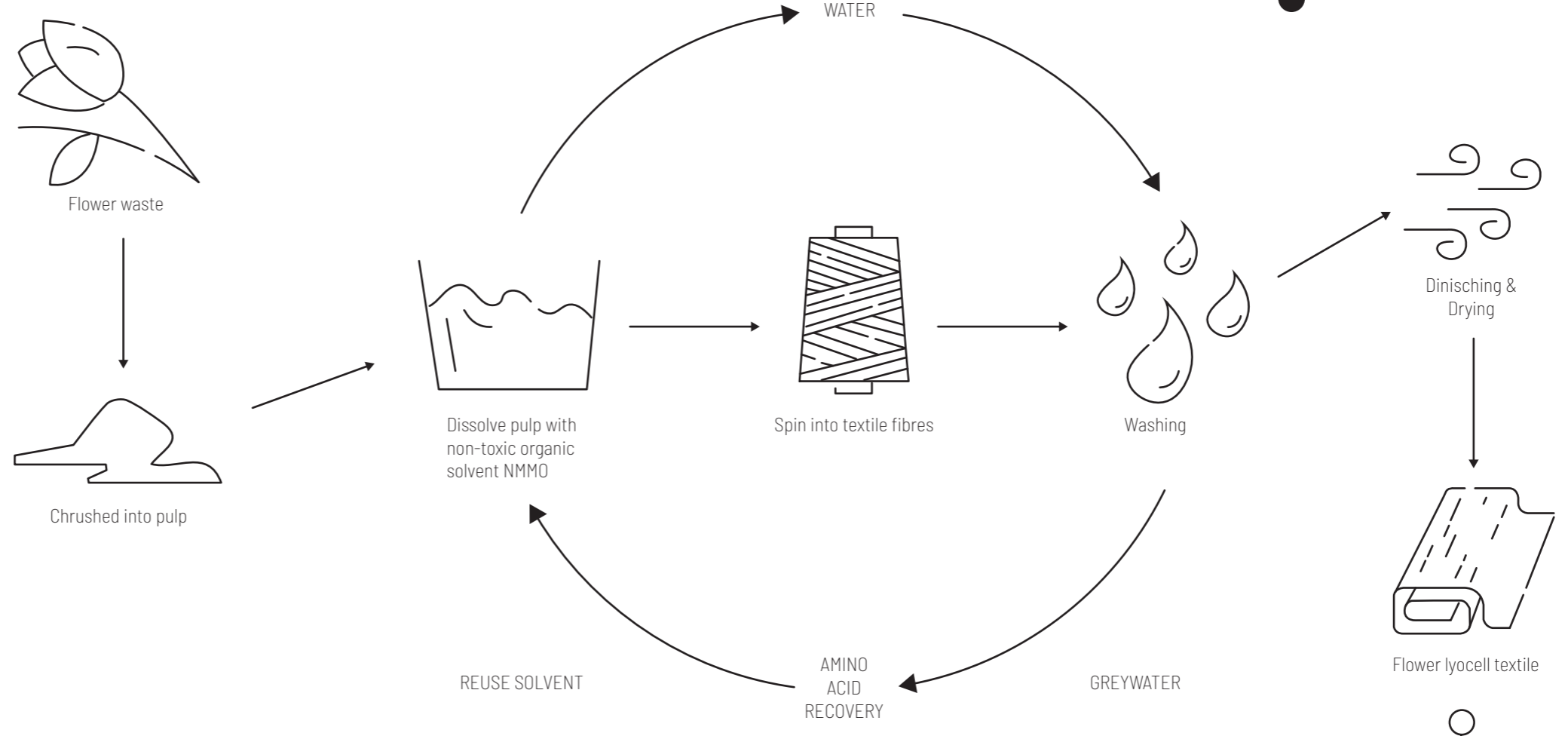
CELLULOSE PRODUCTIONS



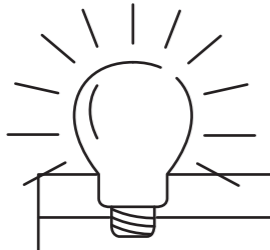
LYOCELL PRODUCTION

RESEARCH

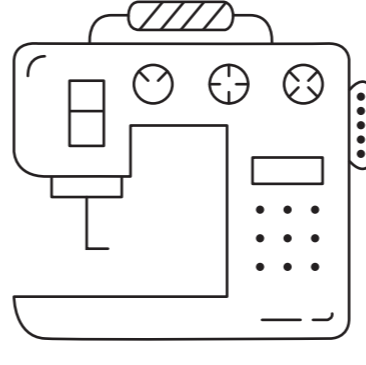
One of the main building blocks in plant tissue is cellulose, which can be used to produce fabrics, paper, biofuel, building materials, additives for pharmaceuticals and fibres. Cellulose as raw material is considered to be an inexhaustible source for sustainable and biodegradable products. Cut flower stems contain approximately between 25% and 40% cellulose. In plants, cellulose has a lot of inter- and intramolecular interactions with surrounding molecules, such as hemicellulose and lignin. Hemicellulose is similar to cellulose, however it consists of an unstructured chain of different sugars. Lignin forms cross links which causes strength and hardens of the plant stem. Due to the hemicellulose and lignin it is hard to access the cellulose. Therefore different steps such as pre-treatments, pulping and polymerisation have to be performed in order to create fibres. These fibres can then be spun into yarn for textile production.



FLOWER LYOCELL TEXTILE



THE CREATION OF A 100% BIODEGRADABLE TEXTILE MADE FROM FLOWERS



DUTCH DESIGNERS