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Development of EU Ecolabel Criteria for Sanitary Products

Technical Report – Draft v.1

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Development of EU Ecolabel Criteria for Absorbent Hygiene Products

(formerly referred to as “sanitary products”)

Technical Report – Draft v.1

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In order to provide an incentive for the improvement of the environmental performance of AHPs, manufacturers could commit on reducing the environmental burdens of their products, as required within the Carbon Reduction Label. However, this would not ensure that the environmental performance of the product is superior to that of

other products on the market. Moreover, even in this case the finalisation of the EC's Product Environmental Footprint methodology should be awaited. 53

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List of Acronyms

ABL	absorption before leakage
ADL	acquisition and distribution layers
AHP	absorbent hygiene products
AOX	adsorbable organic halogen compounds
CS_2	carbon disulfide
CHP	Combined heat and power plant
CLP	Classification, labelling and packaging
COD	hemical oxygen demand
CSA	Canadian Standards Association
CTMP	Chemi-Thermo-Mechanical pulp
ECF	Elemental Chlorine Free
ECOCERT	Organisme de contrôle 6 de certification au service de l´homme et de l'environnement
EPD	Environmental Product Declaration
EU	European Union
ESP	Electrostatic precipitator
FF	Fabric filter
FSC	Forest Stewardship council
GmbH	Gesellschaft mit beschränkter Haftung (company with limited liability)
GOTS	Global organic textile standard
H_2SO_4	Sulfuric acid
HRIPT	Human Repeat Insult Patch Test
IPTS	Institute for Prospective Technological Studies
ISO	International Organization for Standardization

JRC	Joint Research Centre
LCA	life cycle assessment
LDPE	low density polyethylene
NaOH	Sodium hydroxide
NaOCl	Sodium hypochlorite
NOx	Nitrous oxides
P	Phosphorus
PCR	product category rules
PE	polyethylene
PEFC	Programme for the Endorsement of Forest Certification Schemes
PET	polyethylene terephtalate
PP	polypropelene
PU	polyurethane
REACH	Registration, Evaluation, Authorisation and Restriction of Chemical substances
S	Sulphur
SAF	superabsorbent fibres
SAP	superabsorbent polymers
SFI	Sustainable Forestry Initiative
SVHC	substances of very high concern
TCF	Totally Chlorine Free
TEWL	Transepidermal water loss
TMP	Thermomechanical pulp
Zn	Zinc

1. Introduction

The Institute for Prospective Technological Studies (IPTS) delivers scientific and interdisciplinary analyses with the overall goal of supporting the EU policy-making process. In particular, the services of the Sustainable Consumption and Production Unit within the IPTS include providing socio-economic analyses with regards to key aspects of sustainable consumption and performing techno-economic and environmental impact assessment of technologies, products and processes.

The aim of this project is to develop EU Ecolabel criteria for absorbent hygiene products (AHP).

Please note that the product scope initially referred to "sanitary products". However, during the course of this project, it was recommended by stakeholders to change the name to "absorbent hygiene products (AHP)".

The implementation of the EU Ecolabel scheme will assist in the reduction of negative impacts of consumption and production on the environment, on human health and natural resources. The project is led by the Joint Research Centre's Institute for Prospective Technological Studies (JRC-IPTS) with the technical support of DEKRA Consulting GmbH together with PE INTERNATIONAL.

The preliminary report delivered for this project outlines the scientific basis for the development of EU Ecolabel criteria for AHP. It contains the following information:

- An initial scoping document provides the rationale for the products to be included in this project;
- A review of existing legislation, standards and environmental schemes outlines rules, requirements and criteria currently in existence for the relevant products;
- A market analysis for the products within the scope of this project assists in understanding the economic relevance of the selected AHPs;
- A technical analysis providing information on the composition and functionality of AHPs, describing production processes and the main materials needed for the manufacture of AHPs and providing insights on the potential environmental burdens associated with AHPs over their entire life cycle.

In order to award AHPs with an EU Ecolabel, a set of criteria has to be defined. Based on the information contained in the preliminary report, an initial set of criteria was developed. This initial set of criteria was screened considering factors such as the environmental relevance for AHPs over their life cycle on an LCA basis, potential impacts on human health, requirements outlined in the current regulation for EU Ecolabels (EC 66/2010), the effectiveness and

feasibility of a certain criterion, also in terms of measuring, declaration and verification as well as the direct influence of manufacturers to improve the sustainability performance of their products. Feedback gained through stakeholder consultations was considered and discussed.

This report outlines the list of criteria currently proposed for the EU Ecolabel for AHPs. A definition for the product scope is provided in Section 2 and, then, each draft criterion is presented, including: rationale; evaluation of technical feasibility, potential costs and benefits; assessment and verification methods; preliminary proposal of the criteria text. Where suitable, the relevant criteria thresholds are also described.

Companies wishing to apply for the EU Ecolabel will have to provide evidence that they fulfil the criteria for a particular product and will then be awarded the right to display the EU Ecolabel logo on their product or packaging.

2. Definition of the product group scope

In accordance with the product scope as defined in the preliminary report (Sections 2.4), the following definition is proposed for the product group scope:

1. The product group "adsorbent hygiene products" shall include products which:
   a. Are used for the physical and direct collection of human body waste streams and
   b. Are composed of a mix of natural fibres and polymers, with the fibre content lower than 90% by weight and
   c. Are disposable.

2. The product group shall comprise:
   a. all kinds of children's diapers
   b. all kinds of sanitary pads/napkins and panty liners
   c. all kinds of tampons
   d. breast pads

3. The product group shall not comprise incontinence products and any other type of products falling under the scope of the Council Directive 93/42/EEC 14 June 1993 concerning medical devices.

3. List of Proposed Criteria for the EU Ecolabel of Absorbent Hygiene Products

The following EU Ecolabel criteria are suggested for AHPs:

Table 1. Overview of criteria areas and individual criteria suggested for EU Ecolabel for AHPs

Criteria area	***Individual criteria***
1) Fitness for use	a. Consideration of aspects related to the technical performance of the product
2) Materials	a. Consumption of materials b. Production and supply of: • Fluff pulp; • Viscose; • Cotton; • Polymers • Other materials
3) Manufacture of AHPs	a. Minimisation of the production waste
4) End-of-life	No criteria identified
5) Environmental performance	No criteria identified
6) Use of substances in the product	a. Compliance with Art. 6.6 and 6.7 of the EU Ecolabel regulation

4. EU Ecolabel criteria proposal

4.1 Fitness-for-use

Rationale and technical feasibility

The AHP awarded with an EU Ecolabel must provide performance characteristics which are state-of-the-art within the product group and which are therefore adequate for the needs of the consumers.

One of the goals of the EU Ecolabel is that an improved environmental performance of a product does not come at the cost of a reduced product performance. Otherwise, this could lead to an increased consumption of units of products which could ultimately result in an off-set of the environmental benefits potentially associated with that type of product. A number of performance characteristics were screened in order to understand the main functionalities that the products within the scope of this project would need to fulfil.

Based on stakeholder consultation, the following parameters are identified as the most important to describe the performance of the products:

- Overall performance
- Absorption capacity under pressure;
- Moisture retention;
- Leakage protection;
- Skin dryness and compatibility;
- Fit and comfort;
- Odour control; and
- Dermatological testing

With regards to the abovementioned parameters, manufacturer shall provide evidence that the products registered for the EU Ecolabel fulfil an good level of performance which is acceptable to the majority of AHP consumers.

Tests are regularly carried out among manufacturers and have been under development for a long time. However, according to stakeholders involved in this project, no harmonised standards or widely accepted industry methods are available, at the moment, to test the most important performance characteristics for the products. Members of **EDANA informed the Commission that they are currently working on the definition of a harmonised set of testing procedures.** However, a part of the industry would **welcome the use of consumer panel tests.**

Evaluation of potential cost-benefits

Fitness-for-use criteria would allow consumers to choose products with an adequate level of performance. By ensuring that EU ecolabelled products deliver a good level of performance which is acceptable to the majority of AHP consumers, it should be possible to avoid potential trade-offs between frequency of use and environmental impacts of the products.

The magnitude of the environmental benefits associated with EU ecolabelled products depends on the specific environmental performance of the product through its life cycle. This is in turn influenced by conditions of use and by burdens generated through materials selection and consumption as well as manufacturing processes.

Due to the fact that there are no harmonised test methods for the various fitness-for-use criteria, cost estimations are difficult to determine. Besides carrying out particular test methods as suggested below, manufacturers of AHP will also have the option of running consumer panel tests with regards to the fitness-for-use parameters. The costs for large scale consumer tests can be high (> EUR 100K) and sometimes can take up to 3 months. However, costs for these consumer tests should decrease considerably by requiring a minimum of 30 participants.

The proposed choice between either running in-house test methods or involving consumer panels to fulfil some of the fitness-for-use criteria provides flexibility to manufacturers of AHPs and allows them to choose the most cost-effective solution. It can further be expected that most of the tests necessary to demonstrate fitness-for-use of AHPs are run on a regular basis in any case and as such do not present additional costs for the purpose of EU Ecolabel requirements.

Assessment and verification

As indicated above, no harmonised testing methods exist for the specific fitness-for-use criteria. It is therefore recommended that manufacturers self-declare the fitness-for-use attributes of their products. Manufacturers may relate to their in-house testing methods, they may provide testing results from external laboratories or may also carry out consumer panel tests. In the following, a brief description for the relevant test methods is provided.

Overall performance:

An overall performance assessment of AHPs can only be achieved by a **consumer test**. The interaction of different features of AHPs (e.g. fit,

breathability, fluid acquisition, rewet or bowel movement absorption) is too complex to assess them separately.

In a consumer test, participants provide a subjective assessment by completing questionnaires. The test can be a diary study or it can be even carried-out only at the end of the trial period, which should be at least one week long. Mixed views were provided by the stakeholders with respect to the number of participants involved in the test. Some stakeholders stated that the test should involve at least 100 test participants representative for the overall population. Other stakeholders believe that 30-40 is a more reasonable number. It was even mentioned that guidelines for user tests could be available within the Standard ISO 16021:2000 "Urine-absorbing aids - Basic principles for evaluation of single-use adult-incontinence-absorbing aids from the perspective of users and caregivers".

Because reproducing real life conditions, in-use tests are considered by some stakeholders the most reliable method to assess some of the **single performance areas** reported in the followings.

Absorption capacity:

The absorption capacity of AHPs generally describes the amount of liquid that can be absorbed by the product. Stakeholders involved in this project commented that absorption capacity is a criterion that should not be assessed versus a maximum possible absorption rate but rather versus an optimum. If the capacity is below the optimum, this can impact the dryness and leakage performance; if the capacity is above the optimum, it does not add further benefits from the point of view of performance. Consequently, the absorption capacity under a given pressure is considered more suitable and thus the test method MDT 10301 following ISO 11948-1 is not acceptable since it is a test method without applied pressure.[1] Absorption capacity under pressure is a generic testing concept for AHPs.

The **"Absorption before leakage" (ABL) test** has been developed by the renowned independent test lab "Courtray's labservice".[2] to evaluate the performance of **incontinence products**. According to stakeholder feedback it has proved to be a good test method even for assessing leakage protection and adsorption under pressure of **diapers**. However, since the test is performed on a mannequin, movement of a child can only be simulated partially. Moreover, also bowel movement is not simulated. Taking into account these limitations, the ABL test should be used to complement a diary study and not to replace it completely. The ABL follows the test method WSP 354.0 (08) and was published by EDANA, INDA and Worldwide Strategic Partners in 2008.[3] The same document indicates that EDANA developed an equivalent method (WSP 354.1 (10)). An **absorption under pressure test** method also exists **for superabsorbent materials**, i.e. WSP 242.2 (05).[3]

Another absorbency indication could be given by the **'Speed of absorption'**. The test consists on measuring the speed of absorption of a standard **diaper** under the application of a relevant pressure (e.g. 2-3.5 kPa) and a

representative amount of liquid (e.g. 300 mL of synthetic urine to simulate overnight conditions). However, no harmonized methods are yet available.

For **tampons**, a specific test method exists that was developed by EDANA, i.e. WSP 350.1 (05).[4] The method specifies a test procedure for the in-vitro measurement of absorbency of menstrual tampons by the Syngina method. However, EDANA points out that this laboratory test is not intended to be used for predicting absorbency in-vivo. It is applicable for products with an absorbency of up to 25 grams. Further details can be obtained from the description of this test method. Based on the results of this test, the UK Code of Practice for Tampon[18] identifies 5 classes of absorbency, depending on the flow conditions:

- Class 1, <6 g
- Class 2, 6-9 g
- Class 3, 9-12 g
- Class 4, 12-15 g
- Class 5, 15-18 g

Moisture retention:

Moisture retention describes the capacity of AHPs to hold liquid. It is considered an important parameter with correlation to the dryness performance of a diaper core.

As the highest need for good performance is overnight, **in-use testing** should take into account for long wearing time and high loads. Thus, retention should be tested applying the average overnight load, i.e. 300 ml, and realistic pressure. A value covering the 90%-tile of loads may be even used.

A specific test method for **superabsorbent materials**, i.e. WSP 241.2 (05), is mentioned in the Inda/EDANA report.[3] The test determines the fluid retention capacity in saline solution by gravimetric measurement following centrifugation. It is based on the ISO Standard 17190–6:2001, Urine-absorbing aids for incontinence - Test methods for characterizing polymer-based absorbent materials - Part 6: Gravimetric determination of fluid retention capacity in saline solution after centrifugation.[5]

Leakage protection:

The testing of leakage protection is closely related to moisture retention as it determines how well an AHP can keep and does not release liquids.

The most reliable test method to compare leakage protection of different diapers is a **diary study** (see above). This method takes into account both, the liquid handling performance of a diaper as well as the diaper fit. The statistical evaluation of such studies allows also to assess the leakage protection under different conditions (day/night, different loading of the diaper, etc.) and therefore is the most comprehensive method.

It was indicated by stakeholders that the **LD50 test**, which is based on large scale consumer panels, can provide statistical information about the amount of leakage registered after each diaper change. Alternatively, large scale consumer panel tests can be used to rate the leakage performance after 1 week of usage. **Best performing diapers** could be selected based on the following parameters:

- Best in class: leakage result in less than 5% of all diaper changes;
- Good performing diapers: leakage result in less than 10% of all diaper changes;
- X% of consumers rate the product very good or excellent.

Absorption before leakage and **speed of absorption** are other two methods that are correlated to this performance area.

Skin dryness and compatibility:

Skin dryness generally refers to the advantage of AHPs to lead liquids away from the skin, avoiding skin irritation.

One particularly relevant test method is the clinical skin hydration measurements using **"trans-epidermal water loss" (TEWL) measurements**.[6] This method determines the skin dryness performance of a diaper, as it allows to measure skin dryness in an objective way taking into account for important properties as skin dryness, fluid management and breathability performance. According to stakeholders involved in this project, this method has been chosen as a standard to support advertising claims on skin dryness by the British Advertising regulatory agency. This method measures skin dryness in the diaper area of small children wearing a diaper overnight using commercially available Evaporimeters (e.g. Tewameter (Courage + Khazaka, Cologne, Germany), Dermalab (Cortex Technology, Hadsund, Denmark), Vapometer (Delphin, Kuopio, Finland). Stakeholders recommend that a skin hydration study with this method should include about 50 children per product and needs to be performed in a dermatological laboratory under standard conditions (21 °C, 45 % rel. humidity).

Diary studies are also considered a reliable method for determining the skin dryness performance of a diaper. However, compared to the TEWL method, results are based only on a subjective dryness assessment, which can be influenced by brand and aesthetics.

Another test method to assess skin dryness is the **rewet method**. It is a laboratory method, that can be used to estimate the skin dryness performance of a diaper, but only if the different products have comparable breathability and fit. For this method a diaper is loaded with a certain amount of synthetic urine and after a waiting time a pressure is applied onto a paper or collagen sheet put onto the inner liner of the diaper, simulating the child sitting down. This test method is patented by Procter & Gamble in the US (U.S. Patent No 6085579).

Corneometric testing methods also exist to determine skin dryness. Corneometric testing determines the dampness of the skin and is measured at

a specific time after the AHP has been removed from the skin. The research lab 'dermatest' provides further details on the test method.[7]

The **Human Repeat Insult Patch Test (HRIPT)** was even suggested by some stakeholders. It is a test to determine if a material has the potential to cause contact sensitization or skin allergies. Further details on the test are reported in a critical review of methodologies and approaches to assess the inherent skin sensitization potential of chemicals:[8] *"The test includes subjects that are exposed to the chemicals 9 x 24 or 48 h during a 3 weeks period. Following a 2 weeks rest period, challenge is performed on an exposed site and an unexposed site. The challenge is performed using a 24 or 48 h patch test and the resulting reaction is graded for clinical signs. The test can be performed in a variety of manners with varying exposure time and occluding methods. The test is performed on a comparative large group of subjects, typically around 100. Although the use of human subjects for risk assessment is considered unethical and not recommended it has been widely employed with claimed good result."* It should be **discussed with all stakeholders if such test could be accepted** within the set of criteria for AHPs.

The HRIPT is not part of any official test guidelines. Also, no clear guidance exists in the performance of a HRIPT for the safe choice of test concentrations. It is estimated that the costs for a basic design of the HRIPT is EUR 5-8K.

Fit and comfort:

The product performance characteristic fit and comfort provides insights as to how well AHPs fit and allow the user to be comfortable while wearing them. According to stakeholder feedback, no appropriate test methods exist with the exception of consumer panel testing.

Odour control:

This test method relates to the determination of odour concentrations being released by AHPs in use. The relevant standard, i.e. DIN EN 13725:2003-07 defines the mass that is just detectable when evaporated into 1 m3 of neutral gas. Further details can be found in the respective Standard.[9]

Dermatological testing:

It is common practice to carry out dermatological tests (on humans) of all materials contained in AHPs before use, often by both suppliers and AHP manufacturers. However, no common standards are available, according to stakeholder feedback. Research on relevant standards or testing procedures did not lead to any standard industry-wide definitions used to determine how a product must be tested or the results it needs to achieve, before such a claim can be made.[10]

Information collected for shaping fitness-for-use criteria are reported in Table 2.

Table 2. Fitness-for-use characteristics and test methods

Performance area	***Test Options***	***AHP of relevance***	***Est. costs***
Overall performance	• Consumer panel testing.	• All AHP	
Absorption capacity	• Absorption before leakage, WSP 354.0 (08); • Equiv. EDANA test method; • Absorption under pressure (for SAP), WSP 242.2 (05); • Speed of absorption; • WSP 350.0-02 (for tampons) • Consumer panel testing. • Other appropriate in-house or external test methods*	• Diapers • Tampons • **Others?**	Information not yet available
Moisture retention	• Consumer panel testing • Fluid retention capacity in saline solution by gravimetric measurement following centrifugation, WSP 241.2 (05), based on the ISO 17190–6:2001, • Other appropriate in-house or external test methods	• Diapers • **Others?**	
Leakage protection	• Consumer panel testing (e.g. LD50); • Absorption before leakage speed of absorption,	• Diapers • **Others?**	€ 100K plus; 3-months plus

	moisture retention • Other appropriate in-house or external test methods		
Skin dryness and compatibility	• Transepidermal water loss measurements (TEWL), • Consumer panel testing • Rewet method • Corneometric testing ; • Human Repeat Insult Patch Test (HRIPT) • Other appropriate in-house or external test methods	• Diapers • **Others?**	HRIPT: €5.000-8.000
Fit and comfort	• Consumer panel testing	• All AHP	
Odour control	• EN 13725:2003 • Consumer panel testing • Other appropriate in-house or external test methods	• All AHP apart from breast pads?	
Dermatological testing	• Consumer panel testing • Other appropriate in-house or external test methods	• All AHP	

**The test method MDT 10301 following ISO 11948-1 is not acceptable since it is a test method without applied pressure.*

Documentation of the performance of the AHP for each fitness-for-use criteria must be provided (test report). The chosen test must be described and data attached.

***Further input on the testing methods** is necessary. In particular, the following questions should be addressed:*

- ***Which are the most appropriate performance areas and testing methods for each of the AHPs within the scope of the EU Ecolabel?***
- ***Can more detailed guidelines for the testing methods mentioned above be provided?***
- ***Can thresholds be identified for some of the performance areas above?***
- ***Can cost estimates for different testing methods be provided?***

Criteria draft text

Criterion 1: Fitness for use of the product

The product shall fulfil a good level of performance which matches that of equivalent products on the market and which can be acceptable for consumers.

Fitness-for-use has to be tested with respect to the parameter reported in Table X (see

Table 2).

In the case of products where a widely acknowledged test exists, this test must be used, otherwise, alternative testing methods may be used. The test may be a laboratory test, the applicant’s internal quality test, a consumer test or a comparative test with an equivalent product.

Table X (see

Table 2) provides a reference list of tests which could be performed for each specific product and the required performance level, whenever available.

If a consumer test is performed, this should involve at least 30 persons and the product should be rated “above average” or “within top third of the market”.

Assessment and verification and determination of thresholds:

A test report must be provided including a description of test methods, test results and data used. Tests reported in

Table 2 shall be used.

For leakage protection, the following thresholds are suggested:

- Best in class: leakage result in less than 5% of all diaper changes;
- Good performing diapers: leakage result in less than 10% of all diaper changes;
- X% of consumers rate the product very good or excellent.

4.2 Materials

Rationale and technical feasibility

As apparent from the outcomes of the preliminary report, materials are the main driver in determining the environmental impacts of AHPs.

Materials contribute with 62%-97% to all environmental impact categories. The first action that could significantly improve the environmental performance of the products would be to act on the eco-design of AHPs to decrease the weight of the product and to select more eco-friendly materials, while at the same time ensuring the fulfilment of the functions expected from the product.

Designing criteria based on lifecycle impact indicators would be the most comprehensive approach to deal with this issue. However, the possibility to set criteria is currently limited by some factors:

1. The lack of solid and widely accepted rules (the Commission is working on the development of the EC's Product Environmental Footprint methodology and of related Product Category Rules).
2. The lack of information about the performance variation within equivalent categories of AHPs.

The environmental impacts given by materials are a function of the design of the product (weight and composition) and the performance of each material.

Decoupling the problem in two parts, could be a way to clear the hurdle and to set a "simplified" but acceptable list of criteria. In general, environmental benefits could be indeed achieved through:

- A reduction in the consumption of materials used to produce AHPs, since lifecycle impacts are directly related to the weight of the product;
- The selection of materials and components that present superior environmental performance in terms of sourcing and production.

With respect to the former issue, the possibility to **set maximal weight thresholds for equivalent categories of AHPs** could be explored. **A similar limitation could be considered for the amount of cellulose contained in AHPs**, being the trend of the market towards the production of lighter and more sustainable products with a reduced content of cellulose.

The Commission is still in the process of collecting data and opinions on this aspect. However, an example on how this approach would work in practice is reported below.

Based on rough information preliminarily gathered from stakeholders, the weight of size-4 and size-5 diapers ranges from 30-38 g up to +63-77%. 99% of the diapers in the market was reported to weight 12-20% more than the lighter products.

Deeper investigation on weight distributions for classes of products could allow setting thresholds with which **to identify**, for instance, the 20% **lighter (but optimally performing) products**.

However, **a critical issue** here is represented by **the apparent lack of harmonised classifications in terms of sizes and product types** between different producers**,**

Another threshold could be set for cellulose, whose large use is responsible for large contributions to the environmental impacts of diapers. Average content of cellulose in diapers was 36.6% by weight in 2011. The **maximum content of cellulose should be lower than** this **average value** and could be set to X%, yet to be defined.

With respect to the latter issue, **setting thresholds on specific environmental issues per mass of product** (e.g. GHG emissions per kg of AHP) would **not** be **enough**. Reference to the overall weight of functionally equivalent products would be necessary to ensure that environmentally superior products are placed into the market. Moreover, such criteria should be consistent, flexible and not hinder innovation. For instance, defining characterization factors for a pre-set list of materials could be an over-simplification of the reality since this would not allow taking into account for alternative material options, sometimes resulting in contradictory environmental performances (e.g. renewables-based materials).

In order to understand **which measures are likely to have a positive environmental impact on materials**, results from the technical analysis have been coupled with pieces of information from BREF documents[11,12,15] from available literature on chemistry and environmental criteria for AHPs and other products [13,14,16] and from stakeholders of the project.

In order to get as much detailed information as possible for the potential development of criteria, questionnaires based on information from the abovementioned documents were sent out to suppliers of materials and producers of AHPs.

These measures are reported Table 3, 4, 5, 6 and 7. Tables even show of the main substances of potential concern for the single materials used in the production of AHPs and an indicative list with best industrial practices which could form part of the criteria. It would be interesting to understand from stakeholders **which measures are considered more significant and meaningful in terms of development of EU Ecolabel criteria.**

The general goal of all criteria is the reduction of the impacts due to emissions into water and air and a reduction of negative environmental effects due to the use of energy (e.g. GWP, AP, ODP, ADP).

Table 3. Suggested measures to improve the sustainability performance of AHP materials: Fluff pulp

Fluff pulp	***Measure***	***Rationale and cost-benefit evaluation***	***Assessment and Verification***
1. Sourcing	100% sustainable sourcing of the feedstock (certified as FSC, PEFC or equivalent)[Error! Bookmark not defined.].	The sustainable sourcing of raw materials would guarantee that wood sources are managed in an environmentally, socially, appropriate and economically viable manner. This would help exclude the following sources: • Illegally harvested forests; • Wood harvested in violation of traditional and civil rights; • Wood harvested in forests in which High Conservation Values (areas particularly worth of protection) are threatened through management activities; • Wood harvested from conversion of natural forests; • Wood harvested from areas where genetically modified trees are planted. Depending on the certification system, costs may vary. It can be expected that additional costs will occur. A detailed prognosis on costs for the use of certified materials is difficult and should be evaluated on a case-by-case basis.	The applicant shall provide appropriate documentation indicating the types, quantities and origins of wood used in the production.
2. Bleaching	a) The fluff pulp in the product must be produced from unbleached pulp or pulp bleached without chlorine gas, i.e. in accordance with the ECF or TCF method.	During the production of fluff pulp, negative effects on the environment and on human heath, should be minimized. Until the early '90s, chlorine gas was used as the main component of the	a) The supplier shall provide a declaration to the manufacturer that the requirements have been fulfilled. b) The applicant shall provide test

Fluff pulp	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
	b) The AOX emissions from the production of each kind of pulp shall not exceed 0.17 kg/ADT.	bleaching. At that time, it was discovered that significant amounts of the dioxin and furan chemical families were being discharged to watercourses. This led to the introduction of bleaching systems based on alternative chemicals, i.e. TCF and ECF bleaching processes (see Preliminary Report for further details). The TCF bleaching process has the advantage of repressing the production of chlorinated organic compounds. However, stakeholders involved in this project reported that ECF is a widely accepted technology and that almost all fluff pulp worldwide is ECF bleached. Thus, both the processes were considered to be supported. No additional costs are expected with respect to fulfilling this requirement being both the processes already deployed. Chlorinated organic compounds are released into water as effluent from the bleaching process. AOX (adsorbable organic halide) is a surrogate measure of the amount of chlorinated organic compounds in pulp and paper effluent discharge. A limit on AOX is proposed in alignment with the EU Ecolabel criteria for copying and graphic paper (Commision Decision 2011/332/EU).[14] A quantification of costs and environmental benefits associated with this prescription is would be difficult.	reports using the following test method: AOX ISO 9562 accompanied by detailed calculations showing compliance with this criterion, together with related supporting documentation. The supporting documentation shall include an indication of the measurement frequency. AOX shall only be measured in processes where chlorine compounds are used for the bleaching of the pulp. AOX need not be measured in the effluent from non-integrated pulp production or in the effluents from pulp production without bleaching or where the bleaching is performed with chlorine-free substances. Measurements shall be taken on unfiltered and unsettled samples either after treatment at the plant or after treatment by a public treatment plant. The period for the measurements shall be based on the production during 12 months. In case of a new or a re-built production plant, the measurements shall be based on at least 45 subsequent days of stable running of the plant. The measurement shall be representative of the respective

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<tr><th>Fluff pulp</th><th>Measure</th><th>Rationale and cost-benefit evaluation</th><th>Assessment and Verification</th></tr>
<tr><td></td><td></td><td></td><td>campaign.</td></tr>
<tr><td>3. Visual whitening and colouring agents</td><td>Visual whitening and colouring agents must not be intentionally added to the pulp.</td><td>During the production of fluff pulp, negative effects on the environment and on human heath should be minimised. Visual whitening and colouring agents are proposed to be banned not needed for this application. A similar prescription is present in the Nordic Swan criteria for sanitary products[16] and in the GPP guidelines developed by EDANA for AHPs (see Preliminary Report). No additional costs are expected.</td><td>The supplier shall provide a declaration to the manufacturer that the requirements have been fulfilled.</td></tr>
<tr><td>4. Emission of COD and phosphorous (P) to water and sulphur (S) compounds and NOx to air from production</td><td>The emissions to air and/or water from the pulp production shall be expressed in terms of points (P_{COD}, P_S , P_{NOx} , P_P). Points are calculated by dividing actual emission by the reference values reported below.
<table>
<tr><th rowspan="2">Pulp grade</th><th colspan="4">Emissions (kg/ADT)</th></tr>
<tr><th>COD_{ref}</th><th>S_{ref}</th><th>NOx_{refe}</th><th>P_{ref}</th></tr>
<tr><td>Bleached chemical pulp (others than sulphite)</td><td>18.0</td><td>0.6</td><td>1.6</td><td>0.045*</td></tr>
<tr><td>Bleached chemical pulp (sulphite)</td><td>25.0</td><td>0.6</td><td>1.6</td><td>0.045</td></tr>
<tr><td>CTMP</td><td>15.0</td><td>0.2</td><td>0.3</td><td>0.005</td></tr>
<tr><td>TMP/groundwood pulp</td><td>3.0</td><td>0.2</td><td>0.3</td><td>0.01</td></tr>
</table>
*Exemption from this level, up to a level of 0.05, shall be given where it can be demonstrated that the higher level of P is due to P naturally occurring in the wood pulp</td><td>During the production of fluff pulp, negative effects on the environment and on human heath should be minimised. Requirements for emissions of COD and P to water and for emissions of S and NOx to air from fluff pulp production are prescribed in the EU Ecolabel criteria for copying and graphic paper (Commision Decision 2011/332/EU).[14] These are preliminarily reported here as basis of discussion. A quantification of costs and environmental benefits associated with this prescription is would be difficult.</td><td>The applicant shall provide detailed calculations showing compliance with this criterion, together with related supporting documentation which shall include test reports using the following test methods: COD: ISO 6060; NOx: ISO 11564; S(oxid.): EPA no.8; S(red.): EPA no 16A; S content in oil: ISO 8754; S content in coal: ISO 351; P: EN ISO 6878, APAT IRSA CNR 4110 or Dr Lange LCK 349.

The supporting documentation shall include an indication of the measurement frequency and the calculation of the points for COD, S, NOx and P. It shall include all emissions of S and NOx which occur during the production of pulp, including</td></tr>
</table>

Fluff pulp	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
	• None of the individual points P_{COD}, P_S, P_{NOx}, P_P shall exceed 1,5. • The total number of points (P total = P_{COD} + P_S + P_{NOx} + P_P) shall not exceed 4,0. Where different types of pulp are used, measured emissions and reference value shall be weighted according to the relative weight of each pulp type. In case of a co-generation of heat and electricity at the same plant, the emissions of S and NOx resulting from electricity generation can be subtracted from the total amount. The following equation can be used to calculate the proportion of the emissions resulting from electricity generation: 2 × (MWh(electricity)) / [2 × MWh(electricity) + MWh(heat)] The electricity in this calculation is the electricity produced at the co-generation plant. The heat in this calculation is the net heat delivered from the power plant to the pulp production.		steam generated outside the production site, except those emissions related to the production of electricity. Measurements shall include recovery boilers, lime kilns, steam boilers and destructor furnaces for strong smelling gases. Diffuse emissions shall be taken into account. Reported emission values for S to air shall include both oxidised and reduced S emissions (dimethyl sulphide, methyl mercaptan, hydrogen sulphide and the like). The S emissions related to the heat energy generation from oil, coal and other external fuels with known S content may be calculated instead of measured, and shall be taken into account. Measurements of emissions to water shall be taken on unfiltered and unsettled samples either after treatment at the plant or after treatment by a public treatment plant. The period for the measurements shall be based on the production during 12 months. In case of a new or a rebuilt

<table>
<tr><th>Fluff pulp</th><th>Measure</th><th>Rationale and cost-benefit evaluation</th><th>Assessment and Verification</th></tr>
<tr><td></td><td></td><td></td><td>production plant, the measurements shall be based on at least 45 subsequent days of stable running of the plant. The measurement shall be representative of the respective campaign.</td></tr>
<tr><td>5. Emissions of CO_2 from production</td><td>CO_2 emissions from non-renewable energy sources shall not exceed 1100 kg per tonne of pulp produced.

Reference values according to the following table shall be taken into account

<table><tr><th>Fuel</th><th>CO_2 fossil emissions
(g $CO_{2fossil}$/MJ)</th></tr><tr><td>Coal</td><td>95</td></tr><tr><td>Crude oil</td><td>73</td></tr><tr><td>Fuel oil 1</td><td>74</td></tr><tr><td>Fuel oil 2-5</td><td>77</td></tr><tr><td>LPG</td><td>69</td></tr><tr><td>Natural Gas</td><td>56</td></tr><tr><td>Grid Electricity</td><td>400</td></tr></table></td><td>During the production of fluff pulp, negative effects on the environment and on human heath should be minimised. Requirements for emissions of CO_2 are prescribed in the EU Ecolabel criteria for copying and graphic paper (Commision Decision 2011/332/EU).[14] These are preliminarily reported here as basis of discussion. A quantification of costs and environmental benefits associated with this prescription is would be difficult.</td><td>The applicant shall provide detailed calculations showing compliance with this criterion, together with related supporting documentation.

The applicant shall provide data on the air emissions of carbon dioxide. This shall include all sources of non-renewable fuels during the production of pulp, including the emissions from the production of electricity (whether on-site or off-site).

The period for the calculations or mass balances shall be based on the production during 12 months. In case of a new or a rebuilt production plant, the calculations shall be based on at least 45 subsequent days of stable running of the plant. The calculations shall be representative of the respective campaign.

The amount of energy from renewable sources purchased and used for the</td></tr>
</table>

Fluff pulp	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
			production processes will not be considered in the calculation of the CO_2 emissions: appropriate documentation that this kind of energy are actually used at the mill or are externally purchased shall be provided by the applicant.
5. Energy use during the production	a) Electricity The electricity consumption related to the pulp production shall be expressed in terms of points (P_E) as detailed below. The number of points P_E shall be less than or equal to 1,5. Points are calculated by dividing actual emission by the reference values reported below. For each pulp i used, the related electricity consumption ($E_{pulp,i,}$ expressed in kWh/ADT) shall be calculated as follows: $E_{pulp,i}$ = *Internally produced electricity + purchased electricity – sold electricity* Where different types of pulp are used, measured emissions and reference value shall be weighted according to the relative weight of each pulp type. (b) Fuel (heat) The fuel consumption related to the pulp production shall be expressed in terms of points (P_F) as detailed below.	During the production of fluff pulp, negative effects on the environment and on human heath should be minimised. Requirements for energy consumption are prescribed in the EU Ecolabel criteria for copying and graphic paper (Commision Decision 2011/332/EU).[14] These are preliminarily reported here as basis of discussion. A quantification of costs and environmental benefits associated with this prescription is would be difficult.	The applicant shall provide detailed calculations showing compliance with this criterion, together with all related supporting documentation. Reported details shall therefore include the total electricity and fuel consumption. The applicant shall calculate all energy inputs, divided into heat/fuels and electricity used during the production of pulp and paper, including the energy used in the de-inking of waste papers for the production of recycled paper. Energy used in the transport of raw materials, as well as conversion and packaging, is not included in the energy consumption calculations. Total heat energy includes all purchased fuels. It also includes heat energy recovered by incinerating liquors and wastes from on-site processes (e.g. wood waste, sawdust,

<table>
<tr><th>Fluff pulp</th><th>Measure</th><th>Rationale and cost-benefit evaluation</th><th>Assessment and Verification</th></tr>
<tr><td></td><td>
The number of points P_F shall be less than or equal to 1,5. Points are calculated by dividing actual emission by the reference values reported below.

For each pulp i used, the related fuel consumption ($F_{pulp,\ i}$ expressed in kWh/ADT) shall be calculated as follows

$F_{pulp,\ i}$ = Internally produced fuel + purchased fuel – sold fuel – 1,25 × internally produced electricity

$F_{pulp,\ i}$ (and its contribution to $P_{F,\ pulp}$) does not need to be calculated for mechanical pulp unless it is marketed as air dried mechanical pulp containing at least 90 % dry matter.

The amount of fuel used to produce the sold heat shall be added to the term ‘sold fuel’ in the equation above.

Where different types of pulp are used, measured emissions and reference value shall be weighted according to the relative weight of each pulp type.

Reference values according to the following table shall be taken into account.
<table>
<tr><th>Pulp grade</th><th>Fuel
(kWh/ADT)</th><th>Electricity
(kWh/ADT)</th></tr>
<tr><td>Chemical pulp</td><td>4000
(Note: for air dry market pulp (admp) containing at least 90% dry matter, this value may be upgraded by 25% for the drying energy)</td><td>800</td></tr>
</table>
</td><td></td><td>
liquors, waste paper, paper broke), as well as heat recovered from the internal generation of electricity — however, the applicant need only count 80 % of the heat energy from such sources when calculating the total heat energy.

Electric energy means net imported electricity coming from the grid and internal generation of electricity measured as electric power. Electricity used for wastewater treatment need not be included.

Where steam is generated using electricity as the heat source, the heat value of the steam shall be calculated, then divided by 0,8 and added to the total fuel consumption.

In case of integrated mills, due to the difficulties in getting separate fuel (heat) figures for pulp and paper, if only a combined figure for pulp and paper production is available, the fuel (heat) values for pulp(s) shall be set to zero and the figure for the paper mill shall include both pulp and paper production.
</td></tr>
</table>

<table>
<tr><th>Fluff pulp</th><th>Measure</th><th>Rationale and cost-benefit evaluation</th><th>Assessment and Verification</th></tr>
<tr><td></td><td>
<table>
<tr><td>Mechanical pulp</td><td>900
(Note: this value is only applicable for admp)</td><td>1900</td></tr>
<tr><td>CTMP</td><td>1000</td><td>2000</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>6. Industrial best practices[11]</td><td>a). Water consumption and wastewater emissions:`
1. Implementing water-saving solutions such as monitoring of water flow in a facility and water recirculation in closed systems, including the stripping of contaminated steam condensates and the reuse of condensates and white water in the process
2. Separating water loops for each process units (e.g. pulping, bleaching) to prevent the carry-over of pollutants to subsequent process steps and to restrict the organic load of process water
3. Preferring catalytical disinfection with hydrogen peroxide to the use of biocides for the control of the growth of microorganisms
4. Implementing multi-step waste water treatment plants for decreasing the emissions of AOX and unchlorinated toxic organic compounds
5. Using low chlorine dioxide charge bleaching sequences with partial recycling of process water, where elemental chlorine-free (ECF) bleaching is in place.</td><td>During the production of fluff pulp, negative effects on the environment by water use and emissions in water should be minimized. The use of best-practice production methods should be fostered (e.g. using low-chlorine dioxine charge bleaching sequence can lead to a reduction of the consumption of water and bleaching chemicals as well as a reduction of the emissions of organic and organochlorinated substances).
Depending on the measures taken, the measures can either be accompanied by cost savings (e.g. reduced water use) or increases in costs (e.g. installation of additional cleaning techniques).</td><td>The supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.</td></tr>
<tr><td></td><td>b). Waste management
1. Implementing an integrated waste management</td><td>Optimizing waste management strategies can save primary materials as well as resources.</td><td>The supplier has to provide a declaration to the manufacturer that</td></tr>
</table>

Fluff pulp	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
	plan to optimize prevention, reuse, recycling, recovery, and final disposal of waste according to waste hierarchy. 2. Separating different waste fractions to allow reuse or recirculation of the single fractions. 3. Recycling of fibres, wherever possible	This could even lead to financial savings since raw material consumption might be decreased and produced wastes could be recycled, down-cycled or reused internally or externally. Detailed information on cost benefits are difficult to be estimated.	the requirements have been fulfilled.
	c) Air emissions 1. Treating flue gases with electrostatic precipitators (ESP) and fabric filters (FF) to prevent excessive dust emissions. 2. Implementing a system to optimize and to monitor combustion conditions of all combustion steps (e.g. recovery boilers, soda boilers or lime kilns) in order to reduce air emissions. 3. Washing and filtrating lime mud in the kraft pulping process in order to reduce the hydrogen sulfide emissions in the re-burning process.	During the production of fluff pulp, negative effects on the environment by air emissions should be minimized. The use of best-practice production methods should be fostered. Carrying out measures to minimise air emissions can be accompanied by additional costs for suppliers. Depending on their technological status, costs may vary.	The supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.
	d) Energy management 1. Implementing measures to optimize energy efficiency (e.g. via segregation of hot and cold waste water streams prior to heat recovery and recovery of heat from the hot stream) and to reduce the consumption of fossil fuels. 3. Implementing on-site generation of electricity and heat in combined heat and power plants (CHP),	Negative effects on the environment by high energy consumption should be minimized. The use of best-practice production methods should be fostered. Although at first the implementation of an energy management system will probably be associated with additional costs (certification fee, labour cost etc.), it can be expected that cost saving can be achieved from the moment the measure is	Certificates of energy management systems shall be provided by the supplier. Furthermore, the supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.

Fluff pulp	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
	which can save up to 30% of energy when compared to conventional technologies.	installed. Savings strongly depend on the efficiency of the processes before the implementation of new systems.	

Table 4. Suggested measures to improve the sustainability performance of AHP materials: Viscose

<table>
<tr><th>Viscose</th><th>Measure</th><th>Rationale and cost-benefit evaluation</th><th>Assessment and Verification</th></tr>
<tr><td>1. Feedstock</td><td>See above requirements for fluff pulp (1 to 6)</td><td>See above requirements for fluff pulp (1 to 6)</td><td>See above requirements for fluff pulp (1 to 6)</td></tr>
<tr><td>2. Bleaching</td><td>The fluff pulp in the product must be produced from unbleached pulp or pulp bleached without chlorine gas, i.e. in accordance with the ECF or TCF method.</td><td>See requirement 2(a) for fluff pulp</td><td>See requirement 2(a) for fluff pulp</td></tr>
<tr><td>3. Visual whitening and colouring agents</td><td>Visual whitening and colouring agents must not be intentionally added to the pulp.</td><td>See requirement 3 for fluff pulp</td><td>See requirement 3 for fluff pulp</td></tr>
<tr><td>4. Production of viscose</td><td>The following limits shall be respected for resource consumption and air, water. waste, noise emissions
<table>
<tr><th>Consumptions</th><th>Unit per tonne of product</th><th>Viscose staple fibre production</th></tr>
<tr><td>Energy</td><td>GJ</td><td>20-30</td></tr>
<tr><td>Process water</td><td>m^3</td><td>35-70</td></tr>
<tr><td>Cooling water</td><td>m^3</td><td>189-260</td></tr>
</table></td><td>During the production of viscose, negative effects on the environment and on health due to resource consumption and emissions should be minimized. Limit values for production of viscose staple fibres (and filaments) are suggested in the BREF documents on polymers.[15] These are preliminarily reported here as basis of discussion.

Depending on the measures that have to be taken to fulfil the requirements, costs may</td><td>The supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.</td></tr>
</table>

<table>
<tr><th>Viscose</th><th>Measure</th><th>Rationale and cost-benefit evaluation</th><th>Assessment and Verification</th></tr>
<tr><td></td><td>
<table>
<tr><td>Pulp</td><td>t</td><td>1.035-1.065</td></tr>
<tr><td>CS_2</td><td>Kg</td><td>80-100</td></tr>
<tr><td>H_2SO_4</td><td>t</td><td>0.6-1.0</td></tr>
<tr><td>NaOH</td><td>t</td><td>0.4-0.6</td></tr>
<tr><td>Zn</td><td>kg</td><td>2-10</td></tr>
<tr><td>Spin finish</td><td>kg</td><td>3-5</td></tr>
<tr><td>NaOCl</td><td>kg</td><td>0-50</td></tr>
<tr><td>Air emissions</td><td>Unit per tonne of product</td><td>Viscose staple fibre production</td></tr>
<tr><td>S</td><td>kg</td><td>12-20</td></tr>
<tr><td>Water emissions</td><td>Unit per tonne of product</td><td>Viscose staple fibre production</td></tr>
<tr><td>SO_4^{2-}</td><td>kg</td><td>200-300</td></tr>
<tr><td>Zn*</td><td>g</td><td>10-50</td></tr>
<tr><td>AOX**</td><td>g</td><td>10-20</td></tr>
<tr><td>COD</td><td>g</td><td>3000-5000</td></tr>
<tr><td>Waste production</td><td>Unit per tonne of product</td><td>Viscose staple fibre production</td></tr>
<tr><td>Hazardous waste</td><td>kg</td><td>0.2-2</td></tr>
</table>
</td><td>vary. For suppliers already producing with high technological standards, additional costs should be marginal.</td><td></td></tr>
</table>

<table>
<tr><th>Viscose</th><th>Measure</th><th>Rationale and cost-benefit evaluation</th><th>Assessment and Verification</th></tr>
<tr><td></td><td>
<table>
<tr><th>Noise</th><th>Unit</th><th>Viscose staple fibre production</th></tr>
<tr><td>Noise at the fence</td><td>dB(A)</td><td>55-70</td></tr>
</table>
* Zn concentration in wastewater <1.5 mg/L (< 0.3 mg/l for sensitive water bodies [16]

** Reported but not associated with BAT for the production of viscose staple fibres</td><td></td><td></td></tr>
<tr><td>5. Industrial best practices [15]</td><td>a) Water consumption and wastewater emissions

1. Removal of Na_2SO_4 from wastewater (spinning baths, in which the viscose solution is pressed through spinnerets) for coagulation of the fibres

2. Reduction of Zinc from wastewaters by alkaline precipitation followed by sulphide precipitation.

3. Use of anaerobic sulphate reduction techniques for sensitive waterbodies. If further desulphurization is necessary, anaerobic reduction to H_2S must be carried out.

4. Use of separate effluent collection systems for
- Contaminated process effluent water
- Potentially contaminated water from leaks and other sources, including cooling water and surface runoff from process plant areas, etc.
- Uncontaminated water</td><td>During the production of viscose, negative effects on the environment by water use and emissions into water should be minimized. The use of best-practice production methods should be fostered

Depending on the measures taken, the measures can either be accompanied by cost savings (e.g. reduced water use) or increases in costs (e.g. installation of additional cleaning techniques).</td><td>The supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.</td></tr>
<tr><td></td><td>b) Waste management</td><td>Optimizing waste management strategies</td><td>The supplier has to provide a</td></tr>
</table>

Viscose	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
	1. Use of fluidized bed incinerators to burn non-hazardous wastes with subsequent heat and energy recovery 2. Recycling of fibres, wherever possible.	can save primary materials as well as resources. Hazardous wastes can be properly treated through well-monitored incineration. Improving waste management systems can lead to financial savings since raw material consumption might be decreased and produced wastes could be recycled, downcycled or reused. Detailed information on cost benefits are difficult to be estimated.	declaration to the manufacturer that the requirements have been fulfilled.
	c) Air emissions 1. Condensation of exhaust air from spinning streets to recover CS_2 and backcycling into the process. (different technologies available). 2. Operation of spinning frames in houses in order to minimise CS_2 emissions, (spinning frames are the sources of CS_2 emissions). Housings have to be equipped with leak-proof sliding windows and have suction systems inside where excess CS_2 is purged to a recovery facility. 3. Application of exhaust air desulphurization processes based on catalytic oxidation with H_2SO_4 production.	During the production of viscose, negative effects on the environment by air emissions should be minimized. The use of best-practice production methods should be fostered. The reduction of sulphuric emissions from industry can lead to a decrease of the acidification potential of certain products. Carrying out measures to minimise air emissions can be accompanied by additional costs for suppliers. Depending on their technological status, costs may vary.	The supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.
	d) Energy management 1. Implementing measures to optimize energy efficiency (e.g. via segregation of hot and cold waste water streams prior to heat recovery and recovery of heat	Negative effects on the environment by high energy consumption should be minimized. The use of best-practice production methods should be fostered.	Certificates of energy management systems shall be provided by the supplier. Furthermore, the supplier has to provide a declaration to the manufacturer that the requirements

Viscose	Measure	Rationale and cost-benefit evaluation	Assessment and Verification
	from the hot stream) and reduce the consumption of fossil fuels. 2. Applying on-site generation of electricity and heat in combined heat and power plants (CHP), which can save up to 30% of energy when compared to conventional technologies.	Although at first the implementation of an energy management system will probably be associated with additional costs (certification fee, labour cost etc.), it can be expected that cost saving can be achieved from the moment the measure is installed. Savings strongly depend on the efficiency of the processes before the implementation of new systems.	have been fulfilled.

Table 5. Suggested measures to improve the sustainability performance of AHP materials: Cotton

Cotton	Measure	Rationale and cost-benefit evaluation	Assessment and Verification
1. Sourcing	All cotton shall be supplied from sources certified according to GOTS or equivalent schemes.	The use of organic and responsibly produced cotton. Would produce benefit to farmers, retailers and consumers all along the value chain. The environmental benefits of organic cotton relate primarily to the avoidance of pesticide use and the avoidance of artificial fertilisers. Its cultivation is one of the most intensive users of agrochemicals worldwide. Artificial fertilisers and pesticides are energy and resource intensive to produce, contribute to the degradation of the soil structure and health, and also contribute to nitrous oxide emissions from soil which mean that conventionally grown cotton can also contribute more to the greenhouse effect than organic cotton. In some of areas of cultivation cotton also	Respective certificates shall be provided by suppliers.

Cotton	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
		requires substantial irrigation water, but organic cotton does not necessarily address this issue. The use of organic cotton results thus in a reduction in the emission of greenhouse gases but the major environmental benefit is the avoidance of the use of pesticides which benefits both the environment and the health of farmers and local communities that do not have to handle or be exposed to pesticides which, according to studies by the UN FAO, in some cotton growing regions may be applied in large quantities without sufficient protection and precision. Pesticides used may include substances listed under Categories IA/B, II and III of the WHO pesticide hazard classifications and substances listed under the Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. GOTS (Global Organic Textile Standard) is the most widely recognised labelling standard for organic textiles. In order to be GOTS certified, organic textiles must meet certain standards. In order to be labelled as certified organic, no less than 70% of the fibre content must be grown organically. This certification is given by country-specific organic farming accreditation bodies. In order to retain GOTS certification throughout the	

Cotton	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
		supply chain the textiles must also be processed safely (e.g. no use of heavy metals). GOTS certified textiles must also be produced with workers employed in line with International Labour Organisation (e.g. no child labour, workers have specific minimum pay). It can be expected that additional costs will occur. A detailed prognosis on costs for the use of certified materials should be evaluated on a case-by-case basis. The definition of measures for the sustainable sourcing of cotton could be even based on the upcoming outcomes of the ongoing revision of the Commission Decision 2009/567/EC, establishing ecological criteria for the award of the Community eco-label for textile products.	
2. Bleaching	Cotton must be unbleached or bleached with the TCF method.	Reduction of the use of chlorine can have positive effects on the environment (e.g. prevention of dioxine formation and other highly carcinogenic pollutants). Stakeholders involved in project stated they use TCF bleaching for cotton. Costs of different bleaching methods vary but further information was not gathered. The possibility to limit the emission of AOX could be even explored.	The supplier has to provide a declaration to the manufacturer that exclusively totally chlorine free-purified cotton was used for the production.
3. Visual whitening and	Visual whitening and colouring agents must not be	During the production of cotton, negative effects on the environment and on human heath should	The supplier shall provide a declaration to the manufacturer that

Cotton	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
colouring agents	intentionally added to cotton materials	be minimised. Visual whitening and colouring agents are proposed to be banned not needed for this application.	the requirements have been fulfilled.
4. Industrial best practices[12]	a) Water consumption and wastewater emissions 1. Implementing water-saving solutions such as monitoring of water flow in a facility, adjustment of processes in pretreatment to quality requirements in downstream processes and re-use of water. 2. Implementing a monitoring plan in order to avoid/ minimize any kind of surplus of applied chemicals and auxiliaries (e.g. by automated dosing and dispensing of chemicals) and to minimize consumption of complexing agents in hydrogen peroxide bleaching. 3. Implementing multi-step waste water treatment plants to decrease the emission of AOX.	During the production of cotton, negative effects on the environment by water use and emissions into water should be minimized. The use of chemicals and other auxiliaries should be optimised The use of best-practice production methods should be fostered Depending on the measures taken, the measures can either be accompanied by cost savings (e.g. reduced water use and reduction of chemicals and other auxiliaries) or increases in costs (e.g. installation of additional cleaning techniques for AOX removal).	The supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.
	b) Waste management 1. Implementing an integrated waste management plan to optimize prevention, reuse, recycling, recovery, and final disposal of waste according to waste hierarchy. 2. Separating different waste fractions to allow reuse or recirculation of the single fractions.	Optimizing waste management strategies can save primary materials as well as resources. Hazardous wastes can be properly treated through well-monitored incineration. Improving waste management systems can lead to financial savings since raw material consumption might be decreased and produced wastes could be recycled, downcycled or reused. Detailed information on cost benefits are difficult to be estimated.	The supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.

Cotton	Measure	Rationale and cost-benefit evaluation	Assessment and Verification
	c) Air emissions 1. Proving that in the selection of auxiliaries and chemicals within the facility higher preferences are given to products with a low volatility and low smell intensity.	During the production of cotton, negative effects on the environment by air emissions should be minimized. The use of best-practice production methods should be fostered. Carrying out measures to minimise air emissions can be accompanied by additional costs for suppliers. Costs for applying this measure are not predictable.	The supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.
	d) Energy management 1. Implementing measure to optimize energy efficiency (e.g. via segregation of hot and cold waste water streams prior to heat recovery and recovery of heat from the hot stream) and to reduce the consumption of fossil fuels. 2. Applying on-site generation of electricity and heat in combined heat and power plants (CHP), which can save up to 30% of energy when compared to conventional technologies.	Negative effects on the environment by high energy consumption should be minimized. The use of best-practice production methods should be fostered. Although at first the implementation of an energy management system will probably be associated with additional costs (certification fee, labour cost etc.), it can be expected that cost saving can be achieved from the moment the measure is installed. Savings strongly depend on the efficiency of the processes before the implementation of new systems.	Certificates of energy management systems shall be provided by the supplier. Furthermore, the supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.

Table 6. Suggested measures to improve the sustainability performance of AHP materials: Polymers

Polymers	Measure	Rationale and cost-benefit evaluation	Assessment and Verification
1. Sourcing	An X% by weight of the polymers could come from renewable feedstock, the superior environmental performance of which should be demonstrated in comparison with petroleum-based	As described in the Preliminary report, there is an overall trend towards the introduction of polymers based on renewables, i.e. bio-	The supplier shall provide evidence that the use of the specific renewable material is functionally equivalent to

Polymers	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
	ones.	polymers. There is some concern about the possibility of introducing a requirement on renewable materials, as the demonstration of their environmental preferability seem to be not feasible in the framework of the application for the EU Ecolabel. In principle, the use of renewable materials is considered to encourage conservation of resources. However, the promotion of bio-polymers should be supported only if the environmental lifecycle performance of these materials is evaluated in comparison with conventional, petroleum-based polymers. Some bio-polymers could present potential environmental advantages, such as the saving of fossil resources and the biological degradation at the end-of-life. However, environmental trade-offs can be associated to the use of plastics from renewable materials, such as the increased demand of land for the production of biomass. All in all, spatial and technical differences between different bio-plastic production chains can result in a significantly complex range of environmental performances. For instance, a bio-based polymer could present higher energy consumption during its	material conventionally used and does not produce increased environmental burdens. If criteria on renewable polymers were developed, guidelines should be provided in order to set the rules to follow for this evaluation (both in terms of methodology and environmental parameters)

Polymers	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
		production chain compared to a fossil polymer. Moreover, biodegradability of polymers becomes a concrete benefit after use only if material does not go into landfills or incineration plants, which is the conventional disposal scenario for AHPs. Another important point of discussion is the usually higher cost of bio-based materials.	
2. Heavy metals / organostannic compounds	Contents of lead, cadmium, mercury, hexavalent chrome and attendant impurities as well as organostannic compounds must be lower than 0.1% of the mass of the respective material (e.g. plastic) in the product.	Heavy metals such as the ones mentioned in the measure as well as organostannic compounds are hazardous to health and environment. All those substances mentioned are undesired additives due to their environmental and health risks. Heavy metals are very recalcitrant in the environment which increases the risk of damage when discharged in the environment. The requirement is meant to prevent them recurring as additives in plastics and polymers. Limitation in the content of heavy metals / organostannic compounds was suggested in the EDANA's GPP guidelines (see Preliminary Report). A change of costs (either increasing or decreasing) can be caused by a change to materials not containing any of the mentioned	The supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.

Polymers	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
		substances any more.	
3. SAP	a) Super Absorbent Polymers may contain a maximum of 400 ppm residual monomers (total of unreacted acrylic acid and cross linkers). b) SAP may furthermore as a maximum contain 5% (weight/weight) of water-soluble extracts (i.e. monomers and oligomers of acrylic acid with lower molecular weight than SAP and salts)	Concern on Super Absorbent Polymers is given by the release of residual monomers and by water-soluble extracts. In accordance with the Nordic Swan criteria for Sanitary Products, two prescriptions are proposed for residual monomers and water-soluble extracts.[16] These are even subject to the classification requirement of Article 6(6) of the Regulation (EC) No 66/2010, Additional costs may arise if SAP sources have to be switched to a supplier offering SAP with a higher quality.	As test methods, Ert 410.2-02 Residual monomers (EDANA Recommended Test method) and EDANA Ert 470.1-99 (extraction time 1-16 h) could be used**Error! Bookmark not defined.**. If alternative materials than polyacrylic acid are used for SAP production, environmental benefits have to be proven.
4. Industrial best practices[15]	a) Water consumption and wastewater emissions 1. Implementing water-saving solutions such as monitoring of water flow in a facility and circulating the water in closed systems.	During the production of polymers, negative effects on the environment by water use and emissions into water should be minimized. The use of chemicals and other auxiliaries should be optimised The use of best-practice production methods should be fostered The measures can either be accompanied by cost savings (e.g. reduced water use).	The supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.
	b) Waste management 1. Implementing an integrated waste management plan to optimize prevention, reuse, recycling, recovery, and final disposal of waste according to waste hierarchy. 2. Separating different waste fractions to allow reuse or	Optimizing waste management strategies can save primary materials as well as resources. Hazardous wastes can be properly treated through well-monitored incineration. Improving waste management systems can	The supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.

Polymers	Measure	Rationale and cost-benefit evaluation	Assessment and Verification
	recirculation of the single fractions.	lead to financial savings since raw material consumption might be decreased and produced wastes could be recycled, downcycled or reused. Detailed information on cost benefits are difficult to be estimated.	
	c) Energy management 1. Implementing measures to optimize energy efficiency. 2. Reusing the steam generated during the manufacture of SAPs (e.g. at Verbund sites)	Negative effects on the environment by high energy consumption should be minimized. The use of best-practice production methods should be fostered. Although at first the implementation of an energy management system will probably be associated with additional costs (certification fee, labour cost etc.), it can be expected that cost saving can be achieved from the moment the measure is installed. Savings strongly depend on the efficiency of the processes before the implementation of new systems. Those savings strongly depend on the efficiency of the processes before the implementation of new systems.	Certificates of energy management systems shall be provided by the supplier. Furthermore, the supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled.

Table 7. Suggested measures to improve the sustainability performance of AHP materials: Other materials

Other materials	Measure	Rationale and cost-benefit evaluation	Assessment and Verification
1. Adhesive materials	Adhesives must not contain colophony resins, diisobutyl phthalate (CAS 84-69-5) or formaldehyde (50-00-0). The requirement does not apply if D4 and D5 are not intentionally	The mentioned substances can be harmful to health and are even subject of Article 6(6) of the Regulation (EC) No 66/2010. However,	The supplier has to provide a declaration to the manufacturer that

Other materials	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
	added and present in concentrations lower than 100 ppm (0.01% by weight). For formaldehyde, the maximum limit for the content of formaldehyde generated during adhesive production is 250 ppm measured in newly produced polymer dispersion. Contents of free formaldehyde in hardened adhesive (glue) must not exceed 10 ppm (exception: hotmelt adhesives)[Error! Bookmark not defined.].	stricter concentration limits are set with this prescription. In order to protect health of people, this criterion shall reduce source of risks for workers and consumers. Additives of colophony or colophony derivative classified as sensitising according to chemical regulations are not desirable in the product due to their allergenic potential. Similar prescriptions are set in the Nordic Swan criteria for Sanitary Products.[16]	the requirements have been fulfilled.
2. Inks and dyes	As a general rule, material of AHPs must not be dyed. However, materials that are not directly in contact with the skin may, be dyed if the dye has a special function (e.g. dying of nursing pads to reduce visibility of the product through white or light coloured clothing). Titanium dioxide in polymers and viscose is exempted from this requirement. The requirement does not apply to packaging materials and tape. If used, dyestuffs must be according to Article 6(6) of the Regulation (EC) No 66/2010.	Inks and dyes in the single materials of products are not directly necessary for the performance of a product (with the exception mentioned). In order to minimise environmental impacts, therefore the use of inks and dyes should be limited. Similar prescriptions are set in the Nordic Swan criteria for Sanitary Products.[16] Elimination of inks and dyes probably leads to a decrease in production costs.	The supplier has to provide a declaration to the manufacturer that the requirements have been fulfilled. In the case of exemptions for specialist products the manufacturer/supplier of the dyestuff must document that the requirement is fulfilled by means of health, safety and environment datasheets and a report on the contents of the product regarding heavy metal impurities, phthalates and amines[Error! Bookmark not defined.].
3. Lotions and fragrances	a) The ingredients used for fragrances must be contained on the list published by the International Fragrance Association	a) Although the environmental impacts associated with lotions and fragrances can be	a) The manufacturer of AHPs shall provide evidence that the ingredients

Other materials	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
	(IFRA). b) In case a product contains lotions or fragrances, the manufacturer must declare its presence.	considered low, these substances may still contribute to some environmental and/or health impacts. Sometimes fragrances or lotions are contained in AHPs. For example, feminine care pads may be scented in order to increase the sensation of freshness. Similarly, some children's diapers contain lotions to provide extra protection against skin rash. With regards to fragrances, the International Fragrances Association (IFRA) published a list of ingredients contained in fragrances that they consider safe for human health and the environment. The relevant ingredients are assessed based on risk assessments and may prohibit or restrict the use of certain fragrance materials in consumer goods if there is concern for human health or the environment. Adherence to comply with this list is enforced through the IFRA Compliance Program. [17] If materials have to be replaced by other materials, it is possible that either increases or decreases of material costs may occur. Further measures could be considered based on the ongoing work for the revision of the Commission Decision 2007/506/EC, establishing ecological criteria for the award of	used for fragrances are contained on the list published by IFRA b) If fragrances and/or lotions are contained in the AHP, it must be declared and justified on the packaging.

Other materials	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
		the Community eco-label to soaps, shampoos and hair conditioners b) An extra benefit should be provided to customers when the packaging states if fragrances or lotions are contained in the product. The benefit could even be increased if the use of these substances is justified. For example, some stakeholders involved in this project stated that parents usually apply extra lotion when changing the diaper of their babies. It was reported that the amount of lotion used by parents is considerably higher compared to the amount of lotion contained in a diaper "with lotion". Consequently, if the addition of lotion were explained on the diaper packaging, the use of additional lotions could be avoided. The costs of providing this information on the packaging can be considered marginal.	
4. Silicone	a) Where components in sanitary products are treated with silicone, the manufacturer must ensure that employees are protected from the solvents. b) Neither octamethyl cyclotetrasiloxane D4 (CAS 556-67-2) nor decamethyl cyclopentasiloxane D5 (CAS 541-02-6) may be present in chemical products used in the silicone treatment of components. The requirement does not apply if D4 and D5 are not intentionally added and present in concentrations	Some silicone components can be harmful to health. In order to protect health of people, this criteria shall reduce source of risks for workers and consumers. Similar prescriptions are set in the Nordic Swan criteria for Sanitary Products.[16] It is possible that an increase in protection mechanisms is accompanied by additional	a) The supplier has to provide information on the method used in silicone treatment and documentation showing that the employees are protected if solvents are used. b) The supplier has to provide a declaration to the manufacturer

Other materials	*Measure*	*Rationale and cost-benefit evaluation*	*Assessment and Verification*
	lower than 100 ppm (0.01% by weight) in the final product.	costs. Costs for changing materials are not predictable.	that the requirement has been fulfilled.

4.3 Manufacture of AHPs

Rationale and technical feasibility

The manufacturing process contributes to 1-12% of the environmental impacts associated with AHPs, depending on the indicator and on the specific product considered. The highest values are registered for global warming potential with tampons (8%) and breast pads (12%), mainly because of the lower weight of materials for these products.

The dominant proportion of environmental burdens is associated with a demand of energy. However, potential for setting criteria on this issue is considered limited due to the **lack of statistical information on the consumption of energy per unit of product**.

The development of a **criterion on the production and disposal of waste seems more feasible**, although this issue plays a less significant role.

Social criteria could even be relevant. If considered of importance by stakeholders, the draft social criteria could benefit of the work done by the horizontal task force on social issues.

Evaluation of potential cost-benefits

Clear economic and environmental benefits are associated with the reduction of production waste that cannot be reused in the AHP manufacturing process or that are not converted to useful materials and energy. Many stakeholders involved in this project stated that it is one of their key targets to reduce the amount of production waste. The estimation of the relevant costs needed to achieve this target is not possible because it depends on technical parameters related to specific individual situations.

Assessment and verification

With regard the amount of production waste, the manufacturer shall provide evidence of the amount of waste that cannot be reused within the AHP manufacturing process or that is not converted to materials and energy.

Criteria draft text

Criterion 3.1: Production waste

The amount of production waste that is not reused within the AHP manufacturing process or not converted to useful materials and energy shall not exceed 0.5% by weight of the end product.

Assessment and verification:

The manufacturer shall provide evidence of the amount of waste that cannot be reused within the AHP manufacturing process or that is not converted to materials and energy.

4.4 End-of-Life

Rationale and technical feasibility

The LCA carried out for this project reveals that contribution of the end-of-life stage to the impacts of AHPs is significant, especially with respect to eutrophication potential (16% to 25%) and to global warming potential (27% to 33%). Hence, reducing the impacts from the end-of-life would contribute towards an overall improved environmental performance.

However**, setting criteria on End of Life issues is unlikely** given the limited possibilities of intervention on the disposal of the AHPs after use.

4.5 Environmental performance of the product

Rationale and technical feasibility

A life cycle approach is necessary to ensure that the environmental performance of a product is assessed consistently. By means of commonly used impact categories, the environmental performance of products can be determined over their entire life cycle and for a range of different environmental issues, hence allowing the avoidance ofundesirable trade-offs.

The AHPs sector is familiar with LCA. Product Category Rules (PCR) have been developed for AHPs for two different schemes: Environdec (by EDANA) and the French BP X30-323. PCRs provide specific guidelines on how to carry out an LCA study for a particular group of products and how to calculate the environmental impacts. Following PCRs ensures that the life cycle performance of equivalent products is calculated under the same methodological assumptions and thus increases the level of comparability of the results.

The development of pass/fail criteria based on life cycle indicators within the EU Ecolabel scheme is currently limited by:

1. The lack of solid and widely accepted rules (the Commission is working on the development of the EC's Product Environmental Footprint methodology[18] and of related Product Category Rules).

2. The lack of information for calculating a distribution of the life cycle impacts associated with statistical samples of products and the following definition of environmental benchmarks.

Moreover, a LCA study could represent a burden for SME since the cost of such a study could vary between EUR 20K and EUR 60K. The costs for the verification of an LCA can be estimated to be between EUR 5K and EUR 10K.

In order to provide an incentive for the improvement of the environmental performance of AHPs, manufacturers could commit on reducing the environmental burdens of their products, as required within the Carbon Reduction Label.[19] However, this would not ensure that the environmental performance of the product is superior to that of other products on the market. Moreover, even in this case the finalisation of the EC's Product Environmental Footprint methodology should be awaited.

4.6 Use of substances in the product

Rationale and technical feasibility

According to the Article 6(6) of Regulation (EC) No 66/2010 on the EU Ecolabel, the EU Ecolabel may not be awarded to goods containing:

1. Substances or preparations/mixtures meeting the criteria for classification as toxic, hazardous to the environment, carcinogenic, mutagenic or toxic for reproduction (CMR), in accordance with Regulation (EC) No 1272/2008 (CLP),

2. Substances of Very High Concern, as referred to in Article 57 of Regulation (EC) No 1907/2006 (REACH).

The identification of potential sources of hazard is based on a list of hazard statements / risk phrases which apply to all the EU Ecolabel products (see

Table 8). The list generally refers to substances. However, if information on substances cannot be obtained, the classification rules for mixtures apply.

Substances or mixtures which change their properties through processing (e.g., become no longer bioavailable, or undergo chemical modification in a way that removes the previously identified hazard) are exempted from the above requirement.

Table 8. Hazard statements and risk phrases

Hazard Statement[1]	***Risk Phrase***[2]
H300 Fatal if swallowed	R28
H301 Toxic if swallowed	R25
H304 May be fatal if swallowed and enters airways	R65
H310 Fatal in contact with skin	R27
H311 Toxic in contact with skin	R24
H330 Fatal if inhaled	R26
H331 Toxic if inhaled	R23
H340 May cause genetic defects	R46
H341 Suspected of causing genetic defects	R68
H350 May cause cancer	R45
H350i May cause cancer by inhalation	R49
H351 Suspected of causing cancer	R40
H360F May damage fertility	R60
H360D May damage the unborn child	R61
H360FD May damage fertility. May damage the unborn child	R60; R61; R60-61
H360Fd May damage fertility. Suspected of damaging the unborn child	R60-R63
H360Df May damage the unborn child. Suspected of damaging fertility	R61-R62
H361f Suspected of damaging fertility	R62
H361d Suspected of damaging the unborn child	R63
H361fd Suspected of damaging fertility. Suspected of damaging the unborn child	R62-63
H362 May cause harm to breast fed children	R64
H370 Causes damage to organs	R39/23; R39/24; R39/25; R39/26; R39/27; R39/28
H371 May cause damage to organs	R68/20; R68/21; R68/22
H372 Causes damage to organs through prolonged or repeated exposure	R48/25; R48/24; R48/23
H373 May cause damage to organs through	R48/20; R48/21; R48/22

1 *As provided for in Regulation (EC) No 1272/2008 of the European Parliament and of the Council*

2 *As provided for in Council Directive 67/548/EEC*

Hazard Statement[1]	*Risk Phrase*[2]
prolonged or repeated exposure	
H400 Very toxic to aquatic life	R50
H410 Very toxic to aquatic life with long-lasting effects	R50-53
H411 Toxic to aquatic life with long-lasting effects	R51-53
H412 Harmful to aquatic life with long-lasting effects	R52-53
H413 May cause long-lasting harmful effects to aquatic life	R53
EUH059 Hazardous to the ozone layer	R59
EUH029 Contact with water liberates toxic gas	R29
EUH031 Contact with acids liberates toxic gas	R31
EUH032 Contact with acids liberates very toxic gas	R32
EUH070 Toxic by eye contact	R39-41
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled	R42
H317: May cause allergic skin reaction	R43

Stakeholders involved in the project underlined that AHPs are designed in order to ensure that no safety issues occur and that human health is not threatened at any time. Declaring that substances meeting the requirements for classification according to the table above are not contained in AHPs should not be a problem for manufacturers.

In addition to the horizontal ban of substances as outlined above, further requirements for specific groups of substances/uses of substances could be prescribed (see requirements above on materials).

Derogations are in general possible only if it is not technically feasible to substitute a substance or groups of substances or if the use of alternative substances would increase the environmental performance significantly. No derogation is instead possible for substances meeting the criteria of Article 57 of EC Regulation No 1907/2006 in concentrations exceeding 0.1% by weight. This is the minimal prescription to be respected. Stricter prescriptions can be even considered for particular groups of substances by decreasing concentration thresholds and/or referring to single materials, homogeneous parts of the product, or groups of substances. The list of substances identified so far as SVHC (Substances of Very High Concern) can be found in: http://echa.europa.eu/web/guest/candidate-list-table.

A **derogation** could be needed for **sodium polyacrylates** (to be discussed further), which is classified as H412 (harmful to aquatic life with long lasting

effects) in one of the notifications received by the European Chemicals Agency (ECHA).

Asking producers to submit a list of substances contained in products is moreover considered an important step towards increasing transparency.

Evaluation of potential cost-benefits

Hazards for the environment or human health would be minimised by ensuring that the product considered for the EU Ecolabel fulfil the requirements for excluded or limited substances.

When substances not meeting the requirements for classification with the H and R phrases listed above are used, information should be gathered to ensure that these do not produce a hazard for the environment and for health.

Feedback from stakeholders involved in this project suggests that the majority of AHPs on the market comply with these requirements. This should not pose any additional costs to manufacturers.

In order for the Competent Bodies to check whether the product complies with this criterion, it would be helpful if the applicant sublits a list of all substances contained in or added to AHPs. Since it is likely that these pieces of information are available to manufactures, the costs of compiling this list are considered low.

Assessment and verification

According to this approach, applicants must provide evidence that the product or any homogeneous part of the product shall contain:

- No substances classified in accordance with Regulation (EC) No 1272/2008 or Directive 67/548/EC in concentrations above the generic or specific concentration limits determined in accordance with the Article 10 of Regulation (EC) No 1272/2008.
- No substance of very high concern in accordance with Article 57 of Regulation (EC) No 1907/2006 in concentration above 0.1% by weight.

With this respect, it could be worthy **investigating with stakeholders whether the design of different sizes of the same product line could eventually result in different concentrations of substances.**

The list of substances identified as substances of very high concern and included in the candidate list in accordance with Article 59 of Regulation (EC) No 1907/2006 can be found here:

http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp

A list of all ingredients contained in the AHP must also be submitted with the application for the EU Ecolabel.

Criteria draft text

Criterion 6.1: Substances and mixtures of relevance for Article 6(6) of the EU Ecolabel Regulation

According to the Article 6(6) of Regulation (EC) No 66/2010 on the EU Ecolabel, the product or any homogeneous part of the product shall not contain substances meeting criteria for classification with the hazard statements or risk phrases specified in

Table 8 in accordance with Regulation (EC) No 1272/2008 or Directive 67/548/EC nor shall it contain substances referred to in Article 57 of Regulation (EC) No 1907/2006.
Substances or mixtures which change their properties through processing (e.g., become no longer bioavailable, or undergo chemical modification in a way that removes the previously identified hazard) are exempted from the above requirement.

Concentration limits for substances and mixtures which may be, or have been, assigned the hazard statements or risk phrase listed above or which meet the criteria for classification in the hazard classes or categories, and concentration limits for substances meeting the criteria of Article 57 (a), (b) or (c) of Regulation (EC) No 1907/2006, shall not exceed the generic or specific concentration limits determined in accordance with the Article 10 of Regulation (EC) No 1272/2008. Where specific concentration limits are determined they shall prevail over the generic ones.

Concentration limits for substances meeting criteria set out in Article 57(d), (e) or (f) of Regulation (EC) No 1907/2006 shall not exceed 0,1% weight by weight.

Concentrations are referred to the product and to homogeneous parts of the product in which substances can be found.

Sodium polyacrylates, the material conventionally used as SAP, is derogated from the requirement above (to be discussed further with stakeholders).

Assessment and verification:

Applicants must provide evidence that no substances classified according to art. 6(6) and 6(7) of the EU Ecolabel regulation is contained in their products.

For substances not already classified in accordance with Regulation 1272/2008, the applicant shall prove compliance with these criteria by providing:

(i) a declaration that the product nor any homogeneous part of the product do not contain the substances referred to in these criteria in concentration above the authorised limits; and

(ii) a list of substances contained in or added to the AHPs. This list shall include the quantity, function and suppliers of all the substances used in the production process.

The applicant shall demonstrate compliance with this criterion by providing a declaration on the non-classification of each substance into any of the hazard classes associated to the hazard statements referred to in the above list in accordance with Regulation (EC) 1272/2008, as far as this can be determined, as a minimum, from the information meeting the requirements listed in Annex VII of Regulation (EC) 1907/2006. This declaration shall be supported by summarized information on the relevant characteristics associated to the hazard statements referred to in the above list, to the level of detail specified in section 10, 11 and 12 of Annex II of Regulation (EC) 1907/2006 (Requirements for the Compilation of Safety Data Sheets).

Information on intrinsic properties of substances may be generated by means other than tests, for instance through the use of alternative methods such as in vitro methods, by quantitative structure activity models, or by the use of grouping or read-across in accordance with Annex XI of Regulation (EC) 1907/2006. The sharing of relevant data is strongly encouraged.

The information provided shall relate to the forms or physical states of the substance or mixtures as used in the final product.

For substances listed in Annexes IV and V of REACH, exempted from registration obligations under Article 2(7)(a) and (b) of Regulation 1907/2006 REACH, a declaration to this effect will suffice to comply with the requirements set out above.

Criterion 6.2: Substances listed in accordance with Article 59(1) of Regulation (EC) No 1907/2006

No derogation from the prohibition set out in point (a) Article 6(6) of Regulation (EC) No 66/2010 shall be granted concerning substances identified as substances of very high concern and included in the list provided for in Article 59 of Regulation (EC) No 1907/2006, present in the product in concentrations higher than 0,1%. Specific concentration limits determined in accordance with Article 10 of Regulation (EC) No 1272/2008 shall apply where the concentration is lower than 0,1%.

Assessment and verification:

The list of substances identified as substances of very high concern and included in the candidate list in accordance with Article 59 of Regulation (EC) No 1907/2006 can be found at:

http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp

Reference to the list shall be made on the date of application. The applicant shall provide a declaration of compliance with this criterion, together with related documentation, such as declarations of compliance signed by the material suppliers and copies of relevant Safety Data Sheets for substances or mixtures.

Criterion 6.3: Further declaration from the manufacturer:

List of substances contained in or added to the product shall be provided to CBs at the time of the application.

Assessment and verification:

A list of substances contained in or added to the AHP must also be submitted with the application for the EU Ecolabel.

5. Conclusion

This report describes the preliminary set of criteria suggested for the award of the EU Ecolabel for absorbent hygiene products (AHP). For the development of the criteria, key principles are followed which are in line with the philosophy of the EU Ecolabel.

First of all, a multi-criteria approach is adopted encompassing various dimensions of sustainability. The key focus is on the environmental performance of AHPs but also social implications related to the manufacture of AHPs could be considered (see Section 4.3). For all criteria proposed, the financial implications are carefully considered in order to avoid prohibitively high costs for AHP manufactures.

It is of great importance to ensure that the criteria developed for AHPs do not negatively influence the product performance. Consequently, a set of fitness-for-use criteria is included which incorporates specific performance test measures (Section 4.1).

With regards to criteria aimed at the environmental performance of AHPs, a strong life cycle focus is adopted. The detailed analysis of results from life cycle assessments for all AHPs within the product scope provided the basis for the definition of criteria. Reflecting the environmental relevance, criteria are developed for the materials needed for the manufacture of AHPs (see Section 4.2). These criteria also require AHP manufacturers to closely collaborate with their suppliers.

Potential for setting criteria on production and disposal of AHPs is considered limited (see Section 4.3 and Section 4.4). However environmental impacts associated with the production and the disposal of AHPs are smaller compared to the production of materials.

Reflecting the feedback received from stakeholders involved in this project, the development of criteria based on lifecycle indicators is considered another important criteria area. However, at this stage of the project there are practical limitations to the development of such prescriptions (see Section 4.5).

Another criterion aims at avoiding the use of chemical substances of concern and as such reflects the legal requirements posed by the EU Ecolabel Regulation (see Section 4.6).

It is expected that this set of criteria will assist in the reduction of negative impacts of consumption and production on the environment, on human health and natural resources from the use of AHPs. It can be assumed that consumers will value the efforts undertaken by manufacturers of AHPs to comply with these criteria by purchasing their products.

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