

RAW MATERIALS OF THE COMPONENTS OF HYGIENE PRODUCTS

The materials used in each item are in each box in order of quantity. The links explain more details about the environmental and social impacts of the most abundant materials (cotton, cellulose and superabsorbent).

DISPOSABLE	REUSABLE
Nappies and sanitary towels	
<p>Cellulose* flakes (or fluff). This comes from conifer pulp. It is associated with deforestation, serious pollution and the far-reaching transformation of societies because of the large size of the production plants.</p> <p>Synthetic fibres: superabsorbent***, polypropylene and polyethylene. They are petroleum derivatives (global warming, wars, non-biodegradable waste, etc.).</p> <p>Others: adhesives, stickers, Velcro, odour removers, lotions, perfumes, etc. Some of these substances are also petroleum derivatives and some can be allergenic or toxic.</p> <p>Flat sanitary towels usually have individual plastic wrappers.</p>	<p>Cotton**. Many pesticides are used on the crops, causing disease in farmworkers. The normal processing of cotton is highly polluting.</p> <p>Hemp. This can be grown in rather unfertile land with few pesticides. It is not bleached or, if it is, chlorine is not used.</p> <p>Synthetic fibres: nylon, polyurethane, polyester, etc., in the protector. They are petroleum derivatives (global warming, wars, non-biodegradable waste, etc.).</p> <p>Others: adhesives, stickers, Velcro, etc. There tend not to be perfumes or any other chemical.</p>
Internal use	
<p>Tampons are made of cotton or rayon*, which is a chemical transformation of cellulose. We do not know whether they contain chemical residues.</p> <p>The plastic applicator is a petroleum derivative. The cardboard one may be bleached with chlorine.</p>	<p>Marine sponges are not treated with any chemical products. They are collected from the sea bed in many places in the world. When they are picked up they release millions of reproductive cells, so it is believed that their exploitation is sustainable.</p> <p>Menstrual cups contain only one material: natural latex or silicone. Latex is derived from the resin of certain trees. Silicone is derived from silicon, one of the most abundant materials on earth (it is obtained from sand and quartz).</p>

*CELLULOSE AND RAYON

Cellulose is the absorbent element most used in nappies and disposable sanitary towels because it is the cheapest one. Specifically, the cellulose used is obtained from **wood pulp from conifers**, particularly pine. This pulp is transformed to obtain **paste in flakes** (or cellulose fluff), a “cloud” of spongy, absorbent fibres. **Rayon** (viscose), from which many tampons are made (it may or may not be mixed with cotton) is also obtained from wood pulp cellulose through a series of physical and chemical transformations.

○ **Forestry**

The wood for cellulose extraction can come from native forests (the main world producers are the USA, Canada, the Scandinavian countries and China) or, increasingly, from plantations of some species of fast-growing pines which have the disadvantage of impoverishing the fertility of the earth. The big companies usually maintain that the forests or plantations are managed sustainably but, according to Greenpeace, the organisations certifying sustainability are not very credible because they are paid by the industry itself. Nowadays, the only body almost everyone considers to be reliable is the **Forest Stewardship Council** www.fsc.org.

One of these companies is Kimberly-Clark, a big multinational which owns **Huggies** nappies, Kleenex handkerchiefs and Scottex paper products, which for some time has been the target of a Greenpeace campaign for devouring native Canadian forests.

○ **Obtaining cellulose**

Pine plantations, together with plants for obtaining cellulose, tend to be located in Southern countries where land is cheaper and employment and environmental protection measures are less strict. In line with this, Chile, Brazil and Indonesia are coming into the group of principal cellulose exporters.¹ The plants are very big factories (the machinery is complex and expensive) so any leak of the chemical products they use constitutes an important risk. Their large size also leads to an important economical transformation of the place where they are located. The plants use a lot of water and release a great deal of pollution, particularly but not only due to the bleaching process. These spills and emissions into the air harm life in the environment, including local populations (it is one of the most polluting industries). The effects range from bad smell and nausea to hormonal disorders.

○ **Bleaching**

Most pulp for paper is bleached with chlorine dioxide (ECF technology), which pollutes less than bleaching with chlorine but more than bleaching without chlorine (TCF technology). All the sources we have consulted assure us that the pulp for making cellulose fluff is bleached without chlorine but we have not found any legislation making this compulsory.

¹ World Rainforest Movement: *Pulp mills and tree plantations: a duo in power*. Bulletin n. 83, June 2004 . www.wrm.org.uy.

**COTTON

Cotton fibres (the filaments surrounding the plant seeds) can be spun and then woven. The **absorbent parts** of cloth nappies are usually cotton, woven as **towelling** or **flannel**. Cotton fibres can also be arranged in the form of a “cloud” (without being spun or woven). This is how the **cotton wool** from which thick sanitary towels are made is obtained.

o **Cultivation**

Cotton is one of the principal crops in the world (the eighth in terms of area, with 2.3% of the total cultivated area, according to the FAO) and the one using most **pesticides** (10% of world production).² The majority pollute the soil, water and animal life, and some are among the most toxic, particularly for the nervous system. A good part of world cotton is grown in Southern countries (China, India, Pakistan, Uzbekistan and Brazil grow 60% of world cotton, according to the FAO) where proper protective equipment is not used. A Danish documentary from 1997 showed how pesticides were sprayed on cotton fields in Nicaragua and Guatemala while children played in neighbouring fields. 14% of the diseases affecting farmworkers in Southern countries and 10% of fatal diseases are due to pesticide poisoning. In Northern countries, even though protective measures are taken, pesticides also cause disease. Genetically modified cotton is also grown.

There is also **organic cotton**, which is not genetically modified and which is grown without pesticides. At the moment very little of this is grown.

o **Processing**

The most polluting phases of cotton processing are the **scouring** (removing the wax and grease from the fibres) and the dyeing. Scouring results in highly alkaline waste water that is difficult to deal with at treatment works. Nowadays, scouring is carried out above all in Southern countries (the main producers of scoured cotton – as well as raw, completely untreated cotton – are India and China) where environmental regulations are more lax or simply non-existent.

Most cotton is **bleached**. Normally this is done based on oxygenated water with a non-polluting process. Bleaching makes the fibres lose qualities.

***SAP

SAP (superabsorbent polymer or polyacrylate gel) is a synthetic material made of crystals of sodium polyacrylate. It is the most absorbent known material: it can retain up to 800 times its weight in liquid, although in nappies the absorption capacity is less because it loses some in coming into contact with urine.

Of all the material and energy resources involved in making nappies and sanitary towels, sap is the one that makes the greatest contribution to almost all environmental impacts (greenhouse effect, hole in the ozone layer, acid rain, etc.), followed by polypropylene.³

² [Pesticide Action Network LINK www.pan-international.org](http://www.pan-international.org).

³ S. Aumonier i M. Collins: *Life cycle assessment of disposable and reusable nappies in the UK*. United

For example, the fact that an increasing proportion of these materials is put into nappies led to the emissions of some heavy metals doubling in six years. By contrast, CO2 emissions were reduced by 14% by putting less cellulose in nappies.⁴

Kingdom Environment Agency, 2005.

⁴ International Association Serving the Non-Wovens and Related Industries: *Sustainability report: baby diapers and incontinence products*. 2005.