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Revision of EU Ecolabel criteria for furniture products

Final Technical Report

Shane Donatello, Hans Moons and
Oliver Wolf (JRC).

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Contact information

Name: Shane Donatello
Address: Edificio Expo, c/ Inca Garcilaso, 3, Sevilla, 41092 (Spain)
Email: JRC-IPTS-FURNITURE@ec.europa.eu
Tel.: +34 954 488 318
Web: <http://susproc.jrc.ec.europa.eu/furniture/>

JRC Science Hub

<https://ec.europa.eu/jrc>

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Abstract

The technical and ecological criteria for EU Ecolabel furniture are presented together with supporting rationale and relevant stakeholder discussion. The scope for furniture products has been significantly expanded to now include non-wooden furniture. New criteria have been developed for wood, cork, bamboo, rattan, plastics, metals, textiles, leather, coated fabrics, polyurethane foams, latex foams and glass. Restrictions have also been introduced for the use of hazardous substances and mixtures during production processes. Emissions of formaldehyde and other VOCs are restricted by certain criteria where relevant to the furniture product. Criteria relating to the final furniture product have been set to ensure that products are easier to repair and dismantle into constituent materials at end-of-life.

Contents

EXECUTIVE SUMMARY	3
1. INTRODUCTION	5
1.1 Methodology and sources of information	5
1.2 Summary of key outputs from preliminary report and EU Ecolabel criteria revision process	6
1.2.1 Scope and definition	6
1.2.2 Legislation and European standards relevant to furniture.....	7
1.2.3 Market analysis	8
1.2.4 Main environmental impacts of furniture.....	9
1.3 Linking environmental hotspots to EU Ecolabel criteria	10
1.4 Proposed framework of revised EU Ecolabel criteria and main changes.....	10
1.4.1 Product Description	12
1.4.2 General hazardous substance requirements	12
1.4.3 Wood	12
1.4.4 Final product.....	13
1.4.5 Consumer information and information on Ecolabel.....	13
2. CRITERIA PROPOSAL.....	14
Criterion 1: Product description	14
Criterion 2: General hazardous substance requirements	15
2.1 Restriction of SVHCs.....	15
2.2. Restriction of CLP classified substances and mixtures used in the furniture product	16
Criterion 3: Wood, cork, bamboo and rattan	26
3.1 Sustainable wood, cork, bamboo and rattan	26
3.2 Restricted substances	31
3.3 Formaldehyde emissions from wood-based panels.....	37
Criterion 4: Plastics.....	41
4.1 Marking of plastic component parts	42
4.2 Restricted substances	44
4.3 Recycled plastic content.....	47
Criterion 5: Metals	49
5.1 Electroplating restrictions	49
5.2 Heavy metals in paints, primers and varnishes	50
5.3 VOC content in paints, primers and varnishes	50
Criterion 6. Upholstery covering materials	52
6.1 Physical quality requirements	52
6.2 Chemical testing requirements.....	53

6.3 Restrictions during production processes	57
6.4 Cotton and other natural cellulosic seed fibres	64
6.5 PVC-based coated fabrics	69
Criterion 7. Upholstery padding materials	70
7.1. Latex foam	70
7.2 Polyurethane (PUR) foam	73
7.3. Other padding materials.....	77
Criterion 8. Glass – use of heavy metals.....	78
Criterion 9. Final product requirements	80
9.1. Fitness for use	80
9.2. Extended product guarantee.....	81
9.3. Provision of spare parts	82
9.4. Design for disassembly	82
9.5. VOC emissions.....	83
Criterion 10. Consumer information	88
Criterion 11. Information appearing on the EU Ecolabel	91
3. TABLE OF COMMENTS (after June 2015 EUEB meeting)	92
CONCLUSIONS	100
REFERENCES	101
List of definitions	103
List of figures	105
List of tables	106
APPENDIX I: List of FSC & PEFC principles and criteria	107
APPENDIX II: Guidance for calculating VOCs used in surface coating applications	116
APPENDIX III: EN 13336 requirements for furniture leather	117
APPENDIX IV: Prohibited arylamine compounds in final leather, textile and coated fabric materials.....	118
APPENDIX V: Furniture product fitness for use standards.....	120

EXECUTIVE SUMMARY

Policy context

The environmental impacts of products throughout their lifecycle are highly variable from one product group to another and even within a particular product group itself. It is extremely challenging to address or influence all the life cycle stages of different product groups with a single policy tool. For this reason, the Commission has developed an Integrated Product Policy (IPP) which comprises a number of different policy instruments address the life cycle impacts of products from different angles.

As part of the Commission's IPP, the EU Ecolabel ([Regulation \(EC\) No 66/2010](#)) is a voluntary tool led by DG JRC on behalf of DG Environment of the European Commission. Other policy tools relevant to IPP include Green Public Procurement ([COM 2008/400](#)), Energy Labelling (Directive 2010/30/EU), Ecodesign for energy-related products ([Directive 2009/125/EC](#)), End-of-Waste criteria ([related to the Waste Framework Directive 2008/98/EC](#)) and the Industrial Emissions Directive ([Directive 2010/75/EU](#)).

The revision of EU Ecolabel Criteria for all product groups is carried out on a periodic basis, prioritising product groups where criteria may have become outdated or are influenced by external factors such as innovation by industry, market changes and new minimum legal, technical or environmental requirements.

A close relationship between EU Ecolabel criteria and EU Green Public Procurement criteria is desirable so that both policy tools can mutually support each other in order to increase awareness and market uptake of the EU Ecolabel.

Main findings

The expansion of the product scope to no longer set minimum or maximum limits for certain materials in furniture products greatly increases the number of potentially relevant products.

Criteria are predominantly focussed on the materials used in furniture products, given that this is the predominant source of life cycle impacts. Specific criteria for the most relevant materials used in furniture have been developed. These extend to solid wood and wood-based panels, cork, rattan, plastics, metals, leather, textile fabrics, coated fabrics, polyurethane foam, latex foam and glass. Other materials are permitted in the product group for which no criteria have been developed (e.g. rubber or ceramics) so long as these do not amount to more than 5% of the product weight and also respect the general hazardous substance requirements set out in criterion 2.

A strong focus on hazardous substances stems directly from the requirements of the EU Ecolabel Regulation and an ambitious yet pragmatic approach is set out to restrict the use of hazardous substances and mixtures during the production stage instead of applying the restriction only at the final product level. This approach will require potential applicants and their suppliers to communicate clearly and to be fully aware of the requirements of REACH and CLP Regulations and to minimise or avoid the use of hazardous chemicals during the production stage.

VOC emissions from furniture products are a particular concern for end users of indoor furniture. In order to avoid expensive mandatory tests, a flexible approach has been provided to ensure that emissions are minimised, either via the use of low VOC concentration coatings, the use of limited quantities of VOC-containing coatings or the testing of the final product / main sources of VOC emissions in the final product. Emissions of formaldehyde, a Category 1B carcinogenic VOC, from wood-based panels are addressed by a specific criterion which sets stringent limits which are generally twice as low as the existing E1 standard that European Industry works to.

Significant additional work has been carried out on upholstery materials (leather, textile fabrics, coated fabrics, polyurethane foam and latex foam) as part of the product group expansion. Particular emphasis has been placed on residual hazardous chemicals in these upholstery materials due to the high potential for prolonged skin contact with users.

The EU Ecolabel criteria encourage the production of durable products that are fit for purpose and easy to repair in order to maximise their useful lifetime. At End-of-Life, the products will be easy to dismantle into separate material streams to maximise recycling potential. These two features, design for repair and design for disassembly, help ensure that EU Ecolabel furniture products embrace Circular Economy principles and respect the waste hierarchy.

Related and future JRC work

The EU Ecolabel criteria for furniture are closely related to several other EU Ecolabel product groups such as Textiles (see Commission Decision [2014/350/EU](#)), Bed Mattresses (see Commission Decision [2014/391/EU](#)) and Footwear (see Commission Decision (EU) [2016/1349](#)).

The criteria set out in this Technical Report have been officially published in Commission Decision (EU) [2016/1332](#) and will help inform future EU Green Public Procurement criteria, in terms of both relevant criteria and ambition levels.

Quick guide

This report presents each of the final ecological criteria that have been proposed for meeting the requirements of the EU Ecolabel for the product group "Furniture". The text for each criterion is presented together with text explaining how the criterion should be assessed and verified by Competent Bodies. This same text (criterion and assessment and verification) has also been officially published in Decision (EU) [2016/1332](#). Information about the finer details of assessment and verification processes can be found in the User Manual (Parts A-E) for Furniture which has been published on the [DG Environment website](#). The main added value of this technical report is that it provides a technical background for each criterion, together with any relevant summaries of stakeholder discussions that took place as part of a supporting rationale to justify each of the criteria presented.

1. INTRODUCTION

1.1 Methodology and sources of information

The EU Ecolabel criteria for wooden furniture have been revised during the period from October 2013 to January 2016. During this period, an initial scoping document, a Preliminary Report and various versions of Technical Reports have been published. The main tasks covered by the Preliminary Report involve:

- Setting the product group definition and scope,
- Carrying out a market analysis,
- Screening of relevant LCA literature in order to identify the environmental hot-spots of furniture products and
- Conducting a technical analysis that aims to identify improvement potentials of furniture products from an environmental perspective.

During the development of the EU Ecolabel criteria, a continuous and broad consultation was carried out with experts and stakeholders representing manufacturers, intermediaries, consumer organizations, NGO's and Member States. Proposed criteria, together with supporting rationale that considers technical, legal and policy frameworks and market realities were presented in various versions of Technical Reports, which evolved together with stakeholder input into the revision process. Two technical working groups were held (October 2013 and May 2014) and key issues that were flagged up were also presented to EUEB meetings for discussion at the political level. All stakeholder feedback was captured via anonymised minutes for the technical group and EUEB meetings and via specific feedback from registered stakeholders uploaded to the [BATIS platform](#).

The expansion of the product scope to include non-wood based materials has resulted in significant changes to the previous EU Ecolabel criteria for Wooden Furniture published in Decision 2009/894/EC. Criteria for plastics, metals, glass and upholstery materials have also been included as well as fitness for use and VOC emission criteria.

This final Technical Report aims provides the final agreed legal text that was positively voted in January 2016 by the Regulatory Committee and established in Decision (EU) [2016/1332](#), together with supporting rationale for the proposals and any relevant additional information.

1.2 Summary of key outputs from preliminary report and EU Ecolabel criteria revision process

1.2.1 Scope and definition

From the very beginning of the revision process, stakeholders generally agreed on the extension of the scope to other materials and wanted to see the maximum limits for non-wood based materials removed and the minimum limit of 90% for wood/wood-based materials removed. After later consultation and further discussion, this resulted in the Product Group name changing from "Wooden furniture" to "Furniture" and the following text being agreed in the right hand column of Table 1.

Table 1. Comparison of new and previous furniture product scopes and definitions

Previous scope and definition in Decision 2009/894/EC	New scope and definition in Decision (EU) 2016/1332
<p>The product group 'wooden furniture' shall comprise free-standing or built-in units, which are used for storing, hanging, lying, sitting, working and eating of domestic furniture, whether for indoor or outdoor use, or used indoors for business purposes. Business purposes shall include office and school furniture as well as furniture for restaurants and hotels.</p> <p>The following conditions shall be fulfilled:</p> <p>(a) The product shall be made of at least 90 % w/w solid wood or wood-based materials. Glass, if easily replaceable in case of damage or breakage, may be excluded from the weight calculation as may technical equipment and fittings.</p> <p>(b) The weight of any individual material, other than solid wood and wood-based materials, shall not exceed 3 % of the total weight of the product. The total combined weight of such materials shall not exceed 10 % of the total weight of the product.</p>	<p>The product group "furniture" shall comprise free-standing or built-in units whose primary function is to be used for the storage, placement or hanging of items and/or to provide surfaces where users can rest, sit, eat, study or work, whether for indoor or outdoor use. The scope extends to domestic furniture and contract furniture items for use in domestic or non-domestic environments. Bed frames, legs, bases and headboards are included in the scope.</p> <p>The product group shall not comprise the following products:</p> <p>(a) Bed mattresses, which are covered by the criteria set out in Commission Decision 2014/391/EU,</p> <p>(b) Products whose primary function is not to be used as per paragraph 1, including streetlights, railings and fences, ladders, clocks, playground equipment, stand-alone or wall-hung mirrors, electrical conduits, road bollards and building products such as steps, doors, windows, floor coverings and cladding.</p> <p>(c) Second-hand, refinished, refurbished or remanufactured furniture products.</p> <p>(d) Furniture fitted in vehicles used for public or private transit.</p> <p>(e) Furniture products which consist of more than 5% (weight by weight) of materials not included in the following list: solid wood, wood-based panels, cork, bamboo, rattan, plastics, metals, leather, coated fabrics, textiles, glass and padding/filling materials.</p>

A very low uptake of the EU Ecolabel for Wooden Furniture was achieved when the revision process began. As of 2013, only two furniture companies held licenses (1 in Poland and 1 in Italy), covering a total of some 39 products (1 in Poland 38 in Italy). Several stakeholders were of the opinion that the restrictive material content thresholds (e.g. $\geq 90\%$ wood/wood-based material, $\leq 3\%$ any other material)

were presenting obstacles to uptake. Two European furniture associations, representing over 2900 furniture manufacturers, claimed that questionnaire feedback that they have received revealed that only a small fraction of the furniture market consists of products composed of at least 90 % by weight of wood/wood-based materials. By removing restrictions for maximum and minimum contents of specific materials, the number of furniture products potentially eligible for the EU Ecolabel application process increases greatly.

Nonetheless, caution was noted that meaningful ecological criteria must be set for other materials because wood generally has a better environmental profile than other materials used in furniture, provided that the wood originates from certified sustainable sources. Support was expressed for the inclusion of specific criteria for plastics, glass and metals as well as for upholstery materials based on textiles, padding or leather. Furniture is an especially important market for leather producers, accounting for around 14% of global production.

The potential expansion of the furniture product group scope to include second-hand, refinished, refurbished or remanufactured furniture was discussed but the general consensus amongst representatives was that this would require a large amount of further investigation and may be very difficult to develop adequate criteria that are not open to misinterpretation.

The term contract furniture was requested to be used to represent any furniture subject to a contractually bound transaction between two businesses. This way, it is not necessary to specifically mention terms like offices, hotels or hospitals in the definition.

1.2.2 Legislation and European standards relevant to furniture

A large number of Regulations and Directives are relevant to one degree or another for specific furniture products. For all EU Ecolabel products, the overarching piece of legislation is the EU Ecolabel Regulation (EU) No. 66/2010, providing guidance as to how criteria should be developed and implemented.

Leading directly from Articles 6(6) and 6(7) of Regulation 66/2010, the importance of the REACH Regulation (EU) No. 1907/2006 and the CLP Regulation (EU) No. 1272/2008 are highlighted due to the banning or justified derogation of any substances or mixtures that are: toxic, hazardous to the environment, carcinogenic, mutagenic or toxic for reproduction in EU Ecolabel goods. These Regulations apply to all of the materials used in furniture and any assembly/finishing processes. Other more specific legal instruments include the VOC Directive (1999/13/EC) for installations where significant quantities of VOC containing compounds (e.g. surface coating formulations for furniture) are handled and the Biocides Regulation (No. 528/2012) which establishes a framework for the authorization of active ingredients in biocidal products as a function of the product type they are used with.

For wood and wood based materials, the EU Timber Regulation (EU) No. 995/2010 outlines the requirements for any timber to be legally sold on the EU market and links with existing processes for FLEGT and CITES licenses. For sustainably sourced wood, the most relevant standards are those set by the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC) schemes. Across the EU, wooden particleboards, fibreboards and panels, are classified as E1 (0.1ppm) or E2 (0.1-0.3ppm) based on the framework defined in Annex B of EN 13986 and on release rates of formaldehyde as assessed by relevant EN standards such as EN 120 and EN 717.

The presence of other ecolabel schemes used in the EU such as the Nordic Ecolabel and the Blue Angel were considered. EU Ecolabel criteria should embrace and align with any criteria that have been shown to have a positive impact in other ecolabels but not to repeat any specifications that have proven to be problematic or unjustifiable.

A large number of EN standards exist that are specifically designed for individual product types such as EN 527 for work tables and desks in offices, EN 581 for outdoor tables and sets and EN 1728 for domestic seating. Fit for purpose, safe and durable furniture will tend to have a longer useable lifetime. For good quality leather, an important standard is EN 13336 and for upholstered furniture in general, an important standard is EN 1021 for fire resistance, which can effectively require that flame retardants be used with certain materials. A list of furniture standards considered most relevant by industry is provided in Appendix V.

1.2.3 Market analysis

According to the World Furniture Outlook by CSIL, in 2010 the global furniture market was worth around US\$420 billion per year. The global market is dominated by China (37%) but the 3rd and 4th main producers were Germany and Italy (each with a 6% market share). In total, EU-27 countries accounted for around 20% of global furniture production.

The EU furniture industry faces strong competition from cheaper overseas competitors, in particular China. In response, they are developing more innovative and sophisticated furniture products and giving increased attention to the environmental impact of their products. The latter in particular is an important marketing tool in middle to high income countries and fits well with the EU Ecolabel and other European-based ecolabel schemes.

The market report reveals that the most common material used in the furniture sector is wood (56% of the pieces of furniture produced in the EU 27 in 2011 are based on wood, which also represents 56% of the production value). Metal is the second most commonly used material in the furniture industry (12% of items produced and 17% of the production value), followed by plastic (6% of items produced and 1% of the production value) and other materials (1% of items produced and negligible production value) like bamboo, canner, osier, glass. The remaining 25% are not specified within the PRODCOM database. Although wood is the most common material used, most pieces of furniture also contain other materials. Based on the segmentation of the furniture market, it is considered reasonable to widen the scope of the EU Ecolabel criteria in order to cover a much broader share of the furniture market and to respond better to the expectations of the potential licence holders. On both the demand and supply sides of the furniture market there is evidence that the framework is favourable to host EU Ecolabel products, because issues concerning sustainability and environmentally-friendly furniture are becoming increasingly important.

It is difficult to quantify any direct environmental impacts of assumed scenarios of the uptake of the EU Ecolabel criteria listed here because most market data is expressed in number of units of furniture or production value whereas environmental impacts related to materials are directly expressed as unit mass or volume of that material. Nonetheless, some probable impacts of uptake of these EU Ecolabel criteria for furniture would be as follows:

- Increase in demand for sustainable certified wood.
- Incentivize of the use of recycled wood by considering it as sustainable wood.
- Sending a market signal to small and medium enterprises for recycled plastic.
- Improving the product information made available to consumers.
- Encouraging innovation in furniture companies in terms of design for disassembly.
- Improved durability of products encouraged by requirement for five year minimum guarantee.
- Reduction of the quantities of furniture waste sent to landfill as components become easier to separate and consumers are better informed of optimum disposal routes.

1.2.4 Main environmental impacts of furniture

The life cycle of furniture products has been considered in the following phases; Materials, Manufacturing, Packaging, Distribution, Use and End of Life (EoL). An original total of 109 documents related to the LCA of furniture were assessed. After analysis of 13 screened Life Cycle Assessment (LCA) studies and 35 verified Environmental Product Declarations (EPDs), the main outcomes can be summarised as follows:

- The dominant fraction (80-90%) of environmental impacts is linked to furniture **materials/components**. While embodied energy in metals and plastics are higher than wood, durability and recyclability are also important considerations. Specifying recycled materials can help reduce material impact.
- **Manufacturing**, the **assembly** and/or **treatment** of components, is the next most significant source of environmental impacts, particularly in injection moulded plastics and wood-based panels due to the use of elevated temperatures and pressures. Surface coating operations also have some significant environmental impacts due to chemicals used and elevated temperature curing processes.
- Impacts due to **packaging** were not dominant but not negligible either and some room for improvement exists in this area.
- **Distribution** was difficult to investigate since this can vary widely due to the global nature of the furniture market. In most studies, average scenarios were used.
- The **use** phase was not important in terms of environmental impact. However, durability and reparability of products are important considerations to extend the use phase.

Impacts at **EoL** vary considerably depending on what materials are used in the furniture. Recycling of furniture components or recovering energy from furniture waste is often complicated due to difficulties in separating components.

According to the LCA screening, it will be important to set criteria for the different material types which may be used in furniture. The focus should be on the most important environmental impacts associated with wood and wood-based products (such as sustainable forestry), metals, plastics and other possible permitted materials.

The presence of toxic or harmful substances in EU Ecolabel furniture should be restricted. Analysis of the most commonly used substances has been conducted and the identification of substances of concern (e.g. classified with hazard statements according to CLP Regulation) has been made, based on their inherent properties. The substance groups of main concern were identified as biocidal products, flame retardants, adhesives/resins, paints/varnishes/inks/dyes, plasticisers and foaming agents. The relative importance of each substance group will vary with different materials used in furniture.

1.3 Linking environmental hotspots to EU Ecolabel criteria

The general conclusions from the LCA screening analysis for furniture presented in the Preliminary Report was that the majority of LCA impacts are related to the materials used. The following table briefly explains some of the most obvious links between LCA impacts and proposed criteria for EU Ecolabel furniture.

Table 2. Links between furniture LCA hot-spots and EU Ecolabel criteria

Hot spot	Relevant criterion
Use of hazardous substances in manufacture	2.1 and 2.2. Banning the use of Substances of Very High Concern and limiting the use of other substances that are classified as CMR, toxic or hazardous to the environment. 6.2. Restriction on residual chemicals in upholstery materials. 6.3. Specific restriction of substances used during production of textiles, leather and coated fabrics.
Habitat loss, biodiversity pressures, soil erosion due to unsustainable forest management and illegal logging.	3.1. Require that all wood is legally sourced and that at least 70% is from 3 rd party certified sustainably managed forests.
Depletion of oil resources by the production of virgin plastics.	4.3. Require that if furniture contains a significant amount of plastic, that the recycled content of plastic should be at least 30% by weight.
Emissions of Volatile Organic Compounds from furniture items contributing to poor indoor air quality.	3.2(e). Limits on the concentrations or quantities of VOCs applied in coatings to wooden components. 3.3. Strict limits on formaldehyde emissions from wood-based panels. 5.3. Limits on the concentrations or quantities of VOCs applied in coatings to metal components. 9.5. Conditional VOC emission testing of final furniture product or selected component parts/materials.
Increased waste and demand for new products caused by premature End-of-Life (EoL) of poor durability furniture.	9.1. Ensure that product meets any relevant EN standards for fitness for use. 9.2. Oblige manufacturers to provide a 5 year guarantee for their products. 9.3. Oblige manufacturers to commit to making spare parts available for 5 years. 9.4. Oblige manufacturers to design their products for simply disassembly to facilitate repair or replacement of parts and EoL recycling.

1.4 Proposed framework of revised EU Ecolabel criteria and main changes

The expansion of the furniture scope to permit the use of materials other than wood has significantly altered the EU Ecolabel criteria structure. A comparison of the old criteria for wooden furniture and the new criteria established by Commission Decision (EU) [2016/1332](#) is shown in the Table 3.

The table clearly shows the increase in complexity of the new criteria, which was unavoidable due to the fact that the environmental impacts of new materials such as textiles, leather, metals and plastics must be considered for EU Ecolabel furniture products.

Where criteria are present in both the existing and proposed criteria, a brief explanation is provided for the reasons behind the changes after the table below.

Table 3. Comparison of existing and proposed criteria structures

Existing criteria under Decision 2009/894/EC		Proposed criteria	
Area	Heading / sub-section	Area	Heading / sub-section
1. Product Description		1. Product Description	
2. Hazardous substances	a) Excluded risk phrases b) Excluded substances c) Flame retardant restrictions	2. General hazardous substance requirements	2.1. Restriction of substances of very high concern 2.2. CLP restriction of substances and mixtures used in the furniture product
3. Wood	a) Sustainable Forest Management b) Recycled wood fibres c) Impregnating substances and preservatives d) Use of hazardous substances and preparations e) Formaldehyde emission from raw wood-based materials f) Genetically modified wood	3. Wood	3.1. Sustainable wood, cork, bamboo and rattan 3.2. Restricted substances 3.3. Formaldehyde emissions from wood-based panels.
4. Surface treatments	a) Surface treatment with plastic and metals. b) Other surface treatments than plastics and metals c) Formaldehyde d) Plasticisers e) Biocides	4. Plastics	4.1. Marking of plastic components 4.2. Restricted substances 4.3. Recycled plastic content
5. Furniture Assembly	a) Hazardous substances in additives and binding agents b) VOCs	5. Metals	5.1. Electroplating restrictions 5.2. Heavy metals in paints, primers and varnishes 5.3. VOC content in paints, primers and varnishes
6. Final product	a) Durability and safety b) Maintenance c) Recycling and waste d) Consumer information e) Packaging f) Information on packaging g) Information appearing on the EU Ecolabel	6. Upholstery covering materials	6.1. Physical quality requirements 6.2. Chemical testing requirements 6.3. Restrictions during production processes. 6.4. Cotton and other natural cellulosic seed fibres 6.5. PVC-based coated fabrics
		7. Upholstery padding materials	7.1. Latex foam 7.2. Polyurethane foam 7.3. Other padding materials
		8. Glass – use of heavy metals	
		9. Final product	9.1. Fitness for use 9.2. Extended product guarantee 9.3. Design for disassembly 9.5. VOC emissions
		10. Consumer information	
		11. Information appearing on the EU Ecolabel	

1.4.1 Product Description

Although the principle of the criterion remains the same, the wording was changed in order to specifically mention the materials whose weights should be reported. It was also made clear that "other" materials not specifically mentioned in this criterion should not amount to more than 5 % (w/w) of the furniture product.

1.4.2 General hazardous substance requirements

The criterion and its sub-criteria were the subject of much debate and multiple revisions during the stakeholder consultation process. After the existing criteria were published in 2009, the EU Ecolabel Regulation (EC) No. 66/2010 entered in force. Articles 6(6) and 6(7) of the Regulation make specific reference to hazardous properties of substances which should not be present in EU Ecolabel products but also makes allowance for derogation under certain conditions. The wording of the proposed general hazardous criteria reflects these requirements and focuses on two parts: (i) Substances of Very High Concern and (ii) Restrictions of substances and mixtures with certain CLP hazards. This general approach for SVHCs is in line with that of recently revised EU Ecolabel criteria for other product groups.

With CLP restrictions, in order to avoid the need for furniture testing and make the criteria more practical, restrictions are placed on the substances and mixtures before they might be used rather than whether or not they are present in the final furniture product or its component parts/materials. It should be noted that the restricted hazards now refer to hazard classifications (i.e. H300, H310, H351, H400) instead of risk phrases (i.e. R23, 45, R46, R50) and that the term "mixtures" is used instead of "preparations" following the repealing of old Directives 67/548/EEC and 1999/45/EC and the amendment to REACH Regulation (EC) No 1907/2006 by the CLP Regulation (EC) No 1272/2008.

1.4.3 Wood

Considerable debate took place with regards to this criterion and its sub-criteria throughout the revision process.

The precise wording of the criterion for sustainable wood was revised several times based on stakeholder feedback and internal discussions and the terms "cork", "bamboo" and "rattan" were explicitly mentioned since, from a technical perspective at least, these are not actually wood.

The restricted substance criteria relating to wood has substantially changed due to the fact that it is now mainly covered by the general hazardous substance criteria in a horizontal approach. Nonetheless, specific restrictions have been introduced to restrict heavy metals in paints and a tiered approach provided to limit the quantities of VOCs used in coated wooden component parts.

The formaldehyde emission criteria have been altered to allow other, non-EU based assessment methods to also be used as proof of compliance, as their standards were considered to be similar in ambition level to the 50 % of E1 requirement. An allowance for higher formaldehyde emissions for Medium Density Fibreboard (MDF) panels of 65% of E1 is permitted due to practical experience with these panel types and the compromise of panel technical properties that can be caused by using lower quantities of formaldehyde-based resins.

1.4.4 Final product

A number of changes have been introduced into the proposed criteria as per stakeholder feedback during the revision process.

In the existing criteria, a simple reference was made to "EN standards applicable to the usage of the product". In an attempt to be more useful, a list of specific standards was drawn up and is included in Appendix V for reference. Stakeholders insisted that these standards should only apply to the final product and not to the component parts/materials used to make the product, which would restrict the freedom of choice for furniture designers and could create unintended barriers.

As an indirect indicator of the good quality and durability of the product, it was requested that a minimum guarantee for EU Ecolabel furniture should be introduced that goes beyond the 2 year minimum as set out in Directive 1999/44/EC for consumer goods. It was generally agreed that a 5 year guarantee would be a useful compromise between protection of consumers and risk to producers.

No criterion on packaging is included in the new criteria even though this was present in the existing criteria. Even if stakeholders had mixed opinions about this, it was decided not to include a criterion on packaging due to its relatively low impact based on a LCA perspective and the desire to simplify the criteria, which are now much more complex due to the many new materials that are now considered for furniture as a result of expanding the scope.

1.4.5 Consumer information and information on Ecolabel

The main changes here are simply a reflection of new information that is directly related to the new materials that are now included with the expanded scope that has been proposed.

2. CRITERIA PROPOSAL

This section provides a list of the technical and ecological criteria that are proposed for EU Ecolabel furniture, together with how these criteria should be assessed and verified and rationale explaining their relevance.

Criterion 1: Product description

Technical drawings that illustrate the assembly of component parts/materials and sub-component parts/materials that form the final furniture product and its dimensions shall be provided to the competent body along with a bill of materials for the product that shall state the total weight of the product itself and how this is split between the following different materials: solid wood, wood-based panels, cork, bamboo, rattan, plastics, metals, leather, coated fabrics, textiles, glass and padding/filling materials.

Any remaining materials that do not fall within the categories above shall be listed as "other" materials.

The total quantity of "other" materials shall not exceed 5% of the total product weight.

Assessment and verification:

The applicant shall provide documentation to the competent body containing:

- (i) Technical drawings that illustrate the different component parts/materials and sub-component parts/materials used in the assembly of the furniture product;
- (ii) An overall bill of materials stating the total weight of the product unit and how the weight is split amongst solid wood, wood-based panels, cork, bamboo, rattan, plastics, metals, leather, textiles, coated fabrics, glass, padding/filling and "other" materials. Weights of different materials shall be expressed as grams or kilograms and as a percentage of the total product unit weight.

Rationale:

The product description criterion proposed was generally accepted by the stakeholders. Where certain materials are only present in small amounts in a furniture product, it may be argued that their overall contribution to the environmental impact of the product is small, and that no specific criteria are needed. Certain criteria are only triggered if the material is present above certain minimum quantities.

All materials used in the product should be reported, including "other" materials not specified in the criterion text. Reporting requirements under this criterion should clarify if "other" materials exceed 5% of the product weight and thereof render the product ineligible for the EU Ecolabel.

Finally the product description criterion could act as a useful indicator of the typical material composition ranges of EU Ecolabel furniture products in the future and help shape future criteria revision.

Criterion 2: General hazardous substance requirements

The presence in the product and any component parts/materials thereof, of substances that are identified according to Article 59 (1) of Regulation (EC) No 1907/2006 as substances of very high concern (SVHCs) or substances and 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 Council¹ for the hazards listed in Table 4, shall be restricted in accordance with criteria 2.1, 2.2(a) and 2.2(b).

For the purpose of this criterion Candidate List SVHCs and CLP hazard classifications are grouped in Table 4 according to their hazardous properties.

Table 4. Grouping of restricted hazards

Group 1 hazards – SVHCs and CLP
<i>Hazards that identify a substance or mixture as being within Group 1:</i> Substances that appear on the Candidate List for SVHCs Carcinogenic, Mutagenic and/or Toxic for Reproduction (CMR) Category 1A or 1B: H340, H350, H350i, H360, H360F, H360D, H360FD, H360Fd, H360Df
Group 2 hazards – CLP
<i>Hazards that identify a substance or mixture as being within Group 2:</i> Category 2 CMR: H341, H351, H361f, H361d, H361fd, H362 Category 1 aquatic toxicity: H400, H410 Category 1 and 2 acute toxicity: H300, H310, H330 Category 1 aspiration toxicity: H304 Category 1 Specific Target Organ Toxicity (STOT): H370, H372 Category 1 Skin Sensitiser H317
Group 3 hazards – CLP
<i>Hazards that identify a substance or mixture as being within Group 3:</i> Category 2, 3 and 4 aquatic toxicity: H411, H412, H413 Category 3 acute toxicity: H301, H311, H331, EUH070 Category 2 STOT: H371, H373

2.1 Restriction of SVHCs

The product and any component parts/materials thereof, shall not contain SVHCs, at concentrations greater than 0.10% (weight by weight).

No derogation from this requirement shall be given to Candidate List SVHCs present in the product or any component parts/materials thereof at concentrations greater than 0.10% (weight by weight).

Textiles that have been awarded the EU Ecolabel based on the ecological criteria established in Commission Decision 2014/350/EU² are considered to comply with criterion 2.1.

Assessment and verification:

The applicant shall compile declarations of the absence of SVHCs at or above the specified concentration limit for the product and any component parts/materials used in the assembly of the product. Declarations shall be with reference to the latest version of the Candidate List published by ECHA³

For textiles that have been awarded the EU Ecolabel in accordance with Commission Decision 2014/350/EU, a copy of the EU Ecolabel certificate must be provided as a proof of compliance.

2.2. Restriction of CLP classified substances and mixtures used in the furniture product

The requirements are split into two parts, based on the production stage of the furniture product. Part a) refers to substances and mixtures used during any finishing or assembly operations carried out directly by the furniture manufacturer. Part b) refers to substances and mixtures used during the production of supplied component parts/materials.

Textiles that have been awarded the EU Ecolabel based on the ecological criteria established in Commission Decision 2014/350/EU are considered to comply with criteria 2.2(a) and 2.2(b).

2.2(a) Substances and mixtures used by the furniture manufacturer

None of the adhesives, varnishes, paints, primers, wood stains, biocidal products (such as wood preservatives), flame retardants, fillers, waxes, oils, joint fillers, sealants, dyestuff, resins or lubricating oils directly used by the furniture manufacturer shall be classified with any of the CLP hazards listed in Table 4, unless their use is specifically derogated in Table 5.

2.2(b) Substances and mixtures used by suppliers of defined component parts/materials

This criterion shall not apply to individual component parts/materials from suppliers that: (i) weigh less than 25 g and that (ii) do not come into direct contact with users during normal use.

None of the substances or mixtures used by suppliers that fall within the scope defined below shall be classified with any of the CLP hazards listed in Table 4, unless their use is specifically derogated in Table 5.

- Solid wood and wood-based panels: adhesives, varnishes, paints, wood stains, biocidal products (such as wood preservatives), primers, flame retardants fillers, waxes, oils, joint fillers, sealants and resins used.
- Plastics: pigments, plasticisers, biocidal products and flame retardants used as additives.
- Metals: paints, primers or varnishes applied to the metal surface.
- Textiles, leather and coated fabric upholstery: dyestuff, varnishes, optical brighteners, stabilisers, auxiliary compounds, flame retardants, plasticisers, biocidal products or water/dirt/stain repellents used.
- Upholstery padding materials: biocidal products, flame retardants or plasticisers applied to the material.

Table 5. Derogations to the hazard restrictions in Table 4 and applicable conditions

Substance / mixture type	Applicability	Derogated classification(s)	Derogation conditions
(a) Biocidal products (such as wood preservatives)	Treatment of furniture component parts and/or upholstery materials to be used in the final product	All group 2 and 3 hazards listed in Table 4 except for CMR hazards	Only if the active substance contained in the biocidal product is approved, or under examination pending a decision on approval, under Regulation (EU) No 528/2012 or included in Annex I of that Regulation, and in the following circumstances, as appropriate: <ul style="list-style-type: none"> i. For in-can preservatives present in coating formulations applied to indoor or outdoor furniture component parts/materials. ii. For dry-film preservatives present in coatings applied to outdoor furniture only. iii. For preservation treatment of wood to be used in outdoor furniture but only if the original wood does not meet the requirements for Durability class 1 or 2 as per EN 350. iv. For textile fabrics or coated fabrics used in outdoor

Substance / mixture type	Applicability	Derogated classification(s)	Derogation conditions
			furniture products. Verification: The applicant shall declare which, if any, active substances contained in the biocidal product have been used in the manufacture of different furniture component parts/materials, supported by declarations from suppliers, relevant SDSs, CAS numbers and results from EN 350 testing, as appropriate.
(b) Flame retardants	Textiles, leather, coated fabrics in furniture upholstery covering materials and also padding materials	H317, H373, H411, H412, H413	The product must be intended to be used in applications in which it is required to meet fire protection requirements for ISO, EN, Member State or public sector procurement standards and regulations.
(c) Flame retardants / Antimony Trioxide (ATO)		H351	ATO is only permitted when all of the following conditions are met: i. 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. ii. It is used as a synergist with textiles or coated fabrics. iii. Emissions to air in the workplace where the flame retardant is applied to the textile product shall meet an eight hour occupational exposure limit value of 0,50 mg/m ³ .
(d) Nickel	Metal component parts	H317, H351, H372	Only permitted when used in stainless steel or nickel-plated component parts and when the nickel release rate is less than 0.5 µg/cm ² /week according to EN 1811.
(e) Chromium compounds		H317, H411	Derogation only applies to chromium III compounds used in electroplating operations (e.g., chromium III chloride).
(f) Zinc compounds		H300, H310, H330, H400, H410	Derogation only applies to zinc compounds used in electroplating or hot-dip galvanisation operations (such as, zinc oxide, zinc chloride and zinc cyanide).
(g) Dyestuff for dyeing and non-pigment printing	Textiles, leather and coated fabrics in furniture upholstery covering materials	H301, H311, H317, H331	When dust free dye formulations or automatic dosing and dispensing of dyes are used by dye houses and printers to minimise worker exposure.
		H411, H412, H413	Dyeing processes using reactive, direct, vat or sulphur dyes with these classifications shall meet a minimum of one of the following conditions: i. Use of high affinity dyes; ii. Achievement of a reject rate of less than 3.0%; iii. Use of colour matching instrumentation; iv. Implementation of standard operating procedures for the dyeing process; v. Use of colour removal to treat wastewater*. The use of solution dyeing and/or digital printing is exempted from these conditions.
(h) Optical brighteners	Textiles, leather and coated fabrics in furniture upholstery covering materials	H411, H412, H413	Optical brighteners may only be applied in the following cases: i. In white coloured printing; ii. As additives during the production of acrylic, polyamide or polyester with a recycled content.
(i) Water, dirt and stain repellents	Use in any surface treatments of furniture component parts/materials	H413	The repellent and its degradation products shall either: i. be readily and/or inherently biodegradable or have a low potential to bioaccumulate (an octanol-water partition coefficient Log Kow ≤ 3.2 or a Bioconcentration Factor (BCF) <100) in the aquatic environment, including aquatic

Substance / mixture type	Applicability	Derogated classification(s)	Derogation conditions
			sediment.
(j) Stabilisers and varnishes	Use in coated fabric production	H411, H412, H413	Automatic dosing and/or personal protective equipment must be used to minimise worker exposure. At least 95% of these additives must show at least 80% degradation of dissolved organic carbon within 28 days using OECD 303A/B and/or ISO 11733 test methods.
(k) Auxiliaries (comprising carriers, levelling agents, dispersing agents, surfactants, thickeners and binders)	Use in treatment of furniture upholstery covering materials (textiles, leather or coated fabrics)	H301, H311, H317, H331, H371, H373, H411, H412, H413, EUH070	Recipes shall be formulated using automatic dosing systems and processes shall follow standard operating procedures. Substances classified with H311 or H331 shall not be present on the material at concentrations greater than 1.0% w/w.
(l) Paints, varnishes, resins and adhesives	Any furniture component part/material	H304, H317, H412, H413, H371, H373	A Safety Data Sheet (SDS) of the chemical mixture which clearly outlines the correct Personal Protective Equipment and adequate procedures for storage, handling, use and disposal of these mixtures during use and a declaration of proof of compliance with these measures shall be provided.
		H350	Only applicable to formaldehyde-based resins where the free formaldehyde content in the resin formulation (resins, adhesives and hardeners) does not exceed 0.2% (w/w) as determined by ISO 11402 or equivalent methodology.
(m) Lubricating oils	In component parts designed to move repeatedly during normal use	All Group 2 hazards except CMR and all Group 3 hazards listed in Table 4	Lubricants shall only be permitted for use if it can be demonstrated by relevant OECD or ISO tests to be readily or inherently biodegradable in the aquatic environment, including aquatic sediment.

* Colour removal in wastewater treatment shall be considered as taking place when effluents from the dyehouse meets the following spectral coefficients: (i) 7m^{-1} at 436nm, 5m^{-1} at 525nm and 3m^{-1} at 620nm.

Assessment and verification:

The applicant shall provide a declaration of compliance with criterion 2.2(a) and 2.2(b) supported, where appropriate, by declarations from suppliers. Declarations shall be supported by lists of relevant mixtures or substances used together with information about their hazard classification or non-classification.

The following information shall be provided to support declarations of the hazard classification or non-classification for each substance or mixture:

- (i) The CAS, EC or list number (where available for mixtures);
- (ii) The physical form and state in which the substance or mixture is used;
- (iii) Harmonised CLP hazard classifications for substances;
- (iv) Self-classification entries in ECHA's REACH registered substance database (if no harmonised classification is available).
- (v) Mixture classifications according to the criteria laid down in the CLP Regulation.

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' according to the REACH registered substance database, or where a substance has not yet been registered under the REACH system, toxicological data meeting the requirements in Annex VII to Regulation (EC) No 1907/2006 shall be provided that is sufficient to support conclusive self-classifications in accordance with Annex I to Regulation (EC) No 1272/2008 and ECHA's supporting guidance. In the case of 'data lacking' or 'inconclusive' database entries, 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 Safety Data Sheet (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 Harmonised System (GHS) of the classification and labelling of chemicals or CLP hazard classification systems.

Information on the hazardous properties of substances or mixtures 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 the derogated substances and mixtures listed in Table 5, the applicant shall provide proof that all derogation conditions are met.

Textile-based materials that have been awarded the EU Ecolabel in accordance with Commission Decision 2014/350/EU shall be considered compliant with criteria 2.2(a) and 2.2(b), however a copy of the EU Ecolabel certificate must be provided.

General Rationale:

Direct impact of the EU Ecolabel Regulation

Article 6(6) of EU Ecolabel Regulation 66/2010 requires that substances or mixtures with certain hazard classifications are not present in EU Ecolabel products:

"The EU Ecolabel may not be awarded to goods containing substances or mixtures meeting the criteria for classification as toxic, hazardous to the environment, carcinogenic, mutagenic or toxic for reproduction (CMR), in accordance with Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures nor to goods containing substances referred to in Article 57 of Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency".

Relevant findings of the 1st Horizontal Taskforce on Chemicals and in ongoing work

The application of the condition stated above is extremely challenging in reality and arriving at a consistent and unambiguous interpretation of Article 6(6) in EU Ecolabel criteria for all product groups

was one of the main objectives of the 1st Horizontal Taskforce on Chemicals led by the JRC. The taskforce reached the following general conclusions:

- That "containing" should be considered as being present in any component part or material in the furniture product in concentrations greater than 0.10% by weight.
- The hazard statements H317 and H334 may also be restricted depending on the nature of the product and exposure to consumers. In the case of furniture, the potential for skin contact renders H317 (skin sensitizers) as a relevant hazard to restrict.
- That not all restricted hazards are of equal severity and should be grouped according to severity and the degree of severity considered when dealing with derogation conditions and requests for derogation (hazards split into 3 groups).
- Guidance is needed for applicants and Competent Bodies when dealing with data-lacking or unregistered substances and mixtures. This has now been included in the assessment and verification text for criterion 2.2.

Specific developments during the furniture criteria revision process

The requirements of Article 6(6) apply to the final product only. However, during the furniture criteria revision process, it was requested that the CLP restrictions be applied at the level of the substances and mixtures used during the production and finishing processes. This has led to a split approach, where SVHC restrictions under criterion 2.1 apply to the final product and its component parts or materials, and criterion 2.2(a) and 2.2(b) apply to substances and mixtures used during the production stage.

SVHC restrictions applied to individual component parts/materials in final product

The benefit of such an approach for criterion 2.1 is that this fits very well with the existing legal requirements of REACH. Articles 7 and 33 of REACH make provision for the communication of the presence of SVHCs in any supplied article, be it a final complex article or an individual component part. Any potential EU Ecolabel applicant that purchases component parts and materials on the EU market should be informed if the parts/materials supplied contain any SVHCs in concentrations exceeding 0.1% by weight. Until recently, there was uncertainty if the 0.1% threshold applied to complex articles only or to individual articles within complex articles. In 2014, a legal process began which reached the European Court of Justice (ECJ). In February 2015, the Advocate General's decision ruled in favour of the limit being applied to component parts (i.e. individual articles in a complex article). Previous doubts about how the 0.1% limit should apply to complex articles were finally dispelled with the European Court of Justice ruling on case 106/14 in September 2015. The ruling made it clear that the 0.1% threshold limit for SVHCs should apply to individual articles within a complex article and not based on the entire complex article.

CLP restrictions applied to substances or mixtures used in the production process

There was significant interest in applying CLP restrictions at the level of substances or mixtures used, as is the case in equivalent Nordic Ecolabel criteria for furniture. The main advantage of such an approach is that the restriction is placed at a level at which it can easily be controlled and does not require any final product testing or declarations that are not based on concrete data. However, it must be considered that this approach is much more ambitious overall since many substances and mixtures with restricted hazards that are used in small quantities or that would change their properties during processing would now also be restricted. In order to make the criteria workable in reality, a significant number of derogations were required that would not have been necessary if the criterion 2.2(a) and 2.2(b) only applied to the final product.

For example, derogation for H304, H317, H412, H413, H371 and H373 classifications was required for any paints, varnishes, resins and adhesives used despite the fact that once these set and dry into solid films, they would no longer be classified.

Criterion 2.2(a) applies to substances and mixtures used by the furniture manufacturer, who, in most cases, would also be the EU Ecolabel applicant. It should be straightforward for the applicant to be aware of the CLP classification of the different substances and mixtures used since many restricted classifications need to be stated on packaging and other restricted CLP classifications would be mentioned in associated Safety Data Sheets (SDSs).

Criterion 2.2(b) reflects the reality that many of the substances of concern may already be present in parts supplied to the furniture manufacturer. However, it cannot be expected that applicants will be able to obtain comprehensive declarations from all suppliers about the CLP classification of all substances and mixtures that they use. For this reason, declarations are only required for defined substance groups that are considered as the main concerns for supplied component parts made of particular materials

Guidance for assessment and verification of "data-lacking" or unregistered substances

The complete picture of a substance's hazard classification may not be readily available. Based on the discussions with ECHA it has been identified that this may be the case because of a number of factors:

- Substances are progressively being registered under REACH and so a substance may not be registered yet;
- Data gaps may exist in the hazard classifications for a substance and these may only be filled once testing proposals have been evaluated and agreed by ECHA;
- Where a substance has not been registered there may only be self-classifications to use as a reference point. These can be divergent depending on the state/form of the substance and, moreover, depending on the knowledge/expertise of the notifier, they may not correspond to the final EU classification;
- Joint submissions and entries in the REACH registration database tend to provide greater confidence in the hazard classification because, as is encouraged by the REACH system, test data is shared by manufacturers;
- Harmonised classifications are only made where Member States or stakeholders make a proposal, as a result harmonisation may only focus on specific hazards associated with a substance.
- Adaptations to Technical Progress (ATPs) have resulted in changes to the classification rules, which may mean that self-classifications are incorrect.
- Data for low tonnage bands may be more limited so, for example, there is the potential for gaps for hazards such as CMR which require longer term test data.

Because of these factors it may not therefore be possible to make a clear decision on a substances classification. It was therefore decided that, with input from ECHA, a decision making tool should be developed in order support the process. The resulting decision tree is presented in Figure 1.

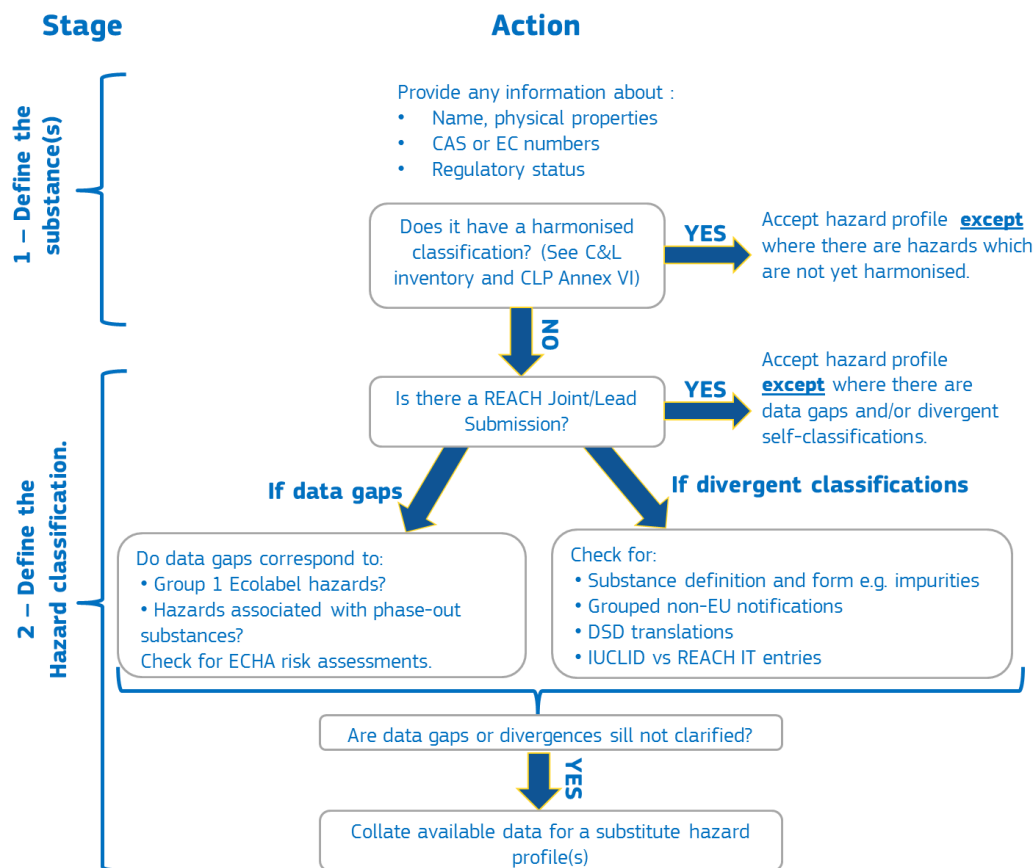


Figure 1. Decision tree used to determine hazard classifications

The applicant should provide information from the product screening against the latest classification, followed by verification of the REACH registered data base. In case of missing data, a number of options are given to provide information sufficient to conclude on the classifications. Accordingly, assessment and verification text was adapted. Whilst the option exists to accept the self-classifications made, cross checking a hazard assessment by an ECHA peer agency provides a potential means of filling the classification gaps and also highlights potential discrepancies in the self-classification for certain end-points.

Rationale for specific derogations

a) Biocides and wood preservatives: The use of these substances in furniture products is not permitted in indoor furniture except in cases where in-can preservatives are used in water-borne coating formulations. This exception is permitted because they are essential to prevent microbial contamination of the coating formulation before it may be used. Typically the concentrations or in-can preservatives are very low (less than 0.1% by weight).

Only in outdoor furniture are other biocides than in-can preservatives permitted to be used and only then if there is an intrinsic need for protection. Specific mention is given to paint coatings, wood and upholstery materials and conditions set-out for wood, because not all types of wood may justify the need for preservation treatment, some types are more resistant than others.

b) Flame retardants (general): Fire safety standards for furniture are most applicable to upholstered furniture. This is due to the fact that they may contain synthetic polymers in textile fabrics and padding materials that burn rapidly. These same materials have already been addressed in other Ecolabel Product Groups (namely Textiles via Decision 2014/350/EU and Bed Mattresses via Decision 2014/391/EU). Because these criteria have been recently voted and no major issues had been brought up by applicants or Competent Bodies relating to flame retardant derogations, the same conditions have been proposed for furniture criteria.

c) Antimony Trioxide (ATO): The derogation for ATO in furniture raised repeated objections from certain stakeholders. However, the derogation is justified based first of all on the fact that it is already derogated in EU Ecolabel Textiles and secondly because the derogation conditions only apply to the use of ATO in a very limited set of circumstances (i.e. production of polyesters) and that the bioavailability of ATO once embedded in the polyester is very limited.

d) Nickel: Nickel is used in metal components either as an alloy in stainless steels, where it is melted together with Iron, and perhaps Chromium metal, or is applied as a fine surface layer of nickel on carbon steels. In both cases, nickel improves the technical properties of the steel. The total quantity of nickel in stainless steel can be 10 % by weight, while the nickel content in electroplated steel is around 1 % by weight. Even though the content of nickel is much higher in stainless steels, the nickel is much less bioavailable. An important concern is that of skin sensitisation caused by nickel-containing articles (H317). Therefore the use of nickel containing steels in furniture parts that come into direct skin contact permitted in EU Ecolabel furniture so long as nickel release rates are below a certain limit, as defined by skin sensitisation studies with human volunteers and as is supported by entry 27 of REACH for nickel containing articles.

e) Chromium: Similar to nickel, chromium can be used either in alloys or as fine surface layers applied via electroplating processes. Even though the metal on the surface layer is essentially pure chromium metal and thus not classified, it is important to distinguish that there are two main forms of chromium compounds: chromium III (largely non-toxic) and chromium VI (highly toxic) that can be used in the process. The derogation condition here applies to chromium (III) chloride and makes it clear that no chromium (VI) compounds should be used during electroplating.

f) Zinc: Zinc is used in the application of fine surface layers on top of iron or steel components via an electroplating process or the application of thicker surface layers by hot-dip galvanisation. In either case, the zinc is used to improve the technical properties of the steel or iron component, especially its resistance to corrosion. Zinc metal in the massive form is actually not classified under REACH so it is made clear here that the derogation applies to the zinc compounds that would actually be used when setting up any electroplating or galvanisation process, namely zinc oxide, zinc chloride or zinc cyanide. In case of any future development of other zinc compounds in these processes, the derogation is also left open to other zinc compounds that have the same restricted but derogated hazards or only some of those restricted but derogated hazards.

g) Dyestuff for dyeing and non-pigment printing; These substances are used in the production of furniture upholstery materials (i.e. textile fabrics, leather and coated fabrics) and are taken directly from the derogation conditions that were voted for in Decision 2014/350/EU for EU Ecolabel Textiles. Representatives of the leather industry and coated fabrics industry did not object to these derogation conditions being applied to their materials.

h) Optical brighteners: These derogation conditions are aligned with those established for EU Ecolabel Textiles in Commission Decision 2014/350/EU and help ensure that any textile upholstery carrying the EU Ecolabel can be considered to comply with the relevant requirements for EU Ecolabel furniture.

Allowance is made for the use of H411, H412 and H413 optical brighteners due to the fact that it would not be possible to achieve certain brightness standards without these additives for white coloured upholstery materials and due to concerns about poorer aesthetics when using fibres from recycled polymers. This approach is reflected in the Global Organic Textile Standard (GOTS).

i) Water, dirt and stain repellents: Again, these derogation conditions are aligned with those established for EU Ecolabel Textiles in Commission Decision 2014/350/EU and help ensure that any textile upholstery carrying the EU Ecolabel can be considered to comply with the relevant requirements for EU Ecolabel furniture.

Polyfluorinated and perfluorinated repellents are widely known to possess CLP hazards that are restricted under criterion 2.2 and so would not be permitted in EU Ecolabel furniture. During the EU Ecolabel criteria revision for Textiles, it was found that silicone based alternatives registered with ECHA had no harmonised classification but some were registered with an H413 classification. In order to ensure that these less hazardous repellents can continue to be used, it was considered prudent to derogate repellents with a H413 classification so long as it can demonstrate good biodegradability or low bioaccumulation.

j) Stabilisers and varnishes: Specific feedback from a representative of coated fabric producers revealed the need to use stabilisers and varnishes for the purpose of imparting light fastness and UV resistance properties that would allow coated fabrics to comply with the physical requirements set out in Criterion 6.1 and that it was not possible to find such substances and mixtures that did not have H411, H412 or H413 properties. Proposed derogation conditions were that these substances should be eliminable (at least 95%) according to OECD or ISO methods, which basically means that they would effectively be broken down in municipal wastewater treatment plants and thus not present a risk to natural watercourses when disposed of correctly. The necessity of the derogation or the details of the derogation conditions were not contested by any other stakeholders and so have been accepted.

k) Auxiliaries (comprising carriers, levelling agents, dispersing agents, surfactants, thickeners and binders): As with the derogation entries g), h) and i), these are in common with the derogation conditions set for EU Ecolabel Textiles in Decision [2014/350/EU](#) and were not contested by representatives of leather or coated fabric producers.

l) Paints, varnishes, resins and adhesives: this derogation condition was introduced due to pressure from stakeholders to move away from approaches that only address substances or mixtures that remain in the final product and towards the approach of the Nordic Ecolabel, which focuses on the classification information of substances or mixtures that are used in the production of the furniture. This means that some derogation would be necessary for paints, varnishes, formaldehyde resin formulations and adhesives.

The most common restricted hazard classifications that occur in Safety Data Sheets for these mixtures were H304, H412, H413, H371 and H373. Appropriate derogation conditions are considered to be the identification of risks associated with the handling, storage, use and disposal of these mixtures and evidence that the users have systems in place to safely manage these risks.

The need for H350 (a Group 1 hazard) derogation for formaldehyde resins was necessary due to the recent reclassification of formaldehyde from a Category 2 to a Category 1B carcinogenic. According to CLP rules, this means that the H350 classification now applies to mixtures containing >0.1% free formaldehyde whereas under the previous classification, the threshold was 1.0%. While resins on the market today generally contain <1.0% free formaldehyde, not many will comply with the 0.1% limit and thus would be classified as H350. It should be noted that free formaldehyde in resins rapidly diminishes to extremely low levels after setting and curing in the production stage and further criteria are applied elsewhere for residual emissions for wood-based panels.

m) Lubricating oils: Derogation for lubricating oils was introduced since there exist many lubricants with significant environmental hazards and these substances may be released to the environment at EoL of the furniture product. The derogation condition is linked to minimum requirements for the biodegradability of the lubricant. Producers are well aware of the standard tests and results required to meet the definitions for "readily biodegradable" or "inherently biodegradable" but a specific definition is included in the TR (and also in the Act of the proposed Decision) for the avoidance of doubt to readers and to make sure that no confusion is made between "inherent primary biodegradability" (much lower requirement) and "inherent ultimate biodegradability" (much higher requirement which applies here).

Criterion 3: Wood, cork, bamboo and rattan

The term "wood" applies not only to solid wood but also to wood chips and wood fibres. Where criteria refer solely to wood-based panels, this is mentioned in the title of those criteria.

Plastic foils manufactured using Vinyl Chloride Monomer (VCM) shall not be used in any part of the furniture product. (For reasoning behind the insertion of this clause, please see the explanatory text box inserted under criterion 4).

3.1 Sustainable wood, cork, bamboo and rattan

This criterion shall only apply when the content of wood or wood-based panels exceeds 5% w/w of the final product weight (excluding packaging).

All wood, cork, bamboo and rattan 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 for the Endorsement of Forest Certification (PEFC) or equivalent.

All virgin wood, cork, bamboo and rattan shall not originate from GMO species and shall be covered by valid sustainable forest management certificates issued by an independent third party certification scheme such as FSC, PEFC or equivalent.

Where a certification scheme allows the mixing of uncertified material with certified and/or recycled materials in a product or production line, a minimum of 70% of the wood, cork, bamboo or rattan material, as appropriate, shall be sustainable certified virgin material 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 or material supplier, as appropriate, shall provide a declaration of compliance supported by valid, independently certified chain of custody certificate(s) for all wood, cork, bamboo or rattan material used in the product or production line and demonstrate that at least 70% of the material originates from forests 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. In case the scheme does not specifically require that all virgin material is sourced from non-GMO species, additional evidence shall be provided to demonstrate this.

If the product or production line includes uncertified virgin 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.

Rationale for expansion of the scope to certain "non-wood" materials:

Previously the title of this criterion had been expanded from "sustainable wood" to "sustainable wood, cork and lignified materials other than wood".

The distinction between "wood", "cork" and "lignified material other than wood" can be made by considering the biological processes by which these materials are produced.

According to ISO 24294:2013, wood is considered as "a lignocellulosic substance between the pith and bark of a tree or a shrub". This definition can be met only by dicotyledonous plants where wood layers build up as secondary xylem in the cambium acting as a secondary meristem.

According to ISO 9229:2007, cork is the protective layer of the cork oak tree which can be periodically removed from its trunk and branches to provide the raw material for cork products. Cork is formed as secondary phloem material in the inner part of the bark. This is its primary distinction from other material defined as wood.

Other lignified materials that are of potential importance in furniture, such as bamboo and rattan are not technically classified as wood either. This is because they grow from monocotyledonous plants, where lignocellulosic material is formed in the cell walls of stems and shoots but, because there is no cambium layer or activity, the plant stem or shoot only grows upwards due to the primary apical meristem and not outwards.

In an optimum climate, bamboo is one of the world's fastest growing plants and can be cultivated and harvested in a sustainable manner. Cork can also be considered as a sustainable material since its harvesting does not actually require the felling of any trees.

At the April 2015 EUEB meeting, a catch-all term for bamboo and rattan of "lignified materials other than wood" was proposed. However, since an adequate definition of when a material stops being "cellulosic" and becomes "lignified" was not provided, it was preferred to use the specific terms "bamboo and rattan".

Issues related to cork and bamboo

A request to remove cork from the "sustainable wood" criterion was received. It was argued that because the harvesting of cork does not involve the felling of trees, the requirement that cork be sourced from forests certified as sustainably managed by third parties is of limited additional value.

The market availability of certified cork was questioned too. Market data for cork forests and production was collected and is summarised in the Table below.

Table 6. Forest certified area and annual cork production by country^{4,5}

Overall cork forest area					Annual production of cork		
Country	Total cork forest area (ha)*	(%)	Cork forest SFM certified area (ha)	(%)	Country	Annual production (tons)*	(%)
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	n.a.	n.a.	Morocco	11.686	5,8
Algeria	230.000	11	n.a.	n.a.	Algeria	9.915	4,9
Tunisia	85.771	4	n.a.	n.a.	Tunisia	6.962	3,5
France	65.228	3	n.a.	n.a.	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

n.a. – data not found

It is clear that cork production is unique to countries in the Mediterranean region and that approximately 10-11 % of all cork forests are either FSC or PEFC certified. With the assumption that production rates are equal in certified and uncertified forests, it could be estimated that some 13-14% of all cork produced comes from sustainable certified forests.

The outer bark, or cork, can be extracted from cork oak (*Quercus suber*) without damaging the tree or affecting biodiversity as following extraction, new bark regrows. This process occurs every 9–14 years, depending on the area, until the tree is approximately 200-300 years old⁶.

The use of cork can be broadly divided into two production groups: the natural cork industry and the granulate-agglomerate industry. Approximately 70% of all the cork harvested is used by the wine industry. The solid corks are "punched" out of the bark, once the corks have been produced, the residual pieces of bark can be redirected to produce other agglomerated products. Most of the companies use hash by-products from the manufacture of the cork stoppers⁷. According to Rives et al.⁸ the by-products typically account for over 70% of the raw cork mass. The cork processing chain is illustrated in Figure 2 below.

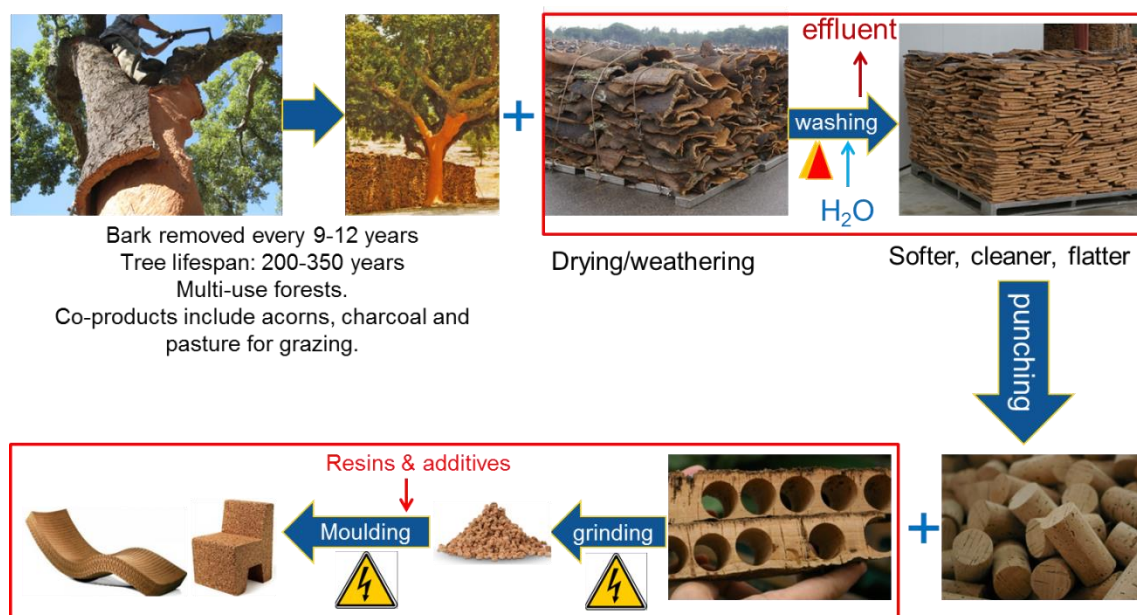


Figure 2. Illustrated example of the cork production and processing chain (images from <http://www.wineanorak.com/corks/howcorkismade.htm>)

In the EUEB June 2015 meeting, stakeholders wanted to keep the requirement for any cork to be sourced from sustainably managed forests. No objections or further supporting evidence about why cork should be exempted from this criterion were provided and so cork is now specifically included in the sustainable forestry criteria.

Stakeholders did not express any opinions about bamboo or rattan, except to confirm that certified bamboo was indeed available and that PEFC had recently reached an agreement with the Chinese Forest Certification Council that should lead to increased amounts of sustainable certified bamboo in the future. The requirement for sustainable certified bamboo is useful in the sense that it ensures that the legality of the source is checked. This is because bamboo furniture is currently exempted from the requirements of the EU Timber Regulation (EC) No 995/2010.

Rationale behind the removal of separate legal wood requirement

The requirement to prove the legal origin of the wood in a separate criterion has been removed because it is already explicitly mentioned in the sustainable wood criterion.

Both the FSC and PEFC schemes have recently adapted their own criteria to align closely with the EU Timber Regulation and require that all certified wood is legally sourced. Due to several concerns expressed about the length and complexity of the EU Ecolabel criteria for furniture, the removal of a criterion on legal wood is one clear opportunity to simplify the requirements.

Rationale for sustainable wood criteria wording

The wording of the criterion for sustainable wood is largely based on a text previously agreed upon by the EUEB and used in Decision 2014/256/EU for EU Ecolabel converted paper products, but with the limits set from the opposite perspective. Instead of setting maximum limits for "unsustainable" wood, minimum limits are instead given for "sustainable" wood content. A cut-off limit of 5% w/w, below which this criterion would not apply, has been proposed. The aim of this approach is to avoid disproportionate assessment and verification efforts for wood sourcing in furniture where wood is only of minor importance. In all cases, the EU Timber Regulation should assure that almost all wood in furniture products available on the EU market are from legal sources anyway.

Some opposition to the wording of this proposal was expressed, saying that the criterion was too vague to lay readers who are not familiar with the principles of the FSC and PEFC certification schemes and instead should refer directly to some common sustainable management principles in the criterion text and then only to FSC or PEFC in the assessment and verification text. Further doubts were expressed about the relevance of the term "FSC, PEFC or equivalent" when even FSC and PEFC do not recognise each other as equivalent.

An example of a definition of sustainable forest management at the European level, provided by Forest Europe, is as follows:

"the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national and global levels and that does not cause damage to other ecosystems."

However, sustainable forest management principles are quite broad and difficult to legally verify. The major advantage of the FSC and PEFC schemes is that they describe not only principles but also systems that audit and verify the forests as well as traders in the timber supply chain and link this to clear labelling of the final product. These two schemes are the dominant certification schemes for sustainable forest management and covered approximately 10% of global forests in 2014. When a Competent Body is attempting to verify the claims that the wood or wood-based material in an EU Ecolabel product is indeed of sustainable origin then the verification process is greatly simplified by the fact that final and intermediate products can be FSC or PEFC labelled. If the certificate number on the label is from an approved trader or producer (this can be checked on a publically available database online) then compliance with the EU Ecolabel criteria is essentially confirmed and a starting point for any further enquiries is clearly defined.

Any attempt to list the sustainable forest management principles that are common to FSC and PEFC would be complicated. This is due to the fact that each scheme has around 10 such principles and around 70 related criteria (see Appendix I for a full list). Furthermore, because FSC and PEFC are private, stakeholder driven schemes, there is the possibility that their principles may change at any time and fall out of alignment with any concrete text drafted into EU Ecolabel criteria. The proposed text was generally accepted because it allows for changes in FSC or PEFC criteria to be taken into account without potentially rendering EU Ecolabel criteria obsolete.

Recycled wood is also explicitly mentioned in the criteria since it can be considered as at least equal to sustainably sourced virgin wood in terms of its environmental footprint. Both the FSC and PEFC schemes make allowances for recycled wood content.

The minimum requirement of 70% sustainable wood (or recycled wood) is not raised higher because this limit aligns well with the current labelling systems in place for both FSC and PEFC schemes, in particular "FSC mix" and "PEFC certified". A total of 5 labels currently exist between the schemes (see Figure 3).

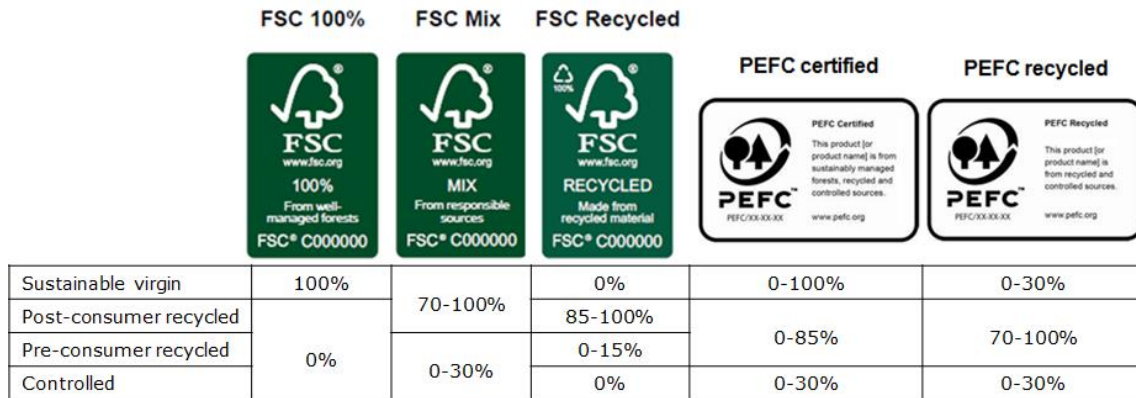


Figure 3. Illustration of the 5 current labels from FSC and PEFC

Basically for all labels, wood is either virgin material sourced from sustainably managed forests, recycled material or controlled material. All labels have a common denominator in that at least 70% of all wood must be either sustainable certified virgin material or recycled material. The FSC recycled and FSC 100% labels go beyond this requirement.

Controlled wood can be considered as the weak point of the FSC and PEFC schemes but because even this type of wood must be legally sourced, it is considered that the requirement for sustainable wood renders a separate requirement for legality of wood obsolete.

According to an evaluation by NEPCON⁹, the requirements for FSC and PEFC can be considered as equivalent for the following aspects:

- Controlled wood should be legally harvested
- Controlled wood should not come from forests being converted into plantations or other non-forest use.
- Wood shall not be from genetically modified organisms.

Both schemes also have further conditions for controlled wood that are related to threats to high conservation value forests and indigenous people although the NEPCON comparison study considered these as non-equivalent.

Although it is unusual to refer directly to private schemes in EU Ecolabel criteria, almost all wood from sustainably managed forests that is available on the market currently falls under FSC or PEFC certification. The use of the term "or equivalent" is necessary when referring to FSC or PEFC since these are indeed private schemes and the EU Ecolabel criteria should not explicitly exclude other potential schemes that may arise in the future.

Some questioned whether the availability of certified wood was sufficient to satisfy demand. This could be a valid point in some EU Member States. For example, from FSC's own data, in some Member States well over 50% of all forests are FSC certified whereas in others less than 10% are certified.

Regarding the type of wood certified, in Europe the availability of softwood from certified forestry is generally high, whereas the availability of hardwood is significantly lower. However, processing techniques exist, such as treatment with alcohol in a pressurized vat and drying at 110°C, which can improve the properties of softwood and make them suitable for applications traditionally reserved for hardwood.

3.2 Restricted substances

In addition to the General conditions on hazardous substances set out in criterion 2, the following conditions shall specifically apply to any furniture component parts made of wood, cork, bamboo or rattan or specifically only to wood-based panels where the latter term is mentioned in the criterion title:

3.2(a) Contaminants in recycled wood used in wood-based panels

Any recycled wood fibres or wood chips used in the manufacture of wood based panels shall be tested in accordance with the European Panel Federation (EPF) standard for delivery conditions of recycled wood¹⁰ and comply with the limits for contaminants as listed in Table 7.

Table 7. Limits for contaminants in recycled wood

Contaminant	Limit values (mg/kg recycled wood)	Contaminant	Limit values (mg/kg recycled wood)
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	Creosote (Benzo(a)pyrene)	0.5

Assessment and verification:

The applicant shall provide either:

- (i) A declaration from the wood-based panel manufacturer that no recycled wood fibres were used in the panel, or
- (ii) A declaration from the wood-based panel manufacturer that all recycled wood fibres used have been representatively tested in accordance with the 2002 "EPF Standard conditions for the delivery of recycled wood", supported by appropriate test reports that demonstrate compliance of the recycled wood samples with the limits specified in Table 7.
- (iii) A declaration from the wood-based panel manufacturer that all recycled wood fibres used have been representatively tested by other equivalent standards that have equal or stricter limits than the 2002 "EPF Standard conditions for the delivery of recycled wood", supported by appropriate test reports that demonstrate compliance of the recycled wood samples with the limits specified in Table 7.

Rationale

During the uncertain history of post-consumer wood, possible treatment with any of a number of hazardous preservatives and fungicides may have occurred. Even after careful pre-treatment, traces of these substances may still remain in the recycled wood fibres and it is necessary to test these materials prior to their re-use in any new products, particularly EU Ecolabel ones.

The EPF has developed a standard for delivery conditions of recycled wood that defines limit values for certain elements and substances that are at particular risk of being present in recycled wood due to treatment with fungicides, paints and varnishes.

The initial limits appear to have been aligned with specifications for modelling clay in the Toys Directive (EN 71-3:1994) but now this Directive has been revised (2013) and splits limit values into three categories: i) dry, brittle, powder-like or pliable materials, ii) liquid or sticky materials and iii) scraped off materials. As per Table 31 in the Preliminary Report, a comparison of the EPF and the new Toys Directive reveals some discrepancies in values. However, the direct relevance between the two sets of standards can be questioned since a) most toys are not wooden and b) wooden toys are highly unlikely to use post-consumer recycled wood fibres from 3rd party sources.

Although some stakeholders questioned the need to refer to an already widely accepted standard practice in Europe as an EU Ecolabel criterion, to ensure product safety, it is worth specifying these limits again for the benefit of any non-EU suppliers of recycled wood fibres or panels containing recycled wood.

One stakeholder suggested that stricter limits in place in Germany should be used rather than those defined by the EPF. However, care must be taken that these stricter limits would not essentially exclude large quantities of available recycled wood from being reused. Consequently, it is not proposed to require any stricter limits for contaminants in recycled wood although compliance with stricter standards may be accepted as proof of compliance with the EPF limits.

3.2(b) Polyvinyl chloride (PVC) foils used in wood-based panels

Criterion 3.2(b) was removed from the final voted legal text prior to positive voting at the Regulatory Committee on 22 January 2016 because it is no longer relevant to the Product Group scope for EU Ecolabel furniture. A detailed explanation of the reasons for this change can be found in the text box inserted under criterion 4 on page 41 of this report.

If PVC foils are used, the emissions of vinyl chloride monomer (VCM) during PVC production and from the resin product shall not exceed the limits set out in Table 8.

Table 8. VCM emission limits for PVC production and from the resin product

	Suspension process (S-PVC)	Emulsion process (E-PVC)	Combined process (E+S PVC)*
Total VCM emissions to air (including fugitive emissions)	< 100 g/tonne PVC	-----< 1000 g/tonne PVC-----	
VCM concentration in aqueous effluents	< 1 g/m ³ effluent and < 5 g/tonne PVC	< 1 g/m ³ effluent and < 10 g/tonne PVC	< 1 g/m ³ effluent and < 5 g/tonne PVC
VCM concentration in final resin product	-----< 1g / tonne PVC-----		

* The combined process applies to where aqueous effluents from separate emulsion and suspension processes are combined prior to any treatment and final discharge.

Assessment and verification:

The applicant shall provide either:

- A declaration from the supplier of the wood-based panel stating that PVC foils have not been used;

or

- A declaration from the supplier of the wood-based panel, supported by a declaration from their PVC supplier, stating that the PVC foils used in wood-based panels were produced in accordance with the VCM emission limits set out in Table 8. The declaration of the PVC supplier shall:

- Specify whether PVC was produced using the Emulsion Process or the Suspension Process and if aqueous effluent is treated for single or combined plants.
- Include evidence of compliance with the relevant total, atmospheric and aqueous VCM emission limits specified in Table 8 via test reports according to EN 13649, ISO 1031 or equivalent methodology.
- Include evidence of compliance with the limit for residual VCM in the final PVC material via test reports of representative samples following the EN ISO 6401 standard or equivalent methodology.

Rationale:

Although PVC is effectively a non-hazardous material, environmental hazards are mainly associated with its production. Historically, PVC manufacture has been linked to cases of angiosarcoma¹¹ (a rare form of liver cancer) amongst workers that were most exposed to Vinyl Chloride Monomer (VCM, CAS No. 75-01-4). Consequently, VCM has been classified as a Category 1A carcinogen (known human carcinogen) and is a major issue because VCM is the major feedstock used to manufacture PVC. Modern plants following best available techniques make serious efforts to minimize the emission of VCM from reaction chambers in order to reduce exposure to workers and the wider environment.

The criterion proposed aligns closely with the current best practice from PVC producers in Europe and the VCM emission limits are taken from the Charter published by the European Council of Vinyl Manufacturers (ECVM)¹² and set out in the European Commission Reference Document on Best Available Techniques in the Production of Polymers¹³ published in 2007. The limits are also linked to the type of production process used, because of technical differences that affect the degree of VCM emission reduction that is practically achievable. It is important not simply to specify VCM concentration limits in emissions but rather total emissions based on production volume because concentration limits can easily be manipulated by dilution of effluents.

3.2(c) Plasticisers in plastic foils used in wood-based panels

Criterion 3.2(c) was removed from the final voted legal text prior to positive voting at the Regulatory Committee on 22 January 2016 because it is no longer relevant to the Product Group scope for EU Ecolabel furniture. A detailed explanation of the reasons for this change can be found in the text box inserted under criterion 4 on page 49 of this report.

Any plastic foils applied to wood-based panel surfaces shall not contain any phthalate plasticisers that are referred to in Article 57 of Regulation (EU) 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 (1000 mg/kg).

Assessment and verification:

The applicant shall provide either:

- (i) A declaration from the wood-based panel supplier stating that plastic foils were not used; or
- (ii) A declaration from the wood-based 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 the ISO 14389 or ISO 8214-6 standards.

Rationale:

Normally this criterion would be considered as already covered by the horizontal approach for functional hazardous substances set out in criterion 2.2. However, because the PVC foil, when used in wood-based panels, only represents a small fraction of the total coated panel weight, it is possible that a supplier of wood-based panels could argue that their PVC foil coated product complies with the 0.1% w/w threshold for non-declaration of SVHCs (i.e. restricted phthalates).

This possibility, coupled with the fact that PVC foils on wood-based panels are likely to come into prolonged skin contact are the main reasons for having such a criterion here.

However, there is no need to take this approach for pure PVC component parts or PVC-based coated fabric materials because phthalates would be used in quantities well above 0.10% w/w of any homogenous component part/material or article.

3.2(d) Heavy metals in paints, primers and varnishes

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

Assessment and verification:

The applicant or material supplier, as appropriate, shall provide a declaration of compliance with this criterion and provide the respective SDS from the suppliers of the paints, primers and/or varnishes used.

Rationale

The previous version of this criterion essentially reflected the restrictions in place for heavy metals in Decision 2014/312/EU on EU Ecolabel criteria for paints and varnishes which prohibits the use of cadmium, lead, chromium VI, mercury, arsenic, barium, selenium, antimony and cobalt compounds but which then provides a number of derogation conditions for the use of certain barium, antimony and cobalt compounds. The level of 0.010% refers to the paint product itself and is often used as an arbitrary cut off limit for unintentionally included impurities in [EU Ecolabel mixtures Product Groups](#).

A number of stakeholders expressed concerns about the complexity of the previous general hazardous substance criterion for furniture, in particular the number of derogations. Some of these derogations were related to barium, antimony and cobalt additives in paints and varnishes. These additives are now simply permitted based on the idea that they will ultimately be present in [EU Ecolabel furniture articles](#) in much lower concentrations than in the paint formulations. Consequently, assessment and verification efforts of proof with derogation conditions would be disproportionate.

However, the criterion remains here, going beyond the requirements of criterion 2, in order to expressly prohibit the use of paints or varnishes that include heavy metals (i.e. cadmium, lead, chromium VI, mercury, arsenic and selenium) because:

- Many of the coating additive compounds based on these heavy metals are REACH restricted but would not be restricted if the coated article was imported to the EU,
- Even if additive compounds based on these metals are non-hazardous, or change their properties during processing to become non-hazardous, the presence of these metals would complicate recycling of the wooden materials at end-of-life if the EPF standard for delivery conditions of recycled wood is considered (see criterion 3.2a),
- 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. The potential to transform into more toxic and/or bioavailable forms also exists if materials containing these metals are landfilled.

3.2(e) VOC content in paints, primers and varnishes

This criterion does not apply to untreated wooden surfaces or to natural wooden surfaces treated with soap, wax or oil.

This criterion shall only apply when the content of coated wood or wood-based panels (excluding untreated wooden surfaces or natural wooden surfaces treated with soap, wax or oil) exceeds 5% w/w in the final furniture product (excluding packaging).

It shall not be necessary to meet the requirements of this criterion if compliance with criterion 9.5 can be demonstrated.

The VOC content of any paints, primers or varnishes used to coat any wood or wood-based panels used in the furniture product shall not exceed 5% (in-can concentration).

However, higher VOC content coatings may be used, if it can be demonstrated that either:

- The total quantity of VOCs in the paint, primer or varnish used during the coating operation amounts to less than 30 g/m² of coated surface area, or
- The total quantity of VOCs in the paint, primer or varnish used during the coating operation is between 30 and 60 g/m² of coated surface area and that the surface finish quality meets all of the requirements set out in Table 9.

Table 9. Surface finish quality requirements if VOC application rate is 30-60g/m²

Test standard	Condition	Required result
EN 12720. Furniture – Assessment of surface resistance to cold liquids	Contact with water	No change after 24 hour contact
	Contact with grease	No change after 24 hour contact
	Contact with alcohol	No change after 1 hour contact
	Contact with coffee	No change after 1 hour contact
EN 12721. Furniture – Assessment of a surface resistance to wet heat	Contact with 70°C heat source	No change after testing
EN 12722. Furniture – Assessment of surface resistance to dry heat	Contact with 70°C heat source	No change after testing
EN 15186. Furniture – Assessment of the surface resistance to scratching	Contact with diamond scratching tip	Method A: no scratches ≥0.30 mm when a load of 5N has been applied or, Method B: no scratches visible in ≥ 6 slots in the viewing template where a load of 5N has been applied

Assessment and verification:

The applicant shall provide a declaration of compliance, specifying whether compliance is achieved because the furniture product is exempt from the criterion or if it is achieved by the controlled use of VOCs in the coating operation.

In the latter case, the declaration by the applicant shall be supported by information from the paint, primer or varnish supplier stating the VOC content and density of the paint, primer or varnish (both in g/L) and a calculation of the effective percentage VOC content.

If the VOC content of the paint, primer or varnish is greater than 5% (in-can concentration), then the applicant shall either:

- (i) Provide calculations demonstrating that the effective quantity of VOCs applied to the coated surface area of the final assembled furniture product is less than 30 g/m², in accordance with the guidance provided in Appendix II.
- (ii) Provide calculations demonstrating that the effective quantity of VOCs applied to the coated surface area of the final assembled furniture product is less than 60 g/m², in accordance with

the guidance provided in Appendix II and provide test reports demonstrating compliance of the surface finishes with the requirements of Table 9.

Rationale

VOCs include a wide variety of compounds, including aldehydes, ketones and other light hydrocarbons that have been linked to human health problems in numerous studies. The coating of furniture materials normally takes place in semi-automated facilities where occupational health and safety concerns for workers and the environment are covered by EU legislation. However, many furniture products are assembled by small to medium enterprises that may not have such tight controls on VOC exposure to workers. The use of organic solvent-based coating materials involve very high VOC contents and a series of hazardous compounds such as toluene, phenol, formaldehyde, xylene, ethylbenzene, methyl methacrylate, butyl methacrylate, heptane and ethyl acetate. These are generally volatile, flammable and harmful to humans by inhalation and skin contact. The term primers is included as well when referring to paints and varnishes since these mixtures, although not always used, can contain high VOC contents.

Furthermore, VOC emissions from the coated furniture product continue after it leaves the factory. VOCs are considered as an important factor in the indoor air quality and have been linked to the phenomenon of "sick building syndrome".

Although VOC testing is of interest, it is recognized that such tests are expensive and time-consuming and may be biased against smaller businesses. If coated panels are supplied to furniture manufacturers, who add no further coatings themselves, data from the coated panel supplier may be used. A flexible approach is allowed where compliance with this criterion is not required if compliance with criterion 9.5 (final product VOC emissions) can be demonstrated.

To avoid overly burdensome assessment and verification requirements, a cut-off limit of 5% w/w, below which this criterion would not apply, has been proposed. This follows the same approach as the Nordic Ecolabel and it can be reasonably assumed that if coated component parts account for less than 5% of the total product mass, then their contribution to potential VOC emissions is limited. This was strongly supported by some industrial representatives during the consultation process. For low VOC content coatings (less than 5%) it is only necessary to demonstrate that the SDS of the coating shows that the VOC concentration is less than 5%. A significant number of coating substances and techniques that are widely regarded to be environmentally friendly are included in the category of less than 5% VOC content, such as powder coatings and many UV cured coatings. Once cured, these coatings have virtually zero VOC emissions.

Further flexibility is built in by providing the manufacturer the option to use high VOC coatings (i.e. greater than 5%), which may be important for imparting certain technical or aesthetic properties to the product, so long as the total VOC applied or emitted is restricted within defined limits. The following sequential approach for demonstrating compliance with this criterion is provided:

- (i) The first option for restriction is to show that less than 30g VOCs are applied per m² of coated surface area. This option is well suited for mass production lines where identical pieces are coated using automated coating techniques and the consumption is an approach that can be assessed and verified by the manufacturer at little additional cost or effort. Due to the potential for cost optimization, it is likely that monitoring of coating substance consumption is undertaken.
- (ii) The second option for restriction makes increased allowance for VOCs to be applied up to 60g/m² of coated surface area, but only if this can be justified by demonstrating that the surface finish is of good quality and can resist damage caused by contact with cold liquids, wet heat, dry heat and scratching. These may be especially important in furniture used in public environments. The choice of 60g/m² as an upper limit aligns with the Nordic Ecolabel

requirement and industrial stakeholders have confirmed that within these limits, the surface quality requirements can be met.

- (iii) The third alternative, if the quantity of VOCs applied is not calculated, is to demonstrate compliance with the final product VOC emission limits established in criterion 9.5.

The overall effect of this criterion should be to shift producers towards using low VOC concentration coatings (less than 5 %) in EU Ecolabel products, but without expressly excluding the use of higher VOC content coatings in certain cases so long as other restrictions are respected.

3.3 Formaldehyde emissions from wood-based panels

This criterion shall only apply when the content of wood-based panels in the final furniture product (excluding packaging) exceeds 5% w/w.

Formaldehyde emissions from all supplied wood-based panels, in the form that they are used in the furniture product (in other words, unfaced, coated, overlaid, veneered), and which were manufactured using formaldehyde-based resins shall either:

- Be lower than 50% of the threshold value allowing them to be classified as E1.
- Be lower than 65% of the E1 threshold value, in the case of Medium Density Fibreboard (MDF) panels.
- Be 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, stating that no other further modification or treatment has been applied by the applicant to the panels that would compromise their compliance with the formaldehyde emission limits of the panels as supplied. 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 10.

Table 10. Assessment and verification of low formaldehyde emission panels

Certification scheme	Verification documentation
E1 (as defined in Annex B of EN 13986)	A declaration from the wood-based panel manufacturer, 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 717-2, EN 120, EN 717-1 or equivalent methods.
CARB – California Air Resources Board: Phase II limits	A declaration from the wood-based panel manufacturer, supported by 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 ¹⁴ . 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 mandatory if the products are sold outside of California or if they were made using no-added formaldehyde or certain ultra-low emitting formaldehyde-based resins).
F-3 or 4 star limits	A declaration from the wood-based panel manufacturer of compliance with the formaldehyde emission limits as per JIS A 5905 (for fibreboard) or JIS A 5908 (for particleboard and plywood), supported by 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 other way that would compromise compliance with the formaldehyde emission limits set out in the E1, CARB, F3-star or F4-star standards, as appropriate.

Rationale:

Wood-based panels represent more economical alternatives to solid wood and have become widely established in many furniture products. These materials have a positive environmental impact in the sense that they reduce the demand for solid wood and represent higher quality end-uses for wood chips and wood fibres that are often co-products of logging and sawmilling operations which would typically be burned for heat recovery.

A crucial aspect in the wood-based panel industry has been the development and optimization of thermosetting resins to bind the wood chips or fibres together to produce solid boards with useful technical properties. Almost all the resins used are 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 diisocyanate (MDI).

The specific manufacturing processes used for each type of wood-based panel are tailored according to the behaviour of the resin and it is not straightforward to simply change from one type of resin to another. Given that the most important environmental impact associated with these resins is formaldehyde emissions from the final product, their use is permitted in EU Ecolabel furniture so long as the final emission criteria are complied with.

Formaldehyde was reclassified as a Category 1B carcinogen (H350 - may cause cancer) in 2015¹⁵. However, the use of formaldehyde-based resin formulations remains the most common method of produced wood-based panels.

The European industry (via the European Panel Federation-EPF) has helped develop the E1 standard for formaldehyde emissions. A framework for testing of wood-based panels is given in EN 13986 (Annex B) where quicker methods (EN 120 or EN 717-2) can be used in conjunction with a standard 28 day chamber test (EN 717-1). Each of these methods provides test results with different numerical values but which can be translated into the E1 standard value. Industry stakeholders stated on several occasions that they considered the E1 requirements to be sufficiently ambitious.

In TR 2.0, due to concerns by industry about the market availability and technical performance of 50% E1 panels, it was proposed to simply require that panels comply with the E1 formaldehyde emission requirement.

However, the ambition level of this criterion was criticised by a number of stakeholders and further research into the subject requested. It is a fact that the E1 limits were initially introduced almost 30 years ago and proposals to shift to a more stringent "E1-plus" standard, that would set limits at around 65% of the current E1 limit, have yet to be agreed upon or even discussed in detail at the EU level. Today many ecolabel initiatives such as the Nordic Ecolabel, Blue Angel and French NF 217, require emissions that are 50% of the E1 limit. The most prominent non-EU initiatives to go beyond E1 requirements are the California Air Resources Board (CARB) and the Japanese F-star rating system (for 3-star and 4-star rated panels). To simply stick with E1 requirements was criticised as unambitious by several stakeholders since this is already a mandatory requirement in 6 MSs (Italy, Germany, Sweden, Austria, Denmark and the Czech Republic).

A direct comparison of formaldehyde emission limits between the CARB, JIS F-star and E1 systems is difficult to make due to the fact that they each use different testing methods. However, research

published in the literature where the same products are tested by different methods and the numerical values correlated can allow for an approximate comparison as illustrated in Figure 4 ^{16,17}.

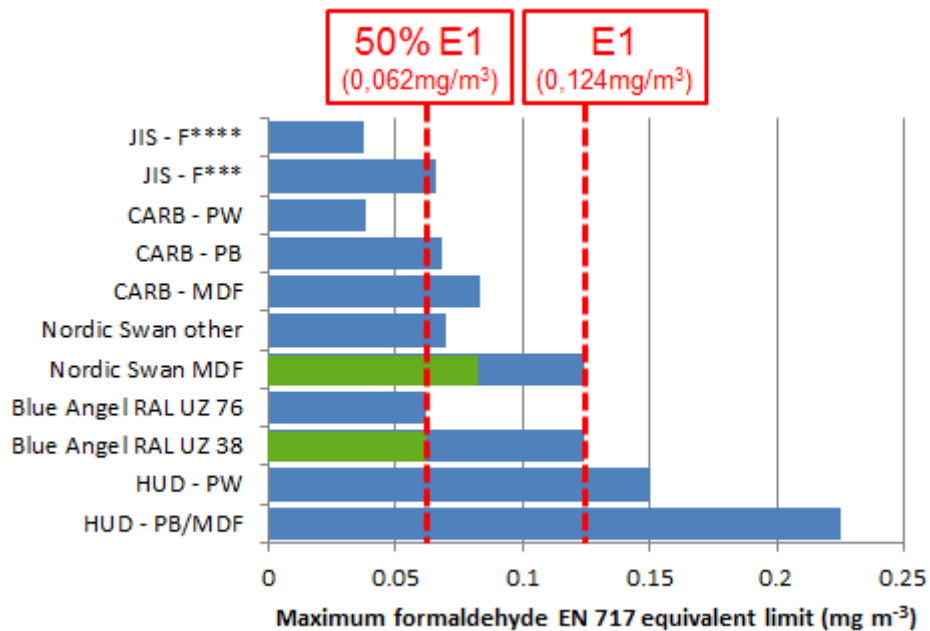


Figure 4. Comparison of formaldehyde emission ambition levels in different schemes for wood-based panels. PW = Plywood; MDF = Medium density fibreboard; PB = Particleboard

The HUD limits are the mandatory maximum formaldehyde emission limits stated in the Housing and Urban Development – Manufactured Home Construction and Safety Standard in place across the US. These are considerably less ambitious (about 80% higher) than E1 although the HUD requirement for plywood (PW) is much closer to the E1 requirement (about 20% higher).

The Blue Angel RAL UZ 38 criteria (Jan. 2013) for low emission wood based furniture and slatted frames permit the use of unfaced E1 panels so long as the final product formaldehyde emissions do not exceed 50% of E1 requirements. This is why two bars (one green and one blue) are plotted. However, with RAL UZ 76 criteria (Apr. 2011) for low emission composite wood panels it is simply stated that panels shall comply with the emission requirements of 50% of E1. It is uncertain if this also extends to unfaced panels or not. The Nordic Ecolabel criteria for furniture and fitments (Version 4.9), reveals an interesting discrepancy between medium density fibreboard panels (MDF) and other wood-based panels. Basically, the emission limit is for 50% of E1 except with MDF panels where, if the EN 120 test method is used, the emission limit is raised to around 62-63% of E1 – this is very similar to the proposed approach for EU Ecolabel criteria. However, the Nordic Ecolabel then states that if the MDF is tested according to EN 717-1, the maximum allowed emission is raised further up to E1 (i.e. 100% of E1). This is the reason for two bars (one green and one blue) being used. Feedback from stakeholders revealed that the distinction between MDF and other wood based panels is based on the practical experiences of a major Swedish furniture manufacturer which attempted to meet 50% of E1 for all wood-based panel products but found that this simply wasn't practical with certain MDF panels. The exact reason for this may be a combination of the fact that MDF is traditionally made using urea formaldehyde (the highest residual formaldehyde emitting resin type) and the fact that MDF panels can be of varying thicknesses. The thicker panels may struggle to meet the EN 717-1 limits because

this test requires that only a fraction of the panel edges be sealed. This could lead to emissions from edges in thicker panels dominating the final result.

The CARB limits also distinguish between MDF and other panel types but go one step further by also distinguishing plywood from other panels. The CARB Phase II levels are very similar to the Nordic Ecolabel level of 62-63% E1 for MDF and are very close to 50% of E1 for particleboards. With plywood, a stricter limit of around 30% E1 is stated and this can be linked to the fact that plywood manufacture traditionally uses phenol formaldehyde, which has very low residual formaldehyde emissions due to the stability of the thermoset resin when it comes into contact with atmospheric humidity.

Finally, the Japanese requirements show that F-3 star levels are roughly equivalent to 50% E1 and the F-4 star level to around 30% E1. The F-4 star level is often considered as the most stringent level for wood based panels constructed with formaldehyde based resins.

In light of the above points, it is considered that the requirement for 50% of E1 is feasible and not overly ambitious but that some flexibility is required with MDF panels and for this reason they are permitted to reach up to 65% of the E1 emission threshold. Other non-EU initiatives are also permitted (i.e. CARB Phase II and Japanese F-3 and 4 star) since these have been demonstrated to be equivalent or better than the 50% / 65% E1 emission limit requirements.

Criterion 4: Plastics

Plastic foils manufactured using Vinyl Chloride Monomer (VCM) shall not be used in any part of the furniture product. (For reasoning behind the insertion of this clause, please see the text box below).

Summary of the stakeholder consultation process on PVC

Background

A comprehensive, open and balanced consultation of all relevant interested parties and stakeholders took place in respect of the revision of EU Ecolabel criteria for wooden furniture.

Between 2013 and 2015, the issue whether Polyvinyl Chloride (PVC) should be included or excluded from the scope of the upcoming EU Ecolabel criteria for furniture was discussed in a number of EU Ecolabelling Board meetings and in the two AHWG meetings (i.e., the open working group meetings) that took place on October 2013 and May 2014.

Summary of the stakeholders' consultation process 2013-2015

At the 1st AHWG meeting (8 October 2013), it was argued that PVC could not be excluded from the scope of EU Ecolabel criteria for furniture, on the basis of concerns with chemical hazards, as this polymer is not classified under CLP. However, a number of stakeholders explicitly requested the ban of PVC, which would align the criteria under the EU Ecolabel with the Nordic and Blue Angel Ecolabels.

Subsequently stakeholders proposed to address concerns expressed on chlorine content in plastics through a requirement stating that plastic parts weighting more than 50g shall not contain chlorine content greater than 50% by weight and that for plastic parts weighting less than 50g, the residual VCM impurities shall be lower than 1 mg/kg.

During the 2nd AHWG meeting (14 May 2014), the discussion on PVC focused on identifying possible requirements that would allow in principle to continue the use of PVC in EU Ecolabel furniture, such as the minimization of impurities of the monomer, and also the threshold of maximum 50% chlorine/chloride content for polymers used in EU Ecolabel furniture similarly to a requirement already established in Commission Decisions 2011/330/EU (EU Ecolabel criteria for notebook computers) and 2014/314/EU (EU Ecolabel criteria for water-based heaters). This proposal was questioned by industry as not being supported by scientific evidence and to result in a de facto ban of PVC, and by some Member States in favour of a ban of PVC, stating that the formulation was not clear enough.

Following this feedback, it was decided to make the criteria proposal more explicit by restricting the use of polymers made with vinyl chloride monomer (CAS No 75 01 4 – a Category 1A Carcinogen) in plastic foils used in the coating of wood-based panels, plastic components and coated fabric upholstery materials. This proposal was accompanied by a summary of the potential negative environmental impacts at different life cycle stages of products manufactured using VCM in Technical Report (3.0). The proposal was taken to the EUEB meeting in November 2014.

At the November 2014 EUEB, the proposal was supported by a number of Member States, especially in light of the fact that this would lead to an alignment with the ban of PVC in other National ISO 14024 Type I ecolabel criteria for furniture and similar materials (e.g., Blue Angel and Nordic Ecolabel). However, it was questioned by stakeholders representing the affected industry, who argued that since PVC was not restricted by REACH, it should not be excluded from EU Ecolabel criteria for furniture based on the classification of a monomer that is used in its production.

The Commission undertook all efforts to identify a compromise solution, allowing the use of PVC under specific and restrictive conditions, requiring in particular that any PVC used should be produced according to current best available techniques (BAT), which minimizes Vinyl Chloride Monomer (VCM) emissions from reaction chambers in order to reduce exposure to workers. This was the final draft proposal on PVC submitted to the EU Ecolabelling Board members.

At the EU Ecolabelling Board meeting held on January 2016, it became clear that a complete exclusion of PVC, as already elaborated during preceding discussions among stakeholders, was supported by the majority of the Member States. This made it necessary for the Commission to reconsider its approach to PVC and go back to the approach already proposed to the EUEB in November 2014, which de facto excluded PVC from being used in EU Ecolabel furniture.

4.1 Marking of plastic component parts

Plastic parts with a mass greater than 100 g shall be marked in accordance with EN ISO 11469 and EN ISO 1043 (parts 1-4). The lettering used in markings shall be at least 2.5mm high.

Where any fillers, flame retardants or plasticisers are intentionally incorporated into the plastic in proportions greater than 1% w/w, their presence shall also be included in the marking as per EN ISO 1043 parts 2-4.

In exceptional cases, non-marking of plastic parts with a weight greater than 100 g is permitted if:

- Marking would impact on the performance or functionality of the plastic part;
- Where marking is not technically possible due to the production method;
- Where parts cannot be marked because there is not enough appropriate surface area available for the marking to be of a legible size to be identified by a recycling operator.

In the above cases, where non-marking is allowed, further details about the polymer type and any additives as per the requirements of EN ISO 11469 and EN ISO 1043 (parts 1-4) shall be included with consumer information referred to in criterion 10.

Assessment and verification:

The applicant shall provide a declaration of compliance with this criterion, listing all the plastic component parts with a weight greater than 100 g in the furniture product and stating whether or not they have been marked according to EN ISO 11469 and EN ISO 1043 (parts 1-4).

The marking of any plastic component parts shall be clearly visible upon visual examination of the plastic component part. Marking does not necessarily need to be clearly visible in the final assembled furniture product.

If any plastic parts with a weight greater than 100 g have not been marked, the applicant shall provide justification for non-marking and indicate where relevant information has been included in consumer information.

In cases of doubt regarding the nature of the plastic for component parts with a weight greater than 100 g and in case suppliers do not provide the required information, laboratory test data using infra-red or Raman spectroscopy or any other suitable analytical techniques to identify the nature of the plastic polymer and the quantity of fillers or other additives shall be provided as evidence supporting the EN ISO 11469 and EN ISO 1043 marking.

Rationale:

While the marking of plastics can indeed facilitate potential recycling at end of product life, feedback from the European plastic recycling industry has revealed that plastics are typically shredded and sorted according to infra-red sorting or separation according to their density floatation/sedimentation techniques. Neither of these sorting methods makes any use of plastic marking. Nonetheless, marking of plastic component parts may represent useful information for manual pre-sorting. However, manual pre-sorting typically only focuses on large parts, for this reason a higher labelling limit of 100g was chosen. This is particularly relevant to furniture, where products and component parts can be large.

It was proposed by one stakeholder to instead follow the marking system promoted by the Society of the Plastics Industry (SPI) resin identification coding system. However, the scope of this system is very limited and is only practical for pure polymers and even then only for the 6 main polymer types: 1-PET, 2-HDPE, 3-PVC, 4-LDPE, 5-PP and 6-PS. Any other pure polymer or co-polymer is simply labelled as "7-Other". EN ISO 11469 and EN ISO 1043 provide an extensive coding system for almost all

commercially used polymers and co-polymers. This would provide much more useful information for manual pre-sorting and also to consumers/end-users.

The requirement for marking according to "intentionally added" additives is to avoid complications when incorporating recycled plastic into component parts, where the presence of certain additives already present in recyclates may not be known.

The EN ISO 1043 standards contain the specific codes for different plastic polymers, fillers, plasticisers and flame retardants. Neither the EN ISO 11469 nor the EN ISO 1043 standards make specific recommendations for the weight of plastic parts that should be marked or the minimum size of lettering that should be considered as appropriate for reading. For this reason, specific requirements are included in this criterion as a guide to applicants and Competent Bodies. Plastic recyclers commented that the automated separation methods are not well suited for plastics that contain significant quantities of fillers. The presence of fillers, in quantities above 10% w/w of the compounded plastic, affect the density of the plastic and may lead to cross-contamination of different polymer streams. The densities of the most commonly produced plastics are summarised in the Table below:

Table 11. Typical densities for common polymers¹⁸

Polymer	Density (g/cm ³)
HDPE	0.94 – 0.97
LDPE	0.91 – 0.93
PP	0.93 – 0.94
PS	1.04 – 1.10
PVC	1.39 – 1.40
PET	1.33 – 1.39
PMMA	1.19 – 1.20
Nylon-6,6	1.20 – 1.30

The table above shows that there are small differences between the densities of pure polymers such as PE and PP or PET and PVC. Although PE and PP are generally compatible since the both belong to the polyolefin family, PET and PVC are completely different polymer types and cross-contamination, especially of PVC in PET streams, can create technical problems during later processing and greatly reduce the value of the recycle batch.

Labelling of plastic pieces in such a manner that plastics with high (i.e. greater than 10%) filler contents can be manually identified and separated during pre-sorting would be useful according to feedback from plastic recyclers. The EN ISO 1043 (part 2) standard refers to a series of symbols to identify the types of filler used and most importantly, requires that a number be attached to any filler that indicates its % weight of the final compounded plastic. Parts 3 and 4 of EN ISO 1043 provide standard symbols for the identification of plasticisers and flame retardants used in compounded plastics and may also represent useful information for plastic recyclers during manual pre-sorting.

The EN ISO 11469 / 1043 marking standard is much more comprehensive than the SPI coding system, as illustrated in Figure 5.

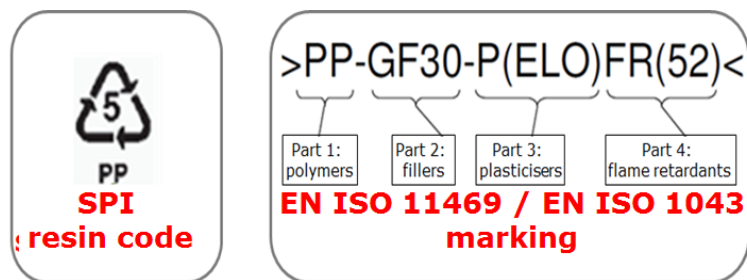


Figure 5. Comparison of the marking that would be required for a polypropylene plastic with 30 % glass fibre filler content, epoxidised linseed oil plasticiser and red phosphorus flame retardant according to the SPI resin coding system (left) and the EN ISO 11469 / EN ISO 1043 standards (right).

Although the example in Figure 5 is an extreme case, it is clear that marking according to EN ISO 11469/1043 may require more space than that the SPI system. Partly for this reason, the threshold weight above which plastics must be marked has been raised from 50g to 100g.

To ensure that rigid and plasticised PVC are able to be recycled appropriately, suitable marking is essential that denotes the presence or absence of plasticisers. The requirements for labelling of composite plastics or co-polymers is not well defined in SPI and these materials may simply be labelled as "7-other". However, marking according to EN ISO 1043 makes provision for a very wide range of commercially used co-polymers and provides guidance on how to make novel co-polymers or other blends of polymers.

4.2 Restricted substances

In addition to the general requirements for hazardous substances established in Criterion 2, the conditions listed below shall apply for plastic component parts.

4.2(a) Heavy metals in plastic additives

Plastic component parts and any surface layers shall not be manufactured using additives that contain cadmium (Cd), chromium VI (CrVI), lead (Pb), mercury (Hg) or tin (Sn) compounds.

Assessment and verification:

The applicant shall provide a declaration of compliance with this criterion.

Where only virgin plastic is used, a declaration from the supplier of the virgin plastic material that no additives containing cadmium, chromium VI, lead, mercury or tin have been used shall be accepted.

Where virgin plastic has been combined with pre-consumer plastic recyclates from known sources and/or with post-consumer polyethylene terephthalate (PET), polystyrene (PS), polyethylene (PE) or polypropylene (PP) from municipal collection schemes, a declaration from the supplier of the recycled plastic material that no compounds containing cadmium, chromium VI, lead, mercury or tin have been intentionally added shall be accepted.

If no suitable declarations are provided by the supplier, or where virgin plastic is combined with pre-consumer recyclates from mixed or unknown sources, representative testing of the plastic component parts shall demonstrate compliance with the conditions set out in Table 12.

Table 12. Assessment and verification of heavy metal impurities in plastics.

Metal	Method	Limit (mg/kg)	
		Virgin	Recycled
Cd	XRF (X-Ray Fluorescence) or acid digestion followed by inductively coupled plasma or atomic absorption spectrophotometry or other equivalent methods for measuring total metal content.	100	1000
Pb		100	1000
Sn		100	1000
Hg		100	1000
CrVI	EN 71-3	0.020	0.20

Rationale:

Multiple entries exist in the REACH Candidate List and Annexes XIV and XVII of REACH for substances based on cadmium, chromium VI, lead, mercury and tin and their compounds.

In the US, under the ASTM Children's Safety Standard, any product intended for use by children that is directly accessible to the child may not contain more than 100 mg/kg lead.

The allowance for higher contents of heavy metal impurities in plastics with recycled contents reflects the approach taken by Regulation 494/2011, which effectively restricts the total cadmium content in PVC to 100 mg/kg unless the plastic contains recovered PVC (in which case derogation applies up to 1000 mg/kg). This is due to the lack of control that producers have about the variability in recycle streams and the excessive testing requirements that would be necessary to ensure compliance with stricter limits.

Substitution of lead-based stabilisers by less hazardous calcium-based stabilisers has already been widely adopted in the EU and an EU-wide phase-out is expected around 2015 as part of a voluntary EU industry commitment. However, these developments do not extend to plastics produced outside of the EU and some specific EU Ecolabel criteria are necessary to make this requirement clear to non-EU based plastic suppliers. Furthermore, the EU Ecolabel criterion does not only apply to stabilisers but also to pigments and other additives.

The choice of 0.01 % w/w (100 mg/kg) as an arbitrary cut-off limit for impurities is a compromise between possible impurities that can arise in other additives and the quantitative detection limits of simple, rapid and relatively low-cost analytical techniques (i.e. XRF) to be used.

The exception to this approach is with chromium VI. This was necessary because many analytical methods (including XRF) do not distinguish between different oxidation states of the same metal (i.e. non-hazardous Cr III and highly toxic Cr VI). For this reason a very specific and standardized analytical technique that prevents the conversion of non-hazardous chromium III to chromium VI is specified. The EN 71-3 method is well adapted for use with plastics. Although the method refers to extractable Cr VI and not total Cr VI, by referring to the Category I limit in EN 71-3, it is considered that this could be an acceptable proxy measure for non-use of Cr VI additives.

Industry representatives have continually argued against strict requirements for impurities in recycled plastics because some plastics such as PVC may have very long service lives (i.e. pipes could be used for 50 years) and strict requirements on impurities could present barriers to recycling. The higher impurity limit of 1000 mg/kg for cadmium in cases where recycled PVC is used follows on from the provision made in Regulation (EU) 494/2011. This is because cadmium-based heat stabilisers have historically been used in PVC. Although these compounds have been banned in the EU for a number of years, cadmium could easily still be introduced via recycled PVC. The same logic for cadmium also applies to lead, tin and mercury. Lead-based heat stabilisers used with PVC are currently being phased

out under a voluntary agreement with EU industry but they could still be introduced to EU Ecolabel plastics as impurities via recycled PVC.

In response to industry concerns, it should be highlighted that any limits on heavy metals in plastics in EU Ecolabel products does not prevent plastics being recycled per se, but simply require that they may be limited in use in EU Ecolabel products if they contain significant quantities of hazardous impurities. It should also be emphasized that any requested derogation for increasing limits beyond 0.1% w/w, of the above listed heavy metals present above this concentration in plastics may come into conflict with the EUEB interpretation of Article 6(6) of the EU Ecolabel Regulation and the general hazardous substance criterion.

4.2(b) Vinyl chloride monomer

Criterion 4.2(b) was removed from the final voted legal text prior to positive voting at the Regulatory Committee on 22 January 2016 because it is no longer relevant to the Product Group scope for EU Ecolabel furniture. A detailed explanation of the reasons for this change can be found in the text box inserted under criterion 4 on page 41 of this report.

Where PVC is used in the furniture product, the PVC resin shall have been supplied from producers that can demonstrate compliance with vinyl chloride monomer (VCM) emissions presented in Table 13 for their production facility.

Table 13. VCM emission limits for PVC production and from the resin product

	Suspension process (S-PVC)	Emulsion process (E-PVC)	Combined process (E+S PVC)*
Total VCM emissions to air (including fugitive emissions)	< 100 g/tonne PVC	----- < 1000 g/tonne PVC -----	
VCM concentration in aqueous effluents	< 1g / m ³ effluent and < 5 g/tonne PVC	< 1 g/m ³ effluent and < 10 g/tonne PVC	< 1 g/m ³ effluent and < 5 g/tonne PVC
VCM concentration in final resin product	----- < 1 g/tonne PVC -----		

*The combined process applies to where aqueous effluents from separate emulsion and suspension processes are combined prior to any treatment and final discharge.

Assessment and verification:

The applicant shall provide either:

- (i) A declaration stating that PVC component parts have not been used in the furniture product, or
- (ii) A declaration stating that PVC component parts have been used in the furniture product, supported by a declaration from their PVC supplier, stating that the PVC was produced in compliance with the VCM emission limits set out in Table 13. The declaration of the PVC supplier shall:
 - Specify whether PVC was produced using the Emulsion Process or the Suspension Process and if aqueous effluent is treated for single or combined plants.
 - Include evidence of compliance with the relevant total, atmospheric and aqueous VCM emission limits specified in Table 13 via test reports according to EN 13649, ISO 1031 or equivalent methodology.
 - Include evidence of compliance with the limit for residual VCM in the final PVC material via test reports of representative samples following the EN ISO 6401 standard or equivalent methodology.

Rationale:

In TR 3.0, it was proposed to effectively ban PVC in EU Ecolabel furniture. Although this proposal was actively supported by many Member States and is reflected in other Type I Ecolabel criteria for furniture and similar materials, it was strongly questioned by industry stakeholders, who argued that since PVC was not restricted by REACH, why should it be excluded from EU Ecolabel furniture?

Due to the fact that the main life-cycle based environmental impacts of PVC are associated with its production and disposal. It was deemed relevant to instead require that any PVC is produced according to current BAT. Further rationale behind the restrictions on VCM emissions during PVC production and from the final product can be found in the rationale for criterion 3.3d). The criterion for marking of any PVC plastics (criterion 4.1) should help ensure that PVC can be identified at EoL and recycled, should this be possible in the local region.

4.3 Recycled plastic content

This criterion shall only apply if the total content of plastic material in the furniture product exceeds 20% of the total product weight (excluding packaging).

The average recycled content of plastic parts (not including packaging) shall be at least 30 % w/w.

Assessment and verification:

The applicant shall provide a declaration from the plastic supplier(s) stating the average recycled content in the final furniture product. Where plastic component parts come from different sources or suppliers, the average recycled content shall be calculated for each plastic source and the overall average recycled plastic content in the final furniture product shall be stated.

The declaration of recycled content from the plastic manufacturer(s) shall be supported by traceability documentation for plastic recyclates. An option would be to provide batch delivery information as per the framework set out in Table 1 of EN 15343.

Rationale:

Plastic is not recycled at high rates, and is often only downcycled into lower grade products such as bollards and plant pots, the specific requirement for a minimum recycled plastic content when plastics constitute more than 20 % of the product mass should help send a signal to the market for recycled plastic in higher end products. Recycled plastic has a substantially lower embodied energy than virgin plastic and offsets the consumption of non-renewable crude oil.

Due to concerns with a 50% recycled plastic content proving too difficult to comply with according to anecdotal experience with the Nordic Ecolabel for furniture and fitments, a more modest threshold of 30% has been proposed. Valid concerns about colour and aesthetic quality of light coloured injection moulded plastics were raised. However, it should be noted that at least with extruded component parts, co-extrusion technology can allow an inner core of recycled plastic to be capped by a thin outer layer of virgin plastic.

With higher recycled contents in resin batches, there is an increased risk of incompatibility between unknown additives in the recycled material and those of the virgin blend. However, this has partly been addressed by the marketing of a group of compounds known as "compatibilisers" which have been developed for this very purpose.

The potential for plastic recyclates to bring hazardous substances into the EU Ecolabel product exists because it is simply not practical to test all batches of plastic recyclates delivered for each of the flame retardants, pigments, plasticisers and other additives that are now REACH restricted.

These concerns are tackled in criterion 4.2a) which establishes testing for some of the heavy metal contaminants of most concern. Post-consumer plastics based on PP, PE and PET do not need to be tested since they are dominated by food and beverage grade plastic, which has a short life-time and so is unlikely to contain hazardous additives that are now banned. Furthermore, the strictest requirements for hazardous additives should by default apply to food and beverage plastics. Testing for flame retardants should not be an issue since these are mainly sourced from waste electrical and electronic equipment (WEEE), which is recovered via a specific network.

Criterion 5: Metals

In addition to the general requirements for hazardous substances stated in Criterion 2, the conditions listed below shall apply for metal component parts in the furniture product.

5.1 Electroplating restrictions

Chromium VI or cadmium shall not be used for electroplating operations of any metal component parts used in the final furniture product.

Nickel shall only be permitted in electroplating operations if the nickel release rate from the electroplated component part is less than 0.5 µg/cm²/week according to EN 1811.

Assessment and verification:

The applicant shall provide a declaration from the supplier of the metal component part(s) that no plating treatments involving chromium VI or cadmium substances have been used in any metal component parts.

Where nickel has been used in electroplating operations, the applicant shall provide a declaration from the supplier of the metal component part(s), supported by a test report according to EN 1811, where results reveal nickel release rates to be less than 0.5 µg/cm²/week.

Rationale:

Aluminium and stainless steels are inherently corrosion resistant while most electroplated metals will be carbon steels. Feedback from stakeholders revealed that electroplating is not a serious obstacle to metal (i.e. steel) recycling. With regards to the allowance of plating in parts subject to heavy physical wear, unless a specific list of component parts is clearly defined, this tends to lead to prolonged discussions between applicants and competent bodies regarding precisely what is and what is not heavy physical wear. Furthermore, a relevant point raised asking why should metal component parts that can be electroplated be specified if the same is not done for painting of metal component parts. For these reasons, all metal component parts can, in principle be electroplated.

Electroplating metals can easily account for more than 0.1% w/w of the plated component part. The criteria has been restructured by specifically banning chromium VI, nickel and cadmium electroplating at any total content.

Coating with chromium can greatly improve the appearance, corrosion resistance or hardness of metal parts. The coating processes can be set up to use either chromium III or VI compounds. Due to the high toxicity of chromium VI, it is required that any chrome plated metals be based on chromium III only. Feedback from metal industry representatives stated that the use of chromium III resulted in less satisfactory colour finishes but was a more robust process and consumed lower amounts of energy.

Cadmium is an excellent corrosion inhibitor but due to its toxic properties, it has been banned from use (for example in the EU End of Life Vehicle Directive 2000/53/EC) or is being phased out where less toxic alternatives exist. For metal used in furniture, a number of viable alternative plating techniques exist, in particular processes based on zinc plating.

Nickel can be used in electroplating to improve corrosion resistance, for decorative purposes or to improve resistance to wear. However, the salts used in nickel electroplating (i.e. NiSO₄·6H₂O and NiCl₂) are classified as Category 1 carcinogenic (H350) as well as mutagenic (H341), toxic to reproduction (H360D) and several other hazards that are restricted in Criterion 2. In zinc and chromium plating operations, these compounds are converted to non-classified, pure metal coatings in the final component part. However, nickel metal is classified and furthermore, has been shown to cause skin

sensitisation in users due to the slow and gradual release of small quantities of nickel upon contact with skin (and especially mediated by human perspiration).

5.2 Heavy metals in paints, primers and varnishes

Paints, primers or varnishes used on metal component parts shall not contain additives based on cadmium, lead, chromium VI, mercury, arsenic or selenium, at concentrations exceeding 0.010% w/w 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 or varnishes used.

Rationale:

The exact same rationale stated for criterion 3.2(d) applies here.

5.3 VOC content in paints, primers and varnishes

This sub-criterion shall only apply when the content of coated metal component parts exceeds 5% w/w in the final furniture product (excluding packaging).

It shall not be necessary to meet the requirements of this sub-criterion if compliance with criterion 9.5 can be demonstrated.

The VOC content of any paints, primers or varnishes used to coat any metal component parts used in the furniture product shall not exceed 5 % (in-can concentration).

However, higher VOC content coatings may be used, if it can be demonstrated that either:

- The total quantity of VOCs in the paint, primer or varnish used during the coating operation amounts to less than 30 g/m² of coated surface area, or
- The total quantity of VOCs in the volume of paint, primer or varnish that is used during the coating operation is between 30 and 60 g/m² of coated surface area and that the surface finish quality meets the requirements set out in Table 14.

Table 14. Surface finish quality requirements if VOC application rate is 30-60g/m²

Test standard	Condition	Required result
EN 12720. Furniture – Assessment of surface resistance to cold liquids	Contact with water	No change after 24 hour contact
	Contact with grease	No change after 24 hour contact
	Contact with alcohol	No change after 1 hour contact
	Contact with coffee	No change after 1 hour contact
EN 12721. Furniture – Assessment of a surface resistance to wet heat	Contact with 70°C heat source	No change after testing
EN 12722. Furniture – Assessment of surface resistance to dry heat	Contact with 70°C heat source	No change after testing
EN 15186. Furniture – Assessment of the surface resistance to scratching	Contact with diamond scratching tip	Method A: no scratches ≥0.30 mm when a load of 5N has been applied or, Method B: no scratches visible in ≥ 6 slots in the viewing template where a load of 5N has been applied.

Assessment and verification:

The applicant shall provide a declaration of compliance, specifying whether compliance is achieved because the furniture product is exempt from the criterion or if it is achieved by the controlled use of VOCs in the coating operation.

In the latter case, the declaration by the applicant shall be supported by information from the paint, primer or varnish supplier stating the VOC content and density of the paint, primer or varnish (both in g/L) and the effective percentage of VOC content.

If the VOC content of the paint, primer or varnish is greater than 5 % (in-can concentration), then the applicant shall either:

- Provide calculations demonstrating that the effective quantity of VOCs applied to the coated surface area of the final assembled furniture product is less than 30 g/m², in accordance with the guidance provided in Appendix II.
- Provide calculations demonstrating that the effective quantity of VOCs applied to the coated surface area of the final assembled furniture product is less than 60 g/m², in accordance with the guidance provided in Appendix II and provide test reports that show compliance of the surface finishes with the requirements of Table 14.

Rationale:

The rationale is essentially the same as stated previously in criterion 3.2(e).

Criterion 6. Upholstery covering materials

Plastic foils manufactured using Vinyl Chloride Monomer (VCM) shall not be used in any part of the furniture product. (For reasoning behind the insertion of this clause, please see page 33 of the report).

6.1 Physical quality requirements

Any leather used as upholstery covering material shall comply with the physical quality requirements presented in Appendix III.

Any textiles used as upholstery covering material shall comply with the physical quality requirements presented in Table 15.

Any coated fabrics used as upholstery covering material shall comply with the physical quality requirements stated in Table 16.

Table 15. Physical requirements for textile fabric covering materials in furniture upholstery

Test factor	Method	Removable and washable coverings	Non-removable and washable coverings
Dimensional changes during washing and drying	Domestic washing: ISO 6330 + EN ISO 5077 (three washes at temperatures as indicated in the product with tumble drying after each washing cycle) Commercial washing: ISO 15797 + EN ISO 5077 (at minimum of 75 °C)	woven furniture upholstery fabrics: ± 2.0% woven furniture ticking fabric: ± 3.0% non-woven furniture ticking: ± 5.0% non-woven furniture upholstery fabrics: ± 6.0%	N/A
Colour fastness to washing	Domestic washing: ISO 105-C06 Commercial washing: ISO 15797 + ISO 105-C06 (at minimum of 75 °C)	≥ level 3-4 for colour change ≥ level 3-4 for staining	N/A
Colour fastness to wet rubbing*	ISO 105 X12	≥ level 2-3	≥ level 2-3
Colour fastness to dry rubbing*	ISO 105 X12	≥ level 4	≥ level 4
Colour fastness to light	ISO 105 B02	≥ level 5**	≥ level 5**
Fabric resistance to pilling and abrasion	Knitted and non-woven products: ISO 12945-1 Woven fabrics: ISO 12945-2	ISO 12945-1 result >3 ISO 12945-2 result >3	ISO 12945-1 result >3 ISO 12945-2 result >3

* Does not apply to white products or products that are neither dyed nor printed.

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

Table 16. Physical requirements for coated fabric covering materials in furniture upholstery

Property	Method	Requirement
Tensile strength	ISO 1421	CH ≥ 35daN and TR ≥ 20daN
Tear resistance of coated fabrics by the trouser tear method	ISO 13937/2	CH ≥ 2,5daN and TR ≥ 2daN
Colour fastness to artificial weathering – Xenon arc fading lamp test	EN ISO 105-B02	Indoor use ≥ 6; Outdoor use ≥ 7
Textiles – abrasion resistance by the Martindale method	ISO 5470/2	≥ 75,000
Determination of coating adhesion	EN 2411	CH ≥ 1,5daN and TR ≥ 1,5daN

Where: daN = deca Newtons, CH = Warp and TR = Weft

Assessment and verification:

The applicant shall provide a declaration from the leather supplier, textile fabric supplier or coated fabric supplier, as appropriate, supported by relevant test reports, stating that the upholstery covering material meets the physical requirements for leather, textile fabrics or coated fabrics as specified in Appendix III, Table 15 or Table 16 respectively.

Textile-based materials that have been awarded the EU Ecolabel in accordance with Decision 2014/350/EU shall be considered compliant with this criterion, however a copy of the EU Ecolabel certificate must be provided.

Rationale:

The physical requirements for upholstery covering materials are of paramount importance to the product. Poor quality covering materials are likely to tear and even small damage will grow into more serious damage with continued normal use if the covering material is not repaired. Damage to upholstery covering materials is highly visual and may (correctly) lead to consumer association with low quality products and perhaps result in premature end-of-life of the entire product.

For leather, the testing standards and minimum requirements set out in Appendix III are identical to those currently specified EN 13336: Leather – Upholstery leather characteristics – Guide for selection of leather for furniture. Leather producers and furniture manufacturers are already familiar with these requirements and they are considered to represent good quality leather and fit for use.

For textiles, the physical quality requirements align with those set out in Decision 2014/350/EU for textile fabrics. For this reason, verification may also be demonstrated by showing that the textile fabrics have been awarded the EU Ecolabel.

For coated fabrics, the physical quality requirements have been developed in collaboration with industry representatives. The values stated in Table 16 are considered to represent very high quality coated fabrics that would effectively prevent the use of much cheaper and lower quality coated fabrics being used in EU Ecolabel furniture.

6.2 Chemical testing requirements

This criterion applies to the upholstery covering materials in the final treated form that they are to be used in the furniture product. In addition to the general conditions on hazardous substances set out in criterion 2, the following restrictions listed in Table 17 shall specifically apply to upholstery covering materials:

Table 17. Chemical testing requirements for leather, textiles and coated fabric covering material.

Chemical	Applicability	Limits (mg/kg)	Test method	
Restricted arylamines from cleavage of azodyes*	Leather	≤ 30 for each amine*	EN ISO 17234-1	
	Textiles and coated fabrics		EN ISO 14362-1 and EN ISO 14362-3	
Chromium VI	Leather	< 3 **	EN ISO 17075	
Free formaldehyde	Leather	≤ 20 (for childrens furniture)*** or ≤ 75 for other furniture	EN ISO 17226-1	
	Textiles and coated fabrics	≤ 20 (for childrens furniture)*** ≤ 75 for other furniture	EN ISO 14184-1	
Extractable heavy metals	Leather	Arsenic ≤ 1.0	Antimony ≤ 30.0	EN ISO 17072-1
		Chromium ≤ 200.0	Cadmium ≤ 0.1	
		Cobalt ≤ 4.0	Copper ≤ 50.0	
		Lead ≤ 1.0	Mercury ≤ 0.02	
		Nickel ≤ 1.0		
	Textiles and coated fabrics	Arsenic ≤ 1.0	Antimony ≤ 30.0****	EN ISO 105 E04
		Chromium ≤ 2.0	Cadmium ≤ 0.1	
		Cobalt ≤ 4.0	Copper ≤ 50.0	
		Lead ≤ 1.0	Mercury ≤ 0.02	
		Nickel ≤ 1.0		
Chlorophenols	Leather	Pentachlorophenol ≤ 0.1 mg/kg Tetrachlorophenol ≤ 0.1 mg/kg	EN ISO 17070	
Alkylphenols	Leather, textiles and coated fabrics	Nonylphenol, mixed isomers (CAS No. 25154-52-3); 4-Nonylphenol (CAS No. 104-40-5) 4-Nonylphenol, branched (CAS No. 84852-15-3) Octylphenol (CAS No. 27193-28-8) 4-Octylphenol (CAS No. 1806-26-4) 4-tert-Octylphenol (CAS No. 140-66-9)	For leather: EN ISO 18218-2 (indirect method)	
		Alkylphenoethoxylates (APEOs) and their derivatives: Polyoxyethylated octyl phenol (CAS No. 9002-93-1) Polyoxyethylated nonyl phenol (CAS No. 9016-45-9) Polyoxyethylated p-nonyl phenol (CAS No. 26027-38-3)	For textiles and coated fabrics: EN ISO 18254 for alkylphenoethoxylates. For alkylphenols final product testing is to be carried out by solvent extraction followed by LC-MS or GC-MS	
Polycyclic Aromatic Hydrocarbons	Textiles, coated fabrics or leather	PAHs restricted under Regulation (EC) No 1907/2006: Chrysene (CAS No. 218-01-9) Benzo[a]anthracene (CAS No. 56-55-3) Benzo[k]fluoranthene (CAS No. 207-08-9) Benzo[a]pyrene (CAS No. 50-32-8) Dibenzo[a,h]anthracene (CAS No. 53-70-3) Benzo[j]fluoranthene (CAS No. 205-82-3) Benzo[b]fluoranthene (CAS No. 205-99-2) Benzo[e]pyrene (CAS No. 192-97-2)	AfPS GS 2014:01 PAK	
		Individual limits for 8 PAHs listed above: ≤ 1 mg/kg		
		Additional PAHs subject to restriction: Naphthalene (CAS No. 91-20-3) Acenaphthylene (CAS No. 208-96-8) Acenaphthene (CAS No. 83-32-9) Fluorene (CAS No. 86-73-7) Phenanthrene (CAS No. 85-1-8)		

Chemical	Applicability	Limits (mg/kg)	Test method
		Anthracene (CAS No. 120-12-7) Fluoranthene (CAS No. 206-44-0) Pyrene (CAS No. 129-00-0) Indeno[1,2,3-c,d]pyrene (CAS No. 193-39-5) Benzo[g,h,i]perylene (CAS No. 191-24-2) Sum Total limit for 18 PAHs listed above: ≤ 10 mg/kg	
N,N-Dimethylacetamide (CAS No. 127-19-5)	Elastane or acrylic-based textiles	Result ≤ 0.005% w/w (≤ 50mg/kg)	Solvent extraction followed by GCMS or LCMS
Chloralkanes	Leather	C10-C13 (SCCP) chloralkanes not detectable C14-C17 (MCCP) chloralkanes ≤ 1000 mg/kg;	EN ISO 18219

* A total of 22 arylamines listed in Entry 43 of Annex XVII to Regulation (EC) No 1907/2006 plus two other compounds (see Table 35 in Appendix IV for a full listed of the arylamines to be tested). Limit of detection for EN ISO 17234-1 is 30mg/kg.

** The detection limit for the EN ISO 17075 is generally assumed to be 3mg/kg.

*** Furniture designed specifically for babies and children less than 3 years old.

**** If the tested textiles have been treated with ATO as a synergist, in accordance with the derogation conditions for ATO use in entry (c) of Table 5, then it shall be exempted from compliance with the leaching limit for antimony.

Assessment and verification:

The applicant shall provide a declaration that the leather, textile fabric or coated fabric upholstery covering material complies with the limits specified in Table 17, supported by test reports.

Textile-based materials that have been awarded the EU Ecolabel in accordance with Commission Decision 2014/350/EU shall be considered compliant with this criterion, however a copy of the EU Ecolabel certificate must be provided.

Rationale:

Upholstery covering materials come into direct contact with users and the potential presence of hazardous substance is an obvious concern. Where skin contact is possible, the extractability of substances can be estimated using artificial sweat solutions. This is reflected in the development of EU Ecolabel criteria for textiles and OEKO-TEX 100 standards for artificial sweat extractable heavy metals. Other hazardous substances that can remain as residues from production processes and that have been addressed in other ecolabel schemes are formaldehyde, arylamine dyes and alkylphenols. The limits have generally been set to align with those in Decision 2014/350/EU for textiles where relevant and for leather, as far as possible a common approach is being taken with the residual hazardous substance criteria currently under development for EU Ecolabel footwear. Regarding alkylphenols, a higher limit of 100 mg/kg was necessary due to the fact that other substances present in leather can result in higher background noise and possible false positive test results during analysis.

Formaldehyde is a chemical residue that is often left after finishing treatments. The most serious hazard classification it has is H351 (suspected of causing cancer) and it is also classified as H317 (skin sensitizer), which is of concern in furniture textiles that come into direct and prolonged skin contact with users. The free formaldehyde limit of 75ppm aligns with the requirements set out in the OEKO-TEX 100 standards for textiles that come into skin contact. It is unclear which Product Group OEKO-TEX considers furniture upholstery in sofas and armchairs to fall under. Clearly these materials are likely to come into direct skin contact more often in domestic furniture but not so much or at all in public furniture. The importance of such a distinction would be that the OEKO-TEX limit would be either 75ppm or 300ppm for extractable formaldehyde. The OEKO-TEX standard is generally referred to in Blue Angel criteria although it should be noted that the Nordic Ecolabel criteria for textiles, hides/skins and leather (Version 4.0, Dec. 2012) state a much more ambitious limit of 20ppm. In the EU Ecolabel

for textiles (Decision 2014/350/EU), the limit of 75ppm refers to interior textiles, which furniture textiles can be considered as (at least for indoor furniture).

The BLC Leather Technology Centre states that modern tanning techniques produce leathers with extractable formaldehyde levels of 400ppm, but that this can be controlled to within limits of 200ppm for general purpose leather and that it is possible to meet limits of 75ppm for leather that will come into direct skin contact and even 20ppm for leather items used by babies (<36 months) by careful choice of chemicals and processing.

In terms of ambition level, it is proposed to match the requirements set out for Blue Angel and Nordic Swan criteria for 75ppm for leather and to match the 75ppm requirement for EU Ecolabel textiles.

Regarding limits on ecoparasiticide concentrations in wool, after examining in detail the EU Ecolabel criteria set for textiles in Decision 2014/350/EU, it became evident that placing a simple limit on ecoparasiticide concentrations could easily be interpreted as being more strict than the EU Ecolabel textile criteria, which would not be justifiable. This situation arises due to the fact that alternative means of verification can be accepted, such as compliance with maximum COD emissions in effluents from wool scouring operations or demonstrating value recovery from certain wastes generated by the wool scouring operation. These criteria would be extremely difficult for furniture manufacturers to verify and are considered unrealistic from so far down the supply chain. Furthermore, the testing specified for residual ecoparasiticide levels is specified for raw wool prior to scouring, not the final textile product. The processing of the wool may dramatically decrease the ecoparasiticide concentrations and render these limits irrelevant.

Where standard tests exist, they are quoted for the particular material type in question (i.e. leather, textile fabrics or coated fabrics). Coated fabric industry representatives confirmed that the standards referred to in this criterion could be complied with by manufacturers of good quality coated fabrics.

6.3 Restrictions during production processes

If the upholstery covering materials account for more than 1.0% w/w of the total furniture product weight (excluding packaging), the supplier of the material shall comply with the restrictions specified in Table 18 on the use of hazardous substances during production.

Table 18. Restricted substances used in leather, textile and coated fabric production stages

1-Hazardous substances used in different production stages	
a) Detergents, surfactants, softeners and complexing agents	
Applicability: To dyeing and finishing process stages in textile, leather or coated fabric production	<p>All non-ionic and cationic detergents and surfactants must be ultimately biodegradable under anaerobic conditions.</p> <p>Assessment and verification: The applicant shall provide a declaration from the leather, textile or coated fabric producer, supported by a declaration from their chemical supplier(s) and by relevant SDSs and results of EN ISO 11734 or ECETOC No 28 OECD 311 tests.</p> <p>The latest revision of the Detergents Ingredients Database shall be used as a reference point for biodegradability and may, at the discretion of the competent body, be accepted as an alternative to providing test reports.</p> <p>http://ec.europa.eu/environment/ecolabel/documents/did_list/didlist_part_a_en.pdf</p>
	<p>Long chain perfluoroalkyl sulfonates ($\geq C6$) and perfluorocarboxylic acids ($\geq C8$) shall not be used in the production processes.</p> <p>Assessment and verification: The applicant shall provide a declaration from the leather, textile or coated fabric producer, supported by a declaration from their chemical supplier(s) and by relevant SDSs of the non-use of these substances for each production stage.</p>
b) Auxiliaries (used in mixtures, formulations and adhesives)	
Applicability: Dyeing and finishing operations for leather, textile or coated fabric production	<p>The following substances shall not be used in any mixtures or formulations for dyeing and finishing of leather, textiles or coated fabrics:</p> <ul style="list-style-type: none"> - bis(hydrogenated tallow alkyl) dimethyl ammonium chloride (DTDMAC) - distearyl dimethyl ammonium chloride (DSDMAC) - di(hardened tallow) dimethyl ammonium chloride (DHTDMAC) - ethylene diamine tetra acetate (EDTA), - diethylene triamine penta acetate (DTPA) - 4-(1,1,3,3-tetramethylbutyl)phenol - Nitrilotriacetic acid (NTA) <p>Assessment and verification: The applicant shall provide a declaration from the leather, textile or coated fabric supplier, supported by relevant SDSs, that these compounds have not been used in any dyeing and finishing operations for leather, textiles or coated fabrics.</p>
c) Solvents	
Applicability: Processing of leather, textile or coated fabric materials	<p>The following substances shall not be used in any mixtures or formulations for the processing of leather, textile or coated fabric materials:</p> <ul style="list-style-type: none"> - 2-Methoxyethanol - N,N-dimethylformamide - 1-Methyl-2-pyrrolidone - Bis(2-methoxyethyl) ether - 4,4'- Diaminodiphenylmethane - 1,2,3-trichloropropane - 1,2-Dichloroethane (ethylene dichloride) - 2-Ethoxyethanol - Benzene-1,4-diamine dihydrochloride - Bis(2-methoxyethyl) ether - Formamide - N-methyl-2-pyrrolidone

	<p>- Trichloroethylene</p> <p>Assessment and verification: The applicant shall provide a declaration from the leather, textile or coated fabric producer, supported by relevant SDSs, that these solvents have not been used in any of the leather, textile or coated fabric production processes.</p>
2-Dyes used in dyeing and printing processes	
<p>i. Carriers used in dyeing process</p> <p>Applicability: Dyeing and printing processes</p>	<p>Where disperse dyes are used, halogenated dyeing accelerants (carriers) shall not be used (Examples of carriers include: 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, chlorophenoxyethanol).</p> <p>Assessment and verification: The applicant shall provide a declaration, supported by declarations of leather, textile or coated fabric producers, their chemical supplier(s) and any relevant SDSs, that states the non-use of any halogenated carriers during the dyeing process of any leather, textiles or coated fabrics used in the furniture product.</p>
<p>ii. Chrome mordant dyes</p> <p>Applicability: Dyeing and printing processes</p>	<p>Chrome mordant dyes shall not be used.</p> <p>Assessment and verification: The applicant shall provide a declaration, supported by declarations of leather, textile or coated fabric producers, their chemical supplier(s) and any relevant SDSs, that states the non-use of any chrome mordant dyes during the dyeing process of any leather, textiles or coated fabrics used in the furniture product.</p>
<p>iii. Pigments</p> <p>Applicability: Dyeing and printing processes</p>	<p>Pigments based on cadmium, lead, chromium VI, mercury, arsenic and antimony shall not be used.</p> <p>Assessment and verification: The applicant shall provide a declaration, supported by declarations of leather, textile or coated fabric producers, their chemical supplier(s) and any relevant SDSs, that states the non-use of any pigments based on the mentioned heavy metals during dyeing or printing processes with any leather, textiles or coated fabrics used in the furniture product.</p>
3-Finishing processes	
<p>i. Fluorinated compounds</p> <p>Applicability: Upholstery covering materials with integrated water or stain repellent function</p>	<p>Fluorinated compounds shall not be impregnated into furniture upholstery covering material finishes in order to impart water, stain and oil repellent functions. This restriction includes perfluorinated and polyfluorinated substances. Non-fluorinated treatments using substances that are readily or inherently biodegradable or have a low potential to bioaccumulate in the aquatic environment shall be permitted.</p> <p>Assessment and verification: The applicant shall provide a declaration of compliance, supported by declarations from leather, textile or coated fabric producers, declarations from chemical supplier(s) and any relevant SDSs, that state non-use of fluorinated, perfluorinated or polyfluorinated substances in leather, textile or coated fabric finishing operations.</p> <p>In the absence of an acceptable declaration, the competent body may further request testing of the covering material according to the methods defined by CEN/TS 15968.</p> <p>For non-fluorinated treatments, readily or inherently biodegradability properties may be demonstrated by tests conducted according to the following methods: OECD 301 A, ISO 7827, OECD 301 B, ISO 9439, OECD 301 C, OECD 301 D, ISO 10708, OECD 301 E, OECD 301 F, ISO 9408.</p> <p>A low potential to bioaccumulate shall be demonstrated by tests that show an octanol-water partition coefficients (Log Kow) of < 3.2 or Bioconcentration Factors (BCF) < 100.</p> <p>With non-fluorinated treatments, the latest revision of the Detergents Ingredients Database shall be used as a reference point for biodegradability and may, at the discretion of the competent body, be accepted as an alternative to providing test reports.</p> <p>http://ec.europa.eu/environment/ecolabel/documents/did_list/didlist_part_a_en.pdf</p>
4 – Tannery effluent quality and specific water consumption	

<p>Applicability:</p> <p>Leather production process</p>	<p>(i) The COD value in wastewater from leather tanning sites, when discharged to surface waters after treatment (whether on-site or off-site), shall not exceed 200 mg /l.</p> <p>Assessment and verification: the applicant or material supplier, as appropriate, shall provide a declaration of compliance supported by detailed documentation and test reports in accordance with ISO 6060 showing compliance with this criterion on the basis of monthly averages for the six months preceding the application. The data shall demonstrate compliance of the production site or, if the effluent is treated off-site, of the wastewater treatment operator.</p>										
<p>Applicability:</p> <p>Leather production process</p>	<p>(ii) Total chromium concentration in tannery wastewater after treatment shall not exceed 1.0 mg/l as specified in the Commission Implementing Decision 2013/84/EU¹⁹.</p> <p>Assessment and verification: the applicant or material supplier, as appropriate, shall provide a declaration of compliance supported by a test report using one of the following test methods: ISO 9174 or EN 1233 or EN ISO 11885 for chromium and showing compliance with this criterion on the basis of monthly averages for the six months preceding the application. The applicant shall provide a declaration of compliance with BAT 10, and either BAT 11 or 12, as appropriate, of Commission Implementing Decision 2013/84/EU for the reduction of chromium content of wastewater discharges.</p>										
<p>Applicability:</p> <p>Leather production process</p>	<p>(iii) Water consumption expressed as annual average volume of water consumed per tonne of raw hides and skins shall not exceed the limits given below:</p> <table border="1" data-bbox="424 846 1244 1016"> <tr> <td>Hides</td> <td>28 m³/t</td> </tr> <tr> <td>Skins</td> <td>45 m³/t</td> </tr> <tr> <td>Vegetable tanned leather</td> <td>35 m³/t</td> </tr> <tr> <td>Pig skin</td> <td>80 m³/t</td> </tr> <tr> <td>Sheepskins</td> <td>180 l/skin</td> </tr> </table> <p>Assessment and verification: the applicant shall provide a declaration of compliance from the leather supplier or leather manufacturing company, as appropriate. The declaration shall specify the annual amount of leather production and related water consumption based on the monthly average values of the last twelve months preceding the application, measured by the quantity of waste water discharged.</p> <p>If the leather production process is conducted in different geographical locations, the applicant or supplier of semi-finished leather shall provide documentation that specifies the quantity of water discharged (m³) for the quantity of semi-finished leather processed in tonnes (t) or number of skins for sheepskin, as appropriate, based on the monthly average values during the twelve months preceding the application.</p>	Hides	28 m ³ /t	Skins	45 m ³ /t	Vegetable tanned leather	35 m ³ /t	Pig skin	80 m ³ /t	Sheepskins	180 l/skin
Hides	28 m ³ /t										
Skins	45 m ³ /t										
Vegetable tanned leather	35 m ³ /t										
Pig skin	80 m ³ /t										
Sheepskins	180 l/skin										

Assessment and verification:

The applicant shall compile all relevant declarations, SDSs and supporting test reports from leather, textile or coated fabric producers, or their suppliers, that are relevant to demonstrate compliance with the requirements for non-use of the hazardous substances listed in Table 18.

Upholstery covering materials made of textiles that have been awarded the EU Ecolabel in accordance with Commission Decision 2014/350/EU shall be considered compliant with this criterion for non-use of the listed hazardous substances during production processes, however a copy of the EU Ecolabel certificate must be provided.

General rationale

The criterion should be relatively straightforward for producers to verify in the sense that all necessary information should be provided from chemical suppliers upon request or generated by good batch process control and record-keeping.

For the avoidance of doubt, a declaration of non-use should only extend to the chemical formulations actually used directly in the treatment of leather, textile or coated fabrics and should in no cases extend to chemicals or substances used in the production of any basic chemical feedstocks, as this could quickly become not only burdensome but also unworkable and irrelevant. This approach aims to align closely with the recently published EU Ecolabel criteria for footwear.

The main impact of this criterion is to send a signal to leather, textile and coated fabric producers to avoid the use of hazardous substances in their production processes and will in turn send a signal to chemical suppliers to either focus on developing less hazardous alternatives or making it clearer that their products avoid the use of these substances. This signal should be especially significant for leather producers if the criteria for footwear and furniture are well aligned. Furniture alone accounts for some 14% of all leather production.

Rationale for COD limits in tannery effluent

The wastewater produced by European tanneries is treated in many different ways and both on-site and off-site treatment is used. In some cases an individual plant applies the Best Available Technologies (BAT) on-site, whereas in other situations only pre-treatment, partial pre-treatment or no treatment at all is applied, redirecting the effluent to a communal treatment plant²¹. More than 80 % of tanneries in Europe discharge their effluent to public sewers. The main exceptions are parts of Italy and Spain where the tanneries are in clusters connected to common effluent treatment plants²². The acceptable level of effluent treatment required, before its discharge to the water environment, differs according to national requirements..

The proposed revised criterion is harmonised with the Commission Implementing Decision No 2013/84/EU on industrial emissions for the tanning of hides and skins, proposing the minimum value 200 mg/l COD. The monitoring should be based on the monthly average for the six months preceding the application.

The proposal to integrate under the revised criterion other than COD emission parameters was generally not supported. The recommendation to assess fish eggs toxicity for direct discharges has been assumed as being of low reliability and limited applicability in the tannery process. It is not listed as a BAT-AEL in the Commission Implementing Decision 2013/84/EU but instead as a quality parameter which is taken into account at the stage of granting the operating permit of the treatment plant, especially if any fish eggs should be present in the receiving waters.

Rationale for chromium limits in tannery effluent

The wastewater produced by European tanneries is treated in many different ways, both on-site and off-site treatment is used. In some cases an individual plant applies the Best Available Technologies (BAT) on-site, whereas in other situations only pre-treatment, partial pre-treatment or no treatment at all is applied, redirecting the effluent to a communal treatment plant. More than 80 % of tanneries in Europe discharge their effluent to public sewers. The main exceptions are those parts of Italy and Spain, where the tanneries are in clusters connected to common effluent treatment plants. The differences in legal requirements between Member States concerning the quality of the waste water discharged into environment along with the implementation of the Directive 91/271/EEC were stated during the consultation process for the EU Ecolabel criteria revision for footwear.

The criterion proposal is harmonized with BAT-associated emissions levels for tanning of Hides and Skins¹⁹.

BAT-AELs values according to the Commission Implementing Decision 2013/84/EU¹⁹ for total chromium content are set for monthly average values in the range of 0.3 to 1 mg/l. In order to take into account the differences in the water treatment infrastructure throughout Europe, the proposed Cr

total emission threshold value reflects the higher threshold of BAT-associated emission levels. The emission levels apply for:

- Direct waste water discharge from tanneries on-site waste water treatment plants,
- Direct waste water discharge from independently operated treatment of waste water under section 6.11 in Annex 1 to Directive 2010/75/EU treating waste water mostly from tanneries.

In order to reduce the chromium content of waste water discharges directly after treatment, BAT is to apply on-site or off-site chromium precipitation. The BAT-AELs (Associated Emission Levels) for direct dischargers applies to the point of discharge in the receiving water stream and the BAT-AELs for indirect dischargers applies to the waste water before it is discharged to the municipal (or industrial) waste water plant. In practice, it means that every tannery should apply water pre-treatment.

With reference to the analytical test method proposed according to Commission Implementing Decision 2013/84/EU, (point 1.2.) BAT is to monitor emissions and other relevant process parameters, with the given associated frequency and to monitor emissions according to EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality. The proposal to use other standardised quantification methods under EU Ecolabel aims at giving to the applicant more flexibility to check the compliance with the criterion.

BAT AELs- recommends using weekly or monthly monitoring of waste water. The annual reporting emission was perceived by stakeholders as the most practical approach for assessment and verification. It is proposed to use monthly average for 6 months before the application (6 values in total).

Rationale for water consumption limits

The following rationale is the same that has been produced during the revision of criteria relating to leather used in EU Ecolabel footwear. It should be noted that while many different types of leather based on different animal hides and skins can be used in footwear, this is not the case with furniture. In furniture products, due to their larger size, most leather used is produced from hides of cows or horses. Consequently, the water consumption limits for these processes are most relevant. Nonetheless, in some rare cases, leather from other animal skins may potentially be used in smaller items such as cushions.

Most of a tannery's operations are wet-processes. Water consumption during tanning of hides and skins can be attributed to water used in the production processes and for cleaning, energy generation, waste water treatment and sanitary purposes.

In order to minimise water consumption, Best Available Techniques (BAT) Reference Document for the Tanning of Hides and Skins²² suggests using one or both of the techniques given below:

- Optimization of water use in all wet process steps, including the use of batch washing instead of running water washes. Optimisation of water use is achieved by determining the optimum quantity required for each process step and introducing the correct quantity using dosing equipment. Batch washing involves washing hides and skins during processing by introducing the required quantity of clean water into the processing vessel and using the action of the vessel to achieve the required agitation, as opposed to running water washes which use the inflow and outflow of large quantities of water.
- Short floats reduce process water consumption per mass of hides or skins processed compared to traditional practices. A minimum amount of water is needed because it also functions as a lubricant and coolant for the hides or skins during processing. The rotation of process vessels containing a limited amount of water requires more robust geared drives because the mass being rotated is uneven.

The Commission Implementing Decision 2013/84/EU established the relation between the leather origin (animal type) and the quantity of water consumed. Accordingly, “hides” and “skins” are defined as follows:

- Hides: the pelts of large animals, such as cattle or horses;
- Skin: the pelt of a small animal, such as calf, pig or sheep.

BAT-associated water consumption limits, as established by the Commission Implementing Decision 2013/84/EU, are specified in Table 19 (for bovine hides) and Table 20 (for sheepskins).

Table 19: BAT water consumption levels – Raw hide

Process stages	Water consumption per tonne of raw hide* (m ³ /tonne)	
	Unsalted hides	Salted hides
Raw to wet blue/white	10 to 15	13 to 18
Post-tanning processes and finishing	6 to 10	6 to 10
Total	16 to 25	19 to 28

*Monthly average values. Processing of calfskins and vegetable tanning may require a higher water consumption.

Table 20: BAT water consumption levels – Skin

Processes stages	Specific water consumption** (litres/skin)
Raw to pickle	65 to 80
Pickle to wet blue	30 to 55
Post-tanning processes and finishing	15 to 45
Total	110 to 180

**Monthly average values. Wool-on sheepskins may require a higher water consumption.

The information on the water consumption during tanning process included in other schemes of reference have been crossed checked and can be summarised as follows:

- (i) Nordic Ecolabel for textiles, hides/skins and leather set the general requirement of 25m³ water/tonne hides/skins and leather that is treated;
- (ii) The Blue Angel for footwear RAL-UZ 155 establishes the relation between water consumption and animal typology:
 - 25 m³/tonne for raw skins of cattle,
 - 45 m³/tonne for hides of calves, goats and kangaroos,
 - 80 m³/tonne for skins of pigs, and
 - 120 m³/tonne for hides of sheep.

Information from stakeholder discussion about the proposed limits led to the conclusions stated below:

1. Hides and skins: For the purpose of the criterion revision, the water consumption during tanning of hides is proposed to be harmonised with the BAT-associated consumption levels (BAT-AELs) as indicated in Table 19 (i.e. 28 m³/tonne). The BAT-AELs do not set a general limit for water consumption during processing of skins such as cattle, goats, kangaroos, etc. It is therefore proposed to refer in the criterion to the average value calculated based on data gathered from several EU Ecolabel license holders for footwear: 44,61 m³/tonne for skins (proposed limit value: 45 m³/tonne of skins). The BAT Reference Document specifies that for the processing of calfskins about 40 m³/tonne and sometimes more is needed²¹. Industry stakeholders stated that this limit was far too low to comply with and that a more practical limit would be 80 m³/tonne.

2. Pig skins: Following the information collected from operating European tanneries in 2008 and 2011 processing of pig skin required 85 m³/tonne of skin. Blue Angel for footwear refers to 80 m³/tonne. It is proposed to align EU Ecolabel requirement with the Blue Angel criteria for footwear.

3. Sheepskins: Because of the nature of the wool, sheepskins generally require more water in wet processing than bovine hides. Water consumption during sheepskin processing is related to the material weight and might range from 30 to 180 m³/tonne. One sheep skin weighs from 1 to 6 kg¹⁹. It is proposed to follow AELs-BAT value, i.e. to require 180 l/skin²³.

4. Vegetable tanning: The process might require higher water consumption than chromium-based techniques. CEN/TC 289/WG4²⁴ specifies water consumption during “vegetable” leather tanning in pits at 35 m³/tonne. The Commission Implementing Decision 2013/84/EU for Tanning of Hides and Skins does not introduce BAT-AELs value for water consumption during vegetable tanning process. Following stakeholder feedback, it is proposed to harmonize with the 35m³/tonne requirement of CEN/TC 289/WG4: Leather – Criteria defining the performance characteristics of leather with a low environmental impact.

Measures established in order to reduce water consumption should refer to the entire tanning process. Water consumed should be expressed by the amount of waste water discharged. This is considered a viable parameter to be monitored and quantified. This approach also offers more flexible approach to these sites that recirculate water within different process stages.

6.4 Cotton and other natural cellulosic seed fibres

Cotton that contains equal or greater than 70 % weight by weight of recycled content is exempted from the requirements of criterion 6.4.

Cotton and other natural cellulosic seed fibres (hereinafter referred to as cotton) that are not recycled fibres, shall contain a minimum content of either organic cotton (see criterion 6.4(a)) or integrated pest management (IPM) cotton (see criterion 6.4(b)).

Textiles that have been awarded the EU Ecolabel based on the ecological criteria established in Commission Decision 2014/350/EU are considered to comply with criterion 6.4.

Assessment and verification:

The applicant or material supplier, as appropriate, shall provide a declaration of compliance.

Where EU Ecolabel textiles are used, the applicant shall provide a copy of the EU Ecolabel certificate showing that it was awarded in accordance with Decision 2014/350/EU.

Where applicable, recycled content shall be traceable back to the reprocessing of the feedstock. This shall be verified by independent third party certification of the chain of custody or by documentation provided by feedstock suppliers and reprocessors.

6.4(a) Organic production standard

A minimum of 10% weight by weight of the non-recycled cotton fibre used in upholstery materials shall be grown according to the requirements laid down in Council Regulation (EC) No 834/2007²⁵, the US National Organic Programme (NOP) or equivalent legal obligations set by trading partners of the EU. The organic cotton content may include organically grown cotton and transitional organic cotton.

Where the organic cotton is to be blended with conventional or IPM cotton, cotton shall be from non-genetically modified varieties.

Organic content claims may only be made when the organic content is a minimum of 95%.

Assessment and verification:

The applicant or material supplier, as appropriate, shall provide a declaration of compliance for the organic content supported by evidence certified by an independent control body to have been produced in conformity with the production and inspection requirements laid down in Regulation (EC) No 834/2007, the US National Organic Programme (NOP) or those set by other trading partners. Verification shall be provided for each country of origin.

The applicant or material supplier, as appropriate, shall demonstrate compliance with the minimum organic cotton content requirement based on the annual volume of cotton purchased to manufacture the final product(s) and according to each product line. Transaction records and/or invoices shall be provided that document the quantity of certified cotton purchased.

For conventional or IPM cotton that is used in blends with organic cotton, a screening test for common genetic modifications shall be accepted as a proof of compliance of the cotton variety.

6.4(b) Cotton production according to Integrated Pest Management (IPM) principles and restriction on pesticides

A minimum of 20% weight by weight of the non-recycled cotton fibre used in upholstery materials shall be grown according to IPM principles as defined by the UN Food and Agricultural Organisation (FAO) IPM programme, or Integrated Crop Management (ICM) systems incorporating IPM principles.

IPM cotton destined for use in the final product shall be grown without the use of any of the following substances: aldicarb, aldrin, campheclor (toxaphene), captafol, chlordane, 2,4,5-T, chlordimeform, cypermethrin, DDT, dieldrin, dinoseb and its salts, endosulfan, endrin, heptachlor, hexachlorobenzene, hexachlorocyclohexane (total isomers), methamidophos, methylparathion, monocrotophos, neonicotinoids (clothianidine, imidacloprid, thiametoxam), parathion, pentachlorophenol.

Assessment and verification:

The applicant or material supplier, as appropriate, shall provide a declaration of compliance with criterion 6.4(b), supported by evidence that at least 20% weight by weight of the non-recycled cotton contained in the product has been grown by farmers that have participated in formal training programmes of the UN FAO or Government IPM and ICM programmes and/or that have been audited as part of third party certified IPM schemes. Verification shall either be provided on an annual basis for each country of origin or on the basis of certifications for all IPM cotton purchased to manufacture the product.

The applicant or material supplier, as appropriate, shall also declare that the IPM cotton was not grown using any of the substances listed in criterion 6.4(b). IPM certification schemes that exclude the use of listed substances shall be accepted as a proof of compliance.

Rationale

Research carried out as part of the revision process for EU Ecolabel and Green Public Procurement (GPP) Criteria for Textiles indicated that ecotoxicity associated with production and use of fertilisers and pesticides is one of the main environmental impacts related to the cotton life cycle. Conventional cotton is one of the most intensively treated crops, accounting for 2.5% of the world's cultivated land but 16% of insecticide consumption²⁶. Energy consumption is also of importance in these stages. Furthermore, the impact of water use for irrigation was also highlighted as being significant. Organic cotton farming seeks to restore and build up the soil, increasing its organic matter content²⁷. A shift towards organic cotton and recycled cotton would greatly reduce environmental impacts associated with cotton although for organic cotton, this would not address water use²⁸.

Recycled cotton

Fibres and their feedstock may be obtained from a range of different sources including recycling. When discussing the recycling of textiles one has to distinguish between post-industrial waste and post-consumer waste. Pre-consumer waste comes from fibre processing and/or product manufacturing, e.g. weaving, cutting, or excess production.

The standard practice in most spinning mills is to transferred residual material from one process into the feed stock of another e.g. for example ring spinning waste will either be fed into the open end spinning line which can handle shorter staple length or be sent back to the beginning of the chain and reincorporated in the bale opening process. The post –industrial material form therefore the close loop and could be considered rather as a by-product.

Post-consumer waste forms a part of household waste stream, e.g. used apparel or home textile products. The recycling of consumer waste is more complex since it commonly consists of unknown fibre mixtures.

Commonly most textiles are blended fabrics²⁹. The recovered fibres from cotton waste can be used to produce blended yarns (cotton waste/virgin fibres) in different portions. They are used in the carded non-woven industry³⁰. Post-consumer cotton waste coming from household resources tends to be recycled into lower quality and non-visible products such nonwovens and felts for applications in car insulation, roofing felt, loudspeaker cones, fillings, etc. Blended materials are more difficult to recycle, whereas plain cotton can be made into new cotton yarn and used to make new fabric³¹.

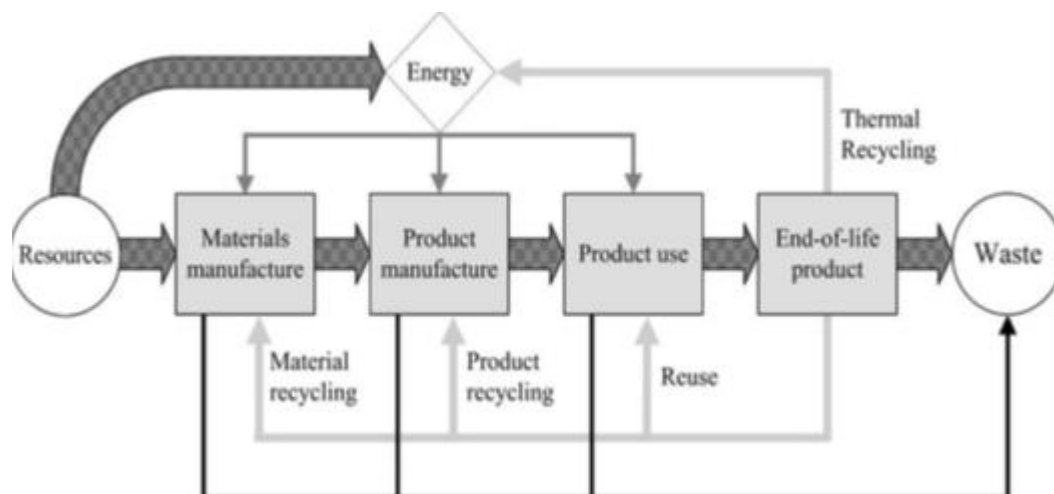


Figure 6.. Schematic flow diagram of 'cradle to grave' process showing the different routes for cycle processes (recycling)³²

When recycled, the waste are segregated by type and colour then placed into stripping machines that breaks the fabric into pieces. Fibres are then pulled apart and the mixture is carded several times to clean and mix the fibres before being respun into new yarns³³. The colour and composition separation at the beginning of the process is a labour-intensive operation that is not financially viable in all economies³⁴. The material knowledge is key issue for the recycling process, if considered, the blended fibres are separated.

The high content of short fibres which is typical for recycled material decreases mechanical properties of the yarn. To improve fibre quality it may get blended with longer staple virgin fibres or synthetic feedstock to improve yarn strength and spinability. The requirements of quality imposed on the finished products allow only the addition of tiny quantities of recovered fibres. The quantity of recycled content in fabrics is a subject of technical specification (durability) of material meant to be used in footwear therefore the exact % w/w of recyclates content should be a subject of case by case analysis³⁵.

In alignment with the approach for EU Ecolabel footwear, exemption from the cotton criteria may be granted if at least 70% w/w of the cotton is recycled content. Recycled cotton is an alternative source of fibre that would reduce the need for cotton cultivation and reduce the occurrence of cotton fabrics in waste streams. The chain of custody for recycled content can now be certified by a number of emerging schemes. The Global Recycling Standard is the most significant and was developed by Control Union Certifications. Since 2011 the standard is owned by the Textile Exchange (formally known as the Organic Exchange).

Pesticides

The Stockholm Convention on Persistent Organic Pollutants (POPs)³⁶ seeks to eliminate the use and production of chemicals that share a number of characteristics: highly toxic, persistent, can travel long distances and bioaccumulate in the food chain.

The World Health Organisation (WHO) recommends classification of Pesticides by hazard³⁷. WHO Class I refers to those pesticides classified by the World Health Organisation as either Extremely (I a) or Highly (I b) Hazardous, based on their acute risk, that is the hazard referred to is "*the risk of single or multiple exposures over a relatively short period of time that might be encountered accidentally by any person handling the product in accordance with the directions for handling by the manufacturer or in accordance with the rules laid down for storage and transportation by competent international bodies*".

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade assists parties to reduce risks from certain hazardous pesticides in international trade. The Convention, together with the Stockholm and Basel conventions and FAO's voluntary Code of Conduct, promotes a life cycle approach and provides the necessary tools for managing pesticides³⁸.

The emerging certification systems such as the Better Cotton Initiative, Cotton Made in Africa and Fair Trade ban the use of pesticides that are listed on the Stockholm Convention, PIC list as well as WHO Class 1 (1a - Extremely hazardous, and 1b - Highly hazardous) pesticide classification lists³⁹.

The results of annual pesticides testing of raw cotton commissioned by the Bremen Cotton Exchange between 1994 and 2013 shows limited detection of pesticide residues⁴⁰. Evidence gathered during the technical work developed in the support of the EU Ecolabel revision for textile criteria suggests that the testing of raw cotton may not always act as an effective safeguard, and that pesticide testing of the cotton boll is not an effective/accurate method for determining specific pesticide use/non-use. Pesticide restrictions can only have scientific value if they are supported by stronger verification e.g. farmer/producer group declarations. However, it currently appears that this may only be possible to obtain in conjunction with an IPM scheme. The stronger criteria focus was therefore suggested on production systems such as IPM and organic, which are intended to educate farmers and control pesticide use at source. IPM production has the potential to achieve substantial reductions in pesticide and fertiliser use whilst achieving the highest recorded yields for cotton. This production option would ensure that the Ecolabel can achieve an acceptable market share and pricing, particularly for commercial products, whilst achieving a significant environmental improvement in cotton production.

Organic and IPM cotton

Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products sets out basic objectives and general principles for organic farming. The objectives focus on sustainable agriculture and production quality including vegetative propagating material and seed used for crops. In general terms, the costs of production, processing and seed purchase still remain a major problem to the organic cotton industry. Nonetheless use of organic cotton appears to gain more importance in certain product groups.

According to the Organic Exchange Farm and Fibre Report 2009, organic cotton was grown in 22 countries with the top ten producer countries being led by India, and including (in order of rank) Turkey, Syria, Tanzania, China, United States, Uganda, Peru, Egypt and Burkina Faso. Approximately 220,000 farmers grew organic cotton fibre. World organic cotton production amounted to 175,113 metric tons in 2008/09, 20% higher than in 2007/08, and was grown on 253,000 hectares⁴¹. Nevertheless, organic cotton represents less than 1% of global cotton production⁴².

IPM cotton is an approach to pest management based on ecologically sustainable control measures which are cost effective and safe for the farmer and consumer. Most success is achieved with IPM which works with farmers in a participatory way, using group discussions and farmer experimentation throughout a growing season. The emphasis is on reduction, and where possible elimination, of pesticide use.

Different minimum organic cotton contents (10% or 95%) and minimum IPM cotton contents (20% or 60%) are stated in EU Ecolabel textile criteria depending on the nature of the final product. The higher limits were principally for textiles in products that come into close and prolonged skin contact during normal use, such as t-shirts, socks and underwear. By choosing the lower minimum requirements, it can be ensured that any cotton material that has been awarded the EU Ecolabel for textiles can be used in EU Ecolabel furniture. Furthermore, the lower requirements for organic or IPM cotton contents

are supported by the fact that furniture upholstery should not come into as much direct skin contact as clothes items such as t-shirts and underwear.

In the interests of creating synergies between different EU Ecolabel products with common materials, the cotton criteria for EU Ecolabel furniture and EU Ecolabel footwear have been aligned, as far as is practical, with that of EU Ecolabel textiles adopted in Decision 2014/350/EU.

However, initial experience with the cotton criteria adopted in Decision 2014/350/EU has revealed problems relating to the proof of non-GMO origin of cotton. If testing at the batch level for cotton bales is a problem for textile manufacturers, then it will be an even bigger problem for furniture manufacturers, since they are at least one or two steps further down the supply chain.

Discussions at the EUEB level regarding GMO-cotton were focussed on potential amendments to the criteria for EU Ecolabel textiles and did not form any direct part of the revision process for EU Ecolabel furniture criteria. Nonetheless, these discussions did have an impact on the final wording of the cotton criteria for EU Ecolabel furniture, due to the desire to align criteria for common materials in different product groups. For ease of reference, a brief summary of the discussion between EU Competent Bodies and Member State experts relating to GMO and organic cotton is provided below.

Some stakeholders, including Member State representatives, proposed to remove part of the original requirements for any non-organic cotton blended with organic cotton to be of non-GMO origin.

After considerable debate, it was decided not to remove the requirement that any non-organic cotton blended with organic cotton be of non-GMO origin despite specific requests from several stakeholders. The main reason for this was cited as the currently ongoing discussions about the revision of the Organic Regulation which indicate that cotton may be included in the scope of the Regulation, probably in a form used as raw material in early stages of the production of textiles e.g. as carded cotton.

6.5 PVC-based coated fabrics

Criterion 6.5 was removed from the final voted legal text prior to positive voting at the Regulatory Committee on 22 January 2016 because it is no longer relevant to the Product Group scope for EU Ecolabel furniture. A detailed explanation of the reasons for this change can be found in the text box inserted under criterion 4 on page 41 of this report.

Where PVC is used in coated fabrics, the PVC resin shall have been supplied from producers that can demonstrate compliance with vinyl chloride monomer (VCM) emissions stated in Table 21 for their production facility.

Table 21. VCM emission limits for PVC production and from the resin product

	Suspension process (S-PVC)	Emulsion process (E-PVC)	Combined process (E+S PVC)*
Total VCM emissions to air (including fugitive emissions)	< 100 g/tonne PVC	----- < 1000 g/tonne PVC -----	
VCM concentration in aqueous effluents	< 1 g/m ³ effluent and < 5 g/tonne PVC	< 1 g/m ³ effluent and < 10 g/tonne PVC	< 1 g/m ³ effluent and < 5 g/tonne PVC
VCM concentration in final resin product	----- < 1g / tonne PVC -----		

* The combined process applies to where aqueous effluents from separate emulsion and suspension processes are combined prior to any treatment and final discharge.

Assessment and verification:

The applicant shall provide either:

- (i) A declaration from the applicant stating that PVC-based coated fabrics have not been used in the final furniture product; or
- (ii) A declaration from the applicant stating that PVC-based coated fabrics have been used in the furniture product, together with a declaration from the producer of the PVC-based coated fabric stating that the PVC-based coated fabric was produced in accordance with the VCM emission limits set out in Table 21. The declaration of the PVC producer shall:
 - Specify whether PVC was produced using the Emulsion Process or the Suspension Process and if aqueous effluent is treated for combined plants.
 - Include evidence of compliance with the relevant total, atmospheric and aqueous VCM emission limits specified in Table 21 via test reports according to EN 13649, ISO 1031 or equivalent methodology.
 - Include third party verified evidence of compliance with the limit for residual VCM in the final PVC material via test reports of representative samples following the EN ISO 6401 standard or equivalent methodology.

Rationale:

The same rationale as stated in criterion 3.2b) and 4.2b) apply here.

Criterion 7. Upholstery padding materials

7.1. Latex foam

7.1(a) Restricted substances

The concentrations in the latex foam of the substances listed below shall not exceed the limit values shown in Table 22.

Table 22. Restricted substances in latex foams used in furniture upholstery padding materials

Group of substances	Substance	Limit value (ppm)	Assessment and verification conditions
Chlorophenols	mono- and di-chlorinated phenols (salts and esters)	1	A
	Other chlorophenols	0.1	A
Heavy metal	As (Arsenic)	0.5	B
	Cd (Cadmium)	0.1	B
	Co (Cobalt)	0.5	B
	Cr (Chromium), total	1	B
	Cu (Copper)	2	B
	Hg (Mercury)	0.02	B
	Ni (Nickel)	1	B
	Pb (Lead)	0.5	B
	Sb (Antimony)	0.5	B
Pesticides*	Aldrin	0.04	C
	o,p-DDE	0.04	C
	p,p-DDE	0.04	C
	o,p-DDD	0.04	C
	p,p-DDD	0.04	C
	o,p-DDT	0.04	C
	p,p-DDT	0.04	C
	Diazinone	0.04	C
	Dichlorfenthion	0.04	C
	Dichlorvos	0.04	C
	Dieldrin	0.04	C
	Endrin	0.04	C
	Heptachlor	0.04	C
	Heptachlorepoxyde	0.04	C
	Hexachlorobenzene	0.04	C
	Hexachlorocyclohexane	0.04	C
	α-Hexachlorocyclohexane	0.04	C
	β-Hexachlorocyclohexane	0.04	C
	γ-Hexachlorocyclohexane (Lindane)	0.04	C
	δ-Hexachlorocyclohexane	0.04	C
	Malathion	0.04	C
Methoxychlor	0.04	C	
Mirex	0.04	C	
Parathion-ethyl	0.04	C	
Parathion-methyl	0.04	C	
Other specific substances that are restricted	Butadiene	1	D

* Only for foams composed of natural latex for at least 20 % by weight.

Assessment and verification:

The applicant shall provide a declaration of compliance with criterion 7.1(a) and, if applicable, test reports according to the following methods:

A. For chlorophenols the applicant shall provide a report presenting the results of the following test procedure. 5 g of sample shall be milled and chlorophenols shall be extracted in the form of phenol (PCP), sodium salt (SPP) or esters. The extracts shall be analysed by means of gas chromatography (GC). Detection shall be made with mass spectrometer or electron capture detector (ECD).

B. For heavy metals the applicant shall provide a report presenting the results of the following test procedure. Milled sample material is eluted in accordance with DIN 38414-S4 or equivalent in a ratio of 1:10. The resultant filtrate shall be passed through a 0.45 µm membrane filter (if necessary by pressure filtration). The solution obtained shall be examined for the content of heavy metals by inductively coupled plasma optical emission spectrometry (ICP-OES), also known as inductively coupled plasma atomic emission spectrometry (ICP-AES), or by atomic absorption spectrometry using a hydride or cold vapour process.

C. For pesticides the applicant shall provide a report presenting the results of the following test procedure. 2 g of sample is extracted in an ultrasonic bath with a hexane/dichloromethane mixture (85/15). The extract is cleaned up by acetonitrile agitation or by adsorption chromatography over florisil. Measurement and quantification are determined by gas chromatography with detection on an electron capture detector or by coupled gas chromatography/mass spectrometry. The testing on pesticides is requested for latex foams with a content of at least 20% natural latex.

D. For butadiene the applicant shall provide a report presenting the results of the following test procedure. Following milling and weighing of the latex foam, headspace sampling shall be performed. Butadiene content shall be determined by gas chromatography with detection by flame ionisation.

Rationale:

Latex foam, together with polyurethane foam, account for around 90% of all padding/filling materials used in furniture and so specific criteria should predominantly focus on these materials. Following the same approach as EU Ecolabel criteria set out for bed mattresses in Decision 2014/391/EC, the criteria align with that Decision on restricted hazardous substances and VOC emissions.

The criteria for bed mattresses were published in June 2014 and will run in parallel with the furniture criteria for several years. A good alignment will help simplify the process for applicants who may manufacture foamed padding material for both bed mattresses and upholstered furniture.

7.1(b) 24h VOC emissions

After 24 hours, the test chamber concentrations of the VOCs listed below shall not exceed the limit values shown in Table 23.

Table 23. VOC emission limits for latex foams

Substance	Limit value (mg/m ³)
1,1,1 – trichloroethane	0.2
4-Phenylcyclohexene	0.02
Carbon Disulphide	0.02
Formaldehyde	0.005
Nitrosamines*	0.0005
Styrene	0.01
Tetrachloroethylene	0.15
Toluene	0.1
Trichlorethylene	0.05
Vinyl chloride	0.0001
Vinyl cyclohexene	0.002
Aromatic hydrocarbons (total)	0.3
VOCs (total)	0.5

* N-nitrosodimethylamine (NDMA), N-nitrosodiethylamine (NDEA), N-nitrosomethylethylamine (NMEA), N-nitrosodi-i-propylamine (NDIPA), N-nitrosodi-n-propylamine (NDPA), N-nitrosodi-n-butylamine (NDBA), N-nitrosopyrrolidinone (NPYR), N-nitrosopiperidine (NPIP), N-nitrosomorpholine (NMOR).

Assessment and verification:

The applicant shall provide a declaration of compliance with criterion 7.1(b) which, if applicable, shall be supported by a test report presenting the results of chamber test analysis in accordance with ISO 16000-9.

The wrapped sample shall be stored at room temperature at least for 24 hours. After this period the sample shall be unwrapped and immediately transferred into the test chamber. The sample shall be placed on a sample holder, which allows air access from all sides. The climatic factors shall be adjusted according to ISO 16000-9. For comparison of test results, the area specific ventilation rate ($q=n/l$) shall be 1. The ventilation rate shall be between 0.5 and 1. The air sampling shall be done 24 ± 1 h after loading of the chamber during 1 hour on DNPH cartridges for the analysis of formaldehyde and other aldehydes and on Tenax TA for the analysis of other volatile organic compounds. Sampling duration for other compounds may be longer but shall be completed before 30 hours.

The analysis of formaldehyde and other aldehydes shall comply with the standard ISO 16000-3. Unless specified differently, the analysis of other volatile organic compounds shall comply with the standard ISO 16000-6.

Testing following the standard CEN/TS 16516 shall be considered as equivalent to those of the ISO 16000 series of standards.

The analysis of nitrosamines shall be done by means of gas chromatography in combination with a thermal energy analysis detector (GC-TEA), in accordance with the BGI 505-23 method (formerly: ZH 1/120.23) or equivalent.

Rationale:

The same rationale as with the previous criteria for latex foam applies.

VOC testing is permitted on smaller samples of foam materials to permit testing in smaller emission chambers which are cheaper and more widely available.

7.2 Polyurethane (PUR) foam

7.2(a) Restricted substances

The concentrations in the PUR foam of the substances listed below shall not exceed the limit values shown in Table 24.

Table 24. List of restricted substances in PUR

Substance group	Substance (acronym, CAS number, element symbol)	Limit value	Method
Biocidal products		Not added intentionally	A
Flame retardants		Not added (unless in compliance with conditions in Table 5 entries b and c)	A
Heavy Metals	As (Arsenic)	0.2 ppm	B
	Cd (Cadmium)	0.1 ppm	B
	Co (Cobalt)	0.5 ppm	B
	Cr (Chromium), total	1.0 ppm	B
	Cr VI (Chromium VI)	0.01 ppm	B
	Cu (Copper)	2.0 ppm	B
	Hg (Mercury)	0.02 ppm	B
	Ni (Nickel)	1.0 ppm	B
	Pb (Lead)	0.2 ppm	B
	Sb (Antimony)	0.5 ppm	B
	Se (Selenium)	0.5 ppm	B
Plasticizers	Dibutylphthalate (DBP, 84-74-2)*	0.01% w/w (sum of all 6 phthalates in furniture for children less than 3 years old) *0.01% w/w (sum of 4 phthalates in all other furniture products)	C
	Di-n-octylphthalate (DNOP, 117-84-0)*		
	Di (2-ethylhexyl)-phthalate (DEHP, 117-81-7)*		
	Butylbenzylphthalate (BBP, 85-68-7)*		
	Di-iso-decylphthalate (DIDP, 26761-40-0)		
	Di-iso-nonylphthalate (DINP, 28553-12-0)		
	ECHA Candidate List** phthalates	Not added intentionally	A
TDA and MDA	2,4 Toluenediamine (2,4-TDA, 95-80-7)	5.0 ppm	D
	4,4'-Diaminodiphenylmethane (4,4'-MDA, 101-77-9)	5.0 ppm	D
Tinorganic substances	Tributyltin (TBT)	50 ppb	E
	Dibutyltin (DBT)	100 ppb	E
	Monobutyltin (MBT)	100 ppb	E
	Tetrabutyltin (TeBT)	-	-
	Monooctyltin (MOT)	-	-
	Dioctyltin (DOT)	-	-
	Tricyclohexyltin (TcyT)	-	-
	Triphenyltin (TPhT)	-	-
	Sum	500 ppb	E
Other specific substances that are restricted	Chlorinated or brominated dioxins or furans	Not added intentionally	A
	Chlorinated hydrocarbons: (1,1,2,2-Tetrachloroethane, Pentachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethylene)	Not added intentionally	A
	Chlorinated phenols (PCP, TeCP, 87-86-5)	Not added intentionally	A
	Hexachlorocyclohexane (58-89-9)	Not added intentionally	A
	Monomethyldibromo-Diphenylmethane (99688-47-8)	Not added intentionally	A
	Monomethyldichloro-Diphenylmethane (81161-70-8)	Not added intentionally	A
	Nitrites	Not added intentionally	A
	Polybrominated Biphenyls (PBB, 59536-65-1)	Not added intentionally	A
	Pentabromodiphenyl Ether (PeBDE, 32534-81-9)	Not added intentionally	A
	Octabromodiphenyl Ether (OBDE, 32536-52-0)	Not added intentionally	A
	Polychlorinated Biphenyls (PCB, 1336-36-3)	Not added intentionally	A
	Polychlorinated Terphenyls (PCT, 61788-33-8)	Not added intentionally	A
	Tris(2,3-dibromopropyl) phosphate (TRIS, 126-72-7)	Not added intentionally	A
	Trimethylphosphate (512-56-1)	Not added intentionally	A
	Tris-(aziridinyl)-phosphin oxide (TEPA, 545-55-1)	Not added intentionally	A
	Tris(2-chloroethyl)-phosphate (TCEP, 115-96-8)	Not added intentionally	A
Dimethyl methylphosphonate (DMMP, 756-79-6)	Not added intentionally	A	

*with reference to the latest version of the ECHA Candidate List at the time of application

Assessment and verification:

The applicant shall provide a declaration of compliance with criterion 7.2(a). Where testing is required, the applicant shall provide the test results and demonstrating compliance with the limits in Table 24. For methods B, C, D and E where analysis is required, 6 composite samples shall be taken from a maximum depth of up to 2 cm from the surface faces of the material sent to the relevant laboratory.

A. For biocidal products, phthalates and other specific substances that are restricted the applicant shall provide a declaration supported by declarations from suppliers of the foam confirming that they have not been added intentionally to the foam formulation.

B. For heavy metals the applicant shall provide a report presenting the results of the following test procedure. Milled sample material is eluted in accordance with DIN 38414-S4 or equivalent in a ratio of 1:10. The resultant filtrate shall be passed through a 0.45 µm membrane filter (if necessary by pressure filtration). The solution obtained shall be examined for the content of heavy metals by atomic emission spectrometry with inductively coupled plasma (ICP-AES or ICP-OES) or by atomic absorption spectrometry using a hydride or cold vapour process.

C. For the total amount of plasticizers the applicant shall provide a report presenting the results of the following test procedure. Extraction shall be performed using a validated method such as the subsonic extraction of 0.3 g of sample in a vial with 9 ml of t-Butylmethylether during 1 hour followed by the determination of phthalates by GC using a single ion monitoring mass selective detector (SIM Modus).

D. For TDA and MDA the applicant shall provide a report presenting the results of the following test procedure. Extraction of a 0.5 g composite sample in a 5 ml syringe shall be performed with 2.5 ml of 1% aqueous acetic acid solution. The syringe is squeezed and the liquid returned to the syringe. After repeating this operation 20 times, the final extract is kept for analysis. A new 2.5 ml of 1% aqueous acetic acid is then added to the syringe and another 20 cycles repeated. After this, the extract is combined with the first extract and diluted to 10 ml in a volumetric flask with acetic acid. The extracts shall be analysed by high-performance liquid chromatography (HPLC-UV) or HPLC-MS. If HPLC-UV is performed and interference is suspected, reanalysis with high performance liquid chromatography–mass spectrometry (HPLC-MS) shall be performed.

E. For tinorganic substances the applicant shall provide a report presenting the results of the following test procedure. A composite sample of 1-2 g weight shall be mixed with at least 30 ml of extracting agent during 1 hour in an ultrasonic bath at room temperature. The extracting agent shall be a mixture composed as it follows: 1750 ml methanol + 300 ml acetic acid + 250 ml buffer (pH 4.5). The buffer shall be a solution of 164 g of sodium acetate in 1200 ml of water and 165 ml acetic acid, to be diluted with water to a volume of 2000 ml. After extraction the alkyl tin species shall be derivatized by adding 100 µl of sodium tetraethylborate in tetrahydrofuran (THF) (200 mg/ml THF). The derivative shall be extracted with n-hexane and the sample shall be submitted to a second extraction procedure. Both hexane extracts shall be combined and further used to determine the organotin compounds by gas chromatography with mass selective detection in SIM modus.

Rationale:

Polyurethane is by far the most commonly used upholstery padding material in furniture and so specific and relevant criteria are necessary.

In the same manner as with latex foam criteria, and for the same reasons, the polyurethane foam criteria have been copied directly from the criteria set out in Decision 2014/391/EU for bed mattress

EU Ecolabel criteria. The criteria for polyurethane in EU Ecolabel bed mattresses are basically the same as those developed by the European CertiPUR scheme, which focuses on the quantities of hazardous substances in the foam material and VOC emissions from small and representative samples of the foam product. By aligning with the CertiPUR criteria it is assured that producers will be familiar with the requirements and that a network of experienced testing laboratories is already in place.

Some further experimental details were requested from representatives of the EuroPUR scheme so that non-CertiPUR certified laboratories would in principle be able to carry out the test. These are now included in the revised text for EU Ecolabel furniture. The details that specifically required the analysis of phthalates with soxhlet apparatus and dichloromethane have been removed after it was communicated that this particular method can have problems with blank results showing detectable levels of phthalates. During discussions with EuroPUR representatives, it was discovered that there are some slight differences in the requirements of the CertiPUR scheme in the US and that promoted in Europe. However, it is much more relevant to align fully with the EuroPUR promoted requirements since all EU Ecolabel furniture will be most likely manufactured using PU foams produced in Europe.

7.2(b) 72h VOC emissions

After 72 hours, the test chamber concentrations of the substances listed below shall not exceed the limit values shown in Table 25.

Table 25. 72-hour VOC emission limits for PUR foams.

Substance (CAS number)	Limit value (mg/m ³)
Formaldehyde (50-00-0)	0.005
Toluene (108-88-3)	0.1
Styrene (100-42-5)	0.005
Each detectable compound classified as categories C1A or C1B according to the Regulation (EC) No 1272/2008 of the European Parliament and of the Council	0.005
Sum of all detectable compound classified as categories C1A or C1B according to Regulation (EC) No 1272/2008	0.04
Aromatic hydrocarbons	0.5
VOCs (total)	0.5

Assessment and verification:

The applicant shall provide a declaration of compliance with criterion 7.2(b). If applicable, the declaration shall be supported by test results that show compliance with the limits stated in Table 25. The test sample/chamber combination shall be either:

1 sample of 25x20x15 cm dimensions is placed in a 0.5 m³ test chamber or

2 samples of 25x20x15 cm dimensions are placed in a 1.0 m³ test chamber.

The foam sample shall be placed on the bottom of an emission test chamber and conditioned for 3 days at 23 °C and 50% relative humidity, applying an air exchange rate n of 0.5 per hour and a chamber loading L of 0.4 m²/m³ (= total exposed surface of sample in relation to chamber dimensions without sealing edges and back) in accordance with ISO 16000-9 and ISO 16000-11.

Sampling shall be done 72 ± 2 h after loading of the chamber during 1 hour via Tenax TA and DNPH cartridges for VOC and formaldehyde analysis respectively. The emissions of VOC are being trapped on Tenax TA sorbent tubes and subsequently analysed by means of thermo-desorption-GC-MS in accordance to ISO 16000-6.

Results are semi-quantitatively expressed as toluene equivalents. All specified individual analytes are reported from a concentration limit $\geq 1 \mu\text{g}/\text{m}^3$. Total VOC value is the sum of all analytes with a concentration $\geq 1 \mu\text{g}/\text{m}^3$ and eluting within the retention time window from n-hexane (C6) to n-hexadecane (C16), both included. The sum of all detectable compounds classified as categories C1A or C1B according to Regulation (EC) No 1272/2008 is the sum of all these substances with a concentration $\geq 1 \mu\text{g}/\text{m}^3$. In case the test results exceed the standard limits, substance specific quantification needs to be performed. Formaldehyde can be determined by collection of the sampled air onto DNPH cartridge and subsequent analysis by HPLC/UV in accordance to ISO 16000-3.

Testing following the standard CEN/TS 16516 shall be considered as equivalent to those of the ISO 16000 series of standards.

Rationale:

The same as mentioned for the previous polyurethane foam criteria. In particular the use of small representative samples, as with latex foam, facilitates the use of more widely available and cheaper small chamber tests.

7.2(c) Blowing agents

Halogenated organic compounds shall not be used as blowing agents or as auxiliary blowing agents.

Assessment and verification:

The applicant shall provide a declaration of non-use from the manufacturer of the foam.

Rationale:

Regulation (EU) No 517/2014 (the "F-gas Regulation") bans the use of hydrofluorocarbons (HFCs) in XPS foams from 1 January 2020 and for all other foams from 1 January 2023.

Such restrictions were introduced in the legislation only in cases where suitable alternatives were fully available to replace HFCs, which are very strong greenhouse gases. A number of relevant expert studies were carried out examining the replaceability in these sectors in great detail (e.g. Oeko-Recherche, 2011⁴³; SKM Environs, 2013⁴⁴).

The full replaceability of HFCs in the foam blowing sector is due to the fact that in recent years a new substance class (hydrofluoroolefins (HFOs)) has been reaching the market for the cases where other suitable alternatives such as CO₂ or hydrocarbons did not give sufficiently good performance as blowing agents, so that the whole sector is able to transition to climate-friendly alternatives in the medium term. The main European industry umbrella organisations that were consulted in the preparation phase for the new Regulation generally agreed that a switch to climate-friendly alternatives is possible, but that they needed some time to make this switch which explains the 2020 and 2023 dates for the prohibitions above.

Other halogenated compounds using bromine or chlorine, which are ozone-depleting substances, and were used as foam blowing agents in the past, have already been banned by Regulation (EC) No 1005/2009.

Given this legal backdrop, the transition away from using these substances in the blowing of foams in the EU is fully underway, with clear endpoints for such use in 2020/2023. Ecolabel as identifying green products should therefore only consider these pieces of furniture that already do not use these substances anymore in the blowing of foams.

7.3. Other padding materials

Other materials may be permitted to be used as padding in furniture upholstery if the following conditions are met:

- General requirements for hazardous substances set out in criterion 2 are respected.
- Halogenated organic compounds are not used as blowing agents or as auxiliary blowing agents.
- Feathers or down are not be used as padding/filling material either alone or in blends.
- If the padding/filling material uses coconut fibre rubberised using latex, compliance with criterion 7.1(a) and 7.1(b) is demonstrated.

Assessment and verification:

The applicant shall provide a declaration of compliance stating:

- (i) The nature of the padding/filling material used and any other blended materials;
- (ii) That the material does not contain any SVHCs or other hazardous substances that are not specifically derogated in Table 5.
- (iii) That halogenated organic compounds have not been used as blowing agents or as auxiliary blowing agents.
- (iv) That down or animal feathers have not been used in the filling/padding material, either alone or in blends.
- (v) If coconut fibres have been rubberised with latex, then compliance with criterion 7.1 for restricted substances and VOC emissions shall be demonstrated.

Rationale:

Other textile fibres such as wool, polyester and dacron can be used by producers as padding materials in furniture upholstery.

The original proposal was to generally align with the relevant EU Ecolabel criteria already set out for textiles in Decision 2014/350/EU, but it was argued that this could greatly increase the complexity of furniture criteria and prove burdensome for EU Ecolabel furniture applicants. Furthermore, criteria should not be too detailed for materials that ultimately only represent a small fraction of the total product weight and that do not come into direct skin contact with the user during normal use. The textile EU Ecolabel criteria set out in Decision 2014/350/EU were designed considering that textile is the dominant material in the product and generally comes into direct skin contact with the user.

With wool, a review of the criteria in Decision 2014/350/EU revealed that it would be difficult to set simple criteria for residual ecoparasiticide levels without the potential argument arising that the criteria in EU Ecolabel furniture for wool is more strict than that for wool in EU Ecolabel textiles. This is because the textile criteria set limits for these ecoparasiticides but also go into alternative means of demonstrating compliance which would require detailed information at the farm level which would be unrealistic to expect furniture manufacturers to be able to collect.

Rationale for the restriction of halogenated blowing agents is the same as that for criterion 7.2(c).

Feathers and down are excluded from EU Ecolabel furniture due to ethical reasons associated with the possible inhumane plucking of down and feathers from live animals. This criteria was specifically requested at a stakeholder meeting and reflects the requirements of the Nordic Ecolabel for textiles, hides/skins and leather (Version 4.0, Dec. 2012). Since there is no practical method by which it can be guaranteed that down or feathers have not been plucked from a live bird that it is simplest to exclude them.

The requirement for rubberised coconut fibres follows the same logic as set out in Decision 2014/391/EC for bed mattresses.

Criterion 8. Glass – use of heavy metals

This criterion applies to any glass-material included in the final furniture product regardless of the weight fraction it presents.

Any glass used in the furniture product shall comply with the following conditions:

- Not contain leaded glass.
- Not contain lead, mercury or cadmium impurities at levels exceeding 100 mg/kg per metal.
- For mirror glass, any paints, primers or varnishes used on the mirror backing shall have a lead content less than 2000 mg/kg of the in-can substance. Coatings shall be applied using the "tin process" instead of the "copper process".

Assessment and verification:

- (i) The applicant shall provide a declaration from the glass supplier stating that no leaded glass is present in the final furniture product. In the absence of a suitable declaration, the competent body may request analysis of glass in the final furniture product via a non-destructive method using a portable X-Ray Fluorescence instrument.
- (ii) The applicant shall provide a declaration from the glass supplier stating that the glass present in the furniture product does not contain lead, mercury or cadmium impurities at levels exceeding 100 mg/kg (0,01% w/w). In the absence of a suitable declaration, the competent body may request testing of these metals in the glass by X-Ray Fluorescence according to the principles of the ASTM F2853-10 standard or equivalent.
- (iii) The applicant shall provide a declaration from the mirror supplier that all paint, primer and varnish formulations used on any mirror backing contains less than 2000 mg/kg lead (0.2% w/w). The declaration shall be supported by a relevant SDS or similar documentation. A further declaration from the mirror glass supplier shall be provided stating that the backing has been applied using the "tin process" and not the "copper process".

Rationale:

Leaded glass is used for decorative purposes but can contain very high contents of lead (18-40% as the oxide PbO). Although the lead is not mobile in the glass matrix, its production requires the mining and processing of lead ores and at the end of life the lead could potentially be mobilised if the glass is ground to a powder and used as fine aggregate or especially if it ends up in municipal waste and being sent to an incinerator.

A brief review of the decorative glass industry revealed that such glass can potentially contain undesirable heavy metals in the glass matrix or use solvent based adhesives and tin-oxide primers in substrates used to bind coloured polyethylene emulsions that may contain various heavy metal based pigments to the glass surface. Due to the lack of expert input from stakeholders and industry, it is best to simply request that three of the heavy metals most commonly associated with glass (lead, cadmium and mercury) are not present in levels beyond the arbitrary limit of 0.01% w/w (100mg/kg) for impurities. Further research in this area may be relevant in future revisions of this criterion.

With mirror glass, a reflective metal backing, where generally silver is applied to the glass surface using the tin process or the copper process. There has been a shift towards the tin process due to problems with copper in effluents forming complexes and being difficult to remove prior to discharge⁴⁵. Lead-based paints are often used to protect the silver backing from corrosion, which would end up impairing the functionality of the mirror. Historically these paints contained high contents of lead (up to 15% w/w) whereas recently it is more common to use lower lead alternatives (<0.5% w/w)⁴⁶. Other European ecolabel criteria, namely the Nordic Ecolabel criteria for furniture and fitments (Version 4.9 Mar. 2011) and the French NF 217 Ecolabel for furniture (Jan, 2014) have criteria that restrict the lead content in protective varnishes to 0.2% w/w (2000mg/kg). From the wording of those criteria, it is

uncertain if the 0.2% limit referred to the in-can varnish product or the final coating layer. The most practical approach is to specify that the limit applies to the concentration of the in-can varnish formulation, which is simpler to assess and verify.

A number of mirror products are available on the market with claims such as "lead-free" and "copper-free". The copper-free claims are no doubt linked to the use of the tin process as a substitute for the copper process when applying the mirror backcoating. With the lead-free claim it is uncertain what precisely is meant by the term "lead free". The uncertainty stems mainly from a lack of specific input from mirror manufacturers but is also due to different definitions being applied to different products.

For example, the interpretation of the RoHS Directive 2002/95/EC considers electrical and electronic equipment as "lead-free" if homogenous materials in contain lead in concentrations less than 0.1 % (weight by weight). This may be quite simple when applying to solder but more complex if applying to a multi-layer coating, in which only one layer contains lead.

In the US in 2014, it was mandated that the wetted surfaces of all pipes, fixtures and fittings sold or installed for potable water applications should be "lead-free". The definition of lead-free for this purpose is considered as materials which:

Do not contain more than 0.2 % lead in solder and flux and

Do not contain more than a weighted average of 0.25 % lead in the entire wetted surface of pipes, fixtures and fittings.

Several lead-free paint formulation exist for mirror back-coatings (i.e. < 0.01 % lead) that may be based on zinc⁴⁷, chromium (II), vanadium (II or III), titanium (II or III), iron (II) and aluminium (III)⁴⁸. However, it is not certain if these formulations are actually used by industry or remains only as a patent. Feedback from industry would be necessary prior to attempting to justify any more ambitious approach to lead limits in varnishes used in mirror backcoatings that go below 0.2 % w/w.

No requirements have been made for excluding different types of glass so long as it complies with the fitness for use criterion (9.1). The Nordic Ecolabel criteria for furniture and fitments excludes crystal glass and wire reinforced glass, presumably on the proviso that such glass is difficult to recycle. However, given the range of different glass types that can be used in furniture and the fact that no collection schemes for furniture glass types are available to the public, it is likely that any furniture glass will end up in landfill where it should remain relatively inert, being incinerated where it will form molten slag and ultimately incinerator bottom ash or being crushed and the millet being used as a fine aggregate (downcycling). These three probable routes for furniture glass are more or less the same for each type. For example, with laminated glass, the laminate would be burned off in the incinerator or separated during crushing to form fine aggregate. With wire reinforced glass, the metal wire may be recovered during crushing to form fine aggregate. With mirror glass, the coated backing layer would no doubt be separated during crushing to form fine aggregates.

Criterion 9. Final product requirements

9.1. Fitness for use

EU Ecolabel furniture shall be considered as fit for use if it complies with the requirements set out in the latest versions of any relevant EN standards listed in Appendix V that relate to the durability, dimensional requirements, safety and strength of the product.

Assessment and verification:

The applicant shall provide a declaration stating which (if any) standards in Appendix V apply to the product and then provide a declaration of compliance with any relevant EN standards, supported by test reports from either the furniture manufacturer or component part/material suppliers, as appropriate.

Rationale:

When considering if a minimum product guarantee could be accepted as an alternative to the product meeting any relevant fitness for use standards, stakeholders were generally against the idea.

Most furniture items are not CE marked and therefore compliance with relevant EN standards for product performance cannot be assumed. Many stakeholders agreed that EN standards for the technical performance of furniture products should be followed wherever relevant standards exist. After discussion with industry stakeholders, a list of relevant EN standards from CEN/TC 207 was drawn up and is provided in Appendix V.

The list in Appendix V has undergone several iterations during the revision process and now focuses only on ratified EN standards that are currently in force and which directly mention minimum requirements. Associated standards that define terminology or details of test procedures only are not included but will be referenced in the standards that appear in Appendix V.

Caution was urged by industry stakeholders not to mention specific minimum technical requirements in the EU Ecolabel criteria that are based on existing standards because these can change with time. It was also recommended not to refer to the year of the standard for the same reason.

Some arguments arose regarding the relevance of ergonomics in EU Ecolabel criteria since this may be considered as a subjective quality. Furthermore, EU workplace directives provide a framework for minimum ergonomic requirements for office furniture. In Denmark and the Netherlands, office tables/desks and chairs must meet the highest type A requirement as specified in EN 527-1 and EN 1335-1. However, other countries have not implemented these requirements in national legislation so it is considered necessary to consider any products complying with dimensional types A-D as acceptable instead of only type A because certain markets may not demand type A products in the first place.

Testing of furniture is not cheap and reference to the 2014 prices in the Italian version of the CATAS catalogue revealed that single tests generally cost slightly more than 100 Euros and can reach over 1000 Euros for more complex tests (although a 50% reduction in these costs would apply to CATAS members). Since the furniture industry is basically an assembly industry, it is likely that suppliers who mass produce panels or other component parts will have relevant testing data already. In those cases, no additional costs are passed on to the applicant.

9.2. Extended product guarantee

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 and indicate 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

The main reasoning behind an extended product guarantee is based on the fact that the lifetime of a furniture product is a key factor in its life-cycle assessment and that products with extended guarantees are more likely to be of good quality and durability.

It is worth noting that the guarantee is to be provided without prejudice to the legal obligations of the manufacturer and seller. In the EU, the legal obligations for products sold to consumers are set out in Directive 1999/44/EC. In principle, it is the responsibility of the consumer to inspect the goods at the time of their delivery to ensure that they conform with the product as it was advertised by the seller and that it performs adequately. Some specific points of Directive 1999/44/EC to consider are:

- Unlike many other EU Ecolabel product groups, furniture is often installed on site, either by an approved party or by consumers themselves. The provisions set out in Article 2(5) of the Directive that relate to any lack of conformity caused by incorrect installation.
- Article 5(3) of the Directive allows a period of up to six months during which, if a lack of conformity of the goods becomes evident, the consumer can request the repair or replacement of the goods, or in some cases, a complete refund. During this six months there is no burden of proof on the part of the consumer to prove that the lack of conformity was already present in the goods at the time of delivery.
- Article 5(1) of the Directive states that consumers can claim for repair or replacement up to a period of two years from the date of delivery of the goods. However, if the lack of conformity is reported between six months and two years after the delivery of the goods, then there is a burden of proof on the part of the consumer to demonstrate that the fault already existed at the date of delivery of the goods.
- Article 5(2) of the Directive states that consumers should inform the seller within two months from the date at which any lack of conformity is first detected. This is an optional clause which has not been adopted equally by all MSs. In 18 of 28 MSs, the two month notification period applies, in 7 MSs there is no time limit for notifying and in 3 MSs it is simply stated that notification should be made within "a reasonable period of time". For the avoidance of confusion to companies who may sell products in different MSs, the conditions that apply to the extended guarantee have a defined period of two months for reporting any lack of conformity. Consequently, any seller can know for certain that any products sold five years and two months ago shall no longer potentially be subject to claims.
- The Directive applies to consumer goods but does not extend to contractual agreements for business to business transactions (i.e. contract furniture).
- When drafting the criteria for EU Ecolabel furniture for the extended product guarantee, there are two main options for defining the extended time limit to five years:
 - The time during which there is no burden of proof on the part of the consumer/purchasing company (i.e. six months for consumers according to Directive 1999/44/EC).
 - The time during which lack of conformity can be reported and which recourse to repair, replacement or a refund of the goods exists (i.e. two years for consumers according to Directive 1999/44/EC).

The EU Ecolabel criterion for an extended guarantee is intended to apply to the second option. Since the guarantee is to be offered at no additional cost, it is considered that any extended guarantee should not extend the period during which burden of proof lies with the seller beyond six months. Such commercial guarantees that do extend the periods where no burden of proof lies with the consumer/purchasing company are often referred to as product warranties, which may be optionally offered by certain sellers for prices that may add 10-20% or more to the final product price. Furniture products are generally not sold with a commercial guarantee already built-in to the price, any attempt to force this in EU Ecolabel furniture would make them appear less price competitive in the market.

9.3. Provision of spare parts

The furniture manufacturer shall make spare parts available to customers for a period of at least 5 years from the date of delivery of the product. The cost (if any) of spare parts shall be proportional to the total cost of the furniture product. Contact details that shall be used in order to arrange the delivery of spare parts shall be provided.

Assessment and verification:

The applicant shall provide a declaration that spare parts shall be available for a period of at least 5 years from the date of delivery of the product. The parts shall be available for free during the guarantee period if the goods are found to be faulty during normal use or at a proportionate cost if the goods were damaged by misuse. Contact information shall be included in consumer information.

9.4. Design for disassembly

For furniture consisting of multiple component parts/materials, the product 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 component parts/materials shall be provided. Disassembly and replacement operations shall be capable of being carried out using common and basic manual tools and unskilled labour.

Assessment and verification:

The applicant shall provide technical drawings that illustrate how the furniture item can be assembled/disassembled using basic tools and unskilled labour. In the case of upholstery, such disassembly may include the use of zip fastenings and velcro to attach/detach sofa cushions from the frame and interior padding from covering materials. If necessary, provision must be made for screw fittings that go directly into wood-based panels so that the screw can be re-inserted during reassembly at a different point than where it was removed from during disassembly.

Rationale for criteria 9.3 and 9.4:

Many furniture component parts/materials are durable and have a long life. The end-of life of a furniture product can arise simply due to user preferences or other logistical reasons. However, end-of-life of a multi-component furniture product can often be brought about by the failure of only one component part/material. In order to prevent such situations, the following conditions need to be met:

- That the damaged component part/material can easily be removed by the user.
- That appropriate spare parts are available and the user knows how to get them.
- That the spare part is free or at least available at a reasonable cost.
- That the user can easily assemble the new part to the furniture product.

Criteria 9.3 and 9.4 aim to ensure that the conditions above can be met for EU Ecolabel furniture.

9.5. VOC emissions

If the furniture product contains any of the component parts/materials listed below, VOC emission testing shall be required:

- Upholstery coverings made of leather;
- Upholstery coverings made of coated fabrics;
- Any component parts that account for more than 5% of the total furniture product weight (excluding packaging) and that have been treated with high VOC content (higher than 5%) coating formulations that have been applied at rates greater than 30g/m² of coated surface area or whose application rates have not been calculated.

Packaging and delivery of samples sent for testing, their handling and conditioning, test chamber requirements and gas analysis methods shall follow the procedures described in the ISO 16000 set of standards.

Testing may be carried out on the entire furniture product (see conditions and limits in Table 26) or in smaller test chambers specifically for the component parts/materials listed above (see conditions and limits in Table 27).

VOC emissions shall not exceed the limit values given in Table 26 and Table 27.

Table 26. Maximum VOC emission limit values for specific furniture products

Test parameter	Armchairs and Sofas		Office chairs		Other furniture items
	3d	28d	3d	28d	28d
Chamber volume	In the range of 2-10m ³				
Loading rate	Product shall occupy approximately 25% of chamber volume				*0.5-1.5m ² /m ³
Ventilation rate	4.0 m ³ /h		2.0 m ³ /h		*0.5-1.5h ⁻¹
Substance	3d	28d	3d	28d	28d
Formaldehyde	-	60 µg/m ³	-	60 µg/m ³	60 µg/m ³
TVOC*	≤ 3000 µg/m ³	≤ 400 µg/m ³	-	≤ 450 µg/m ³	≤ 450 µg/m ³
TSVOC	-	≤ 100 µg/m ³	-	≤ 80 µg/m ³	≤ 80 µg/m ³
C-substances†	≤ 10 µg/m ³ (total limit)	≤ 1 µg/m ³ (per substance)	≤ 10 µg/m ³ (total limit)	≤ 1 µg/m ³ (per substance)	≤ 1 µg/m ³ (per substance)
R-value for LCI substances††	-	≤ 1	-	≤ 1	≤ 1

* Although there is scope to vary the loading rate and ventilation rate for other furniture items, the ratio between the loading rate (m²/m³) and the ventilation rate (h⁻¹) shall be maintained at 1.0.

† Formaldehyde is excluded from consideration within cumulative carcinogenic VOC emission calculations and instead has its own individual limit.

†† R value = total of all quotients (C_i / LCI_i) < 1 (where C_i = 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").

Table 27. Maximum VOC emission limit values for targeted furniture materials/parts

Test parameter	Coated component parts		Leather or coated fabric upholstery covering materials	
Minimum allowed chamber volume	200 L for wood-based component parts 20 L for other component parts		20 L	
Ventilation rate	0.5 h ⁻¹		1.5 m ³ /m ² .h	
Substance	3d	28d	3d	28d
Formaldehyde	-	60 µg/m ³	-	60 µg/m ³
TVOC	≤ 3000 µg/m ³	≤ 400 µg/m ³	-	≤ 450 µg/m ³
TSVOC	-	≤ 100 µg/m ³	-	≤ 80 µg/m ³
C-substances†	≤ 10 µg/m ³ (total limit)	≤ 1 µg/m ³ (per substance)	≤ 10 µg/m ³ (total limit)	≤ 1 µg/m ³ (per substance)
R-value for LCI substances††	-	≤ 1	-	≤ 1

† Formaldehyde is excluded from consideration within cumulative carcinogenic VOC emission calculations and instead has its own individual limit.

†† R value = total of all quotients (Ci / LCIi) < 1 (where Ci = substance concentration in the chamber air, LCIi = 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:

Where the furniture product is deemed to require final product VOC emission testing, 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. 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 or component parts/materials so long as no changes to the manufacturing process or chemical formulations used have been made that would be considered to increase VOC emissions from the final product or relevant component parts/materials.

Test data demonstrating compliance with the limits in Table 27 for relevant component parts/materials that is provided directly by suppliers shall also be accepted if they are accompanied by a declaration from that supplier.

Rationale for approach taken and assessment of costs:

Considerable interest was expressed by some Competent Body representatives for VOC emission testing of the final product. However, setting emission limits for furniture products is not straightforward due to the immense range of possible products that may lie within the scope. Concerns were also expressed by industry that the cost of VOC emission testing is extremely expensive, especially for large chamber testing. Costs of up to 5000 Euros per product test were stated at one meeting. A representative of testing laboratories confirmed that test prices could range as follows:

Table 28. Potential VOC emission test costs

	Small chambers (<1.0m ³)		Large chambers (>1.0m ³)	
	3d or 7d	14d or 28d	3d or 7d	14d or 28d
One time analysis	€1000-1500	€1500-2000	€1500-2500	€2000-3000

The main cost elements of the test are sample and chamber preparation and the extraction and analysis of gas samples. The number of VOCs to be analysed for is apparently not one of the main cost drivers and so there is no problem with requiring that long lists of VOCs be analysed in order to demonstrate compliance with the R-value or carcinogenic substance limits. Some significant cost savings could be introduced if it is possible to demonstrate compliance simply by testing at 3 days only (which would be permitted if chamber concentrations at that stage are already below the 28 days limits).

Due to the high cost of testing, a flexible approach has been proposed where manufacturers may completely avoid the requirement for VOC emission testing (for example by the non-use of coatings, the use of low VOC content coatings or the use of textiles instead of leather or coated fabrics for upholstery covering material).

If testing is required, then one of two approaches can be taken:

- (i) Test only the targeted component parts/materials of highest concern with regards to VOC emissions, or
- (ii) Test the entire assembled furniture product.

Separate limits and test conditions are defined in Table 26 and Table 27 depending on the approach to be taken. These align with the Blue Angel criteria and, according to the approach taken in those criteria, the limits for upholstery materials are set with the idea to limit the contribution of VOC content in indoor-air from EU Ecolabel furniture upholstery to less than $300\mu\text{g}/\text{m}^3$ after 28 days in an average sized living room.

Significant savings (€500-1000 per test) may be made by using smaller test chambers if only one type of component part/material needs to be tested. However, if different component parts/materials need to be tested separately (because different emission limits and loading rates apply) then it may be no more expensive to test the entire assembled product in a large chamber.

Besides cost, another reason for allowing the approach to use small test chambers for targeted component parts/materials is the availability of testing facilities. A representative of the testing industry estimated that there are approximately 1000 small test chambers available in Europe at the moment (split between 40-50 facilities) while there are only around 50 large test chambers in Europe (split between 10-20 facilities). Although almost half of all facilities are concentrated in France and Germany, the sample preparation methods detailed in ISO 16000 make allowance for long range delivery of samples.

Most importantly, by allowing testing of the most relevant component parts/materials in small chambers, it may be practical for applicants to request the testing information from suppliers prior to purchasing component parts/materials or agree to share costs of testing.

Rationale for choice of VOCs to analyse and relevant limits

The conditions set out in Table 26 or Table 27 are generally aligned with requirements set out in the Blue Angel RAL UZ 38, RAL UZ 117 and RAL UZ 148 criteria for "Low emission furniture and slatted frames made of wood and wood-based materials", "Low emission upholstered furniture" and "Low emission upholstery leathers", respectively.

The R-value limit relates to VOCs with an assigned LCI value (*LCI = Lowest Concentration of Interest, i.e. the lowest concentration above which, according to best professional judgement, the pollutant may have some effect on people in the indoor environment*). Harmonisation of LCI values (EU-LCIs) began a few years ago by the European Commission's Joint Research Centre and is based on previously distinct values developed independently by ANSES in France and AgBB in Germany. ECA report 29⁴⁹ describes the harmonised procedure for establishing a list of compounds and their associated EU-LCI values based on an

appropriate health, protective, science-based and transparent yet pragmatic approach. This is an ongoing process and currently (December 2014) some 95 of the 180 identified VOCs of potential concern in indoor-air have still to be assigned EU-LCI values. An updated list of VOC compounds with ascribed LCI values can be found on the [EU LCI Working Group website](#) (which is now hosted on the [DG GROW website](#)).

In line with the previous Blue Angel criteria, an individual limit is set for formaldehyde. For this reason formaldehyde emissions should not be considered when calculating the total emissions of carcinogenic VOCs. The limits for total aldehydes and total compounds with no-LCI value given in the Blue Angel criteria have not been transferred to the EU Ecolabel criteria for furniture since the aim here is to focus mainly on hazardous VOCs. However, a general limit for TVOC and TSVOC is included because this provides a general indication for manufacturers and users of the emissions that can be expected from the product and links to the previous criteria for coatings used on wooden or metal component parts (criterion 3.2e) and 5.3) which only relate to total VOC contents also.

No requirements are set for VOC emissions from textile upholstery coverings partly because anecdotal evidence revealed that VOC emissions were significantly less than those of leather or coated fabrics and also because any requirement could possibly result in EU Ecolabel textiles having to undergo further testing and not being considered compliant by default. The current EU Ecolabel criteria for textiles impose limits for extractable formaldehyde rather than formaldehyde (and other VOC) emissions to air. This could lead to confusion amongst potential applicants if additional testing was required on EU Ecolabel textiles before they could be used in EU Ecolabel furniture. Perhaps in future textile criteria the need to require VOC emission testing, at least for natural textiles that have been treated with easy-care finishes and any synthetic textiles could be introduced and aligned with requirements for furniture.

Rationale for choice of standard method

Reference is made to the use of CEN/TS 16516 even though it has not yet been formally ratified (expected end of 2016) because it will become the reference VOC emission test in Europe due to the fact that it has been developed as part of the Construction Products Regulation (CPR No. 305/2011), and more specifically "EC Mandate 366, a horizontal approach to indoor VOC emissions". The EN 16516 method attempts to improve the ISO 16000-base method by tightening the flexibility afforded in ISO 16000 in certain experimental variables in order to improve the reproducibility of results. At least until EN 16516 is adopted, testing according to ISO 16000 should be permitted. It should be noted that furniture does not lie within the scope of the CPR but any voluntary measures to target VOC emissions to indoor-air, such as the EU Ecolabel for furniture, should attempt to align with EN 16516 which will provide a framework to link results to the European standard reference room.

Information about other approaches to VOC emissions relevant to furniture

The French government has adopted a labelling scheme for VOC emission from construction products, with the following classes: A+, A, B and C. and DG-JRC is continuing to publish a series of reports under the European Collaborative Action on Urban Air, Indoor Environment and Human Exposure⁵⁰. The values chosen above would correspond with the A class equivalent limits.

With regards to VOC emissions from furniture, significant work has been carried out by the FCBA in France summarised in their report "*Contribution de Mobilier a la qualite de l'air interieur dans les creches*" and other related reports.

In the US, the BIFMA scheme (ANSI/BIFMA M7.1-2011) has been set up for VOC emission testing of office furniture and defines two product groups "systems furniture", and "seating". Emissions are measured in a ventilated chamber test and a series of measurements are taken at periods between 3

and 14 days after placement in the chamber. Emission rates can be calculated ($\mu\text{g}/\text{m}^2\cdot\text{h}$) or ($\mu\text{g}/\text{m}^3\cdot\text{h}$) depending on how the product being tested is defined, and 7 day limits for TVOC, formaldehyde, total aldehydes and 4-phenylcyclohexane are set in the ANSI/BIFMA M7.1-2011 standard.

Although there is a global harmonised system in place for labelling the hazards present in packaged products there is no such harmonisation between what levels of VOC contaminants in indoor-air are considered to be of concern to human health. An example of threshold air concentrations of concern of select substances is shown in the table below.

Table 29. VOCs with emission limits defined under different systems

No.	Compound Name	CAS No.	CREL	EU-LCI	ANSES	AgBB
			$(\mu\text{g}/\text{m}^3)$			
1	Acetaldehyde	75-07-0	140	1200	200	--
7	Dichlorobenzene (1,4-)	106-46-7	800	150	60	--
12	Ethylbenzene	100-41-4	2000	850	750	880
28	Styrene	100-42-5	900	250	250	860
30	Toluene	108-88-3	300	2900	300	1900
33	Xylenes, (m-, o-, p-xylene combined)	108-38-3, 95-47-6, 106-42-3	700	500	200	2200

CREL – Chronic Reference Exposure Level, defined by the Californian Office of Environmental Health Hazard Assessment, see: http://www.oehha.ca.gov/air/chronic_rels/

From the examples above it is clear that no significant or consistent trend exists amongst different agencies over what can be considered as a threshold air concentration of concern to human health.

Criterion 10. Consumer information

A single consumer information document shall be provided with the product which includes information in the language of the country where the product is placed on the market, relating to the following aspects:

- A product description as per the requirements of criterion 1.
- A detailed description of the best ways to dispose of the product (i.e. reuse, take-back initiative by the applicant, recycling, energy recovery) shall be given to the consumer, ranking them according to their impact on the environment.
- Information about the polymer types of any plastic component parts with a weight greater than 100 g that were not marked in accordance with the requirements of criterion 4.1.
- A declaration that the designation, description, label or marking of leather are used in accordance with the requirements established in EN 15987 and EN 16223.
- A clear statement under what conditions the furniture product should be used. For example indoors, outdoors, temperature ranges, load bearing capacities and how to correctly clean the product.
- Information regarding the type of glass used, any safety information, its suitability for contact with hard materials such as glass, metal or stone and information regarding the correct disposal of the glass, for example its compatibility or non-compatibility with post-consumer container glass.
- A declaration of compliance with relevant fire safety regulations in the country of sale for upholstered furniture, details regarding which flame retardants have been used (if any) and in what materials (if any).
- A declaration of the non-use of biocidal products in order to provide a final disinfective effect in any furniture that is clearly marketed for indoor use and with outdoor furniture, a declaration of which active substances of biocidal products have been used (if any) and in what materials (if any).
- A statement of compliance with any relevant EN standards as referred to in criterion 9.1. and Appendix V.
- Relevant information regarding the terms and conditions of the product guarantee as per the requirements of criterion 9.2.
- Relevant contact information regarding provision of spare parts as per the requirements of criterion 9.3.
- Well illustrated assembly and disassembly instructions as per the requirements of criterion 9.4.

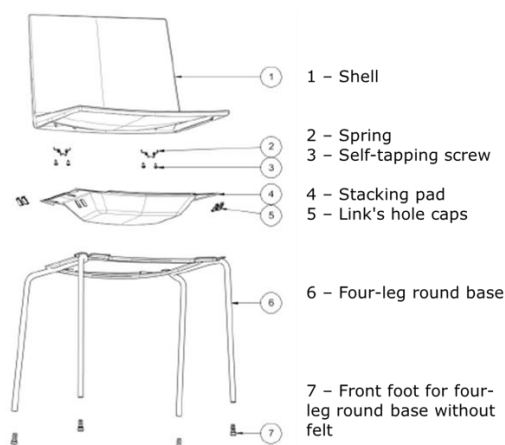
Assessment and verification:

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

Consumers who are most interested in EU Ecolabel products are also those who are most interested in many of the types of information requested in this criterion. It can be noted that much of the requested consumer information is already required in other criteria.

Providing the product description information is already required in criterion 1 although it was not specified that this information also should be available to the consumer and not only the Competent Body. Some leading manufacturers are already making this information available to consumers (see Figure 7 below). Such information could easily complement any requirements for information regarding assembly / disassembly instructions and the identification and reference codes for any spare parts (as per criterion 9.3).



	Component part No. / Materials	Chair weight (g)	% of total weight
Chair	1 – Polypropylene	1648g (x1)	27.1%
	2 – Stainless Steel	2.5g (x2)	0.09%
	3 – Stainless Steel	1g (x4)	0.07%
	4 – Polypropylene	992g (x1)	16.3%
	5 – Polypropylene	2g (x4)	0.13%
	6 – Steel	3407g (x1)	56.1%
	7 - Polyethylene	3g (x4)	0.2%
Packaging	Cardboard	1.105	97.1%
	Polyethylene	0.026	2.3%
	Steel	0.005	0.4%
	Paper	0.002	0.2%
Overall weights	Chair weight	6.076	81.3%
	Packaging weight	1.138	18.7%
	Total weight	7.214	100%

Figure 7. Hypothetical example of product description information in an environmental product declaration of a commercially produced furniture product (image taken from a real example of an EPD for the "Team" chair produced by Arper).

In the future this information may be useful in life cycle assessment studies, improving the ecodesign of furniture products via careful choice and economical use of materials and also in shaping the future direction of revisions to EU Ecolabel criteria for furniture.

Other information such as information on proper cleaning, such as the avoidance of using certain products and load bearing capacities help ensure correct use of the product and reduce the risk of a premature end of life caused by misuse.

The requirement for correct labelling of any leather upholstery used in EU Ecolabel furniture is due to the proliferation of synthetic products that look like leather being labelled using the word 'leather' alone or in combination with other words such as 'eco-leather', 'PU leather', 'leatherette' or 'bonded leather'. Such denominations are liable to confuse consumers and prevent 'real' leather businesses from fair competition conditions in the internal market. The European leather association, Cotance,

estimates that 15-20% of goods sold as leather do not originate from animal skins and hides and that there are currently two to five lawsuits annually in each Member State, which can cost up to €30,000 per lawsuit.

There is evidence that there has been a reduction in sales of leather upholstery, especially during the last five years. This has coincided with an increase in sales of upholstery that has used what is commonly known as 'bonded leather'. The wholesale price of synthetic alternatives to leather is approximately half that of leather. Evidence from European market surveillance authorities and consumer organisations suggest that a proportion of consumers confuse 'bonded leather' or 'leatherette' with leather and some of these consumers have experienced material detriment as a result of making purchasing decisions based upon such information.

The leather designation is not protected at the EU level: a majority of MS do not have specific rules on leather while some Member States have introduced such rules but with divergent scope and mechanisms. Therefore, the EU Ecolabel would be a valuable added-value tool in the fight against such misleading claims.

Information relating to the use or non-use of biocides (linked to both the general hazardous substance requirements 2.1 and 2.2 as well as criterion 3.2f for wooden component parts, criterion 5.4 for metal component parts and criterion 6.3 for upholstery materials) and flame retardants (linked to the general restricted substance criteria 2.1 and 2.2), has been a debateable topic. Arguments in favour generally state that consumers who are buying an EU Ecolabel product in particular should have a right to know if biocides or flame retardants have been used whereas arguments against providing this information are based on the fact that consumers generally understand that all flame retardants and biocides are toxic or hazardous and that this would represent a conflicting signal to the consumer to find this information on an EU Ecolabel product.

Information regarding glass disposal (previously included in criterion 8) is important because, although post-consumer glass containers are widely recycled across the EU, these schemes are generally not compatible with the glass used in furniture. This is mainly due to different chemical compositions that lead to different melting points. The incorrect disposal of small amounts of furniture glass in containers for post-consumer glass can contaminate entire batches of post-consumer glass.

Criterion 11. Information appearing on the EU Ecolabel

If the optional label with text box is used, it shall contain, where relevant, three of the following statements:

- Wood, cork, bamboo and rattan from sustainably managed forests
- Recycled content (wood or plastic, if applicable)
- Restricted hazardous substances
- Not treated with biocidal products (if applicable)
- Not treated with flame retardants (if applicable)
- Low formaldehyde emission product
- Low VOC emission product
- Product designed for disassembly and ease of repair
- Where cotton-based textile materials have been used in furniture upholstery using organic or IPM cotton, text may be displayed in box 2 of the EU Ecolabel as follows:

Table 30. Information that may appear with the EU Ecolabel relating to cotton in textiles

Production specification	Text that may be displayed
Organic content of more than 95%	Textiles made with organic cotton
IPM content of more than 70%	Cotton grown with reduced use of pesticides

The guidelines for the use of the optional label with the text box can be found in the 'Guidelines for the use of the EU Ecolabel logo' on the website:

http://ec.europa.eu/environment/ecolabel/documents/logo_guidelines.pdf

Assessment and verification:

The applicant shall provide a declaration of compliance with this criterion.

3. TABLE OF COMMENTS (after June 2015 EUEB meeting)

Relevant criterion	Comments received	JRC response
Criterion 1: product description	<p>"Applications that go into further detail, for example expressing the type of metal, the type of textile(s), the type of polymer and recycled contents of specific materials may be provided on an optional basis. "</p> <p>The level of detail shall be in line with the assessment and verification stated in each criterion. The last bullet point is redundant when referring to information which is not mandatory or in other way provides information. We suggest to delete the last bullet point.</p>	The extra level of detail is perhaps redundant and so the last point has been removed from the final criteria.
Criterion 2: General hazardous substance requirements : Derogation table	Derogations shall only be granted if it is not possible to produce furniture without the preparation mentioned. The argument or rationale for why water, dirt and stain repellents shall have a derogation for H412 and H413 is missing in the technical report. We suggest to remove this derogation.	The derogation for water, dirt and stain repellents is based on the same conditions that apply to the textile EU Ecolabel and bed mattresses EU Ecolabel criteria. These are equally applicable to furniture although full alignment with these Decisions would mean only derogation for H413 and not H412.
Criterion 2.2(a): Derogation for varnishes in Table 5	Chapter 2.2(a) deals with varnishes and says to go to table 5 for specific derogations. In former versions of the EU Furniture draft, you had mentioned for table 5 that stabilisers <u>and varnishes</u> which are used in coated fabrics production are allowed when risk hazards H411, H412 and H413. In this new version of the draft, varnishes have disappeared from the cell (j): IT NEEDS TO BE PUT AGAIN. The coating fabrics Industry is unable to manufacture its products without this exemption granted. It is even more important since the chapter on COV has been kept in the draft and varnishes are a barrier to emissions.	The derogation for varnishes was previously removed due to a different approach to the general hazardous substance criteria (2.1 and 2.2) being used, which only focussed on substances remaining in the final product > 0.1% w/w. However, now that the approach has been altered, and focuses on substances and mixtures used during processing, the derogation for varnishes has been reinserted.
Criterion 2.2: General hazardous substance requirements	<p>We disagree with the following approach and recommend deleting the following provisions: <i>"Any individual component part from suppliers used in the furniture product that: (i) weigh less than 25 g and that (ii) do not come into direct contact with users during normal use shall be considered exempt from the requirements set out in this criterion."</i></p> <p>This approach is not acceptable as it would introduce a risk based approach to dealing with hazardous substances and allow possibly very toxic substances to be present in EU Ecolabel products. For instance, carcinogenic substances should be totally excluded without any derogation.</p> <p>This is in our view not in line with the findings of the EU Ecolabel Chemicals Horizontal Task Force paper, which states clearly that the precautionary principle should be applied when setting derogations and restrictions criteria on hazardous substances: <i>"Precautionary approach: This shall guide the evaluation of derogations and substance restrictions, especially if inherently safer products are available on the market. Decisions shall be made on a case-by-case basis and based on the latest scientific evidence."</i></p> <p>This precautionary approach and the exemption that parts below 25g which do not come in contact with the skin are in contradiction. Therefore, we call on the JRC to set criteria based on a hazard-based approach and in line with the precautionary principle. This is why we recommend deleting this</p>	<p>The 25g cut-off was introduced to avoid disproportionate assessment and verification efforts to cover issues that do not have a significant contribution to the overall environmental impact of the product. For example, what is the overall impact of using an H410 classified varnish on a 1g wooden dowel used in a 5kg chair?</p> <p>It should be pointed out that ALL components used (i.e. < 25g as well) must be accompanied by a declaration that they do not contain any SVHCs in concentrations exceeding 0.1% w/w. This already covers around 160 substances of high concern.</p> <p>Indeed one CB requested that the threshold actually be increased to 100g. We believe that 25g is a useful compromise.</p> <p>It should be reminded that the general hazardous substance criterion, and its apparent complexity has been a major concern for both applicant and CBs alike, so any</p>

	note in the future criteria proposal.	means to simplify requirements are welcomed.
Criterion 2.2 "Data-lacking" or unregistered substances	In case a substance's hazard classification is not available, and in line with the EU Ecolabel philosophy, we would strongly recommend to apply the precautionary principle to avoid any unknown hazardous substance in the final products.	After consultation with the horizontal task force for hazardous substances and ECHA, the proposed wording to "data lacking" and unregistered substances has been agreed upon and is being applied to other Product Groups too. (computers, televisions and footwear)
Criterion 2.2 Derogation for readily biodegradable substances	In "Table 5. Derogations to the hazard restrictions in Table 4 and applicable conditions", we have noticed that repellents which are readily biodegradable and/or inherently biodegradable are now allowed to be derogated. We strongly call on the JRC to stick to the statement in the previous version: "The repellent or varnish and its degradation products shall be readily biodegradable and non-bioaccumulative in the aquatic environment, including aquatic sediment" We think that readily biodegradable substances should be preferred to the inherently biodegradable ones as these substances have a slower biodegradation in the aquatic environment.	The new wording is almost identical to that include in Decision 2014/350/EU for EU Ecolabel textiles. The only real difference is now that it says "not classified as bioaccumulative" for furniture, instead of "classified as non-bioaccumulative" in response to a point raised by one stakeholder who pointed out that according to Part 4 of Annex I of CLP only a definition of "a real potential to bioaccumulate" is defined as a BCF of >500 when technically it could be argued that a BCF of >1 is proof of a "tendency to bioaccumulate". For concerns about inherent biodegradability, we provide a definition in the Act of the Decision that essentially refers to "inherent ultimate biodegradability" (i.e. >60-70%) which is much greater than that of "inherent primary biodegradability (i.e. >20%)". This same definition is used in the bed mattresses Decision 2014/391/EU.
Criterion 2:2 Flame retardants	The EEB and BEUC strongly recommend that products that are impregnated with hazardous flame retardants to meet fire safety standards are not awarded the EU Ecolabel, as they should not be labelled as green products of environmental excellence. Fire safety is needed but hazardous substances that may affect human health and the environment should be avoided in EU Ecolabel products, and in particular considering that safer alternatives to meet fire safety requirements are available. In this respect, EEB and BEUC recommend the introduction of a wording similar to the Blue Angel requirements for textiles requiring that: The flame-retarding effect should preferably be achieved by use of flame-resistant fibres or by means of the fabric structure. This specification could accompany the derogation conditions for flame retardants, so that the manufacturer should justify that for the specific application under consideration these alternatives are not available. If it is decided to still allow use of flame retardants, at least halogenated flame retardants should be excluded. Furthermore, EEB and BEUC strongly disagree with the derogation granted to antimony trioxide. Antimony Trioxide is a classified substance which may cause cancer (H351) and has only relevance as synergist in combination with brominated flame retardants. The fact that Antimony Trioxide is already derogated in EU Ecolabel for Textiles is not a valid rationale to justify its derogation in	Fire risk is most strongly associated with synthetic textiles and padding, the approach to flame retardants has largely been aligned with that already voted for textiles and bed mattresses EU Ecolabel criteria. Any alignment with the Blue Angel approach would result in a situation where EU Ecolabel textiles could not be used in EU Ecolabel furniture. The simple statement that flame-retarding effects should preferentially be achieved by the use of flame resistant fibres is not a clear criterion for applicants to follow and does not directly link to Fire Safety Regulations which upholstered furniture items must comply with. As has been said several times at stakeholders meetings and in written comments, the approach chosen is not to ban generic groups of substances but instead ban individual substances based on their hazard profiles, in a similar way as REACH and CLP legislation work on an individual substance basis. The derogation for ATO is only allowed under very specific

	<p>Furniture and it does not mean that we support it. On the contrary, we would like to point out that low-ambition requirements of one product group should not lead to the lowering of the ambition level of another product group. The logic mentioned as a rationale by the JRC is definitely not the right one to follow.</p> <p>Furthermore, less hazardous alternatives are available for textiles applications and for bed mattresses as concluded by different studies such as ENFIRO (see: http://greensciencepolicy.org/san-antonio-statement/#statement). Alternatives include flame inherent fibres, intumescent systems or fabric structure design.</p>	<p>and limited circumstances, and should not be interpreted as a green light to use ATO in any EU Ecolabel furniture material. It is true that the ENFIRO report mentions non-hazardous or non-classified flame retardants but we are uncertain of the degree in which these are used in upholstered furniture.</p>								
<p><i>Criterion 2.2: Derogation for zinc (Table 5)</i></p>	<p>As previously indicated, the proposed derogation incorrectly links the zinc and zinc compounds with H412 (aquatic hazard) and prolonged skin contact.</p> <p>(i) Heavy metals / Zinc and zinc compounds - H412 - Only permitted when used in the electroplating or hot-dip galvanising of metal components which are not considered to come into prolonged skin contact</p> <p>In order determine whether derogation is indeed required for zinc and, if so, to refocus the derogation on the aquatic hazard properties of zinc, it is necessary to clarify JRC's original intention. The original cause of concern was prompted by the H412 classification and the use electroplated and hot-dip galvanized metal components in furniture. Therefore, as metal components with electroplated and hot-dip galvanized coatings are coated with zinc metal and their impact on the aquatic environment, it is questionable whether the reference zinc compounds is relevant in this case. Furthermore, as the CLP Inventory lists zinc metal and its compounds on an individual basis with their own distinct and different hazard classifications, it seems inappropriate to use the collective term "zinc and zinc compounds" in the proposed derogation.</p> <p>In addition, zinc metal in the massive form is not classified for any health or environmental endpoint. Therefore, as metal components with electroplated and hot-dip galvanized coatings are coated with zinc metal in the massive form, the proposed derogation based on aquatic hazard H412 is not justified.</p> <p>If, however, the original concern was related to use of zinc and its compounds in the manufacture of electroplated and hot-dip galvanized metal components, then the problem remains that the CLP Inventory lists zinc metal and its compounds on an individual basis with their own distinct and different hazard classifications.</p> <p>Hot-dip galvanising uses zinc metal in liquid form, while zinc electroplating baths employ a variety of zinc compounds (e.g. acid zinc chloride, alkaline non-cyanide zinc, and alkaline zinc cyanide solutions).</p> <p>Hazard Classification of Zinc substances used in electroplating baths</p> <table border="1" data-bbox="443 1238 1406 1391"> <thead> <tr> <th>Substance</th> <th>Hazard Classification</th> </tr> </thead> <tbody> <tr> <td>Zinc oxide</td> <td>H400, H410</td> </tr> <tr> <td>Zinc chloride</td> <td>H400, H410, Acute Tox 4, Skin Corrosion</td> </tr> <tr> <td>Zinc cyanide</td> <td>H400, H410, H300, H310, H330</td> </tr> </tbody> </table>	Substance	Hazard Classification	Zinc oxide	H400, H410	Zinc chloride	H400, H410, Acute Tox 4, Skin Corrosion	Zinc cyanide	H400, H410, H300, H310, H330	<p>This was a mistake that has now been corrected.</p> <p>The link to prolonged skin contact should have been for nickel and not zinc. As is now the case in the final text.</p> <p>To clarify, substances and mixtures are now restricted based on their CLP classification when they are used in the production process, not as the end up in the final product.</p> <p>Consequently, we have introduced derogations that now permit the use of zinc oxide, zinc chloride and zinc cyanide in zinc electroplating operations as per the classification information provided.</p> <p>A similar approach has been made for Cr(III) electroplating operations.</p> <p>No derogation is foreseen as necessary for zinc metal in hot-dip galvanising since this is the metal is in massive form and does not have an official CLP classification like zinc powder does.</p>
Substance	Hazard Classification									
Zinc oxide	H400, H410									
Zinc chloride	H400, H410, Acute Tox 4, Skin Corrosion									
Zinc cyanide	H400, H410, H300, H310, H330									

	Thus, the derogation would have to be formulated with care in order to address the specific workplace and/or environmental concerns.	
Criterion 2: CLP Restrictions on chemical products	<p>BEUC and EEB are very concerned that H334 is not present anymore in the Table of Hazards classifications. As H334 is part of the category 1, Respiratory Sensitizer, we believe that it should be included in the Group 2 of the Hazard table.</p> <p>We would really appreciate to receive from the JRC more information on the rationale of this withdrawal. We would like to remind that this omission can have negative consequences on the consumers' health as it would allow hazardous substances known to cause "allergy or asthma symptoms or breathing difficulties if inhaled" to be present in Ecolabelled furniture.</p> <p>Therefore, we strongly encourage the JRC reintroducing H334 in the table of hazards classifications.</p>	<p>H317 and H334 are not required to be included in the General Hazardous Substance criteria because they do not correspond to Article 57 hazards.</p> <p>These hazards are included only when they are likely to be prominent in the final product and represent risk to users. For example these are both important hazards when dealing with rinse-off cosmetics.</p> <p>With furniture, there are many coating substances and adhesives used in furniture that may carry H317 and H334 hazards, but these hazards do not persist in the final product.</p>
Criterion 2.2: Biocides: Derogation conditions	<p>In the February version were allowed Biocides with CLP class groups 2 and 3 ; in this new version you forbid class 2 risk hazards for biocides used in products marketed for outdoor use. CLASS 2 NEEDS TO BE ALLOWED, as , to our knowledge , no biocides for our type of products exists without class 2 hazards.</p> <p>In the assessment and verification section of this Biocides requirement, you write that coated fabrics should only use Type 6 biocides of EU regulation 528. In fact, in our business, it is important to allow both 6 and 9 biocides types as depending on the process/product structure, the type 6 biocides may not be appropriate for coated fabrics and the only remaining solution is Type 9 biocides.</p>	This issue has been addressed in the final text. Now Group 2 hazards are again allowed, with the notable exception of Category 2 CMRs.
Criterion 3: wood, bamboo and rattan	Denmark support to include also bamboo in certified sustainable forestry as suggested by FSC at the June EUEB meeting.	Sustainable certification is also required for bamboo, cork, rattan and "wood" in criterion 3.1.
Criterion 3.3 Formaldehyde emissions from panels	It needs to be clarified when the panel shall be tested. Is it the "raw" panel or can the test be done on a panel including a surface treatment. The standard referred to are covering both situations.	The text has been clarified, it applies to the wood-based panel in the form that it is used in the final furniture product (i.e. coated or uncoated etc.), as appropriate.
Criterion 3.2 b) and c) Restricted substances in: wood-based panels Criterion 4: Plastics Polyvinyl chloride (PVC)	<p>BEUC and EEB strongly supported the criterion that effectively banned PVC from EU Ecolabel furniture in the last draft from October 2014 and are very concerned that in the new criteria proposal, the JRC did not maintain this criterion. We call on the JRC to review this proposal which is not supported by convincing arguments and to reintroduce the total ban of PVC in EU Ecolabel furniture. Such a step back from an ambitious criterion to a permissive one goes in the wrong direction and tends to undermine the excellent reputation of the EU Ecolabel.</p> <p>There are many very well-known arguments justifying the exclusion of PVC in EU Ecolabel furniture. The restriction of PVC is consistent with the EU Ecolabel Regulation (EC 66/2010): criteria shall be determined on a scientific basis considering the whole life cycle of products. There are strong arguments that justify this restriction:</p> <ul style="list-style-type: none"> ○ Vinyl Chloride Monomer (VCM) is classified as Carcinogenic Category 1A. ○ PVC can have significant environmental impact especially as under uncontrolled 	<p>The official Commission position during the latter half of the revision process has been communicated to stakeholders on several occasions as not promoting in favour of a general ban of PVC but instead to require that any PVC used has been produced using BAT processes and does not contained any phthalate plasticisers that exhibit restricted CLP classifications. This is reflected in criteria 3.2(b), 3.2(c), 4.2(b) and 6.5.</p> <p>In the final legal text published under Commission Decision (EU) 2016/1332, PVC is in fact effectively banned from EU Ecolabel furniture and a detailed explanation of the reasons for this change are included on page 49 of this</p>

	<p>circumstances combustion dioxins can be released from the chlorine content. We remind that dioxins are known to be highly toxic compounds that are environmental pollutants and persistent organic pollutants (POPs).</p> <ul style="list-style-type: none"> ○ PVC is very unstable and needs loads of additives, and some of them are very toxic, such as phthalates. Most of them are classified as toxic or even included in the REACH candidate list due to their very high concern properties. Phthalates (mainly Benzyl butyl phthalate (BBP), Bis(2-ethylhexyl) phthalate (DEHP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) are used in high concentrations when manufacturing PVC plastic and tend to leach out of the material. So we are talking about a high volume chemical used in high concentrations in very many consumer products which present a source of exposure to phthalates. ○ PVC undermines recycling efforts. First, toxic such as DEHP hampers the recyclability of PVC. Secondly, re-injecting hazardous substances in recycled material is in total opposition to a sound circular economy. <p>In addition, there are safer alternatives available on the market, which is proven by an increasing number of PVC-free products proposed by well-known brands like Herman Miller, Knoll, Steelcase, Teknion, IKEA. This is therefore possible to benefit from a large uptake on the market when proposing products marked as PVC-free. This tendency demonstrates that the shift toward PVC-free products and safer alternatives is ongoing. The EU Ecolabel products are supposed to be the top 10% of the best products on the market and are meant to be front-runners. It is therefore unconceivable that PVC is allowed in EU Ecolabel products and it would definitely undermine the credibility of the label.</p> <p>Furthermore, we would like to point out that the very well elaborated scientific evidence to justify the ban of PVC are mentioned in the technical reports from April and October 2014 drafted by the JRC. All arguments to ban PVC are therefore explicitly and well-explained in the last report from the JRC.</p> <p>Finally, a ban of PVC from Ecolabel furniture would be much simplify the Ecolabel criteria and it would be much easier rather than putting requirements on each PVC component.</p>	<p>report.</p>
<p>Criterion 4.2 a) Restricted substances in plastics</p>	<p>The lead limitation to 1,000 ppm in recycled PVC effectively excludes use of recycled post-consumer PVC, which is not in line with the Circular Economy concept. Contrary to the case of cadmium, which refers to a EU Regulation, this limit on lead is entirely arbitrary.</p>	<p>As stated in the rationale of this Technical Report for Criterion 4.2(a), the lead restriction is influenced by the ASTM Children's Safety Standard which restricts lead to 100mg/kg. It should be noted that EU Ecolabel criteria can, and in many cases should, exceed the minimum requirements of legislation.</p>
<p>Criterion 5.1 – Electroplating Restrictions</p>	<p>In view of the information provided about the use of chromate conversion coatings and other supplementary treatments enhance the corrosion resistance of electrodeposited zinc coatings, it may be necessary to revisit the wording of this criterion. Especially, as the reference to chromium VI and cadmium was not intended to refer to zinc coatings.</p> <p>At the recent EUEB meeting, the question was raised of whether there is a need for derogation of trivalent chromium electroplating.</p> <p>Trivalent chromium electro-deposits consist of chromium metal, which is not classified and,</p>	<p>Criterion 5.1 has been reworded accordingly, taking into account the detailed information included in this comment.</p>

	<p>therefore, derogation is not required.</p> <p>Trivalent chromium electroplating baths utilise either chromium chloride or chromium sulphate in tanks lined with either PVC or polypropylene. The tanks are heated with titanium coils or titanium-clad, silica-cased or Teflon-coated electric immersion heaters. Continuous filtration is recommended and, depending on the bath chemistry, graphite, lead or coated titanium anodes are used. Additives are needed to prevent oxidation of Cr(III) at the anodes.</p> <p>Therefore, the use of these substances in the manufacture of Ecolabelled furniture products should also be considered. Anhydrous chromium chloride, chromium chloride hexahydrate and chromium sulphate are self-classified as follows:-</p> <table border="1"> <thead> <tr> <th rowspan="2">Substance Name</th> <th rowspan="2">CAS No</th> <th colspan="2">Harmonised Hazard Classifications</th> </tr> <tr> <th>Health</th> <th>Environmental</th> </tr> </thead> <tbody> <tr> <td>Chromium (III) Chlorine, hexahydrate</td> <td>10060-12-5</td> <td>H302, H315, H319, H332</td> <td>-</td> </tr> <tr> <td>Chromium (III) Chlorine, anhydrous</td> <td>10025-73-1</td> <td>H302, H315, H319</td> <td>H411</td> </tr> <tr> <td>Chromium (III) Sulphate, hydrated</td> <td>10101- 53-8</td> <td>H302, H315, H317, H319, H332</td> <td>-</td> </tr> </tbody> </table> <p>As chromium chloride and chromium sulphate are neither CMRs nor SVHC, the REACH requirements for safe use of these products should be sufficient to protect both workers and the environment. Therefore, it seems unnecessary to identify derogation conditions for chromium (III) chloride and chromium (III) sulphate used in electroplating of components for ecolabelled furniture.</p>	Substance Name	CAS No	Harmonised Hazard Classifications		Health	Environmental	Chromium (III) Chlorine, hexahydrate	10060-12-5	H302, H315, H319, H332	-	Chromium (III) Chlorine, anhydrous	10025-73-1	H302, H315, H319	H411	Chromium (III) Sulphate, hydrated	10101- 53-8	H302, H315, H317, H319, H332	-	
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Chromium (III) Sulphate, hydrated	10101- 53-8	H302, H315, H317, H319, H332	-																	
Criterion 5.1 – Electroplating Restrictions	Why are only certain metal parts allowed to be electroplated but there is no equivalent restriction on which metal parts can be painted?	To avoid any disparity in the criteria, the first paragraph in criterion 5.1 has been deleted. Now it should be clear that any metal component part can in principle be electroplated but should never be electroplated using cadmium or chromium VI.																		
Criterion 6.1. Table 15 physical requirements for coated fabric covering	<p>Furniture fabric is often only textile covering made of wool or cotton. Are these types of fabric included in “coated” fabric? The technical report states “any textile” but this is not clear in the criterion text. The standards are not the same as listed in the criteria document for mattresses. If not, please do not just copy the requirement from this document without checking the applicability. Some covers are quilted and then the test listed (in mattresses) does not apply.</p> <p>The technical report refers to the Textile document (2014/350/EU) but this does only include dimensional changes as physical parameter.</p>	<p>As per the definition included in the Act: <i>“Coated fabrics” are considered as fabrics with an adherent, discrete continuous layer of rubber and/or plastic based material on one or both surfaces, as defined in EN 13360.</i> ”</p> <p>Coated fabrics basically refer to PVC or PU coatings or extruded on a textile support which can be Cotton , Polyester cotton , Cotton polyester, Polyester, PA or PET.</p> <p>Due to their nature, coated fabrics have a different set of standards to any other textiles, as reflected in Table 16.</p>																		
Criterion 6.2 Table 17 chemical testing of upholstery	Formaldehyde is the main contributor to a bad indoor climate. Hence the emission shall be limited and Denmark suggest to set the level for all covers to <75 ppm. The level in The Nordic Ecolabel is 20 ppm for all covers including leather.	<p>The limit has been lowered from 150 to 75mg/kg in the final text.</p> <p>However, the high ambition level of this should be</p>																		

cover materials		<p>recognised. Most leather and coated fabrics used in furniture can be classed as "facing materials", which corresponds to Product Class III in the OEKOTEX-100 standards (and for which an extractable formaldehyde limit of 300mg/kg is set).</p> <p>For furniture designed for babies and children <3 years old, a stricter limit of 20mg/kg is agreed and is specified in the final text.</p> <p>It should also be noted that all leather and coated fabrics to be used in EU Ecolabel furniture are subject to chamber emission tests in line with Blue Angel approaches (see Criterion 9.5).</p>
<p>Criterion 6.2. ATO Flame Retardants</p> <p>***Note below the table 17</p>	In your current draft, compliance with this limit is not compulsory for textiles and coated fabrics which have a backcoating that has been treated with ATO; flame retardants are not always in the backcoating, this exemption should be granted in all cases explained in table 5 cell (d), i.e. also when the product is intended to be used in applications in which it is required to meet fire protection requirements in ISO, EN, member State or public sector procurements standards and regulations, where ever the ATO is in the product .	This exemption text has now been modified in line with the comment.
Criterion 6.4a Organic cotton	The requirement does not work which is clearly indicated in the discussion in regards to the textile document. There is no reason to repeat a mistake!	The approach for organic cotton has been aligned with that applied to EU Ecolabel footwear, which was agreed following detailed discussions with several Competent Bodies and Commission Services.
Criterion 6.4. Cotton and other natural cellulosic seed fibres	The EEB and BEUC welcome the reintroduction of requirements on the traceability of cotton and strongly support requirements to award the use of organic cotton. However, the requirements of a minimum of 10% organic cotton content or 20% IPM cotton content are not enough. NGOs encourage the JRC to raise the minimum requirements for organic cotton in the next draft.	The limits are aligned with those previously agreed for EU Ecolabel criteria for textiles. Increasing those limits for furniture would potentially end up with a situation where EU Ecolabel textiles cannot be used in EU Ecolabel furniture.
Criterion 7.2 Polyurethane (PUR) foam	The EEB and BEUC strongly support the restriction made for phthalates in PUR foams in plasticisers. However, we disagree with the differentiation of age proposed by the JRC. As children use and chew on all kind of furniture in the house, it would be irrelevant to differentiate furniture for adults and children. Based on the precautionary approach, we strongly call the JRC to limit the sum of all 6 phthalates to 0.01% w/w for all ecolabelled furniture without differentiation of age.	<p>The issues relating to the situation with DIDP and DINP plasticisers have been widely discussed. The official stance is that DIDP and DINP are not yet classified and so cannot be restricted based on such classification and that the only credibility for their ban comes from a statement by ECHA that "<i>...a risk from the mouthing of toys and <u>childcare articles</u> with DINP and DIDP cannot be excluded...</i>"</p> <p>The approach in the EU Ecolabel criteria for PUR in furniture reflects this official stance by ECHA.</p>
General comment to testing costs	The assessment and verification shall not be based on self-declarations but the experience from the newly adopted criteria document for mattresses shows that testing costs have increased dramatically and is many times bigger that application costs. Have an assessment of the costs been	The costs of any required testing will really depend on the type of materials in the product and whether suppliers can provide the test information for free or if testing costs are

	<p>made or is it clear how many test shall be performed on one furniture?</p>	<p>shared.</p> <p>For example, VOC emission testing costs have been described in the TR rationale for criterion 9.5. But these tests can be avoided by not using leather or coated fabrics and by only using low VOC content coatings. Even where leather or coated fabrics are used, since these would be the dominant factor behind furniture VOC emissions, it is permitted to only test these materials instead of the entire product. Suppliers could potentially provide this information or share testing costs.</p> <p>Final product testing costs were included in Appendix V of version 4.0 of the Technical Report but these were removed upon request by one stakeholder based on the fact that they could become obsolete quite quickly.</p>
<p>Validity of the criteria</p>	<p>The draft Commission Decision establishing the ecological criteria for the award of the EU Ecolabel for Furniture states that:</p> <p>"The revised criteria, as well as the related assessment and verification requirements should be valid for six years from the date of adoption of this Decision, taking into account the innovation cycle for this product group."</p> <p>BEUC and EEB have concerns regarding the new validity of the criteria which has been established to 6 years and prefer to keep the current 4 years validity.</p> <p>We hold the views that a 4 years period is already long enough for safer alternatives to come up on the market and scientific evidence-based studies to be published. In order to make the EU Ecolabel a signpost and a front-runner in the green sector, it is crucial that the scheme is given flexibility to be able to reflect the market's innovations in the criteria.</p> <p>Such an approach would ensure that the Ecolabel products stay at the forefront of innovation and comply with the highest safety standards existing on the market.</p> <p>In the meantime, we remind that even 4 year valid criteria can be prolonged in a second step if it is not relevant to revise them.</p>	<p>The revision of any Ecolabel criteria is a time and resource consuming process.</p> <p>Six years has been decided on the basis that innovation in the furniture market is not so rapid in comparison to other Product Groups such as computers.</p> <p>Where specific criteria or details clearly become obsolete, there is always the opportunity to make amendments.</p>

CONCLUSIONS

A new set of EU Ecolabel criteria have been published by the European Commission under Commission Decision (EU) [2016/1332](#). The previous scope of the product group, which only permitted wooden furniture ($\geq 90\%$ by weight wood or wood-based materials) has been amended to now allow other materials to be used without any maximum or minimum limits. The expanded scope greatly increase the number of furniture products that are covered by these EU Ecolabel criteria and will hopefully lead to increased uptake in the market.

Specific criteria for the most relevant materials used in furniture have been developed. These extend to solid wood and wood-based panels, cork, rattan, plastics, metals, leather, textile fabrics, coated fabrics, polyurethane foam, latex foam and glass. Other materials are permitted in the product group for which no criteria have been developed (e.g. rubber or ceramics) so long as these do not amount to more than 5% of the product weight and also respect the general hazardous substance requirements set out in criterion 2.

The requirements in criterion 2.2(a) will help raise awareness among potential applicants of the hazardous chemicals that may be used directly by furniture manufacturers themselves. The requirements of criterion 2.2(b) will help raise awareness of the possible hazardous chemicals that can be present in supplied parts and materials and to better understand the responsibilities of REACH throughout the supply chain.

In criteria 3, the sourcing of sustainably sourced wood is strongly supported and the use of low formaldehyde emission resins and adhesives is essentially required for wood-based panels.

Chemical residues present in upholstery materials are strictly regulated due to the high degree of potential skin contact with users and a flexible approach to reducing VOC emissions from EU Ecolabel furniture is presented where compliance can either be demonstrated by careful choice of coating chemicals, where specific parts of the furniture product representing the main sources of emissions can be tested or where the entire final product can be tested.

The EU Ecolabel criteria encourage the production of durable products that are fit for purpose, easy to repair and easy to dismantle into separate material streams at the end-of-life to maximise recycling potential.

Overall, the new criteria offer the possibility for the EU Ecolabel to have a much larger impact on the furniture market than was previously the case and will encourage better communication throughout the furniture supply chain regarding environmentally relevant issues such as the sourcing of timber, classification of chemicals, emission levels of wood-based panels and chemical residues in supplied upholstery materials to name but a few.

REFERENCES

1. 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).
2. Commission Decision 2014/350/EU of 5 June 2014 establishing the ecological criteria for the award of the EU Ecolabel for textile products (OJ L 174, 13.6.2014, p. 45).
3. ECHA, Candidate List of substances of very high concern for Authorisation, <http://www.echa.europa.eu/candidate-list-table>.
4. Sierra-Perez et. al. 2015. Production and trade analysis in the Iberian cork sector: Economic characterization of a forest industry, Resources, Conservation and Recycling, Vol. 98 p.55-66.
5. Possible double certification is not taken into account
6. Pereira, H. and Tomé, M. 20014. Cork oak and cork . In: J. Burley, J Evans, JA Youngquist (Eds.), Encyclopedia of For Sci., Elsevier, Oxford, pp. 613–620
7. Personal communication with Cork Forest Conservation Alliance: <http://www.corkforest.org/>
8. Rives et al. (2011) Environmental analysis of the production of natural cork stoppers in southern Europe (Catalonia – Spain). Journal of Cleaner Production 19 (2–3), pp 259–271
9. NEPCON, 2012, "Comparative analysis of the PEFC system with the FSC Controlled Wood requirements"
10. "EPF Standard for delivery conditions of recycled wood", October 2002. Can be viewed online at: <http://www.europanel.org/upload/EPF-Standard-for-recycled-wood-use.pdf>.
11. IARC Monographs Volume 97, p.311-443
12. See: <http://www.pvcinfo.be/bestanden/S-PVC%20charter.pdf>
13. See: http://eippcb.jrc.ec.europa.eu/reference/BREF/pol_bref_0807.pdf
14. Regulation 93120 "Airborne toxic control measure to reduce formaldehyde emissions from composite wood products" California Code of Regulations.
15. See the following link for specific changes to formaldehyde classification (entry 605-001-00-5): http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:JOL_2014_167_R_0004&from=EN (To be included in part 3 of Annex VI of 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).
16. Groah et al., 1991. Comparative response of reconstituted wood products to European and North American test methods for determining formaldehyde emissions. Envi. Sci. Technol., Vol. 25, p.117-122.
17. Risholm-Sundman et al., 2007. Formaldehyde emission – Comparison of different standard methods. Atmospheric Environment, Vol. 41, p.3193-3202.
18. J. Aguado and D. Serrano, 1999, "Feedstock recycling of plastic wastes." published by the Royal Society of Chemistry, ISBN 0-85404-531-7.
19. Commission Implementing Decision 2013/84/EU of 11 February 2013 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for the tanning of hides and skins (notified under document C(2013) 618) (OJ L 45, 16.2.2013, p. 13).
20. Taneftrat, LIFE02 ENV/NL/000114
21. Best Available Techniques (BAT) Reference Document for the Tanning of Hides and Skins. JRC Reference Report. European Union, 2013.
22. http://eippcb.jrc.ec.europa.eu/reference/BREF/TAN_Adopted552013.pdf
23. According to Art. 3.12 of Directive 2010/75/EU on industrial emissions, BAT-AELs means the range of emission levels obtained under normal operating conditions using a best available technique or a combination of best available techniques, as described in BAT conclusions, expressed as an average over a given period of time, under specified reference conditions.

24. CEN/TC 289/WG4/ Draft WI 00289154 Leather – Criteria defining the performance characteristics of leather with a low environmental impact
25. Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91 ([OJ L 189, 20.7.2007, p. 1](#)).
26. EJF. (2007). *The deadly chemicals in cotton. Environmental Justice Foundation in collaboration with Pesticide Action Network UK*: London, UK. ISBN No. 1-904523-10-2.
27. http://textileexchange.org/sites/default/files/te_pdfs/ocsymbiosis.pdf
28. Detailed information available at:
http://susproc.jrc.ec.europa.eu/textiles/docs/130206%20Ecolabel%20textiles_Technical%20report_EUEB%20final.pdf
29. Lv, F., Wang, C., Zhu, P., and Zhang, C., Isolation (2015) Isolation and recovery of cellulose from waste nylon /cotton blended fabrics by 1-allyl-3-methylimidazolium chloride. *Carbohydrate Polymers*, 123, p.424-431.
30. Taher Halimi, M., Hassen, M.B., Faouzi Sakli, F. (2008) Cotton waste recycling: Quantitative and qualitative assessment. *Resources, Conservation and Recycling* 52 , pp. 785–791
31. <http://www.bir.org/industry/textiles/>
32. Bartil, A., Hackl, A., Mihalyi, B., , Wistuba, M., Marini, I. (2005) Recycling of Fibre Materials. *Process Safety and Environmental Protection*, 83(B4), pp. 351–358
33. <http://www.bir.org/industry/textiles/>
34. <http://textileexchange.org/node/958>
35. Wulfhorst, B. (1984) The technological and economic aspects of the recycling of wastes in modern cotton mills. *Foreign-edition with english supplement, vol. 8 Textile Praxis International* (1984) p. 741–3
36. www.pops.int/
37. http://www.who.int/ipcs/publications/pesticides_hazard_rev_3.pdf
38. <http://www.pic.int>
39. Better Cotton Production principles & criteria explained, October 2013, http://bettercotton.org/wp-content/uploads/2014/01/Better-Cotton-Production-Principles-and-Criteria-Explained-Final-2013_eng_ext.pdf
40. Bremen Baumwollbörse (2013) Analysis of chemical residues – pesticides as per Oeko-Tex Standard 100
41. https://www.icac.org/wp-content/uploads/2011/05/504-Att-3-Organic_Africa.pdf
42. http://organicexchange.org/ocems/images/stories/OE_2009_Farm_and_Fiber_Press_Release_0210_Final.pdf
43. http://ec.europa.eu/clima/policies/f-gas/docs/2011_study_en.pdf
44. http://ec.europa.eu/clima/policies/f-gas/legislation/docs/aerosols_foams_en.pdf
45. BREF (2006) document for Surface Treatment of Metals and Plastics (p.60) see:
http://eippcb.jrc.ec.europa.eu/reference/BREF/stm_bref_0806.pdf
46. BREF (2007) document for Surface Treatment using Organic Solvents (p.388) see:
http://eippcb.jrc.ec.europa.eu/reference/BREF/sts_bref_0807.pdf
47. Jeskey et al, 1991, see: <http://www.google.com.ar/patents/WO1991016197A1?cl=en>
48. Laroche et al., 2004, see: <http://www.google.com/patents/US6749307>
49. Kephelopoulos S and Geiss O., 2013. European Collaborative Action (ECA) on Urban Air, Indoor Environment and Human Exposure. Report No 29: Harmonisation framework for health based evaluation of indoor emissions from construction products in the European Union using the EU-LCI concept.
50. http://ihcp.jrc.ec.europa.eu/our_activities/public-health/indoor_air_quality/eca/jrc-published-harmonisation-framework-health-based-evaluation-emissions

List of definitions

For the purpose of this Technical Report, the following definitions shall apply:

- a) "**Aniline leather**" means leather whose natural grain is clearly and completely visible and where any surface coating with a non-pigmented finish is less than or equal to 0,01mm, as defined in EN 15987;
- b) "**Semi-aniline leather**" means leather that has been coated with a finish containing a small amount of pigment, so that the natural grain is clearly visible, as defined in EN 15987;
- c) "**Pigmented and pigmented split leather**" means leather or split leather whose natural grain or surface is completely concealed with a finish containing pigments, as defined in EN 15987;
- d) "**Patent and patent split leather**" means leather or split leather with generally a mirror-like effect, obtained by application of a layer of pigmented or non-pigmented varnishes, or synthetic resins, whose thickness does not exceed one third of the total thickness of the product, as defined in EN 15987;
- e) "**Coated and coated split leather**" means leather or split leather where the surface coating, applied to the outer side, does not exceed one third of the total thickness of the product but is in excess of 0,15 mm, as defined in EN 15987;
- f) "**Volatile organic compound**" (VOC) means any organic compound having an initial boiling point of less than or equal to 250°C measured at a standard pressure of 101.3 kPa as defined in Directive 2004/42/EC of the European Parliament and of the Council and which, in a capillary column, are eluting up to and including tetradecane (C₁₄H₃₀);
- g) "**Semi volatile organic compound**" (SVOC) means any organic compound having a boiling point of greater than 250 °C and less than 370 °C measured at a standard pressure of 101,3 kPa and which, in a capillary column are eluting with a retention range after n-tetradecane (C₁₄H₃₀) and including n-Docosane (C₂₂H₄₆);
- h) "**Recycled content**" means the proportion, by mass, of recycled material in a product or packaging; only pre-consumer and post-consumer materials are considered as recycled content, as defined in ISO 14021;
- i) "**Pre-consumer material**" means material diverted from the waste stream during a manufacturing process but excluding the reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it as defined in ISO 14021 and also excludes waste wood, chips and fibres from logging and sawmilling operations;
- j) "**Post-consumer material**" means material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose, including returns of material from the distribution chain, as defined in ISO 14021;
- k) "**Recovered/reclaimed material**" means material that would have otherwise been disposed of as waste or used for energy recovery, but has instead been collected and recovered/reclaimed as a material input, in lieu of new primary material, for a recycling or a manufacturing process, as defined in ISO 14021;
- l) "**Recycled material**" means material that has been reprocessed from recovered/reclaimed material by means of a manufacturing process and made into a final product or into a component for incorporation into a product as defined in ISO 14021, but excludes waste wood, chips and fibres from logging and sawmilling operations;
- m) "**Wood-based panels**" means panels fabricated from wood fibres by one of several different processes that may involve the use of elevated temperatures, pressures and binding resins or adhesives;
- n) "**Oriented Strand Board**" means multi-layered board mainly made from strands of wood together with a binder, as defined in EN 300. The strands in the external layer are aligned and parallel to the board length or width. The strands in the internal layer or layers can be randomly orientated or aligned, generally at right angles to the strands in the external layers;

- o) "**Particleboard**" means a panel material manufactured under pressure and heat from particles of wood (wood flakes, chips, shavings, saw-dust and similar) and/or other lignocellulosic material in particle form (flax shives, hemp shives, bagasse fragments and similar), with the addition of an adhesive, as defined in EN 309;
- p) "**Plywood**" means wood-based panels consisting of an assembly of layers glued together with the direction of the grain in adjacent layers usually at right angles, as defined in EN 313. Many different sub-categories of plywood can be referred to based on how the plywood is structured (such as, veneer plywood, core plywood, balanced plywood) or its predominant end use (for instance, marine plywood);
- q) "**Fibreboards**" means a broad set of panel types which are defined in EN 316 and EN 622 and which can be split into the sub-categories of hardboards, medium boards, soft-boards and dry-process boards based on their physical properties and production process;
- r) "**Readily biodegradable substance**" means a substance that shows 70% degradation of dissolved organic carbon within 28 days or 60% of theoretical maximum oxygen depletion or carbon dioxide generation within 28 days using one of the following test methods: OECD 301 A, ISO 7827, OECD 301 B, ISO 9439, OECD 301 C, OECD 301 D, ISO 10708, OECD 301 E, OECD 301 F, ISO 9408;
- s) "**Inherently biodegradable substance**" means a substance that shows 70% degradation of dissolved organic carbon within 28 days or 60% of theoretical maximum oxygen depletion or carbon dioxide generation within 28 days using one of the following test methods: ISO 14593, OECD 302 A, ISO 9887, OECD 302 B, ISO 9888, OECD 302 C;
- t) "**Finishing operations**" means methods where an over-layer or coating is applied to the surface of a material. Methods may include the application of paints, prints, varnishes, veneers, laminates, impregnated papers and finishing foils;
- u) "**Biocidal product**" as defined in Regulation (EU) No 528/2012 of the European Parliament and of the Council means:
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 preceding paragraph, 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 means, and a treated article that has a primary biocidal function;
- v) "**Wood preservatives**" means biocidal products which are applied by surface treatment (e.g. spraying, brushing) or deep penetrating processes (e.g. vacuum-pressure, double vacuum) to wood (i.e., logs received at the sawmill for commercial use and for all subsequent uses of the wood and wood-based products) or wood-based products themselves, or which are applied to non-wood substrates (e.g. masonry and building foundations) solely for the purpose of protecting adjacent wood or wood-based products from attack by wood-destroying organisms (e.g. dry rot and termites) according to the definition agreed upon by the European Committee for Standardisation (source CEN/TC 38 "Durability of wood and wood-based products");
- w) "**E1**" means a classification for formaldehyde-containing wood-based panels adopted across EU Member States based on formaldehyde emissions. According to the definition provided in Annex B to EN 13986, a wood-based panel shall be classified as E1 if emissions are equivalent to steady state concentrations of less than or equal to 0.1 ppm (0.124 mg/m³) of formaldehyde after 28 days of a chamber test carried out according to EN 717-1 or that the formaldehyde content is determined to be less than or equal to 8 mg/100 g oven dry board when measured according to EN 120 or that formaldehyde emission rates are less than or equal to 3.5 mg/m².h according to EN 717-2 or less than or equal to 5.0 mg/m².h according to the same method but within 3 days after production;

- x) **"Coated fabrics"** means fabrics with an adherent, discrete continuous layer of rubber and/or plastic based material on one or both surfaces, as defined in EN 13360, including upholstery materials commonly referred to as "faux leather";
- y) **"Textiles"** mean natural fibres, synthetic fibres and man-made cellulose fibres;
- z) **"Natural fibres"** means cotton and other natural cellulosic seed fibres, flax and other bast fibres, wool and other keratin fibres;
- aa) **"Synthetic fibres"** means acrylic, elastane, polyamide, polyester and polypropylene fibres;
- bb) **"Man-made cellulose fibres"** means lyocell, modal and viscose fibres;
- cc) **"Upholstery"** means the materials used in the craft of covering, padding and stuffing of seating, bedding or other furniture products and may include covering materials such as leather, coated fabrics and textiles as well as padding materials such as flexible cellular polymeric materials based on rubber latex and polyurethane;
- dd) **"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, as defined in Article 3(1) of Regulation (EC) No 1907/2006 of the European Parliament and of the Council;
- ee) **"Mixture"** means a mixture or solution composed of two or more substances as defined in Article 3(2) of Regulation (EC) No 1907/2006;
- ff) **"Component part"** means rigid and discrete units whose shape and form does not need to be altered prior to assembly of the final product in its fully functional form, although its position may change during use of the final product and includes hinges, screws, frames, drawers, wheels and shelves;
- gg) **"Component materials"** means materials whose shape and form may change prior to furniture assembly or during use of the furniture product, and includes textiles, leather, coated fabrics and polyurethane foams used in upholstery. Supplied timber may be considered as a component material but be later sawn and treated to be converted into a component part.

List of figures

Figure 1. Decision tree used to determine hazard classifications.....	22
Figure 2. Illustrated example of the cork production and processing chain (images from http://www.wineanorak.com/corks/howcorkismade.htm).....	28
Figure 3. Illustration of the 5 current labels from FSC and PEFC.....	30
Figure 4. Comparison of formaldehyde emission ambition levels in different schemes for wood-based panels. PW = Plywood; MDF = Medium density fibreboard; PB = Particleboard.....	39
Figure 5. Comparison of the marking that would be required for a polypropylene plastic with 30 % glass fibre filler content, epoxidised linseed oil plasticiser and red phosphorus flame retardant according to the SPI resin coding system (left) and the EN ISO 11469 / EN ISO 1043 standards (right).	44
Figure 6.. Schematic flow diagram of 'cradle to grave' process showing the different routes for cycle processes (recycling) ³²	66
Figure 7. Hypothetical example of product description information in an environmental product declaration of a commercially produced furniture product (imatge taken from a real exemple of an EPD for the "Team" chair produced by Arper).....	89

List of tables

Table 1. Comparison of new and previous furniture product scopes and definitions	6
Table 2. Links between furniture LCA hot-spots and EU Ecolabel criteria.....	10
Table 3. Comparison of existing and proposed criteria structures	11
Table 4. Grouping of restricted hazards	15
Table 5. Derogations to the hazard restrictions in Table 4 and applicable conditions	16
Table 6. Forest certified area and annual cork production by country.....	27
Table 7. Limits for contaminants in recycled wood.....	31
Table 8. VCM emission limits for PVC production and from the resin product.....	32
Table 9. Surface finish quality requirements if VOC application rate is 30-60g/m ²	35
Table 10. Assessment and verification of low formaldehyde emission panels	37
Table 11. Typical densities for common polymers	43
Table 12. Assessment and verification of heavy metal impurities in plastics.....	45
Table 13. VCM emission limits for PVC production and from the resin product.....	46
Table 14. Surface finish quality requirements if VOC application rate is 30-60g/m ²	50
Table 15. Physical requirements for textile fabric covering materials in furniture upholstery	52
Table 16. Physical requirements for coated fabric covering materials in furniture upholstery.....	53
Table 17. Chemical testing requirements for leather, textiles and coated fabric covering material	54
Table 18. Restricted substances used in leather, textile and coated fabric production stages	57
Table 19: BAT water consumption levels – Raw hide	62
Table 20: BAT water consumption levels – Skin.....	62
Table 21. VCM emission limits for PVC production and from the resin product.....	69
Table 22. Restricted substances in latex foams used in furniture upholstery padding materials	70
Table 23. VOC emission limits for latex foams.....	72
Table 24. List of restricted substances in PUR.....	73
Table 25. 72-hour VOC emission limits for PUR foams	75
Table 26. Maximum VOC emission limit values for specific furniture products	83
Table 27. Maximum VOC emission limit values for targeted furniture materials/parts	84
Table 28. Potential VOC emission test costs.....	84
Table 29. VOCs with emission limits defined under different systems.....	87
Table 30. Information that may appear with the EU Ecolabel relating to cotton in textiles.....	91
Table 31. FSC Principles and criteria (FSC-STD-01-001 V5.0).....	107
Table 32. List of the current International PEFC criteria and criteria.....	111
Table 33. Indicative efficiency factors for coating techniques:.....	116
Table 34. Physical requirements of leather used in EU Ecolabel furniture (as per EN 13336).....	117
Table 35. Carcinogenic arylamines to be tested in textiles or leather.....	118
Table 36. Indicative list of dyes that may cleave to form carcinogenic arylamines.....	118
Table 37. Indicative list of EN furniture standards revised by CEN/TC 207 for "Furniture") that are relevant to criterion 9.1	120

APPENDIX I: List of FSC & PEFC principles and criteria

To illustrate how difficult it would be to concisely summarise EU Ecolabel criteria that aligns with that of the FSC and PEFC sustainable forest management certification schemes, the currently valid principles with each scheme are provided in the tables below for reference.

Table 31. FSC Principles and criteria (FSC-STD-01-001 V5.0)

No.	PRINCIPLE / criteria
1 - COMPLIANCE WITH LAWS: <i>The Organization*</i> shall comply with all <i>applicable laws*</i> , regulations and <i>nationally-ratified*</i> international treaties, conventions and agreements.	
1.1	<i>The Organization*</i> shall be a legally defined entity with clear, documented and unchallenged <i>legal registration*</i> , with written authorization from the <i>legally competent*</i> authority for specific activities.
1.2	<i>The Organization*</i> shall demonstrate that the <i>legal status*</i> of the <i>Management Unit*</i> , including <i>tenure*</i> and <i>use rights*</i> , and its boundaries, are clearly defined.
1.3	<i>The Organization*</i> shall have <i>legal*</i> rights to operate in the <i>Management Unit*</i> , which fit the <i>legal status*</i> of The Organization and of the Management Unit, and shall comply with the associated legal obligations in applicable <i>national and local laws*</i> and regulations and administrative requirements. The legal rights shall provide for harvest of products and/or supply of <i>ecosystem services*</i> from within the Management Unit. The Organization shall pay the legally prescribed charges associated with such rights and obligations.
1.4	<i>The Organization*</i> shall develop and implement measures, and/or shall engage with regulatory agencies, to systematically protect the <i>Management Unit*</i> from unauthorized or illegal resource use, settlement and other illegal activities.
1.5	<i>The Organization*</i> shall comply with the applicable <i>national laws*</i> , <i>local laws*</i> , <i>ratified*</i> international conventions and <i>obligatory codes of practice*</i> , relating to the transportation and trade of forest products within and from the <i>Management Unit*</i> , and/or up to the point of first sale.
1.6	<i>The Organization*</i> shall identify, prevent and resolve disputes over issues of statutory or customary law*, which can be settled out of court in a timely manner, through <i>engagement*</i> with <i>affected stakeholders*</i> .
1.7	<i>The Organization*</i> shall publicize a commitment not to offer or receive bribes in money or any other form of corruption, and shall comply with anti-corruption legislation where this exists. In the absence of anti-corruption legislation, The Organization shall implement other anti-corruption measures proportionate to the <i>scale*</i> and <i>intensity*</i> of management activities and the <i>risk*</i> of corruption.
1.8	<i>The Organization*</i> shall demonstrate a long-term commitment to adhere to the <i>FSC Principles*</i> and <i>Criteria*</i> in the <i>Management Unit*</i> , and to related FSC Policies and Standards. A statement of this commitment shall be contained in a <i>publicly available*</i> document made freely available.
PRINCIPLE 2 – WORKERS RIGHTS AND EMPLOYMENT CONDITIONS: <i>The Organization*</i> shall maintain or enhance the social and economic wellbeing of <i>workers*</i> .	
2.1	<i>The Organization*</i> shall <i>uphold*</i> the principles and rights at work as defined in the ILO Declaration on Fundamental Principles and Rights at Work (1998) based on the eight ILO Core Labour Conventions.
2.2	<i>The Organization*</i> shall promote <i>gender equality*</i> in employment practices, training opportunities, awarding of contracts, processes of <i>engagement*</i> and management activities.
2.3	<i>The Organization*</i> shall implement health and safety practices to protect <i>workers*</i> from occupational safety and health hazards. These practices shall, proportionate to <i>scale, intensity and risk*</i> of management activities, meet or exceed the recommendations of the ILO Code of Practice on Safety and Health in Forestry Work.
2.4	<i>The Organization*</i> shall pay wages that meet or exceed minimum forest industry standards or other recognized forest industry wage agreements or <i>living wages*</i> , where these are higher than the legal minimum wages. When none of these exist, The Organization shall through <i>engagement*</i> with <i>workers*</i> develop mechanisms for determining living wages.
2.5	<i>The Organization*</i> shall demonstrate that workers have job-specific training and supervision to safely and effectively implement the <i>management plan*</i> and all management activities.
2.6	<i>The Organization*</i> through <i>engagement*</i> with <i>workers*</i> shall have mechanisms for resolving grievances and for providing fair compensation to workers for loss or damage to property, <i>occupational diseases*</i> , or <i>occupational injuries*</i> sustained while working for The Organization.
PRINCIPLE 3 – INDIGENOUS PEOPLES' RIGHTS: <i>The Organization*</i> shall identify and <i>uphold*</i> <i>indigenous peoples'*</i> legal and <i>customary rights*</i> of ownership, use and management of land, territories and resources affected by management activities.	

3.1	<i>The Organization*</i> shall identify the <i>indigenous peoples*</i> that exist within the <i>Management Unit*</i> or are affected by management activities. The Organization shall then, through <i>engagement*</i> with these indigenous peoples, identify their rights of <i>tenure*</i> , their rights of access to and use of forest resources and <i>ecosystem services*</i> , their <i>customary rights*</i> and legal rights and obligations, that apply within the Management Unit. The Organization shall also identify areas where these rights are contested.
3.2	<i>The Organization*</i> shall recognize and <i>uphold*</i> the legal and <i>customary rights*</i> of <i>indigenous peoples*</i> to maintain control over management activities within or related to the <i>Management Unit*</i> to the extent necessary to protect their rights, resources and lands and territories. Delegation by indigenous peoples of control over management activities to third parties requires <i>Free, Prior and Informed Consent*</i> .
3.3	In the event of delegation of control over management activities, a binding agreement between <i>The Organization*</i> and the <i>indigenous peoples*</i> shall be concluded through <i>Free, Prior and Informed Consent*</i> . The agreement shall define its duration, provisions for renegotiation, renewal, termination, economic conditions and other terms and conditions. The agreement shall make provision for monitoring by indigenous peoples of The Organization's compliance with its terms and conditions.
3.4	<i>The Organization*</i> shall recognize and <i>uphold*</i> the rights, customs and culture of <i>indigenous peoples*</i> as defined in the United Nations Declaration on the Rights of Indigenous Peoples (2007) and ILO Convention 169 (1989).
3.5	<i>The Organization*</i> , through <i>engagement*</i> with <i>indigenous peoples*</i> , shall identify sites which are of special cultural, ecological, economic, religious or spiritual significance and for which these indigenous peoples hold legal or <i>customary rights*</i> . These sites shall be recognized by The Organization and their management, and/or protection shall be agreed through engagement with these indigenous peoples.
3.6	<i>The Organization*</i> shall <i>uphold*</i> the right of <i>indigenous peoples*</i> to protect and utilize their traditional knowledge and shall compensate indigenous peoples for the utilization of such knowledge and their <i>intellectual property*</i> . A binding agreement as per Criterion 3.3 shall be concluded between The Organization and the indigenous peoples for such utilization through <i>Free, Prior and Informed Consent*</i> before utilization takes place and shall be consistent with the protection of intellectual property rights.
PRINCIPLE 4 – COMMUNITY RELATIONS: <i>The Organization*</i> shall contribute to maintaining or enhancing the social and economic wellbeing of <i>local communities*</i> .	
4.1	<i>The Organization*</i> shall identify the <i>local communities*</i> that exist within the <i>Management Unit*</i> and those that are affected by management activities. The Organization shall then, through <i>engagement*</i> with these <i>local communities*</i> , identify their rights of <i>tenure*</i> , their rights of access to and use of forest resources and <i>ecosystem services*</i> , their <i>customary rights*</i> and legal rights and obligations, that apply within the Management Unit.
4.2	<i>The Organization*</i> shall recognize and <i>uphold*</i> the legal and <i>customary rights*</i> of <i>local communities*</i> to maintain control over management activities within or related to the <i>Management Unit*</i> to the extent necessary to protect their rights, resources, lands and territories. Delegation by local communities of control over management activities to third parties requires <i>Free, Prior and Informed Consent*</i> .
4.3	<i>The Organization*</i> shall provide <i>reasonable*</i> opportunities for employment, training and other services to <i>local communities*</i> , contractors and suppliers proportionate to scale and intensity of its management activities.
4.4	<i>The Organization*</i> shall implement additional activities, through <i>engagement*</i> with <i>local communities*</i> , that contribute to their social and economic development, proportionate to the scale, intensity and socio-economic impact of its management activities.
4.5	<i>The Organization*</i> , through <i>engagement*</i> with <i>local communities*</i> , shall take action to identify, avoid and mitigate significant negative social, environmental and economic impacts of its management activities on affected communities. The action taken shall be proportionate to the <i>scale, intensity and risk*</i> of those activities and negative impacts.
4.6	<i>The Organization*</i> , through <i>engagement*</i> with <i>local communities*</i> , shall have mechanisms for resolving grievances and providing fair compensation to local communities and individuals with regard to the impacts of management activities of The Organization.
4.7	<i>The Organization*</i> , through <i>engagement*</i> with <i>local communities*</i> , shall identify sites which are of special cultural, ecological, economic, religious or spiritual significance, and for which these local communities hold legal or <i>customary rights*</i> . These sites shall be recognized by The Organization, and their management and/or protection shall be agreed through engagement with these local communities.
4.8	<i>The Organization*</i> shall <i>uphold*</i> the right of <i>local communities*</i> to protect and utilize their traditional knowledge and shall compensate local communities for the utilization of such knowledge and their <i>intellectual property*</i> . A binding agreement as per Criterion 3.3 shall be concluded between The Organization and the local communities for such utilization through <i>Free, Prior and Informed Consent*</i> before utilization takes place, and shall be consistent with the protection of intellectual property rights.
PRINCIPLE 5 – BENEFITS FROM THE FOREST: <i>The Organization*</i> shall efficiently manage the range of multiple products and services of the <i>Management Unit*</i> to maintain or enhance long term <i>economic viability*</i> and the range of environmental and social benefits.	
5.1	<i>The Organization*</i> shall identify, produce, or enable the production of, diversified benefits and/or products, based on the range of resources and <i>ecosystem services*</i> existing in the <i>Management Unit*</i> in order to strengthen and diversify the local economy proportionate to the <i>scale*</i> and <i>intensity*</i> of management activities.

5.2	<i>The Organization*</i> shall normally harvest products and services from the <i>Management Unit*</i> at or below a level which can be permanently sustained.
5.3	<i>The Organization*</i> shall demonstrate that the positive and negative <i>externalities*</i> of operation are included in the <i>management plan*</i> .
5.4	<i>The Organization*</i> shall use local processing, local services, and local value adding to meet the requirements of The Organization where these are available, proportionate to scale, <i>intensity and risk*</i> . If these are not locally available, The Organization shall make <i>reasonable*</i> attempts to help establish these services.
5.5	<i>The Organization*</i> shall demonstrate through its planning and expenditures proportionate to <i>scale, intensity and risk*</i> , its commitment to long-term <i>economic viability*</i> .
PRINCIPLE 6 – ENVIRONMENTAL VALUES AND IMPACTS: <i>The Organization*</i> shall maintain, conserve and/or restore <i>ecosystem services*</i> and <i>environmental values*</i> of the <i>Management Unit*</i> , and shall avoid, repair or mitigate negative environmental impacts.	
6.1	<i>The Organization*</i> shall assess <i>environmental values*</i> in the <i>Management Unit*</i> and those values outside the <i>Management Unit</i> potentially affected by management activities. This assessment shall be undertaken with a level of detail, scale and frequency that is proportionate to the <i>scale, intensity and risk*</i> of management activities, and is sufficient for the purpose of deciding the necessary conservation measures, and for detecting and monitoring possible negative impacts of those activities.
6.2	Prior to the start of site-disturbing activities, <i>The Organization*</i> shall identify and assess the <i>scale, intensity and risk*</i> of potential impacts of management activities on the identified <i>environmental values*</i> .
6.3	<i>The Organization*</i> shall identify and implement effective actions to prevent negative impacts of management activities on the <i>environmental values*</i> , and to mitigate and repair those that occur, proportionate to the <i>scale, intensity and risk*</i> of these impacts.
6.4	<i>The Organization*</i> shall protect <i>rare species*</i> and <i>threatened species*</i> and their <i>habitats*</i> in the <i>Management Unit*</i> through <i>conservation zones*</i> , <i>protection areas*</i> , <i>connectivity*</i> and/or (where necessary) other direct measures for their survival and viability. These measures shall be proportionate to the <i>scale, intensity and risk*</i> of management activities and to the conservation status and ecological requirements of the rare and threatened species. The Organization shall take into account the geographic range and ecological requirements of rare and threatened species beyond the boundary of the Management Unit, when determining the measures to be taken inside the Management Unit.
6.5	<i>The Organization*</i> shall identify and protect representative sample areas of native ecosystems and/or restore them to more natural conditions. Where representative sample areas do not exist, The Organization shall restore a proportion of the <i>Management Unit*</i> to more natural conditions. The size of the areas and the measures taken for their protection or restoration shall be proportionate to the conservation status and value of the ecosystems at the landscape level, and the <i>scale, intensity and risk*</i> of management activities.
6.6	<i>The Organization*</i> shall effectively maintain the continued existence of naturally occurring native species and genotypes, and prevent losses of <i>biological diversity*</i> , especially through habitat management in the <i>Management Unit*</i> . The Organization shall demonstrate that effective measures are in place to manage and control hunting, fishing, trapping and collecting.
6.7	<i>The Organization*</i> shall protect or restore natural water courses, water bodies, riparian zones and their connectivity. The Organization shall avoid negative impacts on water quality and quantity and mitigate and remedy those that occur.
6.8	<i>The Organization*</i> shall manage the <i>landscape*</i> in the <i>Management Unit*</i> to maintain and/or restore a varying mosaic of species, sizes, ages, spatial scales and regeneration cycles appropriate for the <i>landscape values*</i> in that region, and for enhancing environmental and economic <i>resilience*</i> .
6.9	<i>The Organization*</i> shall not convert <i>natural forest*</i> to <i>plantations*</i> , nor natural forests or plantations to any other land use, except when the conversion: a) affects a very limited portion of the area of the <i>Management Unit*</i> , and b) will produce clear, substantial, additional, secure long-term conservation benefits in the Management Unit, and c) does not damage or threaten <i>High Conservation Values*</i> , nor any sites or resources necessary to maintain or enhance those High Conservation Values.
6.10	<i>Management Units*</i> containing <i>plantations*</i> that were established on areas converted from <i>natural forest*</i> after November 1994 shall not qualify for certification, except where: a) clear and sufficient evidence is provided that <i>The Organization*</i> was not directly or indirectly responsible for the conversion, or b) the conversion affected a very limited portion of the area of the Management Unit and is producing clear, substantial, additional, secure long term conservation benefits in the Management Unit.

<p>PRINCIPLE 7 – MANAGEMENT PLANNING: <i>The Organization*</i> shall have a <i>management plan*</i> consistent with its policies and <i>objectives*</i> and proportionate to <i>scale, intensity and risks*</i> of its management activities. The management plan shall be implemented and kept up to date based on monitoring information in order to promote <i>adaptive management*</i>. The associated planning and procedural documentation shall be sufficient to guide staff, inform <i>affected stakeholders*</i> and <i>interested stakeholders*</i> and to justify management decisions.</p>	
7.1	<i>The Organization*</i> shall, proportionate to <i>scale, intensity and risk*</i> of its management activities, set policies (visions and values) and <i>objectives*</i> for management, which are environmentally sound, socially beneficial and economically viable. Summaries of these policies and objectives shall be incorporated into the <i>management plan*</i> , and publicized.
7.2	<i>The Organization*</i> shall have and implement a <i>management plan*</i> for the <i>Management Unit*</i> which is fully consistent with the policies and <i>objectives*</i> as established according to Criterion 7.1. The management plan shall describe the natural resources that exist in the Management Unit and explain how the plan will meet the FSC certification requirements. The management plan shall cover forest management planning and social management planning proportionate to <i>scale, intensity and risk*</i> of the planned activities.
7.3	<i>The management plan*</i> shall include verifiable targets by which progress towards each of the prescribed management <i>objectives*</i> can be assessed.
7.4	<i>The Organization*</i> shall update and revise periodically the management planning and procedural documentation to incorporate the results of monitoring and evaluation, stakeholder <i>engagement*</i> or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.
7.5	<i>The Organization*</i> shall make <i>publicly available*</i> a summary of the management plan* free of charge. Excluding confidential information, other relevant components of the management plan shall be made available to <i>affected stakeholders*</i> on request, and at cost of reproduction and handling.
7.6	<i>The Organization*</i> shall, proportionate to <i>scale, intensity and risk*</i> of management activities, proactively and transparently engage <i>affected stakeholders*</i> in its management planning and monitoring processes, and shall engage <i>interested stakeholders*</i> on request.
<p>PRINCIPLE 8 – MONITORING AND ASSESSMENT: <i>The Organization*</i> shall demonstrate that, progress towards achieving the management <i>objectives*</i>, the impacts of management activities and the condition of the <i>Management Unit*</i>, are monitored and evaluated proportionate to the <i>scale, intensity and risk*</i> of management activities, in order to implement <i>adaptive management*</i>.</p>	
8.1	<i>The Organization*</i> shall monitor the implementation of its <i>management plan*</i> , including its <i>policies and objectives*</i> , its progress with the activities planned, and the achievement of its verifiable targets.
8.2	<i>The Organization*</i> shall monitor and evaluate the environmental and social impacts of the activities carried out in the <i>Management Unit*</i> , and changes in its environmental condition.
8.3	<i>The Organization*</i> shall analyse the results of monitoring and evaluation and feed the outcomes of this analysis back into the planning process.
8.4	<i>The Organization*</i> shall make <i>publicly available*</i> a summary of the results of monitoring free of charge, excluding confidential information.
8.5	<i>The Organization*</i> shall have and implement a tracking and tracing system proportionate to <i>scale, intensity and risk*</i> of its management activities, for demonstrating the source and volume in proportion to projected output for each year, of all products from the <i>Management Unit*</i> that are marketed as FSC certified.
<p>PRINCIPLE 9 – HIGH CONSERVATION VALUES: <i>The Organization*</i> shall maintain and/or enhance the <i>High Conservation Values*</i> in the <i>Management Unit*</i> through applying the <i>precautionary approach*</i>.</p>	
9.1	<p><i>The Organization*</i>, through <i>engagement*</i> with <i>affected stakeholders*</i>, <i>interested stakeholders*</i> and other means and sources, shall assess and record the presence and status of the following <i>High Conservation Values*</i> in the <i>Management Unit*</i>, proportionate to the <i>scale, intensity and risk*</i> of impacts of management activities, and likelihood of the occurrence of the High Conservation Values:</p> <p>HCV 1 - Species diversity. Concentrations of <i>biological diversity*</i> including endemic species, and <i>rare, threatened or endangered*</i> species, that are significant at global, regional or national levels.</p> <p>HCV 2 - Landscape-level ecosystems and mosaics. Large landscape-level <i>ecosystems*</i> and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.</p> <p>HCV 3 - Ecosystems and habitats. Rare, threatened, or endangered ecosystems, <i>habitats*</i> or <i>refugia*</i>.</p> <p>HCV 4 - Critical ecosystem services. Basic <i>ecosystem services*</i> in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.</p> <p>HCV 5 - Community needs. Sites and resources fundamental for satisfying the basic necessities of <i>local communities*</i> or <i>indigenous peoples*</i> (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.</p> <p>HCV 6 - Cultural values. Sites, resources, habitats and <i>landscapes*</i> of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.</p>

9.2	<i>The Organization*</i> shall develop effective strategies that maintain and/or enhance the identified <i>High Conservation Values*</i> , through <i>engagement*</i> with <i>affected stakeholders*</i> , <i>interested stakeholders*</i> and experts.
9.3	<i>The Organization*</i> shall implement strategies and actions that maintain and/or enhance the identified <i>High Conservation Values*</i> . These strategies and actions shall implement the <i>precautionary approach*</i> and be proportionate to the <i>scale, intensity and risk*</i> of management activities.
9.4	<i>The Organization*</i> shall demonstrate that periodic monitoring is carried out to assess changes in the status of <i>High Conservation Values*</i> , and shall adapt its management strategies to ensure their effective protection. The monitoring shall be proportionate to the <i>scale, intensity and risk*</i> of management activities, and shall include <i>engagement*</i> with <i>affected stakeholders*</i> , <i>interested stakeholders*</i> and experts.
PRINCIPLE 10 – IMPLEMENTATION OF MANAGEMENT ACTIVITIES: Management activities conducted by or for <i>The Organization*</i> for the <i>Management Unit*</i> shall be selected and implemented consistent with The Organization's economic, environmental and social policies and <i>objectives*</i> and in compliance with the <i>Principles*</i> and <i>Criteria*</i> collectively.	
10.1	After harvest or in accordance with the <i>management plan*</i> , <i>The Organization*</i> shall, by natural or artificial regeneration methods, regenerate vegetation cover in a timely fashion to pre-harvesting or more natural conditions.
10.2	<i>The Organization*</i> shall use species for regeneration that are ecologically well adapted to the site and to the management <i>objectives*</i> . The Organization shall use <i>native species*</i> and local <i>genotypes*</i> for regeneration, unless there is clear and convincing justification for using others.
10.3	<i>The Organization*</i> shall only use <i>alien species*</i> when knowledge and/or experience have shown that any invasive impacts can be controlled and effective mitigation measures are in place.
10.4	<i>The Organization*</i> shall not use <i>genetically modified organisms*</i> in the <i>Management Unit*</i> .
10.5	<i>The Organization*</i> shall use <i>silvicultural*</i> practices that are ecologically appropriate for the vegetation, species, sites and management <i>objectives*</i> .
10.6	<i>The Organization*</i> shall avoid, or aim at eliminating, the use of fertilizers. When fertilizers are used, The Organization shall prevent, mitigate, and/or repair damage to <i>environmental values*</i> .
10.7	<i>The Organization*</i> shall use integrated pest management and <i>silviculture*</i> systems which avoid, or aim at eliminating, the use of chemical <i>pesticides*</i> . The Organization shall not use any chemical pesticides prohibited by FSC policy. When pesticides are used, The Organization shall prevent, mitigate, and / or repair damage to <i>environmental values*</i> and human health.
10.8	<i>The Organization*</i> shall minimize, monitor and strictly control the use of <i>biological control agents*</i> in accordance with <i>internationally accepted scientific protocols*</i> . When <i>biological control agents*</i> are used, The Organization shall prevent, mitigate, and/or repair damage to <i>environmental values*</i> .
10.9	<i>The Organization*</i> shall assess risks and implement activities that reduce potential negative impacts from natural hazards proportionate to <i>scale, intensity, and risk*</i> .
10.10	<i>The Organization*</i> shall manage infrastructural development, transport activities and <i>silviculture*</i> so that water resources and soils are protected, and disturbance of and damage to <i>rare* and threatened species*, habitats*, ecosystems* and landscape values*</i> are prevented, mitigated and/or repaired.
10.11	<i>The Organization*</i> shall manage activities associated with harvesting and extraction of timber and <i>non-timber forest products*</i> so that <i>environmental values*</i> are conserved, merchantable waste is reduced, and damage to other products and services is avoided.
10.12	<i>The Organization*</i> shall dispose of waste materials in an environmentally appropriate manner

**The Organization: The person or entity holding or applying for certification and therefore responsible for demonstrating compliance with the requirements upon which FSC certification is based.*

**Other terms denoted * are included in glossary of FSC INTERNATIONAL STANDARD "FSC-STD-01-001 (V5-0)*

The current criteria developed by PEFC are outlined in their document titled "PEFC INTERNATIONAL STANDARD" (PEFC ST 1003:2010). The criteria are summarized in the table below.

Table 32. List of the current International PEFC criteria and criteria

No.	PRINCIPLE / criteria
PRINCIPLE 1 – MAINTENANCE AND APPROPRIATE ENHANCEMENT OF FOREST RESOURCES AND THEIR CONTRIBUTION TO THE GLOBAL CARBON CYCLE.	
1.1	<i>Forest management planning shall aim to maintain or increase forests and other wooded areas and enhance the quality of the economic, ecological, cultural and social values of forest resources, including soil and water. This shall be done by making full use of related services and tools that support land-use planning and nature conservation.</i>
1.2	<i>Forest management shall comprise the cycle of inventory and planning, implementation, monitoring and evaluation, and shall include an appropriate assessment of the social, environmental and economic impacts of forest management operations. This shall form a basis for a cycle of continuous improvement to minimise or avoid negative impacts.</i>

1.3	<i>Inventory and mapping of forest resources shall be established and maintained, adequate to local and national conditions and in correspondence with the topics described in this document.</i>
1.4	<i>Management plans or their equivalents, appropriate to the size and use of the forest area, shall be elaborated and periodically updated. They shall be based on legislation as well as existing land-use plans, and adequately cover the forest resources.</i>
1.5	<i>Management plans or their equivalents shall include at least a description of the current condition of the forest management unit, long-term objectives; and the average annual allowable cut, including its justification and, where relevant, the annually allowable exploitation of non-timber forest products. Note: The identification of annually allowable exploitation of non-timber forest products is required where forest management covers commercial exploitation of non-timber forest products at a level which can have an impact on the long-term sustainability of non-timber forest products.</i>
1.6	<i>A summary of the forest management plan or its equivalent appropriate to the scope and scale of forest management, which contains information about the forest management measures to be applied, is publicly available. The summary may exclude confidential business and personal information and other information made confidential by national legislation or for the protection of cultural sites or sensitive natural resource features.</i>
1.7	<i>Monitoring of forest resources and evaluation of their management shall be periodically performed, and results fed back into the planning process.</i>
1.8	<i>Responsibilities for sustainable forest management shall be clearly defined and assigned.</i>
1.9	<i>Forest management practices shall safeguard the quantity and quality of the forest resources in the medium and long term by balancing harvesting and growth rates, and by preferring techniques that minimise direct or indirect damage to forest, soil or water resources.</i>
1.10	<i>Appropriate silvicultural measures shall be taken to maintain or reach a level of the growing stock that is economically, ecologically and socially desirable.</i>
1.11	<i>Conversion of forests to other types of land use, including conversion of primary forests to forest plantations, shall not occur unless in justified circumstances where the conversion: a) is in compliance with national and regional policy and legislation relevant for land use and forest management and is a result of national or regional land-use planning governed by a governmental or other official authority including consultation with materially and directly interested persons and organisations; and b) entails a small proportion of forest type; and c) does not have negative impacts on threatened (including vulnerable, rare or endangered) forest ecosystems, culturally and socially significant areas, important habitats of threatened species or other protected areas; and d) makes a contribution to long-term conservation, economic, and social benefits.</i>
1.12	<i>Conversion of abandoned agricultural and treeless land into forest land shall be taken into consideration, whenever it can add economic, ecological, social and/or cultural value.</i>
PRINCIPLE 2 – MAINTENANCE OF FOREST ECOSYSTEM HEALTH AND VITALITY	
2.1	<i>Forest management planning shall aim to maintain and increase the health and vitality of forest ecosystems and to rehabilitate degraded forest ecosystems, whenever this is possible by silvicultural means.</i>
2.2	<i>Health and vitality of forests shall be periodically monitored, especially key biotic and abiotic factors that potentially affect health and vitality of forest ecosystems, such as pests, diseases, overgrazing and overstocking, fire, and damage caused by climatic factors, air pollutants or by forest management operations.</i>
2.3	<i>The monitoring and maintaining of health and vitality of forest ecosystems shall take into consideration the effects of naturally occurring fire, pests and other disturbances</i>
2.4	<i>Forest management plans or their equivalents shall specify ways and means to minimise the risk of degradation of and damages to forest ecosystems. Forest management planning shall make use of those policy instruments set up to support these activities.</i>
2.5	<i>Forest management practices shall make best use of natural structures and processes and use preventive biological measures wherever and as far as economically feasible to maintain and enhance the health and vitality of forests. Adequate genetic, species and structural diversity shall be encouraged and/or maintained to enhance the stability, vitality and resistance capacity of the forests to adverse environmental factors and strengthen natural regulation mechanisms.</i>
2.6	<i>Lighting of fires shall be avoided and is only permitted if it is necessary for the achievement of the management goals of the forest management unit.</i>
2.7	<i>Appropriate forest management practices such as reforestation and afforestation with tree species and provenances that are suited to the site conditions or the use of tending, harvesting and transport techniques that minimise tree and/or soil damages shall be applied. The spillage of oil during forest management operations or the indiscriminate disposal of waste on forest land shall be strictly avoided. Non-organic waste and litter shall be avoided, collected, stored in designated areas and removed in an environmentally-responsible manner.</i>
2.8	<i>The use of pesticides shall be minimised and appropriate silvicultural alternatives and other biological measures preferred.</i>
2.9	<i>The WHO Type 1A and 1B pesticides and other highly toxic pesticides shall be prohibited, except where no other viable alternative is available. Note: Any exception to the usage of WHO Type 1A and 1B pesticides shall be defined by a specific forest management standard.</i>

2.10	<i>Pesticides, such as chlorinated hydrocarbons whose derivatives remain biologically active and accumulate in the food chain beyond their intended use, and any pesticides banned by international agreement, shall be prohibited. Note: "pesticides banned by international agreements" are defined in the Stockholm Convention on Persistent Organic Pollutants 2001, as amended.</i>
2.11	<i>The use of pesticides shall follow the instructions given by the pesticide producer and be implemented with proper equipment and training.</i>
2.12	<i>Where fertilisers are used, they shall be applied in a controlled manner and with due consideration for the environment.</i>
PRINCIPLE 3 – MAINTENANCE AND ENCOURAGEMENT OF PRODUCTIVE FUNCTIONS OF FORESTS (WOOD AND NON-WOOD).	
3.1	<i>Forest management planning shall aim to maintain the capability of forests to produce a range of wood and non-wood forest products and services on a sustainable basis.</i>
3.2	<i>Forest management planning shall aim to achieve sound economic performance taking into account any available market studies and possibilities for new markets and economic activities in connection with all relevant goods and services of forests.</i>
3.3	<i>Forest management plans or their equivalents shall take into account the different uses or functions of the managed forest area. Forest management planning shall make use of those policy instruments set up to support the production of commercial and non-commercial forest goods and services.</i>
3.4	<i>Forest management practices shall maintain and improve the forest resources and encourage a diversified output of goods and services over the long term.</i>
3.5	<i>Regeneration, tending and harvesting operations shall be carried out in time, and in a way that does not reduce the productive capacity of the site, for example by avoiding damage to retained stands and trees as well as to the forest soil, and by using appropriate systems.</i>
3.6	<i>Harvesting levels of both wood and non-wood forest products shall not exceed a rate that can be sustained in the long term, and optimum use shall be made of the harvested forest products, with due regard to nutrient off-take.</i>
3.7	<i>Where it is the responsibility of the forest owner/manager and included in forest management, the exploitation of non-timber forest products, including hunting and fishing, shall be regulated, monitored and controlled.</i>
3.6	<i>Adequate infrastructure such as roads, skid tracks or bridges shall be planned, established and maintained to ensure efficient delivery of goods and services while minimising negative impacts on the environment.</i>
PRINCIPLE 4 – MAINTENANCE, CONSERVATION AND APPROPRIATE ENHANCEMENT OF BIOLOGICAL DIVERSITY IN FOREST ECOSYSTEMS	
4.1	<i>Forest management planning shall aim to maintain, conserve and enhance biodiversity on ecosystem, species and genetic levels and, where appropriate, diversity at landscape level.</i>
4.2	<i>Forest management planning, inventory and mapping of forest resources shall identify, protect and/or conserve ecologically important forest areas containing significant concentrations of:</i> <i>a) protected, rare, sensitive or representative forest ecosystems such as riparian areas and wetland biotopes;</i> <i>b) areas containing endemic species and habitats of threatened species, as defined in recognised reference lists;</i> <i>c) endangered or protected genetic in situ resources; and taking into account</i> <i>d) globally, regionally and nationally significant large landscape areas with natural distribution and abundance of naturally occurring species.</i> <i>Note: This does not necessarily exclude forest management activities that do not damage biodiversity values of those biotopes.</i>
4.3	<i>Protected and endangered plant and animal species shall not be exploited for commercial purposes. Where necessary, measures shall be taken for their protection and, where relevant, to increase their population.</i>
4.4	<i>Forest management shall ensure successful regeneration through natural regeneration or, where not appropriate, planting that is adequate to ensure the quantity and quality of the forest resources.</i>
4.5	<i>For reforestation and afforestation, origins of native species and local provenances that are well-adapted to site conditions shall be preferred, where appropriate. Only those introduced species, provenances or varieties shall be used whose impacts on the ecosystem and on the genetic integrity of native species and local provenances have been evaluated, and if negative impacts can be avoided or minimised.</i> <i>Note: CBD (Convention on Biological Diversity) Guiding Principles for the Prevention, Introduction, and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species are recognised as guidance for avoidance of invasive species.</i>
4.6	<i>Afforestation and reforestation activities that contribute to the improvement and restoration of ecological connectivity shall be promoted.</i>
4.7	<i>Genetically-modified trees shall not be used.</i> <i>Note: The restriction on the usage of genetically-modified trees has been adopted based on the Precautionary Principle. Until enough scientific data on genetically-modified trees indicates that impacts on human and animal health and the environment are equivalent to, or more positive than, those presented by trees genetically improved by traditional methods, no genetically-modified trees will be used.</i>
4.8	<i>Forest management practices shall, where appropriate, promote a diversity of both horizontal and vertical structures such as uneven-aged stands and the diversity of species such as mixed stands. Where appropriate, the practices shall also aim to maintain and restore landscape diversity.</i>

4.9	<i>Traditional management systems that have created valuable ecosystems, such as coppice, on appropriate sites shall be supported, when economically feasible.</i>
4.10	<i>Tending and harvesting operations shall be conducted in a way that does not cause lasting damage to ecosystems. Wherever possible, practical measures shall be taken to improve or maintain biological diversity.</i>
4.11	<i>Infrastructure shall be planned and constructed in a way that minimises damage to ecosystems, especially to rare, sensitive or representative ecosystems and genetic reserves, and that takes threatened or other key species – in particular their migration patterns – into consideration.</i>
4.12	<i>With due regard to management objectives, measures shall be taken to balance the pressure of animal populations and grazing on forest regeneration and growth as well as on biodiversity.</i>
4.13	<i>Standing and fallen dead wood, hollow trees, old groves and special rare tree species shall be left in quantities and distribution necessary to safeguard biological diversity, taking into account the potential effect on the health and stability of forests and on surrounding ecosystems.</i>
PRINCIPLE 5: MAINTENANCE AND APPROPRIATE ENHANCEMENT OF PROTECTIVE FUNCTIONS IN FOREST MANAGEMENT (NOTABLY SOLI AND WATER).	
5.1	<i>Forest management planning shall aim to maintain and enhance protective functions of forests for society, such as protection of infrastructure, protection from soil erosion, protection of water resources and from adverse impacts of water such as floods or avalanches.</i>
5.2	<i>Areas that fulfil specific and recognised protective functions for society shall be registered and mapped, and forest management plans or their equivalents shall take full account of these areas.</i>
5.3	<i>Special care shall be given to silvicultural operations on sensitive soils and erosion-prone areas as well as in areas where operations might lead to excessive erosion of soil into watercourses. Inappropriate techniques such as deep soil tillage and use of unsuitable machinery shall be avoided in such areas. Special measures shall be taken to minimise the pressure of animal populations.</i>
5.4	<i>Special care shall be given to forest management practices in forest areas with water protection functions to avoid adverse effects on the quality and quantity of water resources. Inappropriate use of chemicals or other harmful substances or inappropriate silvicultural practices influencing water quality in a harmful way shall be avoided.</i>
5.5	<i>Construction of roads, bridges and other infrastructure shall be carried out in a manner that minimises bare soil exposure, avoids the introduction of soil into watercourses and preserves the natural level and function of water courses and river beds. Proper road drainage facilities shall be installed and maintained.</i>
PRINCIPLE 6: MAINTENANCE OF OTHER SOCIO-ECONOMIC FUNCTIONS AND CONDITIONS	
6.1	<i>Forest management planning shall aim to respect the multiple functions of forests to society, give due regard to the role of forestry in rural development, and especially consider new opportunities for employment in connection with the socio-economic functions of forests.</i> Note: The stimulation of rural development could be achieved by training and employment of local people, including indigenous people, a preference for the local processing of timber and non-wood forest products, etc.
6.2	<i>Forest management shall promote the long-term health and well-being of communities within or adjacent to the forest management area.</i>
6.3	<i>Property rights and land tenure arrangements shall be clearly defined, documented and established for the relevant forest area. Likewise, legal, customary and traditional rights related to the forest land shall be clarified, recognised and respected.</i>
6.4	<i>Forest management activities shall be conducted in recognition of the established framework of legal, customary and traditional rights such as outlined in ILO 169 and the UN Declaration on the Rights of Indigenous Peoples, which shall not be infringed upon without the free, prior and informed consent of the holders of the rights, including the provision of compensation where applicable. Where the extent of rights is not yet resolved or is in dispute there are processes for just and fair resolution. In such cases forest managers shall, in the interim, provide meaningful opportunities for parties to be engaged in forest management decisions whilst respecting the processes and roles and responsibilities laid out in the policies and laws where the certification takes place.</i>
6.5	<i>Adequate public access to forests for the purpose of recreation shall be provided taking into account respect for ownership rights and the rights of others, the effects on forest resources and ecosystems, as well as compatibility with other functions of the forest.</i>
6.6	<i>Sites with recognised specific historical, cultural or spiritual significance and areas fundamental to meeting the basic needs of local communities (e.g. health, subsistence) shall be protected or managed in a way that takes due regard of the significance of the site.</i>
6.7	<i>Forest management operations shall take into account all socio-economic functions, especially the recreational function and aesthetic values of forests by maintaining for example varied forest structures, and by encouraging attractive trees, groves and other features such as colours, flowers and fruits. This shall be done, however, in a way and to an extent that does not lead to serious negative effects on forest resources, and forest land.</i>
6.8	<i>Forest managers, contractors, employees and forest owners shall be provided with sufficient information and encouraged to keep up-to-date through continuous training in relation to sustainable forest management as a precondition for all management planning and practices described in this standard.</i>
6.9	<i>Forest management practices shall make the best use of local forest-related experience and knowledge, such as those of local communities, forest owners, NGOs and local people.</i>

6.10	<i>Forest management shall provide for effective communication and consultation with local people and other stakeholders relating to sustainable forest management and shall provide appropriate mechanisms for resolving complaints and disputes relating to forest management between forest operators and local people.</i>
6.11	<i>Forestry work shall be planned, organised and performed in a manner that enables health and accident risks to be identified and all reasonable measures to be applied to protect workers from work-related risks. Workers shall be informed about the risks involved with their work and about preventive measures.</i>
6.12	<i>Working conditions shall be safe, and guidance and training in safe working practices shall be provided to all those assigned to a task in forest operations.</i> <i>Note: Guidance for specifying national standards can be obtained from the ILO Code of Good Practice: Safety and Health in Forestry Work.</i>
6.13	<i>Forest management shall comply with fundamental ILO conventions</i> <i>Note: In countries where the fundamental ILO conventions have been ratified, the requirements of 5.7.1 apply. In countries where a fundamental convention has not been ratified and its content is not covered by applicable legislation, specific requirements shall be included in the forest management standard.</i>
6.14	<i>Forest management shall be based inter-alia on the results of scientific research. Forest management shall contribute to research activities and data collection needed for sustainable forest management or support relevant research activities carried out by other organisations, as appropriate.</i>
PRINCIPLE 7 – COMPLIANCE WITH LEGAL REQUIREMENTS	
7.1	<i>Forest management shall comply with legislation applicable to forest management issues including forest management practices; nature and environmental protection; protected and endangered species; property, tenure and land-use rights for indigenous people; health, labour and safety issues; and the payment of royalties and taxes.</i> <i>Note: For a country which has signed a FLEGT Voluntary Partnership Agreement (VPA) between the European Union and the producing country, the “legislation applicable to forest management” is defined by the VPA agreement.</i>
7.2	<i>Forest management shall provide for adequate protection of the forest from unauthorised activities such as illegal logging, illegal land use, illegally initiated fires, and other illegal activities.</i>

APPENDIX II: Guidance for calculating VOCs used in surface coating applications

The calculation method requires the following information:

- Total coated surface area of final assembled product
- The VOC content of the coating compound (in g/L).
- The volume of coating compound present before the coating operation.
- The number of identical units processed during the coating operation.
- The volume of coating compound remaining after the coating operation.

An example calculation is as follows:

- Total coated surface area of final assembled product = **1.5m²**
- The VOC content of the coating compound (in g/L) = **120g/L**
- The volume* of coating compound present before coating operation = **18.5L**
- The number of identical units processed during the coating operation = **4**
- The volume* of coating compound remaining after coating operation = **12.5L**

Total area coated	= 4 x 1.5m ²	= <u>6m²</u>
Total volume of coating compound used	= 18.5 – 12.5	= <u>6L</u>
Total VOC applied to surface	= 3.9L x 120g/L	= <u>468g</u>
Total VOC applied per m ²	= 468g/6m ²	= <u>78g/m²</u>

*note that weight measurements can be used instead of volume so long as the density of the coating compound is known and accounted for in the calculation.

Where more than one coating compound is applied, such as primers or finishing coats, the volumetric consumption and VOC contents shall also be calculated and added together.

Options to lower the VOC content used in coatings can be improved by using more efficient techniques. Indicative efficiencies of different coating techniques are shown below.

Table 33. Indicative efficiency factors for coating techniques:

Coating technique	Effectiveness	Efficiency factor
Spraying device without recycling	50%	0.5
Electrostatic spraying	65%	0.65
Spraying device with recycling	70%	0.7
Spraying bell/disk	80%	0.8
Roller varnishing	95%	0.95
Blanket varnishing	95%	0.95
Vacuum varnishing	95%	0.95
Dipping	95%	0.95
Rinsing	95%	0.95

APPENDIX III: EN 13336 requirements for furniture leather

Table 34. Physical requirements of leather used in EU Ecolabel furniture (as per EN 13336)

Fundamental characteristics	Test method		Recommended values		
			Nubuck, Suede and Aniline*	Semi-aniline*	Coated, pigmented and other*
pH and ΔpH	EN ISO 4045		≥ 3.5 (if the pH is <4.0, ΔpH shall be ≤ 0.7)		
Tear load, average value	EN ISO 3377-1		> 20 N		
Colour fastness to to-and-fro rubbing	EN ISO 11640. Total mass of finger 1000g.	Aspects to be evaluated	Change of leather colour and felt staining	Change of leather colour and felt staining No destruction of finish	
		using dry felt	50 cycles, ≥ 3 grey scale	500 cycles, ≥ 4 grey scale	
	Perspiration alkaline solution as defined in EN ISO 11641.	using wet felt	20 cycles, ≥ 3 grey scale	80 cycles, ≥ 3/4 grey scale	250 cycles, ≥ 3/4 grey scale
		using felt wetted with artificial perspiration	20 cycles, ≥ 3 grey scale	50 cycles, ≥ 3/4 grey scale	80 cycles, ≥ 3/4 grey scale
Colour fastness to artificial light	EN ISO 105-B02 (method 3)		≥ 3 blue scale	≥ 4 blue scale	≥ 5 blue scale
Dry finish adhesion	EN ISO 11644		--	≥ 2N / 10mm	
Dry flex resistance	EN ISO 5402-1		For aniline leather with non-pigmented finish only, 20 000 cycles (no finish damage cracks)	50 000 cycles (no finish damage cracks)	50 000 cycles (no finish damage cracks)
Colour fastness to water spotting	EN ISO 15700		≥ 3 grey scale (no permanent swelling)		
Cold crack resistance of finish	EN ISO 17233		--	-15°C (no finish crack)	
Fire resistance	EN 1021 or relevant national standards		Pass		

*Definitions of these leather types are according to EN 15987.

APPENDIX IV: Prohibited arylamine compounds in final leather, textile and coated fabric materials

Included here are the substances listed in Entry 43 of Annex XVII to Regulation (EC) No 1907/2006 that shall be tested for in any dyed leather (using the EN 17234 standard) or textiles (using the EN 14362-1 and -3 standards).

Table 35. Carcinogenic arylamines to be tested in textiles or leather.

Aryl amine	CAS Number	Aryl amine	CAS Number
4-aminodiphenyl	92-67-1	4,4'-oxydianiline	101-80-4
Benzidine	92-87-5	4,4'-thiodianiline	139-65-1
4-chloro-o-toluidine	95-69-2	o-toluidine	95-53-4
2-naphthylamine	91-59-8	2,4-diaminotoluene	95-80-7
o-amino-azotoluene	97-56-3	2,4,5-trimethylaniline	137-17-7
2-amino-4-nitrotoluene	99-55-8	4-aminoazobenzene	60-09-3
4-chloroaniline	106-47-8	o-anisidine	90-04-0
2,4-diaminoanisole	615-05-4	2,4-Xylidine	95-68-1
4,4'-diaminodiphenylmethane	101-77-9	2,6-Xylidine	87-62-7
3,3'-dichlorobenzidine	91-94-1	p-cresidine	120-71-8
3,3'-dimethoxybenzidine	119-90-4	3,3'-dimethylbenzidine	119-93-7
3,3'-dimethyl-4,4'-diaminodiphenylmethane	838-88-0	4,4'-methylene-bis-(2-chloro-aniline)	101-14-4

A number of other dye compounds, which are not directly restricted by Entry 43 of Annex XVII to Regulation (EC) No 1907/2006, are known to cleave during processing to form some of the prohibited substances listed in Table 35. In order to greatly reduce uncertainty about compliance with the established limit of 30 mg/kg for the substances listed in Table 35, manufacturers are recommended, but not obliged, to avoid the use of the dyes listed in Table 36 below.

Table 36. Indicative list of dyes that may cleave to form carcinogenic arylamines

Disperse dyes		Basic dyes	
Disperse Orange 60	Disperse Yellow 7	Basic Brown 4	Basic Red 114
Disperse Orange 149	Disperse Yellow 23	Basic Red 42	Basic Yellow 82
Disperse Red 151	Disperse Yellow 56	Basic Red 76	Basic Yellow 103
Disperse Red 221	Disperse Yellow 218	Basic Red 111	
Acid dyes			
CI Acid Black 29	CI Acid Red 4	CI Acid Red 85	CI Acid Red 148
CI Acid Black 94	CI Acid Red 5	CI Acid Red 104	CI Acid Red 150
CI Acid Black 131	CI Acid Red 8	CI Acid Red 114	CI Acid Red 158
CI Acid Black 132	CI Acid Red 24	CI Acid Red 115	CI Acid Red 167
CI Acid Black 209	CI Acid Red 26	CI Acid Red 116	CI Acid Red 170
CI Acid Black 232	CI Acid Red 26:1	CI Acid Red 119:1	CI Acid Red 264
CI Acid Brown 415	CI Acid Red 26:2	CI Acid Red 128	CI Acid Red 265
CI Acid Orange 17	CI Acid Red 35	CI Acid Red 115	CI Acid Red 420
CI Acid Orange 24	CI Acid Red 48	CI Acid Red 128	CI Acid Violet 12
CI Acid Orange 45	CI Acid Red 73	CI Acid Red 135	
Direct dyes			
Direct Black 4	Direct Blue 192	Direct Brown 223	Direct Red 28
Direct Black 29	Direct Blue 201	Direct Green 1	Direct Red 37
Direct Black 38	Direct Blue 215	Direct Green 6	Direct Red 39
Direct Black 154	Direct Blue 295	Direct Green 8	Direct Red 44

Direct Blue 1	Direct Blue 306	Direct Green 8.1	Direct Red 46
Direct Blue 2	Direct Brown 1	Direct Green 85	Direct Red 62
Direct Blue 3	Direct Brown 1:2	Direct Orange 1	Direct Red 67
Direct Blue 6	Direct Brown 2	Direct Orange 6	Direct Red 72
Direct Blue 8	Basic Brown 4	Direct Orange 7	Direct Red 126
Direct Blue 9	Direct Brown 6	Direct Orange 8	Direct Red 168
Direct Blue 10	Direct Brown 25	Direct Orange 10	Direct Red 216
Direct Blue 14	Direct Brown 27	Direct Orange 108	Direct Red 264
Direct Blue 15	Direct Brown 31	Direct Red 1	Direct Violet 1
Direct Blue 21	Direct Brown 33	Direct Red 2	Direct Violet 4
Direct Blue 22	Direct Brown 51	Direct Red 7	Direct Violet 12
Direct Blue 25	Direct Brown 59	Direct Red 10	Direct Violet 13
Direct Blue 35	Direct Brown 74	Direct Red 13	Direct Violet 14
Direct Blue 76	Direct Brown 79	Direct Red 17	Direct Violet 21
Direct Blue 116	Direct Brown 95	Direct Red 21	Direct Violet 22
Direct Blue 151	Direct Brown 101	Direct Red 24	Direct Yellow 1
Direct Blue 160	Direct Brown 154	Direct Red 26	Direct Yellow 24
Direct Blue 173	Direct Brown 222	Direct Red 22	Direct Yellow 48

APPENDIX V: Furniture product fitness for use standards

Table 37. List of EN furniture standards (revised by CEN/TC 207 for "Furniture") that are considered relevant to criterion 9.1

Standard	Title
Upholstered furniture	
EN 1021-1	Furniture - Assessment of the ignitability of upholstered furniture - Part 1: Ignition source smouldering cigarette
EN 1021-2	Furniture - Assessment of the ignitability of upholstered furniture - Part 2: Ignition source match flame equivalent
Office furniture	
EN 527-1	Office furniture - Work tables and desks - Part 1: Dimensions
EN 527-2	Office furniture - Work tables and desks - Part 2: Mechanical safety requirements
EN 1023-2	Office furniture - Screens - Part 2: Mechanical safety requirements
EN 1335-1	Office furniture - Office work chair - Part 1: Dimensions - Determination of dimensions
EN 1335-2	Office furniture - Office work chair - Part 2: Safety requirements
EN 14073-2	Office furniture - Storage furniture - Part 2: Safety requirements
EN 14074	Office furniture - Tables and desks and storage furniture - Test methods for the determination of strength and durability of moving parts. (after testing, the components shall not be damaged and shall still function as intended).
Outdoor furniture	
EN 581-1	Outdoor furniture - Seating & tables for camping, domestic & contract use: 1: General safety requirements
EN 581-2	Outdoor furniture - Seating & tables for camping, domestic & contract use: 2: Mechanical safety requirements & test methods for seating
EN 581-3	Outdoor furniture: Seating & tables for camping, domestic & contract use: 3: Mechanical safety requirements and test methods for tables
Seating furniture	
EN 1022	Domestic furniture - Seating - Determination of stability
EN 12520	Furniture - Strength, durability and safety - Requirements for domestic seating
EN 12727	Furniture - Ranked seating - Test methods and requirements for strength and durability
EN 13759	Furniture - Operating mechanisms for seating and sofa-beds - Test methods
EN 14703	Furniture - Links for non-domestic seating linked together in a row - Strength requirements and test methods
EN 16139	Furniture - Strength, durability and safety - Requirements for non-domestic seating
Tables	
EN 12521	Furniture - Strength, durability and safety - Requirements for domestic tables
EN 15372	Furniture - Strength, durability and safety - Requirements for non-domestic tables
Kitchen furniture	
EN 1116	Kitchen furniture - Co-ordinating sizes for kitchen furniture and kitchen appliances
EN 14749	Domestic and kitchen storage units and worktops - Safety requirements and test methods
Beds	
EN 597-1	Furniture - Assessment of the ignitability of mattresses and upholstered bed bases - Part 1: Ignition source: Smouldering cigarette
EN 597-2	Furniture - Assessment of the ignitability of mattresses and upholstered bed bases - Part 2: Ignition source: Match flame equivalent
EN 716-1	Furniture - Children's cots and folding cots for domestic use - Part 1: Safety requirements
EN 747-1	Furniture - Bunk beds and high beds - Part 1: Safety, strength and durability requirements
EN 1725	Domestic furniture - Beds and mattresses - Safety requirements and test methods

EN 1957	Furniture - Beds and mattresses - Test methods for determination of functional characteristics and assessment criteria
EN 12227	Playpens for domestic use - Safety requirements and test methods
Storage furniture	
EN 16121	Non-domestic storage furniture - Requirements for safety, strength, durability and stability
Other types of furniture	
EN 1729-1	Furniture - Chairs and tables for educational institutions - Part 1: Functional dimensions
EN 1729-2	Furniture - Chairs and tables for educational institutions - Part 2: Safety requirements and test methods
EN 13150	Workbenches for laboratories - Dimensions, safety requirements and test methods
EN 14434	Writing boards for educational institutions - Ergonomic, technical and safety requirements and their test methods

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