

JRC TECHNICAL REPORTS

Revision of EU Ecolabel Criteria for furniture.

Technical Report **4.0**

Shane Donatello, Hans Moons, Oliver Wolf
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Institute for Prospective Technological Studies

Contact information

Shane Donatello, Hans Moons, Oliver Wolf
Address: Edificio Expo. c/ Inca Garcilaso, 3. E-41092 Seville (Spain)
E-mail: jrc-ipts-secretariat@ec.europa.eu
Tel.: +34 954488318
Fax: +34 954488300

<https://ec.europa.eu/jrc>
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EU ECOLABEL REVISION PROCESS FOR FURNITURE

The EU Ecolabel criteria for wooden furniture¹ are under revision. The revision process involves the publication of a Preliminary report that aims to examine the current situation with the furniture industry and keep up to date with any relevant innovation that is related to the environmental performance of furniture products. The criteria aim to focus on the most important environmental impacts of furniture materials from a life cycle perspective of the final furniture product. The expansion of the product scope to include non-wood based materials has resulted in significant changes to the furniture criteria compared to the previous set published in Decision 2009/894/EC.

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. The evidence base targets available scientific information and data, adopts a life-cycle approach and engages participants to discuss the issues and develop consensus.

Following publication of the Preliminary report, a 1st technical report was published in which draft criteria areas for EU Ecolabel furniture were proposed and a 1st Ad-Hoc Working Group meeting took place in Sevilla on October 7th 2013 to discuss the proposals. Stakeholder feedback was gathered prior to the meeting via questionnaires, during the meeting and after the meeting via ongoing exchange of phone calls, emails and uploading of information onto the Batis webpage, to which all registered stakeholders have access.

After gathering all the stakeholder feedback, a new set of criteria and accompanying rationale were proposed in a 2nd technical report for EU Ecolabel furniture criteria, which was published approximately one month in advance of the 2nd Ad-Hoc Working Group meeting that took place in Brussels on May 15th 2014. Further stakeholder feedback was gathered both during the meeting and via the ongoing exchange of phone calls, emails and uploading of information and opinions onto the Batis webpage. A 3rd technical report (version 3.0) was published 4 weeks prior to the EUEB meeting in Brussels on the 5th November 2014 with what should have been nearly finalised criteria. However, due to the significant feedback received regarding certain issues it was considered necessary to rework a number of criteria to a significant degree.

The reworked technical report (version 3.1) was been published in February 2015 and open to a two week written consultation. Comments were received and any changes made in accordance with the feedback were highlighted and discussed at the April EUEB, which included a special session focussing solely on the general hazardous substance criteria which applies to all EU Ecolabel products. EUEB members had a one week period to submit written comments and these have been considered and a new report (version 4.0), is now available ahead of the June 2015 EUEB meeting. Changes from version 3.1 are highlighted in yellow.

¹ 2009/894/EC: Commission Decision of 30 November 2009 on establishing the ecological criteria for the award of the Community eco-label for wooden furniture, available online at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:320:0023:0032:EN:PDF>

SUMMARY OF KEY POINTS IN BACKGROUND REPORT

In the background report several major issues covered included:

- Legislation and European Standards,
- Market analysis,
- Analysis of Life Cycle Assessment studies

Legal aspects and 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 preparations** 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 programmes are the FSC and PEFC certification schemes. Across the EU, wooden particleboards, fibreboards and panels, are classified as E1 (0.1ppm) or E2 (0.1-0.3 ppm) 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.

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. These standards are important from an environmental point of view when they refer to durability aspects of the furniture. 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 is given in Appendix V.

Market analysis

According to the World Furniture Outlook by CSIL², 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-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 material most commonly used 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 license holders. On both the demand and supply sides of the furniture market there is evidence that the framework is favorable 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.
- 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.

² *CSIL Furniture Outlook. Global trends and forecasts for the furniture sector.* CSIL Alessandra Tracogna. February 2012. (available online at: <http://www.slideshare.net/ClarionGermany/03-csil-alessandratracogna>)

Life cycle assessment 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 reports related to the LCA of furniture were assessed. After analysis of 13 screened Life Cycle Assessment (LCA) studies and 35 verified Environmental Product Declarations (EPD's), 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 chemical formulations 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.

The **EoL** impacts 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.

EU Ecolabel furniture should not contain harmful substances. They should not pose any potential threat to human health and environment along the product life cycle. 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 the substances inherent properties.

Criteria structure, feedback and changes

The criteria structure has essentially not changed since the April 2015 EUEB. Criteria where significant changes to the wording have been made are highlighted in yellow.

Table 1. Main changes to criteria text since April 2015 EUEB criteria (in yellow).

New proposed criteria for EUEB June 2015 (TR 4.0)	
Criterion	Part
1 – Product description	
2 – General hazardous substance requirements	<p>2.1 Restriction of substances of very high concern</p> <p>2.2(a) CLP restriction of substances and preparations used by the furniture manufacturer</p> <p>2.2(b) CLP restriction of substances and preparations used by suppliers in defined component materials</p>
3 – Wood and wood-based materials	<p>3.1 Sustainable wood, bamboo and rattan</p> <p>3.2 Restricted substances</p> <ul style="list-style-type: none"> a) contaminants in recycled wood used in wood-based panels b) polyvinyl chloride foils used in wood-based panels c) plasticisers in plastic foils used in wood-based panels d) heavy metals in paints, primers and varnishes e) VOC content in paints, primers and varnishes f) Use of wood preservatives and biocides in paints, primers and varnishes <p>3.3 Formaldehyde emissions</p>
4 – Plastics	<p>4.1 Marking of plastic components</p> <p>4.2 Restricted substances</p> <ul style="list-style-type: none"> a) Heavy metals in plastic additives b) Vinyl chloride monomer <p>4.3 Recycled plastic content</p>
5 – Metals – Restricted substances	<p>5.1 Electroplating restrictions</p> <p>5.2 Heavy metals in paints, primers and varnishes</p> <p>5.3 VOC content in paints, primers and varnishes</p> <p>5.4 Use of biocides in paints, primers and varnishes</p>
6 – Upholstery covering material (for leather, textiles and coated fabrics)	<p>6.1 Physical quality requirements</p> <p>6.2 Chemical testing requirements</p> <p>6.3 Restricted during production processes</p> <p>6.4 Cotton and other natural cellulosic seed fibres</p> <p>6.5 PVC-based coated fabrics</p>
7 – Upholstery padding materials	<p>7.1. Latex foam</p> <ul style="list-style-type: none"> a) Restricted substances b) 24h VOC emissions from latex foam <p>7.2. Polyurethane foam</p> <ul style="list-style-type: none"> a) Restricted substances b) 72h VOC emissions <p>7.3. Other padding materials</p>
8 – Glass –use of heavy metals	
9 – Final product requirements	<p>9.1 Fitness for use</p> <p>9.2 Extended product guarantee</p> <p>9.3 Design for disassembly</p> <p>9.4 VOC emissions</p>
10 – Consumer information	
Information appearing on the Eco-label	

Stakeholder feedback from the April 2015 EUEB meeting

A total of 28 written comments were received in addition to some points raised during the meeting itself. The main points are summarized below:

Hazardous substance criteria

After presenting the new approach for the general hazardous substance criteria, the following comments were made:

- The furniture industry could comply with these requirements, but only those companies which were willing to invest the time and resources in obtaining information from suppliers.
- Care should be taken with the use of terminology and caution was urged against the use of the proposed term "chemical products".
- It was requested to remove the derogation for Antimony Trioxide (ATO) flame retardants for use as a synergist in back-coating of textiles.
- For data-lacking substances, it was requested that they should be excluded from EU Ecolabel furniture based on the precautionary principle.
- The removal of H334 substances from the list of hazards that are to be screened against the general hazardous substance criteria was requested to be reversed.
- A mixed reaction to the proposal to exempt articles that weigh less than 25g and do not come into contact with users during normal use was received. Some stakeholders wanted this exemption to be increased to 100 g while others wanted no such exemption introduced.
- Concern was expressed about the allowance of up to 0.1 % w/w of SVHCs in an EU Ecolabel furniture product, particularly if it contained textile upholstery.

Wood criteria

A request was made from several industry stakeholders to specifically make allowance for cork and other non-wood materials such as bamboo and rattan which are potentially important in furniture products. A catch-all term of "*lignified materials other than wood*" was proposed but no concrete definition for this term was proposed.

It was requested to remove cork from the sustainable wood requirements due to the fact that the harvest of cork did not involve the felling of any trees. A parallel argument was also proposed for bamboo and rattan.

Clarification was requested whether national schemes and definitions of sustainable wood could be considered as equivalent to the requirements in criterion 3.1. The FSC representative at the EUEB requested that the specific mention of FSC and PEFC be reintroduced into the text of the criterion for sustainable wood itself. The supporting argument for this was a fear that it would potentially allow schemes that are less robust than FSC or PEFC to meet the criterion. It was emphasised by MS that it is very important to define what may be considered as "equivalent" to the FSC and PEFC schemes in the User Manual. The User Manual currently published for copying and graphic paper was cited as a helpful example.

It was pointed out that no specific restrictions should be applied to phthalates in general but only to those phthalates that are REACH classified and with Article 57 classifications.

PVC-related criteria

The previously proposed exclusion of PVC from EU Ecolabel furniture had been changed in an earlier draft of the criteria - effectively permitting PVC but subject to compliance with BAT production criteria for VCM emissions from the production site. A number of stakeholders expressed their regret that PVC was now to be permitted in EU Ecolabel furniture and although they acknowledged the criteria for controlling environmental impacts during production, they stated that this would not solve the most widely known problems associated with PVC at End-of-Life.

From the opposite perspective, industry stakeholders also criticised the PVC-criteria, questioning the need for such criteria to be included stating that this amounted to discrimination against PVC and asking why no other materials had production-related limits.

Other comments

The other following points were raised:

- What was the intention of including Appendix VI in the criterion exactly? And furthermore, clarification on how the R-value is calculated was requested.
- The reintroduction of requirements for tannery effluents during leather production was welcomed.
- Request to increase the minimum requirements for IPM and organic cotton.
- Suggestion that no distinction should be made between children's furniture and other furniture for the phthalates restricted in the PU foam (criterion 7.2).

Summary of main changes in criteria since April EUEB

For ease of reference, any significant changes made since the April EUEB are highlighted in yellow. The main changes and the reasons behind them are summarised below.

General hazardous substance criteria changes

The general hazardous substance criterion text has been completely rewritten. A distinction is made between substances of very high concern that are listed on the ECHA Candidate List (criterion 2.1) and other substances or preparations that may be used in the furniture production process, either by the furniture manufacturer themselves (criterion 2.2a) or by suppliers (criterion 2.2b).

There are no exceptions to the requirements for SVHCs in the furniture products or component parts thereof. The 0.1 % requirement is supported by the REACH Regulation and suppliers of any components are required to provide declarations of compliance.

With criterion 2.2a), the scope is more narrow and defined to encompass the types of substances and preparations that are most likely to be used directly by furniture manufacturers.

The same approach is applied to criterion 2.2b) where the scope is defined for each type of component material that may be used, focussing on the most common materials only, and within a given material, on the substances or preparations that are most likely to exhibit hazardous properties.

Wood criteria changes

The precise wording for the sustainable wood criterion (3.1) has been subject to minor modifications in agreement with internal discussions and with other stakeholders with the aim of providing a common basis for the criteria in the furniture, footwear and wood-based floor covering product groups.

Any reference to cork in sustainable wood criteria has been removed based on arguments presented by stakeholders. It should be discussed at the June EUEB if a similar action would be necessary for bamboo and rattan.

A new sub-criterion specifically excluding the use of biocides in wooden components has been introduced since it was not explicit that biocides added to the product for the purposes of providing a disinfective effect were effectively excluded by the new general hazardous substance criteria since it is possible that active biocidal substances would fall well below the 0.1% threshold limit.

The term primers is included as well when referring to paints and varnishes since these preparations can potentially contain high VOC contents or biocides.

Metal criteria changes

A new sub-criterion specifically excluding the use of biocides in metal components has been introduced since it was not explicit that biocides added to the product for the purposes of providing a disinfective effect were effectively excluded by the new general hazardous substance criteria since it is possible that active biocidal substances would fall well below the 0.1% threshold limit.

The term primers is included as well when referring to paints and varnishes since these preparations can potentially contain high VOC contents or biocides.

Upholstery covering materials

The specific test method, limits and list of restricted PAHs in textiles, leather and coated fabrics has been aligned with the new lists currently being proposed for the footwear and computers product groups.

The cotton criteria has been slightly reworded for the sake of improved clarity and a decision on whether or not to remove the requirement that all organic wool should only be blended with non-GMO cotton is currently being considered.

Potential criterion relating to kitchen tops

Following a request from one MS, the potential to introduce a new criterion relating to the most important materials used in kitchen tops was investigated. Currently the Milieukeur Ecolabel scheme used in the Netherlands used sets criteria for kitchen tops surfaces and the

EU Ecolabel criteria set out for the product group "Hard coverings" in Decision 2009/607/EC sets criteria for similar materials used in kitchen tops even though the scope does not intend to specifically apply to kitchen top products themselves.

Based on a review of both schemes, it is clear that the most relevant material that criteria should apply to is known as "agglomerated stones", as defined in EN 14618:2009. These materials consist of carbonate or silica-based aggregates of defined size distributions that are bound by either resin-based and/or cement-based binders. The aggregate and binder are then mixed together, along with any special additives such as pigments, demoulding agents and UV stabilisers prior to being hot-pressed in a specialised mould. The slabs that exit the mould may then be cut to size and polished prior to shipment.

The process for setting criteria for such materials would need to consider the relative merits of legal and sustainable sourcing of aggregate materials, possible restrictions and derogations for hazardous additives used, limitations of the binder content used and the energy efficiency of the mixing, moulding, cutting and polishing process. It appears that these materials are not explicitly covered by BREF documents and so considerable further investigation would be required. This coupled with the facts that both the current EU Ecolabel criteria for Hard coverings and that of Milieukeur are quite dated and that the revision process for EU Ecolabel criteria is at an advanced stage make it unrealistic that such criteria could be accounted for in the criteria version to be voted. One option would be to later introduce an amendment to the voted furniture criteria once the criteria for Hard Coverings has been revised.

Final product "fitness for use" requirements

The previously proposed flexible approach, where either compliance with relevant EN standards or an extended guarantee was permitted, has been changed. Instead, and in line with the vast majority of stakeholder feedback, compliance with relevant final furniture product EN standards will be required. A mandatory extended guarantee for 5 years is proposed now as well.

A list of relevant EN standards for furniture products is listed in Appendix V. Which standard or standards apply (if any) will depend on the nature of the product.

Final product "extended guarantee" requirements

The previously proposed wording has been altered to more closely reflect the hierarchical structure laid out in Directive 1999/44/EC where first the option to repair or replace should be prioritised over any full or partial refund.

PRODUCT GROUP NAME, SCOPE AND DEFINITIONS

Table 2. Summary of proposed changes in scope and definition for furniture

Scope and definition in TR 3.0/3.1	Scope and definition in TR 4.0
<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 used in domestic or non-domestic environments. Bed frames, legs, bases and headboards are included in the scope but not bed mattresses, which are covered by the criteria established by Decision 2014/391/EU³.</p> <p>The product group shall not comprise the following products:</p> <p>(a) Products whose primary function is not to be used as furniture. Examples include but are not limited to: 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>(b) Second-hand, refinished, refurbished or remanufactured furniture products.</p> <p>(c) Furniture fitted into vehicles used for public or private transit.</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 used in domestic or non-domestic environments. Bed frames, legs, bases and headboards are included in the scope but not bed mattresses, which are covered by the criteria established by Decision 2014/391/EU⁴.</p> <p>The product group shall not comprise the following products:</p> <p>(a) Products whose primary function is not to be used as furniture. Examples include but are not limited to: 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>(b) Second-hand, refinished, refurbished or remanufactured furniture products.</p> <p>(c) Furniture fitted into vehicles used for public or private transit.</p> <p>(d) Furniture products which consist of more than 5% (weight by weight) of materials that are not included in the following list: solid wood, wood-based panels, cork, bamboo, rattan, plastics, metals, leather, coated fabrics, textiles, glass and padding materials.</p>

³ JO L 184, 25.6.2014, p. 18

⁴ JO L 184, 25.6.2014, p. 18

Rationale for changes in product scope and definition

From the 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.

Some stakeholders opined that the reason behind the low number of companies with licenses for Ecolabel furniture (1 in Poland and 1 in Italy) was at least partly related to the very high minimum limit of 90% for wood/wood-based material content. According to the results of a market questionnaire⁵ answered by two European furniture associations representing over 2900 furniture manufacturers, only a few products are composed of at least 90 % by weight of wood/wood-based materials. Consequently it can be assumed that the removal of the maximum and minimum limits for materials will mean that the number of furniture products potentially eligible for the EU Ecolabel application process increases greatly.

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.

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. The general exemption that applied to glass in the old scope was requested to be removed since glass may contribute significantly to the overall environmental footprint of the product.

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.

For the avoidance of doubt, it was asked to specifically mention in part d) of the product scope and definition which materials would not be considered as "other" materials, instead of simply referring to "materials not covered by specific criteria".

⁵ For more information see details in "Background document", available online at the project's website: <http://susproc.jrc.ec.europa.eu/furniture/whatsnew.html>

EU ECOLABEL CRITERIA FOR FURNITURE

Criterion 1: Product description

Technical drawings that illustrate the assembly of components and sub-components 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:

- Technical drawings that illustrate the different components and sub-components used in the assembly of the **furniture** product;
- 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.
- 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.**

Rationale:

The product description proposed was generally accepted by the stakeholders. With the extension of the product scope to include other materials, and in much higher quantities, it will be important to describe which materials are used, together with their respective weights. All materials used in the product should be reported, including replaceable parts, e.g. glass elements or textile parts. **Industry representatives also requested that a distinction be made between wood, cork, bamboo and rattan. Due to the fact that it may be difficult to determine the precise weight of wood used in a wood-based panel, the weight of the entire wood-based panel (including any resins, fillers and coatings) can be reported.**

The information provided in the product description could quickly inform Competent Bodies about whether a certain material exceeds any minimum content thresholds that would trigger certain content-specific criteria to become applicable.

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

Criterion 2: General hazardous substance requirements

The presence in the product, or component parts thereof, of substances that are identified according to Article 59 of Regulation (EC) No 1907/2006 (the 'REACH Regulation')⁶ or substances or preparations that meet the criteria for classification according to Regulation (EC) No 1272/2008 of the European Parliament and of the Council (the 'CLP Regulation')⁷ for the hazards listed in **Error! Reference source not found. Table 3**, shall be restricted in accordance with sub-criteria 2.1 and 2.2.

Table 3. Grouping of Candidate List SVHCs and CLP hazards

<p>Group 1 hazards – Substances of Very High Concern</p> <p><i>Hazards that identify a substance as being within Group 1:</i></p> <ul style="list-style-type: none">○ Substances that appear on the Candidate List for Substances of Very High Concern (SVHC).○ Category 1A or 1B CMR*: H340, H350, H350i, H360F, H360D, H360FD, H360Fd, H360Df
<p>Group 2 hazards – CLP</p> <p><i>Hazards that identify a substance as being within Group 2:</i></p> <ul style="list-style-type: none">○ Category 2 CMR*: H341, H351, H361f, H361d, H361fd, H362○ Category 1 aquatic toxins: H400, H410○ Category 1 and 2 acute toxins: H300, H310, H330, H304○ Category 1 STOT*: H370, H372○ Category 1 Skin Sensitiser H317
<p>Group 3 hazards – CLP</p> <ul style="list-style-type: none">○ Category 2, 3 and 4 aquatic toxins: H411, H412, H413○ Category 3 acute toxins: H301, H311, H331, EUH070○ Category 2 STOT*: H371, H373

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

2.1 Restriction of substances of very high concern (SVHCs)

The furniture product or component parts thereof, shall not contain substances that have been identified according to the procedure described in Article 59(1) of Regulation (EC) No 1907/2006 and included in the Candidate List of 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 in its component parts shall be given to Candidate List SVHCs present in the product or in its sub-assemblies in concentrations greater than 0.10% (weight by weight).

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.

Assessment and verification:

⁶ Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency (OJ L 136, 29.05.2007, p.3).

⁷ 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).

The applicant shall provide a declaration of compliance for the product supported, where relevant, by declarations from any component part supplier(s) regarding the non-presence of SVHCs above the specified concentration limit for any component parts used in the assembly of the product. Declarations shall be with reference to the latest version of the Candidate List published by ECHA⁸.

For textile-based materials 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. CLP Restrictions of substances and preparations used in the furniture product

The criterion is split into two parts:

(a) Referring only to substances and preparations directly used by the furniture manufacturer during assembly and any other treatment of the furniture product and

(b) Referring only to specific substances and preparations used in the production of specific component materials that are bought from suppliers.

2.2(a) CLP restriction of substances and preparations used by the furniture manufacturer

Adhesives, paints, primers, varnishes, wood stains, wood preservatives, resins and sealants but not lubricating oils used by the furniture manufacturer during assembly and any other treatment of the furniture product shall not be classified with any of the CLP hazards listed in **Error! Reference source not found. Table 3**.

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

- That the restricted substance or preparation was used in quantities that amount to less than 0.10% of the weight of the furniture product or weight of the relevant component part to which it was applied.
- That the restricted substance or preparation changes its properties upon processing (e.g. becomes no longer bioavailable or undergoes chemical modification) so that the restricted CLP hazards no longer apply and that any unreacted residual content of the restricted substance or preparation is less than 0.10% (weight by weight) in the furniture product or relevant component part to which it was applied.
- That compliance with specific derogation conditions for specific restricted substances or preparations, as set out in **Table 4**, is demonstrated.

⁸ ECHA, Candidate List of substances of very high concern for Authorisation, <http://www.echa.europa.eu/candidate-list-table>

2.2(b) CLP restriction of substances and preparations used by suppliers in defined component materials

Any individual component part from suppliers used in the furniture product that: (i) weighs less than 25 g and that (ii) does not come into direct contact with users during normal use shall be considered as exempt from the requirements set out in criterion 2.2(b).

Suppliers shall demonstrate that the following component materials have not been produced using substances or preparations that are classified with any of the CLP hazards listed in Table 3, by providing information about specific substances or preparations used in the production of specific furniture component materials as per the scope defined below:

- Solid wood and wood-based panels – classification information for any adhesives, paints, pigments, primers, varnishes, wood stains, wood preservatives, resins and sealants.
- Plastics – classification information for any heat stabilisers, pigments, UV stabilisers, plasticisers, biocides, flame retardants or fillers used.
- Metals – classification information for any paints, pigments, primers or varnishes applied to the metal surface and of any metals used in electroplating or galvanization treatment.
- Textiles, leather and coated fabric upholstery – classification information for any dyestuff, varnishes, optical brighteners, stabilisers, auxiliary compounds, flame retardants, plasticisers, biocides or water/dirt/stain repellants.
- Upholstery padding materials – classification information for any biocides, flame retardants or plasticisers applied to the material.

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

- That the restricted substance or preparation was used in quantities that amount to less than 0.10% of the furniture product weight or relevant component part to which it was applied.
- That the restricted substance or preparation changes its properties upon processing (e.g. becomes no longer bioavailable or undergoes chemical modification) so that the restricted CLP hazards no longer apply and that any unreacted residual content of the restricted substance or preparation is less than 0.10% of the weight of the furniture product or weight of the relevant component part to which it was applied.
- That compliance with specific derogation conditions for specific restricted substances or preparations, as set out in Table 4, is demonstrated.

Table 4. Derogations to the hazard restrictions in Table 3 and applicable conditions

Substance / preparation	Applicability	Derogated classification(s)	Derogation conditions*
(a) Biocides / wood preservatives	Treatment of wooden materials	All group 3 hazards listed in	See criterion 3.2 (f)

	and components to be used in the final product	Table 3	
(b) Biocides	Use in textiles or coated fabrics used in outdoor furniture	All group 3 hazards as listed in Table 3	See criterion 6.3 and part ii of the section under "finishing processes".
(c) Flame retardants		H317(1B), 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.
(d) Flame retardants / Antimony Trioxide (ATO)	Textiles, leather, coated fabrics in furniture upholstery covering materials and also padding materials.	H351	ATO is only permitted when the following conditions apply: <ul style="list-style-type: none"> 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 for the backcoating of interior textiles. 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/m³.
(e) Metals / Nickel	Metal components	H317, H351, H372	Only permitted when used in stainless steel components. When the stainless steel component can be considered to come into direct and prolonged skin contact** during normal use, the Nickel release rate from the stainless steel is shown to be less than 0.5µg/cm ² /week according to EN 1811.
(f) Metals / Zinc and zinc compounds		H412, H413	Only permitted when used in anti-corrosive coatings for iron or steel.
(g) Dyestuff for dyeing and non-pigment printing	Textiles, leather and coated fabrics in furniture upholstery covering materials.	H301, H311, H331, H317, H334	Dust free dye formulations or where automatic dosing and dispensing of dyes shall be used by dye houses and printers to minimise worker exposure.
		H411, H412, H413	Dyeing processes using reactive, direct, vat, sulphur dyes with these classifications shall meet a minimum of one of the following conditions: <ul style="list-style-type: none"> • Use of high affinity dyes; • Achievement of a reject rate of less than 3,0 % • Use of colour matching instrumentation; • Implementation of standard operating procedures for the dyeing process; • Use of colour removal to treat wastewater*** The use of solution dyeing and/or digital printing are 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: <ul style="list-style-type: none"> • In white coloured printing; • 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 components	H412, H413	The repellent and its degradation products shall not be classified as bioaccumulative and shall be classified as either readily or inherently biodegradable in the aquatic environment, including aquatic sediment.
(j) Stabilisers	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 be eliminable in wastewater treatment systems according to the OECD 303A/B and/or ISO 11733 standards.
(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 (1B), H331, H371, H373, H334, H411, H412, H413, EUH070	Recipes shall be formulated using automatic dosing systems and processes shall follow standard operating procedures. Substances classified with H311, H331, H317 (1B) shall not be present in the textile material at concentrations greater than 1.0% w/w.

* Note that no chemical products containing concentrations greater than 0.1% w/w of SVHCs listed in the latest version of the Candidate List at the time of application may be derogated.

**prolonged skin contact for Nickel, as per entry 27 of REACH Annex XVII, is currently defined by CARACAL⁹ as 10 minutes on three or more occasions within a two week period or 30 minutes on one or more occasions during a two week period.

*** 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), supported by a list of all the preparations used during the assembly and any treatment of the furniture product together with their hazard classifications (if any).

The applicant shall compile declarations of compliance with criterion 2.2(b) from suppliers of any of the defined component materials. These declarations shall be supported by lists of any relevant substance and preparations used and their hazard classifications (if any).

The following information shall be provided in relation to the hazard classifications or non-classification for each substance or preparation:

- (i) The substance's CAS, EC or list number;
- (ii) The physical form and state in which the substance or preparation is used;

⁹ See: http://ec.europa.eu/enterprise/sectors/chemicals/reach/caracal/index_en.htm .

(iii) Harmonised CLP hazard classifications;

(iv) Self-classification entries in ECHA's REACH registered substance database¹⁰.

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

Where a classification is recorded as 'data lacking' or 'inconclusive' according to the REACH registered substance database, or where the 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:

- Toxicological studies and hazard assessments by ECHA peer regulatory agencies¹¹, Member State regulatory bodies or Intergovernmental bodies;
- A Safety Data Sheet fully completed in accordance with Annex II to Regulation (EC) No 1907/2006;
- 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;
- An attestation, where appropriate based on expert judgment, issued by an accredited conformity assessment body that carries out hazard assessments according to the GHS or CLP hazard classification systems.

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

For criterion 2.2(a) or 2.2(b), as appropriate, where substance or preparations with the restricted hazards listed in Table 3 are considered to no longer exhibit any restricted hazardous properties in the final product or relevant component part due to physical and/or chemical changes during processing, and residual levels in the final product, or relevant component part, can be considered to be present at concentrations less than 0.10 % w/w, the applicant shall specifically mention this in their declaration and provide supporting arguments.

For both criterion 2.2(a) or 2.2(b), as appropriate, where the use of restricted substances or preparations may be subject to derogation as per Table 4, the applicant shall provide proof

¹⁰ECHA, REACH registered substances database: <http://www.echa.europa.eu/information-on-chemicals/registered-substances>

¹¹ ECHA, Co-operation with peer regulatory agencies, <http://echa.europa.eu/en/about0us/partners-and-networks/international-cooperation/cooperation-with-peer-regulatory-agencies>

that all the derogation conditions are met, as described in Table 4. Where test reports are required, they shall be valid at the time of application for a production model

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:

For substances of very high concern - SVHCs

Article 6(6) of EU Ecolabel Regulation 66/2010¹² requires that certain types of substances or preparations/mixtures are not present in products:

"The EU Ecolabel may not be awarded 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".

There are currently (May 2015) 161 substances listed on the ECHA Candidate List. These substances are referred to in Article 57 of REACH and are prioritised according to the procedure mentioned in Article 59 of REACH as substances of very high concern and subject to being phased out or restricted to very limited uses only. None of these substances should be present in the EU Ecolabel product. However, the non-presence of a substance can effectively be defined as analysis of the product resulting in a result of zero or below the limit of detection. This would require the definition of test methods for the 161 substances and to ensure that the methods were suitable for use in each of the materials that could be used in furniture products. Furthermore, for many substances, no suitable test method exists. Even if test methods were available and well-defined, they would represent a major cost commitment to applicants. Furthermore, with furniture manufacturers, who essentially assemble components, it would be difficult to guarantee the continuous compliance of supplied components without repeated testing.

Guidance from ECHA emphasizes the need to minimize testing, preferring disclosure by suppliers instead. The notion of avoiding the use of hazardous substances at source should be prioritised. The environmental improvement potential must also be balanced against the relative importance of the other EU Ecolabel criteria and the capacity of industry to respond.

The basic approach proposed requires manufacturers and suppliers to screen the Hazard Statements of their production recipes based primarily on Safety Data Sheet information. REACH already requires suppliers of substances and preparations to provide a declaration of the non-presence of SVHCs above 0.10 % weight of their product. If none of the Safety Data Sheet of chemical products used during furniture or component material production process contain SVHCs, then it can be reasonably deducted that the chemical product is free of SVHCs.

¹² OJ L 27, 30.1.2010, p. 1–19

For group 2 and 3 hazardous substances (non-SVHC)

Many functional substances, such as pigments, biocides or flame retardants, which are not identified as SVHCs but which exhibit CLP hazards listed in groups 2 and 3 and that remain in the final product could potentially be used. Consequently it is necessary for these substances to be restricted too. For practical reasons, the scope for such substances has been defined as clearly as possible, focussing on the CLP classification of substances and preparations most commonly used in the manufacture of furniture and its component materials. Scope for the use of such restricted substances and preparations is provided, if at least one of the following conditions can be demonstrated:

- *That the restricted substance or preparation was used in quantities that amount to less than 0.10% of the weight of the furniture product or weight of the relevant component part to which it was applied.*
- *That the restricted substance or preparation changes its properties upon processing (e.g. becomes no longer bioavailable or undergoes chemical modification) so that the restricted CLP hazards no longer apply and that any unreacted residual content of the restricted substance or preparation is less than 0.10% (weight by weight) in the furniture product or relevant component part to which it was applied.*
- *That compliance with specific derogation conditions for specific restricted substances or preparations, as set out in Table 4, is demonstrated.*

Allowance in A+V for "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 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.

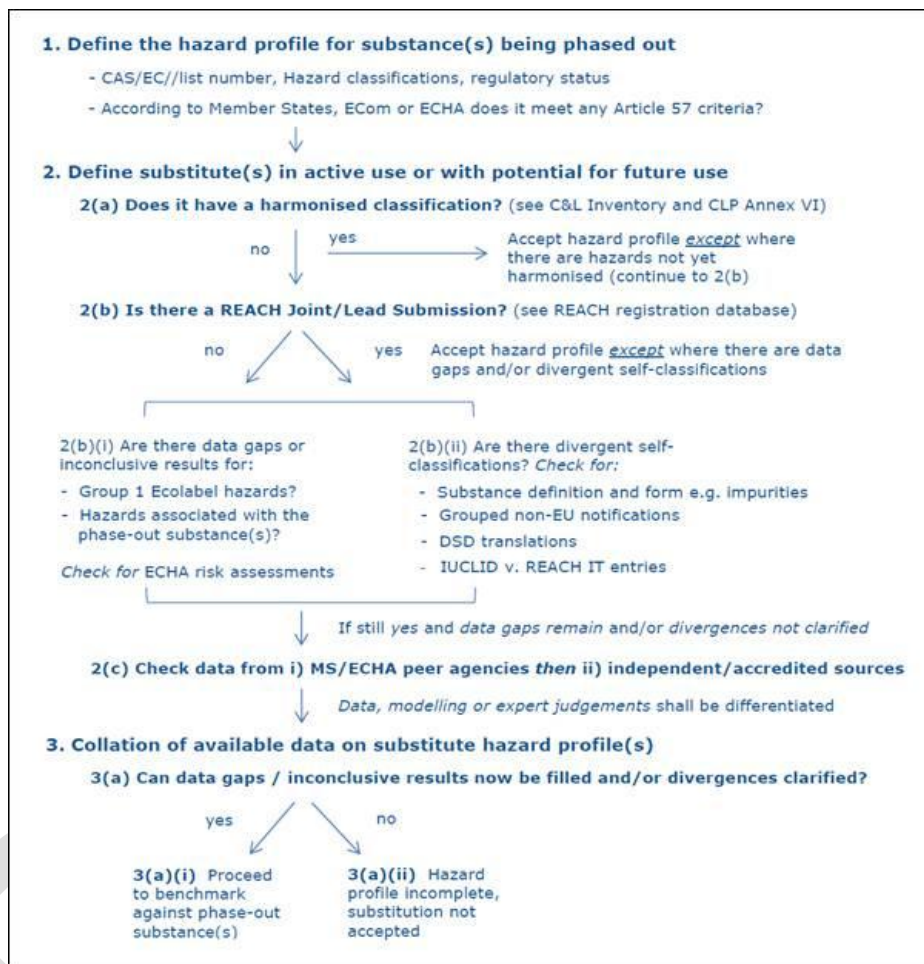


Figure 1. Decision tree used to determine hazard classifications

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 data missing the number of options is 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.

Criterion 3: Wood and wood-based panels

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

Where sub-criteria refer solely to wood-based panels, this is mentioned in the title of those sub-criteria.

3.1 Sustainable wood, 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, bamboo and rattan shall be covered by chain of custody certificates issued by an independent third party certification scheme such as FSC, PEFC or equivalent.

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

Where certification schemes allow mixing of uncertified material with certified and/or recycled materials in a product or product line, a minimum of 70% of the wood 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 shall provide valid, independently certified chain of custody certificates for all wood, bamboo or rattan used in the product or product line and demonstrate that the at least 70% of the material originates from forests managed according to Sustainable Forestry Management principles and/or from recycled sources that meet the requirements set out by the relevant independent chain of custody scheme. FSC, PEFC or equivalent schemes shall be accepted as independent third party certification.

If the product or product line includes uncertified virgin material, proof should 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

Expansion of 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".

Proposed removal of cork from this criterion

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. After further research, it was found that approximately 2.1 million ha of cork forest exist, of which approximately 10 % are certified by either FSC or PEFC. Considering production rates by country, it was estimated that 10-14% of all cork production is from FSC or PEFC certified forest.

Furthermore, as the main market for cork products is for wine bottle stoppers, the vast majority of cork used in furniture products would effectively be a by-product of the stopper production process, or be lower quality cork from young trees which does not yet have adequate properties for use in stopper production.

Often cork forests are combined with mixed land uses for pasture and grazing, hunting or charcoal production¹³. Considering the fact that harvesting of cork is a long-term process,

¹³ See: <http://ga2014.fsc.org/opinion-analysis-74.the-dehasas-and-cork-production-today-and-its-alliance-with-fsc>

where trees can remain profitable for over 200 years¹⁴. The real threat to cork forests is not the management practices used in cork forests but rather market trends in the use of alternative wine bottle stoppers other than cork. SO the added-value of a requirement that cork forests are sustainable certified is limited and so has been provisionally removed.

The relevance of bamboo and rattan to the sustainable wood criterion is also under scrutiny and will be discussed during the June 2015 EUEB meeting. Further information is needed about how to address bamboo and rattan from non-forest sources and the availability of sustainable-certified material on the market. Currently 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.

Removal of separate legal wood requirement

The requirement to prove the legal origin of the wood in a separate sub-criterion has been removed because is already explicitly mentioned in the sustainable wood criterion. The main reason for including a separate criterion for legal wood in the first place was the fact that a number of loopholes exist in the EU Timber Regulation (No. 995/2010) for certain furniture items and components. However, it can be considered that these loopholes are well covered by 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 sub-criterion on legal wood is one clear opportunity to simplify the requirements.

Sustainable wood criteria

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.

¹⁴ Sierra-Perez et al., 2015. Production and trade analysis in the Iberian cork sector: Economic characterization of a forest industry. Resources, Conservation and Recycling, 98, p.55-66.

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 sub-criteria (see Appendix I). 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 2).

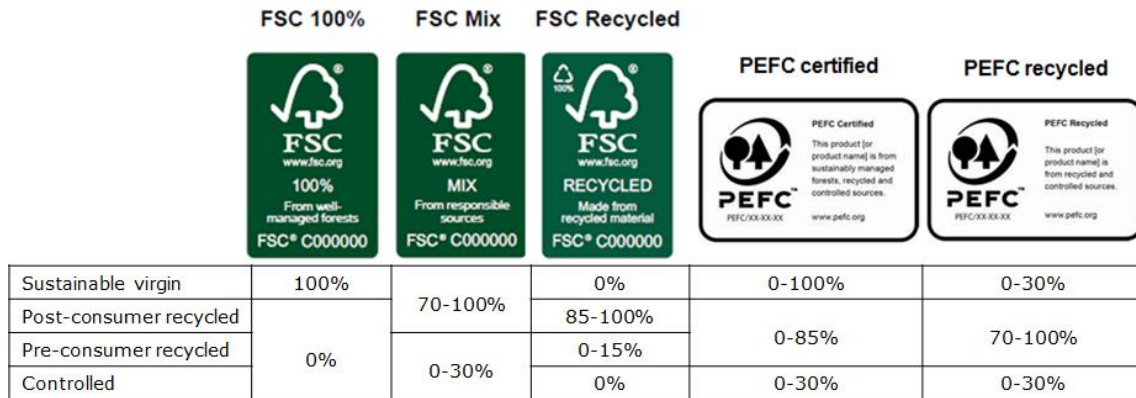


Figure 2. Illustration of the 5 current labels from FSC and PEFC.

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 NEPCON¹⁵, 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.

¹⁵ NEPCON, 2012, "Comparative analysis of the PEFC system with the FSC Controlled Wood requirements"

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 components made of wood, cork, bamboo or rattan or specifically only to wood-based panels where the latter term is mentioned in the sub-criterion title:

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

Any recycled wood chips or wood fibres used in the manufacture of wood based panels shall have been tested in accordance with the EPF standard for delivery conditions of recycled wood¹⁶ and comply with the limits for contaminants as listed in Table 5.

Table 5. 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:

- a declaration from the wood-based panel supplier that no recycled wood fibres were used in the panel, or
- a declaration from the wood-based panel supplier that 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 5.
- A declaration from the wood-based panel supplier that all recycled wood fibres used have been 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

¹⁶ "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>

appropriate test reports that demonstrate compliance of the recycled wood samples with the limits specified in Table 5.

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.

Outcomes of stakeholder meetings

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.

b) Polyvinyl chloride foils used in wood-based panels

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 6.

Table 6. 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 6. 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 6.
- 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 angiosarcoma¹⁷ (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)¹⁸ and set out in the European Commission Reference

¹⁷ IARC Monographs Volume 97, p.311-443

¹⁸ See: <http://www.pvcinfo.be/bestanden/S-PVC%20charter.pdf> and <http://www.pvcinfo.be/bestanden/E-PVC%20charter.pdf>

Document on Best Available Techniques in the Production of Polymers¹⁹ 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.

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

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 non-presence 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:

- A declaration from the wood-based panel supplier stating that plastic foils were not used.

or

- 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 would be the main reasons for having such a sub-criterion here.

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

¹⁹ See: http://eippcb.jrc.ec.europa.eu/reference/BREF/pol_bref_0807.pdf

d) Heavy metals in paints, primers and varnishes

Paints, primers or varnishes used on wood or wood-based materials 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 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. 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.

A number of stakeholders expressed concerns about the complexity of the previous general hazardous substance criterion, 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 do not need to be derogated since derogations for general hazardous substances criteria for furniture should apply to the % content in the final furniture product or % content of coated component parts and not to the % content within chemical products applied to components of the furniture. When considered as a % of the furniture product (or coated component parts) these additives will be far below the 0.1% w/w arbitrary cut-off limit that has been widely used for EU Ecolabel articles.

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.

e) VOC content in paints, primers and varnishes

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

This sub-criterion shall only apply when the content of coated wood or wood-based panels not described above 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 9.4 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 the Table 7.

Table 7. 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:

- Provide calculations demonstrating that the effective quantity of VOCs applied to the coated surface area of the final assembled furniture product is < 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 < 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 7.

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 preparations, 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 9.4 (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 sub-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 components 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 (<5%) it is only necessary to demonstrate that the SDS of the coating shows that the VOC concentration is <5%. A significant number of coating substances and techniques that are widely regarded to be environmentally friendly are included in the <5% VOC content category 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 so long as the total VOC applied or emitted is restricted within defined limits.

However, it is appreciated that in some cases the use of higher VOC concentration coatings may be desirable for durability, aesthetic or other practical reasons with certain components. The sequential criterion does allow for the use of higher VOC concentration coatings (no upper limit for VOC concentration of the coating substance is set) so long as the total quantity of VOC applied or emitted is restricted. This restriction can be applied in one of two ways the preferred method may depend on how the coating is applied.

- 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 and 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 third 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.

The overall effect of this criterion should be to shift producers towards using low VOC concentration coatings (<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.

f) Use of wood preservatives and biocides in paints, primers and varnishes

Any individual wooden component part from suppliers used in the furniture product that: (i) weighs less than 25 g and that (ii) does not come into direct contact with users during normal use, shall be considered exempted from the requirements set out in this criterion.

No wood preservatives or paints, primers and varnishes that contain biocidal substances shall be used in the coating of any wooden components of the furniture product except under the following conditions set out in Table 8.

Table 8. Cases in which the use of wood preservatives and biocides are permitted

Cases	Conditions
Use of wood preservatives	<p>Only permitted if:</p> <ul style="list-style-type: none"> The furniture product is clearly marketed for outdoor use. The untreated wood does not meet the durability class I or II requirements according to EN 350. The any wood preservation product used (and the active substance(s) it contains are approved for use under Product Type 8 or 18 as per the requirements of Regulation (EU) No 528/2012 of the European Parliament and of the Council (the "Biocidal Products Regulation")²⁰.

²⁰ Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products (OJ L 167, 27.6.2012, p. 1).

	The actual wood preservative chemical formulation is not CLP classified with Group 1 or Group 2 hazards as listed in Table 3 in criterion 2 of this document.
In-can preservatives present in paints, primers and varnishes	Only permitted if: The paint, primer or varnish formulation and any active substance(s) it contains are approved under Product Type 6 as per the requirements of the Biocidal Products Regulation (EU) No 528/2012.
Dry-film preservatives in coatings for wooden components	Only permitted if: The furniture product is clearly marketed for outdoor use The uncoated wood does not meet the durability class I or II requirements according to EN 350. The coating substance shall have a score of 0 for fungal resistance and 0 for algal resistance according to EN 15457 and EN 15458 respectively. The formulation and any active substance(s) it contains are approved under Product Type 7 as per the requirements of the Biocidal Products Regulation (EU) No 528/2012.

Assessment and verification:

The applicant shall provide a declaration of compliance with this criterion, supported by a declaration from the supplier of wooden components which, where relevant, includes information regarding details of any wood preservatives, paints, primers or varnishes used to coat the wooden components and proof that these preparations are approved under the Biocidal Products Regulation (EU) No 528/2012 or are biocide-free.

For outdoor wooden furniture components that have been treated with biocidal products, the applicant shall provide a declaration from the wooden component supplier that the wood, prior to any coating or preservation treatment, does not meet the durability class I or II requirements according to EN 350 and, where dry-film preservatives are used in the paint, primer or varnish, provide a declaration from the paint primer or varnish supplier that they meet the requirements for fungal and algal resistance.

Rationale

The previous set of criteria made reference to derogations for the use of biocides in wooden components in the general hazardous substances criteria. However, considering the wording of the new general hazardous substance criteria, in many cases it is possible that the biocidal substance is present well below the 0.1 % weight threshold limit.

In order to make it clear that biocides are not to be used in wooden components by default, it was necessary to add a specific sub-criterion in this respect.

3.3 Formaldehyde emissions from wood-based panels

This sub-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 manufactured using formaldehyde-based resins shall either:

- Have formaldehyde emissions that are lower than 50 % of the threshold value allowing them to be classified as E1²¹.
- Have formaldehyde emissions that are lower than 65 % of the E1 threshold limit, in the case of MDF (Medium Density Fibreboard) panels.
- Have formaldehyde emissions that are lower than the limits set out in the CARB Phase II or the Japanese F-3 star or F-4 star standards.

Assessment and verification:

The applicant shall provide a declaration of compliance with this criterion. The assessment and verification of low formaldehyde emission panels shall vary depending on the certification scheme it falls under. The verification documentation required for each scheme is described in Table 9.

Table 9. 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 supplier, stating that the panel is compliant with 50% of E1 emission limits or, in the case of MDF panels, with 65% of E1 emission limits, supported by test reports carried out according to either EN 717-1, EN 717-2 or EN 120.
CARB – California Air Resources Board: Phase II limits	A declaration from the wood-based panel supplier, 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 ²² . Optionally, the wood-based panel may be labelled in accordance with Section 93120.3(e), containing details in respect of the manufacturer's name, the product lot number or batch produced, and the CARB assigned number for the third party certifier (this part is not mandatory if the products are sold outside of California or if they were made using no-added formaldehyde or specific ultra-low emitting formaldehyde-based resins).
F-3 or 4 star limits	A declaration from the panel supplier of compliance with the formaldehyde emission limits as per JIS A 5905 (for fibreboard) or JIS A 5908:2003 (for particleboard and plywood), supported by 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:

²¹ E1 is a threshold emission limit originally introduced in 1985 in the EU due to concerns over adverse health effects due to formaldehyde exposure. The emission limits are defined in Annex B of EN 13986 and correspond to steady state background levels of 0.1ppm (or 0.124mg/m³) formaldehyde after 28d in a chamber test according to EN 717-1.

²² Regulation 93120 "Airborne toxic control measure to reduce formaldehyde emissions from composite wood products" California Code of Regulations.

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 component 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 behavior 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 is currently classified as a Category 2 carcinogen (H351 - suspected of causing cancer) and is due to be reclassified as a Category 1B carcinogen (H350 - may cause cancer) in 2015²³. 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

²³ 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.

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 3^{24,25}.

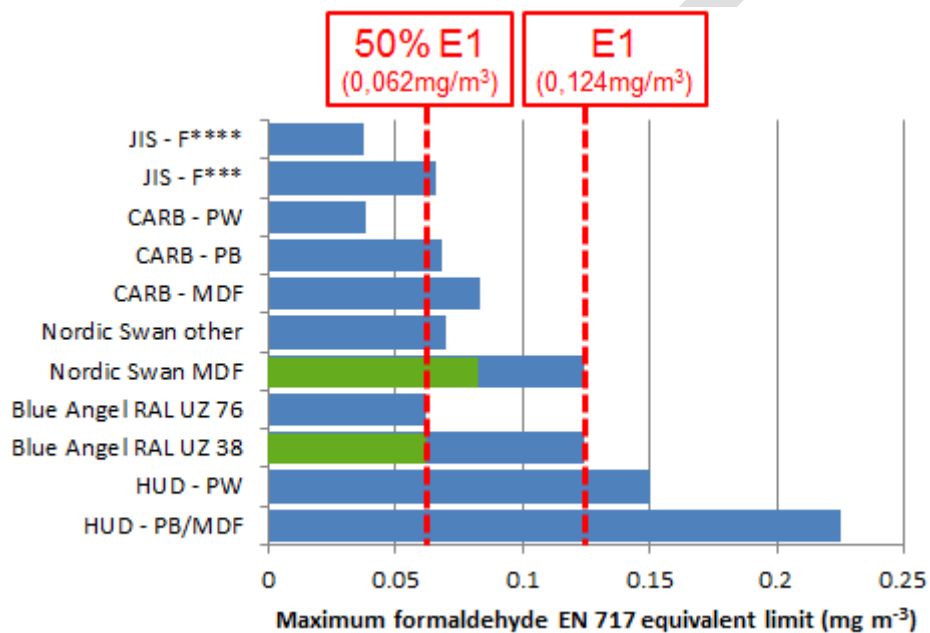


Figure 3. Comparison of formaldehyde emission ambition levels in different schemes for wood-based panels. PW = Plywood; MDF = Medium density fibreboard; PB = Particleboard

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

²⁴ 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.

²⁵ Risholm-Sundman et al., 2007. Formaldehyde emission – Comparison of different standard methods. *Atmospheric Environment*, Vol. 41, p.3193-3202.

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

The requirements set out in **this criterion** only apply to components that are made of plastic but not to foils, thermosetting resins used in wood-based panels or plastic materials used in upholstery, which are covered by criteria 3.2b), 3.2c), 3.3, 6.1, 6.2, 6.3, 7.1, and 7.2.

4.1 Marking of plastic components

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 should be at least 2.5 mm high.

Where any fillers, flame retardants or plasticisers are intentionally incorporated into the plastic in proportions greater than 1 % w/w, their presence should 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 components **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 components shall be clearly visible upon visual examination of the plastic component. 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 components **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 components may represent useful information for manual pre-sorting. However, manual pre-sorting typically only focuses on large components, for this reason a higher labelling limit of 100g was chosen. This is particularly relevant to furniture, where products and components 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 10. Typical densities for common polymers²⁶

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

²⁶ From J. Aguado and D. Serrano, 1999, "Feedstock recycling of plastic wastes." published by the Royal Society of Chemistry, ISBN 0-85404-531-7

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. >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 4.

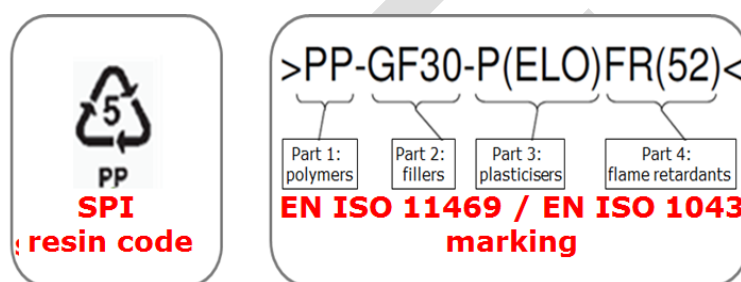


Figure 4. Comparison of the marking that would be required for a polypropylene plastic with 30% glass fibre filler content, epoxidised linseed oil plasticiser and red phosphorus flame retardant according to the SPI resin coding system (left) and the EN ISO 11469 / EN ISO 1043 standards (right).

Although the example in Figure 4 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 components.

a) Heavy metals in plastic additives

Plastic components 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 and/or with post-consumer PVC recyclates, representative testing of the plastic components shall demonstrate compliance with the conditions set out in Table 11.

Table 11. Assessment and verification of heavy metal impurities in plastics.

Metal	Method	Limit (mg/kg)	
		Virgin	Recycled
Cd	XRF or acid digestion followed by inductively coupled plasma or atomic absorption spectrophotometry or other adequate 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 use of heavy metal based pigments, stabilisers and other types of additives used to impart specific physical properties to compounded plastics has been widespread and is now beginning to be regulated more strictly. In the EU, Regulation 494/2011 effectively restricts the total cadmium content in plastics to 100 mg/kg unless the plastic contains recovered PVC (in which case a derogation applies up to 1000 mg/kg).

Substitution of lead-based stabilisers in PVC 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 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, although there is no specific EU Regulation for lead impurities in plastics. 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.

b) Vinyl chloride monomer

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 12 for their production facility.

Table 12. 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:

- A declaration stating that PVC components have not been used in the furniture product, or
- A declaration stating that PVC components 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 12**. 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 12**.
 - 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 components 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 **Error! Reference source not found.** 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. With light coloured injection moulded plastics, concerns about the colour and aesthetics of the component may be raised. However, it should be noted that with extruded components, 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.

The potential for plastic recyclates to bring hazardous substances into the EU Ecolabelled 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 be 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. Phthalates should not need to be tested since these are used in plasticised PVC, which is not widely recycled at all and if it was recycled via a technique such as VinyLoop™, then phthalate contaminants should be removed.

Criterion 5: Metals

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

5.1 Electroplating restrictions

Only components subject to heavy physical wear (i.e. nuts, bolts, nails, screws, hinges, brackets, runners, gas lifts and wheels) or components not subject to prolonged skin contact may be electroplated.

Chromium VI or cadmium compounds shall not be used for electroplating operations of any metal components used in the final furniture product. Zinc may be used for electroplating or hot-dip galvanising so long as the derogation conditions in Table 4 are respected.

Assessment and verification:

The applicant shall provide a declaration from the supplier of the metal component(s) that no plating treatments involving chromium VI or cadmium substances have been used. Where the furniture manufacturer has used zinc coated components, either electroplated or hot-dip galvanised, evidence of compliance with the relevant derogation conditions in Table 4 shall be provided.

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 components 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. For this reason, a particular list of parts considered to be subject to physical wear has been specifically introduced in the criteria.

Electroplating metals can easily account for more than 0.1% w/w of the plated component. The criteria has been restructured by specifically banning chromium VI and cadmium electroplating at any total content in material specific sub-criteria while mentioning the derogated use of nickel (in stainless steel) and zinc (electroplating or hot-dip galvanising) for corrosion resistance purposes so long as the conditions in Table 4 are respected.

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.

5.2 Heavy metals in paints, primers and varnishes

Paints, primers or varnishes used on metal components 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 3.2d) applies here.

5.3 VOC content in paints, primers and varnishes

This sub-criterion shall only apply when the content of coated metal components 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 9.4 can be demonstrated,

The VOC content of any paints, primers or varnishes used to coat any metal components 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 13.

Table 13 **Error! Reference source not found.**

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 < 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 < 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 13.

Rationale:

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

5.4 Use of biocides in paints, primers and varnishes

Any individual metal component part from suppliers used in the furniture product that: (i) weighs less than 25 g and that (ii) does not come into direct contact with users during normal use, shall be considered exempted from the requirements set out in this criterion.

No paints, primers or varnishes that contain biocidal substances shall be used in the coating of any metal components of the furniture product except under the following conditions set out in Table 14.

Table 14. Cases in which the use of biocides are permitted

Cases	Conditions
In-can preservatives present in paints, primers and varnishes	Only permitted if: <ul style="list-style-type: none">• The paint, primer or varnish formulation and any active substance(s) it contains are approved under Product Type 6 as per the requirements of the Biocidal Products Regulation (EU) No 528/2012
Dry-film preservatives in coatings for metal components	Only permitted if: <ul style="list-style-type: none">• The furniture product is clearly marketed for outdoor use• The coating substance shall have a score of 0 for fungal resistance and 0 for algal resistance according to EN 15457 and EN 15458 respectively• The formulation and any active substance(s) it contains are approved under Product Type 7 as per the requirements of the Biocidal Products Regulation (EU) No 528/2012• The actual biocidal preparation is not CLP classified with Group 1 or Group 2 hazards as listed in Table 3 in criterion 2 of this document

Assessment and verification:

The applicant shall provide a declaration of compliance with this criterion supported, where relevant, by declarations from suppliers of paints, primers or varnishes used to coat the any

metal components, that their products are approved under the Biocidal Products Regulation (EU) No 528/2012 or are biocide-free.

Where paints, primers or varnishes that contain dry-film preservatives are used, the applicant shall also provide a declaration that their product meets the requirements for fungal and algal resistance.

Rationale

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

DRAFT

Criterion 6. Upholstery Covering Materials

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: $\pm 2.0\%$ woven furniture ticking fabric: $\pm 3.0\%$ non-woven furniture ticking: $\pm 5.0\%$ non-woven furniture upholstery fabrics: $\pm 6.0\%$	N/A
Colour fastness to washing	Domestic washing: ISO 105-C06 Commercial washing: ISO 15797 + ISO 105-C06 (at minimum of 75 °C)	\geq level 3-4 for colour change \geq level 3-4 for staining	N/A
Colour fastness to wet rubbing*	ISO 105 X12	\geq level 2-3	\geq level 2-3
Colour fastness to dry rubbing*	ISO 105 X12	\geq level 4	\geq level 4
Colour fastness to light	ISO 105 B02	\geq level 5**	\geq 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 ≥ 35 daN and TR ≥ 20 daN
Tear resistance of plastic film and sheeting by the trouser tear method	ISO 13937/2	CH $\geq 2,5$ daN and TR ≥ 2 daN
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	$\geq 75,000$
Determination of coating adhesion	EN 2411	CH $\geq 1,5$ daN and TR $\geq 1,5$ daN

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 Commission 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	≤ 150	EN ISO 17226-1
	Textiles and	≤ 75 for textiles and ≤ 150 for coated fabrics	EN ISO 14184-1

	coated fabrics			
Extractable heavy metals	Leather	Arsenic ≤ 1.0	Antimony ≤ 30.0	
		Chromium ≤ 200	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 $\leq 30.0^{***}$	
		Chromium ≤ 2.0	Cadmium ≤ 0.1	
		Cobalt ≤ 4.0	Copper ≤ 50.0	
		Lead ≤ 1.0	Mercury ≤ 0.02	
		Nickel ≤ 1.0		
Chlorophenols	Leather	Pentachlorophenol ≤ 1 mg/kg Tetrachlorophenol ≤ 1 mg/kg	EN ISO 17070	
Alkylphenols	Leather	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)	EN ISO DIS 18218-1	
	Textiles and coated fabrics	<u>Alkylphenoethoxylates (APEOs) and their derivatives:</u> 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) Sum Total limit value : ≤ 25mg/kg - textiles /coated fabric ≤ 100mg/kg - leather	Solvent extraction followed by LC-MS	
Polycyclic Aromatic Hydrocarbons	Textiles, coated fabrics or leather	REACH restricted PAHs: 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) Individual limits for 10 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) 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	AfPS GS 2014:01 PAK	
N,N-	Elastane or	Result $\leq 0.005\%$ w/w (≤ 50 mg/kg)	Solvent extraction	

Dimethylacetamide (CAS.: 127-19-5)	acrylic-based textiles		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 of REACH plus two other compounds (see **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.

*** If textiles are tested together with a backcoating that has been treated with ATO as a synergist, 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 results.

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 in to 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 sensitiser), 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. 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).

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, textiles or coated fabrics). Coated fabric industry representatives confirmed that the standards referred to in Table 17 can also be applied to 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) Surfactants, softeners and complexing agents	
<p>Applicability: To dyeing and finishing process stages in textile, leather or coated fabric production.</p>	<p>All non-ionic and cationic surfactants must be 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 should 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 preparations, formulations and adhesives)	
<p>Applicability: Intermediate materials and final leather, textile or coated fabric</p>	<p>The following substances shall not be used in any preparations or formulations within the supply chain:</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)

product.	<ul style="list-style-type: none"> 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 declarations from chemical supplier(s) and relevant SDSs, that these compounds have not been used in any of the production stages for leather, textiles or coated fabrics.</p>
c) Solvents	
<p>Applicability: Intermediate materials and final leather, textile or coated fabric product.</p>	<p>The following substances shall not be used in any preparations or formulations during leather, textile or coated fabric production or any part thereof</p> <ul style="list-style-type: none"> 2-Methoxyethanol N,N-dimethylformamide 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,N-dimethylacetamide (DMAC) N-methyl-2-pyrrolidone; 1-methyl-2-pyrrolidone Trichloroethylene 1-Methyl-2-pyrrolidone <p>Assessment and verification: The applicant shall provide a declaration from the leather, textile or coated fabric producer, supported by declarations from chemical suppliers and relevant SDSs, stating 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:</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</p>

Dyeing and printing processes	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.
iii. Pigments Applicability: Dyeing and printing processes	Pigments based on cadmium, lead, chromium VI, mercury, arsenic and antimony shall not be used. 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.
3-Finishing processes	
i. Poly-fluorinated compounds Applicability: Upholstery covering materials with integrated water or stain repellent function	Fluorinated compounds shall not be impregnated into furniture upholstery 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 biodegradable and have a low potential to bioaccumulate in the aquatic environment shall be permitted. 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. 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 15968:2010. For non-fluorinated treatments, readily 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). A low potential to bioaccumulate shall be demonstrated by tests that show partition coefficients (Log Kow) of ≤ 3 or Bioconcentration Factors (BCF) ≤ 100 . With non-fluorinated treatments, the latest revision of the Detergents Ingredients Database should 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. http://ec.europa.eu/environment/ecolabel/documents/did_list/didlist_part_a_en.pdf
ii. Biocides Applicability: Leather, coated fabrics and textiles	Biocides shall not be incorporated into any leather, coated fabrics or textiles with the purpose of providing a final disinfective effect except under the following conditions: <ul style="list-style-type: none"> • That the upholstered furniture is clearly marketed for outdoor use. • The biocide chemical formulation and active substance(s) have been approved for use under Product Type 6 (for polymers and plastics) or Product Type 9 (for textiles) as appropriate. • The actual biocide chemical formulation is not CLP classified with Group 1 or Group 2 hazards as listed in Table 3 in criterion 2 of this document. Assessment and verification: The applicant shall provide a declaration of compliance with this criterion supported, where relevant, by declarations from suppliers of leather, coated fabrics or textiles used in the furniture upholstery that either state the non-use of biocides during finishing treatments or that state that any biocidal products used are approved under the Biocidal Products Regulation (EU) No 528/2012 for Product Type 6 for coated fabrics or leather or Product Type 9 for textiles.
4 – Tannery effluent quality and specific water consumption	

Applicability: Leather production process	<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 shall provide 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>(ii) Total chromium concentration in tannery wastewater after treatment shall not exceed 1 mg/l.</p> <p>Assessment and verification: the applicant shall provide a test report of his supplier using 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 11, and BAT 10 or 12 following Commission Implementing Decision 2013/84/EU for the reduction of chromium content of waste water discharges.</p>												
	<p>(iii) Water consumption expressed as annual average volume of water consumed per tonne of raw leather for the tanning of hides and skins shall not exceed the limits given below:</p> <table border="1" data-bbox="421 790 1243 1061"> <tr> <td>Hides</td> <td>28 m³/tonne</td> </tr> <tr> <td>Skins</td> <td>45 m³/tonne</td> </tr> <tr> <td>Vegetable tanned leather</td> <td>35 m³/tonne</td> </tr> <tr> <td>Pig skin</td> <td>80 m³/tonne</td> </tr> <tr> <td>Calfskin</td> <td>40 m³/tonne</td> </tr> <tr> <td>Sheepskins</td> <td>180 l/skin</td> </tr> </table> <p>Water consumption shall be calculated based on the monthly average values of the last twelve months before the application and measured by the amount of water discharged.</p> <p>Assessment and verification: the applicant shall provide a declaration of compliance from the leather supplier or leather manufacturing company, where relevant. 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><i>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 produced (tones) or number of skins for sheepskin, as appropriate, based on the monthly average values during the twelve months preceding the application.</i></p> <p><i>The verification shall refer to the entire tanning process.</i></p>	Hides	28 m ³ /tonne	Skins	45 m ³ /tonne	Vegetable tanned leather	35 m ³ /tonne	Pig skin	80 m ³ /tonne	Calfskin	40 m ³ /tonne	Sheepskins	180 l/skin
Hides	28 m ³ /tonne												
Skins	45 m ³ /tonne												
Vegetable tanned leather	35 m ³ /tonne												
Pig skin	80 m ³ /tonne												
Calfskin	40 m ³ /tonne												
Sheepskins	180 l/skin												

Assessment and verification:

The applicant shall compile all relevant declarations, SDSs and optional 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.

Rationale:

General

The general criteria for hazardous substances in criterion 2 apply the exclusion of SVHCs in the final product and to certain functional hazardous substances that are likely to remain in the final product. Allowance for these substances is permitted so long as certain derogation conditions are respected and can be verified.

However, criterion 6.3 is somewhat independent of the general criterion on hazardous substances and beyond its scope because it does not specifically relate to substances that are likely to remain in the final material in significant concentrations. For this reason it is included as a sub-criterion for upholstery covering materials and not in criterion 2. The criterion should be relatively simple to verify. The main effort in demonstrating compliance will come from the leather, textile or coated fabric manufacturer who should already be in possession of all the necessary information. It should not be necessary to actually test commercially marketed chemical formulations or active substances for properties such as biodegradability because this information should be available already, either in SDSs, REACH dossiers or similar literature. Specific test methods are mentioned in some requirements in case this may help manufacturers if they need to contact suppliers of chemical formulations to seek clarification of any doubts.

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 currently-under-revision 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 around 14% of all leather production.

This text was previously summarised in 3 tables in Appendix IV of TR 3.0 but has now been combined into a single table and brought directly into the criteria text.

COD 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.²⁷ 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 plants²⁸. The acceptable level of effluent

²⁷ Taneftrat, LIFE02 ENV/NL/000114

²⁸ Best Available Techniques (BAT) Reference Document for the Tanning of Hides and Skins. 2013. JRC Reference Report. European Union, 2013

treatment required, before its discharge to the water environment, differs according to the 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 AELs in the Commission Implementing Decision 2013/84/EU being considered rather the quality parameter which is taken into account at the stage of operational permit of the treatment plant. The need to perform such a test depends on the receiving environment, the point of being monitored (if any fish eggs should be present).

Chromium in tannery effluent

The criterion intends to address different technological/infrastructure solutions identified throughout Europe and is harmonized with BAT-AELs for tanning of Hides and Skins. The change from the current requirements for Cr (III) content to Cr total content reflects the industry agreement reached during the BREF for the Tanning of Hides and Skins Technical Working Group Meeting.

One stakeholder highlighted that when industries that discharge their water into wastewater treatment plants, they are often not aware of the exact quantitative pollution load in the wastewater. In this case the EU Ecolabel should refer to the national legislation. Otherwise, all industries that discharge their water into municipal treatment plants would potentially be excluded. 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. It was further suggested from one side to increase the Cr content to 2 mg/l, or by contrast to establish more ambitious level such as 0.5 mg/l.

It should be stressed that the pollution load in the effluent is a measure of environmental efficiency of the leather making process. An increase in the efficiency of maximising chromium uptake will solve most of the problems in the final effluent. Reducing the chromium losses to effluent will lead to a lower amount of chromium in the sludge generated during waste water treatment. Without introducing any new chemicals or techniques, tanners can improve the chromium uptake up to 90% (compared to about 60 % in normal operation) simply by altering both physical and chemical parameters (float levels, chrome offers).

The differences in the European infrastructure for tannery effluence treatment support the need to introduce a specific threshold value for chromium content in process effluents. The proposed Cr total emission threshold value reflects the higher threshold of BAT-AELs according to the Commission Implementing Decision 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

(2013/84/EU)²⁹. BAT-AELs values of total chromium content are in range from 0.3 to 1 mg/l, set as average monthly values, 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 AELs for direct dischargers applies to the point of discharge in the receiving water stream and the 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 recommend 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).

Water consumption

The following rationale is the same that has been produced during 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 technical water needed 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 Skins³⁰ suggests using one or both of the techniques given below:

²⁹ C(2013) 618) O.J. L 45/20 16.2.2013

³⁰ http://eippcb.jrc.ec.europa.eu/reference/BREF/TAN_Adopted552013.pdf

- 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 measuring 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.
- The use of short floats which reduced process water use in per mass of hides or skins processed, as 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, 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 ³¹ (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

Table 20: BAT water consumption levels – Skin

Processes stages	Specific water consumption ³² (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

³¹ Monthly average values. Processing of calfskins and vegetable tanning may require a higher water consumption.

³² 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:

1. Nordic Ecolabel for textiles, hides/skins and leather set the general requirement of 25m³ water/tonne hides/skins and leather that is treated;
2. 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.

The collated information was furthermore contrasted with the industry stakeholder's feedback. Correspondingly, the following specification is proposed to be introduced under the revised criteria for the EU Ecolabel in Footwear:

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 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 needed³³. Considering that no specific referenced value has been established, it is proposed to integrate this type of material into general category skins.

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 kg.³⁴ It is proposed to follow AELs-BAT value, i.e. to require 180 l/skin³⁵.

³³BREF for Tanning of Hides and Skins, 2013

³⁴ OJ L 45, 16.2.2013, p. 13–29

³⁵ 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.

4. Vegetable tanning: The process might require higher water consumption than chromium-based technique. CEN/TC 289/WG4³⁶ 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 the stakeholders feedback, it is proposed to harmonize requirement with CEN/TC 289/WG4: Leather – Criteria defining the performance characteristics of leather with a low environmental impact (i.e. to set the limit at 35 m³/tonne).

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 and other natural cellulosic seed fibres (hereinafter referred to as cotton) shall contain a minimum content of either organic cotton (see criterion 6.4a) or integrated pest management (IPM) cotton (see criterion 6.4b). In addition to this:

- All conventional cotton and IPM cotton used shall comply with the pesticide restrictions in criterion 6.4c,
- All organic and IPM cotton shall be fully traceable in accordance with criterion 6.4d,

Products meeting specific content thresholds for organic or IPM cotton shall be permitted to display additional text alongside the EU Ecolabel logo, communicating the content claim, in accordance with the guidance provided in criterion 11.

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

Textile-based materials that have been awarded the EU Ecolabel in accordance with Commission Decision 2014/350/EU shall be considered compliant with criterion 6.4.

6.4(a) Organic production standard

A minimum of 10 % weight by weight of the cotton used in furniture shall be grown according to the requirements laid down in Council Regulation (EC) No 834/2007³⁷, the US National Organic Programme (NOP) or equivalent legal obligations set by trade partners of the EU. The organic cotton content may include organically grown cotton and transitional organic cotton.

All conventional cotton and IPM cotton blended with organic cotton shall come from non-genetically modified varieties.

³⁶ CEN/TC 289/WG4/ Draft WI 00289154 Leather – Criteria defining the performance characteristics of leather with a low environmental impact

³⁷ 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).

Assessment and verification:

The applicant shall provide a declaration of compliance with criterion 6.4(a), supported by evidence confirming that at least 10 % of the cotton contained in the product is organic and 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 trade partners. Verification shall be provided on an annual basis for each country of origin.

Non-genetically modified varieties of cotton shall be verified in conformity with Regulation (EC) No 1830/2003 of the European Parliament and of the Council³⁸. IPM schemes that exclude genetically modified cotton shall be accepted as proof of compliance for IPM content.

6.4(b) Cotton production according to IPM principles

A minimum of 20 % weight by weight of the cotton used in the product 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, and shall comply with the pesticide restrictions in criterion 6.4(c).

Assessment and verification:

The applicant shall provide a declaration of compliance with criterion 6.4(b), supported by evidence that at least 20 % weight by weight of the 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 bales purchased to manufacture the product.

6.4(c) Pesticide restrictions applying to conventional and IPM cotton

All cotton used in textile-based materials shall be grown without the use of any of the following substances:

Alachlor, aldicarb, aldrin, campheclor (toxaphene), captafol, chlordane, 2,4,5-T, chlordimeform, chlorobenzilate, cypermethrin, DDT, dieldrin, dinoseb and its salts, endosulfan, endrin, glyphosulfate, heptachlor, hexachlorobenzene, hexachlorocyclohexane (total isomers), methamidophos, methyl-o-demeton, methylparathion, monocrotophos, neonicotinoids (clothianidine, imidacloprid, thiametoxam), parathion, phosphamidon, pentachlorophenol, thiofanex, triafanex, triazophos.

Cotton shall not contain more than 0.5 ppm in total of the substances listed above.

Assessment and verification:

The applicant shall provide a declaration of compliance with criterion 6.4(c). Proof of compliance with the pesticide restriction shall not be required for schemes that prohibit use of the substances listed and where either testing is carried out or declarations of non-use are obtained from farmers and/or farmer producer groups that are verified by site visits carried out by control bodies accredited by either national governments or recognised organic or IPM certification schemes.

³⁸ Regulation (EC) No 1830/2003 of the European Parliament and of the Council of 22 September 2003 concerning the traceability and labelling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms and amending Directive 2001/18/EC (OJ L 268, 18.10.2003, p. 24).

Cotton shall be tested for the listed substances. A test report shall be provided based on the following test methods, as appropriate:

- US EPA 8081 B (organo-chlorine pesticides, with ultrasonic or Soxhlet extraction and apolar solvents (iso- octane or hexane)),
- US EPA 8151 A (chlorinated herbicides, using methanol),
- US EPA 8141 B (organophosphorus compounds),
- US EPA 8270 D (semi-volatile organic compounds).

Tests shall be made on samples of raw cotton from each country of origin and before it passes through any wet treatment. For each country of origin testing shall be carried out on the following basis:

- (i) Where only one lot of cotton is used per year a sample shall be taken from a randomly selected bale;
- (ii) If two or more lots of cotton are used per year composite samples shall be taken from 5 % of the bales.

Cotton is not required to be tested where it has been certified by an IPM scheme that prohibits the use of the listed substances.

6.4(d) Traceability requirements applying to organic and IPM cotton

All cotton grown according to the organic and IPM production standards and used to manufacture a textile product shall be traceable from the point of verification of the production standard up until, as a minimum, greige fabric production.

Assessment and verification:

The applicant shall provide a declaration of compliance with criterion 6.4(d) and demonstrate that the minimum cotton content requirement is met, either for the annual volume of cotton purchased or for the blend of cotton used to manufacture the final product(s) and according to each product line:

- (i) On an annualised basis: Transaction records and/or invoices shall be provided that document the quantity of cotton purchased on an annual basis from farmers or producer groups, and/or the total weight of certified bales, up until greige fabric production.
- (ii) On a final product basis: Documentation shall be provided from the spinning and/or fabric production stages. All documentation shall reference the Control Body or certifier of the different forms of cotton.

Rationale:

Support was expressed by several Competent Bodies and NGO stakeholders for requirements for a minimum organic cotton or IPM cotton content in EU Ecolabel criteria for furniture. The main environmental impacts are due to pesticide and fertiliser contamination of the wider environment, worker exposure risks to pesticides and the considerable energy invested in the manufacture of these substances. Conventional cotton is one of the most intensively treated crops, accounting for 2.5% of the world's cultivated land but 16% of insecticide consumption³⁹.

³⁹ 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

Since such criteria have recently been adopted in Decision 2014/350/EU for EU Ecolabel textiles, the same approach has been introduced for furniture. At the present moment (May 2015) an amendment is being considered to the EU Ecolabel criteria for Textiles to no longer require that any organic cotton is only blended with non-GMO cotton. Apparently this is very difficult to achieve in real life and so will be briefly discussed during the June 2015 EUEB.

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 is EU Ecolabel awarded can be used in EU Ecolabel furniture. Additional reasons why the lower requirements for organic or IPM cotton contents are the facts that furniture upholstery should not come into as much direct skin contact as clothes items such as t-shirts and underwear and also that only 1% of current cotton production was estimated to be certified as organic in 2009⁴⁰.

6.5 PVC-based coated fabrics

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:

- A declaration from the applicant stating that PVC-based coated fabrics have not been used in the final furniture product; or
- 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:

⁴⁰ Textile Exchange, *Organic cotton farm and fibre report 2009/10*

- 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.
- 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.

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Criterion 7. Upholstery padding materials

7.1. Latex foam

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

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 7.1a) 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:

The same criteria were presented in TR 2.0 and no comments were added by stakeholders during the 2nd AHWG or expressed on the Batis online system during the subsequent feedback period.

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 only recently published (June 2014) and it is possible that furniture criteria are during the second half of 2015, so the criteria may run in parallel for several years and should align as best as possible in order to simplify the process for applicants who may manufacture both bed mattresses as well as upholstered furniture items.

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 7.1b) 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 sub-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

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
Biocides		Not added intentionally	A
Flame retardants		Not added (unless in compliance with conditions in Table 4 entries f and g)	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 <3 years old)	C
	Di-n-octylphthalate (DNOP, 117-84-0)*		
	Di (2-ethylhexyl)-phthalate (DEHP, 117-81-7)*		
	Butylbenzylphthalate (BBP, 85-68-7)*	*0.01 % w/w (sum of 4 phthalates in all other furniture products)	
	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 7.2a). Where testing is required, the applicant shall provide the test results and demonstrating compliance with the limits in Table 24 **Error! Reference source not found.** 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 biocides, phthalates and other specific substances that are restricted the applicant shall provide a declaration supported by declarations from suppliers of the foam confirming that the listed substances 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 5ml 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 2.5ml 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 30ml 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 specified 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.

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/m³)
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 7.2b). 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 $0.4 \text{ m}^2/\text{m}^3$ (= 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 components are reported from a concentration limit $\geq 1 \text{ }\mu\text{g}/\text{m}^3$. Total VOC value is the sum of all components with a concentration $\geq 1 \text{ }\mu\text{g}/\text{m}^3$ 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 $\geq 1 \text{ }\mu\text{g}/\text{m}^3$. 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 sub-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.

7.3. Other padding materials

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

- **G**eneral requirements for hazardous substances set out in criterion 2 are respected.
- 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 7.1a) and b) is demonstrated.

Assessment and verification:

The applicant shall provide a declaration of compliance stating:

- The nature of the padding/filling material used and any other blended materials;
- That the material does not contain any SVHCs or other hazardous substances that are not specifically derogated in Table 4.
- That down or animal feathers have not been used in the filling/padding material, either alone or in blends.

- 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 cotton, wool, polyester and blends thereof 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 ecoparasitocides but also go into alternative means of demonstrating compliance which would be unrealistic to expect of furniture manufacturers.

Feathers and down are excluded from EU Ecolabel furniture due to ethical reasons associated with the inhumane plucking of down and feathers from live animals. This criteria was specifically requested by one stakeholder 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:

- i. Not contain leaded glass.
- ii. Not contain lead, mercury or cadmium impurities at levels exceeding 100 mg/kg per metal.
- iii. For mirror glass, any paints, primers or varnishes used on the mirror backing shall have a lead content <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 criteria.

With mirror glass, a reflective metal backing, where generally silver is applied to the glass 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 discharge⁴¹. 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)⁴². There are a significant number of mirror products on the market with claims to be "lead-free", and 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. In either case, it is highly unlikely that the lead content would be sufficiently high in the mirror backing to be restricted by the general hazardous substance criterion (i.e. >0.1% w/w of the entire piece of mirror glass).

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:

- i. Do not contain more than **0.2%** lead in solder and flux and
- ii. 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 zinc⁴³, on chromium (II), vanadium (II or III), titanium (II or III), iron (II) and

⁴¹ 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

⁴² BREF (2007) document for Surface Treatment using Organic Solvents (p.388) see: http://eippcb.jrc.ec.europa.eu/reference/BREF/sts_bref_0807.pdf

⁴³ Jeskey et al, 1991, see: <http://www.google.com.ar/patents/WO1991016197A1?cl=en>

aluminium (III)⁴⁴. 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 (8.1). 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.

⁴⁴ Laroche et al., 2004, see: <http://www.google.com/patents/US6749307>

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 may relate to the durability, dimensional requirements, safety and strength of the product.

Assessment and verification:

The applicant shall provide a declaration stating compliance with any relevant EN standards, supported by test reports from either the furniture manufacturer or component part suppliers, as appropriate.

Rationale:

Previously it was proposed to allow applicants to comply with fitness for use criteria by either providing a minimum 5 year guarantee or to demonstrate compliance with relevant EN technical standards. Much concern was expressed about the questionable benefits of prolonged guarantees due to certain terms and conditions that may make it extremely difficult to claim for corrective action to be taken by the seller. It was generally considered that this would not be an acceptable alternative to compliance with EN standards.

Most furniture items are not CE marked and therefore compliance with relevant EN standards for product performance cannot be assumed. The overwhelming majority of stakeholders agreed that EN standards for furniture technical requirements should be followed where available. Consequently, a list of relevant EN standards from CEN/TC 207 is provided in Appendix V.

The list has been narrowed down, removing standards that were listed as non-ratified EN standards (i.e. all CEN/TS references) and standards that were either not currently in force or that did not refer to testing and minimum requirements. For example, all references related to terminology have been removed. Standards that are only related to safety have been removed since this is technically not an environmental issue and glass safety, which is arguably the biggest concern, is covered separately in glass sub-criteria.

Caution was urged by industry stakeholders not to make specific technical requirements relating to the standards since these can change with time. It was also recommended not to refer to the year of the standard for the same reason. It was however requested to introduce the title of the standard alongside the standard number for reader information.

Some arguments arose regarding the relevance of ergonomics in 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. Instead of requiring that products meet type A requirements for adjustability, compliance with the dimensional types A-D is acceptable.

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 this information relevant to some of these tests. In these cases, no additional costs are passed on to the applicant. However, where standards refer to testing of the final assembled product, the costs could be very significant to smaller companies with lower sales volumes and so an alternative and simplified approach is allowed, which would be to provide a 5 year guarantee.

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. During this period, the consumer shall be entitled to have the goods brought into conformity free of charge by repair or replacement. If repair or replacement is deemed impossible or disproportionate by the seller, an appropriate reduction in the price shall be offered. In cases of a major lack of conformity and where repair or replacement cannot be offered within a reasonable time or without significant inconvenience to the consumer, the purchasing contract may be rescinded.

Any lack of conformity resulting from incorrect installation of the consumer goods shall be deemed to be equivalent to lack of conformity of the goods if installation forms part of the contract of sale of the furniture product and the furniture product was installed by the seller or under his responsibility. This shall apply equally if the product, intended to be installed by the consumer, is installed by the consumer and the incorrect installation is due to a shortcoming in the installation instructions.

Any lack of conformity that becomes apparent within 6 months of the date of delivery of the furniture product, unless proved otherwise, shall be presumed to have existed at the time of delivery of the product unless this presumption is incompatible with the nature of the goods or the nature of the lack of conformity.

The seller shall be held liable for any lack of conformity that becomes apparent within five years of the delivery of the furniture product so long as the seller is informed by the consumer of the lack of conformity within two months of it being detected.

This guarantee shall be provided without prejudice to the legal obligations of the manufacturer and seller under national law. The guarantee shall:

- state that the consumer has legal rights under applicable national legislation governing the sale of consumer goods and make clear that those rights are not affected by the guarantee,
- set out in plain intelligible language the contents of the guarantee and the essential particulars necessary for making claims under the guarantee, notably the duration and territorial scope of the guarantee as well as the name and address of the guarantor.

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 are related to 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.

The basic conditions for legal guarantees that apply to consumer goods sold in the EU 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.

Unlike many other EU Ecolabel product groups, furniture is often installed on site, either by an approved party or by consumers themselves. For this reason, it was considered appropriate to also state the provisions set out in Article 2(5) of the Directive that relate to any lack of conformity caused by incorrect installation.

However, under Article 5(3) of the Directive, a period of up to six months is permitted 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.

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 (i.e. six months 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 according to Directive 1999/44/EC).

The EU Ecolabel criteria for an extended guarantee has been applied 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 this, often referred to as warranties,

may be optionally offered by certain sellers for prices that may add 10-20% or more to the final product price. Since non-ecolabelled furniture products are generally never sold with a commercial guarantee already built-in to the price but are instead optional based on consumer choice.

9.3. Design for disassembly and provision of spare parts

- a) For furniture consisting of multiple components, the product shall be designed for disassembly and simple and illustrated instructions regarding the disassembly and replacement of damaged component parts shall be provided. Disassembly and replacement operations should be capable of being carried out using common and basic manual tools and unskilled labour.
- b) The furniture manufacturer shall make spare parts available to customers for a period of at least 5 years from the date when the furniture item shall cease to be manufactured. The cost (if any) of spare parts shall be proportional to the total cost of the furniture product. Contact details that should be used in order to arrange the delivery of spare parts shall be provided.

Assessment and verification

- a) 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 velco 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.
- b) The applicant shall provide a declaration that spare parts shall be available for a period of at least 5 years from the date when the furniture item shall cease to be manufactured. 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.

Rationale:

Many furniture components 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. In order to prevent such situations, the following aspects are needed:

- That the damaged component 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.

This criterion aims to ensure that the 4 points above can be met with regards to EU Ecolabel furniture.

9.4. VOC emissions

If the furniture product contains any of the materials or components listed below, VOC emission testing shall be required.:

- Upholstery coverings made of leather
- Upholstery coverings made of coated fabrics
- Any components that account for >5% of the total furniture product weight (excluding packaging) and that have been treated with high VOC content (>5%) coating formulations that have been applied at rates >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 listed above (see conditions and limits in Table 27).

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

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

Test parameter	Armchairs and Sofas		Office chairs		Other furniture items
Chamber volume	In the range of 2-10m ³				
Loading rate	Product should 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, the ratio between the loading rate (m²/m³) and the ventilation rate (h⁻¹) shall be maintained at 1.0.

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

Test parameter	Coated components		Leather or coated fabric upholstery coverings	
Minimum allowed chamber volume	200 L for wood based components 20 L for other components		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

* TVOC – Total Volatile Organic Compounds, defined as those compounds eluting within the retention range of C₆ to C₁₆ (inclusive) on a capillary column coated with 5% phenyl / 95% methyl-poly-siloxane..

** TSVOC – Total Semi-Volatile Organic Compounds, defined as those compounds eluting within the retention range of >C₁₆ to C₂₂ (inclusive) on a capillary column coated with 5% phenyl / 95% methyl-poly-siloxane.

† Carcinogenic VOC substances (see Table 39 in Appendix VI). 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". (see an indicative list of the substances that have been allocated interim LCI values in Appendix VI).

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 components 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.

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

Rationale:

Testing approach taken – costs and availability of facilities

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 communicated at the 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 components 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 300µg/m³ 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 needs to be tested. However, if different components 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 components 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 components in small chambers, it may be practical for applicants to request the testing information from suppliers prior to purchasing components or agree to share costs of testing.

Testing approach taken – choice of limits and VOCs to analyse

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 value⁴⁵. Harmonisation of LCI values (EU-LCIs) has been started a few years ago by the European Commission's Joint Research Centre and is based on previously distinct values developed independently by ANSES²⁸ in France and AgBB²⁸ in Germany. ECA report 29²⁷ 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. A list of substances currently derived or ascribed EU-LCI values is included in Appendix VI as well as an example calculation of how test results can be converted into R values.

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 carcinogenic VOCs to be analysed are listed in Appendix VI. 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 sub-criteria for coatings used on wooden or metal components (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 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.

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

⁴⁵ LCI = Lowest Concentration of Interest (of individual VOCs). The LCI concept was first developed by the European Collaborative Action on 'Indoor Air Quality and its Impact on Man' when considering the best way to evaluate emissions from solid flooring materials. It was defined (see ECA Report No.18, 1997) as "the lowest concentration above which, according to best professional judgement, the pollutant may have some effect on people in the indoor environment".

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.

Other relevant approaches to VOC emissions

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 Exposure⁴⁶. 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/

⁴⁶ See: http://ihcp.jrc.ec.europa.eu/our_activities/public-health/indoor_air_quality/eca/jrc-published-harmonisation-framework-health-based-evaluation-emissions

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..

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Criterion 10. Consumer Information

A single consumer information document shall be provided with the product which includes information in English and 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.
- Information about the polymer types of any plastic components with a weight greater than 100g that were not marked in line with the requirements of criterion 4.1.
- 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, which flame retardants have been used (if any) and in what materials (if any).
- A declaration of the non-use of biocides 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 biocides 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.
- Well illustrated assembly and disassembly instructions as per the requirements of criterion 9.3.
- Relevant contact information regarding provision of spare parts as per the requirements of criterion 9.3.

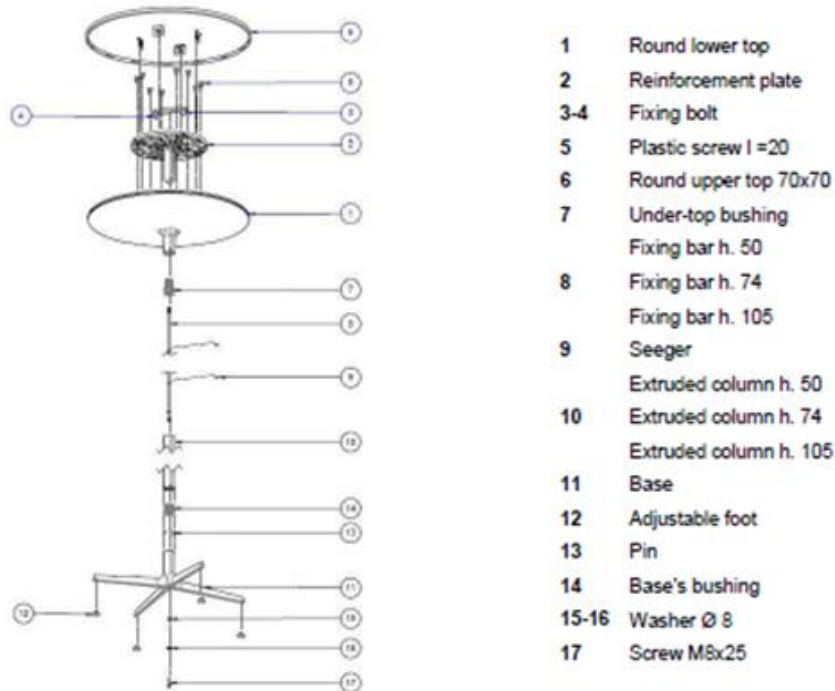
Assessment and verification:

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 should be available to the consumer, only the Competent Body. Some leading manufacturers are already making this information available to consumers (see Figure 5 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).



- 1 Round lower top
- 2 Reinforcement plate
- 3-4 Fixing bolt
- 5 Plastic screw l =20
- 6 Round upper top 70x70
- 7 Under-top bushing
- Fixing bar h. 50
- 8 Fixing bar h. 74
- Fixing bar h. 105
- 9 Seeger
- Extruded column h. 50
- 10 Extruded column h. 74
- Extruded column h. 105
- 11 Base
- 12 Adjustable foot
- 13 Pin
- 14 Base's bushing
- 15-16 Washer Ø 8
- 17 Screw M8x25

	Material	Ginger H50 (kg)	Ginger H74 (kg)	Ginger H105 (kg)
Ginger	Polypropylene	5,38	5,38	5,38
	Aluminium	1,86	2,17	2,55
	Glass fibre	1,27	1,27	1,27
	Steel	0,42	0,63	0,91
	Nylon	0,09	0,09	0,09
	Glue	0,03	0,03	0,03
	Paint	0,02	0,03	0,03
Packaging	Cardboard	7,25	7,25	7,25
	Polyethylene	0,03	0,03	0,03
	Steel	0,02	0,02	0,02
	Paper	0,01	0,01	0,01
Weight	Table weight	9,07	9,59	10,26
	Packaging weight	7,31	7,31	7,31
	Total weight	16,38	16,90	17,57

Figure 5. Example of product description information in an environmental product declaration of a commercially produced furniture product⁴⁷.

⁴⁷ Product belonging to the "Ginger" range produced by Arper see: http://gryphon.environdec.com/data/files/6/9173/EPD_Ginger_S-P-00340.pdf

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.

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 components, criterion 5.4 for metal components 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

Box 2 of the Ecolabel may contain, where relevant, the following information:

- Wood, bamboo and rattan from sustainably managed forests
- Recycled content (wood or plastic, if applicable)
- Restricted hazardous substances
- Not treated with biocides (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 Eco-label as follows:

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

Production specification	Text that may be displayed
Organic content of more than 50%	Made with xx% organic cotton
Organic content of more than 95%	Made with organic cotton
IPM content of more than 70%	Cotton grown with reduced 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.

Appendix I: List of FSC & PEFC principles & sub-criteria for reference

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 nationally- <i>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 FSC <i>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 gender <i>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 analyze 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 sub-criteria

No.	PRINCIPLE / criteria
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>
CRITERION 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>
CRITERION 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>
CRITERION 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>
CRITERION 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>
CRITERION 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. 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 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>
CRITERION 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. 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 VOC used in surface coatings

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 should 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 Ecolabel furniture (as per EN 13336)

Fundamental characteristics	Test methods		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 that should 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 dye compounds, although not directly restricted themselves, are known to cleave to form some of the prohibited substances listed in Table 35 above. Thus it is strongly recommended that their use be avoided in leather and textile dyeing processes in order to comply with the requirements for carcinogenic arylamines.

As a guide to applicants, the following dyes should not be used:

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

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Appendix V: Furniture product durability, strength and ergonomic standards.

Table 37. Indicative list of EN furniture standards under CEN TC 207 relevant to criterion 9.1

EN No.	Title	2014 CATAS test price
Upholstered furniture		
1021-1	Furniture - Assessment of the ignitability of upholstered furniture - Part 1: Ignition source smouldering cigarette	115-230 €
1021-2	Furniture - Assessment of the ignitability of upholstered furniture - Part 2: Ignition source match flame equivalent	115-230 €
Office furniture		
527-1	Office furniture - Work tables and desks - Part 1: Dimensions	62-124 €
527-2	Office furniture - Work tables and desks - Part 2: Mechanical safety requirements	62-124 €
1023-2	Office furniture - Screens - Part 2: Mechanical safety requirements	65 - 375 €
1335-1	Office furniture - Office work chair - Part 1: Dimensions - Determination of dimensions	63-391 €
1335-2	Office furniture - Office work chair - Part 2: Safety requirements	95-190 €
14073-2	Office furniture - Storage furniture - Part 2: Safety requirements	76-152 €
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).	Up to 1400-2800 € (depends on how many sub-tests apply)**
Outdoor furniture		
581-1	Outdoor furniture - Seating and tables for camping, domestic and contract use - Part 1: General safety requirements	85-170 €
581-2	Outdoor furniture - Seating and tables for camping, domestic and contract use - Part 2: Mechanical safety requirements and test methods for seating	
581-3	Outdoor furniture - Seating and tables for camping, domestic and contract use - Part 3: Mechanical safety requirements and test methods for tables	Up to 205 - 410 € **
Seating furniture		
1022	Domestic furniture - Seating - Determination of stability	71-142 €
12520	Furniture - Strength, durability and safety - Requirements for domestic seating	170-340 €
12727	Furniture - Ranked seating - Test methods and requirements for strength and durability	Up to 1676-3352 € **
13759	Furniture - Operating mechanisms for seating and sofa-beds - Test methods	

14703	Furniture - Links for non-domestic seating linked together in a row - Strength requirements and test methods	240-480 €
16139	Furniture - Strength, durability and safety - Requirements for non-domestic seating	200-400 €
Tables		
12521	Furniture - Strength, durability and safety - Requirements for domestic tables	190-380 €
15372	Furniture - Strength, durability and safety - Requirements for non-domestic tables	190-380 €
Kitchen furniture		
1116	Kitchen furniture - Co-ordinating sizes for kitchen furniture and kitchen appliances	
14749	Domestic and kitchen storage units and worktops - Safety requirements and test methods	Up to 1100-2200 € **
Beds		
597-1	Furniture - Assessment of the ignitability of mattresses and upholstered bed bases - Part 1: Ignition source: Smouldering cigarette	96-192 €
597-2	Furniture - Assessment of the ignitability of mattresses and upholstered bed bases - Part 2: Ignition source: Match flame equivalent	96-192 €
716-1	Furniture - Children's cots and folding cots for domestic use - Part 1: Safety requirements	67-134 €
747-1	Furniture - Bunk beds and high beds - Part 1: Safety, strength and durability requirements	130-260 €
1725	Domestic furniture - Beds and mattresses - Safety requirements and test methods	Up to 700-1400 € **
1957	Furniture - Beds and mattresses - Test methods for determination of functional characteristics and assessment criteria	Up to 1700-3400 € **
12227	Playpens for domestic use - Safety requirements and test methods	
Storage furniture		
16121	Non-domestic storage furniture - Requirements for safety, strength, durability and stability	108-216 €
Other types of furniture		
1729-1	Furniture - Chairs and tables for educational institutions - Part 1: Functional dimensions	125-250 €
1729-2	Furniture - Chairs and tables for educational institutions - Part 2: Safety requirements and test methods	Up to 680-1360 € **
13150	Workbenches for laboratories - Dimensions, safety requirements and test methods	Up to 1400-2800 € **
14434	Writing boards for educational institutions - Ergonomic, technical and safety requirements and their test methods	Up to 3500-7000 €**

* indicative costs only based on 2014 CATAS catalogue (lower costs represent 50% discount for CATAS members). **Maximum indicative costs if all sub-tests apply to the product.

Appendix VI: VOCs of concern

VOCs with derived or ascribed EU-LCI values

These substances should be measured when determining the "R value" of VOC emissions from a particular furniture product or component that is being tested in a chamber.

When calculating the R-value, for each substance that is identified, the concentration should be compared to its EU-LCI value and a quotient calculated. For example, if 50ug/m³ of toluene were detected, which has an EU-LCI value of 2900ug/m³, this would equate to a quotient of (50 / 2900) = 0.017. If another VOC with an EU-LCI value was also detected, for example ethylbenzene at say, 100ug/m³, then this quotient would also be calculated (100 / 850) = 0.117. If these were the only VOCs with EU-LCI values detected, the R-Value would be 0.134.

The setting of EU LCI values is an ongoing process and both the substances on the list and their associated EU LCI values may change with time. The latest version of the EU LCI substances and values available at the **EU LCI Working Group website**⁴⁸ should be referred to when carrying out any VOC emission tests.

Table 38. Indicative list of VOCs (as of March 2015) that have been assigned EU-LCI values. Note that entries in green have specific ascribed values whereas entries in yellow only have derived values.

EU-LCI no.	CAS No.	Compound name	EU-LCI limit (ug/m3)
1-AROMATIC HYDROCARBONS			
1-1	108-88-3	Toluene	2900
1-2	100-41-4	Ethylbenzene	850
1-3	1330-20-7, 106-42-3, 108-38-3, 95-47-6	Xylene (o-, m-, p-) and mixes of these isomers	500
1-5	103-65-1	n-Propylbenzene	950
1-6	108-67-8, 95-63-6, 526-73-8	Trimethylbenzene (1,2,3-; 1,2,4-; 1,3,5-)	450
1-8	527-84-4, 535-77-3, 99-87-6, 25155-15-1	Cymene (o-,m-,p-) (1-Isopropyl-2(3,4)-methylbenzene) and mix of o-, m- and p-cymene	1000
1-9	95-93-2	1,2,4,5-Tetramethylbenzene	500
1-10	104-51-8	n-Butylbenzene	1100
1-11	99-62-7, 100-18-5	Diisopropylbenzene (1,3-;1,4-)	750
1-12	2189-60-8	Phenyl octane and isomers	1100
1-16	100-42-5	Styrene	250
1-23	91-20-3	Naphthalene	10
2-SATURATED ALIPHATIC HYDROCARBONS			
2-2	110-82-7	Cyclohexane	6000
2-3	108-87-2	Methyl cyclohexane	8100
2-6		Other saturated aliphatic hydrocarbons higher than C9	6000
3-TERPENES			
3-1	498-15-7	3-Carene	1500
3-2	80-56-8	α-Pinene	2500
3-3	127-91-3	B-Pinene	1400
3-4	138-86-3	Limonene	5000
3-5		Other terpene hydrocarbons	1400
4-ALIPHATIC ALCOHOLS			
4-1	75-65-0	2-Methyl-2-propanol (tert-butanol)	620

⁴⁸ See: http://www.eu-lci.org/EU-LCI_Website/EU-LCI_Values.html

4-3	71-36-3	1-Butanol	3000
4-4	71-41-0, 30899-19-5, 94624-12-1, 6032-29-7, 584-02-1, 137-32-6, 123-51-3, 598-75-4, 75-85-4, 75-84-3	1-Pentanol (all isomers)	730
4-5	111-27-3	1-Hexanol	2100
4-6	108-93-0	Cyclohexanol	2000
4-7	104-76-7	2-Ethyl-1-hexanol	300
4-9	123-42-2	4-Hydroxy-4-methyl-pentane-2-on (diacetone alcohol)	960
5-AROMATIC ALCOHOLS			
5-2	128-37-0	BHT (2,6-di-tert-butyl-4-methylphenol)	100
5-3	100-51-6	Benzyl alcohol	440
6-GLYCOLS, GLYCOETHERS			
6-4	111-46-6	Diethylene glycol	440
6-8	110-98-5, 25265-71-8	Dipropylene glycol	670
6-9	110-63-4	1,4-Butanediol	2000
6-11	6846-50-0	2,2,4-Trimethylpentanediol diisobutyrate (TXIB)	450
6-15	111-96-6	Diethylene glycol dimethyl ether (1-Methoxy-2-(2-methoxy-ethoxy)-ethane)	28
6-16	25265-77-4	2,2,4-Trimethyl-1,3-pentanediol monoisobutyrate (Texanol)	600
6-17	109-59-1	Ethylene glycol isopropylether (2-Methylethoxyethanol)	220
6-22	111-90-0	Diethylene glycol monoethyl ether (2-(2-ethoxyethoxy) ethanol)	350
6-23	2807-30-9	Ethylene glycol monoisopropyl ether (2-Propoxyethanol)	860
6-24	111-76-2	Ethylene glycol monobutylether (2-butoxyethanol)	1100
6-26	112-34-5	Diethylene glycol monobutylether	670
6-27	124-17-4	Diethylene glycol monomethyl ether acetate (Butyldiglykolacetate, 2-(2-butoxyethoxy) ethyl acetate)	850
6-28	122-99-6	2-Phenoxyethanol	1100
6-32	1589-47-5	1-Propylene glycol 2-methyl ether (2-methoxy-1-propanol)	19
6-33	70657-70-4	1-Propylene glycol 2-methyl ether acetate (2-methoxy-1-propyl acetate)	28
6-35	34590-94-8	Dipropylene glycol monomethyl ether	3100
6-40	63019-84-1, 89399-28-0, 111109-77-4	Dipropylene glycol dimethyl ether	1300
7-ALDEHYDES			
7-2	75-07-0	Acetaldehyde	1200
7-4	123-72-8	Butanal	650
7-5	110-62-3	Pentanal	800
7-6	66-25-1	Hexanal	900
7-7	111-71-7	Heptanal	900
7-8	123-05-7	2-Ethyl-hexanal	900
7-9	124-13-0	Octanal	900
7-10	124-19-6	Nonanal	900
7-11	112-31-2	Decanal	900
8-KETONES			
8-1	78-93-3	2-Butanone (ethylmethylketone)	5000
8-2	563-80-4	3-Methyl-2-butanone	7000

8-4	120-92-3	Cyclopentanone	900
8-5	108-94-1	Cyclohexanone	410
8-7	583-60-8	2-Methylcyclohexanone	2300
8-8	98-86-2	Acetophenone	490
9-ACIDS			
9-2	79-09-4	Propionic acid	310
9-10	149-57-5	2-Ethylhexanoic acid	150
10-ESTERS			
10-1	108-21-4	Propyl acetate (n-, iso-)	4200
10-2	108-65-6	2-Methoxy-1-methylethyl acetate	2700
10-7	110-19-0	Isobutyl acetate	4800
10-8	123-86-4	n-butyl acetate	4800
10-10	96-33-3	Methyl acrylate	180
10-11	140-88-5	Ethyl acrylate	200
10-12	141-32-2	n-Butyl acrylate	110
10-13	103-11-7	2-Ethylhexyl acrylate	380
10-14		Other acrylates (acrylic acid esters)	110
10-15	627-93-0	Dimethyl adipate	50
10-16	106-65-0	Dimethyl succinate	50
10-17	1119-40-0	Dimethyl glutarate	50
10-20	105-75-9	Dibutyl fumarate	50
10-21	105-76-0	Maleic acid dibutylester	50
10-22	13048-33-4	Hexamethylene diacrylate	10
11-CHLORINATED HYDROCARBONS			
11-3	106-46-7	1,4-Dichlorobenzene	150
12-OTHERS			
12-2	105-60-2	Caprolactame	300
12-4	556-67-2	Octamethylcyclotetrasiloxane (D4)	1200
12-7	100-97-0	Hexamethylenetetramine	30
12-11	26172-55-4	5-chloro-2-methyl-2H-isothiazol-3-one (CIT)	1
12-12	2682-20-4	2-Methyl-4-isothiazolin-3-one (MIT)	100

Carcinogenic VOCs

An indicative list of carcinogenic VOCs that are expected to be of relevance to construction products are included in in table below. Although not all VOCs may be of direct relevance it should serve as a useful guide as to what VOCs to look for in test results.

The limits for these substances are in general much stricter than those of VOCs with assigned EU-LCI values.

Table 39. Indicative list of carcinogenic VOCs.

No.	CAS	Name	No.	CAS	Name
1.	79-06-1	Acrylamide	31.	79-46-9	2-Nitropropane
2.	107-13-1	Acrylonitrile	32.	924-16-3	N-Nitrosodibutylamine
3.	106-92-3	Allyl glycidyl ether	33.	55-18-5	N-Nitrosodiethylamine
4.	71-43-2	Benzene	34.	621-64-7	Nitrosodipropylamine
5.	1464-53-5	2,2'-Bioxirane	35.	601-77-4	N-Nitrosodiisopropylamine
6.	542-88-1	Bis (chloromethyl) ether	36.	612-64-6	N-Ethyl-N-nitrosoaniline
7.	101-90-6	Resorcinol diglycidyl ether	37.	1116-54-7	2,2'-(Nitrosoimino)bisethanol

No.	CAS	Name	No.	CAS	Name
8.	106-47-8	4-Chloroaniline	38.	10595-95-6	N-Methyl-N-nitrosoethylamine
9.	106-89-8	Epichlorhydrine	39.	59-89-2	N-Nitrosomorpholine
10.	51594-55-9	(R)-(-)-Epichlorohydrine	40.	100-75-4	N-Nitrosopiperidine
11.	95-69-2	4-Chloro-2-methylaniline	41.	930-55-2	N-Nitrosopyrrolidine
12.	100-44-7	Benzyl chloride	42.	88-72-2	2-Nitrotoluene
13.	14977-61-8	Chromyl chloride	43.	122-60-1	Phenyl glycidyl ether
14.	96-12-8	1,2-Dibromo-3-chloropropane	44.	1120-71-4	1,3-Propansulton
15.	106-93-4	1,2-Dibromoethane	45.	91-22-5	Quinoline
16.	764-41-0	1,4-Dichlorobut-2-ene	46.	94-59-7	5-Allyl-1,3-benzodioxole
17.	505-60-2	Bis(2-chloroethyl) sulfide	47.	96-09-3	Styrene oxide
18.	107-06-2	Ethylene dichloride	48.	95-06-7	Sulfallate
19.	96-23-1	1,3-Dichloro-2-propanol	49.	5216-25-1	4-Chlorobenzotrighloride
20.	542-75-6	1,3-Dichloropropene, isomers	50.	509-14-8	Tetranitromethane
21.	79-44-7	Dimethylcarbamoyl chloride	51.	95-53-4	o-Toluidine
22.	540-73-8	N,N'-Dimethylhydrazine; 1,2-Dimethylhydrazine	52.	2431-50-7	2,3,4-Trichlorobut-1-ene
23.	106-87-6	Vinylcyclohexane diepoxide	53.	79-01-6	Trichloroethylene
24.	680-31-9	Hexamethylphosphoric triamide	54.	96-18-4	1,2,3-Trichloropropane
25.	90-04-0	2-Methoxyaniline	55.	98-07-7	Benzotrighloride
26.	120-71-8	6-Methoxy-m-toluidine	56.	137-17-7	2,4,5-Trimethylanilin
27.	592-62-1	Methyl azoxy methyl acetate	57.	51-79-6	Urethane
28.	51-75-2	N-Methylbis(2-chloroethyl)amine			
29.	838-88-0	4,4-Methylenedi-o-toluidine			
30.	15159-40-7	Morpholine-4-carbonyl chloride			



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