Packaging

Initial packaging drafts

In this chapter, the concept of product packaging will be discussed. The different ideas presented make it possible to prioritize different notions, such as marketing or ecology. At the end of the presentation, a conclusion drawn up with the help of a table will make it possible to decide on the ideal solution.

Introduction

Before talking about the packaging, it is important to define what elements are provided with the bin.

Since the product is fully assembled beforehand, there are only a few additional elements. For the garbage can, it comes with a charging cable, and two boxes, allowing you to collect the compost, and grow the plants at the top of the garbage bin.

The composting process requires help to get started. This is why a starter pack is also being considered. It would include ready-made compost, as well as seedlings.

Generally, this type of product is also accompanied by a leaflet. It is possible to consider making it dematerialized, accessible from a QR code, or from the application provided with the device. This prevents unnecessary printing of paper, which often ends up in the trash. A paragraph will be devoted to this element for each of the solutions.

First idea – Classic

This trash bin is a household appliance like there are already many on the market. In this first solution, it will be considered to apply the same packaging as these existing devices.

They consist of a cardboard box in which all the elements of the product are found, with an expanded polystyrene (EPS) to hold all the elements in place and protect them. It is generally used because it is very cheap, cardboard and EPS are easy to produce and inexpensive. In addition, they are very lightweight, which makes the device easy to carry. Finally, EPS provides optimal protection, because by giving it a shape adapted to all the elements, it is possible to protect everything from shocks.

However, this solution has several trade-offs, such as space and ecological impact. EPS is not reusable when the product is unpacked. It is difficult to recycle, because it is very light for a large volume, so it is not interesting to recycle it. The storage of the packaging also requires a lot of space, and EPS is difficult to reuse as it is, because of its shape, which is specific to the product.

In summary, this solution is the most economical, and easily adaptable to the bin and its components. However, its environmental impact is very bad, which makes this solution difficult to consider.

Second idea – Adapted classic

The main problem with the previous solution is the PSE. It is possible to keep the cardboard as the outer packaging, while adapting the interior with healthier material for the environment:

- The "Honeycomb" cardboard provides good protection for the elements of the bin. It is lightweight, is 100% recyclable.
- Kraft paper is also very light, more modular than "honeycomb" cardboard, and less expensive. The protection is weaker, less rigid.

A mix of these two elements keeps the elements inside the overall carton. With this solution, all the packaging can be recycled or reused (especially kraft paper, which is not shaped specifically for this product). The unit cost may be a little higher than with EPS, but does not require investment in mold, as is the case with the first solution.

As explained above, the leaflet is also an element of the packaging. It is possible to make it dematerialized, via a QR code on the cardboard. Thus, no additional paper in the packaging, the QR code will allow the application to be set up, connected to the bin. Within the application you will find the instructions, which will be accessible at any time.

Figure 1 shows how this idea will look.

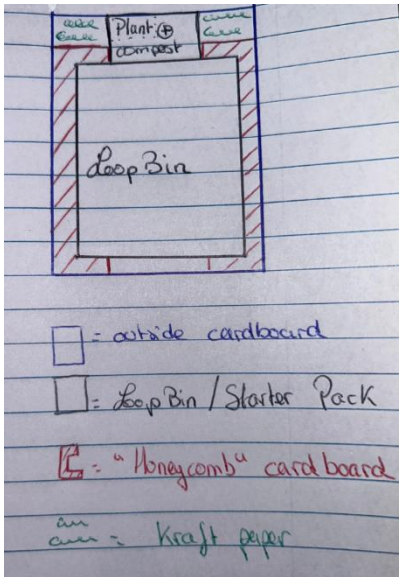


Figure 1 Second idea drawing

Third idea – Compostable

The image of Leftlovers is to offer an accessible, easy-to-use, but above all ecological solution for managing food waste. The idea of the latter solution is to apply this to packaging by offering 100% compostable packaging.

For this, the packaging must be made of cardboard, but there are several points to consider. First of all, resistance. Indeed, the cardboard will be less solid, therefore more sensitive to crushing, shocks... It also does not have to be treated in order to be composted. It will therefore also be sensitive to humidity. This poses logistical problems, the bins will have to be stored in a dry place, without risk of shock.

It is also necessary to limit the use of glue, and ink on the cardboard, for a healthier compost. The glue can be minimized with a well-thought-out folding, which allows for a solid structure. For ink, there are biodegradable inks, such as soy ink for example.

The main problem with this solution is the complexity of the model to be set up, the cardboard, which must have well-thought-out ribs/folds to have a rigid structure. It is also a more expensive solution than the two presented previously, due to the complexity of the cardboard once again, and the biodegradable ink.

Fourth idea – Second life

Leftlovers is a sustainable brand dedicated to reducing food waste. However, the focus extends beyond food — minimizing all forms of waste, including packaging, is equally important. To address this, a packaging solution has been developed that allows the packaging to serve a second purpose instead of being discarded. The primary goal of the packaging is to ensure safe delivery of the composting bin to the consumer. The second goal is to give the packaging a second life once the bin is unpacked.

To protect the bin from shocks during transport, it is enclosed in a box made of cork. After unpacking, this cork box can be transformed into a window planter. This directly supports the brand's goal of enabling gardening for urban residents without access to outdoor space. In this way, the packaging becomes an extension of the product itself. The product already has a garden on top, but the cork box creates more space for growing new plants.

The box is made from agglomerated cork — a lightweight, durable, and biodegradable material that is commonly found in Portugal. Agglomerated cork is more cost-effective and easier to shape than solid cork, making it a practical material for this application. To extend the life of the cork box and prevent leaks while gardening, a protective inner layer can be added.

Because cork alone is not sturdy enough, a cardboard box is placed around the cork box. This adds strength and protects the bin during transport. After unpacking, the cardboard can be composted directly in the bin, eliminating waste.

To make the transformation from the box into a planter easy for the user, an instruction manual is included, featuring a QR code linking to a video tutorial. There is also extra space in the cardboard box for a bag with additional accessories, such as a hook or rope to mount the planter on a window.

Comparison

The purpose of the following table is to determine the most interesting option for the project. To do this, three criteria are taken into account:

- The price
- Feasibility
- Ecological impact

Price is an important criterion, as the objective is to offer an affordable product, to stand out from the solutions already on the market. Feasibility takes into account the simplicity of the process, as well as its implementation. The ecological impact is a priority for this project. As explained earlier, the idea of the project is to offer a product that allows you to act for the environment. It would be counterproductive to have highly polluting packaging. Finally, repurpose means that the packaging has a second life after it is unpacked.

	Price	Feasibility	Ecological impact	Repurpose	Total
Classic	5	5	1	1	12
Adapted classic	4	4	3	2	13
Compostable	2	3	5	3	13
Second life	3	3	5	5	16

A score is assigned to each criterion, 5 for the most advantageous solution, 1 for the least. Thus, the total indicates the most appropriate solution, considering the different criteria.

Looking at the results, it appears that the classic solution is the most affordable and the easiest, but it also has the worst impact on the climate.

The adapted classic has a high score on price and feasibility. It also does not damage the climate. However, the fact that it has no repurpose makes it less attractive for this project.

The compostable solution is very sustainable and its ecological impact is in line with the direction of the project. However, its price and complexity make it difficult to implement. It may be interesting to keep this idea for a future product, a more luxurious range for example.

Lastly, the second life solution scores the highest in general. It has a second life and therefore it has a positive ecological impact. The only thing that needs to be considered is that it might be expensive and harder to accomplish.

Detailed drawings

The comparison revealed that the Second Life- idea is the best fit for this project. So detailed drawings have been created for this concept.

The outer cardboard box will be made from double-wall corrugated cardboard (BC flute), as shown in Figure 2. This provides protection during transport and can later be composted as brown waste directly in the bin.

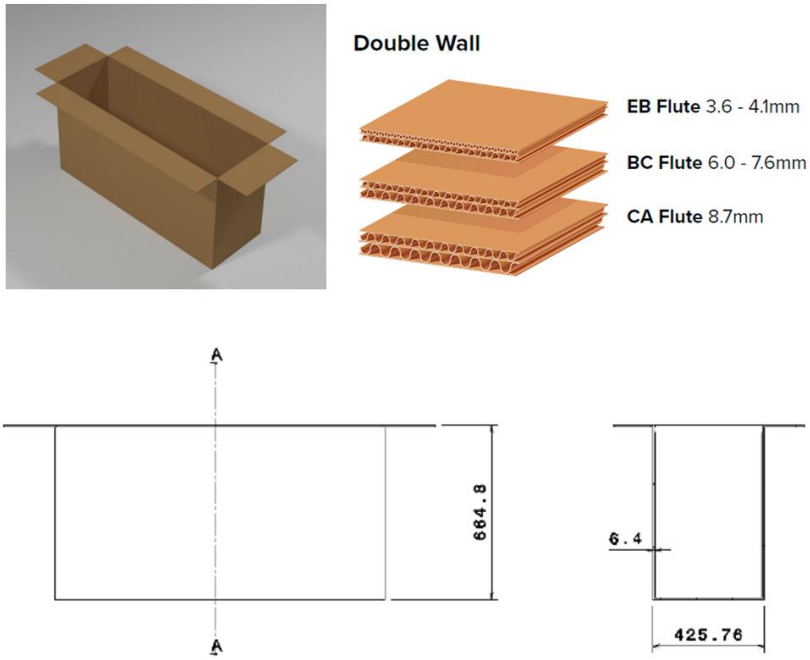
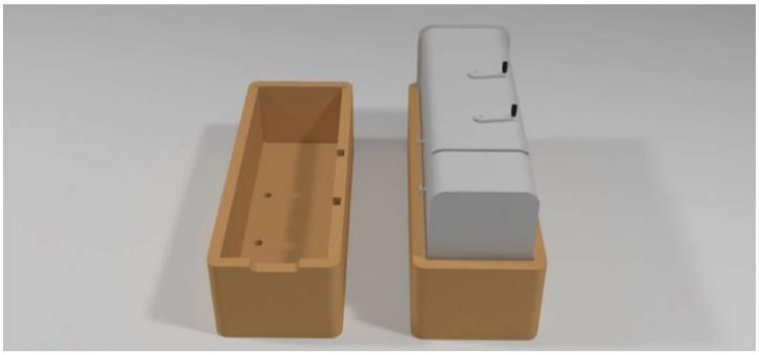


Figure 2 Drawings cardboard box

For the cork box, agglomerated cork will be used. This material has a natural cellular structure that cushions impacts and protects the bin. It can compress and then return to its original shape, providing flexible protection in tight spaces. After unpacking, the box can be reused as a window planter.

As seen in figure X, the cork box consists of two parts to securely protect the compost bin. Both parts have two drainage holes, which are essential for a planter to prevent water from pooling and drowning the plants. The holes in the top part of the cork box have an additional function: it fits precisely over the handles of the compost bin, preventing them from breaking during transport.



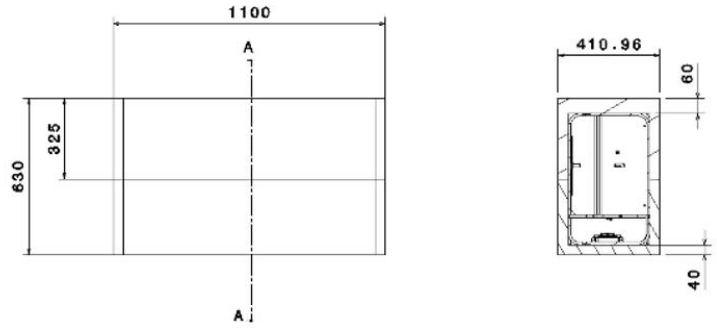


Figure 3 Drawings cork box

As seen in figure 4, there is extra space inside the box for a bag with the instruction manual and additional accessories, such as a hook or rope to hang the planter on a window, and possibly a compost starter to help initiate the composting process inside the bin.

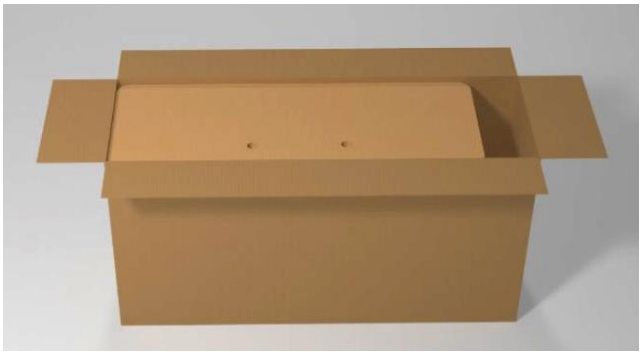


Figure 4 Cork box inside cardboard box