

# **BLUE ANGEL**

**The Environmental Label**



**Textiles**

**DE-UZ 154**

**Basic Award Criteria**

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Bundesministerium  
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The Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz) is the owner of the label. It regularly provides information on the decisions taken by the Environmental Label Jury.



The German Environment Agency with its specialist department for "Ecodesign, Eco-Labeling and Environmentally Friendly Procurement" acts as office of the Environmental Label Jury and develops the technical criteria of the Basic Criteria for Award of the Blue Angel.



The Environmental Label Jury is the independent, decision-making body for the Blue Angel and includes representatives from environmental and consumer associations, trade unions, industry, the trade, crafts, local authorities, academia, the media, churches, young people and the German federal states.



RAL gGmbH is the awarding body for the environmental label. It organises the process for developing the relevant award criteria in independent, expert hearings – which involve all relevant interest groups.

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**This document is a translation of a German original. In case of dispute, the original document should be taken as authoritative.**

# 1 Introduction

## 1.1 Preface

In cooperation with the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection, the German Environment Agency and considering the results of the expert hearings conducted by RAL gGmbH, the Environmental Label Jury has set up these Basic Criteria for the Award of the Environmental Label. RAL gGmbH has been tasked with awarding the Environmental Label.

Upon application to RAL gGmbH and on the basis of a Contract on the Use of the Environmental Label to be concluded with RAL gGmbH, the permission to use the environmental label may be granted to all products, provided that they comply with the requirements as specified hereinafter. The product must comply with all the legal requirements in the country in which it is to be marketed. The applicant shall declare that the product meets these conditions.

## 1.2 Background

The textile and fashion sector comprises about 1400 companies with a total of around 124,000 employees in Germany. The turnover of the German textile and fashion industry is approx. 28 billion Euro. The production activities cover technical textiles, clothing textiles and house and home textiles. More than 40 percent of the products produced by the German textile and fashion sector is exported (Confederation of the German Textile and Fashion Industry 2021<sup>1</sup>).

Turnover in this sector in the EU-28 was 162 billion Euro in 2019. 160,000 European companies employed 1.5 million workers (EURATEX, 2020<sup>2</sup>).

Alongside Germany, other important European production locations can be found in Italy, Spain, Portugal and France<sup>3</sup>. However, most of the textile products sold in Germany are imported goods – mostly from Asian countries. The production process, especially the labour-intensive final production (assembly/packaging), but also the finishing and dyeing processes and not least the harvesting of cotton, is carried out under inadequate quality standards using hazardous substances, untenable working conditions or insufficient environmental protection. The textile industry comprises a large number of subsectors that cover the entire production cycle from the production of the raw materials (synthetic fibres and filaments, natural fibres) and semi-finished products (yarn, knitwear incl. associated processes) right through to the final production. For these Basic Award Criteria, the entire production cycle was considered and requirements for environmentally relevant processes were developed.

Alongside natural fibres (cotton, flax or the textile material linen, jute, hemp, kapok, nettles, ramie, wool, alpaca, cashmere and silk from silk farms, recycled natural fibres and natural fibres produced from residues from food and agricultural production), the Basic Award Criteria also focus on regenerated fibres (viscose, lyocell) and synthetic fibres (polyacrylic, elastane, elastolefin, polyamide, polyester, polylactide and polypropylene) due to their importance on the textile market. In terms of the global market shares accounted for by the different fibres in 2019, the two most important fibres by far were polyester with a market share of more than 54% and cotton with a market share of approx. 22%. So-called “man-made” or regenerated

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<sup>1</sup> <https://textil-mode.de/de/verband/branchen/>, last checked on 21.12.2022

<sup>2</sup> EURATEX: Key figures of the textile & clothing industry, 2019.  
<https://euratex.eu/wp-content/uploads/EURATEX-Facts-Key-Figures-2020-LQ.pdf>

<sup>3</sup> [https://ec.europa.eu/growth/sectors/fashion/textiles-and-clothing-industries/textiles-and-clothing-eu\\_en](https://ec.europa.eu/growth/sectors/fashion/textiles-and-clothing-industries/textiles-and-clothing-eu_en), last checked on 21.12.2022

fibres/regenerated cellulose fibres were in third place with a market share of approx. 6%, while polyamide has a market share of approx. 5%. All other plant-based natural fibres, such as flex, hemp and jute, had a joint market share of almost 6%. If the remaining synthetic fibres are added together, they have a market share of approx. 5.2%. In terms of animal-based natural fibres, only wool (sheep's wool) accounted for a significant market share at almost 1%. (Textile Exchange, 2022)<sup>4</sup>

553,000 tonnes of synthetic fibres, 17,000 tonnes of cotton and 14,000 tonnes of wool were processed in Germany in 2021 according to the German Association for the Manmade Fibre Industry (Industrievereinigung Chemiefaser e.V.) (2021)<sup>5</sup>.

In view of the global environmental issues facing our generation that are caused to some extent by the demand for resources, numerous different actors in the textile sector are promoting the use of various alternative fibres. This includes, in particular, the development and refinement of various recycling processes and the rediscovery and new development of alternative fibres. Against this background, the Blue Angel addresses the use of recycled fibres using specific requirements. As the majority of the recycled polyester fibres on the market are still produced using mechanical recycling processes and are sourced from non-textile waste flows, the Blue Angel does not exclude the use of fresh fibres in the production of polyester. The reasons for this are that a) pollutants are not removed from the waste flows used in mechanical recycling and b) the process is associated with a reduction in the quality of the fibres. The possible presence of pollutants in the recycled fibres is addressed by the Blue Angel for textiles in requirements for the testing of the end products.

As pesticides used in cotton cultivation are almost completely removed during various processing stages in textile production, there is no impact on health due to pesticide residues when using recycled cotton fibres and this is therefore not addressed in the testing of the end products. However, the use of pesticides in cotton cultivation should be viewed critically due to the associated impact on the environment and corresponding health risks for workers in cotton cultivation. Against this background, the Blue Angel requires that any non-recycled cotton fibres are sourced 100% from controlled organic cultivation.

Overall, it should be pointed out here that the exclusive use of recycled fibres will not necessarily lead to a sustainable circular economy with closed substance and material flows in the textile sector. This would require the implementation of a so-called "design for circularity" in which the whole life cycle of the textile is taken into account. However, it is outside of the expertise of a product labelling system to develop a set of highly complex requirements that can fully cover a "design for circularity" with specifications for the design and production of recyclable, durable, repairable, functional textiles with tracking IDs. The Blue Angel does cover some aspects – such as the use of recycled fibres or residual or waste substances, lower use of chemicals or bans on the use of certain chemicals – with specific requirements and also has criteria for the durability and reparability of products. It is nevertheless recommended that applicants constantly focus on the theme of circular textiles in their product development activities so that they can exploit the associated potential for reducing the burden on the environment.

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<sup>4</sup> TextileExchange (2022): Preferred Fiber & Materials Market Report 2022, [https://textileexchange.org/app/uploads/2022/10/Textile-Exchange\\_PFMR\\_2022.pdf](https://textileexchange.org/app/uploads/2022/10/Textile-Exchange_PFMR_2022.pdf), last checked on 21.12.2022.

<sup>5</sup> Industrievereinigung Chemiefaser e.V. (2022): Processing of fibres in Germany (bar chart). Available online at <https://www.ivc-ev.de/de/faserverarbeitung-deutschland-balkendiagramm>, last checked on 21.12.2022.

An improvement in the environmental and health standards in production, sales and the products themselves can only be achieved with the most complete documentation possible of the work processes and transport routes, the consumption of raw materials and energy and the materials used in the production and processing stages. Applicants and suppliers are thus recommended to implement an environmental management system and publicly document it in the form of an environmental or sustainability report. It is also possible to improve social issues in the supply chain and protect fundamental human rights in the production countries if companies set corresponding minimum social and environmental standards for their own business activities and their suppliers and monitor compliance with them. Applicants and suppliers are thus recommended to comply with the requirements defined in the German Act on Corporate Due Diligence in Supply Chains (Lieferkettensorgfaltspflichtengesetz), even if they are not obligated to do so due to the size of their company.

In terms of providing information on the sustainability of their products, it is also recommended that applicants comply with the "Guidelines for Providing Product Sustainability Information"<sup>6</sup>, which were published by the United Nations Environment Programme (2017). These guidelines are the result of an international, multi-stakeholder process, led by an international working group within the UN's 10 Year Framework of Programmes for Sustainable Consumption and Production<sup>7</sup>.

### **1.3 Objectives of the environmental label**

In order to make consumers clearly aware of the efforts being made in the area of product responsibility, it is necessary to provide transparent and credible product information and product labelling. The objective of the environmental label is thus to highlight those products that:

- meet high environmental standards in their production;
- improve occupational safety and social conditions in the manufacturing process;
- avoid the use of chemicals hazardous to health in the end product;
- verify the product's fitness for use and durability and
- use residual materials and recycled products.

The environmental label will thus offer guidance for the use of sustainable products.

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<sup>6</sup> United Nations Environment Programme (2017): Guidelines for Providing Product Sustainability Information. ISBN: 978-92-807-3672-4. The guidelines have been published in six languages and are available in German under the following link:

[https://www.oneplanetnetwork.org/sites/default/files/from-crm/guidelines\\_full\\_german.pdf](https://www.oneplanetnetwork.org/sites/default/files/from-crm/guidelines_full_german.pdf), last checked on 21.12.2022.

<sup>7</sup> This programme is also known under the abbreviated name "10YFP CONSUMER INFORMATION PROGRAMME" (in German: 10YFP Verbraucher-Informationsprogramm). For further information on this programme, see <https://www.unep.org/explore-topics/resource-efficiency/what-we-do/one-planet-network/10yfp-10-year-framework-programmes>, last accessed on 21.12.2022.

Therefore, the following benefits for the environment and health are stated in the explanatory box:



#### 1.4 Compliance with legal requirements

Compliance with the currently valid versions of relevant existing laws and legal requirements is a prerequisite for those products awarded with the environmental label and their production. We take into account the Chemicals Regulation REACH (EC) No. 1907/2006<sup>8</sup> and the substance classifications according to the CLP Regulation (EC/1272/2008)<sup>9</sup>.

#### 1.5 Definitions

Important note: The "Definitions" section only includes those fibres that are covered by the scope of the Basic Award Criteria. This means that the definitions for natural fibres, synthetic fibres and regenerated fibres do not include a full list of the different fibres covered by these terms or definitions of them. Other fibres may be approved after examination by the German Environment Agency.

**Work clothing:** Clothing worn at work that does not have any special protective function (e.g. aprons/overalls to absorb dirt).

**Bedding** in the sense of these Basic Award Criteria are filled quilts, mattress protectors, mattress covers, toppers, encasing for mattresses, duvets, pillows and sleeping bags.

**Bed linen** describes sheets, covers for pillows and duvets, encasing for bed linen, as well as textiles between bed sheets and mattresses (unfilled mattress protectors).

**Book & Claim (supply chain management):** Manufacturers purchase certificates via a trading platform based on the quantity of raw materials added to their product. There is no physical relationship between the added raw materials and the production promoted by the certificate.

**Chlorinated bleaching agents:** Bleaching agents are defined as substances that have the property to reduce the colour of e.g. textiles and thus also remove colouring impurities. The bleaching process is also used as a preparatory step for textile finishing. Bleaching agents with

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<sup>8</sup> Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

<sup>9</sup> Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, as well as amending Regulation (EC) No. 1907/2006 (CLP Regulation)

chlorine compounds (e.g. sodium hypochlorite) are used in the chlorine bleach that chemically destroy the pigments by oxidation. Reactive chlorine or chlorine compounds are released during this process.

**End product:** Product labelled with the Blue Angel ecolabel and offered for sale on the market.

**Fillings:** Materials for filling and padding: Latex, polyactide, polyurethane, down and feathers. All approved fibres can also be used as fillings.

**Functional clothing:** Textiles that have an additional functional feature such as those that are windproof, waterproof, breathable, thermally regulating or with UV protection. It does not include functional textiles that provide a personal protective function<sup>10</sup> in the sense of protection against flames, radiation, chemicals, etc. and which are worn as protective equipment in certain jobs (such as in the fire and emergency services or to combat dangers such as radioactive radiation, etc.).

**Mixture:** Mix, mixture or solution composed of two or more substances.<sup>11</sup>

**House and home textiles:** Goods that are used for interior fittings and interior decoration. This includes blankets & throws, plaids, bed linen, table linen, kitchen linen, bathroom textiles, linen for personal hygiene, curtains, drapes, valances and passements, as well as fabric covers for furniture.

**Identity preserved (supply chain management):** The raw material from a certified production location is processed and sold separately in the supply chain by all processing companies and dealers from the production site through to the end product. The producers and processing companies must ensure that they can demonstrate that the different material flows do not come into contact with one another. Identity preserved raw materials can be traced back to the production site of the raw material.

**Laminate** in the sense of these Basic Award Criteria is a composite of one or more textile layers that is stuck together with a waterproof and at the same time often breathable membrane. Two or multiple layer laminates are found in, amongst other things, functional clothing.

**Mass balance (supply chain management):** The raw material from a certified production site is monitored administratively in the supply chain based on its weight. The raw material can be mixed with non-certified raw materials and then separated from the mixture using a mass balance.

**Membranes** in the sense of these Basic Award Criteria Award Criteria are waterproof, windproof and at the same time breathable barrier layers based on polyurethane, polyester or polyamide.

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<sup>10</sup> Refer to Regulation (EU) 2016/425 of the European Parliament and of the Council of 9 March 2016 on personal protective equipment and repealing Council Directive 89/686/EEC (accessible under: <https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:32016R0425&from=EN>) for the areas of application for personal protective equipment and the risks that they protect against.

<sup>11</sup> See [REACH regulation](#) Article 3

**Mulesing:** The removal of skin around the tail of sheep without any painkillers being administered. The aim of mulesing is to combat infestation with fly maggots.

**Nanomaterial:** A natural, incidental or manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for 50% or more of the particles in the number size distribution, one or more external dimensions is in the size range 1 nm - 100 nm.<sup>12</sup>

**Natural fibres**<sup>13</sup>: The following are currently approved as natural fibres in these Basic Award Criteria: cotton, flax or the textile material linen, jute, hemp, kapok, nettles, ramie, wool, alpaca, cashmere and silk from silk farms. Natural fibres produced using residues from food and agricultural production are also approved. Other fibres may be approved after examination by the German Environment Agency.

**Contract textiles:** Textile products designed for use in the commercial sector. This includes, in particular, hospitals, care facilities, hotels and the gastronomy sector.

**Recycled content:** Proportion of recycled materials in a product or packaging by mass. Recycled content only includes pre-consumer waste and post-consumer waste as defined below. The term pre-consumer waste (or pre-consumer material) describes material diverted from the waste stream during a manufacturing process. Excluded is reutilisation of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it. The term post-consumer waste (or post-consumer material) describes material generated by households or by commercial, industrial and institutional facilities in their role as end users of the goods or service which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

**Recycled fibres:** Fibres sourced from different textile waste (woven fabric, knitwear, yarn, fibres) or non-textile waste (e.g. plastic packaging) and which contains a certain recycled content. This waste originates from the production and processing stages along the entire textile manufacturing process including polymer and fibre production (pre-consumer waste) or from end consumer waste (post-consumer waste, including waste from commercial and industrial facilities, if they are the end consumers of the product). In contrast, material that accumulates during the manufacturing process and is reused in the same process is not considered to be waste and can thus not be included as recycled material nor can it be used to calculate the recycled content<sup>14</sup>.

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<sup>12</sup> Recommendation of the European Commission from 18 October 2011 for the definition of nanomaterials (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:275:0038:0040:DE:PDF>)

<sup>13</sup> The generic names listed here are taken from the DIN EN ISO 6938:2015-01 standard and refer to the definitions given in this standard.

<sup>14</sup> This definition is based on the definition for the use of the term recycled content in DIN EN ISO 14021:2016 Environmental labels and declarations - Self-declared environmental claims (Type II environmental labelling). According to this standard, production and processing waste (pre-consumer waste) (including polymer and fibre production waste, as well as waste cuttings from textile and clothing production) and consumer waste (post-consumer waste) can be used as source materials in the production of recycled textile fibres.

**Regenerated fibres<sup>15</sup>:** Fibres regenerated by dissolving natural polymers. These polymers can be cellulose or proteins. Lyocell and viscose are currently approved in these Basic Award Criteria. Other fibres may be approved after examination by the German Environment Agency.

**Segregation (supply chain management):** The raw material from a certified production site is kept separate from other non-certified raw materials along the entire supply chain.

**Secondary packaging:** Packaging that can be removed from the product without changing its properties and which contains a certain number of sales units that are sold together to the end user or consumer at a retail outlet.

**Dust:** Solid particles of any form, structure or thickness that are dispersed during the gas phase and remain upstream of a defined filter after drying under specified conditions (according to DIN EN 13284-1). The sum of the dust emissions at the recovery boiler and lime kiln, given as dust.

**Substance:** A chemical element and its compounds in the natural state or obtained by any manufacturing process, including any additive necessary to preserve its stability and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition<sup>16</sup>.

**Synthetic fibres<sup>17</sup>:** The synthetic fibres polyacrylic, elastane, polyamide, polyester, polylactide and polypropylene are approved in these Basic Award Criteria. Other fibres may be approved after examination by the German Environment Agency.

**Textile accessories:** Goods that do not have a required function but act as an adapted accessory for a main function such as hats, belts, gloves, pockets, visors, pouches, scarves, ribbons, zips, insoles, buttons, labels or textile jewellery.

**Textile fibres:** Natural fibres, synthetic fibres, regenerated fibres and recycled fibres.

**Textile fabrics:** Textile fabrics include woven fabric, knitted articles, felt, carpets, tufted carpets, nonwoven fabric, bobbinet, net, netting, multi-textiles and stitch-bond fabric.

**Transport packaging:** Transport packaging or delivery packaging is packaging that facilitates the transport of goods, protects the goods against damage during transport or which is used for reasons of safety of the transport.

**Repackaging:** Packaging that contains a certain number of sales units, consisting of the goods and their sales packaging, and which is typically offered to the end consumer with the sales units or is designed for stocking the shelves in the retail outlet.

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<sup>15</sup> The generic names listed here are taken from the DIN EN ISO 2076:2014-03 standard and refer to the definitions given in this standard.

<sup>16</sup> REACH, Article 3, and CLP Regulation, Article 2

<sup>17</sup> The generic names listed here are taken from the DIN EN ISO 2076:2014-03 standard and refer to the definitions given in this standard.

**Composite packaging:** Packaging that consists of different materials that cannot be separated by hand, in which no material accounts for more than 95% by mass of the packaging.

**Sales packaging:** Packaging that is typically offered to end consumers as a sales unit consisting of the goods and packaging.

**Delivery packaging:** Packaging that is filled with goods by the final sales company and enables or supports the delivery of goods to the end consumer.

**Impurity:** An unintended and not deliberately added constituent present in a substance as manufactured. Impurities may originate from the starting materials or be the result of incomplete or secondary reactions during the manufacturing process.<sup>18</sup>

**VOC:** A "volatile organic compound" describes any organic compound having a vapour pressure of 0.01 kPa or more at 293.5 K, or having a corresponding volatility under the particular conditions of use. In the sense of Directive 2010/75/EU, the fraction of creosote that exceeds this vapour pressure at 293.15 K is considered a volatile organic compound.

## 2 Scope

The product group "textile products" comprises the following end products, whereby non-textile fillings and membranes are not included in the weight calculations:

- Textile clothing and textile accessories consisting of at least 90% textile fibres by mass;
- Textile products for use inside buildings (house and home textiles incl. uncoated carpets) consisting of at least 90% textile fibres by mass;
- Functional clothing (see the definition under 1.5 "Definitions") in which more than 90% by mass of the material is textile fibres or textile substances that have undergone finishing processes (impregnation, sealing, etc.).
- Bedding consisting of at least 90% textile fibres by mass;
- Cleaning textiles: woven or nonwoven textiles consisting of at least 90% textile fibres by mass that are designed for the wet or dry cleaning of surfaces or for drying household articles;
- Handbags, bicycle bags, backpacks and school bags<sup>19</sup> consisting of at least 70% textile fibres by mass.
- Textile products designed for food contact (e.g. waxed cloths),
- Fibres, yarn, fabric, knitted and crocheted items, nonwovens (including textile composites<sup>20</sup>);
- Fibres made of stainless steel and mineral fibres are limited to a maximum of 10% by mass.

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<sup>18</sup> Guidance for identification and naming of substances under REACH and CLP, Version 2.1 March 2017, Terms, p. 17; [https://echa.europa.eu/documents/10162/23036412/substance\\_id\\_de.pdf/eb1721f9-74ec-4f8c-8aa3-1490fd510685](https://echa.europa.eu/documents/10162/23036412/substance_id_de.pdf/eb1721f9-74ec-4f8c-8aa3-1490fd510685)

<sup>19</sup> Other products can be approved by the German Environment Agency on request.

<sup>20</sup> Textile composites are textile fabrics (substances) consisting of textile fibres, yarns or both, but not woven or crocheted/knitted. They are produced by sewing over nonwovens or layers of yarn laid lengthways and crossways or strengthening nonwovens using chemical, mechanical or thermoplastic processes etc. Felts are also considered to be textile composites. Textile composites are used to produce lining materials, decorative materials, cleaning cloths etc. and also many technical articles.

**Excluded from the scope of these Basic Award Criteria are:**

- End products that are designed to be thrown away after a single use;
- Upholstered furniture, mattresses, textile floor coverings e.g. carpets and textile fabrics made of recycled plastics for façade, advertising and decorative applications<sup>21</sup>;
- Textile footwear with a solid sole<sup>22</sup>;
- Materials, accessories and applications made of PVC,
- Materials, components, accessories and applications made of polytetrafluoroethylene (PTFE);
- Textiles made out of asbestos, silver, cupro and cellulose fibres;
- Textile end products with electrical components – if passive electronic components (RFID) are added, these must be removable/separable.
- Products subject to the German Medical Products Law (e.g. bandage dressings);
- Textiles treated with biocidal products;
- Textiles produced from old textiles without breaking down the fibres, i.e. textiles that are put together using existing textiles to make new ones;
- Materials sourced from animal, plant or wood species listed either in CITES<sup>23</sup> in Annexes I, II or III<sup>24</sup> or which originate from a region included on the IUCN Red List<sup>25</sup> and are classified in the categories “critically endangered”, “endangered” or “vulnerable”.

The applicant must explain to RAL gGmbH in Annex 1 which materials and components the end product consists of and enclose a colour photo of the corresponding model with the application documents.

### 3 Requirements

#### 3.1 General regulations

Only those test reports produced by laboratories accredited according to DIN EN ISO/IEC 17025 “general requirements for the competence of testing and calibration laboratories” will be accepted. Verifications in the form of test reports for other certificates such as the EU Ecolabel, OEKO-TEX® Association, Global Organic Textile Standard (GOTS), Austrian Environmental Label, Internationaler Verband der Naturtextilwirtschaft e.V. (IVN) Best, bluesign®, Fairtrade Textile, Global Recycled Standard (GRS), Recycled Claim Standard (RCS) and Cradle to Cradle, insofar as they comply with the following limit values, will also be accepted. Also certificates for a label e.g. about compliance with the OEKO-TEX Standard (Appendix B), which can be expanded in discussion with the German Environment Agency.

The required test reports for the process-related verifications in the various sections must not be more than two years old at the time of application.

The required test reports for the ingredients in the materials added to the products and for the product's fitness for use in the various sections must not be more than one year old at the time of application.

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<sup>21</sup> Environmental labels already exist for these products: DE-UZ 117 for upholstered furniture, DE-UZ 119 for mattresses, DE-UZ 128 for textile floor coverings and DE-UZ 193 for textile fabrics made from recycled plastics.

<sup>22</sup> The environmental label DE-UZ 155 for footwear already exists here.

<sup>23</sup> Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

<sup>24</sup> See <https://cites.org/eng/app/appendices.php>; last accessed on 21.12.2022

<sup>25</sup> The IUCN Red List of Threatened Species, see <https://www.iucnredlist.org>, last accessed on 21.12.2022.

For all of the named standards, legal regulations and certification schemes, the rules and regulations in place at the time of application are valid, unless specifically stated otherwise. When examining the applications and monitoring compliance with the criteria, recognised environmental management systems such as EMAS or ISO 14001 can be taken into account. A list of the named legal regulations and testing standards can be found in Anhang A.

## **3.2 Requirements for textile fibres**

The requirements in 3.2.1 and 3.2.2 for the origin and production process of the textile fibres are valid for all textile fibres that comprise  $\geq 5\%$  by mass of all the textile fibres in the end product.

### **3.2.1 Requirements for the origin of natural fibres, cellulose and other plant-based raw materials**

#### **3.2.1.1 Requirements for the origin of natural fibres**

Textile natural fibres (cotton, hemp, flax or the textile material linen, kapok, nettles, ramie, jute, wool silk from silk farms, alpaca and cashmere) must be sourced from controlled organic cultivation or controlled biological animal husbandry or from fibres from the conversion phase<sup>26</sup> and comply with the requirements of Regulation (EC) No 2018/848 (EC Organic Regulation) or the American National Organic Programme (NOP).

In the case of alpaca, certification according to the Responsible Alpaca Standard © 2021 Textile Exchange<sup>27</sup> can be submitted as an alternative to certification of controlled biological animal husbandry.

In the case of cashmere, certification according to the Good Cashmere Standard® (GCS) by AbTF<sup>28</sup> can be submitted as an alternative to certification of controlled biological animal husbandry.

At all stages of the processing chain, it must be ensured that controlled biological fibres and products are not mixed with conventional fibres and products and that the controlled biological fibres are not contaminated due to contact with prohibited substances.

The fibres used in the products must not be sourced from genetically modified organisms (GMO). Mulesing is not permitted.

In the case of fine yarns (fineness range  $> \text{NM}100$ ), where the required fibre lengths cannot currently be sourced from the controlled organic cultivation of cotton, the German Environment Agency can conduct an inspection to decide whether the cotton used in the product that has been certified by a different certification system (e.g. Cotton made in Africa (CmiA) and Fairtrade Cotton) can also be approved.

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<sup>26</sup> "Conversion": Transition from non-organic to organic farming within a given period of time, during which the provisions concerning organic production have been applied; Regulation (EU) 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labelling of organic products and repealing Council Regulation (EC) No 834/2007; <https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:32018R0848&from=DE>

<sup>27</sup> The standard is available to download under the following link: <https://textileexchange.org/documents/responsible-alpaca-standard/>; last accessed on 21.12.2022.

<sup>28</sup> Aid by Trade Foundation (AbTF); The standard is available to download under the following link: [https://thegoodcashmerestandard.org/wp-content/uploads/2021/04/The-Good-Cashmere-Standard-by-AbTF\\_v1.1\\_EN.pdf](https://thegoodcashmerestandard.org/wp-content/uploads/2021/04/The-Good-Cashmere-Standard-by-AbTF_v1.1_EN.pdf); last accessed on 21.12.2022.

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1. Fibres labelled with the German organic logo (Bio-Siegel) or the EU organic logo ("Euro leaf") or in accordance with the American National Organic Programme (NOP) will be accepted. In addition, corresponding certificates from an internationally recognised certification body accredited by the IFOAM or in accordance with DIN EN ISO/IEC 17065 that verify compliance with recognised international or national ecological farming standards can be submitted. In the case of alpaca, certification according to the Responsible Alpaca Standard 1.0 © 2021 Textile Exchange can be submitted as an alternative to certification of controlled biological animal husbandry.*

*The certification of products "in conversion" is only possible if the regulations on which the certification of the fibre production is based include the possibility of such certification for the fibres in question. However, they must be specially labelled in accordance with these regulations.*

*If requested to do so by RAL GmbH, the applicant shall submit, where relevant, a shipping or transaction certificate<sup>29</sup> from an accredited certification body verifying compliance with the requirement at all stages of the processing chain, as well as information on the amount of biofibres produced and about the certification body and certification standard.*

#### **3.2.1.2 Requirements for the origin of cellulose and other plant-based raw materials**

- a) Cellulose for regenerated cellulose fibres and plant-based raw materials for the production of latex must be sourced from wood or bamboo that has been cultivated in accordance with the principles of sustainable forestry management as defined by the FAO. In the case of cellulose sourced from bamboo, a transaction certificate must also be submitted. The certificate must guarantee that a transaction verification process<sup>30</sup> has been carried out on the source of the cellulose and verify that the information provided by the label user is correct. As an alternative to cellulose sourced from wood, cellulose from production, processing and consumer waste (= recycled materials) can also be used. The same applies to cellulose sourced from residues from food and agricultural production.

### **Compliance verification**

*In the case of cellulose fibres used in the product, the applicant shall submit certificates verifying compliance with this criterion. For this purpose, the applicant shall obtain valid independently issued certificates about the product chain from the fibre producers verifying that the wood or bamboo used for the cellulose fibres was cultivated in accordance with the principles of sustainable forestry management. A transaction certificate must also be submitted for cellulose extracted from bamboo. The Forest Stewardship Council (FSC), the Programme for the*

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<sup>29</sup> This is a certificate that confirms that the traded product (e.g. raw cotton or yarn) was produced in accordance with the relevant standard.

<sup>30</sup> The growing demand for bamboo for use in various products (building sector, plastic products made of biological resources, etc.) harbours the danger that bamboo will be increasingly cultivated in large-scale monocultures. Bamboo products can now be certified with the FSC Seal. The certification criteria guarantee that the bamboo comes from responsible sources. However, inaccuracies and declaration errors in the bamboo supply chain, which were identified in an investigation carried out by the FSC and ASI (Accreditation Services International), meant that the FSC introduced an obligatory transaction verification process from 2017. Against this background, it is recommended in the case of bamboo that not only certification from responsible sources but also an additional transaction certificate, which guarantees that the information provided by the label user is correct, is requested as verification. See <https://www.fsc-deutschland.de/transaktionsueberpruefung-fuer-bambus-lieferkette-wird-eingefuehrt/>; last accessed on 21.12.2022

*Endorsement of Forest Certification Schemes (PEFC) or equivalent rules will be accepted as independent certification.*

*If production, processing and consumer waste is used in the production of textile fibres, the proportions of the different sources of cellulose shall be stated. The use of production, processing and consumer waste must be traceable back to the conditioning of the source material. This must be verified in the form of independent certification of the product chain (e.g. using the Recycled Claim Standard or an equivalent certification approach). Alternatively, purchasing and procurement receipts for these resources and a plausible list of their quantities can be submitted verifying that the amount of cellulose used in production that is not sourced from wood cultivated according to the guidelines for sustainable forestry based on the definition from the FAO is covered by the purchased quantities of production, processing and consumer waste.*

- b) If renewable raw materials are used to produce bio-based polyester or polyamide fibres, these must be sourced from sustainable cultivation on cultivation areas that can verify that they are managed in an ecological and socially responsible manner. The origin of the renewable raw materials for the production of the bio-based plastics must be verified in the form of a certificate from one of the following certification systems:
- International Sustainability and Carbon Certification (ISCC+),
  - Roundtable on Sustainable Biomaterials (RSB),
  - RedCert<sup>31</sup> (only in Europe)
  - Rainforest Alliance (Sustainable Agriculture Network (SAN)),
  - Roundtable on Responsible Soy (RTRS),
  - Roundtable on Sustainable Biomaterials (RSB),
  - Forest Stewardship Council (FSC),
  - Programme for the Endorsement of Forest Certification Schemes (PEFC)
  - or a comparable certification system whose scope and requirement standards is equivalent to one of the named certification systems. The equivalence of the certification system must be confirmed by an independent environmental verifier.
  - Alternatively, individual verifications in accordance with the criteria and verification requirements of one of the named certification systems may be presented if an equivalent level of protection can be achieved. The equivalence of the individual verifications must be confirmed by an independent environmental verifier.
  - Alternatively, residues from food and agricultural production may also be used.

The use of purchased certificates based on the Book & Claim system is excluded so that the traceability of the raw materials is possible. Certificates based on the identity preserved, segregation and mass balance systems are approved.

The proofs of purchase for the raw materials or semi-finished products must be based on processes according to the identity preserved, segregation or mass balance systems (see Paragraph 1.5 "Definitions").

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<sup>31</sup> REDcert GmbH operates one of the leading certification systems for sustainable biomass and biofuels in Germany and Europe (REDcert-DE and REDcert-EU).

### **Compliance verification**

*The applicant shall declare in Annex 1 to the contract whether renewable raw materials are used to produce polyester and polyamide fibres. If this is the case, the applicant shall document the origins and proportions by mass of the renewable raw materials used for the plastics in Annex 2 and submit the required certificates or verifications.*

*As verification for the use of residues from agricultural and food production, the applicant shall supply justifiable calculations to demonstrate which quantities of the residues are required for the production of a defined amount of fibre. In addition, the applicant shall submit corresponding purchasing and procurement receipts for the residues and information on the amount of fibres produced using the residues for a period of one year (12 months) before submitting the application.*

- c) If using residues from the agricultural, timber and food industries (e.g. bagasse from sugar cane production, pineapple leaves, the "stems" of banana plants, the fibres from oilseed flax, residues from the processing of cork) as a raw material or component in the production of textile fibres or insulation and filling materials, the residues do not have to be sourced from controlled organic cultivation or from fibres from the conversion phase, neither do they have to comply with the requirements of Regulation (EC) No 834/2007 (EC Organic Regulation) or the American National Organic Programme (NOP). In the case of fibres or filling materials that are exclusively or partially produced using residues from the agricultural, timber and food industries, the applicant must enclose a precise declaration about the components of the fibre in the form of a data sheet.

### **Compliance verification**

*As verification for the use of residues from the agricultural, timber and food industries, the applicant shall declare compliance with the requirement in Annex 1 to the contract. The applicant shall submit a precise declaration about the components of the fibre, insulation or filling material verifying the proportion of the fibres, filling or insulation materials that was produced using these residues. In addition, the applicant shall provide justifiable calculations to demonstrate which quantities of the residues are required for the production of a defined amount of fibre, filling or insulation material. Furthermore, the applicant shall submit corresponding purchasing and procurement receipts for the residues for a period of one year (12 months). The applicant shall also provide information on the amount of fibres, filling or insulation materials produced using these residues.*

## **3.2.2 Requirements for the production process for fibres**

### **3.2.2.1 Production of flax and other bast fibres**

Flax and other bast fibres may only be produced with the aid of water retting if the water used for the water retting has been treated so as to reduce the chemical oxygen demand (COD) or the total organic carbon by at least 75% for hemp fibres and by at least 95% for flax and other bast fibres.

This requirement does not apply to recycled fibres.

### **Compliance verification**

*If water retting is used, the applicant shall declare their compliance with the requirement according to 3.2.2.1 in Annex 1 and submit confirmation from the operator of the plant (Annex 3). The operator shall enclose a test report to verify compliance with the requirement. The test of the COD will be carried out in accordance with ISO 6060 or DIN 38409-41 or DIN 38409-44 or DIN-ISO 15705 on the basis of a qualified random sample or a 2-hour mixed sample.*

*If discharged to an urban waste water treatment plant (indirect discharge), the applicant shall also enclose a notice of approval verifying that the discharge process has been approved and that the urban waste water treatment plant meets the requirements of Directive 91/271/EEC.*

### **3.2.2.2 Wool and other keratin fibres**

#### **3.2.2.2.1 Requirements for waste water from wool scouring before mixing (indirect discharge)**

The chemical oxygen demand (COD) of the cleaning water discharged into the sewerage system must not exceed 45 g/kg of greasy wool before mixing with other waste water.

This requirement does not apply to recycled fibres.

#### **3.2.2.2.2 Requirements for waste water from wool scouring at the discharge point (direct discharge)**

The chemical oxygen demand (COD) of the cleaning water treated on-site and discharged to surface waters must not exceed 150 mg/l (qualified random sample) or 1.5 mg/l (2-hour mixed sample) of greasy wool. The pH value of the waste water discharged to surface waters must be between 6 and 9 (unless the pH value of the receiving waters is outside this range) and the temperature must be below 35 °C (unless the temperature of the receiving waters is already above this limit).

This requirement does not apply to recycled fibres.

### **Compliance verification**

*The applicant shall declare compliance with the requirement in accordance with either 3.2.2.2.1 or 3.2.2.2.2 in Annex 1 and submit confirmation from the operator of the wool scouring plant (Annex 4). The operator of the wool scouring plant shall also provide information on how he/she treats the cleaning water (on-site treatment + direct discharge or on-site treatment + indirect discharge).*

*The applicant shall enclose a test report to verify compliance with the requirements. The test of the COD will be carried out in accordance with ISO 6060 or DIN 38409-41 or DIN 38409-44 or DIN-ISO 15705 on the basis of a qualified random sample or a 2-hour mixed sample.*

*If discharged to an urban waste water treatment plant, the applicant shall also enclose a notice of approval verifying that the discharge process has been approved and that the urban waste water treatment plant meets at least the requirements of Directive (EEC) 91/271.*

#### **3.2.2.2.3 Exclusion of washing agents containing alkylphenol ethoxylates (APEO)**

Washing agents containing alkylphenol ethoxylates (APEO) are prohibited. The limits for direct and indirect discharge may not exceed 5µg/l APEO (NPEO, OPEO, NP and OP).

## Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 and submit a *declaration of conformity from the operator of the processing plant and test reports verifying compliance with the requirements in accordance with Annex 57 of the German Waste Water Ordinance or equivalent international test reports (Annex 4). The following test methods can be used here (on the basis of a qualified random sample or a 2-hour mixed sample):*

*NPEO, OPEO, NP and OP: ISO 18857-1, ISO 18857-2, ISO 18254-1 or ASTM D7742-17.*

### 3.2.2.3 Regenerated fibres (viscose and lyocell fibres)

#### 3.2.2.3.1 Emissions to waste water in the production of cellulose

Strict requirements apply to the emissions to waste water during the production of the cellulose used in the cellulose fibres. The applicant must determine the levels of the following chemical substances in the emissions to waste water at the cellulose plant (measurement specifications, see Appendix CAnhang B "Measurement of emissions to waste water in the production of cellulose"):

- Chemical oxygen demand (COD) in kg O<sub>2</sub> per air dry tonne<sup>32</sup>  
Proportion of chemically oxidising organic compounds in the waste water (usually based on analyses using dichromate oxidation), given as O<sub>2</sub>
- Total nitrogen content in kg N per air dry tonne  
Total-N (Total nitrogen, Tot-N), given as N. This includes organic nitrogen, free ammonia and ammonium (NH<sub>4</sub><sup>+</sup>-N), nitrites (NO<sub>2</sub><sup>-</sup>-N) and nitrates (NO<sub>3</sub><sup>-</sup>-N).
- Total phosphorous content in kg P per air dry tonne  
Total-P (Tot-P), given as P. This includes both dissolved phosphorous and also undissolved phosphorous which enters the waste water in the form of precipitates or microorganisms.

The following reference values apply to the named substances:

- Chemical oxygen demand: COD<sub>Reference</sub> = 18.00 kg O<sub>2</sub>/air dry tonne
- Total nitrogen content: N<sub>Reference</sub> = 0.25 kg N/air dry tonne
- Total phosphorous content: P<sub>Reference</sub> = 0.03 kg P/air dry tonne

Based on the measurement values, the applicant must calculate so-called emission points (P) for each of the measured substances as a ratio between the measurement value and the reference value as follows:

- $P_{\text{COD}} = \frac{CSB_{\text{Messwert}}}{CSB_{\text{Referenz}}}$
- $P_{\text{N}} = \frac{N_{\text{Messwert}}}{N_{\text{Referenz}}}$
- $P_{\text{P}} = \frac{P_{\text{Messwert}}}{P_{\text{Referenz}}}$

The following requirements apply:

- a) For each of the emission points P<sub>COD</sub>, P<sub>N</sub> and P<sub>P</sub>, a value of 1.5 must not be exceeded in each case and
- b) the sum of the emission points for emissions to waste water and air (P<sub>COD</sub>, P<sub>N</sub>, P<sub>P</sub>, P<sub>Sulphur</sub> and P<sub>NOx</sub>, see criteria 3.2.2.3.1 and 3.2.2.3.2) must not exceed a value of 5.0.

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<sup>32</sup> air dry: air dried cellulose

### **Compliance verification**

The applicant shall declare compliance with the requirement in Annex 1 to the contract and submit Annex 5 (emission values) completed by the producers of the cellulose, as well as test reports and the required supplementary documentation to the contract. The supplementary documentation comprises calculations of the emission points verifying compliance with this requirement. The test reports must comply with the requirements in the measurement specifications in Appendix C "Measurement of emissions to waste water". The submitted test reports must be produced by a testing laboratory accredited according to DIN EN ISO/IEC 17025 (general requirements for the competence of testing and calibration laboratories) or with official accreditation as a GLP laboratory<sup>33</sup>. In-house laboratories are recognised as being of an equivalent standard when they have been accredited by an independent body as an SMT laboratory (supervised manufacturer testing laboratory).

#### **3.2.2.3.2 Emissions to air in the production of cellulose**

Strict requirements apply to the emissions to air during the production of the cellulose used in the cellulose fibres. The emissions to air include those from the recovery boiler, lime kiln, steam boiler and incinerator for strong smelling gases. Diffuse emissions must also be taken into account. The applicant must determine the levels of the following chemical substances in the emissions to air at the cellulose plant (measurement specifications, see Appendix D "Measurement of emissions to air in the production of cellulose"):

- Gaseous sulphur compounds (sulphur) in kg S per air dry tonne  
Total reduced sulphur (TRS): Sum of the following reduced bad-smelling sulphur compounds released during the production of the cellulose: hydrogen sulphide, methyl mercaptan, dimethyl sulphide and dimethyl disulfide, given as S, plus sulphur dioxide (SO<sub>2</sub>), given as S
- Nitrogen oxide (NO<sub>x</sub>) in kg NO<sub>x</sub> per air dry tonne  
Sum of nitrogen oxide (NO) and nitrogen dioxide (NO<sub>2</sub>), given as NO<sub>2</sub>
- Dust emissions (dust<sup>34</sup>) in kg dust per air dry tonne

The following reference values apply to the named substances:

- Gaseous sulphur compounds: Sulphur<sub>Reference</sub> = 0.6 kg S/air dry tonne
- Nitrogen oxide: NO<sub>xReference</sub> = 2 kg NO/air dry tonne

Based on the measurement values, the applicant must calculate so-called emission points (P) for each of the measured substances as a ratio between the measurement value and the reference value as follows:

- $P_{Schwefel} = \frac{Schwefel_{Messwert}}{Schwefel_{Referenz}}$
- $P_{NOx} = \frac{NOx_{Messwert}}{NOx_{Referenz}}$

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<sup>33</sup> <https://www.oecd.org/chemicalsafety/testing/oecdseriesonprinciplesofgoodlaboratorypracticeglpand-compliance-monitoring.htm>, last accessed on 21.12.2022

<sup>34</sup> See Paragraph 1.5 for the definition

The following requirements apply:

- a) For each of the emission points  $P_{\text{Sulphur}}$  and  $P_{\text{NO}_x}$ , a value of 1.5 must not be exceeded in each case and
- b) the sum of the emission points for emissions to waste water and air ( $P_{\text{COD}}$ ,  $P_{\text{N}}$ ,  $P_{\text{P}}$ ,  $P_{\text{Sulphur}}$  and  $P_{\text{NO}_x}$ , see criteria 3.2.2.3.1 and 3.2.2.3.2) must not exceed a value of 5.0.

In addition, it is recommended for the dust emissions that a reference value of 0.45 kg dust/air dry tonne is not exceeded. In future revisions of these Basic Award Criteria, it is anticipated that this value will be set as an obligatory requirement.

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 to the contract and submit Annex 5 (emission values) completed by the producers of the cellulose, as well as test reports and the required supplementary documentation to the contract. The supplementary documentation comprises calculations of the emission points verifying compliance with this requirement. The test reports must comply with the requirements in the measurement specifications in Appendix DAnhang D "Measurement of emissions to air in the production of cellulose". The submitted test reports must be produced by a testing laboratory accredited according to DIN EN ISO/IEC 17025 (general requirements for the competence of testing and calibration laboratories) or with official accreditation as a GLP laboratory<sup>35</sup>. In-house laboratories are recognised as being of an equivalent standard when they have been accredited by an independent body as an SMT laboratory (supervised manufacturer testing laboratory).*

### **3.2.2.3.3 Bleaching processes**

In the production of the cellulose, the following requirements apply to the bleaching process:

- The cellulose must not be bleached using elementary chlorine and hypochlorite. Hypochlorite may still be used for a transitional period of 5 years. This means that the use of hypochlorite in the production of cellulose for the production of regenerated fibres is still permitted for a transitional period of 5 years from the date on which these Basic Award Criteria come into force. After this transitional period, the use of hypochlorite is prohibited, even for the bleaching of cellulose for the production of regenerated fibres.
- In the case of chlorine compounds used as bleaching agents, only a modern elementary chlorine free (ECF) bleaching process using chlorine dioxide is permitted<sup>36</sup>. In this case, the specific amount of chlorine dioxide ( $\text{ClO}_2$ ) consumed, expressed as an annual average, must be stated in kg  $\text{ClO}_2$  per air dry tonne. The adsorbable organically combined halogens (AOX) must be measured in the waste water. The annual average for the measured AOX emissions to waste water must not exceed a value of 0.14 kg AOX per air dry tonne.
- The specific amounts of poorly biodegradable complexing agents (thylenediaminetetraacetic acid (EDTA) and diethylenetriaminepentaacetic acid (DTPA)) must be stated in kg per air dry tonne, expressed as an annual average.

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<sup>35</sup> <https://www.oecd.org/chemicalsafety/testing/oecdseriesonprinciplesofgoodlaboratorypracticeglpand-compliance-monitoring.htm>, last accessed on 21.12.2022

<sup>36</sup> The use of hypochlorite is prohibited or only permitted for a transitional period of 5 years from the date on which these Basic Award Criteria come into force.

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 to the contract and submit a declaration from the cellulose producer in Annex 5 verifying that no elemental chlorine or hypochlorite is used in the bleaching process or a declaration that hypochlorite will only be used for bleaching the cellulose until 31.12.2027 . Based on test reports, the applicant shall state the specific amounts of EDTA and DTPA consumed, as well as the ClO<sub>2</sub>, in Annex 5. If chlorine compounds (e.g. ClO<sub>2</sub>) are added to the bleach for the cellulose, the applicant shall submit a test report for the AOX emissions to waste water in Annex 5. One of the test methods ISO 9562, DIN EN 1485, DIN 38409 Part 14 or the equivalent EPA 1650C must be used for measuring the AOX emissions. The measurements shall be carried out over a production period of 12 months, with measurements taken on at least a monthly basis. The submitted test reports must be produced by a testing laboratory accredited according to DIN EN ISO/IEC 17025 (general requirements for the competence of testing and calibration laboratories) or with official accreditation as a GLP laboratory<sup>37</sup>. In-house laboratories are recognised as being of an equivalent standard when they have been accredited by an independent body as an SMT laboratory (supervised manufacturer testing laboratory).*

#### **3.2.2.3.4 Energy consumption in the production of cellulose**

The specific energy consumption in the production of cellulose must not exceed the following limit values:

- Electrical energy: ≤1,125 kWh/air dry tonne
- Heating energy: ≤7,500 kWh/air dry tonne

##### a) Electrical energy (electricity):

The electricity consumed in the production of cellulose must be measured over a period of 12 months and stated in relation to the cellulose produced (air dry tonnes) during this period. The electricity consumption is calculated as follows:

Electricity consumption = electricity generated at the plant  
plus the electricity purchased from outside of the plant  
less the electricity sold outside of the plant  
less the electricity consumed for processes not related to the cellulose production at the plant  
less the electricity consumed at the treatment plant

##### b) Heating energy (fuel):

The heating energy consumed in the production of cellulose must be measured over a period of 12 months and stated in relation to the cellulose produced (air dry tonnes) during this period. Heating energy can be in the form of gaseous, liquid or solid fuels (e.g. natural gas, heating oil, biomass) or in the form of heat transfer media (e.g. water, steam). For the energy content of the fuel, the lower heating value (LHV) for the relevant fuel is used. In the case of damp fuels (e.g. wood, biomass), the effective calorific value (after subtracting the evaporation energy of the enclosed water) is used, while the effective energy content is used for heat transfer media.

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<sup>37</sup> <https://www.oecd.org/chemicalsafety/testing/oecdseriesonprinciplesofgoodlaboratorypracticeglpand-compliance-monitoring.htm>, last accessed on 21.12.2022

The heating energy consumption is calculated as follows:

Heating energy consumption = fuel produced at the plant  
plus the purchased heating energy or fuel  
less the heating energy or fuel sold  
less 1.25 x the electricity generated at the plant  
less heating energy consumed for processes not related  
to the cellulose production at the plant

Please note:

The heating energy includes all fuels used (their lower heat value) and the heating energy recovered from the incineration of pulping liquors and waste at the production site (e.g. waste wood, sawdust, pulping liquor, waste paper, rejected paper), as well as the heating energy recovered from the plant's own electricity generation. The applicant must present the calculation for the energy consumption for the production of cellulose in the form of an energy statement together with the calculation parameters used. If the applicant does not have their own heat values for the fuels used, the heat values documented in the Nordic ecolabel for paper products<sup>38</sup> may be used.

#### **Compliance verification**

*The applicant shall state the specific energy consumption and declare compliance with the requirement in Annex 1 to the contract. In addition, the applicant shall submit an energy statement in Annex 5, which documents the energy consumption over a period of 12 months, the heat values for the relevant fuels used, the annual production of cellulose and the calculation of the specific energy consumption values.*

#### **3.2.2.3.5 Halogen content**

The halogen content of the fibres must not exceed 150 mg/kg.

This requirement also applies to recycled fibres.

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit confirmation from the operator of the plant (fibre producer), as well as a test report (Annex 5). The test shall be carried out in accordance with ISO 11480 (controlled combustion and microcoulometry).*

#### **3.2.2.3.6 Emissions to air**

In the case of viscose fibres, the sulphur content of the emissions of sulphur compounds to air from fibre production processes, expressed as an annual average, must not exceed 30 g/kg of staple fibres produced, 40 g/kg of filament fibres for batch washing and 170 g/kg of filament fibres for integrated washing. If both types of fibres are produced at a particular site, the total emissions must not exceed the corresponding weighted average value.

This requirement also applies to recycled fibres.

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<sup>38</sup> Nordic Ecolabelling of Paper Products – Basic Module Version 3.0 • 05 October 2020 – 31 December 2025; see [https://www.nordic-ecolabel.org/globalassets/ai001\\_3.0\\_basic\\_module\\_cd.pdf](https://www.nordic-ecolabel.org/globalassets/ai001_3.0_basic_module_cd.pdf); last accessed on 21.12.2022

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit confirmation from the operator of the plant (viscose producer) (Annex 5), as well as a sulphur emissions report<sup>39</sup>.*

#### **3.2.2.3.7 Emissions to water in the production of viscose fibres**

The waste water from the production of viscose fibres must not exceed the following values (expressed as annual averages) when discharged to surface waters:

- Zinc: 1.5 mg/l,
- AOX: 1 mg/l,
- COD: 100 mg/l,
- Sulphide: 0.3 mg/l.

This requirement does not apply for approved discharge into an urban waste water treatment plant that meets at least the requirements of the Council Directive of 21 May 1991 concerning urban waste water treatment (91/271/EEC).

This requirement also applies to recycled fibres.

### **Compliance verification**

*The applicant shall declare compliance with the requirements in Annex 1 and submit a declaration of compliance from the operator of the plant (viscose producer) (Annex 5), as well as a test report (the test report for the waste water measurement at the plant). The following methods may be used for completing these tests:*

- Zinc: EN ISO 11885,
- AOX value: EN ISO 9562,
- COD: ISO 6060 or DIN ISO 15705 or DIN 38409-41 or DIN 38409-44,
- Sulphide: DIN 38405-27 or ISO 10530.

*If discharged to an urban waste water treatment plant (indirect discharge), the applicant shall also enclose a notice of approval for the fibre producer verifying that the discharge process has been approved and that the urban waste water treatment plant meets at least the requirements of Directive 91/271/EEC.*

#### **3.2.2.4 Polyester fibres**

Textile end products made out of polyester must comply with subcriterion a) as well as either of b) or c).

- a) The amount of antimony present in the polyester fibres must not exceed 260 ppm or an elutable amount of 30 mg/kg.

This requirement also applies to recycled fibres.

### **Compliance verification**

*The applicant shall declare in Annex 1 that he/she uses antimony-free polyester fibres and submit a corresponding declaration for his/her supplier (Annex 6), or if fibres containing antimony have been used, the applicant shall submit a test report from the suppliers of the fibres to verify*

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<sup>39</sup> Note: Using a sulphur emissions report on the carbon disulphide added and reused, it is possible to calculate what amount is actually emitted.

*compliance with this requirement. The test shall be carried out using the following method: direct determination by atomic absorption spectrometry. The test shall be carried out on the raw fibre prior to any wet processing. Leaching according to DIN EN ISO 105-E04 / determined according to ISO 17294-2 (ICP/MS). The recycling process must be described if using recycled fibres.*

- b) Fibres must be produced using a minimum content of PET that has been recycled from production and/or consumer waste. The use of PET beverage packaging is not permitted. However, the use of PET beverage packaging in the production of recycled fibres is still permitted for a transitional period of two years from the date on which these Basic Award Criteria come into force. Mixtures of staple fibres must contain a minimum of 50% recycled fibres and filament fibres must contain at least 20% recycled fibres. This requirement does not apply to microfibres, which must comply with subcriterion c).
- c) The emissions of volatile organic compounds (VOC) in the sense of the Industrial Emissions Directive (2010/75/EU) during polymerisation and the production of polyester fibres, measured at the process steps where they occur, expressed as an annual average, must not exceed 1.2 g/kg for PET chips, 10.3 g/kg for filament fibres or 0.2 g/kg for produced polyester resin. This requirement does not apply to recycled polyester fibres, unless the recycling process breaks down the materials to the monomer level. If this is the case, this requirement also applies to recycled polyester fibres.

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit a declaration of conformity from the suppliers of the fibres (Annex 6), as well as a test report in accordance with DIN EN 12619 that verifies compliance with this requirement. The recycling process must be described if using recycled fibres.*

#### **3.2.2.5 Polyamide fibres**

Textile end products made out of polyamide must comply with at least one of the product standards stated in subcriteria a) and b).

- a) Fibres must be manufactured using a minimum content of 20% nylon that has been recycled from production and/or consumer waste.
- b) The N<sub>2</sub>O emissions to air during the monomer production, expressed as an annual average, must not exceed 9 g/kg of polyamide 6 fibre produced or 9 g/kg of polyamide 6.6 fibre produced. In addition, reduction technologies must be used in the production of caprolactam and adipic acid. It must be ensured that the degree of reduction in the N<sub>2</sub>O emissions during adipic acid production is at least 95%. This requirement does not apply to recycled fibres, unless the recycling process breaks down the materials to the monomer level. If this is the case, this requirement also applies to recycled fibres.

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit a declaration of conformity from the monomer producer (Annex 7), as well as test reports for the raw and clean gas verifying that a reduction of at least 95% has been achieved. The recycling process must be described if using recycled fibres.*

### **3.2.2.6 Polyacrylic fibres**

#### **3.2.2.6.1 Acrylonitrile**

The residual acrylonitrile content in raw fibres leaving the fibre production plant must be less than 1.5 mg/kg. This requirement does not apply to recycled fibres, unless the recycling process breaks down the materials to the monomer level. If this is the case, this requirement also applies to recycled fibres.

#### **Compliance verification**

*The applicant shall declare in Annex 1 that he/she complies with the requirement above and submit confirmation from the suppliers of the fibres (Annex 8), as well as a test report from the suppliers of the fibres verifying compliance with this requirement. The test shall be carried out in accordance with the following method: Extraction with boiling water and quantification by capillary gas-liquid chromatography. The recycling process must be described if using recycled fibres.*

#### **3.2.2.6.2 Acrylonitrile emissions**

The emissions to air of acrylonitrile (during polymerisation and up to the solution ready for spinning), expressed as an annual average, must be less than 1 g/kg of fibre produced. This requirement does not apply to recycled fibres, unless the recycling process breaks down the materials to the monomer level. If this is the case, this requirement also applies to recycled fibres.

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit confirmation from the suppliers of the fibres (Annex 8) and a test report in accordance with VDI Guideline 3863, sheets 1 and 2 verifying compliance with this requirement. The recycling process must be described if using recycled fibres.*

### **3.2.2.7 Elastane fibres**

#### **3.2.2.7.1 Organotin compounds**

The use of organotin compounds is not permitted.

#### **Compliance verification**

*The applicant shall declare in Annex 1 that such compounds are not used and submit confirmation from the suppliers of the fibres. The recycling process must be described if using recycled fibres and verification of the content of organotin compounds in accordance with DIN CEN ISO/TS 16179 or DIN EN ISO 22744-1 must be submitted.*

#### **3.2.2.7.2 Aromatic diisocyanates**

The concentration of aromatic diisocyanates from the polymerisation and the spinning processes must not exceed a value of 0.05 mg/m<sup>3</sup> (corresponds to 0.005 ml/m<sup>3</sup>) at the workplaces in which the relevant process steps occur, expressed as an 8 hour average (shift average). This requirement does not apply to recycled fibres, unless the recycling process breaks down the

materials to the monomer level. If this is the case, this requirement also applies to recycled fibres.

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit confirmation from the suppliers of the fibres to verify compliance with this requirement (Annex 9). Suitable test methods using HPLC from recognised testing laboratories will be accepted. The recycling process must be described if using recycled fibres.*

#### **3.2.2.8 Polypropylene fibres**

It is not permitted to use lead-based pigments. This requirement also applies to recycled fibres.

#### **Compliance verification**

*The applicant shall declare in Annex 1 that such compounds are not used and submit confirmation from the suppliers of the fibres (Annex 10). The recycling process must be described if using recycled fibres.*

#### **3.2.2.9 Elastolefin**

The spinning oils used in the production of elastolefin may not contain the following substances:

- Octamethylcyclotetrasiloxane D4 CAS 556-67-2,
- Decamethylcyclopentasiloxane D5 CAS 541-02-6,
- Dodecamethylcyclohexasiloxane D6 CAS 540-97-6

Impurities of these substances in the spinning oil may not exceed a limit of 0.10%. This requirement does not apply to recycled fibres, unless the recycling process breaks down the materials to the monomer level. If this is the case, this requirement also applies to recycled fibres.

#### **Compliance verification**

*The manufacturer shall declare in Annex 1 that no impurities above the acceptable limit of 0.10% are present in the spinning oil and shall submit confirmation from the suppliers of the fibres (Annex 11) and the latest safety data sheets for the spinning oil. The recycling process must be described if using recycled fibres.*

#### **3.2.2.10 Requirement for recycled fibres**

If recycled fibres are used, the applicant must provide information on the recycled content and the type and composition of the recycled fibres. The origins and composition of the materials fed into the recycling process must also be stated. The applicant must submit a description of the recycling process.

In addition, the applicant must verify the origins and composition of the materials fed into the recycling process by submitting a certificate from one of the following certification systems:

- RCS (Recycled Claim Standard),
- GRS (Global Recycled Standard),
- International Sustainability and Carbon Certification (ISCC+),
- Roundtable on Sustainable Biomaterials (RSB),
- RedCert (only in Europe)

- or a comparable certification system whose scope and requirement standards is equivalent to one of the named certification systems. The equivalence of the certification system must be confirmed by an independent environmental verifier.

The use of purchased certificates based on the Book & Claim system is excluded so that the traceability of the raw materials is possible. Certificates based on the identity preserved, segregation and mass balance systems are approved.

The proofs of purchase for the materials fed into the recycling process must be based on processes according to the identity preserved, segregation or mass balance systems (see Paragraph "Definitions").

### **Compliance verification**

*The manufacturer shall state the recycled content and the origins of the recycled materials in Annex 12 and submit the required certificates and verifications.*

## **3.2.3 Requirements for the biodegradability of auxiliaries and finishing agents for fibres and yarns**

### **3.2.3.1 Sizing preparations**

At least 95% (dry weight) of the components of any sizing preparation applied to yarns must be sufficiently biodegradable or recycled. The sum of the individual components must be taken into account.

### **3.2.3.2 Spinning solution additives**

Spinning solution additives, spinning auxiliaries and mixtures for primary spinning (including carding oils, spin finishes and lubricants): At least 90% (dry weight) of the components in the mixture must be sufficiently biodegradable or eliminable in waste water treatment plants.

### **Compliance verification**

**Table 1: Scope of restriction, limit values and compliance verifications for various spinning solution additives**

<b>Substance group</b>	<b>Scope of restriction</b>	<b>Limit values</b>	<b>Compliance verification</b>
i) Sizing preparations applied to fibres and yarns  Applicability: Spinning processes	At least 95% (by dry weight) of the components must be readily biodegradable.  In all cases, the sum of the individual components must be taken into account.	<b>Readily biodegradable:</b> 70% degradation of dissolved organic carbon within 28 days  or  60% of theoretical maximum oxygen depletion or carbon dioxide generation within 28 days	Declaration from the chemical supplier supported by OECD or ISO test results  Test methods:  OECD 301 A, ISO 7827 OECD 301 B, ISO 9439 OECD 301 C, OECD 301 D, OECD 301 E, OECD 301 F, ISO 9408 OECD 310, ISO 14593 ISO 10708
ii) Spinning solution additives, spinning additives	At least 90% (by dry weight) of the components must be readily	<b>Readily biodegradable:</b> See definition under i)	Declaration from the chemical supplier

Substance group	Scope of restriction	Limit values	Compliance verification
and mixtures for primary spinning (including carding oils, spin finishes and lubricants)  Applicability: Primary spinning processes	biodegradable, inherently biodegradable or eliminable in waste water treatment plants.  In all cases, the sum of the individual components must be taken into account.	<b>Inherently biodegradable:</b> 80% degradation of dissolved organic carbon within 7 days (possibly 28 days).  <b>Eliminability in laboratory clarification units:</b> 80% degradation of dissolved organic carbon (plateau phase)	supported by OECD or ISO test results  Test methods:  See compliance verifications under i) readily biodegradable tests.  Inherently biodegradable tests that are accepted:  OECD 302 B, ISO 9888 OECD 302 C  Tests for eliminability in laboratory clarification units:  OECD 303A/B, ISO 11733

*This degree of biodegradation (refer to Table 1) must be achieved within 10 days of the beginning of the degradation phase starting with the day when 10% of the substance has been degraded, unless the substance has been identified as a UVCB (unknown or variable compositions, complex reaction products or biological materials) or as a complex multi-constituent substance with structurally similar constituents. In this case, and when there is sufficient reason, the 10-day window shall not be applied and the result shall only be achieved after 28 days.*

*The applicant shall submit a list of all spinning solution additives, spinning auxiliaries and mixtures for primary spinning (including carding oils, spin finishes and lubricants) and their manufacturers. In addition, the applicant shall submit declarations from the chemical suppliers and the corresponding test reports or safety data sheets, indicating the tests used to investigate the substances and their results.*

*The corresponding ISO standards and REACH methods<sup>40</sup> will be recognized as equivalent.*

### 3.3 Requirements for the production process for laminates

In the case of textile end products that contain laminates, the laminates added to the products must comply with the following requirements:

a) **Textiles used**

For the fibres of the textiles used, the requirements stated in the relevant sections are valid.

b) **Membranes used**

For membranes produced on the basis of polyester, polyurethane, and polyamide, they must comply with at least one of the two subcriteria i) and ii).

i) The membranes must be produced using at least 30% recycled materials from production and/or consumer waste.

ii) The membranes must not be produced using organic solvents.

<sup>40</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:142:0001:0739:DE:PDF>  
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:220:0001:0094:de:PDF>

The requirement for the amount of antimony in polyester fibres (3.2.2.4a) also needs to be taken into account in the case of polyester membranes. The N<sub>2</sub>O (3.2.2.5b) requirement for polyamide fibres needs to be taken into account for polyamide membranes, while the limit values for polyurethane (3.5.2) need to be taken into account for polyurethane membranes. Components produced from polyurethane must also comply with the textile fibre requirement for organotin compounds (3.6.6.7) and the requirement for workplace exposure to aromatic diisocyanates (3.2.2.7.2).

c) **Adhesives used**

Solvent-based adhesives must not be used in the laminating process. Only thermoplastic or reactive (e.g. moisture curing) hotmelt adhesives may be used. If reactive polyurethane-based hotmelt adhesives are used, the concentration of aromatic diisocyanates must not exceed a value of 0.05 mg/m<sup>3</sup> (corresponds to 0.005 ml/m<sup>3</sup>) measured at the workplaces, expressed as an 8 hour average (shift average).

d) **Functional products**

The exclusion criteria in Paragraph 3.6.2.4 apply to the functional products used on the textiles.

**Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit declarations of conformity from the membrane suppliers/adhesive suppliers or the laminate manufacturers (Annex 14).*

**3.4 Requirements for down and feathers from water fowl (geese and ducks)**

The extraction of feathers from living animals, live plucking and plucking during moulting, as well as the extraction of feathers and down from animals that are held for the production of foie gras, is not permitted.

**Compliance verification**

*Verification of the traceability of the goods/filling, as well as verification that no feathers are extracted from living animals, must be provided in audit reports or certificates from qualified and accredited testing institutions, for example according to the Responsible Down, Traceable Down or DOWNPASS standard.*

**3.4.1 Requirements for waste water at the discharge point in the processing of down and feathers**

Waste water from the wet processing must not exceed the following values when discharged to surface water (direct discharge):

- COD: 160 mg/l (expressed as an average yearly value),
- BOD5: 30 mg/l,
- TSS: 30 mg/l,
- Ammonium nitrogen: 10 mg/l,
- Total nitrogen: 20 mg/l,
- Phosphorous: total 2 mg/l,
- Persistent foam at the discharge point

- The pH value of the waste water discharged to surface waters must be between 6 and 9 (unless the pH value of the receiving waters is outside this range) and the temperature must be below 35 °C (unless the temperature of the receiving waters is already above this limit).

In the case of indirect discharge, the discharge into the urban waste water treatment plant has been approved and the urban waste water treatment plant meets at least the requirements of the Council Directive of 21 May 1991 concerning urban waste water treatment (91/271/EEC).

### **Compliance verification**

*The applicant shall declare compliance with the requirements in Annex 1 and submit a declaration of conformity from the operator of the processing plant and test reports verifying compliance with the requirements in accordance with Annex 38 of the German Waste Water Ordinance or equivalent international test reports (Annex 15). The following test methods can be used here (on the basis of a qualified random sample or a 2-hour mixed sample):*

*COD: ISO 6060 or DIN 38409-41 or DIN 38409-44 or DIN ISO 15705,*

*BOD: DIN EN 1899-1 or ISO 5815-1/-2,*

*TSS: DIN EN 872 or ISO 11923,*

*Ammonium nitrogen: DIN EN ISO 11732,*

*Total nitrogen: DIN EN ISO 12260,*

*Total phosphorous: DIN EN ISO 11885.*

*The waste water treatment plant must be regularly monitored. In addition, the applicant shall submit a declaration from the operator of the processing plant about the frequency of the measurements of the discharge values (at least every six months) (Annex 15).*

*In the case of indirect discharge, the applicant shall submit the permit from the municipal wastewater treatment plant, that the discharge process has been approved and that the urban waste water treatment plant meets at least the requirements of Directive 91/271/EEC.*

### **3.4.2 Exclusion of washing agents containing alkylphenol ethoxylates (APEO)**

Washing agents containing alkylphenol ethoxylates (APEO) are prohibited. The limits for direct and indirect discharge may not exceed 5 µg/l APEO (NPEO, OPEO, NP and OP).

### **Compliance verification**

*The applicant shall declare compliance with the requirements in Annex 1 and submit a declaration from the operator of the processing plant and test reports verifying compliance with the requirements (Annex 15). The following test methods can be used here (on the basis of a qualified random sample or a 2-hour mixed sample):*

*NPEO, OPEO, NP and OP: ISO 18857-1, ISO 18857-2, ISO 18254-1 or ASTM D7742-17.*

### **3.4.3 Hygiene requirements**

**Table 2: Requirements for down and feathers**

<b>Description</b>	<b>Requirement EN 12935</b>	<b>Test methods</b>
Oxygen index	max. 20 Target: less than 10	EN 1162
Microbiological state		EN 1884

Description	Requirement EN 12935	Test methods
Mesophil aerobic bacteria count	Less than 10 <sup>6</sup> CFU/g	
Faecal streptococci count	Less than 10 <sup>2</sup> CFU/g	
Sulphite reducing clostridium count	Less than 10 <sup>2</sup> CFU/g	
Presence of salmonella	Not present in 20 g	
Oil and grease content	0.5 to 2%	EN 1163
Turbidity	min. 300 mm	EN 1164
pH value	6.6 to 8	ISO 3071

### Compliance verification

Test reports according to the above-mentioned standards. Certificates from Downafresh® and Daunasan® will also be accepted, if both the oxygen index and the microbial state have been measured. Other certificates may be approved after examination by the German Environment Agency.

### 3.5 Requirements for fillings

Fillings added to the product must comply with the requirements in Paragraph 3.6.1 "General exclusion of substances with certain properties". Special requirements are formulated as follows:

#### 3.5.1 Latex

##### a) Hazardous substances

The concentrations of the substances listed below in latex foam must not exceed the limits in Table 3:

**Table 3: Restricted substances in latex foams that are used in fillings**

Substance group	Substance	Limit value (ppm)	Evaluation and test conditions
Chlorophenols	Mono and di-chlorinated phenols (Salts and esters)	1	A
	Other chlorophenols	0.1	A
Heavy metals	As (Arsenic)	0.5	B
	Cd (Cadmium)	0.1	B
	Co (Cobalt)	0.5	B
	Cr (Chromium), total	1	B
	Cu (Copper)	2	B
	Hg (Mercury)	0.02	B
	Ni (Nickel)	1	B
	Pb (Lead)	0.5	B
Pesticides (only for foam composed of at least	Sb (Antimony)	0.5	B
	Aldrin	0.04	C
	o,p'-DDE	0.04	C

Substance group	Substance	Limit value (ppm)	Evaluation and test conditions
20% natural latex by mass)	p,p'-DDE	0.04	C
	o,p'-DDD	0.04	C
	p,p'-DDD	0.04	C
	o,p'-DDT	0.04	C
	p,p'-DDT	0.04	C
	Diazinone	0.04	C
	Dichlorfenthion	0.04	C
	Dichlorvos	0.04	C
	Dieldrin	0.04	C
	Endrin	0.04	C
	Heptachlor	0.04	C
	Heptachlorepoxyde	0.04	C
	Hexachlorobenzene	0.04	C
	Hexachlorocyclohexane	0.04	C
	α-Hexachlorocyclohexane	0.04	C
	β-Hexachlorocyclohexane	0.04	C
	γ-Hexachlorocyclohexane (Lindane)	0.04	C
	δ-Hexachlorocyclohexane	0.04	C
	Malathion	0.04	C
	Methoxichlor	0.04	C
Mirex	0.04	C	
Parathion-ethyl	0.04	C	
Parathion-methyl	0.04	C	
Other specific substances that are restricted	Butadiene	1	D

### Compliance verification

For requirement a), the applicant shall submit a declaration of compliance and test reports in accordance with the following test methods:

- a) *Method A: The applicant shall submit a report for chlorophenols that presents the results of the following test method: A 5 g sample is milled and the chlorophenols are extracted in the form of phenol (PCP), sodium salt (SPP) or esters. The extracts are analysed by means of gas chromatography (GC). Detection is carried out using a mass spectrometer or electron capture detector (ECD).*
- b) *Method B: The applicant shall submit a report for heavy metals that presents the results of the following test method: Milled sample material is eluted in accordance with DIN 12457 or an equivalent standard in a ratio of 1:10. The resultant eluate is passed through a 0.45 µm membrane filter (if necessary, by pressure filtration). The solution obtained is examined for the content of heavy metals by inductively coupled plasma optical emission spectrometry (ICP-OES), also known as inductively coupled plasma atomic emission spectrometry (ICP-AES), or by atomic absorption spectrometry using a hydride or cold vapour process.*
- c) *Method C: The applicant shall submit a report for pesticides that presents the results of the following test method: A 2 g sample is extracted in an ultrasonic bath with a hexane/dichloromethane mixture (85/15). The extract is cleaned up by acetonitrile agitation or by adsorption chromatography over Florisil. Measurement and quantification are carried out*

using gas chromatography with detection on an electron capture detector or by coupled gas chromatography/mass spectrometry. The testing of pesticides is required for latex foams with a content of at least 20% natural latex.

- d) *Method D: The applicant shall submit a report for butadiene that presents the results of the following test method: Following milling and weighing of the latex foam, headspace sampling is performed. The butadiene content is determined using gas chromatography with detection by flame ionisation.*

**b) VOC emissions after 72 hours**

The test chamber concentrations for the following volatile organic compounds (VOC) after 72 hours must not exceed the limit values in Table 4:

**Table 4: VOC emission limit values for latex foam**

<b>Substance</b>	<b>Limit value (mg/m<sup>3</sup>)</b>
1,1,1-trichloroethane	0.2
4-phenylcyclohexene	0.02
Carbon disulphide	0.02
Formaldehyde	0.005
Nitrosamines (*)	0.001
Styrene	0.005
Tetrachloroethylene	0.15
Toluene	0.1
Trichlorethylene	0.05
Vinyl chloride	0.0001
Vinyl cyclohexene	0.002
Aromatic hydrocarbons (total)	0.3
VOC (total)	0.5
(*) N-nitrosodimethylamine (NDMA), N-nitrosodiethylamine (NDEA), N-nitrosomethylethylamine (NMEA), N-nitrosodi-i-propylamine (NDiPA), N-Nitrosodi-n-propylamine (NDPA), N-Nitrosodi-n-butylamine (NDBA), N-nitrosopyrrolidinone (NPYR), N-nitrosopiperidine (NPIP), N-nitrosomorpholine (NMOR).	

**Compliance verification**

*The applicant shall submit a declaration of conformity with requirement b), accompanied by a test report that presents the results of a test chamber analysis in accordance with ISO 16000-9. The wrapped sample must be stored at room temperature for at least 24 hours. After this period, the sample is unwrapped and immediately transferred to the test chamber. The sample is placed on a sample holder, which allows air access from all sides. The climatic factors are adjusted in accordance with ISO 16000-9. In order to receive comparable test results, the area specific ventilation rate ( $q=n/l$ ) must be 1. The ventilation rate must be between 0.5 and 1. The air sampling is carried out  $24\pm 1$  h after loading of the chamber for a duration of 1 hour using DNPH cartridges for the analysis of formaldehyde and other aldehydes and using Tenax TA tubes for the analysis of other volatile organic compounds. Sampling for other compounds may take longer but must be completed within 30 hours.*

*The analysis of formaldehyde and other aldehydes must comply with the standard ISO 16000-3. Unless specified differently, the analysis of other volatile organic compounds must comply with the standard ISO 16000-6. Testing in accordance with the standard CEN/TS 16516 will be considered as equivalent to the ISO 16000 series of standards.*

The analysis of nitrosamines is carried out using gas chromatography in combination with a thermal energy analysis detector (GC-TEA), in accordance with the DGUV 213-523 testing method or an equivalent.

### 3.5.2 Polyurethane (PUR)

#### 3.5.2.1 Production of polyurethane

##### 3.5.2.1.1 Diisocyanates

The concentration of aromatic diisocyanates must not exceed a value of 0.05°mg/m<sup>3</sup> (corresponds to 0.005°ml/m<sup>3</sup>) at the workplaces in which the relevant process steps occur, expressed as an 8 hour average (shift average).

##### **Compliance verification**

The applicant shall declare compliance with the requirement in Annex 1 and submit confirmation from the manufacturer and a test report verifying compliance with this requirement (Annex 16). Suitable test methods using HPLC from recognised testing laboratories will be accepted.

##### 3.5.2.1.2 Chlorofluorohydrocarbons (CFCs)

Chlorofluorohydrocarbons may not be used as a foaming agent for polyurethane.

##### **Compliance verification**

The applicant shall declare compliance with the requirement in Annex 1 and submit confirmation from the manufacturer verifying compliance with this requirement (Annex 16).

##### 3.5.2.1.3 Hazardous substances and mixtures, VOC emissions and blowing agents in PUR foam

###### a) Hazardous substances and mixtures

The concentrations of the substances and mixtures listed below in PUR foam must not exceed the limit values in Table 5:

**Table 5: List of restricted substances and mixtures in PUR**

Substance group	Substance (acronym, CAS number, element symbol)	Limit value	Test method
Biocidal products		Not intentionally added	A
Flame retardants		Not added	A
Metals and metal compounds	As (Arsenic)	0.2 ppm	B
	Cd (Cadmium)	0.1 ppm	B
	Co (Cobalt)	0.5 ppm	B
	Cr (Chromium), total	1.0 ppm	B
	Cr(VI) (Chromium(VI))	0.01 ppm	B
	Cu (Copper)	2.0 ppm	B
	Hg (Mercury)	0.02 ppm	B
	Ni (Nickel)	1.0 ppm	B
	Pb (Lead)	0.2 ppm	B
	Sb (Antimony)	0.5 ppm	B

Substance group	Substance (acronym, CAS number, element symbol)	Limit value	Test method
	Se (Selenium)	0.5 ppm	B
TDA and MDA	2,4-toluoldiamine (2,4-TDA, 95-80-7)	5.0 ppm	C
	4,4'-Diaminodiphenylmethane (4,4'-MDA, 101-77-9)	5.0 ppm	C
Organotin compounds	Tributyltin (TBT)	50 ppb	D
	Dibutyltin (DBT)	100 ppb	D
	Monobutyltin (MBT)	100 ppb	D
	Tetrabutyltin (TeBT)	—	—
	Monooctyltin (MOT)	—	—
	Diocetyl tin (DOT)	—	—
	Tricyclohexyltin (TcyT)	—	—
	Triphenyltin (TPhT)	—	—
	Total amount	500 ppb	D
Other restricted substances xxx	Chlorinated or brominated dioxins or furans	Not intentionally added	A
	Chlorinated hydrocarbons: (1,1,2,2-Tetrachloroethane, Pentachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethylene)	Not intentionally added	A
	Chlorinated phenols (PCP, TeCP, 87-86-5)	Not intentionally added	A
	Hexachlorocyclohexane (58-89-9)	Not intentionally added	A
	Monomethyldibromo-diphenylmethane (99688-47-8)	Not intentionally added	A
	Monomethyldichloro-diphenylmethane (81161-70-8)	Not intentionally added	A
	Nitrites	Not intentionally added	A
	Polychlorinated biphenyls (PBB, 59536-65-1)	Not intentionally added	A
	Pentabromodiphenyl ether (PeBDE, 32534-81-9)	Not intentionally added	A
	Octabromodiphenyl ether (OctaBDE, 32536-52-0)	Not intentionally added	A
	Polychlorinated biphenyls (PBB, 1336-36-3)	Not intentionally added	A
	Polychlorinated terphenyls (PCT, 61788-33-8)	Not intentionally added	A
	Tris(2,3-dibromopropyl) phosphate (TRIS, 126-72-7)	Not intentionally added	A
	Trimethylphosphate (512-56-1)	Not intentionally added	A
	Tris-(aziridinyl)-phosphin oxide (TEPA, 545-55-1)	Not intentionally added	A

Substance group	Substance (acronym, CAS number, element symbol)	Limit value	Test method
	Tris(2-chloroethyl)-phosphate (TCEP, 115-96-8)	Not intentionally added	A
	Dimethyl methylphosphonate (DMMP, 756-79-6)	Not intentionally added	A

### Compliance verification

The applicant shall submit a declaration of compliance with requirement 3.5.2.1.3 (a). If tests are required, the applicant shall submit the test results verifying compliance with the limit values stated in Table 5. If an analysis is prescribed for test methods B, C and D, six samples taken at a maximum depth of 2 cm under the surface shall be sent to the responsible laboratory.

- Method A: In the case of biocidal products and other specific substances that are restricted, the applicant shall submit a declaration together with declarations from the suppliers verifying that these substances have not been intentionally added to the formulation.
- Method B: The applicant must submit a report according to DIN EN 16711-2 for metals and metal compounds.
- Method C: The applicant shall submit a report for TDA and MDA that presents the results of the following test method: DIN EN 14362 without adding the reducing agent (replace the sodium dithionite solution with water) and subsequent detection using HPLC methods
- Method D: The applicant shall submit a report for organotin compounds that presents the results of the following test method: DIN EN ISO 22744-1 (textile) or DIN CEN ISO/TS 16179.

### b) VOC emissions after 72 hours

The test chamber concentrations for the following volatile organic compounds (VOC) after 72 hours must not exceed the limit values in Table 6:

**Table 6: Limit values for VOC emissions after 72 hours for PUR foam**

Substance (CAS number)	Limit value (mg/m <sup>3</sup> )
Formaldehyde (50-00-0)	0.005
Toluene (108-88-3)	0.1
Styrene (100-42-5)	0.005
Each detectable compound classified in categories C1A or C1B according to the CLP Regulation (EC) No 1272/2008	0.005
Sum of all detectable compounds classified in categories C1A or C1B according to CLP Regulation (EC) No 1272/2008	0.04
Aromatic hydrocarbons	0.3
VOC (total)	0.5

### Compliance verification

The applicant shall submit a declaration of compliance with requirement 3.5.2.1.3 (b), accompanied by test results verifying compliance with the limit values in Table 6. The following combination of samples and test chambers are accepted:

1 sample with dimensions of 25 × 20 × 15 cm is placed in a 0.5 m<sup>3</sup> test chamber;  
or

2 samples with dimensions of 25 × 20 × 15 cm are placed in a 1.0 m<sup>3</sup> test chamber.

The foam sample is placed on the bottom of an emission test chamber and conditioned for three days at a temperature of 23 °C and a relative humidity of 50% in accordance with the standards DIN EN ISO 16516, 16000-9 and ISO 16000-11. The air exchange rate  $n$  is 0.5 per hour at a loading factor  $L$  for the test chamber of 0.4 m<sup>2</sup>/m<sup>3</sup> (= total exposed surface of the sample in relation to chamber dimensions without sealed edges and the back of the sample).

Sampling will take place 72 ± 2 hours after loading the chamber for a duration of one hour with Tenax TA tubes and DNPH cartridges for the VOC and formaldehyde analysis. The VOC emission will be trapped in Tenax TA adsorbent tubes and analysed using thermal desorption GC-MS in accordance with the standard ISO 16000-6. The results will be expressed semi-quantitatively as toluene equivalents. All specified individual components from a concentration limit ≥ 1 µg/ m<sup>3</sup> will be recorded. The total VOC value is the sum of all components with a concentration ≥ 1 µg/m<sup>3</sup> that elute during the retention time windows between *n*-hexane (C6) (inclusive) and *n*-hexadecane (C16) (inclusive). The sum of all detectable compounds classified in categories C1A or C1B according to CLP Regulation (EC/1272/2008) is the sum of all these substances with a concentration ≥ 1 µg/m<sup>3</sup>. If the test results exceed the standard limits, substance specific quantification needs to be performed. Formaldehyde can be determined by collecting the sampled air on a DNPH cartridge and subsequently analysing it using HPLC/UV in accordance with the standard ISO 16000-3. Testing in accordance with the standard CEN/TS 16516 will be considered as equivalent to the ISO 16000 series of standards.

### c) Blowing agents

It is not permitted to add halogenated organic compounds as blowing agents or auxiliary blowing agents.

#### **Compliance verification**

The applicant shall declare compliance with the requirement in Annex 1 and submit a declaration from the foam manufacturer confirming that these substances have not been added (Annex 16).

## **3.6 General requirements**

### **3.6.1 General exclusion of substances with certain properties**

The following requirements apply to dyes and textile auxiliaries:

- a) Dyes and textile auxiliaries must not contain any substances which are identified as particularly alarming under the European Chemicals Regulation REACH (1907/2006/EC)<sup>41</sup> and which have been incorporated into the list drawn up in accordance with Article 59, Paragraph 1 of the REACH Regulation (so-called "list of candidates"). The version of the list of candidates at the time of application is valid<sup>42</sup>. If the substance is part of a mixture, its concentration must not exceed 0.10% by mass. If a stricter, more specific concentration limit is

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<sup>41</sup> Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

<sup>42</sup> The list of candidates in its currently valid version can be found at:  
<https://echa.europa.eu/de/candidate-list-table>

specified for a substance in a mixture in the CLP Regulation (EC/1272/2008) then this is valid.

- b) Dyes and textile auxiliaries must comply with the limit values in Chapter 1 of the ZDHC MRSL. The current version of the ZDHC MRSL at the time of application is valid.<sup>43</sup>
- c) Dyes and textile auxiliaries, which according to the criteria of the CLP Regulation (EC/1272/2008)<sup>44</sup> are assigned the following H Phrases named in Table 7 or which meet the criteria for such classification, must not be added.<sup>45</sup>
- d) The following are exempt from regulations a) and c): Impurities in concentrations that are not specified in the safety data sheet. The components to be listed on the safety data sheet must correspond with the regulations according to Annex II, No. 3, of the REACH regulation (EC/1907/2006). If the substance in this case is part of a mixture then its concentration may not exceed the general generic cut-off values according to the CLP Regulation (EC/1272/2008). If a stricter, more specific concentration limit is specified for a substance in a mixture then this is valid.
- e) The following shall be exempt from regulation c): Monomers or additives that turn into polymers during the manufacture of plastics or are chemically (covalently) bound to the plastic if their residual concentrations are below the classification thresholds for mixtures.
- f) Upon evaluation by the German Environment Agency (Umweltbundesamt), further exemptions from regulation c) may be adopted, provided that these are technologically non-substitutable substances and consumer safety continues to be guaranteed. A list of the approved exemptions can be found in Appendix F.

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<sup>43</sup> <http://www.roadmaptozero.com/programme/manufacturing-restricted-substances-list-mrsl-conformity-guidance/>, last accessed on 21.12.2022

<sup>44</sup> Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 concerning the classification, labelling and packaging of substances and mixtures (CLP Regulation).

<sup>45</sup> The harmonized classifications and labellings of dangerous substances can be found in Part 3 of Annex VI to the CLP Regulation (EC/1272/2008).

**Table 7: H Phrases according to the CLP Regulation**

<b>CLP Regulation (EC/1272/2008)</b>	<b>Wording</b>
<b>Toxic substances</b>	
H300	Fatal if swallowed
H301	Toxic if swallowed
H304	May be fatal if swallowed and enters airways
H310	Fatal in contact with skin
H311	Toxic in contact with skin
H330	Fatal if inhaled
H331	Toxic if inhaled
H370	Causes damage to organs
H371	May cause damage to organs
H372	Causes damage to organs through prolonged or repeated exposure (state all organs affected)
H373	Causes damage to organs through prolonged or repeated exposure (state all organs affected, if known)
<b>Carcinogenic, mutagenic and reprotoxic substances</b>	
H340	May cause genetic defects
H341	Suspected of causing genetic defects
H350	May cause cancer
H350i	May cause cancer if inhaled
H351 <sup>46</sup>	Suspected of causing cancer
H360F	May damage fertility
H360D	May damage the unborn child
H360FD	May damage fertility May damage the unborn child
H360Fd	May damage fertility Suspected of damaging the unborn child
H360Df	May damage the unborn child Suspected of damaging fertility
H361f	Suspected of damaging fertility
H361d	Suspected of damaging the unborn child
H361fd	Suspected of damaging fertility Suspected of damaging the unborn child
H362	May cause harm to breast fed children
<b>Water-hazardous substances</b>	
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long-lasting effects
H411	Toxic to aquatic life with long-lasting effects
H412	Harmful to aquatic life with long lasting effects
H413	May cause long lasting harmful effects to aquatic life
<b>Other Health and Environmental Effects</b>	
H420 <sup>47</sup>	Harms public health and the environment by destroying ozone in the upper atmosphere (replaces EUH059)
<b>Sensitizing substances</b>	

<sup>46</sup> An exception is made for titanium dioxide because its classification is only based on the respirable dust.

<sup>47</sup> Commission Regulation (EC) No 286/2011 of 10 March 2011 amending CLP Regulation (EC/1272/2008).

CLP Regulation (EC/1272/2008)	Wording
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H317	May cause an allergic skin reaction

### Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 and submit confirmation from their suppliers verifying compliance with the requirements (Annex 17). If requested to do so by RAL gGmbH, the applicant shall submit the relevant safety data sheets. If substances listed in Table 8 are used, the applicant shall name them and confirm that the exemption conditions (e.g. using metering systems) have been fulfilled.

**Table 8: Deviations for substances**

Substance group	Hazard classification affected by the exemption		Exemption conditions
Auxiliaries including carriers, fastness enhancers, levelling agents, dispersing agents, surfactants, thickeners, binding agents	H317	May cause an allergic skin reaction	The recipes must be formulated using automatic metering systems and the process must follow standard operating procedures. Substances classified with H317 (1B) must not have a higher concentration than 0.1% by mass in the final product.
	H371	May cause damage to organs	
	H372 H373	Causes damage to organs through prolonged or repeated exposure	
	H411	Toxic to aquatic life with long-lasting effects	
	H412	Harmful to aquatic life with long lasting effects	
	H413	May cause long lasting harmful effects to aquatic life	
Enzymatic desizing agents and enzymatic surface modification <sup>48</sup>	H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled	The recipes must be formulated using automatic metering systems and the process must follow standard operating procedures. A safety data sheet for the desizing agent, as well as confirmation of the GM free production of the enzyme must be submitted.
	H400	Toxic to aquatic organisms	
	H411	Toxic to aquatic life with long-lasting effects	
Fatty alcohol ethoxylates used as substitutes for alkylphenol ethoxylates (APEOs)			The exemption for these substances only applies to their use in mixtures and if the percentage by mass of the substance in the mixture does not cause the mixture to be assigned the H phrases listed in Table 7(Paragraph 3.6.1 of the Basic Award Criteria)

<sup>48</sup> AMFEP & EURATEX (2022): Industry Guidelines on the Safe Handling of Enzymes in the Textile Industry Supply Chain, Part II: Textile Finishing & Garment Finishing Industry, Version 1

Substance group	Hazard classification affected by the exemption		Exemption conditions
Hydroxymethane sulfinic acid sodium salt used as a reducing agent for direct printing with vat dyes and as a discharge agent for white and coloured discharged printing			The exemption for these substances only applies to their use in mixtures and if the percentage by mass of the substance in the mixture does not cause the mixture to be assigned the H phrases listed in Table 7 (Paragraph 3.6.1 of the Basic Award Criteria).
Ammonia for use in pigment printing and coating, provided that low-emission formulas are used			This means that ammonia emissions must be less than 0.6 g NH <sub>3</sub> /kg of product, based on an air/product ratio of 20 m <sup>3</sup> /kg of product. The emissions shall be calculated on the basis of Appendix Eof the Basic Award Criteria.
Proteases	H400  H411	Very toxic to aquatic life  Toxic to aquatic life with long-lasting effects	The recipes must be formulated using automatic metering systems and the process must follow standard operating procedures.
Dyes for dyeing and non-pigment printing	H301 H311 H331 H317 H334 H373 H411 H412 H413	Toxic if swallowed Toxic in contact with skin Toxic if inhaled May cause an allergic skin reaction May cause allergy or asthma symptoms or breathing difficulties if inhaled Causes damage to organs through prolonged or repeated exposure Toxic to aquatic life with long-lasting effects Harmful to aquatic life with long lasting effects May cause long lasting harmful effects to aquatic life	Solution dyes and/or digital printing are excluded from these conditions. Dye houses and printers must use dust free dye formulations or automatic dosing and dispensing of dyes to minimise worker exposure. Dyeing processes using reactive, direct, vat and sulphur dyes with these classifications must meet at least one of the following conditions: - Use of high affinity dyes - Achievement of a reject rate of less than 3.0% - Use of colour matching instrumentation - Use of standard operating procedures for the dyeing process - Use of colour removal to treat waste water (see criteria 3.6.4)

### **3.6.2 Special substance requirements in finishing processes**

These special substance requirements apply in addition to the general substance requirements or make them more concrete by once again explicitly pointing out particularly problematic substances for certain processing steps.

#### **3.6.2.1 For all process steps**

##### **3.6.2.1.1 Quaternary ammonium compounds**

DTDMAC, DSDMAC and DHTDMAC are not permitted.

##### **3.6.2.1.2 Use of nanomaterials**

The use of technically produced nanomaterials with the H Phrases listed in Paragraph 3.6.1 is not permitted. The classification must be carried out based on suitable data for the nanoform of the substance added to the product.

##### **3.6.2.1.3 Mineral oil-based defoamers**

The use of mineral oil-based defoamers is not permitted.

#### **3.6.2.2 In the pretreatment process**

##### **3.6.2.2.1 Chlorinated bleaching agents**

The use of chlorinated bleaching agents is not permitted.

##### **3.6.2.2.2 Enzymatic desizing agents and enzymatic surface modification**

Enzymatic processes are only permitted under the exemption conditions specified in Table 8 and in compliance with the European "Industry Guidelines on the Safe Handling of Enzymes in the Textile Finishing/Garment Finishing Industry"<sup>49</sup>.

#### **3.6.2.3 In the dyeing process**

##### **3.6.2.3.1 Mordant dyes containing chromium salts**

It is not permitted to use mordant dyes containing chromium salts.

#### **3.6.2.4 In the finishing process**

##### **3.6.2.4.1 Biocidal and biostatic products**

The use of biocidal products, as defined in the Biocidal Directive (EU) 528/2012<sup>50</sup>, and biostatic products<sup>51</sup> is not permitted. In-can preservatives are exempted. Substances found in the European Biocidal Directive in the list of preservatives for products during storage (product-type PT6) may be used as in-can preservatives.

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<sup>49</sup> AMFEP & EURATEX (2022): Industry Guidelines on the Safe Handling of Enzymes in the Textile Industry Supply Chain, Part II: Textile Finishing & Garment Finishing Industry, Version 1

<sup>50</sup> Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products

<sup>51</sup> All substances with an inhibitory effect on growth and reproduction shall be considered as biostatic products.

#### **3.6.2.4.2 Flame retardant materials**

The flame-retarding effect should preferably be achieved by means of the structure of the fabric. The use of flame retardants or inherent flame retardants in the finishing of textiles is not permitted.

If the use of a flame retardant on work clothing and contract textiles is nevertheless necessary for fire protection reasons, the flame-retarding effect should preferably be achieved using inherent flame retardants.

Additive flame retardants, which comply with the requirements in Paragraph 3.6.1, can be approved after examination by the German Environment Agency.

Products finished with flame retardant substances must be correspondingly labelled.

#### **3.6.2.4.3 Halogenated substances**

Halogenated substances as such or in mixtures may not be used as anti-felt agents for finishing products.

#### **3.6.2.4.4 Perfluorinated and polyfluorinated chemicals (PCs)**

The use of perfluorinated and polyfluorinated chemicals (PFCs) is not permitted.

#### **3.6.2.5 Volatile organic compounds (VOC) used in impregnating, printing or coating**

The ready-to-use formulas for the impregnation liquors, printing pastes or coating compounds must not contain more than 5% volatile organic compounds (VOCs).

#### **Compliance verification**

*The applicant shall declare compliance with the requirements according to Paragraph 3.6.2 in Annex 1 and submit confirmation from the chemical supplier or textile finisher (Annex 18) verifying compliance with these requirements.*

*A manufacturer's declaration must be produced to disclose whether nanomaterials have been added or not (Annex 18). If yes, the applicant shall specify which nanomaterials have been added and what form of the substance was used for the tests and the classification.*

*The applicant shall declare that flame retardants and inherent flame retardants have not been used. If there are fire protection reasons for their use, the applicant shall justify them and submit information on either the type and name of the inherent fibres or flame retardants used, including the CAS number.*

*Regarding the requirement in 3.6.2.5, the applicant shall declare in Annex 1 that he/she either uses no auxiliaries to impregnate, print or coat the products or that he/she complies with the above-mentioned requirement. If such auxiliaries have been used, the applicant shall submit a test report/suitable documentation<sup>52</sup> from his/her textile finisher verifying compliance with this requirement (Annex 18).*

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<sup>52</sup> This could include reports on a test of the printing pastes for VOCs, when it is not possible to calculate the VOC content, for example, if the VOC content of a component is not available. Other relevant documents could be safety data sheets and supplier declarations on the VOC content in the components, declarations from the textile finisher or the formula used for calculating the VOC content.

### 3.6.3 Requirements for the degradability of textile auxiliaries

At least 90% by mass of the ingredients of fabric softeners, complexing agents and surfactants must be readily biodegradable under aerobic conditions or inherently biodegradable and/or eliminable in waste water treatment plants. Surfactants must be readily biodegradable under aerobic conditions. All non-ionic and cationic surfactants must also be readily biodegradable under anaerobic conditions.

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit confirmations from the textile finisher or the chemical suppliers (Annex 19).*

*The applicant shall submit additional documentation (safety data sheets and/or test reports) verifying compliance with the requirements. One of the following test methods can be used to verify compliance with the requirements. The applicant shall specify which test method was used and state the corresponding individual test results when submitting the application.*

*The requirements for the aerobic biodegradability of surfactants correspond to the information in section i) of the verifications for 3.2.3.2 and for the aerobic biodegradability of complexing agents and fabric softeners they correspond to those in section ii). The corresponding ISO standards and the REACH methods<sup>53</sup> will be recognized as equivalent.*

*The test for anaerobic degradability shall be based on OECD test 11734, OECD 311 or an equivalent test method, with the requirement of 60% ultimate degradability under anaerobic conditions. In order to verify at least 60% degradability under anaerobic conditions, test methods can also be used that simulate the conditions in a corresponding anaerobic environment.*

*The latest version of the DID list can be used for the evaluation.*

*In the case of additives not included in the DID list, the following process can be used to verify the biodegradability under anaerobic conditions:*

- a) *Apply reasonable extrapolation. Use test results obtained with one raw material to extrapolate the ultimate anaerobic degradability of structurally related surfactants. Where anaerobic biodegradability has been confirmed for a surfactant (or a group of homologues) according to the DID list, it can be assumed that a similar type of surfactant is also anaerobically biodegradable (e.g. C12/15 A 1-3 EO sulphate [DID No 8] is anaerobically biodegradable, and a similar anaerobic biodegradability may also be assumed for C12/15 A 6 EO sulphate). Where anaerobic biodegradability has been confirmed for a surfactant by use of an appropriate test method, it can be assumed that a similar type of surfactant is also anaerobically biodegradable (e.g. literature data confirming the anaerobic biodegradability of surfactants belonging to the group alkyl ester ammonium salts may be used as documentation for a similar anaerobic biodegradability of other quaternary ammonium salts containing ester-linkages in the alkyl chain(s)).*
- b) *Screening test for anaerobic degradability. If a new test is necessary, perform a screening test according to EN ISO 11734, ECETOC No 28 (June 1988), OECD 311 or an equivalent method.*
- c) *Low-dosage degradability test. If a new test is necessary and difficulties are experienced in the screening test (e.g. inhibition due to toxicity of the test substance), repeat the test using a low dosage of the surfactant and monitor degradation by C14 measurements or chemical*

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<sup>53</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:142:0001:0739:DE:PDF>  
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:220:0001:0094:de:PDF>

analyses. Testing at low dosages may be performed in accordance with OECD 308 (August 2000) or an equivalent method.

### **3.6.4 Requirements for waste water from the textile finishing process**

#### **3.6.4.1 Requirements for waste water at the discharge point (direct discharge)**

Waste water from wet-processing sites (except waste water from water retting of flax and other bast fibres) shall, when discharged to surface waters, not exceed the following limits:

- COD: 100 mg/l<sup>54</sup> (expressed as an average yearly value),
- BOD<sub>5</sub>: 30 mg/l,
- Sulphite: 1 mg/l,
- Ammonium nitrogen: 10 mg/l,
- Total nitrogen: 15 mg/l,
- Total phosphorous: 2 mg/l,
- The dye must comply with the following values:  
Spectral absorption coefficient at:
  - ♦ 436 nm (yellow spectral region) 7 m<sup>-1</sup>
  - ♦ 525 nm (red spectral region) 5 m<sup>-1</sup>
  - ♦ 620 nm (blue spectral region) 3 m<sup>-1</sup>
- Toxicity to fish eggs GEI: 2
- The pH value of the waste water discharged to surface waters must be between 6 and 9 (unless the pH value of the receiving waters is outside this range) and the temperature must be below 35 °C (unless the temperature of the receiving waters is already above this limit).

This requirement shall not apply if it can be proven that the discharge into the urban waste water treatment plant has been approved and the urban waste water treatment plant meets at least the requirements of the Council Directive of 21 May 1991 concerning urban waste water treatment (91/271/EEC).

#### **3.6.4.2 Requirements for waste water before mixing (direct and indirect discharge)**

The waste water shall not exceed the following values before it is mixed with the other waste water:

- AOX: 0.5 mg/l,
- Sulphide: ≤1 mg/l,
- Copper: 0.4 mg/l,
- Nickel: 0.2 mg/l,
- Total chromium: 0.3 mg/l,
- Tin: 2 mg/l,
- Zinc: 0.8 mg/l,

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<sup>54</sup> The limit can be increased to 150mg/l in exceptional circumstances.

- if the specific volume of waste water is less than 25m<sup>3</sup>/t of treated textile – as an average yearly value
- if the cleaning performance is at least 95% as an average yearly value.

- Antimony: 1.2 mg/l.

### **Compliance verification**

*The applicant shall declare compliance with the requirements in 3.6.4.1 and 3.6.4.2 in Annex 1 and submit a declaration of conformity from the operator of the textile finishing plant and test reports verifying compliance with the requirements in accordance with Annex 38 of the German Waste Water Ordinance or equivalent international test reports (Annex 19). The following test methods can be used here (on the basis of a qualified random sample or a 2-hour mixed sample, the requirement for AOX applies to the sample):*

*COD: ISO 6060 or DIN 38409-41 or DIN 38409-44 or DIN ISO 15705,*

*BOD: DIN EN 1899-2 or ISO 5815-1,*

*Copper and nickel: ISO 8288,*

*Total chromium: ISO 9174 or DIN EN 1233,*

*Sulphide: DIN 38405-27 or ISO 10530,*

*Sulphite: DIN EN ISO 10304-3,*

*Toxicity to fish eggs: DIN EN ISO 15088,*

*AOX (chloride content < 5g/l): DIN EN ISO 9562,*

*Spectral absorption coefficient: DIN 38404-3,*

*Ammonium nitrogen: DIN EN ISO 11732,*

*Total nitrogen: DIN EN ISO 12260,*

*Total phosphorous: DIN EN ISO 11885,*

*Tin: DIN EN ISO 11885,*

*Zinc: DIN EN ISO 11885,*

*Antimony: DIN EN ISO 11885.*

*The waste water treatment plant must be regularly monitored. In addition, the applicant shall submit a declaration from the operator of the textile finishing plant about the frequency of the measurements of the discharge values (at least every six months).*

*As an alternative to measuring the copper, nickel and chromium contents, the applicant can submit a declaration from the operator of the textile finishing plant that metal complex dyes containing copper, chromium or nickel do not form part of the dye formula.*

*If discharged to an urban waste water treatment plant, the applicant shall also enclose a notice of approval for the textile finishing plant verifying that the discharge process has been approved and that the urban waste water treatment plant meets at least the requirements of Directive 91/271/EEC.*

### **3.6.5 Requirements for emissions to air in the textile finishing process**

#### **3.6.5.1 Requirements for emissions to air in the textile finishing process in thermo-setting, thermosoling, coating, impregnating or finishing of textiles**

In the thermosetting, thermosoling, coating, impregnating or finishing of textiles, including the associated drying facilities, the sum of the organic substances as total carbon must not exceed 0.8°g C per kg of textiles.

In addition, a maximum of 0.4 g C per kg of textiles may be emitted from carry-overs from upstream processes and from residual preparations in each case.

In the case of critical substances such as formaldehyde and gaseous inorganic substances such as ammonia, the applicant must also state the substance emission factor. Maximum emission limits of 5 mg/m<sup>3</sup> for formaldehyde and 10 mg/m<sup>3</sup> for ammonia apply.<sup>55</sup>

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit confirmation from the textile finishing plant verifying compliance with this requirement (Annex 19).*

*In addition, the operator of the textile finishing plant shall submit either a report in accordance with Appendix E with the projected emissions based on the emission factors or a test report in accordance with DIN EN 12619 (total gaseous organic carbon), DIN CEN/TS 17638 (formaldehyde) and DIN EN ISO 21877 (ammonia). In the test, the product-related emission factor shall be determined from the measured concentration value and the actual air/product ratio.*

### **3.6.5.2 Requirements for emissions to air from firing systems in the textile finishing process in thermosetting, thermosoling, coating, impregnating or finishing of textiles**

The emissions to air from firing systems, gas turbines and generators must not exceed the emission limits in Appendix G for the parameters CO, SO<sub>x</sub>, NO<sub>x</sub> and dust.

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 to the contract and submit Annex 19 (emission values) completed by the operators of the plants, as well as test reports.*

*Depending on the heating capacity, the heating boilers must be tested as follows:*

- 0.3 MW to 2 MW every 3 years
- > 2 MW at least yearly
- > 5 MW continuously

*Sampling and analysis of all pollutants must be carried out in accordance with CEN or ISO standards. If no CEN or ISO standards are available, other national and international standards may be used if the resulting data is of an equivalent scientific quality.*

### **3.6.6 Requirements for specific substances and testing of the end product**

The requirements for specific substances apply in addition to the requirements in Paragraphs 3.6.6.1 and 3.6.6.2 and put them into concrete terms by stipulating testing of the end product. Annual random analytical tests must be carried out in the case of recycled fibres.

#### **3.6.6.1 Formaldehyde**

The amount of free and partly hydrolysable formaldehyde in the final fabric must not exceed 20 mg/kg in clothing, home textiles and bedding for babies and young children under 3 years old, and 75 mg/kg for all other textiles.

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<sup>55</sup> Exception: if ammonium sulphamate is used as a flame retardant, the maximum limit for ammonia is 20 mg/m<sup>3</sup>. If the textile has an easy care (also non-crease or permanent press), flame resistant and/or water and dirt-repellent function, the maximum limit for formaldehyde is 10 mg/m<sup>3</sup>.

### **Compliance verification**

The applicant shall declare compliance with the requirement in Annex 1. The applicant shall also submit test results in accordance with the DIN EN ISO 14184-1 test method.<sup>56</sup>

The applicant shall declare in Annex 1 the intended age group for the end product in the application and state the clothing sizes included in the application in the case of clothing.

#### **3.6.6.2 Extractable heavy metals**

The following limit values in Table 9 must not be exceeded by the extractable heavy metals.

**Table 9: Extractable heavy metals**

<b>Extractable heavy metals</b>	<b>Limit values<sup>57</sup> in mg/kg</b>
Antimony	30
Arsenic	0.2
Lead	0.2
Cadmium	0.1
Chrome	1
Cr(VI)	< 0.5
Cobalt	1
Copper	25
Nickel	1
Mercury	0.02

### **Compliance verification**

The applicant shall declare compliance with the requirements in Annex 1. The applicant shall also submit a test report in accordance with DIN 54233 or DIN EN 16711-2.

Chromium (VI) can also be measured in accordance with method DIN 38405-24 (D-24), although the detection limit must not exceed 0.5 mg/kg.

#### **3.6.6.3 Requirements for natural rubber**

The content of soluble proteins from natural rubber must not exceed 200 mg/kg. The products must also be labelled if the soluble proteins exceed 20 mg/kg.

### **Compliance verification**

The applicant shall submit a test report based on the following methods: Quantitative determination of soluble proteins in extracts from consumer goods according to DIN EN 455-3 (medical gloves) or according to the 59th Notification from the BfR (formerly BgVV), BGBl. 42 (gloves, balloons, suction cups). The applicant must confirm that the product has been labelled in accordance with the requirement.

#### **3.6.6.4 Testing of accessories**

If metal and plastic parts such as zips, buttons and other closures are used, the following tests must be carried out and the stated limits apply.

<sup>56</sup> Test reports in accordance with the Öko-Tex Standard 100 will also be recognised.

<sup>57</sup> Corresponds to category I of OEKO-TEX®

In the case of accessories made of metal, the applicant must carry out tests for lead, cadmium and chromium (if the parts are chromed). The following limits must be complied with: Lead: 90 mg/kg, Cadmium: 50 mg/kg, Chromium: 60 mg/kg. If nickel is used for metal objects that come into contact with the skin for long periods of time, the migration value for metal alloys is 0.5 ug/cm<sup>2</sup>/week.

No phthalates may be used in accessories made of plastic parts.

### **Compliance verification**

*The applicant shall declare in Annex 1 that he/she either does not use any nickel-containing metal alloys or other metal accessories or shall declare compliance with the requirement and submit a certificate from the supplier verifying that the metal components used comply with this requirement (Annex 20). Alternatively, the applicant can also submit a test report from a testing institution approved for this test verifying the harmlessness of the dermal exposure for nickel. DIN EN 1811 in combination where relevant with DIN EN 12472 can be used as the test method. The test of the composition of the other metal components shall be carried out according to GC-ICP-MS or DIN ISO 11466, while the test for phthalates shall be carried out according to 3.6.6.6.*

### **3.6.6.5 Chlorophenols**

The sum of chlorophenols and their salts and esters in the final fabric must not exceed the following limit values (Table 10).

**Table 10: Limit values for chlorphenoles in final fabrics**

<b>Chlorphenole</b>	<b>Limit values<sup>58</sup> in mg/kg</b>
Dichlorphenole (DCP) free	0.5
Monochlorphenole (MCP) free	0.5
Pentachlorphenole (PCP)	0.05
Tetrachlorphenole (TeCP)	0.05
Trichlorphenole (TrCP)	0.2

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1. The applicant shall also submit test results in accordance with the test method for chlorophenols based on DIN EN ISO 17070 or DIN 50009.*

### **3.6.6.6 Phthalates and plasticizers**

The sum of the phthalates and plasticizers named in Appendix H1 must not exceed a maximum of 1000 mg/kg.

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit a corresponding test report. The test shall be carried out in accordance with DIN EN ISO 1438 or DIN EN ISO 16181. For the test for TCEP, suitable test methods used by testing laboratories accredited according to DIN EN ISO 17025 will be accepted.*

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<sup>58</sup> Corresponds to category I of OEKO-TEX®.

### 3.6.6.7 Organotin compounds

The content of organotin compounds must not exceed the limit values stated in Table 11.

**Table 11: Limit values for organotin compounds in final fabrics**

Organotin compounds		Limit values in mg/kg
Dibutylzinn / Dibutyltin	DBT	1
Dimethylzinn / Dimethyltin	DMT	1
Diethylzinn / Diethyltin	DET	1
Diphenylzinn / Diphenyltin	DPhT	2
Dipropylzinn / Dipropyltin	DPT	1
Monomethylzinn / Monobutyltin	MMT	2
Monobutylzinn / Monobutyltin	MBT	1
Monooctylzinn / Monooctyltin	MOT	2
Monophenylzinn / Monophenyltin	MPhT	1
Tetrabutylzinn / Tetrabutyltin	TeBT	1
Tetraethylzinn / Tetraethyltin	TeET	1
Tributylzinn / Tributyltin	TBT	0.5
Tricyclohexylzinn / Tricyclohexyltin	TCyHT	1
Trimethylzinn / Trimethyltin	TMT	1
Triethylzinn / Triethyltin	TET	1
Triphenylzinn / Triphenyltin	TPhT	0.5
Tetraoctylzinn / Tetraoctyltin	TeOT	1
Tripropylzinn / Tripropyltin	TPT	1

#### **Compliance verification**

The applicant shall declare compliance with the requirement in Annex 1. The applicant shall also submit test results in accordance with the test method DIN EN ISO 22744, CEN ISO/TS 16179, CEN ISO/TS 16179 or BVL B 82.02-33 or another suitable test method<sup>59</sup>.

### 3.6.6.8 Dyes

Azo dyes used on the yarns, fabrics and finished products added to the product that may cleave to one of the aromatic amines named in Appendix H2 must not exceed a limit value of 20 mg/kg. A limit value of 50 mg/kg applies to the other dyes named in Appendix H2.

#### **Compliance verification**

The applicant shall declare compliance with the requirement in Annex 1 and verify that the dyes in Appendix H2 have not been used in the yarns, fabrics and finished products added to the product.

The applicant shall also submit the test results in accordance with the test method DIN EN 14362-1 and DIN EN 14362-3 (for arylamine) and DIN 54231 (for dispersion dyes).

(Note: Tests to detect the presence of 4-aminoazobenzene can result in false positive values. Therefore, a control measurement is recommended).

<sup>59</sup> Test methods used by testing laboratories accredited according to DIN EN ISO 17025 are accepted.

### **3.6.6.9 Free aniline in jeans products**

The content of free aniline in jeans products must not exceed 30 ppm.

#### **Compliance verification**

*The applicant shall submit a test report for extraction with MeOH / LC-MS or DIN EN ISO 14362-1 without reductive cleavage.*

### **3.6.6.10 Chlorinated benzenes and toluenes**

The content of the compounds listed in Appendix H3 must not exceed 1 mg/kg.

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1. The applicant shall also submit test results in accordance with the test method EN 17137.*

### **3.6.6.11 Polycyclic aromatic hydrocarbons**

For the chemical fibres, yarns and threads used in the product, as well as the plastic materials, the maximum value for polycyclic aromatic hydrocarbons (PAH) for GS Mark approval in category 2 (with foreseeable skin contact for longer than 30 seconds) must not be exceeded.

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit the GS certificate or the test report verifying compliance with the stated limit values. The measurements should be taken in accordance with the guidelines in the AfPS GS PAK document "Testing and assessment of polycyclic aromatic hydrocarbons (PAHs) in the course of awarding the GS mark" or according to DIN 17132.*

### **3.6.6.12 Dimethylformamide, dimethylacetamide and N-methylpyrrolidone**

The content of dimethylformamide (DMF), dimethylacetamide (DMAc) and N-methylpyrrolidone (NMP) must not exceed the value of 0.1% by mass.

#### **Compliance verification**

*The test for DMF shall be carried out using methanol extraction, GC/MS. The test for DMAc shall be carried out using extraction with methanol, GC/MS or LC/MS, while for NMP it shall be carried out using a 2-step extraction process with THF and methanol, GC/MS or EN 17131.*

### **3.6.6.13 Alkylphenols and alkylphenol ethoxylates**

4-tert-butylphenol, pentylphenol, heptylphenol, octylphenol and nonylphenol as well as octylphenolethoxylate and nonylphenolethoxylate may not exceed the following limits in the end product: A total limit value of 10 mg/kg for alkylphenols and 100 mg/kg for alkylphenols and alkylphenol ethoxylates combined.

These limit values do not apply to end products that are exclusively produced using recycled cotton/wool and polyester without the use of alkylphenols and alkylphenol ethoxylates; however, verification including an analysis report must still be submitted.

### **Compliance verification**

The applicant shall declare compliance with the requirement in Annex 1 and submit confirmation that these substances have not been used. The applicant shall also submit an analysis report: Solvent extraction followed by LCMS (alkylphenol) and EN ISO 21084, EN ISO 18254-1 or EN ISO 18254-2 (alkylphenol ethoxylate).

#### **3.6.6.14 Perfluorinated and polyfluorinated chemicals (PFCs) in hydrophobized textiles**

Perfluorinated and polyfluorinated chemicals (PFCs) may not be added (see 3.6.2.4.4). In hydrophobized textiles, the concentrations of the PFCs listed in Appendix H4 may not be exceeded.

### **Compliance verification**

The applicant shall declare in Annex 1 that the substances have not been used and submit an analysis report based on CEN/TS 15968 or DIN EN 17681-1.

#### **3.6.6.15 Chinoline/quinoline**

The content of chinoline/quinoline must not exceed 50 mg/kg.

### **Compliance verification**

The applicant shall declare in Annex 1 that the substance has not been used and submit an analysis report based on the following method: Extraction with methanol or THF, analysis using HPLC-MS/MS, HPLC-DAD or DIN EN 54231.

#### **3.6.6.16 Pesticides in textiles containing recycled cotton/wool**

In textiles containing > 5% recycled cotton/wool or yarn by mass, which is produced from, amongst other things, residues from the agricultural, timber and food industries, the sum of the pesticides named in Appendix H5 may not exceed 0.5 mg/kg. In addition, the value for glyphosate and salts<sup>60</sup> may not exceed 5 mg/kg.

### **Compliance verification**

The applicant shall submit test results according to the test method BVL L 00.00-34:2010-09 or BVL L 00.00-114:2007-12.

## **3.7 Textile products designed for food contact**

In the case of products designed for food contact, a declaration that the product and its coating are suitable for this purpose must be enclosed with the application.

### **Compliance verification:**

The applicant shall declare compliance with the requirement in Annex 1 and submit a declaration according to EU Regulation No 1935.

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<sup>60</sup> Glyphosate is the biologically active main component in a total herbicide, which the chemical company Monsanto sells under the name RoundUp. The different RoundUp products differ based on their salt formulations, medium (solution or granulate) and glyphosate concentration. Example formulations include Glyphosate Ammonium Salt (CAS no. 40465-66-5) and Glyphosate Isopropylamine Salt (CAS no. 38641-94-0).

Source: <https://www.chemie.de/lexikon/Glyphosat.html>, last accessed on 21.12.2022

### 3.8 Requirements for energy and water consumption

Textile finishing companies must submit information on their average energy (kWh/kg textile) and water (l/kg textile) consumption per year, which is consumed or measured during pre-treatment, dyeing and finishing of textiles (including the associated washing and drying processes), preferably specific to the textile product certified with the environmental label.

#### **Compliance verification**

*The applicant shall prepare reports on the average energy and water consumption per kg of textile (over a period of one year) for all finishing companies.*

### 3.9 Requirements for energy sources

Textile finishing companies must list the energy sources used during the pre-treatment, dyeing and finishing of the textiles (including the associated washing and drying processes).

#### **Compliance verification**

*The applicant shall submit a report on the energy sources used.*

### 3.10 Requirements for waste

Textile finishing companies must not burn waste internally at the company or dispose of waste in uncontrolled landfills. Controlled burning of waste at the company for the purpose of generating energy is exempt from this ban. Waste should preferably be recycled or taken back and reused. A waste register must be kept in which at least the type, category, quantity and disposal method or recycling method for all production waste is recorded and documented. The disposal practices, including for the disposal of hazardous waste, must also be documented.

#### **Compliance verification**

*The applicant shall submit documentation that records all production waste, including hazardous materials, and the relevant disposal methods or recycling methods (waste register). The corresponding approvals from the applicable authorities for the disposal of hazardous waste must also be submitted. Official approval for the controlled burning of waste at the company must be submitted where relevant. If requested to do so by RAL gGmbH, the applicant shall submit further information.*

### 3.11 Energy efficiency techniques used during washing, rinsing and drying

The applicant must verify that the finishing companies have implemented the minimum number of BAT energy saving techniques stated in Table 12. These techniques are also listed below.

**Table 12: Minimum number of BAT energy saving techniques to be used during washing, rinsing and drying**

BAT area	Production volume	
	< 10 tonnes	> 10 tonnes
General energy management	Two techniques	Three techniques
Washing and rinsing	One technique	Two techniques
Drying and finishing on stretching frames	One technique	Two techniques

**Table 13: Energy efficiency techniques during washing, rinsing and drying**

<p><b>General energy efficiency techniques</b></p> <ul style="list-style-type: none"> <li>◆ Measuring what energy is consumed where</li> <li>◆ Process monitoring and automatic control systems for flow controls, filling volumes, temperatures and time management</li> <li>◆ Insulating pipelines, valves and flanges</li> <li>◆ Frequency controlled electric motors and pumps</li> <li>◆ Enclosed design of machines to reduce steam losses</li> <li>◆ Reuse/recycling of water and liqueur in batch operation</li> <li>◆ Combining multiple wet treatments in one process</li> <li>◆ Recovering heat, e.g. from washing, steam condensate, waste process air, combustion gases</li> <li>◆ Solar panels, photovoltaic systems or heat recovery systems that within the energy generating process supply at least 30% of the energy required by the process</li> </ul>
<p><b>Washing and rinsing</b></p> <ul style="list-style-type: none"> <li>◆ Using cooling water as process water</li> <li>◆ Using overflow processes with emptying/filling processes</li> <li>◆ Using intelligent rinsing technologies with water flow and counterflow control systems</li> <li>◆ Installing heat exchangers</li> </ul>
<p><b>Drying and finishing on stretching frames</b></p> <ul style="list-style-type: none"> <li>◆ Optimising air circulation</li> <li>◆ Insulating the housing</li> <li>◆ Installing effective combustion systems</li> <li>◆ Installing heat recovery systems</li> </ul>

### **Compliance verification**

*The applicant shall verify the implementation of the BATs by submitting technical descriptions of the processes and an evaluation of the energy savings from the finishing companies, as well as a visualisation of the technique (e.g. a drawing or photo). Energy management systems according to DIN EN ISO 50001 or comparable systems will also be accepted as verification.*

### **3.12 Fitness for use**

#### **3.12.1 Change in dimensions during washing and drying**

After washing and drying in accordance with the care instructions, the change in the dimensions of the final textile must not exceed the following (see Table 14):

**Table 14: Tolerances for the change in dimensions of the textile end product or type of material after washing and drying**

<b>Textile end product or type of material</b>	<b>Change in dimensions after washing and drying</b>
Knitted fabrics	+/- 5%
Chunky knit	+/- 6%
House and home textiles	+/- 8%
Woven fabrics: Cotton and cotton mix	+/- 3%

<b>Textile end product or type of material</b>	<b>Change in dimensions after washing and drying</b>
Linen, flax and silk	+/- 3%
Cotton and cotton mix for bedding Wool mix	+/- 5%
Regenerated fibres and synthetic fibres for woven fabrics:	+/- 3%
Regenerated fibres and synthetic fibres for knitted fabrics:	+/- 5%
Bathroom linen, including terry towelling and fine rib fabrics	+/- 8%
Socks and hosiery	+/- 5%

These requirements do not apply to:

- Fibres or yarn;
- End products clearly labelled with "dry clean only" or equivalent (insofar as such end products are generally labelled accordingly in practice);
- Furniture fabrics that are not removable and washable.

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit a test report for verification. The test shall be carried out in accordance with the test methods DIN EN ISO 6330 and DIN EN ISO 5077 taking into account the following modification: three washes at temperatures indicated on the end product with tumble drying after each washing cycle, insofar as no other drying processes are indicated on the end product.*

#### **3.12.2 Colour fastness to washing**

The colour fastness to washing in accordance with the care instructions must be at least levels 3-4 according to DIN EN ISO 105-A03 (grey scale for assessing staining) or DIN EN ISO 105-A04 (instrumental assessment of the degree of staining) and according to DIN EN 2015-A02 (grey scale for assessing change in colour) or DIN EN ISO 105-A05 (instrumental assessment of change in colour).

This requirement does not apply to end products that are clearly labelled with "dry clean only" or equivalent labelling (insofar as these products are generally labelled accordingly in practice). In addition, it does not apply to indigo dyed denim and end products that are neither dyed nor printed, or to non-washable furniture fabrics.

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit a test report for verification. The test is carried out in accordance with test method DIN EN ISO 105-C06 (single wash, at temperature marked on the product, with perborate powder).*

#### **3.12.3 Colour fastness to perspiration (acid, alkaline)**

The colour fastness to perspiration (acid and alkaline) must be at least levels 3-4 according to DIN EN ISO 105-A03 (grey scale for assessing staining) or DIN EN ISO 105-A04 (instrumental assessment of the degree of staining) and according to DIN EN 2015-A02 (grey scale for assessing change in colour) or DIN EN ISO 105-A05 (instrumental assessment of change in colour).

This requirement does not apply to end products that are neither dyed nor printed and also does not apply to curtains or similar textiles intended for interior decoration, except for cushions.

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit a test report for verification. The test is carried out in accordance with the test method DIN EN ISO 105-E04 (acid and alkaline, comparison with multi-fibre fabric).*

#### **3.12.4 Colour fastness to rubbing**

The colour fastness to wet rubbing must be at least levels 2-3, and for dark colours at least level 2, according to DIN EN ISO 105-A03 (grey scale for assessing staining) or DIN EN ISO 105-A04 (instrumental assessment of the degree of staining) and according to DIN EN 2015-A02 (grey scale for assessing change in colour) or DIN EN ISO 105-A05 (instrumental assessment of change in colour). This requirement does not apply to end products that are neither dyed nor printed.

The colour fastness to dry rubbing must be at least levels 3-4 for dark colours and at least level 3 for denim according to DIN EN ISO 105-A03 (grey scale for assessing staining). This requirement does not apply to end products that are neither dyed nor printed and also does not apply to curtains or similar textiles intended for interior decoration.

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit a test report for verification. The test is carried out in accordance with test method DIN EN ISO 105-X12.*

#### **3.12.5 Colour fastness to light**

The colour fastness of furniture, curtains or drapes to light must be at least level 5 according to DIN EN ISO 105-A03 (grey scale for assessing staining) or DIN EN ISO 105-A04 (instrumental assessment of the degree of staining) and according to DIN EN 2015-A02 (grey scale for assessing change in colour) or DIN EN ISO 105-A05 (instrumental assessment of change in colour). For all other products, the colour fastness to light must be at least level 4. Level 4 is accepted if 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.

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit a test report for verification. The test is carried out in accordance with test method DIN EN ISO 105-B02.*

#### **3.12.6 Colour fastness to saliva**

The textile materials must be colour fast to the effects of saliva. This corresponds to level 5 of the currently valid standard DIN 53160 Part 1. This requirement applies to babies and children up to 36 months old. This requirement does not apply to end products that are neither dyed nor printed.

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit a test report for verification. The test shall be carried out in accordance with §64 of the LFGB (German Food and Feed Code), B 82. 92-3 and BVL B 82.92-13 in combination with DIN 53160-1.*

#### **3.12.7 Fabric resistance to pilling and abrasion**

Nonwoven fabrics and knitted garments, accessories and blankets<sup>61</sup> made of wool, wool mixes and polyester (including fleece), must resist pilling up to a minimum rating of 3. Woven cotton fabrics used for garments must also resist pilling up to a minimum rating of 3. Polyamide tights and leggings must resist pilling up to a minimum rating of 2.

### **Compliance verification**

*The applicant shall submit reports on the completion of suitable tests for the relevant substrate: For knitted and nonwoven materials: DIN EN ISO 12945-1 Pilling box method. For woven fabrics: DIN EN ISO 12945-2 Martindale method.*

#### **3.12.8 Durability of function**

In the case of finishes, treatments and additives that impart a water repellent function, a flame retardant function or an easy care function (also referred to as non-crease or permanent press) to the textile end products when they are in use, this functionality must be durable according to the values and parameters defined in the following requirements. In the case of a water repellent function, the consumer must be provided with care instructions on how to maintain this functionality.

##### **a) Water repellent function**

The functionality of the water repellent finish must still be 80 out of 90 after 5 domestic washing and drying cycles at 40 °C or after 5 industrial washing and drying cycles at a minimum of 75 °C.

In the case of industrial washing cycles, the temperature for garments with taped seams may be reduced to 60 °C. Care instructions on the reimpregnation of the product must be supplied with the textile.

### **Compliance verification**

*The applicant shall submit test reports that were carried out according to the following standards based on the relevant end product: For all products, domestic washing cycles according to DIN EN ISO 6330 or industrial washing cycles according to DIN EN ISO 15797, in combination with DIN EN ISO 4920 in each case.*

##### **b) Flame retardant functions**

Washable end products must also retain their functionality after 25 industrial washing and drying cycles in accordance with the care instructions.

### **Compliance verification**

*The applicant shall submit test reports that were carried out according to the following standards based on the relevant end product: For domestic washing cycles according to DIN EN ISO 6330*

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<sup>61</sup> Blankets: this does not include bedding

or for industrial washing cycles according to DIN EN ISO 10528, in combination with DIN EN ISO 12138 in each case.

### **c) Easy care function (also non-crease or permanent press)**

Natural fibre products must achieve an SA-3 fabric smoothness grade and blended natural and synthetic fibre products an SA-4 fabric smoothness grade after 10 domestic washing and drying cycles at 40 °C.

#### **Compliance verification**

*The applicant shall submit test reports according to the standard ISO 7768 – process for assessing the smoothness appearance of fabrics after domestic washing and drying.*

### **3.12.9 Abrasion resistance**

Socks (tested on the heel), carpets without coating for private households and work clothing must demonstrate an abrasion resistance of at least 15,000 abrasion cycles. Contract textiles<sup>62</sup> must have an abrasion resistance of at least 20,000 abrasion cycles.

#### **Compliance verification**

*The applicant shall submit a report on the tests in accordance with the DIN EN ISO 12947-2 standard. The test shall be carried out in a dry state using the load stated in the standard for the type of textile.*

### **3.12.10 Strength of zip and hook-and-loop fasteners**

The applicant must test the strength of zip and hook-and-loop fasteners to ensure that they comply with the stipulated values in the test standard (see compliance verification).

#### **Compliance verification**

*The applicant shall submit a report on the tests in accordance with the DIN EN 16732 (zips) or DIN 3415-1 (hook-and-loop fasteners) standards.*

## **3.13 Packaging**

### **3.13.1 General packaging requirements**

The applicant must provide a description of the packaging for the textile to be certified. Unnecessary packaging material must be avoided. Composite packaging is not permitted and the packaging may not contain any dimethyl fumarate. The requirements apply to repackaging and transport, sales and delivery packaging that is directly used by the applicant<sup>63</sup>. Clothes hangers<sup>64</sup> are exempt from this requirement.

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<sup>62</sup> Contract textiles: Textile products designed for use in the commercial sector. This includes, in particular, hospitals, care facilities, hotels and the gastronomy sector.

<sup>63</sup> Other packaging along the supply chain and delivery packaging used by other online retailers is exempt from these requirements.

<sup>64</sup> According to Annex 1 § 3 (1) of the German Packaging Law (VerpackG), clothes hangers sold with a piece of clothing are considered to be packaging.

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and provide RAL gGmbH with a description of the intended packaging solution, incl. the designation of the packaging and its composition, the raw materials used (designation/trade name) and their origin (supplier) as well as a sample of the product packaging (photo) where relevant.*

#### **3.13.2 Special requirements for packaging made of paper, paperboard and cardboard**

Packaging made of paper, paperboard and cardboard must contain at least 80% recycled materials. Packaging materials are considered recycled if product waste (post-consumer waste) has been subjected to a material recycling process. Full-surface coating and partial coating (e.g. in the form of lettering) of paper, paperboard and cardboard packaging with plastics or metals is not permitted. It must be possible to verify the origin of the wood for the virgin fibres added to the product. The wood must be sourced from forests that are able to verify that they have been managed according to the guidelines for sustainable forestry. The relevant forestry business must work in accordance with a high ecological and social standard and be certified accordingly. The certification systems FSC and PEFC and certification according to the Naturland standard will be accepted.

### **Compliance verification**

*The applicant shall provide information on the recycled content (PCR) of the packaging solution. If primary fibres are used, the applicant shall submit a certificate for sustainable forestry management (FSC, PEFC or Naturland standard).*

#### **3.13.3 Special requirements for packaging made of plastic**

It is only permitted to use unmixed plastic without any coating. The plastics used for the packaging of the product are not permitted to contain any halogenated polymers. PE bags must contain at least 80% recycled plastic (PCR materials according to ISO-14021, 7.8.1.1 a, 2). The packaging must be recyclable in accordance with the current "minimum standard for determining the recyclability of packaging" (Central Agency Packaging Register/Zentrale Stelle Verpackungsregister 2020).

### **Compliance verification**

*The applicant shall submit confirmation from the packaging suppliers about the recycled content and the recyclability of the packaging in accordance with the "minimum standard for determining the recyclability of packaging" (Central Agency Packaging Register/Zentrale Stelle Verpackungsregister 2020). The Blue Angel ecolabel DE-UZ 30a "Products made from recycled plastic" can also be submitted as verification of the recycled content.*

### **3.14 Consumer information**

Insofar as the textile end products are sold in Germany, the consumer information must also be fully provided in German.

The fibres used in the end product must be declared in accordance with Regulation (EC) No 1007/2011 of the European Parliament and of the Council<sup>65</sup>. In addition, care and cleaning information must be provided in the form of textile care symbols in accordance with the guidelines of GINETEX<sup>66</sup> or DIN EN ISO 3758. The standards ISO 15797 and ISO 10023 apply to industrial washable textiles. If passive electronic components (RFID) are used, these must be removable/separable and corresponding information must be provided.

In addition, information on which parts of the textile – depending on the type and severity of the damage or wear – are repairable or replaceable, e.g. buttons, zips, hook-and-loop fasteners and seams, should also be provided. All information must be made available on the product itself, the packaging, via a brochure or via the website operated by the manufacturer.

### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit a sample of the consumer information where relevant.*

### **3.15 Working conditions**

The textile product to be certified must comply with the social and human rights requirements for the recognition of certification labels in the respective recognition areas for the Green Button 2.0 from 1 August 2024<sup>67</sup>:

For a transitional period up until 31 July 2024, it is still possible to comply with the product requirements with respect to social and human rights for the Green Button 1.0<sup>68</sup>.

The current social and human rights requirements for the recognition of certification labels by the Green Button 2.0 in the recognition areas manufacturing, wet processes and fibre and material use are presented below<sup>69</sup>.

#### **3.15.1 Social and human rights requirements for the recognition of certification labels for manufacturing (B.1) according to the Green Button 2.0**

- Labour Rights Management,
- Freedom of Association and Protection of the Right to Organise (ILO C087),
- Worker Representatives' Rights (ILO R143),
- Right to Organise and Collective Bargaining (ILO C098),
- Workers' Representation Where Restricted by Law<sup>70</sup>,

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<sup>65</sup> Regulation (EC) No 1007/2011 of the European Parliament and of the Council of 27 September 2011 on textile fibre names and related labelling and marking of the fibre composition of textile products and repealing Council Directive 73/44/EEC and Directives 96/73/EC and 2008/121/EC of the European Parliament and of the Council

<sup>66</sup> <http://www.ginetex.de/>

<sup>67</sup> Green Button Standard 2.0: Process and Requirements for the Recognition of Certification Labels, Part B: Requirements for the recognition of certification labels; <https://www.gruener-knopf.de/standard-20>, last accessed on 21.12.2022

<sup>68</sup> Green Button Standard 1.0, Chapter 2. Product requirements, subsection 2.1 Social Criteria; <https://www.gruener-knopf.de/standard-10>, last accessed on 21.12.2022

<sup>69</sup> They are available online under: Green Button Standard 2.0: Process and Requirements for the Recognition of Certification Labels at: [https://www.gruener-knopf.de/sites/default/files/file/2022-06/Gr%C3%BCner%20Knopf%20Standard%202.0\\_Metaansatz.pdf](https://www.gruener-knopf.de/sites/default/files/file/2022-06/Gr%C3%BCner%20Knopf%20Standard%202.0_Metaansatz.pdf), (Version: June 2022)

<sup>70</sup> Prohibition, "alternative forms of independent and free workers' organisations and collective bargaining as defined in ILO Conventions 87 and 98 in countries in which the national, regional, or local law prohibits

- Prohibition of Forced Labour (ILO C029 and ILO C105),
- Bonded Labour and Financial Deposits (ILO C029, ILO C095, ILO C181)
- Withholding of Papers and Wages (ILO C029, ILO C095),
- Freedom of Movement (ILO C155, ILO C170),
- Minimum Age (ILO C138),
- Age Verification (ILO C138),
- Prohibition of Worst Forms of Child Labour (ILO C138, ILO C182 and ILO R190),
- Special Protection of Young Workers (ILO C090, ILO 138, ILOC182, C090, ILO R146 and ILO R190),
- Child Labour Remediation,
- Non-Discrimination (ILO C100, ILO C111, ILO C135 and ILO C158),
- Harassment and Abuse,
- Anonymous Worker Grievance Mechanism,
- Conditions of Employment Relationship (ILO R085 and ILO C189),
- Legal Minimum Wage,
- Payment of Statutory Social Benefits,
- Provision of Legal Maternity Leave and Protection (ILO C158 and ILO C183),
- Working Hours (ILO C001, ILO C014 and ILO R116),
- Working Time Records,
- Paid Overtime (ILO C001 and ILO R116),
- Provision of Break Times,
- Targets for Piece-Rate Workers,
- Rights of Sub-Contracted Workers,
- Occupational Safety and Health (OSH) Management System (ILO C155, ILO C148, ILO R164, ILO C174, ILO C062, ILO C170 and ILO R156),
- Workplace Safety (ILO C155 and ILO R164),
- Medical Treatment of Work Related Accidents (ILO C155 and ILO C062),
- Workplace Conditions (ILO R097),
- Potable Water (ILO R097),
- Building Safety (ILO C155 and ILO R164),
- Fire Preparedness (ILO C155),
- Emergency and Evacuation Safety (ILO C155),
- Dormitories,
- Legal Compliance, and
- Business Legality.

### **3.15.2 Social and human rights requirements for the recognition of certification labels for wet processes (B.2) according to the Green Button 2.0**

- Chemical Management (ILO C155),
- Chemical Storage and Labelling,
- Use of Chemicals,

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or restricts these rights. This shall include not hindering the establishment of and membership in alternative forms of workers' organisations or representations, free elections of representatives, access to the workplace, entering into social dialogue and taking on voluntary negotiations with the employer, as well as enjoying adequate protection against discrimination and interference" (BMZ 2022; GREEN BUTTON Standard 2.0, Process and Requirements for the Recognition of Certification Labels).

- Hazard Communication (ILO C155),
- Personal Protective Equipment (ILO C155, ILO R164 and ILO R079), and
- Training on Chemical Handling and Exposure (ILO C155 and ILO R177).

### **3.15.3 Social and human rights requirements for the recognition of certification labels for fibre and material use (B.3) according to the Green Button 2.0**

#### *B.3.1 Requirements for raw materials for man-made fibres from natural polymers (regenerated) – forestry*

- Verification of Employee Rights and Working Conditions,
- Ensure Respect for the Rights of Indigenous Peoples, and
- Local Community Relations .

#### *B.3.2 Social and human rights requirements for raw materials from other sustainable, agricultural production (plant-based fibres) 71 according to the Green Button 2.0*

- Freedom of Association (ILO C087),
- Collective Bargaining (ILO 098),
- Forced Labour (ILO C029 and C105),
- Minimum Age (ILO C138),
- Worst Forms of Child Labour (ILO C182),
- Ensuring Occupational Health and Safety,
- Sub-Contractors,
- Labour Contracts,
- Equal Remuneration (ILO C100), and
- Non-Discrimination (ILO C111).

#### **Compliance verification**

*The applicant shall declare in Annex 1 to the contract that the manufacturer of the products to be certified complies with all of the relevant social and human rights requirements for the recognition of certification labels in the respective recognition areas for the Green Button 2.0. Alternatively, the applicant can declare until 31 July 2024 in Annex 1 that the manufacturer of the products to be certified complies with all of the relevant product requirements with respect to social and human rights for the Green Button 1.0. In addition, the applicant shall submit the names and addresses of all suppliers and factories (for the recognition area/value added chain stages covered by the Green Button at the time of application) that process the product to be certified or process the raw materials used to produce the product to be certified in Annex 1.*

*The applicant shall submit a corresponding certificate in Annex 1 to the contract to verify that the product to be certified has been certified by one of the standards recognised by the Green Button for the applicable recognition area or that the manufacturer of the product to be certified is a member of a standard recognised by the Green Button for the applicable recognition area. In the case of the Green Button 1.0, this includes those standards recognised for the social criteria. This obligation to provide verification only applies if at least one of the recognition areas/value added chain stages covered by the Green Button for the product to be certified is located in a country at risk at the time of the application. A country is considered to be at risk if*

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<sup>71</sup> Acceptance of a mass balance chain of custody, as long as the volumes of input (certified fibres) and output (products containing fibres that are labelled as certified) are reconciled within the standard/certification system.

*the country was classified in the categories "Highest Risk" or "High Risk" in the country risk assessment process for the SA8000 standard<sup>72</sup>, which is based on the World Governance Indicators (WGI). This requirement does not apply if none of the recognition areas/value added chain stages covered by the Green Button for the product to be certified are located in a country at risk at the time of the application.*

*Instead of submitting a standard recognised by the Green Button, as described above, the applicant can submit verification in the form of a test report from an independent, accredited auditing body for the product to be certified in Annex 1. The audit report must confirm:*

- ♦ compliance with the social and human rights requirements for the recognition of certification labels in the respective recognition areas for the Green Button 2.0 or*
- ♦ compliance with the product requirements with respect to social and human rights for the Green Button 1.0.*

*The audit on which the report is based must not be more than one year old when the application is submitted.*

*The independent auditing bodies must be recognised and monitored by a third party or accredited. They must also use test methods and indicators that are at least equivalent to one of the standards recognised by the Green Button. Alternatively, the auditing bodies must meet the requirements for independence (Chapter VIII(A) of the Fair Labor Association (FLA) Charta), expertise and accountability (ISO 19011) of the independent, third party auditing bodies. Reports from the following auditing bodies will be recognised in all cases:*

- ♦ Reports from an RBA-approved auditor,*
- ♦ Auditing bodies accredited according to SA8000.*

*If the product to be certified or the raw materials used to produce the product to be certified are processed in countries classified in the categories "Highest Risk" or "High Risk" in the country risk assessment process for the SA8000 standard, which is based on the World Governance Indicators (WGI), the audits and corresponding audit reports must be completed every year. If deficiencies are identified during the audits or due to concerns raised by external organisations, such as independent trade unions or non-governmental organisations, the corrective action plan (CAP) according to section 3.1 "Cease, prevent or mitigate harm in the enterprise's own operations" of the "OECD Due Diligence Guidance for Responsible Supply Chains in the Garment and Footwear Sector" must be implemented. This includes an obligation for the applicant and manufacturer of the product to be certified to provide information to RAL gGmbH and a six month transitional period to correct the deficiency and supplement the verifications, which must also be confirmed by an independent, accredited auditing body.*

### **3.16 Restriction on the processing of denim**

The use of manual and mechanical sandblasting to achieve distressed denim finishes and the use of potassium permanganate is not permitted.

#### **Compliance verification**

*The applicant shall provide detailed information on all production sites at which denim end products holding the environmental label are produced, as well as documentation and photos to verify*

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<sup>72</sup> A complete list is available at: <https://sa-intl.org/resources/country-risk-assessment-process-for-sa8000/>, Version 2020, last accessed on 21.12.2022

*the alternative processes with which the distressed denim effect is achieved. The applicant must confirm that no mechanical sandblasting or potassium permanganate is used.*

### **3.17 Outlook**

The rapid developments that can currently be observed at various levels of the textile sector (process technologies, new fibres, political framework conditions, etc.) could open up possibilities for making textile production even more sustainable in the future. An important driver of these developments is the recently published EU Textiles Strategy. It envisages, amongst other things, obligatory requirements for the design of textiles in terms of, for example, their recyclability and the composition of the materials.

However, some developments can also be accompanied by dangers. For example, there is a danger when recycling old textiles that pollutants could accumulate. Ultimately, it was not possible to evaluate all of these new developments as part of this revision process. There is, for example, still no standardised analytic method available for measuring microplastic emissions. As a result, it has not been possible to develop expedient criteria for minimising the risk of microplastic emissions – including the required compliance verifications. Relevant aspects, which ultimately could not be evaluated in this revision, are listed below so that they can be considered once again as part of the next revision process.

- A crucial starting point for establishing a circular economy for textiles is the design of the textiles. A good “design for circularity” that covers the design and production of recyclable, durable, repairable and functional textiles with tracking IDs would offer huge potential for the development of a practical and fully functioning circular economy that can help minimise the environmental impact of the textile sector. However, it is outside of the expertise of a product labelling system to develop a set of highly complex requirements that will directly influence a design for circularity. Issuing a recommendation to focus on simple and uncomplicated pattern designs, fewer material mixtures and uncomplicated prints and applications is nevertheless sensible and has thus been addressed in the introduction to these Basic Award Criteria. In the next revision process, the Blue Angel will once again examine whether the framework conditions have changed to such an extent that it is then possible to develop meaningful requirements in this area, such as criteria for the composition of materials.
- In future revisions of the Blue Angel as a product labelling system, aspects such as a minimum content of recycled fibres in the end product or a system for automatic sorting of materials and high quality recycling could also be relevant for promoting the reuse or recycling of old textiles. The EU Waste Framework Directive (2018/851/EC) has created the framework for the separate collection of old textiles from 2025 and should help to improve the recycling of textiles. The German Circular Economy Act (BMJV 2020) was adopted to implement the EU Waste Framework Directive, which is why the collection and recycling of old textiles will also change in Germany. In line with the EU Textiles Strategy, there are plans to extend the responsibility of producers in the Waste Framework Directive beyond the separate collection of textiles. Advances in mechanical and chemical recycling will also promote better recycling and thus make it easier to use recycled fibres. Therefore, the next revision will once again examine, in particular, aspects such as the recycled content of specific fibres and a minimum content of recycled fibres in the end product. In this context, the Blue Angel will once again examine in detail whether new findings on the pollutant risks posed by the recycling of old textiles make it necessary to revise the testing of the end

products. The question of whether to place greater focus on the traceability of the textile chain for recycled fibres will also be examined.

- The market development of “cupro” will be examined in more detail to evaluate whether this fibre can be included in the next version of the Basic Award Criteria.
- The current revision of the Basic Award Criteria does not include a test of the feathers and down in end products because there were no findings available on the potential pollutants. This aspect will be examined once again in the next revision. The next revision will also examine whether to develop a requirement for recycled down. With respect to the use of residues from the agricultural, timber and food industries, the label plans to only permit the use of inputs that are largely free of pollutants in the future. The next revision will thus examine whether it is possible and expedient to also exclusively promote the use of raw materials from controlled organic cultivation and controlled biological animal husbandry for these input flows.
- In terms of input flows (such as wood, palm oil, etc.) that pose an increased risk of deforestation and which are associated with a serious loss of biodiversity and losses to ecosystem services, the next revision will examine whether a plausibility assessment of the input flows can and should be introduced.
- The subject of microplastic emissions was thoroughly examined as part of this revision. The discussions focussed, on the one hand, on the lack of a standardised analysis method and, on the other hand, on the lack of opportunities to effectively reduce the emission of microplastic from textiles. The EU Textiles Strategy also focuses on measures to reduce microplastic emissions, including the development of standardised measurement methods. One possible measure is to require a prewash of textiles by the textile manufacturer. The next revision will thus examine how the issue of microplastics can be tackled by the Blue Angel.
- In the Industry 4.0 era and a circular textile economy, manual sorting as a preliminary stage of the recycling process for old textiles is not a viable option. The volume of textiles that need to be sorted can only be handled by machines. Therefore, it is essential that electronic and biological markers and other methods such as QR codes are used to label or identify the fibres (and the processing agents) found in the product. This would make it possible to identify and sort textiles with the same fibre composition (and the same quality, if this information is also saved on the tracking IDs) from the mass of other textiles and recycle them together. Digital tracking IDs are also suitable for storing information on suitable recycling methods. This could improve the management of recycling processes (Niebler 2020<sup>73</sup>). Various different developments can currently be observed in the field of digital tracking. As part of the EU Textiles Strategy, the EU Commission plans to introduce a digital product passport, which will contain information on sustainability aspects and also on the recyclability of the product. Therefore, this aspect will be examined as part of the next revision.

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<sup>73</sup> Niebler, R. (2020): Waste management business models for textiles in the circular economy (Abfallwirtschaftliche Geschäftsmodelle für Textilien in der Circular Economy). Sonderforschung ökonomische und juristische Institutionenanalyse (SOFIA) e.V. ISBN 978-3-941627-83-3

- Figures on water and energy consumption are collected in the current Basic Award Criteria. In order to conserve more resources and further reduce greenhouse gas emissions, a future revision of the criteria will examine whether it is possible to derive and implement demanding benchmarks for water and energy consumption in the production of different product groups. The Product Environmental Footprint Category Rules within the EU Textiles Strategy will be taken into account in this context.
- In order to conserve resources in the packaging of textiles, reusable packaging should be used where possible. As the development of suitable logistical systems in this area is often challenging, the use of reusable packaging is not currently required. A future revision will re-evaluate this issue and could, for example, also take into account the Blue Angel for "Returnable Transportation Packagings" DE-UZ 27.
- Alongside the criteria for paper, paperboard and cardboard packaging and plastic packaging, future revisions will examine whether it is possible to formulate requirements for textile packaging and storage packaging. As an addition to the currently considered packaging, which is designed to ensure that a textile reaches customers in an undamaged state, storage packaging is designed for the (repeated) storage of the product by consumers during its service life. This includes, for example, cotton bags designed for the (seasonal) storage of bedding. This type of packaging is thus an additional product offered to consumers for long-term use on multiple different occasions. It is recommended that companies provide customers with instructions on the use of storage packaging. At the same time, a product certification system such as the Blue Angel cannot test whether the (textile) packaging is (re-)used by consumers. As (textile) storage packaging is considered to be a complete product, the applicant can currently decide whether to certify this product separately. If desired, the criteria for the Blue Angel for textiles can be used for textile storage packaging. In view of the limited availability of and high prices for cotton from controlled organic cultivation, it does raise the question of whether it is currently expedient to set such high requirements on packaging products. If textile packaging is used, it should thus be designed so that it provides an additional benefit, such as the long term storage of the product.
- In the area of work conditions, the next revision will examine whether to continue with the selected approach of focussing on countries at risk.

#### **4 Applicants and parties involved**

Manufacturers or distributors of products according to Paragraph 2 shall be eligible for application.

Parties involved in the award process are:

- RAL gGmbH to award the Blue Angel environmental label,
- the federal state being home to the applicant's production site,
- Umweltbundesamt, (German Environment Agency) which after the signing of the contract receives all data and documents submitted in application for the Blue Angel in order to be able to further develop the Basic Award Criteria.

## **5 Use of the environmental label**

The use of the environmental label by the applicant is governed by a contract on the use of the environmental label concluded with RAL gGmbH.

Within the scope of such contract, the applicant undertakes to comply with the requirements under Paragraph 3 while using the environmental label.

Contracts on the Use of the Environmental Label are concluded to fix the terms for the certification of products under Paragraph 2. Such contracts shall run until 31 December 2027.

They shall be extended by periods of one year each, unless terminated in writing by 31 March 2027 or 31 March of the respective year of extension.

After the expiry of the contract, the Environmental Label may neither be used for labelling nor for advertising purposes. This regulation shall not affect products being still in the market.

The applicant shall be entitled to apply to RAL gGmbH for an extension of the right to use the ecolabel on the product entitled to the label if it is to be marketed under another brand/trade name and/or other marketing organizations.

The Contract on the Use of the Environmental Label shall specify:

- Applicant (manufacturer/distributor)
- Brand/trade name, product description
- Distributor (Label User), i.e. the marketing organization.

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## Anhang A Legal regulations and testing standards

The current versions are named here, the valid versions of the standards at the time of application will be accepted.

- Association of Manufacturers & Formulators of Enzyme Products (AMFEP) & European Apparel and Textile Confederation (EURATEX) (2022): Industry Guidelines on the Safe Handling of Enzymes in the Textile Industry Supply Chain, Part II: Textile Finishing & Garment Finishing Industry, Version 1
- APAT IRSA CNR 29/03 Met. 4110A2: Fosforo
- ASTM D1252 2006 Edition, February 15, 2006 Standard Test Methods for Chemical Oxygen Demand (Dichromate Oxygen Demand) of Water; Standard Test Methods for Chemical Oxygen Demand (Dichromate Oxygen Demand) of Water
- ASTM D7742 Standard Practice for Determination of Nonylphenol Polyethoxylates (NPnEO,  $3 \leq n \leq 18$ ) and Octylphenol Polyethoxylates (OPnEO,  $2 \leq n \leq 12$ ) in Water by Single Reaction Monitoring (SRM) Liquid Chromatography/ Tandem Mass Spectrometry (LC/MS/MS)
- BVL B 82.10-1:2011-12 Analysis of commodity goods - Testing of coloured children's toys with respect to their resistance to saliva and perspiration (adoption of the German standard DIN 53160 with the same name, edition June 1974)
- DIN 38404-3 2005-07 German standard methods for the examination of water, waste water and sludge - Physical and physical-chemical parameters (Group C) - Part 3: Determination of absorption in the range of the ultraviolet radiation, Spectral absorptions coefficient (C 3) ammonium nitrogen
- DIN 38405-24:1987-05 German standard methods for the examination of water, waste water and sludge; anions (Group D); photometric determination of chromium(VI) using 1,5-diphenylcarbonohydrazide (D 24)
- DIN 38405-27:1992-07 German standard methods for the examination of water, waste water and sludge; anions (Group D); determination of readily liberatet sulphide (D 27)
- DIN 38409-41:1998-12 German standard methods for the examination of water, waste water and sludge; summary action and material characteristic parameters (Group H); determination of the chemical oxygen demand (COD) in the range over 15 mg/l (H 41)
- DIN 38409-44:1992-05 German standard methods for the examination of water, waste water and sludge; parameters characterizing effects and substances (Group H); determination of the chemical oxygen demand (COD), ranging from 5 to 50 mg/l (H 44)
- DIN 38414-14:2011-08 German standard methods for the examination of water, waste water and sludge - Sludge and sediments (group S) - Part 14: Determination of selected polyfluorinated compounds (PFC) in sludge, compost and soil - Method using high performance liquid chromatography and mass spectrometric detection (HPLC-MS/MS) (S 14)
- DIN 53160-1:2010-10 Determination of the colourfastness of articles for common use - Part 1: Test with artificial saliva
- DIN 53160-2:2010-10 Determination of the colourfastness of articles for common use - Part 2: Test with artificial sweat
- DIN 54231:2005-11 Textiles - Detection of disperse dyestuffs
- DIN 54232:2010-08 Textiles - Determination of the content of bonds based on chlorobenzene and chlorotoluene

- DIN 54233-2:2014-07 Testing of textiles - Determination of metals - Part 2: Determination of extractable metals by hydrochloric acid
- DIN EN 1162:1996-10 Feather and down - Test methods - Determination of the oxygen index number; German version EN 1162:1996
- DIN EN 1164:1998-10 Feather and down - Test methods - Determination of the turbidity of an aqueous extract; German version EN 1164:1998
- DIN EN 1485:1996-11 Water quality - Determination of adsorbable organically bound halogens (AOX); German version EN 1485:1996
- DIN EN 1811:2015-10: Reference test method for release of nickel from all post assemblies which are inserted into pierced parts of the human body and articles intended to come into direct and prolonged contact with the skin; German version EN 1811:2011+A1:2015
- DIN EN 1163:1996-10 Feather and down - Test methods - Determination of the oil and fat content; German version EN 1163:1996
- DIN EN 1189:1996-12 Water quality - Determination of phosphorus - Ammonium molybdat spectrometric method; German version EN 1189:1996
- DIN EN 1233:1996-08 Water quality - Determination of chromium - Atomic absorption spectrometric methods; German version EN 1233:1996
- DIN EN 1884:1998-11 Feather and down - Test methods - Determination of microbiological state; German version EN 1884:1998
- DIN EN 12457-4:2003-01 Characterization of waste - Leaching; Compliance test for leaching of granular waste materials and sludges - Part 4: One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 10 mm (without or with limited size reduction); German version EN 12457-4:2002
- DIN EN 12472:2009-09 Method for the simulation of wear and corrosion for the detection of nickel release from coated items; German version EN 12472:2005+A1:2009
- DIN EN 12619:2013-04 Stationary source emissions - Determination of the mass concentration of total gaseous organic carbon - Continuous flame ionisation detector method; German version EN 12619:2013
- DIN EN 13234:2007-01 Advanced technical ceramics - Mechanical properties of ceramic composites at ambient temperature - Evaluation of the resistance to crack propagation by notch sensitivity testing; German version EN 13234:2006
- DIN EN 13284-1 Stationary source emissions - Determination of low range mass concentration of dust - Part 1: Manual gravimetric method; German version EN 13284-1:2017.
- DIN EN 14792:2017-05 Stationary source emissions - Determination of mass concentration of nitrogen oxides - Standard reference method: chemiluminescence; German version EN 14792:2017
- DIN EN ISO 105-B02:2014-11 Textiles - Tests for colour fastness - Part B02: Colour fastness to artificial light: Xenon arc fading lamp test (ISO 105-B02:2014); German version EN ISO 105-B02:2014
- DIN EN ISO 105-C06:2010-08 Textiles - Tests for colour fastness - Part C06: Colour fastness to domestic and commercial laundering (ISO 105-C06:2010); German version EN ISO 105-C06:2010
- DIN EN ISO 105-E04:2013-08 Textiles - Tests for colour fastness - Part E04: Colour fastness to perspiration (ISO 105-E04:2013); German version EN ISO 105-E04:2013
- DIN EN ISO 105-X12:2016-11 Textiles - Tests for colour fastness - Part X12: Colour fastness to rubbing (ISO 105-X12:2016); German version EN ISO 105-X12:2016

- DIN EN ISO 3071:2006-05 Textiles - Determination of pH of aqueous extract (ISO 3071:2005); German version EN ISO 3071:2006
- DIN EN ISO 3758:2013-12 Textiles - Care labelling code using symbols (ISO 3758:2012); German version EN ISO 3758:2012
- DIN EN ISO 4920:2012-12 Textile fabrics - Determination of resistance to surface wetting (spray test) (ISO 4920:2012); German version EN ISO 4920:2012
- DIN EN ISO 5077:2008-04 Textiles - Determination of dimensional change in washing and drying (ISO 5077:2007); German version EN ISO 5077:2008
- DIN EN ISO 6330:2013-02 Textiles - Domestic washing and drying procedures for textile testing (ISO 6330:2012); German version EN ISO 6330:2012
- DIN EN ISO 7827:2013-03 Water quality - Evaluation of the "ready", "ultimate" aerobic biodegradability of organic compounds in an aqueous medium - Method by analysis of dissolved organic carbon (DOC) (ISO 7827:2010); German version EN ISO 7827:2012
- DIN EN ISO 9408:1999-12 Water quality - Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium by determination of oxygen demand in a closed respirometer (ISO 9408:1999); German version EN ISO 9408:1999
- DIN EN ISO 9439:2000-10 Water quality - Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium - Carbon dioxide evolution test (ISO 9439:1999); German version EN ISO 9439:2000
- DIN EN ISO 9562:2005-02 Water quality - Determination of adsorbable organically bound halogens (AOX) (ISO 9562:2004); German version EN ISO 9562:2004 (Halogen content (chlorine content < 5g/l))
- DIN EN ISO 9888:1999-11 Water quality - Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium - Static test (Zahn-Wellens method) (ISO 9888:1999); German version EN ISO 9888:1999
- DIN EN ISO 10304-2:1996-11 Water quality - Determination of dissolved anions by liquid chromatography of ions - Part 2: Determination of bromide, chloride, nitrate, nitrite, orthophosphate and sulfate in waste water (ISO 10304-2:1995); German version EN ISO 10304-2:1996
- DIN EN ISO 10528:1995-08 Textiles - Commercial laundering procedure for textile fabrics prior to flammability testing (ISO 10528:1995); German version EN ISO 10528:1995
- DIN EN ISO 11732:2005-05 Water quality - Determination of ammonium nitrogen - Method by flow analysis (CFA and FIA) and spectrometric detection (ISO 11732:2005); German version EN ISO 11732:2005
- DIN EN ISO 11733:2004-11 Water quality - Determination of the elimination and biodegradability of organic compounds in an aqueous medium - Activated sludge simulation test (ISO 11733:2004); German version EN ISO 11733:2004
- DIN EN ISO 12138:2017-02 Textiles - Domestic laundering procedures for textile fabrics prior to flammability testing (ISO/DIS 12138:2017); German and English version prEN ISO 12138:2017
- DIN EN ISO 12260:2003-12 standard, Water quality - Determination of nitrogen - Determination of bound nitrogen (TNb), following oxidation to nitrogen oxides; German version EN 12260:2003
- DIN EN ISO 12945-1:2001-08 Textiles - Determination of fabric propensity to surface fuzzing and to pilling - Part 1: Pilling box method (ISO 12945-1:2000); German version EN ISO 12945-1:2000

- DIN EN ISO 12945-2:2000-11 Textiles - Determination of fabric propensity to surface fuzzing and to pilling - Part 2: Modified Martindale method (ISO 12945-2:2000); German version EN ISO 12945-2:2000
- DIN EN ISO 14184-1:2011-12 Textiles - Determination of formaldehyde - Part 1: Free and hydrolysed formaldehyde (water extraction method) (ISO 14184-1:2011); German version EN ISO 14184-1:2011
- DIN EN ISO 14362-1:2017-05 Textiles - Methods for determination of certain aromatic amines derived from azo colourants - Part 1: Detection of the use of certain azo colourants accessible with and without extracting the fibres (ISO 14362-1:2017); German version EN ISO 14362-1:2017
- DIN EN ISO 14362-3:2017-05 Textiles - Methods for determination of certain aromatic amines derived from azo colourants - Part 3: Detection of the use of certain azo colourants, which may release 4-aminoazobenzene (ISO 14362-3:2017); German version EN ISO 14362-3:2017
- DIN EN ISO 14593:2005-09 Water quality - Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium - Method by analysis of inorganic carbon in sealed vessels (CO<sub>2</sub> headspace test) (ISO 14593:1999); German version EN ISO 14593:2005
- DIN EN ISO 15088:2009-06 Water quality - Determination of the acute toxicity of waste water to zebrafish eggs (*Danio rerio*) (ISO 15088:2007); German version EN ISO 15088:2008
- DIN EN ISO 15797:2017-03 Textiles - Industrial washing and finishing procedures for testing of work wear (ISO/DIS 15797:2017); German and English version prEN ISO 15797:2017
- DIN EN ISO 17070:2015-05 Leather - Chemical tests - Determination of tetrachlorophenol-, trichlorophenol-, dichlorophenol-, monochlorophenol-isomers and pentachlorophenol content (ISO 17070:2015); German version EN ISO 17070:2015
- DIN EN ISO 17353:2005-11 Water quality - Determination of selected organotin compounds - Gas chromatographic method (ISO 17353:2004); German version EN ISO 17353:2005
- DIN EN ISO 18856:2005-11 Water quality - Determination of selected phthalates using gas chromatography/mass spectrometry (ISO 18856:2004); German version EN ISO 18856:2005
- DIN EN ISO/IEC 17025:2017-02 General requirements for the competence of testing and calibration laboratories (ISO/IEC DIS 17025:2016); German and English version prEN ISO/IEC 17025:2016
- DIN ISO 15705:2003-01 Water quality - Determination of the chemical oxygen demand index (ST-COD) - Small-scale sealed tube method
- DIN EN ISO 10304-3:1997-11 Water quality - Determination of dissolved anions by liquid chromatography of ions - Part 3: Determination of chromate, iodide, sulfite, thiocyanate and thiosulfate (ISO 10304-3:1997); German version EN ISO 10304-3:1997
- DIN EN ISO 11734:1998-11 Water quality - Evaluation of the "ultimate" anaerobic biodegradability of organic compounds in digested sludge - Method by measurement of the biogas production (ISO 11734:1995); German version EN ISO 11734:1998
- DIN EN ISO 11885:2009-09 Water quality - Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES) (ISO 11885:2007); German version
- DIN EN ISO 13395:1996-12 Water quality - Determination of nitrite nitrogen and nitrate nitrogen and the sum of both by flow analysis (CFA and FIA) and spectrometric detection (ISO 13395:1996); German version EN ISO 13395:1996

- DIN EN ISO/IEC 17025:2018-03 General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2017); German and English version EN ISO/IEC 17025:2017
- EPA Method 1650: Adsorbable Organic Halides by Adsorption and Coulometric Titration
- EPA Method 7E: Determination Of Nitrogen Oxides Emissions From Stationary Sources
- EPA Method 16A: Determination of total reduced sulfur emissions from stationary sources (impinge technique)
- EPA Method 8: Determination of sulfuric acid and sulfur dioxide emissions from stationary source (instrumental analyzer procedure)
- EPA Method SM 5220D: Chemical Oxygen Demand
- EUV 1007/2011Add:2011-12-21 Addendum to the Regulation (EC) No 1007/2011 of the European Parliament and of the Council of 27 September 2011 on textile fibre names and related labelling and marking of the fibre composition of textile products and repealing Council Directive 73/44/EEC and Directives 96/73/EC and 2008/121/EC of the European Parliament and of the Council
- Hach Method 8000 Oxygen Demand, Chemical Using Reactor Digestion Method
- ISO 105-A03 Technical Corrigendum 2:2005-10 Textiles - Tests for colour fastness - Part A03: Grey scale for assessing staining; correction 2
- ISO 6060:1998-10 Water quality; determination of the chemical oxygen demand
- ISO 6878:2004 Water quality — Determination of phosphorus — Ammonium molybdate spectrometric method
- ISO 7768:2009-05 Textiles - Test method for assessing the smoothness appearance of fabrics after cleansing
- ISO 8288:1986-03 Water quality; Determination of cobalt, nickel, copper, zinc, cadmium and lead; Flame atomic absorption spectrometric methods
- ISO 9174:1998-07 Water quality - Determination of chromium– Atomic absorption spectrometric methods
- ISO 10530:1992-09 Water quality; determination of dissolved sulphide; photometric method using methylene blue
- ISO 10708:1997-02 Water quality - Evaluation in an aqueous medium of the ultimate aerobic biodegradability of organic compounds - Determination of biochemical oxygen demand in a two-phase closed bottle test
- ISO 10849:1996 Stationary source emissions — Determination of the mass concentration of nitrogen oxides — Performance characteristics of automated measuring systems
- ISO 11480:2017-05 Pulp, paper and board - Determination of total chlorine and organically bound chlorine
- ISO 11564:1998 Stationary source emissions — Determination of the mass concentration of nitrogen oxides — Naphthylethylenediamine photometric method
- ISO 16000-3:2011-10 Indoor air - Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air - Active sampling method
- ISO 16000-6:2011-12 Indoor air - Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA® sorbent, thermal desorption and gas chromatography using MS or MS-FID
- ISO 16000-9:2006-02 Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method

- ISO 16000-11:2006-02 Indoor air - Part 11: Determination of the emission of volatile organic compounds from building products and furnishing - Sampling, storage of samples and preparation of test specimens
- ISO 17294-2:2016-07 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS) - Part 2: Determination of selected elements including uranium isotopes
- ISO 18254-1 Textiles - Method for the detection and determination of alkylphenol ethoxylates (APEO) - Part 1: Method using HPLC-MS (ISO 18254-1:2016); German version EN ISO 18254-1:2016
- ISO 18857-1 Water quality - Determination of selected alkylphenols - Part 1: Method for non-filtered samples using liquid-liquid extraction and gas chromatography with mass selective detection
- ISO 18857-2 Water quality - Determination of selected alkylphenols - Part 2: Gas chromatographic-mass spectrometric determination of alkylphenols, their ethoxylates and bisphenol A in non-filtered samples following solid-phase extraction and derivatisation
- Lange LCK 349 Phosphorus total / Phosphate ortho
- German Waste Water Ordinance (Abwasserverordnung) in the version published on 24 July 2009 (BGBl. I p. 2205), which was changed by the Ordinance from 3 August 2009 (BGBl. I P. 2630)
- NF T90-101:2021-02-13 Water quality - Determination of chemical oxygen demand (COD)
- NS 4725:3ED 1984 Water analysis - Determination of total phosphorus - Digestion by peroxodisulphate; superseded by NS-EN 1189:1996
- OECD No. 301 (1992) Ready Biodegradability
  - 301 A: DOC Die-Away
  - 301 B: CO<sub>2</sub> Evolution (Modified Sturm Test)
  - 301 C: MITI (I) (Ministry of International Trade and Industry, Japan)
  - 301 D: Closed Bottle
  - 301 E: Modified OECD Screening
  - 301 F: Manometric Respirometry
- OECD No. 302 B (1992) Zahn-Wellens / EMPA Test
- OECD No. 302 C (2009) Modified MITI Test (II)
- OECD No. 303 (2001) Simulation Test - Aerobic Sewage Treatment:
  - 303 A: Activated Sludge Units - 303 B: Biofilms
- OECD Nr. 308 (2002) Aerobic and Anaerobic Transformation in Aquatic Sediment Systems
- OECD No. 310 (2014) Ready Biodegradability - CO<sub>2</sub> in sealed vessels (Headspace Test)
- OECD No. 311 (2006) Anaerobic Biodegradability of Organic Compounds in Digested Sludge: By Measurement of Gas Production
- Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast)
- COUNCIL DIRECTIVE of 21 May 1991 concerning urban waste water treatment 91/271/EEC Table 1: Requirements for discharges from urban waste water treatment plants, the values for concentration or for the percentage of reduction shall apply
- SFS 3866 Determination of particulate emissions from stationary sources (Pölypäästön määrittäminen)
- SFS 5504 Veden kemiallisen hapen kulutuksen (COD Cr) määrittäminen suljetulla putkimenetelmällä. Hapetus dikromaatilla
- SFS 5505 Jäteveden epäorgaanisen ja orgaanisen typen määrittäminen. Modifioitu kjeldahlmenetelmä

- SFS-3026. Determination of total phosphorus in water. Digestion with peroxodi-sulfate
- SM 4500-H+B: pH Value in Water by Potentionmetry Using a Standard Hydrogen Electrode
- SN - NS 4748:1991 Water analysis - Determination of chemical oxygen demand in water - Oxidation with dichromate - (COD<sub>Cr</sub>)
- SN - NS 4859:1983 Air quality - Emission measurement - Manual determination of concentration of sulphur trioxide/sulphuric acid and sulphur dioxide in dustladen gases - Isopropanol method
- SS028142 Vattenundersökningar – Bestämning av kemisk oxygenförbrukning hos vatten – COD<sub>Cr</sub> oxidation med dikromat -[Determination of chemical oxygen demand in water – COD<sub>Cr</sub> oxidation with dichromate] (Svensk Standard No. SS028142), 2004. SIS - Standardisation Commission i Sweden, Stockholm
- VDI 3863 Sheet 1:1987-04 Measurement of gaseous emission; determination of acrylonitrile; gaschromatographic method; grab sampling
- VDI 3863 Sheet 2:1991-02 Gaseous emission measurement; determination of acrylonitrile; gas chromatographic method; sampling by absorption in low temperature solvents
- Regulation (EU) No. 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products
- Regulation (EU) No. 952/2013 of the European Parliament and of the Council of 9 October 2013 laying down the Union Customs Code
- Regulation (EC) No 1007/2011 of the European Parliament and of the Council of 27 September 2011 on textile fibre names and related labelling and marking of the fibre composition of textile products and repealing Council Directive 73/44/EEC and Directives 96/73/EC and 2008/121/EC of the European Parliament and of the Council
- Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, as well as amending Regulation (EC) No. 1907/2006 (CLP Regulation)
- Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC
- Regulation (EC) No 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labelling of organic products and repealing Regulation (EEC) No 834/2007 the Council

## Anhang B Accepted verification of examination reports of other certificates

DE UZ 154, 2023 Textiles	Fairtrade textile	EU Ecolabel (2014), as amended in 2017	Global Organic Textile Standard (GOTS)	bluesign® System	Made in Green by OEKO-TEX® (= "STeP" for production + "STANDARD 100" for end product)
1.4 Compliance with legal requirements	Yellow	Red	Red	Green	Green
3 Requirements					
3.1 General regulations	Green	Green	Green	Green	Green
3.2 Requirements for textile fibres	Yellow	Yellow	Yellow	Red	Red
3.2. Requirements for the origin of natural fibres, cellulose and other plant-based raw materials					
3.2.1.1 Requirements for the origin of natural fibres	Yellow	Yellow	Green	Red	Yellow
3.2.1.2 Requirements for the origin of cellulose and other plant-based raw materials a)	Red	Yellow	Yellow	Yellow	Yellow
3.2.1.2 Requirements for the origin of cellulose and other plant-based raw materials b)	Red	Red	Red	Yellow	Red
3.2.1.2 Requirements for the origin of cellulose and other plant-based raw materials c)	Red	Red	Yellow	Red	Red
3.2.2 Requirements for the production process for fibres					
3.2.2.1 Production of flax and other bast fibres	Red	Green	Green	Red	Red

<b>DE UZ 154, 2023 Tex- tiles</b>	<b>Fairtrade textile</b>	<b>EU Ecolabel (2014), as amended in 2017</b>	<b>Global Organic Textile Stand- ard (GOTS)</b>	<b>bluesign® System</b>	<b>Made in Green by OEKO-TEX® (= "STeP" for production + "STANDARD 100" for end product)</b>
3.2.2.2 Wool and other keratin fibres					
3.2.2.2.1 Requirements for waste water from wool scouring before mixing (indirect discharge)	Red	Green	Green	Red	Red
3.2.2.2.2 Requirements for waste water from wool scouring at the discharge point (direct discharge)	Red	Green	Green	Red	Red
3.2.2.2.3 Exclusion of washing agents containing alkylphenol ethoxylates (APEO)	Red	Yellow	Yellow	Green	Green
3.2.2.3 Regenerated fibres (viscose and lyocell fibres)					
3.2.2.3.1 Emissions to waste water in the production of cellulose	Red	Red	Yellow	Yellow	Yellow
3.2.2.3.2 Emissions to air in the production of cellulose	Red	Red	Yellow	Yellow	Yellow
3.2.2.3.3 Bleaching processes	Red	Yellow	Yellow	Yellow	Yellow
3.2.2.3.4 Energy consumption in the production of cellulose	Red	Red	Red	Yellow	Yellow
3.2.2.3.5 Halogen content	Red	Green	Yellow	Red	Red
3.2.2.3.6 Emissions to air	Red	Green	Yellow	Green	Red
3.2.2.3.7 Emissions to water in the production of viscose fibres	Red	Yellow	Yellow	Yellow	Red
3.2.2.4 Polyester fibres	Red	Yellow	Yellow	Red	Red
a) Amount of anti-mony	Red	Yellow	Green	Green	Green

<b>DE UZ 154, 2023 Tex- tiles</b>	<b>Fairtrade textile</b>	<b>EU Ecolabel (2014), as amended in 2017</b>	<b>Global Organic Textile Stand- ard (GOTS)</b>	<b>bluesign® System</b>	<b>Made in Green by OEKO-TEX® (= "STeP" for production + "STANDARD 100" for end product)</b>
b) Minimum content of PET that has been recycled from production and/or consumer waste	Red	Green	Yellow	Red	Red
c) Emissions of VOCs	Red	Green	Red	Green	Yellow
3.2.2.5 Polyacrylic fibres	Red	Green	Yellow	Red	Red
a) Fibres manufactured from production and/or consumer waste	Red	Green	Yellow	Red	Red
b) N2O Emissions	Red	Green	Red	Yellow	Red
3.2.2.6 Polyacrylic fibres					
3.2.2.6.1 Acrylonitrile	Red	Red	Green	Green	Red
3.2.2.6.2 Acrylonitrile emissions	Red	Green	Green	Green	Red
3.2.2.7 Elastane fibres					
3.2.2.7.1 Organotin compounds	Red	Green	Green	Green	Yellow
3.2.2.7.2 Aromatic diisocyanates	Yellow	Green	Red	Green	Red
3.2.2.8 Polypropylene fibres	Red	Green	Green	Yellow	Yellow
3.2.2.9 Elastolefin	Red	Red	Green	Green	Green
3.2.2.10 Requirement for recycled fibres	Red	Red	Yellow	Red	Red
3.2.3 Requirements for the biodegradability of auxiliaries and finishing agents for fibres and yarns					
3.2.3.1 Sizing preparations	Red	Green	Green	Red	Red
3.2.3.2 Spinning solution additives	Red	Green	Green	Red	Red
3.3 Requirements for the production process for laminates	Red	Yellow	Red	Green	Red
a) Textiles used	Red	Yellow	Red	Green	Red

<b>DE UZ 154, 2023 Tex- tiles</b>	<b>Fairtrade textile</b>	<b>EU Ecolabel (2014), as amended in 2017</b>	<b>Global Organic Textile Stand- ard (GOTS)</b>	<b>bluesign® System</b>	<b>Made in Green by OEKO-TEX® (= "STeP" for production + "STANDARD 100" for end product)</b>
b) Membranes used	Red	Yellow	Red	Yellow	Red
i) Recyclate share	Red	Red	Red	Red	Red
ii) Solvents	Red	Red	Red	Yellow	Yellow
c) Adhesives used	Red	Yellow	Red	Red	Red
d) Functional products	Red	Red	Red	Yellow	Yellow
3.4 Requirements for down and feathers from water fowl (geese and ducks)	Red	Red	Yellow	Yellow	Yellow
3.4.1 Requirements for waste water at the discharge point (direct discharge) in the pro- cessing of down and feathers	Yellow	Red	Red	Green	Yellow
3.4.2 Exclusion of washing agents con- taining alkylphenol ethoxylates (APEO)	Yellow	Red	Red	Green	Green
3.4.3 Hygiene require- ments	Red	Red	Red	Green	Red
3.5 Requirements for fillings	Red	Yellow	Yellow	Red	Yellow
3.5.1 Latex					
a) Hazardous sub- stances	Red	Red	Yellow	Red	Yellow
b) VOC emissions after 72 hours	Red	Red	Yellow	Yellow	Yellow
3.5.2 Polyurethane (PUR)					
3.5.2.1 Production of polyurethane					
3.5.2.1.1 Diisocya- nates	Yellow	Green	Red	Green	Red
3.5.2.1.2 Chlorofluo- rohydrocarbons (CFCs)	Red	Red	Red	Green	Green

<b>DE UZ 154, 2023 Tex- tiles</b>	<b>Fairtrade textile</b>	<b>EU Ecolabel (2014), as amended in 2017</b>	<b>Global Organic Textile Stand- ard (GOTS)</b>	<b>bluesign® System</b>	<b>Made in Green by OEKO-TEX® (= "STeP" for production + "STANDARD 100" for end product)</b>
3.5.2.1.3 Hazardous substances and mixtures, VOC emissions and blowing agents in PUR foam					
a) Hazardous substances and mixtures					
b) VOC emissions after 72 hours					
c) Blowing agents					
3.6 General requirements					
3.6.1 General exclusion of substances with certain properties					
a) List of candidates					
b) Limit values from ZDHC/MRSL					
c) H-Phrases					
d) Exception of contaminations					
e) Exception chemically reacted substances					
f) Exceptions Annex C and further exceptions possible after evaluation by UBA					

<b>DE UZ 154, 2023 Tex- tiles</b>	<b>Fairtrade textile</b>	<b>EU Ecolabel (2014), as amended in 2017</b>	<b>Global Organic Textile Stand- ard (GOTS)</b>	<b>bluesign® System</b>	<b>Made in Green by OEKO-TEX® (= "STeP" for production + "STANDARD 100" for end product)</b>
3.6.2 Special sub- stance requirements in finishing processes					
3.6.2.1 For all process steps					
3.6.2.1.1 Quaternary ammonium com- pounds	Red	Green	Green	Green	Green
3.6.2.1.2 Use of nano- materials	Green	Yellow	Green	Green	Red
3.6.2.1. Mineral oil- based defoamers	Red	Red	Red	Yellow	Red
3.6.2.2 In the pre- treatment process					
3.6.2.2.1 Chlorinated bleaching agents	Green	Yellow	Green	Yellow	Yellow
3.6.2.2.2 Enzymatic desizing agents and enzymatic surface modification	Red	Red	Yellow	Red	Red
3.6.2.3 In the dyeing process					
3.6.2.3.1 Mordant dyes containing chro- mium salts	Green	Green	Green	Green	Red
3.6.2.4 In the finishing process					
3.6.2.4.1 Biocidal and biostatic products	Green	Green	Green	Yellow	Yellow
3.6.2.4.2 Flame re- tardant materials	Yellow	Yellow	Yellow	Yellow	Yellow
3.6.2.4.3 Halogenated substances	Red	Yellow	Green	Green	Red
3.6.2.4.4 Perfluori- nated and polyfluori- nated chemicals (PCs)	Red	Green	Green	Yellow	Yellow
3.6.2.5 Volatile or- ganic compounds (VOC) used in impreg- nating, printing or coating	Red	Yellow	Yellow	Yellow	Yellow

<b>DE UZ 154, 2023 Tex- tiles</b>	<b>Fairtrade textile</b>	<b>EU Ecolabel (2014), as amended in 2017</b>	<b>Global Organic Textile Stand- ard (GOTS)</b>	<b>bluesign® System</b>	<b>Made in Green by OEKO-TEX® (= "STeP" for production + "STANDARD 100" for end product)</b>
3.6.3 Requirements for the degradability of textile auxiliaries	Yellow	Green	Green	Yellow	Yellow
3.6.4 Requirements for waste water from the textile finishing process					
3.6.4.1 Requirements for waste water at the discharge point (direct discharge)	Yellow	Yellow	Yellow	Yellow	Yellow
3.6.4.2 Requirements for waste water before mixing (direct and indirect discharge)	Yellow	Red	Yellow	Yellow	Yellow
3.6.5 Requirements for emissions to air in the textile finishing process					
3.6.5.1 Requirements for emissions to air in the textile finishing process in thermo-setting, thermosoling, coating, impregnating or finishing of textiles	Yellow	Yellow	Yellow	Green	Yellow
3.6.5.2 Requirements for emissions to air from firing systems in the textile finishing process	Yellow	Yellow	Yellow	Yellow	Green
3.6.6 Requirements for specific substances and testing of the end product	Red	Yellow	Yellow	Yellow	Red
3.6.6.1 Formaldehyde	Yellow	Green	Green	Yellow	Yellow

<b>DE UZ 154, 2023 Tex- tiles</b>	<b>Fairtrade textile</b>	<b>EU Ecolabel (2014), as amended in 2017</b>	<b>Global Organic Textile Stand- ard (GOTS)</b>	<b>bluesign® System</b>	<b>Made in Green by OEKO-TEX® (= "STeP" for production + "STANDARD 100" for end product)</b>
3.6.6.2 Extractable heavy metals	Red	Yellow	Green	Yellow	Yellow
3.6.6.3 Requirements for natural rubber	Red	Red	Yellow	Red	Red
3.6.6.4 Testing of accessories	Red	Yellow	Yellow	Green	Yellow
3.6.6.5 Chlorophenols	Yellow	Yellow	Green	Yellow	Yellow
3.6.6.6 Phthalates and plasticizers	Yellow	Yellow	Green	Green	Green
3.6.6.7 Organotin compounds	Green	Yellow	Green	Green	Yellow
3.6.6.8 Dyes	Yellow	Yellow	Green	Green	Green
3.6.6.9 Free aniline in jeans products	Red	Red	Yellow	Green	Yellow
3.6.6.10 Chlorinated benzenes and toluenes	Green	Green	Green	Green	Green
3.6.6.11 Polycyclic aromatic hydrocarbons	Red	Red	Green	Yellow	Yellow
3.6.6.12 Dimethylformamide, dimethylacetamide and N-methylpyrrolidone	Green	Yellow	Yellow	Green	Green
3.6.6.13 Alkylphenols and alkylphenol ethoxylates	Green	Yellow	Green	Green	Green

<b>DE UZ 154, 2023 Tex- tiles</b>	<b>Fairtrade textile</b>	<b>EU Ecolabel (2014), as amended in 2017</b>	<b>Global Organic Textile Stand- ard (GOTS)</b>	<b>bluesign® System</b>	<b>Made in Green by OEKO-TEX® (= "STeP" for production + "STANDARD 100" for end product)</b>
3.6.6.14 Perfluorinated and polyfluorinated chemicals (PFCs) in hydrophobized tex-tiles	Red	Yellow	Green	Green	Green
3.6.6.15 Chino-line/quinoline	Red	Red	Green	Green	Green
3.6.6.16 Pesticides in textiles containing recycled cotton/wool	Yellow	Yellow	Green	Green	Yellow
3.7 Textile products designed for food contact	Red	Yellow	Yellow	Red	Red
3.8 Requirements for energy and water consumption	Green	Yellow	Green	Green	Green
3.9 Requirements for energy sources	Red	Red	Green	Green	Green
3.10 Requirements for waste	Yellow	Yellow	Yellow	Green	Green
3.11 Energy efficiency techniques used during washing, rinsing and drying	Red	Green	Red	Yellow	Yellow
3.12 Fitness for use					
3.12.1 Change in dimensions during washing and drying	Red	Yellow	Yellow	Red	Red
3.12.2 Colour fastness to washing	Red	Green	Green	Red	Yellow
3.12.3 Colour fastness to perspiration (acid, alkaline)	Red	Green	Green	Green	Green
3.12.4 Colour fastness to rubbing	Red	Yellow	Green	Red	Yellow
3.12.5 Colour fastness to light	Red	Green	Yellow	Red	Red
3.12.6 Colour fastness to saliva	Red	Red	Green	Green	Green

<b>DE UZ 154, 2023 Tex- tiles</b>	<b>Fairtrade textile</b>	<b>EU Ecolabel (2014), as amended in 2017</b>	<b>Global Organic Textile Stand- ard (GOTS)</b>	<b>bluesign® System</b>	<b>Made in Green by OEKO-TEX® (= "STeP" for production + "STANDARD 100" for end product)</b>
3.12.7 Fabric resistance to pilling and abrasion					
3.12.8 Durability of function					
a) Water repellent function					
b) Flame retardant functions					
c) Easy care function (also non-crease or permanent press)					
3.12.9 Abrasion resistance					
3.12.10 Strength of zip and hook-and-loop fasteners					
3.13 Packaging					
3.13.1 General packaging requirements					
3.13.2 Special requirements for packaging made of paper, paperboard and cardboard					
3.13.3 Special requirements for packaging made of plastic					
3.14 Consumer information					
3.15 Working conditions					
3.15.1 Social and human rights requirements for the recognition of certification labels for manufacturing (B.1) according to the Green Button 2.0					

<b>DE UZ 154, 2023 Textiles</b>	<b>Fairtrade textile</b>	<b>EU Ecolabel (2014), as amended in 2017</b>	<b>Global Organic Textile Standard (GOTS)</b>	<b>bluesign® System</b>	<b>Made in Green by OEKO-TEX® (= "STeP" for production + "STANDARD 100" for end product)</b>
3.15.2 Social and human rights requirements for the recognition of certification labels for wet processes (B.2) according to the Green Button 2.0	Yellow	Red	Yellow	Green	Green
3.16 Restriction on the processing of denim	Green	Yellow	Yellow	Yellow	Yellow

## **Anhang C Measurement of emissions to waste water in the production of cellulose**

Measurement of emissions to waste water must be carried out on unfiltered and unsettled samples, either after preparation at the production plant or after preparation at an urban waste water treatment plant.

The measurements must be carried out over a production period of 12 months. The frequency of the measurements must be at least monthly (once a month). In the case of new or renovated production plants, the measurements must be based on at least 45 consecutive days of continuous plant operation. The measurements must be representative for the relevant periods.

Accepted test methods include:

- CSB ISO 6060, ISO 15705, NS 4748, SFS 5504, SS 028142, DIN 38409 part 41, NFT 90101, ASTM D 1252 83, EPA SM 5220D or HACH 8000
- Total-N: EN ISO 11732, EN 10304-2, EN ISO 13395, SFS 5505, SS 0280101
- Total-P: ISO 6878, SS 028102, SFS 3026, NS 4725, EN 1189:1993, SM4500, APAT IRSA CNR 4110 or Dr Lange LCK 349
- An equivalent test method whose scope and requirement standards is equivalent to one of the named national and international standards or one of the named standards. The equivalence of the certification system must be confirmed by an independent environmental verifier.
- Alternatively, individual verifications in accordance with the criteria and verification requirements of one of the named test methods may be presented if an equivalent level of protection can be achieved. The equivalence of the individual verifications must be confirmed by an independent environmental verifier.

## **Anhang D Measurement of emissions to air in the production of cellulose**

The measurements of the emissions to air are carried out over a production period of 12 months. The frequency of the measurements must be at least monthly (once a month). Emissions associated with the generation of electrical energy do not need to be taken into account. The sulphur emissions associated with the generation of heating energy from oil, coal and other external fuels with known S-contents can be measured or calculated and must be taken into account. In the case of new or renovated production plants, the measurements must be based on at least 45 consecutive days of continuous plant operation. The measurements must be representative for the relevant periods.

Accepted test methods include:

- ♦ Gaseous sulphur compounds: NS 4859, SFS 5265, SS 028421, EPA 8, EPA 16A
- ♦ NO<sub>x</sub>: ISO 11564, ISO 10849, EN 14792, SS 028425, EPA 7E
- ♦ Dust: EN 13284-1, SFS 3866
- ♦ An equivalent test method whose scope and requirement standards is equivalent to one of the named national and international standards or one of the named standards. The equivalence of the certification system must be confirmed by an independent environmental verifier.
- ♦ Alternatively, individual verifications in accordance with the criteria and verification requirements of one of the named test methods may be presented if an equivalent level of protection can be achieved. The equivalence of the individual verifications must be confirmed by an independent environmental verifier.

## **Anhang E Calculation of the emissions to air in the textile finishing process**

The textile finisher should calculate the emissions before using a recipe in order to ensure that they are using recipes with the lowest possible emissions. It is necessary to calculate the total organic carbon emissions and also the emissions of specific critical substances if they are relevant in the textile auxiliary. This process is carried out with the aid of emission factors, which must be provided by the supplier of the textile auxiliary. This information can sometimes be found in the safety data sheet but usually it is necessary to specifically ask the supplier to provide it. These emission factors are usually provided separately for cotton (as a representative example of polar fibres) and polyester (as a representative example of non-polar fibres) because the finishing temperatures are different. The textile finisher should use the most suitable emission factor in each case.

The substance emission factor is defined as the amount of substance in grams that may be emitted under defined process conditions (curing time, temperature, substrate) by 1 kg of the textile auxiliary.

A differentiation is made between the following emission factors:

$f_c$  = Emissions of organic substances, given in total carbon per kg of textile auxiliary

$f_s$  = Emission factor for a specific substance, given in g of the substance per kg of textile auxiliary

Substance emission factors must be provided for carcinogenic, mutagenic or reprotoxic substances, other critical organic substances such as formaldehyde and gaseous inorganic substances such as ammonia.

### **1 Calculation of the product-related emission factors from the substance emission factors:**

$$\mathbf{WF_c = \Sigma(FA \times FK \times f_c) \text{ and}} \\ \mathbf{WF_s = \Sigma(FA \times FK \times f_s)}$$

THM: Textile auxiliary

WF<sub>c</sub>: Product-related emission factor in g of total carbon per kg of textile material or

WF<sub>s</sub>: Product-related emission factor in g of substance per kg of textile material

FA: Liquor pickup in kg of liquor per kg of textile material

FK: Liquor concentration in g of textile auxiliary per kg of liquor

$f_c$ : Total carbon substance emission factor in g of total carbon per gram of textile auxiliary  
or

$f_s$ : Substance emission factor in g of substance per gram of textile auxiliary

Calculation of the product-related emission factors for two formulas (by way of example):

Liquor	Auxiliary material	FK [g/kg]	FA [kg/kg]	Substrate	T [°C]	fs [g/g]	fc [g/g]	FK*FA* fs	FK*FA* fc	WFs [g/kg]	WFc [g/kg]
Formula 1	Fatty acid ester	20	0.65	CO	170	-	0.0152		0.2	-	-
	Polysiloxane	20	0.65	CO	170	-	0.0052	-	0.07	-	-
	Reactant crosslinking agent with catalyst	100	0.65	CO	170	0.0041 FO	0.0009	0.27 FO	0.06	-	-
	Stearyl urea derivative with catalyst	20	0.65	CO	170	0.0165 FO	0.0162	0.21 FO	0.21	-	-
Total 1		-	-	-	-	-	-	-	0.48 FO	0.54	
Formula 2	Softening agent	50	1	CO	150	-	0.005		0.25	-	-
	Crease-resistant finish (formaldehyde-free)	12	1	CO	150	-	0.010	-	0.12	-	-
	Catalyst	12	1	CO	150	-	0.008	-	0.1	-	-
Total 2									-	0.47	

FK: Liquor concentration in g of textile auxiliary per kg of liquor

FA: Liquor pickup in kg of liquor per kg of textile substrate

Substrate: Textile goods to be finished

T: Finishing temperature in °C,

fs: Substance emission factor of an auxiliary in g of substance per g of auxiliary,

fc: Total carbon emission factor of an auxiliary in g of organic carbon per g of auxiliary

WFs: Product-related emission factor for a recipe in g of textile material per kg of textile substrate =  $\Sigma(\text{FK} \cdot \text{FA} \cdot \text{fs})$  (summable within the same substance class)

WFc: Product-related total carbon emission factor for a recipe in g of C per kg of textile substrate =  $\Sigma(\text{FK} \cdot \text{FA} \cdot \text{fc})$

FO: Formaldehyde

## 2 Calculation of the product-related emission factors from the measured concentrations:

The air/product ratio (LWV) in m<sup>3</sup>/kg is firstly calculated from the measured waste gas flow (V) (in m<sup>3</sup>/h) of all emission points of a thermal treatment unit and the product throughput (W) (in kg/h):

$$LWV = V/W$$

If multiple thermal treatment units are connected to a waste gas cleaning plant, the weighted LWV is determined by dividing the total waste gas flow by the total product throughput.

The product-relevant emission factors can then be calculated from the measured mass concentrations of the emissions, multiplied by the measured air/product ratio.

$$WF_c = LWV \times \Sigma c_c \text{ or } WF_s = LWV \times \Sigma c_s$$

WF<sub>c</sub>: Product-related emission factor in g of total carbon per kg of textile material

WF<sub>s</sub>: Product-related emission factor in g of substance per kg of textile material

LWV: Air/product ratio in m<sup>3</sup> of waste gas per kg of textile material

c<sub>c</sub>: measured concentration in g of total carbon per m<sup>3</sup> of waste gas

c<sub>s</sub>: measured concentration in g of substance per m<sup>3</sup> of waste gas

## **Anhang F Exemptions to Paragraph 3.6.1 Letter f)**

Upon evaluation by the German Environment Agency (Umweltbundesamt), further exemptions from requirement c) may be adopted in accordance with Paragraph 3.6.1, Letter f), provided that these are technologically non-substitutable substances and consumer safety continues to be guaranteed.

The following are exempt from regulation c):

There are currently no exemptions.

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## Anhang G Limits for emissions to air from firing systems

The following requirements do not apply to systems that are only used in emergency situations and are operated for less than 500 operating hours per year.

The emission limits refer to a volume content of oxygen in waste gas of:

3 percent for liquid or gaseous fuel;

6 percent for solid fuel;

15 percent for gas turbine systems and diesel generators.

Waste gas in the sense of these requirements is the carrier gas with the solid, liquid or gaseous emissions, given as the waste gas volumes in a standard state, temperature 273.15 Kelvin (K), pressure 101.3 Kilopascal (kPa), after deduction of the dampness content of the steam.

The carbon monoxide (CO) emissions in the waste gas may not exceed the following mass concentrations:

Parameter	Limit values in mg/Nm <sup>3</sup>
<b>CO for systems with a heating capacity of between 0.3 and 2 MW</b>	
Solid fuel	100
Liquid fuel	700
Gaseous fuel	500
<b>CO for systems with a heating capacity greater than 2 MW</b>	
Solid fuel	800
Liquid fuel	500
Gaseous fuel	500
<b>CO for gas turbines</b>	
Gaseous fuel	500
<b>CO for gas/diesel generators greater than 0.3 MW</b>	
Gaseous fuel	500
Diesel	500

The emissions of sulphur dioxide and sulphur trioxide (SO<sub>x</sub>) in the waste gas may not exceed the following mass concentrations, given as sulphur dioxide (SO<sub>2</sub>):

Parameter	Limit values in mg/Nm <sup>3</sup>
<b>SO<sub>2</sub> for systems with a heating capacity of between 0.3 and 50 MW</b>	
Solid fuel	750
Liquid fuel	650
Gaseous fuel	100
<b>SO<sub>2</sub> for systems with a heating capacity greater than 50 MW</b>	
All fuels	650
<b>SO<sub>2</sub> for gas turbines</b>	
Gaseous fuel	1300
<b>SO<sub>2</sub> for gas/diesel generators greater than 0.3 MW</b>	
Gaseous fuel	200
Diesel	900

The emissions of nitrogen monoxide and nitrogen dioxide (NO<sub>x</sub>) in the waste gas may not exceed the following mass concentrations, given as nitrogen dioxide (NO<sub>2</sub>):

Parameter	Limit values in mg/Nm <sup>3</sup>
<b>NO<sub>x</sub> for systems with a heating capacity greater than or equal to 0.3 MW</b>	
Solid fuel	650
Liquid fuel	650
Gaseous fuel	300
<b>NO<sub>x</sub> for gas turbines</b>	
Gaseous fuel	500
<b>NO<sub>x</sub> for gas/diesel generators greater than 0.3 MW</b>	
Gaseous fuel	500
Diesel	1000

The emissions of total dust in the waste gas may not exceed the following mass concentrations:

Parameter	Limit values in mg/Nm <sup>3</sup>
<b>Total dust for systems with a heating capacity of between 0.3 and 10 MW</b>	
Solid fuel	200
Liquid fuel	200
Gaseous fuel (except natural gas)	50
<b>Total dust for systems with a heating capacity greater than 10 MW</b>	
Solid fuel	150
Liquid fuel	150
Gaseous fuel (except natural gas)	50
<b>Total dust for gas/diesel generators greater than 0.3 MW</b>	
Gaseous fuel (except natural gas)	150
Diesel	150

## **Anhang H Phthalates and plasticizers according to 3.6.6.6, dyes according to 3.6.6.8, chlorinated benzenes and toluenes according to 3.6.6.10, perfluorinated and polyfluorinated compounds according to 3.6.6.14 and pesticides according to 3.6.6.16**

### **1 Phthalates and plasticizers**

In accordance with Paragraph 3.6.6.6, it is not permitted to use the following phthalates in coated or printed materials or in flexible foams and accessories made of plastic:

- BBP (butylbenzylphthalate)
- DBP (dibutylphthalate)
- DEHP (di-ethylhexyl phthalate)
- DMEP (di-(2-ethylhexyl)phthalate)
- DIHP (di-C6-8-branched alkylphthalates, C7 rich)
- DHNUP (di-C7-11-branched and linear alkylphthalates)
- DCHP (di-cyclohexylphthalat), DHxP (di-hexylphthalate, branched and linear)
- DIBP (di-isobutylphthalate)
- DIDP (di-isodecylphthalate)
- DIHxP (di-iso-hexylphthalate)
- DINP (di-isononylphthalate)
- DHP (di-n-hexylphthalate)
- DNOP (di-n-octylphthalate)
- DPP (di-pentylphthalate (N-,iso-, or mixed))
- TCEP (Tris(2-chlorethyl)phosphate)

### **2 Azo dyes that may cleave to any one of the following aromatic amines (according to Directive 2002/61/EC)**

- 4-aminobiphenyl (92-67-1)
- benzidine (92-87-5)
- 4-chloro-o-toluidine (95-69-2)
- 2-naphtylamine (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-chloro-aniline) (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 (95-68-1)
- 2,6-xylidine (87-62-7)
- 

### **Dyes that are carcinogenic, mutagenic or toxic to reproduction**

- C.I. Basic Red 9
- C.I. Disperse Blue 1
- C.I. Acid Red 114
- 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 Blue 15
- C.I. Direct Brown 95
- C.I. Direct Red 28
- C.I. Disperse Yellow 3
- Disperse Yellow 23
- Disperse Orange 149
- Solvent Yellow 1
- Solvent Yellow 3
- Basic Blue 26 (with  $\geq 0.1\%$  Michler's ketone or base)
- Basic Green 4 (oxalate, chloride or free)
- Basic Violet 3 (with  $\geq 0.1\%$  Michler's ketone or base)
- Pigment Red 104
- Pigment Yellow 34

### **Potentially sensitizing dispersion dyes**

(based on Decision 2014/350/EU (EU-UZ for textile products):

- C.I. Disperse Blue 1
- C.I. Disperse Blue 3
- C.I. Disperse Blue 7
- C.I. Disperse Blue 26
- 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. Disperse Orange 3
- C.I. Disperse Orange 76 (previously designated Orange 37)
- C.I. Disperse Red 1
- C.I. Disperse Red 11

- C.I. Disperse Red 17
- C.I. Disperse Yellow 1
- C.I. Disperse Yellow 3
- C.I. Disperse Yellow 9
- C.I. Disperse Yellow 39
- C.I. Disperse Yellow 49

### 3 Chlorinated benzenes and toluenes

- In accordance with Paragraph 3.6.6.10, it is not permitted to use the following chlorinated benzenes and toluenes in dyed chemical fibres:
- Chlorobenzenes
- Dichlorobenzenes
- Trichlorobenzenes
- Tetrachlorobenzenes
- Pentachlorobenzenes
- Hexachlorobenzenes
- Chlorotoluenes incl. benzylchloride
- Dichlorotoluenes
- Trichlorotoluenes
- Tetrachlorotoluenes
- Pentachlorotoluene
- 

### 4 PFCs, Per- und polyfluorierte Verbindungen / PFCs, Per- and polyfluorinated compounds

•	CAS no.	Acronym	Limits
Perfluorooctansulfonsäure und -sulfonate / Perfluorooctane sulfonic acid and sulfonates	1763-23-1, et. al.	PFOS	1 µg/m <sup>2</sup>
Perfluorooctansulfonamid / Perfluorooctane sulfonamide	754-91-6	PFOSA	1 µg/m <sup>2</sup>
Perfluorooctansulfonfluorid / Perfluorooctane sulfonfluoride	307-35-7	PFOSF / POSF	1 µg/m <sup>2</sup>
N-Methyl perfluorooctan sulfonamid / N-Methyl perfluorooctane sulfonamide	31506-32-8	N-Me-FOSA	1 µg/m <sup>2</sup>
N-Ethyl perfluorooctan sulfonamid / N-Ethyl perfluorooctane sulfonamide	4151-50-2	N-Et-FOSA	1 µg/m <sup>2</sup>
N-Methyl perfluorooctan sulfonamid ethanol / N-Methyl perfluorooctane sulfonamide ethanol	24448-09-7	N-Me-FOSE	1 µg/m <sup>2</sup>
N-Ethyl perfluorooctan sulfonamid ethanol / N-Ethyl perfluorooctane sulfonamide ethanol	1691-99-2	N-Et-FOSE	1 µg/m <sup>2</sup>
Perfluorheptansäure und Salze / Perfluoroheptanoic acid and salts	375-85-9, et. al.	PFHpA	0.025 mg/kg
Perfluorooctansäure und Salze / Perfluorooctanoic acid and salts	335-67-1, et. al.	PFOA	0.025 mg/kg

•	CAS no.	Acronym	Limits
Perfluornonansäure und Salze / Perfluorononanoic acid and salts	375-95-1, et.al.	PFNA	0.025 mg/kg
Perfluordecansäure und Salze / Perfluorodecanoic acid and salts	335-76-2, et. al.	PFDA	0.025 mg/kg
Henicosaf fluorundecansäure und Salze / Henicosaf fluoroundecanoic acid and salts	2058-94-8, et. al.	PFUdA	0.025 mg/kg
Tricosaf fluorododecansäure und Salze / Tricosaf fluorododecanoic acid and salts	307-55-1, et. al.	PFDoA	0.025 mg/kg
Pentacosaf fluorotridecansäure und Salze / Pentacosaf fluorotridecanoic acid and salts	72629-94-8, et. al.	PFTrDA	0.025 mg/kg
Heptacosaf fluorotetradecansäure und Salze / Heptacosaf fluorotetradecanoic acid and salts	376-06-7, et. al.	PFTeDA	0.025 mg/kg

#### Weitere perfluorierte Carboxylsäuren / Further Perfluorinated carboxylic acids

Name	CAS no.	Acronym	Limits
Perfluorbutansäure und Salze / Perfluorobutanoic acid and salts	375-22-4, et. al.	PFBA	0.025 mg/kg
Perfluorpentansäure und Salze / Perfluoropentanoic acid and salts	2706-90-3, et. al.	PFPeA	0.025 mg/kg
Perfluorhexansäure und Salze / Perfluorohexanoic acid and salts	307-24-4, et. al.	PFHxA	0.025 mg/kg
Perfluor(3,7-dimethyloctansäure) und Salze / Perfluor(3,7-dimethyloctanoic acid) and salts	172155-07-6, et. al.	PF-3,7-DMOA	0.025 mg/kg

#### Perfluorierte Sulfonsäuren / Perfluorinated sulfonic acids

Name	CAS no.	Acronym	Limits
Perfluorbutansulfonsäure und Salze / Perfluorobutane sulfonic acid and salts	375-73-5, 59933-66-3, et. al.	PFBS	0.025 mg/kg
Perfluorhexansulfonsäure und Salze / Perfluorohexane sulfonic acid and salts	355-46-4, et. al.	PFHxS	0.025 mg/kg
Perfluorheptansulfonsäure und Salze / Perfluoroheptane sulfonic acid and salts	375-92-8, et. al.	PFHpS	0.025 mg/kg
Henicosaf fluorodecansulfonsäure und Salze / Henicosaf fluorodecane sulfonic acid and salts	335-77-3, et. al.	PFDS	0.025 mg/kg

#### Teilweise fluorierte Carbon- / Sulfonsäuren / Partially fluorinated carboxylic / sulfonic acids

Name	CAS no.	Acronym	Limits
7H-Perfluorheptansäure und Salze / 7H-Perfluoroheptanoic acid and salts	1546-95-8, et. al.	7HPFHpA	0.025 mg/kg
2H,2H,3H,3H-Perfluorundecansäure und Salze / 2H,2H,3H,3H-Perfluoroundecanoic acid and salts	34598-33-9, et. al	4HPFUnA	0.025 mg/kg

Name	CAS no.	Acronym	Limits
1H,1H,2H,2H-Perfluorooctansulfonsäure und Salz / 1H,1H,2H,2H-Perfluorooctane sulfonic acid and salts	27619-97-2, et. al.	1H,1H,2H,2H-PFOS	0.025 mg/kg

#### PFOA-bezogene Stoffe / PFOA related Substances

Name	CAS no.	Acronym	Limits
1H,1H,2H,2H-Perfluordecyl acrylat / 1H,1H,2H,2H-Perfluordecyl acrylate	27905-45-9	8:2 FTA	0.025 mg/kg
1H,1H,2H,2H-Perfluor-1-decanol / 1H,1H,2H,2H-Perfluoro-1-decanol	678-39-7	8:2 FTOH	0.025 mg/kg
Perfluorooctanethylsulfonsäure / Perfluorooctylethyl-sulphonic Acid	39108-34-4, et. al.	8:2 FTS	0.025 mg/kg

## 5 Pesticides

In accordance with Paragraph 3.6.6.16, textiles containing > 5% of recycled cotton/wool or yarn by mass, which is produced from, amongst other things, residues from the agricultural, timber and food industries, the value for glyphosate and salts<sup>74</sup> may not exceed 5 mg/kg and the sum of the following pesticides may not exceed 0.5 mg/kg:

- 2,4,5-T (93-76-5)
- 2,4-D (94-75-7)
- Acetamiprid (135410-20-7, 160430-64-8)
- Aldicarb (116-06-3)
- Aldrin (309-00-2)
- Azinophosethyl (2642-71-9)
- Azinophos-methyl (86-50-0)
- Bromophos-ethyl (4824-78-6)
- Captafol (2425-06-1)
- Carbaryl (63-25-2)
- Chlorobenzilate (510-15-6)
- Chlordane (57-74-9)
- Chlordimeform (6164-98-3)
- Chlorfenvinphos (470-90-6)
- Clothianidin (210880-92-5)
- Coumaphos (56-72-4)
- Cyfluthrin (68359-37-5)
- Cyhalothrin (91465-08-6)
- Cypermethrin (52315-07-8)
- DEF (78-48-8)

<sup>74</sup> Glyphosate is the biologically active main component in a total herbicide, which the chemical company Monsanto sells under the name RoundUp. The different RoundUp products differ based on their salt formulations, medium (solution or granulate) and glyphosate concentration. Example formulations include Glyphosate Ammonium Salt (CAS no. 40465-66-5) and Glyphosate Isopropylamine Salt (CAS no. 38641-94-0).

Source: <https://www.chemie.de/lexikon/Glyphosat.html>, last accessed on 21.12.2022

- Deltamethrin (52918-63-5)
- DDD (53-19-0, 72-54-8)
- DDE (3424-82-6, 72-55-9)
- DDT (50-29-3, 789-02-6)
- Diazinon (333-41-5)
- Dichlorprop (120-36-5)
- Dicrotophos (141-66-2)
- Dieldrin (60-57-1)
- Dimethoat (60-51-5)
- Dinoseb, salts and acetates (88-85-7 et al.)
- Dinotefuran (165252-70-0)
- Endosulfan,  $\alpha$ - (959-98-8)
- Endosulfan,  $\beta$ - (33213-65-9)
- Endrin (72-20-8)
- Esfenvalerate (66230-04-4)
- Fenvalerate (51630-58-1)
- Heptachlor (76-44-8)
- Heptachlor epoxide (1024-57-3)
- Hexachlorobenzene (118-74-1)
- Hexachlorocyclohexane,  $\alpha$ - (319-84-6)
- Hexachlorocyclohexane,  $\beta$ - (319-85-7)
- Hexachlorocyclohexane,  $\delta$ - (319-86-8)
- Imidacloprid (105827-78-9, 138261-41-3)
- Isodrin (465-73-6)
- Kelevan (4234-79-1)
- Chlordecone (kepone) (143-50-0)
- Lindane (58-89-9)
- Malathion (121-75-5)
- MCPA (94-74-6)
- MCPB (94-81-5)
- Mecoprop (93-65-2)
- Metamidophos (10265-92-6)
- Methoxychlor (72-43-5)
- Mirex (2385-85-5)
- Monocrotophos (6923-22-4)
- Nitenpyram (150824-47-8)
- Parathion (56-38-2)
- Parathion-methyl (298-00-0)
- Perthane (72-56-0)
- Phosdrin/Mevinphos (7786-34-7)
- Phosphamidon (13171-21-6)
- Propethamphos (31218-83-4)
- Profenophos (41198-08-7)
- Strobane (8001-50-1)
- Quinalphos (13593-03-8)
- Telodrin (297-78-9)
- Thiacloprid (111988-49-9)

- Thiamethoxam (153719-23-4)
- Toxaphene (Camphechlor) (8001-35-2)
- Trifluralin (1582-09-8)