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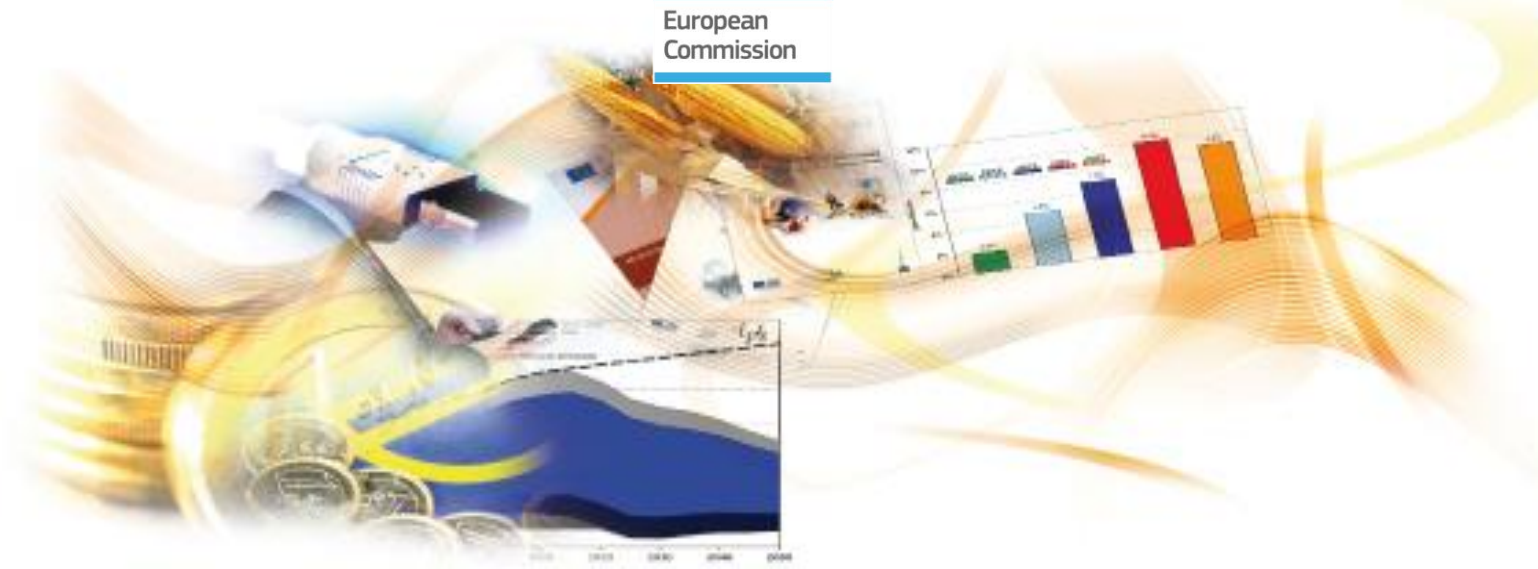

J R C T E C H N I C A L R E P O R T S

Revision of the European Ecolabel Criteria for: WOODEN FLOOR COVERING

Technical Report 3.5:
Draft criteria proposal for revision of ecological criteria

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Abstract
The EU Ecolabel criteria for wxxxxxxxxxxxxxxxxx

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1 INTRODUCTION

This document is intended to provide the background information for the revision of the Ecolabel criteria for Wooden Floor Coverings. The study has been carried out by the Joint Research Centre's Institute for Prospective Technological Studies (JRC-IPTS) with the technical support from Life-Cycle Engineering (LCE). The work is being developed for the European Commission's Directorate General for Environment.

The main purpose of this document is to evaluate the current criteria and discuss if the criteria are still relevant or should be revised, restructured or removed. This document is complemented and supported by the preliminary report[i] released in September 2014, which consists of a series of chapters addressing:

- scope and definition
- market analysis
- technical analysis
- improvement potential

and a first and second technical reports (TR1.0 and TR2.0, respectively) that were released in September 2014 and April 2015 including the first and second criteria proposals, as well as the feedback from the stakeholders of the project and further research carried out by this group of authors. The first draft version of the technical report (TR1.0) was built the basis for the first Ad-Hoc Working Group (AHWG) meeting which took place in October 2014 in Seville (Spain). The second draft version of the technical report (TR2.0) was the basis of the discussions held during the second AHWG meeting which was placed in May 2015 in Brussels (Belgium). The discussions held in both AHWG meetings are publicly available [i.]

Moreover, during the course of the revision process two general questionnaires on the scope and improvement potential as well as queries specific to certain criteria were sent out to selected stakeholders. The target groups were industry, Member States, NGOs and academia representatives. The specific information, views and suggestions arising from questions asked were reflected in the preliminary report and were taken into consideration as far as possible in the proposals for the criteria revision.

The current revised technical report (TR3.0) provides an update of the criteria development process based on new information (stakeholder's discussion at the 2nd AHWG meeting, further stakeholder inputs following the meeting, views and suggestions arising from the second questionnaire and further desk research). The structure of this technical report has been slightly changed from previous technical reports. It consists of the following parts:

- **Introduction**: this section describes the goal and content of the document, the sources of information and the coming steps in the project. This section aims at being a link between the information and deliverables already published and the new draft of the criteria. Among the different sources of information listed and summarized in this section especial attention should be paid to the link between key environmental aspects of this product group and the criteria proposals.

- **Assessment and verification:** this section includes the desirable requirements that a laboratory should fulfil to be qualified to conduct the proposed tests. Although certification is not mandatory in this proposal there are several well-known standards that guarantee the reproducibility and repeatability of the testing and that are an asset for those that comply with.

- **Criteria proposal:** this section presents the last and most updated EU Ecolabel criteria proposals for the product group "Wooden floor coverings". The proposal is presented in a blue box and followed by a brief rationale. The rationale is based on the most relevant aspects found out along the project and not only in those investigated since the 2nd AHWG meeting.

A tracking of the development of the criteria can be found in the section "Table of Comments" and in the previous technical reports (TR1.0 and TR2.0)

- **Table of comments:** this section consists of all the comments and feedback reported by the stakeholders from the 2nd AHWG meeting up to today and presented in an anonymous way. The section is completed by the assessment of the stakeholder's feedback, further research on the points highlighted by the participants and an explanation on how they triggered the changes on the criteria leading to the current criteria proposal.

Comments were classified under three categories:

a) *Accepted:* the comment is fully integrated in the new criterion wording

b) *Partially accepted:* this category includes those comments that either point out at a good idea that is integrated in the new criterion wording or suggest some modifications of the criteria wording and that even if they are not literately introduced, they are partially introduced.

c) *Rejected:* the comment is not on board in the proposal. This fact can be due to different reasons such as lack of standards to perform the measurement, creation of market restrictions/distortions, etc

d) *Acknowledged*: this category includes comments that supply information to the report but that they don't lead to modification in the criteria wording

1.1 METHODOLOGY AND SOURCES OF INFORMATION

The revision of the EU Ecolabel criteria for Wooden Floor Coverings and the revision of the scope and definition is based on the most recent literature publicly available. No additional research was carried out in this project.

Regarding the scope and definition of the product group, different information sources such as publications in scientific journals, publications by industry associations and companies, national and international legislation and voluntary schemes were revised. These publications led the authors to identify the most relevant environmental impacts of each product included into the product group.

Of remarkable relevance was the information related to the market and the changes that have been performed during the last years. This information was mainly provided by official statistics of end products such as Prodcom and by the European producers associations.

The revision of the environmental impacts of the products is based on LCA and environmental assessment studies published by independent institutions and the industry. Environmental product declarations (EPDs) that provide LCA results were widely reviewed. LCA evaluates a product's environmental impacts throughout its various life stages from raw material sourcing and extraction through end-of-life disposal or recycling and provides a comprehensive picture of the amount of energy, water, and materials consumed in the production and use of a product. The results reported in a EPD ensures that manufacturers follow a standard method and format to inform/report the life cycle data with clarity, accuracy and getting verified product information.

All the revised studies were either LCA from "cradle to gate" or from "cradle to grave" as represented in Figure 1.The large number of studies, their soundness and coverage led the authors conclude that it was no need to carry out additional studies on this aspect.

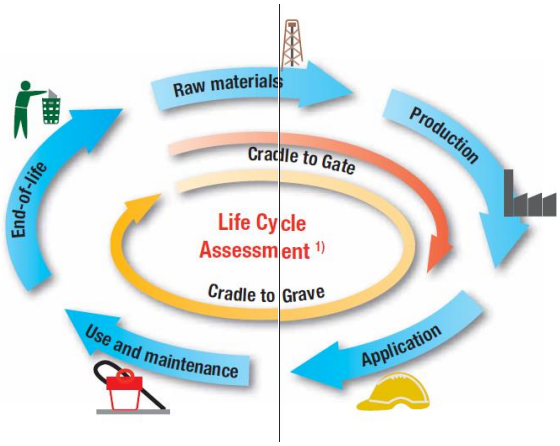

Figure 1. Types of life cycle assessments

Finally, the revision of the EU Ecolabel criteria largely considers the personal information provided by the stakeholders during the two AHWG meetings held as well as during bilateral meetings. The information related to the revision of the EU Ecolabel criteria is summarized in the series of TRs while the information described above is mainly included in the preliminary report.

1.2 SUMMARY OF THE PRELIMINARY REPORT and LINK TO THE EU ECOLABEL CRITERIA

This section starts with the product name, scope and definition of the product group and subsequently summarizes the key market data and environmental impacts of the floor coverings and the relation to the revised criteria.

The product name, scope and definition state clearly what is included in this product group setting the boundaries of the study and reflecting the current situation of these products in Europe.

The key environmental impacts were studied considering the boundaries previously mentioned. The environmental impacts were assessed by means of LCA and non-LCA studies and identify the main hotspots along the life cycles of the product.

EU Ecolabel criteria aim at reducing the environmental impacts of the products along their whole life cycle. Therefore, the EU Ecolabel criteria should be linked to the main identified environmental hotspots and should be proportional and feasible (suitable benchmarks and verifying wordings). Table 1 included in section 1.2.2 shows the relationship between the environmental hotspots and the revised EU Ecolabel criteria including a short explanation on how it is tackled.

1.2.1 Product group name, scope and definitions

Product group name:
Wood, wood-based, cork, cork-based, bamboo and bamboo-based floor coverings

Product scope
The product group of 'Wood, wood-based, cork, cork-based, bamboo and bamboo-based floor coverings' shall comprise indoor floor coverings, including wood floorings, laminate floorings, cork floor coverings and bamboo floorings which are made, for more than 80 % in mass (in the final product), from wood, wood-based, cork, cork-based, bamboo, bamboo-based and/or plant-based materials or fibres. Synthetic fibres are not permitted in any of the composing layers. The scope of this product group does not apply to wall coverings, coverings for external use or with a structural function. The scope does not apply for levelling compounds

Product scope
Assessment and verification
The applicant shall provide the following information about the floor covering: - brand/trade name[ii] - a description of the product and the raw materials or substances involved: percentage composition of the raw materials or substances in the flooring if possible in mass including any additive and surface treatment, when relevant. - a description of the manufacturing procedure. Suppliers of raw materials or substances shall be described with the name of the business, production site, contact details and description of the production step(s) they carried out or are part of. The product data sheet, environmental product declaration (EDP) or equivalent document can be accepted for the compliance of this criterion if it includes the listed information is included.

Product definitions
Wood flooring means, in accordance with prEN 13756, an assembly of wood elements pre-assembled boards or parquet panels which constitute the wearing surface of the floor. A wood floor covering can be either unfinished or be prefinished in a factory. Unfinished wood flooring, once installed, is sanded and then finished on site. ***Laminate floorings*** means in accordance with EN 13329 'rigid floor covering with a surface layer consisting of one or more thin sheets of a fibrous material (usually paper), impregnated with aminoplastic thermosetting resins (usually melamine), pressed or bonded on a substrate, normally finished with a backer'. ***Cork floor coverings*** means floor coverings made of granulated cork mixed with a binder, and then cured or several layers of cork (agglomerated/ veneer) that can be pressed together with glue. *The cork floor coverings can be divided into natural cork tiles* (the main component of which is agglomerated composition of cork, intended to be used with a finish) *and in engineered cork panels* (consisting of several layers including a fibreboard the main component of which is agglomerated cork or has cork as technical solution, intended to be used with a finishing wear layer). ***Bamboo floor coverings*** means made of bamboo in solid pieces or in agglomerates mixed with a binder

Rationale of proposed name, scope and proposed definitions

- changing the name of the product to include all the possible raw materials and avoid misleading product group names for the consumers
- lowering the minimum threshold content of wood- based and plant-based materials in the floorings and including the condition that synthetic fibers cannot be accounted as plant-based material
- removal of unnecessary adjectives regarding the function of the flooring in the buildings and inclusion of others to better characterize these types of floorings.
- introduction of a list of documents to be provided to better assess the composition and type of floorings that apply for the EU Ecolabel

The name of the product group is proposed to be changed from "wooden floor covering" to "**Wood, wood-based, cork, cork-based, bamboo and bamboo-based floor coverings"** in order to better reflect the presence of other materials different from wood that can take part in the floor coverings. In this sense, the name aims at better informing about all the different materials the floorings can be made of (eg non-wooden materials such as cork, bamboo and their derivative materials or adhesives) so that consumers don't have misleading information.

The requirements regarding the use of biocidal products have been removed from the definition and are now included as part of criterion 3. The use of biocides is not permitted at any stage of the production process[iii].

The proposed change concerning the mass of plant-based materials threshold is due to the changes in the European market in the recent past. Nowadays the dominant product in the European wooden floor covering market is the laminate flooring (representing 70 % of the market share[i]). This product consists of several layers of mainly wood-based material along with other materials (eg paper or melamine). Its average wood-based material content amounts to 75-80 % in mass having no evidence that the higher the wood-based material content in the product the better its environmental performance is. In order to prevent a possible worsening environmental performance an exclusion of synthetic fibers is proposed in any composing layer.

Reference is included in the product scope about the non-structural function of these floor coverings in the buildings. It is implicitly understood that floor coverings are not prepared to perform structural functions in the building. Excluded from this product group is the concept of floor levelling components, a combined name for products and methods used to create a surface that is either ready for a floor covering or which can itself constitute a finished floor surface

Further information can be found in 4.1

1.2.2 Key environmental aspects and relation with the criteria proposal

The *market analysis* reveals that the most common kind of wooden flooring in the current EU market is laminate flooring (about 70 %). Solid wood flooring is the second type most commonly used (about 20 %, considering also mosaic floors) and other types such as cork or bamboo have lower market shares. Laminate flooring (regardless of the main forestry material used) is made, on average, of 70-80 % wt. wood and wood-based materials while other floor coverings generally reach a forestry material content above 90% wt.

Based on the LCA review presented in the chapter 4 of the preliminary report the overall findings indicate that the production phase and the extraction of the materials are associated with the most significant environmental impacts during the life cycle of floor coverings.

a) *Extraction of materials:* this stage causes the second most important lifecycle environmental impacts of floor coverings. The most common materials used in the production of floor coverings are wood, cork, bamboo, wood- based and plant-based materials, resins and other spreadable materials widely used for the preservation and treatment of wooden surfaces. The environmental impacts caused during the extraction of materials stage are mainly due to unsustainable management of the forests and plantations. Therefore, it is important that wood and any other plant-based resources used in the floor covering production come from well managed and reliable sustainable sources. Ensuring legality and sustainability of the wooden and any other plant-based materials and products placed on the EU market is the first step to guarantee the future of the forest and forest-based sectors.

b) *Production stage:* This stage causes the main environmental impacts due to energy consumption and the use of adhesives, resins and other materials during floor covering assembly. Depending on the type of floor covering the energy demand as well as the chemicals used are different, however, in all cases they score similarly and cause environmental impacts such as use of non-renewable raw materials, air-pollutant emissions (VOCs and formaldehyde), limited recyclability of the final product due to the impregnation with biocides, paints and/or varnishes.

c) *Packaging and transportation stage*: this stage does not cause significant environmental impact (lower than 2 %) except for a possible international sea transportation of either the raw materials or the finished products. Packaging is made by using different kinds of plastics, paper or cardboard and, although these aspects present room for environmental improvement,

due to their low weight compared to the finished product weight, they do not significantly influence the overall environmental impact of the product group

d) *Use stage*. The environmental impacts caused during this life cycle stage are not significant in comparison to those of other lifecycle stages. Nevertheless, an extension of the lifetime of floor covering products would imply a lower rate of replacement of these products. This fact would bring significant environmental benefits related to other lifecycle stages such as a lower extraction of materials, a saving of natural resources, lower energy consumption and lower production of residues, among others. Environmental benefits would also be achieved during the end-of-life stage.

e) *End-of-Life stage*: its environmental impacts highly depend on the end-user behaviour. If floor coverings are reused or recycled, the environmental impacts of this lifecycle stage are lower than if floor coverings are incinerated (even with energy recovery) or disposed of landfills.

As a conclusion and according to this summarized environmental information special attention should be paid to the energy consumed and the use of chemicals during the manufacturing processes and, then to the environmental aspects related to the extraction of wood, cork, bamboo and wood-based and plant-based materials.

Table 1 shows the link between the identified hotspots (LCA and non-LCA impacts) and the proposed EU Ecolabel criteria in TR3.0.

Table 1. Link between the hotspots identified (LCA and non-LCA impacts) and the revised EU Ecolabel criteria

Hotspots	**% total impact**	**Revised EU Ecolabel criteria**	**Comments in the related criteria**
Extraction of the raw materials			
Extraction of forestry raw materials	(-25) to 50%	Sustainable managed wood, cork and bamboo materials	It ensures that, at least 70% of the forestry raw materials used in the finished product are certified by a sustainable management forest certificate.
		Contaminants in recycled wood, cork and bamboo	It ensures that recycled wood can be introduced in the production stage without lowering the quality of the finished product. It does not prevent the use of recycled materials and preserves the extraction of new materials from forests.
		Preservatives	It ensures that wood could be successfully recycled at the end-of-life stage of the product and preserves the extraction of new forestry materials to be used
		Information appearing on the EU Ecolabel	It informs consumers that the product has a minimum amount of certified forestry material compared to other products while they are making purchase decisions. The information is not included in the EU Ecolabel label logo but in the stamp of the certification scheme.
Transport	Negligible [iv]	--	The little relevance of these hotspots are the main reason for not being tackled by EU Ecolabel criteria
Waste generation		--	
Water use		--	
Production and manufacturing of flooring			
Energy consumed (drying, heating and pressing)	2-85%	Energy saving	The criterion limits the amount of total energy used during the production and sets up caps for the maximum electricity and fossil fuel sourced energy to be used.
		Information appearing on the EU Ecolabel	It informs consumers that the product has saved energy compared to other products while they are making purchase decisions

Waste generation	1-10%	Waste management	This criterion has been removed due to the lack of measurable standards that allow their verification and application in the EU Ecolabel scheme.
Packaging Transport to and from the facilities	< 2%	-- --	Their environmental impacts are not significant from the life-cycle perspective. Therefore, no criteria have been proposed
Water use	Not rated	--	
Adhesives production	5-25%	VOCs and formaldehyde in adhesives	It limits the amount of VOCs and formaldehyde used in the resins
		Plasticizers	It ensures that plasticizers (phthalates) are not used in the production of adhesives
Finish and surface treatment production	Up to 6%	Heavy metals in paints and varnishes	It ensures that the quantity of heavy metals in used paints and varnishes is strictly restricted
		VOC content in surface treatment	It ensures that end user's health will be protected during the use phase
Emissions from the core board	Not rated	Formaldehyde emissions from the core board	It strictly limits the emissions coming out from the main core boards of the flooring, thus protecting end-users
		Information appearing on the EU Ecolabel	It informs consumers that the product reaches the lowest values of the standards regarding the VOC and formaldehyde emissions
Other chemical	Not rated	Biocides/preservatives	It ensures that no persistent or biocide preservatives are included as an ingredient to the product
		Flame retardants	It limits the use of potentially hazardous substances and mixtures that can be included in the product to those required by the national legislation. This limits the environmental and health risks for the consumers
		Hazardous substances and mixtures	
		Ingoing substances listed in accordance with article 59(1) of Regulation (EC) no 1907/2006	
		Information appearing on the EU Ecolabel	It informs consumers that the product has a limited amount of hazardous substances while they are making purchase decisions
Installation and use stage			
Laying and installation		User information	It ensures that end users are provided with the needed information to lay the flooring respecting the environment and are able to choose complementary materials with the lowest possible attributed environmental impacts. Unfinished floor covering should provide information about the most recommended surface treatment to be applied.
Use phase	Not rated	Formaldehyde and VOC emissions	It ensures that end user's health is preserved as it is ensured that floorings are low-emitting products
	Indirect effects	Fitness for use	It ensures flooring will have a realistic/minimum useful life time for its intended use. It prevents from a premature refurbishment, thus saving resources.
	10-30%	Maintenance (included in the user information)	No specific criterion has been developed against this environmental aspect, due to the difficulties in verifying how end consumers clean the floorings once installed. However, to prevent from the environmental impacts that can be caused during the useful life due to the use of VOC containing products and their associated emissions, appropriate instructions are given to the consumers allowing maintenance of the floorings without use of organic cleaners.

		User information	It ensures that consumers are provided with the needed information to maintain and use the product satisfactorily
End-of-life			
End life	(-20) to 50%	User information	It ensures that consumers are provided with the information needed to properly handle the product at the end its useful life. Further actions are out of the scope of this policy tool. Additionally, aspects that could harm an environmentally proper management have been tackled in other life-cycle stages of the product and are being addressed under other criteria
Overall lifecycle			
Extension of the lifetime	--	User information	It ensures that consumers are provided with the information needed to properly handle the product in case any repair is needed
		Fitness for use	It ensures a minimum quality in the product to last for the expected lifetime under certain conditions (eg intended use, indoor use, etc)
		Reparability and extended guarantee	It ensures that information on how to repair and how to find professionals to do so is given to the consumers.

1.2.3 Proposed main changes in the set of EU Ecolabel criteria.

The proposed framework for the revision of the EU Ecolabel criteria is shown in Table 2 This table shows the simplification process that the EU Ecolabel criteria for wooden floor coverings have undergone in along this revision process.

Table 2 Comparison of the criteria structure

	Current EU Ecolabel	**Proposed simplified criteria**
Raw materials	Sustainable forest management	Certified sustainable wood, cork and bamboo
	Recycled wood and plant materials	
	Impregnating substances and preservatives	
	Genetically modified wood	
Use of dangerous substances	Dangerous substances for the raw wood and plant treatments	General restriction on hazardous substances
		Recycled wood, wood-based, cork, bamboo and plant materials
	Wood preservatives	Preservatives
	Biocides	Biocides
	Adhesives - VOC content	Adhesives - VOC content
	Formaldehyde	Formaldehyde
	Dangerous substances in the coating and surface treatments	VOCs in surface treatment
		Other substances – VOC content
		Heavy metals in paints and varnishes
	Plasticisers	Plasticisers
		Halogenated organic compounds
Production process	Energy consumption	Energy consumption
	Waste management	
Use phase	Release of dangerous substances from the final product	Emissions of formaldehyde from the floor coverings
		Emission of VOCs from the floor coverings
		Reparability and extended product guarantee
Packaging	Packaging	
Fitness for use	Fitness for use	Fitness for use

Consumer information	Consumer information Information appearing in the EU Ecolabel	Consumer information Information appearing in the EU Ecolabel

Several current EU Ecolabel criteria have been delated in this revision due to different reasons.

- The first one is the requirement of using non-GMO wood has been removed because this requirement is one of the basic requirements of to award a sustainability wood, cork or bamboo certification.
- The criteria requiring a waste management system has also been removed to bring the scheme in line with other EU Ecolabel criteria sets and due to the uncertainties and difficulties that this criterion showed for verification.
- The criterion on packaging has been removed due to the low relevance of the environmental impacts caused by the packaging in comparison to the overall environmental impact of this product.

Finally, other criteria such as those dealing with the use of chemicals and raw materials have been reorganized, merged or separated trying to better accommodate and address the current market conditions. These changes are commented in more detail, where appropriate, along the TR3.0 but a summary of the criteria can be found in Annex I (section 5)

2 ASSESSMENT AND VERIFICATION

Assessment and verification

The specific assessment and verification requirements are indicated within each criterion.

Where the applicant is required to provide declarations, documentation, analyses, test reports, or other evidence to show compliance with the criteria, these may originate from the applicant and/or their supplier(s), etc., as appropriate.

Competent bodies shall preferentially recognise attestations which are issued by bodies accredited according to the relevant harmonised standard for testing and calibration laboratories and verifications by bodies that are accredited according to the relevant harmonised standard for bodies certifying products, processes and services.

Where appropriate, test methods other than those indicated for each criterion may be used if the competent body assessing the application accepts their equivalence.

Where appropriate, competent bodies may require supporting documentation and may carry out independent verifications

As pre-requisite, the product must meet all respective legal requirements of the country (countries) in which the product is intended to be placed on the market. The applicant shall declare the product's compliance with this requirement.

The following information shall be provided to the Competent Body:

(i) The full formulation of the flooring indicating for each raw material or substance the trade name, chemical name, CAS no[v]., and the quantity (in concentration)

(ii) Safety data sheets (SDS) for each raw material (substance or mixture) in accordance with REACH.

(iii) If a supplier prefers not to disclose the substances of a mixture to the applicant, the information can be sent directly by the supplier to the Competent Body by the supplier;

(iv) In exceptional cases, if the information is not available at substance level, the applicant can supply the information for a mixture.

Rationale

- inclusion of the revised harmonized text referring to the assessment and verification requirements of the criteria

- deletion of the laboratory requirements to conduct the testing and inclusion of open statement referring to harmonized standards.

- inclusion of the information to be provided to the competent bodies that includes the full list of ingredients and their SDS.

The assessment and verification texts include the type of test methods that are considered as relevant for the each type of criteria. Where appropiate, test methods other than those indicated for each criterion may be used if the component body assessing the application accepts their equivalence. Some equivalent test methods or standards are already suggested either in the wording of the criteria or in the user manual.

Further information about the terms used in the criteria and assessment and verification are included in section 4.2. For example, in this section is defined what is understood in this document under 'accredited third party verification' that is required in Criterion 1.

As a pre-requisite, the product must meet all respective legal requirements of the country (countries) in which the product is intended to be placed on the market. The applicant shall declare the product's compliance with this requirement.

A significant modification of the assessment and verification clause is the requirements a laboratory should fulfil to conduct the testings. The EU Ecolabel Regulation (EC) No 66/2010

indicates that Competent Bodies shall preferentially recognise verifications performed by bodies which are accredited under the EN 45011. However, this standard is nowadays phased-out and certification bodies are no longer accredited in accordance with these requirements. A new statement has been included in the text.

Other terms to be included in the pre-amble of the criteria

A revision of the terms that shall be included in the pre-amble of the EU Ecolabel criteria document has also been conducted. Among those terms the following ones are proposed to be added.

- *Volatile organic compounds (VOCs):* means 'any organic compound having an initial boiling point less than or equal to 250C measured at a standard pressure of 101.3kPa' or 'any organic compound having a vapour pressure equal or higher than 0.01kPa at 20C.' Even if both definitions are not exactly the same, the classification of the compounds as VOC or non VOC is very close.

- *Impurity* is another term added to the EU Ecolabel criteria set. Impurity refers to residues from primary production which may be found in the finished product at concentrations below 100 ppm (0.01% by weight, 100 mg/kg), but not substances that have been added to a raw material or the product actively and for a particular purpose, irrespective of quantity. Impurities of over 1% concentration in the primary product are, however, regarded as constituent substances. Substances known to be degradation products of the constituent substances are also themselves considered to be constituent substances.

- *Raw material:* is a basic material that is used to produce goods, finished products, energy or intermediate materials which are feedstock for future finished products. The term connotes these materials that are bottlenecks assets and are highly important with regards to producing other products. These materials are usually materials unprocessed or minimally processed or unprocessed and that are internationally marketed in substantial volumes.

- *Substance* means a chemical element and its compounds in the natural state or obtained by any manufacturing process, including any additive necessary to preserve its stability and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition

- *Mixture* means a mixture or solution composed of two or more substances as defined in Article 3(2) or Regulation (EC) No 1907/2006

- *Solvent* means the liquid in which a solute is dissolved to form a solution.

- *Manufacturer*: means any natural or legal person established within the Community who manufactures a substance within the Community

- *Supplier of a substance or a preparation*: means any manufacturer, importer, downstream user or distributor placing on the market a substance, on its own or in a preparation, or a preparation;

- *E1* means a formaldehyde emission threshold limit adopted across EU Member States for emissions from wood based panels, according to the definition provided in Annex B to EN 13986. The threshold limit is considered as being equivalent to steady state concentrations of 0.1ppm (0.124 mg/m3) of formaldehyde after 28 days of a chamber test carried out according to EN 717-1. The E1 limit is also considered as equivalent to a formaldehyde content of 8mg/100 g oven dry board when measured according to EN 120 and as equivalent to overall emissions rates of 3.5-8.0 mg/m^{2}h according to EN 717-2 or 5.0-12.0 mg/m2h within 3 days after production.

- *Biocidal product'* means, in accordance with Article 3(1)(a) of Regulation (EU) No 528/2012:

    - any substance or mixture, in the form in which it is supplied to the user, consisting of, containing or generating one or more active substances, with the intention of destroying, deterring, rendering harmless, preventing the action of, or otherwise exerting a controlling effect on, any harmful organism by any means other than mere physical or mechanical action,

- any substance or mixture, generated from substances or mixtures which do not themselves fall under the first indent, to be used with the intention of destroying, deterring, rendering harmless, preventing the action of, or otherwise exerting a controlling 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

- *Preservative* means, in accordance with Annex V of Regulation (EU) No 528/2012, products used for the preservation of wood, from and including the saw-mill stage, or wood products by the control of wood-destroying or wood-disfiguring organisms, including insects. This definition includes both preventive and curative products.

- *Active substance* means, in accordance with Article 3(1)(c) of Regulation (EU) No 528/2012, a substance or a micro-organism that has an action on or against harmful organisms.

3 CRITERIA PROPOSAL

This section shows the last proposal of the criteria wording. The new criteria are included in the blue boxes and subsequently the reader can find a brief rationale that summarizes the findings and inputs received along the project and that underpin the criteria.

Should the reader want to get further information about the criteria, this can be found either in the previously published preliminary report and technical reports (TR1.0 or TR 2.0) or in section "Table of comments" section 4 of this TR3.0.

Criteria are presented in the order proposed for the last draft. This order does not correspond to the current EU Ecolabel criteria set.

The candidate flooring, regardless the type of flooring it belongs to, shall comply with all criteria, unless specifically stated.

CRITERION 1: Sustainable wood, wood-based, cork, cork-based bamboo and bamboo-based materials

Proposal for criterion 1: Sustainable certified wood, wood-based materials, cork and bamboo

All wood, wood-based cork, cork-based, bamboo, bamboo-based and plant-based materials weighting more than 1% of the finished product shall be covered by chain of custody certificates issued by an independent third party certification scheme such as the Forest Stewardship Council (FSC) , the Programme of the Endorsement of Forest Certification (PEFC) or equivalent

All virgin wood, cork and bamboo shall be covered by valid sustainable forest management certificates issued by an independent third party certification scheme such as FSC, PEFC or equivalent.

When certification schemes allow mixing of uncertified material with certified and/or recycled materials in a product or production line, a minimum of 70% of the wood, cork and/or bamboo shall be sustainable certified virgin materials and/or recycled material

Uncertified material shall be covered by a verification system which ensures that it is legally sourced and meets any other requirement of the certification scheme with respect to uncertified material.

The certification bodies issuing forest and/or chain of custody certificates shall be accredited or recognised by that certification scheme.

Assessment and verification

The applicant shall provide valid, independently certified chain of custody certificates for all wood, wood-based cork, cork-based, bamboo, bamboo-based and plant-based material, used in the product or production line and demonstrate that at least 70% of the materials originates from forests and/or areas managed according to Sustainable Forestry Management principles and/or from recycled sources that meet the requirements set out by the relevant independent chain of custody scheme. FSC, PEFC or equivalent schemes shall be accepted as independent third party certification

If the product or production line includes uncertified material, proof shall be provided that the content of uncertified virgin material does not exceed 30% and is covered by a verification system which ensures that it is legally sourced and meets any other requirement of the certification scheme with respect to uncertified material.

*plant-based materials means material made by wood, cork or bamboo as well as materials made by binding with adhesives and/or glues with one or more of the following materials: wood fibres, and/or stripped or sheared wood

Proposal for criterion 1: Sustainable certified wood, wood-based materials, cork and bamboo
sheets, and/or wood residues from forest, plantations, sawn wood, residues from pulp/paper industry, recycled wood, cork fibres, recycled cork, bamboo fibres, and/or recycled bamboo. Wood-based materials comprise: hardboard, fibreboard, medium density fibreboard, particleboard, OSB (oriented strand board), plywood, and panels in solid wood. It also refers to composite materials made from wood-based panels coated by plastics, or laminated plastics, or metals, or other coating materials and finished/semi-finished wood-based panels. Similar definitions should stand for cork-based and bamboo based materials.

Rationale

- re-structuration of the current criteria block based on the restrictions of chemicals and needs for verification of certified and uncertified wood, wood-based materials, cork and bamboo against the FSC and PEFC criteria
- Scope of the criterion and level of ambition:
a) inclusion of cork and bamboo materials and requirements at the same level than those for wood and wood-based materials
b) implicit exclusion of the paper ingredients if they are lighter than 1% by weight due to the large efforts for traceability required.
c) Suitability of FSC and PEFC or equivalent certification schemes for verifying the criterion

Relevant changes are proposed for the criteria group dealing with the sustainable certified plant based materials. Firstly, it is worth nothing the different structure of the criteria block that is proposed. This criterion aims to tackle only the impacts caused by the unsustainable management of the forests and plantation areas to extract the raw materials and no other environmental aspects that can be caused by using plant-based materials.

In this sense, the ban on GMO materials is removed as it is part of the three basic requirements of both certification schemes and equivalent proposed for verification. These three basic requirements and the additional two coming from FSC are bans on:

- Illegally harvested wood
- Wood harvested in violation of traditional and civil rights (only FSC)
- Wood harvested in forests where High Conservation Values are threatened by management activities (only FSC)
- Wood harvested from natural forests that were converted to non-forest uses
- Wood from genetically modified trees.

Secondly, the sub-criteria dealing with the use of preservatives and impregnation substances and pollutants in the recycled wood have been kept but moved to the block focused on the prevention of hazardous substances.

Regarding the content of the sustainable certified wood, cork, bamboo and plant-based materials, a fixed threshold has been set up for all the materials at 70%. This threshold does not differentiate between:

- units (in mass, in volume, in costs, etc) and relies on those proposed by the certificate

- recycled and sustainable virgin materials as long as the recycled materials fulfil the requirements of the certification schemes. Recycled materials are considered at the same level than virgin sustainable certified materials. The purpose of this equivalence is to enhance the use of recycled materials in the finished product, if possible and available

- types of materials. Long discussions have been held about the possibility of setting up different thresholds for different materials or even release cork and bamboo from compliance with this criterion. Providing the certification ensures that these materials are legal, harvested in a controlled way and meeting other requirements. It seems a step backwards not to include cork, bamboo and their derivative materials in the criterion 1. Further information can be found in section 4.3.

The newly proposed criterion wording includes an implicit exemption of compliance with this criterion to the paper layer of laminates weighting less than 1% by mass.

Rationale of proposed "Assessment and verification"

Several aspects have been considered during the revision of the criteria.

- Certification schemes: there are a large number of schemes that certify the sustainability of materials. These schemes are working at national or international level and are based on different principles. All they are different even if their purposes can be considered as equivalent.

Due to the nature of the EU Ecolabel and its direct implementation across Europe, international standards, widely recognized and applied in all the Member States would be preferred. Among them, two certification schemes were identified: FSC and PEFC. Both schemes have been proposed as way of verification in other EU Ecolabel schemes too and are based on basic principles although they are not completely equivalent (eg. they don't recognise each other as equivalent).

Finally, relying on those well recognized schemes, it is ensured that cork and cork products that are not covered by the EU Timber Regulation are legally harvested.

- Level of ambition: an only threshold of at least 70% has been set for all the materials included in this criterion. This level of ambition allows conducting the assessment and verification of the criteria through one of the five recognized official existing labels. One of them require minimum sustainable certified wood content of 100% (FSC 100% label), two more require a minimum sustainable certified wood content of 70% (FSC mix label and PEFC certified label) and the last two labels require 70% recycled wood or a combination with certified wood (FSC Recycled label and PEFC certified and recycled label). Further information about labels is available at http://www.pefc.co.uk/chain-of-custody-logo-use/pefc-label and http://welcome.fsc.org/understanding-the-fsc-labels.27.htm.

- Chain of custody or balance sheets: the verification of the amount of certified or recycled materials can be carried out throughout two different ways. The first one is providing the chain of custody. The chain of custody is issued from the same certification party that certifies the origin of the virgin or recycled material and each of the members of the chain the material passes through is assessed and certified under several criteria. Once the member holds the chain of custody, their products can be labelled with one of the FSC or PEFC labels and show the stamps. Members of the chain of the product and bodies that do not hold the chain of custody certificate cannot work with the product so that the chain of custody is preserved. This makes the assessment and verification of the certified material content very easy.

Further information can be found in section 4.3

CRITERION 2: General restrictions on hazardous substances

Proposal for criterion 2:General restrictions on hazardous substances
The presence in the product of substances that are identified according to Article 59 (1) of Regulation (EC) No 1907/2006 of the European Parliament and of the Council[1] as substances of very high concern (SVHCs) or substances or mixtures that meet the criteria for Classification, Labelling and Packaging (CLP) according to Regulation (EC) No 1272/2008 of the European Parliament and of the Council[2] for the hazards listed in Table 2.1, shall be restricted in accordance with criteria 2.1 and 2.2.

[1] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (OJ L 396 30.12.2006, p. 1).

[2] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (OJ L 353, 31.12.2008, p.1).

Proposal for criterion 2:General restrictions on hazardous substances

Table 2.1 Grouping of restricted hazards

Group 1 Hazards – SVHC and CLP *Hazards that identify a substance as being within Group 1:* - substances that are considered SVHC in accordance with article 57 (d), (e) and (f) of Regulation (EC) No 1907/2006 - category 1A or 1B CMR*: H340, H350, H350i, H360F, H360D, H360FD, H360Fd, H360Df
Group 2 Hazards – CLP *Hazards that identify a substance as being within Group 2*: - category 2 CMR*: H341, H351, H361f, H361d, H361df, H362 - category 1 aquatic toxins: H400, H410 - category 1 and 2 acuate toxins: H300, H310, H330, H304 - category 1STOT*: H370, H372 - category 1 skin sensitiser H317
Group 3 Hazards – CLP *Hazards that identify a substance as being within Group 3:* - category 2, 3 and 4 aquatic toxins: H411, H412, H413 - category 3 acute toxins: H301, H311, H331, EUH070 - category 2 STOT*: H371, H373

*CMR= carcinogenic, mutagenic or toxic to reproduction; STOT= specific target organ toxicity

2.1 Restriction of SVHCs

The floor covering shall not contain SVHC at concentrations in the final product greater than 0.10% (weight by weight)

Assessment and verification

The applicant shall provide a declaration of compliance for the product supported, where relevant, by declarations from any supplier(s) regarding the non-presence of SVHCs at concentrations greater than 0.10% (weight by weight). Declarations shall be with reference to the latest version of the Candidate List published by ECHA[3].

2.2 Restriction of CLP classified substances or mixtures used in the floor covering

Substances or mixtures used by the floor covering manufacturer or his suppliers during the preparation of raw materials, manufacturing, assembly or any other treatment of the floor covering shall not be classified with any of the CLP hazards listed in Table 2.1. Restricted substances or mixtures shall include adhesives, paints, primers, varnishes, stains, preservatives, resins, active substances of biocidal products (or biocidal products), fillers, waxes, oils, joint fillers, dyestuff and sealants.

However, the use of such restricted substances shall be permitted if one or more of the following conditions apply:

- that the restricted substance or mixture was used in quantities that amount to less than 0.10% of the total weight of the floor covering and/or
- that the restricted substance changes its properties upon processing (e.g. becomes no longer bioavailable or undergoes chemical reaction) so that the restricted CLP hazards no longer apply and that any unreacted residual content of the restricted substance is less than 0.10% of the total weight of the floor covering

Assessment and verification

The applicant and/or his suppliers shall provide a declaration of compliance with criterion 2.2 supported by a list of relevant substances or mixtures used together with declarations about their hazard classification or non-classification, their added quantities and if the substances change their properties upon processing so that the restricted CLP hazards no

[3] ECHA, Candidate List of substances of very high concern for Authorisation, http://www.echa.europa.eu/candidate-list-table.

Proposal for criterion 2:General restrictions on hazardous substances

longer apply. If so, the quantities of any unreacted residual content of the restricted substance shall be provided.

The following information shall be provided in relation to the hazard classification or non-classification for each of the substances:

i. the substance's CAS, EC or list number (where available for mixtures)
ii. the physical form and state in which the substance or mixture is used
iii. harmonized CLP hazard classifications
iv. self-classification entries in ECHA's REACH registered substance database[4] (if no harmonized classification available).

When considering self-classification entries in the REACH registered substance database, priority shall be given to entries from joint submissions. Where a classification is recorded as 'data-lacking' or 'inconclusive', or where the substance has not yet been registered under the REACH database, the self-classifications shall be verified, with the following information sources being accepted:

i. Toxicological studies and hazard assessments by ECHA peer regulatory agencies[5], Member State regulatory bodies or Intergovernmental bodies;
ii. A SDS fully completed in accordance with Annex II to Regulation (EC) No 1907/2006;
iii. A documented expert judgment provided by a professional toxicologist. This shall be based on a review of scientific literature and existing testing data, where necessary supported by results from new testing carried out by independent laboratories using methods approved by ECHA;
iv. An attestation, where appropriate based on expert judgment, issued by an accredited conformity assessment body that carries out hazard assessments according to the Globally Harmonized System (GHS) of the classification and labelling of chemicals.

Rationale of Proposed Criterion text

- No different clauses for manufacturer and for suppliers of raw materials. Manufacturers have the ownership of the full application, but information can be sent directly to the Competent Bodies from the suppliers if confidentially should be preserved.
- NO inclusion of terms referring to parts of the products such as ' component parts', the criterion always refers to the finished product. Reference to the raw materials the floorings are made only for the identification of the classified substances, but overall accounting should refer to the finished product
- Chemicals are always referred as substances or mixtures, no use of preparation, chemical products and other complex names….
- List of derogations: no requested for the moment

The criterion on restricted hazardous substances has been included as a requirement of the EU Ecolabel Regulation (EC) No 66/2010. The wording of this criterion has been recognized to be difficult to understand; therefore several modifications aiming to simplify the criterion are proposed.

The main points of this simplification of this criterion are:

- the criterion restricts the types of substances: those listed in the list of SVHC or the candidates list, for which no presence in the finished product at concentration higher than 0.010% weight by weight is allowed and for which no derogations can be awarded.

- all the materials intentionally used in the manufacturing of the product (comprising the preparation of the raw materials, manufacturing, assembly and any further treatment) shall comply with this criterion, regardless who and/or where these materials are used. The materials

[4] ECHA, REACH registered substances database: http://www.echa.europa.eu/information-on-chemicals/registered-substances.
[5] ECHA, Co-operation with peer regulatory agencies, http://echa.europa.eu/about-us/partners-and-networks/international-cooperation/cooperation-with-peer-regulatory-agencies.

are referred as 'substances', 'mixtures' or 'raw materials'. These names include any chemical product, preparation, etc. For example adhesives, resins, paints, varnishes, wood, cork, etc would fall under this criterion

- the mass concentration limit, 0.10%wt when applicable, always refers to the total weight of the finished product. There are no references to any components or parts of the product, even if it consists of several layers.

- the product is referred as floor covering to avoid any discrimination due to the main raw material or manufacturing process.

Further information can be found in section 4.4

CRITERION 3: Specific restrictions on hazardous substances

Proposal for criterion 3: Specific restrictions on hazardous substances

3. a) Elements and compounds in recycled wood, cork and bamboo

Any recycled fibres or chips used in the manufacture of panels included in the final floor covering product shall be tested in accordance with the European Panel Federation (EPF) standard for delivery conditions of recycled wood[6] and comply with the limits for contaminants as listed in Table 3.1.

Table 3.1. Limits for contaminants in recycled wood, cork, bamboo and their fibres or chips (mg/kg dry panel)

Elements	Limit values	Elements and compounds	Limit values
Arsenic (As)	25	Mercury (Hg)	25
Cadmium (Cd)	50	Fluorine (F)	100
Chromium (Cr)	25	Chlorine (Cl)	1000
Copper (Cu)	40	Pentachlorophenol (PCP)	5
Lead (Pb)	90	Tar oils (benzo(a)pyrene)	0.5

Assessment and verification:

The applicant shall provide:

i. A declaration from the panel supplier that no recycled wood, cork, bamboo or their fibres or chips were used in the panel, or

ii. A declaration from the panel supplier that all recycled wood, cork, bamboo or their fibres or chips used have been representatively tested in accordance with the 2002 "EPF standard conditions for the delivery of recycled wood" supported by test reports that demonstrate compliance of the recycled samples with the limits specified in Table 3.1

iii. A declaration from the panel supplier that all recycled wood, cork, bamboo or their fibres used have been representatively tested by equivalent standards that have equal or stricter limits than the 2002 "EPF standard conditions for the delivery of recycled wood", supported by test reports that demonstrate compliance of the recycled samples with the limits specified in Table 3.1

If it can be proved that the substances indicated have not been used in any previous preparation or treatment, the application of test to demonstrate compliance with this requirement can be avoided

[6] "EPF Standard for delivery conditions of recycled wood", October 2002. Can be viewed online at: http://www.europanels.org/upload/EPF-Standard-for-recycled-wood-use.pdf.

3.b) Biocidal products

The treatment of wood, cork and/or bamboo of the floor coverings with preservatives[7] shall not be permitted.

Assessment and verification:

The applicant shall provide a declaration of non-use of preservatives.

The use of other biocidal products[8] shall not be permitted. Active substances[9] exclusively used for in-can preservation of water-based substances of mixtures such as adhesives or lacquers shall be exempt from this requirement.

Assessment and verification

The applicant shall either:

i. provide a declaration of non-use of biocidal products

ii. provide a declaration stating what active substances contained in biocidal products have been used in can water-based substances supported by SDS from the in-can water-based substances' suppliers.

3.c) Flame retardants

The use of flame retardants shall not be permitted

Assessment and verification

The applicant shall provide a declaration of non-use of flame retardants

[7] As defined in Annex V of the Regulation (EU) No 528/2012 of the European Parliament of the Council of the 22 May 2012 concerning the making available on the market and use of biocidal products

[8] As defined in Article 3(1)(a) of the Regulation (EU) No 528/2012 of the European Parliament of the Council of the 22 May 2012 concerning the making available on the market and use of biocidal products

[9] With the meaning of the Article 3(1)(c) of the Regulation (EU) No 528/2012 of the European Parliament of the Council of the 22 May 2012 concerning the making available on the market and use of biocidal products

3. d) VOCs content in substances and mixture used (in-can concentrations) apart from those used for surface treatment

In-can adhesives and/or resins used in manufacturing of the floor coverings should have

- VOC content of less than 3% by weight,
- Free-formaldehyde* of less than 0.2% by weight.

Other substances apart from in-can adhesives and resins and surface treatment (criterion 3.f) used in manufacturing of the floor coverings should have VOC content less of than 1% by weight.

The criterion relates to the total VOC in the substances with the chemical composition they have in wet form. If the products require dilution prior to use, the calculation is to be based on the content in the diluted product.

This criterion does not apply to mixtures used for repairing the knots during the manufacturing process

Assessment and verification

The applicant shall provide the SDS of any in-can adhesive or resin or other substances used or an equivalent declaration of compliance with this requirement, together with a complete recipe with designation of quantities and CAS numbers.

If the SDS states that the VOC content is less than 3% by weight of the in-can adhesive or resin used or less than 1% by weight of other substances used, then no further verification shall be necessary. Should the VOC content information not be included in the SDS, the VOC content should be calculated from the list of substances. The concentration of each VOC ingredient should be stated as a percentage by weight. Confidential details from the manufacturers in the form of content declarations/formulations can be sent directly to the respective Competent Body.

The applicant shall provide test reports demonstrating that the free-formaldehyde content in the in-can adhesives and resins is less than 0.2% wt in accordance with prEN ISO 11402

*The content of free-formaldehyde in the resin and/or adhesive formulation shall be in accordance with prEN ISO 11402 Phenolic, amino and condensation resins - Determination of free formaldehyde content.

3.e) VOC content in surface treatment

Surface treatment chemicals used on wood, wood-based, cork, bamboo or plant-based materials shall either:

- Have a total VOC content of less than 5% by weight (in-can substance concentration), or
- Have a total VOC content greater than 5% by weight but be shown to be applied in quantities that amount to less than 2g/m^2 of treated surface area

The criterion relates to the total VOC in the surface treatment products with the chemical composition they have in wet form. If the products require dilution, the calculation is to be based on the content in the dilutive product.

Assessment and verification

The applicant shall provide the SDS of any surface treatment substances used on wood, wood-based, cork, bamboo or/and plant-based materials. If the SDS states that the VOC content of the surface treatment products used is less than 5% by weight, then no further verification shall be necessary.

Should the VOC content information not be included in the SDS, the VOC content should be calculated from the list of substances of the surface treatment chemicals. The concentration of each VOC ingredient should be stated as a percentage by weight. Confidential details from manufacturer/s in the form of content declarations/formulations can be sent directly to the respective Competent Body.

Alternatively, if the VOC content is higher, then the applicant shall provide a calculation demonstrating that the effective quantity of VOC applied per m2 of the treated surface area of the floor covering is less than 2g/m^2, in accordance with the guidance provided in Appendix I.

This criterion does not apply to mixtures used for repairing the knots during the manufacturing process

Appendix I. Guidance on the calculation of the quantity of VOC applied

The requirement relates to the total VOC in the surface treatment products with the chemical composition they have in the wet form. If the products required dilutions, the calculation is to be based on the content in the dilutive product.

This method is based on the application method that calculates the quantities applied per m^2 surface area. It determines the content of the organic solvents as a percentage of quantity of the surface treatment applied.

The applied quantity of VOC is calculated using the following formula

$$\sum_{n=1}^{i} Quantity\ of\ surface\ treatment\ product\ x\ \%\ VOC\ x\ surface\ treatment\ efficacy$$

The formula consists in:

- Quantity of surface treatment product: Per each coating applied the amount of surface treatment fed in the system should be reported in g/m^2.
- The proportion of VOC in the surface treatment products: the concentration is to be stated as a percentage by weight,
- The surface treatment efficiency that depends on the application method. The efficacy is tabled in accordance with the state-of-the-art of the surface treatment industry as shown in Table 3.2.
- The sum of all the coatings applied.

Table 3.2. Efficacy of the surface treatments

Surface treatment	Efficiency	Surface treatment	Efficiency
Automatic spray application, no recycling	50%	Roller coating	95%
Automatic spray application with recycling	70%	Curtain coating	95%
Spray application, electrostatic	65%	Vacuum coating	95%
Spray application, bell/disc	80%		

3.f) Heavy metals in paints, primers and varnishes

Paints, primers and varnishes used on wood, wood-based, cork, bamboo or plant-based materials shall not contain substances based on cadmium, lead, chromium VI, mercury, arsenic or selenium at concentrations exceeding 0.010% by weight for each individual metal in the in-can paint, primer or varnish formulation.

Assessment and verification

The applicant shall provide a declaration of compliance with this criterion and provide the respective SDS from the suppliers of the paints, primers and varnished used.

3g) Plasticizers

Any plastic foils applied to panel surfaces shall not contain any phthalate plasticisers that are referred to in Article 57 of Regulation (EC) No 1907/2006. The absence of these phthalates shall be considered as the total sum of the listed phthalates amounting to less than 0.10% of the plastic foil weight (1000mg/kg)

Assessment and verification

The applicant shall provide either:

i. A declaration from the panel supplier stating that plastic foils were not used, or

ii. a declaration form the panel supplier stating that plastic foils were used and that none of the phthalate plasticisers with Article 57 hazard classifications have been used in the plastic foil.

In the absence of a suitable declaration, plastic foil materials shall be tested for the presence of these phthalates according to ISO 14389 or ISO 8214-6 standard

3.h) Halogenated organic compounds

Halogenated organic compounds are not permitted in the substances used in the manufacture of floor coverings (eg as binders, flame retardants, adhesives, coatings, etc)

Assessment and verification

The applicant shall provide a declaration of non-use of halogenated organic compounds, if so supported by the manufacturer of the substances. In addition, the respective SDS of substances shall be provided.

Rationale of the proposed criterion

a) Contaminants in recycled wood, cork and bamboo

- *unknown origin of the recycled wood*
- *pollutants prevent recyclability and high quality new products*
- *extension to cork and bamboo although for the time being not separated collection of these materials in place*
- *extension of A+V through valid national schemes to avoid double verification*

Possible treatment with any of a number of hazardous preservatives and chemicals may have occurred during the previous manufacture and use of the wood, cork, bamboo and plant-based materials to be recycled. Even after careful pre-treatment, traces of these substances may still remain and it is necessary to test these materials prior to their re-use in any new products, in particular EU Ecolabel ones.

The 2002 ¨EPF standard conditions for the delivery of recycled wood¨ has been identified as a well-unknown and applied standard on the market that ensures a minimum quality of the materials to be recycled. For this reason, this standard is kept in this revision.

Extension of the criteria to cork and bamboo materials is also proposed, although for the time being separated collection of both materials is not widely applied. Extension of the possibilities to verify the criteria are also proposed by including national schemes that have an equal or strictness level. This measure will avoid double costly testing. The user manual includes examples of possible national schemes that can be accepted as proof of compliance.

b) Biocidal products

- *no need for preservatives for indoor-products*
- *extension of no use of preservatives to cork and bamboo floorings*

Preservatives are generally not needed in indoor applications since the environments are not aggressive to wood, cork, bamboo and plant-based products. For this reason, instead of permitting the use of preservation or impregnation treatments in the EU Ecolabel floor coverings, confidence is placed in the end user to take the appropriate action if needed in individual cases.

- *no need for biocides for indoor-products*
- *exception for the biocides working as preservatives of in-can substances*
- *extension to cork and bamboo floorings*

Biocidal products should not be used at any stage of the production process, except for those included in in-can preparations as preservatives. The use of biocidal products in indoor products with the purpose of achieving a disinfectant and antibacterial treatment or a disinfectant or antibacterial surface is understood as not needed as most of the indoor environments are not aggressive for these types of floor coverings

The criterion has become stricter than the current EU Ecolabel criterion where only biocidal products containing biocidal active substances included in Annex IA of Directive 98/8/EC, and authorized for use in floor coverings, are allowed.

Additionally, the criterion is drafted removing any discrimination toward non-wooden materials and is not included in the definition part as it does not describe any of the function or main characteristic of the floorings.

c) Flame retardants

- no need for flame retardants

Feedback from the industry indicated that no flame retardants are required due to safety reasons in the floorings. Therefore a ban on flame retardants is proposed.

d) VOCs and formaldehyde content

- low containing VOC and formaldehyde materials are likely to have lower emissions during the use phase and end-of-life of the product.

- revision of VOC definition in accordance with standard with the paint regulation

Manufacturing floor coverings with resins and adhesives that are VOC and free-formaldehyde low-containing products can contribute to decrease the emissions of these substances during the use and end-of-life phases of the floorings. This is the main reason behind this criterion. This measure can however be considered as a precautionary measure because resins and adhesives are cured during the manufacture process becoming a very stable matrix.

The revision of this criterion started with the revision of the terms "VOCs" and "free-formaldehyde". The *VOC content* is defined as the amount of organic compounds falling under the classification of VOC[vi] divided by the weight of the adhesive or resins in its ready-to-use form. The VOC content limit is expressed in percentage by weight, but some other units can be found on the market.

Thus, the ingredients in a product that are classified as VOCs may not account for more than a certain percent of the weight of the product. In order to demonstrate compliance with such limits, product manufacturers must keep adequate records of the amounts of ingredients used to manufacture their products. Although this can be a substantial burden in terms of record keeping, the methodology for determining compliance is, however, straightforward.

The information related to the VOC content of the adhesives and resins may be included in the SDSs of the adhesives and resins although this information is not mandatory. If included, it is shown in the section 9. If not, the list of the ingredients and the amount of substances classified as VOC shall be provided in the section 3.

The *free-formaldehyde* is acting in some substances as preservative. The formaldehyde-releasing preservatives are known to hydrolyse in aqueous system; however, reliable analytical techniques have not been available for quantitating this reaction in all kind of products. Free formaldehyde is regulated in the Cosmetic Directive 76/768/EC making the industry to become familiar with this term. However, the term is not defined in the directive and the issue of what constitutes "free formaldehyde" had not been canvassed on scientific literature, although some variations in interpretation have been evident from various test methodologies.

The term "free formaldehyde" in the cosmetic directive is linked to the official EU test method. The EU method for determination of formaldehyde in the presence of formaldehyde donors uses chromatography (HPLC) to separate aqueous formaldehyde, which was predominantly in the form of methylene glycol, from the formaldehyde donor compound, and then forms a coloured derivative of formaldehyde which can be quantified. All aqueous formaldehyde, including methylene glycol, was determined as being "free formaldehyde" using the method.

In the in-can adhesives and resins the limits for VOC content and free formaldehyde are proposed to become stricter thanks to the development of this industry. According to the industry feedback, adhesives with only 3% in mass or only 0.2% in mass of free-formaldehyde can be used to produce high-quality products.

e) VOCs in the surface treatments

- Removal of the compliance of this criterion through compliance with criteria 6.1
- Clarification related to the dilution, if needed, of surface treatment products prior to application
- Verification of the required substances content in the different preparations through information provided in their SDS or declaration of the suppliers
- Possibility of sending the list of ingredients and SDS directly to the competent bodies if confidentiality should be preserved.

To guarantee low-emitting products is one of the objectives of this EU Ecolabel criteria set and limits on the VOC content of the surface treatment products used to manufacture the products is one of the multiple way to achieve it. This measure is in line with the previous sub-criterion.

Surface treatment products used for lacquering, waxing, etc usually content higher amounts of VOCs than other preparations and therefore, limiting its content will ensure that the overall VOC content of the finished product is reduced.

As commented, this measure can also be considered as a preventive measure as most of the surface treatments undergo a curing treatment that significantly decreases the amount of VOC remaining in the finishing and therefore its emission during the use phase of the floor covering.

This criterion has been modified by removing its compliance throughout the fulfilment of criterion 6 (VOC emissions) because it has been considered that both measures are complementing each other and that are both relevant for this product group: a) to control the VOC content in the raw materials and b) to ensure a low-emission during the use phase.

The safe data sheet (SDS) of the substances provides information related to their physical and chemical properties as well as their possible classifications. The information included in this sheet is standardized and should be revised every certain number of years. It is important to select those SDSs as most updated as possible since the hazard classification of the ingredients may have been changed.

As commented, the information included in the SDS is standardized and regulated at European level by the Annex II of REACH regulation. According to the last amendment of this annex, section 3 should display a list of those ingredients that meet the criteria for classification (H-phrases) and are included in a concentration greater than 0.1%wt. Moreover, section 9 may provide information about the VOC content of the product. However, this information is not mandatory and could be left in blank.

In those cases where the ingredients are not classified[vii], added in small quantities, or where the information is missing, manufacturers or supplier should provide in addition to the SDS, a full list of the ingredients of the substances. Given the list of ingredients to the manufacturers of the flooring can create confidentially conflicts as the formulations can be not revealed by the suppliers. In those cases, suppliers can send the required information directly to the competent bodies preserving possible damages to their businesses.

f) Heavy metals in paints and varnishes

- restriction due to the hazards of these metals and possible end-of-life routs
- in agreement with other Ecolabel criteria sets

Heavy metals in paints and varnishes are now simply permitted by the criterion 2 based on the idea that they are not used in high quantities in the final flooring product. For this reason, an additional restriction is included in criterion 3. This restriction aims at prohibiting the use of paints or varnishes that contain the heavy metals (ie cadmium, lead, chromium IV, mercury, arsenic and selenium) because:

- many of the additive compounds based on these heavy metals are REACH restricted
- even if additive compounds based on these metals are non-hazardous, the presence of these metals would complicate recycling of the wooden materials at end-of-life if the

2002 ¨EPF standard conditions for the delivery of recycled wood¨ is considered (see criterion 3.a)

- if materials containing these metals are incinerated, regardless of the hazard profile of the original additive, the metals may be transformed into more toxic and/or bioavailable forms and either remain in fly ash, bottom ash, air pollution control residues or be released directly to the atmosphere.

g) Plasticizers

- Restriction of phthalates that can be used in the top layer of some floorings
- wording of the criterion in line with other EU Ecolabel criteria sets

Phthalates are chemical compounds primarily used to manufacturer some plastics. They are widely selected to soften vinyl because of their strong performance, durability and stability. Depending on the application the phthalates are also called plasticizers, especially if they are used to soften vinyl and make it flexible. For this reason, a general reference to this type of chemicals is proposed in this revision.

Phthalates are categorized as high or low, depending on their molecular weight.

- high phthalates include those with 7-13 carbon atoms in their chemical backlbone, which gives them increase permanency and durability. The most common types of high phthalates include diisononyl phthalate (DINP), diisodecyl phthalate (DIDP) and dipropylheptyl phthalate (DPHP). All them were explicitly banned in the existing criterion and are proposed to be banned in this revision. High phthalates are commonly used in PVC products such as flooring, wall coverings, self-adhesive films, etc

- low phthalates include those with 3-6 carbon atoms in their chemical backbone. The most common types of low phthalates include di(2-ethylhexyl) phthalate (DEHP) and dibutyl phthalate (DBP). Low phthalates are commonly used in medical devices, general purpose PVC, adhesives, inks, and cosmetics.

h) Halogenated organic compounds

- Restriction of halogenated organic compounds that can be used in several substances

A way to make organic compounds more stable is to introduce one or more halogens, such as fluoride, chloride, bromide or iodine atoms in the molecule. These halogenated organic compounds make up an important class of dangerous pollutants due to their persistence and propensity to dioxin formation.

Halogenated organic compounds can be found in all plastics containing chlorine and fluorine such as chlorinated polyethylene, chlorinated polyvinyl chloride, chlorosulfonated polyethylene, polyvinyl chloride or fluorinated ethylene propylene as well as in all brominated or halogenated flame retardants containing bromine, chlorine or fluorine. Therefore, common uses for halogenated organic compounds have been as solvents, pesticides, refrigerants, fire-resistant oils, ingredients of elastomers, adhesives and sealants, electrically insulating coatings, plasticizers, and plastics.

Alternative materials free of added chlorine or other halogens can be found in all applications which meet or exceed performance requirements.

Further information can be found in section 4.4

CRITERION 4: Energy consumption

Proposal for criterion 4: Energy consumption
The average annual energy consumed for the production of the floor coverings shall be calculated as indicated in Table 4.1 and Appendix II and shall exceed the following limits (E = score):

Proposal for criterion 4: Energy consumption

- E > 11.0 for wood floorings (one single solid layer)
- E > 8.0 for multi-layer wood floorings, bamboo and cork floor coverings and laminate floor coverings

Table 4.1. Calculation of the scoring point

Formula		Environmental parameter		Maximum requirements
$E = \frac{A}{20} + \left(5 - \frac{B}{3}\right) + \left(5 - \frac{C}{7}\right)$	A	Proportion of renewable energy	%	--
	B	Electricity consumption	kWh/m^2	15 kWh/m^2
	C	Fuel consumption	kWh/m^2	35 kWh/m^2

Where

$$A = Proportion\ of\ renewable\ energy = \frac{Renewable\ fuels\ \left(\frac{kWh}{m2}\right) + 1{,}25\ non-fuel\ renewable\ energy\ \left(\frac{kWh}{m2}\right)}{non-renewable\ \ fuels\ \left(\frac{kWh}{m2}\right) + Renewable\ fuels\ \left(\frac{kWh}{m2}\right) + 1{,}25\ non-fuel\ renewable\ energy\ \left(\frac{kWh}{m2}\right)}\ x\ 100$$

B= Electricity consumption means the sum of the electricity purchased from an external supplier and the electricity produced on-site from non-combustible renewable energy sources. If the electricity purchase is green electricity a factor of 0.8 should be applied.

Green electricity should be demonstrated by the guarantees of origin in accordance with the Directive 2009/28/EC[viii]

C= Fuel consumption means the sum of all the fuels purchased or sourced as by-products in the manufacturing of the floorings and used to generate energy on-site

The following conditions shall be included in the calculations

- for solid wood floorings and bamboo floorings the electricity and fuel consumed in drying, grinding and sawing shall be included
- for cork and laminate floorings that may include a core board in their structure, the energy consumed in the manufacture of the board is to be included
- energy consumption in the manufacture of adhesives, lacquers or any other in-can preparation used in the manufacture of the flooring is not included in the calculation
- E scoring shall be calculated per m^2 of produced flooring and accounting the direct and indirect energy consumed in the production of the flooring (eg energy consumed in pressing, proportional energy consumed for heating and lighting of the facilities, etc)

Assessment and verification

The applicant should state and demonstrate:

- The type and quantity of electricity that has been, on average, purchased from an external supplier per year. Should green electricity be purchased, the guarantees of origin shall be provided.
- the type(s) of fuels and quantities that have been used in the manufacturing of the floor coverings by means of the contracts, bills or equivalent documentation that includes dates, quantity delivered/purchased and specifications of the fuel (eg physic-chemical properties, LHV, etc). Declaration of which of those used fuels are coming from renewable sources in accordance with Renewable Energy Directive 2009/80/EC shall be included.
- The type and quantity of energy that has been sold. The calculations should include the type and quantity of fuels, if any, used for generating the energy sold, the dates or periods of time in which it was generated and the selling dates.
- A declaration of the quantity of flooring that applies for the EU Ecolabel (in m^2) that has been, on average, annually produced.

The documents used to communicate the energy consumption, fuel purchase and/or energy

generation as well as the documents to communicate flooring production to the national authorities can be used to demonstrate compliance with this criterion.

Appendix II. Guidance for calculating the process energy used in manufacturing the floor covering that applies for the EU Ecolabel

Energy consumption per flooring m^2 is calculated as an annual arithmetic average of the last three years. Should the company not have these data, the competent bodies will assess the acceptance of equivalent data

If the producer has an energy surplus that is sold as electricity, steam or heat, the sold quantity can be deducted from the fuel consumption. Only fuel that is actually consumed in the manufacture of the floor covering[ix] is to be included in the calculation.

Energy consumption is reported in kWh/m^2, although calculations may also be made in MJ/m^2 (1 kWh=3.6 MJ).

The energy content of the fuels is calculated based on the table 4.2. If electrical energy is produced on-site, one of the following methods can be used for calculating fuel consumption;

- Actual annual consumption of fuel,
- Consumption of electricity produced on-site multiple by 1.25, if the origin is a non-combustible renewable source.

Values of the energy consumption and should be calculated by means of the standard fuel values. The energy contents of various fuels are given in Table 4.2.

Table 4.2. Standard fuel values[x]

Fuel	MJ/kg	Fuel	MJ/kg
Petrol	44.0	Pellets (7% W)	16.8
Diesel		Peat	7.8-3.8
LPG	45.2	Straw (15% W)	
Eo1 oil	42.3	Biogas	
Eo5 oil	44.0	Wood chips (25%W)	13.8
Natural gas	47.2	Waste Wood	
Power station coal	28.5	*GJ/ton is equivalent to MJ/kg*	

(% W) is the percentage by weight of water in the fuel and given the letter f in the formulas below. If nothing else is stated, f = 0% W and the ash content is average.

The formula for calculating the energy content of woodchips depends on the water content. Energy is required to evaporate the water in the wood. This energy reduces the heat value of the woodchips. The energy content can be calculated as:

$$\text{Woodchip} = 19.0\ \left(\frac{\text{MJ}}{\text{kg}}\right) - 21.442 \times \frac{\text{f}}{100}$$

Where f is the water content in %W of the wood. The factor 21.442 is the sum of water's heat of evaporation (2.442MJ/kg) and the energy content of dry wood 19.0 MJ/kg. If the applicant has laboratory analyses of the heat value of a fuel, the competent bodies may consider using this heat value for calculating the energy content.

Rationale of Proposed Criterion text

- new formula based on the total energy consumption and the sources of the energy consumed
- calculations based on annual arithmetic averages, primary energy and conversion factors provided in the Energy efficiency Directive
- promotion of the energy efficiency in the production facilities

- promotion of the use of renewable sources introducing a factor that credits the purchase of green electricity and the production of on-site green electricity (eg non-combustible renewable energies such as PV or wind farms).
- use of guarantees of origin to verify the purchase of green electricity, bills or contracts to verify the purchase of the external electricity and the on-site generated energy that is sold and registrations or internal records to demonstrate the on-site energy that is generated and used.

An ambitious energy consumption criterion is key to tackle the environmental impacts of this product group during the production because the energy consumed for manufacturing is causing the highest environmental impact. Two complementing ways of reducing the associated the impacts are a) decreasing the overall energy consumption (either as electricity purchase or as fuel to generate electricity, heat or steam onsite) and b) to increase the renewable origin of the energy

Both aspects are considered in the new formula proposed in this criterion. The formula is based on the Nordic Ecolabel for floor coverings version 6. Detailed explanations of the terms as well as of other aspects related to the formula can be found in the accompanying background report[xi]. In brief, this new formulation promotes the high energy efficiency in the production lines and favours the use of energy coming from renewable sources.

Additionally, some aspects of the criterion have been polished and redefined in this revision. The calculations of the energy consumption are proposed to be done in primary energy, being the electricity consumed accounted separately. Among the revised aspects are:

- The definition of "renewable sources" has been aligned with the Renewable Energies Directive 2009/80/EC. This definition should be considered to calculate the share of renewable energy sources used in the manufacturing process and reflected in the factor A.
- The introduction of conversion factors to

  a) Account for the electricity produced onsite from non-combustible energy sources, eg PV-production. In those cases, it was estimated that a 1.25 factor could be used. The target of this factor is to estimate how many kWh of an unreal combustible would be needed to generate the same amount of energy that is generated in the non-combustible energy source (in other words, the amount of combustible that would have been needed if the energy were produced by means of renewable fuels).

  The calculations of the energy that is produced and consumed on-site should be supported by internal records or registrations.

  b) Credit the purchase of green electricity that is demonstrated to come from renewable energy source by means of the guarantees of origin. The factor to be used is 0.8. The goal of this factor is to decrease the weighting of the electricity with a green origin in the overall sum of purchase electricity. The reason behind is that the green electricity is associated with a lower environmental impact and therefore this factor aims at decreasing the penalization that the purchase of electricity brings to E scoring.

- Explanations about how to calculate and report the annual values related to the energy consumption, floor production and energy sold were included. Values are proposed to be calculated as the arithmetic average of the consumptions and productions of the last three years the company has information. This number can be changed if the Competent Bodies consider that the number of year that are representative of the actual consumption and production (eg. after main renovations, changes of relevant equipment, etc) is different. The contracts or bills that include the dates and specifications of the fuels and energy consumed or sold are included as proof of compliance.

Further information can be found in section 4.5

CRITERION 5: Use phase: emissions of formaldehyde from floor coverings

Proposal for criterion 5:

Use phase: emissions of formaldehyde from the core board panels

The floor covering manufactured by using formaldehyde-based adhesives or resins and/or formaldehyde-based finishing agents shall either:

- have formaldehyde emissions that are lower than 50% of the threshold value allowing them to be classified as E1[10] (0.067mg/m^3 or 4mg/100g dry mass)[xii].
- have formaldehyde emissions that are lower than 65% of the E1 threshold limit (0.08mg/m^3 or 5mg/100g dry mass) in case of having Medium Density Fibreboard (MDF) panels,
- have formaldehyde emissions that are lower than the limits set out in the CARB Phase II or
- have formaldehyde emissions that are lower than the limits set out in the Japanese F-3 star or F-4 star standards.

Assessment and verification:

The applicant shall provide a declaration of compliance with this criterion. The assessment and verification of low formaldehyde emission floor coverings shall vary depending on the certification scheme it falls under. The verification documentation required for each scheme is described in Table 5.1.

Table 5.1. Assessment and verification of low formaldehyde emission floor coverings

Certification scheme	Assessment and verification
E1 (as defined in Annex B of EN 13986)	A declaration from the manufacturer, stating that the floor covering is compliant with 50% of E1 emission limits[xiii] or, in the case of floor coverings made of MDF panels, with 65% of E1 emission limits, supported by test reports carried out according to either EN 717-1, EN 717-2 or EN 120 or an equivalent method
CARB – Califonia Air Resources board: Phase II limits	A declaration from the manufacturer, supported by third party verified test results according to ASTM E1333 or ASTM D6007, demonstrating floor covering compliance with the formaldehyde Phase II emission limits defined in the California Composite Wood Products Regulation 93120[xiv]. Optionally, the floor covering may be labelled in accordance with Section 93120.3(e), containing details in respect of the manufacturer's name, the product lot number or batch produced, and the CARB assigned number for the third party certifier (this part is not required if the products were made using no-added formaldehyde or certain ultra-low emitting formaldehyde-based resins).
F-3 or 4 star limtis	A declaration from the manufacturer of compliance with the formaldehyde emission limits as per JIS A 5905 (for fibreboard) or JIS A 5908:2003 (for particleboard and plywood), supported by third party verified test data according to the JIS A 1460 desicator method.

[10] E1 is a threshold emission limit originally introduced in 1985 in the EU due to concerns over adverse health effects due to formaldehyde exposure. The emission limits are defined in Annex B of EN 13986 and correspond to steady state background levels of 0.1ppm (or 0.124mg/m^3) formaldehyde after 28d in a chamber test according to EN 717-1.

Proposal for criterion 5: Use phase: emissions of formaldehyde from the core board panels
The declarations shall be accompanied by the analysis reports including which testing method/standard was used, measurement results and measurement frequency.

Rationale of Proposed Criterion text

- *intermediate testing ensures the low-emission of formaldehyde during the end-of-life stage*
- *compliance by any of the world-wide recognized standards*
- *extension to all kind of raw materials used in the boards or panels*

The criterion 5 aims at limiting the emissions of formaldehyde during the use phase. Panels produced from wood, cork or bamboo materials bonded with adhesives that contain formaldehyde are common in the core panel industry and in the flooring industry. And, a crucial step in this production is the optimization of the thermosetting resins to bind the wood or plant-based materials together to product the solid core boards with useful technical properties.

Up to know, almost all the resins used haven been formaldehyde based: urea-formaldehyde (UF), melamine-urea-formaldehyde (MUF), melamine-formaldehyde (MF) and phenol-formaldehyde (PF). The only significant non-formaldehyde based resin used is methylene diisocynate (MDI). Given that the most important environmental impact associated with these resins is formaldehyde emissions; their use is permitted in the EU Ecolabel as long as the final emission criteria are complied with criterion 3.

World-wide there are three reliable standards to rate the boards regarding their formaldehyde emissions: E1 standard, F standard and CARB standard. These standards are going to be used to rate the flooring emissions. The level of ambition of these last two standards goes slightly beyond half the E1 standard and therefore this limit is the benchmark proposed. Suggesting this level of ambition, the strictness of this criterion has been slightly enhanced. However, feedback from stakeholders confirmed its feasibility. They showed the existence of finished products on the market that fulfil this limit.

Two levels of ambition are proposed depending on the nature of the board used (MDF and mon-MDF boards). This fact is in accordance with the Nordic Ecolabel criteria for floor covering (version 6) and the CARB limits that also recognized the difficulties that face MDF manufacturers to reach low emission values.

Further information can be found in section 4.7

CRITERION 6: Use phase: VOC emissions from the floor coverings

Proposal for criterion 6: Use phase: VOC emissions fro the floor coverings
The laminate, cork and bamboo floor coverings shall not exceed the emission values listed in Table 6.1 and the wood floor coverings shall not exceed the emission values listed in Table 6.2 measured in a test chamber in accordance with CEN/TS16516

Table 6.1. Emission requirements for laminate, cork and bamboo floor coverings

Compound or substance	Limit Value after 28 days storage in a ventilated test chamber (see CEN/TS16516) in mg/m^3 air[d]
Total VOC[a]	< 0.3
Total SVOC[b]	< 0.1
R-value for LCI substances[c]	≤1

Table 6.2. Emission requirements for wooden floor coverings

Proposal for criterion 6: Use phase: VOC emissions fro the floor coverings

Compound or substance	Limit Value after 28 days storage in a ventilated test chamber (see CEN/TS16516) in mg/m^3 air[d]
Total VOC[a] – [acetic acid] (CAS 64-19-7)[e]	< 0.3
Total SVOC[b]	< 0.1
R-value for LCI substances[c]	≤1

[a] TVOC: total volatile organic compounds, defined as those compounds within the retention range of n-C_6 to n-C_{16} (inclusive).
[b] TSVOC: total volatile organic compounds, defined as those compounds within the retention range of >n-C_{16} to n-C_{22} (inclusive)
[c] R value is the sum of all Ri values where Ri value is the ratio Ci / LCIi, where Ci is the chamber mass concentration of compound i, and LCIi is the LCI value of compound i defined under the European Collaborative Action "urban air", indoor environment and human exposure
[d] The chamber test has to be carried out 28 days after the conclusion of the surface treatment. Up to this point in time the product to be tested is stored in a sealed package at the production site and thus delivered to the test laboratory
[e] emissions of acetic acid from the natural wood the floor covering is made of and measured in accordance with CEN/TS 16516 (same conditions as the tests for the finished product)

Assessment and verification

The applicant shall provide a declaration of compliance supported by the test reports from chamber tests carried out in accordance with CEN/TS16516 or equivalent method showing that the limits above have been met.
Test reports showing that the limits in the Table 6.1 or Table 6.2 are met shall include:
- which test method was used,
- test results for laminate floorings, cork and bamboo floorings and those floor coverings that comply with Table 6.1. For wooden floor coverings complying with Table 6.2, test results of the untreated and treated wooden floor coverings together with the needed calculations to demonstrate compliance should be provided.

If the chamber concentration limits specified at 28 days can be met 3 days after placing the sample in the chamber, or any other time period between 3 and 27 days after placing the sample in the chamber, then the compliance with the requirements can be declared and the test may be stopped prematurely.
Test data from up to 12 months prior to the EU Ecolabel application shall be valid for products so long as no changes to the manufacturing process or chemical formulations used have been made that would be considered to increase VOC emissions form the final product.
A valid certificate from relevant indoor climate labels can also be used as proof of compliance if the indoor climate label fulfils the requirements of this criterion and if it is judge by the competent body to be equivalent

Rationale of Proposed Criterion text

- strictness of the criterion has not been increased although some members of the industry informed that it can be easily achieved for some kinds of floorings.
- correction of the limits to become feasible for wooden floor coverings (both single board and multi-layer wood floorings) due to the emissions of acetic acid from the raw material.
- deletion of the formaldehyde limit as it is measured/restricted by the criterion 5
- verification of the compliance with the criterion has been extended to other well-recognized schemes

Criterion 6 aims at limiting the emissions of VOCs into the indoor environment and by doing so, to limit people's exposure to proven harmful substances. Therefore, floor covering products must comply with thresholds levels concerning the emissions of harmful substances from the product after 28 days after being applied the surface treatment and storage (if needed) in sealed package.

The revision of this criterion focused on three aspects:

- the type of compounds to be tested depending on their harmfulness
- the alignment of this criterion with national regulation in terms of type and number of testing, and
- the availability and adequacy of international well-accepted standards to perform and report the results.

Regarding these three points, it was identified the relevance of testing TVOC and TSVOC after 28 days in accordance with the new so called horizontal European Emission testing method CEN/TS 16516. Additionally, it was proposed measuring the R-value as a comprehensive test to reduce the emissions from a group of substances considered of high relevance.

A new limit is proposed for the wooden floor coverings, both solid wooden floor coverings and multi-layer wood floor coverings, due to the high emissions of acetic acid coming from the natural wood. It is showed that wooden floor coverings in general but especially those made of oak, pine or beeches exceed the VOC limits because natural wood contains acetic acid which is a contributor to high VOC indoor emissions values.

Tests show that acetic acid accounts for 70% wt of the total VOC emissions in oak floorings and to a large percentage in those coming from beech floorings. In order to adapt this criterion to the specific conditions of the floorings made of natural wood, new thresholds for the TVOCs from wooden floor coverings are proposed. This new limit aims at limiting the VOC emissions released from the chemicals added but not from the natural wood itself. The new limit is based on the difference between the TVOC emissions from the final product and the acetic acid emissions from the natural wood the floor covering is made of.

In order to achieve the existing (un-revised) threshold the manufacturer of the wooden floor coverings should apply additional wood surface treatment (eg extra layers or thicker layer of the treatment surface) to block the emission of acetic acid from the natural wood. This would increase the environmental impacts coming from the wooden floor coverings because it implies higher energy consumption and higher consumption of chemicals and resources among others. Additionally, the used of higher quantities of surface treatment products would compromise the compliance with criterion 2 (general restriction of hazardous substances), criterion 3 (VOC content in surface treatments) and criterion 4 (energy consumption)

Testing of these parameters is currently proposed in some national regulations such as Belgium, Germany or France among other emissions. Thus, in those three countries the testing of the products to apply for the EU Ecolabel should not bring additional costs. An estimate of the testing costing was provided in the TR2.0 and reported in Table 3.

Table 3. Testing costs in €$_{2015}$ in Italy related to compliance with criterion 6

	Standard	**Samples /conditions**	**€$_{2015}$**
Formaldehyde	(EN 717-2)	3 sample 400mm x 50mm x panel thickness	290
VOC- 1st sample	ISO 16000-9	28 days	990
VOC – 2nd sample	ISO 16000-9	28 days	700

Further information can be found in section 4.7

CRITERION 7: Fitness for use

Proposal for criterion 7: Fitness for use

Only the requirements associated with the specific type of flooring have to be fulfilled. Floor coverings shall achieve at least:

- the level of use of class 22 (alternatively WR1) for floor coverings intended for private use
- the level of use of class 32 (alternatively WR2) for floor coverings intended for commercial use.

The floor coverings should be tested and classified in accordance with the latest versions of the standards and indications included in Table 7.1

Table 7.1. Standards for testing and classifying the floor coverings

Flooring	**Test method**	**Classification**

Proposal for criterion 7: Fitness for use

Laminate flooring	EN 13329 EN 14978 EN 15468	EN ISO 10874 Cork flooring classification properties EN 14085
Cork tile	EN 12104	
Cork flooring	??	
Bamboo	EN 14354 for resistance to abrasion and impact resistance	
Factory lacquer wood floorings	EN 13696 for wear resistance	EN 14354, Wear resistance in appendix D3.7[xv]
Multilayer wood floorings		
Factory oiled, untreated wood and untreated multilayer wood flooring	EN 13696 annex A	EN 14354
	Accompanying a recommendation for floor care to ensure that the durability of the floor will be maintained.	

The wear resistance of floor coverings other than those mentioned above shall be tested according to test methods selected by an independent test institute specialized in wear tests for flooring. The test methods shall be selected taking into account the intended use area of the flooring.

Assessment and verification

The applicant shall provide a declaration stating which (if any) standards applied to the product and provide a declaration of compliance with this criterion. Declaration shall be supported by test reports that shall include: the type of flooring, the test method/s selected, the test results and the classification of the flooring according to the results and the appropriate standard.

If the floor covering has been tested according to a test method other than what is specified above, this may be acceptable if the test methods are comparable in the opinion of an independent third party

Rationale of Proposed Criterion text

- fitness for use guarantee a long lifespan reducing the
- durability is assessed in different ways and classified under a different standards depending on the nature of the flooring. Revision of the standards and test methods has been conducted
- extent the flexibility for testing the floorings according to other standards and test methods as long as an specialized third party institute considers than both test methods are equivalent.

Floor coverings are products with a relatively long life span that varies between 15 and 50 years. Despite the long life, LCA studies showed that a reduction of the environmental impacts caused by the floor coverings can be achieved if the service life of the product is extended since a lower number of turn-overs is required. To guarantee a long durability of the finished products a design for durability, reparability, maintenance and fitness for use is needed. Therefore, this criterion plays an important role in minimizing the environmental damages.

Due to the different properties of the floorings included in this product group, the fitness for use of each flooring type should be measured and assessed separately. Most of the floorings types under considerations have durability measures and classification categories standardized as shown in Table 6.1. This is the case of laminate floorings, cork tile floorings, cork floorings or wood floorings (several types). For these types of floorings, the minimum requirements (level of ambition) are set differently depending on the intended use of the floorings (private or commercial).

For other types of floor coverings such as the bamboo floorings, there are no standards in place but the industry reports the properties of these products. Among these properties there are parameters used to characterize the durability such as the wear layer thickness, shrink or swell, the resistance to indentation or modulus of elasticity.

Further information can be found in section 4.7

CRITERION 8: Reparability and extended product guarantee

Proposal for criterion 8: reparability and extended product guarantee

For the purpose of undertaking repair and replacement of worn out parts, the floor covering shall meet

Proposal for criterion 8: reparability and extended product guarantee

the following requirements:

- Reparability:

a) *Design for repair and repair manual*: For floor coverings that are not glued down, the flooring shall be designed for disassembly with a view to facilitating repair, reuse and recycling. Simple and illustrated instructions regarding the disassembly and replacement of damaged elements shall be provided. Disassembly and replacement operations shall be capable of being carried out using common and basic manual tools.

b) *Repair Service / Information*: Information should be included in the consumer instructions or the manufacturer's website to let the user know how to obtain professional repairs, including contact details as appropriate

c) *Advice on provision of spare parts*: Information/recommendation to the end-users of keeping spare panels in stock for possible event of repair shall be provided

- Extended product guarantee;

a) The applicant shall provide at no additional cost a minimum of a five year guarantee effective from the date of delivery of the product. This guarantee shall be provided without prejudice to the legal obligations of the manufacturer and seller under national law.

Assessment and verification

The applicant shall provide a declaration of compliance supported by:

i. A copy of the repair manual or the consumer instructions or any other material where the information on design for repair, repair services/information and advice on provision of spare parts is provided.

ii. A copy of the guarantee that indicates the terms and conditions of the extended product guarantee that are provided in consumer information documentation and that meet the minimum requirements set out in this criterion

Rationale of Proposed Criterion text

- extension of the lifetime is the most effective measure to reduce the overall environmental impact of the floor coverings
- durability shall be ensured by reparability or replacement of the damages parts.
- advice of keeping spare parts and information about how to repair the floorings / professionals that can repair the flooring are key to make it possible
- guarantee for five years would avoid a premature "failure" of the floor covering.

Addressing durability and reparability of products is one of the key pillars of the circular economy as stated in the European Commission's communication on the Circular Economy, released in July 2014 "*an important starting-point is the design of production processes, products and services. Products can be redesigned to be used longer, repaired, upgraded, remanufactured or partially recycled, instead of being thrown away*".

Therefore, a move towards a truly circular economy requires a horizontal approach across different policy areas on durability and reparability of products and the EU Ecolabel policy tool can contribute to this aim ensuring that the products last longer and that they can be easily repaired if needed.

The issues identified as requirements to ensure the reparability and long lasting of the floor coverings are:

- *designing of the floor coverings so they are easier to repair*. The design requirements for floor coverings shall ensure non-destructive disassembly into individual parts and components for replacement

- *extend minimum legal warranties* to at least 5 years (approx. one third or one quarter of the expected lifetime of the product) and oblige manufacturers to prove the full repairing or replacement of their products in case of early damage

- *make repair information and repair service information available* to all independent repairers and consumers.

- *advice to keep spare parts* is the most economical way to ensure that the floor covering can be repair if needed.

So far the EU Ecolabel did not address information or design requirements effectively, even if construction products and thus floor coverings are considered as resource-intensive products. This is the main reason why this sub-criterion is introduced in this proposal even if no comments were received from the stakeholders apart from the requirements of providing information on the company services and the extension of the minimum legal warranty.

CRITERION 9: Consumer information

Proposal for criterion 9: Consumer information

The product shall be sold with the relevant consumer information on the packaging and/or any other documentation accompanying the product. Only the requirements associated with the specific type of flooring have to be fulfilled.

Instructions should be legible and be provided in the language of the country where the product is placed on the market or include graphical representation or icons and related to the following aspects:

a) **Recommendations for the installation**, including all relevant instructions referring to the best environmental installation practices
- *floating installation* is recommended whenever possible as it is easier, quicker and environmentally-friendly in respect to the end-of-life phase. If floating installation is recommended, reference should be made to the necessary preparation of the underlaying surface and the auxiliary materials needed.
- if *glued down installation* is recommended due to the possible longer duration, recommendation of using an adhesive/glue certified with a Type I Ecolabel or a low emission adhesive complying with EMICODE EC1 or equivalent should be included
-well illustrated assembly and disassembly instructions as per the requirements of criterion 8 (if applicable)

b) Recommendations for the use, cleaning and maintenance of the product.
- relevant information for routine cleaning including a mention of the most recommended cleaning products. If possible, cleaning products with a Type I ecolabel should be recommended.
- relevant information for maintenance instructions, including maintenance products, and products for occasional renovation or intensive cleaning. If possible, maintenance products with a Type I ecolabel should be recommended.
- a clear statement of the flooring's areas of use and a statement of compliance with the relevant EN standards for the product as referred to in criterion 7

c) Recommendation for the surface treatment for unfinished floor coverings and floorings needing an oiled surface.
- relevant information about the type and quantity of the surface treatment products needed (eg oil or lacquer) to achieve the intended durability.
- relevant information about the finish the floorings with low emitting finishes in accordance with the Directive 2004/42/EC (Paint Directive)
- information should be included about how the service life of the flooring can be extended through renovation e.g. sanding and surface treatment.

d) Information related to the reparability:
- relevant information regarding the terms and conditions of the product guarantee as per the requirements of criterion 8
- relevant company contact information and/or any other relevant parties regarding repair or replacement services as per the requirements of criterion 8
- a clear statement recommending the provision of spare parts.

e) A detail description of the best ways to dispose of the product (i.e. reuse, recycling, energy recovery, etc) shall be given to the consumer, ranking them according to the impact on the

Proposal for criterion 9: Consumer information
environment. ***Assessment and verification:*** The applicant shall provide a copy of the consumer information document that is to be provided with the product that shows compliance with each of the points listed in the criterion, as appropriate.

Rationale of Proposed Criterion text

- *information on the installation: underlaying materials for floating floorings and low-emitting glues. Reduction of the VOC and formaldehyde emissions*
- *information for proper use, proper cleaning and proper maintenance*
- *information for proper finishing of un-finished products or those to be oiled*
- *information on the company contact details/other parties for repairing and replacement*
- *indications of the route of recycling and disposal*

Information is essential for proper environmental behaviours of the end users. Although the floorings are not likely to cause significant environmental impacts during the use phase, the information given to the end users is the only way to guarantee that these small impacts are even reduced.

The first block of information regards the installation of the flooring at the end user's place. Information on this section should indicate/recommend those materials that award distinctions due to their outstanding environmental performance such as products with a Type I ecolabel. For example, if the floor should be glued to the sub-floor recommendations on using an adhesive with a Type I ecolabel or adhesives that are considered as Emicode EC1 should be included.

The second block of information regards the use, cleaning and maintenance of the flooring. In this section, there is information related to the most recommended area of the building to be used (eg dorms, corridors, kitchens, etc), recommendations of the cleaning products to use with especial emphasis in the environmental performance of the cleaning products and methods as well as information regarding the maintenance. The maintenance of the floorings depends on the type of flooring but in some cases, sanding and surface treatments can extend the service life.

The third point aims at giving information about how to perform the finishing of the floorings at the end user's place. There are lots of surface treatments that can be applied on the floorings. However, two general characteristics to carry out an environmental-friendlier surface treatment are: a) the use of low emitting products and b) use of the lowest possible quantity.

An extension of the lifetime of the floor coverings can be achieved if the floor coverings are repaired or partially replaced. Clear information on the company contact details and any other involved party is needed for this action.

Finally information regarding the best environmental routes for the end-of-life stage of the product is recommended.

Further information can be found in section 4.7

CRITERION 10: Information appearing on the EU Ecolabel

Proposal for criterion 10: Information appearing on the EU Ecolabel
The logo should be visible and legible. The EU Ecolabel registration/licence number must appear on the product and must be legible and clearly visible. The subgroup to which the product belongs (engineered wood, solid wood, laminate, cork or bamboo flooring) and if a surface treatment is still needed at user's place should be stated The optional label with text box shall contain the following text: - Limited hazardous substances used,

Proposal for criterion 10: Information appearing on the EU Ecolabel
- Low-emitting product (50% or 65% E1) - Lower energy consumption for manufacturing ***Assessment and verification:*** The applicant shall provide a copy of the information showing compliance with this criterion.

Rationale of Proposed Criterion text

- indication of the registration and/or license number to increase the control and traceability of the EU Ecolabel products
- exact type of flooring the product belongs to avoid misleading information about the list and amount of materials
- indication if the product is finished or untreated
- relevant properties are the lower emissions levels and the lower energy consumption during manufacturing

Among the proposed changes are the importance of including an EU Ecolabel logo and application number clearly visible and the limitation to three statements that highlight the main characteristics of this product from an environmental point of view.

Additionally, the exact name of the subgroup the product belongs should be stated to avoid misunderstanding and confusion among the consumers. In line with this requirement, information about the finish (done already or to be done) should also be included.

There are several pieces of information that although it is relevant from the environmental point of view, there are other labels and symbols that are used to communicate them. For example, the amount of certified sustainable wood, wood-based, cork or bamboo materials is not included in the list because the threshold and the requirement of having a certified chain of custody allow the product to exhibit the FSC or PEFC logo. Similarly, the fitness for use requirements, especially those based on standards are already included in most of the flooring's labels.

An important aspect that should be communicated is the low-emission level reached by this product. The CE-marking requires only a level of emissions of E1 while the EU Ecolabel products reach a level of emissions that is 50 or 65% of the E1.

Finally, it is proposed to include a statement regarding the energy consumption during the use phase. This is the environmental aspect that causes the higher environmental impacts and consumers should be aware of.

Further information can be found in section 4.7

4 TABLE OF COMMENTS

4.1 Table of comments and further research on Name, scope and definition

The name, scope and definition wording the comments are on are as follows:

> The product group of **'wood-based floor covering'** shall comprise wood- and plant-based pre-manufacturing floor coverings including wood and timber coverings, laminate floorings, cork coverings and bamboo floorings which are made, for more than 80 % in mass (in the final product), from wood, wood powder and/or wood/plant-based material.

Details of the rationale and previous stakeholders' comments considered to redrafting the name, scope and definition can be found in the TR2.0 and in the slides presented at the 2nd AHWG meeting.

The comments received through BATIS are summarized in **Table 4**

Table 4. Stakeholders' feedback on the name, scope and definition

	Stakeholder's feedback	Decision taken and IPTS analysis and further research
Name	A precise name for the product group would be ”*Wood, cork, bamboo and laminate floorings*".	**Partially accepted.** Two options are pointed out for a new product group name: a) *based on the main raw material used for the production*. The materials would be wood, wood-based materials, cork and bamboo b) *based on the type of floor covering*: the name will mainly include wood flooring, engineered wood floorings, cork floorings, cork tiles, bamboo floorings and laminate floorings. Option (a) follows the current name and seems to be supported by a larger number of stakeholders. However, there is no consensus on the exact name. Among the proposals received during the project, at the 2nd AHWG meeting it was proposed **"wood, wood-based, cork and bamboo floor coverings**". A new proposal after the meeting suggested **"wood, wood-based, cork, cork-based, bamboo and bamboo-based floor coverings**" which for the moment is most complete one. However, it is a bit too long and therefore also **"wood, cork, bamboo and plant-based floor coverings**" is proposed as alternative. Any of the proposals considers the main materials flooring can be made of, is not misleading regarding the wood content of the floorings and included all type of manufacturer processes.
	At the working group meeting it has been discussed whether the name of the product group “Wooden Floor coverings” should be changed into *“wood-based floor coverings. We agree with this proposal.*	
	However, since wood might not be the only one material present in floor coverings, we suggest to use the term “*wood-derivate floor coverings*” in order to avoid confusion for the customer.	
	But *it does not state clear enough that other floorings e.g. bamboo floorings are not wood or not wood-based since bamboo is a grass* and bamboo floorings completely made of bamboo are on the market. In this case the *title is misleading the end-user who thinks he buys a wooden-product.*	

	Wood-based floor coverings This title is a good improvement. But it does not state clear enough that other floorings e.g. bamboo floorings are not wood or not wood-based since bamboo is a grass and bamboo floorings completely made of bamboo are on the market. *In this case the title is misleading the end-user who thinks he buys a wooden-product*. That is the reason why in CEN/TC 175/WG 33 the scope is broadened to *lignified material other than wood*.[xvi]	**Partially accepted** Although the proposed idea of including in the product group name the "lignified material other than wood" to indicate the possibility of awarding floorings that are not made of wood or wood-based materials is of significant importance, the terms are considered as too technical and not easy to be understood by the consumers. Keeping in mind the idea proposed, it is suggested in the third revision of the criteria to include the terms of cork and bamboo indicating the two additional materials (cork and bamboo) the flooring included in this scheme can be made of (see above the propose new name).
Scope and definition	*Exclusion of floor adhesives:* It ensures that end users are provided with the needed information to lay the flooring respecting the environment: not relevant for products (e.g. two-layer parquet) to be glued on the subfloor (e.g. concrete) by specialists because end users do not have the skills for doing so	**Accepted** Adhesives for gluing the floor coverings on the structural floor are left out of the EU Ecolabel scope. The main reason is that both products do not fall under the same "*product group*" defined in the EU Ecolabel Regulation (EC) No 666/2010 as "*a set of products that serve similar purposes and are similar in terms of use, or have similar functional properties, and are similar in terms of consumer perception*". Adhesives and floor coverings are complemented products but each of them has a different purpose and functional properties.
	for *non-structural indoor use*? if so, please add	**Partially accepted** The word "floor covering" is, according to the definition given in the dictionary, a term to generically describe any finish material applied over a floor structure to provide a walking surface. This term is used interchangeably with flooring but floor covering refers more to the loose-laid materials. Therefore the "non-structural" function is implicit in the term "floor covering" and its addition seems to be redundant. The specification of "indoor" is however needed and therefore accepted.
	It is reasonable to restrict the product group so, that it includes *only the pre-manufactured floor coverings.* "The products falling under the first group are so-called *pre-manufactured* wood-based floor coverings and they are the ones to be considered in this revision." If only these products are dealt with and can be awarded the Ecolabel this might be mentioned in the scope write *ready to use*: The product group of *'wood-based floor covering' shall comprise wood- and plant-based pre-manufacturing ready-to-use floor coverings*	**Rejected** Both types of products can be included in the Ecolabel as expressed by stakeholders during the 2nd AHGW. The products as sold are complying with all the criteria and therefore both product types can be awarded. Due to the fact that untreated floorings are usually finished at the user's place, information about the most recommended surface treatment method and materials should be attached to the product.

	Linoleum could be included in the product group.	**Rejected** Linoleum is a kind of flooring that has likely a higher level of adhesives and which forestry materials do not reach the required level (90% by weight)
	We are in favour of *the inclusion of cork* in the scope of the product group.	**Accepted** Cork floorings are considered as part of this product group due to the large quantities of cork used in the production of the floorings and the global market share (around 2% in EU). The inclusion of cork and bamboo in the criterion has also been supported by several competent bodies after consultation at the EUEB level (meeting held in June 2015).
	Following the discussions during the 2nd AHWG meeting, BEUC and EEB would like to reiterate the need to *exclude hybrid floors* from the EU Ecolabel scope. Floors which are not made of wood are likely to contain a higher amount of hazardous and unwanted substances. Indeed, hybrid floor can comprise floors made of PVC, carpets or other materials which do not comply with the high safety standards usually required in Ecolabel products.	**Accepted** The risk of including hybrid floorings into this product group is limited because of the definition and the scope. Setting up specific thresholds (ie 80%) will ensure also that only the minimum amount of chemicals needed for a good technical performance of the floorings is used and additionally it will be ensured that only those products classified with laminate, wood, cork or bamboo floorings are able to apply for this scheme. Should the hybrid floorings comply with both requirements (threshold and definition), should they be considered as candidates

Level of wood, wood-based materials, cork and bamboo	As our initial recommendation has been *maintaining 90%*, any lower threshold will not be supported by us. We advocate for a maximum amount of wood or wood-based material in the product to ensure its safety. As we consider that *less wood content means more chemicals*, we still disagree with the change of content in the content of the product. Considering that the current Ecolabel criteria require 90% of wooden material in Floor Coverings, EEB and BEUC are concerned that *the change from 90% to 80% or 75% will lead to a less ecological product*. An increase of 15% of other materials than wood which are made of non-renewable sources *implies almost doubling the current amount of synthetic or plastic components, which can correlate with higher emissions of formaldehyde or VOCs.* By lowering the scope to 75% there will be other materials or glues that may have a higher impact on the environment, lead to higher energy consumption in production and more emissions. Besides the negative environmental impacts inherent to the non-wooden components there may be *possible negative effects on recyclability as mixing together materials of a different type are always problematic*. Additionally, depending on hazardous substances potentially present in the material, *waste materials of mixed wooden flooring might have to be treated as chemical waste*[xvii] . BEUC and EEB want to avoid any hazardous substances that could undermine the product's potential for re-use, remanufacturing and recycling activities. *Hazardous chemicals present in the product will without any doubts hinder the recycling process*, remain in the recycled material and therefore affect consumers' health during the second life of the material. In the context of a circular economy, we consider that the EU Ecolabel is an excellent tool to promote and allow safe, efficient and high quality recycling. The EU Ecolabel can contribute towards reaching the recycling target set by the EC and closing loopholes in a circular economy. We reiterate that the objectives of the EU Ecolabel scheme are to promote safe and environmental-friendly products in a matter of health and environment protection[xviii]	**Rejected** No scientific evidence has been found that a lower wooden material content leads neither to a lower environmental impact nor prevents floorings from being recycled, this proposal is rejected and the new proposal suggests a minimum plant-based material limit of 80% wt A high wooden material content in the floorings ensures a lower used of chemicals and likely makes easier to produce a low emitting VOC and formaldehyde final product. Therefore, 90% in mass could also have been proposed to be kept for solid wood, cork and bamboo floorings, as it seems an ambitious but feasible limit for them A threshold of 90% in mass for laminate floorings would mean that most of the laminates are excluded from the scope of this EU Ecolabel scheme. As commented, laminate floorings are around 70% of the European market and therefore it does not seem to be appropriate to leave out this product and leave consumers without the information on the best environmental performing products of this subgroup, even if they are a priority choice. Therefore, a threshold for the wooden material to be contented in the laminate floorings is proposed and set at 80% in mass. The average value of wood-based material content in laminate floorings is around 80-75% in mass. This value will ensure that a large share of the market can be a candidate to be awarded with the EU Ecolabel if all the other requirements are fulfilled.
	We support this threshold value. (80% in mass)	

other	BEUC and EEB would like to make a suggestion that the JRC has not considered in their report but that we think can have a very valuable contribution for consumers. We suggest requiring *manufacturers to apply a detailed composition label in a standardized format on the product* which would *properly inform the customer about the materials and their quantities being used in the product*. Since there are many possibilities of materials such as cork, wood and bamboo, it is essential that the customer knows exactly what the material he is buying for floor covering is made of.	**Partially accepted** Information appearing in the EU Ecolabel is proposed to include the type of flooring the product is classified. The environmental product declaration (EPD) is a standardized way of communicating the environmental information of a product. as far as we know, EPD are not mandoty for floorings and therefore criteria can not rely on this doc as a way of verification.,

Further research on extending the scope for the inclusion of linoleum

Linoleum is a floor covering made from materials such as solidified linseed oil (linoxyn), pine rosin, ground cork dust, wood flour, and mineral fillers such as calcium carbonate, most commonly on a burlap or canvas backing; pigments are often added to the materials. Linoleum floors can last for as much as forty years if properly maintained. High quality linoleum is still in use in many places (especially in non-allergenic homes, hospitals and health care facilities) but most of the linoleum floorings has been largely replaced with polyvinyl chloride (yet still colloquially known as "linoleum"), which has similar properties of flexibility and durability, but which has greater brightness and translucency and which is relatively less flammable. The range of material composition for this type of floorings has not been found.

The largest present day manufacturer of linoleum is Kirkcaldy-based Forbo Nairn, which sells the material under the trademarked name of Marmoleum. The company, which is part of the Switzerland-based Forbo Group, is the oldest manufacturer of linoleum in the world.

Further research on extending the scope for the inclusion of hybrid floorings

Hybrid floorings are the next generation of floor coverings that combine the advantages of laminate and resilient floorings. Hybrid floorings are emerging materials that can be created with additional values such as having an extended service life of the wood product resulting in significant reduction in environmental impacts and carbon footprint of the waste materials[xix]. Additionally, hybrid floorings may have unique properties which differ significantly from the original materials such as higher mechanical strengths (i.e. stiffness), higher biological resistance (i.e. resistances of hybrid floorings to water absorption and thickness swelling can be significantly improved) or better thermal performance (i.e higher thermal mass that can be used for off-peak storage of thermal energy and reduced and shift to night-time electricity consumption when its costs are lower)[xx]. Although hybrid floorings have the potential to be successfully applied in many areas and to become very popular in Europe, at present they are not. Literature on the properties and characteristics of this product is scared and for the moment no market data are available.

Hybrid floorings can be made of numerous materials including wood-based materials. However, not all hybrid floorings are based on wood-based materials as they can be produced by using just plastics. Due to the scarce information, no data on the average wood-based and plant-based materials content in this type of product could be found. The following composition and description is an example of one of the few wood hybrid floorings found[xxi]:

- a moisture *resistant HDF core* with sealed perimeter edge to protect against moisture penetration
- a solid some milimeter thick resilient surface-core (LVT) that reduces reflective sound and provides warmth and comfort under foot when walked upon and that can be made of different materials
- an ultra-high resolution printed design which is mainly made of paper
- *a transparent vinyl wear layer* that provides significant durability against scuffs and abrasions
- a *microscopic ceramic particles suspended in a clear liquid overlay* for superior wear resistance.

This type of hybrid floor claims to have a floating installation that does not need adhesives and a lifespan for 7 or 25 years under commercial or residential uses, respectively. Thanks to its top transparent vinyl wear layer it claims significant durability against scuffs, abrasions and stains and a greatly simplified care and maintenance. Additionally, this floor has a revolutionary ceramic bead overlay that provides extra protection of the decorative surface ensuring years of carefree performance. The maintenance is recommended through simply sweep, dust mop, vacuum cleaning and damp-mop as needed using especial cleaners. No waxing or surface treatments are required. As seen this example is a combination of wood-based materials (wood and resins), printed paper, ceramic materials and vinyl, however, no information was found on the amount/quantity of materials used what makes difficult to assess if this type of flooring will fall under the definitions included in this EU Ecolabel scheme.

Further research on the minimum quantity of wood, wood-based materials, cork, cork-based materials, bamboo or bamboo-based materials

The minimum quantity of plant-based materials has been a point for discussion in the last AHWG meetings as well as the EUEB meetings. An open consultation was opened in June 2015 for several weeks. This consultation enquired the opinion of the EUEB members on the type of floorings to be covered by this scheme regarding two points: a) the inclusion or not of flooring with ready finishing and b) the amount of wood, wood-based materials, cork and bamboo.

Four competent bodies replied to the open consultation and the feedback is shown in Table 5. As shown, 2 out of 4 replies are in favour of including the pre-finished and untreated floorings what reveal a tendency to open the scope of the product group. Concerning the percentage of forestry materials, there is no a unanimous opinion on the limit to be set up. One Member State is in favour of keeping the current threshold, another one considered better lowering it and two other considered that it can be lowered if this fact is reflected somehow in the criteria included in the scheme. This diversity in the feedback is in agreement with the feedback received from other stakeholders.

Considering both questions together and the reasons given, and remarking the repeating reasoning of keeping the scope as broad as possible while preserving the coverage of unknown products such as hybrid floorings, a differentiate threshold depending on the type of flooring is proposed. In this sense to minimum material content can be set up:

a) the current threshold (90% wt) for solid wood, cork and bamboo floorings

b) 80% in mass for laminate floorings

The advantages of splitting the threshold are among others:

a) a lower content of chemicals (ie adhesives, surface treatment chemicals, etc) is ensured in three out of four product groups this scheme consists of. In this sense, the expressed concerns about possible higher environmental impacts of the floorings due to their higher content in adhesives is partially dismissed

b) most of the laminate floorings can be candidates for this scheme. In this sense, the scheme under revision will cover most of the laminate floorings produced and consumed in Europe.

c) the EU Ecolabel does not cover hybrid flooring and this exclusion is supported by two main facts. The first one is that hybrid flooring is not defined as a sub product in the definition (solid wood, laminate, cork or bamboo floorings) and the second one is that it material should be more than 80%.

Table 5 Feedback from stakeholders regarding the scope and definition of the wooden floor covering product group

	Should the scope of the product group be narrowed by including the terms 'pre-manufactured' or 'pre-finished' into the definition of the product group?	**Should the percentage of wood, wood powder and/or wood-plant-based material (in the final product) be reduced from current 90% down to 80- 75%?**
Denmark	The *scope should be as broad as possible* and not only include "ready to use products".	The *limit of 90% can be discussed* but if lowering the limit more weight should be put to the non-wood fraction, hence this part will then have a higher weight looking at the whole product.
Belgium	We are *not in favour to narrow the scope* of the product group by including the terms "pre-finished" into the definition of the product group. The scope should be as broad as possible	*We would like to keep the current limit of 90%.* A reduction of this limit needs to be in balance with the other criteria.
Estonia		*We support 75%wt for minimum wood and plant-material quantity*. We support excluding hybrid flooring.
Italy	The p. g. scope should not be narrowed to only "pre-finished" products. For the unfinished coverings it should be clearly stated in EU Ecolabel Box 2 that a surface treatment is needed at the user's place. For the pre-finished coverings it should be clearly stated in EU Ecolabel Box 2 that no other surface treatment is needed at the user's place.	The percentage of wood in the final wooden as well as wood-based products shouldn't be lower than 90%. The percentage of bamboo in the final bamboo products shouldn't be lower than 90%. The percentage of cork in the final cork products shouldn't be lower than 90%. The percentage of wood in the final laminated products shouldn't be lower than 90%.

Industry Parquet	YES the scope of the product group is narrowed to only 'pre-finished' products, because the unfinished floorings need surface treatment to be applied at user's place with lower amount of chemicals used by the manufacturers and easier compliance with the Ecolabel criteria. An Ecolabel unfinished flooring can't give guarantee to consumers about the indoor quality, VOC content, hazardous substances or SVHC substances, content, etc. after the surface treatment that is applied at user's place with no ecolabel criteria on chemical products used. Ecolabel 'pre-finished' products give to consumer the guarantee of the respect of Ecolabel criteria If the unfinished flooring will be included in the scope of the product group it is necessary to eliminate the verification of VOCs and formaldehyde emissions/content at the final product level (the criterion 6.1 Indoor emission) and leave only the verification of VOCs and formaldehyde emissions/content at the raw materials level.	NO *because scope of the product group is wood-based floor covering and it is necessary valorise the naturally origin of the product.* If the percentage of wood will be reduced to 75% it is necessary verify if specific criteria or thresholds different for laminate and solid wood/parquet have to be defined in this Decision (for example for indoor emission like Nordic Eco labelling Floor coverings version 6.0) or if it is better define another specific decision for laminate. If the percentage of wood will be reduced to 75% it is necessary to introduce in criterion 7 Information obligation to communicate the percentage of wood.

Due to the fewer responses collected, a second questionnaire was sent to all competent bodies in September 2015. In this occasion, competent bodies were asked to express their preferences on three alternatives. The questionnaire contained the following information:

> *"If the threshold is kept at 90% in mass, most of the laminate floorings on the market (representing 70% of the whole WFC market) can not apply for the EU Ecolabel. Therefore, it has been proposed to reduce this threshold, but concerns have been expressed by some stakeholders that a higher amount of other materials may mean a higher environmental impact. This fact is not scientifically proven. The remaining 10-20% in mass of the product will consist of components (such as adhesives, sealants, coatings, etc) which include chemicals whose environmental impacts are expected to be covered mainly by criterion 2 and 3 (restriction of general and specific chemicals). ..... Then, at this point, we would like to have your opinion on reducing the limit on wood, wood power and/or wood/plant based materials. The options that we have for the scope are the following ones:*
>
> *a) Keep the current threshold (90% in mass) covering totally the wood and bamboo flooring markets and partially the cork flooring market. Only few laminates floorings will be able to apply for, and therefore we will continue to address only a limited portion of the market (currently 1 EU Ecolabel license holder)*
>
> *b) Decrease the threshold to 80% in mass: the four product groups will be able to apply for*
>
> *c) Split the threshold keeping a minimum content of 90% in mass for wood flooring and bamboo flooring (even cork flooring could be included here) and setting a new separate threshold of 80% in mass for laminates covering most of the laminate floorings.*

The replies are collected in Table 6

Table 6. Replies to the second questionnaire sent to the competent bodies in September 2015 on the scope and definition of this product group

Competent body	Opinion/feedback
Belgium	We could accept to split the threshold but we would like to amend the option c) as follows : - Min. 90% (in mass) in the final product for wood flooring and bamboo flooring (even cork flooring could be included here). - For laminate flooring: min. 80% (in mass) in the final product, but min. 90% (in mass) in the wood-based panel.
Czech Republic	Considering very low attractiveness of most of the new/revised criteria sets lately, we think that option c) is well justified
Norway	Norway thinks we should have a broad product group covering as many wooden floors as possible. We will therefore accept to reduce the threshold of wood to 80% of the final product. We must of course also have good criteria on the remaining 20% of the product. In line with this, we also want to include floorings that are installed as untreated floors, and where the customer chooses the final finish with the final oil/wax/varnish and matt or glossy as he whish. We can either look at this in the same way as we look at textile-fiber which can be ecolabelled on their own, or we can require that the floor producer shall include one or more preferred surface treatments in the application, complying with the criteria. This or these surface treatments shall be offered to be sold together with the flooring, but made optional for the final customer. Both options are acceptable for us.
Denmark	Our major concern in regards to lowering the limit I what about the not material – this will have a higher weight. Your suggestion wills lower our concerns and we will support to have also laminate flooring included. I think you have argued that the non-wood part of a laminate floor is covered by chemical requirement. I will recommend repeating this and explaining again which materials we are taking about at the next meeting. This will probably hinder a discussion of the non-wood part.
Finland	We can accept alternatives b) and c). The Finnish ecolabelling board has in their opinion already stated that alternative b) is acceptable. If it can be justified that the alternative c) would be more reasonable, we can accept it also
Italy	The percentage of wood in the final wooden as well as wood-based products shouldn't be lower than 90%. The percentage of bamboo in the final bamboo products shouldn't be lower than 90%. The percentage of cork in the final cork products shouldn't be lower than 90%. The percentage of wood in the final laminated products shouldn't be lower than 90%.

Further research on the references to CEN/TS in the definition of the products

The existing definitions of the four main products this scheme consists in are followed by a reference to the CEN/TS, where the technical position of the industry is reflected. For example, in the case of wood and timber coverings reference to the CEN/TS 112 is added or in the case of laminate floorings reference to the CEN/TS 134.

The core business of the Technical Specification (CEN/TS) is to develop and publish European Standards and technical specifications that meet the evolving needs of European business and other organizations. This important work brings concrete benefits, such as improving safety, quality and reliability of products, services and processes, reinforcing a single market and the economic growth and the spread of technologies and innovation.

The standards, under CEN, are developed on the knowledge of experts and the cooperation with organizations representing the different stakeholders, including consumers, workers, environmental interests and SMEs. CEN produces a set of deliverables - differing in the levels of transparency, consensus and approval required before issue, offering a flexible means to meet market needs for technical requirements and information. Amongst these, CEN/TS serves as normative document in areas where the actual state of the art is not yet sufficiently stable for a European Standard (EN).

CEN/TS is, then, a normative document made available by CEN, approved by a CEN Technical Committee by a weighted vote of CEN National Member and announced and made available at national level. Conflicting national standards may continue to exist. CEN/TS may compete against another CEN/TS with the same scope, but a CEN/TS may not conflict with a European Standard. This implies that existing CEN/TS shall be withdrawn if the publication of a subsequent EN brings the CEN/TS conflict with that EN.

The reason why CEN/TS is chosen/selected to be developed is to provide an 'appropriate' consensus/transparency solution to a market need where there is no immediate need for national implementation and withdrawal of conflicting national standards. CEN/TS can be transformed into a EN and thus may serve as a CEN 'pre-standard'. This pre-standardization role is further acknowledged through the possibility of allowing 'competing' Technical Specifications which permits CEN to test two (or more) solutions to a specific market need: with experience, the preferred solution could then be transformed into EN.

The CEN/TS can act as a pre-standard, but it can also be accepted that the 'appropriate consensus' represented by the CEN/TS could continue to meet a market need without eventual conversion into an EN. CEN/TS may be established with a view to serving for instance the purpose of:

- publishing aspects of a subject which may support the development and progress of the European market but where a European standard is not feasible or not yet feasible;
- giving guidance to the market on or by specifications and related test methods;
- providing specifications in experimental circumstances and/or evolving technologies

Furthermore, a CEN Technical Committee may decide to publish a work item, originally intended to result in an EN, as a CEN/TS where:

- there had been insufficient support at the CEN Enquiry for the work item to progress to an EN;
- no consensus can be reached on the submission of the work item to Formal Vote within the given target date.

It may also be preferable to publish two or more CEN/TS if, for instance, the draft EN had dealt with more than one class of product, or included alternative methods of test. CEN/TS may, therefore, compete with each other. The process of elaboration (drafting), translation and voting is summarized in http://boss.cen.eu/developingdeliverables/TS/Pages/default.aspx

The CEN/TS 112 aggregates norms and standards focused on the definition, characteristics, classification and other aspects related to the wood core boards. The list of standards compiled in 2012 is shown in Table 7

Table 7. List of standards grouped under CEN/TS 112 in 2005

Norm	Date	Title-definition
EN 120	1992-07-00	Wood based panels; determination of formaldehyde content; extraction method called the perforator method
CR 213	1984-06-00	Particle boards; determination of formaldehyde emission under specified conditions; method called formaldehyde emission method
EN 300	1997-03-00	Oriented Strand Boards (OSB) - Definitions, classification and specifications
EN 309	1992-07-00	Wood particleboards; definition and classification
EN 310	1993-02-00	Wood-based panels; determination of modulus of elasticity in bending and of bending strength
EN 311	2002-05-00	Wood-based panels - Surface soundness - Test method
EN 312	2003-08-00	Particleboards - Specification
EN 313-1	1996-03-00	Plywood - Classification and terminology - Part 1: Classification
EN 313-2	1999-10-00	Plywood - Classification and terminology - Part 2: Terminology
prEN 314-1	2001-10-00	Plywood - Bonding quality - Part 1: Test methods
EN 314-1	1993-02-00	Plywood; bonding quality; part 1: test methods
EN 314-2	1993-02-00	Plywood; bonding quality; part 2: requirements
EN 315	2000-07-00	Plywood - Tolerances for dimensions
EN 316	1999-09-00	Wood fibreboards - Definition, classification and symbols
EN 317	1993-02-00	Particleboards and fibreboards; determination of swelling in thickness after immersion in water
EN 318	2002-03-00	Wood based panels - Determination of dimensional changes associated with changes in relative humidity
EN 319	1993-02-00	Particleboards and fibreboards; determination of tensile strength perpendicular to the plane of the board
EN 320	1993-02-00	Fibreboards; determination of resistance to axial withdrawal of screws
EN 321	2001-11-00	Wood-based panels - Determination of moisture resistance under cyclic test conditions
EN 322	1993-02-00	Wood-based panels; determination of moisture content
EN 323	1993-02-00	Wood-based panels; determination of density
EN 324-1	1993-02-00	Wood-based panels; determination of dimensions of boards; part 1: determination of thickness, width and length
EN 324-2	1993-02-00	Wood-based panels; determination of dimensions of boards; part 2: determination of squareness and edge straightness
EN 325	1993-02-00	Wood-based panels; determination of dimensions of test pieces
EN 326-1	1994-02-00	Wood-based panels - Sampling, cutting and inspection - Part 1: Sampling and cutting of test pieces and expression of test results
EN 326-2	2000-07-00	Wood-based panels - Sampling, cutting and inspection - Part 2: Quality control in the factory
EN 326-3	2003-11-00	Wood-based panels - Sampling, cutting and inspection - Part 3: Inspection of an isolated lot of panels
EN 335-3	1995-07-00	Durability of wood and wood-based products - Definition of hazard classes of biological attack – Part 3: Application to wood-based panels
EN 382-1	1993-02-00	Fibreboards; determination of surface absorption; part 1: test method for dry process fibreboards
EN 382-2	1993-11-00	Fibreboards; determination of surface absorption; part 2: test method for hardboards
EN 622-1	2003-04-00	Fibreboards - Specifications - Part 1: General requirements
prEN 622-2	2003-08-00	Fibreboards - Specifications - Part 2: Requirements for hardboards / Note: Intended as replacement for EN 622-2 (1997-06).
EN 622-2	1997-06-00	Fibreboards - Specifications - Part 2: Requirements for hardboards / Note: To be replaced by prEN 622-2 (2003-08).
prEN 622-3	2003-08-00	Fibreboards - Specifications - Part 3: Requirements for medium boards / Note: Intended as replacement for EN 622-3 (1997-06).

EN 622-3	1997-06-00	Fibreboards - Specifications - Part 3: Requirements for medium boards / Note: To be replaced by prEN 622-3 (2003-08).
EN 622-4	1997-06-00	Fibreboards - Specifications - Part 4: Requirements for softboards
EN 622-5	1997-06-00	Fibreboards - Specifications - Part 5: Requirements for dry process boards (MDF)
EN 633	1993-10-00	Cement-bonded particleboards; definition and classification
EN 634-1	1995-03-00	Cement-bonded particleboards - Specification - Part 1: General requirements
EN 634-2	1996-08-00	Cement-bonded particleboards - Specifications – Part 2: Requirements for OPC bonded particleboards for use in dry, humid and exterior conditions
EN 635-1	1994-12-00	Plywood - Classification by surface appearance - Part 1: General
EN 635-2	1995-05-00	Plywood - Classification by surface appearance - Part 2: Hardwood
EN 635-3	1995-05-00	Plywood - Classification by surface appearance - Part 3: Softwood
ENV 635-4	1996-09-00	Plywood - Classification by surface appearance - Part 4: Parameters of ability for finishing, guideline
EN 635-5	1999-03-00	Plywood - Classification by surface appearance - Part 5: Methods for measuring and expressing characteristics and defects
EN 636	2003-07-00	Plywood - Specifications
prEN 717-1	2002-05-00	Wood-based panels - Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method
ENV 717-1	1998-12-00	Wood-based panels - Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method
EN 717-2	1994-11-00	Wood-based panels - Determination of formaldehyde release - Part 2: Formaldehyde release by the gas analysis method
EN 717-2/AC	2002-07-00	Wood-based panels - Determination of formaldehyde release - Part 2: Formaldehyde release by the gas analysis method; Amendment AC
EN 717-3	1996-03-00	Wood-based panels - Determination of formaldehyde release - Part 3: Formaldehyde release by the flask method
EN 1072	1995-07-00	Plywood - Description of bending properties for structural plywood
EN 1084	1995-06-00	Plywood - Formaldehyde release classes determined by the gas analysis method
EN 1087-1	1995-02-00	Particleboards - Determination of moisture resistance - Part 1: Boil test
ENV 1099	1997-10-00	Plywood - Biological durability - Guidance for the assessment of plywood for use in different hazard classes
EN 1128	1995-10-00	Cement-bonded particleboards - Determination of hard body impact resistance
ENV 1156	1998-12-00	Wood-based panels - Determination of duration of load and creep factors
EN 1328	1996-08-00	Cement bonded particleboards - Determination of frost resistance
EN 12369-1	2001-01-00	Wood-based panels - Characteristic values for structural design - Part 1: OSB, particleboards and fibreboards
EN 12369-2	2004-02-00	Wood-based panels - Characteristic values for structural design - Part 2: Plywood
EN 12775	2001-01-00	Solid wood panels - Classification and terminology
EN 12871	2001-05-00	Wood-based panels - Performance specifications and requirements for load bearing boards for use in floors, walls and roofs
ENV 12872	2000-07-00	Wood-based panels - Guidance on the use of load-bearing boards in floors, walls and roofs
EN 13017-1	2000-11-00	Solid wood panels - Classification by surface appearance - Part 1: Softwood
EN 13017-2	2000-11-00	Solid wood panels - Classification by surface appearance - Part 2: Hardwood
EN 13353	2003-06-00	Solid wood panels (SWP) - Requirements
CEN/TS 13354	2003-05-00	Solid wood panels - Bonding quality - Test method
EN 13446	2002-05-00	Wood-based panels - Determination of withdrawal capacity of fasteners
EN 13810-1	2002-12-00	Wood-based panels - Floating floors - Part 1: Performance specifications and requirements

CEN/TS 13810-2	2003-04-00	Wood-based panels - Floating floors - Part 2: Test methods
EN 13879	2002-05-00	Wood-based panels - Determination of edgewise bending properties
prEN 13986	2004-03-00	Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking / Note: Intended as replacement for EN 13986 (2002-06).
EN 13986	2002-06-00	Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking / Note: To be replaced by prEN 13986 (2004-03).
ENV 14272	2002-06-00	Plywood - Calculation method for some mechanical properties
prEN 14279	2001-10-00	Laminated Veneer Lumber (LVL) - Specifications, definitions, classification and requirements
prEN 14322	2003-10-00	Wood-based panels - Melamine faced boards for interior uses - Definitions, requirements and classification
prEN 14323	2003-10-00	Wood-based panels - Melamine faced boards for interior uses - Test methods
prEN 14354	2001-12-00	Wood-based panels - Wood veneer floor covering
prEN 14755	2003-08-00	Extruded particleboards - Specifications

Similarly, the CEN/TS 134 groups the standards and norms that are related to the laminate and cork floorings. Further details are given in Table 8

Table 8. List of standards grouped under CEN/TS 134 in 2005

Norm	Date	Title-definition
EN 423	2001-12-00	Resilient floor coverings - Determination of resistance to staining
EN 424	2001-12-00	Resilient floor coverings - Determination of the effect of simulated movement of a furniture leg
EN 425	2002-04-00	Resilient and laminate floor coverings - Castor chair test
EN 426	1993-09-00	Resilient floorcoverings; determination of width, length, straightness and flatness of sheet material
EN 427	1994-08-00	Resilient floor coverings - Determination of the side length, squareness and straightness of tiles
EN 428	1993-09-00	Resilient floor coverings; determination of overall thickness
EN 429	1993-09-00	Resilient floor coverings; determination of the thickness of layers
EN 430	1994-08-00	Resilient floor coverings - Determination of mass per unit area
EN 431	1994-08-00	Resilient floor coverings - Determination of peel resistance
EN 432	1994-08-00	Resilient floor coverings - Determination of shear force
EN 433	1994-08-00	Resilient floor coverings - Determination of residual indentation after static loading
EN 434	1994-08-00	Resilient floor coverings - Determination of dimensional stability and curling after exposure to heat
EN 435	1994-08-00	Resilient floor coverings - Determination of flexibility
EN 436	1994-08-00	Resilient floor coverings - Determination of density
prEN 548	2004-01-00	Resilient floor coverings - Specification for plain and decorative linoleum / Note: Intended as replacement for EN 548 (1997-05).
EN 548	1997-05-00	Resilient floor coverings - Specification for plain and decorative linoleum / Note: To be replaced by prEN 548 (2004-01).
EN 649	1996-10-00	Resilient floor coverings - Homogeneous and heterogeneous polyvinyl chloride floor coverings - Specification
EN 649/A1	2003-10-00	Resilient floor coverings - Homogeneous and heterogeneous polyvinyl chloride floor coverings - Specification; Amendment A1
EN 650	1996-10-00	Resilient floor coverings - Polyvinyl chloride floor coverings on jute backing or on polyester felt backing or on polyester felt with polyvinyl chloride backing - Specification

EN 651	1996-10-00	Resilient floor coverings - Polyvinyl chloride floor coverings with foam layer - Specification
EN 651/A1	2003-10-00	Resilient floor coverings - Polyvinyl chloride floor coverings with foam layer - Specification; Amendment A1
EN 652	1996-10-00	Resilient floor coverings - Polyvinyl chloride floor coverings with cork-based backing - Specification
EN 653	1996-10-00	Resilient floor coverings - Expanded (cushioned) polyvinyl chloride floor coverings - Specification
EN 654	1996-10-00	Resilient floor coverings - Semi-flexible polyvinyl chloride tiles - Specification
EN 654/A1	2003-10-00	Resilient floor coverings - Semi-flexible polyvinyl chloride tiles - Specification; Amendment A1
EN 655	1996-10-00	Resilient floor coverings - Tiles of agglomerated composition cork with polyvinyl chloride wear layer - Specification
EN 660-1	1999-04-00	Resilient floor coverings - Determination of wear resistance - Part 1: Stuttgart test
EN 660-1/A1	2003-04-00	Resilient floor coverings - Determination of wear resistance - Part 1: Stuttgart test; Amendment A1
EN 660-2	1999-04-00	Resilient floor coverings - Determination of wear resistance - Part 2: Frick-Taber test
EN 660-2/A1	2003-04-00	Resilient floor coverings - Determination of wear resistance - Part 2: Frick-Taber test; Amendment A1
EN 661	1994-11-00	Resilient floor coverings - Determination of the spreading of water
EN 662	1994-11-00	Resilient floor coverings - Determination of curling on exposure to moisture
EN 663	1994-11-00	Resilient floor coverings - Determination of conventional pattern depth
EN 664	1994-11-00	Resilient floor coverings - Determination of volatile loss
EN 665	1994-11-00	Resilient floor coverings - Determination of exudation of plasticizers
EN 666	1994-11-00	Resilient floor coverings - Determination of gelling
prEN 667	1992-03-00	Rubber floor coverings; determination of indentation hardness by means of a durometer (Shore A hardness)
prEN 668	1992-03-00	Rubber floor coverings; determination of abrasion resistance using a rotating cylindrical drum device and non-rotating sample holder
EN 669	1997-09-00	Resilient floor coverings - Determination of dimensional stability of linoleum tiles caused by changes in atmospheric humidity
EN 670	1997-09-00	Resilient floor coverings - Identification of linoleum and determination of cement content and ash residue
EN 672	1996-12-00	Resilient floor coverings - Determination of apparent density of agglomerated cork
EN 684	1995-12-00	Resilient floor coverings - Determination of seam strength
EN 685	1995-12-00	Resilient floor coverings - Classification
EN 685/A1	2003-04-00	Resilient floor coverings - Classification; Amendment A1
EN 686	1997-05-00	Resilient floor coverings - Specification for plain and decorative linoleum on a foam backing
EN 687	1997-05-00	Resilient floor coverings - Specification for plain and decorative linoleum on a corkment backing
EN 688	1997-05-00	Resilient floor coverings - Specification for corklinoleum
EN 718	1995-12-00	Resilient floor coverings - Determination of mass per unit area of a reinforcement for a backing of polyvinyl chloride floor coverings
EN 984	2001-12-00	Textile floor coverings - Determination of the mass per unit area of the use surface of needled floor coverings
EN 985	2001-07-00	Textile floor coverings - Castor chair test
EN 986	1995-04-00	Textile floor coverings - Tiles - Determination of dimensional changes due to the effects of varied water and heat conditions and distortion out of plane / Note: To be replaced by prEN 986 (2004-03) (in preparation).
EN 986/AC	1998-04-00	Textile floor coverings - Tiles - Determination of dimensional changes due to the effects of varied water and heat conditions and distortion out of plane; Amendment AC
EN 994	1995-07-00	Textile floor coverings - Determination of the side length, squareness and straightness of tiles
EN 995	1995-07-00	Textile floor coverings - Assessment of the creep of the backings

EN 1081	1998-01-00	Resilient floor coverings - Determination of the electrical resistance
EN 1269	1997-02-00	Textile floorcoverings - Assessment of impregnations in needled floorcoverings by means of a soiling test
prEN 1307	2002-09-00	Textile floor coverings - Classification of pile carpet
EN 1307	1997-01-00	Textile floor coverings - Classification of pile carpets
EN 1318	1996-12-00	Textile floor coverings - Determination of the apparent effective thickness of the backing
EN 1399	1997-09-00	Resilient floor coverings - Determination of resistance to stubbed and burning cigarettes
EN 1399/AC	1998-04-00	Resilient floor coverings - Determination of resistance to stubbed and burning cigarettes; Amendment AC
EN 1470	1997-10-00	Textile floor coverings - Classification of needled floor coverings except for needled pile floor coverings
EN 1471	1996-12-00	Textile floor coverings - Assessment of changes in appearance
EN 1471/A1	2003-10-00	Textile floor coverings - Assessment of changes in appearance; Amendment A1
EN 1813	1997-10-00	Textile floor coverings - Determination of wool fibre integrity using an abrasion machine
EN 1814	1997-11-00	Textile floor coverings - Determination of resistance to damage at cut edges using the modified Vettermann drum test
EN 1815	1997-11-00	Resilient and textile floor coverings - Assessment of static electrical propensity
EN 1816	1998-03-00	Resilient floor coverings - Specification for homogeneous and heterogeneous smooth rubber floor coverings with foam backing
EN 1817	1998-03-00	Resilient floor coverings - Specification for homogeneous and heterogeneous smooth rubber floor coverings
EN 1818	1998-09-00	Resilient floor coverings - Determination of the effect of loaded heavy duty castors
EN 1963	1997-10-00	Textile floor coverings - Tests using the Lisson Tretrad Machine
EN 12103	1999-03-00	Resilient floor coverings - Agglomerated cork underlays - Specification
EN 12104	2000-05-00	Resilient floor coverings - Cork floor tiles - Specification
EN 12105	1998-07-00	Resilient floor coverings - Determination of moisture content of agglomerated composition cork
EN 12199	1998-03-00	Resilient floor coverings - Specifications for homogeneous and heterogeneous relief rubber floor coverings
EN 12455	1999-09-00	Resilient floor coverings - Specification for corkment underlay
EN 12466	1998-03-00	Resilient floor coverings - Vocabulary
EN 13297	2000-08-00	Textile floor coverings - Classification of needled pile floor coverings
EN 13329	2000-06-00	Laminate floor coverings - Specifications, requirements and test methods
EN 13413	2001-12-00	Resilient floor coverings - Polyvinyl chloride floor coverings on a filled fibrous backing - Specification
EN 13553	2002-04-00	Resilient floor coverings - Polyvinyl chloride floor coverings for use in special wet areas - Specification
prEN 13845	2003-08-00	Resilient floor coverings - Polyvinyl chloride floor coverings with enhanced resistance - Specification
EN 13893	2002-11-00	Resilient, laminate and textile floor coverings - Measurement of dynamic coefficient of friction on dry floor surfaces
prEN 14041	2003-10-00	Resilient, textile and laminate floor coverings - Health, safety and energy-saving requirements
EN 14085	2003-03-00	Resilient floor coverings - Specification for floor panels for loose laying
prEN 14159	2001-05-00	Textile floor coverings - Recommendations for tolerances on (linear) dimensions of rugs and wall-to-wall carpet and for tolerances on pattern repeat
EN 14215	2003-05-00	Textile floor coverings - Classification of machine-made pile rugs and runners
CEN/TS 14472-1	2003-06-00	Resilient, textile and laminate floor coverings - Design, preparation and installation - Part 1: General
CEN/TS 14472-2	2003-06-00	Resilient, textile and laminate floor coverings - Design, preparation and installation - Part 2: Textile floor coverings
CEN/TS 14472-3	2003-06-00	Resilient, textile and laminate floor coverings - Design, preparation and installation - Part 3: Laminate floor coverings

CEN/TS 14472-4	2003-06-00	Resilient, textile and laminate floor coverings - Design, preparation and installation - Part 4: Resilient floor coverings
prEN 14499	2002-06-00	Texile floor coverings - Classification of carpet underlays
prEN 14521	2004-01-00	Resilient floor coverings - Specifications for smooth rubber floor coverings with or without foam backing and with a decorative layer
prEN 14565	2003-12-00	Resilient floor coverings - Floor coverings based upon synthetic thermoplastic polymers - Specification
EN ISO 11378-2	2001-05-00	Textile floor coverings - Laboratory soiling tests - Part 2: Drum test (ISO 11378-2:2001)
EN ISO 11857	2002-01-00	Textile floor coverings - Determination of resistance to delamination (ISO 11857:1999)
prEN ISO 21868	2002-02-00	Textile floor coverings - Guidelines for maintenance and cleaning (ISO/DIS 21868:2002)

As shown, the reference to the CEN/TSs that group the standards where the products are classified do not bring additional information to the definition although it restricts or limits other norms and standards that can be proposed to define the products. it is proposed to leave them out of the definition.

4.2 Table of comments and further research on definitions

Several terms are defined in the legal text. These terms are needed to be revised as well. This section provides an overview of the terms required to be revised, the new definitions and the sources of information used

Table 9 Definitions: terms revised

Term	Definition	Rationale and sources of information
Certified evidence	No definition was found.	The meaning in context would mean that any evidence provided by a certified institution
Final product	In production, a final product is a product that is ready for sale without significant further processing	Wouters, Mark; Selto, Frank H.; Hilton, Ronald W.; Maher, Michael W. (2012): *Cost Management: Strategies for Business Decisions*, International Edition, Berkshire (UK), p. 532.

Final stages of the production	No definition was found No longer needed as the focus of the criterion has been changed to the whole product.	The meaning in context would mean the last stages of the flooring production. Generally speaking the production stages are reception and preparation of the log (including cleaning, drying and cutting), hot pressing (being different processes depending on the type of flooring) and subsequently application of the surface treatment (if needed). Afterwards the floorings are packed, storage and delivered. Context indicates that final stages of the production mainly refers to the application of the surface treatment.
Parquet	1. Wood floor covering element with a top layer of minimum 2 mm prior to installation. 2. Assembly of the above with a defined pattern.	prEN 13756:1999
Solid wood floor coverings	*Solid wood floors a solid piece of wood from top to bottom*. The thickness of solid wood flooring can vary, but generally ranges from ¾" to 5/16". One of the many benefits of solid wood flooring is that it can be sanded and refinished many times. Solid wood flooring can be installed above or on grade *Engineered wood floors are real wood floors that are manufactured using multiple layers of different wood veneers.* The sub layers can be of the same species, or of different species. The grain of each layer runs in different directions, which makes it very stable. This means that the wood will expand and contract less than solid wood flooring during fluctuations in humidity and temperature. The top layer of engineered wood flooring consists of high-quality wood. While this type of flooring can be sanded and finished, it cannot be done as many times as solid wood flooring. Engineered wood flooring can be installed above, on or below grade.	http://woodfloors.org/types.aspx The so-called "solid wood flooring" in the TR2.0 refers to both types of flooring.
Third party certification body	Third-party certification means that an independent organization has reviewed the manufacturing process of a product and has independently determined that the final product complies with specific standards for safety, quality or performance. This review typically includes comprehensive formulation/material reviews, testing and facility inspections. Most certified products bear the certifier's mark on their packaging to help consumers and other buyers make educated purchasing decisions.	http://www.nsf.org/about-nsf/what-is-third-party-certification/

Accredited third party laboratories	See below the description for: - accredited testing laboratory - third party laboratory An accredited third party laboratory is an independent testing laboratory that meets the general requirements of ISO/IEC 17025	Accredited laboratory requirement has been removed in line with other EU Ecolabel criteria sets. This requirement has been replaced by "Where possible, the testing should be performed by laboratories that meet the general requirements of EN ISO 17025 or equivalent'
Accredited laboratory	Accredited laboratories are testing organizations that meet the general requirements of ISO 17025 or any other scheme considered as equivalent. In the case of ISO 17025, a list of accredited third party laboratories, and the tests for which they are accredited, may be found on the web site http://european-accreditation.org/.	
Third party laboratory	Third party laboratories are testing organizations that carried out third-party activities independent of the activities carried out by manufacturers and suppliers and activities performed by buyers, users or consumers. Third party laboratories are independent organizations that may include non-federal government, university, private and other institutional laboratories.	

Further research on accredited laboratories.

The requirement of testing the product in an accredited laboratory is deleted in the last proposal. However, in the EU Ecolabel regulation states: ***"Where possible, the testing should be performed by laboratories that meet the general requirements of EN ISO 17025 or equivalent'".*** This requirement indicates the preference of testing the products by laboratories that have certain management procedures in place that guarantee the reproducibility and repeatability of the testing.

The **ISO/IEC 17025 "General requirements for the competence of testing and calibration laboratories"** specifies the general requirements for the competence to carry out tests and/or calibrations, including sampling. It covers testing and calibration performed using standard methods, non-standard methods and laboratory-developed methods. This ISO standard is applicable to all organizations performing tests and/or calibrations. These include first-, second- and third-party laboratories and laboratories where testing and calibration forms part of inspection and production certification. ISO/IEC 17025 is for use by laboratories in developing their management system for quality, administrative and technical operations. Laboratory customers, regulatory authorities and accreditation bodies may also use it in confirming or recognizing the competence of laboratories. The laboratories that are accredited are listed by country and it is available at: http://european-accreditation.org/.

However, there is a scarcity on the market of laboratories and institutions complying with the requirements of ISO 17025 due to the phase-out of this standard. This is the main reason (the market distortion that this requirement will create) why the compliance with ISO 17025 has been deleted from the wording of the assessment and verification of the last voted EU Ecolabel criteria sets. The requirements are no longer explicitly required and an open formulation has been preferred.

Good laboratories practice (GLP) is another regulation to assure data quality, but if it shares the same end objective that ISO 17025, their means to this end are markedly different. GLP regulations focus on requirements for a study plan, appointment of a study director, inspections of each study by a Quality Assurance Unit and specific requirements for data storage. ISO 17025 provides much more detailed requirements than GLPs for analytical issues as the selection of method, equipment maintenance and calibration and measurement traceability. ISO 17025 also requires a Quality manual, GLP regulations don't. When some laboratories have to comply with both GLP regulations and ISO 1705 requirements they generate a quality manual and standard operating procedures that meet the general requirements of ISO 17025 and include additional specifications for GLP studies. All in all the GLP regulation can be considered, in most of the cases, as equivalent to the ISO 17025
Further information about what can be considered as equivalent can be found in the user manual

Further research on first- second- and third party laboratory

Testing is defined according to EN 45020 as "technical operation that consists of the determination of one or more characteristics of a given product, process or service according to a specified procedure". Different parties can be involved in testing activities and therefore one distinguishes between

- first-party activities carried out by manufacturers and suppliers
- second-party activities performed by buyers, users or consumers
- third-party activities done by organisations independent of the above mentioned parties.

First-party testing is for example used as an internal quality control measure that the products, materials, items and services are up the requirements expressed in legislation, standards, technical specifications and contracts with the clients. The manufacturers' declaration of conformity expressed by different ways of marking the product is often based also on the outcome of these tests.

Second-party testing is performed by the receiver of the products, materials, items and services mainly in order to ensure that agreed requirements and specifications are fulfilled. For ordinary consumers, testing can be performed by consumer interest organisations or buyer organisations of products.

Third-party testing is especially required, preferred or used if the results have a considerable influence or effect on public or societal issues, in particular related to health, environment, safety and large economic values. Third-party testing is expected to provide a nonbiased view and thus a better confidence in the test results. The public sector prefers to use independent third-party testing laboratories to provide objective evidence and facts for studies, evaluations, analyses and technical support for decision making processes. This is the main reason why third party verification is large proposed in the EU Ecolabel.

Further research on third party accreditation

Independent, third-party testing and certification helps organizations to

- Demostrate compliance with national and international standards and regulations
- Demostrate independent validation and verification and their commitment to safety and quality
- Increase credibility and acceptance with retailers, consumers and regulators
- Benefit from enhanced product quality and safety

4.3 Table of comments and further research on certified sustainable wood, wood-based material, cork and bamboo

The sustainable certified wood, cork and bamboo criteria wording the comments are on are as follows:

The term "wood" applies not only to solid wood but also wood chips and wood fibres.

All wood, wood-based materials, cork and bamboo shall be covered by chain of custody certificates issued by an independent third party certification scheme such as FSC, PEFC or equivalent

All virgin wood, cork and bamboo shall be covered by valid sustainable forest management certifies issued by an independent third party certification scheme such as FSC, PEFC or equivalent.

When certification schemes allow mixing of uncertified material with certified and/or recycled materials in a product or product line, a minimum of 70% of the wood, cork and/or cork shall be sustainable certified virgin materials and/or recycled material

Uncertified material shall be covered by a verification system which ensures that it is legally sourced and meets any other requirement of the certification scheme with respect to uncertified material.

The certification bodies issuing forest and/or chain of custody certificates shall be accredited or recognised by that certification scheme.

Assessment and verification

The applicant shall provide valid, independently certified chain of custody certificates for all wood, cork and bamboo used in the product or production line and demonstrate that at least 70% of the wood, cork or bamboo originates from forest managed according to Sustainable Forestry Management principles and/or form recycled sources that meet the requirements set out by the relevant independent chain of custody scheme. FSC, PEFC or equivalent schemes shall be accepted as independent third party verification

If the product or production line includes uncertified material, proof should be provided that e content of uncertified materials does not exceed 30% and is covered by a verification system which ensures that it is legally sourced and meets any other requirement of the certification scheme with respect to uncertified material.

Details of the rationale and previous stakeholders' comments considered to redrafting the name, scope and definition can be found in the TR2.0 and in the slides presented at the 2nd AHWG meeting. The comments received through BATIS are summarized in Table 10

Table 10. Stakeholders' feedback on certified sustainable wood

	Stakeholder's feedback	Decision taken and IPTS analysis and further research
Scope	*These criteria apply to solid wood, wood chips and wood fibres as well as cork and lignified materials other than wood such as bamboo. Hereinafter, these distinct materials are simply referred to as "wood".* First sentence: perfect! Second sentence: you *shall not call something wood that is not wood*. Maybe an abbreviation of "*cork and lignified materials other than wood*" like "c&lmow" would be a solution.	**Partially accepted** Precision on the wording of the criteria bring clarity and avoid possible misunderstandings. Therefore, it is proposed to keep the first sentence that clearly refer to the scope of the criteria and the materials that are covered and keep this list of materials whenever needed in the criteria body without using any type of abbreviation.
certified %	The EEB and BEUC highly recommend having *requirements that as far as virgin wood is concerned, 100% should come from certified sustainably managed forests*, instead of the current 70% threshold proposed by the EC. We reiterate therefore that for virgin wood, 100% certified sustainable wood should be required.	**Rejected** Requiring 100% certified virgin wood can, on the one hand, but create market restrictions of the market fluctuates or cut-offs in the production if there is no supply
	50% of certified materials should be the threshold for cork content because of the availability of certified material	**Rejected** Requiring 50% of certified virgin cork is difficult to verify throughout the proposed schemes
Requirements on uncertified wood	In addition, we have concerns about the origin of the remaining non-certified wood: the EC proposes to require that "*Uncertified material shall be covered by a verification system which ensures that it is legally sourced*." We consider that the requirements for the sourcing of the remaining wood are not stringent enough which could result in suspicious and unknown wood material being present in Ecolabel products which is not in line with consumer expectations. Therefore, we strongly recommend the JRC aligning with the wording used in the EU Ecolabel Furniture product group – version February 2015, which states: *"Uncertified material shall be covered by a verification system which ensures that it is legally sourced and meets any other requirements of the certification scheme with respect to uncertified material".*	**Accepted** The wording referring to the materials that do hold a certification showing their sustainable management origin has been redrafted before the meeting and will be kept as such. These uncertified materials are required to comply with the requirements of the certification for "controlled materials". Although these requirements are different depending on the scheme, there are three common ones: - Illegally harvested wood - Wood harvested from natural forests that were converted to non-forest uses - Wood from genetically modified trees. - Wood harvested in violation of traditional and civil rights (only FSC) - Wood harvested in forests where High Conservation Values are threatened by management activities (only FSC)

	For keeping an FSC or PEFC claim, *the part not from certified forests or not being recycled, the remaining component has to comply with Controlled Wood (FSC) or Controlled Sources (PEFC) requirements*, which go beyond verifying the legality of the wood. Indeed, they also tackle wood harvested in violation of traditional and human rights (FSC), wood harvested in forests in which High Conservation Values are threatened by management activities (HCVs are areas particularly worth of protection) (FSC), wood harvested in forests being converted to plantations or non-forest use (FSC/PEFC), Genetically Modified Wood (FSC/PEFC).	
	If the product or product line includes uncertified material… this again is only pointing at certified material. please add and if not originating from regional forests and which have not been further processed in regional saw mills where national forest laws include SFM and the Corruptions Perception Index by Amnesty International is higher than 70	**Acknowledged**
	We call upon the Commission and the EUEB members to include, as done in all criteria for wood relevant products, that the part *not coming from certified forest should be legal and comply with all further requirements the respective forest certification scheme sets*. In this way we can at least prevent wood to be included that comes from plantations *where GMOs are used or wood that is linked to deforestation*. Obviously we regret that PEFC does not include the two other requirements of FSC, and that brings us back to a proposal we have made before, to look into what different certification schemes actually require and how they operate. please add to the sentence above: *"and meets any other requirement of the certification scheme with respect to uncertified material."* This addition is consistent with the Ecolabel criteria for sustainable sourcing of wood based products of the last few years. It *ensures that the claims of FSC and PEFC can actually be used by Ecolabel applicants*. Because FSC and PEFC require for the 30% non-certified, non-recycled materials not only that it is legally sourced, but they have 2 (PEFC) or 4 (FSC) additional requirements. These additional requirements are quite relevant for the environmental quality of the Ecolabel.	**Accepted** The part of the sentence "*… and meets any other requirement of the certification scheme with respect to uncertified materials…"* has been added to the criterion body draft. This inclusion has been already presented in the 2nd AHWG meeting and therefore it appears on the above table. Likely, the same wording has been added in the assessment and verification part

	First of all, *both PEFC and FSC require that no GMOs are being used in this controlled wood/sources component*; secondly, they require that the *wood does not originate from plantations which are the result of conversion of natural forests*. In addition, in the case of FSC, respect for *customary rights and protection of areas with High Conservation Value* is included. Indeed, the requirements of FSC and PEFC are not the same, and this is one of the reasons why FSC is more complete than PEFC. But at least no-GMOs and non-conversion are ensured with the addition, and it is consistent with earlier Ecolabel decisions. *The addition should be made BOTH in the criterion itself and the assessment and verification part*.	
Verification schemes	If this will not be supported by other EUEB members, we strongly call on the JRC and the Competent Bodies to further investigate the *mixture of certified and non-certified wood.* We remind that, in case certified wood is mixed with non-certified wood which is checked on legal origin only, *the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (FEPC) forbid to make any FSC/PEFC claim on the product.* A company cannot make reference in output information to the FSC/PEFC component.	**Acknowledged** If the certified material is mixed with the uncertified material, the product can claim the FSC or PEFC award if the mixture of the material content more than 70% of certified material, the uncertified material complies with the criteria to be classified as "controlled material" and the chain of custody has been preserved. According to the revised wording of the criterion, this will be the case of the EU Ecolabel products, as the criterion requires a minimum of 70% certified material, that the uncertified material is legally sourced and meets any other requirement of the certification scheme with respect to uncertified materials and that all the materials are covered by chain of custody certificates issued by FSC, PEFC or equivalent.
	However, BEUC and EEB *do not support allowing other certification schemes in addition to FSC/FEPC without naming them explicitly* in the criteria document and without assessing whether the criteria or non-GMO wood are stringent enough. In our view *referring to too many other schemes is not useful because it always contains the risk that the criteria of other schemes change over time which makes enforcement quite complicated.*	**Rejected** *"... or equivalent*" is a condition that should be introduced in all the criteria that require the verification of the conditions through a specific scheme or test method. This "… or equivalent" gives flexibility to demonstrate that the requirements have been fulfilled with the same level of ambitious as in the criteria wording. The flexibility is a key aspect in the workability of the criteria as they are designed to be implemented across Europe, where very different conditions exist simultaneously. This "… or equivalent", although deeming the harmonization that the EU Ecolabel aims to achieve in all Member States allows feasibility in the implementation of the criterion Guidance about the assessment of equivalent schemes for certification of wood, cork, bamboo and plant-based schemes will be included in the user manual. However, this guidance can not be development in in-depth detail as even FSC and PEFC consider themselves as not equivalent.

	Sustainable Forest Management (SFM) is the best way to protect endangered flora and fauna in the world. But still there is no consensus or a clear definition at political stage about SFM. There are some countries like *Germany, Austria, Switzerland and others* that *do have SFM as national laws*. E.g in Germany you have this since Carlowitz "invented" SFM 300 years ago. So why should these well and sustainable forests be certified again stating what is legally binding? In this case, this is a finance programme for FSC/PEFC. In other countries for sure third party auditing is absolutely necessary, but not in all.	**Accepted (Acknowledged)** Information received from the stakeholders is appreciated and in this case, this information will be used to elaborate the guidance to be included in the user manual to help competent bodies and verification bodies to assess the possibility of establishing other schemes as equivalent to FSC or PEFC.
Verification schemes	*Who is by which criteria verifying the accredability of FSC/PEFC or equivalent?* That is unclear. Furthermore this seems to be a charter for those schemes since the criteria the COM as granting the Ecolabel does not release these. *What if the schemes are changing their rules in a contraproductive way?* please modify: "Virgin wood shall be covered by valid sustainable forest management and chain of custody certificates issued by an independent third party certification scheme such as FSC, PEFC or equivalent. *Alternatively it shall be possible to demonstrate by documentation that wood and wooden products which originate from regional forests and which have been further processed in regional saw mills where national forest laws include SFM and the Corruptions Perception Index by Amnesty International is higher than 70"* The certification bodies issuing forest and/or chain of custody certificates shall be accredited or recognised by that certification scheme. *Who is by which criteria verifying the accredability of FSC/PEFC or equivalent.*	**Accepted (Acknowledged)** Doubts concerning who is and by which criteria are both FSC and PEFC accredited and what can happen if the schemes decide to change their rules in a contra-productive way are sensible doubts that arisen during the revision process. Investigations led us to contact FSC and PEFC representatives and ask similar questions. A change of their rules is possible but unlikely to happen as the standards and criteria are voted and approved by the members. For example, in FSC commenced in 2009 a comprehensive review, which resulted in major revisions to the wording, although not the substance, of the Principles and Criteria being proposed in 2011. Voting on the new version closed in January 2012, with the new version of the FSC Principles and Criteria (FSC-STD-01-001 V5-0 D5-0 EN) being approved by 75% of the membership vote. This procedure makes rather difficult that changes are made drastically. Further information about the process to develop the standards is available at: https://ic.fsc.org/setting-standards.212.htm

	Verification system due diligence system / due care system ?	**Acknowledged** Due to the scarce information provided in the feedback, we suppose that it intends to propose the due diligence system or the due care system as mean of verification. This is the assessment carried out in this box. Both terms are used in legal terms and show little differences: - Due diligence is performing reasonable examination and research before committing to a course of action, eg researching the terms of a contract before signing it. The opposite of due diligence might be "not doing your homework." - Due care is performing the ongoing maintenance necessary to keep something in proper working order, or to abide by what is commonly expected in a situation. The opposite of due care is "negligence." Neither one nor the other option seems to be feasible ways of verification for the sustainable certified material criterion. The core of the 'due diligence' notion in the EU Timber Regulation[xxii] (EUTR) is that operators undertake a risk management exercise so as to minimise the risk of placing illegally harvested timber, or timber products containing illegally harvested timber, on the EU market. The three key elements of the "due diligence system" are: - Information: The operator must have access to information describing the timber and timber products, country of harvest, species, quantity, details of the supplier and information on compliance with national legislation. - Risk assessment: The operator should assess the risk of illegal timber in his supply chain, based on the information identified above and taking into account criteria set out in the regulation. - Risk mitigation: When the assessment shows that there is a risk of illegal timber in the supply chain that risk can be mitigated by requiring additional information and verification from the supplier. Although the due diligence concept covers the legality of the materials there are raw materials such as cork that is not covered by the EUTR and other aspects such as the non-GMO origin that is required by the EU Ecolabel criteria and not considered in the EUTR.

	"Virgin wood shall be covered by valid sustainable forest management and chain of custody certificates issued by an independent third party certification scheme such as FSC, PEFC or equivalent" Notice that the only way the wood in the floor can be *"covered by valid sustainable forest management and chain of custody certificates" is that the floor producer has its own CoC certificate.* However, even if the floor producer has it, there is no guarantee that there is any wood that is certified with a FSC or PEFC forest management standard. Therefore, *in the V&A it should be written that the verification is a valid CoC certificate of the floor producer and an extract or copy of the balance sheet where it can be checked that there are enough certified wood in the production for all the claims and labels that the producers puts on the product.* The balance sheet is the book keeping system of the CoC system (like a bank account) where all purchases and sales of the wood are booked. Normally there are no physical transfers of certified wood but the amount of it is traced and booked in the invoices for the transfers between the parts in the delivery chain. *It must be checked that after deductions done for the FSC/PEFC certified wood in the balance sheet there must still be enough certified wood left for the EU Ecolabel floor that is not labelled with FSC or PEFC. Otherwise the certified wood would be sold twice.*	**Rejected (acknowledged)** An example of the use of balance sheets was proposed in the 2nd AHWG and both competent bodies and representatives of the certification schemes rejected the idea, ensuring that the CoC is enough to assess and verify the compliance with the criterion.
GMO	EEB and BEUC insist that Ecolabel *wooden floor coverings should not contain Genetically Modified (GMO)* Wood and the final criteria document must clearly state such a ban. The GMO wood might indeed be covered under the criterion 1 on sustainable wood and we know that the FSC and PEFC schemes do not allow the use of GMO Wood. This is discriminating wood. What about the other GMO plant materials?	**Partially accepted** As state FSC and PEFC schemes do not allow the use of GMO wood. Therefore the requirement of being certified by FSC and PEFC already demonstrates the requirement that the wood is not GMO. In this revision, simplified criteria are intended to be developed avoiding redundancy among other issues. The extension of this requirement to other types of materials will be introduced in the wording of the certified sustainable forest material criteria. However, as this criterion relies on the FSC and PEFC schemes, it is up to those schemes to require this requirement to non-wood materials.
Wording	*Note 1*: It should be clarified that this note refers only to this criterion and not to the whole document	**Accepted** The note will be removed and the full list of materials the criterion applies to introduced in the main body of the criterion body

Additionally, feedback from the stakeholders was requested a posteriori regarding the possible exception of cork and bamboo materials from this criterion.

The reasons why this question was sent are as follows:

- *bamboo* is not wood, it is a grass. To produce bamboo products no deforestation is necessary or even possible. The bamboo is harvested when the plants are only 5-6 years old. Bamboo is an agricultural product, mainly grown in plantations from where it is harvested and where replanting is not needed as no clear cutting is taken place. Even though, there are certifications regarding the sustainable origin of the bamboo. These schemes are also in place for practical reasons as the no certification of the materials (ie bamboo) could exclude them for taking part of public contracts or competitions.

  However, the existence of a recognized certification and consequently the administration procedure to keep records of the paths followed by the bamboo has a cost. The certification costs of the whole chain within FSC certification, will bring the price of the bamboo products at least 8-10% higher, according to stakeholders. This means that a higher cost of the materials is required without a clear evidence of the environmental preference for this type of products.

- *cork* is defined in ISO 9229 as the protective layer in the inner bark layer of the cork oak tree which can be periodically removed from its truck and branches to provide the raw material for cork products. It is defined in a separate way than the wood that is defined in ISO 24294 as a lignocellulosic substance between the pitch and bark of a tree or a shrub.

  Cork is a natural, renewable material and is typically Mediterranean in the sense that this area, in particular the Iberian Peninsula, is home of the majority of cork oak forests and, therefore, most cork extraction activity. The cork oak tree is a long-life species (250- 350 years) with an outer bark, the cork; whose extraction occurs every 9-14 years, depending on the area, until the tree is about 200 years old[xxiii]. Approximately 80% in mass of the cork produced worldwide is originated in Portugal and Spain, as seen in Table 11

Table 11. Cork certified forest area and annual productions around the world[xxiv].

Forest Area					**Annual production**		
Country	**Area (ha)***	**% of global area**	**Certified area (ha) (FSC+PEFC)**	**% area Certified**	**Country**	**Annual production of cork (tons)***	**Percentage**
Portugal	715.992	34	110.000	15,3%	Portugal	100.000	49,6
Spain	574.248	27	116.000	20,2%	Spain	61.504	30,5
Morocco	383.120	18	?	?	Morocco	11.686	5,8
Algeria	230.000	11	?	?	Algeria	9.915	4,9
Tunisia	85.771	4	?	?	Tunisia	6.962	3,5
France	65.228	3	?	?	Italy	6.161	3,1
Italy	64.800	3	86,5	0,1%	France	5.200	2,6
Total	**2.119.089**	**100**	**≥ 226.086**	**≥ 10,6%**	**Total**	**201.428**	**100**

The industry of the cork sector is composed of private industries and can be divided into the stopper producers (including the natural cork producers that prepare the raw material of the stoppers) and the industry of other cork good producers. Other cork good products are mainly produced from forest cork by-products and wastes from the natural cork industry that are cut into small particles of cork getting the cork granulates. From the 100kg of the initial raw cork

in the forest, only 23.2% will be transformed into natural cork products after passing through the preparation industry and natural cork industry. This means that although 865kg really enter the natural cork product production system; significant amounts of cork waste or by-products will be generated and consequently recycled into cork granulates, concretely more than 70% of the material that enters this system will be later sent to the granulate-agglomerate industry[xxv]. Cork granulates are mixed with adhesives or other binding techniques such as temperature to form agglomerate products. In general two type of granulates can be found: white cork granulate generated mainly from natural cork industry wastes that will be used in the technical stopper industry and the black cork granulate generated from forestry cork by-products and used for decoration, construction, insulation material and other non-food applications (this subsector represents in Catalonia around 2% of the total turn-over)

However, although the granulate-agglomerate industry is a solution to manage the large amount of forestry and industry wastes generated being an example of a raw material optimization system (all the cork flows that were a waste in one point could become granulates and used as resources for other products) it cannot be classified as waste and therefore it cannot be considered as a recycled materials and accounted as sustainable material.

On the other hand, since some years ago there are certification schemes FSC and PEFC that certify the sustainable management of the oak forest. The area covered by FSC and PEFC varies widely depending on the country but it can reach around 20% but these schemes guarantee that the harvest of the cork is done regarding the regeneration times.

The possible exclusion of cork and bamboo from these requirements was presented in the EUEB meeting held in Brussels in June 2015. Competent Bodies were requested to provide their view in written and although replies were very scarce all of them indicated the preference of keeping both materials in the sustainable certified wood, wood-based materials, cork and bamboo.

Further research on the verification process by means of chain of custody and/or balance sheets.

Between the forest and the final consumer, forest products may undergo many stages of processing, transformation, manufacturing and distribution. Chain of Custody certification verifies that certified material is identified or kept segregated from non-certified or non-controlled material through this chain. Mixing of certified and non-certified products must be done under controlled procedures that meet the Chain of Custody requirements of the scheme. As commented by the schemes, Chain of Custody certification is essential for businesses seeking to access environmentally and socially aware markets, or to demonstrate compliance with public and private procurement policies that specify environmentally responsible materials. This is the case of the EU Ecolabel, where a certain amount of certified material is required, being this limit set up in accordance to the possible combinations offered by the schemes.

There are three types of labels that can be displayed on the products if all the members that touch the material, from the forest managers to the retailers, are chain of custody certified. There are several types of chain of custody certificates, but all are developed with the same aim: they monitor, control and enforce sustainable material. The chain of custody system provides information about the path taken of the product from the forest to the consumer through the certificates that accompany certified goods.

The label informing about the quantity of material that can be certified can only be displayed on the product if the chain of custody is kept. In this way, the three types of labels that can be displayed are

- The *FSC Recycled label* and *PEFC recycled* were introduced in recognition of the important role that reclaimed material plays in protecting the world's forests. FSC certified reclaimed materials can also be used in products carrying the FSC Mix label and FSC certified projects.

- *FSC certified (100%)* ensure that all the wood in the product comes from FSC-certified forests. Research suggests one-third of all FSC-certified products are FSC 100%.

- *FSC mix and PEF certified* means at least 70% of the wood in the product is from FSC-certified or PEFC-certified material, respectively or recycled material that meets or exceeds FSC or PEFC's Sustainability Benchmark requirements; and 30% is controlled wood. While not fully FSC-certified or PEFC-certified, controlled wood cannot be:
  Illegally harvested
  Harvested in violation of traditional and civil rights (only FSC)
  Harvested in forests where High Conservation Values are threatened (only FSC)
  Harvested in forests being converted to plantations or non-forest use
  Harvested in forests where genetically modified trees are planted.

4.4 Table of comments and further research on general and specific requirements on hazardous substances

The general restrictions on hazardous substances criterion wording the comments are on is as follows:

The presence in the product of substances that meet the criteria for identification with the Article 59 of the REACH Regulation[xxvi] or meet the criteria for classification according to the CLP Regulation[xxvii] for the hazards listed in Table 2.1 shall be restricted in accordance with sub-criterion 2.a and 2.b.

Table 2.1. Grouping of Candidate List SVHCs and CLP hazards

Group 1 hazards – Substances of Very High Concern
Hazards that identify a substance as being within Group 1:
○ Substances that appear on the Candidate List for Substances of Very High Concern (SVHC).
○ Category 1A or 1B CMR*: H340, H350, H350i, H360F, H360D, H360FD, H360Fd, H360Df
Group 2 hazards – CLP
Hazards that identify a substance as being within Group 2:
○ Category 2 CMR*: H341, H351, H361f, H361d, H361fd, H362
○ Category 1 aquatic toxins: H400, H410
○ Category 1 and 2 acute toxins: H300, H310, H330, H304
○ Category 1 STOT*: H370, H372
○ Category 1 Skin Sensitiser H317
Group 3 hazards – CLP
○ Category 2, 3 and 4 aquatic toxins: H411, H412, H413
○ Category 3 acute toxins: H301, H311, H331, EUH070
○ Category 2 STOT*: H371, H373

*CMR = Carcinogenic, Mutagenic or toxic to reproduction; STOT = Specific Target Organ Toxicity

2.a) Restriction of Substances of Very High Concern (SVHC's)

The wood-based floor covering product shall not contain substances that have been identified according to the procedure described in Article 59(1) of the Regulation (EC) No 1907/2006 (the 'REACH' Regulation) and included in the Candidate List for SVHCs, at concentrations of greater than 0.10% wt.

No derogation from this requirement shall be given to Candidate List SVHCs present in the product if they are present in the final product in concentrations greater than 0.10%wt.

Assessment and verification

The applicant and/or chemical product supplier shall provide a declaration of compliance supported, where relevant, by declarations from chemical product supplier or component part suppliers regarding the non-presence of SVHCs above the specified concentration limit for the final product. Declarations shall be with reference to the latest version of the Candidate List published by ECHA[xxviii]

2.b) CLP restriction of the chemical products used in the wood-based floor covering product

Note 1: This requirement specifically refers to chemical products that are used in the manufacture of the wood-based floor covering product. The criterion is split into two parts.

2.b.1) Referring specifically to chemical products used by the wood-based floor covering manufacturer during the production or assembly and any other treatment of the wood-based floor covering and

2.b.2) Referring only to listed chemical products used in the production of certain component materials that are bought from suppliers[xxix].

2.b.1) CLP restriction of chemical products used by wood-based chemical

Chemical products used by the wood-based floor covering manufacturer during manufacture, assembly or any other treatment of the wood-based floor covering product shall not be classified with any of the CLP hazards listed in Table 2.1. Restricted chemical products shall include adhesives, paints, varnishes, wood stains, wood preservatives, resins and sealants.

However, the use of such restricted chemical products shall be permitted if one or more of the following conditions apply:

- that the restricted chemical product was used in quantities that amount to less than 0.10% of the final wood-based floor covering product weight
- that the restricted chemical product changes its properties upon processing (e.g. becomes no longer bioavailable or undergoes chemical modification so that the restricted CLP hazards no longer apply and that the residual content of the restricted chemical product in the final product is less than 0.10%wt
- that compliance with specific derogation conditions, as set out in Table 2.2 is demonstrated.

2.b.2) CLP restriction of chemical products used by suppliers in components of the wood-based chemical

Note 2: any individual component part from suppliers used in the wood-based floor covering product that does not come into direct contact with users during normal use shall be considered exempt from the requirements set out in criterion 2.b.2

Suppliers of solid wood and plant-based panels, paper layers or other components shall demonstrate that the components have not been produced using chemical products that are classified with any of the CLP hazards listed in Table 2.1.

However, the use of such restricted chemical products shall be permitted if one or more of the following conditions apply:

- that the restricted chemical product was used in quantities that amount to less than 0.10% of the final wood-based floor covering product weight
- that the chemical product changes its properties upon processing (e.g. becomes no longer bioavailable or undergoes chemical modification so that the restricted CLP hazards no longer apply and that the residual content of the restricted chemical product in the final product is less than 0.10%wt
- that compliance with specific derogation conditions, as set out in Table 2.2 is demonstrated.

Table 2.2. Derogations to the hazard restrictions in Table 2.1 and applicable conditions.

Chemical product type	Applicability	Derogated classification	Derogation conditions
(a) biocides/ preservatives	Treatment of wooden materials and components to be used in the final product	All group 3 hazard listed in Table 2.1	Only permitted when the formulation and any active substance(s) present are approved under Product Type 6 as per the requirements of the Biocidal Products Regulation (EU) No 528/2012
(b) flame retardants		H351	The product must be intended to be used in applications in which it is required to meet fire protection requirements in ISO, EN, Member State or public sector procurement standards and regulations

Assessment and verification

The applicant shall provide a declaration of compliance with criterion 2.b.1), supported by a list of all the chemical products used by the wood-based floor covering manufacturer during the production, assembly and any treatment of the wood-based floor covering product together with their hazard classification (if any).

The applicant shall compile declarations of compliance with criterion 2.b.2) from suppliers of any of the components. These declarations shall be supported by lists of any relevant chemical products used and their hazard classifications (if any).

The following information shall be provided to support declarations of the hazard classifications or non-classification for each substance or mixture identified as being present in the product/component part:

i. substance's CASxxx, ECxxxi or list number

ii. the physical form and state in which the substance is used

iii. harmonised CLP hazard classifications

iv. self-classification entries in ECHA's REACH registered substance databasexxxii

Self-classification entries from joint submissions shall be given priority when comparing entries in the REACH registered substance database.

- Toxicological studies and hazard assessment by ECHA peer regulatory agenciesxxxiii, Member State regulatory bodies or intergovernmental bodies

- A Safety Data Sheet (SDS) completed in accordance with sections 2, 3, 9, 10, 11 and 12 of the Annex II of the Regulation (EC) No 1907/2006

- A documented expert judgement based on a review of scientific literature and existing testing data, where necessary supported by results from new testing carried out by independent laboratories using methods approved by ECHA

- An attestation, where appropriate based on expert judgment, issued by an accredited conformity assessment body that carries out hazard assessments according to the GHS or CLP hazard classification systems.

Information on the hazardous properties of chemical products may, in accordance with Annex XI to Regulation (EC) No 1907/2006, be generated by means other than tests, for instance through the use of alternative methods such as in vitro methods, by quantitative structure activity models or by the use of grouping or read-across.

For criterion 2.b.1) or 2.b.2), as appropriate, where chemical products with the restricted hazards listed in **Error! Reference source not found.** are added in a concentration no greater than 0.10%wt of the final product or are considered to no longer exhibit any restricted hazardous properties in the final product or relevant component part due to physical and/or chemical changes during processing, and residual levels in the final product, or relevant component, can be considered to be present at concentrations less than 0.1% by weight, the applicant shall specifically mention this in their declaration and provide supporting arguments.

For criterion 2.b.1) or 2.b.2), as appropriate, where the use of restricted chemical products may be subject to derogation as per Table 2.2, the applicant shall provide proof that all the derogation conditions are met, as described in Table 2.2. Where test reports are required, they shall be valid at the time of application for a production model

The specific restrictions on hazardous substances criteria wording the comments are on is as follows:

3. a) Contaminants in recycled wood

Any recycled wood fibres used in the manufacture of wood-based panels included in the final wood-based floor covering product shall be tested for delivery conditions in accordance with the 2002 ¨EPF standard conditions for the delivery of recycled wood¨ (Table 3.1) or any other national regulation in place with equivalent or stricter limit values.

Table 3.1. Limit values for delivery conditions if no other national regulation is in place (mg/kg dry panel)

Elements and compounds	Limit values	Elements and compounds	Limit values
Arsenic	25	Mercury	25
Cadmium	50	Fluorine	100
Chromium	25	Chlorine	1000
Copper	40	Pentachlorophenol (PCP)	5
Lead	90	Tar oils (benzo(a)pyrene)	0.5

Assessment and verification:

The applicant and/or his/her supplier(s) shall provide a declaration of compliance with the criterion supported by the following documentation:

- A declaration that no recycled wood fibres are used in the panel, or
- A declaration that all recycled wood fibres used have been tested in accordance with the 2002 "EPF standard conditions for the delivery of recycled wood" or any other national regulation with equivalent or restricted limits, supported by appropriate test reports that demonstrate compliance of the recycled wood samples with the limits specified in the table 3.1 or those of the national regulation.

3.b) Wood preservatives

Treatment of wooden components with preservatives shall not be permitted.

Assessment and verification:

The applicant shall provide a declaration of non-use of wood preservatives

3.c) Biocides

Biocides shall not be permitted. Biocides exclusively used for in-can preservation in aqueous coating materials and glues or flame retardants according to criterion 3.d) shall be exempt from this requirement.

Assessment and verification

The applicant shall either:

- Provide a declaration of non-use of biocides
- Provide a declaration stating what biocides or formulation(s) have been used with wood and wood-based materials, supported by SDS from the in-can preservation suppliers.

3.d) Flame retardants

Flame retardants should not be permitted in wood and wood-based materials unless specifically required for the wood-based floor covering to meet fire safety requirements in the country or countries where it is to be sold. Flame retardant substances shall comply with the general hazardous substance requirements set out in Criterion 2.

Assessment and verification

The applicant shall either

- Provide a declaration of non-use of flame retardants or,
- Provide a declaration stating what flame retardant substance(s) or formulation(s) have been used with wood and wood-based materials, supported by SDS from the flame retardant suppliers. The flame retarding substances shall meet the requirements on criterion 2 and being demonstrated in accordance with the "Assessment and verification" requirements of criterion 2,
- Provide evidence that the wood-based floor covering, when treated with flame retardant substance(s) or formulation(s), meets the fire safety requirements in the country or countries where it is to be sold.

3. e) VOCS and formaldehyde in adhesives and resins

Adhesives and/or resins used in manufacturing of the wooden boards should have

- VOC content less than 3% by weight,
- Free-formaldehyde less than 0.2% by weight.

Assessment and verification

The applicant and/or its supplier shall provide the material SDSs or an equivalent declaration of the compliance of this requirement, together with a complete recipe with designation of quantities and CAS numbers for constituent substances.

The content of free-formaldehyde in the resin and/or adhesive formulation shall be in accordance with ISO 11402

3.f) Heavy metals in paints and varnishes

Paints and varnishes used on wood and wood-based materials shall not contain additives based on cadmium, lead, chromium VI, mercury, arsenic, barium, selenium, antimony or cobalt at concentrations exceeding 0.010% by weight for each individual metal in the in-can paint or varnish formulation.

Assessment and verification

The applicant shall declare that the paint or varnish formulations do not contain the aforementioned heavy metals in concentrations > 0.010% by weight and provide the respective SDS from the suppliers of the coating substances used.

3. g) VOC content in surface treatment

Note 1: It shall not be necessary to meet the requirements of this sub-criterion if compliance with criterion 6.1 can be demonstrated

Surface treatment chemical products used to coat wood and wood-based materials, cork or bamboo panels used in the wood-based floor covering product shall either:

a) Have a total VOC content of less than 5% by weight (in-can substance concentration), or
b) Be greater than 5% by weight VOC content but be shown to be applied in quantities that amount to less than 2g/m^2 of the coated surface area

Assessment and verification

The applicant shall provide the SDS of any coating substances used on wooden materials. If the SDS states that the VOC content of the surface treatment chemicals used is less than 5% by weight, then no further verification shall be necessary. If the VOC content is higher, then the applicant shall either:

- Provide calculations that demonstrate the effective quantity of VOC applied per m^2 of the coated surface area of the final wood-based floor covering product is < 2g/m^2. Guidance on these calculations is provided in Appendix I, or
- Provide a test report demonstrating compliance with criterion 6.1 for the finished product.

Appendix I. Guidance on the calculation of the quantity of VOC applied

The requirement relates to the total VOC in the chemical products with the chemical composition they have in the wet form. If the products required dilutions, the calculation is to be based on the content in the dilutive product.

This method is based on the application method that calculates the quantities applied per m^2 surface area but it determines before the content of organic solvents and/or environmentally harmful substances as percentage of the surface treatment quantity applied.

The applied quantity of VOC according to option b) is calculated using the following formula

$$\frac{Applied\ quantity\ \left(\frac{g}{m2}\right) \times proportion\ VOC\ in\ surface\ treatment\ (\%)}{surface\ treatment\ efficacy}$$

The formula consists in three parameters:

- The applied quantity of surface treatment reported in g/m^2. It depends on the number of coats and the quantity applied per coat,
- The proportion of VOC in the surface treatment: the concentration is to be stated as a percentage by weight,
- The surface treatment efficiency that depends on the application method is tabled in accordance with the state-of-the-art of the coating industry as shown in Table 3.2.

Table 3.2. Efficiency of the surface treatments

Surface treatment	Efficiency	Surface treatment	Efficiency
Automatic spray application, no recycling	50%	Roller coating	95%
Automatic spray application with recycling	70%	Curtain coating	95%
Spray application, electrostatic	65%	Vacuum coating	95%
Spray application, bell/disc	80%		

3.h) Halogens

No halogenated organic compounds may be used (e.g. as binders, flame retardants) in the manufacture of the products, including the materials used in the manufacture (wood-based materials, adhesives, coatings, etc). Paints and varnishes with long chain perfluoroalkyl sulfonates (>C_6) and/or perfluorocarboxylic acids (>C_8) shall not be used on wood and wood-based materials

Assessment and verification

The applicant shall provide a declaration of non-use of halogenated organic compounds, supported by SDS in the case of the paints and varnishes

Details of the rationale and previous stakeholders' comments considered to redrafting the name, scope and definition can be found in the TR2.0 and in the slides presented at the 2nd AHWG meeting. The comments received through BATIS are summarized in Table 12

Table 12. Stakeholders' feedback on general and specific

	Stakeholder's feedback	Decision taken and IPTS analysis and further research
Restriction based on CLP hazard classification	We disagree with the *derogation proposed for flame retardant H351 as we do not consider its use as necessary*. We remind that flame retardants are *neither needed nor compulsory to fulfil fire safety requirements in domestic houses, in public and commercial buildings*; there are no legal requirements existing for normal floorings. In addition, manufacturers who were directly asked by the EC at the technical meeting confirmed that they do not need flame retardants when producing wooden floor coverings. There are therefore no obstacles to ban it completely from EU Ecolabel products.	**Accepted** Derogation for flame retardant H351 has been removed based on the information provided by the industry that confirm the no obligation of adding flame retardants according to the national legislation
	"The final product shall not contain substances that have been identified according to the procedure described in Article 59(1) of the Regulation (EC) No 1907/2006 and included in the Candidate List for SVHCs at or above the concentrations limit 0.10% wt". *The JRC proposes to restrict SVHC that are present in concentrations above 0.1% by weight of the product.* In reaction to the discussions during the 2nd AHWG meeting, BEUC and the EEB are in favour of a *stricter approach*, *which is to establish the 0.1% threshold by weight of one of the layers involved and not by weight of whole product as it is the case now*. Therefore, *SVHC above 0.1% by weight of one of the layers should be considered and assessed*. In case of laminate, it would restrict further the most hazardous chemicals in all three layers composing the floorings; this is to say the upper varnish, the core board or the balance sheet at the bottom. There are no doubts that our proposal brings more stringency with regards to hazardous and unwanted substances present in the components of the floor and would result in safer final products.	**Rejected** According to the decisions taken in the EUEB meeting held in April 2015, the general threshold should be applied, whenever possible to the whole product. This is the case of floor coverings. The concerns expressed in this feedback about the lowering in strictness of the criterion on general hazardous substances are reasonable and the proposed idea could be a solution. However, the layers the floorings consist of are not homogenous and applying the same threshold to all the layers can be regarded as unfair. Regarding the strictness of the proposed criterion, it should be noted that this criterion is complemented by criterion 3 where all the substances of concern are restricted or banned. In this way, no hazardous substances are expected to be remaining in the final product.
	The name of the criterion seems wrong.	**Acknowledged**
en t an d	This part should be simplified. Do we need more than a list of chemicals used and their SDS?	**Acknowledged**

	"a complete recipe with designation of quantities and CAS numbers for constituent substances". This is the secret of the *suppliers*. They *will not hand out the recipes to the manufacturer or to anyone else*. The one having it might go to another producer of the resin, adhesive, etc. asking for a better price. There is a lot of knowledge behind that. Very often recipes are custom-made for the manufacturer. That is why they also do not want their supplier to hand out this secret that then may get into the hands of a competitor taking advantage of that.	Confidently and competition between suppliers want to be preserved in the EU Ecolabel scheme and therefore it is offered the possibility of sending the documentation straight to the Competent bodies, without disclosing this information to the flooring manufacturers. Revision of the wording on this procedure seems to prevent future misunderstandings. However, in most of the cases the screening of the hazardous substances will not go beyond information contented in the SDS of the suppliers. Suppliers should include in the SDS of their products all those compounds that can be classified with a CLP phrase the limit
	The assessment and verification should be simpler. *Provide the SDS of the chemical products (substances or mixtures) is enough because SDS contains all the information about hazard components*.	
	It could be clearer specifying that the assessment and verification of the respect of the threshold 0.1%wt, regarding CLP requirement, shall be done *first on the entire chemical product* and *not at the individual substances in the product*, and *then on the individual substances in the product that are classified with any of the CLP hazards listed in table 2.1*	
Contaminants in recycled wood	Pollutants in recycled wood in accordance with EPF 2002 standards. We can't give opinion because we don't use recycled wood	**Accepted** Discrimination of materials should be allowed in the EU Ecolabel criteria. We appreciate the comments and the wording of the criteria is modified as requested. However, and for the best of our knowledge, nowadays wood is the only fibre that is separately collected and consequently, recycled. Limits included in the EPF standard are for recycled wood and no information about the appropriateness of these limits for other types of fibres is included in the standard.
	This is *discriminating wood.* What about the contaminants in recycled lignified materials other than wood (e.g. bamboo)?	
	What about contaminants in *other recycled fibres*? This is only targeting at wood and by that discriminating since other materials are under the scope that could possibly come from recycling materials. 1. Change headline to Contaminants in recycled wood, cork and lignified material other than wood. 2. Leave text and table as it is 3. add: This requirements are also applicable for cork and lignified material other than wood 4. Assessment and verification: bullet points , please add: ... recycled fibres of wood, cork and lignified material other than wood ...	

	"or any other national regulation in place with equivalent or stricter limit values". We support the provisions added at the end of the 1st paragraph. We agree with the fact that *if national mandatory legislations in place are stricter, the applicant has to comply with this national legislation and there is no need to require additional testing in accordance with the European Panel Federation (EPF) Standards*. Avoiding double testing result indeed in time and cost savings. However, *taking into account that the national rules differ*, this could lead to *conflicts regarding the coherence of the scheme* and it could trigger competition between the Competent Bodies for new applicants which might want to shop around for the lowest requirements. *If thresholds for contaminants are not the same for everyone, it would result in slightly different levels of contaminants being present in EU Ecolabel products, depending on in which country the applicant requested the Ecolabel.*	**Rejected** Although it is true that if the thresholds for contaminants are not the same for everyone, it could result in slightly different levels of contaminants being present in EU Ecolabel products, it is consider that setting minimum requirements across Europe is enough to ensure that the wood can be recovered at the end of its life and that a high quality can be achieved in the production of the flooring. Additionally, it is considered that the reduction in the cost-testing is also a positive effect of this modification that will be set off if the exemption is not introduced.
	Table 3.1 Limit values for delivery conditions if no other national regulation is in place BEUC and EEB are concerned that the Commission still proposes to apply the EPF standards as limit values for contaminants in recycled wood, like in the first draft criteria proposal published in October 2014. Indeed, we are concerned about the ambition level of these EPF values: BEUC and EEB consider that these values are not stringent enough compared to the German recycled Wood Directive (Altholzverordnung). Likewise they are not stringent enough compared to the test parameters set by the Naturplus label. We strongly recommend the JRC coming up with a more ambitious proposal to further reduce the level of contaminants in wood.	**Rejected** The proposal of setting the minimum values in accordance with the EPF standards has been supported by other stakeholders. A balance should be found between the strictness of the criteria and the promotion of recycling
	Any recycled wood fibres used in the manufacture of wood-based panels included in the final wood-based floor covering product shall be tested for delivery conditions in accordance with the 2002 ¨EPF standard conditions for the delivery of recycled wood¨ (Table 3.1) or any other national regulation in place with equivalent or stricter limit values. *To verify this criterion, an extensive testing is required and we have our doubts about if it is even possible in practice.* Is it possible to do this type of testing on each incoming batch of recycled wood to the factory? What would the cost for the tests be? *We would like to promote the use of recycled wood but this criterion including extensive testing can be contra productive*	**Rejected** Relying on EPF standard that is widely used in the sector, it is ensured that the testing can be carried out and that there is enough expertise in place to be performed. Although it is understandable to consider that extensive testing can prevent the use of recycled wood, wood-based materials, cork or bamboo, minimum requirements are needed to ensure that a high quality finished product is achieved. Considering the costing, the acceptance of the compliance with mandatory national regulation in this area as a proof of compliance with this criterion will significantly reduce the cost of testing in some Member States.

Biocides	*No preservatives, biocides or flame retardants apart from those required by national legislation* Our opinion is that the use of *wood preservatives is no needed for indoor products.* Our opinion is that the use *of biocides is no needed for indoor products*. Biocides is needed for in-can preservation in aqueous coating materials so the formulation of the criterion 3c) is correct. *The SDS of those formulations is enough to ensure that no other biocidal substances are used*, Is no needed a *derogation for, any biocide or biocidal product to comply with this criterion*.	**Accepted** Preservatives and biocides are banned for indoor floorings. The verification of these criteria should be carried out by checking the ingredients included in the SDS of the substances used for manufacturing the flooring The wording of the criteria has been checked to remove any discrimination of wood with respect to other materials
	That is discriminating wood. Consumers may think that only wood is treated with biocides but not cork and lignified material other than wood.	
VOCS and formaldehyde in adhesives and resins	*The new limits are adequate.* Are those kinds of adhesives with concentrations of VOCs and formaldehyde higher than 3% and 0.2% by weight respectively widely used in the wood based floor covering manufacturing? *NO (parquet industry)* *YES (laminate industry)at least for free formaldehyde*	No further data provided even if JRC explicitly contacted stakeholders asking for further information. No changes proposed for the time being.
	Would it be necessary to introduce derogation for some specific substances? If so, which of them and why? NO	**Accepted**
	The assessment and verification should be simpler. *Provide the safety data sheet of the chemical products (substances or mixtures) is enough because SDS contains all the information about hazard components.*	**Accepted**
	Important for health and safety is what is coming out of the product? *So the VOCs and HCHO in adhesives and resins is not this important.* Re-introduction in TR 2.0 is not necessary	**Rejected** Although the aim of the criterion 3 restricting the use of VOC and formaldehyde containing adhesives and the criteria 6.1 restricting the emissions of these compounds from the final product is pretty similar, both criteria are proposed to be kept, as unanimously expressed in the EUEB meeting held in June 2015 and the posteriori feedback
	"Adhesives and/or resins used in manufacturing of the wooden boards should have... " that is again discriminating wood and wood-based materials, instead of "of the wooden boards" use floor covering	**Accepted** Discriminating wording has been removed from the criteria body as proposed

VOC content in surface treatment	Is the limit of total *VOC content < 5% by weight* (in-can preparations) appropriate? *The limit is too low(parquet industry)* Which value of applied quantity would you suggest to ensure that the final product meets all the needed technical requirements and at the same time has an outstanding environmental performance? Would 2 g/m2 limit be an appropriate benchmark? *The limit is too low. You can find a value between this limit and the limit in the Current criteria (35 g/m2).*	No further data provided even if JRC explicitly contacted stakeholders asking for further information. No changes proposed for the time being.
	Is the note ¨compliance with the VOC emission limits as specified in criterion 5.2¨ equivalent to the previous ones or should the criterion be drafted in a different way? *If you leave note 1 (note 1: It shall not be necessary to meet the requirements of this sub-criterion if compliance with criterion 6.1 can be demonstrated) you can introduce in paragraph 6 that if the applicant respects the limit a) (in criterion 3.g) is not necessary verify the respect of the limit in criterion 6.1.* In the criterion 6.1 the LIMITS ARE TOO LOW. It is very difficult guaranteeing high quality products with these limits.	**Accepted** Corresponding notes have been added to the criteria bodies. Limits proposed for criteria 6.1 have been revised as those proposed in TR2.0 were wrong.
	According to Italian stakeholders the threshold of 2 g/m2 is very too low. With the aim to promote the diffusion of the EU Ecolabel it should be raised to 10 g/m2.	No further data provided even if JRC explicitly contacted stakeholders asking for further information. No changes proposed for the time being.
	This criterion refers to the surface treatment phase (production phase). Criterion 6.a “Indoor emissions” refers to the use phase. It is not very clear why to accept that “It shall not be necessary to meet the requirements of this sub-criterion if compliance with criterion 6.a can be demonstrated”. The respect of criterion 6.1 can’t prove the compliance with criterion 3.g). Moreover the two criteria can be considered equivalent.	**Acknowledged**
3.f) Heavy metals in paints and varnishes	The criterion 3f) is adequate. Is not necessary to introduce derogation for some specific substances	**Accepted**
flame retardants	"*with wood and wood-based materials"* that is discriminating wood. Consumers may think that only wood is treated with flame retardants (because wood burns - people think) but not cork and lignified material other than wood.	**Accepted**

	that is discriminating wood. Consumers may think that only wood is treated with flame retardants but not cork and lignified material other than wood.	Discriminating wording has been removed from the criteria body as proposed
phthalate	"*Additionally DNOP (di-n-octyl phthalate), DINP (di-isononyl phthalate), DIDP (di-isodecyl phthalate) are not permitted in the product"* *We suggest removing this sentence due to its inaccuracy. This restriction of DINP and DIDP is not based on science.* DINP and DIDP are not classified and been the object of a risk assessment conducted by ECHA and which lasted four years. The conclusions of this re-evaluation of new scientific evidence concerning DINP and DIDP have been endorsed by the Commission in January 2014, confirming that "no unacceptable risk has been characterised for the uses of DINP and DIDP in articles other than toys and childcare articles which can be placed in the mouth". *Therefore, DINP and DIDP are safe for all current consumers' application and the already existing restriction on toys and childcare articles that can be put in the mouth is maintained, based on the precautionary principle.*	**No correct** The comments do not refer to the last Criteria draft presented during the 2nd AHWG. Although these comments provide general information about the classification of these substances, what is welcome and will be considered, it can not be considered in the revision of this last proposal as phthalates were not included.
	Please replace "all phthalates" with "classified phthalates". The exclusion of "all phthalates" is discriminatory because only low molecular weight phthalates are classified.	
plasticiser	"*plasticisers or additives based on lead, cadmium, chrome (VI), mercury and their compounds, arsenic, boron, copper and organic tin compounds".* Please note *that plasticisers are not based on lead, cadmium, chrome (VI), mercury and their compounds, arsenic, boron, copper and organic tin compounds.* Please remove the word "plasticisers"	**Accepted** Wording will be changes are recommended
preservatives	This is discriminating wood. What about the preservatives in lignified materials other than wood (e.g. bamboo)? please clarify. *Delete wood remain: stains, preservatives*	**Accepted** Discriminating wording has been removed from the criteria body as proposed
	"wood stains, wood preservatives" This is only targeting at wood and by that discriminating since other materials are under the scope.	
	this shall also be applicable for , cork and lignified material other than wood , just use "Preservatives" as headline	
	Preservatives may be used in cork and lignified material other than wood too. Rephrase: Treatment of wooden, cork and lignified materials other than wooden components with preservatives shall not be permitted.	
	"The applicant shall provide a declaration of non-use of wood preservatives"'. consequently it shall be rephrased, The applicant shall provide a declaration of non-use of preservatives	

	Halogenated organic compounds shall not be allowed in substances and mixtures	**Accepted**

4.5 Table of comments and further research on energy consumption and waste management during the production process

The energy consumption criteria wording the comments are on is as follows:

Criterion 4.1 Energy consumption

The energy consumption shall be calculated as the process energy used for the production of the coverings. The process energy, calculated as indicated in the Appendix IIa, shall exceed the following limits (E = scoring point):

- E > 11.0 for solid wood,
- E > 8.0 for parquet, bamboo and cork floor coverings and laminate floor.

Assessment and verification

The applicant shall demonstrate that the E score has been calculated according to the Appendix IIa instructions and exceeds the limits of this criterion.

Table 4.1. Calculation of the scoring point

Formula	Maximum requirements	
$E = \frac{A}{20} + \left(5 - \frac{B}{3}\right) + \left(5 - \frac{C}{7}\right)$	A	--
	B	15 kWh/m^2
	C	35 kWh/m^2

Where A is the proportion of renewable fuel (%), B is the electricity consumption (kWh/m^2) and C is the fuel consumption (kWh/m^2)

The applicant should state and demonstrate:

- Which type(s) of fuel have been used in the manufacture of the wood based floor covering over the year prior to the application, and
- Which fuels are coming from renewable sources in accordance with Renewable Energy Directive 2009/80/EC[xxxiv].

In addition, it should be stated and declared how much electricity has been used (purchased) and how much flooring (m^2) has been produced over the year prior to the application in accordance with the instructions given in Appendix IIb.

Appendix IIa. Guidance for calculating the process energy used

Energy consumption is calculated as an annual average. The following delimitations apply for what is included in the energy calculation:

- Electricity and fuel consumed in drying and sawing is included in the calculation for parquet flooring, bamboo flooring and solid wood floor,
- For laminate flooring that includes wood-based board in its structure, the energy consumed in the manufacture of the board is to be included.

At least 95%by weight of raw materials in the flooring must be included in the calculation of energy consumption during the manufacture process. Energy consumption in the manufacture of adhesives and lacquers used in the manufacture of the flooring is not included in the calculation.

Electricity consumption refers to electricity purchased from an external supplier. If the producer has an energy surplus that is sold as electricity, steam or heat, the sold quantity can be deducted from the fuel consumption. If electrical energy is produced on-site, one of the following methods can be used for calculating fuel consumption;

- Actual annual consumption of fuel,
- Consumption of electricity produced on-site multiple by 1.25.

Only the fuel that is actually used in floor covering production shall be included in the calculations. Energy consumption is reported in kWh/m^2, although calculations may also be made in MJ/m^2 (1 kWh=3.6 MJ). The energy contents of various fuels are given in Table 4.2.

Table 4.2. Standard fuel values[xxxv]

Fuel	MJ/kg	Fuel	MJ/kg	Fuel	MJ/kg
Petrol	44.0	Natural gas	47.2	Biogas	
Diesel		Power station coal	28.5	Wood chips (45% W)	13.8 (25%W)
LPG	45.2	Pellets (7% W)	16.8	Waste Wood	
Eo1 oil	42.3	Peat	7.8-3.8	*GJ/ton is equivalent to MJ/kg*	
Eo5 oil	44.0	Straw (15% W)			

(% W) is the percentage by weight of water in the fuel and given the letter f in the formulas below. If nothing else is stated, f = 0% W and the ash content is average.

The formula for calculating the energy content of woodchips depends on the water content. Energy is required to evaporate the water in the wood. This energy reduces the heat value of the woodchips. The energy content can be calculated as:

$$\text{Woodchip} = 19.0\ \left(\frac{\text{MJ}}{\text{kg}}\right) - 21.442 \times \frac{\text{f}}{100}$$

Where f is the water content in %W of the wood. The factor 21.442 is the sum of water's heat of evaporation (2.442MJ/kg) and the energy content of dry wood 19.0 MJ/kg. If the applicant has laboratory analyses of the heat value of a fuel, the competent bodies may consider using this heat value for calculating the energy content.

Appendix IIb. Guidance for reporting the type of fuels and amount of electricity consumed during the manufacturing process and the amount of flooring produced.

1) Specification of the fuels, quantities and flooring production per year

Year of calculations:

Total production in this year (m^2/year):

Total electricity purchase (kWh/year)

Total fuel purchase:

Column	A	B	C	D	E
Fuel	Energy Source (non-RE /RE)	Quantity (kg/year)	Standard fuel value	MJ	kWh/m^2

Where:

Column A: classification of the fuels depending on the source. Fuels classified as RE should comply with the definition of ¨energy from renewable sources¨ in accordance with Renewable Energy Directive 2009/28/EC

> "***energy from renewable sources'*** *means energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases*"

Fuels not complying with the above definition should be classified as non-RE.

Column B: quantity of fuel purchased during the year considered

Column C: Standard fuel value is the factor attributed to each fuel as included in Table 6 of the Appendix IIa

Column D: Total MJ contented in the annual purchase of this fuel. Column D is calculated for each fuel as follows: $MJ = Quantity\ \left(\frac{kg}{year}\right) \times Factor\ \left(\frac{MJ}{kg}\right)$

Column E: Total power per square meter of wood base floor covering attributed with each fuel. The column E should be calculated as

$$\frac{kWh}{m2} = \frac{MJ\ (column\ D)}{3.6\ \times total\ production\ this\ year\ (m2)}$$

2) Calculation of the values A, B and C to be used in the formula (Table 5) for calculating the energy consumed:

The values A, B and C are calculated as follows: $A = \frac{\sum MJ_{Fuels\ classified\ as\ RE\ (Column\ A)}}{\sum MJ}$ $B = \frac{Total\ electricty\ purchase\ (\frac{kWh}{year})}{Total\ production\ (\frac{m2}{year})}$ $C = \sum \frac{kWh}{m2}(Column\ E)$

The waste management criteria wording the comments are on is as follows:

Criterion 4.2 Waste minimization management plan

The producer shall:

f) Sort waste at source into the fractions that arise during the production, and
g) Draw up an appropriate waste minimization management programme stating waste fractions and describing implemented processes to deal with and to minimise waste originated from the production process through recovery and reuse or reprocessing.
h) Implement the waste minimization management programme for at least the last year prior to the EU Ecolabel application and demonstrate its good performance

Waste from production with energy content greater than 10 MJ/kg (2.78 kWh/kg dry test) must be recovered, reused or reprocessed.

The waste management programme prepared under the responsibility of the applicant shall content and annually monitor and report the following information:

- Kind and quantity of waste produced,
- Breakdown of the total waste recovered to type of processes (information about the reuse of waste and secondary materials in the production of new products),
- Initiatives taken to reduce waste production and improve production efficiency,
- Initiatives taken to calculate and reduce the environmental impacts associated with the waste minimization or recovery,
- Initiatives or requirements for suppliers or contract manufactures.

Assessment and verification

The applicant shall provide appropriate documentation showing compliance with these requirements in writing and demonstrating its implementation during the last year (prior to the EU Ecolabel application). The documentation should include:

- Description of the facilities to sort waste at source into fractions stating the type of fractions to be sorted out and their capacity,
- Description of the waste minimization processes and procedures implemented,
- Information in form of mass balance sheets or/and environmental reporting system showing the rates and detail breakdown of recovery achieved in the previous year and the initiatives taken.

Details of the rationale and previous stakeholders' comments considered to redrafting the energy consumption criterion and the waste management criteria can be found in the TR2.0 and in the slides presented at the 2nd AHWG meeting.

The comments received through BATIS are summarized in Table 13

Table 13. Stakeholders comments on the energy and waste management criteria

	Stakeholder's feedback	Decision taken and IPTS analysis and further research
Scope of energy criterion	It would be good to *include also transports from the production place to the market,* but how easy this is, is another thing.	The inclusion of other energy consumption sources along the life cycle of the product could be a way of differentiate those products that are locally produced and consumed from those that have to travel long distances from the cradle to the grave. Although the measure could be based on estimates on the distance already covered by the raw materials and those that the finished products will be delivered and this estimate be introduced as an extra factor in the energy consumption criterion, the idea is full of uncertainties. Further details and accurate information is needed from industry to carry out and have a first estimation of the factors to apply to consider the transportation of raw materials and finished products for each of the floorings under consideration. As long as this information is not collected and assessed, it is preferable not to introduce the energy consumed in the transportation into this criterion.
	kWh/m² is *this kWh per m² production area (with storage? under roof?)* or per *m² produced flooring?*	**Accepted** The maximum energy consumption is proposed to be per m2 produced flooring. Exact units/wording will be introduced in the criteria wording.
	Is the calculation of the *E factor clear enough? NO* is not clear and too complicate. And it is too strict Is better to not use the same letters in the formula of *E=(A/20)…and in the table in appendix IIb (columns A, B, C..).* It can be source of confusion. In not clear the statement: *If electrical energy is produced on-site, one of the following methods can be used for calculating fuel consumption; actual annual consumption of fuel, consumption of electricity produced on-site multiple by 1.25* In the case of production of energy from photovoltaic system	**Accepted** The criterion on the energy consumption is revised in more detailed in the new EU Ecolabel draft aiming at provided higher clarity regarding the following aspects; - procedure for the calculations - accountability of the energy produced on site, especially the electricity produced on-site ie PV systems - accountability of the green electricity - conversion factors for fuels and electricity - types of floorings that are considered in the criterion and which calculations should be considered for each type of flooring.
	The table 4.2 in incomplete. *Referring to the example in slide (n. 51, 52) it is not clear if in the table 4.2 of appendix IIa have to be included a value for electricity like in current criteria.*	

	What about the *Energy produced? Such as electrical energy or heat energy. This is an important factor.* *Lots of manufacturers produce their own energy by solar power or own power plants or their own heat by burning their own waste.* This has a not negligible positive effect on these criteria that shall be taken into account.	
Renewable sources and electricity	We think that the idea of this criterion is to *promote use of renewable energy* which we support. However, it is not clear from the criteria if *the term A (the share of renewable fuels) also include the renewable fuels used for electricity production.* *Can the amount of purchased green electricity or the electricity generated on site from solar panels be added to the term A?* We would support an approach where renewable electricity could be taken into account. Please clarify this.	**Accepted** Due to the importance of promoting renewable energy sources and the use of renewable energy several modifications have been proposed in the criteria; - the A factor includes the electricity produced on-site from renewable sources. If the renewable source has an energy carrier, the energy content in the energy carrier is accounted in the A factor. If the energy is produced without an energy carrier, the electricity produced is multiplied by 1.25 and the value is added to the energy content of other renewable energy carriers that have been used for the generation electricity. - the amount of green electricity however is not accounted in the A factor, as the electricity contributes to the B factor. However, in order to promote the use of renewable sources, a factor of 0.8 is used for the certified green electricity. This factor aims at decreasing the value representing the electricity consumption and leads to a higher overall E score.
	Both sub-criteria should be simplified. Moreover a working certified *environmental management system should be required dealing in particular with energy a waste issues. EMAS should be accepted as proof of compliance*.	**Rejected** The environmental management systems aim at a continuous improvement of the environmental performance of the facilities where it is implemented. However, this policy tool does not set up horizontal threshold for an industry sector to be achieved. Therefore, this type of systems does not fulfil the requirements to be used as a proof of compliance.
Waste management criterion	*Organizations certified against ISO 14001 shall automatically pass these criteria by showing their certificate.* This *criterion is too complex and has too many gaps* it should be simplified *Recognition of either:* *ISO 14001Environmental Management System,* *ISO 50001 Energy management or EPD* "Waste minimization management plan" is very difficult to be verified and of uncertain efficacy. Both sub-criteria should be simplified. Moreover a working certified environmental management system should be required dealing in particular with energy a waste issues. EMAS should be accepted as proof of compliance.	**Rejected** The general agreement expressed during the 2nd AHWG meeting about the complexity and high number of gaps in the criteria wording as well as the uncertainties for the proper assessment and verification of this criterion supported the idea of withdrawing it. A consultation was launched after the EUEB meeting held in June 2015 and the feedback from the Competent bodies pointed out that it would be better to remove it. The deletion of this criterion is also in agreement with most of the recently revised EU Ecolabel criteria sets where there is no waste management criterion. We appreciate, however, the ideas of the stakeholders and the comments received.

Further research on the primary energy conversion factor from non-combustible energy sources[xxxvi]

The concepts of primary and secondary energy have been further investigated to find out a way to integrate the electricity produced onsite into the formula. This introduction should favour the generation of electricity, heat or steam coming from renewable sources with or without energy carriers.

The method for calculating the primary energy of fossil fuels is clear and consistent. This method is based on the calorific value of the fuel and the amount of fuel required to generate a given unit of electricity or heat. The conversion factors, defined as standard fuel values in this scheme, as tabled in the Efficiency Energy Directive and proposed to be used in the calculations of fossil fuels and biomass. They are relatively straightforward to use and lead to simply the calculations. In contrast, primary energy factors for electricity or heat generated from renewable energies, waste or other sources are not calculated according to a single consistent methodology.

For electricity and heat from non-combustible renewable energy, several methodologies to account for primary energy and to calculate primary energy factors have been developed and applied. Among them there are methodologies that consider that the primary energy is, by definition, always zero for non-combustible, renewable energy sources. Other methodologies use so-called primary energy equivalents to calculate the primary energy of the generated electricity or heat. These primary energy factors have different values depending on the system boundaries under consideration.

Unlike biomass plants where the input of fuel and the generated electricity are measured similarly to fossil fuel plants, only the output of electricity is measured in non-combustible power plants using renewable energies (ie hydro power stations, wind turbines, PV, etc.). In theory, the primary energy equivalence for electricity from technologies such as wind turbines can be determined by using technical conversion efficiency for the generator that converts the kinetic energy of the wind into electricity. In practice, several conversion efficiencies would have to be determined for renewable energy carriers that would depend upon climatic conditions, technologies used and overall system integration. Instead, standardized (not technology, climate specific, etc) primary energy factors are used for electricity or heat generation.

There are several methods to determine the primary energy factors, for example, the zero equivalent method, mentioned previously or the direct equivalent method. The further assumes a conversion factor of zero and the latter uses a primary energy equivalence of 100% between primary energy and electricity or heat for non-combustible renewable energy sources. This is a conversion factor that is also applicable in the physical energy content method for energy sources such as wind and hydro where the first practical use is electricity itself. The technical conversion method calculates the factors depending on multitude of factors, such as applied technologies and climatic conditions, the availability of data and the assumptions.

Due to the difficulties to apply these established methodologies, a common primary energy factor is suggested to be used in this scheme. This simplification is based on scarce diversity of non-combustible energy sources that are installed in the manufacture floor covering's facilities. In most of the cases, and due to the room limitations only PV panels are possible. The factor 1.25 was proposed by the Nordic Ecolabellling and adopted in this scheme.

Further research on credits for the purchase of green electricity[xxxvii]

The use of green electricity instead of conventional electricity and its promotion has been requested to be revised during this project. The green electricity refers to the electricity generated from renewable sources. It is difficult to assess the benefits of using electricity coming from renewable sources from the environmental perspective. The Table 14 shows some data collected for the electricity generation in Texas coming from different sources. As shown, the emissions of CO_2, SO_2 and NO_x are considerably

higher for the conventional energy sources. Water consumption is also higher for conventional sources and nuclear energy source. The only environmental impact indicator, the renewable energy sources score higher than the conventional ones is land used.

Table 14. Data estimations in USA by fuels[xxxviii]

	Coal	Natural gas	Nuclear	Wind	Hydro	Solar
Cost of the capacity (million $/MW)	1.5	0.9	5.0	2.5	1.7	5.0
O&M cost ($/MWh)	5	5	15	10	10	9.5
Fuel cost ($/MWh)	15	80	5	0	0	0
CO_2 emissions (lbs/MWh)	2293	1146	0	0	0	0
SO_2 emissions (lbs/MWh)	6.8	1	0	0	0	0
NO_x emissions (lbs/MWh)	5	0.03	0	0	0	0
Water consumption (gal/MWh)	426	223	600	0	0	0
Land use (acres/MW)	1.2	0.05	0.05	25	131	4.6

It is difficult to sum up the environmental impacts in just one number and to estimate in how many times the conventional electricity generation is impacting the environment compared to the renewable sourced electricity generation. Additionally, this value would also depend on the type of sources compared, the normalization and weighting methods chosen and the specific conditions of the region.

Even if the determination of a factor is difficult, its use would enormously simply the process. This is the reason why a factor for the green electricity is proposed. Due to the fact that the non-combustible energy sources are considered in the factor A by being multiplied by 1.25 a similar factor, a similar factor is considered appropriate in magnitude for promoting the green electricity. In this case, a reducing factor should be applied. Its value would be 1/1.25 = 0.8

4.6 Table of comments and further research on fitness for use

The use phase: fitness for use criteria wording the comments are on is as follows:

Wooden floor coverings shall achieve at least:
Class 32 for floor coverings for private use,
Class 33 for floor coverings for commercial use,
in accordance with standard EN 685 or EN ISO 10874.

Assessment and verification:
The applicant shall provide third party verified test results in accordance with the appropriated standard that demonstrates that the requirement is fulfilled. The test method should be performed in accordance with:

- EN 13329 and EN 12104 (cork tiles) or equivalent for laminate flooring,
- EN 14354 (veneer wood flooring) or EN 438-2 or equivalent for wood flooring including solid wood flooring, factory lacquer wood flooring and parquet flooring,
- EN 687 or equivalent for bamboo flooring.

Details of the rationale and previous stakeholders' comments considered to redrafting the fitness for use criteria can be found in the TR2.0 and in the slides presented at the 2nd AHWG meeting. The comments received through BATIS are summarized in Table 15

Table 15. Stakeholders feedback on fitness for use

	Stakeholder's feedback	**Decision taken and IPTS analysis and further research**
Level of strictness	Is the fitness for use too strict? *YES.*	**Accepted** The main reason why the classes have been decreased one level is to harmonize the requirements among the different types of floorings as much as possible. The wood floorings are rated from W1 to W4 while other floorings are rated from Class 21 to 41. Equivalence table shows that class 22 correspond to W2 and that class 32 would fall under W3
	Would it be better to set up a minimum fitness for use performance on class 32 independently of the use? NO. *Is enough class 22 and class 32 instead of 23 and 33*	
	BEUC and EEB *hold the views that floor coverings should achieve class 32 for private use AND commercial use*. Our rationale is that *class 32 guarantees the product's resistance, durability and therefore an expanded product lifetime*, which is one of the main features of ecological products. Besides, the class 32 is always recommended to consumers by the staff working in building supply stores. Even big manufacturer like Quick Step in the UK advertises their laminate floors by making reference to the class 32 on their website. Please check: http://www.quick-step.co.uk/Articles/Quality-standards-for-laminate-flooring.	**Rejected** Even if this level of performance may be offered by the laminate flooring industry due to the fast development of the last years, a similar level is almost to be applied for wood floorings. Additionally, there are laminate floorings that claim to be AC4 or even AC5 for private use, that would be classified as higher class than 22 regarding this aspect but that fail the overall classification when other aspects are also considered.
standards	It is better a reference to the general rules of the field and not specific. *For CE mark our reference (parquet producers) is EN 14342 that not include that classification in accordance with EN 685.*	**Acknowledged**
Refurbishment	"*It prevents from a premature refurbishment saving resources.*" *Refurbishment is one of the biggest advantages of parquet compared to other flooring products that are thrown away if refurbishment would be needed*. At normal use parquet can be renovated twice at least. Pre-assumption is that real *parquet as defined in EN 13756 defines parquet with a wooden top layer of equal or more than 2.5 mm prior to installation*. If this requirement is not fulfilled a products must not be called parquet.	**Acknowledged / accepted** The requirement for parquets to be able to be refurbished having introduced in the criterion 6.c updating and reparability. Additionally, this information is set as requirement in the User information criterion.

	The criterion should apply to all different kind of products in the scope not only to wooden ones. The EN 14342 standard should be considered as well.	**Accepted** Modifications in the wording have been proposed with this regard.

Further research on the standards and types of floorings

During the 2nd AHWG meeting industry pointed out that the proposed standards to measure the fitness for use of the different types of flooring was not correct because of mismatches between the purposes of the standards and the type of floorings and other points.

The revision of the appropriateness of the standards was carried out based on the information provided in the environmental product declarations (EPD) of different products:

a) cork flooring:

a.1) *cork floor tiles* according to EN 12104 is a flooring made from agglomerated composition cork supplied in tile form which is designed to be used with a factory finish and/or an in situ finish. Cork floor coverings can be covered with other complementary layers of decorative materials, e.g. decorative cork or wood veneers, with or without applied colours

EN 12104 includes a classification system based on intensity of use which shows where cork floor tiles should give satisfactory service (see EN 685). It also specifies requirements for marking, labelling and packing. The table for the classification requires different tests and to achieve different benchmarks as reported in Table 16

Table 16. Table for the fitness for use classification of the cork flooring

Class	Level of use	Overall Thickness (mm)	Apparently density (kg/m^3)	Residual indentation (mm)	Castor chair	Simulated movement of a furniture leg
21	Domestic moderate	≥ 3.2	≥ 400	≤ 0.4	No requirement	No requirement
22	Domestic general	≥ 4.0	≥ 450 with or without veneer	≤ 0.4		
23	Domestic heavy	≥ 4.0		≤ 0.4		
31	Commercial moderate	≥ 4.0	≥ 500 with or without veneer	≤ 0.4		
32	Commercial general	≥ 4.0		≤ 0.3	No disturbance to the surface other than slight change in appearance and no delamination shall occur	No damage shall be visible after testing with type 2 foot
41	Industrial moderate	≥ 4.0		≤ 0.3		
Relevant standard	EN 685 EN ISO 10874	EN 428	EN 672	EN 433	EN 425	EN 424

The cork tile floorings report in the EPD the values of the product thickness and surface weight according to EN ISO 24346 and EN ISO 23997 respectively. The reference service life of the product can be or cannot be reported in the EPD. In the latter case, a reference to an online tool for the calculation on the ERFMI[xxxix] home page can show up.

a.2) *cork floor covering* is a floor covering the main component of which is agglomerated composition cork, intended to be used with a finish (source: EN 12466)

The cork flooring is classified regarding the application in accordance with ISO 10574 standard (replacing the EN 685). Several testing should be carried out to determine the parameters that allow this classification. According to the EPD, these parameters are included in Table 17

Table 17. Classification properties and test methods for cork floorings

Classification properties	**Standard**	**Classification properties**	**Standard**
Wear layer density	ISO 23996	Nominal thickness of cork surface	EN 660-1
Flatness of the panel: Length: concave/convex Width: concave/convex	EN 14085 Annex A	Wearing group	EN 660-1
Opening between the panels	EN 14085 Annex B	Castor chair	EN 425
Height difference between the panels	EN 14085 Annex B	Simulated movement of a furniture leg	EN 425
Dimensional stability (humidity)	EN 14085 Annex C / EN 669	Residual indentation	ISO 24343-1
Mass per unit area	ISO 23996		

b) laminate floorings:

Laminates are according to the EN 13329 a floor covering with a surface layer that consisting of one or more thin sheets of a fibrous material (usually paper), impregnated with aminoplastic, thermosetting resins (usually melamine). The standard EN 13329 includes the requirements that all the laminate floor coverings shall conform to and the tested methods as well as the classification requirements.

All laminates should be classified as suitable for different levels of use according to the requirements specified in this standard EN 13329 when tested by the test methods given. The classification shall also conform to the scheme specified in EN 685. The requirements and the test methods to be tested are shown in Table 18

Table 18. Classification properties and test methods for laminate floorings

Classification properties	**Test method**	**Classification properties**	**Test methods**
Abrasion resistance	EN 13329: Annex E	Effect of a furniture leg	EN 424
Impact resistance	EN 13329: Annex E	Effect of a castor chair	EN 425
Resistance to staining	EN 438	Thickness swelling	EN 13329 : Annex E
Resistance to cigarette burns	EN 438		
Additional requirements			
Humidity at dispatch from the manufacturer	EN 322	Appearance, surface defects	EN 438

The products require a declaration of performance that takes into account the harmonized EN 14041 and the CE marking. Product specifications, requirements and test methods for laminate flooring are laid down in EN 13329. *Definitions of the utility classes for certain usage areas and performance classes are based on the above-mentioned norm and ISO 10874*

c) Wooden floor coverings:

Several types of wood floor coverings are not classified by the use as the laminate floorings do. These are parquet (lamparquet, mosaic parquet or multi-layer parquet), wood veneer floor coverings or solid hardwood floorings among others. A couple of the characteristics of these flooring regarding the durability are the hardness in accordance with EN 1534 and the *requirement of being capable of undergoing renovation at least twice, provided installation and renovation are done properly.*

The *standard EN 1534, Wood and parquet flooring- Determination of resistance to indentation (Brinell) - Test method*" specifies a method, derived from the Brinell test, for determining the resistance to indentation of wood and parquet flooring. The indentation is measured as indentation under action that is the deformation of the surface of the test specimen while the action of the indenter is applied. However, this standard does not address from a comprehensive point of view the fitness for use of the flooring, but just a single aspect.

The *standard EN 14342, Wood flooring - Characteristics, evaluation of conformity and marking* defines and specifies the relevant characteristics, requirements and appropriate test methods for determination of the suitability of wood products for use as internal flooring including in fully enclosed public transport premises.

The Standards applied for the following floorings:

- Solid parquet elements with tongues and grooves (EN 13226);
- Solid lamparquet products (EN 13227);
- Solid wood overlay elements including blocks with an interlocking system (EN 13228);
- Mosaic parquet elements (EN 13488);
- Multi-layer parquet elements (EN 13489);
- Solid pre-assembled hardwood board (EN 13629);
- Solid softwood floor boards (EN 13990);
- Parquet: vertical finger, wide finger and module brick (EN 14761).

d) Bamboo floor coverings

The durability of bamboo floorings is not standardized. In this cases, the industry reports the characteristics of the bamboo flooring (test results and test methods) without classifying the flooring. Due to the lack of standards, industry can adapt standards developed for other types of floorings to their necessities (eg FprEN 1534) or carrying out their out measurements, leading to different measures that are not comparable. Setting a minimum performance, is therefore, extremely difficult.

Among the parameters measured to obtain the CE-marking set in the Building Materials Directive 89/106/CEE in accordance with harmonised standard EN 14342:2005 + A1:2008, system level 3 certification the bamboo floorings should comply with the following requirements:

Table 19. Testing included in the CE-marking

Type of test	Required level	Norm
Density and thickness	500 kg/m3, 15 mm	EN 14342:2005 + A1:2008
Reaction to fire	Dfl-s1	EN 13501-1
Formaldehyde emissions	E1	EN 717-1 and 2
Thermal conductivity	0,17 W/m°K	EN 335-1 and 2
Biological durability	Class 1 - Class 5	EN 335-1 and 2
Content of pentachlorophenol	< 5 ppm	EN 14342:2005 + A1:2008

Additionally, other characteristics of the bamboo floorings are recommended to be assessed such as;

- moisture content
- hardness in accordance with the Brinell scale (EN 1534)
- resistance to abrasion in accordance with EN-14354 standard
- adhesion of the coating to the underlying material tested in accordance with EN-ISO 2490 standard, and
- impact resistance tested in accordance with EN-14354 standard

Table 20 shows the type of floorings in this sub-group, the standards that regulate their characteristics and the possible thresholds suggested

Table 20. Standards that regulate their characteristics the type of floorings

Standard	Flooring	Characteristic	Standard and threshold
EN 13226	Wood flooring – Solid parquet elements with grooves and/or tongues		
EN 13227	Wood flooring – Solid lamparquet products	If required, typical values for wood hardness shall be determined by the test defined in EN 1534. Solid lamparquet shall be capable of undergoing renovation at least twice, provided installation and renovation are done properly.	
EN 13488	Wood flooring – Mosaic parquet elements	The products specified by this standard are a component part of a total parquet construction and therefore can only meet the technical requirements when in service if the whole parquet has been fully specified and installed to those specifications. Typical values for indentation are specified on the basis of EN 1534.	
EN 13489	Wood flooring – Multi-layer parquet elements	Multi-layer parquet with a mosaic-like pattern shall be classified according to EN 13488 Multi-layer parquet shall be capable of undergoing renovation at least twice, provided installation and renovation are done properly.	
EN 13629	Wood flooring – Solid individual and pre-assembled hardwood boards	Typical values for wood hardness shall be determined by the test defined in EN 1534. The solid element as described in this standard shall be capable of undergoing renovation at least twice, if not subject to excessive wear and tear or if renovation does not remove an excessive amount of wood	

EN 13990	Wood flooring – Solid softwood floor boards	Softwood floor boards referred to in this standard are renewable. The minimum thickness of the wear layer is 3 mm (compare with table 1 - thickness of upper lip).	
EN 14342,	Wood flooring – Characteristics, evaluation of conformity and marking		
EN 14761	Wood flooring – Solid wood parquet – Vertical finger, wide finger and module brick	Typical values for wood hardness are determined by the test defined in EN 1534. Specific site requirements Refer to EN 14342	

Further research on the benchmarks

The strictness of the benchmarks is one of the aspects of the criterion that should be revised. There is no consensus in the feedback from stakeholders about the minimum level to be required. In general, as explain before a serie of classification properties that lead it to be label with two numbers. The first digit indicates the type of use that the flooring is suitable for (eg domestic (2), commercial (3) or industrial (4)). Regarding this first classification, an increase in the number order indicates an increase in the classification properties (eg commercial floorings classified with 3x have a higher wear layer density than those classified as domestic ones (2x)).

The second digit denotes the traffic the flooring is prepared for. There are three levels of traffic: moderate (1), general (2) or heavy (3). Likely the use digit, the higher the digit the higher the classification property value.

Nowadays, even if the floorings are intended to be used in a domestic sector, most of the floorings reach the values to be classified as commercial floorings. This fact guarantees that a flooring has a potential longer lifespan since its quality is higher than that of a domestic flooring. For example, the EPD of several floorings indicated to be use in the residential sector state

> *".... This flooring fit the most demanding needs for domestic areas. This product meets the requirements of the usage classes 31 for commercial use and 23 for domestic use according to ISO 10874 standard. Class 31 products are besides residential use also suitable for commercial areas with low or intermittent use*"
>
> *"…….laminate floor coverings are intended for domestic and commercial level of use and meet the requirements of EN 13329"*
>
> *"…This document applies to the average of the laminate flooring in application class 31, 32 and 33 (AC3 through AC5) … Application: Laminate flooring is used for interior applications in new construction or renovations, with floating installation on screed or other sub floors such as wood, tiles or PVC. Installation must be performed according to the installation instructions and state-of-the-art technology."*

4.7 Table of comments and further research on formaldehyde from floor covering and indoor climate

The comments received on these issues are based on the following wordings:

Formaldehyde emissions from all supplied wood-based panels manufactured using formaldehyde-based resins or finishing agents shall either:

- Have formaldehyde emissions that are lower than 50% of the threshold value allowing them to be classified as E1[xl].
- Specifically, in the case of MDF (Medium Density Fibreboard) panels, have formaldehyde emissions that are lower than 65% of the E1 threshold limit.
- Have formaldehyde emissions that are lower than the limits set out in the CARB Phase II or the Japanese F-3 star or F-4 star standards.

Assessment and verification:

The applicant shall provide a declaration of compliance with this criterion. The assessment and verification of low formaldehyde emission panels shall vary depending on the certification scheme it falls under. The verification documentation required for each scheme is described in Table 5.1.

Table 5.1. Assessment and verification of low formaldehyde emission panels

Certification scheme	Assessment and verification
E1- as defined in Annex B of the EN 13986 (developed in the EU)	A declaration from the wood-based panel supplier, stating that the panel is compliant with 50% of E1 emission limits or, in the case of MDF panels, with 65% of E1 emission limits, supported by test reports carried out according to either EN 717-1, EN 717-2 or EN 120
CARB- California Air Resources Board: Phase II limits (developed in the USA)	a declaration from the wood-based panel supplier, supported by third party verified test results according to ASTM E1333 or ASTM D6007, demonstrating panel compliance with the formaldehyde Phase II emission limits defined in the California Composite Wood Products Regulation 93120[xli]. Optionally, the wood-based panel may be labelled in accordance with Section 93120.3(e), containing details in respect of the manufacturer's name, the product lot number or batch produced, and the CARB assigned number for the third party certifier (this part is not required if the products were made using no-added formaldehyde or certain ultra-low emitting formaldehyde-based resins).
F-3 or 4 star (developed in Japan)	the applicant shall provide a declaration from the panel supplier of compliance with the formaldehyde emission limits as per JIS A 5905 (for fibreboard) or JIS A 5908:2003 (for particleboard and plywood), supported by third party verified test data according to the JIS A 1460 desicator method.

In all cases, the applicant shall also declare that no further formaldehyde-based surface treatment was applied to supplied panels and that the panels were not modified in any another way that would comprise compliance with the formaldehyde emission limits set out in the European, American and Japanese schemes, as appropiate.

The indoor climate criteria the comments are based on is as follows:

The wood-based floor coverings shall not exceed the emission values listed in Table 6.1 measured in a test chamber in accordance with TS/CEN 16516 or equivalent method and ISO EN 16000-3 for the formaldehyde emission value.

Table 6.1. Emission requirements

Compound or substance	Limit Value after 28 day in mg/m3 air
TVOC*	0.16
TSVOC**	0.016
R-value***	1
Cancerogenic substances	0.004
Formaldehyde	0.04

* TVOC – total volatile organic compounds, defined as those compounds within the retention range of C_6 to C_{16} (inclusive)
** TSVOC – total volatile organic compounds, defined as those compounds within the retention range of C_{17} to C_{22} (inclusive)
***R value: total of all quotients $(C_i/LCI_i)<1$ (where Ci=substance concentration in the chamber air, LCI_i = LCI value of the substance as defined by the latest data defined under the European Collaborative Action "urban air", indoor environment and human exposure

Assessment and verification

The applicant shall provide a declaration of compliance, supported by a test report from chamber tests carried according to the ISO 16000 series of standards. Tests carried out according to CEN/TS 16516 shall be considered as equivalent to ISO 16000.
The total VOC emissions per product unit basis shall be calculated and separately comply within each limit.

Details of the rationale and previous stakeholders' comments considered to redrafting the emissions from the core board can be found in the TR2.0 and in the slides presented at the 2nd AHWG meeting. The comments received through BATIS are summarized in Table 21

Table 21. Stakeholders comments for the criteria on emissions from the core board and the finished products

	Stakeholder's feedback	Decision taken and IPTS analysis and further research
Formaldehyde emissions from the core board	*"VOC and formaldehyde testing in the finished product will decrease the uncertainties"* The EEB and BEUC hold the view that *BOTH, the particle board core AND the final product should be controlled and should not have more than 50% E1 formaldehyde emissions.* Some industry stakeholders have stated at the technical meeting that controls and tests only on *the final product were sufficient and proposed to limit the formaldehyde emissions to E1 which is the threshold for all boards today*. On the contrary, we think it is more relevant from a consumer and safety perspective to carry out testing at an early stage to avoid any hazardous substances being present in the final product. In addition, the board which is labelled with the EU Ecolabel should have an added value compared to the other boards existing on the market, so it is not relevant to have the same formaldehyde restriction as in non-labelled, conventionally produced board. It is true that once the covering layers are applied on the final product, they mask formaldehyde emissions which do not get out of the panel and therefore the formaldehyde emissions from the final product will be very low. However, it does not mean there are no emissions as those contained in the panel will be released as residues over time into the indoor air once the product is already installed in consumers' homes. Hence checking the components and materials that make of a product at an early stage is very useful. *Therefore, the threshold of 50% of E1 in raw core board and finished the product should be implemented.*	**Partially accepted.** There are comments on two different criteria, although as commented these criteria are linked. Regarding the proposed limit of 50% E1 for the core board, and the final product, the comment is accepted and modifications have been included into the criteria wording. This support makes criteria 5 to be kept. Regarding the emissions of the final product, the emissions of formaldehyde are measured together with other emissions (eg VOCs), due to the changes in the criterion 5, formaldehyde is proposed not to be measured in criteria 6
	"50% of E1 emission limits or, in the case of MDF panels, with 65% of E1 emission limits" The requirement for the wood based panel, criterion 5: *emissions of formaldehyde in wood-based boards, should be E1 and not 50% or 65% E1.* There is a threshold at which formaldehyde can be considered safe and E1 is that limit, there is no health based justification for going lower than this. The fact that in some regulatory jurisdictions a lower limit might be cited is not in itself a solid justification. The European wood based panel industry is committed to E1 and for many countries exporting to Europe, E1 will be a stretched target.	**Rejected** The E1 is a mandatory level that guarantees a product to be considered as safe but it is not a sign of excellence. The E1 level should be fulfilled by all the products that are going to be placed in the European market. If the criteria 5 required a level of compliance of E1, this would be useless since the level E1 is already required by the CE marking and it is not able to make any difference among the products. Higher levels of ambition are therefore needed.

	Have formaldehyde emissions that are lower than 50% of the threshold value allowing them to be classified as E1 Our experience from the Nordic Ecolabel is that this *criterion can be very confusing with the references to the different formaldehyde standards and labels.* Therefore we would like to suggest that you rewrite the criterion so that *instead of referring to different per cents of E1 and CARB you actually write out the absolute limits in ppm and mg/m^2.* *The E1 CARB phase II standards include different test methods that should be accepted.* The verification of the requirement would be the *test result and test report* showing that the formaldehyde emission is lower than the limit value Otherwise the complexity of the CARB phase II standard with its different limit values for formaldehyde emissions for different boards will only confuse the applicant and make the assessment procedure difficult.	**Accepted** The numerical values of the limits have been added to the criterion wording. However, we proposed to keep also the percentages to gives an idea of the level of ambitions required and because it seems the way how the emissions are expressed in the sector.
	"have formaldehyde emissions that are lower than 50% of the threshold value allowing them to be classified as E1. In the case of MDF panels, formaldehyde emissions shall be lower than 65% of the E1 threshold limit". BEUC and EEB *fully support the limit to formaldehyde emissions to 50% of the threshold value allowing them to be classified as E1,* which is the applied standard for normal production. We are glad to see that the ambition level of the formaldehyde requirements is in line with the Japanese standard which is considered as one of the front-runners in the sector.	**Acknowledged**
Level of strictness emissions from finished product	BEUC and EEB *support the JRC proposal to set limits to: 0.16 mg/m^3 air for TVOC, and 0.016mg/m^3 for TSVOC and we will not support any lower thresholds as we consider these limits are ambitious and feasible.* Indeed, OCU, the Spanish organisation for users and consumers has got tests performed by laboratories on laminate floors sold in Spanish shops. The results have shown that the VOC emissions in the final products are lower than the ones proposed by the JRC. There are therefore no obstacles for manufacturers to comply with these requirements considering the existing products in the market. In addition the values proposed by the JRC are aligned with the Nordic Swan Ecolabel and this demonstrates the feasibility of such thresholds (please see the JRC first technical report from September 2014, on p.65)	**Rejected** The values set in TR2.0 seem to be unfeasible to be reached at industrial level and with today's technology. Likely, the proposed values in the TR2.0 contained a typing mistake that should be corrected

	We generally support the thresholds proposed by the JRC in the criterion on indoor climate. Some thresholds (Total organic compounds within the retention range of C_6 to C_{16} (TVOC), and Total organic compounds within the retention range of > C_{16} to C_{22} (TSVOC)) have been questioned by industry stakeholders during the technical meeting who suggested to lower them in alignment with the Blue Angel or Nordic Swan criteria. BEUC and the EEB see the usefulness in general to align between the requirements of different schemes but disagree in this case at it would result in a loss of ambition.	
	Table 6.1. Emission requirements. *I* did not understand the rationale behind these limits and would propose a copy of Blue Angel RAL UZ 176 limits instead.	**Accepted** Limits have been revised finding out that the values were not possible to be achieved. In the new version they are proposed to be in line with several national schemes such as Blue angel RAL UZ 176 and Nordic Labelling for Floor coverings version 6, among others
	We encourage the JRC to lower the threshold for carcinogenic substances from 0.004 mg/m^3 (the current EU Ecolabel limit) to 0.001 at least. A threshold of 0.001 mg/m3 is the current value in the Blue Angel requirements and we therefore believe the same limit value should be set for the EU Ecolabel. *In addition, we strongly encourage the JRC to lower the initial R-value from 1 to 0.5.*	**Rejected** The value on carcinogenic substances is proposed to be withdrawn due to the lack of information. Additionally, the presence of CMR covers partially this aspect. The R-value is proposed to be kept as 1 to be in line with most of the voluntary schemes and national legislations
Withdraw of testing formaldehyde emissions	*"The wood-based floor coverings shall not exceed the emission values listed in Table 6.1 measured in a test chamber in accordance with TS/CEN 16516 or equivalent method and ISO EN 16000-3 for the formaldehyde emission value"* This is a good general requirement on the dangerous emissions from the finished floor. Because the *limits in this requirement are so stringent it could be an alternative to criterion 2.6, that as a limit for emissions of formaldehyde in boards, accept both E1 and CARB phase 2.* This would make the assessment procedure faster and decrease the confusion regarding all the different limits and test methods in the criterion 2.6.	**Rejected / Acknowledged** Two points are considered not to accept the comment: - the limits of the VOCs emissions from the finished products are considered as unreachable and therefore lower limits are proposed in the new draft - testing the VOCs and formaldehyde content in the raw materials and their emissions from the finished products to comply with the EU ecolabel criteria was the decision of the EU Ecolabel Board in June 2015. Therefore, both criteria are proposed to be kept in this new proposal.
	Derogations might be carefully assessed referring to substances naturally present in wood (like e. g. acetic acid).	**Acknowledged** The process for assessing the information regarding the emission of acetic acid from wood that is above the proposed VOC limits has started. The consultation with experts on this point may lead in the modification of the criteria wording for wood floorings

Wording: clarifications	This is discriminating wood. What about the formaldehyde emissions from boards made of lignified materials other than wood?	**Accepted** Wording of the criteria has been revised to extend the scope of the criteria to all the materials The unclear sentence has been replaced by "Each of the compounds or substances included in Table 6.1 shall be calculated and separately comply within each limit"
	The total VOC emissions per product unit basis shall be calculated and separately comply within each limit. Please clarify*: m² of flooring?*	
	The total VOC emissions per product unit basis shall be calculated and separately comply within each limit. Unclear what this means in this document here.	
	It should be specified that the *chamber test has to be carried out 28 days after the conclusion of the surface treatment.* At this time the product to be tested has to be put in a sealed package at the production site and thus delivered to the test laboratory.	**Accepted** Wording has been revised and improved introducing the clarifications indicated during the revision process
	A clearer and more explanatory wording could be: *... after 28 days storage in a ventilated test chamber (see CEN/TS 16516).*	
	CEN/TS 16156 and ISO 16000-9 for formaldehyde These st*andards are for VOC emissions in general, among that also for formaldehyde.* This is not clear from present wording. Just delete "for formaldehyde".	**Acknowledged** Because the focus of the criterion 5 has been changed, this requirement is no longer needed. The restriction on the emissions of formaldehyde from the whole product are measured and assessed in the criterion 5 instead of the criterion 6.
	So EN 16000-3 analysis is included in TS 16516 and does not need to be mentioned separately.	
	CEN TS 16516 1: The *nomination is wrong, should be CEN/TS 16516* (not the other way round). This occurs repeatedly in the text. 2: The link behind contains private advertisement for on lab, please use this neutral link instead: http://www.centc351.org/	
	Formaldehyde emissions from all supplied wood-based panels manufactured using formaldehyde-based resins or finishing agents shall either: Please see the table with the different limit values in the different standards for formaldehyde emissions	

	We have *concerns regarding limits for TVOCs* as it is not a health based indicator and any limits are therefore arbitrary and a little crude. Wood can emit many different VOCs, to simply add them up and assume they are all dangerous is not correct. There have been studies on pine wood that report, even at high emission levels, the toxicological effect is without risk to health[xlii] This in turn *would also question the relevance of the R value*, whilst this is based on the lowest concentration of interest (LCI), products with many LCIs will be penalised. Surely the lowest concentration of interest is just that and any emissions at or below it (assuming it is the correct level) can be considered safe for any individual substance, why should their relative proportions be added up to determine safety, *what the R value in effect does is to place a safety factor on the safety limit which already has a safety factor, it doesn't make a product any safer because it was safe to begin with.* In light of the studies on the toxicological effects of wood and the TVOC and R value arguments above, *we would question the need for any VOC requirement being placed on wood products' natural VOCs*. The *exception* to this would of course *be the release of dangerous substances from something added to the wood e.g. formaldehyde based resins, which are dealt with in criterion 5* and in addition there is legislation regarding carcinogens that already determine safe limits for them. *We would therefore argue that criterion 6 is not needed and can therefore be deleted*.	**Acknowledged - accepted** The process for assessing the information regarding the emission of acetic acid from wood that is above the proposed VOC limits has started. The consultation with experts on this point may lead to modifications in the criteria wording
	The wood contains naturally acetic acid that is a VOC that gives a high contribute to indoor emissions values. The tests we have done show a contribution about 70 % acetic acid on total VOC emissions, in particular with the oak. Should be very important have derogation for acetic acid (CAS n. 64-19-7). Is needed specify that cancerogenic substances are cancerogenic VOC's (like in AgBB standard) It is enough test on TVOCs, TSVOCs and no needed the limit on R value	

Wording VOC emissions from the finished products	"*TVOC – total volatile organic compounds, defined as those compounds within the retention range of C6 to C16 (inclusive)"* This definition deviates from CEN/TS 16516 and ISO 16000 definition, and therefore yields different test results without any need. The markers are n-hexane (not hexane which is a mixture of several isomers) and n-hexadecane (not hexadecane which again is a mixture of a large number of isomers). Single substances are needed for unambiguous definition. Correct wording as in the standards is: *TVOC – total volatile organic compounds, defined as those compounds within the retention range of n-C6 to n-C16 (inclusive).*	**Accepted** The CEN/TS 16516 and the ISO 16000 are the standard proposed as a reference for the compliance with this criterion, therefore the definition of TSVOC should be fully in line with these standard. The definition of TSVOC in the criteria wording has been replaced and additionally, the definition included in the CEN/TS 16516 will be included in the user manual.
	"TSVOC – total volatile organic compounds, defined as those compounds within the retention range of C_{17} to C_{22} (inclusive" This definition deviates from CEN/TS 16516 and ISO 16000 definition, and therefore yields different test results without any need. The markers are n-hexadecane (not hexadecane which is a mixture of a large number of isomers) and n-docosane (not docosane which again is a mixture of a large number of isomers). Single substances are needed for unambiguous definition. And the definition in the standards also includes some hexadecane isomers in the SVOC definition - those appearing after n-hexadecane in the chromatogramme. Therefore the lower margin must be "after (or larger than) n-C16". Correct wording as in the standards is: *TSVOC – total volatile organic compounds, defined as those compounds within the retention range of >n-C16 to n-C22 (inclusive)*	
Spelling and corrections in the rationale	*"and Finland"* No, not compulsory in Finland.	**Accepted**
	"*adequate voluntary labels like the eco-INSTITUT-Label, Nordic Labelling or Blue Angel can also be evaluated according to these type of tests"* To stay *neutral towards the market of test labs, please either mention all of them, with the respective links (i.e. add natureplus, M1, Indoor Air Comfort Gold), or delete any names mentioned* here (maybe with the exception of Blue Angel because it is public, and it has the most certified products).	**Accepted** Wording of the criteria has been revised to become as neutral as possible towards the market of test labs.
	French VOC regulation. DIBt and AgBB The link behind contains private advertisement for on lab, please use this neutral links instead: France: http://www.developpement-durable.gouv.fr/Chapitre-I-Mode-d-emploi-de-l.html AgBB: http://www.umweltbundesamt.de/en/document/agbb-evaluation-scheme-2015 DIBt: https://www.dibt.de/en/Departments/Section_II4.html Belgium[xliii]:	**Acknowledged** Changes in the TR2.0 as indicated have also been applied to TR3.0 whenever suitable.

	Belgium and French VOC regulation. DIBt and AgBB measurement, however, can be consulted in this context. Not completely. *French measurement only delivers TVOC and formaldehyde, not the other parameters. On the other hand, AgBB and DIBt tests deliver all here requested data.*	**Acknowledged** Changes in the TR2.0 as indicated have also been applied to TR3.0 whenever suitable.

4.8 Table of comments and further research on other issues

The information criteria wording the comments are on is as follows:

Criterion 7.1 User information

The product shall be sold with the relevant user information on the packaging and/or on documentation accompanying the product, which provides advice on the product's proper installation, use and maintenance and indications to minimize waste at the end of its lifespan. These instructions should be legible or include graphical representation or icons and include information on:

a) Recommendations for the installation. This information should include all relevant instructions referring to the best environmental installation practices. As appropriate, reference should be made to the necessary preparation of the underlaying surface and the auxiliary materials needed, for example, the plastic underlayers or the adhesives and glues that can be used for its installation. In the case where adhesives is to be applied to the complete surface, it must be possible to use an adhesive certified with a Type I Ecolabel or at least a low emission adhesive complying with EMICODE EC1 or equivalent,

b) Recommendations for the use and maintenance of the product. This information should highlight all relevant instructions particularly referring to the maintenance and use of products. As appropriate, reference should be made to the features of the product's use under difficult conditions, for example, water absorption, stain resistance, resistance to chemicals, necessary preparation of the underlying surface, cleaning instructions and recommended types of cleaning agents and cleaning intervals. The information should also include any possible indication on the product's potential life expectancy in technical terms, either as an average or as a range value,

i) An indication of the route of recycling or disposal (explanation in order to give the consumer information about the high possible performance of such a product);

Assessment and verification:

The applicant shall provide a sample of the packaging and/or texts enclosed.

Criterion 7.2 Information appearing on the EU Ecolabel

The logo should be visible and legible. The use of the EU Ecolabel 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:

- Certified sustainable wood and wood-based materials,
- Limited hazardous substances used,
- Low-emitting product, emissions lower than 50%E1

Assessment and verification:
The applicant shall provide a sample of the packaging.

Details of the rationale and previous stakeholders' comments considered to redrafting the information criteria can be found in the TR2.0 and in the slides presented at the 2nd AHWG meeting. The comments received through BATIS on this and other issues are summarized in Table 16

Table 22. Stakeholders feedback on packaging and information criteria

	Stakeholder's feedback	**Decision taken and IPTS analysis and further research**
packaging	The EEB and BEUC disagree with the withdrawal of a criterion related to packaging. Wooden Floor coverings are bulky products which therefore possibly come along with a huge amount of packaging. It is very incoherent to produce an eco-product and wrap it in a non-ecologic packaging. In addition, we believe finding more environmentally friendly packaging is possible without too much burden and costs for producers. The Blue Angel *sets a very relevant criterion for this product group: the products shall be packed for sale so as to allow post-manufacture outgassing of volatile elements.* We call for this criterion to be included into the EU Ecolabel criteria.	**Rejected (acknowledged)** Floorings are usually packaged grouping a certain number of slabs (around 10) with cardboard in covering 7 out of 8 sides of the package and being wrapped with a light plastic. Thus, although floor coverings could be considered bulky products they don't use huge amounts of packaging. Taking into account the above information and that the expected lifetime of this product group lasts between 15 and 50 years, it is clear that the environmental impact of the packaging in negligible and therefore there is no reason for an EU Ecolabel criterion. It is agreed that an environmental-friendly product should not be wrapped in a non-environmental friendly packaging. But due to the characteristics of the EU

	A criterion on packaging should be defined stating that packaging materials must be re-used or recycled. The environmental impact of flooring packaging is certainly not a significant one. Nevertheless it would be odd that the packaging of an EU Ecolabel product were not environment-friendly. Besides it would be very easy for applicants to comply with a packaging criterion	Ecolabel scheme, a packaging criterion will communicate the idea that taking care of the packaging is as relevant as reducing the energy consumption in the manufacture process from the environmental point of view, as both criteria have the same weight/importance in a pass/fail system. Setting a packing criterion easy to comply with would damage the reputation of the EU Ecolabel and its ambition.
User information	The licensee should inform customers: - that the covering on-site installation and its final on-site surface treatment, if any, should be made using EU Ecolabel products if available and, in any case, products which have low impact on the environment and the health. - about the percentage of wood, wood-based, bamboo or cork present in the product. In the case of laminated coverings the licensee should inform customers about the percentage of wood-based material the product is made of.	**Accepted** Both aspects pointed out in this feedback are of relevance for this product group. The amount of wood, cork, bamboo and plant-based material is important to communicate in order to avoid misleading information due to other communications that can be associated with pure wooden floorings. Information about the surface treatments needed in case of unfinished products and how the selection of these materials can help reducing the overall environmental impact of the floorings is worth communicating.
Information appearing on the EU Ecolabel	With the aim to clearly differentiate between wood and other materials, the label with text box has to be used containing the following text: - wooden or wood based or laminated or bamboo or cork unfinished or prefinished hard covering (specifying the relevant percentage of material), - certified sustainable wood or wood-based materials or …….. - limited hazardous substances used - produced with energy savings processes	**Partially accepted** We acknowledge the relevance of the points listed in this feedback but we should keep in mind that the room devoted to the information appearing on the EU Ecolabel is limited, therefore we considered that more than three points (as suggested in the EU Ecolabel manual) should not be included. The percentage of wood, cork, bamboo and plant-based materials are already included in the consumer information and may be this point can be dropped out form this list or maybe be integrated in the introduction of the list.
others	Appendix 1: For the sake of clarity, the difference between “efficiency” and “efficacy” if any should be stated.	**Accepted** Appendix 1 will be revised in this way

	Requirement of environmental product declaration to all the EU ecolabel products (EPD)	**Acknowledged** Environmental product declaration (EPD) is a useful tool to communicate the environmental performance of a product in a standardized way. this tool allows the comparisons among the products and could be potentially used as proof of compliance with several proposed EU Ecolabel criteria. However, there are several aspects that prevent their use as only way of compliance: a) it is not mandatory for floorings and therefore there are products which environmental performance could be so good as other but that they are lacking the EPD b) not all types of floorings have product category rules that guides the process to produce the EPD c) the information reported does not completely match the requirements of the criterion, and although calculations can be performed based on the data, it is not straight forward.

5 ANNEX – EXISTING AND PROPOSED CRITERIA COMPARISON

EXISTING NAME	PROPOSED NAME
'wooden floor coverings	**Wood, wood-based, cork, cork-based, bamboo and bamboo-based floor coverings**
EXISTING SCOPE	**PROPOSED SCOPE**
The product group 'wooden floor coverings' shall comprise wood- and plant-based coverings: including wood and timber coverings, laminate floorings, cork coverings and bamboo floorings which are made, for more than 90 % in mass (in the final product), from wood, wood powder and/or wood/ plant-based material. It does not apply to wall coverings, where properly indicated, or coverings for external use or for coverings with a structural function. This product group will not include any covering treated with biocidal products at any stage of the production process, except where those biocidal products are included in Annex IA to Directive 98/8/EC of the European Parliament and of the Council (2) and where the active substance is authorised for the use in question according to Annex V to Directive 98/8/EC.	The product group of 'Wood, wood-based, cork, cork-based, bamboo and bamboo-based floor coverings' shall comprise indoor floor coverings, including wood floorings, laminate floorings, cork floor coverings and bamboo floorings which are made, for more than 80 % in mass (in the final product), from wood, wood-based, cork, cork-based, bamboo and/or bamboo-based materials or fibres. Synthetic fibres are not permitted in any of **the** composing layers. The scope of this product group does not apply to wall coverings, coverings for external use or with a structural function. The scope does not apply for levelling compounds ***Assessment and verification*** The applicant shall provide the following information about the floor covering: - brand/trade name - a description of the product and the raw materials or substances involved: percentage composition of the raw materials or substances in the flooring if possible in mass including any additive and surface treatment, when relevant. - a description of the manufacturing procedure. Suppliers of raw materials or substances shall be described with the name of the business, production site, contact details and description of the production step(s) they carried out or are part of. The product data sheet, environmental product declaration (EDP) or equivalent document can be accepted for the compliance of this criterion if it includes the listed information is included.
EXISITING DEFINITIONS	**PROPOSED DEFINITIONS**

Wood and timber coverings are 'wood floors or wall coverings made of one solid piece of wood that have tongue and groove sides or constructed from several wood plies that are glued together in a multilayer panel. A wood covering can be unfinished, and once installed sanded, then finished on site or pre-finished in a factory.' Wood and timber coverings criteria can be applicable both for wall and floor coverings, if the production processes remain the same, using the same materials and the same manufacturing methods. The criteria are set for internal use only. The industry producing wood floor coverings determines its technical position in the European Committee for Standardisation CEN/TC 112.	***Wood flooring*** means, in accordance with prEN 13756, an assembly of wood elements pre-assembled boards or parquet panels which constitutes the wearing surface of the floor. A wood floor covering can be either unfinished or be prefinished in a factory. Unfinished wood flooring, once installed, is sanded and then finished on site.
Laminate floorings are 'rigid floor covering with a surface layer consisting of one or more thin sheets of a fibrous material (usually paper), impregnated with aminoplastic thermosetting resins (usually melamine), pressed or bonded on a substrate, normally finished with a backer'. Laminates coverings criteria can be applicable only for floor coverings and for indoor use. The industry producing laminate floor coverings determines its technical position in the European Committee for Standardisation CEN/TC 134.	***Laminate floorings*** means in accordance with EN 13329 'rigid floor covering with a surface layer consisting of one or more thin sheets of a fibrous material (usually paper), impregnated with aminoplastic thermosetting resins (usually melamine), pressed or bonded on a substrate, normally finished with a backer'
Cork coverings are floor or wall coverings the main component of which is cork. The granulated cork is mixed with a binder, and then cured or several layers of cork (agglomerated/veneer) can be pressed together with glue. The cork coverings can be divided into natural cork tiles (the main component of which is agglomerated composition cork, intended to be used with a finish) and in engineered cork panels (consisting of several layers including a fibreboard the main component of which is agglomerated cork or has cork as technical solution, intended to be used with a finishing wear layer). Cork coverings criteria can be applicable both for wall and floor coverings, if the production processes remain the same, using the same materials and the same manufacturing methods. The criteria are set for indoor use only. The European 'cork' floor covering	***Cork floor coverings*** means floor coverings made of granulated cork mixed with a binder, and then cured or several layers of cork (agglomerated/ veneer) that can be pressed together with glue. *The cork floor coverings can be divided into natural cork tiles* (the main component of which is agglomerated composition of cork, intended to be used with a finish) *and in engineered cork panels* (consisting of several layers including a fibreboard the main component of which is agglomerated cork or has cork as technical solution, intended to be used with a finishing wear layer).

industry determines its technical position in the European Committee for Standardisation CEN/TC134.	
Bamboo floor covering are made of bamboo in solid pieces or in agglomerates as a main component. Bamboo coverings criteria can be applicable only for floor coverings and for indoor use.	***Bamboo floor coverings*** means made of bamboo in solid pieces or in agglomerates mixed with a binder
EXISITING CRITERIA	
All cork, bamboo and virgin wood must originate from forests that are managed so as to implement the principles and measures aimed at certifying sustainable forest management. **1.1. Sustainable forest management** The producer shall have a policy for sustainable wood procurement and a system to trace and verify the origin of wood and tracking it from forest to the first reception point. The origin of all wood shall be documented. The producer must ensure that all wood originate from legal sources. The wood shall not come from protected areas or areas in the official process of designation for protection, old growth forests and high conservation value forests defined in national stakeholder processes unless the purchases are clearly in line with the national conservation regulations. — Until 30 June 2011, for wooden products placed on the market bearing the Ecolabel, at least 50 % of any solid wood and 20 % wood-based materials must originate either from sustainably managed forests which have been certified by independent third party schemes fulfilling the criteria listed in paragraph 15 of the Council Resolution of 15 December 1998 on a forestry strategy for the European Union (1) and further development thereof, or from recycled materials. — From 1 July 2011, until 31 December 2012 for wooden products placed on the market bearing the Ecolabel at least 60 % of any solid wood and 30 % wood-based materials must originate either from sustainably managed forests which have been certified by independent third party schemes fulfilling the criteria listed in paragraph 15 of the Council Resolution of 15 December 1998 on a forestry strategy for the European Union and further development	All wood, wood-based cork, cork-based, bamboo, bamboo-based and plant-based materials weighting more than 1% of the finished product shall be covered by chain of custody certificates issued by an independent third party certification scheme such as the Forest Stewardship Council (FSC) , the Programme of the Endorsement of Forest Certification (PEFC) or equivalent All virgin wood, cork and bamboo shall be covered by valid sustainable forest management certificates issued by an independent third party certification scheme such as FSC, PEFC or equivalent. When certification schemes allow mixing of uncertified material with certified and/or recycled materials in a product or production line, a minimum of 70% of the wood, cork and/or bamboo shall be sustainable certified virgin materials and/or recycled material Uncertified material shall be covered by a verification system which ensures that it is legally sourced and meets any other requirement of the certification scheme with respect to uncertified material. The certification bodies issuing forest and/or chain of custody certificates shall be accredited or recognised by that certification scheme. **Assessment and verification** The applicant shall provide valid, independently certified chain of custody certificates for all wood, wood-based cork, cork-based, bamboo, bamboo-based and plant-based material, used in the product or production line and demonstrate that at least 70% of the materials originates from forests and/or areas managed according to Sustainable Forestry Management principles and/or from recycled sources that meet the requirements set out by the relevant independent chain of custody scheme. FSC, PEFC or equivalent schemes shall be accepted as independent third party certification If the product or production line includes uncertified material, proof shall be provided that the content of uncertified virgin material does not exceed 30% and is covered by a verification system

thereof, or from recycled materials. — From 1 January 2013, for wooden products placed on the market bearing the Ecolabel at least 70 % of any solid wood and 40 % wood-based materials must originate either from sustainably managed forests which have been certified by independent third party schemes fulfilling the criteria listed in paragraph 15 of the Council Resolution of 15 December 1998 on a forestry strategy for the European Union and further development thereof, or from recycled materials.	which ensures that it is legally sourced and meets any other requirement of the certification scheme with respect to uncertified material.
Assessment and verification: for meeting these conditions, the applicant shall demonstrate that any of their wooden eco-labelled products, when first placed on the market after the dates shown in the criterion will meet the appropriate level of certified wood. If this cannot be demonstrated the competent body will only issue the Ecolabel licence for the period for which compliance can be demonstrated. The applicant shall provide appropriate documentation from the wood supplier indicating the types, quantities and precise origins of wood used in the production of floor coverings. The applicant shall provide appropriate certificate(s) showing that the certification scheme correctly fulfils the requirements as laid down in paragraph 15 of the Council Resolution of 15 December 1998 on a forestry strategy for the European Union.	

Recycled wood and plant materials (for laminate flooring and multilayer wood coverings)

Post-consumer wood, chips or fibres applied in the production of wood-based materials (input), shall at least complywith the provisions in the EPF industry standard, as reported in paragraph 6 of document 'EPF standard for deliveryconditions of recycled wood' of 24 October 2002.

The total amount of the recycled material shall comply with the limits indicated in table below:

Elements and compounds Limit values Elements and compounds Limit values Arsenic 25 Cadmium 50
Chromium 25 Copper 40
Lead 90 Mercury 25 Fluorine 100 Chlorine 1000 Pentachlorophenol (PCP) 5 Tar oils (benzo(a)pyrene) 0.5

Assessment and verification: a declaration shall be provided that recycled wood or plant materials comply with limit values as laid down in text. If it can be proved that the substances indicated have not been used in any previous preparation or treatment, the application of test to demonstrate compliance with this requirement can be avoided.

3. a) Elements and compounds in recycled wood, cork and bamboo

Any recycled fibres or chips used in the manufacture of panels included in the final floor covering product shall be tested in accordance with the European Panel Federation (EPF) standard for delivery conditions of recycled wood and comply with the limits for contaminants as listed in Table 3.1.

Table 3.1. Limits for contaminants in recycled wood, cork, bamboo and their fibres or chips (mg/kg dry panel)

Elements	Limit values	Elements and compounds	Limit values
Arsenic (As)	25	Mercury (Hg)	25
Cadmium (Cd)	50	Fluorine (F)	100
Chromium (Cr)	25	Chlorine (Cl)	1000
Copper (Cu)	40	Pentachlorophenol (PCP)	5
Lead (Pb)	90	Tar oils (benzo(a)pyrene)	0.5

Assessment and verification:

The applicant shall provide:

i. A declaration from the panel supplier that no recycled wood, cork, bamboo or their fibres or chips were used in the panel, or

ii. A declaration from the panel supplier that all recycled wood, cork, bamboo or their fibres or chips used have been representatively tested in accordance with the 2002 "EPF standard conditions for the delivery of recycled wood" supported by test reports that demonstrate compliance of the recycled samples with the limits specified in Table 3.1

iii. A declaration from the panel supplier that all recycled wood, cork, bamboo or their fibres used have been representatively tested by equivalent standards that have equal or stricter limits than the 2002 "EPF standard conditions for the delivery of recycled wood", supported by test reports that demonstrate compliance of the recycled samples with the limits specified in Table 3.1

If it can be proved that the substances indicated have not been used in any previous preparation or treatment, the application of test to demonstrate compliance with this requirement can be avoided

Impregnating substances and preservatives Wooden flooring shall not be impregnated. Solid wood, after logging, shall not be treated with substances or preparations containing substances that are included in any of the following lists: — WHO recommended classification of pesticides by hazard classified as class 1a (extremely hazardous), — WHO recommended classification of pesticides by hazard classified as class 1b (highly hazardous). Moreover, the treatment of wood shall be in accordance with the provisions of Council Directive 79/117/EEC and Council Directive 76/769/EEC. **Assessment and verification:** the applicant shall provide a declaration showing compliance to this criterion, a list of the substances which have been used and a data sheet for each of them.	See criterion on Biocidal products
Genetically modified wood The product shall not contain GMO wood. **Assessment and verification:** the applicant shall provide a declaration that no GMO wood has been used.	

2. USE OF DANGEROUS SUBSTANCES

2.1. Dangerous substances for the raw wood and plant treatments

(a) No substances or preparations that are assigned, or may be assigned at the time of application, any of the following risk phrases (or combinations thereof) may be added to the wooden product:
R23 (toxic by inhalation)
R24 (toxic in contact with skin)
R25 (toxic if swallowed)
R26 (very toxic by inhalation)
R27 (very toxic in contact with skin)
R28 (very toxic if swallowed)
R39 (danger of very serious irreversible effects)
R40 (limited evidence of a carcinogenic effect)
R42 (may cause sensitisation by inhalation)
R43 (may cause sensitisation by skin contact)
R45 (may cause cancer)
R46 (may cause heritable genetic damage)
R48 (danger or serious damage to health by prolonged exposure)
R49 (may cause cancer by inhalation)
R50 (very toxic to aquatic organisms)
R51 (toxic to aquatic organisms)
R52 (harmful to aquatic organisms)
R53 (may cause long-term adverse effects in the aquatic environment)
R60 (may impair fertility)
R61 (may cause harm to the unborn child)
R62 (possible risk of impaired fertility)
R63 (possible risk of harm to the unborn child)
R68 (possible risk of irreversible effects),
as laid down in Council Directive 67/548/EEC of 27 June 1967 on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances (1) (Dangerous Substances Directive), and its subsequent amendments, and considering Directive 1999/45/EC of the European Parliament and of the Council (2) (Dangerous Preparations Directive).

2. USE OF DANGEROUS SUBSTANCES

The presence in the product of substances that are identified according to Article 59 (1) of Regulation (EC) No 1907/2006 of the European Parliament and of the Council as substances of very high concern (SVHCs) or substances or mixtures that meet the criteria for Classification, Labelling and Packaging (CLP) according to Regulation (EC) No 1272/2008 of the European Parliament and of the Council for the hazards listed in Table 2.1, shall be restricted in accordance with criteria 2.1 and 2.2.

Table 2.1 Grouping of restricted hazards

Group 1 Hazards – SVHC and CLP *Hazards that identify a substance as being within Group 1:* - substances that are considered SVHC in accordance with article 57 (d), (e) and (f) of Regulation (EC) No 1907/2006 - category 1A or 1B CMR*: H340, H350, H350i, H360F, H360D, H360FD, H360Fd, H360Df
Group 2 Hazards – CLP *Hazards that identify a substance as being within Group 2*: - category 2 CMR*: H341, H351, H361f, H361d, H361df, H362 - category 1 aquatic toxins: H400, H410 - category 1 and 2 acuate toxins: H300, H310, H330, H304 - category 1STOT*: H370, H372 - category 1 skin sensitiser H317
Group 3 Hazards – CLP *Hazards that identify a substance as being within Group 3:* - category 2, 3 and 4 aquatic toxins: H411, H412, H413 - category 3 acute toxins: H301, H311, H331, EUH070 - category 2 STOT*: H371, H373

*CMR= carcinogenic, mutagenic or toxic to reproduction; STOT= specific target organ toxicity

2.1 Restriction of SVHCs

The floor covering shall not contain SVHC at concentrations in the final product greater than 0.10% (weight by weight)

Assessment and verification

Alternatively, classification may be considered according to Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (1). In this case no substances or preparations may be added to the raw materials that are assigned, or may be assigned at the time of application, any of the following hazard statements (or combinations thereof): H300, H301, H310, H311, H317 H330, H331, H334, H351, H350, H340, H350i, H400, H410, H411, H412, H413, H360F, H360D, H361f, H361d H360FD, H361fd, H360Fd, H360Df, H341, H370, H372.	The applicant shall provide a declaration of compliance for the product supported, where relevant, by declarations from any supplier(s) regarding the non-presence of SVHCs at concentrations greater than 0.10% (weight by weight). Declarations shall be with reference to the latest version of the Candidate List published by ECHA. **2.2 Restriction of CLP classified substances used in the floor covering** Substances or mixtures used by the floor covering manufacturer or his suppliers during the preparation of raw materials, manufacturing, assembly or any other treatment of the floor covering shall not be classified with any of the CLP hazards listed in Table 2.1. Restricted substances or mixtures shall include adhesives, paints, primers, varnishes, stains, preservatives, resins, biocides, fillers, waxes, oils, joint fillers, dyestuff and sealants. However, the use of such restricted substances shall be permitted if one or more of the following conditions apply: - that the restricted substance or mixture was used in quantities that amount to less than 0.10% of the total weight of the floor covering and/or - that the restricted substance changes its properties upon processing (e.g. becomes no longer bioavailable or undergoes chemical reaction) so that the restricted CLP hazards no longer apply and that any unreacted residual content of the restricted substance is less than 0.10% of the total weight of the floor covering ***Assessment and verification*** The applicant and/or his suppliers shall provide a declaration of compliance with criterion 2.2 supported by a list of relevant substances or mixtures used together with declarations about their hazard classification or non-classification, their added quantities and if the substances change their properties upon processing so that the restricted CLP hazards no longer apply. If so, the quantities of any unreacted residual content of the restricted substance shall be provided. The following information shall be provided in relation to the hazard classification or non-classification for each of the substances: i. the substance's CAS, EC or list number (where available for mixtures) ii. the physical form and state in which the substance or mixture is used iii. harmonized CLP hazard classifications iv. self-classification entries in ECHA's REACH registered substance database (if no harmonized classification available). When considering self-classification entries in the REACH registered substance database, priority

	shall be given to entries from joint submissions. Where a classification is recorded as 'data-lacking' or 'inconclusive', or where the substance has not yet been registered under the REACH database, the self-classifications shall be verified, with the following information sources being accepted: i. Toxicological studies and hazard assessments by ECHA peer regulatory agencies, Member State regulatory bodies or Intergovernmental bodies; ii. A SDS fully completed in accordance with Annex II to Regulation (EC) No 1907/2006; iii. A documented expert judgment provided by a professional toxicologist. This shall be based on a review of scientific literature and existing testing data, where necessary supported by results from new testing carried out by independent laboratories using methods approved by ECHA; iv. An attestation, where appropriate based on expert judgment, issued by an accredited conformity assessment body that carries out hazard assessments according to the Globally Harmonized System (GHS) of the classification and labelling of chemicals.
(b) The product must not contain halogenated organic binding agents, azidirin and polyaziridins as well as pigments and additives based on: — lead, cadmium, chrome (VI), mercury and their compounds, — arsenic, boron and copper, — organic tin.	**3.i) Halogenated organic compounds** Halogenated organic compounds are not permitted in the substances used in the manufacture of floor coverings (eg as binders, flame retardants, adhesives, coatings, etc) Assessment and verification The applicant shall provide a declaration of non-use of halogenated organic compounds, if so supported by the manufacturer of the substances. In addition, **the respective SDS of substances shall be provided.**
2.2. Dangerous substances in the coating and surface treatments Generic requirements (a) The requirements of part 2.1 on dangerous substances for the raw wood and plant treatments shall also apply for coating and surface treatments. (b) Chemical substances classified as harmful for the environment by the chemical manufacturer/supplier in accordance with EU	**3. f) VOC content in surface treatment** Surface treatment chemicals used on wood, wood-based, cork, bamboo or plant-based materials shall either: - Have a total VOC content of less than 5% by weight (in-can substance concentration), or - Have a total VOC content greater than 5% by weight but be shown to be applied in quantities that amount to less than 2g/m2 of treated surface area

classification system (28th Amendment to Directive 67/548/EEC) shall comply with the two following limits: — chemical substances classified as harmful for the environment in accordance with the Directive 1999/45/EC must not be added to substances and preparations for surface treatment. Nevertheless the products may contain up to 5 % volatile organic compounds (VOC) as defined in Directive 1999/13/EC. If the product requires dilution, the contents of the diluted product must not exceed the abovementioned threshold values, — the applied quantity (wet paint/varnish) of environmentally harmful substances shall not exceed 14 g/m2 surface area and applied quantity (wet paint/varnish) of VOC shall not exceed 35 g/m2 . **Assessment and verification:** the applicant shall provide a declaration of compliance with this criterion, together with documents to support this declaration, including: — a complete recipe with designation of quantities and CAS numbers for constituent substances, — the test method and test results for all substances present in the product, according to the Directive 67/548/EEC, — a declaration stating that all constituent substances have been disclosed, — number of coats and quantity applied per coat per square metre of surface. The following standard degrees of effectiveness are used for the purpose of calculating the consumption of surface treatment product and of the applied quantity: spraying device without recycling 50 %, spraying device with recycling 70 %, electrostatic spraying 65 %, spraying, bell/disk 80 %, roller coating 95 %, blanket coating 95 %, vacuum coating 95 %, dipping 95 %, rinsing 95 %.	The criterion relates to the total VOC in the surface treatment products with the chemical composition they have in wet form. If the products require dilution, the calculation is to be based on the content in the dilutive product. ***Assessment and verification*** The applicant shall provide the SDS of any surface treatment substances used on wood, wood-based, cork, bamboo or/and plant-based materials. If the SDS states that the VOC content of the surface treatment products used is less than 5% by weight, then no further verification shall be necessary. Should the VOC content information not be included in the SDS, the VOC content should be calculated from the list of substances of the surface treatment chemicals. The concentration of each VOC ingredient should be stated as a percentage by weight. Confidential details from manufacturer/s in the form of content declarations/formulations can be sent directly to the respective Competent Body. Alternatively, if the VOC content is higher, then the applicant shall provide a calculation demonstrating that the effective quantity of VOC applied per m2 of the treated surface area of the floor covering is less than 2g/m2, in accordance with the guidance provided in Appendix I. This criterion does not apply to mixtures used for repairing the knots during the manufacturing process

(c) The content of free formaldehyde in products or preparations used in the panels shall not exceed 0,3 % by weight.
The content of free formaldehyde in binding agents, adhesives, and glues for plywood panels or laminated wood panels shall not exceed 0,5 % by weight.

Assessment and verification:
the applicant shall provide appropriate declarations verifying that the above requirements are respected. For the chemical products used in the production a SDS or equivalent documentation shall be presented containing information on health hazard classification.

Adhesives

(a) The requirements of part 2.1 on dangerous substances for the raw wood and plant treatments shall also apply for adhesives.

Assessment and verification:
the applicant shall provide appropriate declarations verifying that the above requirements are met. For each chemical product used in the assembly of the product, a SDS or equivalent documentation shall be presented containing information on health hazard classification. Test reports or a declaration from the supplier shall be provided for the free formaldehyde content.

(b) The VOC content of adhesives used in the assembly of the product shall not exceed 10 % by weight (w/w).

Assessment and verification:
a declaration shall be provided by the applicant indicating all adhesives used in the assembly the product, as well as the compliance with this criterion.

3. e) VOCs content in substances and mixture used (in-can concentrations) apart from those used for surface treatment

In-can adhesives and/or resins used in manufacturing of the floor coverings should have

- VOC content of less than 3% by weight,
- Free-formaldehyde* of less than 0.2% by weight.

Other substances apart from in-can adhesives and resins and surface treatment (criterion 3.f) used in manufacturing of the floor coverings should have VOC content less of than 1% by weight.

The criterion relates to the total VOC in the substances with the chemical composition they have in wet form. If the products require dilution prior to use, the calculation is to be based on the content in the diluted product.

This criterion does not apply to mixtures used for repairing the knots during the manufacturing process

Assessment and verification

The applicant shall provide the SDS of any in-can adhesive or resin or other substances used or an equivalent declaration of compliance with this requirement, together with a complete recipe with designation of quantities and CAS numbers.

If the SDS states that the VOC content is less than 3% by weight of the in-can adhesive or resin used or less than 1% by weight of other substances used, then no further verification shall be necessary. Should the VOC content information not be included in the SDS, the VOC content should be calculated from the list of substances. The concentration of each VOC ingredient should be stated as a percentage by weight. Confidential details from the manufacturers in the form of content declarations/formulations can be sent directly to the respective Competent Body.

The applicant shall provide test reports demonstrating that the free-formaldehyde content in the in-can adhesives and resins is less than 0.2% wt in accordance with prEN ISO 11402

*The content of free-formaldehyde in the resin and/or adhesive formulation shall be in accordance

Plasticisers The requirements of part 2.1 on dangerous substances for the raw wood and plant treatments shall also apply for any phthalates used in the manufacturing process. Additionally DNOP (di-n-octyl phthalate), DINP (di-isononyl phthalate), DIDP (di-isodecyl phthalate) are not permitted in the product. **Assessment and verification:** the applicant shall provide a declaration of compliance with this criterion.	**3.h) Plasticizers** Any plastic foils applied to panel surfaces shall not contain any phthalate plasticisers that are referred to in Article 57 of Regulation (EC) No 1907/2006. The absence of these phthalates shall be considered as the total sum of the listed phthalates amounting to less than 0.10% of the plastic foil weight (1000mg/kg) ***Assessment and verification*** The applicant shall provide either: i. A declaration from the panel supplier stating that plastic foils were not used, or ii. a declaration form the panel supplier stating that plastic foils were used and that none of the phthalate plasticisers with Article 57 hazard classifications have been used in the plastic foil. In the absence of a suitable declaration, plastic foil materials shall be tested for the presence of these phthalates according to ISO 14389 or ISO 8214-6 standard
Biocides Only biocidal products containing biocidal active substances included in Annex IA of Directive 98/8/EC, and authorised for use in floor coverings, shall be allowed for use. **Assessment and verification:** the applicant shall provide a declaration that the requirements of this criterion have been met along with a list of biocidal products used.	**3.b) Biocidal products** The treatment of wood, cork and/or bamboo of the floor coverings with preservatives shall not be permitted. Assessment and verification: The applicant shall provide a declaration of non-use of preservatives. The use of other biocidal products shall not be permitted. Active substances exclusively used for in-can preservation of water-based substances of mixtures such as adhesives or lacquers shall be exempt from this requirement. Assessment and verification The applicant shall either: - i. provide a declaration of non-use of biocidal products - ii. provide a declaration stating what active substances contained in biocidal products have been used in can water-based substances supported by SDS from the in-can water-based substances' suppliers.

3.d) Flame retardants

The use of flame retardants shall not be permitted

Assessment and verification
The applicant shall provide a declaration of non-use of flame retardants

3.g) Heavy metals in paints, primers and varnishes

Paints, primers and varnishes used on wood, wood-based, cork, bamboo or plant-based materials shall not contain substances based on cadmium, lead, chromium VI, mercury, arsenic or selenium at concentrations exceeding 0.010% by weight for each individual metal in the in-can paint, primer or varnish formulation.

Assessment and verification
The applicant shall provide a declaration of compliance with this criterion and provide the respective SDS from the suppliers of the paints, primers and varnished used.

3. PRODUCTION PROCESS

3.1. Energy consumption

The energy consumption shall be calculated as the process energy used for the production of the coverings.
The process energy, calculated as indicated in the Technical Appendix, shall exceed the following limits (P = scoringpoint):
Wood floor and bamboo coverings > 10,5
Laminate floor coverings > 12,5
Cork coverings > 9

Assessment and verification:
the applicant shall calculate the Energy consumption of the production
process according to the Technical Appendix instructions providing the related results and supporting documentation.

4. ENERGY CONSUMPTION IN THE PRODUCTION PROCESS

The average annual energy consumed for the production of the floor coverings shall be calculated as indicated in Table 4.1 and the Appendix II and shall exceed the following limits (E = scoring point):

- E > 11.0 for wood floorings (one single solid layer)
- E > 8.0 for multi-layer wood floorings, bamboo and cork floor coverings and laminate floor coverings

Table 4.1. Calculation of the scoring point

Formula		Environmental parameter		Maximum requirements
$E = \frac{A}{20} + \left(5\text{-}\frac{B}{3}\right) + \left(5\text{-}\frac{C}{7}\right)$	A	Proportion of renewable energy	%	--
	B	Electricity consumption	kWh/m^2	15 kWh/m^2
	C	Fuel consumption	kWh/m^2	35 kWh/m^2

Where

A= Proportion of renewable energy =

$$\frac{\text{Renewable fuels } \left(\frac{kWh}{m2}\right) + 1{,}25 \text{ non-fuel renewable energy } \left(\frac{kWh}{m2}\right)}{\text{non-renewable fuels } \left(\frac{kWh}{m2}\right) + \text{Renewable fuels } \left(\frac{kWh}{m2}\right) + 1{,}25 \text{ non-fuel renewable energy } \left(\frac{kWh}{m2}\right)} \text{ x } 100$$

B= Electricity consumption means the sum of the electricity purchased from an external supplier and the electricity produced on-site from non-combustible renewable energy sources. If the electricity purchase is green electricity a factor of 0.8 should be applied.

Green electricity should be demonstrated by the guarantees of origin in accordance with the Directive 2009/28/EC

C= Fuel consumption means the sum of all the fuels purchased or sourced as by-products in the manufacturing of the floorings and used to generate energy on-site

The following conditions shall be included in the calculations

- for solid wood floorings and bamboo floorings the electricity and fuel consumed in drying, grinding and sawing shall be included
- for cork and laminate floorings that may include a core board in their structure, the energy consumed in the manufacture of the board is to be included
- energy consumption in the manufacture of adhesives, lacquers or any other in-can preparation used in the manufacture of the flooring is not included in the calculation
- E scoring shall be calculated per m^2 of produced flooring and accounting the direct and indirect energy consumed in the production of the flooring (eg energy consumed in pressing, proportional energy consumed for heating and lighting of the facilities, etc)

Assessment and verification

The applicant should state and demonstrate:

- The type and quantity of electricity that has been, on average, purchased from an external supplier per year. Should green electricity be purchased, the guarantees of origin shall be provided.
- the type(s) of fuels and quantities that have been used in the manufacturing of the floor coverings by means of the contracts, bills or equivalent documentation that includes dates, quantity delivered/purchased and specifications of the fuel (eg physic-chemical properties, LHV, etc). Declaration of which of those used fuels are coming from renewable sources in accordance with Renewable Energy Directive 2009/80/EC shall be included.
- The type and quantity of energy that has been sold. The calculations should include the type and quantity of fuels, if any, used for generating the energy sold, the dates or periods of time in which it was generated and the selling dates.

	- A declaration of the quantity of flooring that applies for the EU Ecolabel (in m2) that has been, on average, annually produced. The documents used to communicate the energy consumption, fuel purchase and/or energy generation as well as the documents to communicate flooring production to the national authorities can be used to demonstrate compliance with this criterion.
3.2. Waste management The applicant shall provide an appropriate documentation on the procedures adopted for the recovery of the byproducts originated from the process. The applicant shall provide a report including the following information: — kind and quantity of waste recovered, — kind of disposal, — information about the reuse (internally or externally to the production process) of waste and secondary materials in the production of new products. **Assessment and verification** the applicant shall provide appropriate documentation based on, for example, mass balance sheets and/or environmental reporting systems showing the rates of recovery achieved whether externally or internally, for example, by means of recycling, reuse or reclamation/regeneration.	
4. USE PHASE **4.1. Release of dangerous substances** The release of formaldehyde from the panels of cork, bamboo or wood fibres constituting the covering shall not exceed 0,05 mg/m 3 . **Assessment and verification:** the applicant shall provide appropriate documentation based on test following the chamber method according to EN 717-1 method.	**5. FORMALDEHYDE EMISSIONS FROM THE FLOOR COVERING** The floor covering manufactured by using formaldehyde-based adhesives or resins and/or formaldehyde-based finishing agents shall either: - have formaldehyde emissions that are lower than 50% of the threshold value allowing them to be classified as E1 (0.067mg/m^3 or 4mg/100g dry mass). - have formaldehyde emissions that are lower than 65% of the E1 threshold limit (0.08mg/m^3 or 5mg/100g dry mass) in case of having Medium Density Fibreboard (MDF) panels, - have formaldehyde emissions that are lower than the limits set out in the CARB Phase II or - have formaldehyde emissions that are lower than the limits set out in the Japanese F-3 star or F-4 star standards.

Assessment and verification:

The applicant shall provide a declaration of compliance with this criterion. The assessment and verification of low formaldehyde emission floor coverings shall vary depending on the certification scheme it falls under. The verification documentation required for each scheme is described in Table 5.1.

Table 5.1. Assessment and verification of low formaldehyde emission floor coverings

Certification scheme	Assessment and verification
E1 (as defined in Annex B of EN 13986)	A declaration from the manufacturer, stating that the floor covering is compliant with 50% of E1 emission limits or, in the case of floor coverings made of MDF panels, with 65% of E1 emission limits, supported by test reports carried out according to either EN 717-1, EN 717-2 or EN 120 or an equivalent method
CARB – Califonia Air Resources board: Phase II limits	A declaration from the manufacturer, supported by third party verified test results according to ASTM E1333 or ASTM D6007, demonstrating floor covering compliance with the formaldehyde Phase II emission limits defined in the California Composite Wood Products Regulation 93120. Optionally, the floor covering may be labelled in accordance with Section 93120.3(e), containing details in respect of the manufacturer's name, the product lot number or batch produced, and the CARB assigned number for the third party certifier (this part is not required if the products were made using no-added formaldehyde or certain ultra-low emitting formaldehyde-based resins).
F-3 or 4 star limtis	A declaration from the manufacturer of compliance with the formaldehyde emission limits as per JIS A 5905 (for fibreboard) or JIS A 5908:2003 (for particleboard and plywood), supported by third party verified test data according to the JIS A 1460 desicator method.

The declarations shall be accompanied by the analysis reports including which testing method/standard was used, measurement results and measurement frequency.

Volatile organic compounds (VOC)
The finished products must not exceed the following emission values:
Substance
Requirement (after 3 days)
Total organic compounds within the retention range C6 — C16 (TVOC) 0,25 mg/m 3 air
Total organic compounds within the retention range > C16 — C22 (TSVOC) 0,03 mg/m 3 air
Total VOC without LCI (*)
0,05 mg/m 3 air
Assessment and verification: the applicant shall present a test certificate according to emission tests prEN 15052 or EN ISO 16000-9.

6. VOCS EMISSIONS FROM THE FLOOR COVERING

The laminate, cork and bamboo floor coverings shall not exceed the emission values listed in Table 6.1 and the wood floor coverings shall not exceed the emission values listed in Table 6.2 measured in a test chamber in accordance with CEN/TS16516

Table 6.1. Emission requirements for laminate, cork and bamboo floor coverings

Compound or substance	Limit Value after 28 days storage in a ventilated test chamber (see CEN/TS16516) in mg/m^3 air[d]
Total VOC[a]	< 0.3
Total SVOC[b]	< 0.1
R-value for LCI substances[c]	≤1

Table 6.2. Emission requirements for wooden floor coverings

Compound or substance	Limit Value after 28 days storage in a ventilated test chamber (see CEN/TS16516) in mg/m^3 air[d]
Total VOC[a] – [acetic acid] (CAS 64-19-7)[e]	< 0.3
Total SVOC[b]	< 0.1
R-value for LCI substances[c]	≤1

[a] TVOC: total volatile organic compounds, defined as those compounds within the retention range of n-C_6 to n-C_{16} (inclusive).
[b] TSVOC: total volatile organic compounds, defined as those compounds within the retention range of >n-C_{16} to n-C_{22} (inclusive)
[c] R value is the sum of all Ri values where Ri value is the ratio Ci / LCIi, where Ci is the chamber mass concentration of compound i, and LCIi is the LCI value of compound i defined under the European Collaborative Action "urban air", indoor environment and human exposure
[d] The chamber test has to be carried out 28 days after the conclusion of the surface treatment. Up to this point in time the product to be tested is stored in a sealed package at the production site and thus delivered to the test laboratory
[e] emissions of acetic acid from the natural wood the floor covering is made of and measured in accordance with CEN/TS 16516 (same conditions as the tests for the finished product)

Assessment and verification

The applicant shall provide a declaration of compliance supported by the test reports from chamber tests carried out in accordance with CEN/TS16516 or equivalent method showing that the limits above have been met.
Test reports showing that the limits in the Table 6.1 or Table 6.2 are met shall include:

	- which test method was used, - test results for laminate floorings, cork and bamboo floorings and those floor coverings that comply with Table 6.1. For wooden floor coverings complying with Table 6.2, test results of the untreated and treated wooden floor coverings together with the needed calculations to demonstrate compliance should be provided. If the chamber concentration limits specified at 28 days can be met 3 days after placing the sample in the chamber, or any other time period between 3 and 27 days after placing the sample in the chamber, then the compliance with the requirements can be declared and the test may be stopped prematurely. Test data from up to 12 months prior to the EU Ecolabel application shall be valid for products so long as no changes to the manufacturing process or chemical formulations used have been made that would be considered to increase VOC emissions form the final product. A valid certificate from relevant indoor climate labels can also be used as proof of compliance if the indoor climate label fulfils the requirements of this criterion and if it is judge by the competent body to be equivalent
PACKAGING Packaging must be made out of one of the following: — easily recyclable material, — materials taken from renewable resources, — materials intended to be reusable. **Assessment and verification:** a description of the product packaging shall be provided on application, together with a corresponding declaration of compliance with this criterion.	
FITNESS FOR USE The product shall be fit for use. This evidence may include data from appropriate ISO, CEN or equivalent testmethods, such as national procedures. **Assessment and verification:** details of the test procedures and results shall be provided, together with adeclaration that the product is fit for use based on all other information about the best application by the end-user. According to Directive 89/106/EEC (1) a product is presumed to be fit for use if it conforms to a harmonisedstandard, a European	**7. FITNESS FOR USE** Only the requirements associated with the specific type of flooring have to be fulfilled. Floor coverings shall achieve at least: - the level of use of class 22 (alternatively WR1) for floor coverings intended for private use - the level of use of class 32 (alternatively WR2) for floor coverings intended for commercial use. The floor coverings should be tested and classified in accordance with the latest versions of the standards and indications included in Table 7.1 **Table 7.1. Standards for testing and classifying the floor coverings**

technical approval or a non-harmonised technical specification recognised at Community level.
The EC conformity mark 'CE' for construction products provides producers with an attestation of conformity easilyrecognisable and may be considered as sufficient in this context.

Flooring	Test method	Classification
Laminate flooring	EN 13329 EN 14978 EN 15468	EN ISO 10874 Cork flooring classification properties EN 14085
Cork tile	EN 12104	
Cork flooring	??	
Bamboo	EN 14354 for resistance to abrasion and impact resistance	
Factory lacquer wood floorings	EN 13696 for wear resistance	EN 14354, Wear resistance in appendix D3.7
Multilayer wood floorings		
Factory oiled, untreated wood and untreated multilayer wood flooring	EN 13696 annex A	EN 14354
	Accompanying a recommendation for floor care to ensure that the durability of the floor will be maintained.	

The wear resistance of floor coverings other than those mentioned above shall be tested according to test methods selected by an independent test institute specialized in wear tests for flooring. The test methods shall be selected taking into account the intended use area of the flooring.

Assessment and verification

The applicant shall provide a declaration stating which (if any) standards applied to the product and provide a declaration of compliance with this criterion. Declaration shall be supported by test reports that shall include: the type of flooring, the test method/s selected, the test results and the classification of the flooring according to the results and the appropriate standard.
If the floor covering has been tested according to a test method other than what is specified above, this may be acceptable if the test methods are comparable in the opinion of an independent third party

8. REPARABILITY AND EXTENDED GUARANTEE

For the purpose of undertaking repair and replacement of worn out parts, the floor covering shall meet the following requirements:

- Reparability:

a) *Design for repair and repair manual*: For floor coverings that are not glued down, the flooring shall be designed for disassembly with a view to facilitating repair, reuse and recycling. Simple and illustrated instructions regarding the disassembly and replacement of damaged elements shall be provided. Disassembly and replacement operations shall be capable of being carried out using common and basic manual tools.

b) *Repair Service / Information*: Information should be included in the consumer instructions or the manufacturer's website to let the user know how to obtain professional repairs,

	including contact details as appropriate c) Advice *on provision of spare parts*: Information/recommendation to the end-users of keeping spare panels in stock for possible event of repair shall be provided - Extended *product guarantee;* *a) The* applicant shall provide at no additional cost a minimum of a five year guarantee effective from the date of delivery of the product. This guarantee shall be provided without prejudice to the legal obligations of the manufacturer and seller under national law. Assessment and verification The applicant shall provide a declaration of compliance supported by: i. A copy of the repair manual or the consumer instructions or any other material where the information on design for repair, repair services/information and advice on provision of spare parts is provided. ii. A copy of the guarantee that indicates the terms and conditions of the extended product guarantee that are provided in consumer information documentation and that meet the minimum requirements set out in this criterion
CONSUMER INFORMATION The product shall be sold with relevant user information, which provides advice on the product's proper and best general and technical use as well as its maintenance. It shall bear the following information on the packaging and/or on documentation accompanying the product: (a) information that the product has been awarded the EU Ecolabel together with a brief yet specific explanation as to what this means in addition to the general information provided by box 2 of the logo; (b) recommendations for the use and maintenance of the product. This information should highlight all relevant instructions particularly referring to the maintenance and use of products. As appropriate, reference should be made to the features of the product's use under difficult conditions, for example, water absorption, stain	**9. CONSUMER INFORMATION** The product shall be sold with the relevant consumer information on the packaging and/or any other documentation accompanying the product. Only the requirements associated with the specific type of flooring have to be fulfilled. Instructions should be legible and be provided in the language of the country where the product is placed on the market or include graphical representation or icons and related to the following aspects: j) **Recommendations for the installation**, including all relevant instructions referring to the best environmental installation practices - *floating installation* is recommended whenever possible as it is easier, quicker and environmentally-friendly in respect to the end-of-life phase. If floating installation is recommended, reference should be made to the necessary preparation of the underlaying surface and the auxiliary materials needed. - if *glued down installation* is recommended due to the possible longer duration, recommendation of using an adhesive/glue certified with a Type I Ecolabel or a low emission adhesive complying with EMICODE EC1 or equivalent should be included

resistance, resistance to chemicals, necessary preparation of the underlying surface, cleaning instructions and recommended types of cleaning agents and cleaning intervals. The information should also include any possible indication on the product's potential life expectancy in technical terms, either as an average or as a range value; (c) an indication of the route of recycling or disposal (explanation in order to give the consumer information about the high possible performance of such a product); (d) information on the EU Ecolabel and its related product groups, including the following text (or equivalent): 'for more information visit the EU Ecolabel website: http://ec.europa.eu/environment/ecolabel/'. **Assessment and verification:** the applicant shall provide a sample of the packaging and/or texts enclosed.	-well illustrated assembly and disassembly instructions as per the requirements of criterion 8 (if applicable) **k) Recommendations for the use, cleaning and maintenance of the product.** - relevant information for routine cleaning including a mention of the most recommended cleaning products. If possible, cleaning products with a Type I ecolabel should be recommended. - relevant information for maintenance instructions, including maintenance products, and products for occasional renovation or intensive cleaning. If possible, maintenance products with a Type I ecolabel should be recommended. - a clear statement of the flooring's areas of use and a statement of compliance with the relevant EN standards for the product as referred to in criterion 7 **l) Recommendation for the surface treatment for unfinished floor coverings and floorings needing an oiled surface.** - relevant information about the type and quantity of the surface treatment products needed (eg oil or lacquer) to achieve the intended durability. - relevant information about the finish the floorings with low emitting finishes in accordance with the Directive 2004/42/EC (Paint Directive) - information should be included about how the service life of the flooring can be extended through renovation e.g. sanding and surface treatment. **m) Information related to the reparability:** - relevant information regarding the terms and conditions of the product guarantee as per the requirements of criterion 8 - relevant company contact information and/or any other relevant parties regarding repair or replacement services as per the requirements of criterion 8 - a clear statement recommending the provision of spare parts. n) A detail description of the best ways to dispose of the product (i.e. reuse, recycling, energy recovery, etc) shall be given to the consumer, ranking them according to the impact on the environment. ***Assessment and verification:*** The applicant shall provide a copy of the consumer information document that is to be provided with the product that shows compliance with each of the points listed in the criterion, as appropriate

INFORMATION APPEARING ON THE ECOLABEL Box 2 of the Ecolabel shall contain the following text: — sustainable managed forests and reduced impact on habitats, — hazardous substance restricted, — production process energy saving, — lower risk to health in the living environment.	**10. INFORMATION APPEARING ON THE ECOLABEL** The logo should be visible and legible. The EU Ecolabel registration/licence number must appear on the product and must be legible and clearly visible. The subgroup to which the product belongs (engineered wood, solid wood, laminate, cork or bamboo flooring) and if a surface treatment is still needed at user's place should be stated The optional label with text box shall contain the following text: - Limited hazardous substances used, - Low-emitting product (50% or 65% E1) - Lower energy consumption for manufacturing ***Assessment and verification:*** The applicant shall provide a copy of the information showing compliance with this criterion.

[ii] http://susproc.jrc.ec.europa.eu/wooden_floor_coverings/documents.html
[ii] Trade name means all names under which the substance is marketed within the Community market.
[iii] derogation provided for those with preservative functions in in-can chemical products
[iv] Transportation significantly scores only in the case of bamboo flooring due to the long distances. International oversees transportation can amount for the second largest environmental impact of the product although it depends on the sources of the raw materials and the environmental profile of the flooring. Local transportation, however, scores similarly to other floorings and depends on the distances, type of transportation (trucks, rail, etc) and their energy efficiency (eg Euro 5).
[v] Chemical Abstract Service index number. It is a unique numeric identifier, designates only one substance, has no chemical significance, is a link to a wealth of information about a specific chemical substance.
[vi] VOC means 'any organic compound having an initial boiling point less than or equal to 250C measured at a standard pressure of 101.3kPa' or alternatively as 'any organic compound having a vapour pressure equal or higher than 0.01kPa at 20C'. Both definitions are very close
[vii] Classification of the ingredients is not fully harmonized at European level and it still largely relies on self-declarations
[viii] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, L 140/16, OJEU 5.6.2009
[ix] Manufacture of the floor covering included energy used in the production line as well as other auxiliaries (eg lighting, heating, energy consumed in offices, etc)
[x] There values are reported by the Energy Efficiency Directive 2012/27/EC, Chapter IV, "Energy content of selected fuels for end users". Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC,L 315/1, OJEU 14.11.2012
[xi] Background report of the Nordic Ecolabelling criteria for Floor coverings version 6, available at: http://joutsenmerkki.fi/wp-content/uploads/2014/05/Floor-coverings-background-version-6.0.pdf
[xii] E1 is a threshold emission limit originally introduced in 1985 in the EU due to concerns over adverse health effects due to formaldehyde exposure. The emission limits are defined in Chapter B of EN 13986 and correspond to steady state background levels of 0.1ppm formaldehyde after 28d in a chamber test according to EN 717-1.
[xiii] The requirements apply to floor coverings with a moisture content of H=6.5%
[xiv] Regulation 93120 "Airborne toxic control measure to reduce formaldehyde emissions from composite wood products" California Code of Regulations.
[xv] Floorings intended for private use shall achieve class WR1 and flooring intended for commercial use shall achieve WR2
[xvi] To understand and clearly differentiate the following definitions and botanic facts have to be taken into consideration:
- wood: lignocellulosic substance between the pith and bark of a tree or a shrub [Source: ISO 24294:2013]
- biological view: Dicotyledones or dicots are characterized by cotyledons (seeds with two embryonic leaves) and produce
- wood by the activity of the cambium. For the dicots it is the cambium as secondary meristem which is responsible for the
- growth of thickness. Intervascular and vascular cambium together form the lateral meristem between the xylem and phloem. By that wood is built up inwards as secondary xylem.
- lignified material other than wood: lignocellulosic material deriving from bark of a tree or shrub or from monocotyledonous plants which due to the lack of a growth layer (cambium) are not able to form wood, e.g. bamboo, rattan.

- biological view: Monocotyledonous or monocots do not have a cambium and do not produce wood. Lignified materials may presume a tree-like character by their lignified straws by enclosuring lignin in the cell walls and by growing tall. Hereby the growth is determined by the primary apical meristem. The diameter of the stems corresponds to the diameter of the shoot, it becomes hardly thicker. Because of the dissimilarities in the characteristics compared to wood, e.g. mechanical performance, resistance to fungi and insects, deliquescence, and lots more, differences in manufacturing of products from lignified materials other than wood result as well as in their treatment and processability.
- cork: protective layer of the cork oak tree (Quercus Suber L), which can be periodically removed from its trunk and branches to provide the raw material for cork products [Source: ISO 9229:2007]
- biological view: Cork develops from the cork cambium, the phellogen outward and is characteristic of the secondary phloem, the inner part of the bark.

[xvii] According to the Commission Decision of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste: waste from wood preservatives, wastes from inorganic chemical processes, wastes from organic chemical processes, wastes from the manufacture, formulation supply and use of coating paints (paints, varnishes and vitreous enamels), adhesives, sealants, have to be treated as hazardous waste.

[xviii] We are very concerned that the JRC suggestion to reduce the content of wood is *likely to degrade the environmental profile of the EU Ecolabel products.* If the scope lowers to 80% or 75% the content of wood, we strongly recommend to the JRC investigating further and coming up with stringent criteria on dangerous substances and waste treatment.

[xix] TH Yang, TH Yang, WC Chao, SY Leu, Characterization of the property changes of extruded wood-plastic composites during year round subtropical weathering, Construction and building materials 83 (2015) 159-168

[xx] SG Jeong, J Jeon, J Seo, JH Lee, S Kim, Performance evaluation of the microencapsulated PCM for wood-based flooring application, Energy conversion and management 64 (2012) 516-521

[xxi] www.thehybridfloors.com

[xxii] OJ L 295, 12.11.2010, p. 23. Regulation (EU) No 995/2010 Laying down the obligations of operators who place timber and timber products on the market (EU Timber Regulation; EUTR)

[xxiii] http://icta.uab.cat/ecotech/jornada/ISIE2014/ISIE14_cork.pdf

[xxiv] Sierra-Perez et. al., Production and trade analysis in the Iberian cork sector: Economic characterization of a forest industry, 2015. Resources, Conservation and Recycling, Vol. 98 p.55-66. Feedback from PEFC Espana.

[xxv] Environmental assessment of the cork industrial sector in Catalonia, Part III, http://www.tdx.cat/bitstream/handle/10803/51440/jrb1de1.pdf?sequence=1

[xxvi] 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 (OJ L 136, 29.05.2007, p.3).

[xxvii] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (OJ L 353, 31.12.2008, p.1).

[xxviii] ECHA, Candidate List of Substances of Very High concern for Authorization http://www.echa.europa.eu/candidate-list-table

[xxix] e.g. if the wooden core panel is directly bought and not manufactured by the applicant

[xxx] CAS, https://www.cas.org/content/chemical-substances/faqs

[xxxi] EC, http://en.wikipedia.org/wiki/European_Community_number

[xxxii] ECHA, REACH registered substances database: http://www. Echa.europa.eu/information-on-chemcials/registered-substances

[xxxiii] ECHA, Co-operation with peer regulatory agencies, http://echa.europa.eu/en/about0us/partners-and-networks/international-cooperation/cooperation-with-peer-regulatory-agencies

[xxxiv] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, L 140/16, OJEU 5.6.2009

[xxxv] There values are reported by the Energy Efficiency Directive 2012/27/EC, Chapter IV, "Energy content of selected fuels for end users". Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC,L 315/1, OJEU 14.11.2012

[xxxvi] A. Stoffregern, O. Schulle, Primary Energy demand of renewable energy carriers – part 1: definitions, accounting methods and their applications with a focus on electricity and heat from renewable energies, April 2014, commissioned by the European Copper institute, Pe international AG

[xxxvii] A. Stoffregern, O. Schulle, Primary Energy demand of renewable energy carriers – part 1: definitions, accounting methods and their applications with a focus on electricity and heat from renewable energies, April 2014, commissioned by the European Copper institute, Pe international AG

[xxxviii] Melissa Christenberry Lott, Quantifying the Economic and Environmental Tradeoffs of Electricity Mixes in Texas, Including Energy Efficiency Potential Using the Rosenfeld Effect as a Basis for Evaluation, Thesis Presented The University of Texas at Austin December 2010
http://www.webberenergygroup.com/publications/quantifying-the-economic-and-environmental-tradeoffs-of-electricity-mixes-in-texas-including-energy-efficiency-potential-using-the-rosenfeld-effect-as-a-basis-for-evaluation/

[xxxix] http://www.erfmi.com/calculator.php ERFMI is the European resilient flooring manufacturer institute association that performs the following activities: 1. obtaining and disseminating to members such relevant information about the resilient flooring industry as may be considered desirable; 2. represents the industry in negotiations with government departments, public bodies, trade associations, NGO and similar bodies in the European market 3. promoting the preparation of international standards, specifications and classification systems and their adoption; 4. promoting any activities that further the interests of the resilient flooring industry.

[xl] E1 is a threshold emission limit originally introduced in 1985 in the EU due to concerns over adverse health effects due to formaldehyde exposure. The emission limits are defined in Chapter B of EN 13986 and correspond to steady state background levels of 0.1ppm formaldehyde after 28d in a chamber test according to EN 717-1.

[xli] Regulation 93120 "Airborne toxic control measure to reduce formaldehyde emissions from composite wood products" California Code of Regulations.

[xlii] Cytotoxicity and genotoxicity in human lung epithelial A549 cells caused by airborne volatile organic compounds emitted from pine wood and oriented strand boards – (Richard Gminski, Tao Tang, Volker Mersch-Sundermann – 2009) & Chemosensory irritations and pulmonary effects of acute exposure to emissions from oriented strand board – (Richard Gminski, Rainer Marutzky, Sebastian Kevekordes, Frank Fuhrmann, Werner Burger, Dieter Hauschke, Winfried Ebner, and Volker Mersch-Sundermann – 2010).

[xliii]

http://www.google.be/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0CCwQFjAC&url=http%3A%2F%2Fhealth.belgium.be%2Finternet2Prd%2Fgroups%2Fpublic%2F%40public%2F%40mixednews%2Fdocuments%2Fie2law%2F19099823_de.pdf&ei=NChnVYa1FcWBU5HhgPgJ&usg=AFQjCNEkbShrmsNmz-G_swB2LmX7D-AfZw&bvm=bv.93990622,d.d24&cad=rja