



WPO
WORLD
PACKAGING
ORGANISATION

Better quality of life, through better
packaging, for more people

World Packaging Organisation Goals 2022-2023

1. Reduce food waste
 2. Reduce packaging waste
 3. Increase packaging awareness thru education
- WPO targets unnecessary packaging
 - WPO encourages phasing out of materials that are not recyclable or recoverable
 - WPO focuses on the development of mono-material packaging

It's a new way to design, make, and use things within planetary boundaries.

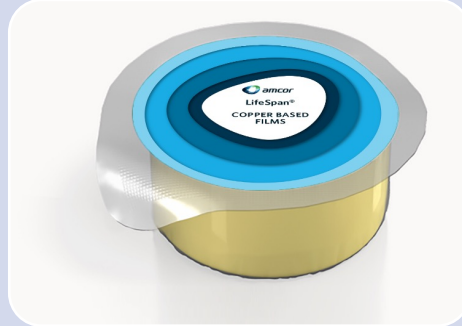
By designing out waste and pollution, keeping products and materials in use, and regenerating natural systems we can reinvent everything.



Key Global Packaging Trends from the point of view of WPO



Sustainability



Extended Shelf
Life and Food
Safety



Personalization
and Branding



E-commerce
Packaging

Global Packaging Design for Recycling Guide

- Increase recyclability and recycling rate of packaging
- Create a common understanding of Circular Packaging Design
- Provide a practical design tool - easy to use and understand
- International harmonisation of design standards
- Stimulate global education and training in Circular Packaging Design



How to Use the Guide

EXAMPLE

COLLECTION FLOW NOT AVAILABLE



To download this guide and your respective country waste stream sheet, please go to: <https://worldpackaging.org/wpo/45/>

HOW TO USE GUIDE

PAGE 4

EXAMPLE

COLLECTION FLOW NO INFORMATION AVAILABLE



To download this guide and your respective country waste stream sheet, please go to: <https://worldpackaging.org/wpo/45/>

HOW TO USE GUIDE

PAGE 5

Easy to Use

Colour coding



Main Criteria



Traffic Light System

Packaging types for which detailed recommendations already exist are divided into three categories (green, yellow, red). Design recommendations for packaging types – for which a further level of detail is currently being worked on – are divided into the categories green and red. In some cases, further comments are made on individual design criteria, which can be found in Chapter 5 / Glossary.



Material-Specific recommendations

2.3.1 Plastics



- Use materials that are as widely available as possible (**PP, PE, PET**).
- Recyclable material combinations (ideally **mono-materials**).
- The surface area of the base material should, at best, be covered to a max. 50 %² with the sleeve/label/banderole.
- Easy mechanical separability of the individual components in the sorting process.
- If possible, use transparent materials.
- As few additives as possible.
- Adhesives recyclable or washable under certain conditions.
- No barrier layers, but if necessary: **carbon plasma coating**³, **SiOx-** or **Al²O³** barrier.



- Avoid small parts that can be separated by the last consumer (**Littering**).
- Non-recyclable material composites (see specific design recommendations).
- Density-changing **additives** (for example, density-increasing additives in PE and PP packaging lead to problems in sorting).
- Use of **Carbon black** -based inks

Material-Specific recommendations

2.3.3 Glass



- Standard colouring in green, brown, white (transparent) or related shades.
- Regular three-component packing glass (quartz sand, soda, **limestone**).
- Engravings and paper labels (wet-strength).



- No packaging glass, such as heat-resistant glass (e.g.: boro-silicate glass).
- Lead crystal, cryolite glass.
- Ceramic parts.
- Full-surface, colour-coated bottles.
- Full-surface **sleeves**.
- Permanently adhesive and large-area plastic labels.



Material-Specific recommendations

2.3.5

Aluminium



- **Non-ferrous metal parts**
- Direct printing process.
- Embossing or direct printing.
- Paint coating.
- Closures made of aluminium



- Aluminium in material composite.⁶
- Non-compliant colours.
- Aerosol cans with hydrocarbon substance-based propellants and/or residual content.



Recommendations per packaging type

3.1 BOTTLES

3.1.1 PET



MATERIAL

- ✓** Transparent mono-PET is best suited for high-quality and material-identical recycling.

If barrier requirements exist, a silicon oxide (**SiOx**), an aluminium oxide (**Al₂O₃**) barrier or a **carbon plasma coating** (only for coloured bottles) can be used, as these do not significantly affect the quality of the recycle.
- ✓** Pale, light, dark or opaque material can be collected or recycled, but of lower quality than transparent material.

Additives such as **UV stabilisers**, **optical brighteners** and **oxygen absorbers** should only be added if necessary.

In principle, the use of barriers should be avoided. However, **PA** barriers (mass fraction <5 wt %), a multilayer material with **PGA**, **PTN** alloys and **TPE** or **PO**-based barriers can be used under certain circumstances.
- ✗** It is important to avoid the use of materials with a density <1 g/cm³ and density-changing additives in the **polymer**, as **PET** sorting is based on density separation.

Barriers made of **EVOH** and **PA** (mass fraction > 5 wt %) as well as other inserted barriers can sometimes strongly impair the recycle quality.

Other types of PET (e.g. **PET-G**) as well as a composite with other plastics such as **PLA**, **PVC** and **PS** are not compatible with the PET fraction and are considered interfering materials.

Special additives such as oxygen/bio/**Oxo-degradable** additives, **nanoparticles** and a **PA additive** damage the recycle. Furthermore, the addition of oxo-degradable additives will be banned throughout the EU from 2021 due to the Single-Use Plastics Directive.

Carbon black-based colours can prevent sorting. Metallic and fluorescent colours must be avoided due to the **contamination** of the recycle.

DECORATION AND OTHER COMPONENTS

- ✓** Direct printing on the packaging should be avoided if possible. If this is necessary, the printing inks must at least be **EuPIA**-compliant and **non-bleeding** to avoid potential **contamination**.

The **batch coding** and the indication of the **best-before date** should ideally be carried out in the form of an embossing or laser marking.

If labels and **sleeves** are used, they should cover a maximum of 50% of the packaging* and be made of a material with a density <1g/cm³ (e.g. **PP**, **PE**) so that they can be separated in the sorting process.
- ✓** Wet-strength paper labels are preferable to conventional paper labels because no fibres come out of them in the washing process that can contaminate the recycle.

The batch coding and indication of the best-before date can, if necessary, also be carried out by means of minimal direct printing with other **coding** systems (e.g. **ink-jet**), provided that food-grade inks are used.
- ✗** Extensive direct printing on the packaging is disadvantageous, as released printing inks can impair the clarity of the recycle or contaminate the recycling stream via released printing inks in the wash water (potential formation of **NIAS**).

Large-scale decorations covering more than 50% of the packaging surface* can impair the sorting of the packaging.

Labels and sleeves made of a material with a density > 1 g/cm³ (e.g. **PVC**, **OPS**, **PLA**), **PET** as well as non-wet-strength paper labels can contaminate the PET fraction.

Adhesive materials containing metal or aluminium (with a layer thickness of > 5 µm) can lead to unwanted sorting into the metal fraction.

CLOSURE SYSTEM

- ✓** Closures are best made of **PP**, **HDPE** or other materials with a density < 1 g/cm³, as they can be separated from PET in the recycling process.

If sealing foils are used, they must be easy to remove without leaving any residue.

Closure systems without **liners** are preferred. If necessary, **EVA** or **TPE** liners should be used.

From 2024 onwards, the adhesion of the closure (according to Article 6, 2019/904/EC) must be guaranteed for the time of intended use for beverage containers up to 3 litres.
- ✓** If a sealing and other components made of silicone are necessary, they should have a density < 1 g/cm³ to enable separation in the sorting process.
- ✗** Components made of metal, aluminium-containing materials (with a layer thickness > 5 µm), **du-roplast**, **PS**, **POM** and **PVC** are considered interfering materials, as they interfere with the sorting and reprocessing of the material and can damage extruders and equipment, among other things.

This also applies to non-removable sealing films or silicones, glass and metal springs of pump systems or materials with a density > 1 g/cm³.



WPO
WORLD
PACKAGING
ORGANISATION

10 TRANSLATIONS NOW AVAILABLE



German



Arabic



Spanish



Portuguese



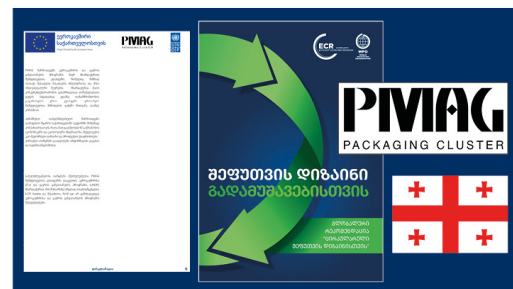
English



Thai



Czech



Georgian



Hungarian



Latvian

Better quality of life, through better packaging, for more people



WPO
WORLD
PACKAGING
ORGANISATION

Waste Stream Mapping Tools – 27 countries



WPO
WORLD
PACKAGING
ORGANISATION

WASTE STREAM MAPPING TOOLS

27 COUNTRIES



WPO
WORLD
PACKAGING
ORGANISATION



AUSTRALIA



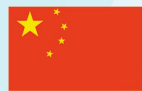
AUSTRIA



BELGIUM



BRAZIL



CHINA



CZECHIA



DENMARK



FINLAND



FRANCE



GERMANY



GREECE



HUNGARY



IRELAND



ISRAEL



ITALY



JAPAN



LUXEMBOURG



NETHERLANDS



NEW ZEALAND



RUSSIA



SINGAPORE



SPAIN



SWEDEN



SWITZERLAND



UNITED KINGDOM



UNITED STATES OF AMERICA



VANUATU

Waste Stream Mapping Tools – 27 countries

WASTE STREAM MAPPING TOOLS



VANUATU

Packaging waste streams Vanuatu (Port Vila)		
Composite beverage carton		X
Paper		X
Aluminium		~
Tin plate		X
Glass		~
PS	rigid	X
	flexible	X
PVC	rigid	X
	flexible	X
PE	rigid	X
	flexible	X
PP	rigid	X
	flexible	X
PET	blow moulded	X
	thermoformed	X
	flexible	X

Legend	Rating	Description
Packaging waste stream infrastructure available	✓	There is an area-wide collection of the material (> 50%)
limited available	~	The material is collected in some regions or municipalities, but the total amount is 10-50%
not available	X	In this country is no waste stream for that material available or the collected waste amount for that material is < 10%
No information	n.i.	No information is available for this country at the time. There will be further research.

According to Plastic Recyclers Europe
For further information, please contact:



CHINA

Packaging waste streams China		
Composite beverage carton		~
Paper		~
Aluminium		✓
Tin plate		n.i.
Glass		~/✓
PS	rigid	~
	flexible	~
PVC	rigid	~
	flexible	~
PE	rigid	~
	flexible	~
PP	rigid	~
	flexible	~
PET	blow moulded	✓
	thermoformed	~
	flexible	~

Legend	Rating	Description
Packaging waste stream infrastructure available	✓	There is an area-wide collection of the material (> 50%)
limited available	~	The material is collected in some regions or municipalities, but the total amount is 10-50%
not available	X	In this country is no waste stream for that material available or the collected waste amount for that material is < 10%
No information	n.i.	No information is available for this country at the time. There will be further research.

According to Plastic Recyclers Europe
For further information, please contact: info@worldpackaging.org



ITALY

Packaging Waste Streams Italy		Industrial Packaging Waste Streams
Composite beverage carton	✓	✓
Paper	✓	✓
Aluminium	✓	✓
Tin plate	✓	✓
Glass	✓	✓
PS	rigid	✓
	flexible	~
PVC	rigid	X
	flexible	X
PE	rigid	✓
	flexible	✓
PP	rigid	✓
	flexible	✓
PET	blow moulded	✓
	thermoformed	✓
	flexible	~

¹ In Italy, some technical specifications have been established to define what kind of packaging can be recycled and the quality of the secondary material from the recycling (e.g. colours, material density, metallisation, etc.)



27 COUNTRIES

Australia • Austria • Belgium • Brazil • China • Czechia • Denmark • Finland • France • Germany • Greece • Hungary • Ireland • Israel • Italy • Japan • Luxembourg • Netherlands • New Zealand • Russia • Singapore • Spain • Sweden • Switzerland • United Kingdom • United States of America • Vanuatu



Sustainable Packaging Special Award



WORLDSTAR
SUSTAINABLE PACKAGING
SPECIAL AWARD
WINNERS 2023

2023 WORLDSTAR SUSTAINABLE PACKAGING AWARD WINNERS

GOLD



Sugarcane pulp hot and cold cup lids

BioPak



AUSTRALIA

SILVER



SeaStretch the first manual stretch wrap made of paper

Raja



NORWAY

BRONZE



Coca-Cola label-free PET bottle

Coca-Cola Tokyo Research & Development



JAPAN

Better quality of life, through better packaging, for more people

SILVER



SeaStretch the first manual stretch wrap made of paper

Raja



NORWAY

- First Paper Manual Stretch Wrap.
- Easily Recycled Sustainable Wrap.
- Eco-Friendly Alternative to Plastic for Shipping and Storage.
- Creped Paper for Flexibility, Stretch, and Tear Resistance.
- PEFC-Certified Kraft Paper Pallet Wrap.
- Sticky Inner Layer for Support, Protection, and Cleanliness.

Extended Shelf Life and Food Safety



LifeSpan Copper Based Film developed by Amcor Chile and Copperprotek.

- Smart packaging with copper microparticles added to film resin.
- Inherits copper properties, reducing microorganism growth.
- Extends product shelf life by up to 250%.
- Significant reduction in food waste.
- Collaboration between Amcor Flexibles Chile and CopperProtek.

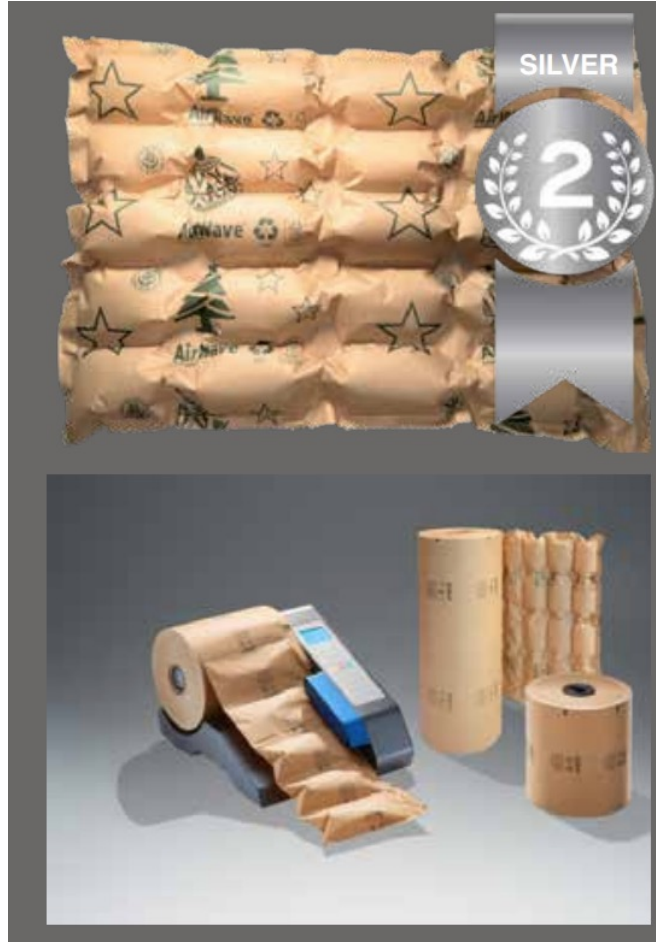
Personalization and Branding



Every bird is special as they are developed by Pyroll Packaging Group Ltd.

- Consumer-Designed Lids: Consumers design paper lids.
- Art Showcase: Selected designs featured online.
- Pyroll Partnership: Collaborative customization.
- Supporting Children: Sales margin aids kids' skills.
- Sustainability & Brand Boost: Paper lids enhance Arla.

E-commerce Packaging



*AirWave PaperWave developed by
Flöter Verpackungs-Service GmbH.*

- Sustainability & Protection: FSC® (C162510) certified, 100% recycled paper.
- Energy & Emissions Savings: Produced at packing station, reducing energy and CO2 during transport.
- Minimal Material: Comprises 5% material and 95% air.
- Consumer-Friendly: Easily recognizable as paper (visually, tactilely, PAP22).
- Marine-Friendly Decomposition: Biodegrades in less than 90 days, leaving no residue in the sea.

Closing remarks

- WPO & WorldStar Awards acknowledge evolving packaging trends.
- Awarded packages exemplify sustainability, functionality, consumer experience, and brand impact.
- The packages mentioned present the efforts that the industry has been making in this line, always connected with the basic functions of packaging: to protect, preserve, transport and inform.
- These trends not only shape the future of packaging but also contribute to a more responsible and innovative industry that addresses the evolving needs and expectations of consumers and the environment alike.

