

# Product Category Rules (PCR)

for preparing an Environmental Product Declaration  
(EPD) for Product Group

## Sleeping solution

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## 1. General information

These Product Category Rules are intended for sleeping solution, a subcategory of furniture. The rules apply to products that provide the function of a sleeping solution, and other functions that the product may provide are not considered herein.

This document specifies the requirements for the LCA study and for the format and content of the EPD itself. Recognising the global aspects of the furniture industry the geographical coverage is global.

The PCR document has been prepared by Lars Thortveit and Christofer Skaar at the Norwegian University of Science and Technology in accordance with ISO/CD 14025 and the Norwegian adaptation of this standard (NEPD 2004). Criteria for Swan labeling and the EU Flower have been used as reference documents, especially for section 2b. Companies participating in the preparation process have been Ekornes Møbler AS, Helland Møbler AS, HÅG ASA and Jensen Møbler AS.

## 2. Product description

The product or range of products will be identified by the number square metres fit for use as sleeping area provided and the guaranteed lifetime of the main product(s).

In accordance with the “Requirements for an International EPD scheme”, similar products (i.e. products with different textiles, surface treatments, foam type, etc.) can be included in the same declaration provided that the range of variation within each impact category does not exceed  $\pm 5\%$ . The relevant impact categories are listed in section 9.

## 3. List of materials and chemical substances

The materials and substances listed below must be reported in the environmental product declaration (EPD). The emissions listed in b1 and b2 are the emissions that are considered to be the most relevant from the furniture industry.

- a) Product specifications, consisting of:
  1. Material composition, in kg per functional unit (FU) and in percentage of total weight.
  2. Weight percentage of the product from suppliers with certified environmental management system.
  3. Weight percentage of the product from suppliers with environmental declarations (Type I, II or III).
  4. Product content of hazardous substances:
    - i. Formaldehyde.
    - ii. Bromated flame retardants.
    - iii. Heavy metals (specified).
- b) Emissions (sorted by production – use – disposal):
  1. Emissions to air, in kg per FU, including:
    - i. Fossil CO<sub>2</sub>

- ii. CH<sub>4</sub>
  - iii. N<sub>2</sub>O
  - iv. NO<sub>x</sub>
  - v. SO<sub>x</sub>
  - vi. NMVOC
  - vii. Dioxins
  - viii. Heavy metals (specified)
2. Emissions to water, in kg per FU, including:
- i. Phosphates
  - ii. Nitrates
  - iii. Dioxins
  - iv. Heavy metals (specified)
3. Wastes, in kg per FU, sorted by:
- i. Material recycling.
  - ii. Incineration with energy recovery.
  - iii. Incineration without energy recovery.
  - iv. Disposal.
  - v. Hazardous waste.

#### **4. Functional unit**

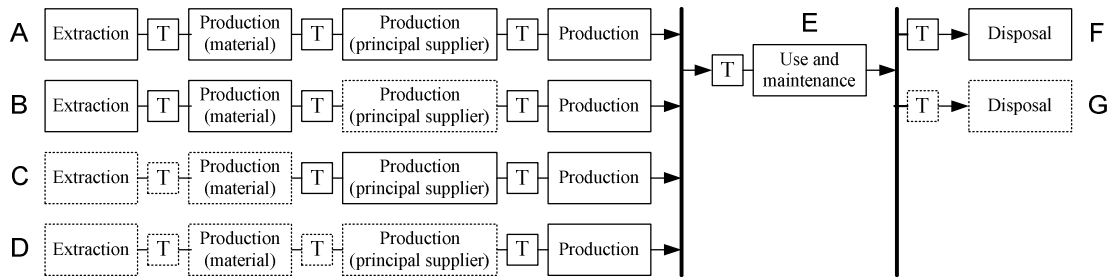
The functional unit for the life cycle assessment is one square metre fit for use as sleeping area with a guaranteed lifetime of 15 years for the major components (for example foam, springs, bed frame). It is assumed that a guaranteed lifetime of 15 years corresponds to a technical lifetime of at least 25 years.

The EPD shall provide information for the entire physical product. Aggregated results for the number of square metres of sleeping area provided by the product shall be reported. The reported area must be clearly specified on the front page of the EPD.

#### **5. System boundaries**

The entire life cycle is to be covered. This includes all industrial processes from raw material extraction and production, processing, use and maintenance, transportation, and disposal. Rules on how recycling processes should be handled are described in detail in chapter 7, Allocation rules.

Production of capital goods, infrastructure, and personnel related activities are not included, nor is biological CO<sub>2</sub> consumptions and emissions included within the system boundaries.



**Figure 1 – Flow chart of system boundaries.**

If the EPD does not cover the entire life cycle (cradle to grave, shown as units AEF in Figure 1) this shall be clearly stated on the front page of the EPD. Alternative statements for the following system boundaries are:

- AEF: This declaration covers environmental impacts throughout the product life cycle, from raw material extraction to product disposal.
- AEG: This declaration covers environmental impacts from raw material extraction to use and maintenance. The declaration does not cover product disposal, and is therefore not comparable to declarations that cover the entire product life cycle.
- A: This declaration covers environmental impacts from raw material extraction to production. The declaration does not cover use and maintenance or product disposal, and is therefore not comparable to declarations that cover the entire product life cycle.
- D: This declaration is a module environmental product declaration. It covers the main production process of the product. Raw material extraction and production, use and maintenance, and disposal are not included.

## 6. Cut-off rules

Processes and activities that contribute to less than 1 % of the total environmental impact for any impact category are allowed to be omitted from the inventory analysis. Components and materials of composition similar to the major components (>20 weight %) of the final product may be assumed to have the same environmental impact in percent as their weight percentage, and may therefore be excluded on weight basis alone.

## 7. Allocation rules

The following methods of allocation are preferred:

- Multi-output processes: Allocation based on the economical relationships between the output products.
- Multi-input processes: Allocation based on physical relationships (i.e. mass balances).
- Open loop recycling: No allocation should be made for materials subject to recycling. The recycling processes are included when recycled materials are used as inputs. Outputs subject to recycling are regarded as outputs to the next life cycle.

Deviation from these allocation rules must be documented and reasoned for.

## 8. Units

SI units shall be used for both the LCA and the EPD.

## 9. Calculation rules and data quality requirements

Specific data should always be used in the upstream phases (extraction, processing and production). Information from databases may be regarded as specific data, if they fulfil the following requirements:

1. Representative of the geographical area, i.e. from areas with same legislative framework and same energetic mix.
2. Technological equivalence.
3. Boundaries towards nature, i.e. data shall report all the quantitative information (resources, emissions, etc.) necessary for the EPD redaction.
4. Boundaries towards technical systems must be identical.

Product dispersion in the use and disposal phases is significant. Generic data for these phases are therefore preferred. The generic data should relate to the geographical region where the end product is most likely to be used and/or disposed.

The contribution to the environmental impact categories in the manufacturing part of the life cycle must not exceed 10 % of the total contribution to the environmental impact categories. Data should represent annual averages from a specific year. Deviation from this must be specified in the EPD. Impact assessment categories and calculation methods are listed in Table 1.

Impact assessment category	Calculation method
1. Global warming potential (GWP 100 years) [kg CO <sub>2</sub> -eq.]	CML 2001
2. Ozone layer depletion potential (ODP, steady state) [kg R11-eq.]	CML 2001
3. Acidification potential (AP) [kg SO <sub>2</sub> ]	CML 2001
4. Photochemical ozone creation potential (POCP) [kg ethen-eq.]	CML 2001
5. Eutrophication potential (EP) [kg phosphate-eq.]	CML 2001
6. Heavy metals [kg Pb-eq.]	EcoIndicator 95

Table 1 – Impact assessment categories and calculation methods.

## 10. Parameters to be declared in the EPD

The following parameters must be declared in the EPD:

1. Material resources, sorted by:
  - a. Virgin renewable resources.
  - b. Recycled renewable resources.
  - c. Virgin non-renewable resources.
  - d. Recycled non-renewable resources
2. Land usage.
3. Energy consumption:

- a. Fossil fuels
  - b. Nuclear fuels
  - c. Renewable fuels
  - d. Miscellaneous fuels (surplus heat, incineration of waste)
4. Impact assessment categories, as specified in section 9.
  5. Emissions and wastes, as specified in section 3b.

## 11. Recycling declaration

A recycling declaration may include information on aspects that are important for the understanding and appreciation of the recycling properties of the product. The recycling declaration may also include information about the dismantling of products and reuse of materials.

- Information on suitable procedures for recovery of selected parts of the entire products
- Information on a suitable method for reuse of the product (or parts of the product) and the proper handling of the product as waste at the end of its life cycle.

## 12. Other environmental information

Information may be included on aspects how the product should be handled during use, maintenance and recycling to reduce environmental impacts. Other factors such as noise, visual impact, risk related issues, HSE (i.e. ergonomic factors) may also be included in this section.

## 13. References

The EPD shall refer to:

- The national/regional guidelines for Environmental Product Declarations.
  - Norway: NEPD Næringslivets Stiftelse for Miljødeklarasjoner (2004): Retningslinjer for Næringslivets Stiftelse for Miljødeklarasjoner. Oslo: NEPD.
  - Sweden: Requirements for Environmental Product Declarations, EPD, (MSR 1999:2) published by the Swedish Environmental Management Council at [www.environdec.com](http://www.environdec.com)
- The relevant PCR document.
- The underlying LCA report.
- Other documents that verify and complement the EPD.

## 14. EPD format

The format of the environmental product declaration shall be structured as follows:

1. Front page:
  - a. Picture of product
  - b. Manufacturer's name and contact information.
  - c. Information on the EPD programme operator.
  - d. Date of certification and period of validity.
  - e. Functional unit.

- f. Key environmental parameters:
    - i. Global warming potential
    - ii. Total energy consumption
    - iii. Percentage of recycled materials
    - iv. Guaranteed lifetime
2. Product specifications, as described in section 3a.
3. Material resources, sorted by:
  - g. Virgin renewable resources.
  - h. Recycled renewable resources.
  - i. Virgin non-renewable resources.
  - j. Recycled non-renewable resources
4. Land usage.
5. Energy consumption:
  - k. Fossil fuels
  - l. Nuclear fuels
  - m. Renewable fuels
  - n. Miscellaneous fuels (surplus heat, incineration of waste)
6. Impact assessment categories, as specified in section 9.
7. Emissions and wastes, as specified in section 3b.
8. Graphical illustration of waste treatment.
9. Methodological information:
  - o. Criteria for including flows.
  - p. Statement on excluded processes.
  - q. Allocation rules.
  - r. Data quality (percentage specific/generic data).
  - s. Graphical presentation of product system.
6. Additional information, as specified in section 12.
10. References, as specified in section 13.