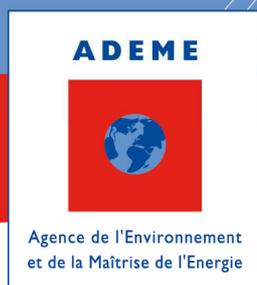


GENERAL PRINCIPLES FOR AN ENVIRONMENTAL COMMUNICATION ON MASS MARKET PRODUCTS

METHODOLOGY FOR THE ENVIRONMENTAL IMPACTS ASSESSMENT OF UPHOLSTERED AND CONVERTIBLE SEATS

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READING GUIDE



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INTRODUCTION

► Background

► General background on environmental labelling

Article 54 of law No. 2009-967 passed on 3 August 2009 states that consumers shall be given objective environmental information on product characteristics (environmental impacts of the product/package pair).

Environmental labelling applies to all consumer products targeted at the end-consumer. Since spring 2008, AFNOR has been conducting work headed by ADEME to develop the methodologies assessing environmental impacts with the involvement of all stakeholders: professionals, but also based on input from civil society. **The AFNOR repository of best practices BP X30-323 is the framework document that sets out the general principles** so that companies who wish to initiate environmental labelling can do so on the basis of a common methodology. The repository has established that the indicators should allow products belonging to the same category to be compared. It is therefore necessary for the indicators to be calculated in the same manner. For this reason, and as an extension of this repository, work groups have met to specify calculation methods.

Sector-specific work groups bring together professionals and other stakeholders concerned by a product family to discuss and propose calculation methodologies specific to a given product.

► Specific background of the reading guide: work on upholstered and convertible seats

This repository applies specifically to any seat padded with compressible material that represents more than 15% of the seat and the backrest: two- or three-seat couches, armchairs, ottomans, convertible couch etc.

► Environmental labelling principles

In order to provide consumers with information that is representative of the main environmental impacts of products, the environmental labelling

system is based on a key method for all work in the area: **life-cycle analysis** (LCA). This assessment makes it possible to identify and evaluate all the potential environmental impacts of a product at each stage of its life cycle: raw materials production or extraction, product manufacture, distribution, product use and the impacts associated with its end-of-life processing or disposal.

ISO 14040 and ISO 14044 ¹ provide an international framework for this type of assessment. The standards have, however, left various methodological options open. The purpose of the cross-sector methodology annex and the sector-specific methodology annexes is to further specify these methodologies in order to ensure that **all calculations follow the same method and that the results included in the environmental labelling system are therefore comparable.**

► Objective of the reading guide

The aim of this reading guide is to explain some of the concepts and requirements included in the repository of upholstered seats and convertible couch and make them accessible to a wider audience so that everyone can understand the choices made in the repository.

There is also a reading guide for the cross-sector methodology annex that is applicable to all products.

¹ www.iso.org



PRESENTATION OF THE PRODUCT COVERED BY THE REPOSITORY

▶ Introduction

The work group on Furniture (WG7), jointly led by the Union Nationale des Industries Françaises d'Ameublement (UNIFA — national association of French furniture industries) and ADEME, started meeting in February 2009. The work conducted in 2009 and 2010 culminated in a repository for the "Upholstered seats" product category. The PROPILAE pilot project, conducted by the FCBA Technological Institute, provided valuable input. The upholstered seats repository was adopted by the general platform in May 2011, and it was extended to the "convertible seat" category, adopted in October 2012.

▶ Functional unit

▶ Determining the functional unit and the reference flow

▪ Functional unit

The functional unit is the unit of measurement used to evaluate the service provided by the product. For upholstered seats, the functional unit chosen is: **"1 sitting place — a minimum of 50 cm wide when the product is advertised as accommodating at least two people — for each year of use"**.

▪ Lifespan

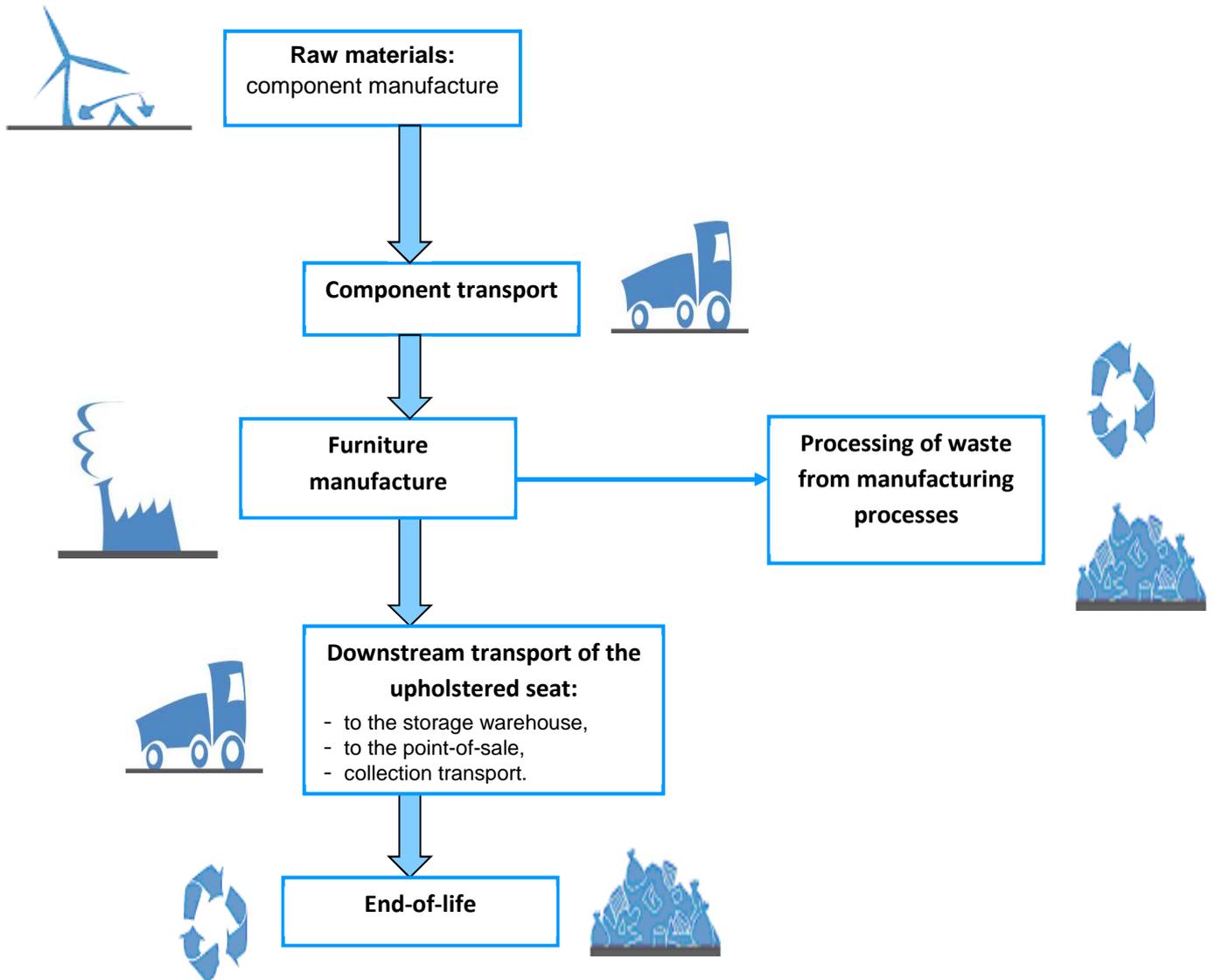
The product lifespan makes it possible to express the functional unit **for one year of use**: the impacts labelled represent the impact of the product divided by its lifespan.

The lifespan can be determined according to product design or by performance tests (see the lifespan section).

▶ Upholstered seat life cycle and study scope

All the stages of the life cycle are taken into account. The only stages that are not counted are those:

- With **negligible impact** on the environmental balance of the seat:
 - packaging transport;
 - transport of waste produced by manufacturing processes;
 - transport of after-sales services products;
 - distributor;
 - use;
 - point-of-sale;
- That are **excluded by the methodological repository BP X30-323** (consumer transport is not directly included in indicators).



UPHOLSTERED SEAT AND CONVERTIBLE COUCH LIFE CYCLE

EXPLANATION OF METHODOLOGICAL CHOICES

▶ Lifespan calculation

▶ Standart lifespans

Standard lifespans for all upholstered seats and convertible couch (except the sofa-bed/BZ) have been specified by furniture sector professionals. A minimum **standard lifespan** common to all upholstered seat categories has been set at **10 years**.

Other standard lifespans have been specified according to the design criteria for the upholstered seat and the convertible couch:

Standard lifespan	Design criterion
15 years	<ul style="list-style-type: none"> - Mechanically assembled structure (screws) - PU foam $\geq 25 \text{ kg/m}^3$ in density
20 years	<ul style="list-style-type: none"> - Glued and/or welded structure - PU foam $\geq 35 \text{ kg/m}^3$ in density

For the sofa-bed/BZ, the minimum standard lifespan has been set at 5 years, and others standard lifespans according to the design criteria are:

Standard lifespan	Design criterion
10 years	- PU foam $\geq 25 \text{ kg/m}^3$ in density
15 years	- PU foam $\geq 35 \text{ kg/m}^3$ in density

▶ Calculated lifespans according to performance tests results

Manufacturers can claim lifespans that differ from the above values, on the basis of performance test results.

Example: Cloth seat

As the (minimum) **standard lifespan** that is common to all seat categories is **10 years**, a professional can prove that his cloth seat lasts longer with performance tests, as described in the harmonized standards:

- hardness modification after dynamic fatigue;
- coating material abrasion resistance.
- determination of tilting mechanism durability
- determination of convertible couch's switch throw mechanism durability

For each of these tests, the upholstered seat or the convertible couch is given a rating on a scale of 1 to 8 (1, 2, 4 or 8). Not all tests are equally important, and they are therefore weighted with a coefficient.

Test	Rating	Coeff.
Hardness modification after dynamic fatigue	1	30
	2	
	4	
	8	
Coating material abrasion resistance	1	50
	2	
	4	
	8	
Determination of tilting mechanism durability and determination of convertible couch's switch throw mechanism durability	1 : breaking or unrealised test	20
	8 : any breaking	



▪ **Greenhouse effect**

The overall rating is thus obtained by calculating the weighted mean of the ratings and converting it to a percentage to **determine the lifespan of the cloth seat:**

Overall rating	Lifespan (years)
<20%	5
Between 20 and 50%	10
Between 50 and 80%	15
>80%	20

There are similar tests with the same rating principle and corresponding weighting coefficients for leather seats, convertible seats and sofa-bed/BZ. These tests assess:

- dynamic fatigue,
- die durability.
- determination of tilting mechanism durability
- determination of convertible couch's switch throw mechanism durability
- ...

➤ **Environmental issues and impacts**

The selection of the environmental impacts to use in environmental labelling **communication** was carried out on the basis of several criteria:

- ease of implementation for the database used by the company;
- differentiability of the impact for a majority of products on the market;
- impact coverage over the life cycle as a whole.

➤ **Environmental impact assessment**

Some criteria have been identified as significant for the overall environmental balance of upholstered seats and convertible seats:

The manufacturing, storage and transport activities that occur throughout the life cycle of an upholstered or a convertible seat result in greenhouse gas emissions that drive climate change. **The Grenelle 2 laws and the requirements of BP X30-323 have made it mandatory to consider this issue.**

▪ **Natural resource depletion**

Manufacturing the various components of an upholstered seat or a convertible seat requires the use of non-renewable materials and resources. This indicator is distinguishing for a majority of products on the market. However it is partially redundant with the greenhouse effect indicator. For this reason, **it was not taken into account in the environmental communication** of upholstered and convertible seats. **It is still taken into account in the impacts calculation.**

▪ **Eutrophication**

Eutrophication is the modification and deterioration of an aquatic environment, which has negative effects on biodiversity, water quality and health. **The extensive impact of manufacturing phase allows distinguishing products in the market with the eutrophication indicator. Therefore this indicator is taken into account in the environmental communication.**

▪ **Photochemical oxidant production**

Atmospheric emissions of Volatile Organic Compounds (VOC) lead to chemical reactions in the atmosphere under the effect of sunlight that form photochemical oxidants. The main photochemical oxidant is ozone, which contributes to an increase in background pollution, is harmful to plant species and can contribute to climate change (greenhouse gas). **This indicator is relevant according to the high importance of the environmental issue of upholstered seat and convertible couch in the all lifecycle. However, due to a lack of data reliability, this indicator was not taken into account in the environmental communication, but it is still calculated.**



▪ **Air acidification**

Some gases (e.g. sulphur dioxide and nitrogen dioxide) released into the air by the wood furniture industry become acids when they come in contact with humidity. These acids then fall back to the ground during rainfall events and modify the pH of rivers, lakes and soil. **This indicator highlights the transport phase (which is not highlighted by others). It is therefore distinguishing the products, in particular imports.**

The choice of environmental indicators for the environmental labeling was made on several criteria:

- indicator relevance: importance of the impact and differentiation for a majority of market products (comparability)
- indicator ease of implementation: feasibility for the database and accessibility of the data for the firm
- indicator consistency: coverage of the whole life cycle scope and product packaging scope, consistency with other posted indicators
- indicator robustness and reliability: methodological recognition and robustness, reliable data.

Indicators retained for upholstered seats:

- **the greenhouse effect**, expressed in kg CO₂ eq.;
- **acidification**, expressed in g SO₂ eq.;
- **eutrophication**, expressed in g P eq. (to freshwater).

(see the Unit glossary)

▸ **Data underlying impacts and articulation of specific and generic data**

▸ **Type of data used for labeling**

The work group shall specify which parts of the quantified data shall necessarily be specific data and which can or shall be generic data.

The data qualification depends on:

- the relative importance of this data for the overall balance,
- the availability of the data,
- the cost involved in obtaining the data

Data used to calculate impacts:

Activity data: data relating to the activity

- **Specific data**: data measured or calculated by the company. Example: nature and quantity of the packaging material.
- **Generic data**: averaged data used by all companies of a specific sector. Example: loss rate of a specific process.
- **Semi-specific data**: data that is proposed by default and that the company can replace with primary data.

Inventory generic data sets: data available in the ADEME database.

Example: impact factors of a material

The following table summarizes the choices made for upholstered and convertible seat modelling:

Phase	Activity data			Inventory generic data sets
	Specific data	Semi-specific data	Generic data	
Raw materials	<ul style="list-style-type: none"> - Product composition - Sustainable forestry - For sofa-bed : mechanism and composition of part of the mattress 	<ul style="list-style-type: none"> - For sofa-bed: manufacturing energy use of the steel mechanism 	<ul style="list-style-type: none"> - composition of part of the mattress 	
Manufacture	<ul style="list-style-type: none"> - Energy use per product type - Wood output efficiency 	<ul style="list-style-type: none"> - VOC emissions - Amount of manufacturing waste 		<ul style="list-style-type: none"> - Energy impacts, depending on the energy mix
Transport		<ul style="list-style-type: none"> - Default values for transport scenarios for materials and furniture 	<ul style="list-style-type: none"> - Secondary data on procurement (truck fill factor and empty backhaul rate) 	<ul style="list-style-type: none"> - Tonne-kilometre impacts depending on the mode of transport
End-of-life		<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> - Materials impacts 	<ul style="list-style-type: none"> - End-of-life of bulky materials (including collection) and household packaging



➤ **Other methodological choices**

➤ **Impact allocation of the plant**

Several types of products can be manufactured on the same plant. If specific data of the seat is not available, consumption and total release of the site must be allocated between the various co-products. This allocation of environmental impacts between the different co-products should be as follows:

Allocation rules	
Mono-Product manufacturing	Multi-Product manufacturing
Allocation on a pro rata basis of the functional units produced for this stage of production	Allocation (in order of preference): - by physical relationships by priority (i.e. the mass of foam used, the volume of wood used for the frame, the surface area of the fabric..) - by functional unit , - by production unit

➤ **Modeling the use of recycled materials and recycling**

▪ **The recycling of wood process scrap:**

The distribution of **the benefits is set to 50/50** between whoever produces and whoever uses the recycled material. This choice could change depending on the work that is underway on this subject.

▪ **The use of felt and recycling textiles:**

Felt is a material historically derived from recycling textile process scrap. Professionals consider felt to be a material in and of itself, and no virgin material can industrially substitute for it. Therefore the allocation of the recycling benefit is conducted according to the stock method, which

is not accepted by the repository BP X 30-323-0. The benefit of using recycled material is allocated to the product that uses the recycled material.

➤ **Data validity period and frequency of updates**

The minimum update frequency of environmental information is set at **5 years** for the first communication, and then is conditioned by each update to the present repository. **Any change that would generate a substantial increase in environmental impact on one of the adopted indicators requires new environmental communication.** In practice, the environmental communication must be updated in the following situations:

- a change in the production location
- a change to the product's composition
- a change in the procurement area for a component
- a change in the finishing product
- a change in wood supplier

➤ **How data is validated**

The company shall keep the information used in the calculations available for any subsequent inspection.

➤ **Accounting for delayed greenhouse gas emissions**

Not all the emissions associated with a product life cycle take place at the same time. As greenhouse gas impact is assessed over 100 years, when emissions are significantly delayed (in relation to product manufacture), they generate fewer impacts on the greenhouse effect over this 100 year timescale. For furniture, it has been decided to take this delay into account as part of this repository using the method proposed by Appendix G of the repository BP X 30-323-0.



UNIT GLOSSARY

Indicator	Unit	Illustration
Greenhouse effect	kg CO ₂ eq.	A vehicle emits 0,13kg of CO ₂ per kilometer covered
Acidification	g SO ₂ eq	The transport of goods by truck is equivalent to 0.30kg of SO ₂ eq. per tonne.km covered
Eutrophication	g P eq. (to freshwater).	A dishwasher rejects the equivalent of 6,13g of phosphate in the fresh water

ABOUT ADEME

The French Environment and Energy Management Agency (ADEME) is a public agency under the joint authority of the Ministry of Ecology, Sustainable Development and Energy, and the Ministry for Higher Education and Research. The agency is active in the implementation of public policy in the areas of the environment, energy and sustainable development.

ADEME provides expertise and advisory services to businesses, local authorities and communities, government bodies and the public at large, to enable them to establish and consolidate their environmental action. As part of this work the agency helps finance projects, from research to implementation, in the areas of waste management, soil conservation, energy efficiency and renewable energy, air quality and noise abatement.



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