Green Public Procurement – Textiles

Technical Background Report


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# Abbreviations

<table>
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<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AOX</td>
<td>Adsorbable organic halogen</td>
</tr>
<tr>
<td>APEO</td>
<td>Alkylphenoxyethoxylate</td>
</tr>
<tr>
<td>BAT</td>
<td>Best Available Technology</td>
</tr>
<tr>
<td>BBP</td>
<td>Benzylbutylphthalate</td>
</tr>
<tr>
<td>BDE</td>
<td>Brominated diphenyl ethers</td>
</tr>
<tr>
<td>BREF</td>
<td>BAT reference document</td>
</tr>
<tr>
<td>COD</td>
<td>Chemical oxygen demand</td>
</tr>
<tr>
<td>DBP</td>
<td>Dibutyl phthalate</td>
</tr>
<tr>
<td>DDT/DDD</td>
<td>Dichlorodiphenyltrichloroethane</td>
</tr>
<tr>
<td>DEHP</td>
<td>Bis(2-ethylhexyl)phthalate</td>
</tr>
<tr>
<td>DSDMAC</td>
<td>Distrearyl dimethyl ammonium chloride</td>
</tr>
<tr>
<td>DTDMAC</td>
<td>Dimethyl ammonium chloride</td>
</tr>
<tr>
<td>DTPA</td>
<td>Diethylene triamine penta acetate</td>
</tr>
<tr>
<td>EDTA</td>
<td>Ethylene diamine tetra acetate</td>
</tr>
<tr>
<td>EIPPCB</td>
<td>European IPPC Bureau</td>
</tr>
<tr>
<td>EPA</td>
<td>US Environmental Protection Agency</td>
</tr>
<tr>
<td>GHS</td>
<td>Globally harmonised system (for classification and labelling)</td>
</tr>
<tr>
<td>GMO</td>
<td>Genetically modified organism</td>
</tr>
<tr>
<td>GOTS</td>
<td>Global organic textiles standard</td>
</tr>
<tr>
<td>GPP</td>
<td>Green Public Procurement</td>
</tr>
<tr>
<td>IFOAM</td>
<td>International Federation of Organic Agriculture Movements</td>
</tr>
<tr>
<td>IPPC</td>
<td>Integrated Pollution and Prevention Control</td>
</tr>
<tr>
<td>IWTO</td>
<td>International Wool Textile Organisation</td>
</tr>
<tr>
<td>LAS</td>
<td>Linear Alkylbenzene Sulfonate</td>
</tr>
<tr>
<td>LCA</td>
<td>Life cycle assessment</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>PAH</td>
<td>Polycyclic aromatic hydrocarbon</td>
</tr>
<tr>
<td>PBB</td>
<td>Polybrominated biphenyl</td>
</tr>
<tr>
<td>PCB</td>
<td>Polychlorinated biphenyls</td>
</tr>
<tr>
<td>PLA</td>
<td>Polylactic acid</td>
</tr>
<tr>
<td>POP</td>
<td>Persistent organic pollutant</td>
</tr>
<tr>
<td>REACH</td>
<td>Registration, evaluation, authorisation and restriction of chemicals (Regulation)</td>
</tr>
<tr>
<td>TEPA</td>
<td>Tetraethylenepentamine</td>
</tr>
<tr>
<td>TOC</td>
<td>Total organic carbon</td>
</tr>
<tr>
<td>TRIS</td>
<td>Tris(hydroxymethyl)aminomethane</td>
</tr>
<tr>
<td>VOC</td>
<td>Volatile organic compound</td>
</tr>
</tbody>
</table>
1 Introduction

The European Commission has developed common EU GPP criteria for a range of different products and services\(^1\). Green Public Procurement is a voluntary instrument.

This Technical Background Report provides background information on the environmental impact of textile based on the life cycle data and outlines the key relevant European legislation affecting this product group. It presents market availability of this product group, some cost consideration and public procurement needs. It outlines the rationale for the core and comprehensive environmental purchasing criteria that are being proposed. It then goes on to describe existing standards and ecotags that cover textile product group.

This report accompanies the associated EU GPP criteria document, which contains the proposed purchasing criteria and ancillary information for green tender specifications and as such they should be read alongside one another.

2 Definition, Scope and Background

A standard definition of textile products should be referred to as, at present, the definition used by schemes in member states vary\(^2\). A textile was originally defined as a woven fabric but the term is now applied to fibres, filaments, or yarns, natural or man-made, and products obtained from them. For example, threads, cords, ropes, braids, lace, embroidery, nets, and fabrics made by weaving, knitting, felting, bonding, and tufting are textiles.

This report covers the following textile products, namely:

- Textile clothing and accessories: clothing and accessories (such as handkerchiefs, scarves, bags, shopping bags, rucksacks, belts etc.) consisting of at least 90 % by weight of textile fibres;
- Interior textiles: textile products for interior use consisting of at least 90 % by weight of textile fibres. Wall and floor coverings are excluded;
- Fibres, yarn and fabric: intended for use in textile clothing and accessories or interior textiles.

For ‘textile clothing and accessories’ and for ‘interior textiles’: down, feathers, membranes and coatings need not be taken into account in the calculation of the percentage of textile fibres. Interior textiles also do not include textile floor coverings.

The textile and clothing (T&C) industry comprises:

- the treatment of raw materials, i.e. the preparation or production of various textiles fibres, and/or the manufacture of yarns (e.g. through spinning).
  - "Natural" fibres include cotton, wool, silk, flax, jute, hemp, linen, bamboo etc.

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\(^1\) [http://www.ec.europa.eu/environment/gpp](http://www.ec.europa.eu/environment/gpp)

\(^2\) Textile Terms and Definitions, M.E.Denton & P.N.Daniels, published by the Textile Institute
"Man-made" fibres include fibres coming from transformation of natural polymers (cellulosic fibres e.g. viscose, acetate, modal, etc.), synthetic fibres (i.e. organic fibres based on petrochemicals, such as polyester, nylon/polyamide, acrylic, polypropylene, etc), and fibres from inorganic materials (e.g. glass, metal, carbon or ceramic).

- In relation to textile materials, the terms "man-made", "synthetic" and "artificial" fibres are often used interchangeably. According to the manufacturing processes used, "synthetic" fibres are those gained through polymerization of organic monomers, while "artificial" fibres are obtained through chemical transformation of natural organic polymers.

- the production of knitted and woven fabrics (i.e. knitting and weaving);
- finishing activities - aimed at giving fabrics the visual, physical and aesthetic properties which consumers demand - such as bleaching, printing, dyeing, impregnating, coating, plasticising, etc;
- the transformation of those fabrics into products such as:
  - garments, knitted or woven (= the so-called "clothing" industry);
  - carpets and other textile floor coverings;
  - home textiles (such as bed linen, table linen, toilet linen, kitchen linen, curtains, etc);
  - technical or 'industrial' textiles.

- The distribution sector constitutes the last element of the so-called "textile and clothing chain" and is therefore important for all T&C products which are sold to the final consumer. Although some T&C companies have set up their own distribution networks in the framework of their vertical integration strategy, the manufacturing and distribution sectors remain very different in their characteristics and nature, and should therefore be treated separately.

### 3 Market Availability

The textile and clothing (or T&C) industry is a diverse and heterogeneous industry which covers an important number of activities from the transformation of fibres to yarns and fabrics to the production of a wide variety of products such as industrial and technical textiles, apparel or clothing and interior and household goods. The share of each fibre type in the EU textiles and clothing sector is shown in figure 1:

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3 European Commission; Textiles and Clothing: The EU-27 textiles and clothing industry; 2005
The sector is an important part of the European manufacturing industry. It plays a crucial role on the economy and social well-being in numerous regions of the EU-27. There were
79,100 enterprises across the EU-27 for which the manufacture of textiles (NACE Division 17) was their main activity in 2006.

The principal textile manufacturing Member State was Italy, producing 31,859 tonnes in 2006 accounting for around 32 % of the EU-27 total. The textiles manufacturing sectors in Germany, the United Kingdom and France were the next largest, together contributing just over a third (33.0 %) of the EU-27’s total production. All three countries were relatively unspecialised in textile manufacturing, however, as the relative contribution of this sector to national non-financial business economy value added was beneath the EU-27 average. In contrast, Portugal, Bulgaria (2005) and Italy were relatively specialised in the manufacture of textiles, as this sector contributed about 1.5 % of the total value added in their respective non-financial business economies in 2006, between two and a half and three times the EU-27 average.

**Figure 3: Textiles and clothing industry: share of production by member state**
(Source: European Commission – Textile Production Statistics (2009))

The textile and clothing sector in Europe has been subject to a series of radical transformations over the last years, due to a combination of technological changes, evolution of production costs, the emergence of important international competitors and the elimination of imports quotas after 2004.

In response to competitive challenges, the textile and clothing industry in Europe has undertaken a lengthy process of restructuring, modernisation and technological progress. Companies have improved their competitiveness by substantially reducing or ceasing mass production and simple fashion products, and concentrating instead on a wider variety of products with a higher value-added. Moreover, European producers are world leaders in markets for technical/industrial textiles and non-wovens (for example industrial filters,

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4 European Commission: Glossary:Statistical classification of economic activities in the European Community (NACE)
geotextiles, hygiene products, or products for the automotive industry or the medical sector), as well as for high quality garments with a high design content.

Competitiveness has also been retained by sub-contracting, or relocation of production facilities, for labour-intensive activities such as garment make-up to companies in countries with lower labour costs, mainly in the Euro-Mediterranean Zone. The competitive advantages of the textiles and clothing sector in the EU are now found in a focus on quality and design, innovation and technology, and high value-added products.

At the same time, globalisation and technological progress led to the need to rethink the textiles and clothing industry's clustering strategy. While still playing an important role for some activities, cooperation at local, district or regional level has increasingly proved inadequate to ensure that the chain of production remains at close geographical proximity to the European market. Therefore, clustering of its much diversified activities is now also based on a wider geographical area, i.e. the Euro-Mediterranean Zone.

In 2007 the overall trade deficit of the EU-27 reached EUR43,8 billion.

Among the top four textile and clothing suppliers that in 2007 made up 64% of the imports in value and 59% of the volumes (in tonnage) 5:

**Table 1: Main suppliers of imports of textiles and clothing to EU**

<table>
<thead>
<tr>
<th>Country</th>
<th>% by value of imports</th>
<th>% by volume of imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>34</td>
<td>31</td>
</tr>
<tr>
<td>Turkey</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>India</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

The European market for organic cotton, linen and wool products

Cotton has the largest share of natural fibre usage and also dominates the organic fibre market. Organic cotton farming involves the use of beneficial insects, crop rotation and organic manure. While Germany has traditionally led Europe’s demand for organic cotton, with mail order companies accounting for the bulk of sales in this category, at 1,500 tonnes. Meanwhile, demand in the United Kingdom is catching up with Germany at around 750 tonnes. Total sales of organic cotton in the United Kingdom increased from UK£60–65 million in 2007 to UK£85–90 million in 2008, up 40 percent year-on-year. Organic cotton accounts for around 91% of UK organic textile sales, with the remainder consisting of wool, linen and other fibres. Total sales of organic clothing and textile, including wool and linen, are expected to treble between 2008 and 2012, reaching UK£280 million.

France, which is believed to be another booming market for organic cotton products, is estimated to have consumed 600 tonnes of organic cotton in 2007. Other important

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5 Euratex; The EU-25 Textile & Clothing Industry in the year 2007
markets are Sweden (350 tonnes in 2007), Italy (250 tonnes) and the Netherlands (100 tonnes). There are similar stipulations on the production of organic linen which needs a crop rotation with wheat and alfalfa to be successful.

Most of the wool grown in the EU is not suitable for the manufacture of apparel. The UK is the biggest producer in the EU at 2% of the total world wool clip. Australia is largest wool producer with 25% of the total. A recent survey in Australia showed that around 40% of their wool clip could potentially meet the pesticide requirements of the EU Eco-label. However at present less than 1% is tested and sold as compliant. The production of certified organic wool is forecast to rise to 5–10% of the annual wool clip with the most suitable areas of production being in the drier, pastoral areas of the country.

4 Key Environmental Impacts

Most LCA information sources on textiles focus on the environmental impacts related to the production and processing of textiles, and/or possible health impacts related to the use of the products themselves. In many cases these two impact areas overlap as they derive from the use of certain chemicals and other substances which may have both environmental and health impacts. This can apply to both synthetic polymers and natural fibres e.g. plasticizer use in the production of PVC and the use of mothproofing agents on wool. However when the full ‘cradle to gate’ impacts are taken into account, natural fibres do have a lower environmental impact.

A great variety of material types are used in today’s textile industry, some naturally grown, and some synthetically produced. Both the production/cultivation and then the processing of such materials are highly varied and consequently have a variety of different potential impacts. As with foodstuffs, for naturally grown fibres such as cotton, the use of pesticides and organic or non-organic fertilisers is of particular importance from an environmental perspective, however the processing and “finishing” of products is also significant. For synthetic fibres concerns relate to both the chemicals used to manufacture the products as well as processing and “finishing”.

A report commissioned by Defra in the UK in April 2010 has used life cycle assessment to determine the relative environmental impacts of textile fibres using the indicators of energy use, water use, greenhouse gas emissions, waste water and direct land use. The environmental assessment shows that cotton and polyester, which have a continuing dominance in the clothing sector, also have relatively high environmental impacts when compared to other niche and emerging fibres. However, there are means of reducing such impacts. Recycling polyester, via waste textiles or other polyester waste streams can significantly cut energy use, resource depletion and greenhouse gas emissions. Organic cotton production can reduce the toxicity, energy use and greenhouse gas emissions environmental impacts of growing cotton and has the potential to deliver added social benefits, but uptake needs to be encouraged from current low levels. However, this may be at the cost of an increased land requirement where cotton yields are reduced. Development

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6 FAO; The Market for Organic and Fair-trade Cotton fibre and Cotton fibre Products; 2009
7 Farming Ahead, Oct 2007, Issue 189
8 Much of the information here taken from the Handbook of Sustainable Textile Purchasing: http://www.eco-forum.dk/textile-purchase/index.htm
9 Defra: The role and business case for existing and emerging fibres in sustainable clothing; Apr 2010
of more heat-resistant forms of polylactic acid (PLA) look promising as a less energy demanding alternative to cotton and polyester; current limited production hampers assessment of its real potential. Hemp and flax are well-established niche fibres with low environmental impact but are relatively costly to produce, so the market potential is limited. Further work is required to improve the suitability and yield of these, and other fibres with favourable environmental profiles, for wider use in apparel applications. The summaries presented in this report identify the high-level key sustainability impacts of the fibres investigated. Further research is required to fill data gaps and verify these findings to a level that allows direct comparisons between fibres and to examine the wider environmental and social impacts of niche and emerging textile fibres. Consistency in methods, scope, data gathering, and analysis techniques will be key to providing a strong evidence base in accordance with best practice in life cycle assessment (LCA), that can be used by industry and consumer-focussed applications to make informed choices about product sustainability. These impacts are summarised in table 2 below:

<table>
<thead>
<tr>
<th>Decreasing environmental impact</th>
<th>Energy use</th>
<th>Water use</th>
<th>Greenhouse gases</th>
<th>Waste water</th>
<th>Direct land use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylic</td>
<td>Cotton</td>
<td>Nylon</td>
<td>Regen. cellulosic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nylon</td>
<td>Silk</td>
<td>Nylon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyester/PT T</td>
<td>Polyester</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regen. cellulosic (viscose, Modal)</td>
<td>PLA</td>
<td>Viscose</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLA/Cotton/Lyocell</td>
<td>Hemp</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wool</td>
<td>Natural bast fibres</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural bast fibres (nettle, hemp, flax)</td>
<td>Polyester</td>
<td></td>
<td></td>
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</tbody>
</table>

### 4.1 Fertilisers and pesticides

Intensive agriculture requires heavy pesticide and fertiliser use in order to realise the high yield potential of the crop varieties used. Cotton is a particularly chemical intensive crop – despite accounting for just 2.5% of global cropland, cotton is responsible for the release of 16% of global insecticides (by market share)\(^{10}\). 

Locally, substance use raises levels of nitrates and pesticides (both hazardous to public health) in groundwater and reduces soil quality. Certain fertilisers can acidify the soil, a condition that leaches out key nutrients and compromises the long-term productivity of the land. Worldwide, farmers use 10 times more fertiliser today than in 1950, and spend roughly 17 times as much - adjusted for inflation - on pesticides. Yet the effectiveness of these applications has plummeted - a tenfold increase in fertiliser use has coincided with just a threefold increase in food production, while the share of the harvest lost to pests

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\(^{10}\) *The Deadly Chemicals in Cotton*, a Report by the Environmental Justice Foundation in collaboration with the Pesticide Action Network UK
remains largely the same as in 1950 despite the use of much greater quantities of pesticide\textsuperscript{11}. Natural grown cotton (and other natural fibres) do not allow use of pesticides and only the use of organically produced fertilisers.

**Pesticides** are biological, physical or chemical substances or mixtures of substances intended for preventing, destroying, repelling or mitigating pests. Though often misunderstood to refer only to insecticides, the term pesticide also applies to herbicides, fungicides, bactericide and various other substances used to control specific pests (such as insects, weeds, fungi, bacteria, mice, etc.).

By their very nature pesticides can cause harm to humans, animals or the environment because they are designed to kill or otherwise adversely affect living organisms\textsuperscript{12}. The World Health Organization estimates that every year 3 million people suffer from severe pesticide poisoning, matched by a greater number of unreported, mild cases that result in acute conditions such as skin irritation, nausea, diarrhoea, and breathing problems\textsuperscript{13}. These are, however, only the health problems caused by direct use and contact with pesticides. Pesticides also have ecotoxic effects when such products pollute soils and water-courses and, as a consequence, bioaccumulate and are biomagnified\textsuperscript{14} through the food chain causing hazardous effects on animals and consumers.

Persistent organic pollutants (POP) give rise for concern as they are:
- persistent in the environment and in human tissues,
- bio accumulate in the food chain due to their lipophilic properties,
- have the potential for long-range environmental transport
- show adverse effects ranging from acute to chronic toxicity.

The Stockholm Convention aims at protecting human health and the environment from POPs, of which nine have been or are being used as pesticides (aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex and toxaphene). Parties to the Convention are required to take a number of actions to eliminate / reduce production and use of these intentionally produced chemicals and to control their export and import.

**Fertilisers** are compounds given to promote growth of both plant-based fibres such as cotton and linen and also to promote the growth of vegetation as a foodstuff for sheep; they are usually applied either via the soil, for uptake by plant roots, or by foliar feeding, for uptake through leaves. Fertilisers can be either organic (from composted vegetal matter and/or animals dropping or peat) or inorganic (such as mineral depositions or chemically produced compounds) and they contain plant nutrients in concentrated form.

Although the health risk of fertilisers is smaller than that of pesticides, their inappropriate use is responsible for important environmental impacts such as:

\textsuperscript{12} US Environment Protection Agency (EPA). \url{http://www.epa.gov/pesticides/about/index.htm}.
\textsuperscript{14} Bioaccumulation occurs when an organism absorbs a toxic substance at a rate greater than that at which the substance is excreted or degraded biologically. Biomagnification is the increase in concentration of a substance that occurs in a food chain as a consequence of: food chain energetics and a low (or non-existent) rate of excretion/degradation of the substance. Although sometimes used
• Water pollution and eutrophication\textsuperscript{15} by nitrate and phosphate loss through leaching which causes i.a. toxic algae blooms,
• Species diversity reduction and the long-term disruption of aquatic ecosystems,
• Acidification\textsuperscript{16} of soil and water, which helps mobilise heavy-metals that can then enter food chains,
• Reduction of natural soil productivity due to the loss of plant nutrients.

4.2 \textbf{Substances used in the processing of textiles}

With such a huge variety of different materials used in the production of modern textiles\textsuperscript{17}, there is a correspondingly large variety of processing techniques. As well as individual techniques relating to certain fibres, processes such as dyeing, finishing, bleaching, softening, increasing fire resistance tend to be chemical intensive processes.

A great many different substances are used in the processing of fibres which have negative environmental impacts when released into either water or air\textsuperscript{18}. They are often poorly degradable and toxic in the aquatic environment, and can also cause health problems to users if remaining as residues in textiles, for example through the use of certain potentially carcinogenic amines created during the dyeing process.

In most cases these impacts can be considerably reduced through using different techniques, substances or through appropriate waste treatment.

4.3 \textbf{Water and energy use}

Considerable amounts of water and energy are used in the processing of different materials in the textile production chain. Water is of course also used in great quantities for irrigation during the growing of natural fibres, depending on the localised rainfall patterns.

A report by the Danish Environmental Protection Agency\textsuperscript{19} has indicated that there is a large potential in the industry for water and energy savings, including energy reclamation, the reuse of hot and waste water and the use of mechanical techniques not requiring water. The report indicates that in a Danish pigment print-house, the implementation of a number

\textsuperscript{15} Eutrophication is a process whereby water bodies, such as lakes, estuaries, or slow-moving streams receive excess nutrients that stimulate excessive plant growth

\textsuperscript{16} Acidification is the build-up of excess sulphuric and nitric acids in soils, waters, and air caused by acid depositions. These depositions originate from anthropogenic (human) emissions of mainly sulphur dioxide, nitrogen oxides, and ammonia from, for example, the use of animal manure and other soil improvers in agriculture. Acid depositions have negative impacts on water, forests, and soil. They cause defoliation and weakening of trees; they can also change soil and water pH mobilising heavy metals and other harmful substances with toxic effects on soil and aquatic organisms; and also damage buildings and monuments.

\textsuperscript{17} The European Ecolabel includes criteria specific to the following fibres: acrylic, cotton and other natural cellulosic seed fibres, elastane, flax and other bast fibres, greasy wool and other keratin fibres, man-made cellulose fibres, polyamide, polyester and polypropylene

\textsuperscript{18} The European Ecolabel has 33 criteria related to certain substances used in production and processing of textiles. The full criteria list of the European Ecolabel is included in Annex I.

\textsuperscript{19} Danish experience. Best Available Techniques - BAT - in the clothing and textile industry. Document prepared for the European IPPC Bureau and the TWG Textile by the Danish Environmental Protection Agency (2002)
of water saving measures has reduced annual consumption of water by approximately 25,000 m³ (55% reduction).

However, this issue is not dealt with in detail by any of the major ecolabelling schemes, without any specific limit values set. In terms of procurement, therefore, it is currently impractical to specifically focus on this aspect.

4.4 Recycled fibres

The amount of textile products purchased has risen rapidly in recent years (in the UK consumption has risen by 60% in the last 10 years, making it the country's fastest growing household waste stream).²⁰

The procurement of textile products which are completely or partly made up of recycled fibres is a useful way to effectively address this growing waste problem and the most direct way to limit the impacts described above by limiting the amount of virgin fibres used.

In 2008 around 14m tonnes of textile waste were generated in Europe of which 5m tonnes were recovered. About 75% of this was reused, usually in non-European countries, or recycled, mainly as wipers and in industrial applications²¹.

5 Cost Considerations

At the time of writing there are over 400 textile products listed as carrying the EU Ecolabel. However not all these products will be suitable for Green Public Procurement. Taking the UK as an example, there is no additional cost to meet the minimum mandatory specification - it is assumed that there is currently a sufficient supply of textiles within the market that meet this standard. Additional costs are assumed for the award criteria only. It is assumed that up to 30% of the value of textile procurement will meet the award criteria by 2013. It is also assumed that textile products that meet the award criteria may incur a small cost premium (estimated at between 0.8% and 1.25%) but this cost is assumed to decline to zero over a three year period as these standards become more widely adopted in the market. It should be noted that, although the review provided further data on textile procurement by government, there is still uncertainty regarding cost implications and the assumption described above is used as a best estimate.

Although in the private sector purchases of organic clothing tend to be approximately twice as expensive, the one example of public procurement identified (City police of Zürich) indicated that the price differences for police uniforms were negligible – possibly as the costs for textile finishing are lower than for conventional products, offsetting the additional price paid for organic fibres. Additionally the Zürich case study indicated that the quality and user comfort of the green alternative is better than that of the conventional one.

²⁰ Textiles Recycling Association – Alan Wheeler
²¹ http://www.oakdenehollins.co.uk/textiles-clothing.php
6 Public Procurement Needs

The total market for textiles and clothing in the public sector amounts to more than EUR10bn. These products are used by the army, firemen, police, post office, railways and other public services in European countries. Public procurement has an important role to play with regard to protective textiles, representing 100% of the market for certain product groups. However, budgetary constraints of public entities often result in short-term price focused purchasing that sacrifices other, long-term criteria. The protective textiles lead market offers opportunities for the entire textile sector as spill-over effects from faster growing innovations in protective textiles to other market segments such as interior textiles or functional clothing would considerably increase the economic impact of the lead market, thus increasing the knowledge content and the added-value, contributing to a sustainable competitiveness of the entire textile sector.

Promptex, the European federation for the promotion of textiles and leather procurement contracts, points out that more than half of this amount goes to tenderers who have their products made - often very cheaply - outside the European Union (EU).

Promptex estimates employment by the military and civil services in Europe is more than 5 million people. And more than 100,000 European textile and clothing workers are involved in the manufacturing of fabrics, uniforms and other textile supplies for these public markets.

In general, governmental organisations do not procure home textiles directly. Upholsterers and tenderers hired by the government buy the textiles fabrics used for their assignments from intermediaries (e.g. wholesalers, distributors and retailers). The sustainable trade channels are similar to those for ordinary home textiles products. Some wholesalers and producers have included sustainable products in their assortment. There will also be several niche players that focus solely on sustainable products.

A survey carried out on behalf of the EU into public purchases of clothing and fabrics in seven countries in western Europe also revealed that cotton and wool dominate public procurement markets. The market share of 100% synthetic articles (excluding mixtures) is little more than 7%.

However, the prevailing preference for natural fibres does not necessarily reflect a progressive choice for ecological sustainability by the public buyers.

7 Conclusions and Summary

7.1 Environmental and health issues

- The most important environmental impacts are likely the arise from the use of pesticides during the production process of cotton as well as from the amount of water discharged and the chemical load it carries as a result of textile processing.

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Other important environmental impacts relate to energy consumption, air emissions and solid waste.

Significant health concerns for end users also exist regarding the use of potentially carcinogenic or sensitizing substances in textiles.

The most direct approaches for reducing the environmental impacts of textiles is to use recycled fibres, re-use textiles or use organic production methods.

7.2 Ecolabels, verification aspects and market concerns

There are currently over 400 EU Ecolabelled textile products on the market but not all will be relevant for contracting authorities. By contrast there are almost 60,000 labelled by Öko-Tex.

Öko-Tex does not include criteria relating to production processes, and is solely concerned with end user toxicity.

The criteria for the EU Ecolabel and Öko-Tex regarding end user toxicity differ slightly, with the EU Ecolabel criteria being stricter.

The verification of environmental criteria relating to production processes can be challenging.

The supply of organically produced natural fibres such as cotton, linen and wool is currently limited.

8 Recommended core and comprehensive GPP criteria

The recommended core and comprehensive criteria for textiles are set out below. The GPP criteria are designed to reflect the key environmental risks. This approach is summarised in the following table:
### Key Environmental Impacts

- **Air pollution, ozone formation (smog), bioaccumulation or food chain exposure and hazardous effects on aquatic organisms or the increased growth of undesirable aquatic organisms which can degrade water quality, due to the inappropriate use of certain pesticides and fertilisers in the production of fibres, and substances used during the processing of fibres and final textile products**
- **Negative impact on the occupational health of users due to residues of certain substances harmful to human health**
- **Avoidance of early failure and consequent waste of textiles by promoting colour-fast fabrics that do not shrink during use**

### GPP Approach

- Purchase organically produced textiles
- Purchase used textiles which can be reused for their original purpose or purchase textiles that contain recycled fibres
- Purchase textiles with a reduced use of environmentally harmful substances in production
- Purchase textiles with lower residues of substances harmful to human health
- Purchase textiles which meet the minimum requirements for colour fastness and dimensional stability

Please note that the order of impacts does not necessarily translate to the order of their importance.

For the **Core** criteria products meeting either the requirements of the Öko-Tex Standard 100 label or the EU Ecolabel for textiles will comply with the specifications. Additionally award criteria have been included relating to the use of organically produced cotton and recycled fibres.

The **Comprehensive** criteria include production process and fibre-specific criteria taken from the requirements under the EU Ecolabel in the specifications, with the use of organically produced cotton, recycled fibres being encouraged in the award phase. Additionally there are fitness for use criteria which specify minimum requirements for colour fastness and dimensional stability. These should be verified with test results.

The requirements of the Type 1 Ecolabel Nordic Swan also refer directly to those of the EU Ecolabel.

The full recommended criteria sets can be found in the EU GPP criteria for Textiles.

### 9 Verification issues

Verifying the environmental and health parameters of textile products represents a significant challenge for public authorities. This is particularly difficult for criteria referring to production processes, where compliance cannot be judged by testing the final
product itself. Furthermore non-experts would likely struggle with the complexity of the chemical information to be assessed.

In some cases the use of certain chemicals in the production process can to some extent be traced by assessing the final product, as residues remain. For pesticides this topic has been addressed by the EU Ecolabel Commission Decision of 2009. In the current criteria it is not specified when the test for pesticide residues should be made, however it notes that “it is well known that pesticides are removed by a simple washing”. The proposal is therefore that the revised criteria should state: “The test should be made on raw cotton, before it comes through any wet treatment”. Whilst certainly appropriate for this function, this revision would present a problem for contracting authorities as a simple test of the final product would no longer be sufficient for verification purposes – the contracting authority would need to request appropriate means of proof, such as test data on raw cotton before wet treatment (particularly challenging if imported from outside Europe), or certification that it has been produced organically. Although this may prove possible there are two further concerns with such an approach:

(a) the supply of organically grown cotton is currently rather small on the market
(b) Setting specific restrictions on cotton may have the effect of favouring other non-natural fibres in textiles where no criteria or verification procedures for production methods are set. This would achieve the opposite of encouraging the use of organically grown cotton.

One potential solution to this problem may be to provide additional weighting at the award stage for organically grown cotton or other natural fibres.

It would not seem realistic to include criteria regarding production processes at the Core level for a number of reasons:

• Obtaining appropriate verification of compliance throughout the supply chain would likely be challenging
• The proportion of suppliers able to comply with the production criteria developed by the EU Ecolabel is difficult to assess and therefore product availability is uncertain, especially given the relative scarcity of products carrying the EU Ecolabel (see below)
• If only certain criteria underlying the Ecolabel are selected there is a danger of favouring one fibre type over another

For future revisions it may be possible to include additional criteria on production methods within the Core criteria. For the time being these can be included only in the Comprehensive criteria set.

A further difference between the approach of Öko-Tex/EKU and the EU Ecolabel is that where Öko-Tex names specific substances which are restricted, in some cases the EU Ecolabel sets environmental/health requirements:

• E.g. The EU Ecolabel restricts the use of certain flame retardants assigned with certain risk phrases (R40, 45, 46, 49, 50, 51, 52, 53, 60, 61, 62, 63, 68). Öko-Tex instead lists restricted flame-retardants by name: PBB, TRIS, TEPA, pentaDBE, and octaDBE.

The EU Ecolabel approach to this is more comprehensive, and also has the advantage of
applying equally to other potential substances which may be substituted for certain named flame retardants but which may be equally harmful. However, contracting authorities in the EKU consultation clearly indicated that they would prefer to have substances named directly as this makes checking compliance easier.

A further issue relates to the number of ecolabelled products on the market. At present there are relatively few suppliers of EU Ecolabelled products relevant for public purchases. The majority of labelled products are directed at the private clothing market. There are fewer “workwear” products labelled. A Commission study on the Costs & Benefits of GPP in 2007,\textsuperscript{23} could only identify one potential supplier for the product groups researched: police shirts, underpants for military use, coats for hospital staff and cotton roll towels. For other types of textiles purchased by public authorities there will likely be further suppliers of European Ecolabelled products, but not a large number currently (see the results of the Costs & Benefits study in Annex II).

As a large number of Öko-Tex labelled products are at present available on the market (60,000 license holders), and only few European Ecolabelled products, it seems appropriate for the Core level to recommend specifications for which both the EU Ecolabel and Öko-Tex (and Nordic Swan) can demonstrate compliance. In many cases these overlap, however the European Ecolabel criteria tend to be stricter, and often tested higher up the production chain. This would therefore mean that in each case the less strict criterion would need to be used.

10 Relevant European Legislation and Policies

There are several pieces of legislation relevant to the textiles industry, particularly in relation to the use of certain chemicals and substances in production.


This integrated approach considers:

- emissions to air, water and soil;
- aspects of waste-management;
- resource and energy efficiency.


Finally, much of the information presented below is taken from the Handbook of Sustainable Textile Purchasing, developed by EcoForum in 2006 in Denmark\textsuperscript{24}


\textsuperscript{24} [http://www.eco-forum.dk/textile-purchase/index_files/Page2018.htm](http://www.eco-forum.dk/textile-purchase/index_files/Page2018.htm)
10.1 Organic production


In general terms, the organic production criteria set by EU Regulation (834/2007) include:

- Specific procedures to maintain soil fertility and to control pests or other diseases
- Limited use of fertilisers, soil conditioners, pesticides, feed materials, additives, cleaning and disinfection products
- Use of seeds or vegetative propagating material produced by organic production methods
- Exclusion of the use of genetically modified organisms
- Original plants produced following organic criteria for at least one generation or, in the case of perennial crops, two growing seasons
- Livestock origin, feeding, disease prevention, reproduction, transport, free range and housing conditions.

The current Regulation on organic production of agricultural products (834/2007) is designed to make arrangements simpler for both farmers and consumers as compared with the previous one (Regulation 2092/91). Some of the key changes are as follows:

- A new permanent import regime and a more consistent control regime.
- The use of the EU organic logo will be mandatory, but it can be accompanied by national or private logos.
- The place where the products were farmed has to be indicated to inform consumers.
- Food will only be allowed to carry an organic logo if at least 95 percent of the ingredients are organic. Non-organic products will be entitled to indicate organic ingredients on the ingredients list only.
- The use of genetically modified organisms will remain prohibited. It will now be made explicit that the general limit of 0.9 percent for the accidental presence of authorised GMOs will also apply to organic products.

10.2 Substances used for impregnation


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polybrominated biphenyls (PBB), pentabromodiphenyl ether (pentaBDE) and octabromodiphenyl ether (octaBDE) in fireproofing garments. This, together with other legislation presented below, limits the potentially hazardous substances which may be found in textile products.

10.3 Dyes

- Azocolourants make up a significant proportion of the dyes used in textile production, however there are concerns about possible health impacts such as potentially carcinogenic properties. Directive 2002/61/EC amending 76/769/EEC, restricts the use of certain azocolourants, which may produce certain amines, which in turn may pose cancer risks.
- Further restrictions were set by Directive 2003/3/EC on the marketing and use of the “blue colourant”, due to its potentially negative impact on the environment, adding a list of restricted “azodyes”. This regulatory framework ensures that the worst of the impacts related to azocolourants are now effectively dealt with and need not be addressed by GPP.

10.4 Certain metals

The use of lead (Directive 89/677/EEC) and cadmium (Directive 91/338/EEC) is also restricted, covering their use in dyes and other applications for textiles.

10.5 REACH and GHS


REACH entered into force on 1 June 2007. Enterprises which manufacture or import more than one tonne of a chemical substance per year will be required to register it in a central database administered by the new EU Chemicals Agency.

A new Chemicals Agency, based in Finland, will act as the central point in the REACH system: it will run the databases necessary to operate the system, co-ordinate the in-depth evaluation of suspicious chemicals and run a public database in which consumers and professionals can find information.

In future, this will provide not only a rigorous testing and restriction procedure for all chemicals on the European market, but also provide a highly valuable centralised information source which could be used by contracting authorities.

Regulation (EC) No 1272/2008 (commonly known as the classification, labelling and

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packaging or CLP Regulation) and Regulation (EC) 1907/2006 (the REACH Regulation), which amend and repeal Directives 67/548/EEC\textsuperscript{28} and 1999/45/EC\textsuperscript{29}, require producers and suppliers of dangerous substances in EU member states to classify the harmful properties of their substances and to provide industrial and professional users with detailed health, safety and environmental information and advice about their products. All chemical products sold must be accompanied by material safety data sheets (SDS). If the products contain ingredients (above a certain percentage of the weight of the final product) which are classified as dangerous, then this information must be included in the SDS and also on the product label.

The CLP Regulation introduces what is known as the Globally Harmonised System (GHS) for classification and labelling of substances and mixtures into the EU. The GHS is a UN initiative which aims to harmonise the information related to human health and environment provided by manufacturers worldwide, given the global nature of the trade.

The requirements of the CLP Regulation are being gradually phased in up until 2015. In the meantime, the older systems for classification and labelling of substances (based on Directive 67/548/EEC) and preparations (mixtures) (based on Directive 1999/45/EC) will operate in parallel. Therefore up until 1\textsuperscript{st} June 2015 two different classification and labelling systems will exist that will apply to substances used in textiles.

\textbf{10.6 Waste}

Current EU waste policy is based on a concept known as the waste hierarchy. This means that, ideally, waste should be prevented and what cannot be prevented should be re-used, recycled and recovered to the extent feasible, with landfill being used as little as possible. Landfill is the worst option for the environment as it signifies a loss of resources and could become a future \textit{environmental} liability. The waste hierarchy should not be seen as a hard-and-fast rule, particularly since different waste treatment methods can have different environmental impacts. However, the aim of moving towards a recycling and recovery society means moving up the hierarchy, away from landfill and more and more towards recycling and recovery.

The legal framework underpinning this strategic approach includes horizontal legislation on waste management, e.g. the Waste Framework Directive, the Hazardous Waste Directive, as well as the Waste Shipment Regulation. Despite the considerable progress which has been made, overall waste volumes are growing and the absolute amount of waste going into landfill is not decreasing. Article 5 of the EU Landfill Directive already places restrictions on the amount of biodegradable waste (including biodegradable textile waste) that can be sent to landfill in the future.

\textbf{11 Existing Standards, Ecolabels and other criteria sources}

\textsuperscript{28} Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.

\textsuperscript{29} Directive 1999/45/EC concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations.
11.1 EU Ecolabel

Commission Decision 2009/567/EC updated the original criteria for the European Ecolabel for textiles, covering all the products mentioned in Section 1. It was one of the first groups covered by the Ecolabel. Currently there are over 400 licences for this product group in Europe\(^{30}\). However not all of these are relevant for Green Public Procurement. For other types of textiles purchased by public authorities there will likely be further suppliers of European Ecolabelled products.

Due to the great variety of materials and processing techniques used within the textiles industry, the criteria underlying the Ecolabel are very extensive. The full list of criteria is included in Annex I. There are 33 environmental and health criteria headings, several of which contain more than one specific criterion. In addition there are a number which relate to fitness for use or information appearing on the label.

The environmental criteria are grouped into two sections. The first sets criteria specific to a particular fibre type (acrylic, cotton and other natural cellulosic seed fibres, elastane, flax and other bast fibres, greasy wool and other keratin fibres, man-made cellulose fibres, polyamide, polyester and polypropylene). For other fibres not included in this list there are no specific criteria, although mineral fibres, glass fibres, metal fibres, carbon fibres and other inorganic fibres are excluded from ecolabelled products. The individual fibre criteria are also only applied where the fibre type makes up more than 5% of the total textile weight of the final product.

The second set relates to processes and chemicals, and is applied to all products, although there is a certain acceptance level for residues remaining in recycled fibres. These cover for example the use of dyes, finishing agents, fabric softeners, flame-retardants etc.

Currently the criteria do not demand a specific percentage of cotton to come from organic sources. However, if a product is certified as having at least 50% organic content then it does not need to comply with the criteria on the use of pesticides.

The criteria do not simply apply to the product itself (through testing for residues of harmful substances etc.), but also to the production processes, including emissions to water and air during certain processing stages.

The latest version of the applicable criteria, for reference, is available on the EU Ecolabel website at [http://ec.europa.eu/environment/ecolabel/index_en.htm](http://ec.europa.eu/environment/ecolabel/index_en.htm).

11.2 Öko-Tex

The draft report on revisions of the EU Ecolabel criteria contains a detailed comparison with the existing Öko-Tex label ([www.oeko-tex.org](http://www.oeko-tex.org)). This is a private label which has by far the widest coverage of any label in this field in Europe – 53,000 companies were covered in 2005\(^{31}\). The Öko-Tex criteria are outlined in the Öko-Tex Standard 100\(^{32}\).

\(^{30}\) [http://www.eco-label.com/default.htm](http://www.eco-label.com/default.htm)

\(^{31}\) Revision of the Textile Eco-label – Draft final report, July 13\(^{th}\) 2007, Produced by Asqual

Besides being a private label, a significant difference with the European Ecolabel is that initially it only covered issues relating to the health of users of the final textiles. As explained above, many of the environmental and health concerns overlap substantially, and so many of the criteria underpinning the two labels also overlap. However environmental impacts related to production are not addressed by Öko-Tex and tests are only carried out on the final product.

Organic production is not included in the Öko-Tex standard.

A further difference is that the Öko-Tex Standard 100 sets different limit values for substances depending on the type of garment. Four different categories are given:

- Garments for babies (up to 36 months)
- Garments in regular contact with the skin
- Garments not in regular contact with the skin
- Decoration materials

In 1995 the scheme was extended to address the environmental impacts of production processes – the Öko-Tex Standard 1000 (www.oeko-tex1000.com)\(^{33}\), which labels manufacturing sites. This Standard covers a number of aspects relating to the production site:

- Quality management
- Environmental management
- Certain substances and technology used in production:
  - Prohibited substances
  - Prohibited technologies (printing systems based on heavy benzene, dichromate as oxidising agent to improve colour fastness, chlorinated organic solvents and fluoro chlorinated organic solvents in open systems)
- Water/waste water
- Exhaust air
- Noise
- Energy
- Workplace
- Social criteria

According to the website, there are currently 35 companies which hold the Öko-Tex Standard 1000 certificate.

In 1999 the Öko-Tex Standard 100 Plus was introduced, which enables the labelling of products which meet the Standard 100, and derive from manufacturing sites carrying the Standard 1000 label. It is not clear at this stage how many products are available in Europe which carry this label.

11.3 Other Type I Ecolabels\(^{34}\)


\(^{34}\) The International Standards Organization (ISO) has categorised the different kind of product labels on the market. “Type I” labels are those where the underlying criteria are set by an independent body and which are monitored by a certification and auditing process. As such they are a highly transparent, reliable and independent information source for contracting authorities.
The Nordic Swan also covers textile products (Swan label for textiles, skins and leather), however there are currently not too many label holders. The criteria actually refer directly to those of the European Ecolabel, which all products must meet, with some additional requirements. In particular there is a requirement that all natural vegetable fibres are organically grown.

The Bra Miljöval or “Good Environmental Choice” label also covers textiles. Criteria focus on the production processes, and all natural fibres are required to be grown in compliance with organic standards.


The new version is a result of a stakeholder input process in which various organizations with expertise in organic production, textile processing and social criteria participated. It follows the overall approach of GOTS to define high level verifiable environmental criteria throughout the entire processing chain of apparel and home textiles (including spinning, knitting, weaving, wet processing, manufacturing, and trading) made from a minimum of 70% certified organic fibres and requiring social minimum criteria while still providing for a practical set of requirements that is technically achievable even in large scale industrial textile production and for mass market brands and retailers in order to achieve a considerable environmental and social impact in the textile industry.

All GOTS certified companies must fully comply with Version 3.0 by 1st of March 2012. They receive all required information through their applicable certification body.

The Blue Angel Criteria for Textiles were published in January 2011. They are based on the EU eco-label criteria, but they were tightened and clarified in different areas. Additionally, all natural fibres are required to be grown organically. The manufacturing process of fibre must meet strict requirements for waste water and air emissions. For the first time there are also included minimum social standards according to the ILO International Labour Standards.

11.4 Other GPP guidance on textiles

11.4.1 EKU

The EKU criteria for textiles and leather present two levels of criteria. The first level (Basic Requirements) is applicable to the complete product range, and the second level (Additional Requirements) is applicable for certain products.

Type 1 labels can be used by contracting authorities as the source of criteria, and also as one means of verification as they are compliant with the definition of usable ecotags used in the Public Procurement Directives, namely that the criteria are developed based on scientific information, the ecotag is based on a process in which all relevant stakeholders are part, and the ecotag is open to any stakeholder.

37 http://www.blauer-engel.de/de/produkte_marken/vergabegrundlage.php?id=212
38 http://www.msr.se/sv/Upphandling/Kriterier/Inredning-och-textil/
The Basic requirements are based on chemical guidelines issued by Öko-Tex and the Textile Importers’ Association in Sweden, which primarily concern environmental requirements that are measurable in the finished textile.

This approach was decided on as the wide availability of Öko-Tex labelled products greatly simplifies the verification process. In addition to requirements on producer responsibility and quality assurance, a number of ecological requirements are set. A comprehensive stakeholder process led to the conclusion that these criteria directly addressed the most important environmental and health concerns which could most readily be taken into account by contracting authorities. Certain of these criteria are less strict than the European Ecolabel, others are complementary. The criteria are presented below, together with a comparison with the European Ecolabel in italics:

**Organic substances**
- Azo dyes that can decompose to arylamines prohibited by 2003/3/EC (max. content 30 mg/kg). This follows the regulatory requirement included within the mentioned Directive – the European Ecolabel goes further and completely bans these, as does Öko-Tex 100.
- Dispersion dyes that are classified as allergenic (R43) (max. 0 mg/kg additives for textiles intended for children under 3 years, max. content 0.1% by weight; max. 100 mg/kg additives for other textiles, max. content 0.1% by weight). Covered by the European Ecolabel which bans certain potentially sensitising dyes
- Certain flame-retardants: PBB, pentaBDE, octaBDE, decaBDE, TRIS, TEPA according to 76/769/EC (max. 0 mg/kg as additive, max. content 0.1% by weight). PBB and TRIS are already restricted by legislation. The European Ecolabel restricts flame-retardants with certain risk-phrases which would cover these.
- Organic tin compounds, (max 0 mg/kg as additive, max. content 0.5 mg/kg). For the European Ecolabel its use is banned in the manufacture of elastane or for the transportation/storage of products. This should cover the major usages.
- Pentachlorophenol and 2,3,5,6 tetrachlorophenol and its salts, (max. content 0.5 mg/kg). The European Ecolabel restricts the use of pentachlorophenol as a pesticide, and tetrachlorophenol as a biocide.
- Certain phthalate softeners: DEHP, DBP, BBP (ref:76/769/EC) (max. content 0.1% by weight). The European Ecolabel sets biodegradability criteria for softeners, which would have the same (but broader) effect.

**Heavy metals**
- Lead, (max content 0.5 mg/kg)
- Cadmium according to 76/769/EC, (max. content 0.5 mg/kg)

**Other metals**
- Nickel according to 2004/96/EG (max. content 0.5 ug/cm²/week)
- Chromium (VI) (max. content 0.5 mg/kg)

For these four criteria relating to metals the European Ecolabel has a different approach. These should only be present in dyes and perhaps water-resistant coverings. For the Flower, lead-based pigments are banned in polypropylene (used for some specialist clothing). There are also restrictions about their use in dyes (The levels of ionic impurities in the dyes used shall not exceed the following: Cd 20 ppm; Cr 100 ppm; Ni 200 ppm; Pb 100 ppm) and in pigments (The levels of ionic impurities for
pigments used shall not exceed the following: Cd 50 ppm; Cr 100 ppm; Pb 100 ppm).
Finally the European Ecolabel also restricts copper, chromium, and nickel in waste water emissions from the cellulose dyeing process.

**Formaldehyde**
The emission of formaldehyde from the finished textile must not exceed:
- 20 mg/kg for textiles for children in direct skin contact (<24 months)
- 100 mg/kg for textiles in direct skin contact
- 300 mg/kg for other textiles

*Also covered by the European Ecolabel but with tougher limits (especially the proposed revision, which sets even stricter limits)*

The Additional Requirements are based on ecolabelling criteria (Swan/EU Ecolabel and Good Environmental Choice). These place requirements on fibre production and the manufacturing process. The criteria state that products which meet any of these ecolabels or comply with the Regulation on organic production or IFOAM basic standards\(^{39}\) would be accepted.

### 11.5 Information Sources

- **Worldwatch Institute:** [www.worldwatch.org](http://www.worldwatch.org)
- **US Environment Protection Agency (EPA):** [http://www.epa.gov/pesticides/about/index.htm](http://www.epa.gov/pesticides/about/index.htm)
- **Handbook of Sustainable Textile Purchasing:** [http://www.eco-forum.dk/textile-purchase/index.htm](http://www.eco-forum.dk/textile-purchase/index.htm)
- **The Deadly Chemicals in Cotton, a Report by the Environmental Justice Foundation in collaboration with the Pesticide Action Network UK:** [http://www.ejfoundation.org/pdf/the_deadly_chemicals_in_cotton.pdf](http://www.ejfoundation.org/pdf/the_deadly_chemicals_in_cotton.pdf)


Swan labelling of textiles, skins and leather:
Green Public Procurement – Textiles


- *Bra Miljöval: Environmental Criteria for Textiles:*

- *EKA criteria for textiles and leather:*
  http://www.msr.se/en/greenprocurement/criteria/Furnishing-and-textiles

- *Study on costs/benefits of Green public procurement in Europe, Öko-Institut & ICLEI 2007:*
  http://ec.europa.eu/environment/gpp/index_en.htm

  http://ec.europa.eu/enterprise/leadmarket/technical_textiles.htm
Annex I – EU Ecolabel criteria

From the Commission Decision of 9th July 2009 establishing the ecological criteria for the award of the Community Ecolabel for textile products.

CRITERIA
The criteria are divided into three main categories, concerning textile fibres, processes and chemicals, and fitness for use.

TEXTILE FIBRE CRITERIA
Fibre-specific criteria are set in this section for acrylic, cotton and other natural cellulosic seed fibres, elastane, flax and other bast fibres, greasy wool and other keratin fibres, man-made cellulose fibres, polyamide, polyester and polypropylene. Other fibres for which no fibre specific criteria are set are also allowed, with the exception of mineral fibres, glass fibres, metal fibres, carbon fibres and other inorganic fibres.

The criteria set in this section for a given fibre-type need not be met if that fibre contributes to less than 5% of the total weight of the textile fibres in the product. Similarly they need not be met if the fibres are of recycled origin. In this context, recycled fibres are defined as fibres originating only from cuttings from textile and clothing manufacturers or from post-consumer waste (textile or otherwise). Nevertheless, at least 85% by weight of all fibres in the product must be either in compliance with the corresponding fibre-specific criteria, if any, or of recycled origin.

*Assessment and verification:* The applicant shall supply detailed information as to the composition of the textile product.

1. Acrylic

1.1 The residual acrylonitrile content in raw fibres leaving the fibre production plant shall be less than 1.5 mg/kg.

*Assessment and verification:* The applicant shall provide a test report, using the following test method: extraction with boiling water and quantification by capillary gas-liquid chromatography.

1.2 The emissions to air of acrylonitrile (during polymerisation and up to the solution ready for spinning), expressed as an annual average, shall be less than 1 g/kg of fibre produced.

*Assessment and verification:* The applicant shall provide detailed documentation and/or test reports showing compliance with this criterion, together with a declaration of compliance.

2. Cotton and other natural cellulosic seed fibres (including kapok)

Cotton and other natural cellulosic seed fibres (hereinafter referred to as cotton) shall not
contain more than 0.05 ppm (sensibility of the test method permitting) of each of the following substances: aldrin, captafol, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, hexachlorocyclohexane (total isomers), 2,4,5-T, chlordimeform, chlorobenzilate, dinoeb and its salts, monocrotrophos, pentachlorophenol, toxaphene, methamidophos, methylparathion, parathion, phosphamidon. This requirement does not apply where more than 50% of the cotton content is organically grown cotton or transitional cotton, that is to say certified by an independent organisation to have been produced in conformity with the production and inspection requirements laid down in Council Regulation (EEC) No 2092/91 of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs (1).

This requirement does not apply if documentary evidence can be presented that establishes the identity of the farmers producing at least 75% of the cotton used in the final product, together with a declaration from these farmers that the substances listed above have not been applied to the fields or cotton plants producing the cotton in question, or to the cotton itself.

Where at least 95% of the cotton in one product is organic, that is to say certified by an independent organisation to have been produced in conformity with the production and inspection requirements laid down in Regulation (EC) No 834/2007 the applicant may place the mention ‘organic cotton’ next to the eco-label. Where between 70% and 95% the cotton is organic, it may be labelled ‘made with xy% organic cotton’.

*Assessment and verification:* The applicant shall either provide proof of organic certification or documentation relating to the non-use by the farmers or a test report, using the following test methods: as appropriate, US EPA 8081 A (organo-chlorine pesticides, with ultrasonic or Soxhlet extraction and apolar solvents (iso-octane or hexane)), 8151 A (chlorinated herbicides, using methanol), 8141 A (organophosphorus compounds), or 8270 C (semi-volatile organic compounds).

3. Elastane

3.1 Organotin compounds shall not be used.

*Assessment and verification:* The applicant shall provide a declaration of non-use.

3.2 The emissions to air of aromatic diisocyanates during polymerisation and spinning, expressed as an annual average, shall be less than 5 mg/kg of fibre produced.

*Assessment and verification:* The applicant shall provide detailed documentation and/or test reports showing compliance with this criterion, together with a declaration of compliance.

4. Flax and other bast fibres (including hemp, jute, and ramie)

Flax and other bast fibres shall not be obtained by water retting, unless the waste water from the water retting is treated so as to reduce the COD or TOC by at least 75% for hemp fibres and by at least 95% for flax and the other bast fibres.

*Assessment and verification:* If water retting is used, the applicant shall provide a test
report, using the following test method: ISO 6060 (COD).

5. Greasy wool and other keratin fibres (including wool from sheep, camel, alpaca, goat)

5.1 The sum total content of the following substances shall not exceed 0.5 ppm: \( \gamma \)-hexachlorocyclohexane (lindane), \( \alpha \)-hexachlorocyclohexane, \( \beta \)-hexachlorocyclohexane, \( \delta \)-hexachlorocyclohexane, aldrin, dieldrin, endrin, p,p'-DDT, p,p'-DDD.

5.2 The sum total content of the following substances shall not exceed 2 ppm: diazinon, propetamphos, chlorfenvinphos, dichlorfenthion, chlorpyriphos, fenchlorphos.

5.3 The sum total content of the following substances shall not exceed 0.5 ppm: cypermethrin, deltamethrin, fenvalerate, cyhalothrin, flumethrin.

5.4 The sum total content of the following substances shall not exceed 2 ppm: diflubenzuron, triflumuron.

These requirements (as detailed in 5.1, 5.2, 5.3 and 5.4 and taken separately) do not apply if documentary evidence can be presented that establishes the identity of the farmers producing at least 75 \% of the wool or keratin fibres in question, together with a declaration from these farmers that the substances listed above have not been applied to the fields or animals concerned.

Assessment and verification for 5.1, 5.2, 5.3 and 5.4: The applicant shall either provide the documentation indicated above or provide a test report, using the following test method: IWTO Draft Test Method 59.

5.5 For scouring effluent discharged to sewer, the COD discharged to sewer shall not exceed 60 g/kg greasy wool, and the effluent shall be treated off-site so as to achieve at least a further 75 \% reduction of COD content, expressed as an annual average.

For scouring effluent treated on site and discharged to surface waters, the COD discharged to surface waters shall not exceed 5 g/kg greasy wool. The pH of the effluent discharged to surface waters shall be between 6 and 9 (unless the pH of the receiving waters is outside this range), and the temperature shall be below 40 °C (unless the temperature of the receiving water is above this value).

Assessment and verification: The applicant shall provide relevant data and test report, using the following test method: ISO 6060.

6. Man-made cellulose fibres (including viscose, lyocell, acetate, cupro, triacetate)

6.1 The level of AOX in the fibres shall not exceed 250 ppm.

Assessment and verification: The applicant shall provide a test report, using the following test method: ISO 11480.97 (controlled combustion and microcoulometry).

6.2 For viscose fibres, the sulphur content of the emissions of sulphur compounds to air
from the processing during fibre production, expressed as an annual average, shall not exceed 120 g/kg filament fibre produced and 30 g/kg staple fibre produced. Where both types of fibre are produced on a given site, the overall emissions must not exceed the corresponding weighted average.

Assessment and verification: The applicant shall provide detailed documentation and/or test reports showing compliance with this criterion, together with a declaration of compliance.

6.3 For viscose fibres, the emission to water of zinc from the production site, expressed as an annual average, shall not exceed 0.3 g/kg.

Assessment and verification: The applicant shall provide detailed documentation and/or test reports showing compliance with this criterion, together with a declaration of compliance.

6.4 For cupro fibres, the copper content of the effluent water leaving the site, expressed as an annual average, shall not exceed 0.1 ppm.

Assessment and verification: The applicant shall provide detailed documentation and/or test reports showing compliance with this criterion, together with a declaration of compliance.

7. Polyamide

The emissions to air of N₂O during monomer production, expressed as an annual average, shall not exceed 10 g/kg polyamide 6 fibre produced and 50 g/kg polyamide 6,6 produced.

Assessment and verification: The applicant shall provide detailed documentation and/or test reports showing compliance with this criterion, together with a declaration of compliance.

8. Polyester

8.1 The amount of antimony in the polyester fibres shall not exceed 260 ppm. Where no antimony is used, the applicant may state ‘antimony free’ (or equivalent text) next to the eco-label.

Assessment and verification: The applicant shall either provide a declaration of non-use or a test report using the following test method: direct determination by Atomic Absorption Spectrometry. The test shall be carried out on the raw fibre prior to any wet processing.

8.2 The emissions of VOCs during polymerisation of polyester, expressed as an annual average, shall not exceed 1.2 g/kg of produced polyester resin. (VOCs are any organic compound having at 293.15 K a vapour pressure of 0.01 kPa or more, or having a corresponding volatility under the particular conditions of use).

Assessment and verification: The applicant shall provide detailed documentation and/or test reports showing compliance with this criterion, together with a declaration of compliance.
9. Polypropylene

Lead-based pigments shall not be used.

Assessment and verification: The applicant shall provide a declaration of non-use.

PROCESSES AND CHEMICALS CRITERIA

The criteria in this section apply, where appropriate, to all stages of production of the product, including the production of the fibres. It is nevertheless accepted that recycled fibres may contain some of the dyes or other substances excluded by these criteria, but only if they were applied in the previous life-cycle of the fibres.

10. Auxiliaries and finishing agents for fibres and yarns

10.1 Size: At least 95 % (by dry weight) of the component substances of any sizing preparation applied to yarns shall be sufficiently biodegradable or eliminable in wastewater treatment plants, or else shall be recycled.

Assessment and verification: In this context, a substance is considered as ‘sufficiently biodegradable or eliminable’:

- if when tested with one of the methods OECD 301 A, OECD 301 E, ISO 7827, OECD 302 A, ISO 9887, OECD 302 B, or ISO 9888 it shows a percentage degradation of at least 70 % within 28 days,
- or if when tested with one of the methods OECD 301 B, ISO 9439, OECD 301 C, OECD 302 C, OECD 301 D, ISO 10707, OECD 301 F, ISO 9408, ISO 10708 or ISO 14593 it shows a percentage degradation of at least 60 % within 28 days,
- or if when tested with one of the methods OECD 303 or ISO 11733 it shows a percentage degradation of at least 80 % within 28 days,
- or, for substances for which these test methods are inapplicable, if evidence of an equivalent level of biodegradation or elimination is presented.

The applicant shall provide appropriate documentation, safety data sheets, test reports and/or declarations, indicating the test methods and results as above, and showing compliance with this criterion for all sizing preparations used.

10.2 Spinning solution additives, spinning additives and preparation agents for primary spinning (including carding oils, spin finishes and lubricants): At least 90 % (by dry weight) of the component substances shall be sufficiently biodegradable or eliminable in wastewater treatment plants.

This requirement does not apply to preparation agents for secondary spinning (spinning lubricants, conditioning agents), coning oils, warping and twisting oils, waxes, knitting oils, silicone oils and inorganic substances.

Assessment and verification: ‘Sufficiently biodegradable or eliminable’ is as defined above in part 10.1. The applicant shall provide appropriate documentation, safety data sheets, test reports and/or declarations, indicating the test methods and results as above, and showing compliance with this criterion for all such additives or preparation agents used.

10.3 The content of polycyclic aromatic hydrocarbons (PAH) in the mineral
oil proportion of a product shall be less than 3.0% by weight.

Assessment and verification: The applicant shall provide appropriate documentation, safety date sheets, product information sheets or declarations, indicating either the content of polycyclic aromatic hydrocarbons or the non-use of products containing mineral oils.

11. Biocidal or biostatic products

Chlorophenols (their salts and esters), PCB and organotin compounds shall not be used during transportation or storage of products and semi-manufactured products.

Assessment and verification: The applicant shall provide a declaration of non-use of these substances or compounds on the yarn, fabric and final product. Should this declaration be subject to verification the following test method and threshold shall be used: extraction as appropriate, derivatisation with acetic anhydride, determination by capillary gas-liquid chromatography with electron capture detection, limit value 0.05 ppm.

12. Stripping or depigmentation

Heavy metal salts (except of iron) or formaldehyde shall not be used for stripping or depigmentation.

Assessment and verification: The applicant shall provide a declaration of non-use.

13. Weighting

Compounds of cerium shall not be used in the weighting of yarn or fabrics.

Assessment and verification: The applicant shall provide a declaration of non-use.

14. Auxiliary chemicals

Alkylphenolethoxylates (APEOs), linear alkylbenzene sulfonates (LAS), bis(hydrogenated tallow alkyl) dimethyl ammonium chloride (DTDMAC), distearyl dimethyl ammonium chloride (DSDMAC), di(hardened tallow) dimethyl ammonium chloride (DHTDMAC), ethylene diamine tetra acetate (EDTA), and diethylene triamine penta acetate (DTPA) shall not be used and shall not be part of any preparations or formulations used.

Assessment and verification: The applicant shall provide a declaration of non-use.

15. Detergents, fabric softeners and complexing agents

At each wet-processing site, at least 95% by weight of detergents, fabric softeners and complexing agents used shall be sufficiently degradable or eliminable in wastewater treatment plants.

This is with the exception of surfactants in detergents and fabric softeners at each wet processing site, which shall be ultimately biodegradable.

Assessment and verification: ‘Sufficiently biodegradable or eliminable’ is as defined above.
in the criterion related to auxiliaries and finishing agents for fibres and yarns. The applicant shall provide appropriate documentation, safety data sheets, test reports and/or declarations, indicating the test methods and results as above, and showing compliance with this criterion for all detergents, fabric softeners and complexing agents used.

16. Bleaching agents

This requirement does not apply to the production of man-made cellulose fibres (see criterion 6.1).

Assessment and verification: The applicant shall either provide a declaration of non-use of chlorinated bleaching agents.

17. Impurities in dyes

The levels of ionic impurities in the dyes used shall not exceed the following: Ag 100 ppm; As 50 ppm; Ba 100 ppm; Cd 20 ppm; Co 500 ppm; Cr 100 ppm; Cu 250 ppm; Fe 2 500 ppm; Hg 4 ppm; Mn 1 000 ppm; Ni 200 ppm; Pb 100 ppm; Se 20 ppm; Sb 50 ppm; Sn 250 ppm; Zn 1 500 ppm.

Any metal that is included as an integral part of the dye molecule (e.g. metal complex dyes, certain reactive dyes, etc.) shall not be considered when assessing compliance with these values, which only relate to impurities.

Assessment and verification: The applicant shall provide a declaration of compliance.

18. Impurities in pigments

The levels of ionic impurities for pigments used shall not exceed the following: As 50 ppm; Ba 100 ppm, Cd 50 ppm; Cr 100 ppm; Hg 25 ppm; Pb 100 ppm; Se 100 ppm Sb 250 ppm; Zn 1 000 ppm.

Assessment and verification: The applicant shall provide a declaration of compliance.

19. Chrome mordant dyeing

Chrome mordant dyeing is not allowed.

Assessment and verification: The applicant shall provide a declaration of non-use.

20. Metal complex dyes.

If metal complex dyes based on copper, chromium or nickel are used:

20.1 In case of cellulose dyeing, where metal complex dyes are part of the dye recipe, less than 20 % of each of those metal complex dyes applied (input to the process) shall be discharged to waste water treatment (whether on-site or off-site).

In case of all other dyeing processes, where metal complex dyes are part of the dye recipe, less than 7 % of each of those metal complex dyes applied (input to the process) shall be...
discharged to waste water treatment (whether on-site or off-site).

The applicant shall either provide a declaration of non-use or documentation and test reports using the following test methods: ISO 8288 for Cu, Ni; ISO 9174 or prEN 1233 for Cr.

20.2 The emissions to water after treatment shall not exceed: Cu 75 mg/kg (fibre, yarn or fabric); Cr 50 mg/kg; Ni 75 mg/kg.

Assessment and verification: The applicant shall either provide a declaration of non-use or documentation and test reports using the following test methods: ISO 8288 for Cu, Ni; ISO 9174 or prEN 1233 for Cr.

21. Azo dyes

Azo dyes shall not be used that may cleave to any one of the following aromatic amines:
4-aminodiphenyl (92-67-1)
Benzidine (92-87-5)
4-chloro-o-toluidine (95-69-2)
2-naphthylamine (91-59-8)
o-amino-azotoluene (97-56-3)
2-amino-4-nitrotoluene (99-55-8)
p-chloroaniline (106-47-8)
2,4-diaminoanisol (615-05-4)
4,4’-diaminodiphenylmethane (101-77-9)
3,3’-dichlorobenzidine (91-94-1)
3,3’-dimethoxybenzidine (119-90-4)
3,3’-dimethylbenzidine (119-93-7)
3,3’-dimethyl-4,4’-diaminodiphenylmethane (838-88-0)
p-cresidine (120-71-8)
4,4’-methylene-bis-(2-chloraniline) (101-14-4)
4,4’-oxydianiline (101-80-4)
4,4’-thiodianiline (139-65-1)
o-toluidine (95-53-4)
2,4-diaminotoluene (95-80-7)
2,4,5-trimethylaniline (137-17-7)
4-aminoazobenzene (60-09-3)
o-anisidine (90-04-0)
2,4-Xylidine
2,6-Xylidine

Assessment and verification: The applicant shall provide a declaration of non-use of these dyes. Should this declaration be subject to verification the following standard shall be used: EN 14 362-1 and 2. (Note: false positives may be possible with respect to the presence of 4-aminoazobenzene, and confirmation is therefore recommended).

22. Dyes that are carcinogenic, mutagenic or toxic to reproduction

22.1 The following dyes shall not be used:
C.I. Basic Red 9
C.I. Disperse Blue 1
C.I. Acid Red 26
C.I. Basic Violet 14
C.I. Disperse Orange 11
C. I. Direct Black 38
C. I. Direct Blue 6
C. I. Direct Red 28
C. I. Disperse Yellow 3

Assessment and verification: The applicant shall provide a declaration of non-use of such dyes.

22.2 No use is allowed of dye substances or of dye preparations containing more than 0.1% by weight of substances that are assigned or may be assigned at the time of application any of the following risk phrases (or combinations thereof):
R40 (limited evidence of a carcinogenic effect),
R45 (may cause cancer),
R46 (may cause heritable genetic damage),
R49 (may cause cancer by inhalation),
R60 (may impair fertility),
R61 (may cause harm to the unborn child),
R62 (possible risk of impaired fertility),
R63 (possible risk of harm to the unborn child),
R68 (possible risk of irreversible effects),

Assessment and verification: The applicant shall provide a declaration of non-use of such dyes.

23. Potentially sensitising dyes

The following dyes shall not be used:
C.I. Disperse Blue 3 C.I. 61 505
C.I. Disperse Blue 7 C.I. 62 500
C.I. Disperse Blue 26 C.I. 63 305
C.I. Disperse Blue 35
C.I. Disperse Blue 102
C.I. Disperse Blue 106
C.I. Disperse Blue 124
C.I.Disperse Brown 1
C.I. Disperse Orange 1 C.I. 11 080
C.I. Disperse Orange 3 C.I. 11 005
C.I. Disperse Orange 37
C.I. Disperse Orange 76
(previously designated Orange 37)
C.I. Disperse Red 1 C.I. 11 110
C.I. Disperse Red 11 C.I. 62 015
C.I. Disperse Red 17 C.I. 11 210
C.I. Disperse Yellow 1 C.I. 10 345
C.I. Disperse Yellow 9 C.I. 10 375
C.I. Disperse Yellow 39
C.I. Disperse Yellow 49

Assessment and verification: The applicant shall either provide a declaration of non-use of these dyes.

24. Halogenated carriers for polyester

Halogenated carriers shall not be used.

Assessment and verification: The applicant shall provide a declaration of non-use.

25. Printing

25.1 Printing pastes used shall not contain more than 5 % volatile organic compounds (VOCs: any organic compound having at 293,15 K a vapour pressure of 0.01 kPa or more, or having a corresponding volatility under the particular conditions of use).

Assessment and verification: The applicant shall either provide a declaration that no printing has been made or provide appropriate documentation showing compliance together with a declaration of compliance.

25.2 Plastisol-based printing is not allowed.

Assessment and verification: The applicant shall either provide a declaration that no printing has been made or provide appropriate documentation showing compliance together with a declaration of compliance.

26. Formaldehyde

The amount of free and partly hydrolysable formaldehyde in the final fabric shall not exceed 20 ppm in products for babies and young children under 3 years old, 30 ppm for products that come into direct contact with the skin, and 75 ppm for all other products.

Assessment and verification: The applicant shall either provide a declaration that formaldehyde containing products have not been applied or provide a test report using the following test method: EN ISO 14184-1.

27. Waste water discharges from wet-processing

27.1 Waste water from wet-processing sites (except greasy wool scouring sites and flax retting sites) shall, when discharged to surface waters after treatment (whether on-site or off-site), have a COD content of less than 20 g/kg, expressed as an annual average.

Assessment and verification: The applicant shall provide detailed documentation and test reports, using ISO 6060, showing compliance with this criterion, together with a declaration of compliance.
27.2 If the effluent is treated on site and discharged directly to surface waters, it shall also have a pH between 6 and 9 (unless the pH of the receiving water is outside this range) and a temperature of less than 40 °C (unless the temperature of the receiving water is above this value).

Assessment and verification: The applicant shall provide documentation and test reports showing compliance with this criterion, together with a declaration of compliance.

28. Flame retardants

Only flame retardants that are chemically bound into the polymer fibre or onto the fibre surface (reactive flame retardants) may be used in the product. If the flame retardants used have any of the R-phrases listed below, these reactive flame retardants should, on application, change their chemical nature to no longer warrant classification under any of these R-phrases. (Less than 0.1 % of the flame retardant on the treated yarn or fabric may remain in the form as before application.)

- R40 (limited evidence of a carcinogenic effect),
- R45 (may cause cancer),
- R46 (may cause heritable genetic damage),
- R49 (may cause cancer by inhalation),
- R50 (very toxic to aquatic organisms),
- R51 (toxic to aquatic organisms),
- R52 (harmful to aquatic organisms),
- R53 (may cause long-term adverse effects in the aquatic environment),
- R60 (may impair fertility),
- R61 (may cause harm to the unborn child),
- R62 (possible risk of impaired fertility),
- R63 (possible risk of harm to the unborn child),
- R68 (possible risk of irreversible effects),


Flame retardants which are only physically mixed into the polymer fibre or into a textile coating are excluded (additive flame retardants).

Assessment and verification: The applicant shall either provide a declaration that additive flame retardants have not been used and indicate which reactive flame retardants, if any, have been used and provide documentation (such as safety data sheets) and/or declarations indicating that those flame retardants comply with this criterion.

29. Anti felting finishes

Halogenated shrink-resist substances or preparations shall only be applied to wool slivers and loose scoured wool.

Assessment and verification: The applicant shall provide a declaration of non-use (unless used for wool slivers and loose scored wool).

30. Fabric Finishes
No use is allowed of finishing substances or of finishing preparations containing more than 0.1% by weight of substances that are assigned or may be assigned at the time of application any of the following risk phrases (or combinations thereof):
- R40 (limited evidence of a carcinogenic effect),
- R45 (may cause cancer),
- R46 (may cause heritable genetic damage),
- R49 (may cause cancer by inhalation),
- R50 (very toxic to aquatic organisms),
- R51 (toxic to aquatic organisms),
- R52 (harmful to aquatic organisms),
- R53 (may cause long-term adverse effects in the aquatic environment),
- R60 (may impair fertility),
- R61 (may cause harm to the unborn child),
- R62 (possible risk of impaired fertility),
- R63 (possible risk of harm to the unborn child),
- R68 (possible risk of irreversible effects), as laid down in Directive 67/548/EEC and its subsequent amendments.

Assessment and verification: The applicant shall either provide a declaration that finishes have not been used, or indicate which finishes have been used and provide documentation (such as safety data sheets) and/or declarations indicating that those finishes comply with this criterion.

31. Fillings

31.1 Filling materials consisting of textile fibres shall comply with the textile fibre criteria (Nos 1 — 9) where appropriate.
31.2 Filling materials shall comply with criterion 11 on ‘Biocidal or biostatic products’ and the criterion 26 on ‘Formaldehyde’.
31.3 Detergents and other chemicals used for the washing of fillings (down, feathers, natural or synthetic fibres) shall comply with criterion 14 on ‘Auxiliary chemicals’ and criterion 15 on ‘Detergents, fabric softeners and complexing agents’.

Assessment and verification: As indicated in the corresponding criteria.

32. Coatings, laminates and membranes

32.1 Products made of polyurethane shall comply with the criterion set out in point 3.1 regarding organic tin and the criterion set out in point 3.2 regarding the emission to air of aromatic diisocyanates.

Assessment and verification: As indicated in the corresponding criteria.

32.2 Products made of polyester shall comply with the criterion set out in point 8.1 regarding the amount of antimony and the criterion set out in point 8.2 regarding the emission of VOCs during polymerisation.

Assessment and verification: As indicated in the corresponding criteria.
32.3 Coatings, laminates and membranes shall not be produced using plasticisers or solvents, which are assigned or may be assigned at the time of application any of the following risk phrases (or combinations thereof):
- R40 (limited evidence of a carcinogenic effect),
- R45 (may cause cancer),
- R46 (may cause heritable genetic damage),
- R49 (may cause cancer by inhalation),
- R50 (very toxic to aquatic organisms),
- R51 (toxic to aquatic organisms),
- R52 (harmful to aquatic organisms),
- R53 (may cause long-term adverse effects in the aquatic environment),
- R60 (may impair fertility),
- R61 (may cause harm to the unborn child),
- R62 (possible risk of impaired fertility),
- R63 (possible risk of harm to the unborn child),
- R68 (possible risk of irreversible effects),

Assessment and verification: The applicant shall provide a declaration of non-use of such plasticizers or solvents.

33. Energy and water use

The applicant shall provide data on water and energy use for the manufacturing sites involved in wet processing.

Assessment and verification: The applicant is requested to provide the abovementioned information.

FITNESS FOR USE CRITERIA

The following criteria apply either to the dyed yarn, the final fabric(s), or the final product, with tests carried out as appropriate.

34. Dimensional changes during washing and drying

The dimensional changes after washing and drying shall not exceed:
- plus or minus 2 % for curtains and for furniture fabric that is washable and removable,
- more than minus 8 % or plus 4 % for other woven products and durable non-woven, other knitted products or for terry towelling,

This criterion does not apply to:
- fibres or yarn,
- products clearly labelled ‘dry clean only’ or equivalent (insofar as it is normal practice for such products to be so labelled),
- furniture fabrics that are not removable and washable.

Assessment and verification: The applicant shall provide test reports using the following standards EN ISO 63 30, ISO 5077 as follows: 3 washes at temperatures as indicated on the product, with tumble drying after each washing cycle unless other drying procedures are indicated on the product,
35. **Colour fastness to washing**

The colour fastness to washing shall be at least level 3 to 4 for colour change and at least level 3 to 4 for staining.

This criterion does not apply to products clearly labelled ‘dry clean only’ or equivalent (insofar as it is normal practice for such products to be so labelled), to white products or products that are neither dyed nor printed, or to non-washable furniture fabrics.

*Assessment and verification:* The applicant shall provide test reports using the following standard EN: ISO 105 C06 (single wash, at temperature as marked on the product, with perborate powder).

36. **Colour fastness to perspiration (acid, alkaline)**

The colour fastness to perspiration (acid and alkaline) shall be at least level 3 to 4 (colour change and staining).

A level of 3 is nevertheless allowed when fabrics are both dark coloured (standard depth > 1/1) and made of regenerated wool or more than 20 % silk.

This criterion does not apply to white products, to products that are neither dyed nor printed, to furniture fabrics, curtains or similar textiles intended for interior decoration.

*Assessment and verification:* The applicant shall provide test reports using the following standard EN: ISO 105 E04 (acid and alkaline, comparison with multi-fibre fabric).

37. **Colour fastness to wet rubbing**

The colour fastness to wet rubbing shall be at least level 2 to 3. A level of 2 is nevertheless allowed for indigo dyed denim.

This criterion does not apply to white products or products that are neither dyed nor printed.

*Assessment and verification:* The applicant shall provide test reports using the following standard EN: ISO 105 X12.

38. **Colour fastness to dry rubbing**

The colour fastness to dry rubbing shall be at least level 4.

A level of 3 to 4 is nevertheless allowed for indigo dyed denim.

This criterion does not apply to white products or products that are neither dyed nor printed, or to curtains or similar textiles intended for interior decoration.

*Assessment and verification:* The applicant shall provide test reports using the following standard EN: ISO 105 X12.
39. Colour fastness to light

For fabrics intended for furniture, curtains or drapes, the colour fastness to light shall be at least level 5. For all other products the colour fastness to light shall be at least level 4.

A level of 4 is nevertheless allowed when fabrics intended for furniture, curtains or drapes are both light coloured (standard depth < 1/12) and made of more than 20 % wool or other keratin fibres, or more than 20 % silk, or more than 20 % linen or other bast fibres.

This requirement does not apply to mattress ticking, mattress protection or underwear.

Assessment and verification: The applicant shall provide test reports using the following standard EN: ISO 105 B02.

40. Information appearing on the eco-label

Box 2 of the eco-label shall contain the following text:

• encouraging the use of sustainable fibres
• durable and high quality
• hazardous substances restricted

Assessment and verification: The applicant shall provide a sample of the product packaging showing the label, together with a declaration of compliance with this criterion.