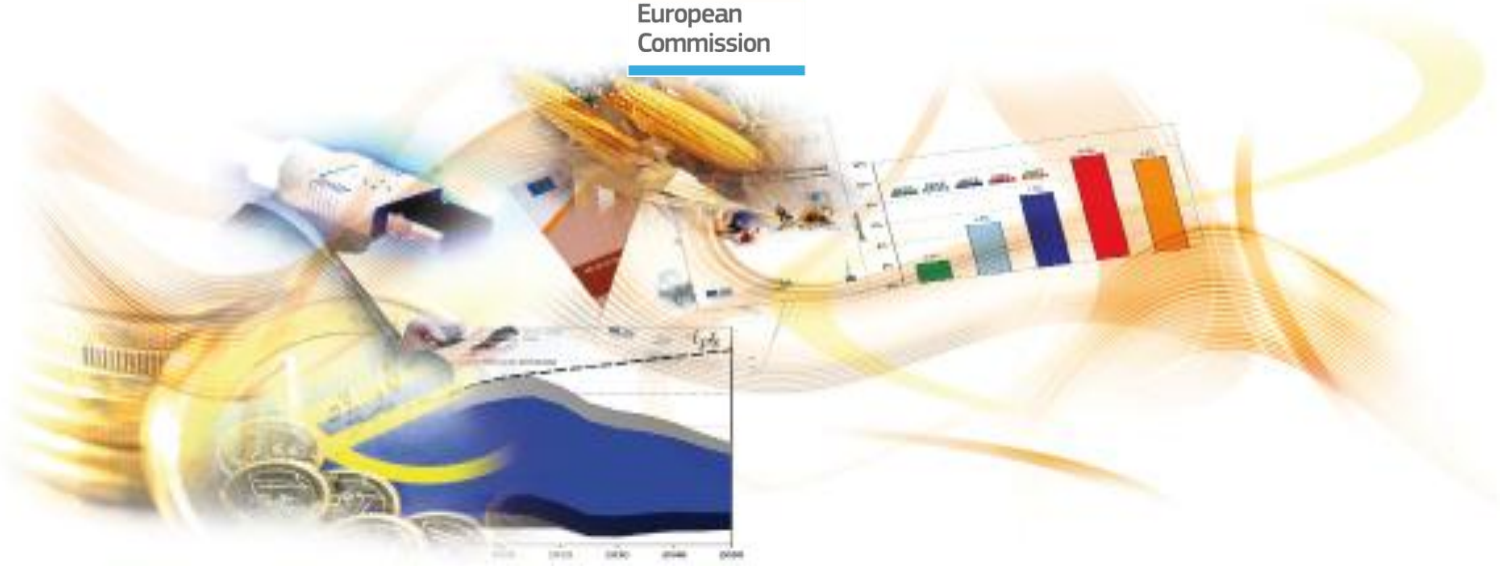
European Commission



J R C T E C H N I C A L R E P O R T S

Revision of European Ecolabel Criteria for laundry detergents, dishwasher detergents, industrial and institutional automatic dishwasher detergents, industrial and institutional laundry detergents, hand dishwashing detergents and all-purpose cleaners and sanitary cleaners

Annexe to support technical reports (Draft)

Renata Kaps, Galyna Medyna, Alicia Boyana (JRC-IPTS Seville)
Josie Arendorf, David Parker (Oakdene Hollins)

December 2014

Joint Research Centre

Table of Contents

List of Tables

Glossary

Active content	The weight of organic ingredients in the product including in-going substances and any organic propellants or solvents.
AE	Alcohol ethoxylates; a class of compounds (including APEOs) on the DID List.
AISE	Detergents industry trade body.
APEOs APDs	Alkylphenolethoxylates; alkylphenol derivatives; persistent surfactants.
CEFIC	European Chemical Industry Council.
CESIO	European Committee of Organic Surfactants and their Intermediates.
CLP Regulation	Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures.
CDV	Critical dilution volume; factorial reduction volume of water needed to render a compound below its TFchronic. The factor is adjusted by the Degradation Factor i.e. how fast it degrades in the environment.
DF	Degradation factor; as described for a substance on the DID List, a measure of its rate of degradation in the environment and hence diminution of toxic potential.
DID List	A tool developed for the EU Ecolabel and Nordic Swan, which contains toxicity and degradation information on over 200 commonly used ingredients in detergents and cosmetics.
ECHA	European Chemicals Agency.
HERA	Human & Environmental Risk Assessment; a voluntary industry programme to carry out Human and Environmental Risk Assessments on ingredients of household cleaning products
I&I	Industrial & Institutional (commonly used as a prefix to uses, users, products…).
IFRA	International Fragrance Association.
In-going substance	A named compound in a product irrespective of whether it is intended (i.e. it is an ingredient) or unintended (i.e. it is an impurity in an ingredient).
Ingredient	A named compound in a product; the compound as stated on the material data sheet. Compare 'In-going substance'.
LAS	Linear alkyl benzene sulphonates; a particularly persistent surfactant formulation on the DID List.
OECD	Organisation for Economic Development and Cooperation.
PEC/PNEC	Predicted Environmental Concentration (PEC)--which is the concentration one expects to find in the environment; and Predicted No Effect Concentration (PNEC)--that is, the concentration that causes no adverse effect to the Environment. The ratio is used as an indicator of risk and is called the Risk Quotient (RQ).

PVNO/PVPI	Poly(2-vinylpyridine-1-oxide), and poly(2-vinylpyridine-1-oxide)-poly(N-vinyl-pyrrolidone); dye transfer inhibitors used in laundry detergents which bond to metals in dyes.
REACH	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency
SCCS (formerly SCCP)	Scientific Committee on Consumer Safety.
SCHER	Scientific Committee on Health and Environmental Risks; one of three independent non-food Scientific Committees provide the Commission with the scientific advice it needs when preparing policy and proposals relating to consumer safety, public health and the environment.
TF(chronic, acute)	Toxicity factor; a measure of the aquatic harm potential of a substance. Major substances are recorded in the DID List.
WHO	World Health Organisation.
WUR	Weight/utility ratio; a measure of the amount of packaging per number of doses/washes/cleaning operations notionally available from the product contents.
WWTP	Waste water treatment plant.

1 INTRODUCTION

The following Technical Annexe presents background information, templates for harmonised wording of criteria and rationale behind the proposed changes for horizontal issues that are common to several EU Ecolabels related to detergent product groups. Its aim is to limit the amount of identical content in the six Technical Reports and to facilitate the understanding of how horizontal issues are currently and are proposed to be handled in the EU Ecolabel scheme.
In all, there are six sets of EU Ecolabel criteria in the detergent product groups. These are:

- laundry detergents (LD),
- industrial and institutional laundry detergents (IILD),
- detergents for dishwashers (DD),
- industrial and institutional automatic dishwasher detergents (IIDD),
- hand dishwashing detergents (HDD),
- all-purpose cleaners and sanitary cleaners (APC).

In order to get a full understanding of each EU Ecolabel criteria under revision, one should consult the corresponding Technical Report and the following Technical Annexe. General information on the product groups can also be found in the Preliminary Reports that have been published.

2 CRITERIA STRUCTURE

The current structure of the EU Ecolabels related to the detergents product groups are schematically presented in Table 1 below. Criteria that cover similar issues are highlighted in identical colours, including where two or more existing criteria will be merged into a single one (i.e. fragrances will now always be included under the general criterion related to restricted substances). From the Table 1 it is clear that while a large portion of the structures are similar, more harmonisation can be achieved – the new proposed structures for the criteria sets are shown in Table 2.

Table 1 Current structure of the EU Ecolabels related to the detergents product groups

Criterion	LD	IILD	DD	IIDD	APC	HDD
1	Dosage requirement	Dosage information	Total chemicals	CDV	CDV	CDV
2	CDV	CDV	Restricted substances	Biodegradability	Biodegradability	Biodegradability
3	Biodegradability	Biodegradability	CDV	Restricted substances	Restricted substances	Restricted substances
4	Restricted substances	Restricted substances	Biodegradability	Packaging	Fragrances	Fragrances
5	Packaging	Packaging	Washing performance	Washing performance	VOC	Corrosive properties
6	Washing performance	Washing performance	Packaging	Automatic dosing system	Phosphorus	Packaging
7	Points	Automatic dosing system	Consumer information	Consumer information/information on EU Ecolabel	Packaging	Washing performance
8	Consumer information	Consumer information/ information on EU Ecolabel	Information on EU Ecolabel		Washing performance	Consumer information
9	Information on EU Ecolabel				Consumer information	Information on EU Ecolabel
10					Information on EU Ecolabel	
11					Professional training	

Table 2 Proposed structure of the EU Ecolabels related to the detergents product groups

Criterion	LD	IILD	DD	IIDD	APC	HDD
1	Dosage requirement	CDV	Dosage requirement	CDV	CDV	CDV
2	CDV	Biodegradability	CDV	Biodegradability	Biodegradability	Biodegradability
3	Biodegradability	Sustainable sourcing of palm oil, etc.	Biodegradability	Sustainable sourcing of palm oil, etc.	Sustainable sourcing of palm oil, etc.	Sustainable sourcing of palm oil, etc.
	Sustainable sourcing of palm oil, etc.	Restricted substances	Sustainable sourcing of palm oil, etc.	Restricted substances	Restricted substances	Restricted substances
4	Restricted substances	Packaging	Restricted substances	Packaging	VOC	Corrosive properties
5	Packaging	Fitness for use	Packaging	Fitness for use	Packaging	Packaging
6	Fitness for use	Automatic dosing systems	Fitness for use	Automatic dosing systems	Fitness for use	Fitness for use
7	Points (if kept)	Consumer information/ information on EU Ecolabel	Consumer information/ information on EU Ecolabel	Consumer information/ information on EU Ecolabel	Consumer information/ information on EU Ecolabel	Consumer information/ information on EU Ecolabel
8	Consumer information/ information on EU Ecolabel				Professional training (if not merged with "consumer information")	

While ideally it would be simpler to have all identical criteria in the same position as to be able to always refer to "criterion 3 in detergents EU Ecolabel" and know that it refers to i.e. biodegradability, this is not possible given the fact that the maximum dosage, or other requirements regarding dosage and dosing, should always be the first criterion to meet but is not present in all EU Ecolabels related to detergents.

3 ARTICLE 1 – NAME, SCOPE AND DEFINITION

3.1 Industrial and institutional vs consumer detergents

Within the context of the EU Ecolabel and this report, the definition of detergents is that used in Regulation (EC) No 648/2004 (the Detergents Regulation)[1]:

> *'**Detergent'** means any substance or mixture containing soaps and/or other surfactants intended for washing and cleaning processes. Detergents may be in any form (liquid, powder, paste, bar, cake, moulded piece, shape, etc.) and marketed for or used in household, or institutional or industrial purposes.*

This definition is broad in scope as says nothing *per se* about the differentiating features of products intended for different uses and/or users. The current EU Ecolabels for detergents make mostly a difference based on the intended use of the products and/or the users, even if there appear to be no absolute criteria to differentiate them. The wording among the definitions is neither harmonized nor completely clear in this respect.
Regarding the users of the products, different users imply different user requirements and methods of application of products, which at the same time, interacts strongly with their formulation. Regarding the use of the detergents or the places to be applied, there are mainly two groups of detergents to differentiate: those that are classified as industrial and institutional detergents and the ones for household use.
Industrial and institutional facilities are considered to be places such as business, hospitals, nursing homes, prisons, schools, textile leasing companies, hotels, restaurants, health clubs, processing and other industries. In some cases, domestic products could be readily used for industrial and institutional use, where the application appears to be the same. For example, routine cleaning of uniforms from a retail environment would be indistinguishable from apparel washing in the home.
The differences in formulation between detergents intended for private and professional use mainly fall into the following two categories:

- restricted or permitted ingredients: there are substances that are allowed in detergents intended for private use but restricted in those intended for professional use and vice versa. For example fragrances are often more restricted in professional products as aesthetic requirements do not outweigh the chemical risks related to dangerous substances in more concentrated products.
- undiluted/concentrated or ready-to-use format: professional users will often buy concentrated formulations that need dilution at the point of use. This is in order to achieve economies of scale in purchase, minimize transport and storage volumes and provide flexibility in determining concentration depending on application (degree of soiling; potentially catering for water hardness, though this is not commonly indicated as a user parameter). However, this is not an exclusive differentiator between users. Professional users will also buy the ready-to-use sprays, etc. commonly used by domestic customers. Conversely, concentrated products are also available to private consumers, as is typically the case for hard surface cleaners (floors, for example) making it difficult to differentiate 'professional use' solely on the concentration of products.

The following table summarizes the current definitions stated in the EU Ecolabels of the detergent product groups that are under revision; the indicated intended uses are highlighted in bold.

[1] Regulation (EC) No 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents (L 104/1 OJEU 8.4.2004) Available from: http://ec.europa.eu/enterprise/sectors/chemicals/documents/specific-chemicals/detergents/index_en.htm

Table 3 Summary of the current definition for detergents

Product group	Current definitions for detergents
Industrial and **institutional** dishwasher detergents	Shall comprise single- and multi-component dishwasher detergents, rinse and pre-soaks, designed **for use in professional dishwashers**. The following products are excluded from the scope of this product group: CADD, detergents intended to be used in washers of medical devices or in special machines for the food industry. Sprays not dosed via automatic pumps are excluded from this product group.
Industrial and **institutional** laundry detergents	Are laundry detergent products **performed by professional users in the industrial and institutional sectors**. Included in this product group are multi-component-systems constituting of more than one component used to build up a complete detergent or a laundering program for automatic dosing system. This product group shall not comprise products for obtaining textile attributes such as water-repellent, waterproof or fire-proof, etc. Furthermore, the product group shall not comprise products that are dosed by carriers such as sheets, cloths or other materials, as well as washing auxiliaries used without subsequent washing, such as stain removers for carpets and furniture upholstery. **Consumer laundry products are excluded from the scope of this product group.**
Detergents for dishwashers	Shall comprise detergents for dishwashers and product used as rinse aids, whether in powder, liquid or any other form, which are **intended to be marketed and used exclusively** in **automatic domestic dishwashers** and in **automatic dishwashers for professional use**, the size and usage of which is **similar to that of domestic dishwashers.**
Laundry detergents	Laundry detergents and pre-treatment stain removers whether in powder, liquid or any other form **which are marketed and used for the washing of textiles principally in household machines** but not excluding their use in laundrettes and common laundries. Pre-treatment stain removers include stain removers used for direct spot treatment of textiles (before washing in the machine) but do not include stain removers dosed in the washing machine and stain removers dedicated to other uses besides pre-treatment. This product group shall not comprise products that are dosed by carriers such as sheets, cloths or other materials nor washing auxiliaries used without subsequent washing such as stain removers for carpets and furniture upholstery.
All-purpose cleaners	Shall comprise: all-purpose cleaners, window cleaners, and sanitary cleaners. a) All-purpose cleaners comprising detergent products intended for the routine cleaning of floors, walls, ceilings, windows and other fixed surfaces, and which are either diluted in water prior to use or used without dilution. **All-purpose cleaners shall mean products intended for indoor use in buildings which include domestic, commercial and industrial facilities**. b) Window cleaners comprising specific cleaners intended for the routine cleaning of windows, and which are used without dilution. c) Sanitary cleaners comprising detergent products intended for the routine removal, including by scouring, of dirt and/or deposits in sanitary facilities, such as laundry rooms, toilets, bathrooms, showers and kitchens. This subgroup thus contains bathroom cleaners and kitchen cleaners. The **product group shall cover products for both private and professional use.** The products shall be mixtures of chemical substances and must not contain micro-organisms that have been deliberately added by the manufacturer.
Hand dishwashing detergents	Shall comprise all detergents intended to be used to wash by hand dishes, crockery, cutlery, pots, pans, kitchen utensils and so on. The **product group shall cover products for both private and professional use**. The products shall be a mixture of chemical substances and must not contain microorganisms that have been deliberately added by the manufacturer.

As seen in Table 3, there is a variety of terms that refers to each of the two types of detergents (industrial & institutional and for household use). For example, terms related with the use of the detergents by professionals include 'industrial and institutional', 'professional use', 'use in professional equipment', 'commercial facilities', 'industrial facilities', 'industrial and institutional sector', etc. On the other hand, terms related to the use of detergents by the general public include 'consumer product', 'private use', 'domestic facilities', 'household equipment', etc.

The Detergent Regulation (EC) No 648/2004 provides several definitions that can guide the detergents classifications and be the basis for a possible harmonization. This Regulation, however, does not provide the definitions for all type of detergents and even those that are provided are not fully harmonized. For example, 'consumer laundry detergents' and ' consumer automatic dishwasher detergents' are defined as follows

> *"**consumer laundry detergent**" means a detergent for laundry placed on the market for use by non-professionals, including in public laundrettes*
>
> *"**consumer automatic dishwasher detergents**" means a detergent placed on the market for use in automatic dishwashers by non-professionals*

Moreover, in Annex VII of the Regulation, which sets up the provisions on labelling that shall apply to the packaging, the same detergents are referred to as *'**detergents sold to the general public'.***

In both definitions, the words related to the use of the detergents are highlighted. Several differences can be noted when comparing these two definitions to those included in the current EU Ecolabel criteria for detergents for dishwashers and laundry detergents:

a) the word 'consumer' is not included in the name of the EU Ecolabel schemes. The scope of the EU Ecolabel schemes is also wider than that of the definitions provided by the Detergent Regulation as in the EU Ecolabels both cover consumer detergents and also those that are similar or can be used in the facilities where consumer detergents can be used.

b) the intended use refers to different things. In the Detergent Regulation the use refers to the type of user (non-professionals) while in the EU Ecolabel the use refers to the facilities to be used.

The Detergents Regulation does not provide definitions for consumer all-purpose cleaners and hand dishwashing detergents. In the respective EU Ecolabels, the intended use of these products is not defined including the word 'consumers' but by making a reference to the facilities and the type of users, for example, 'domestic facilities' or 'private use'.

The Detergent Regulation also provides a general definition of what should be considered an 'industrial and institutional detergent'. This definition reads:

> *"**industrial and institutional detergent**" means a detergent for washing and cleaning outside the domestic sphere, carried out by specialised personnel using specific products.*

This definition uses the terms 'outside the domestic sphere' and 'specialised personnel' to refer to the use and users. Although the terms 'industrial and institutional product' is used in the EU Ecolabel for detergent product groups, they also introduce other terms to define both the use ('professional use', 'professional equipment', 'to be used in commercial or industrial facilities') and the users ('specialised personnel' as 'professional users in the industrial and institutional sector') of this kind of products.

Even though there is a lack of harmonisation in the terms used, there is a need to clearly make a distinction between products to be used by professional users and the ones intended for household use. Indeed, as the Detergents Regulation requirements concerning the restriction of substances and labelling of products are different for the two types of products, and the detergents intended to be used in the industrial and institutional sector should not be made available to members of the general public without the inclusion of additional information on the label to ensure appropriate consumer protection.

In order to bring higher harmonization among the terms used in the definitions included in the EU Ecolabels related to detergent product groups under revision and those included in the Detergent Regulation, a rewording of the current EU Ecolabel definitions is proposed. In the revised definitions,

and in line with the terms included in the Regulation, the names of the products shall be labelled as **'consumer'** detergents' or **'industrial and institutional'** detergents' and the **intended users** of the products will be referred, as much as possible, as **'consumers'** or **'non-professionals'** and **'professionals'** or **'specialised personnel'.**

The terms included in the Detergent Regulation regarding the **intended use** of the products are not so clear. Therefore the proposed harmonization is based on the six current definitions in the EU Ecolabel schemes. The use carried out by professionals is proposed to be named as **'professional use'** or as taking place in **'professional facilities'** or **'industrial and institutional facilities'** while the use performed by non-professionals is proposed to be named **'private use'** or as taking place in **'domestic facilities'**.

Using the proposed harmonisation approach, the revised names and definitions read:

Table 4 Proposal for revised names and definitions

EU Ecolabel proposed names and definitions	
Industrial and institutional dishwasher detergents	Shall comprise single- and multi-component dishwasher detergents, rinse and pre-soaks, designed for use in professional dishwashers. Multi-component systems may incorporate a number of products including pre-soaks and rinsing agents**.** The following products are excluded from the scope of this product group: consumer automatic dishwasher detergents (CADD), detergents intended to be used in washers of medical devices or in special machines for the food industry. Sprays not dosed via automatic pumps are excluded from this product group.
Industrial and institutional laundry detergents	Shall comprise laundry detergent products used by professionals in industrial and institutional facilities. Included in this product group are multi-component-systems constituting of more than one component used to build up a complete detergent or a laundering program for automatic dosing system. This product group shall not comprise products for obtaining textile attributes such as water-repellent, waterproof or fire-proof, etc. Furthermore, the product group shall not comprise products that are dosed by carriers such as sheets, cloths or other materials, as well as washing auxiliaries used without subsequent washing, such as stain removers for carpets and furniture upholstery. Consumer laundry products are excluded from the scope of this product group.
Consumer dishwasher detergents	Shall comprise detergents for dishwashers and product used as rinse aids, whether in powder, liquid or any other form, which are intended to be marketed and used exclusively in automatic domestic dishwashers and in automatic professional dishwashers, the size and usage of which is similar to that of domestic dishwashers.
Consumer laundry detergents	Shall comprise laundry detergents and pre-treatment stain removers whether in powder, liquid or any other form which are marketed and used for the washing of textiles principally in domestic machines but not excluding their use in laundrettes and common laundries. Pre-treatment stain removers include stain removers used for direct spot treatment of textiles (before washing in the machine) but do not include stain removers dosed in the washing machine and stain removers dedicated to other uses besides pre-treatment. This product group shall not comprise products that are dosed by carriers such as sheets, cloths or other materials nor washing auxiliaries used without subsequent washing such as stain removers for carpets and furniture upholstery.
Cleaning products	Shall comprise: all-purpose-cleaners, window cleaners and sanitary cleaners. a) All-purpose cleaners comprising detergent products intended for routine cleaning of hard surfaces such as walls, floors and other fixed surfaces.

EU Ecolabel proposed names and definitions	
	b) Window cleaners comprising specific detergents intended for the routine cleaning of windows, glass and other highly polished surfaces. c) Sanitary cleaners comprising detergents products intended for the routine removal, including by scouring, of dirt and/or deposits in sanitary facilities, such as laundry rooms, toilets, bathrooms, showers and kitchens. This subgroup contains WC cleaners, bathroom cleaners and kitchen cleaners. The product group shall cover products for both private and professional use, intended for indoor use and sold either in ready-to-use (to be used without dilution in water) or undiluted form. Products shall be mixtures of chemical substances and must not contain micro-organisms that have been deliberately added by the manufacturer. Wipes containing cleaning agents are not eligible for the EU Ecolabel for cleaning products.
Hand dishwashing detergents	Shall comprise all detergents intended to be used to wash by hand glassware, crockery and kitchen utensils including cutlery, pots, pans and ovenware. The product group shall cover products for both private and professional use. The products shall be a mixture of chemical substances and must not contain microorganisms that have been deliberately added by the manufacturer.

4 ARTICLE 2 – DEFINITIONS

4.1 Current state

In the current versions of the EU Ecolabels related to detergents, the section on definitions of terms can often be found in Article 2 of the body of the EU Ecolabels. As shown in Table 5, there are more or fewer terms defined and some definitions can are included in the Annexes (only the example of "ingoing substances" is included).

Table 5 Summary of the current product group definitions

	Current product group definitions
Laundry detergents	(1) 'heavy-duty detergents' means detergents used for ordinary washing of white textiles at any temperature; (2) 'colour-safe detergents' means detergents used for ordinary washing of coloured textiles at any temperature; (3) 'low-duty detergents' means detergents intended for delicate fabrics; (4) 'substance' means a chemical element and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the products and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition. Annex (1)(b) mentions, "Ingoing substances are defined as all substances in the product including additives (e.g. preservatives or stabilisers) in the ingredients. Impurities resulting from the raw material production, which are present in concentrations > 0,010 % by weight of the final formulation shall also comply with the criteria."
I&I Laundry detergents	No explicit definitions in the main text. Annex (1) (b) mentions, "Substances meeting the threshold limit as listed above are hereby referred to as 'Ingoing substances'."
Dishwasher detergents	'Substance' means a chemical element and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the products and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition. Annex (1)(b) mentions, "Ingoing substances are defined as all substances in the product including additives (e.g. preservatives or stabilizers) in the ingredients. Impurities resulting from the raw material production, which are present in concentrations > 0,010 % by weight of the final formulation shall also comply with the criteria."
I&I Dishwasher detergents	No explicit definitions in the main text. Annex (1) (b) mentions, "Substances meeting the threshold limit as listed above are hereby referred to as 'Ingoing substances'."
All-purpose cleaners and sanitary cleaners	1. 'substance' means a chemical element and its compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurity deriving from the process used but excluding any solvent, which may be separated without affecting the stability of the substance or changing its composition; 2. 'product' (or 'mixture') means a mixture or solution of two or more substances, which do not react.
Hand dishwashing detergents	1. 'substance' means a chemical element and its compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurity deriving from the process used but excluding any solvent, which may be separated without affecting the stability of the substance or changing its composition; 2. 'product' (or 'mixture') means a mixture or solution of two or more substances, which do not react.

4.2 Proposed harmonised text

Article 2 (partial)
(*) definitions specific to each EU Ecolabel (*) "ingoing substances and mixtures" means - biocides, fragrances, colouring agents, and mixtures thereof, regardless of concentration in the final formulation, - substances and mixtures intentionally added, by-products and impurities from raw materials, the concentration of which equals or exceeds 0,010% by weight of final formulation, (*) "undiluted product" means a product that is diluted in water prior to use; (applicable for APC) (*) "ready-to-use (RTU) product" means a product that should not be diluted in water before use; (applicable for APC) (*) "concentrated product" means a product that has a "concentrated" claim made by the manufacturer in the sense that less product is to be used for the same function and without dilution; (applicable for LD/DD/HDD) (*) "primary packaging" means - for single doses in a wrapper that is intended to be removed before washing, the individual dose wrapping in direct contact with the content and the packaging conceived so as to constitute the smallest sales unit of distribution to the final user or consumer at the point of purchase, including label where applicable; (applicable to DD), - for all other types of products, packaging conceived so as to constitute the smallest sales unit of distribution to the final user or consumer at the point of purchase in direct contact with the content, including label where applicable; (applicable to LD /DD) (*) "primary packaging" means packaging conceived so as to constitute the smallest sales unit of distribution to the final user or consumer at the point of purchase in direct contact with the content, including label where applicable; (applicable to IILD/IIDD/HDD/APC)

4.3 Rationale and discussion

The harmonisation of terms in the main body of the text aims to simplify and clarify the reading of the different EU Ecolabels concerned. In the case of APCs and HDDs, some definitions have been removed as they are now covered by the Detergents Regulation.

The terms "substances" and "ingoing substances" are proposed to be clarified as "ingoing substances and mixtures" harmonising with the most recently voted criteria documents for industrial and institutional detergent products.

Definitions are proposed to be added to distinguish between "undiluted" and "concentrated" products as, in the current sets of criteria, the usage of "concentrated" and "undiluted" can lead to confusion. In many cases "concentrated" is both used to designate products which should and should not be diluted. For example, there is a mention "concentrated" LDs, etc. that are obviously not meant to ever be diluted but also of "concentrated" APCs that should be diluted before use.

In order to avoid further confusion, the following guidelines are proposed to be applied to detergents EU Ecolabel criteria:

- "concentrated" shall only refer to products that have a "concentrated" claim made by the manufacturer in the sense that less product is to be used for the same function and without dilution (i.e. a concentrated laundry detergents dose should be lower than the dose of a regular laundry detergent). If no "concentrated" specification is made about a product, the limits set out for normal (conventional) products are to be respected.
- "undiluted" shall only refer to products that must be diluted before their intended use (i.e. an undiluted all-purpose cleaner should only be used when the recommended dose is diluted in the amount of water prescribed by the manufacturer). The term for products that should be used without dilution is "ready to use" (RTU).

With these two definitions, it is then possible to have a concentrated undiluted product, which then designates a product for which a lower dose is necessary and that should be diluted before use.

For packaging, two harmonised definitions are proposed. This differentiation is made in order to clarify what constitutes the primary packaging for products that are sold as a main container filled with individually wrapped doses, as this type of product is becoming more and more present on the laundry and dishwasher detergent markets. The criteria text for LD and DD specifies that "If the product has a water-soluble foil intended not to be removed before washing, the foil must be considered to be part of the product formulation in all requirements" therefore it is considered as part of the product. Thus, only individually wrapped doses with wrapping that is intended to be removed before washing are singled out by the packaging definition. The individual wrappers should be considered for the packaging requirements as they generate domestic waste.

5 MEASUREMENT THRESHOLDS

5.1 Background

Measurement thresholds indicate the concentration of ingredients in the product for which documentation of compliance is required. As the ingredients of detergents end up in wastewater after use and are not all removed in wastewater treatment plants, even small quantities can potentially have an impact on ecosystems. In the current sets of criteria, there are two measurement thresholds – 0.010% by weight of the final formulation for the majority of ingredients and a lower threshold defined as "regardless of concentration" or "irrespective of weight" assigned to ingredients such as fragrances and preservatives, with some exceptions. There is no set definition as to what constitutes the minimum requirement for "regardless of concentration" or "irrespective of weight", which has been pointed out by stakeholders having the potential to lead to confusion.

The main differences between the measurement threshold definitions are highlighted in Table 6. The differences in wording are mainly due to the fact that the previous revisions of the sets of criteria were performed two at a time for the detergent group, LD paired with DD, IILD with IIDD, and APC with HDD, and the criteria for rinse-off cosmetics was revised separately. As indicated in the bottom three lines, the each type of ingredient (additives, impurities and the other "normal" substances) is covered slightly differently by the four definitions.

Table 7 shows definitions linked to the ingredients as indicated in other ecolabel schemes. There are no explicit measurement threshold definitions in these schemes but by defining thresholds for impurities and by-products, and when those should be considered, they seem to implicitly require compliance with the criteria for all other substances regardless of weight.

Outside of other ecolabels, measurement thresholds can be found in REACH and CLP requirements. In REACH, the threshold of 0.1% (w/w) is used for substances in articles. CLP defines "relevant ingredients" as those that are present in mixtures in concentrations of 1% (w/w) unless there is a reason to suspect that an ingredient present in smaller concentrations is still relevant for classification purposes.

Table 6 Wording of ingredients, measurement thresholds and compliance with criteria in EU Ecolabel

	LD/DD	IILD/IIDD	APC/HDD	Rinse-off cosmetics
Current wording	Constituent substances the concentration of which exceeds 0,010 % by weight of the preparation shall comply with the ecological criteria. For preservatives, colouring agents and fragrance compliance with the criteria is required regardless of their concentration except for criterion 4(b) on excluded or limited substances and mixtures. Ingoing substances are defined as all substances in the product including additives (e.g. preservatives or stabilisers) in the ingredients. Impurities resulting from the raw material production, which are present in concentrations > 0,010 % by weight of the final formulation shall also comply with the criteria. (where "substance" means a chemical element and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the products and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its	Compliance with the ecological criteria is required for substances intentionally added, as well as for by-products and impurities from raw materials, the concentration of which equals or exceeds 0,010 % by weight of final formulation. For biocides, colouring agents and fragrance compliance with the criteria is required regardless of their concentration. Substances meeting the threshold limit as listed above are hereby referred to as 'Ingoing substances'.	All substances in the product, including additives (e.g. preservatives or stabilisers) in the ingredients, of which the concentration exceeds 0,010 % by weight of the final formulation shall comply with the EU Ecolabel criteria, except for Criterion 1, where each intentionally added substance should be included, irrespective of its weight. Impurities resulting from the production of the ingredients which are present in concentrations > 0,010 % by weight of the final formulation shall also comply with the criteria. (where "substance" means a chemical element and its compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurity deriving from the process used but excluding any solvent, which may be separated without affecting the stability of the substance or changing its composition.)	Compliance with the ecological criteria is required for all ingoing substances, with the exception of compliance with criterion 3(b) and 3(c) for preservatives, colorants and fragrances which is requested when their concentration equals or exceeds 0.010% by weight in the final formulation. (where '"ingoing substances" means preservatives, fragrances and colorants, regardless of the concentration, and other substances intentionally added, by-products and impurities from raw materials, the concentration of which equals or exceeds 0.010 % by weight of final formulation' as defined in Article 2)

	composition.)			
Additives (e.g. biocides, fragrances, colouring agents, stabilisers)	All criteria: "regardless of concentration" Except: 0.010% for Section (b) of Criterion the content of hazardous substances and mixtures.	All criteria: "regardless of concentration"	All criteria: 0.010% Except: "irrespective of weight" for Criterion on the toxicity to aquatic organisms.	All criteria: "regardless of concentration" Except: 0.010% for Criteria 3(b) and 3(c) on hazardous substances and mixtures.
Impurities	All criteria: 0.010%	All criteria: 0.010%	All criteria: 0.010%	All criteria: 0.010%
Rest	All criteria: 0.010%	All criteria: 0.010%	All criteria: 0.010% Except: "irrespective of weight" for Criterion on the toxicity to aquatic organisms.	All criteria: 0.010%

Table 7 Wording linked to ingredients in other ecolabelling schemes

Ecolabel	**Measurement threshold definition**
Nordic Swan – (similar wording for most product groups)	Unless otherwise specified, the term 'constituent substances' refers to all substances in products, including additives in the raw materials (e.g. preservatives and stabilisers), but not impurities from primary production. Impurities comprise residues from primary production that may be found in the laundry detergent at concentrations below 100 ppm (0.0100% by weight, 100 mg/kg) Substances that are added to an ingredient, deliberately or for a purpose, are not regarded as impurities, regardless of concentration. Impurities at concentrations greater than 1.0% in the ingredient are regarded as constituent substances. Substances/products known to be liberated by a constituent substance are also regarded as constituent substances.
New Zealand Environmental Choice	No clear definition for measurement thresholds is indicated in the criteria documents.
Good Environmental Choice Australia	No clear definition for measurement thresholds is indicated in the criteria documents. Impurities are defined as, "Residual products from primary production that can be found in the product/ingredient in concentrations below 0.010% (100 ppm). Substances that are actively added to an ingredient or product for a particular purpose are not considered to be impurities, irrespective of quantity. Substances/products known to be liberated by an ingredient (e.g. formaldehyde and arylamine) are not considered to be impurities or contaminants." Trace amounts (<100ppm) of certain impurities are exempted from compliance with some criteria.

5.2 Proposed harmonised text (to be complemented in each criteria set with appropriate text additions, if necessary):

Article 2
(*) "ingoing substances and mixtures" means - biocides, fragrances, colouring agents, and mixtures thereof, regardless of concentration in the final formulation, - other substances and mixtures intentionally added, by-products and impurities from raw materials, the concentration of which equals or exceeds 0,010% by weight of final formulation;

Annex – 1 (b) - Measurement thresholds
Compliance with the ecological criteria is required for all ingoing substances and mixtures, with the exception of compliance with criterion 3(b) and 3(c) for preservatives, colorants and fragrances which is requested when their concentration equals or exceeds 0,010% by weight in the final formulation.

5.3 Rationale

Detergent ingredients have been shown to have different levels of impact on the environment. With the specification of a measurement threshold, the competent bodies and applicants know which substances should be taken into account when assessing and verifying a product's compliance for each criterion. As some substances can have impacts even at very low concentrations, the requirements for them to be considered "regardless of concentration" has been kept for criteria such as toxicity to aquatic organisms and biodegradability.

EU Ecolabels require applicants to provide competent bodies with the full formulation of products (indicating trade name, chemical name, CAS number and INCI designations, DID number, the ingoing quantity including and excluding water, the function and the form of all ingredients regardless of concentration). Thus it should be understood that in the definition of "ingoing substances", "regardless of concentration" means that if a substance that is a biocide, fragrance or colouring agent and is on the bill of material, even in quantities lower than 0,010%, it should be considered in criteria compliance calculations.

It was agreed during the revision of the EU Ecolabel on rinse-off cosmetics that on limited substances (criteria 3(b) and 3(c)) shall be required for all ingredients concentration of which exceeds 100 ppm. This is also aligned with the horizontal approach on hazardous substances for formulations.

6 FUNCTIONAL UNIT AND REFERENCE DOSAGE

The current EU Ecolabel criteria sets indicate in different ways which unit and which reference dosage should be used when calculating compliance with a criterion (Table 8). Some differences are due to the fact that the detergents have different uses but wording can be aligned for similar products. Moreover, the "functional unit" specified in several EU Ecolabels does not actually refer to the functional unit – for example, the functional unit for a laundry detergent is a kilogram of dry laundry to be washed and not grams [of product] per kilogram of laundry. This error in the statement of the functional unit leads to what might appear inconsistencies in some criteria (i.e. for LDs Criterion 1 referenced both "g/kg wash" and "ml/kg wash" when it was stated that the functional unit was "g/kg wash" and could lead one to believe that the "ml/kg wash" was an error).

Table 8 Summary of texts related to functional unit and reference dosage

	LD	**IILD**	**DD**	**IIDD**	**APC**	**HDD**
Functional unit	g/kg wash (grams per kilo wash)	g/kg laundry (grams per kilo laundry)	Quantity of product required to wash 12 place settings with a standard soil	g/l washing solution (grams per litre washing solution)	(nothing explicit)	(nothing explicit)
Reference dosage	Quantity recommended by the manufacturer necessary for: - 4.5kg load (heavy duty detergent) - 2.5kg load (low duty detergent)	(nothing explicit)	Quantity necessary for normally soiled dishes and 12 place settings	(nothing explicit)	Quantity necessary for 1l of washing water (undiluted products) or 100g (ready-to-use products).	Quantity necessary for 1l of washing water for normally soiled dishes.

It is proposed to remove the mention of a functional unit and state that the "reference dosage" is used for all calculations, where "reference dosage" always refers to the quantity recommended by the manufacturer for a specific application described in the EU Ecolabel text. It is also proposed to state that if a product is in liquid form, its total chemicals weight (i.e. weight minus the water content) is to be considered. A summary of the changes proposed are included in Table 9. Please refer to each Technical Report for the exact proposed wording for each EU Ecolabel.

Table 9 Summary of changes proposed to texts related to functional units and reference dosage.

LD	IILD	DD	IIDD	APC	HDD
Quantity recommended by the manufacturer to wash 1kg of dry laundry (based on the dosage recommender for: - 4,5kg load (heavy duty detergent) - 2,5kg load (low duty detergent)), for stain removers – 2,7ml/kg of dry laundry (based on 2 ml per application and 6 applications per wash-load of 4,5 kg)	Quantity recommended by the manufacturer to wash 1kg of dry laundry	Quantity recommended by the manufacturer to wash normally soiled dishes and 12 place settings, 3ml for rinse aids	Quantity recommended by the manufacturer for 1l of washing solution	Quantity recommended by the manufacturer for 1l of washing water (undiluted products) or 100g (ready-to-use products)	Quantity recommended by the manufacturer for 1l of washing water for normally soiled dishes.

7 WATER HARDNESS AND WATER TEMPERATURE

7.1 Water hardness

Water hardness is referenced in all detergent EU Ecolabels although it does not directly intervene in all criteria. In some it is referenced in °dH (deutsche Härte, degree of General Hardness) and in others in mmol $CaCO_3$/l. As the Detergents Regulations refers to water hardness in mmol $CaCO_3$/l, this unit is proposed to be consistently used throughout the concerned EU Ecolabels.
The Detergents Regulation specifies that 2,5 mmol $CaCO_3$/l is considered to be medium water hardness. The levels of soft and hard water are not explicitly cited. Nevertheless the commonly agreed upon thresholds for water hardness throughout Europe (as found in the German detergents and cleansing agents act[2]) are indicated in Table 10.

Table 10 Classification of water hardness ranges according to the German Washing and Cleansing Agents Act.

Water hardness	mmol $CaCO_3$/l	Equivalent °dH
Soft	< 1,5	< 8,4
Medium	1,5 – 2,5	8,4 – 14
Hard	> 2,5	> 14

In the EU Ecolabels for industrial and institutional laundry and dishwasher detergents, compliance with several criteria is to be calculated based on the water hardness of the water that is used during the washing. It is not specified how this water hardness is to be determined as in many cases industrial and institutional set ups have water softening components, as washing in soft water necessitates less detergent, and the water inside the washing machine does not correspond to the water coming in from the utilities supplier.
Moreover, the current thresholds for water hardness indicated in these two EU Ecolabels (0-6°dH, 7-13°dH, and >14°dH) do not correspond to the ones commonly found in European documents (Table 10). Thus it is proposed to remove the indications of water hardness ranges and state values at water of medium hardness**.**

Consultation questions	
1	Should values be revised in order to reflect this change in water hardness ranges?

7.2 Water temperature

Water temperature represents an important part of the total environmental impacts attributed to detergents, as hot water is often used during the use phase (see LCA results in Section 4 of Preliminary Reports). According to LCA performed as part of this revision work, the environmental impacts due to the heating of water can be reduced either by choosing a cleaner energy source to heat up the water or reducing the water temperature.

[2] Gesetz über die Umweltverträglichkeit von Wasch- und Reinigungsmitteln (Wasch- und Reinigungsmittelgesetz – WRMG). Date of text: 29 April 2007. Bundesgesetzblatt, Part I, No. 17, 4 May 2007, pp. 600-603.

7.2.1 Background information

Influencing the choice of the energy source used for water heating is not in the hands of the EU Ecolabel scheme. The EU Ecolabel scheme can, to some extent, influence the water temperature used during the use phase and this aspect is discussed in this section.
All detergents are not equal when it comes to water temperature as some claim that can be effectively used with cold water (eg rinsing off certain all-purpose cleaners) while others require high temperatures to fulfil their function (eg washing hospital linen using industrial and institutional laundry detergent). Recent market trends indicate that some products that have been traditionally used at high temperatures (consumer laundry detergents) are now being developed to be used at cold and low water temperatures and are becoming more popular among users. However, even if there is a trend for producer to develop products that are effective at low temperatures, this does not guarantee that a lower washing temperature will be used as this largely depends on user behaviour. The users are the ones responsible for correctly using the products and those that take the ultimate decision of whether warm water will be used or not.
Influencing user behaviour is very complex, as the decisions made by users are both conscious and unconscious (i.e. culture, traditions, perceptions, etc.). A deep knowledge of the reasons of why users make the decisions they make and a good comprehension of the context of user behaviour are required to design EU Ecolabel requirements that address this issue. Some of the factors that can be influenced and that determine user behaviour include:

- the knowledge and the preconceptions of the need to use hot water to get good washing performances,
- the socio-cultural factors and traditions that influence a user's behaviour and choices,
- the economic factors linked to a purchase: the detergent market is driven by brand-fidelity or by price. Subsidising or reducing the price of those products with a better environmental performance would influence purchase decisions.

Regarding the whole life-cycle of the product, the success of an initiative towards an efficient use of the product depends on the collaboration, the acceptance and the commitment of all the actors involved. Considering this analysis, the activities can be ranked under these general themes listed below:

a) Technological excellence

The producers should ensure and demonstrate that the product is effective at lower temperatures in order to build up the confidence of users in low temperature products.

a) Education, training, information and communication

Information must be available to generate awareness of the environmental impacts caused as well as of the potential alternative behaviours, to make the audience responsive to efforts to change behaviour.
Information, education, training and communication should remove barriers to behavioural change and encourage and reinforce positive behaviour. People more easily change habits when they understand the stakes from a personal point of view, know the repercussions of any choice and know that they do not undergo disadvantages (e.g., they will get a surface as clean using cold water as with warmer water).
For example, AISE has launched the "I prefer 30"[3] campaign to promote washing at lower temperatures among users by providing easy-to-understand information on the impacts washing temperature has on the longevity of materials and on the associated environmental benefits.

[3] For more details see: http://www.iprefer30.eu/

c) Technical assistance

A technical assistance can provide the users with accurate information as well as help them identifying the biggest impacts on their habits (water temperature and energy use related), set reachable objectives in energy use and water consumption and diffuse appropriate advices and messages. This type of service is not yet at all ubiquitous but in certain cases, such as in industrial and institutional settings, it could be set up without many further efforts.

For example, in the case of the EU Ecolabel, such technical assistance can be of especial interest in the case of industrial and institutional products as well as for "Cleaning services".

d) Incentives and dissuasion.

In a private sphere, the primary beneficiary of an energy efficient behaviour (washing at low temperatures) is usually the individual making the change or the immediate family of the individual. In contrast, in an industrial and institutional sphere, the primary beneficiary may be the owner of the building or facility or the tender of the service.

Behavioural change can be encouraged through using incentives to promote the desirable behaviours and deterrents to discourage unwanted behaviours. Incentives and deterrents can be financial and non-financial. Reducing or subsidising the cost or price of lower temperature efficient products and raising awareness of the monetary savings due to the use of cold / tap water are among the easiest measures to implement. Nevertheless, apart from providing information on potential monetary savings, little can be done under the EU Ecolabel framework.

In the current EU Ecolabels related to detergents, water temperature is considered in several ways (Table 11). In the current criteria, water temperature is mainly tackled through suggestions made in the criteria on user information, although the EU Ecolabel for laundry detergents also has a criterion that favours detergents that the manufacturers claim are effective at low temperatures (Criterion 7 "Points").

Table 11 Water temperature indications in the different EU Ecolabel criteria

	Water temperature indications
LD	C6: Washing performance (fitness for use): the testing is to be done at a maximum of 30C (in accordance with the revised performance test from 20/06/2014). C7: Points: products much obtain a minimum of 3 points and points are obtained based on their efficiency in cold water, their maximum dosage, their CDV values and how they fare in terms of biodegradability. C8: Consumer information: there is a recommendation stating, "Wash at the lowest possible temperature".
IILD	C6: Washing performance (fitness for use): the testing is to be done at the lowest recommended wash temperature. C8: Consumer information: there is a recommendation stating, "Wash at the lowest possible temperature".
DD	C5: Washing performance (fitness for use): the tests shall be carried out at 55°C ± 2°C (or at a lower temperature if the detergent claims to be efficient at a temperature below 55°C) with cold pre-wash without detergent. C7: Consumer information: "The following text (or equivalent) shall appear on or in the product: 'This Ecolabelled detergent works well at low temperatures (8). Select low temperature washing cycles on the dishwasher, wash full loads and do not exceed the recommended dosage. This will minimise both energy and water consumption and reduce water pollution."
IIDD	C5: Washing performance (fitness for use): the testing shall be done at the lowest recommended temperature.
APC	No water temperature indications.
HDD	No water temperature indications.

Similar approaches have been adopted in other ecolabelling schemes, as shows in Table 12. It can be observed that for cleaning products (APC), a recommendation to use cold water for dilutions is often included.

Table 12 Water temperature indications in different ecolabelling schemes and other voluntary agreements

Product group (scheme or agreement)	**Water temperature indications**
Laundry detergents and stain removers (Nordic Swan)	Colour safe detergents must be tested at 30 ºC, all other detergents must be efficient at 40 ºC or below (tests performed at 40C and 30C, depending on the type of detergent). The following indication must appear on all detergents, "Reduce the temperature of your normal wash programmes to safeguard the environment."
Laundry detergents for professional use (Nordic Swan)	There are two sets of requirements, one for detergents that are to be used at 30-40C and those that are to be used at 40-60C. CDV limits, the amount of phosphonates allowed and the washing performance tests are different in the two sets of requirements, the ones for 40-60C detergents are stricter in terms of CDV limits and amount of phosphonates allowed.
Laundry detergents (New Zealand)	The following indication must appear on packaging: "Use the lowest recommended temperature."
Floor cleaners/Commercial and institutional cleaners	"Dilution from the cold tap shall be recommended."
Cleaning Products for Household Use (USA – Green Seal)	"Each product as used, when diluted with water from the cold tap at no more than 50F, shall clean common soils and surfaces in its category effectively, as measured by a standard test method." (50F = 10C) The label shall state that "dilution with water from the cold tap is recommended."
Laundry detergents (USA – Green Seal)	The benchmark product shall be tested at 32 +/-1C. The product to be ecolabelled shall be tested at 27 +/-3C.

7.2.2 Water temperature in this revision

In this revision of the EU Ecolabels related to detergents, it is proposed to tackle the question of water temperature through communication and the availability of high quality products efficient at low temperatures.
Where appropriate, the criterion "Fitness for use" is proposed to require that tests are performed the tests at temperatures that are lower than commonly used by users in the case of consumer products and at the lowest temperature recommended by the manufacturer in the case of industrial and institutional products. For example, in the case of consumer laundry detergents, the average washing temperatures across Europe is of 41C[4] and it is proposed to require all tests to be performed at 30C or lower, if the manufacturer claims that the detergent is effective at lower temperatures. Through such requirements, the EU Ecolabel can promote products that are truly effective at lower temperatures and contribute to convincing users that they can, indeed, save energy and money by using less hot water. This would create a positive attitude towards low/cold temperature products and increase their use. More information on the proposed changes can be found in the respective Technical Reports.

[4] AISE I Prefer 30 substantiation dossier – June 2013

Furthermore, the criterion "User information" is proposed to indicate statements related to water temperatures and recommendations to wash and use water at the lowest suitable temperature. This type of information is a direct point of contact between the user and the EU Ecolabel and is the best way the EU Ecolabel can influence user behaviour. While this approach only has a limited reach and requires the user to read, understand and follow instructions, it is important to improve the environmental education of consumers. Creative signs and slogans can also be developed to catch the attention of users and create a break in their routine. For example a large bucket with "cold water" written on it might cause a person to consider using cold water for floor cleaning instead of always turning to warm water.

A specific criterion addressing possible producers' claims on low temperature washing is not proposed to be set in this EU Ecolabel revision. Instead of that, a combination of the requirements included into two criteria is proposed to encourage low temperature washing: the "Fitness for use" criterion is proposed to be used to ensure that a product is effective a low temperatures and the "User information" criterion is proposed to communicate the effectiveness of the product as well as the associated environmental impacts. Thus, for consumer laundry detergents, Criterion 7 ("Points") would to be removed.

Table 13 explains in detail how each EU Ecolabel criteria set under revision is tackling this issue.

Table 13 Revised criteria related to water temperature in the current EU Ecolabel revisions

Product group	Water temperature indications
Consumer laundry detergents	***Criteria requirements*** "Fitness for use": testing of the products should be performed at 15-30C depending on the product or at a lower temperature if the producer claims the product is effective. "User information": includes the following recommendations: - wash at the lowest suitable temperature - wash full loads Information about the environmental impacts due to the use of the laundry detergent is also included on the packaging urging the consumer act in a more environmentally responsible way.
	Reasoning: The average washing temperature in Europe for consumer laundry detergents is 41C, only slightly higher than the standard temperature (40C) commonly used to test the products. In this revision we propose to test the products at temperatures between 15 and 30C, depending on the type of product, ensuring that the detergent will be effective with colder water. Most of the washing machines include a program that is able to wash with low temperature, if not cold, water. The information given to the consumers is key in this EU Ecolabel criteria set. It is required that the user information is displayed on the packaging in a legible and visible way and that includes recommendation regarding the washing temperature, the loads and the environmental impacts due to the use of detergents.
Industrial and institutional laundry detergents	***Criteria requirements*** "Fitness for use": testing of the product should be performed at the lowest temperature recommended by the manufacturer. Due to the large variety of products and intended uses, it is difficult to set benchmarks for testing temperatures. "User information": includes the following recommendations: - wash at the lowest suitable temperature - wash full loads Information about the environmental impacts due to the use of the laundry detergent is also included on the packaging urging the consumer act in a more environmentally responsible way.

	Reasoning: The average washing temperature for industrial and institutional laundry detergents varies depending on the intended use of the detergent (i.e., it will be different for bed lines, towels, working cloths or uniforms, etc.) A standard washing temperature is thus difficult to set. For this reason, the fitness for use criteria proposes to test the product at the lowest temperature the producer recommends and at which they claim the product to be effective. User information is a powerful tool to make the user aware of the environmental impacts and possible savings that can be achieved if the washing temperature is reduced. Recommendations on low washing temperatures, full wash loads and indications on the environmental impacts due to the use of detergents aim at changing user behaviour and at encouraging environmental friendlier decisions.
Consumer dishwasher detergents	***Criteria requirements*** "Fitness for use": testing of the product should be performed at 50C (-/+ 2C) or at a lower temperature if the detergent claims to be effective at a temperature below 50C with cold pre-wash without detergent. "User information": includes the following recommendation: - wash at the lowest suitable temperature - wash full loads Information about the environmental impacts due to the use of the dishwasher detergent is also included on the packaging urging the consumer act in a more environmentally responsible way.
	Reasoning: The average consumer dishwasher temperature varies between 55 and 75C and the European average washing temperature is close to 60C.[5] In this revision the testing temperature of the products is proposed to be lowered to 50C (it is currently at 55C) as there is evidence that good performances can be achieved at lower temperatures due to improvements in detergents and dishwashers. Nowadays, most of best environmental performing dishwashers on the market (rated AAA)[6] include "ecological" programs washing at 45C, a sign that the dishwasher market is evolving in this direction. User information is a powerful tool to make the user aware of the environmental impacts and possible savings that can be achieved if the washing temperature is reduced. Recommendations on low washing temperatures, full wash loads and indications on the environmental impacts due to the use of the detergent aim at changing the user behaviour and at encouraging environmental friendlier decisions.
Industrial and institutional dishwasher detergents	***Criteria requirements*** "Fitness for use": testing of the product should be done at the lowest washing temperature recommended by the producer. Due to the large variety of products and intended uses, it is difficult to set benchmarks for testing temperatures. "User information": includes the following recommendation: - wash at the lowest suitable temperature - wash full loads Information about the environmental impacts due to the use of the dishwasher detergent is also included on the packaging urging the consumer act in a more environmentally responsible way.

[5] Preparatory studies for ecodesing requirements of EuPs, LOT 14 Domestics washing machines and dishwashers, task 1 and 2, available at http://www.ebpg.bam.de/de/ebpg_medien/014_studyf_08-12_part1-2.pdf

[6] Information sources by revising several dishwasher producer's websites such as: http://www.candy-domestic.co.uk/products/?catid=4, http://www.miele.co.uk/dishwashers/ and http://www.siemens-home.co.uk/our-products/dishwashers/full-size-dishwashers.html

	Reasoning: The average washing temperature for industrial and institutional dishwasher detergents varies from 65 to 71C, depending on the intended use, and a final rinse off is conducted at an average temperature of 82C. This high temperature rinse-off can be avoided if a chemical sanitizer is used. A standard washing temperature is thus difficult to set. For this reason, the fitness for use criteria proposes to test the product at the lowest temperature the producer recommends and at which they claim the product to be effective. User information is a powerful tool to make the user aware of the environmental impacts and possible savings that can be achieved if the washing temperature is reduced. Recommendations on low washing temperatures, full wash loads and the environmental impacts due to the use of the detergent aim at changing the user behaviour encouraging environmental friendlier decisions.
Cleaning products	***Criteria requirements*** "Fitness for use": testing of the products should be performed under realistic use conditions. Due to the variety of cleaning products included in this product group, the different use conditions and the low relevance of the water use in this product group in general, it was decided not to set a testing temperature "User information": encourages users to use cold tap water for diluting products. Information about the environmental impacts due to the use of the detergent is also included on the packaging urging the consumer act in a more environmentally responsible way.
	Reasoning: The amount and temperature of the water used with cleaning products intended to clean surfaces, floors, windows or kitchen and sanitary installations is not as relevant as in the other detergent products. Water is mainly used for diluting and most of the producers do recommend using wipes or mops and not the use of excessive water. Even so, the recommendation to dilute the cleaning product, if needed, with cold tap water can help reduce environmental impacts. Thus, the main water temperature information is proposed to be included in the "User information", which is to be displayed on the packaging in a legible and visible manner.
Hand dishwasher detergents	***Criteria requirements*** "Fitness for use": testing of the products should be performed under realistic use conditions. No specific water temperature is indicated for the tests but the same water temperature should be used throughout the duration of the testing. "User information" encourages users to use the lowest amount of water at the lowest temperature. Information about the environmental impacts due to the use of the detergent is also included on the packaging urging the consumer act in a more environmentally responsible way.

	Reasoning: The temperature of the water used for washing up strongly depends on the preferences and tolerances of the users. On average, hand dishwashing is performed with hot water but habits greatly vary throughout Europe[7]. The temperature is, generally speaking, hot enough so that it is not uncomfortable for user's bare hands to be submerged for very long. Human hands tolerate water temperatures up to approx. 45C (slightly higher if dishwashing gloves are used). Additionally, anecdotal evidence suggests high water temperature is generally considered of importance when rinsing dishes, going up to an average of 75C, in order to shorten air drying time and reducing streak and spots[8]. Thus no specific testing temperature is set but rather the temperature most adapted to the market where a product is sold should be considered. User information recommends to use the lowest amount of water, what really matters from the environmental point of view for this product group, at the lowest suitable temperature. As the water temperature strongly depends on user preferences and tolerances, no benchmarks have been included.

Consultation questions	
1	Are the requirements proposed to be included in the "Fitness for use" and "User information" criteria a suitable way of targeting the impacts related to washing temperatures? Should any other requirement be set related to water temperature?

[7] Stamminger, R., Elschenbroich, A., Rummler, B. & Broil, G. (2007a) Washing-up behaviour and techniques in Europe. Hauswirtschaft und Wissenschaft, 1, 31–37.

[8] http://housekeeping.about.com/od/dishes/qt/dishwatertemp.htm

8 TOXICITY TO AQUATIC ORGANISMS

To a greater or lesser extent, the active ingredients used in detergents have an impact on the aquatic fauna and flora during their entire life cycle. Since detergent wastewaters are ultimately disposed to the aquatic environment – preferably via water treatment facilities – a consideration of the impact of the substances released is necessary.

8.1 Assessment of toxicity to aquatic organisms

Several methods can be used to estimate the toxicity to aquatic organisms, such as CDV, USETox, and others (i.e. see list of LCA-based ecotoxicity assessment methods p. 78 of ILCD Handbook: Recommendations for Life Cycle Impact Assessment in the European Context[9]). Each method relies on different principles and assumptions, thus providing different results. In the current versions of the EU Ecolabels related to detergents, CDV is used. During the revision process, the possibility of using of USEtox for toxicity to aquatic organisms was asked to be reviewed by stakeholders.

CDV is currently used by six EU Ecolabel criteria for detergents, one EU Ecolabel criteria for rinse-off cosmetic products and several criteria of the Nordic Swan and French NF Environnement ecolabels, among others, to evaluate toxicity to aquatic organisms. It is a method that was developed specifically to be used in the scope of ecolabelling and is, as such, based on a pass/fail assessment. It makes heavy use of the precautionary principle for substances where data is lacking or of bad quality to make sure that the most sensitive species are protected and there is currently no information on the uncertainty linked to results obtained. Data on over 200 of the most common substances found in detergents and cosmetics are stored in the Detergents Ingredients Database (DID) list that is regularly updated. For substances that are not found in the DID list, an applicant must provide data to fill in two parameters – one linked to ready biodegradability and one linked to chronic toxicity. When chronic toxicity information is limited, acute results may be used but with the application of heavy safety factors to align with the precautionary principle.

USEtox is a model that was developed to bring scientific consensus on human toxicity and freshwater ecotoxicity indicators used in LCA and is recommended by the ILCD handbook for midpoint analysis for freshwater ecotoxicity. Currently it is mainly applied in academic work and in the scope of the French informative environmental labelling scheme , "Affichage Environnemental", which aims to provide environmental impact information on products for customers to be able to compare products and make more environmentally responsible choices during their shopping. Large databases of over 3000 entries exist that cover multiple fields and a specific database has been developed to cover substances that are found in the DID list, although the quality of the data contained in these databases varies. If a substance is not found in a database, its data can be calculated by providing fifteen parameters ranging from molecular weight to degradation rates and partitioning coefficients. The data from the databases has also been implemented in LCA software such as SimaPro and GaBi. Uncertainty of results has been found to be in the range of 10-100 (2 orders of magnitude) for freshwater ecotoxity and to be highly dependent on the type of substance assed, with data linked to inorganics often lacking in quality.

Peer reviewed comparisons of CDV and USEtox are limited but show that overall results are similar and differences are mainly due to the fact that the two methods take different approaches to calculating environmental impacts. Overall, both methods have been developed with different goals in mind and have different uses. While the CDV method has

[9] JRC - IES 2011. ILCD Handbook: Recommendations for Life Cycle Impact Assessment in the European context. First edition ed.: European Commission.

been applied in the scope of labelling since 1995 and widely used by industry and competent bodies, USEtox has been mainly applied in academia.

Table 14 Main characteristics of CDV and USEtox

	CDV	**USEtox**
Coverage	Biodegradability and toxicity to aquatic organisms	Freshwater ecotoxicity (ecological effect, fate in the environment, exposure) and human health
Life cycle coverage	Only considers the ecotoxicity of the substances in the product as they are at the time of production of the final product	Life cycle oriented approach
Goal	Pass/fail assessment in the scope of ecolabelling	Indicators to be used as part of LCA studies
Vision	Conservative (applies the principle of precaution by aligning results on those of the most sensitive species and large SFs where data is lacking)	Moderate (considers the mean chronic/acute data for all species and does not apply an equivalent of SFs)
Past and current applications	Widely used in the industry sector and by the competent bodies since 1995 when it was introduced in the EU Ecolabel for laundry.	Used in academia and informative environmental labelling, eg. French "affichage environmental" scheme since 2010 No applications in the scope of labelling
Database	DID list (200+ detergent-centric substances)	USEtox WG database (3000+ entries, all fields), CyclEco database (includes information on all DID list entries)
Revision of the database	Updated regularly with input from stakeholders and experts in the field Last updating in 2012 that lasted for 18months	No information on updates and how updated information is assessed
Thresholds establishment to be applied in pass/fail schemes	Already established depending on the type of products	To be established based on product formulations on the market
Calculation of results for substances not present in databases	2 parameters (gathering and review time: unknown)	15 parameters (gathering and review time: 1 hour/substance) Indications are needed to easily calculate CFs by users and competent bodies
Data sources	Existing databases, scientific literature, laboratory and *in silica* test results	Existing databases, scientific literature, laboratory and *in silica* test results
Uncertainty of results	Unknown	2-3 orders of magnitude of ecotoxicity Should new CFs be calculated, indications on how to limit the uncertainty of results are needed.
Endorsement	EU Ecolabel, Nordic Swan, NF Environnement criteria	UNEP-SETAC, recommended by ILCD for midpoint evaluation for freshwater ecotoxicity
Appears in	Spreadsheet	Spreadsheet, LCA software (SimaPro, GaBi, etc.)
Linked scientific literature	Very limited	Abundant

Further information on the two methods, as well as linked databases, can be found in the appended report.

8.2 Proposed common template for criteria

Criterion X – "Toxicity to aquatic organisms"

The critical dilution volume (CDV) of the product must not exceed the following limits for the reference dosage:

Product type	Limit CDV
Type of product covered	xx xxx

***Assessment and verification**:* Calculation of the CDV of the product. A spreadsheet for calculation of the CDV value is available on the EU Ecolabel website.

The Critical Dilution Volume (CDV) is calculated for all ingoing substances and mixtures (i) in the product using the following equation:

$$CDV = \sum CDV(i) = 1000 \cdot \sum dosage(i) \cdot \frac{DF(i)}{TF(i)}$$

Where:

dosage(i): weight (g) of the substance or mixture *i* in the reference dose,

DF(i): degradation factor for the substance or mixture *i*

TF(i): toxicity factor for the substance or mixture *i*

The values of *DF(i)* and *TF(i)* shall be as given in the DID list Part A (Appendix I). If a substance or mixture is not included in the DID list Part A, the applicant shall estimate the values follow the approach described in the DID list Part B (Appendix I).

8.3 Rationale

CDV is proposed, for the moment, to be kept as the toxicity to aquatic organisms assessment method in EU Ecolabels related to detergents. The use of another ecotoxicity assessment method was suggested, more specifically USEtox, during stakeholder consultation but at the time of writing this report not enough data was available on the applicability of USEtox in the scope EU Ecolabels and on thresholds that could be set for all product groups concerned. After the results of the Product Environmental Footprint pilot study on detergents will be released, the feasibility of including aquatic toxicity requirements in the EU Ecolabel criteria based on the USEtox method will be assessed. To discuss the results obtained during the application of USEtox in the scope of PEFs and the scope of its current status and future developments, DG ENV is organising a meeting on the "Current and future implementability of USEtox" that will take place on January 15th, 2015. Outcomes related to the EU Ecolabel will be presented at the 1st AHWG meeting.

The proposed harmonised text states that the CDV value is to be calculated for the reference dosage and specific CDV values are proposed for each product type covered by the specific EU Ecolabel in question.

The proposed harmonised "assessment and verification" text includes the expression "all ingoing substances or mixtures" to be defined in the main text of the EU Ecolabels and that would set the measurement thresholds for the ingredients that must be considered when calculating a product's CDV value.

Each set of criteria contains revised CDV threshold values and these can be found, along with supporting data, in the individual technical reports. Overall, three main types of data

were considered during the revision – CDV values of detergents currently available on the market (although largely skewed towards ecolabelled products because this type of data is more readily available from competent bodies and testing institutes), stakeholder input and updates to the DID list (that might cause CDV values to be different).

9 BIODEGRADABILITY

9.1 Background on biodegradability of detergents

The technical analysis[10] showed that detergent ingredients and related impacts, particularly on the aquatic environment, are of high importance for these product groups as after the use the product is discharged to the aquatic environment (ideally after going through a wastewater treatment process).

In accordance with the CLP regulation[11] the basic elements used for classification of aquatic environmental impacts are:

- Acute aquatic toxicity;
- Potential for or actual bioaccumulation;
- Degradation (biotic or abiotic) for organic chemicals;
- Chronic aquatic toxicity.

Chemicals that degrade rapidly can be quickly removed from the environment, while in the absence of fast degradation a substance present in the aquatic environment has the potential to exert toxicity over a wide temporal and spatial scale. Thus, limiting the amount of substances in products that are not biodegradable should be a general requirement for EU Ecolabel detergents.

Under the Detergents Regulation, ready biodegradability of surfactants is required for products sold on the European market. However, the Regulation does not outline requirements for anaerobic biodegradability of surfactants, or the biodegradability of non-surfactant organics.

The Detergents Regulation[12] distinguishes:

- 'Primary biodegradation', i.e. *the structural change (transformation) of a surfactant by micro-organisms resulting in the loss of its surface-active properties due to the degradation of the parent substance and consequential loss of the surface-active property as measured by test methods listed in Annex II.*
- 'Ultimate aerobic biodegradation', i.e. *the level of biodegradation achieved when the surfactant is totally used by micro-organisms in the presence of oxygen resulting in its breakdown to carbon dioxide, water and mineral salts of any other elements present (mineralisation), as measured by test methods listed in Annex III, and new microbial cellular constituents (biomass).*

The requirements for biodegradability vary for the different EU Ecolabel detergent product groups, as summarised in Table 15.

[10] See respective preliminary reports.

[11] Regulation 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006, available online at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:353:0001:1355:EN:PDF.

[12] Regulation (EC) No 648/2004 2008 of the European Parliament and of the Council of 31 March 2004 on detergents, available online at: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02004R0648-20120419&qid=1406037728667&from=EN.

Table 15 Comparison of biodegradability requirements in EU Ecolabels related to detergent product groups

	Surfactants must be aNBO	Surfactants must be anNBO	Limits on aNBO of organics	Limits on anNBO of organics
DD			X	X
LD			X separately for liquid and powder products	X separately for liquid and powder products
IILD	X	Non-ionic and cationic surfactants only	X separately for soft, medium and hard water	X separately for soft, medium and hard water
IIDD	X	X	X separately for soft, medium and hard water	X separately for soft, medium and hard water
HDD	X	Surfactants that are not biodegradable under anaerobic conditions may be used in the product provided that the surfactants are not classified with H400/R50 (Very toxic to aquatic life) within the limit specified.		
APC	X	Surfactants not biodegradable under anaerobic conditions may be used in the product within specified limitations provided that they are not classified with H400/R50 (Very toxic to aquatic life)		

It can be seen that, in principle, three different approaches are used for the above product groups, depending on the time of the criteria development, revisions and linked consultation processes. The requirements for industrial and institutional detergents are the most restrictive as they cover both surfactants and organics. They are also the most recent ones.
Requirements of other ecolabels for various detergents and cleaning product groups are presented in their respective preliminary reports. Table 16 and Table 17 briefly summarises those requirements.
It can be seen that different labels also differently regulate the use of anaerobically degradable ingredients. For instance, New Zeeland Environmental Choice label asks that all surfactants must be readily biodegradable and anaerobically degradable. Nordic Swan and Bra Miljöval (Good Environmental Choice) take differentiated approaches. For example in the case of laundry detergents restrictions are put on the amount of non-anaerobically degradable organic substances, while for other product groups their approaches differ.

Table 16 Requirements on biodegradability for LD, DD and HDD in EU Ecolabel and other schemes

<table>
<tr><th>EU Ecolabel</th><th>Nordic Swan</th><th>Environmental Choice New Zealand</th><th>Bra Miljöval (Good Environmental Choice)</th></tr>
<tr><td colspan="4">Laundry detergents</td></tr>
<tr>
<td>The content of organic substances in the product that are aerobically non-biodegradable (aNBO) or anaerobically non-biodegradable (anNBO) shall not exceed the following limits:
<table>
<tr><th>Product type</th><th>aNBO (g/kg wash)</th></tr>
<tr><td>Heavy-duty LD - Powder</td><td>1.00</td></tr>
<tr><td>Heavy-duty LD - Liquid</td><td>0.55</td></tr>
<tr><td>Low-duty LD - Powder</td><td>0.55</td></tr>
<tr><td>Low-duty LD - Liquid</td><td>0.30</td></tr>
<tr><td>Stain-remover pre-treatment - powder</td><td>0.10</td></tr>
<tr><td>Stain-remover pre-treatment - liquid</td><td>0.10</td></tr>
</table>
<table>
<tr><th>Product type</th><th>anNBO (g/kg wash)</th></tr>
<tr><td>Heavy-duty LD - Powder</td><td>1.30</td></tr>
<tr><td>Heavy-duty LD - Liquid</td><td>0.70</td></tr>
<tr><td>Low-duty LD - Powder</td><td>0.55</td></tr>
<tr><td>Low-duty LD - Liquid</td><td>0.30</td></tr>
<tr><td>Stain-remover pre-</td><td>0.10</td></tr>
</table>
</td>
<td>The content of organic substances that are aerobically non-biodegradable(aNBO) and/or anaerobically non-biodegradable (anNBO) must not exceed the following limits:
<table>
<tr><th>Product type</th><th>aNBO (g/kg wash)</th></tr>
<tr><td>Heavy-duty LD (normally soiled)</td><td>1.00</td></tr>
<tr><td>Low-duty LD (lightly soiled)</td><td>0.50</td></tr>
<tr><td>Stain-removers (in-wash)</td><td>0.20</td></tr>
<tr><td>Stain-removers (pre-treatment)</td><td>0.10</td></tr>
</table>
<table>
<tr><th>Product type</th><th>anNBO (g/kg wash)</th></tr>
<tr><td>Heavy-duty LD (normally soiled)</td><td>1.00</td></tr>
<tr><td>Low-duty LD (lightly soiled)</td><td>0.50</td></tr>
<tr><td>Stain-removers (in-wash)</td><td>0.20</td></tr>
<tr><td>Stain-removers (pre-treatment)</td><td>0.10</td></tr>
</table>
</td>
<td>All surfactants must be readily biodegradable and anaerobically degradable.</td>
<td>Organic ingredients must be readily bio-degradable in accordance with OECD 301 or an equivalent test.
Organic ingredients must be 60 % anaerobically biodegradable in accordance with ISO 11734 or an equivalent test.
Ingredients that are not fully biodegradable in accordance with OECD 302 must not exceed a total concentration of 2 % by weight. (additional requirement for laundry detergents)
Preservatives, thickening agents/ dissolving agents, bleaching agents and acids must be readily biodegradable according to OECD 301 or an equivalent test.</td>
</tr>
</table>

<table>
<tr><th>EU Ecolabel</th><th>Nordic Swan</th><th>Environmental Choice New Zealand</th><th>Bra Miljöval (Good Environmental Choice)</th></tr>
<tr><td>
<table>
<tr><td>treatment - powder</td><td></td></tr>
<tr><td>Stain-remover pre-treatment - liquid</td><td>0.10</td></tr>
</table>
</td><td></td><td></td><td></td></tr>
<tr><td colspan="4">Dishwasher detergents</td></tr>
<tr><td>The content of organic substances in the product that are aerobically non-biodegradable (not readily biodegradable aNBO) or anaerobically non-biodegradable (anNBO) shall not exceed the following limits:
<table>
<tr><th>Product type</th><th>aNBO</th><th>anNBO</th></tr>
<tr><td>Dishwasher detergents</td><td>1.0 g/wash</td><td>5.50 g/wash</td></tr>
<tr><td>Rinse aid</td><td>0.15 g/wash</td><td>0.50 g/wash</td></tr>
</table>
</td><td>All surfactants must be readily biodegradable (aerobically). All surfactants classified as environmentally hazardous (with H410, H411, H412, H413) must also be anaerobically degradable.</td><td>All surfactants must be readily biodegradable and anaerobically degradable.</td><td>Surfactants must be readily biodegradable.
Surfactants must be 60 % anaerobically biodegradable.
Surfactants must have a very low residual content of organohalogen compounds – below 100 mg/kg Tox.
Surfactants must not be very toxic to aquatic organisms. Surfactants must not be classified as R50, very toxic to aquatic organisms.</td></tr>
<tr><td colspan="4">Hand dishwashing detergents</td></tr>
<tr><td>Each surfactant used in the product shall be readily biodegradable.
Surfactants that are not biodegradable under anaerobic conditions may be used in the product provided that the surfactants are not classified with H400/R50 (Very toxic to aquatic life) and that the total weight of such anaerobically non-biodegradable surfactants do not exceed 0.20 g of the recommended dose expressed for 1 litre of dishwashing water.</td><td>All surfactants must be aerobically and anaerobically biodegradable.</td><td>All surfactants must be readily biodegradable and anaerobically degradable.</td><td>Surfactants must be readily biodegradable.
Surfactants must be 60 % anaerobically biodegradable.
Surfactants must have a very low residual content of organohalogen compounds (<100 mg/kg TOX).
Surfactants must not be very toxic to aquatic organisms. Surfactants must not be classified as R50, very toxic to aquatic organisms.</td></tr>
</table>

Table 17 Requirements on biodegradability for APC in EU Ecolabel and other schemes

<table>
<tr><th colspan="6">All-purpose cleaners and sanitary cleaners</th></tr>
<tr><th>EU Ecolabel [13]</th><th>Nordic Swan [14]</th><th>Env Choice NZ[15]</th><th>Good Env Choice AU [16](</th><th>Bra Miljöval (Good Env Choice) [17]</th><th>Green Seal[18]</th></tr>
<tr>
<td>Each surfactant used in the product shall be readily biodegradable.
Surfactants that are not biodegradable under anaerobic conditions may be used in the product within specified limitations provided that the surfactants are not classified with H400/R50 (Very toxic to aquatic life):
<table><tr><th>Product</th><th>Weight of anaerobic-ally non-bio-degradable surfactants</th></tr><tr><td>Diluted all-purpose cleaner</td><td><0.40 g/l of water</td></tr></table></td>
<td>All surfactants must be aerobically and anaerobically biodegradable.

The product's total content of aerobic (aNBO) and/or anaerobic (anNBO) non-biodegradable organic materials must not exceed the limits stated below per litre of in-use solution.
aNBO and anNBO values are calculated for all organic substances in the detergent.
<table><tr><th>Market/ cat</th><th>aNBO (g/l)</th><th>an-NBO (g/l)</th></tr><tr><td>Concentrated, con-sumer</td><td>0.10</td><td>0.10</td></tr></table></td>
<td>All surfactants must be readily biodegradable and anaerobically degradable.</td>
<td>All surfactants and organic ingredients must be readily biodegradable in accordance with AS 4351, relevant OECD tests, or shown on the most recent Detergents Ingredients Database (DID) list.
All surfactants used in the product must be anaerobically biodegradable in accordance with ISO 11734,</td>
<td>Surfactants must be readily biodegradable.
Surfactants must be 60 % anaerobically biodegradable.
Surfactants must have a very low residual content of organohalogen compounds – below 100 mg/kg TOX.
Surfactants must not be very toxic to aquatic organisms.
Surfactants must not be classified as R50, very toxic to aquatic organisms.
If palm oil is used as a raw material in surfactant production, the surfactant manufacturer or the palm oil supplier must be a member of the Roundtable on Sustainable Palm Oil</td>
<td>Each of the organic ingredients in the product as used shall exhibit ready biodegradability in accordance with the OECD definition except for the polymer portion of a carpet cleaner. However, all other ingredients in carpet cleaner must comply. Biodegradability shall be measured by one of the following methods: OECD TG 301A-F, ISO 9439 carbon dioxide (CO_2) evolution test, ISO 10708 (two-phase closed-bottle test), ISO 10707 (closed bottle test), or ISO 7827 (dissolved organic carbon removal).
- Removal of Dissolved Organic Carbon (DOC) > 70 %
- Biochemical Oxygen Demand (BOD) > 60 %</td>
</tr>
</table>

[13] all-purpose cleaners and sanitary cleaners)
[14] cleaning products)
[15] (general purpose cleaning products)
[16] cleaning products)
[17] chemical products)
[18] (cleaning products for household use)

All-purpose cleaners and sanitary cleaners									
Undiluted all-purpose cleaner	<4.0 g/100 g of product	RTU WC, con-sumer	2.10	6.00		relevant OECD test or shown on the most recent DID list.	(RSPO) or be able to show that the palm oil used to produce the surfactants comes from a plantation that is certified in accordance with RSPO's sustainable cultivation rules. For soft soaps, only surfactants made from saponified vegetable fatty acids may be used.	- BOD, as % of Theoretical Oxygen Demand (ThOD) > 60 % - CO_2 evolution, as % of theoretical CO_2 > 60% For organic ingredients that do not exhibit ready biodegradability in these tests, the manufacturer may demonstrate biodegradability in sewage treatment plants using the Coupled Units Test found in OECD 303A by demonstrating DOC removal > 90 %.
Sanitary cleaner	<2.0 g/100 g of product	RTU other, con-sumer	2.00	2.00				
Window cleaner	<2.0 g/100 g of product	RTU window, con-sumer and profess-ional	2.00	2.00				
		Conc'd, profess-ional	0.045	0.250				
		RTU WC, profess-ional	2.25	30.0				
		RTU, profess-ional	0.70	0.70				

9.1.1 Biodegradability of surfactants

A number of studies have considered the role of anaerobic biodegradability as an indicator of environmental toxicity or persistence. Anaerobic biodegradability (by analogy with aerobic) is the breakdown in the environment of complex organic compounds into basic molecular forms. Aerobic oxidation, since it is in the presence of oxygen, tends to result in highly oxidised and hence chemically stable forms. On the other hand, anaerobic oxidation results in less oxidised forms as a consequence of low or no-oxygen reactions; these products may therefore react further when exposed to an oxygen-rich environment.

A review by Berna et al (2007[19]), examined these effects as well as experimental methods for standardising tests, and came to the following conclusions:

> *"Anaerobic biodegradability as a strict pass/fail criterion is not in line with the environmental interpretation and significance that it should be given... If a surfactant is rapidly degradable under aerobic conditions, and its transitory presence in in anaerobic environments does not affect [other compounds and processes] e.g. it is not inhibitory, then its anaerobic degradability is of minor importance."*

The authors admit that it is often not proven that such compounds are not inhibitory once in nature. For example, some cationic surfactants have been proven to have inhibitory effects. Nevertheless, the opinion is that lack of anaerobic biodegradability is not a good indicator of adverse impact.

In 2000, the European Commission (DG Enterprise and Industry) contracted a study to the Fraunhofer Institute (UMSICHT) to assess the environmental impact in the EU resulting from the incomplete biodegradation of detergent surfactants under anaerobic conditions[20]. The report was completed in 2003 and covered among other aspects a survey of statistical data on detergent production and consumption in Europe as well as a set of recommendations for test methods and cost/effective measures on the anaerobic biodegradability of surfactants.

The main conclusions of Fraunhofer Report were:

- Surfactants must be ultimately and readily biodegradable under aerobic conditions in order to prevent adverse environmental impact.
- The poor biodegradability of some surfactants (e.g. LAS) under anaerobic conditions may sometimes result in a significant surfactant content in sewage sludge, especially after treatment in waste water treatment plants (WWTP) employing an anaerobic sludge stabilisation process. When the anaerobically treated sludge is used as fertiliser in agriculture, the surfactant concentration in the sludge amended soil is predicted to decrease rapidly because of the aerobic biodegradation process occurring in soil.
- With regard to sediments, no accumulation of aerobically ready biodegradable surfactants has been observed, in particular for LAS even over a period of several decades. This seems to confirm that aerobic (rather than anaerobic) biodegradation plays the main role in elimination of organic compounds.

In 2007, DG Enterprise and Industry made a request to the SCHER Committee for an opinion on: '(a) "Anaerobic biodegradation of surfactants" and (b) "Biodegradation of non-surfactant organic ingredients", calling upon the previous research of HERA and the OECD[21].

An environmental risk assessment conducted by SCHER on non-biodegradable detergent surfactants under anaerobic conditions concluded that the requirement of anaerobic degradation is not an effective measure of the environmental performance of the product. This opinion is also shared by the Commission and was expressed in a study published in 2009 which reviews the

---

[19][19] Berna, J.L. et al (2007) Anaerobic biodegradation of surfactants – scientific review, Tensdie Surf. Det. (2007) 6, at http://www.erasm.org/study/Anaerobic_biodegrad-Tenside.pdf

[20] Part of report REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL Pursuant to Article 16 of Regulation (EC) No 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents, concerning anaerobic biodegradation at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0230:FIN:EN:PDF

[21] The full SCHER Opinion on anaerobic biodegradation can be found at http://ec.europa.eu/health/ph_risk/committees/04_scher/docs/scher_o_109.pdf.

anaerobic biodegradation of surfactants.[22] A conclusion of this study was that "in contrast to the adverse effects observed in the absence of aerobic degradation, the lack of anaerobic degradation does not seem to be correlated with any apparent risk for these environmental compartments."
The opinions of stakeholders are largely divided on this issue (see respective Preliminary Reports for summary of stakeholder feedback). Observing the approach taken by other schemes, it can be seen that anaerobic biodegradability of surfactants is often adopted requirement.

9.1.2 Biodegradability of organic substances and mixtures

Although surfactants can be considered as the most impactful component of detergent products, they are not the only non-biodegradable ingredient found in detergents products. Detergent products also contain a range of other organic components which are not biodegradable and therefore affect the environmental performance of the product.
Commonly used organic substances in detergents that are not **aerobically** biodegradable include for instance phosphonates, polycarboxylates, silicone, polymers, fragrance, colourants and optical brighteners.
The EU Ecolabel criteria for LD, IILD, DD and IIDD limit the amount of non-surfactant organics that are not biodegradable under both aerobic and anaerobic conditions. However, the key substance groups are generally handled using dedicated criteria, for example, for phosphonates, fragrances, and other, and are discussed in detail in dedicated sections of the Technical Annex and specific technical reports.

9.1.3 Assessment of biodegradability

Several OECD screening tests (OECD 301A-F, 302, 304, 306 and 310) and simulation tests (OEDE 303, 307, 308 and 309) are available for assessment of aerobic biodegradability of organic compounds. Potential biodegradability of organic compounds under anoxic conditions can be assessed in a screening test for anaerobic biodegradability (OECD 311)[23].
After December 2015, the ready biodegradability tests set out by the CLP Regulation shall be used in the scope of EU Ecolabels. This Regulation specifies that *'substances are considered **rapidly degradable** in the environment if one of the following criteria holds true:*

(a) if, in 28-day ready biodegradation studies, at least the following levels of degradation are achieved;

(i) tests based on dissolved organic carbon: 70 %

(ii) tests based on oxygen depletion or carbon dioxide generation: 60 % of theoretical maximum.

These levels of biodegradation must be achieved within 10 days of the start of degradation which point is taken as the time when 10 % of the substance has been degraded; or

(b) if, in those cases where only BOD and COD data are available, when the ratio of BOD5/COD is ≥ 0,5;

or

(c) if other convincing scientific evidence is available to demonstrate that the substance can be degraded (biotically and/or abiotically) in the aquatic environment to a level > 70 % within a 28-day period.'

[22] Report from the Commission to the European Parliament and the Council. Pursuant to Article 17 of Regulation (EC) N° 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents, concerning anaerobic biodegradation. Brussels, 2009. Report available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0230:FIN:EN:PDF.
[23] http://ec.europa.eu/health/ph_risk/committees/04_scher/docs/scher_o_109.pdf

For anaerobic biodegradability, EN ISO 11734 norm or equivalent shall be used in the scope of EU Ecolabels. More information on the types of tests acceptable can be found in Appendix to EU Ecolabels related to detergents and rinse-off cosmetics, the text is provided below in Section 9.2.

9.2 Proposed common template

Given the differences in approaches that have been previously taken on the subject and the different opinions of the stakeholders during consultation, no proposal for changes are presented in this version of the technical document. It is proposed to discuss during the 1st Ad-Hoc Working Group meeting whether and how a harmonised approach can be worked out for all EU Ecolabel detergent and cleaning product groups. The most recent criteria for industrial and institutional laundry/dishwasher products are proposed to be taken as a starting point for the discussion. Then also all product specific modifications, exemptions should be analysed (for instance the agreed in IILD criteria exemption for anionic surfactants.
The text below is a template that can be used to build the harmonised text.

Criterion X – "Biodegradability"

a) Biodegradability of surfactants
To be discussed at the 1st AHWG meeting.

All surfactants shall be biodegradable under aerobic conditions.

All (non-ionic and cationic) surfactants shall be biodegradable under anaerobic conditions.

b) Biodegradability of organic substances and mixtures
To be discussed at the 1st AHWG meeting.

The content of organic substances and mixtures in the product that are aerobically non-biodegradable (not readily biodegradable aNBO) or anaerobically non-biodegradable (anNBO) shall not exceed the following limits for the reference dosage:

Product type	**aNBO**	**anNBO**
Type of product	x,xx g	x,xx g

Assessment and verification: The applicant shall provide documentation for the degradability of surfactants, as well as the calculations of aNBO and anNBO for the product. A spreadsheet for use in calculating aNBO and anNBO values is available on the EU Ecolabel website.

For both surfactants and aNBO and anNBO values, reference shall be made to the DID List. For ingredients which are not included in the DID List, the relevant information from literature or other sources, or appropriate test results, showing that they are aerobically and anaerobically biodegradable shall be provided as described in Appendix I.

In the absence of documentation in accordance with the above requirements, an ingoing substances and mixtures other than a surfactant may be exempted from the requirement for anaerobic degradability if one of the following three alternatives is fulfilled:

1. Readily degradable and has low adsorption (A < 25%,);
2. Readily degradable and has high desorption (D > 75%);
3. Readily degradable and non-bioaccumulating.

Testing for adsorption/desorption may be conducted in accordance with OECD guidelines 106.

Appendix I:

Documentation of ready biodegradability

The test methods provided for in Regulation (EC) No 1272/2008 for ready biodegradability shall be used.

Documentation of anaerobic biodegradability

The reference test for anaerobic degradability shall be EN ISO 11734, ECETOC No 28 (June 1988), OECD 311 or an equivalent test method, with the requirement of 60% ultimate degradability under anaerobic conditions. Test methods simulating the conditions in a relevant anaerobic environment may also be used to document that 60% ultimate degradability has been attained under anaerobic conditions.

Extrapolation for substances not listed in the DID-list

Where the ingoing substances are not listed in the DID-list, the following approach may be used to provide the necessary documentation of anaerobic biodegradability:

(1) *Apply reasonable extrapolation*. Use test results obtained with one raw material to extrapolate the ultimate anaerobic degradability of structurally related surfactants. Where anaerobic biodegradability has been confirmed for a surfactant (or a group of homologues) according to the DID-list, it can be assumed that a similar type of surfactant is also anaerobically biodegradable (e.g., C12-15 A 1-3 EO sulphate [DID No 8] is anaerobically biodegradable, and a similar anaerobic biodegradability may also be assumed for C12-15 A 6 EO sulphate). Where anaerobic biodegradability has been confirmed for a surfactant by use of an appropriate test method, it can be assumed that a similar type of surfactant is also anaerobically biodegradable (e.g., literature data confirming the anaerobic biodegradability of surfactants belonging to the group alkyl ester ammonium salts may be used as documentation for a similar anaerobic biodegradability of other quaternary ammonium salts containing ester-linkages in the alkyl chain(s)).

(2) *Perform screening test for anaerobic degradability*. If new testing is necessary, perform a screening test by use of EN ISO 11734, ECETOC No 28 (June 1988), OECD 311 or an equivalent method.

(3) *Perform low-dosage degradability test*. If new testing is necessary, and in the case of experimental problems in the screening test (e.g. inhibition due to toxicity of test substance), repeat testing by using a low dosage of surfactant and monitor degradation by 14C measurements or chemical analyses. Testing at low dosages may be performed by use of OECD 308 (August 2000) or an equivalent method.

10 EXCLUDED AND LIMITED SUBSTANCES AND MIXTURES

Limiting the amount of environmentally harmful substances contained in detergents is essential as there is close contact between the aquatic environment and detergents throughout their lifetime. Although detergent wastewaters generally go through sewage treatment systems, in the worst case scenario, ingredients may be released directly into the aquatic environment. The Detergent Directive does not prohibit the use of substances in detergent products on the basis of their environmental properties, but the EU Ecolabel Regulation 66/2010 sets out general requirements for substances:

> *"The EU Ecolabel may not be awarded to goods containing 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 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, nor to goods containing substances referred to in Article 57 of Regulation (EC) No 1907/2006 of the European parliament and the Council of 18 December 2006 concerning the Registration, evaluation, authorization of chemicals (REACH) establishing a European Chemicals Agency".*

The Regulation allows derogations of specific substances under strictly defined conditions:

> *"For specific categories of goods containing substances referred to in paragraph 6, and only in the event that it is not technically feasible to substitute them as such, or via the use of alternative materials or designs, or in the case of products which have a significantly higher overall environment performance compared with other goods of the same category, the Commission may adopt measures to grant derogations from paragraph 6".*
>
> *"No derogation shall be given concerning substances that meet the criteria of Article 57 of Regulation (EC) No 1907/2006 and that are identified according to the procedure described in Article 59(1) of that Regulation, present in mixtures, in an article or in any homogeneous part of a complex article in concentrations higher than 0,1 % (weight by weight)".*

Moreover, the EU Ecolabel Regulation also requires individual EU Ecolabels to go above and beyond the general requirements on substances and proposed criteria that would further ensure that EU Ecolabel products have a reduced impact on the environment. Therefore, the aim of this criterion on excluded and limited substances aims to exclude or limit toxic or hazardous substances and mixtures, thus ensuring that the EU Ecolabel is only awarded to the least environmentally impacting products.

The EU Ecolabel criteria can limit the inclusion of certain substances and mixtures using three approaches:

- specific exclusions for substances and mixtures that may not have been prohibited by other requirements,
- exclusions and limitations based on classification with hazard classes, and
- specific limitations by substance type/ substance group.

For each product group LCA studies performed as part of the technical analysis (Section 4 of the respective Preliminary Reports) have shown that chemicals used for the manufacturing of detergent products significantly contribute to the overall environmental impact. The chemicals contribute mainly due to the impacts caused during their extraction (evidence was shown that contributes in particular categories such as terrestrial ecotoxicity, agricultural land occupation and natural land transformation, but also for ozone depletion and metal depletion. These environmental impacts are mainly associated with the use of land and the use of non-renewable energy to synthesize them) and in other aspects not covered by ReCiPe, such as ecotoxicity..

The end-of-life stage includes the treatment of wastewater once the product has been used. The wastewater contains the water used for the washing and the rinsed-off detergent – in the case of some product groups such as laundry detergent, almost all the detergent goes to the wastewater. This stage has important share in all environmental impact categories analysed, but the particular interest are the scores got for marine eutrophication and metal depletion.

The restriction or exclusion of substances in the EU Ecolabels related to detergents aims to considerably reduce the overall environmental impact of these products through .the identification of those substances that cause the highest environmental impacts and their restricted use in EU Ecolabel products. Among the substances that have been found to have a high environmental impact, there are some that are essential ingredients in detergents formulations and for which, for the time being, there are no viable alternatives. Derogations are proposed for these substances.

10.1 Specified excluded ingoing substances and mixtures

Being proactive (e.g. taking as basis the precautionary principle) some specific substances which arise environmental or health related concern have been discussed and considered to be specifically excluded or restricted in the product group under study. The substances currently excluded from the detergents and cleaning product groups are those included in Table 18.

Table 18 Specified excluded ingoing substances and mixtures in the currently valid criteria

Substance	IIDD	DD	IILD	LD	APC	HDD
Phosphates		x	x	x		
EDTA	x	x	x	x	x	x
APEO and ADP	x		x		APEO and derivatives	APEO and derivatives
DTPA		x				
Fragrances	x	Fragrances subject to declaration requirement ≥ 0100 ppm	Fragrances subject to declaration requirement ≥ 0100 ppm	Fragrances subject to declaration requirement ≥ 0100 ppm	Fragrances subject to declaration requirement ≥ 0100 ppm	Fragrances subject to declaration requirement ≥ 0100 ppm
Nitromusks and plycyclic musks		x	x	x	x	x
Quaternary ammonium salts not readily biodegradable						x
Reactive chlorine compounds	x	x				
Perborates		x				
5-bromo-5-nitro-1,3-dioxane					x	x
2-bromo-2-nitropropane-1,3-diol					x	x
Diazolinidylurea					x	x
Sodium hydroxyl methyl glycinate					x	x
Formaldehyde					x	x

They are briefly presented below:

10.1.1 Phosphorous: Total phosphorus content, phosphates and/or phosphonates

Phosphorus compounds such as phosphates and phosphonates are commonly used as builders in detergent based products. Builders are chemical compounds that soften water by removing cations

(mainly calcium, Ca^{2+}, and magnesium Mg^{2+}) contained in wash solutions and highly present in areas where water is hard. The effect of water softening is to improve wash performance by ensuring calcium and magnesium deposits do not remain on the washed items and to ensure that the active detergent component is directed at its primary washing function, rather than being neutralized by the cations. Softeners also help by assisting washing equipment to remain sediment-free and hence more efficient. All these outcomes are aligned to reduced environmental impact.

However, phosphorus is a major contributor to eutrophication in water systems and as such the use of phosphorus compounds in laundry and dishwasher detergents is being phased out in favour of lower impact alternatives. In general terms, emissions of phosphates from point sources such as wastewater have fallen over the past 30 years. This is primarily due to improved cleaning of wastewater in Northern and Western Europe, following implementation of the EU's Urban Waste Water Treatment Directive 1991/271/EEC.

Keeping on reducing the emission of phosphates to the environment, on 19 April 2012 a consolidated version of Regulation (EC) No. 648/2004 was published, containing the latest adopted amendment, Regulation (EC) No. 259/2012. This imposes a restriction on phosphates in domestic laundry and dishwasher detergents. These limitations are reported in Table 19.

Table 19 Limitations on the content of phosphates and of other phosphorus compounds

Detergents	Limitations	From on
1. Consumer laundry detergents	Shall ***not be placed*** on the market if the ***total content of phosphorus*** is ***equal to or greater than 0.5g*** in the recommended quantity of the washing process for a standard washing machine load as defined in section B of Annex VII for water of hard water hardness - for 'normally soiled' fabrics in the case of heavy-duty detergents - for 'lightly soiled' fabrics in the case of detergents for delicate fabrics	30 June 2013
2. Consumer automatic dishwasher detergents	Shall ***not be placed*** on the market if the ***total content of phosphorus*** is ***equal to or greater than 0.3g*** in the standard dosage as defined in section B of Annex VII	1 January 2017

Annex VII of the Regulation sets provisions on labelling and how they should be applied to the packaging of detergents sold to the general public, the content of phosphates and phosphonates added in a concentration above 0.2% wt shall be indicated following weight percentage ranges. This Annex VII also sets what is considered the standard conditions. In this respect the standard washing machine loads are 4.5kg dry fabric for heavy-duty detergents and 2.5kg dry fabric for light-duty detergents. A detergent shall be considered a heavy-duty detergent unless the claims of the manufacturer predominantly promote fabric care, i.e. low temperature wash, delicate fibres and colours. The standard washing cycle for consumer automatic dishwasher detergents is normally soiled tableware in a fully loaded 12 place settings dishwasher, making provisions, where relevant, for soft, medium and hard water hardness.

It should be noted that these limits apply to each detergent product separately, they do not sum up for different detergent and auxiliary products which may be used together in a wash cycle and additionally, they apply only to consumer detergents placed on the market.

Even if the content of phosphorus is recognized to cause environmental burdens, the case for and against the use of phosphorous is not straightforward. The traditional chemical form has been phosphate, such as sodium tri-phosphate, which has been the target of reduction efforts. Alternative phosphonate forms exist, which have a lower eutrophication potential and have thus replaced phosphate to some extent. The characteristic of this type of chemicals are:

- *phosphates (DID no 113)* are quite strong complexing agents, phosphates have good environmental properties in that they are not harmful to aquatic organisms and as they are inorganic there is no great point in considering degradability. However, phosphates are nutrients and contribute to eutrophication of the aquatic environment. Phosphates are therefore not a problem-free. Phosphates are also regulated separately in several countries in order to reduce

emissions of phosphates into vulnerable aquatic environments. Moreover, the Commission in 2007 released a report supporting the restrictions in the use of phosphates in detergents[24]

- *phosphonates (DID no 119)* are a range of phosphorus compounds that are good complexing agents. Phosphonates are not harmful to aquatic organisms, but they are persistent and not anaerobically degradable. Phosphonates contain phosphorus and are therefore a nutrient that can lead to eutrophication. Phosphonates are used as complexing agents to a lesser extent than phosphates, since phosphates are much stronger complexing agents.

In the last years, phosphonates have been indeed recognized as effective chelating agents that bind tightly to di- and trivalent metal ions, preventing them from forming insoluble precipitates (scale) and suppressing their catalytic properties. For this reason phosphonates have increased their application in detergents, because they prevent precipitation of calcium salts, stabilize per-oxybleaches and have anti-corrosion properties. In combination with zeolites, they play a major role in phosphate-free or low-phosphate detergents[25]. A study conducted on behalf of the European Commission on non-surfactant organic ingredients found that there is no significant risk posed by the presence of phosphonates in sewage sludge[26]. The majority of phosphonates found in detergents will end up in sewage sludge, due to their low terrestrial toxicity, but this should not be a cause for concern.

Most commonly used phosphonates in European detergent products are: aminotris (methylene phosphonic acid) (ATMP), diethylene triamine penta(methylene phosphonic) acid (DTPMP) and hydroxyethane dimethylene phosphonic acid (HEDP). The health and environmental risks of these three acids have been studied by HERA. The overall conclusion of this report is that in terms of environmental risk, the use of ATMP, HEDP and DTPMP in household laundry and cleaning products is that there is no overall risk, but further studies on degradation and the fate of phosphonates in the environment is recommended.

The environmental data of phosphonates has been reviewed in depth by Gledhill and Feijtel in a study published in 1992, the data from this study has been used by the HERA report and a Procter & Gamble environment information sheet. Phosphonates show only a low degree of ultimate biodegradation when using the OECD screening test. Studies have shown that evidence of phosphonates can be found in soil, activated sludge or river water, thus providing evidence of its low biodegradability.

The preference for using one or another chemical depends on several factors. Among them the hardness of water is of relevance. In areas with hard water, phosphates are much better than other complexing agents. Phosphates also allow a reduction on dosing compared with other complexing agents such as citrates. Higher dosing requires more chemicals, which leads to increased emissions of chemicals into the aquatic environment.

The preference for using one or another chemical depends on several factors. Among them the hardness of water is of relevance. In areas with hard water, phosphates are much better than other complexing agents. Phosphates also allow a reduction on dosing compared with other complexing agents such as citrates. Higher dosing requires more chemicals, which leads to increased emissions of chemicals into the aquatic environment.

The benefits of moving from phosphate-free detergents have been assessed for each of the EU-25 countries in 2006. The greatest benefits are estimated in countries with high phosphate detergent use, low provision of tertiary sewage treatment and sever problems with eutrophication. Based on this assessment, there are only few or some benefits to gain in Northern and Central Europe, whereas the most benefits from moving to phosphate free detergents are assumed to be gained in the Baltic, Eastern and Southern European countries (Czech Republic, Slovakia, Poland, Spain,

[24] Report from the Commission to the council and the European parliament. Pursuant to Article 16 of Regulation (EC) No 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents, concerning the use of phosphates.
http://eur- lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0234:FIN:en:PDF

[25] Polyphosphonates (phosphonic acids), ingredient safety information, P&G Environmental Science data.

[26] Non-surfactant Organic Ingredients and Zeolite-based Detergents, Final Report prepared for the European Commission, RPA June 2006. Available from: http://ec.europa.eu/enterprise/sectors/chemicals/files/studies/rpa_non_surf_organ_zeolites_en.pdf

Portugal, Latvia and Lithuania, among other countries)[27]. Phosphate-free detergents are widely available on European markets[28]

The content of phosphorus is restricted in most of the ecolabel schemes for detergents. Ecolabels have taken a variety of approaches to phosphates and phosphonates including excluding phosphates only, any phosphorous compounds, or a middle way, where a limit is set on total phosphorous. Some of these restrictions are summarized in Table 20.

Table 20 Summary of the restrictions related to P-content in the selected ecolabelling schemes

<table>
<tr><th>Label</th><th>Restriction</th></tr>
<tr><td colspan="2"><u>Industrial and institutional automatic dishwasher detergents (IIDD)</u></td></tr>
<tr><td>Nordic labelling</td><td>The total content of phosphorus in the product is limited to:
<table>
<tr><th>Product type</th><th>P (g/l water)</th></tr>
<tr><td>Dishwasher detergents and pre-soaks</td><td>0.08</td></tr>
<tr><td>Rinse aids</td><td>0.04</td></tr>
</table>
The total content of phosphonates/phosphonic acids must not exceed the limits specified below:
Dishwasher detergents and presoaks: 0.01 g/l water
Rinse aids: 0.006g/l water</td></tr>
<tr><td>Env. Choice NZ</td><td>Total phosphorus must not exceed the following quantities:
<table>
<tr><th>Product type (in soft water)</th><th>P (gP/L solution)</th></tr>
<tr><td>Dishwasher detergents and pre-soaking liquid</td><td>0.4</td></tr>
<tr><td>Drying agent</td><td>0.4</td></tr>
</table>
The product must not contain more than 0.2 g of phosphonates that are not readily biodegradable (aerobically) per wash.</td></tr>
<tr><td>EU Ecolabel</td><td>The total quantity of phosphates and other phosphorus compounds must not exceed the limit values specified in the table below:
<table>
<tr><td>(g P/l water)</td><td colspan="3">Water hardness (°dH)</td></tr>
<tr><td>Product type</td><td>Soft (0-6)</td><td>Med (7-13)</td><td>Hard (>14)</td></tr>
<tr><td>Pre-soaks</td><td>0.08</td><td>0.08</td><td>0.08</td></tr>
<tr><td>Detergents</td><td>0.15</td><td>0.30</td><td>0.50</td></tr>
<tr><td>Rinse aids</td><td>0.02</td><td>0.02</td><td>0.02</td></tr>
<tr><td>Multicomp system</td><td>0.17</td><td>0.32</td><td>0.52</td></tr>
</table></td></tr>
<tr><td colspan="2"><u>Consumer automatic dishwasher detergents(DD)</u></td></tr>
<tr><td>Nordic labelling</td><td>The total content of phosphorus in the product must not exceed:
<table>
<tr><th>Product type</th><th>P (g/wash)</th></tr>
<tr><td>Dishwasher detergents</td><td>0.20</td></tr>
<tr><td>Rinsing agents</td><td>0.030</td></tr>
</table></td></tr>
<tr><td>Env. Choice NZ</td><td>The product must not contain more than 0.2 g phosphonates which are not readily biodegradeable (aerobically) per wash.</td></tr>
<tr><td>EU Ecolabel</td><td>Phosphates shall not be included in the product, neither as part of the formulation nor as part of any mixture included in the formulation</td></tr>
<tr><td>Milik Bjorn</td><td>Ingredients that contain phosphorus must not be added to the product intentionally.</td></tr>
<tr><td>Good env choice AU</td><td>The product must not be manufactured using any phosphorus compounds. Trace amounts of phosphorus must not exceed 0.05% w/w excluding water.</td></tr>
<tr><td>Singapore Green Labelling</td><td>The total phosphorus content shall not exceed 0.5 %.
The pH value of the detergent shall be < 11.</td></tr>
</table>

[27] Non-surfactant organic ingredients and zeolite-based detergent. Final report prepared for the European Commission, risk an policy analysis limited (RPA) June 2006

[28] http://auneconservation.org.uk/wp-content/uploads/2011/04/phosphatefree-detergent-list.pdf

<table>
<tr><td colspan="2"><u>Industrial and institutional laundry (IILD)</u></td></tr>
<tr><td>Nordic labelling</td><td>a) Phosphorus
The total content of phosphonates and other phosphorus compounds in the product is limited to:
Light soiling: 0.50 g/kg laundry
Medium soiling: 1.00 g/kg laundry
Heavy soiling: 1.50 g/kg laundry
Products containing more phosphorus than what is allowed under the Norwegian regulations must not be sold and used in Norway or areas where there are rules and bans on phosphorus in laundering chemicals.
b) phosphonates/phosphonic acid
the total phosphonate/phosphonic acid may not exceed the limit value shown in the table
<table>
<tr><th>g/kg laundry</th><th>light</th><th>medium</th><th>heavy</th></tr>
<tr><td>At 30-40C washes</td><td>0.15</td><td>0.20</td><td>0.30</td></tr>
<tr><td>At 30-40C washes</td><td>0.075</td><td>0.10</td><td>0.15</td></tr>
</table></td></tr>
<tr><td>Env. Choice NZ</td><td>a) The maximum concentration of complexing agents (e.g. phosphate, phosphonate, silicate, polycarboxylate, polyarcylate, zeolite and iminodisuccinate) in the product must not exceed 10 g/kg laundry (dry wt.).
Citrate shall not be included in this amount.
b) The product shall not contain more than the following concentrations of phosphorus, counted as P:
Light soiling – 0.5 g phosphorus /kg laundry (dry weight)
Medium soiling – 1.0 g phosphorus /kg laundry (dry weight)
Heavy soiling – 1.5 g phosphorus /kg laundry (dry weight)
c) The product shall not contain more than 0.5 g of phosphonates that are not readily biodegradable (aerobically) per kg laundry (dry weight).</td></tr>
<tr><td>EU Ecolabel</td><td>Phosphates shall not be included in the product, neither as part of the formulation nor as part of any mixture included in the formulation apart from those that comply with the biodegradability criterion.</td></tr>
<tr><td colspan="2"><u>Consumer laundry detergents (LD)</u></td></tr>
<tr><td>Nordic labelling</td><td>The total content of phosphorus in the product is limited to:
<table>
<tr><th>Product type</th><th>P (g/kg wash)</th></tr>
<tr><td>Heavy-duty LD (normally soiled)</td><td>0.030</td></tr>
<tr><td>Low-duty LD (lightly soiled)</td><td>0.030</td></tr>
<tr><td>Stain-removers (in-wash)</td><td>0.010</td></tr>
<tr><td>Stain-removers (pre-treatment)</td><td>0.005</td></tr>
</table></td></tr>
<tr><td>Env. Choice NZ</td><td>The product must not contain > 0.15 g phosphonates which are not readily biodegradable / kg laundry (dry wt)</td></tr>
<tr><td>EU Ecolabel</td><td>Phosphates shall not be included in the product, neither as part of the formulation nor as part of any mixture included in the formulation</td></tr>
<tr><td>Milik Bjorn</td><td>Ingredients that contain phosphorus must not be added to the product intentionally.</td></tr>
<tr><td>Singapore Green Labelling</td><td>Phosphonates are prohibited from the product. The total amount of phosphorus shall be <0.5 %.</td></tr>
<tr><td colspan="2"><u>All-purpose cleaners consumer user (APC)</u></td></tr>
<tr><td>Nordic labelling</td><td>--</td></tr>
<tr><td>Env. Choice NZ</td><td>The product shall not be formulated with phosphates and phosphonates that are not aerobically biodegradable</td></tr>
<tr><td>EU Ecolabel</td><td>The total quantity of elemental phosphorus in the product shall be calculated on the basis of the dosage of the product recommended by the manufacturer for preparing 1 litre of washing water for cleaning of normally soiled surfaces (for products diluted in water prior to use) or per 100 g of product (for products used without dilution):
<table>
<tr><th>Product</th><th>Maximum phosphorus level</th></tr>
<tr><td>Diluted all-purpose cleaner</td><td><0.02 g/l of water</td></tr>
<tr><td>Undiluted all-purpose cleaner</td><td><0.2 g/100 g of product</td></tr>
<tr><td>Sanitary cleaner</td><td><1.0 g/100 g of product</td></tr>
<tr><td>Window cleaner</td><td>Zero</td></tr>
</table></td></tr>
</table>

Good Env Choice AU	The product must not be manufactured using any phosphorus compounds. Trace amounts of phosphorus must not exceed 0.05 % w/w excluding water.
Milik Bjorn	Ingredients that contain phosphorus must not be added to the product intentionally.
Green Seal	the product as used shall not contain more than 0.5 % by weight of total phosphorus
Industrial and institutional all-purpose cleaner (IIAPC)	
EU Ecolabel	See consumer APC
Env. Choice NZ	Phosphorus may be included in commercial and institutional cleaners up to no more than 0.5% of total weight. All phosphonates must be readily aerobically biodegradable.
Green Seal	The product as used shall not contain more than 0.5% by weight of total phosphorus
Hand dishwasher detergents consumer use (HDD)	
EU Ecolabel	--
Nordic labelling	--
Env. Choice NZ	--
Good Env. Choice CR	Ingredients that contain phosphorous must not be added to the product intentionally

Requiring phosphorus-free detergents would be desirable and there are already available products on the market and their performance is at present similar to that of the phosphorus-content detergents. The technical problems reported some years ago concerning the solubility of dirt and keeping it in suspension during washing or problems to remove staining on glass when using alternatives builders in hard water areas have been mainly solved over the course of time.

The larger, mainly international, producers of detergents (mainly laundry and dishwasher detergents) have already adapted to the various market demands of supplying phospohrous-free detergents with acceptable technical performance. There is therefore no major problem with the supply of phosphorus-free detergents. For example, in Sweden between 2005 and 2007 the proportion of phosphorus-free automatic dishwasher detergents on the Swedish market grew from 10 to 27%. When only domestic production was considered, 74% were phosphorus-free. Between 2007 and 2009 the domestic production of phosphorus free automatic dishwasher detergents continued to grow from 74 to 96%.

Banning phosphates in detergents or requiring phosphorus-free detergents is among the cheapest possible measures to reduce phosphorus at source, compared to measures within agriculture or the construction of wetlands etc[29]. However, smaller companies producing detergents may in some countries have difficulties with increased costs when their products must be reformulated. These costs however need to be put into perspective with the overall costs of achieving the goals of e.g. the Water Framework Directive[30].

Therefore, it is proposed that the phosphorus content in the revision of the EU Ecolabel criteria, will be dealt, whenever possible, as follows:

- ban for phosphates
- ban for phosphonates that are not aerobically-biodegradable, and
- limit on total amount of phosphorus. The limit in phosphorus content follows the approach included in the Detergent Regulation but it has a higher level of ambition

Consequently, the assessment and verification process of most of the current EU Ecolabel criteria should be changed, reflecting the proposed changes. The assessment and verification of each of the above conditions are proposed to be met by:

a) Assessment and verification for the ban for phosphates: The applicant shall provide a signed declaration of compliance supported by declarations from manufacturers of mixtures, as appropriate, confirming that the listed substances and/or mixtures have not been included in the product.

[29] Economic analysis on the BSAP with focus on eutrophication, Report 2(1) (2007) to HELCOM, COWI Group Consulting.
[30] http://www.kemi.se/Documents/Publikationer/Trycksaker/Faktablad/QandA_Phosphates_in_Detergents.pdf

b) Assessment and verification for the ban for phosphonates, those are not aerobically biodegradable: The applicant shall provide written statements on compliance, including:

- information on the complexing agents in the product (detail information of the type of phosphonates added as ingredients);
- information for the biodegradability of the phosphonates. A spreadsheet for use in calculating aNBO values is available on the EU Ecolabel website.

For aNBO values reference should be done to the DID List. For phosphonates which are not included in the most updated DID list, the relevant information from literature or other sources, or appropriate test results, showing that they are aerobically biodegradable shall be provided as described in Appendix I.

c) Assessment and verification for the limited total amount of phosphorusThe applicant shall provide written statements on compliance, including:

- information on the complexing agents in the product (detail information of the type of phosphorus-content substances added as ingredients);
- information on the recommended dose for different levels of soiling or water hardness (when applicable);
- calculation of the product's total P-content

10.1.2 EDTA and DTPA

EDTA (ethylenediaminetetraacetic acid $C_{10}H_6N_2O_8$) is a compound of massive use worldwide with household and industrial applications, being one of the anthropogenic compounds with highest concentrations in inland European waters. This substances is used in detergents as a chelating agent to stabilise perborates. The use of EDTA is proposed to be restricted because its salts are not readily biodegradable and, according to the EU's risk evaluation, in conditions found in municipal wasterwater treatment EDTA is poorly biodegradable[31], is persistent and contributes to remobilization of heavy metals bioavailability in the environment, which is a big concern. According to ECHA, EDTA has been registered as H319 Causes serious eye irritation[32], H332 Harmful if inhaled and H412 Harmful to aquatic life with long lasting effects[33].

In the EU Ecolabel criteria for rinsed-off cosmetics and the current EU Ecolabel criteria for detergents EDTA is already excluded. In the feedback during the development of those EU Ecolabel criteria sets it was emphasized that better biodegradable chelants are already available. e.g. Methylglycinediacetic acid MGDA (trilon M) or Ethylenediamine-N,N'disuccinic acid EDDS.

DTPA (diethylene triamine pentaacetic acid) is used for similar function as EDTA. It is commonly used as chelant. The environmental fate of diethylenetriaminepentaacetic acid $C_{14}H_{23}N_3O_{10}$ (DTPA) has been in the last years studied and confirmed that DTPA is persistent toward biodegradation in water treatment plants[34]. It has also been classified as toxic for reproduction. However, as the classification is not yet harmonized under the CLP Regulation, therefore it should be explicitly excluded from use.

NTA Nitrolotriacetic acid (NTA) is a common industrial chelating agent. It is used for instance as a builder in order to replace phosphates in laundry detergents. Environmental concern related to NTA are linked firstly, to its contribution to the eutrophication and secondly, to its ability to solubilize and mobilize heavy metals from sediments and activated sludge[35]. NTA is classified as carcinogenic however there is not a harmonised classification. It is excluded in several schemes. In the EU

[31] European chemical industry council http://www.cefic.be

[32] http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/cl-inventory/view-notification-details/108021/28709045

[33] http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/cl-inventory/view-notification-details/108021/28808610

[34] Nordic Ecolabelling of Dishwasher detergents and Rinsing agents Version 6.1, 19 March 2014 - 31 March 2018, available at: http://www.nordic-ecolabel.org/criteria/product-groups/

[35] Kyung Jang J. et al., Nitrolotriacetic Acid Degradation Under Microbial Fuel Cell Environment, Biotechnology and Bioengeneering, Wiley InterScience, 2006.

Ecolabel it is derogated as an impurity in MGDA and GLDA In concentrations lower than 1,0 % in the raw material as long as the total concentration in the final product is lower than 0,10 %.
EDTA is explicitly restricted in most of the ecolabel schemes and in all the products under study. However, this is not the case for DTPA that, although it is restricted due to its classification as a CMR substance, it is only explicitly restricted in consumer detergents for dishwashers and APCs but not in laundry detergents. Finally, NTA is explicitly excluded in professional laundry and dishwasher detergents in Nordic Ecolabelling and in general in Environmental Choice New Zeeland products.

Table 21 Comparison of exclusions of EDTA, DTPA and NTA in revised ecolabelling schemes

Ecolabel scheme	LD	IILD	DD	IIDD	APC	HDD
EDTA						
Current EU Ecolabel	x	x	x	x	x	
Nordic Labelling	x	x	x	x	x	
Bra Miljoval						
Env. Choice NZ	x	x	x	x	x	
Good Env choice AU					x	
Green Seal						
Singapore green	x		x			
DTPA						
Current EU Ecolabel			x			
Nordic Labelling			x		x	
Bra Miljoval						
Env. Choice NZ			x		x	
Good Env choice AU					x	
Green Seal						
Singapore green			x			
NTA						
Current EU Ecolabel	Derogation apply	Derogation apply	Derogation apply	Derogation apply		
Nordic Labelling		x		x		
Bra Miljoval						
Env. Choice NZ	x	x	x	x	x	
Good Env choice AU						
Green Seal						
Singapore green				x		

10.1.3 APEO and ADP

Alkylphenol ethoxylates (APEOs) and alylphenol derivatives (APDs) belong to the group of non-ionic surfactants used in detergents for household and industrial cleaning. Together with their degraded intermediates they are ubiquitously present in runoffs, sewage discharge and sludge. They are persistent and can be found not only in water or sediments but also in animals and in human bodies[36, 37]. They are potential endocrine disruptors, thus their presence in Ecolabel products should be explicitely excluded.

[36] Leung, Sau-mei, Teresa: Nonylphenol- and octylphenol-ethoxylates in surfactant products : need control or not? An overview of their consumption, environmental fate and risks and public awareness in Hong Kong as compared to overseas countries, Master thesis, The University of Hong Kong, 2013

[37] P. Whitehouse: Environmental Impacts of Alkylphenol Ethoxylates and Carboxylates. Part 1: Proposals for the Development of Environmental Quality Standards, R&D Technical Report P2-115/TR3, Environment Agency, Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, 2002.

On biodegradation APEOs produce less biodegradable products (alkylphenols) which are known to be persistent in sewage treatment facilities and rivers. These metabolites are known to be more toxic than the original compounds and have hormone-like effects. APEOs can be biodegraded through a mechanism involving stepwise loss of ethoxy groups to form lower EO congeners (shorter APE homologues), carboxylated products (alkylphenol ethoxycarboxylates), and APs such as nonylphenol ethoxylates (NPE) and octylphenol ethoxylates (OPE) in the environment[38]. NP and OP are known to be more toxic than their EO precursors and to mimic the effect of the hormone estrogen. The route of human and wildlife exposure to these chemicals is mainly through water, although there is some exposure through terrestrials as well[39].

Regarding the presence of APEOs on the market, in 2002 the industrial applications comprised 55% of the APE market. The remaining uses includes industrial and institutional cleaning products (30%), household cleaning products (15%) and other miscellaneous uses (<1%). The most significant commercial APEs are OPEs and NPEs. NPEs account for about 80% of total APE use. Approximately, 500,000 tons are produced annually worldwide, 60% of which ends up in the aquatic environment[40].

An expression of concern about the use of these substances as detergent ingredient has been expressed in the Regulation (EC) No 624/2004 on Detergents[41] and to a certain extent prohibited on the grounds of poor degradability under the requirements concerning the degradability of surfactants.

APEO and APD are restricted in most of the schemes through the requirement that all the surfactants should be biodegradable under aerobic and anaerobic conditions. The restriction is explicitly requested in most of the European ecolabel schemes and Environmental Choice from NZ scheme as seen in Table 22.

[38] N. Jonkers, T.P. Knepper, P. de Voogt, Aerobic biodegradation studies of nonylphenol ethoxylates in river water using liquid chromatography–electrospray tandem mass spectrometryEnviron Sci Technol, 35 (20001), pp. 335–340

[39] G. Ying. B. Williams, R.Kookana, Environmental fate of alkylphenols and alkylphenol ethoxylates-a review, Env Int 28, 3, 2002, 215–226

[40] M. Sole, M.J. Lopez de Alda, M. Castillo, C. Porte, K. Ladegaard-Pedersen, D. Barcelo, Estrogenicity determination in sewage treatment plants and surface waters from the Catalonian area (NE Spain), Environ Sci Technol, 34 (2000),. 5076–5083

[41] Ditallow-dimethyl-ammonium-chloride (DTDMAC) and nonylphenol (including ethoxylates derivatives-APEs) are priority substances undergoing at Community level risk assessment activities, in accordance with Council Regulation (EEC) No 793/93 of 23 March 1993 on the evaluation and control of the risks of existing substances (3), and if necessary adequate strategies to limit the risks of exposure to these substances should therefore be recommended and implemented in the framework of other Community provisions

Table 22 Comparison of excluded APEO and APD substances and their derivatives in revised ecolabelling schemes

Ecolabel scheme	LD	IILD	DD	IIDD	APC	HDD
APEO						
Current EU Ecolabel		x	x	x	x	
Nordic Labelling	x	x	x	x	x	
Bra Miljoval						
Env. Choice NZ	x	x	x	x	x	
Good Env choice AU					x	
Green Seal						
Singapore green						
APD						
Current EU Ecolabel		x	x	x		
Nordic Labelling	x	x	x	x	x	
Bra Miljoval						
Env. Choice NZ	x	x	x	x		
Good Env choice AU						
Green Seal						
Singapore green						

Declaring APEO and APD, both the compounds themselves and APEO derivatives as excluded substances simplifies the application process of exclusion and ensures that they are not present in the EU Ecolabel products (being the horizontal approach followed in the revision of the EU Ecolabel criteria).

10.1.4 Nitromusks and plycyclic musks

Artificial musks, like nitromusks are poycyclic musks are broadly used as inexpensive fragrances and fixatives in personal and household care products.[42] Their use in Europe is apparently limited, which may not be the case outside of Europe. They have undesired health and environmental properties[43]. Some are classified as hazardous to the aquatic environment, and thus already excluded through the criterion on hazardous substances and mixtures above 100 ppm. A search of the ECHA C&L Inventory Database was conducted. Only some of the musks could be found, nevertheless, these have harmonised classification as hazardous to the environment (see below table). Specific exclusion of nitro- and polycyclic musks is still proposed to be kept as a relevant preventive measure. This requirement excludes for instance the substances given in Table 23.

[42] Taylor et al.: Human exposure to nitro musks and the evaluation of their potential toxicity: an overview. Environmental Health 2014, pp. 13:14.
[43] Nordic Ecolabelling, Laundry detergents and stain removers, version 7. Background report, 2013.

Table 23 Nitromusks and polycyclic musks

Substance	CAS-No		Classification in ECHA database	
Musk xylene	81-15-2	5-tert-butyl-2,4,6-trinitro-m-xylene[44]	H201	Explosive; mass explosion hazard.
			H351 H400 H410	Carc. 2 Aquatic Acute 1 Aquatic Chronic 1 (harmonised entry)
Musk ambrette	83-66-9	4-tert-butyl-3-methoxy-2,6-dinitrotoluene		
Moskene	116-66-5	1,1,3,3,5-pentamethyl-4,6-dinitroindan		
Musk tibetine	145-39-1	1-tert-butyl-3,4,5-trimethyl-2,6-dinitrobenzene		
Musk ketone	81-14-1	4-tert-butyl-2'-6'-dimethyl-3',5'-dinitroacetaphenone	H351 H400 H410	Carc. 2 Aquatic Acute 1 Aquatic Chronic 1 (harmonised entry)
HHCB	114109-62-5			
	114109-63-6			
	1222-05-5[45]		H400 H410	Aquatic Acute 1 Aquatic Chronic 1 (harmonised entry)
	78448-48-3			
	78448-49-4			
AHTN	1506-02-1 21145-77-7			

Comparing with other ecolabel schemes, it can be seen that the exclusion of musks is included in most of the European schemes and other non-European ones such as Environmental Choice New Zeeland or the Singapore Green when referring to consumer detergents. This restriction is also included in some industrial and institutional laundry detergent schemes.

Table 24 Exclusion of nitromusks in revised ecolabelling schemes

Ecolabel scheme	LD	IILD	DD	IIDD	APC	HDD
Current EU Ecolabel	x	x	x		x	
Nordic Labelling	x		x		x	
Bra Miljoval					x	
Env. Choice NZ	x	x			x	
Good Env choice AU					x	
Green Seal						
Singapore green	x		x			

10.1.5 Quaternary ammonium salts not readily biodegradable

Quaternary ammonium compounds are commonly used as biocides in a broad range of products, among them in detergents.[46] In accordance with available information there are alternatives available (such as ester quats) which have better environmental properties. Quaternary ammonium compounds are not easily degradable and often very toxic to aquatic organisms, classified as H400

[44] http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/cl-inventory/view-notification-summary/21513
[45] http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/cl-inventory/view-notification-details/106687/28852495
[46] Hegstad K1, Langsrud S, Lunestad BT, Scheie AA, Sunde M, Yazdankhah SP: Does the wide use of quaternary ammonium compounds enhance the selection and spread of antimicrobial resistance and thus threaten our health? Microb Drug Resist. 2010 Jun;16(2):91-104.

(aqute), or if non-readily biodegradable – H410 (very toxic to aquatic life with long-lasting effects). Moreover, they are reported to cause certain allergic reactions.[47'48]
Restriction on use of quaternary ammonium salts as part of the APCs is included in many of the analysed schemes as reported in Table 25.

Table 25 Exclusion of quaternary ammonium salts that are not readily biodegradable in revised ecolabelling schemes

Ecolabel scheme	LD	IILD	DD	IIDD	APC	HDD
Current EU Ecolabel					x	
Nordic Labelling					x	
Bra Miljoval					x	
Env. Choice NZ	x	x	x		x	
Good Env choice AU					x	
Green Seal						
Singapore green						

10.1.6 Reactive chlorine compounds

Reactive chlorine compounds are used in a variety of different forms in detergent products. They include for instance sodium or calcium hypochlorite, organochlorides, chlorine gas, chloramines and chlorine dioxide. Due to their disinfectants/anti-bacterial properties they are mainly used in e.g. laundry detergents to remove stains and to bleach textiles. They are toxic, persistent and bioaccumulating, or can form such substances47.
According to ECHA C&L Inventory database, hypochlorites are classified as shown in Table 26.

Table 26 Classification of hypochlorite compounds in ECHA database

	Classification	
Sodium hypochlorite, solution CAS: 7681-52-9[49]	H314	Causes severe skin burns and eye damage.
	H400	Very toxic to aquatic life.
calcium hypochlorite CAS 7778-54-3[50]	EUH031	Contact with acids liberates toxic gas.
	H272	May intensify fire; oxidiser.
	H302	Harmful if swallowed.
	H314	Causes severe skin burns and eye damage.
	H400	Very toxic to aquatic life.

Use of chlorine based bleach is not common in household detergents but it is used e.g. as part of the detergent system in professional laundries. Furthermore, it has been stated that chlorine based bleach is sometimes used in association with low temperature wash in other parts of the world (e.g. in USA) to reduce bacterial growth.
It is proposed that as far as possible the exclusion of reactive chlorine compounds should be considered in the EU Ecolabel products, also as a preventive measure.
Comparing with other ecolabel schemes, the restriction of excluding reactive chlorine compounds is explicitly stated in Nordic Ecolabelling, Environmental Choice New Zeeland and in DD and IIDD in

[47] Nordic Ecolabelling of Dishwasher detergents and Rinsing agents Version 6.1, 19 March 2014 - 31 March 2018, available at: http://www.nordic-ecolabel.org/criteria/product-groups/
[48] Quaternary ammonium compounds, benzyl-C8-18-alkyldimethyl, chlorides is classified in ECHA database as: H302+H3012 Harmful if swallowed or in contact with skin, H314 Causes severe skin burns and eye damage, H318 Causes serious eye damage and H400 Very toxic to aquatic life. Information is available at: http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/cl-inventory/view-notification-details/48306/28846366
[49] http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/cl-inventory/view-notification-details/86244/28780974
[50] http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/cl-inventory/view-notification-details/49011/28650561

the currently valid EU Ecolabel. Extension of this restriction to laundry products and APC is proposed.

Table 27 Exclusion of reactive chlorine compounds in revised ecolabelling schemes

Ecolabel scheme	LD	IILD	DD	IIDD	APC	HDD
Current EU Ecolabel			x	x		
Nordic Labelling		x	x	x	X	
Bra Miljoval						
Env. Choice NZ	x	x	x	x	X	
Good Env choice AU					X	
Green Seal						
Singapore green						

10.1.7 Perborates

Perborates (e.g. sodium perborate) are carriers for hydrogen peroxide. In aqueous solution they dissociate into sodium metaborate and hydrogen peroxide. This property of perborates makes it possible to incorporate hydrogen peroxide in detergents without major interactions with other detergent components.
Hydrates of perborate, tetra- and nomohydrate fulfil important requirements for bleaching agents: they are affordable, safe to handle and non-damaging to fabrics[51].
Although perborate gives a good performance and has been utilized for decades, boron is blamed for damaging green algae, reeds and other aquatic beings such as trout fishes within a concentration of approximately 1mg/l of boron in surface waters.
Additionally perborates are classified as toxic for reproduction- Repr 1B, H360 (under the CLP regulation) and thus restricted under the general requirement for the restriction and limitation of chemicals. The classification of the perborates in accordance with ECHA is shown in Table 28.

Table 28 Perborates classified in ECHA database

Name	Classification	
Sodium perborate CAS 15120-21-5[52]	H272	Ox. Sol. 2
	H302	Acute Tox. 4 *
	H318	Eye Dam. 1
	H335	STOT SE 3
	H360Df	Repr. 1B
Perboric acid, sodium salt CAS: 7632-04-4[53]	H272	Ox. Sol. 2
	H302	Acute Tox. 4 *
	H318	Eye Dam. 1
	H331	Acute Tox. 3
	H335	STOT SE 3
	H360Df	Repr. 1B

Comparing other ecolabel schemes, the restriction on perborates is explicitly stated in the industrial and institutional detergents in the Nordic labelling and some schemes for consumer detergents in the current EU Ecolabel and the Singapore green scheme as reported in Table 29.

[51] Dorfer A., Lieser T., Hydrogen peroxide carriers, Proceedings of the 3rd World Conference on Detergents: Global Perspectives, The American Oil Chemists Society, 1994,
[52] http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/cl-inventory/view-notification-summary/11818
[53] http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/cl-inventory/view-notification-summary/62020

Table 29 Exclusion of perborates in revised ecolabelling schemes

Ecolabel scheme	LD	IILD	DD	IIDD	APC	HDD
Current EU Ecolabel			x			
Nordic Labelling		Boric acid and borates		x and borates		
Bra Miljoval						
Env. Choice NZ						
Good Env choice AU						
Green Seal						
Singapore green	X					

10.1.8 Formaldehyde

Formaldehyde is a known sensitizer and a known carcinogen, recently classified by WHO. Based on its classification[54]:

- H301: toxic if swallowed,
- H311: toxic in contact with skin,
- H314: causes severe skin burns and eye damage,
- H317: may cause an allergic skin reaction ,
- H331: toxic if inhaled,
- H351: suspected of causing cancer.

should be restricted the use of formaldehyde in ecolabelled products. In accordance with the current list of H phrases formaldehyde and its classification as CMR substance, formaldehyde would automatically be excluded by general criterion on excluded and restricted substances and mixtures above 100 ppm.

Beside formaldehyde there are also **formaldehyde releasers** used as preservatives. They decompose to form formaldehyde upon degradation, even in amounts that can be above the classification limits for formaldehyde[55]. There are also studies that demonstrate that people exposed to formaldehyde releasers may experience allergic reactions[56], therefore they are a proposed subject to restriction. Several examples are briefly mentioned below:

10.1.9 5-bromo-5-nitro-1,3-dioxane (BND)

BND (5-bromo-5-nitro-1, 3-dioxane) is a formaldehyde releaser. BND is a nitro-substituted compound that is added as biocides to the cleaners at levels of 0.01 or 0.1% wt (e.g. to prevent biological oxidation in static cleaning tanks). BND is classified as H302 and H315 and it is combined with non-ionic detergents or proteins in mainly liquid reagents to obtain the most stable system.

10.1.10 2-bromo-2-nitropropane-1,3-diol (Bronopol)

Bronopol is also a formaldehyde releaser. It is used (depending on the detergents type, e.g. in washing-up liquids, detergents, fabric softeners, window cleaners or wax emulsions) in

[54] For details see the information contained at ECHA website: http://apps.echa.europa.eu/registered/data/dossiers/DISS-9d8ad2a1-0d51-13f7-e044-00144f67d249/AGGR-aa1957ab-42e8-43c6-856d-09b14245e171_DISS-9d8ad2a1-0d51-13f7-e044-00144f67d249.html#L-9cf4f64b-5725-4012-aad3-657063a4f5b6

[55] Final report. EU Eco-label for shampoo and soaps. Ecolabelling Norway. Eskeland,, M.B, Svanes, E., 2006

[56] http://share.eldoc.ub.rug.nl/FILES/root2/2010/Formretof/de_Groot_2010_Contact_Dermatitis.pdf

concentration range of 0.2 - 1.0 g/kg (0.02 - 0.10%)[57]. According to Annex VI of CLP and ECHA classification, it is, classified as[58]

- H302: harmful if swallowed,
- H312: harmful in contact with skin,
- H318: causes serious eye damage,
- H335: may cause respiratory irritation,
- H400: Very toxic to aquatic life.

Bronopol has a moderate capacity for inducing skin allergies. It is a strong eye irritant and to be capable of causing difficulties in breathing and induce eczematous reactions in people who are already sensitized. As an explicitly excluded substance, it can be found in laundry detergents, HDDs and APCs in a maximum use concentration of 0.01%.

10.1.11 Diazolinidylurea

Diazolinidylurea is an antimicrobial preservative effective against a broad spectrum of bacteria, fungi and yeast. It may cause allergy on skin when it is exposed to these substances.

10.1.12 Sodium hydroxyl methyl glycinate (SMGH)

SHMG is a preservative that has been associated with allergic contact dermatitis, possibly due to the formaldehyde they release, although it is not a classified substance. Studies on SHMG in animals have demonstrated potential for sensitization and dermatitis, and formaldehyde –allergic patients have been reported to improve when products containing SHMG are avoided[59].

The above mentioned substances are excluded mainly in some or the detergent and cleaning product groups in the currently valid EU Ecolabel criteria. EDTA and musks are excluded from all the product groups, however for instance formaldehyde releasers only from APC and HDD or APEOs from all except of LD and DD.

In order to exclude in a harmonised way the undesired substances from products groups where they are actually used stakeholders feedback and expert knowledge is necessary. Some proposals are made in the technical background reports nevertheless, this criterion needs further development. Stakeholders are asked to support identifying in which other groups the above specifically excluded substances should be covered. This could be done filling in and/or commenting the Table 30.

[57] http://microsites.schuelke.com/wet-wipe-preservation/leaflets/SMBronopolZTM_P_HH_EEN.pdf
[58] http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/cl-inventory/view-notification-details/117530/28769463
[59] Sodium hydroxymethylglycinate, Rusell k, Jacob SE. Dermatitis. 2010 Apr 21 (2):109-10

Table 30 Ingredients to be excluded from EU Ecolabel detergent and cleaning products to be discussed at AHWG

Substance	IIDD	DD	IILD	LD	APC	HDD
EDTA	x	x	x	x	x	x
APEO and ADP	x		x		x*	x*
DTPA		x				
Quaternary ammonium salts not readily biodegradable						x
Reactive chlorine compounds	x	x				
Perborates		x				
5-bromo-5-nitro-1,3-dioxane					x	x
2-bromo-2-nitropropane-1,3-diol					x	x
Diazolinidylurea					x	x
Sodium hydroxyl methyl glycinate					x	x
Formaldehyde					x	x

*APEOs and derivatives

Beside the described substances and substance groups there are also other ingredients of concern. Stakeholders feedback, analysis of the existing schemes and own research on substances which shall potentially be excluded from EU Ecolabel products was conducted. A brief summary is given below:

10.1.13 LAS

LAS is a common surfactant used in cleaning products. It is not anaerobically biodegradable, thus it is excluded from some criteria through the requirement on anaerobic biodegradability of surfactants. In the Nordic labelling scheme it is banned in most detergent product groups (see Table 31).

Table 31 Exclusion of LAS in ecolabelling revised schemes

Ecolabel scheme	LD	IILD	DD	IIDD	APC	HDD
Current EU Ecolabel						
Nordic Labelling		x	x	x	X	
Bra Miljoval						
Env. Choice NZ						
Good Env choice AU					x	
Green Seal						
Singapore green						

10.1.14 Perfluorinated and polyfluorinated alkylated substances (PFAS)

PFAS are a big group of man-made highly fluorinated organic chemicals. They are used since the 1950s as components of surfactants and surface protectors in industrial and consumer products. PFAS with fluorinated carbon chains longer than six decompose to the very stable forms PFOS perfluoro octanesulfonic acid (PFOS) and perfluoro octanoic acid (PFOA) and similar compounds. Studies showed that these compounds may occur in some types of multipurpose cleaners as

fluorinated surfactants[60]. The substances are persistent and bioaccumulating. They affect the biological processes in the body and are suspected to be endocrine disruptive[61].

10.1.15 Potential endocrine disrupters

"*An endocrine disrupter (ED) is an exogenous substance or mixture that alters function(s) of the endocrine system and consequently causes adverse health effects in an intact organism, or its progeny, or (sub)populations*".[62]

Endocrine system consists of a complex network of hormones, receptors and glands. Through providing a communication link, the endocrine system effectively controls growth, childhood development, regulation of bodily functions and reproductive processes. A change to this system can have undesirable effects on health. A particular area of focus is on the hormones which control gender development and reproduction. Evidence of reproductive and gender changes in animals have led to this concern[63,64].

However, the identification of endocrine disrupting substances is challenging due to the difficulty in distinguishing between endocrine activity and endocrine disruption. Under current legislation, ED can be identified as Substances of Very High Concern (SVHCs).

The European Commission is currently working on a proposal for science-based criteria for endocrine disruptors in response to the growing concern over the potential negative impacts of these substances.[65] At present, a public consultation and road map[66] have been launched as well as a priority list of substances for further evaluation. At the time of writing this document, just the consultation forum was opened and will have finished on 16th of January 2015.

Along the consideration on the classification of EDs the following two categories (based on strength of evidence and additional considerations in a weight of evidence approach) were planned:

- Category 1: Endocrine disruptors,
- Category 2: Suspected endocrine disruptors.

Emissions to the aquatic environment are the primary source of EDs. Some potential endocrine disrupter substances may already be restricted or excluded through:

(a) Article 6(6) of Regulation (EC) No 66/2010
(b) Hazardous substances and mixtures and
c) Substances of Very High Concern.

Nevertheless, recognising the importance of this issue, setting a specific exclusion of ED substances shall be considered in this criteria revision and is initially proposed for restriction. This requirement was also considered in the recent revision of the EU Ecolabel criteria for rinse-off cosmetic products but could not be implemented yet as the work of responsible services was ongoing.

Some examples of substances that are potential endocrine disruptors include: triclosan, nonylphenol (NP) or octylphenol[67]. They are banned for use in several EU Ecolabel schemes for detergents, for instance in Nordic Ecolabelling, New Zeeland Environmental Choice and Green Seal. An overview of the approaches taken by different ecolabel schemes is presented in Table 32.

---

[60] Environmental and Health Risk Assessment of Perfluoroalkylated and Polyfluoroalkylated Substances (PFASs) in Sweden available at http://www.naturvardsverket.se/Documents/publikationer6400/978-91-620-6513-3.pdf

[61] Perfluorooctane Sulphonate (PFOS) OSPAR Commission 2005 (2006 Update) available at http://www.ospar.org/documents/dbase/publications/p00269/p00269_bd%20on%20pfos%20_2006%20version_.pdf

[62] WHO/UNEP State of the Science of Endocrine Disrupting Chemicals 2012 update.

[63] Dimitra A. Lambropoulou, Leo M. L. Nollet: Transformation Products of Emerging Contaminants in the Environment: Analysis, Processes, Occurrence, Effects and Risks, John Wiley & Sons, 2014.

[64] ECHA Endocrine Disruptor Expert Group, http://www.echa.europa.eu/en/web/guest/addressing-chemicals-of-concern/substances-of-potential-concern/substance-specific-groups/endocrine-disruptor-expert-group

[65] For more information see http://ec.europa.eu/environment/chemicals/endocrine/index_en.htm

[66] Titled: "Defining criteria for identifying Endocrine Disruptors in the context of the implementation of the Plant Protection Product Regulation and Biocidal Products Regulation", available at http://ec.europa.eu/smart-regulation/impact/planned_ia/docs/2014_env_009_endocrine_disruptors_en.pdf [accessed November 2014].

[67] Study on enhancing the Endocrine priority list with a focus on low production volume chemicals, report to DG Environment, DHI Water & Environment, 2007. Available from: http://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf

Table 32 Approaches to restricting endocrine disruptors taken by various Ecolabel schemes

Scheme	Criterion
Nordic Ecolabelling	The product must not contain the following compounds: Substances on the European Union's list of 118 substances documented to cause endocrine disruption or potential endocrine disruption: http://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf
Env. Choice NZ	Commercial and institutional cleaning products shall not be formulated or manufactured with substances (active content only) that are: Classified as Category 1 or Category 2 under the European Commission priority list developed under the Community strategy for endocrine disruptors.
Good Env. Choice	No requirements
Green Seal	The undiluted product shall not contain any components that are on the U.S. Environmental Protection Agency (EPA) List of Chemicals for Tier 1 Screening that have been shown to disrupt hormones (e.g., have estrogen- or androgen-mediated effects), tested according to the EPA Series 890 – Endocrine Disruptor Screening Program Test Guidelines.
Current EU Ecolabel	No requirements

Comparing this policy line to criteria of other ecolabelling schemes, it is revealed that the Nordic Labelling and the Environmental Choice (NZ) scheme have followed this approach and they explicitly refer the strategy on EDs and ban Category 1 and Category 2 of the priority list of substances for further evaluation of their role in endocrine disruption[68] (using the precautionary approach in a broad number of detergents).
The proposed strategy for the revision of the EU Ecolabel schemes for detergents is to observe the development of the EC in this area and, if considered feasible, to exclude the use of substances on the potential endocrine disruptors. More information on this subject will be provided after the public consultation is closed and the results available.

10.1.16 Triclosan

The broad-spectrum antimicrobial activity of 5-chloro-2-(2,4-dichlorophenoxy)phenol) or triclosan has led to its incorporation as a preservative in an extended range of product formulations intended for home use such as detergents. Triclosan is classified as an agent that may cause adverse environmental effects and has sensitizing properties. Based on ECHA C&L database it has a harmonised cl classification with the following hazards[69].

- H410: very toxic to aquatic life with long lasting effects,
- H400: aquatic toxic
- H315: causes skin irritation and
- H319: causes serious eye irritation.

Triclosan is used also in cosmetic products and is excluded from EU Ecolabel for rinse-off cosmetics. Its exclusion is also proposed for detergents.

10.1.17 Microorganisms/enzymes

The use of enzymes in detergent products is not a recent innovation; in fact they have been used for this purpose since the 60s. Enzymes are proteins which act as catalysts to increase the rate of chemical reaction. In detergent products they are used for removal of stains and for improving washing performance at low temperatures. They function by targeting difficult stains and breaking

[68] For the list please see: http://ec.europa.eu/environment/chemicals/endocrine/strategy/being_en.htm.
[69] http://apps.echa.europa.eu/registered/data/dossiers/DISS-9ea3b5cc-80fb-15ea-e044-00144f67d031/AGGR-09e9b0f0-bf29-4975-8fbea3a2dd0ac2be_DISS-9ea3b5cc-80fb-15ea-e044-00144f67d031.html#L-137752f6-fbea-4638-b8d8-acce5e212979

them down into smaller parts which can be more easily removed. As catalysts they do not lose functionality after use, therefore they can replace large quantities of other chemicals which perform the same function.

The enzymes used in detergents include: proteases (used to break down protein stains), lipolases (used to break down fat stains) and amylases (used to break down starches and other carbohydrate based stains)[70]. Enzymes have been typically used as ingredients in industrial and institutional laundry detergents and dishwasher detergents for professional use.

In terms of environmental performance enzymes are relatively inert as they are biodegradable and are unlikely to be dangerous to the aquatic environment.[71] However, enzymes can cause a respiratory allergy response in some people. As such some enzymes were classified as sensitising substances with the risk phrase R42 'May cause sensitisation via inhalation', but they are not harmonized under a GHS classification. The risk of using microorganisms and/or enzymes is that they can be inhaled. This risk is decreased is the enzymes are used in a liquid or in another dust free form.

Within the current EU Ecolabel criteria for the product groups under revision, in all criteria there is a derogation for enzymes for the classification with H317 (May cause allergic skin reaction) and H334 (May cause allergy or asthma symptoms or breathing difficulties if inhaled). In general enzymes are exempt from requirements on sensitising substances, since there are few enzymes which are not classified as sensitising. In industrial and institutional laundry and dishwasher detergents there is additionally a requirement that: 'Enzymes must be in liquid form or dust-free granulate. Enzymes must be free from micro-organism remnants from manufacture'.

In Nordic Ecolabelling criteria for IIDD there is also a limitation on the allowed format products containing enzymes: enzymes are not permitted in products which are dosed by sprays, since this entails a greater risk of exposure and therefore respiratory problems than products in other forms. And in its criteria for IILD manufacturers are required to have in place appropriate health and safety measures to prevent employees working from exposure.

Of especial importance is the use of subtilisins (CAS 9014-01-1) that are proteolytic enzymes, mainly used in detergents and household cleaning products to remove proteinaceous deposits and stains[72]. Subtilisins are of bacterial origin, produced by a fermentation process and active from pH 6 to 11 (mainly pH 9-11). Subtilisins show good solubility but little stability in water. The total amount of subtilisin produced and used in EU in 2002 was about 1,000 tons of pure enzyme and mainly (>90% of the production) used in automatic dish wash detergents and in all types of powder and liquid household laundry detergents, and in laundry bleach additives. They are also used in industrial cleaning and laundering products. Its concentration in household detergent and cleaning products is very low and depends on the type of product (0.007-0.1 %)

Subtilisins are readily and ultimately biodegradable in the environment, being removed to a very high extent (> 99%) in sewage treatment plants. However, these enzymes are of concern from the environmental point of view as they are inactivated to a large extent under washing or cleaning conditions (an 80% reduction of protease activity in the washing process was conservatively assumed). Based on evidence that the inactivation of proteases is equivalent to the loss of their ecotoxic properties, the risk assessment has to take this fact into account.

The existing data (2010) on hazard phrases of subtilisin classified the substance as H400 aquatic acute by self-classification when it was registered under ECHA[73]. This classification follows a derogation, in 2011, from the criteria for H400 aquatic acute from the relevant criteria documents for Nordic and EU Ecolabelling. Regulation (EU) No 286/2011 added new classification criteria for long-term aquatic hazard based on chronic aquatic toxicity. On the basis of the new criteria, a

[70] What are enzymes and why do we use them in laundry detergents? Science in the box, P&G website 2012 http://www.scienceinthebox.com.de/en_UK/safety/whatareenzymes_en.html

[71] Collection of information on enzymes, European Commission, 2002. http://ec.europa.eu/environment/archives/dansub/pdfs/enzymerepcomplete.pdf

[72] SUBTILISIN – HERA Report available at: http://www.heraproject.com/files/22-F-07_PROTEASE_HERA_Final%20Edition%20(unsecured%20-%20PDFA-1b).pdf

[73] http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/cl-inventory/view-notification-details/22165/28812150

recent study conducted by the REACH SIEF for subtilisin indicated that subtilisin should be classified as Aquatic Chronic 2 (H411) even though it is readily biodegradable.

10.1.18 Nanosilver

The European Commission[74] defines nanomaterials as:

> a *natural, incidental or manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for 50 % or more of the particles in the number size distribution, one or more external dimensions is in the size range 1 nm-100 nm.*
>
> *In specific cases and where warranted by concerns for the environment, health, safety or competitiveness the number size distribution threshold of 50 % may be replaced by a threshold between 1 and 50 %.*

Along the consultation several stakeholders requested investigating the use of nanomaterials in detergent product groups. It is agreed at the EU Ecolabel scheme level that nanomaterials shall only be addressed on a specific substance basis.

In detergent products, according to information collected and received in the stakeholder's feedback, the following nanomaterials are used: silver, silicon dioxide, synthetic amorf silicon dioxide and titanium dioxide.

For instance, in the recent criteria for rinse-off cosmetics exclusion of nanosilver was introduced. Silver nanoparticles (AgNP) reveal high ecotoxicity even at very low effect concentrations. AgNP are classified as very toxic towards aquatic organisms (very low values of EC50, e.g. for algae of 4 µg/l and also for crustaceans – far below 1 mg/l have been reported). Another important aspect is that at low concentrations inhibition of nitrifying bacteria can occur and the function of wastewater treatment plants may be affected due to the presence of AgNP[75]. Therefore, in the discussion on the revised criteria for detergents and cleaning products the nano-silver is proposed to be excluded.

Further analysis on specific uses and related environmental impacts of single nanomaterials used in detergents and cleaning products is needed and, if relevant, information will be provided in later stage of the process.

10.1.19 Summary

Besides the already covered in one or few detergent and cleaning product groups substances and groups of substances (i.e. EDTA, APEO and ADP, DTPA, nitromusks and plycyclic musks, quaternary ammonium salts, reactive chlorine compounds, perborates, 5-bromo-5-nitro-1,3-dioxane, 2-bromo-2-nitropropane-1,3-diol, diazolinidylurea, sodium hydroxyl methyl glycinate and formaldehyde) additional ingredients, not yet covered by the scope of the restriction on specific ingoing substances and mixtures were described above. Stakeholders feedback is sought regarding the need of extending the scope by one of the above mentioned (or other relevant) substance from one or more of the product groups.

For the moment minor amendments are made to this criterion. It is presented for in the TBRs for specific product groups. Horizontally it is proposed to exclude:

- Hydroxyisohexyl 3-cyclohexene carboxaldehyde (HICC), Atranol and Chloroatranol; considered as unsafe to consumers (see section on fragrances)

Additional substances may be added in this criterion following the 1st physical consultation process and further development.

[74] Commission Recommendation of 18 October 2011 On the Definition of Nanomaterial (2011/696/EU), available online at: http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:275:0038:0040:EN:PDF.

[75] Mikkelsen et al.: Survey on basic knowledge about exposure and potential environmental and health risks for selected nanomaterials, Danish Environmental Protection Agency, 2011.

10.2 Hazardous substances and mixtures

This (and the following) sub-criterion are linked with the previously mentioned Article 6(6) and 6(7) of the EU Ecolabel Regulation (EC) No 66/2010. It text is agreed and aligned horizontally for all detergent and cleaning product groups.
In this revised criterion version, the verification and assessment was amended in order to indicate clearly which proof is required for substances and mixtures present in the product formulation to confirm the compliance with the requirements. This is in line with recently voted criteria for ROCs.
In this sense the *"assessment and verification"* of the section b asks for:

1) Compliance for any in-going substance or mixture present at concentration greater than 0.010% in the product, including preservatives, colouring agents and fragrances by declaring that the ingredients are not classified with one or more hazard statements listed in the below table. In-going substances, in accordance with the definition provided in Technical Annex, Section 4.2 Definitions, are biocides, fragrances, colouring agents and mixtures thereof regardless of concentration in the final formulation and substances and mixtures intentionally added, by products and impurities from raw materials, the concentration of which equals or exceeds 0.010% by weight of final formulation.
   The declaration should be supported by technical information related to the forms and physical states of the ingoing substances and/or mixtures as present in the detergent or cleaning product. This supporting information differs if the substances have been registered under Regulation (EC) No 1907/2006 and/or if they have a harmonised CLP classification.
2) In the case of mixtures: safety data sheets (SDSs) should be provided. If SDSs are not available then the calculation of the mixture classification shall be provided according to the rules under Regulation (EC) No 1272/2008 and the information relevant to the mixtures hazard classification according to Annex II to Regulation (EC) No 1907/2006
3) Finally, a declaration on the presence of ingoing substances that fulfil the derogation conditions shall be provided and supported by declarations from the producers of the raw materials. Concentrations of these ingoing substances in the final product should be included.

The wording of the main criteria body and the assessment and verification is proposed as follows:

Criterion X – "Hazardous substances and mixtures"

According to Article 6(6) of Regulation (EC) No 66/2010, the EU Ecolabel may not be awarded to any product that contains substances meeting criteria for classification with the hazard statements specified in Table xx in accordance with Regulation (EC) No 1272/2008 of the European Parliament and of the Council or Council Directive 67/548/E or substances referred to in Article 57 of Regulation (EC) No 1907/2006.. However, if information on substances cannot be obtained, the classification rules for mixtures apply.

Substances or mixtures which change their properties through processing and thus become no longer bioavailable, or undergo chemical modification in a way that removes the previously identified hazard are exempted from criterion x(b)

Table x – Hazard statements

GHS Hazard Statement
H300 Fatal if swallowed
H301 Toxic if swallowed
H304 May be fatal if swallowed and enters airways
H310 Fatal in contact with skin
H311 Toxic in contact with skin
H330 Fatal if inhaled
H331 Toxic if inhaled
H340 May cause genetic defects

H341 Suspected of causing genetic defects
H350 May cause cancer
H350i May cause cancer by inhalation
H351 Suspected of causing cancer
H360F May damage fertility
H360D May damage the unborn child
H360FD May damage fertility. May damage the unborn child
H360Fd May damage fertility. Suspected of damaging the unborn child
H360Df May damage the unborn child. Suspected of damaging fertility
H361f Suspected of damaging fertility
H361d Suspected of damaging the unborn child
H361fd Suspected of damaging fertility. Suspected of damaging the unborn child.
H362 May cause harm to breast fed children
H370 Causes damage to organs
H371 May cause damage to organs
H372 Causes damage to organs through prolonged or repeated exposure
H373 May cause damage to organs through prolonged or repeated exposure
H400 Very toxic to aquatic life
H410 Very toxic to aquatic life with long-lasting effects
H411 Toxic to aquatic life with long-lasting effects
H412 Harmful to aquatic life with long-lasting effects
H413 May cause long-lasting harmful effects to aquatic life
EUH059 Hazardous to the ozone layer
EUH029 Contact with water liberates toxic gas
EUH031 Contact with acids liberates toxic gas
EUH032 Contact with acids liberates very toxic gas
EUH070 Toxic by eye contact
Sensitising substances
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
H317: May cause allergic skin reaction

This criterion applies to all ingredients present in concentrations ≥ 0.010%, including preservatives, colouring agents and fragrances.

For EU Ecolabel xxx products, the substances in Table y are exempted from the obligation in Article 6(6) of Regulation (EC) No 66/2010 following application of Article 6(7) of the same Regulation.
Table y – Derogated substances - To be discussed in the 1st AHWG meeting

Assessment and verification: the applicant shall demonstrate compliance with criterion x (b) for any ingoing substance or mixture present at concentrations greater than 0.010% in the product.
A declaration of compliance shall be provided by the applicant supported, where appropriate, by the declarations from producer(s) of the raw materials that none of these ingoing substances and/or mixtures meet the criteria for classification with one or more of hazard statements listed in Table xx in the form(s) and physical state(s) they are present in the product.
The following technical information related to the form(s) and physical state(s) of the ingoing substances and/or mixtures as present in the product shall be provided to support the declaration of non-classification:
(i) For substances that have not been registered under Regulation (EC) No 1907/2006 and/or which do not yet have a harmonised CLP classification: Information meeting the requirements listed in Annex VII to that Regulation;
(ii) For substances that have been registered under Regulation (EC) No 1907/2006 and which do not meet the requirements for CLP classification: Information based on the REACH registration dossier confirming the non-classified status of the substance;
(iii) For substances that have a harmonised classification or are self-classified: safety data sheets where available. If these are not available or the substance is self-classified then information shall be provided relevant to the substances hazard classification according to Annex II to Regulation (EC) No 1907/2006;

(iv) In the case of mixtures: safety data sheets where available. If these are not available then calculation of the mixture classification shall be provided according to the rules under Regulation (EC) No 1272/2008 together with information relevant to the mixtures hazard classification according to Annex II to Regulation (EC) No 1907/2006.
For substances listed in Annexes IV and V to Regulation (EC) No 1907/2006, which are exempted from registration obligations under point (a) and (b) of Article 2(7) of that Regulation, a declaration to this effect by the applicant shall suffice to comply with criterion 3(b).
A declaration on the presence of ingoing substances that fulfil the derogation conditions shall be provided by the applicant, supported, where appropriate, by declarations from the producer(s) of the raw materials. Where required for the derogation, the applicant shall confirm the concentrations of these ingoing substances in the final product.

Derogations

Derogations can be granted in specific circumstances indicated in Article 6(7) of the Regulation. Information is collected to justify the need for keeping all the derogations, for the time being little feedback has been received. The information below reflects the feedback received so far from the stakeholders and information collected up to now.

10.2.1 Surfactants derogated for H400, H411 and H412

The derogation for surfactants classified with H411 (for HDD only) and H412 (for all detergents) was introduced in response to the classification of many surfactants following GHS revision implemented in the 2nd ATP to CLP (Regulation (EU) No 286/2011) which came into force on 1st December 2012. AISE reported in 2013 that this reclassification affected 31 out of 58 surfactants on the DID List 2007. As such the choice of surfactants for EU Ecolabel products would have been severely restricted, if the derogation was not implemented[76].
The classification as H400 indicates that the substances present "Aquatic Acute I" toxicity, which corresponds to, in broad terms, L(E)50 >= 1mg/l. Three anionic surfactants listed in the DID list would be classified, 13 non-ionic, 1 amphoteric, and 1 cationic, but we cannot forget that banned substances are also listed in the DID list.
The classification as H412 indicates that the substances present are toxic to aquatic life with long-lasting effects with category III. These kinds of surfactants classified with H412 are exempted from the requirement, provided that they are readily degradable and anaerobically degradable. At present the derogation for surfactants in all detergents and cleaning products are as follows (see Table 33):

Table 33 Derogation for surfactants classified as H400, H411 and H412

	Decision	Derogation	Classified
DD	2011/263/EU	Surfactants in total concentrations <25% in the final product	H400
LD	2011/264/EU	Surfactants in total concentrations <25% in the final product (*)	H412
HDD	2011/382/EU	Surfactants in total concentrations <25% in the final product (a)	H400
		Surfactants in total concentrations <25% in the final product (*)	H412
		Surfactants in total concentrations <2,5% in the final product (*)	H411
APC	2011/383/EU	Surfactants in total concentrations <25% in the final product (a)	H400
		Surfactants in total concentrations <25% in the final product (*)	H412
IILD	2012/720/EU	Surfactants in total concentrations <25% in the final product	H400
		Surfactants in total concentrations <25% in the final product	H412

[76] For further information on the surfactants classified with H400 and H412 see: http://www.cefic.org/Documents/Industry%20sectors/CESIO/CESIO-Environmental-classification-of-Surfactant-according-to-2nd-ATP.pdf

IIDD	2012/721/EU	Surfactants in total concentrations <25% in the final product	H400
		Surfactants in total concentrations <25% in the final product ([b])	H412

(*) This derogation is applicable provided that they are ready degradable and anaerobically degradable

([a]) the percentage must be divided by the M-factor[77] established in accordance with the Regulation (EC) No 1272/2008

([b]) this derogation is applicable provided that surfactants comply with criterion 3(b) and they are anaerobically degradable.

The current limits on the derogation for surfactants allow detergents to easily comply with this criterion. Table 34 shows the ranges of percentages of surfactants included in different products.

[77] Regulation (EC) 1272/2008: "'M-factor' means a multiplying factor. It is applied to the concentration of a substance classified as hazardous to the aquatic environment acute category 1 or chronic category 1, and is used to derive by the summation method the classification of a mixture in which the substance is present."

M-factors are either given in Part 3 of Annex VI of that regulation (very few of them are actually listed) or they can be calculated based on L(E)C50 or NOEC77 :

L(E)C50	M-factor	NOEC	M-factor – NRD (RD)77
0.1< L(E)C50<=1	1	0.01<NOEC<=0.1	1 (-)
0.01< L(E)C50<=0.1	10	0.001<NOEC<=0.01	10 (1)
0.001< L(E)C50<=0.01	100	0.0001<NOEC<=0.001	100 (10)
	(and so forth)		

It should be noted that as of the current DID list, not a single anionic surfactant or non-ionic surfactant falls below the 0.1 threshold, meaning that their M-factors are all 1 and have no incidence of how their presence percentage is calculated. Only one cationic surfactant (Alkyl trimethyl ammonium salts) would receive an M-factor of 10 given that its L(E)50 is of 0.1.

When NOEC is considered, one anionic and one non-ionic surfactant would receive an M-factor of 10, besides the one also pointed out by L(E)50.

Table 34 Surfactants content (round %) in the product groups[78]

Product type	Surfactants	
	Min	Max
Domestic automatic dishwasher detergent	1	5
Heavy duty laundry detergent	10	25
Conventional laundry detergent	10	15
Compact laundry detergent	10	25
Heavy duty laundry tablets zeolite based	13	18
Heavy duty laundry tablets phosphate based	15	18
Heavy duty unstructured liquid laundry detergent	22	48
Heavy duty structured liquid laundry detergent	16	35
Delicate textiles laundry detergent	7	30
Woolen laundry detergent	12	40
Curtains laundry detergent	12	28
APC	17	
APC 2	14	
APC 2	24	
Kitchen cleaner spray	<5[79]	
Window cleaner	15[80]	
Scouring cleaner 1	3.5	
Scouring cleaner 2	4	
Scouring cleaner 3	3	
Hand dishwashing detergent	9	16
Concentrated hand dishwashing detergent	20	39

Red figures are those above the current threshold of the surfactants derogation

As seen, most of the detergents, even if we consider the higher surfactant content will comply with this criterion without making any effort. Information is hard to come by for industrial and institutional products but they should technically be more concentrated than consumer products and therefore they could possibly have more surfactants in them.

Other findings from this research show that given the 25% threshold and the fact that M-factors are not applicable, all surfactants in liquid detergents will get the derogation, unless they are found in APC and/or HDD and have an extremely low $L(E)_{C50}$.

The only issue that might be raised is the fact that we are seeing a trend towards more compact formulations and therefore the percentage of surfactants is increasing. But that does not mean that all the surfactants included in the formulation should fall under the classified with H400 and consequently that all surfactants should be allowed. As an example, Ecover standards are labelling and making distinctions for those detergents without any H400 surfactants as reported in the Preliminary report. This indicates that formulations of detergents without H400 classified surfactants are possible.

Professional laundry machines apply much higher mechanical action than domestic machines allowing reducing water, energy and detergent consumption by 75%. With the weaker non classified defoaming type of non-ionic surfactant, more surfactants would need to be added into the product. In professional detergents combinations of different types of surfactants are often needed in order to cover different types of soiling and also different washing temperatures to which the detergents are applied. This makes is difficult to find alternatives to the effective surfactants classified H400.

Table 35 provides a comparison of the wording included in other national Ecolabels and environmental schemes

[78] Ullmman;s encyclopedia
[79] ISO LCA Kitchen cleaners (also has for regular kitchen cleaner but inconclusive of actual concentration of surfactants.
[80] http://www.google.com/patents/US5362422

Table 35 Comparison of the restriction on surfactants classified with H400, H411 or H4412

	Criteria	
Nordic Swan	DD	All surfactants must be **readily degradable (aerobically**). All surfactants classified as environmentally hazardous* must also be **anaerobically degradable**. *Classified as environmentally hazardous with H410, H411, H412, H413.
	IIDD	All surfactants (irrespective of function) must display **ready biodegradability under aerobic** conditions in accordance with OECD Guidelines for the Testing of Chemicals, test no. 301 A F, or other equivalent scientifically proven test method. This is also a legal requirement for this category of products. **All surfactants must display biodegradability under anaerobic conditions according to ISO 11734,** ECETOC no. 28 or equivalent test method. Documentation shall primarily refer to the DID list of 2007 or later. For surfactants not covered by the DID list, other documentation such as test reports and literature references may be submitted.
	LD	Surfactants classified with **H412 are exempted from the requirement, provided that they are readily degradable* and anaerobically degradable**.** **In accordance to the DID-list or test method No. 301 A-F or No. 310 in OECD guidelines for testing of chemicals or other equivalent test methods.* *** In accordance to the DID-list or ISO 11734, ECETOC No. 28 (June 1988) or other equivalent test methods, where a minimum of 60% degradability under anaerobic conditions is achieved.*
	IILD	All surfactants must be **readily degraded aerobically** in accordance with Test Method No. 301 A-F in the OECD Guidelines for Testing of Chemicals or other equivalent test methods. **All surfactants must be anaerobically degradable**, **which means at least 60% degradability under anaerobic conditions**, in accordance with ISO 11734, ECETOC no. 28 or equivalent test methods. Documentation must primarily refer to the DID List dated 2014 or later. For surfactants that are not covered by the list, other documentation, such as test reports or literature references, may be used
	HDD	Substances that are classified as environmentally hazardous are only permitted in limited quantities in the product, **Surfactants classified with H411 or H412 are exempted from the requirement, provided that they are readily degradable* and anaerobically degradable**.**
	APC	The use of substances classified with any of the hazard statements H410, H411 or H412 is limited. **Surfactants classified with H412 are exempted from the requirement, provided that they are readily biodegradable* and anaerobically degradable**.**
Env good choice NZ	Substances that are classified under Hazardous Substances and New Organisms (HSNO) Act as 9.1A ("Substances that are very ecotoxic in the aquatic environment") must be readily biodegradable and not potentially bioaccumulative. **Therefore H400 surfactants are technically allowed if they meet the other criteria**.	
Ecologo	Only mention of ecotoxicity is: "The laundry detergent or fabric softener shall demonstrate No Observable Effects at the expected release concentration using a battery of toxicity tests using three different species of divergent taxonomic and ecological ranks." (so far have not checked for the other products but the requirements should be about the same).	
Green Seal	only specifies that the "product as used" (e.g. diluted to the correct level it should be diluted) shall not be toxic to aquatic life and that means that the lowest available and representative LC50 for any of the three species should be greater or equal to 100 (for LD, APC, HDD).	
Good Env Choice AU	H400 substances banned if >1% but H400 surfactants <25% are allowed if they are not excluded by any other classification.	
AISE charter	There is nothing in the criteria specifically about excluded substances but they might be limited through the ESC tool, which does have some limitations on ecotoxicity	

ACI Charter	The products should be safe for humans and the environment but no specific information is given on any possible excluded substances. The ACI has a list of ingredients that can be found in detergents but does not give any information on whether those are good or bad for the environment.

Summarizing the data presented in this section, stricter limits to reduce the use of surfactants classified with H400, H410, H411 and H412 hazard phrases are seen to be advisable, at least in those products for private use.
Regarding the thresholds and the opposite trends in the market (on one hand detergents are becoming more concentrated and on the other hand, H400 free surfactant detergents are being promoted and sought by the consumers), it is difficult to come up with a relevant threshold for each of the product groups under revision.
Information provided by other national schemes shows that a feasible way of limiting the environmental hazard of surfactants in the ecosystem but still allowing the use of surfactants that can fall under H-phrase classification is to require being degradable aerobically and anaerobically. In this way, the exposure to those substances is restricted.
The proposed wording for this issue to be further discussed during the 1st AHWG meeting:

Criterion X – "surfactants"
All the surfactants must be readily degradable. Surfactants classified with H410, H411 and H412 are derogated from the criterion on Excluded and limited substances and mixtures, section b, provided that they are both readily and anaerobically degradable. Degradability shall be demonstrated by reference to the most updated DID list. If DID list lacks the relevant data for surfactants, data may be taken from the safety data sheet on condition that the data is reliable and calculations must be made in accordance with section B of the DID list. It is also permitted to refer to analogous observations, as long as they are carried out by a competent third party, and refer to relevant data from literature that has been subjected to scientific scrutiny. **Assessment and verification** The applicant shall provide a declaration of surfactants that are exempted from the requirement including the quantity, classification and content in percentage by weight of those substances classified as H410, H411 and/or H412 and degradability.

10.2.2 Biocides used for preservation purposes

The use of biocides is restricted in the current EU Ecolabel detergents as given below:

Table 36 Comparison of the derogations included in the current criteria sets

	Decision	Derogation	Classified
DD **LD**	2011/263/EU 2011/264/EU	Biocides used for preservation purposes (*)	H410 H411 H412
IIDD **IILD**	2012/721/EU 2012/720/EU	Biocides for preservation purpose *(only for liquids with pH between 2 and 12 and maximum 0.10% w/w of active material)*	H331 H334 H317 H400
APC	2011/383/EU	The product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This does not refer to surfactants, which may also have biocidal properties	H410 H411
HDD	2011/382/EU		

		Biocides, either as part of the formulation or as part of any mixture included in the formulation, that are used to preserve the product and that are classified H410 or H411 in accordance with Directive 67/548/EEC, Directive 1999/45/EC of the European Parliament and of the Council or Regulation (EC) No 1272/2008, are permitted but only if their bioaccumulation potentials are characterised by log Pow (log octanol/water partition coefficient) < 3,0 or an experimentally determined bioconcentration factor (BCF) ≤ 100.	

(*) This derogation is applicable provided that biocides' bioaccumulation potentials are characterised by log Pow (log octanol/water partition coefficient)<3.0 or an experimentally determined bioconcentration factor (BCF) ≤ 100.

10.2.3 Fragrances

The use of perfumes is linked to the consumer perception and preference of certain cleaning products. Fragrances are widely use as ingredients which give the detergents a pleasant smell and /or to mask possible unpleasant smell.

Fragrances may be a cause of allergy and according to Videncenter for allergie, 2010[81] around 4% of the adult population is suffering from fragrance allergy. Most of the fragrances are furthermore classified as hazardous for the aquatic environment. Due to this classification and the CDV criterion, most of the fragrances use is limited in EU Ecolabel products.

For that reasons the current derogation stands for fragrances classified with H412 for consumer products, namely consumer laundry detergents, consumer detergents for dishwashers, all-purpose cleaners and sanitary cleaners and hand dishwashing detergents.

Table 37 Current derogation for fragrances classified with H412

Product group	Decision	Derogation	Classified as
Detergent for Dishwashers	2011/263/EU	Fragrances	H412
Laundry Detergents	2011/264/EU		
Hand dishwashing detergents	2011/382/EU		
All-purpose cleaners and sanitary cleaners	2011/383/EU		

Due to the presence in the market of fragrances-free products for private use and the classification of these substances with H-phrases it is required to the industry to provide data regarding the need of keeping this derogation in the revision of the EU Ecolabel criteria.

10.2.4 Enzymes

The use of enzymes and specifically subtilisins as reported is common in detergents and household cleaning products. These proteases are used in low concentrations in cleaning products (0,007% to 0,1% wt) and in terms of environmental performance, they are readily and ultimately biodegradable and as a consequence are removed to a very high extent from sewage treatment plants.

The current derogation stands for enzymes that are classified with the H-phrases shown in Table 38. Stakeholder requested that derogation should be added for enzymes classified with H400 due to the classification of several proteases (there is already a derogation granted for IIDD and IILD). However at this stage it has not been possible to gather enough evidence to support derogation

[81] Maria Vølund Heisterberg, PhD Thesis: Fragrance allergy Diagnosis, causes and quality of life University of Copenhagen Gentofte Hospital Denmark 2013

and therefore this point will bring for discussion during the 1st AHWG meeting. Industry members are encouraged to fill up the template enclosed at the end of this technical annexe, if derogation is considered necessary.

Table 38 Current derogation for enzymes

Product group	Decision	Derogation	Classified
Detergent for Dishwashers	2011/263/EU	Enzymes (***)	H334
Laundry Detergents	2011/264/EU		
Hand dishwashing detergents	2011/382/EU		H317
All-purpose cleaners and sanitary cleaners	2011/383/EU		
Industrial and institutional dishwasher detergents Industrial and institutional laundry detergents	2012/720/EU 2012/721/EU	Enzymes (***)	H334
			H317
			H400

(***) including stabilisers and other auxiliary substances in the preparations

10.2.5 Bleach catalysts

Laundry detergents widely contain bleaches for stain removal for private and professional use. These detergents contain quite large amounts of bleaching chemicals and it is expected that these levels could be reduced considerably leading to an improved environmental profile by adding low concentrations of bleach catalysts. The main purpose of the bleach catalysts is, therefore, boosting the stain removal and getting good washing performance at lower temperature. Further, catalyst that may activate bleaches to lower the washing temperatures, can lead to major energy saving.
Traditionally, the bleach catalysts are many transition metal complexes such as nickel, chromium or cobalt salts or their compounds being considered toxic. Other substances such as catalysts based on e.g. manganium are right now under development[82] and they are also intended to be applied for dishwasher detergents.
The current derogation stands for bleach catalysts used in consumer and industrial and institutional laundry detergents, although the derogation refers to different H-phrases depending on the product. At this stage, it has not been possible to gather enough evidence to support derogation as alternative catalysts with better environmental performance seems to be turning up into the market.

Therefore, this point will be brought for discussion during the 1st AHWG meeting to assess if the derogation should or should not be kept. Industry members are encouraged to fill up the template enclosed at the end of this technical annexe, if they consider so. Additionally, this derogation can be extended to other detergent (which require bleaching agents) products providing enough evidence is submitted.

Table 39 Current derogation for bleach catalysts

Product group	Decision	Derogation	Classified
Laundry Detergents	2011/264/EU	Bleach catalysts (*)	H334
			H317
Industrial and institutional laundry detergents	2012/721/EU	Bleach catalysts (*)	H400

(*) including stabilisers and other auxiliary substances in the preparations

[82] http://www.teknoscienze.com/Articles/HPC-Today-Low-temperature-bleach-catalysts-for-improved-tea-stain-removal.aspx

10.2.6 NTA as an impurity in MGDA and GLDA

MGDA is a complexing agent patented by BASF that is mainly used in laundry and dishwasher detergents (for private and professional used) as well as in all-purpose cleaners. MGDA is readily biodegradable that has high performance being more cost-effective than other weaker complexing agents such as citrates or succinates. This complexing agent is used as replacement of other restricted complexing agents such as phosphates, phosphonates, zeolites and silicates, etc

GLDA (Glutamic acid, N,N-bis(carboxymethyl)-tetrasodium salt) is another complexing agent that is largely used in dishwasher detergents. Their function is comparable to that of MGDA but it is mainly biobased[83].

Both components were assessed by BASF from the environmental point of view along with STPP[84]. The results show that STPP tabs have highest impact in the categories emissions and resource consumption, they have the lowest impact in land use and risk potential. GLDA tabs have the highest impact in energy consumption, land use and risk potential and MGDA tabs have the lowest impact in the categories emissions, resource consumption and in human and eco-toxicology. This study shows that MGDA and GLDA are interesting alternatives to STPP from the environmental point of view.

However, both complexing agents have as impurity Nitrolo Triacetic Acid (NTA). NTA is also a complexing agent but it is now officially classified as carcinogenic and is thus excluded through criterion excluding CMR substances.

The current derogation stands for NTA as impurity of MGDA and GLDA is granted for the entire detergent product group. At this stage, not enough information has been gathered to assess if this derogation is needed in the future or if MGDA and GLDA can be produced with higher purity preventing the presence of NTA. Therefore, this point will be brought for discussion during the 1st AHWG meeting to assess if the derogation should or should not be kept. Industry members are encouraged to fill up the template enclosed at the end of this technical annexe, if they consider so.

Table 40 Current derogation for NTA as impurity in MGDA and GLDA

Product group	Decision	Derogation	Classified as
Detergents for dishwashers	2011/263/EU	NTA as an impurity in MGDA and GLDA (*)	H351
Laundry detergents	2011/264/EU		
Hand dishwashing detergents	2011/382/EU		
All-purpose cleaners and sanitary cleaners	2011/383/EU		
Industrial and institutional dishwasher detergents	2012/720/EU		
Industrial and institutional laundry detergents	2012/721/EU		

(*) In concentrations lower than 1.0 % in the raw material as long as the total concentration in the final product is lower than 0.10 %.

[83] http://cdn.intechopen.com/pdfs-wm/20357.pdf

[84] https://www.basf.com/documents/corp/en/sustainability/management-and-instruments/quantifying-sustainability/eco-efficiency-analysis/examples/automatic-dishwashing-tabs/BASF_Label_Household_Tabs.pdf

10.2.7 Optical brighteners (only for heavy duty laundry detergent)

Optical brighteners also known as fabric whitening agent or Fluorescent Whitening Agents (FWA) are fluorescent dyes that glow blue-white when exposed to ultraviolet light. The blue-white colour makes yellowed fabrics appear white.

Optical brighteners may be potentially toxic to humans and to the aquatic life. Optical brighteners are not readily biodegradable and may bioaccumulate, so they pose a potential hazard to aquatic life. Additionally, optical brighteners undergo photo degradation and numerous metabolites may be produced that are not yet identified.
Nowadays, there are alternative products on the market. There are optical brightener-free products or products that should be used with other agents such as the so-called non-chlorine oxygen based bleaches that prevent the use of optical brighteners getting a good washing performance.
At this point, the current derogation and the need for keeping this derogation in the revised EU Ecolabel criteria set will be brought on the table during the discussions held at the 1st AHWG meeting. Table 41 presents the current derogation included in the EU Ecolabel criteria set for laundry detergents.

Table 41 Current derogation for optical brighteners

Product group	Decision	Derogation	Classified
Laundry detergents	2011/264/EU	Optical brighteners (only for heavy duty laundry detergent)	H413

10.3 Ingoing substances listed in accordance with Article 59(1) of Regulation (EC) No 1907/2006

Criterion X – " Ingoing substances listed in accordance with Article 59(1) of Regulation (EC) No 1907/2006"
No derogation from the exclusion in Article 6(6) of Regulation (EC) No 66/2010 shall be given concerning ingoing substances identified as substances of very high concern and included in the list provided for in Article 59(1) of Regulation (EC) No 1907/2006[85], present in the product in concentrations higher than 0.010 % (weight by weight). ***Assessment and verification:*** *reference to the list of substances identified as substances of very high concern shall be made on the date of application. The applicant shall provide the full formulation of the product to the competent body. The applicant shall also provide a declaration of compliance with criterion 3(c), 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.*

No content-wise change is proposed. Harmonisation of wording.

[85] http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp

10.4 Fragrances

There are more than 5000 different fragrance substances, which are used frequently as mixtures in various consumer products; mainly in cosmetics but also in household products, textiles, shoes and even toys. Approximately 20% of fragrances is used in household products [86], being detergents good representatives of this type of products.

Fragrances are used to neutralise the inherent odour of detergent chemicals and give laundry, dishes and other items being cleaned a pleasant smell. These do not enhance the cleaning properties of such products. Instead, fragrances can have negative environmental and health effects. They are very often classified as toxic to aquatic environment. Some fragrances are sensitizers and known triggers of allergic reactions such as asthma and contact dermatitis. [87] In addition to the skin exposure, fragrances are volatile and therefore a perfume exposes also the eyes and naso-respiratory tract.

Prevention of contact sensitisation to fragrances is an important objective and thus is proposed to address this issue under the EU Ecolabel criteria by reducing the amount of allergens in products and consequently preventing the exposure to known contact allergens.

However, it should also be added that along with efficacy of the product, fragrances have become a very important factor for consumers. For instance, research by Datamonitor on " Consumer and Innovation Trends in Laundry Care" found that 51% of consumers worldwide state that the fragrance of a laundry care product has high or very high influence over their product choice, while only 42% state that product efficacy has an equal influence[88].

Restrictions on fragrances are addressed in a number of ecolabels. A summary of the respective requirements is given in Table 42.

Table 42 Summary of the restrictions on fragrances in the revised Ecolabel schemes

Detergent	Label	Restriction
Consumer automatic dishwasher detergents	Nordic labelling	If used, must be done in accordance with IFRA guidelines. The following substances must not be included in the product at levels >100 ppm per substance: • 26 fragrance substances encompassed by the declaration requirement in the Detergents Regulation and its subsequent amendments • Fragrances classified as H317 (R43) or H334 (R42) • *Cananga odorata* and Ylang-ylang oil • *Eugenia caryophyllus* leaf/flower oil • *Jasminum grandiflorum / officinale* • *Myroxylon pereirae* • *Santalum album* • Turpentine oil • Verbene absolute.
	Env. Choice NZ	Fragrances must be produced and used in accordance with the code of practice compiled by IFRA
	EU Ecolabel	Any ingredients added to the product as a fragrance shall be manufactured and handled following the code of practice of the International Fragrance Association (IFRA)

[86] SCCS (2012), *Opinion on Fragrance allergens in cosmetic products.* Available at: http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_102.pdf [Accessed October 2014]

[87] Final report of the project supported by the 5th Framework Programme of the European Commission, under the Quality of Life and Management of Living Resources thematic programme, key action Environment and Health: (contract QLK4-CT-1999-01558) "Fragrance chemical allergy: a major environmental and consumer health problem in Europe", March 2003, available on line at: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_fragrance-allergy_en.pdf

[88] Datamonitor (2012) *Consumer and Innovation Trends in Laundry Care. Available at:* http://www.datamonitor.com/store/Product/consumer_and_innovation_trends_in_laundry_care?productid=CM00198-019

Detergent	Label	Restriction
	Good Env. Choice CR	Are not permitted.
	Singapore Green Labelling	All fragrances synthesised and included in the final product must comply with the IFRA code of practice
Industrial and institutional automatic dishwasher detergents	Nordic labelling	No requirements
	Env. Choice NZ	
	EU Ecolabel	
Consumer laundry detergents	Nordic labelling	Fragrances encompassed by the declaration requirement in the Detergents Regulation 648/2004/EEC and its subsequent amendments must not be present in quantities >100 ppm (0.010 %) per substance. Fragrance substances classified with H317 and/or H334 can be included, the amounts have to be <0.010 % (100 ppm). Any ingredients added to the product as a fragrance shall have been manufactured and/or handled following the IFRA code of practice.
	Env. Choice NZ	Fragrances must be produced and used in accordance with the code of practice compiled by IFRA.
	EU Ecolabel	Any ingredients added to the product as a fragrance shall be manufactured and handled following the code of practice of the International Fragrance Association (IFRA).
	Good Env. Choice CR	No more than 0.50 % by weight fragrance content is permitted in the product. This limit also applies to concentrated products that are diluted before use. Fragrances must be used in accordance with the recommendations drawn up by IFRA. Nitromusk compounds and polycyclic musk compounds are not permitted in fragrances.
	Singapore Green Labelling	All fragrances synthesised and included in the final product must comply with IFRA's code of practice
Industrial and institutional laundry detergents	Nordic labelling	--
	Env. Choice NZ	Fragrances must be produced and used in accordance with the code of practice compiled by IFRA
	EU Ecolabel	Any ingredients added to the product as a fragrance shall be manufactured and handled following the code of practice of the IFRA
All-purpose cleaners consumer use	Nordic labelling	If fragrance is used this must be done in accordance with the International Fragrance Association (IFRA) guidelines. The following substances must not be included in the product at levels >100 ppm (0.010%) per substance: • 26 fragrance substances encompassed by the declaration requirement in the Detergents Regulation 648/2004/EEC and its subsequent amendments • Fragrances classified as H317 or H334 Fragrances must no longer be included in professional spray products or their refills.
	Env. Choice NZ	Fragrances must be produced and used in accordance with the code of practice compiled by IFRA. Fragrance containing nitro-musk or polycyclic musk compounds must not be used.

Detergent	Label	Restriction
		Fragrance ingredients added for functions other than smell must also comply with all other requirements in this specification.
	EU Ecolabel	The product shall not contain perfumes containing nitro-musks or polycyclic musks. Any substance added to the product as a fragrance must have been manufactured and/or handled in accordance with the code of practice of the International Fragrance Association. Fragrance substances subject to the declaration requirement provided for in Regulation (EC) No 648/2004 (Annex VII) shall not be present in quantities ≥ 0.010 % per substance.
	Good Env Choice AU	Fragrance must be used in accordance with the 'Code of Practice' compiled by the International Fragrance Associations (IFRA)
	Good Env. Choice CR	No more than 0.5 % by weight fragrance content is permitted in the product. This limit also applies to concentrated products that are diluted before use.
	Green Seal	Manufacturers shall disclose the use of any added fragrances on their safety data sheets (SDSs) and product labels. Any ingredient added to a product as a fragrance must follow IFRA's Code of Practice.
Industrial and institutional all-purpose cleaners	EU Ecolabel	The product shall not contain perfumes containing nitro-musks or polycyclic musks. Any substance added to the product as a fragrance must have been manufactured and/or handled in accordance with the code of practice of the International Fragrance Association. Fragrance substances subject to the declaration requirement provided for in Regulation (EC) No 648/2004 (Annex VII) shall not be present in quantities ≥ 0.010 % per substance.
	Env. Choice NZ	Fragrances must be produced and used in accordance with the code of practice compiled by IFRA. Fragrance containing nitromusk or polycyclic musk compounds must not be used. Fragrance ingredients added for functions other than smell must also comply with all other requirements in this specification.
	Green Seal	Fragrances added to the product must follow the code of practice of the IFRA. All fragrance components must be disclosed to the certifying body.
Hand dishwasher detergents consumer use	EU Ecolabel	Any substances added to the product as a fragrance must have been manufactured and/or handled in accordance with the code of practice of the International Fragrance Association.
	Nordic labelling	If fragrance is used this must be done in accordance with IFRA guidelines. The following substances must not be included in the product at levels >100 ppm (0.010 %) per substance: • 26 fragrance substances encompassed by the declaration requirement in the Detergents Regulation 648/2004/EEC and its subsequent amendments • Fragrances classified as H317 (R43) or H334 (R42)
	Env. Choice NZ	Fragrances must be produced and used in accordance with the code of practice compiled by IFRA.
	Good Env. Choice CR	No more than 0.5 % by weight fragrance content is permitted in the product. This limit also applies to concentrated products that are diluted before use

IFRA code of practice

It can be seen that the majority of ecolabel, including the EU Ecolabel, require that fragrances used in labelled products shall be manufactured and handled in accordance with the code of practice of the International Fragrance Association (IFRA). The organisation fosters globally accepted and

recognized risk management system for the safe use of fragrance ingredients that is part of the IFRA Code of Practice, available at: http://www.ifraorg.org.
This is the self-regulating system of the industry, based on risk assessments carried out by an independent Expert Panel. The IFRA Code of Practice is a comprehensive document that provides products that are safe for use by the consumer and to the environment. The Code of Practice applies to the manufacture and handling of all fragrance materials, for all types of applications and contains the full set of IFRA Standards. Abiding by the IFRA Code of Practice is a prerequisite for all fragrance supplier companies that are members of IFRA (either directly or through national associations).
Amendments to the Code, if required, are issued annually, based on new scientific developments. These contain either new usage restrictions or revisions of existing usage restrictions. The IFRA Code of Practice is used worldwide including governmental regulatory bodies associations, companies and many other stakeholders.
This requirement shall be kept also in the revised criteria proposed for all product detergents groups where fragrances are used.

Exclusions of specific ingredients

Some schemes do not allow use of fragrances for certain product groups. But mainly restrictions on specific ingredients are imposed. Among these the most common are the following restrictions:

- 26 fragrance substances encompassed by the declaration requirement in the Detergents Regulation 648/2004/EEC and its subsequent amendments shall not be used at concentration greater than 100 ppm (0.010 %) per substance,
- Fragrances classified as H317 (R43) 'may cause allergic skin reaction' or H334 (R42) 'may cause allergy or asthma symptoms or breathing difficulties if inhaled' shall not be used,
- Fragrance containing nitromusk or polycyclic musk compounds shall not be used.

Detergents Regulation (EC) No 648/2004 requires that if the allergenic fragrances, listed in Table 43, are added at concentrations exceeding 0,01 % by weight of the final detergent product, then they shall be listed by name on the product packaging. This restriction refers to the ingredients listed in Annex III, Part 1 of Directive 76/768/EEC, as a result of its amendment by Directive 2003/15/EC to include the allergenic perfume ingredients from the list first established by the Scientific Committee on Cosmetics and Non Food Products (SCCNFP) in its opinion SCCNFP/0017/98. Since July 2013 the new EU Regulation 1223/2009 (Cosmetics Regulation) [89] is in force. At present the fragrances which needs to be listed are contained in the Annex III of this Regulation.

Table 43 Fragrances which require labelling in detergent and cosmetic products

Common name	CAS number
Amyl cinnamal	(CAS No 122-40-7)
Benzyl alcohol	(CAS No 100-51-6)
Cinnamyl alcohol	(CAS No 104-54-1)
Citral	(CAS No 5392-40-5)
Eugenol	(CAS No 97-53-0)
Hydroxy-citronellal	(CAS No 107-75-5)
Isoeugenol	(CAS No 97-54-1)
Amylcin-namyl alcohol	(CAS No 101-85-9)
Benzyl salicylate	(CAS No 118-58-1)
Cinnamal	(CAS No 104-55-2)
Coumarin	(CAS No 91-64-5)
Geraniol	(CAS No 106-24-1)

[89] Regulation (EC) No 1223/2009 of the European Parliament and of the Council of 30 November 2009 on cosmetic products

Common name	CAS number
Hydroxy-methylpentylcyclohexenecarboxaldehyd	(CAS No 31906-04-4)
Anisyl alcohol	(CAS No 105-13-5)
Benzyl cinnamate	(CAS No 103-41-3)
Farnesol	(CAS No 4602-84-0)
2-(4-tert-Butylbenzyl) propionald-hyd	(CAS No 80-54-6)
Linalool	(CAS No 78-70-6)
Benzyl benzoate	(CAS No 120-51-4)
Citronellol	(CAS No 106-22-9)
Hexyl cinnam-aldehyd	(CAS No 101-86-0)
d-Limonene	(CAS No 5989-27-5)
Methyl heptin carbonate	(CAS No 111-12-6)
3-Methyl-4-(2,6,6-tri-methyl-2-cyclohexen-1-yl)-3-buten-2-one	(CAS No 127-51-5)
Oak moss and treemoss extract	(CAS No 90028-68-55)
Treemoss extract	(CAS No 90028-67-4)

Source: listed at http://ec.europa.eu/enterprise/sectors/chemicals/documents/specific-chemicals/detergents/

Additionally, for instance in Nordic Ecolabelling for automatic dishwasher detergents several additional fragrances are excluded, including:

- Cananga odorata and Ylang-ylang oil
- Eugenia caryophyllus leaf/flower oil
- Jasminum grandiflorum / officinale
- Myroxylon pereirae
- Santalum album
- Turpentine oil
- Verbene absolute.

In the recent revision of the criteria for rinse-off cosmetics a similar approach was considered. It was initially proposed to exclude use of established fragrance contact allergens of special concern as identified in the Scientific Committee on Consumer Safety (SCCS) Opinion on Fragrance allergens in cosmetic products[90] (see Table 44).

Table 44 Established fragrance contact allergens of special concern

Common name
Cinnamal
Cinnamyl Alcohol*
Citral
Coumarin
Eugenol*
Farnesol*
Geraniol*
Hydroxycitronellal
Hydroxyisohexyl 3-cyclohexene carboxaldehyde (HICC)
Isoeugenol*
Limonene (oxidised)
Linalool* (oxidised)
Chloroantranol – main allergenic constituents of Everna prunasteri (oak moss)
Atranol – main allergenic constituents of Everna prunasteri (oak moss) and Everna furfuracea
Canonanga odorata and Ylang-ylang oil
Eugenia caryphyllus leaf/flower oil

[90] SCCS (2012), Opinion on Fragrance allergens in cosmetic products. Available at: http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_102.pdf [Accessed October 2014]

Jasminum Grandyflorum/officinale
Myroxylon pereirae (Balsam of Peru)
Santalum album (Sandelholz)
Turpentine (oil)

*including their respective esters

At the same period DG SANCO began works and later on a public consultation on potential revision of the ANNEX III of the Cosmetics Regulation and potential inclusion of additional sensitizing fragrances or complete ban of few chosen ones. The results of this process should be known in the near future.

10.4.1 Proposed common template

Bearing in mind that a complete horizontal exclusion of fragrances in detergent product groups does not seem feasible given the importance these have to consumers, and at the same time taking seriously the concerns regarding their sensitizing properties it is considered appropriate to keep the limit the amounts of sensitising substances used in EU Ecolabel products to reduce the risk of allergies. Extending the current restriction to fragrances which are recognised as allergens of special concern in SCCS opinion mentioned previously is proposed for discussion. For the moment, addition of three substances is proposed (as done also in ROC criteria) due to their especially high sensitizing potential. Hydroxyisohexyl 3-cyclohexene carboxaldehyde (HICC), Atranol and Chloroatranol shall not be used in detergent products.
Exclusion of the fragrances from IIDD products is proposed to be kept.

Criterion X – "Fragrances "
In sub-criterion **(a) Specified excluded ingoing substances and mixtures** - hydroxyisohexyl 3-cyclohexene carboxaldehyde (HICC), Atranol and Chloroatranol shall be added to the list, i.e.: The following ingredients must not be included in the product, neither as part of the formulation nor as part of any preparation included in the formulation: - hydroxyisohexyl 3-cyclohexene carboxaldehyde (HICC), Atranol and Chloroatranol. - Fragrance substances subject to the declaration requirement provided for in Regulation (EC) No 648/2004 of the European Parliament and of the Council on detergents (Annex VII) and which are not already excluded by criterion 2b and (other) fragrance substances classified H317/R43 (May cause allergic skin reaction) and/or H334/R42 (May cause allergy or asthma symptoms or breathing difficulties if inhaled) shall not be present in quantities ≥ 0.010 % (≥ 100 ppm) per substance. In sub-criterion **(b) Hazardous substances and mixtures** Restriction on substances and mixtures classified with (H317) and (H334) should be included. In sub-criterion **Fragrances**: (i) Any ingoing substance or mixture added to the product as a fragrance shall be manufactured and handled following the code of practice of the International Fragrance Association (IFRA). The code can be found on the IFRA website: http://www.ifraorg.org. The recommendations of the IFRA Standards concerning prohibition, restricted use and specified purity criteria for materials shall be followed by the manufacturer.

10.5 Biocides/Preservatives

According to the Biocide Product Regulation (BPR 528/2012/EC) **biocide** means any substance or mixture with one or more active ingredients that are intended to destroy, deter, render harmless, prevent the action of, or otherwise exert an effect on any harmful organism by any means other than mere physical or mechanical action. A treated article that has a primary biocidal function shall be considered a biocidal product (see BPR 528/2012/EC, Art. 3 (1)(a)).

Although biocidal products are not commonly used in household products, the active ingredients of the biocidal products in categories 1-9 of the Regulation are widely used in household products and other consumer products. Regular use of household products such as laundry detergents, cleaning products, pet disinfectants and general disinfectants are the major sources of exposure to biocides in home settings. Biocides present in these products may be from different chemical groups, but their mechanism of action may be similar.
Biocides are used in detergent products for preservation purposes. They prevent the product from spoiling during storage by preventing the growth of microorganism.
Biocides shall be used only for preservative purposes and properly used for this function. This means, in accordance with the BPR, minimal amount of biocides shall be used and only for the most necessary reasons. The BPR states that the proper use of biocides is declared as *"limited to the minimum necessary"* (see Art. 17, BPR), which includes avoidance of the biocides in favour of "*rational application of a combination of physical, biological, chemical or other measures*". When deciding whether an active substance may be approved, the availability of suitable and sufficient alternative substances or technologies shall be a key consideration. The use of a biocidal product containing active substances approved shall be subject to appropriate risk mitigation measures to ensure that exposure of humans, animals and the environment to those active substances is minimised.

There is no definition of **preservatives** included in the Detergents Regulation. The reference to preservation agents and the Council Directive 76/768/EEC (the Cosmetics Directive) is made only. However, Art 2 (1) lit. l of Regulation (EC) No 1223/2009 on cosmetic products (which substituted the Cosmetics Directive since July 2013) defines '*preservatives*' as "*substances which are exclusively or mainly intended to inhibit the development of micro-organisms in the cosmetic product*". Preservatives function is to ensure that products are safe to be used by the consumers over long period and to maintain the appearance of the product.
The use of biocides is a cause for concern, as they are highly toxic to aquatic organisms and can also produce hypersensitivity and allergies. The combination of high toxicity, poor degradability and bioaccumulation gives a high risk for environmental damage. This is the main reason, why its use is proposed to be restricted in EU Ecolabel products.

The restriction on use of preservatives is included in most of the national ecolabels. A summary of requirements set in the current EU Ecolabel, the Nordic Ecolabelling and the Environmental Choice New Zeeland is given in Table 45.

Table 45 Summary of the restrictions on biocides and preservative in the revised national ecolabel schemes

Label	Restriction
Industrial and institutional automatic dishwasher detergents	
Nordic labelling	**Preservatives:** The product may contain preservatives provided that the preservatives are not bioaccumulating. A preservative is not considered bioaccumulating if BCF < 500 or $\log K_{ow}$ < 4.0. If both BCF and $\log K_{ow}$ values are available, the highest measured BCF value shall be used.
Env. Choice NZ	**Biocides:** The product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This criterion does not apply to ingredients (e.g.: quaternary ammonium salts) added for other functions but which may also have biocidal properties.
EU Ecolabel	**Biocides:** The product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This does not refer to surfactants which may also have biocidal properties. The product may contain biocides provided that they are not bioaccumulating. A biocide is not considered bioaccumulating if BCF < 100 or $\log K_{ow}$ < 3.0. If both BCF and $\log K_{ow}$ values are available, the highest measured BCF value shall be used

Consumer automatic dishwasher detergents	
Nordic labelling	**Preservatives:** Must not be bioaccumulating. The requirement applies to all preservatives in product ingredients and raw materials
Env. Choice NZ	**Preservatives/biocides:** The product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone.
EU Ecolabel	**Biocides:** The product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This does not refer to surfactants which may also have biocidal properties. It is prohibited to claim on the packaging or by any other communication that the product has an antimicrobial action
Industrial and institutional laundry detergents	
Nordic labelling	**Preservatives:** may be added in liquid products if the preservatives are not bioaccumulable.
Env. Choice NZ	**Biocides and preservatives:** The product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This criterion does not apply to ingredients (e.g. quaternary ammonium salts) added for other functions but which may also have biocidal properties.
EU Ecolabel	**Biocides:** the product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This does not refer to surfactants which may also have biocidal properties.
Consumer laundry detergents	
Nordic labelling	
Env. Choice NZ	**Biocides and preservatives:** The product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This criterion does not apply to ingredients (e.g. quaternary ammonium salts) added for other functions but which may also have biocidal properties.
EU Ecolabel	**Biocides:** the product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This does not refer to surfactants which may also have biocidal properties.
All-purpose cleaners consumer use	
Nordic labelling	**Preservatives:** must not be bioaccumulating. The requirement applies to all preservatives in product ingredients and raw materials. Preservatives may not be added to produce a disinfecting or antibacterial effect
Env. Choice NZ	**Biocides and preservatives:** The product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This criterion does not apply to ingredients (e.g. quaternary ammonium salts) added for other functions but which may also have biocidal properties.
EU Ecolabel	**Biocides:** the product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This does not refer to surfactants which may also have biocidal properties. It is prohibited to claim on the packaging or by any other communication that the product has an antimicrobial action.
Industrial and institutional all-purpose cleaners	
EU Ecolabel	**Biocides:** the product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This does not refer to surfactants which may also have biocidal properties. It is prohibited to claim on the packaging or by any other communication that the product has an antimicrobial action.
Env. Choice NZ	**Biocides and preservatives:** The product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This criterion does not apply to ingredients (e.g.: quaternary ammonium salts) added for other functions but which may also have biocidal properties

Hand dishwasher detergents	
EU Ecolabel	**Biocides:** the product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This does not refer to surfactants which may also have biocidal properties. It is prohibited to claim on the packaging or by any other communication that the product has an antimicrobial action.
Nordic labelling	**Preservatives:** must not be bioaccumulating. The requirement applies to all preservatives in product ingredients and raw materials.

In most ecolabelling schemes preservatives are required, to be non-bioaccumulating. Bioaccumulation of the substances is assessed by the bioconcentration factor (BCF) or if no BCF results are available the log K_{ow} value.

REACH defines **bioaccumulative potential** as *"the potential of the substance or certain substances in a mixture to accumulate in biota and, eventually, to pass through the food chain. Test results relevant to assess the bioaccumulative potential shall be given. This shall include reference to the octanol-water partition coefficient (K_{ow}) and bioconcentration factor (BCF), if available"*.

In accordance with the CLP Regulation *"for organic substances the potential for bioaccumulation shall normally be determined by using the octanol/water partition coefficient, usually reported as a log K_{ow}. The relationship between the log K_{ow} of an organic substance and its bioconcentration as measured by the bioconcentration factor (BCF) in fish has considerable scientific literature support. Using a cut-off value of log K_{ow} ≥ 4 is intended to identify only those substances with a real potential to bioconcentrate. While this represents a potential to bioaccumulate, an experimentally determined BCF provides a better measure and shall be used in preference if available. A BCF in fish of ≥ 500 is indicative of the potential to bioconcentrate for classification purposes. Some relationships can be observed between chronic toxicity and bioaccumulation potential, as toxicity is related to the body burden"*.

Thus, the CLP refers to BCF ≥ 500 or, if absent, the log K ow ≥ 4. EU Ecolabel, on the other hand, so far used the following thresholds: BCF < 100 or logPow < 3,0. If both BCF and logPow values were available, the highest measured BCF value should be used.

Discussions on aligning with the threshold from CLP were conducted in the recent criteria development and revisions but the general agreement among MS was to keep the stricter approach and the later limit values.

A requirement that preservatives shall not be bioaccumulating is proposed to be kept horizontally in all the EU Ecolabel criteria revised. The motivation behind is that biocides which are bioaccumulating store in the fat issues of living organisms and can cause long-lasting damaging effects.

As harmonisation among similar product groups is sought it is also proposed to include the following requirement (introduced in the new ROS criteria):

(i) Preservatives in the product shall not release or degrade to substances that are classified in accordance with the requirements of criterion x(b) Hazardous substances and mixtures.

10.5.1 Proposed common template

Bearing in mind the need of preserving the products and at the same time, trying to reduce as much as possible their environmental and human health impacts the following horizontal approach is proposed for discussion:

Criterion X – "Preservatives "

(i) The product may contain preservatives provided that they are not bioaccumulating. A preservative is not considered bioaccumulating if BCF < 100 or logPow < 3,0. If both BCF and log K_{ow} values are available, the highest measured BCF value shall be used.

(ii) Preservatives in the product shall not release or degrade to substances that are classified in accordance with the requirements of criterion x(b) Hazardous substances and mixtures.

(iii) It is prohibited to claim or suggest on the packaging or by any other communication that the product has an antimicrobial action.

Assessment and verification: the applicant shall provide a signed declaration of compliance, together with copies of the safety data sheets of any preservative added, and information on its BCF and/or log K_{ow} values. The applicant shall provide also artwork of the packaging.

10.6 Colorants

Colouring agents are added to the product in very small amounts in order to colour the product itself and, for some products like HDD, to facilitate the consumer applying appropriate dosage of the product. It also influences the appearance of the product.

Along the development of the criteria for ROCs the issue of colorants was raised. Contact of the human body with certain colorants, their impurities, or their decomposition products (that may occur during processing or storage of the product) can produce allergic reactions, sensitization or photosensitization in susceptible people[91]. During the development of the criteria for Nordic Swan[92] it was emphasized that the environmental properties of colorants are often very poorly documented. Many of them are toxic; nevertheless they are used in very small quantities. In order to reduce the environmental and health related impacts of these ingredients it was agreed to exclude colorants that may bioaccumulate.

It is expected that similar colouring agents are used in detergents and they seem to gain importance in products like liquid LD or HDD. In the current Nordic Ecolabelling detergent criteria there is a requirement set for colorants. It is therefore proposed to consider whether a restriction, which is included already in the EU Ecolabel criteria for IIDD. It is thus proposed to consider horizontal application of the requirement, also currently included in the ROCs criteria, that the colorants used shann not be bioaccumulating. Additionally, substances which have been approved for use in food are also accepted in Ecolabel products. Their list can be found at the EC website[93].

The proposed criterion is as follows:

Criterion x – "Colorants"

Colorants in the product must not be bioaccumulating. A colorant is considered not bioaccumulating if BCF < 100 or logPow < 3,0. If both BCF and log K_{ow} values are available, the highest measured BCF value shall be used. In the case of colouring agents approved for use in food, it is not necessary to submit documentation of bioaccumulation potential.

Assessment and verification: the applicant shall provide copies of the safety data sheets of any colorant added together with information on its BCF and/or log K_{ow} value, or documentation to ensure that the colouring agent is approved for use in food.

[91] Rosenthal et al., 1988; Wei et al., 1994, 1995; Mselle, 2004; Antonovich and Callen, 2005; Klontz et al., 2005

[92] Final report. EU Eco-label for shampoo and soaps. Ecolabelling Norway. Eskeland,, M.B, Svanes, E., 2006.

[93] Lists of authorized food additives: http://ec.europa.eu/food/food/fAEF/additives/lists_authorised_fA_en.htm.

11 PACKAGING

11.1 Background

Packaging is an increasing environmental concern as the average EU-27 citizen generated over 150kg of packaging waste per year[94]. Despite this, it is a necessity as it greatly reduces damage to products from the environment and vice versa, allows for easier identification of contents and packaging labels provide information on ingredients, safety and dosage advice. In the case of detergents, packaging represents from 0 to 37% of a product's environmental impacts, depending on the product, packaging and environmental impact considered (cf. Section 4 of Preliminary Reports). This is not the most important environmental impact of a detergent's life cycle; nevertheless the environmental aspects linked to packaging have improvement potential and can be acted upon at EU Ecolabel level.

In Europe, the Directive on Packaging and Packaging Waste[95] is the main policy tool to harmonize national measures concerning the management of packaging and packaging waste to prevent and reduce their impact, thus providing a high level of environmental protection and to avoid obstacles to trade in the European market. It contains provisions on the prevention, reuse, recovery and recycling of packaging and so all of it should, for example:

- have weight and volume minimized to the amount needed for safety and acceptance of the packed product,

- be suitable for material recycling, energy recovery and composting or reuse if intended,

- be manufactured in a way which ensures any noxious or hazardous constituents should have minimum impact on the environment.

Additionally, in the European Union there are targets for the recovery and recycling of packaging waste, fixing dates and percentage of waste that should be recycled.

The Directive on Packaging and Packaging Waste provides the following definitions:

- *"sales packaging or primary packaging, i.e. packaging conceived so as to constitute a sales unit to the final user or consumer at the point of purchase"*

- *"grouped packaging or secondary packaging, i.e. packaging conceived so as to constitute at the point of purchase a grouping of a certain number of sales units whether the latter is sold as such to the final user or consumer or whether it serves only as a means to replenish the shelves at the point of sale; it can be removed from the product without affecting its characteristics"*

Harmonisation with the wording of the Directive will be sought as much as possible.

11.2 Proposed common template

Criterion X – "Packaging"
a) Requirements specific to each EU Ecolabel, if any b) Weight/utility ratio (WUR) The weight/utility ratio (WUR) of the product shall be calculated for the primary packaging only and shall not exceed the following values for the reference dosage:

[94] http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Packaging_waste_statistics

[95] European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste, OJ L 365, 31.12.1994, p. 10–23

Product type	WUR
Type of product covered	xx,xx g

Are exempted from this requirement:

- Plastic/paper/cardboard packaging containing more than 80 % recycled materials,
- Paper/cardboard packaging that comes 80% from certified sustainable sources,
- Plastic packaging containing more than 80 % plastic from sustainable sources.

***Assessment and verification**: the applicant shall provide the calculation of the WUR of the product. A spreadsheet for this calculation is available on the EU Ecolabel website. If the product is sold in different packaging (i.e. with different volumes), the calculation shall be submitted for each packaging size for which the EU Ecolabel shall be awarded.*

The applicant shall provide a completed and signed declaration for the content of recycled material in the packaging.

- For paper and cardboard, packaging is regarded as recycled if the raw material used to make the packaging has been collected from packaging manufacturers at the distribution stage or at the consumer stage. Where the raw material is industrial waste from the material manufacturer's own production process, then the material will not be regarded as recycled.

- For plastic, packaging is regarded as recycled if the raw material used to make the packaging comes from industrial waste or has been collected from packaging manufacturer at the distribution or at the consumer stage.

The applicant shall provide a completed and signed declaration for the content of sustainably sourced material in the packaging. For paper and cardboard, the applicant shall provide TBD. For plastic, the applicant shall provide TBD.

The WUR is calculated as follows:

$$WUR = \sum((W_i + U_i)/(D_i * R_i)$$

Where:

Wi: weight (g) of the primary packaging (i),
Ui: weight (g) of non-recycled and non-sustainably sourced packaging in the primary packaging (i). Ui = Wi unless the applicant can document otherwise,
Di: number of reference doses contained in the primary packaging (i),
Ri: number of times that the primary packaging (i) can be refilled and used for the same purpose. Ri = 1 (packaging is not reused for the same purpose) unless the applicant can document a higher number.

c) Design for recycling

Plastic packaging shall be designed to facilitate effective recycling by avoiding potential contaminants and incompatible materials that are known to impede separation or reprocessing or to reduce the quality of recyclate. The label or sleeve, closure and, where applicable, barrier coatings shall not comprise, either singularly or in combination the materials and components listed in Table X.Z. Sprays and pumps are exempted from this requirement.

Table X.Z – Materials and components excluded from packaging elements

Packaging element	Excluded materials and components[96]
Label or sleeve	- PS label or sleeve in combination material used with a PET, PP or HDPE bottle - PVC label or sleeve in combination with a PET, PP or HDPE bottle - PETG label or sleeve in combination with a PET bottle - Sleeves made of different polymer than the bottle - Labels or sleeves that are metallised or are welded to a packaging body (in mould labelling)
Closure	- PS closure in combination a with a PET, HDPE or PP bottle - PVC closure in combination with a PET, PP or HDPE bottle - PETG closures and/or closure material with density of above 1 g/cm3 in combination with a PET bottle - Closures made of metal, glass, EVA - Closures made of silicone. Exempted are silicone closures with a density < 1 g/cm3 in combination with a PET bottle and silicone closures with a density > 1g/cm3 in combination with PEHD or PP bottle - Metallic foils or seals which remain fixed to the bottle or its closure after the product has been opened
Barrier coatings	Polyamide, EVOH, functional polyolefins, metallised and light blocking barriers

***Assessment and verification**:* The applicant shall submit a signed declaration of compliance specifying the material composition of the packaging including the container, label or sleeve, adhesives, closure and barrier coating, and a sample of primary packaging.

11.3 Rationale and discussion

In the case of detergents, the environmental performance of packaging can be improved in several ways while ensuring that it protects the product well and remains satisfactory to customers. For example, the amount of material used in the packaging can be reduced, combinations of materials compatible with recycling streams can be promoted, as well as the use of recycled raw materials and those from sustainable sources.

The product groups covered by the six EU Ecolabels in the "detergents" group present, to a large extent, similar packaging practices and thus the wording and the contents of the "packaging" criterion in the sets of criteria has been harmonised as much as possible, without being identical to respect product differences.

The following sections summarize the important information to be considered when selecting the most appropriate criteria and thresholds in the packaging field.

11.3.1 Reduction of the amount of packaging

In packaging, every gram counts. Generally speaking, lighter packaging is cheaper to transport and store and its manufacturing and distribution require less energy and fewer raw materials. However there are trade-offs as reducing packaging too much can produce flimsy packaging leading to undesirable consequences such as product deterioration or spillage, uncontrolled dosing, etc.
The weight-utility-ratio (WUR) is a measure of the mass of packaging used to deliver a functional unit (i.e. a washing cycle). This indicator is used to limit the amount of packaging and consequently reduce the impact of producing packaging material and transportation. The indicator also promotes

[96] EVA – Ethylene Vinyl Acetate, EVOH – Ethylene vinyl alcohol, HDPE – High-density polyethylene, PET – Polyethylene terephtalate, PETG – Polyethylene terephthalate glycol-modified, PP – Polypropylene, PS – Polystyrene, PVC – Polyvinylchloride

the use of recycled and renewable and sustainably sourced material in packaging and the reuse of packaging components.

$$WUR = \sum((W_i + U_i)/(D_i * R_i)$$

Where:
W_i: weight (g) of the primary packaging (i),
U_i: weight (g) of non-recycled plastic/paper/cardboard packaging, non-sustainably sourced paper/cardboard packaging and plastic packaging of non-renewable origin in the primary packaging (i). Ui = Wi unless the applicant can document otherwise.
D_i: number of reference doses contained in the primary packaging (i),
R_i: number of times that the primary packaging (i) can be refilled and used for the same purpose. R_i = 1 (packaging is not reused for the same purpose) unless the applicant can document a higher number.
The level of ambition of WUR depends on the product group and also on the types of products found in that product group (i.e. powder and liquid detergents might have different WUR limits to highlight the differences in packaging between the two types). In the EU Ecolabel, the use of recycled and sustainably sourced content is promoted in the calculation of the WUR values and through exemptions, as covered in Sections 11.3.2 and 11.3.3. Moreover, the WUR considers the possibility of packaging being refilled through *Ri*, although difficulties have been encountered by stakeholders when trying to interpret how one should document the fact that a packaging can and will be refilled by users. Indeed, while a manufacturer can prove that refills do exist on the market and that theoretically one packaging can withstand a certain amount of reuses, they cannot prove that users are and will be using refills with the original packaging. One approach that is taken by some products aimed at professional users where a product is only sold as part of a multi-pack (one main bottle together with several refills). Domestic products are rarely sold in this fashion as they require space for storage and large one-time investments.
As the WUR requirements are different for each product group, these are listed, along with comparisons to other ecolabels and statistics, in their respective technical reports. Table 46 summarises that information. The WUR approach as it is presented in five out of the six current EU Ecolabels related to detergents can also be found in four Nordic Swan ecolabel criteria (most notably it is absent from criteria sets for product groups solely targeting products intended for professional use). New Zealand's Environmental Choice uses a simpler formula that does not promote the use of recycled materials.

Table 46 Summary on reduction of packaging criterion in the revised Ecolabel schemes

Ecolabel	LD	IILD	DD	IIDD	APC	HDD
EU Ecolabel	WUR	WUR	≠ formula (primary packaging weight/FU)	WUR	WUR	WUR
Nordic Swan	WUR	---	WUR	---	WUR	WUR
New Zealand – Env. Choice	≠ formula (primary packaging weight/FU)	≠ formula (primary packaging weight/FU)	≠ formula (primary packaging weight/FU)	≠ formula (primary packaging weight/FU)	≠ formula (primary packaging weight/FU)	≠ formula (primary packaging weight/FU)

("WUR" indicates the uses of the same formula as indicated above)

11.3.2 Requirements on paper and cardboard

Stakeholders pointed out the need for promoting recycled content for cardboard packaging as well as certified sustainable sources of wood fibres. It was proposed that they should be equally considered as responsibly managed forests address the environmental, social and economic aspects of sustainability and will have a lower life cycle impact than non-sustainably managed sources. Moreover, certifications schemes exist for both recycled wood fibres and sustainably managed sources of wood fibres.

The issue of percentage of recycled or certified wood fibres requirements is a common discussion point for many EU Ecolabel product groups and the threshold of 70% recycled or certified wood fibres has been proposed. Although 100% recycled or certified wood fibres is desirable it could be difficult to maintain for manufacturers due to possible fluctuations in market supplies. The threshold of 70% of recycled or certified wood fibres comes from the fact that both FSC and PEFC propose certification schemes ensuring these levels, meaning that the verification and assessment of recycled or certified wood fibre content is facilitated as one can prove compliance by producing the certificates.

In the EU Ecolabels related to detergents, recycled and certified wood fibres intervene in two ways – they can either lower the WUR results if the recycled material content of the packaging (paper, cardboard and plastic) is below 80% or if the certified wood fibre content is below 80%, or by exempting the need to comply with the WUR criteria if either of these thresholds is met. These high thresholds are proposed as the exemptions should be only granted in cases where the recycled or certified wood fibre content is exceptional. A requirement for 100% is not proposed as often packaging is not formed from a single material, for example labels can come from a different source than the main packaging. With this proposal, the applicant would have to prove that they meet the recycled material content threshold (80%) by providing information on where the material comes from and the calculations showing that the threshold is met. The applicant would have to prove that they meet the certified wood fibre content threshold (80%) by providing the certification information from an approved certification body, FSC or PEFC for example, and the calculations showing that the threshold is met.

Currently, many types of products are already produced with packaging that contains a high level of recycled cardboard. For example several brands of dishwasher tablets claim over 90% of recycled material in their packaging.

11.3.3 Requirements on plastics

Plastic packaging is highly used in the detergents sector as it can be easily shaped and serve many purposes.

Plastics present several characteristics that make them an interesting choice from an environmental point of view. However, there are some requirements that plastic should comply with to ensure that their environmental impacts are as limited as possible including, among other aspects, use of recycled materials, longer durability that enables reusability (e.g. refillable bottles), recyclability, energy recovery or biodegradability.

Recycled plastics

The use of recycled plastics is proposed to be promoted through two ways, identical to recycled cardboard: the WUR is lowered is recycled plastic is used and the applicant may be exempted from the WUR requirement if over 80% of the packaging used (paper, cardboard and plastic, combined) comes from recycled sources. The quantity of recycled plastic that can be used in packaging depends both on the type of plastic and the packaging, for example concerns about the colour and aesthetics of the finished product can be raised for light coloured injection moulded plastics. For extruded components, co-extrusion technology allows an inner core of recycled plastic to be surrounded by a thin outer layer of virgin plastic, making it easier to control colour and aesthetic aspects. Moreover, there are also possible concerns of unexpected variations in the quality and

quantity of recycled plastics available on the market. There is also potential for plastic recyclates to bring hazardous substances into the EU Ecolabel product exists because it is simply not practical to test all batches of plastic recyclates delivered for each of the flame retardants and plasticisers that are REACH restricted. To date no industry wide standard exists for impurities for recycled plastics (analogous to the EPF standard for recycled wood fibres) but would be a welcome addition to improving confidence in recycled plastic. The issue of contaminants in recyclates is less problematic for recycled plastic coming from industrial waste as the origin is more controlled. For example, recycled PP coming from industrial waste is available on the market and can be used in non-food packaging[97].

Thus, as the recycled plastics market is yet as developed as the market for recycled cardboard and paper, it is proposed to promote both the use of industrial waste and post-consumer recycled plastic. The corresponding wording in the assessment and verification of the WUR is thus proposed to be changed to include the option of using industrial waste.

Plastics from renewable sources

Stakeholders have also proposed to consider requirements for the inclusion of plastics from renewable sources. These plastics are still a niche market but they are becoming more and more cost competitive and they can offer a point of differentiation for manufacturers.

Packaging represented 70% of the overall market for plastics from renewable sources[98], with applications in multiple industries, showing that there is potential for this type of material. The main selling point of this type of material is the savings that can be made on fossil resources but there are concerns that plastics from renewable sources can have social and ethical implications as the crops for these materials compete with those cultivated for food supply. There are also environmental trade-offs to be considered - environmental impacts caused by the non-renewable energy necessary for their production and the water pollution and land use that this production would entail. Thus, to avoid causing extra environmental impacts, plastics should not only come from renewable sources but also sustainable sources. For the moment, there are no standards or certification schemes on the subject but a standard for certification and declaration tools for bio-based products is being developed and is expected to be voted on in 2016[99].

As an EU Ecolabel criteria set is voted for a relatively long time span, it is important to consider possible future developments. Even though this is still a relatively new type of material, with a limited market and limited testing, it is proposed to promote its use through a reduction in the WUR or an exemption from the WUR requirement if the threshold of over 80% of plastic from renewable sources is met.

11.3.4 Design for recycling

EU Ecolabel criteria should try to ensure the recyclability of various components of packaging. The best case is mono-material packaging. For packaging made of different materials, all materials in the packaging should be separable by hand (paper, cardboard, plastic, metal, glass) for sorting, or should be suitable for recycling. Packaging elements such as caps or labels also have to be considered to ensure that these elements do not pose difficulties in recycling processes.

Several stakeholders argued that in some cases it may be better to stay with multiple materials if this allows for material reduction, especially in countries with low waste recycling rates and a lack of recycling facilities. Nevertheless, it is agreed that Ecolabel should promote recycling as the best waste treatment and it is considered appropriate to set a requirement to guarantee recyclability of packaging. And even if multiple materials are used, it should be ensured that this design does not impede the recyclability of the packaging.

[97] Example of product: http://www.akgpolymers.com/producten.asp

[98] PlasticEurope, presentation at Future of Bioplastics, Warsaw 02.10.2013

[99] CEN/TC 411/WG 5 - Certification and declaration tools - http://standards.cen.eu/dyn/www/f?p=204:22:0::::FSP_ORG_ID,FSP_LANG_ID:904049,25&cs=17CEE6ABD62731B8DF67E7AC8ABC134B4

The proposed formulation in the criterion is aligned with the one from the EU Ecolabel on Rinse-off cosmetics and is as follows:

> *Plastic packaging shall be designed to facilitate effective recycling by avoiding potential contaminants and incompatible materials that are known to impede separation or reprocessing or to reduce the quality of recyclate. The label or sleeve, closure and, where applicable, barrier coatings shall not comprise, either singularly or in combination the materials and components listed in Table 47. Pumps are exempted from this requirement.*

Table 47 Materials and components excluded from packaging elements

Packaging element	Excluded materials and components[100]
Label or sleeve	- PS label or sleeve in combination material used with a PET, PP or HDPE bottle - PVC label or sleeve in combination with a PET, PP or HDPE bottle - PETG label or sleeve in combination with a PET bottle - Sleeves made of different polymer than the bottle - Labels or sleeves that are metallised or are welded to a packaging body (in mould labelling)
Closure	- PS closure in combination a with a PET, HDPE or PP bottle - PVC closure in combination with a PET, PP or HDPE bottle - PETG closures and/or closure material with density of above 1 g/cm3 in combination with a PET bottle - Closures made of metal, glass, EVA - Closures made of silicone. Exempted are silicone closures with a density < 1 g/cm3 in combination with a PET bottle and silicone closures with a density > 1g/cm3 in combination with PEHD or PP bottle - Metallic foils or seals which remain fixed to the bottle or its closure after the product has been opened
Barrier coatings	Polyamide, EVOH, functional polyolefins, metallised and light blocking barriers

No indications are given on the fact that all materials in the packaging should be separable by hand (paper, cardboard, plastic, metal, glass) for sorting as such a requirement would be difficult to verify. The requirement for the labelling of plastics parts has been removed in order to limit the number of requirements linked to recycling and recyclability and due to the fact that many recycling schemes use automated systems that do require the marking of plastic in order to separate polymers.

11.4 Consultation questions

1	How can the interpretation of *Ri* (refills and packaging reuse) be facilitated?
2	Should the exemptions for packaging containing 80% for recycled/sustainably sourced material be kept? Changed?
3	How should the applicant document the sourcing of material?

[100] EVA – Ethylene Vinyl Acetate, EVOH – Ethylene vinyl alcohol, HDPE – High-density polyethylene, PET – Polyethylene terephtalate, PETG – Polyethylene terephthalate glycol-modified, PP – Polypropylene, PS – Polystyrene, PVC – Polyvinylchloride

12 FITNESS FOR USE

12.1 Background

The performance test is primarily a quality requirement to ensure a satisfactory result of cleaning at the specified dosage of the EU Ecolabel product. A product that is effective at the dosage recommended on the label reduces the risk of overdosing since the user experiences that the product is effective and does not need to use more than recommended.
For each of the detergent product groups under revision, there are industry and other tests to assess the cleaning performance of the products. The methods for ascertaining the cleaning performance are specific for each type of detergent and have been updated throughout the years. The main reasons for these revisions are the changes in detergent composition, appliances, dishes or chemicals that are no longer available or that have been introduced in the market.
Regarding the performance tests in the current EU Ecolabel criteria, some difficulties in their application and heterogeneous wording were detected. The first is mainly due to the wide range of washing parameters in Europe (water hardness, types of soil, customer habits, and different types of machines) while the latter can be due to the different points in time when the EU Ecolabel criteria were developed.
Table 48 summarises the existing EU Ecolabel protocols and the standards referred to assess the washing performance of the products and shows the fitness for use criteria included in other national ecolabelling schemes. There are few standards and protocols and therefore the use of laboratory testing or user testing is needed.

Table 48 Comparison of the fitness for use requirements of selected ecolabels

Label	Restriction
Industrial and institutional automatic dishwasher detergents (IIDD)	
Nordic labelling	The **performance of the single or multicomponent system** must be satisfactory at the recommended dosage with soft water. The product must satisfy the requirements **for the user test or internal testing** in accordance with Appendix 5. The results from tests from **at least 8 test locations** shall be submitted along with a report summarising these results and specifying the number and position of respondents Dosing must agree with the producer's recommendations. The test period must last for at least four weeks. At least 80% of the test locations must assess the product as offering satisfactory or excellent performance on all accounts. Respondents must also be satisfied or very satisfied with the customer visit agreement. If the **products** that are destined for **use in instrumental maintenance** within health care (as defined in the products group definition) are tested according to the standard ISO 15883 no user tests are required. In case a test report from a certified laboratory showing that he tests have been carried out according to the standard with satisfying results shall be included as documentation.
Env. Choice NZ	The product must be fit for its intended use and conform, an appropriate, to relevant product performance standards. Performance of the product with respect to both cleaning ability and cleaning performance (the total amount of soil removed per dish wash) must be assessed.
Current EU Ecolabel	The performance and efficiency of the product must be satisfactory. The product must satisfy the requirements for the **user test or internal testing** in accordance with Appendix II. Either internal testing or user testing can be used
Consumer automatic dishwasher detergents (DD)	
Nordic labelling	Cleaning performance is to be tested in accordance with the standard test for dishwasher detergents developed by **IKW, with the following amendments**: -wash temperature 50 °C for the test product and 55 °C for the reference -water hardness 6 °dH

	-reference detergent IEC-D or IEC-B is to be used at a dose of 20 g -reference rinsing agent (formula III) at dose setting of between 2 and 3
Env. Choice NZ	The product shall be fit for its intended use and conform, as appropriate, to relevant product performance standards. Product performance with respect to both cleaning ability (ability to remove soil) and cleaning performance (the total amount of soil removed per wash) must be assessed
Good env choice AU	Test reports showing the product to be **equal to or better than a reference detergent** after the fifth wash cycle**, based on EN 50242 conducted** with the following modifications, or equivalent: - Tests shall be **performed at 50 ± 2°C,** with a cold prewash without detergent; - The machine used for testing shall be a 12 place setting machine with a 5 star or higher WELS rating; - The machine's drying program shall be used but only the cleanliness of the dishes assessed; - A mildly acidic rinsing agent according to the standard (formulation III) shall be used; - The rinsing agent setting shall be set to 2 or 3; - The manufacturer's recommended dosage shall be used during testing; and - Three trials shall be performed at the water hardness stated in the standard. One trial shall comprise five wash cycles with the results assessed after the fifth cycle without cleaning between cycles
Green Seal	Requires only a test 'using an objective, scientifically-validated method conducted under controlled and reproducible laboratory conditions' and in comparison to a market-leading product.
EU Ecolabel	Tests shall be carried out to ensure that the product has a satisfactory wash performance at the recommended dosage according to the standard test **developed by IKW or the modified standard EN 50242:2008** The tests shall **be carried out at 55C or at a lower temperature** if the product claims to be efficient at this temperature. When applying for rinse aids in combination with dishwasher detergents, the rinse aid shall be used in the test instead of the reference rinse aid. For multifunctional products the applicant must submit documentation providing the effect of the claimed functions.
Industrial and institutional laundry detergents (IILD)	
Nordic labelling	The primary laundering effects of the detergent such as dirt removal and stain removal capacity must be documented by the manufacturer/applicant with the aid of artificially soiled test clothes which are washed in the process. The test must be conducted by **a laboratory** fulfilling the requirements in annex 4. The test must be conducted with soft water (0-6d°H). The measurements must be performed on unlaundered and laundered test clothes. Evaluation of the test results shall be made by the laboratory and it shall be clearly stated in the report. The measurements of the secondary effects such bleaching effect, bleaching factor, ash content, greying and fluidity increase shall be made **with multiwash test clothes and analysed according to standard ISO 4312.** Examples of what may be used as wash test clothes included the following: -**WFK-PCMS-55 for industrial laundering processes**, consisting of 13 different small dirt patches (WFK-Cleaning Technology Research Institute, Germany). - **EMPA 102,** consisting of 15 different fresh spots (Swiss EMPA-Testmaterials). -**Wash clothes of DTI (**Danish Technology Institute) for industrial washing processes or equivalent The laundry detergent shall meet the requirements for the user test in accordance with Appendix. Laundering effectiveness must be shown with the dosage for the same level of soiling as used in calculations in section 1.2 - Total content of environmentally harmful substances in laundering chemicals.
Env. Choice NZ	The product must be fit for its intended use and conform, as appropriate, to relevant product performance standards. Performance of the product with respect to both cleaning ability (ability to remove soil) and cleaning performance (the total amount of soil removed per dish wash) must be assessed.

EU Ecolabel	The primary laundering effects of the detergent such as dirt removal and stain removal capacity must be documented by the producer/applicant with the aid of artificially soiled test clothes which are washed in the process. The test may be conducted by an external or internal laboratory fulfilling the requirements in Appendix II[101]. The test must be conducted with the recommended dosage and at the corresponding water hardness and the degree of soiling at the lowest recommended wash temperature. The measurements must be performed on unlaundered and laundered test clothes. Evaluation of the test results shall be made by the laboratory and it shall be clearly stated in the report. The measurements of secondary effects such as bleaching effect, bleaching/damage factor, ash content, greying and fluidity increase can for instance be made with multi wash test clothes and analysed according **to standard ISO 4312.** Examples of what may be used as wash test clothes included the following: - **WFK-PCMS-55** for industrial laundering processes, consisting of 13 different small dirt patches (WFK-Cleaning Technology Research Institute, Germany) - **EMPA 102**, consisting of 15 different fresh spots (Swiss EMPA-Testmaterials) - **wash clothes of DTI** (Danish Technology Institute) for industrial washing processes or equivalent As **an alternative to the above mentioned laboratory test**, **a user test may be used to document efficiency. The user test should then meet the requirements stated in Appendix II.** For both laboratory test and user test the following apply: -The test product must be tested against a reference product. -The reference product may be a well-established product on the market or, in the case of a user test, the product normally used by the user. -The test product must show efficiency equal to or better than the reference product.
<u>Consumer laundry detergents (LD)</u>	
Nordic labelling	The fitness for use shall be documented by use of the Nordic Ecolabelling Performance Test for laundry detergents and stain removers (Appendix 6) The performance of colour safe detergent at the recommended dosage on normally soiled clothing must be satisfactory at 30 °C compared to the reference detergent tested at 40 °C. For detergents for white wash and for stain removers the performance of the products must by the recommended dosage on normally soiled clothing be satisfactory at 40 °C compared to the reference detergent tested at 40 °C. For detergents for delicates the performance must be satisfactory at the recommended dosage to lightly soiled clothing at 30 °C compared to water, which also is tested at 30 °C. Please note that all the products always need to pass the performance test at the lowest temperature stated on the packaging or in another marketing material. If lower washing temperature than the normal temperature for the product type is stated (for example 30 °C stated on white wash), the washing efficiency has to be determined at this temperature. For cold water products (see the definition R18), the temperature should maximum be 20 °C. The reference is still to be washed at 40 °C for all product types except for detergents for delicates, where the reference is to be washed at 30 °C. The performance test is performed with - The reference dosage multiplied with 3.5 for washes in 3-5kg washing machines or - The reference dosage multiplied by 4.5 for washes in 4-5kg washing machines. See Appendix 1 (part 1B) concerning the requirements applicable to test institutions. **<u>Heavy-duty laundry detergents:</u>** The table below summarises the limit values for the performance parameters tested for heavy-duty laundry detergents according to the Nordic Ecolabelling Performance test:

		Heavy duty- white wash	**Heavy duty, color wash**
	Cleaning effect:		
	ΔY	≤ 10*	≤ 10*
	ΔM	≤ 10	≤ 10
	Average ΔM	< 5	< 5
	Secondary effects:		
	Greying	< 2.8	Not applicable
	Encrustation	< 0.6%	< 0.6%
	Chemical wear	< 1.0 Rhes	Not applicable

* ΔY for one stain type may be < 20
ΔY is defined as follows: ΔY = Yr – Yp; where Yr is the mean reflectance value for the reference detergent and Yp is the mean relectance value for the test product.

ΔM is defined as follows: ΔM = Mr – Mp; where Mr is the mean reflectance value for the soil type (bleachable, enzymatic (protease and amylase) or general) for the reference detergent and Mp is the mean reflectance value for the soil type for the product.

Low-duty laundry detergents:
The ΔY for all soil strips must be less than -5. ΔY for one of the tested stain type can be 0,0.
The dimension changes in relation to water must not exceed ± 2%.
ΔY is defined as follows: ΔY = Yw – Yp; where Yv is the mean reflectance value for water and Yp is the mean reflectance value for the product.
Products for washing of silk and products without specific declaration on type of textile must in addition meet the following requirements:
Colour maintenance must be lower (better) than or equal to the average value for water.
Stain removers
Documentation must be submitted of the performance for all stain types for which the product is claimed to have an effect. If no particular stains are emphasised on the product, the product must be tested on a minimum of four different stain strips and the reasons for the choice of stains must be given. The following performance requirement must be met for the stain types tested.
Stain removers with subsequent washing
The normalised wash result for each stain type must be at least 110% in relation to the reference product.
Stain removers without subsequent washing
Stain removers that are used without subsequent washing (stain removers used e.g. for carpets or upholstry furniture) must fulfill one of the following two requirements:
- Visual evaluation: the rulting sum of the score must be at least 10 for each textile within each stain type. No result must be lower than a score of 2
- Mechanical evaluation: the Y value of the cleaned textile must be at least 80% in relation to the unsoiled textile

Env. Choice NZ	The product shall be fit for its intended use and conform as appropriate to relevant product performance standards. Performance of the product with respect to both cleaning ability and cleaning performance must be assessed
EU Ecolabel	The product shall comply with the performance requirements as specified in the EU Ecolabel **laundry detergents performance test's latest version**
All-purpose cleaners consumer use (APC)	
Nordic labelling	The product must through **laboratory testing** demonstrate equal or superior cleaning performance to a reference product within the same product category. The product must also clean better than water alone. If the product is marketed for both professional and consumer use it shall be tested against a professional product
Env. Choice NZ	The product shall be fit for its intended use and conform as appropriate to relevant product performance standards. Performance of the product with respect to both cleaning ability and cleaning performance must be assessed

Good Env Choice AU	To be certified, the products must be fit to perform its intended purpose or application The product must demonstrate fitness for purpose or market acceptance or suitability or quality. If reformulation takes place, the applicant must demonstrate that the new formulation also complies with this requirement.
Green Seal	Standard performance requirements: each product, as used when dilute with water from the cold tap, shall clean common soils and surfaces in its category effectively, as measured by a standard test method. The criteria give details of recommended test methods by product groups: - general purpose cleaners: **shall remove at least 80% of the particulate soil in ASTM int. D4488-95** -restroom cleaners: shall **have a pH between 3-10 and tested following the requirements of an appropriate method as outlined in the standard** - glass cleaners**: shall achieve at least a rating of three in each of the following consumer speciality products associations (CSPA) DCC09 categories: soil removal, smearing and streaking**
EU Ecolabel	The product shall be fit for use, meeting the needs of the consumers. *(a) All-purpose cleaners and window cleaners* For **all-purpose cleaners**, **only fat-removing effects must be documented**. For window cleaners, **stripe-less drying must be documented**. The cleaning ability must be equivalent to or better than that of a market-leading or generic reference product, approved by a competent body. The performance of the product must either be tested by: **— an adequate and justifiable laboratory test, or** **— an adequate and justifiable consumer test.** Both tests must be carried out and reported within specified parameters as stated in the framework described in 'Framework for testing the performance of all-purpose cleaners, window cleaners and sanitary cleaners' that can be found here: http://ec.europa.eu/environment/ecolabel/ecolabelled_products/categories/purpose_cleaners_en.htm *b) Sanitary cleaners* Sanitary cleaners include bathroom cleaners, toilet cleaners and kitchen cleaners. For **bathroom cleaners**, both **limesoap and limescale removal** shall be documented. For **acidic toilet cleaners**, only **limescale removal** shall be documented. For **kitchen cleaners fat removing effects** shall be documented. The cleaning ability must be equivalent to or better than that of the generic reference detergent specified below. The performance of the product must either be tested by: — **an adequate and justifiable laboratory test, or** **— an adequate and justifiable consumer test.** Both tests must be carried out and reported within specified parameters as stated in the framework described in '**Framework for testing the performance of all-purpose cleaners, window cleaners and sanitary cleaners'**. The generic reference detergent shall be the one prescribed in **IKW performance test** 'Recommendation for the quality assessment of acidic toilet cleaners' (SÖFW-Journal, 126, 11, pp. 50-56, 2000). The reference detergent is applicable for toilet cleaners and bathroom cleaners; however the pH must be reduced to 3,5 for the testing of bathroom cleaners. http://www.ikw.org/pdf/broschueren/EQ_WC_Reiniger_Englisch.pdf
Hand dishwasher detergents consumer use (HDD)	
Nordic labelling	The performance test shall be conducted by a laboratory within the framework specified by **laboratory test.** The test results shall be documented in accordance with Appendix 5. The test shall be performed by a laboratory complying with laboratory requirements. The reference product is tested **at the lowest recommended dosage** that is stated on the packaging. If no dosage instructions are provided, the same dosage is used as for the test product. The test product is tested at the lowest recommended dosage. The reference product is defined as one of the well-established (3-4 market-leading) HDDs in a Nordic country or the Nordic region. The reference product shall be different from the product to be ecolabelled. The reference product must come from a different manufacturer than that of the product to be ecolabelled. The reference product must be purchased in connection with the performance of

	the test. The product shall be tested against another consumer product. If the product is marketed for both professional and consumer use it shall be tested against a professional product.
Env. Choice NZ	The product shall be fit for its intended use and conform, as appropriate, to relevant product performance standards. Performance of the product with respect to both cleaning ability (ability to remove soil) and cleaning performance (the total amount of soil removed per dish wash) must be assessed.
EU Ecolabel	The product shall be fit for use, meeting the needs of the consumers. The cleaning ability and cleaning capacity must be equivalent to or better than that of the generic reference detergent specified below. The cleaning ability and cleaning capacity must be tested by means of an **adequate and justifiable laboratory performance test** carried out and reported within specified parameters as stated in the framework described in 'Framework for testing the performance of hand dishwashing detergents' that can be found here: http://ec.europa.eu/environment/ecolabel/documents/performance_test.pdf The generic **reference detergent shall be the one prescribed in IKW performance test** 'Recommendation for the quality assessment of the cleaning performance of hand dishwashing detergents' with the adaptation that the dosage applied in the performance test is set at 2,5 ml of the reference detergent per 5 litres of water. The **IKW performance test 'Recommendation for the quality assessment of the cleaning performance of hand dishwashing detergents' (SÖFW-Journal, 128, 5, pp. 11-15, 2002) method may be applied** with the mentioned adaptation and can be downloaded from: http://www.ikw.org/pdf/broschueren/EQ_Handgeschirr_e.pdf

Appendix on laboratory and user test – Industrial and institutional automatic dishwasher detergents (IIDD)

(a) Internal testing

The manufacturer's test laboratory can be approved to conduct testing to document effectiveness if the following additional requirements are met:

— it must be possible for ecolabelling organisations to monitor the performance of testing,
— the ecolabelling organisation must have access to all data on the product,
— performance of the effectiveness test must be described in the quality control system.

The applicant must submit documentation proving that the product has been tested under realistic conditions:

(a) Dishes soiled with spots that are representative for the kind of soiled expected in the areas where the products will be marketed.

(b) Recommended dosage and at the corresponding water hardness at the lowest recommended wash temperature

The applicant must submit documentation proving:

— the product's ability to remove soiling from the dishes,
— the product's ability to dry the dishes.

The test product must be tested against a reference product. The reference product may be a well-established product on the market and the tested product must be at least as effective as the reference.

(b) User test

1. Responses must be obtained from at least five test centres representing a random selection of customers.
2. The procedure and dosage must conform to the manufacturer's recommendations.
3. The test period must continue for at least four weeks with at least 400 test cycles.
4. Every test centre must assess the effectiveness of the product or multi-component system by answering questions relating to the following aspects (or similar formulations):

— the product's ability to remove soiling from the dishes,
— the product's ability to dry the dishes,

— the respondent's satisfaction with the agreement on customer visits.

5. The response must be rated on a scale comprising at least three levels, for example, 'insufficiently effective', 'sufficiently effective' or 'very effective'. With regard to how satisfied the test centre is with visit reporting arrangements, the categories must be 'not satisfied', 'satisfied' and 'very satisfied'.

6. At least 80 % must rate the product as sufficiently effective or very effective on all points (see point 4) and be satisfied or very satisfied with customer visiting arrangements.

7. All raw data from the test must be specified.

8. The test procedure must be described in detail.

Standards or well-described washing performance tests are referred to whenever possible. Laboratory tests and user tests are only recommended when appropriate standards are not available. Regarding the washing performance conditions of single- or multi-component detergents, most of the schemes highlight the need to carry out the testing under realistic conditions and according to the manufacturer's dosage recommendations at the water hardness to be tested, at the lowest water temperature the manufacturer claims the product is effective and at the lowest recommended concentration.

The testing must be conducted by a laboratory fulfilling the requirements of ISO 17025 or be an officially GLP-approved analysis laboratory.

Appendix on laboratory and user test – Industrial and institutional laundry detergents (IILD)

(a) Laboratory test

The analysis laboratory must meet the general requirements pursuant to standard EN ISO 17025 or be an officially GLP-approved analysis laboratory.

The applicant's analysis laboratory/measurement may be approved to conduct analyses and measurements if:

— the authorities monitor the sampling and analysis process, or

— the manufacturer has a quality system incorporating testing and analyses and which is certified in accordance with ISO 9001, or

— the manufacturer can show that there is conformity between a first-time test conducted as a parallel test between an impartial test institution and the manufacturer's own laboratory and that the manufacturer takes samples in accordance with a prescribed sampling plan.

The manufacturer's test laboratory can be approved to conduct testing to document effectiveness if the following additional requirements are met.

— It must be possible for ecolabelling organisations to monitor the performance of testing

— The ecolabelling organisation must have access to all data on the product

— The samples must be made anonymous for the test laboratory

— Performance of the effectiveness test must be described in the quality control system.

(b) User test

1. Responses must be obtained from at least five test centres representing a selection of customers.

2. The procedure and dosage must conform to the manufacturer's recommendations.

3. The test period must continue for at least four weeks.

4. Every test centre must assess the serviceability of the product or multi-component system, dosability, compressibility, rinsing and solubility.

5. Every test centre must assess the effectiveness of the product or multi-component system by answering questions relating to the following aspects (or similar formulations):

(a) ability to launder lightly, moderately or heavily soiled articles to be washed;

(b) an assessment of primary laundering effects such as dirt removal, stain removal capacity and bleaching effect must be rated;

(c) assessment of secondary laundering effects such as greying of white washing and colour-fastness and staining of coloured washing;

(d) assessment of the effect of the rinsing agent on drying, ironing or mangling of the articles to be washed;

(e) how satisfied the test subject is with customer visiting arrangements.

6. The response must be rated on a scale comprising at least three levels, for example, 'insufficiently effective', 'sufficiently effective' or 'very effective'. With regard to how satisfied the test centre is with visit reporting arrangements, the categories must be 'not satisfied', 'satisfied' and 'very satisfied'.

7. At least five test centres must submit responses. At least 80 % must rate the product as sufficiently effective or very effective on all points (see point 4 and be satisfied or very satisfied with customer visiting arrangements.

8. All raw data from the test must be specified.

9. The test procedure must be described in detail.

12.2 Laboratory requirements, laboratory tests and user tests

Regarding the current information provided in the Appendix of the current EU Ecolabel criteria, harmonization among the requirements of the laboratories and the conditions to carry out and reporting the results from laboratory tests and users tests are addressed in this section

There are several aspects of the current EU Ecolabel criteria for fitness for use that have caught the attention of the stakeholder:

a) **the links to the EU Ecolabel washing performance tests** and in some case the IKW washing performance tests have been removed and replaced by the available links

b) the **"EN 50242:2008** Electric dishwashers for household use. Test method for measuring the performance" refers only to powder detergents and any suggestion for a modification to adapt the method to liquid and other detergent forms is requested.

Additionally the current modification of this standard to test the products requires a temperature of 55C

*c) "For **kitchen cleaners** fat removing effects shall be documented"* and it has been **included the evaluation of burnt on soil removal**

Concerning the EU Ecolabel protocols for fitness for use that the EU Ecolabel criteria refer to, the feedback from the stakeholders is that the **target performances are easy to reach** and that the **reference products have to be adapted and harmonized across Europe**.

Some of these suggestions include

- an increase in the number of repetitions reaching 20 in all the cases
- an **attachment with the chemical characterization** to the performance test to allow a further quality control

In this section, it is proposed guidance for the three following points to be included in the EU Ecolabel criteria

12.2.1 Laboratory requirements

The laboratory that carries out the tests can be an internal or an external laboratory. The laboratory can be approved to conduct testing to document effectiveness of the detergents if the following requirements are met:

a) the external analysis laboratory must meet the general requirements pursuant to standard EN ISO 17025 "General requirements for the competence of testing and calibration laboratories" or be and official GLP- approved analysis laboratory

b) the internal applicant analysis laboratory may be approved to conduct analyses if

- the authorities monitor the sampling and analysis of the process, or
- the manufacturer can show that there is conformity between a first-time test conducted as a parallel test between an impartial test institution and the manufacturer's own laboratory and that the manufacturer takes samples in accordance with a prescribed sampling plan

c) the internal manufacturer test laboratory can be approved to conduct testing to document effectiveness if the following additional requirements are met:

- it must be possible for ecolabelling organizations to monitor the performance testing
- the ecolabelling organization must have access to all data on the product
- the samples must be made anonymous for the test laboratory
- performance of the effectiveness test must be described in the quality control system

If the product does not have a standard test method or an EU Ecolabel test protocols, it can be assessed by means of internal or external laboratory tests or, as the last alternative by means of user tests. The minimum requirements for both kinds of tests are included below.

12.2.2 Laboratory tests

Laboratory test means that the test product is tested under laboratory conditions against a reference product (that should be well established/known on the market. It usually refers to the 2-3 lider brands on the market). The reference product shall be in the same product category and have the same area of use as the test product. The test product must be equally or more effective than the reference product and more effective than water in order to pass the performance test (e.g. the tested cleaning product must clean better than water alone).

The requirements of the performance test – laboratory test are:

1 **– Goal:** the product must through laboratory testing demonstrate equal or superior cleaning performance to a reference product with the same product category. The product must also clean better than water alone. If the product is marketed for both professional and consumer use it shall be tested against a professional product.

2 – **Procedure:** the test institute must fulfil these framework requirements so that the test provides a reliable result.

a) **Reference product**: the test product and comparative reference product shall be tested in the same way. Both products shall belong to the same category (professional/consumer or RTU/concentrated) and designed for the same area of use (WC, laundry, kitchen, etc) that is referred in the definition of the product group. The reference product must be recently purchased.

b) **Dosage**: the lowest specified dosage for normal soils/normal use of the test product and the reference product respectively shall be used for the performance test

c) **Water test**: a water test shall be performed using the same quantity of water as in the other tests. Data from the water test shall be collated together the other test data. The test and the reference product must both perform better than water alone.

The test shall be performed at the lowest recommended wash temperature, or the lower temperature the product claims that is efficient

d) **Soil**: the soiling used for each test must be relevant to the product's intended area of use of the product, homogenous and based on well-described and internationally available substances. Examples and minimum soil removal tests are shown in Table 49.

Table 49 Relevant soil for each detergent

Product/area of use	Soil(s)
Sanitary cleaner and WC cleaner	Fat/lime soap and limescale (de-scaling performance)
All-purpose cleaner and kitchen cleaner	Fat
Window and glass cleaner	Fat (footprints) and particulate matter (dust and/or soot)
Kitchen cleaner	Fat and burnt on soil
Consumer laundry detergents	Tea, coffee, red wine, fruit juice, tomato puree, carrot baby food, French squeezy mustard, chocolate, grass, grass/mud, blood, unused motor oil, frying fat, make up
Consumer dishwasher detergents	Coloured, bleachable soils (eg tea, ketchup, carrot juice, curry saffron, lipstick) Persistent burnt soil (burnt meat, burnt custard, burnt milk, burnt casseroles, etc) Dried starchy soil (amylase-specific) (eg porridge, starchy sauces, gravies, casseroles such as pasta, rice, potatoes, remains of dough/batter, baked-on residues) Dried, proteinaceous soil (protease-specific) (eg egg yolk, casseroles such as cheese, meat and eggs)

e) **Method of cleaning**: the method of cleaning shall be relevant to the product type. The test shall be performed for the soil types specified in Table 49 that are relevant to the product's area of use.

De-scaling performance can be determined by gravimetric analysis. Fat-removing performance is determined by reflectance. The removal of particulate matter can be determined by gravimetric analysis or reflectance.

g) **Description of the test:** the same number of repetitions shall be performed for the test product, reference product and water (it is proposed 20 times per product). One batch of soil that is sufficient to all tests shall be used. The soil shall be applied to at least 30 test pieces of relevant materials/surfaces.

The test shall be performed using a random selection of soiled test pieces, eg at least 10 pieces shall be chosen at random for the test product, the same number for the reference product and the same number for the water test.

The reflectance of all plates/surfaces/materials must be measured before the soil is applied, after the soil has been applied and after washing. Effectiveness is calculated separately for each plate/surface/material and recorded in a table

h) **Calculation of the wash effectiveness index (EFF):** it is calculated using the following formula:

$$EFF = (Rc - Rb) / (Ra - Rb)$$

Where:

Ra is the reflectance before soiling,
Rb is the reflectance after soiling and
Rc is the reflectance after washing.

This is performed for each individual product: the reference product, the test product and the water, getting the values for EFFp (product), EFFs (reference product) and EFFw (water).

3 - **Requirement levels to pass the test must fulfil**:

a) It must be shown with 95% unilateral confidence interval that the test product has a wash effectiveness that is greater than or equal to that of the reference product, account being taken of uncertainty.

b) EFFp > EFFs

c) Irrespective of the method of evaluation (a or b) the following shall be fulfilled: EFFp > EFFw

4 - **Reporting of the results**

The applicant must submit documentation providing that the product has been tested under realistic conditions, including:

a) surfaces and material soiled with spots that are representative for the kind of soiled expected in the areas where the products will be marketed

b) recommended dosage and at the corresponding water hardness at the lowest recommended wash temperature.

The applicant must submit documentation providing:

- the products ability to remove soiling from the surfaces or materials. In the case of laundry detergents the ability to launder slightly, moderately or heavily soiled articles (primary effect)
- the product or multicomponent system ability to perform other tasks such as dry the dishes, greying of white washing and colour fastness, staining of coloured washing, effect of rising agent on drying, ironing or mangling of the articles to be washed, etc (secondary effects)

c) an attachment with the chemical characterization to the performance test to allow a further quality control

12.2.3 User tests

The user test means that the product is distributed along with a questionnaire to a selection of test individuals/companies. The product is tested at least five times at each location. The tester compares the performance of the test product with that of the product they normally use (reference product). The reference product shall belong to the same product category and be intended for the same area of use. The tester shall then evaluate effectiveness based on the following parameters;

- ability to remove soil
- gentleness to the surface being cleaned
- performance

For a positive test result, 80% of the test individuals must respond that the product is equally or more effective than the reference product. The product shall perform better than water too. The user test is the last option to test the washing performance of the detergents and it is only recommended for professional products. Professional users have more experience through their profession of cleaning making such testing more relevant.

1- Conduction of the user test

This section describes the way in which a professional product test is to be performed, in case no standards or laboratory tests can be applicable. The purpose of the test is to demonstrate whether or not the test product for which an EU Ecolabel licence is sought is as good as or better than a comparative product and the water alone. The test must also demonstrate if the test product hams the surfaces that it is marketed for use on.

a) **Quality requirements:** at least 80% of the test persons must assess the product to be as good as or better than the reference product in order to fulfil the performance test in all the points and be satisfied or very satisfied with customer visiting arrangements

b) **Test individuals must be professional users of the cleaning product**. At least five professional users shall test the product. The five individuals shall be randomly chosen and shall come from five different organizations

c) **The comparative/reference product must not be the same as the test product** and must be normally used by the user. The test product and the comparative product may be produced by the same manufacturer

d) **Performance of the test**: The test must be performed on the type(s) of surface/materials relevance in relation to the recommendations of the product label. The dosage used must be the minimum dosage specified on the label for normal soil and the test water hardness. Likewise, the dosage of the comparative product must be the lowest recommended dosage for normal soil at the same water hardness

The duration of the test period must be sufficient for the test procedure to be used at least five times by the test user on the same place. For example, for dishwasher detergents it is recommended that the test period last at least four weeks with at least 400 cycles and for laundry detergents that the test period lasts at least four weeks.

2- Performance questionnaire

Each test individual must complete all questions on the questionnaire (one questionnaire shall be completed per product). The responses shall be tabulated indicating the number of responses and number of each answer. The applicant must also document which individuals have answered the questionnaire and the percentage of answers. It must be demonstrated that the recipe of the test product at the time of the performance test is the same as the submitted on application to the competent body.

The assessment of each test centre on the effectiveness of the product or multi-component system should be provided by answering questions related to the following aspects (or similar formulations):

For dishwasher detergents:

- the product's ability to remove soiling from the dishes
- the product's ability to dry dishes
- the respondent's satisfaction with the agreement on customer visits

For laundry detergents

- ability to launder lightly, moderately or heavily soiled articles to be washed
- an assessment of primary laundering effects such as dirt removal, stain removal capacity and bleaching effect must be rated
- assessment of secondary laundering effects such as greying of white washing and colour-fastness and staining of coloured washing
- how satisfied the test subject is with customer visiting arrangements

3- Documentation requirements/reporting of the results: the following documentation must be submitted to the competent body.

- a description of the way in which the test users were selected
- all raw data from the test must be specified
- the test procedure must be described in detail
- all reply forms received from the test users
- the overall result/all replies on the wash performance of the user test specified in a table/ a form. The response must be rated on a scale comprising at least three levels, eg 'insufficiently effective', 'sufficiently effective' or 'very effective'.
- With regard to how satisfied the test centre is with visit reporting arrangements, the categories must be "not satisfied", "satisfied" and "very satisfied"

12.3 Proposed common template

Criterion "Fitness for use"
Tests shall be carried out to ensure that the product has a satisfactory wash performance at the lowest recommended dosage for the water hardness according to (in descent order): - appropriate international standards (eg. modified standard EN 50242:2008) - EU Ecolabel protocols - well-known test procedures such as IKW procedures - laboratory tests, or - user tests The tests shall be carried out at the water temperature stated in the standards/protocols or at the lowest temperature the product claims to be effective at. The test shall be performed by a laboratory that meets the requirements in Appendix (to be added) If a laboratory tests is needed, the reference product is tested at the lowest recommended dosage that is stated on the packaging. If no dosage instructions are provided, the same dosage is used as for the test product.. The product shall be tested against another consumer product. If the product is marketed for both professional and consumer use it shall be tested against a professional product When applying for rinse aids in combination with dishwasher detergents, the rinse aid shall be used in the test instead of the reference rinse aid. For multifunctional products the applicant must submit documentation providing the effect of the claimed functions. ***Assessment and verification**:* The applicant shall provide documentation confirming that the product has been tested under the realistic conditions and following one of the above mentioned test methods. Information should be provided demonstrating: a) The recommended dosage at the corresponding water hardness and the lowest recommended wash temperature at which the product claims to be effective b) Type of spots that are representative for the kind of soiled expected in the areas where the products will be marketed c) The performance of the tests (all raw data from the test, test procedure descriptions, Information about the reference product against which the test product has been tested: market leadership, lowest commended dosage or dosage used (if no information is provided) and temperature, date of purchase and date of testing, etc) (d) The product's ability to remove soiling from the surfaces or materials and the effectiveness of other products the detergent shall be used with (eg. rinse aids) (results from the test conducted by the laboratory or reply forms from the user tests) (e) Documentation confirming the compliance within the laboratory requirements included in Appendix (to be added). If a user test is performed, the applicant should provide information on: (a) the way the test users were selected, all raw data from the tests and the test procedure (b) all reply forms received from the test users and the overall result on the wash performance of the user test specified in a table/a form. The response must be rated in accordance with Appendix (to be added) (c) information on how satisfied the test center is with visit reporting arrangements and the categories rated.

Regarding the product groups under revision, Table 50 shows the preferred option to test their fitness for use

Table 50 Recommended test methods for washing performance ascertaining

Product	Test method
LD	The revised EU Ecolabel performance test for consumer laundry detergents introduced in 2014 (20/06/2014) as a separate activity to this EU Ecolabel criteria revision. http://ec.europa.eu/environment/ecolabel/documents/Performance%20Test%20Laundry%20Detergents.pdf
IILD	Wash test clothes such as -WFK-PCMS-55 for industrial laundering processes (WFK-Cleaning Technology Research Institute, Germany). - EMPA 102 (Swiss EMPA-Test materials). -Wash clothes of DTI (Danish Technology Institute) for industrial washing processes or equivalent The measurement of secondary effects such as bleaching effect, bleaching/damage factor, ash content, greying and fluidity increase can for instance be made with multi wash test clothes and analysed according to standard ISO 4321 ''Surface active agents -- Evaluation of certain effects of laundering -- Methods of analysis and test for unsoiled cotton control cloth'' As an alternative to the laboratory test, a user test may be used to document effectiveness.
DD	The IKW performance test: 'Methods for ascertaining the cleaning performance of dishwasher detergents' available at http://www.ikw.org/fileadmin/content/downloads/Haushaltspflege/HP_DishwasherA_B_e.pdf or the modified standard EN 50242: Electric dishwashers for household use. Test method for measuring the performance
IIDD	Internal testing or user tests
APC	EU Ecolabel protocols 'Framework for testing the performance of all-purpose cleaners, window cleaners and sanitary cleaners' that can be found here: http://ec.europa.eu/environment/ecolabel/ecolabelled_products/categories/purpose_cleaners_en.htm IKW framework for testing of all-purpose cleaners, window cleaners and sanitary cleaners' cleaning performance: http://www.ikw.org/fileadmin/content/downloads/Haushaltspflege/HP_EQ-Allzweck-englisch.pdf IKW performance test 'Recommendation for the quality assessment of acidic toilet cleaners': http://www.ikw.org/fileadmin/content/downloads/Haushaltspflege/HP_EQ-Allzweck-englisch.pdf
HDD	EU Ecolabel framework for testing the performance of hand dishwashing detergents: http://ec.europa.eu/environment/ecolabel/documents/performance_test.pdf The IKW performance test 'Recommendation for the quality assessment of the cleaning performance of hand dishwashing detergents' method may be applied with the an adaptation[102]: http://www.ikw.org/pdf/broschueren/EQ_Handgeschirr_e.pdf

[102] 'Recommendation for the quality assessment of the cleaning performance of hand dishwashing detergents' with the adaptation that the dosage applied in the performance test is set at 2,5 ml of the reference detergent per 5 litres of water.

13 USER INFORMATION

13.1 Background

Information appearing on the packaging and/or information sheets shall provide useful information on how the product must be effectively used to achieve the best cleaning results whilst minimising the environmental impacts.
According to the information provided in the Preliminary Reports, the information given to consumers and professionals should be focused on the following points:

13.1.1 Dosage and avoidance of overdosing

Dosage instructions provide the information necessary for users to simultaneously optimise the product use to achieve the required performance, while minimising the environmental impact of the detergent. The LCA studies included in chapter 4 of the respective Preliminary Reports indicate that over-dosing has a significant impact on the overall environmental performance, as explained in Section 6.
The dosage needed to achieve an optimal performance depends on several factors, but especially on the hardness of the water used for washing, the degree of soiling and the wash load. Therefore, user knowledge and behaviour could be beneficially influenced by access to better information on both the hardness of water in their location and the characteristics of what a 'standard' wash is considered. Packaging design and use instructions can heavily influence ability to dose correctly, especially for loose powders and liquids.
The current EU Ecolabel criteria on consumer information include a reference to the proper dosage of the detergent as well as most of the revised national ecolabels schemes (see Table 51). This reference is not harmonized among the detergent products. In order to bring clarity in this point and to align the information given to the consumers and professional users, the text is proposed to be changed including the dosing instructions for various water hardness and various levels of soiling.

13.1.2 Water temperature and water consumption

Generally speaking in Europe, the water used in the washing processes is heated up by using fossil fuels. The source of energy – renewables or otherwise – has a significant impact on CO_2 emissions and climate change. Whilst the source of energy to be used in the washing processes cannot be enforced neither in the domestic consumer domain nor in the professional one, a rational and efficient use of the energy and water can help to decrease the environmental impacts due to the washing process.
Consumers and professionals are in the position to decide the water temperature for the washing process. Accordingly, precise and clear information is proposed for addition to the criterion which alerts users and consumers to the environmental benefits that might be achieved by an appropriate choice of water temperature. Similarly information should be added to encourage end-users to set wash full loads, saving water consumptions and reducing water pollution.
Most of the current EU Ecolabel criteria for detergents and Ecolabel criteria from other schemes include recommendations on these points. However, these recommendations are not harmonized among the products. Thus, the revision of the text proposes the recommendation on washing at the lowest temperature the product claims effectiveness (or as default temperature 50C for consumer dishwasher detergents and 30C for laundry detergents), diluting the product with cold tap water (if applicable) or washing beddings and clothes at 60C if the users suffer from allergies to house dust or infectious diseases (if applicable).

Similarly, the information should encourage users do not use running water but immerse the dishes (for HDD) and wash full loads (for laundry and dishwasher detergents)

13.1.3 Packaging recycling

Information about the end-of-life stage of the packaging and how the end users can help to reduce its environmental impact is important. This information is required to be included in other ecolabels while it is not present in the current EU Ecolabel criteria sets for detergents. However, recycling labels are mandated on packaging for other recently reviewed product groups, such as rinse-off cosmetics. It is proposed to include information on the packaging of the EU Ecolabel detergents too.

13.1.4 Labelling of ingredients

The requirement to indicate the type of enzyme has been removed to bring the criteria in line with consumer laundry and industrial and institutional laundry detergents criteria. The indication of the type of enzyme is in addition to the legal requirements in the Detergent Regulation (EC) No. 648/2004 regarding labelling (annex VII) and is felt to be unnecessary.

13.2 Current state of the information given to users

The existing labels provide similar but different information aspects to the users. The points addressed depend on the region to be marketed (e.g. dosage at different hardness levels), use of the products, intended users, etc. As seen in most of the schemes the information for the consumers is joint to the information appearing on the logo and to the claims of the product. In this revision, we proposed to separate these sections into two criteria to be in line with other EU Ecolabel criteria sets. Additionally, it is proposed to call this criterion "user information" as at this point there is a variety of names. Table 51 summaries the criterion on Consumer information or user information of selected ecolabelling schemes

Table 51 Summary of the current wording for consumer information or user information criteria in selected ecolabelling schemes

Label	Criteria
Industrial and institutional automatic dishwasher detergents (IIDD)	
EU Ecolabel	The following recommendations must appear on the packaging, and/or product information sheet or equivalent: - dose according to soil and water hardness, follow the dosing instructions - using this EU Ecolabel product according to the dosage instructions will contribute to the reduction of water pollution, waste production and energy consumption. **Information appearing on the EU Ecolabel:** The logo should be visible and legible. The use of the EU Ecolabel logo is protected in primary EU law. The EU Ecolabel registration/licence number must appear on the product, it must be legible and clearly visible. The optional label with text box shall contain the following text: - reduced impact on aquatic ecosystems - limited hazardous substances - performance tested The guidelines for the use of the optional label with text box can be found in the "Guidelines for use of the Ecolabel logo" on the website: http://ec.europa.eu/environment/ecolabel/documents/logo_guidelines.pdf

Consumer automatic dishwasher detergents (DD)	
Nordic labelling	The following should be clearly stated on the label: - the recommended dosage for soft water and a recommendation is to be given to use salt to soften the water in the dishwasher - information stating that the product is efficient at/from 50C (or lower if tested at a lower temperature) Exceptions: If multifunction products meet the performance requirement without added salt in the machine, the recommendation about salt does not need to be given. The requirement does not apply to rinsing agents.
Env. Choice NZ	The detergents shall be accompanied by instruction for proper use so as to maximise product performance and minimise waste. These instructions shall include information on reuse, recycling and/or correct disposal packaging The applicant shall take suitable steps to help the consumer respect the recommended dosage, for example making available a dosage device (e.g. liquid or powdered products), and/or by indicating the recommended dosage at least in ml (for powder or liquid products) A recommendation shall appear on the packaging for the consumer to content their water supplier or local authority to find out the degree of hardness of their tap water. All dishwashing detergents must display on the container a list of product ingredients that complies with the labelling requirements of the New Zeeland law. The following or equivalent words should be clearly displayed on the packaging: "all detergents have an effect on the environment. Always use the correct dose for maximum efficiency and minimum environmental impact. Use the lowest recommended temperature". Any proposed changes/alterations to this wording must be submitted to and approved by The Trust. All packaging shall include a website reference where a copy of the product data sheet can be obtained.
Singapore green labelling	Instructions requiring the appropriate use of the product to enhance performance and generate lesser waste (eg reuse/recycle and disposal methods) should be available to consumers. Product ingredients must be clearly visible on the product packaging in accordance with the labelling criteria stated in the Article 11 of the detergent directive and the amended version in 907/2006/EC
EU Ecolabel	The following information on text shall appear on the packaging: *a) Information on the packaging* This EU Ecolabel detergent works well at low temperatures (*). Select low temperature washing cycles on the dishwasher, wash full loads and do not exceed the recommended dosage. This will minimise both energy and water consumption and reduce water pollution. (*) the applicant shall insert here the recommended temperature or range at temperatures that shall not exceed 55C. *b) dosage instructions* Dosage instructions shall appear on the product packages. The recommended dosages shall be specified for the ranges of water hardness appropriate to where the product is marketed. The instructions shall specify how to make best use of the product according to the soil The applicant shall take suitable steps to help the consumer respect the recommended dosage, for example, by making available a dosage device (for powdered or liquids products) and/or by indicating the recommended dosage at least in ml (for powdered or liquid products). *c) Information and labelling of the ingredients.* The type of enzymes shall be indicated on the packaging **Information appearing on the EU Ecolabel:** The optional label with text box shall contain the following text: - reduced impact on aquatic ecosystems - limited hazardous substances - performance tested The guidelines for the use of the optional label with text box can be found in the "Guidelines for use of the Ecolabel logo" on the website: http://ec.europa.eu/environment/ecolabel/documents/logo_guidelines.pdf

Industrial and institutional laundry detergents (IILD)	
Env. Choice NZ	The detergents must be accompanied by instruction for proper use so as to maximise product performance and minimise waste. These instructions shall include information on reuse, recycling and/or correct disposal packaging The label, or an accompanying technical product data sheet, must include details of the recommended dosage (in ml or g) for in kg of laundry to be washed for different levels of soiling and for different water hardness. The following or equivalent words should be clearly displayed on the packaging: "*all detergents have an effect on the environment. Always use the correct dose for maximum efficiency and minimum environmental impact. Use the lowest recommended temperature*". Any proposed changes/alterations to this wording must be submitted to and approved by The Trust.
EU Ecolabel	Under the existing criteria, the following washing recommendations shall appear on the packaging: - wash at the lowest possible temperature - always wash with full load - dose according to soil and water hardness, follow the dosing instructions - if you are allergic to house dust, always wash bedding at 60C . increase wash temperature to 60C in case of infectious diseases - using this EU Ecolabel product according to the dosage instructions will contribute to the reduction of water pollution, waste production and energy consumption
Consumer laundry detergents (LD)	
Nordic labelling	**Dosage instructions** Water hardness for the recommended dosage must be stated in German degrees of hardness (ºdH). Water hardness must be expressed in ranges that are relevant to the geographic areas in which the product is on sale. See also requirement R9 regarding dosage limits for different degrees of soiling. **Mandatory consumer guidance on packaging** The Nordic Ecolabel with correct license number shall be present on the packaging. The label/packaging must clearly indicate the temperature at which the product has been performance tested, e.g. "Efficient at 40 °C" (In R19 it is stated which test temperatures should be used for the different product types). The following washing advices (or equivalent) shall appear on the packaging of laundry detergents (not applicable for stain removers). The washing advices may be present either as text or symbols. - Preferably wash with full load - Dose correctly according to soil and water hardness. Overdosing does not make the laundry cleaner and is harmfully for the environment - Reduce the temperature of your normal wash programmes to safeguard the environment - If you are allergic to house dust, always wash bedding at 60 °C or above - Run a 60 °C wash now and again with a bleach containing detergent (white wash powder detergent) and follow the machine manufacturer's recommendations regarding maintenance - Leave the machine open between washes In cases where the whole text on the label must to appear in two or more languages, e.g. due to official language minority considerations in the country, and the size of the packaging is too small to include all the washing advices above on the (for the size of the product) ordinary label, the applicant can be excepted from writing the last three washing advices on the label. In these cases the applicant has to ensure that the information regarding the last three washing advices will be available for the consumers otherwise (e.g. via advertising material or homepage). **Claims on the packaging** Products marketed as cold water products* should pass the performance test in R19 at the lowest indicated temperature where the effect of the product is stated - but maximum at 20 °C. Reference is still washed at 40 °C. *i.e. "cold water product" or similair text or symbol (for example washtub with 20 °C), indicating a normal user temperature at < 30 °C.

	A stain remover must always pass the performance requirements (R19) for any specific stain type for which the product claims to be effective. Documentation for other performance related claims shall be made available to Nordic Ecolabelling on request. If claims are made regarding the content of certified raw materials (e.g. organically grown ingredients), the total content in weight percent of these ingredients must be clearly stated on the pack (e.g. "contains x% organic ingredients"). The certification body, system or standard must be indicated. Documentation for certified ingredients must be provided according to R11.
Env. Choice NZ	The laundry detergents shall be accompanied by instruction for proper use so as to maximise product performance and minimise waste. These instructions shall include information on reuse, recycling and/or correct disposal packaging. The applicant shall take suitable steps to help the consumer respect the recommended dosage, eg making available a dosage device (for powdered or liquid products), and/or by indicating the recommended dosage at least in ml (for powdered or liquid products). A recommendation shall appear on the packaging for the consumer to contact their water supplier or local authority in order to find out the degree of hardness of their tap water. All laundry detergents must display on the container a list of product ingredients that complies with the labelling requirements of Article 11 of Regulation (EC) No 648/2004 and amended by Regulation (EC) No 907/2006. The following or equivalent words should be clearly displayed on the packaging: "*all laundry detergents have an effect on the environment. Always use the correct dose for maximum efficiency and minimum environmental impact. Use the lowest recommended temperature*". Any proposed changes/alterations to this wording must be submitted to and approved by The Trust. All labelling shall comply with the requirements of the HSNO legislation or the appropriate hazardous substance legislation for the country where the product is sold. All packaging shall include a website reference where a copy of the product data sheet can be obtained.
Singapore green labelling	Instructions guiding the appropriate use of the product to enhance performance and generate lesser waste (eg reuse/recycle and disposal methods) should be available to consumers. Product ingredients must be clearly visible on the product packaging in accordance with the labelling criteria stated in Article 11 of the Regulation (EC) No 648/2004 and the amended version in Regulation (EC) No 907/2006
EU Ecolabel	The following information on text shall appear on the packaging: - wash at the lowest possible temperature - always wash with full load - dose according to soil and water hardness, follow the dosing instructions - if you are allergic to house dust, always wash bedding at 60C . increase wash temperature to 60C in case of infectious diseases - using this EU Ecolabel product according to the dosage instructions will contribute to the reduction of water pollution, waste production and energy consumption **<u>Information appearing on the EU Ecolabel:</u>** The logo should be visible and legible. The use of the EU Ecolabel logo is protected in primary EU law. The EU Ecolabel registration/licence number must appear on the product, it must be legible and clearly visible. The optional label with text box shall contain the following text: - reduced impact on aquatic ecosystems - limited hazardous substances - performance tested
<u>All-purpose cleaners consumer use (APC)</u>	
Nordic labelling	The following should be clearly stated on the label: - the information text on the packaging must comply with Regulation (EC) No 648/2004 and the amended version in Regulation (EC) No 907/2006 - for products to be sold in Norway, documentation must also be submitted to demonstrate that

	'uten fosfat' (phosphate free) is displayed on the label.
Env. Choice NZ	**<u>Consumer cleaning products</u>** The product shall be accompanied by instruction for proper use so as to maximise product performance and minimise waste. These instructions shall include information on reuse, recycling and/or correct disposal packaging. If the product requires dilution before use, the recommended dosage at a normal level of soiling/normal use must be stated clearly on the primary packaging in ml/l diluting water. - a second well-known metric, such as teaspoons, shall additionally be given in brackets. However, if the packaging has an efficient and convenient dosing system that can provide an equally reliable dosage, an alternative metric (eg capfuls, squirts, or other) can be used. - the dosing instructions may be stated for various water hardness and for various levels of soiling All products must display on the container a list of product ingredients that complies with the labelling requirements of Article 11 of Regulation (EC) No 648/2004 and amended by Regulation (EC) No 907/2006. The following or equivalent words should be clearly displayed on the packaging: "*all laundry detergents have an effect on the environment. Always use the correct dose for maximum efficiency and minimum environmental impact. Use the lowest recommended temperature*". Any proposed changes/alterations to this wording must be submitted to and approved by The Trust. All labelling shall comply with the requirements of the HSNO legislation or the appropriate hazardous substance legislation for the country where the product is sold. All packaging shall include a website reference where a copy of the product data sheet can be obtained. The product data sheets shall be prepared and available on a website with public access and shall include: - the product name - contact details of the NZ importer, supplier or manufacturer including a phone number - listing of all hazardous ingredients added to the product - identification of any hazards associated with the product as sold and used - directions for use, including relevant dilution rates and dose rates, and - disposal information **<u>Industrial and institutional cleaning products</u>** The product shall be accompanied by instructions for proper use so as to maximise product performance and minimise waste. These instructions shall include information on reuse, recycling and/or correct disposal of packaging. The manufacturer's label must include English and a graphical representation or icons, to assist illiterate or non-English speaking personnel. - icons shall be included to explain dilution, use and appropriate PPE only, appropriate hazard symbols must also be included on the label, where necessary - the recommended dosage and dilution instructions at a normal level of soiling/normal use must be stated clearly on the primary packaging in ml/l diluting water - a second well-known metric, such as teaspoons, shall additionally be given in brackets. However, if the packaging has an efficient and convenient dosage system that can provide an equally reliable dosage, an alternative metric (eg capfuls, squirts, or other) can be used. - the dosage instructions may be stated for various water hardness and for various levels of soiling All products must display on the container a list of product ingredients that complies with the labelling requirements of Article 11 of Regulation (EC) No 648/2004 and amended by Regulation (EC) No 907/2006. The following or equivalent words should be clearly displayed on the packaging: "*all laundry detergents have an effect on the environment. Always use the correct dose for maximum efficiency and minimum environmental impact. Use the lowest recommended temperature*". Any proposed changes/alterations to this wording must be submitted to and approved by The Trust. Dilution from the cold tap water shall be recommended. All labelling shall comply with the requirements of the HSNO legislation or the appropriate

	hazardous substance legislation for the country where the product is sold. The label or accompanying documents must specify that the product is intended for use in commercial and institutional facilities only. No claim or suggestion, on the packaging or by any other means, shall be made that the product has an antimicrobial action.
Good Env Choice AU	Suitable information must be supplied with the product or made available to the public. Information that must be included on the label includes: - instructions for correct use including doses or dilution rates for varying levels of soiling if applicable - all hazards associated with the product, its use, storage or disposal - complete ingredients listing, according to Annex VII of Directive 89/542/ECC on labelling of detergents and cleaning products
Green Seal	**<u>Consumer cleaning products</u>** The label must include detailed instructions for proper use to maximise performance and minimise waste. When the product is intended to be diluted with water by the consumer prior to use, the label shall clearly state and prominently that dilution with water from the cold tap is recommended and shall state the recommended level of dilution in commonly understood measures The label must include proper disposal instructions. If the product is a towelette or other disposable wipe product, the label must clearly indicate proper disposal of the wipes. For the package disposal, the label must include clear recycling instructions If plastic, the packaging must be clearly marked with the appropriate Society of the plastic industry symbol to identify the type of plastic for recycling. **<u>Industrial and institutional cleaning products</u>** The manufacturer's label shall state the following - clearly and prominently that dilution with water form cold tap is recommended and shall state the recommended level of dilution - explicitly disposal, recycling, reuse and refill instructions, proper and clear instructions fo ruse and appropriate precautions and recommendations for the use of personal protective equipment - declaration if a fragrance has been added or not
EU Ecolabel	Dosage instructions. Information on the recommended dosage of APCs shall appear on the packaging. In the case of a concentrated product, it shall be clearly indicated on the packaging that only a small quantity of the product is needed compared to normal (eg diluted) products. The following text (or equivalent) shall appear on the packaging: *''proper dosage saves costs and minimises environmental impacts''* The following text (or equivalent) shall appear on the packaging of ready-to-use all-purpose cleaners: *''the product is not intended for large-scale cleaning''* The following text (or equivalent) shall appear on the product in text or as pictogram: *''keep away from children* *''don't mix different cleaners''* *''avoid inhaling sprayed product''* only for products that are packaged as sprays
<u>Hand dishwasher detergents consumer use (HDD)</u>	
Env. Choice NZ	The HDDs shall be accompanied by instructions for proper use so as to maximise product performance and minimise waste. These instructions shall include information on reuse, recycling and/or correct disposal of packaging. The product must have information on the recommended dosage on the primary packaging. The dosage must be quoted in whole ml for 5 l of dishwashing water. - A second well-known metric, such as teaspoons, shall additionally be given in brackets. However, if the packaging has an efficient and convenient dosing system that can provide an equally reliable dosage, an alternative metric (e.g. capfuls, squirts, or other) can be used. - The dosing instructions may be stated for various water harnesses and for various levels of soiling or for various levels of washing up.

	All HDDs must display on the container a list of product ingredients that complies with the labelling requirements of Article 11 of Regulation (EC) No. 648/2004 of the European Parliament and of the Council of 31 March 2004 on Detergents, as amended by Regulation (EC) No 907/2006 of 20 June 2006. The following or equivalent words should be clearly displayed on the packaging. "*All detergents have an effect on the environment. Always use the correct dose for maximum efficiency and minimum environmental impact.*" Any proposed changes/ alterations to this wording must be submitted to and approved by The Trust. All labelling shall comply with the requirements of HSNO legislation or the appropriate hazardous substance legislation for the country where the product is sold. All packaging shall include a website reference where a copy of the product data sheet can be obtained.
EU Ecolabel	The product shall bear the following information on the packaging: - "Do not use running water but immerse the dishes, and use the recommended dosage" (or equivalent text) - Information on the recommended dosage shall appear on the packaging in a reasonably sufficient size and against a visible background. The information shall be provided in millilitres (and tea spoons) of product for 5 litres of dishwashing water suitable for 'dirty' and 'less dirty' dishes An indication of the approximate number of washes that the consumer can perform with one bottle is recommended but voluntary.

13.3 Proposed common template

The proposed common template tries to harmonize the different wording and points of information that should be given to the users in order to get the maximum performance of the product at the minimum environmental impact. Two different criteria are proposed: "User information" and "Information appearing on EU Ecolabel".

Criterion "User information"
The detergent shall be accompanied by instructions for proper use so as to maximise product performance and minimise waste. These instructions shall be legible or include graphical representation or icons and include information on: - dosing instructions for various water hardness and various levels of soiling. a) if applicable, the recommended dilution instructions at a normal level of soiling/normal use in ml/l should be included. A second well-known metric shall, if applicable, be given in brackets. If the packing has an efficient and convenient dosage system that can provide an equally reliable dosage, an alternative metric (eg capfuls, squirts, or other) can be used. c) information on the water hardness or where this information can be found out shall be included or alternatively, the dosing instructions shall refer to the water hardness where the product is intended to be marketed - recommendation on washing at the lowest temperature: the applicant shall: a) recommend washing at the lowest temperature the product claims effectiveness (or as default temperature 50C for consumer dishwasher detergents and 30C for laundry detergents) b) encourage users to dilute the product with cold tap water (if applicable) c) recommend washing beddings and cloths at 60C if the users suffer from allergies to house dust or infectious diseases. - water saving measures: a) do not use running water but immerse the dishes (for HDD) b) wash full loads (for laundry and dishwasher detergents) - reuse, recycling and/or correct disposal packaging - environmental information: ''All detergents have an effect on the environment. Always use the correct dose for maximum effectiveness, the lowest recommended temperature (and wash full loads). This will minimize both energy and water

consumption and reduce water pollution''.

The applicant shall take suitable steps to help consumers respect the recommended dosage, making available a dosage device and/or indicating the recommended dosage in a well-known metric.

Assessment and verification The applicant shall provide a sample of the product packaging, including the label.

14 INFORMATION APPEARING ON THE EU ECOLABEL

Information on the label is useful for reinforcing messages that endorse the user's or consumer's choice of this product over non-EU Ecolabel alternatives. A number of aspects could be described drawing on elements of the criteria and currently the different EU Ecolabels propose different aspects to be promoted (Table 52).

Table 52: Aspects mentioned in the "Information on EU Ecolabel" criterion

Claim on label	ROC	HDD	APC	LD	IILD	DD	IIDD
Fulfils strict biodegradability requirements	Yes						
Limits packaging waste/ Reduced packaging waste	Yes	Yes	Yes				
Reduced impact on aquatic life		Yes	Yes	Yes	Yes	Yes	Yes
Reduced use of hazardous substances/Limited hazardous substances		Yes	Yes	Yes	Yes	Yes	Yes
Clear user instructions		Yes	Yes				
Performance tested.				Yes	Yes	Yes	Yes

Harmonisation and standardisation of claims

According to Article 8 (3b) of the EU Ecolabel Regulation 66/2010, for each product group, key environmental characteristics (typically three) of the ecolabelled product may be displayed in the optional label with text box. The guidelines for the use of the optional label with text box can be found in the 'Guidelines for the use of the EU Ecolabel logo' on the website: http://ec.europa.eu/environment/ecolabel/documents/logo_guidelines.pdf.

The EU Ecolabel Regulation limits text to factual information regarding the product properties and does not permit statements regarding use. Further, the information may not mislead product users or imply that non-EU Ecolabel products do or may not have the same beneficial properties. For example, the recent revision to the Rinse-Off Cosmetics criteria revealed this principle as stakeholders admitted that such statements would be prohibited under the Cosmetics Regulation, for example. Caution therefore needs to be applied in determining how EU Ecolabel claims are phrased.

As packaging is not considered as one of the most important aspects of an EU Ecolabel product in the detergents group, it is proposed to keep the following three claims for all product groups:

- reduced impact on aquatic ecosystems,
- limited hazardous substances,
- performance tested.

14.1 Proposed common template

Criterion "Information appearing on the EU Ecolabel "
The logo should be visible and legible. The use of the EU Ecolabel logo is protected in primary EU law. The EU Ecolabel registration/licence number must appear on the product, it must be legible and clearly visible. The optional label with text box shall contain the following text: - reduced impact on aquatic ecosystems - limited hazardous substances - performance tested **Assessment and verification** The applicant shall provide a sample of the product packaging, including the label.

15 SUSTAINABLE SOURCING OF PALM OIL, PALM KERNEL OIL AND THEIR DERIVATIVES

15.1 Proposed common template

Proposed addition
Ingredients used in the product which are derived from palm oil or palm kernel oil must be sourced from plantations that meet the criteria for sustainable management that have been developed by multi-stakeholder organisations who have a broad based membership including NGOs, industry and government.
Assessment and verification: the applicant shall provide third-party certifications that the palm oil used in the manufacturing of the product originates from sustainable managed plantations. Certifications accepted shall include RSPO (by identified preserved, segregates or mass balance) or any equivalent scheme based on multi-stakeholder sustainable management criteria. For chemical derivatives of palm oil it is acceptable to demonstrate sustainability for these through book an claim systems such as GreenPalm or equivalent.

15.2 Rationale and discussion

Surfactants can either be derived from oleochemical or petrochemical sources, and there are environmental impacts associated to both types[103]. The environmental impact of surfactant origin was investigated in the sensitivity analysis conducted as part of the technical analysis presented in the Preliminary Reports (for example in Section 4.7.2 of the APC and HDD reports). This study found that the natural land transformation impact category experienced the greatest change when replacing a surfactant of oleochemical origin with one of petrochemical origin. However, the study also found that the available life cycle data for surfactants was outdated and unreliable.

Palm oil, palm kernel oil and their derivatives are commonly used oleochemical raw materials for the surfactants used in detergent products. They, along with coconut oil, are typically used with petrochemical raw materials to form surfactants of mixed origin, which account for around 50% of the surfactants used in detergents and maintenance products in Europe[103,104]. Currently the percentages of palm oil and coconut oil used are not known and largely depend on market availability and prices[104].

As surfactants are an essential component of detergents products, understanding the environmental impacts linked to the choice of their origin is important. This is especially true if the EU Ecolabel criteria were to encourage the use of surfactants for one origin over another. Although some of the benefits of moving away from petrochemical-based ingredients may seem obvious, there are ecological, economic and social concerns surrounding their replacements.

Procter & Gamble published a report named 'Natural and Synthetic Surfactants – Which one is better?'[105] The report aims to investigate the pros and cons between surfactants from oleochemical and petrochemical origin.

The study concluded that a total substitution of petrochemical surfactants for oleochemicals ones is not recommended for the following reasons:

- It would be more difficult to meet the wide range of consumer needs, such as wash conditions, with oleochemical surfactants alone,
- Surfactants from both origins are comparable in terms of the key environmental indicators (biodegradation, toxicity and removal by sludge treatment),

[103] Some facts about 'natural' cleaning products, American Cleaning Institute. Available from: http://www.cleaninginstitute.org/sustainability/some_facts_about_4.aspx

[104] IKW Fact sheet: Facts on the use of palm (kernel) oils in detergents and maintenance products for private households in Germany. March 2013. Available from: http://www.ikw.org/fileadmin/content/downloads/Haushaltspflege/HP_Facts-News-Palmoil.pdf

[105] Natural and synthetic surfactants – which one is better? Procter & Gamble 2012, available from http://www.scienceinthebox.com.de/en_UK/programs/natural_synthetic_en.html

- Life cycle studies show that replacing petrochemical with oleochemical surfactants does not lead to significant savings in energy consumption or reductions in water or air emissions.

The Nordic Swan Ecolabel considered the possibility of restricting the use of materials from non-renewable origin in its criteria for detergent products. The following was stated[106]:

- At present, the overall benefit to climate change of switching from non-renewable raw materials to renewable raw materials is unclear,
- An increase in demand for renewable raw materials would lead to an increase in pressure for arable land and may result in deforestation and/or a reduction in food supply,
- Availability of renewable and sustainable raw materials for detergents may be limited and expensive.

The Council for LAB/LAS Environmental Research has reported the following[107].

- LAS manufacture has much lower emissions to air, water and land. The emissions total for LAS manufacture is 184 kg per 1,000 kg of product, for oleochemical surfactants this ranges from 278 kg to over 379 kg.
- Production of natural oils would need to increase by around 4 million tons per year in order to accommodate surfactant demands. This would require a significant increase in land use for surfactant production and, consequently, natural habitat destruction.

From a functional view point, there is no clear advantage to using oleochemical derived surfactants over petrochemical ones – they are not more biodegradable and still require a significant amount of processing. However, as the topic of sustainable palm oil gains momentum, many consumers are expressing interest in this type of materials. Industry has responded with adopting sustainable palm oil sourcing policies, for example Unilever has committed to sourcing all of their palm oil from known and certified sources by 2020.

Stakeholders requested the inclusion of a criterion on sustainable source of renewable raw materials in EU Ecolabels related to detergent products. The technical analysis aspect of the sourcing of oleochemical raw materials, such as palm oil, has shown a significant impact on the overall environmental performance of the product, so measures for encouraging the use of oleochemical raw materials for sustainable sources seem reasonable. At the time of writing of this report, only information was available on certification schemes for palm oil, palm kernel oil and their derivatives, thus the horizontal criterion proposed concerns these substances. For example, since 2004, the Roundtable on Sustainable Palm Oils (RSPO) proposes principles and criteria for certified sustainable palm oil. If further information is gathered showing the existence and the credibility of an equivalent certification scheme for coconut oil, the sustainability requirement can be extended to this type of oil.

Other ecolabelling schemes have requirements on sustainable sourcing of renewable raw materials. A summary of the approaches adopted by other schemes can be found in Table 53.

Table 53: Approaches to renewable materials adopted by various ecolabel schemes

Scheme	Criterion
Nordic labelling	*No requirements*
Env. Choice NZ	The licence applicant (or holder) must have an effective purchasing policy for all palm oil, palm kernel oil (or derivatives) or raw materials that are manufactured from palm kernel oil (including surfactants) to maximise the use of palm oil and palm kernel oils from sustainable

[106] About Nordic Ecolabelled Laundry detergents and stain removers, Criteria Version 7, Background document 19 February 2014. Available from: http://www.ecolabel.dk/kriteriedokumenter/006e_7_Background_Document.pdf

[107] Oleochemical and petrochemical surfactants, Council for LAB/LAS Environmental Research, available from: http://www.cler.com/facts/oleochemical.html

	sources. This shall include implementing a preferential purchasing policy that includes the following stepped policy: i. Purchasing raw materials from suppliers which contain RSPO-certified sustainable palm oil or palm kernel oil ii. Purchasing raw materials which use palm oil or contain palm kernel oil from suppliers who have policies in place to purchase certified sustainable palm kernel oil or who support sustainable palm oil and palm kernel oil through GreenPalm and to increase the percentage over time; Where suppliers of raw materials who have policies around sustainable palm oil and palm kernel oil are not available, directly purchasing and redeeming GreenPalm certificates for the volume of palm oil and palm kernel oil used within the product.
Good Env. Choice	If palm oil is used as a raw material in surfactant production, the surfactant manufacturer or the palm oil supplier must be a member of the Roundtable on Sustainable Palm Oil (RSPO) or be able to show that the palm oil used to produce the surfactants comes from a plantation that is certified in accordance with RSPO's sustainable cultivation rules.
Good Env. Choice. AUS	**Palm oil:** A minimum of 20% of palm oil and palm oil derivatives used in the product must be Roundtable on Sustainable Palm Oil (RSPO) certified (identity preserved, segregated or mass balance) or equivalent, with the remainder required to be offset by 'Book and Claim' system such as GreenPalm, or equivalent. Additionally, applicants must commit to increasing the total percentage of RSPO certified palm oil and palm oil derivatives used in products by 10% each year. Exemption: If only chemical derivatives of palm oil are used in the product, it is acceptable to demonstrate sustainability for these through book and claim systems such as GreenPalm in case RSPO certified palm oil derivatives are not available on the market. **Palm kernel oil:** The applicant/licensee must make a positive contribution to the production of sustainable and responsibly grown palm kernel oil by either:: • Purchasing, for use in the product, any amount of certified sustainable palm kernel oil (CSPKO) and/or palm kernel oil derivatives that contain or are manufactured using CSPKO; or • Purchasing all palm kernel oil and palm kernel oil derivatives used in the product, from suppliers that are RSPO members; or • Ensuring palm kernel oil used in the product is offset by the supplier or the applicant/licensee using a 'Book and Claim' system such as GreenPalm, or equivalent.
Green Seal	*No requirements*
EU Ecolabel	*No requirements*
Revised EU Ecolabel	Ingredients used in the product which are derived from palm oil or palm kernel oil must be sourced from plantations that meet the criteria for sustainable management that have been developed by multi-stakeholder organisations who have a broad based membership including NGOs, industry and government.

15.3 Consultation questions

1	Should a criterion on sustainable sourcing of palm oil and palm kernel oil derivatives be included?
2	Is this approach inaccessible for SMEs?

16 APPENDIX X. TEMPLATE FOR DEROGATIONS

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE
Institute for Prospective Technological Studies (Seville)
Sustainable Production & Consumption Unit

EU Ecolabel .....
Substitution information and Derogation request form

1. Common information requirements

To be treated as confidential?	☐Yes ☐No

Contact name	
Organisation	
Email	
Telephone No.	
Supplementary documents attached	*Please list additional evidence provided*

1a. Chemical substance name(s)	
1b. CAS, EC or Annex VI numbers	*The CAS No shall always be provided*
1c. Current EU regulatory status	*E.g. notified, on or proposed for the SVHC candidate list, registered, authorised*
1d. CLP Classifications from the EU Ecolabel hazard listing	*Please specify the source and evidence for the classification(s).*
1e. Proportional contribution to final product classification (for mixture ingredients)	*This is relevant for mixtures where the CLP rules shall be used to classify the final product mixture.*
1f. Existing scientific evidence and risk assessments relating to the substance	*E.g. REACH dossiers, ECHA evaluations, peer reviewed scientific research/screening exercises.*
1g. Functional need and significance to the final product	*What technical function does it provide and why is it needed? The need for the substance to be present in the product shall be detailed based on specific consumer requirements or standards.*

1h. Typical concentration in the final product and specific components or articles	*This should be indicative include ranges where this varies according to function.*

2. Additional information required for <u>derogation requests</u>

2a. The relevance of the hazard classification(s) along the life cycle of the product (e.g. manufacturing, use, disposal)	*Where the risks of exposure to the hazard may occur e.g. workforce exposure, wastewater release, consumer exposure. Scientific evidence relating to risks of exposure.*
2b. Market availability of alternatives and the potential for substitution	*Market availability and technical status of alternatives – why are they currently not suitable? This shall be substantiated with technical evidence*

3. Additional information required about <u>substitutes</u>

3a. Comparative evaluation of environmental performance	*Identification of substances that can/have been substituted and supporting evidence of the improvement for specific hazards i.e. CLP classifications, reference to scientific research/screening exercises.*
3b. The relevance of the hazard substitution along the life cycle of the product (e.g. manufacturing, use, disposal)	*Evidence of where the greatest improvement potential along the lifecycle can be detected e.g. through reduced workforce exposure, wastewater release, consumer exposure.*
3c. Compliance with product performance and functional requirements	*Verifiable evidence that the substitute fulfills the same functional requirements and technical needs e.g. fitness for use test results, specifications*
3d. Market diffusion and technical maturity	*Evidence of the market availability and technical maturity of substitute(s)*