



Textile



Laminate



Resilient

PCR - Floor Coverings

Product Category Rules

In co-operation with:



European Carpet and Rug Association



European Producers of Laminate Floorings



European Resilient Flooring Manufacturers Institute



Gemeinschaft umweltfreundlicher Teppichboden e.V.

Environmental Product Declarations

Harmonised Rules for

Textile, Laminate and Resilient Floor Coverings



Product Category Rules accepted by the Advisory Board

Institut Bauen und Umwelt e.V
www.bau-umwelt.com



Institut Bauen und Umwelt e.V.

Product group	Textile, Resilient, Laminate Floor coverings	
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General information

This document specifies the requirements for format and content of Environmental Product Declarations (EPD) in accordance with ISO 14025 /1/.

These Product Category Rules are intended for resilient, textile and laminate floor coverings.

According EN 14041 /2/ these floor coverings are specified as:

- resilient floor coverings manufactured from plastics, linoleum, cork or rubber, excluding loose-laid mats;
- textile floor coverings, excluding loose-laid mats and rugs;
- laminate floor coverings;
- floor panels for loose-laying.

The EPD can be developed for:

- single, individual products
- product groups
- average products

a **single product** is unambiguously described by its construction or composition data (e.g. relevant product standard, trade name, product code)

a **product group** contains a number of single/individual products with similar characteristics (e.g. similar and comparable production processes, same classification etc.). The variation for the environmental impact shall be described and the minimum and maximum level for the products environmental performance (e.g. environmental impact) shall be given.

an **average product** covers an average, hypothetical floor covering whose characteristics like material content of the product, weight or production processes are calculated based on e.g. market shares or geographical coverage.

The EPD shall consider all life cycle stages. If life cycle stages are not included, this shall be stated.

The EPD shall include name and address of the company responsible for the declaration and the programme operator's address with logo and website.

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The EPD shall provide the information listed in the following table:

PCR review, was conducted by: Example name and organisation of the chair, and information on how to contact the chair through the programme operator
Independent verification of the declaration and data, according to ISO 14025 <input type="checkbox"/> internal <input type="checkbox"/> external
(where appropriate) third party verifier: Example: name of third party verifier

In order to support the implementation of these Product Category Rules into an EPD, several chapters contain examples. Information and data provided in the given examples is not necessarily complete. Other cases and examples are feasible.

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0 Product definition

0.1 Product classification and description

The floor covering must be identified unambiguously.

Product groups and average products shall be clearly defined.

Additionally the product description should be illustrated by a picture or a technical figure showing the main characteristics of the floor covering.

0.2 Range of Application

The typical application of the floor covering shall be specified.

Declaration according to EN 14041 /2/:

The products are intended for use as floor coverings within a building or externally, according to the manufacturer's specifications.

Resilient, textile and laminate floor coverings have a number of specific characteristics and are classified in a number of use classes. The use classes are defined in EN 685 /3/ and shall be the basis for assumptions concerning use stage and service life. The use classes shall be described in the EPD by using the appropriate floor covering standard symbols according to CEN TS 15398 /4/ (Floor Covering Standard Symbol (FCSS), see also www.floorsymbols.com).

0.3 Product Standard / Approval

The appropriate standards or national technical approval shall be listed for single products or product groups.

0.3.1 Resilient floor coverings

Example

EN 14041	CE-Labeling
EN 649	Resilient floor coverings – Homogeneous and heterogeneous polyvinyl chloride floor coverings – Specification
EN 1817	Homogeneous and heterogeneous smooth surfaced rubber floor coverings
EN 548	Specification for plain and decorative linoleum
EN 653	Cushioned Polyvinyl chloride floor coverings
EN 13501-1	Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests.
DIBt	Approval Principles for Health-related Evaluation of Building Products by DIBt (German Institute for Building Technology)

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0.3.2 Textile floor coverings

Example

EN 14041	CE-Labeling
DIBt	Approval Principles for Health-related Evaluation of Building Products by DIBt (German Institute for Building Technology)
EN 1307	Textile floor coverings - Classification of pile carpet
EN 13501-1	Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests.

0.3.3 Laminate floor coverings

Example

EN 14041	CE-Labeling
DIBt	Approval Principles for Health-related Evaluation of Building Products by DIBt (German Institute for Building Technology)
EN 13329	Laminate floor coverings - Elements with a surface layer based on aminoplastic thermosetting resins - Specifications, requirements and test methods
EN 14978	Laminate floor coverings - Elements with acrylic based surface layer, electron beam cured - Specifications, requirements and test methods
EN 15468	Laminate floor coverings - Elements with directly applied printing and resin surface layer - Specifications, requirements and test methods

0.4 Accreditation

A description of any proof or certificate of quality control (e.g. ISO 9001 /5/), environmental management systems (e.g. ISO 14001 /6/) or of environmental performance (Type I, ISO 14024 /7/) may be given for single products or product groups.

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0.5 Delivery status

The delivery conditions or characteristics shall be described. Basis for the description shall be the appropriate product standards. Where such standards are not available equivalent descriptions shall be given.

0.5.1 Resilient floor coverings

Example based on a flooring meeting EN 649

Characteristics		Average value	Unit	Maximum value	Minimum value
Product Thickness			mm		
Wear layer thickness (where relevant)			mm		
Product Weight			g/m ²		
Abrasion Class					
Product Form	Rolls		mm		
	Width Length		M		
	Tiles		mm		

0.5.2 Textile floor coverings

Example according to EN 1307

Characteristics	Nominal value	Unit	Tolerance
Type of manufacture			
Yarn type			
Pile fibre composition		[%]	
Total thickness		[mm]	
Total carpet weight		[g/m ²]	
surface pile thickness		[mm]	
Number of tufts or loops /dm ²		[dm ²]	Nominal +10 -7,5 %
Surface pile weight		[g/m ²]	
Secondary backing			
Additional characteristics according to EN 1307			

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0.5.3 Laminate floor coverings

Example

Characteristics	Nominal value	Tolerance
Thickness of the element, t	6-15 mm	Δt average $\leq 0,50$ mm, relative to nominal value t max.- t min. $\leq 0,50$ mm
Length of the surface layer, l	30-2000 mm	For the nominal values given, no measured value shall exceed: l ≤ 1500 mm: $\Delta l \leq 0,5$ mm l > 1500 mm: $\Delta l \leq 0,3$ mm/m
Width of the surface layer, w	7-250 mm	Δw average $\leq 0,10$ mm, relative to nominal value w max. – w min. $\leq 0,20$ mm
Length and width of squared l = w	250-650 mm	Δl average $\leq 0,10$ mm relative to nominal value Δw average $\leq 0,10$ mm, relative to nominal value l max. – l min. $\leq 0,20$ mm w max. – w min. $\leq 0,20$ mm
Density	800-1200 kg/m ³	

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1 Material content

A declaration covering materials and substances contained in the product in delivery condition shall be given as a mass % in accordance with the cut-off rules of 1 % (see chapter 7.3.)

Statements on the general availability and the materials origin shall be given for the main materials.

Materials and substances according to national regulations adversely affecting human health and the environment, in all stages of the life cycle, shall be declared independently of the cut-off rules.

1.1 Material content of the product

1.1.1 Resilient floor coverings

Example for a product meeting EN 548 Linoleum

component	material	mass %	availability		origin of raw material
			renewable	non renewable	
Binder	Linseed Oil	24	Bio-based crop		US
Binder	Gum Rosin	7	Sustainably harvested		China
Filler	Wood Flour	36	waste product from wood processing		Europe
Filler	Cork	9	Sustainably harvested		Portugal
Filler	Calcium carbonate	20.4		mineral abundant	global
Pigment	Titanium dioxide	1.6		mineral limited	global
Backing	Jute Felt	2	Bio-based crop		India / Bangladesh

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1.1.2 Textile floor coverings

Example

component	material	mass %	availability		origin of raw material
			renewable	non renewable	
Pile material	80 %Wool 20% PA	38	abundant	fossil res. limited	New Zealand global
Primary backing	PES	8		fossil res. limited	global
Precoat	x-SBR based	30		fossil res. limited	global
	Filler: chalk			mineral abundant	Germany
Back coating	x-SBR based	20		fossil res. limited	global
	Filler: chalk			mineral abundant	Germany
Secondary backing	PP	4		fossil res. limited	global

1.1.3 Laminate floor coverings

Example

component	material	mass %	availability		origin of raw material
			renewable	non re-renewable	
Core: HDF	75-85% wood 25-15 % resin	90	abundant		Europe
Surface layer	Printed, impregnated paper	1%	abundant		Europe
	Impregnated overlay	1%	abundant		Europe
	corundum	1%	abundant		global
	lacquer	1%	abundant		
Backing	impregnated kraft paper	3	abundant		Europe

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1.2 Production of main materials

A short description of the main materials and their manufacturing process shall be given.

Examples:

Styrene Butadiene Rubber

Produced by the polymerisation of styrene and butadiene both of which are sourced from crude oil.....

Natural Rubber.

Produced from the latex of the rubber tree (*hevea brasiliensis*), predominantly in Malaysia and neighbouring countries. The latex requires treatment to produce a natural rubber crumb.....

Titanium Dioxide

A white pigment produced from the mineral rutile which is a naturally occurring form of titanium dioxide. The production of the pigment is a large scale chemical process.....

Wool

Wool is a fibre derived from the fur of a sheep. Before the wool can be used for commercial purposes it must be scoured, cleaned.....

PES

Polyester is a category of polymers which contain the ester functional group in their main chain. Although there are many forms of polyesters, the term "polyester" is most commonly used to refer to polyethylene terephthalate (PET).....

x-SBR (carboxylated styrene-butadiene rubber)

x-SBR is a tri-polymer consisting of styrene, butadiene and a small quantity of a carboxylic acid.

Chalk

Chalk is a soft, white, porous sedimentary rock; a form of limestone composed of the mineral calcite and added as filler to latexes.....

HDF (high density fibreboard)

Core board is an HDF board composed of wood fibres and a thermosetting resin, mainly MUF (melamine-ureum-formaldehyde).

Thermosetting resins

The surface layers of a laminate floor are obtained by polymerisation of mainly melamine-ureum-formaldehyde resin in a heated press.....

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2 Production of the floor covering

2.1 Production process

The production process shall be described (process flow or short description).

2.2 Health, safety and environmental aspects during production

Statements on means to protect health, safety and the environment during production going beyond the relevant regulations of the countries of production may be given.

Example:

Environmental management systems (e.g. EMAS, ISO 14001)

Worker safety management systems (e.g. OHSAS 18001)

Use of certain production equipment (e.g. additional filter)

3 Delivery and installation of the floor covering

3.1 Delivery

Statements on the delivery of the floor covering (e.g. estimated vehicle, distances to the typical markets) shall be given.

3.2 Installation

A general description of installing the floor covering shall be given, including ancillary materials used for installation e.g. glues.

For full details on installation recommendations a reference to the manufacturers' instructions can be given.

3.3 Health, safety and environmental aspects during installation

Means to protect health, safety and the environment during installation should be given.

3.3.1 Resilient floor coverings

Example:

During installation, water based acrylic adhesives/glues are recommended, harmful substances are not released and no specific protection is required.

3.3.2 Textile floor coverings

Example:

The use of glues fulfilling at least the EMICODE EC1 recommendations (very low in emissions) is recommended according to the manufacturers' instructions.

3.3.3 Laminate floor coverings

Example:

Appropriate means for protection against saw dust must be taken.

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3.4 Waste

Collection and separation of waste accumulated at the construction site shall be described. Any take-back systems in place for post installation floor covering waste or packaging should be stated.

3.4.1 Resilient floor coverings

Example:

Post installation resilient floor covering waste may be easily be recycled as floor covering either through manufacturers' facilities or through specific facilities such as AgPR in Germany.

Therefore post installation resilient waste are collected and forwarded back to factories through the manufacturers.

3.4.2 Textile floor coverings

Example:

Post installation textile floor covering waste may be collected and thermally recycled in a waste incineration plant or thermally and materially recycled in the cement industry. Unmixed polyamide or polypropylene floor covering post installation waste can be used for plastic recycling.

3.4.3 Laminate floor coverings

Example

Post installation laminate floor covering waste may be easily recycled as wood waste through specific facilities comparable to AgPR in Germany.

3.5 Packaging

Kind and material of packaging shall be described.

Example

Material	Example
Paper	wrapping, labels, cores
Cardboard	boxes, cores
Wood	Pallets
Plastics	foils etc.

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4 Use stage

4.1 Use of the floor covering

Statements on the use stage of a floor covering should contribute to a modelling of the use in a building. A statement on the minimum reference service life shall be given. For the estimated service life the FCSS shall be considered.

4.1.1 Cleaning and maintenance

Details on how to clean and maintain the floor covering should be given.

Example:

Level of use	Cleaning process	Cleaning frequency [times/a]	Consumption of energy and resources
domestic commercial	vacuum cleaning	Depending on the use/type of building The manufacturer may give recommendations	electric energy water detergent
	buffing		
	damp mopping		
	wet cleaning		

4.1.2 Prevention of structural damage

Details on the prevention of structural damages of a floor covering should be given

Example:

To prevent structural damage it is important to choose a floor covering in accordance with the intended use conditions taking the EN 685 classification into consideration (see also www.floorsymbols.com).

4.2 Health aspects during usage

Potential emissions to indoor-air shall be given according to the testing methods based on ECA 18 report /8/. In addition national regulations of the typical markets shall be considered.

5 Singular effects

5.1 Fire

Declaration of the floor coverings' fire behaviour according to EN 14041 /2/.

Example:

Fire class

5.2 Water damage

Declaration of floor coverings' behaviour when exposed to water.

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5.2.1 Resilient floor coverings

Example:

For EN 649 type floor coverings

These floorings are resistant to water spills on the upper surface. However care in installation should be taken to prevent moisture from reaching the back of the flooring. For maximum resistance to water damage the manufacturer's recommendations should be followed regarding the use of moisture barriers in the subfloor, appropriate adhesives, seam welding and coving.

5.2.2 Textile floor coverings

Example:

An exposure to water (e.g. flooding) for a longer period can lead to a mechanical destruction of a textile floor covering.

5.2.3 Laminate floor coverings

Example:

An appropriate DPM (damp proof membrane) needs to be installed under laminate floor coverings in order to hold back potential rising dampness. Exposure to moisture during a longer period can lead to irreversible destruction of the material.

5.3 Mechanical damage

Means to avoid mechanical damage

Example:

Chose the right floor covering in accordance with application area and take the precautions recommended by the manufacturer.

6 End of life stage

Classification in accordance with the European Waste Catalogue (EWC) /9/.

Example

Used floor coverings can be classified to:

Main category

17 00 00 construction and demolition waste (including road construction)

Waste code:

17 02 01 Wood

17 02 03 Plastic

17 07 03 Mixed construction and demolition waste other than those mentioned in

17 07 02

6.1 Recycling or reuse

Applied recycling or reuse methods for the floor covering should be described. Statements on the transport (e.g. estimated vehicle, distance to the recycling/reuse site) shall be given.

6.2 Disposal

Applied disposal methods for the floor covering should be described. Statements on the transport (e.g. estimated vehicle, distance to the disposal site) shall be given.

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7 Life cycle assessment

A Life Cycle Assessment (LCA) in accordance with ISO14040ff /10, 11/ shall be carried out for the EPD. The LCA shall be based on data fulfilling the data requirements of chapter 7.6 for floor covering of single products, product groups and average products.

If model assumptions are necessary for the LCA they shall be clearly described.

7.1 General

The LCA for the life cycle stage: PRODUCTION is mandatory. If one or more of the life cycle stages described in chapter 7.7 are not included, the reasons must be given (e.g. if different use or disposal scenarios are possible). Double counting shall be avoided.

Variations of these rules have to be specified and justified.

7.2 Description of the declared or functional unit

For EPDs covering all life cycle stages (e.g. production, use, service life, end of life) a functional unit has to be defined.

Example:

1m² of floor covering for a specified applications and use areas according to EN 685 and reference service life.

For EPDs covering only the production stage a declared unit has to be defined.

Example:

1m² of floor covering with specified construction/composition parameters.

The reference flow unit is 1m² of floor covering.

7.3 Cut-off criteria

Criteria for the inclusion of inputs and outputs (cut-off rules) in the LCA and additional information shall support an efficient calculation procedure. They shall not be applied in order to hide data.

In case of insufficient input data, the cut-off rule shall be 1% of energy usage and of the total mass as inputs into the process; assuming the manufacturing process of this particular in-put does not constitute a production process with relevant impacts on the environment. The total sum of neglected input per process shall be a maximum of 5% of energy usage and mass.

Variations of these rules have to be documented and justified.

7.4 Allocation

According EN ISO 14040 /10/ allocation is defined as:

Partitioning the input or output flow of a unit process to the product system under study.

Allocation shall follow the guidance of ISO 14044:2006-07, clause 4.3.4. For floor coverings the following rules are applicable:

- Allocation shall respect the main purpose of the studied processes. If the main purpose of combined processes cannot be defined (combined multi outputs e.g.

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farming producing wool, milk products and meat), economic allocation may be used to divide resources and emissions between the products.

- The principle of modularity shall be maintained. Where processes influence the products environmental performance during its life cycle, they shall be assigned to the module where they occur.
- The sum of the allocated inputs and outputs of a unit process shall be equal to the inputs and outputs of the unit process before allocation. This means no double counting of inputs or outputs is permissible.

Examples:

CO ₂ locked in wood	CO ₂ emitted through combustion or decompose of wood	Balance
negative value: A	Positive value: B	A+B

- Multi-input: allocation is based on physical causal relationships, i.e. relationship between how the pollutant emission from the process is affected by changes in the input flows.
- A closed-loop allocation procedure applies to closed-loop product systems. It also applies to open-loop product systems where no changes occur in the inherent properties of the recycled material. In such cases, the need for allocation is avoided since the use of secondary material displaces the use of virgin (primary) materials.
- An open-loop allocation procedure applies to open-loop product systems where the material is recycled into other product systems and the material undergoes a change to its inherent properties. Inputs of recycled materials or energy to a product system shall be included without adding their data about environmental impact caused in „earlier” life cycles, but including the data on impacts caused by the collection, transport, and recycling process. Hence, outputs of materials subject to open loop recycling shall be regarded as inputs to the „next” life cycle.

7.5 Background data

For all EPD's developed, using this PCR the same background data shall be applicable.

The reference database is the European Reference Life Cycle Data System (ELCD) /13/, and the GaBi-database /12/. For materials not included in these databases the ecoinvent database should be used. If other background data are used the comparability with these databases must be described.

7.6 Data quality

For the purpose of transparency all data shall be precise, complete and representative.

The data quality requirements address:

Time-related coverage (Period under consideration: 12 months, deviations have to be documented)

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Geographical coverage (where the process takes place)

Technology coverage (current practice, technology reflecting the production process)

Use of specific or generic data:

Whenever possible, specific data should be used. For those processes the producer can influence, e.g. manufacture of the floor covering, specific data shall be used. In the case of average product declarations, average specific data shall be used. For processes outside the influence of the producer, so called upstream or downstream processes, e.g. provision of electricity from the grid or waste incineration, generic data may be used.

Example

Process	Kind of date	Period	Country of data collection	Data source	Completeness	Accuracy
Tufting	Input-output analysis	2006	Germany	vertical integrated large scale plant	o.k.	good
Paper impregnation	Input-output analysis	2005	Europe	SME	o.k.	good
dyeing	Input-output analysis	2007	Belgium	Laboratory	o.k.	very good

The last revision of the data should not be older than 10 years.

7.7 System boundaries

The life cycle of floor coverings shall be subdivided into the following 4 stages:

- Production stage:

The production stage includes all relevant processes from “cradle to factory gate” within the cut off rules. This includes for example the extraction and manufacture of all raw materials and their delivery to the production site, the manufacturing of floor coverings from raw materials, storage and transports. Packaging is included. Production of capital goods, infrastructure, production of manufacturing equipment and personnel related activities are not included. Heating, artificial lighting and transports within the production site are in general not considered, only if they are relevant for the production process (e.g. air conditioning).

- Construction stage:

This stage includes the delivery of the floor covering to the point of installation and its fitting as well as raw material extraction and manufacture of all auxiliary material (if relevant) for the fitting.

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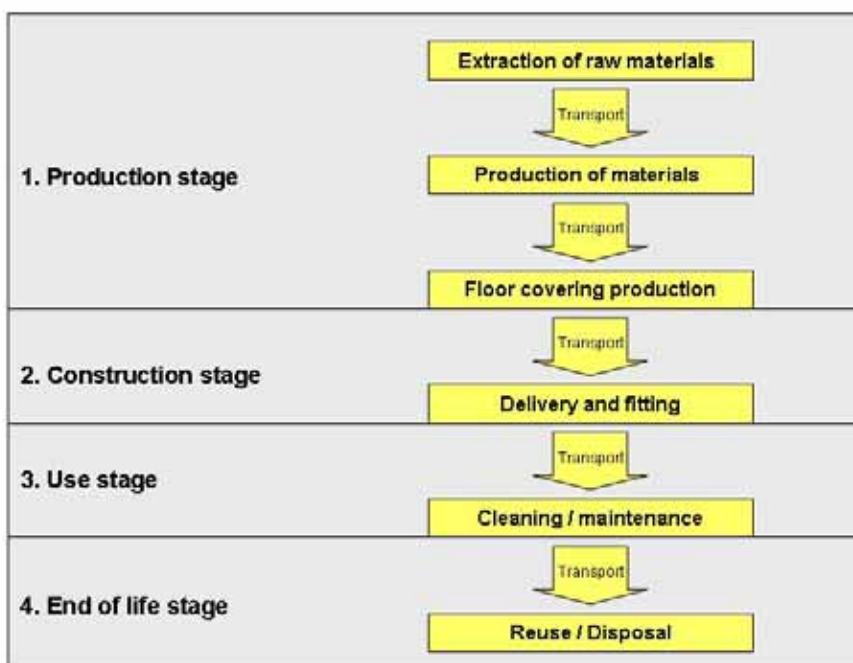
- Use stage:

The use stage includes the cleaning and maintenance of the floor covering during its life time as well as extraction, manufacture and transport of all auxiliary material (if relevant e.g. cleaning agent) for the maintenance.

- End of life stage:

The end of life stage includes the transport of the floor covering to the end of life processes such as incineration, recycling or final deposit. All waste management processes are included in the calculation until final deposition, with the exception of the deposition of nuclear waste, which cannot be modelled due to its extremely long deposition times.

The following figure shows the system boundary:



7.8 Note on use stage

The estimated service life of a floor covering depends e.g. on the kind of floor covering and the area of application, the user himself and the maintenance of the product. Comparisons of different floor coverings are only allowed if these parameters are considered in a consistent way. For this purpose the FCSS and ISO 15686-1 /14/ give guidance.

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7.9 Results of the assessment

The LCA results shall be documented separately for the stages:

- Production stage
- Construction stage
- Use stage
- End of life stage

7.10 Life cycle inventory analysis

The following parameter shall be calculated and declared in the EPD:

Primary energy of non-renewable resources (MJ), subdivided into (%):

- lignite
- mineral coal
- natural gas
- oil
- uranium

Primary energy of renewable resources (MJ), subdivided into (%):

- hydropower
- wind power
- solar energy (solar power, biomass)

Secondary fuels (specified) (MJ)

Non-renewable material resources (kg)

Water consumption (m³)

Output flows (kg):

- Non-hazardous waste (kg)
- Hazardous waste (kg)

Product group	Textile, Resilient, Laminate Floor coverings	
Cod Product	FC-EU	
Description/Certification	Accepted by the Advisory board	January-31-2008

7.11 Life cycle impact assessment

The following parameters of environmental impact assessment, based on CML 2002 /15/ shall be declared:

- Global warming (GWP)
- Acidification (AP)
- Ozone depletion (ODP)
- Photochemical oxidant formation (POCP)
- Eutrophication (NP)
- Non renewable material resources as abiotic resource depletion (ADP), not including primary energy

7.12 Interpretation

The results of the LCI and the impact assessment shall be declared for 1m² of specified floor covering (see declared or functional unit). Comparisons of different floor coverings are only allowed, where similar background data and calculation methods are used and when the building context is taken into account, i.e. on the basis of the same FCSS-classification, same service life and comparable assumptions for the end of life.

8 Additional Information, evidence and test results

The manufacturer declares on the basis of e.g. a test report the tested substances; for substances that are not detectable the appropriate detection limit is indicated.

8.1 Emissions

Example:

The name of the testing institute, the number of the test report and the results according to the testing methods described in the ECA 18 report shall be given.

8.2 Others

Product group	Textile, Resilient, Laminate Floor coverings	
Cod Product	FC-EU	
Description/Certification	Accepted by the Advisory board	January-31-2008

9 References

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- /7/ (1999). ISO 14024.: Environmental labels and declarations - Type I environmental labelling-Principles and procedures
- /8/ ECA-IAQ (European Collaborative Action 'Indoor Air Quality and Its Impact on Man' (1997). Evaluation of VOC emissions from building products – solid flooring materials. Report No 18. Luxembourg: Office for Official Publications of the European Communities, 1997
- /9/ 94/3/EC: Commission Decision of 20 December 1993 establishing a list of wastes pursuant to Article 1a of Council Directive 75/442/EEC on waste
- /10/ (2006). ISO 14040 : Environmental management - Life cycle assessment – Principles and framework
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