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**COMMISSION DECISION**

**of 26 November 2009**

**on establishing the ecological criteria for the award of the Community Ecolabel for wooden floor coverings**

*(notified under document C(2009) 9427)*

**(Text with EEA relevance)**

(2010/18/EC)

(OJ L 8, 13.1.2010, p. 32)

Amended by:

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► <b><u>M1</u></b>	Commission Decision 2013/295/EU of 17 June 2013	L 167	57	19.6.2013
► <b><u>M2</u></b>	Commission Decision (EU) 2015/345 of 2 March 2015	L 60	39	4.3.2015

Corrected by:

- **C1** Corrigendum, OJ L 70, 14.3.2013, p. 11 (2010/18/EC)
- **C2** Corrigendum, OJ L 199, 24.7.2013, p. 7 (2010/18/EC)

**COMMISSION DECISION****of 26 November 2009****on establishing the ecological criteria for the award of the  
Community Ecolabel for wooden floor coverings***(notified under document C(2009) 9427)***(Text with EEA relevance)**

(2010/18/EC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Regulation (EC) No 1980/2000 of the European Parliament and of the Council of 17 July 2000 on a revised Community eco-label award scheme <sup>(1)</sup>, and in particular the second subparagraph of Article 6(1) thereof,

After consulting the European Union Eco-labelling Board,

Whereas:

- (1) Regulation (EC) No 1980/2000 provides that specific eco-label criteria, drawn up on the basis of the criteria drafted by the European Union Eco-labelling Board, are to be established according to product groups.
- (2) The ecological criteria, as well as the related assessment and verification requirements, should be valid for four years from the date of notification of this decision.
- (3) Measures provided for in this Decision are in accordance with the opinion of the Committee instituted by Article 17 of Regulation (EC) No 1980/2000,

HAS ADOPTED THIS DECISION:

*Article 1*

The product group 'wooden floor coverings' shall comprise wood- and plant-based coverings: including wood and timber coverings, laminate floorings, cork coverings and bamboo floorings which are made, for more than 90 % in mass (in the final product), from wood, wood powder and/or wood/plant-based material. It does not apply to wall coverings, where properly indicated, or coverings for external use or for coverings with a structural function.

This product group will not include any covering treated with biocidal products at any stage of the production process, except where those biocidal products are included in Annex IA to Directive 98/8/EC of the European Parliament and of the Council <sup>(2)</sup> and where the active substance is authorised for the use in question according to Annex V to Directive 98/8/EC.

<sup>(1)</sup> OJ L 237, 21.9.2000, p. 1.

<sup>(2)</sup> OJ L 123, 24.4.1998, p. 1.

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*Article 2*

In order to be awarded the Community Ecolabel under Regulation (EC) No 1980/2000, wooden floor coverings must fall within the product group ‘wooden floor coverings’ as defined in Article 1, and must comply with the ecological criteria set out in the Annex to this Decision.

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*Article 3*

The ecological criteria for the product group ‘wooden floor coverings’, and the related assessment and verification requirements, shall be valid until 31 December 2016.

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*Article 4*

For administrative purposes the code number assigned to the product group ‘wooden floor coverings’ shall be ‘35’.

*Article 5*

This Decision is addressed to the Member States.



## ANNEX

### FRAMEWORK

#### The aims of the criteria

These criteria aim in particular at promoting:

- the reduction of impacts on habitats and associated resources,
- the reduction of energy consumption,
- the reduction of discharges of toxic or otherwise polluting substances into the environment,
- the reduction of use of dangerous substances in the materials and in the finished products,
- safety and absence of risk to health in the living environment,
- information that will enable the consumer to use the product in an efficient way which minimises the whole environmental impact.

The criteria are set at levels that promote the labelling of coverings that are produced with low environmental impact.

#### Assessment and verification requirements

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

This product group includes 'Wood and timber coverings', 'Laminate floorings', 'Cork coverings' and 'Bamboo floorings';

*Wood and timber coverings* are 'wood floors or wall coverings made of one solid piece of wood that have tongue and groove sides or constructed from several wood plies that are glued together in a multilayer panel. A wood covering can be unfinished, and once installed sanded, then finished on site or pre-finished in a factory.'

Wood and timber coverings criteria can be applicable both for wall and floor coverings, if the production processes remain the same, using the same materials and the same manufacturing methods. The criteria are set for internal use only.

The industry producing wood floor coverings determines its technical position in the European Committee for Standardisation CEN/TC 112.

*Laminate floorings* are 'rigid floor covering with a surface layer consisting of one or more thin sheets of a fibrous material (usually paper), impregnated with aminoplastic thermosetting resins (usually melamine), pressed or bonded on a substrate, normally finished with a backer'.

Laminates coverings criteria can be applicable only for floor coverings and for indoor use.

The industry producing laminate floor coverings determines its technical position in the European Committee for Standardisation CEN/TC 134.

*Cork coverings* are floor or wall coverings the main component of which is cork. The granulated cork is mixed with a binder, and then cured or several layers of cork (agglomerated/veneer) can be pressed together with glue.

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The cork coverings can be divided into natural cork tiles (the main component of which is agglomerated composition cork, intended to be used with a finish) and in engineered cork panels (consisting of several layers including a fibreboard the main component of which is agglomerated cork or has cork as technical solution, intended to be used with a finishing wear layer).

Cork coverings criteria can be applicable both for wall and floor coverings, if the production processes remain the same, using the same materials and the same manufacturing methods. The criteria are set for indoor use only.

The European 'cork' floor covering industry determines its technical position in the European Committee for Standardisation CEN/TC134.

*Bamboo floor covering* are made of bamboo in solid pieces or in agglomerates as a main component.

Bamboo coverings criteria can be applicable only for floor coverings and for indoor use.

The functional unit, to which inputs and outputs should be related, is 1 m<sup>2</sup> of finished product.

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

Where possible, testing should be performed by appropriately accredited laboratories or laboratories that meet the general requirements expressed in standard EN ISO 17025.

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

## WOODEN FLOOR COVERINGS CRITERIA

### 1. RAW MATERIALS

All cork, bamboo and virgin wood must originate from forests that are managed so as to implement the principles and measures aimed at certifying sustainable forest management.

#### 1.1. *Sustainable forest management*

The producer shall have a policy for sustainable wood procurement and a system to trace and verify the origin of wood and tracking it from forest to the first reception point.

The origin of all wood shall be documented. The producer must ensure that all wood originate from legal sources. The wood shall not come from protected areas or areas in the official process of designation for protection, old growth forests and high conservation value forests defined in national stakeholder processes unless the purchases are clearly in line with the national conservation regulations.

— Until 30 June 2011, for wooden products placed on the market bearing the Ecolabel, at least 50 % of any solid wood and 20 % wood-based materials must originate either from sustainably managed forests which have been certified by independent third party schemes fulfilling the criteria listed in paragraph 15 of the Council Resolution of 15 December 1998 on a forestry strategy for the European Union <sup>(1)</sup> and further development thereof, or from recycled materials.

<sup>(1)</sup> OJ C 56, 26.2.1999, p. 1.

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- From 1 July 2011, until 31 December 2012 for wooden products placed on the market bearing the Ecolabel at least 60 % of any solid wood and 30 % wood-based materials must originate either from sustainably managed forests which have been certified by independent third party schemes fulfilling the criteria listed in paragraph 15 of the Council Resolution of 15 December 1998 on a forestry strategy for the European Union and further development thereof, or from recycled materials.
- From 1 January 2013, for wooden products placed on the market bearing the Ecolabel at least 70 % of any solid wood and 40 % wood-based materials must originate either from sustainably managed forests which have been certified by independent third party schemes fulfilling the criteria listed in paragraph 15 of the Council Resolution of 15 December 1998 on a forestry strategy for the European Union and further development thereof, or from recycled materials.

**Assessment and verification:** for meeting these conditions, the applicant shall demonstrate that any of their wooden eco-labelled products, when first placed on the market after the dates shown in the criterion will meet the appropriate level of certified wood. If this cannot be demonstrated the competent body will only issue the Ecolabel licence for the period for which compliance can be demonstrated. The applicant shall provide appropriate documentation from the wood supplier indicating the types, quantities and precise origins of wood used in the production of floor coverings. The applicant shall provide appropriate certificate(s) showing that the certification scheme correctly fulfils the requirements as laid down in paragraph 15 of the Council Resolution of 15 December 1998 on a forestry strategy for the European Union.

**Definition:** Wood-based materials means material made by binding with adhesives and/or glues one or more of the following materials: wood fibres, and/or stripped or sheared wood sheets, and/or wood residues from forest, plantations, sawn wood, residues from pulp/paper industry, and/or recycled wood. Wood-based materials comprise: hardboard, fibreboard, medium density fibreboard, particleboard, OSB (oriented strand board), plywood, and panels in solid wood. The term 'wood-based material' also refers to composite materials made from wood-based panels coated by plastics, or laminated plastics, or metals, or other coating materials and finished/semi-finished wood-based panels.

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

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

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

Elements and compounds	Limit values (mg/kg of total dry panel)
Arsenic	25
Cadmium	50
Chromium	25

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Elements and compounds	Limit values (mg/kg of total dry panel)
Copper	40
Lead	90
Mercury	25
Fluorine	100
Chlorine	1 000
Pentachlorophenol (PCP)	5
Tar oils (benzo(a)pyrene)	0,5

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

### 1.3. *Impregnating substances and preservatives*

Wooden flooring shall not be impregnated.

Solid wood, after logging, shall not be treated with substances or preparations containing substances that are included in any of the following lists:

- WHO recommended classification of pesticides by hazard classified as class 1a (extremely hazardous),
- WHO recommended classification of pesticides by hazard classified as class 1b (highly hazardous).

Moreover, the treatment of wood shall be in accordance with the provisions of Council Directive 79/117/EEC <sup>(1)</sup> and Council Directive 76/769/EEC <sup>(2)</sup>.

**Assessment and verification:** the applicant shall provide a declaration showing compliance to this criterion, a list of the substances which have been used and a data sheet for each of them.

### 1.4. *Genetically modified wood*

The product shall not contain GMO wood.

**Assessment and verification:** the applicant shall provide a declaration that no GMO wood has been used.

## 2. USE OF DANGEROUS SUBSTANCES

### 2.1. *Dangerous substances for the raw wood and plant treatments*

- (a) No substances or preparations that are assigned, or may be assigned at the time of application, any of the following risk phrases (or combinations thereof) may be added to the wooden product:

R23 (toxic by inhalation)

R24 (toxic in contact with skin)

R25 (toxic if swallowed)

R26 (very toxic by inhalation)

R27 (very toxic in contact with skin)

<sup>(1)</sup> OJ L 33, 8.2.1979, p. 36.

<sup>(2)</sup> OJ L 262, 27.9.1976, p. 201.

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- R28 (very toxic if swallowed)
- R39 (danger of very serious irreversible effects)
- R40 (limited evidence of a carcinogenic effect)
- R42 (may cause sensitisation by inhalation)
- R43 (may cause sensitisation by skin contact)
- R45 (may cause cancer)
- R46 (may cause heritable genetic damage)
- R48 (danger or serious damage to health by prolonged exposure)
- R49 (may cause cancer by inhalation)
- R50 (very toxic to aquatic organisms)
- R51 (toxic to aquatic organisms)
- R52 (harmful to aquatic organisms)
- R53 (may cause long-term adverse effects in the aquatic environment)
- R60 (may impair fertility)
- R61 (may cause harm to the unborn child)
- R62 (possible risk of impaired fertility)
- R63 (possible risk of harm to the unborn child)
- R68 (possible risk of irreversible effects),

as laid down in Council Directive 67/548/EEC of 27 June 1967 on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances<sup>(1)</sup> (Dangerous Substances Directive), and its subsequent amendments, and considering Directive 1999/45/EC of the European Parliament and of the Council<sup>(2)</sup> (Dangerous Preparations Directive).

*Alternatively*, classification may be considered according to Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006<sup>(3)</sup>. In this case no substances or preparations may be added to the raw materials that are assigned, or may be assigned at the time of application, any of the following hazard statements (or combinations thereof): H300, H301, H310, H311, H317 H330, H331, H334, H351, H350, H340, H350i, H400, H410, H411, H412, H413, H360F, H360D, H361f, H361d H360FD, H361fd, H360Fd, H360Df, H341, H370, H372.

- (b) The product must not contain halogenated organic binding agents, azidirin and polyaziridins as well as pigments and additives based on:
- lead, cadmium, chrome (VI), mercury and their compounds,
  - arsenic, boron and copper,
  - organic tin.

<sup>(1)</sup> OJ 196, 16.8.1967, p. 1.

<sup>(2)</sup> OJ L 200, 30.7.1999, p. 1.

<sup>(3)</sup> OJ L 353, 31.12.2008, p. 1.



**▼B**2.2. *Dangerous substances in the coating and surface treatments***Generic requirements**

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

**▼C2**

- (b) Chemical substances classified as harmful for the environment by the chemical manufacturer/supplier in accordance with EU classification system (28th Amendment to Directive 67/548/EEC) shall comply with one of the two following limits:

- chemical substances classified as harmful for the environment in accordance with the Directive 1999/45/EC must not be added to substances and preparations for surface treatment.

Nevertheless the products may contain up to 5 % volatile organic compounds (VOC) as defined in Directive 1999/13/EC<sup>(1)</sup> (VOC shall mean any organic compound having at 293,15 K a vapour pressure of 0,01 kPa or more, or having a corresponding volatility under the particular conditions of use). If the product requires dilution, the contents of the diluted product must not exceed the abovementioned threshold values,

- the applied quantity (wet paint/varnish) of environmentally harmful substances in accordance with Directive 1999/45/EC shall not exceed 14 g/m<sup>2</sup> surface area and applied quantity (wet paint/varnish) of VOC shall not exceed 35 g/m<sup>2</sup>.

**Assessment and verification:** the applicant shall provide a declaration of compliance with this criterion, together with documents to support this declaration, including:

- a complete recipe with designation of quantities and CAS numbers for constituent substances,
- the test method and test results for all substances present in the product, according to the Directive 67/548/EEC,
- a declaration stating that all constituent substances have been disclosed,
- number of coats and quantity applied per coat per square metre of surface.

**Method of application:**

The following standard degrees of effectiveness are used for the purpose of calculating the consumption of surface treatment product and of the applied quantity: spraying device without recycling 50 %, spraying device with recycling 70 %, electrostatic spraying 65 %, spraying bell/disk 80 %, roller coating 95 %, blanket coating 95 %, vacuum coating 95 %, dipping 95 %, rinsing 95 %.

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- (c) The content of free formaldehyde in products or preparations used in the panels shall not exceed 0,3 % by weight.

The content of free formaldehyde in binding agents, adhesives, and glues for plywood panels or laminated wood panels shall not exceed 0,5 % by weight.

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

<sup>(1)</sup> OJ L 85, 29.3.1999, p. 1.

**▼B****Adhesives**

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

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

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

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

**▼C1****Formaldehyde**

Formaldehyde emissions from substances and preparations for surface treatment liberating formaldehyde shall be less than 0,062 mg/m<sup>3</sup> air.

*Assessment and verification:* the applicant and/or his supplier shall provide a declaration that the above requirement is met, together with either information on the formulation of the surface treatment (e.g. Safety Data Sheets) or test results proving that the maximum formaldehyde emission value does not exceed the stated limit (based on EN 717-1).

**▼B****Plasticisers**

The requirements of part 2.1 on dangerous substances for the raw wood and plant treatments shall also apply for any phthalates used in the manufacturing process.

Additionally DNOP (di-n-octyl phthalate), DINP (di-isononyl phthalate), DIDP (di-isodecyl phthalate) are not permitted in the product.

*Assessment and verification:* the applicant shall provide a declaration of compliance with this criterion.

**Biocides**

Only biocidal products containing biocidal active substances included in Annex IA of Directive 98/8/EC, and authorised for use in floor coverings, shall be allowed for use.

*Assessment and verification:* the applicant shall provide a declaration that the requirements of this criterion have been met along with a list of biocidal products used.

**3. PRODUCTION PROCESS****3.1. Energy consumption**

The energy consumption shall be calculated as the process energy used for the production of the coverings.

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The process energy, calculated as indicated in the Technical Appendix, shall exceed the following limits (P = scoring point):

Product family	Limit (P)
Wood floor and bamboo coverings	10,5
Laminate floor coverings	12,5
Cork coverings	9

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

### 3.2. *Waste management*

The applicant shall provide an appropriate documentation on the procedures adopted for the recovery of the by-products originated from the process. The applicant shall provide a report including the following information:

- kind and quantity of waste recovered,
- kind of disposal,
- information about the reuse (internally or externally to the production process) of waste and secondary materials in the production of new products.

**Assessment and verification:** the applicant shall provide appropriate documentation based on, for example, mass balance sheets and/or environmental reporting systems showing the rates of recovery achieved whether externally or internally, for example, by means of recycling, reuse or reclamation/regeneration.

## 4. USE PHASE

**▼C1**

### 4.1. *Release of dangerous substances*

Wood-based materials are only allowed for use in wooden floor coverings if they comply with the following requirements on formaldehyde emissions:

- (a) Particleboard: the emission of formaldehyde from particleboards in their raw state, i.e. prior to machining or coating, shall not exceed 50 % of the threshold value that would allow it to be classified as E1 according to standard EN 312.
- (b) Fibreboard: the emission of formaldehyde from fibreboard(s) in their raw state, i.e. prior to machining or coating, shall not exceed 50 % of the threshold value that would allow it to be classified as E1 quality according to EN 622-1. However, fibreboard(s) classified as E1 will be accepted if they do not represent more than 50 % of the total wood and wood-based materials used in the product.
- (c) Cork and bamboo: The release of formaldehyde shall not exceed 0,062 mg/m<sup>3</sup> air.

**Assessment and verification:** the applicant and/or his supplier shall provide evidence that the wood-based materials emit less than 4 mg/100 g oven dry board according to EN 120 (perforation method) or less than 0,062 mg/m<sup>3</sup> air according to EN 717-1 (chamber method). Additionally, a declaration that a system of factory production control in accordance with EN 312 or EN 622-1 has been established, shall be provided.

**▼B****Volatile organic compounds (VOC)**

The finished products must not exceed the following emission values:

Substance	Requirement (after 3 days)
Total organic compounds within the retention range C6 — C16 (TVOC)	0,25 mg/m <sup>3</sup> air
Total organic compounds within the retention range > C16 — C22 (TSVOC)	0,03 mg/m <sup>3</sup> air
Total VOC without LCI (*)	0,05 mg/m <sup>3</sup> air

(\*) LCI = lowest concentration of interest; see 'Health risk assessment process for emissions of volatile organic compounds (VOC) from building products' (Federal Environmental Agency).

**Assessment and verification:** the applicant shall present a test certificate according to emission tests prEN 15052 or EN ISO 16000-9.

**5. PACKAGING**

Packaging must be made out of one of the following:

- easily recyclable material,
- materials taken from renewable resources,
- materials intended to be reusable.

**Assessment and verification:** a description of the product packaging shall be provided on application, together with a corresponding declaration of compliance with this criterion.

**6. FITNESS FOR USE**

The product shall be fit for use. This evidence may include data from appropriate ISO, CEN or equivalent test methods, such as national procedures.

**Assessment and verification:** details of the test procedures and results shall be provided, together with a declaration that the product is fit for use based on all other information about the best application by the end-user. According to Directive 89/106/EEC <sup>(1)</sup> a product is presumed to be fit for use if it conforms to a harmonised standard, a European technical approval or a non-harmonised technical specification recognised at Community level. The EC conformity mark 'CE' for construction products provides producers with an attestation of conformity easily recognisable and may be considered as sufficient in this context.

**7. CONSUMER INFORMATION**

The product shall be sold with relevant user information, which provides advice on the product's proper and best general and technical use as well as its maintenance. It shall bear the following information on the packaging and/or on documentation accompanying the product:

- (a) information that the product has been awarded the EU Ecolabel together with a brief yet specific explanation as to what this means in addition to the general information provided by box 2 of the logo;

<sup>(1)</sup> OJ L 40, 11.2.1989, p. 12.

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- (b) recommendations for the use and maintenance of the product. This information should highlight all relevant instructions particularly referring to the maintenance and use of products. As appropriate, reference should be made to the features of the product's use under difficult conditions, for example, water absorption, stain resistance, resistance to chemicals, necessary preparation of the underlying surface, cleaning instructions and recommended types of cleaning agents and cleaning intervals. The information should also include any possible indication on the product's potential life expectancy in technical terms, either as an average or as a range value;
- (c) an indication of the route of recycling or disposal (explanation in order to give the consumer information about the high possible performance of such a product);
- (d) information on the EU Ecolabel and its related product groups, including the following text (or equivalent): 'for more information visit the EU Ecolabel website: <http://ec.europa.eu/environment/ecolabel/>'.

Assessment and verification: the applicant shall provide a sample of the packaging and/or texts enclosed.

**8. INFORMATION APPEARING ON THE ECOLABEL**

Box 2 of the Ecolabel shall contain the following text:

- sustainable managed forests and reduced impact on habitats,
- hazardous substance restricted,
- production process energy saving,
- lower risk to health in the living environment.

**▼B***Technical appendix for wood- and plant-based coverings***ENERGY CONSUMPTION CALCULATION**

Energy consumption is calculated as an annual average of the energy consumed during the production process (excluding premises heating) from the raw material in bulk to the finished covering. This means, for example, that the energy calculation for wood- and plant-based products shall be measured from the input of the raw material into the factory until the finishing operations, packaging included.

The calculation shall not include the energy content of the raw material (i.e. feedstock energy).

The energy required to manufacture adhesives and varnish or coatings shall not be included in the calculations.

The unit chosen for the calculations is the MJ/m<sup>2</sup>.

Electricity consumption refers to electricity purchased from an external supplier.

If the producer has an energy surplus that is sold as electricity, steam or heat, the quantity sold can be deducted from the fuel consumption. Only the fuel that is actually used in floor covering production shall be included in the calculations.

**Solid wood floor and bamboo coverings**


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Environmental parameter

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A = Wood from certified, sustainable forest (%)

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B = Proportion of renewable fuels (%)

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C = Electricity consumption (MJ/m<sup>2</sup>)

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D = Fuel consumption (MJ/m<sup>2</sup>)

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$$P = \frac{A}{25} + \frac{B}{25} + (4 - 0,055 \times C) + (4 - 0,022 \times D)$$

**Laminate flooring**


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Environmental parameter

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A = Cork, bamboo or wood from certified, sustainable forest (%)

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B = Proportion of recycled wood raw materials (%)

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C = Proportion of renewable fuels (%)

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D = Electricity consumption (MJ/m<sup>2</sup>)

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E = Fuel consumption (MJ/m<sup>2</sup>)

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$$P = \frac{A}{25} + \frac{B}{25} + \frac{C}{25} + (4 - 0,055 \times D) + (4 - 0,022 \times E)$$

**▼B****Cork coverings**

Environmental parameter
A = Proportion of recycled cork (%)
B = Proportion of renewable fuels (%)
C = Electricity consumption (MJ/m <sup>2</sup> )
D = Fuel consumption (MJ/m <sup>2</sup> )

$$P = \frac{A}{25} + \frac{B}{25} + (4 - 0,055 \times C) + (4 - 0,022 \times D)$$

The energy contents of various fuels are provided in the following table:

**Table for calculating fuel consumption**

Production period — 1 year:

Days:

From:

To:

Fuel	Quantity	Units	Conversion factor	Energy (MJ)
Straw (15 % W)		kg	14,5	
Pellets (7 % W)		kg	17,5	
Waste wood (20 % W)		kg	14,7	
Wood chips (45 % W)		kg	9,4	
Peat		kg	20	
Natural gas		kg	54,1	
Natural gas		Nm <sup>3</sup>	38,8	
Butane		kg	49,3	
Kerosene		kg	46,5	
Gasoline		kg	52,7	
Diesel		kg	44,6	
Gas oil		kg	45,2	
Heavy fuel oil		kg	42,7	
Dry steam coal		kg	30,6	
Anthracite		kg	29,7	
Charcoal		kg	33,7	
Industrial coke		kg	27,9	
Electricity (from net)		kWh	3,6	
<b>Total energy (MJ)</b>				