écomobilier

MATERIALS GUIDE

Recyclability of home materials, objects and equipment

April 2022

contents

An experienced partner

Eco-mobilier, an eco-organisation in the furniture sector since 2012, is also certified to recycle DIY and garden items, games and toys since April 2022.

This extension of the scope of its activity reflects the new directives of the French law on "Combatting Waste for a Circular Economy".

The purpose of this guide is to provide information to all members and their service providers on the definition of materials in the product codification system used for Eco-mobilier scales, and the recyclability of these materials.

Gaining a clearer understanding of material recyclability

Eco-mobilier is continuing its efforts to achieve ZERO waste by encouraging manufacturers and distributors across the various sectors to eco-design. One of the primary objectives of this approach is to improve the recyclability of products placed on the market.

Recycling used products involves a series of different sorting and preparation steps in order to obtain a new recycled raw material ready to be incorporated into new products.

The recyclability of materials depends on their inherent ability to be transformed into a new recycled raw material. It also depends on their ability to be separated from other materials in the stream.

The recyclability of products depends on the individual recyclability of each material of which they are composed. It also depends on the separability of these materials and therefore on the ability to produce deposits of materials with the purest possible composition. Given the industrial nature of a collection, sorting and recycling system such as that established by Eco-mobilier, this separability must be considered from both a technical and economic perspective.

When the deposits of recoverable materials obtained are overly heterogeneous mixtures, they cannot be recycled and must be recovered to produce energy.

Energy recovery of non-recyclable materials involves transforming them into a fuel which can supply energy-intensive industrial facilities as a replacement for the fossil fuels traditionally used.

To achieve its ZERO waste objective, Eco-mobilier remains committed to working with its partners to implement an innovation policy seeking to develop new techniques for sorting, recycling and recovering energy from products and materials. The eco-organisation also aims to promote the emergence through R&D of new uses of the secondary materials and fuels obtained. This work also makes it possible to anticipate the increased collection of used home and garden products in France.

The various materials on the eco-fee scale

1 Metals

Description

This category of materials includes all crude metals and metal alloys.

End-of-life recovery

Products made from metal can be more easily recycled.

Furthermore, metals are inherently recyclable materials, retaining all their technical properties when melted and re-formed after their initial use.

They are also easy to isolate from the rest of the stream when sorting used items for recycling.

2 Wood and its derivatives

This family of materials includes all materials derived directly from forestry and wood-based composite materials (chipboard, fibreboard or cellular board, mainly wooden boards).

A. Solid wood

Description

Solid wood means wood derived directly from timber plank and materials obtained by assembling wooden strips, such as glulam.

Labels

Wood is derived from a natural resource, and is only to be considered renewable if it comes from forests managed in a sustainable and responsible manner. For this reason, only wooden products hallmarked with PEFC or FSC* forest certification are included in the category of "certified solid wood" components of the Eco-mobilier eco-fee scale.

End-of-life recovery

Solid wood components are recyclable. After grinding, the wooden particles are sufficiently large to make a new first-class recycled raw material from them, which can then be used to manufacture chipboard.

***PEFC:** Programme for the Endorsement of Forest Certification
FSC: Forest Stewardship Council

B. Chipboard

Description

There are various types of wooden board, distinguished by the nature, size and shape of the wood particles used (thin strips, large chips, particles, planer shavings, wood shavings), their density, and the type of binder providing their cohesion (urea-formaldehyde, phenol-formaldehyde or melamine-urea-formaldehyde (MUF) thermosetting resins, etc.):

- board made of wood particles and a synthetic binder is called agglomerated board or particleboard. This may contain wood particles derived from the recycling of used products;
- board made from thin, long and oriented strips, called OSB (oriented strand board);
- board assembled by bonding cross-grain wooden sheets, known as plywood panels.

All these boards represent the particleboard family in the eco-fee rate scale.

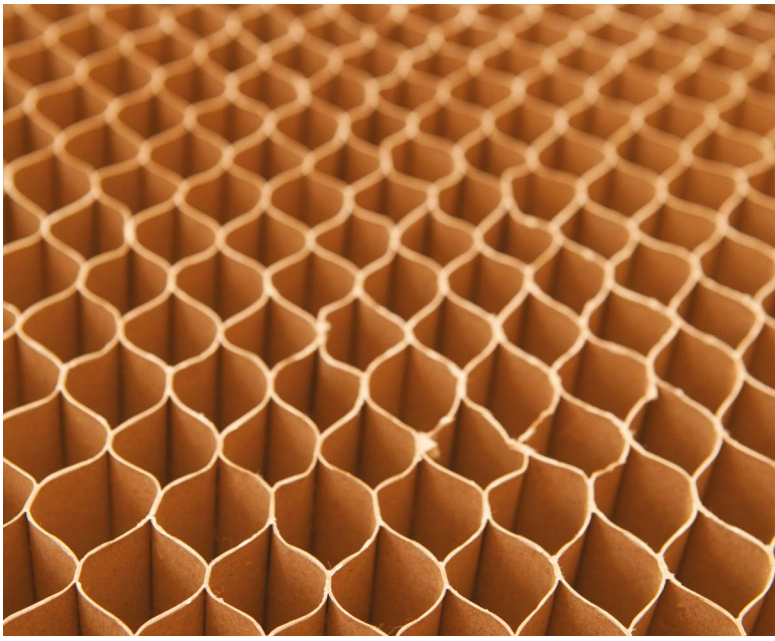
End-of-life recovery

Chipboard as described above is recyclable. After grinding, the particles obtained are smaller than those obtained from solid wood, but they are still sufficiently large to make a new recycled raw material from them, which can then be used to manufacture chipboard.

These materials can also provide a quality fuel for heat production facilities.

The water-repellent or flame-retardant coatings (wood veneer, melamine layer, laminate) or treatments currently used do not affect the recyclability of these boards.

C. Fibreboard



Description

This family includes fibreboard referred to as "medium-density" and "hard", used untreated or covered (with a wooden veneer, a melamine sheet or a laminated veneer) and treated to acquire waterproof or flame-retardant properties.

It concerns board made from fibres produced during the defibration of wood or other lignocellulosic materials.

End-of-life recovery

No industrial technology currently exists for recycling fibreboard. In addition, its presence in the stream of used wood products requires additional sorting to extract it.

Fibreboard is mainly recovered in the form of energy.

D. Cellular board

Description

So-called "cellular" board is generally composed of three layers:

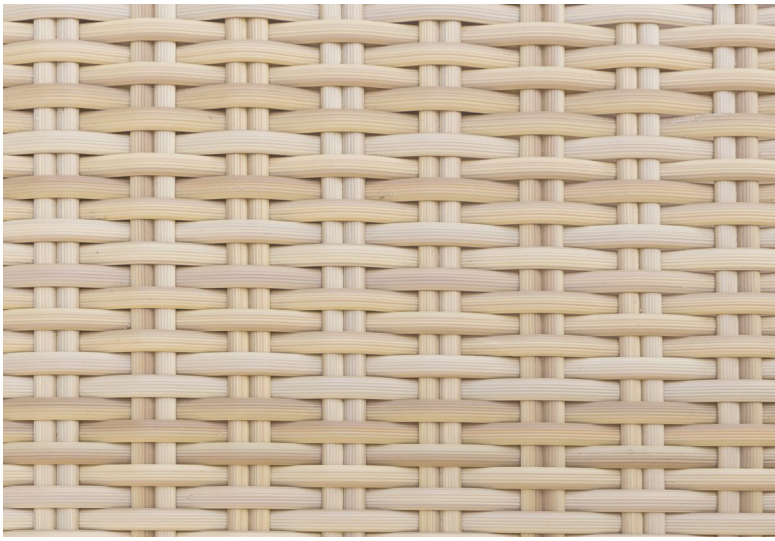
- a cellular core;
- outer layers such as chipboard or fibreboard;
- a core often made from cardboard, but it can also be composed of foam or even aluminium.

End-of-life recovery

Cellular board is thus composed of several materials that are firmly bonded (often by gluing) and must sorted from used wooden products. This is a complex operation because it is difficult to identify during sorting.

Cellular board can be incinerated for energy recovery after grinding and extraction of materials that are recyclable (metal) or that cannot be included as a combustible resource (PVC).

E. Materials produced from plant stalks



Description

Plant-based materials produced from plant stalks, such as rattan, bamboo and wicker, are assigned to the family of wood and its derivatives.

End-of-life recovery

These plant materials cannot be used to make chipboard and therefore recycled with wood or its derivatives. They must be separated from used wood products, and are recovered to produce energy.

3 Plastics

Description

The plastics family includes all synthetic or artificial polymers derived from oil or bio-sourced materials, whether of thermoset or thermoplastic type.

In home and garden products, the main plastics used are thermoplastics: polyethylene (PE), polyethylene terephthalate (PET), polypropylene (PP), polyvinyl chloride (PVC), and acrylonitrile butadiene styrene (ABS), either alone or in combination.

It should be noted that synthetic textile fibres and yarns are not part of this family (see section 4 concerning textiles, leather and fur).

End-of-life recovery

Thermoplastics are components whose structure and viscosity can be modified by successive heating and cooling, in a reversible manner. This property makes them recyclable.

However, when these materials are used in a mixture (of different plastics or plastics with other materials) in home and garden products, their recyclability is greatly reduced. Indeed, additional sorting operations will be necessary. Some combinations even make separation for recycling impossible. These mixtures of materials will mainly end up being used for energy recovery.

PVC has a special chemical composition which prevents energy recovery. This characteristic requires additional sorting operations in order to separate it from mixtures of materials or products to be used for energy recovery.

4 Textiles, leather and fur

Description

Textiles are produced by weaving or knitting natural fibres (such as cotton and linen), artificial fibres (such as viscose) or synthetic fibres (such as polyester or polyethylene terephthalate, PET, etc.). Some textiles can be coated to give them additional properties.

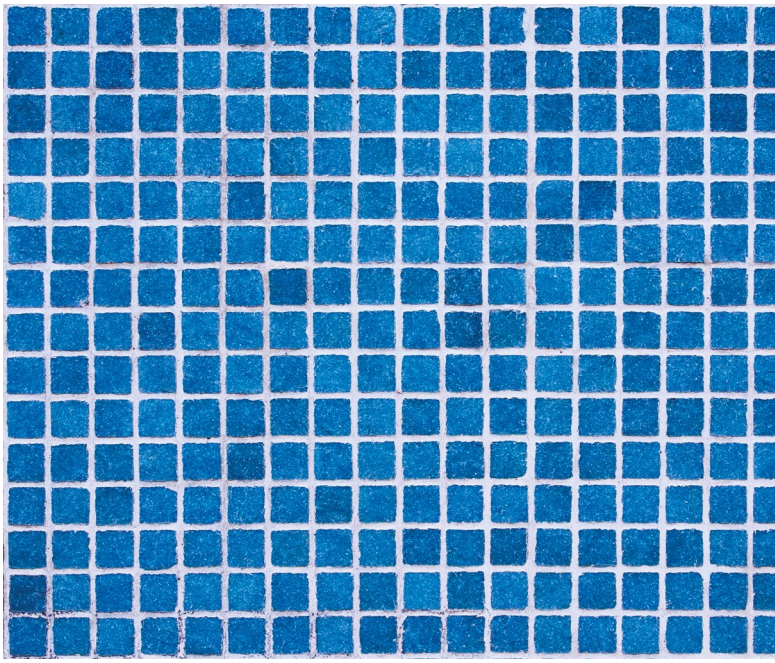
This family also includes skins and furs, which have an end-of-life recovery similar to that of textiles.

End-of-life recovery

Generally used as a mix and/or firmly bonded to other materials to make home and garden furnishing product components, their recycling would require dismantling and sorting operations with poor technical-economic feasibility.

The textiles and leather contained in used home furniture are mostly incinerated for energy recovery.

5 Minerals and inert materials



Description

Mineral materials, still referred to as inert, include all inorganic materials. In the case of home products, these are mainly glass and mirrors, ceramics (earthenware, stoneware, porcelain, etc.), natural stones (slate, granite, quartz, etc.) and concrete.

End-of-life recovery

These materials do not evolve over time, but the recycling potential of these materials remains extremely limited currently. Additionally, their inorganic character prevents any energy recovery.

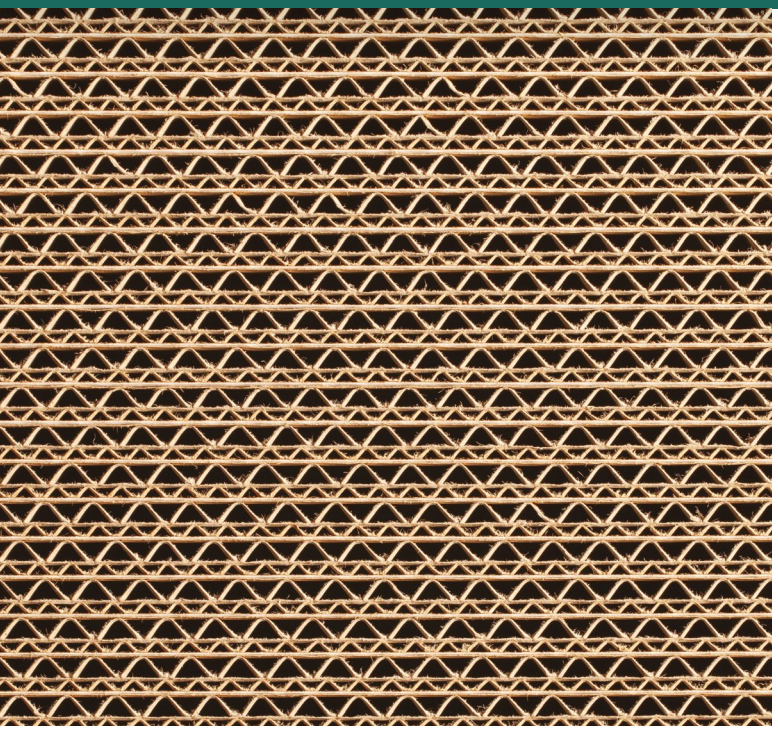
6 Composites

Description

A composite is a material consisting of two immiscible materials (substances which cannot be mixed together homogeneously). In home products, the main composite materials used are wood-plastics, "thermosetting resin/paper" (such as Compacts and HPL), materials combining minerals and resins, for example artificial stones, solid surfaces, glass-fibre composites, etc.

End-of-life recovery

The bi-material make-up of composites and the impossibility of separating these two very different materials makes them difficult to recycle. If their mineral content is low enough, they can be recovered for energy.



7 Paper and cardboard

Description

Paper is mainly manufactured from plant fibres reduced to a pulp, which is then processed to transform it into thin sheets.

Cardboard is composed of sheets of paper stacked and glued to obtain thicker and more rigid sheets.

End-of-life recovery

Both paper and cardboard are recyclable materials. However, their presence in the wood stream degrades the recyclability of the overall stream, and it is not easy to extract them from this stream.

These materials are therefore recovered for energy.

8 Polyurethane (PU) foam

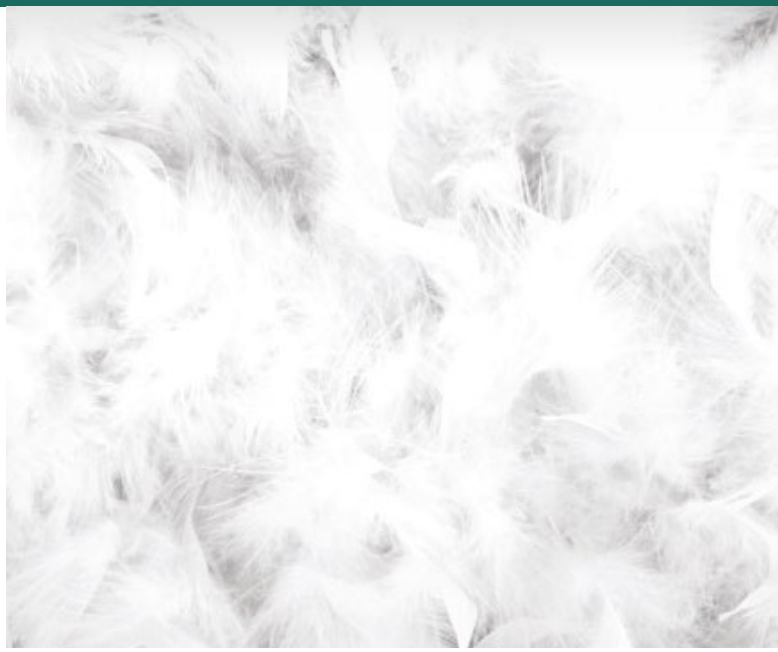
Description

Polyurethane is a thermoset polymer derived from petrochemicals. It can be found in the cores of mattresses, padded seats (foam used in the seat itself or the back rest), upholstered furniture, etc. It has many uses and often comes in the form of blocks or flakes.

End-of-life recovery

If it can be easily isolated (as with mattresses), polyurethane foam can be recycled. It can be mechanically recycled by manufacturing agglomerated foam for the construction, automotive, sports/leisure or furniture sectors. Since 2021, PU foam can also be chemically recycled. This innovative recycling method involves chemical treatment of PU foam to obtain recycled molecules which can then be used to manufacture a new foam with properties very close to the virgin material.

If it cannot be easily isolated in the waste stream, PU foam can be used for energy production.



9 Latex

Description

The latex used in mattresses is either natural or synthetic. Natural latex comes from the sap of the rubber tree, which also enables synthesis of natural rubber. Synthetic latex, on the other hand, is a mix of polymer emulsions derived from petroleum and a varying proportion of natural latex.

End-of-life recovery

Latex, if it can be easily isolated, can be mechanically recycled and used in combination with PU foam in some agglomerated foams derived from recycling.

If it cannot be easily isolated, latex can then be recovered for energy production.

10 Other padding materials

Description

Padding materials are either natural (hair, feathers and down, latex, etc.) or synthetic (foam flakes, polymer fibres, polymer beads).

End-of-life recovery

Padding materials used in home and garden products are diverse and generally used in combination with other materials to which they are often strongly bound (by stitching, braiding, gluing, etc.) or in which they are often enclosed.

They are also most often enclosed in a textile envelope which complicates their identification when sorting. It is therefore difficult to isolate them for recycling.

Padding materials are therefore mainly used for energy production. They can be separated from their envelope, making them recyclable.

Please note that padded products are not recycled by Eco-mobilier and are recovered for energy production.

Please get in touch
if you have any questions:

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