ECODESIGN GUIDE

FOR SPIRITS PACKAGING

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ENTIDAD SIN ÁNIMO DE LUCRO

ESPIRITUOSOS ESPAÑA

EXECUTIVE SUMMARY

INDEX

Walking in circles

Thinking about how to produce before producing is to anticipate, and anticipation is the instinct that has made human beings evolve since their origins. I have no doubt that those who are reading this guide have already anticipated. Taking care of the packaging eco-design is opening the door to a future more aligned with the environmental challenges of our time, a more efficient future in the consumption of resources and energy, a more competitive future, adapted to the requirements of the legislation and a future that also satisfies the new demands of consumers.

The Spirit's sector does not give up its roots, but at the same time it adapts and evolves, and, overall, it anticipates. It is precisely this wise balance that has given it all the weight, value and representativeness that it has in Spanish society. As reported to Ecovidrio in the last *Packaging prevention and Eco-design Plan* (2020-2022), the sector declared 300 eco-design measures in the past two years.

Today, we know, and it has been confirmed by the studies of the Ellen McArthur Foundation, that the packaging design stage can account for up to 80 % of the total impact. Together with a correct waste management at the end of the packaging's life, this initial phase is essential to achieve true circularity. It is no coincidence that eco-design is a fundamental pillar in the *Action Plan for the Circular Economy* of the European Commission and has a leading role in the Spanish Law on Waste and Contaminated Soils for the Circular Economy. In the coming years, we will see how these principles are translated into economic and legislative implications for producers. Hence, the value of going ahead.

For Ecovidrio it has been a pleasure to work side by side with a sector committed to this in-depth analysis of environmental impact, study of market trends, review of the most solvent international sources and landing on tools for all phases of the life cycle of primary, secondary, and tertiary packaging.

We will continue to walk circles, not only forward but also in circles.

José Manuel Núñez-Lagos
CEO OF ECOVIDRIO

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Commitment to sustainable production

Environmental protection has always been a distinctive sign of advanced societies.

Beyond fashions and trends, taking care of the ecosystems, in which we operate is a sign of intelligence and, as such, it should be part of business decisions.

Within this framework, Sustainability with capital letters must be part of the business development of companies and sectors and all this must be necessarily compatible with two fundamental aspects; the transition translated in action when changing from a mode of being to a different one and the speed of that transition.

The exercises are not theoretical but impose an exercise in realism without which they are doomed to unwanted effects and distant targets. Sustainability encompasses a multiplicity of factors, from the awareness of the starting position, production and energy models and the role of each sector.

Adjustment and competitiveness must necessarily go hand by hand and, as such, the food and beverages sector, from its geostrategic position, both for the economy and employment, as well as for the chain of value upstream and downstream, must keep on working in the transition towards a productive model based on a real and sustainable circular economy.

From Espirituosos España we boast about being a responsible sector. A sector committed to the consumer, to society in general, and with it, also with the environment.

Bosco Torremocha
CEO OF ESPIRITUOSOS ESPAÑA

Our commitment to the environment goes further of national legislation or that which comes to us from Europe (Farm to fork Strategy, Green Deal...) in which sustainability constitutes a mainstay.

As it should be, this pillar also stands as the basis of our DNA, by placing the consumers, and their concerns, at the centre of our decisions. The demands of an increasingly demanding consumers make us focus on sustainability, in an interrelated way with all the productive chain steps, since we design our product until it is consumed.

Eco-design also plays a key role here throughout the life cycle, from design to its management as waste.

At Espirituosos España we are committed to the sustainable production of spirits, and we do it with the conviction that collaboration is key. There is a well-known popular proverb that says: "if you want to go fast go alone, if you want to go far, go accompanied." We want to make it lesson ours; we want to go far and for this reason we have considered strategic to go hand by hand with Ecovidrio, which has accompanied us to create this Guide, which will serve as a reference for our Sector, that not only cares about making products of quality, but also considers the sustainability and caring for the planet.

INTRODUCTION

This document is intended to be used as a **packaging eco-design guide** for the Spirits sector. **Ecovidrio** and **Espirituosos España** has propelled this project together.

Since its beginning, Ecovidrio has contributed with its associated partners in the promotion of initiatives regarding packaging prevention and eco-design. Some examples are the development of **Packaging Prevention Plans**, the publishing of **technical materials** and advisory services in relation to packaging prevention.

On the other hand, companies have acknowledged a series of advantages in packaging prevention, such as the promotion of their **Sustainability Policy** and **Corporate Social Responsibility**, the reduction in **operational costs** and the **collaboration with consumers to keep environmental commitments**.

Therefore, the guide focuses on potential improvements in packaging eco-design, to be implemented in the spirit drinks sector. In doing so, companies will be more prepared to adapt their activities to the new modulated fees for extended producer responsibility schemes, regulated by the ***Spanish Law 1055/2022 of packaging and packaging waste*** (approved on Dec 28th, 2022).

Summary of the new guidelines for modulated fees for extended producer responsibility schemes related to glass

BONUSES

- Exceeding recycling targets.
- Reduction of weight and volume's packaging.
- Increase of recyclability.
- Incorporation of secondary raw materials.
- Use of reusable packaging.

PENALTIES

- Not reaching recycling targets.
- Low recyclability.
- Presence of elements or substances that hinder recycling:
  - Presence of ceramic swing caps or any other infusible elements (made of porcelain, ceramics...) attached to the bottle.
  - Use of different types of glass other than the regular one (made from sodium carbonate and limestone), such as opal glass or borosilicate glass.

Source: Anex VIII of *Spanish Law 1055/2022 of packaging and packaging waste* (approved on Dec 28th, 2022).

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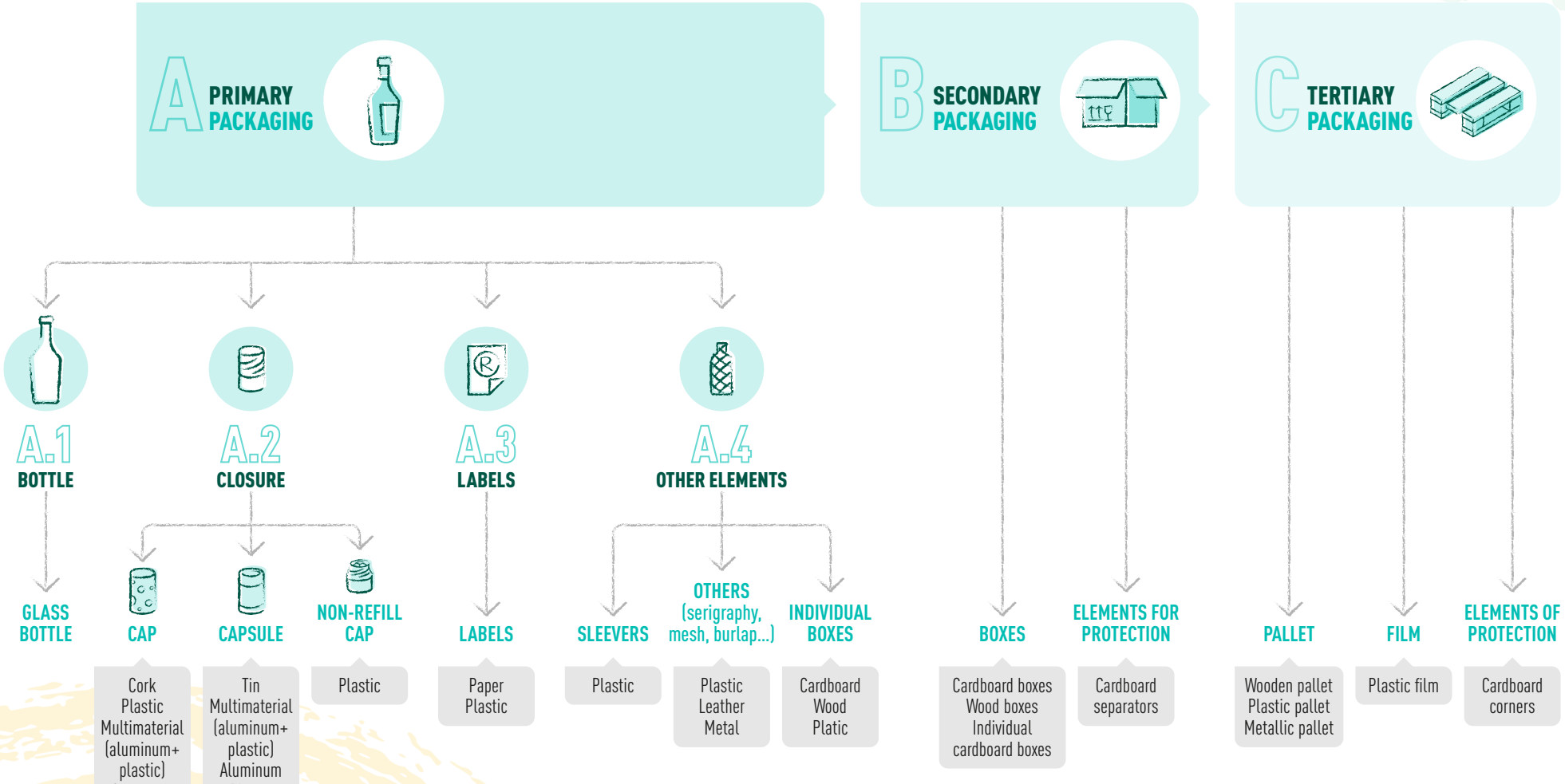
PACKAGING ELEMENTS INCLUDED IN THE GUIDE

As it can be seen below, these are the elements of primary, secondary and tertiary packaging considered in the guide.



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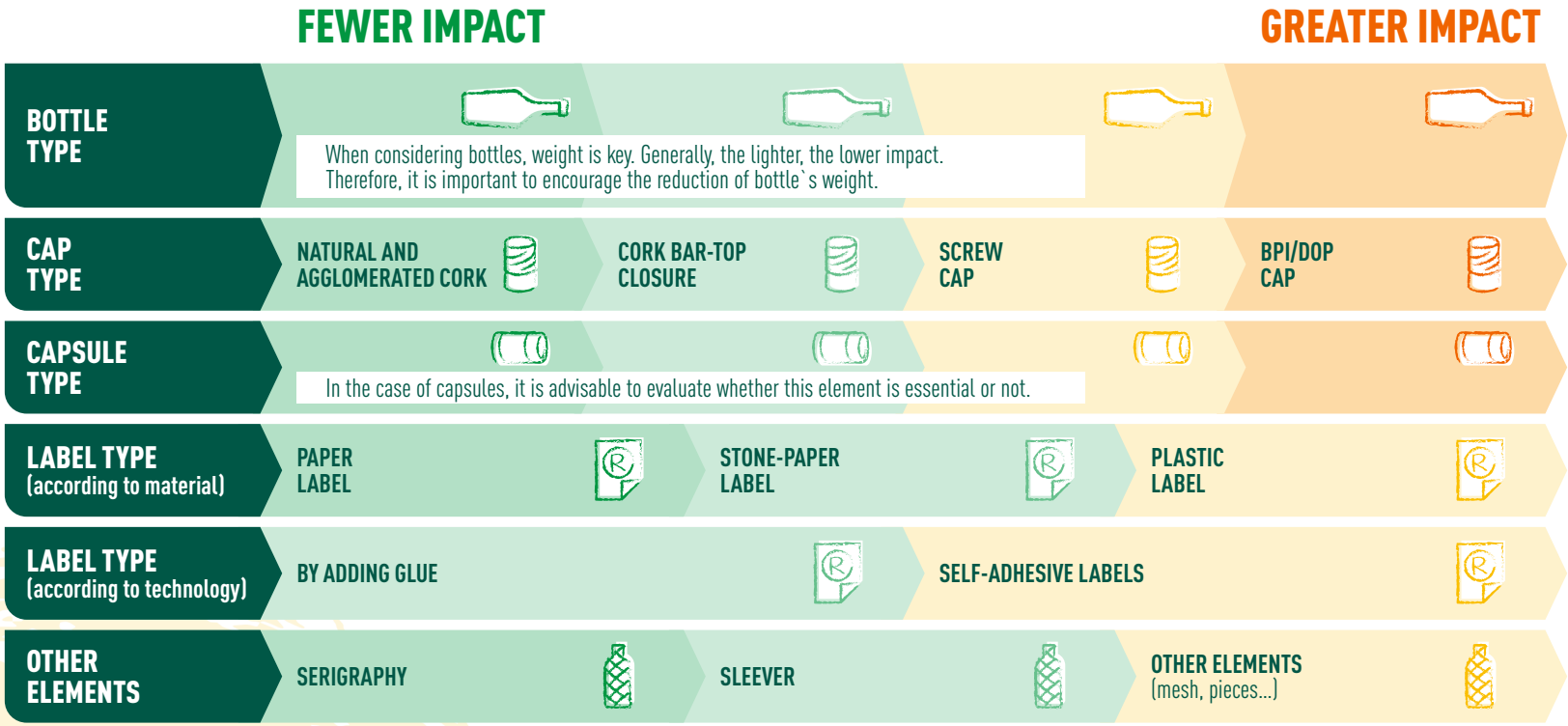
PRODUCTION AND RECYCLING IMPACTS

Summary fo the impacts associated to the production and the recycling of the different types of the packaging included in the guide

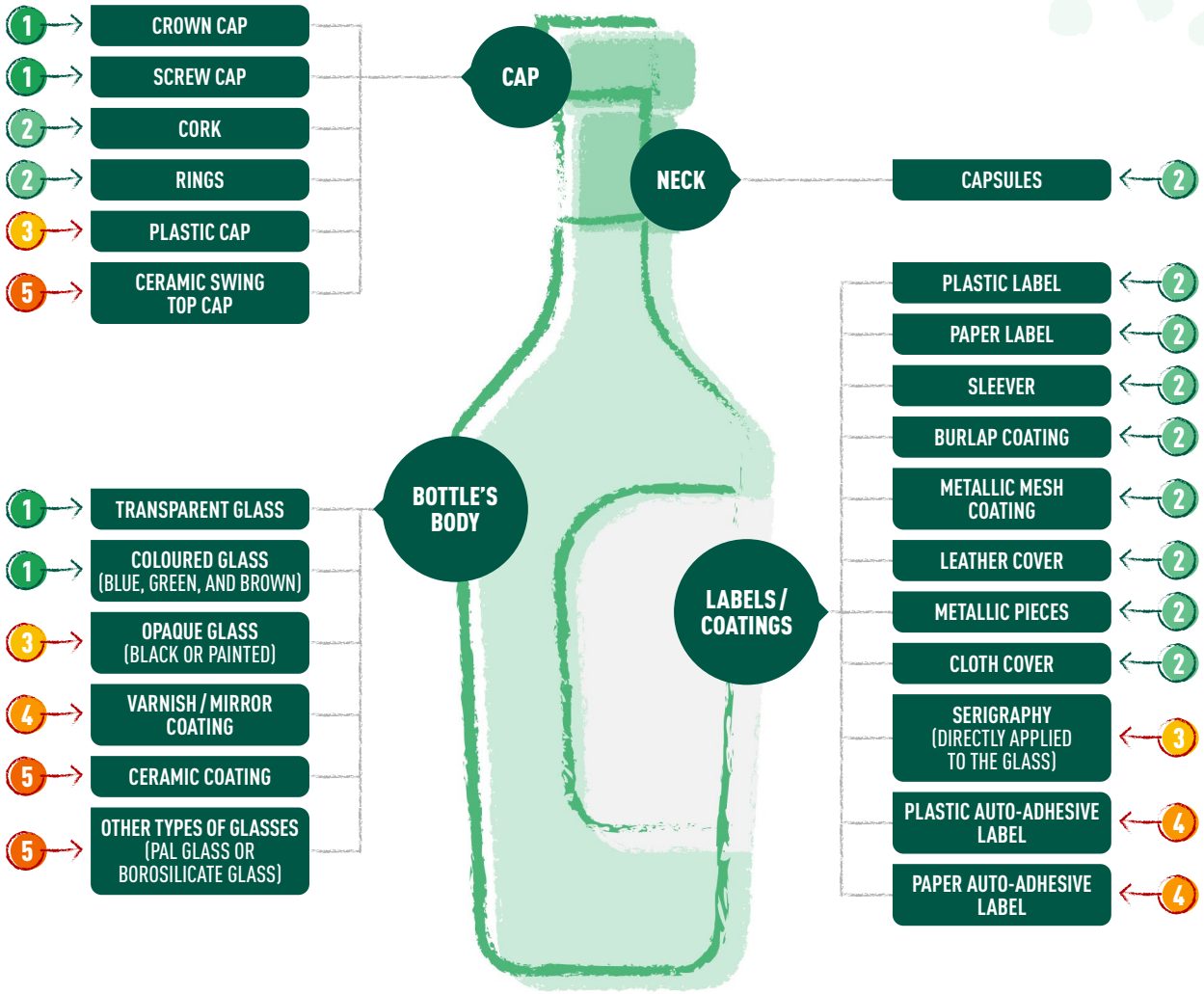
The table below shows a summary of the impact assessment of all **primary packaging** elements considered in the guide. For each type (bottle, cap, capsule, labels, sleevers and other elements), **the main alternatives on the market are presented sorted by their estimated overall impact**. In order to do this, information from several technical sources such as scientific publications, other industrial guides and technical reports has been compared. This estimate of the overall impact has been made by considering only the main impacts associated with the standard production process of each element, how they fit into the current recycling systems and the influence they have on the recyclability of glass. Aspects related to the use or price of each alternative have been excluded from the analysis.



PRODUCTION AND RECYCLING IMPACTS

Summary fo the impacts associated to the production and the recycling of the different types of the packaging included in the guide

TO IMPROVE BOTTLE'S RECYCLABILITY, THE ELEMENTS THAT ARE MORE DIFFICULT TO SEPARATE SHOULD BE AVOIDED



Rating based on the easiness to separate the element from the glass

1 2 3 4 5

Easy to separate

Hard to separate

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ECODESIGN MEASURES TO IMPLEMENT

Types of eco-design measures

MEASURES

REMOVAL OF PACKAGING ELEMENTS

The aim of these measures is to evaluate **which packaging elements are not necessary, in order to eliminate them. Consequently**, the amount of waste generated per product (Kr/Kp ratio) is reduced.

REDUCTION OF PACKAGING WEIGHT

Aiming to reduce the amount of waste per product (Kr/Kp ratio), these measures seek to **reduce the unitary weight of the glass bottle, or any other packaging element**, by changing their composition or design.

IMPROVEMENT OF PACKAGING SOLUTIONS/ LOGISTICS SERVICES

Minimizing the ratio of packaging waste to product (Kr/Kp ratio) can also be achieved by optimizing the packaging solution so that it **contains as much product as possible**. Logistics can also be upgraded.

PROMOTION OF PACKAGING REUSING SYSTEMS

This category includes all the initiatives focused on **promoting the use of reusable packaging at the primary, secondary, and tertiary levels,** so that, extending its useful life.

IMPROVEMENT OF PACKAGING RECYCLABILITY

This group of measures focuses on **improving packaging performance at the end of its life cycle**, by making more likely the recycling and subsequent use of the material as secondary raw material.

REDUCTION OF THE ECOLOGICAL FOOTPRINT

The production of packaging has an associated environmental impact that can be reduced **through the implementation of measures at critical points in the production chain** (e. g., extraction of raw materials).

INDIRECT MEASURES TO PROMOTE ECO-DESIGN

The direct application of the measures described above is only possible by developing indirect measures to **enhance the compromise of all the stakeholders** and to promote innovation (e. g., R&D projects).

SUMMARY OF THE BOTTLE SECTION

Summary of bottle's production and recycling impacts

The criteria followed when producing a glass bottle are basically two:

01 **Weight:** the lower the mass of the bottle, the lower the relative impact per bottle.

02 The **colour or coating**, as this influences the percentage of cullet added to the new containers.

In addition, when adding **elements** to the bottle (closures, labels...) **they must be easy to separate**, so that, a larger percentage of glass can be recycled..

MAIN ACTIONS

- **Reducing the weight** of the bottle.
- **Promoting the separability** of the elements attached to the bottle.
- **Eliminating** as many **ornamental elements** as possible.

SUMMARY

TYPE OF BOTTLE	IMPACTS FROM PRODUCTION	IMPACTS FROM RECYCLING
GREEN 	Higher cullet percentage compared to transparent ones.	Doesn't interfere with the functioning of optical systems.
AMBER 	Higher cullet percentage compared to transparent ones.	Doesn't interfere with the functioning of optical systems.
NO COLOUR 	Lower cullet percentage in the melt.	Doesn't interfere with the functioning of optical systems.
OTHER COLOURS (dark) 	Higher cullet percentage compared to transparent ones.	Lighter coloured bottles tend to recycle better as they interfere less with the optical system (transmittance limit: 20 %*).
OTHER COATINGS 	Regardless of the colour, the application of coatings such as varnishing and painting adds steps onto the production process and therefore increases the impact.	Some of these coatings are ceramic, so they are infusible in the ovens. In many cases they interfere with glass container recycling processes.

* Source: PICVISA, 2021.

SUMMARY OF THE BOTTLE SECTION

Exemples of ecodesign measures related to the bottle

MEASURE — REDUCTION OF PACKAGING WEIGHT

- Replacing the bottle for lighter options with the same volume.

MEASURES — REDUCTION OF THE ECOLOGICAL FOOTPRINT

- Calculating carbon footprint.
- Purchasing local raw materials.
- Preferably using green or amber bottles.

MEASURE — PROMOTION OF PACKAGING REUSING SYSTEMS

- Promoting domestic reuse of packaging.

MEASURES — IMPROVEMENT OF PACKAGING RECYCLABILITY

- Promoting the separability of the elements attached to the bottle.
- Reducing the use of materials or elements containing materials that make more difficult the process of glass recovery.
- Increasing recyclability of headed caps.

MEASURE — IMPROVEMENT OF PACKAGING SOLUTIONS/ LOGISTICS SERVICES

- Selling the product in bigger volumes.

MEASURE — INDIRECT MEASURES TO PROMOTE ECO-DESIGN

- Incorporation of instructions for the proper recycling of packaging.

SUMMARY OF THE CAP SECTION

Summary of cap's production and recycling impacts

MAIN ACTIONS TO REDUCE THE IMPACT RELATED TO CAPS

- If possible, choosing **single-material caps and capsules** or reducing the number of different materials.
- Ensuring that the **caps and closures are easily separable from the glass container**.
- Indicating in which container the cap should be placed.

SUMMARY

TYPE OF CAP	IMPACTS FROM PRODUCTION	IMPACTS FROM RECYCLING
NATURAL AND AGGLOMERATED CORK 	✓ Cork oak forests act as carbon sinks. ✓ The process is optimized so that the waste generated during the production of natural cork is used to manufacture agglomerated cork.	✓ Cork is a biodegradable natural product that can be composted. ✗ If it reaches the oven treatment plant, the cork is discarded and is not recovered.
CORK BAR-TOP CLOSURE 	– Given the wide variety of materials that can be used in their manufacture, the associated production impacts are highly variable.	✓ If it is only composed by one material, it can be fully recovered. ✓ It is easy to separate from the glass bottle and once it is separated, it leaves no trace on the neck, so it does not affect the recyclability of the glass (as long as it is deposited in the proper container).
SCREW CAP 	✗ The initial stages of raw material extraction (plastic and aluminium) have a relevant environmental impact, especially in relation to water and energy consumption.	✓ Aluminium and other metallic materials are recovered in some glass and light packaging treatment plants. ✗ One part may remain attached to the neck of the glass bottle, interfering with its recyclability.
BPI/DOP CAP (non-refill) 	✗ The initial stages of raw material extraction (plastic and aluminium) have a relevant environmental impact, especially in relation to water and energy consumption.	✓ Aluminium and other metallic materials are recovered in some glass and light packaging treatment plants. ✗ One part may remain attached to the neck of the glass bottle interfering with its recyclability.

SUMMARY OF THE CAP SECTION

Exemples of ecodesign measures related to the cap

MEASURES

IMPROVEMENT OF PACKAGING RECYCLABILITY

- Reducing the use of materials or elements containing materials that hinder glass recovery.
- Increasing recyclability of headed caps.

MEASURE

REDUCTION OF THE ECOLOGICAL FOOTPRINT

- Preferably using biodegradable materials and renewable raw materials.

MEASURE

REMOVAL OF PACKAGING ELEMENTS

- Disposing of unrefillable caps.

SUMMARY OF THE CAPSULE SECTION

Summary of capsule's production and recycling impacts and exemples of ecodesign measures related to the capsule

MAIN ACTIONS TO REDUCE THE IMPACT RELATED TO CAPSULES

- **Identifying in which cases the capsule only has an ornamental function** and, if so, think about removing.
- If it cannot be eliminated, **shortening the skirt length, and reducing the weight**.
- If it cannot be eliminated, **choosing preferably single-material capsules and/or capsules made of recycled raw materials**.

MEASURES

REDUCTION OF THE ECOLOGICAL FOOTPRINT

- Calculating carbon footprint.
- Preferably choosing renewable raw materials.
- Identifying new uses to increase valorisation of waste.

MEASURE

REDUCTION OF PACKAGING WEIGHT

- Reducing capsule size.

MEASURE

IMPROVEMENT OF PACKAGING RECYCLABILITY

- Promoting separability of those elements accompanying/bonded to the bottle (e.g., using pre-cut sleevers).

SUMMARY OF THE LABELS SECTION

Summary of labels' production and recycling impacts

MAIN ACTIONS TO REDUCE THE IMPACT RELATED TO LABELS

- **Reducing label size*** to minimize the risk of organic material entering the melting furnace and thus minimize the loss of adhered glass.
- Prioritize those **adhesives with less cohesion** (easily detachable).

* This measure may be hindered by the need to comply with labelling and consumer information regulations.

SUMMARY

TYPE OF MATERIAL	IMPACTS FROM PRODUCTION	IMPACTS FROM RECYCLING
PAPER LABEL 	✓ Paper is a raw material of renewable origin. ✓ When the label substrate material is paper, less drying energy is required to fix the ink.	✓ If they end up in the oven, they have a low impact on the melting process. ✓ They have a lower abrasion resistance than plastic or stone paper labels, therefore, they are easier to peel off.
STONE-PAPER LABEL 	✓ Compared to conventional paper, its manufacture does not require chlorine or forest resources. In addition, the production of stone paper consumes less water and energy. ✗ About 20 % of its composition is HDPE. Generally, HDPE is made of petrochemical origin and therefore, it has a non-renewable origin.	✗ They are more resistant to abrasion than paper, therefore, they are more difficult to peel off. ✓ If they reach the oven, they have less impact on the melting process than plastic labels, since 80 % of their composition is calcium carbonate.
PLASTIC LABEL 	✗ In many cases, plastic is manufactured from non-renewable raw materials. ✗ When the label base material is plastic, more drying energy is required during printing.	✗ If they reach the oven, they have a greater impact than paper on the melting process and on the quality of the new bottles. ✗ They are more resistant to abrasion than paper, so they are more difficult to peel off.

TYPE OF TECHNOLOGY	IMPACTS FROM PRODUCTION	IMPACTS FROM RECYCLING
BY ADDING GLUE 	✓ No need to produce an anti-adherent coating. ✗ The bonding process is more complex, and they are less resistant to external conditions and may generate more waste in the process.	✓ Unlike self-adhesive labels, they are not bonded to an anti-adhesive layer, thus saving this waste. ✓ In the glue application process, the number of gluing points can be minimized, which reduces glass losses in processing plants (as less glass would remain adhered to the label).
SELF-ADHESIVE LABELS 	✗ The non-stick layer must also be produced. ✓ The gluing process is more efficient, saving time and reducing the risk of waste generation. They are also stronger so there is less risk of detachment during distribution and labelling.	✗ More waste is generated because of the anti-adhesive layer. ✗ The entire surface of the label is already attached. As a result, they tend to contribute to more glass loss (as they stick to the label more easily).

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SUMMARY OF THE LABELS SECTION

Exemples of ecodesign measures related to the labels

MEASURES

REMOVAL OF PACKAGING ELEMENTS

- Replacing primary packaging labels for other techniques as engraved glass.
- Substituting primary packaging labels for other techniques as serigraphy.
- Remove unnecessary labelling elements.

MEASURES

REDUCTION OF THE ECOLOGICAL FOOTPRINT

- Calculating carbon footprint.
- Preferably choosing renewable raw materials.

MEASURE

REDUCTION OF PACKAGING WEIGHT

- Reducing labels size.

MEASURE

IMPROVEMENT OF PACKAGING RECYCLABILITY

- Promote the separability of the elements attached to the bottle (e. g., use of pre-cut sleevers).

MEASURES

INDIRECT MEASURES TO PROMOTE ECO-DESIGN

- Using Sustainable Forest Management (FSC o PEFC) certified paper, cardboard, and Wood.
- Incorporating instructions for correct recycling.

SUMMARY OF OTHER ELEMENTS SECTION

Summary of other elements' production and recycling impacts

MAIN ACTIONS

- **Eliminate elements that have no function**, in order to save raw materials and minimize the management of the packaging waste.
- If they cannot be eliminated, it is advisable to **reduce weight** in order to save raw materials.

SUMMARY

TYPE OF OTHER ELEMENTS	IMPACTS FROM PRODUCTION	IMPACTS FROM RECYCLING
SERIGRAPHY* 	✓ It is less material intensive compared to sleevers or labels. Therefore, if the ink is used properly, the production impact is lower.	✗ The intensive use of ink generates interference with the optical system. ✓ If the design is simple, serigraphy has less impact on the recyclability of the glass.
SLEEVER 	✗ The initial stages of raw material extraction have a relevant environmental impact (non-renewable raw materials). ✗ Compared to the other elements, it usually involves a greater amount of material as it covers the entire bottle. ✓ When it replaces labels and/or bottle finishes (e. g., paints) it saves the materials associated with their production.	✓ If it has a pre-cut to facilitate its separability, the consumer is more likely to separate it from the bottle and recycle it with the rest of the light packaging. ✓ If the sleever is not separated and arrives at the glass treatment plant, it is easier to separate than labels. Therefore, it has a lower impact on the recyclability of glass. ✗ If the sleever arrives at the glass treatment plants, although it has a lower impact on the recyclability of glass than labels, raw materials cannot be recovered.
OTHER ELEMENTS (mesh, pieces...) 	✗ The addition of decorative elements involves additional production processes and increased consumption of raw materials.	✗ If their separability is not guaranteed, they may affect the recyclability of the glass.

* Serigraphy is always the best option as long as the design is simple enough.

SUMMARY OF OTHER ELEMENTS SECTION

Exemples of ecodesign measures related to other elements

MEASURES

REDUCTION OF THE ECOLOGICAL FOOTPRINT

- Calculating carbon footprint.
- Preferably using biodegradable materials and renewable raw materials.

MEASURE

REMOVAL OF PACKAGING ELEMENTS

- Eliminating ornamental elements of the bottle, such as fabric nets.

MEASURES

IMPROVEMENT OF PACKAGING RECYCLABILITY

- Promoting separability of the elements attached to the bottle (e. g., use of pre-cut sleevers).
- Reducing the use of materials or elements containing materials that hinder glass recovery.

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SUMMARY OF SECONDARY AND TERTIARY PACKAGING SECTION

Measures to reduce secondary and tertiary packaging's production and recycling impacts

SUMMARY

MAIN ACTIONS TO REDUCE THE IMPACT RELATED TO SECONDARY PACKAGING

- **Eliminating ornamental elements** (individual boxes, separators...).
- **Cardboard is lighter than wood.** This reduces CO_2 emissions during transportation.
- **Wrap-around box** models adjust to the volume of the primary package, so that, **the use of cardboard is optimized**.
- **Simplifying the printing design** of grouping boxes, so that, the use of inks is reduced, and recyclability is increased.
- Replace raw materials with secondary raw materials.

MAIN ACTIONS TO REDUCE THE IMPACT RELATED TO TERTIARY PACKAGING

- Choosing wooden pallets from **sustainably managed forests**.
- Choosing **pallets with modular dimensions** to optimize efficiency in transport operations.
- Using **a pool of reusable pallets** (external company or internal reverse logistics system). The fact that plastic pallets can withstand a greater number of uses should be considered.
- **Reducing the use of raw materials** by using cardboard slipsheets instead of conventional pallets. In addition, the use of slip sheets makes it possible to reduce the volume and weight of the product column, thus reducing environmental impacts related to transportation.
- **Adjusting consumption of film, strapping and/or separators.**
- **Eliminating non-essential elements** (strapping and corner pieces).
- **Using transparent films**, in order to reduce ink consumption.
- **Improving the packaging process** by optimizing the placement of unit loads on the pallet. This reduces the need to use protective elements (such as plastic film, strapping or corner protectors).

SUMMARY OF SECONDARY AND TERTIARY PACKAGING SECTION

Exemples of ecodesign measures related to secondary and tertiary packaging

MEASURES

REMOVAL OF PACKAGING ELEMENTS

- Eliminating individual boxes.
- Eliminating separators or other elements for protection from secondary packaging.
- Eliminating corner pieces in tertiary packaging.

MEASURES

REDUCTION OF PACKAGING WEIGHT

- Reducing weight of grouping boxes.
- Using wrap-around boxes (instead of the standard B1 pattern) in secondary packaging.
- Reducing separator length in case it cannot be eliminated.
- Reducing plastic film use in tertiary packaging.

MEASURE

INDIRECT MEASURES TO PROMOTE ECO-DESIGN

- Using Sustainable Forest Management (FSC o PEFC) certified paper, cardboard, and wood.

MEASURES

IMPROVEMENT OF PACKAGING SOLUTIONS/ LOGISTICS SERVICES

- Increasing the number of product units per grouping unit in secondary packaging.
- Maximizing the load per pallet in tertiary packaging.
- Designing containers and packaging to suit modular storage, transport and distribution dimensions.

MEASURES

PROMOTION OF PACKAGING REUSING SYSTEMS

- Developing an internal reusable circuit for secondary and tertiary packaging (inverse logistics).
- Using a pool of reusable pallets.

MEASURES

REDUCTION OF THE ECOLOGICAL FOOTPRINT

- Calculating carbon footprint.
- Reducing intensive use of ink on boxes and/or plastic films.
- Using biodegradable organic pigments.

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EXEMPLES OF ECODESIGN MEASURES RELATED TO THE SPIRITS SECTOR

Other exemples of eco-design measures

MEASURES

REDUCTION OF THE ECOLOGICAL FOOTPRINT

- Calculating carbon footprint.
- Implementing efficient sewage treatment systems and processes to minimize liquid discharges.
- Integrating facilities into the landscape.
- Reducing consumption associated with manufacturing stages.
- Implementing energy efficiency measures and promote renewable energies.

MEASURE

IMPROVEMENT OF PACKAGING SOLUTIONS/ LOGISTICS SERVICES

- Optimizing transportation routes.

MEASURES

INDIRECT MEASURES TO PROMOTE ECO-DESIGN

- Joining and/or promoting R&D projects.
- Developing and/or joining training activities.
- Eco-design guide for marketing/ purchasing.

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REFERENCES

Moreover, the following sources have been consulted:

Centre International Technique de l'Embouteillage (Cetie)

The Association of European Producers of steel for packaging (APEAL)

European Printing Ink Association (EuPIA)

Plastics Europe

The European Container Glass Federation (FEVE)

Metal Packaging Europe

Asociación para el Reciclado de Productos de Aluminio (ARPAL)

AIMPLAS. Instituto Tecnológico del Plástico

Asociación Española Metalgráfica (AME)

Spirits Europe

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