

The SUEZ.circpack®

DESIGN FOR RECYCLING GUIDELINES

for packaging



Design for Recycling



Packaging has multiple functions. A very important role is to **protect & preserve** the product during the product's lifecycle. The packaging is also used to **communicate** with the consumer and **provide essential information**.

Having performed its primary functions, **packaging inevitably becomes waste**.

The highest impact of packaging's **ecological footprint** comes from its **production** and the **used materials**. As these used **resources are limited**, it becomes more and more **important** to give these materials a **circular life**.

Sustainable plastic packaging will ultimately be circular: containing recycled raw materials for production AND being fully recyclable. In order to achieve this, the wasted materials will have to follow a **recycling route** which ensures high quality reuse of the materials.

Enabling the recycling of packaging does not start at the end of its life, but right at the beginning. The design phase is the most essential moment to take recycling into account.

These guidelines will assist you to ensure that the packaging you design can be recycled.

As technologies are evolving, this guideline is a living document, and will be updated regularly.

Let's give packaging a second life. Let's design for recycling!

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6. Summary

HOW WE CAN ASSIST

SUEZ is one of the world's biggest companies in the waste management sector. We have insights and hands-on experience in collection, sorting, reprocessing and recycling of packaging. On top of this we are also active in licensing & certification.

We love to share our knowledge to complete the circle, to give packaging a second life, to save our resources and to protect our planet.

We are ready for the Resource Revolution!



Our Vision

SUEZ.circpack[®] is an internationally active consulting service of SUEZ, specialized in circular packaging and recyclability. Our main services are:

- ❖ **Workshop & visit: DISCOVER** the world of recycling. Visit a sorting installation for household packaging and learn the essentials of recycling and design for recycling in a half day workshop.
- ❖ **Dedicated research:** make your question our challenge. From a basic operational sorting test up to dedicated lab-research or desk studies, all types of research are part of our **EXPLORE** service
- ❖ **Help in packaging design:** Let's **CO-CREATE** new packaging. With our combination of theoretical and operational knowledge we support you in the design of new packaging in order to ensure its recyclability.

CERTIFY: certification of recyclability

On top of the services above, we offer **CERTIFY**. Based on a clear methodology, the recycling percentage of a packaging will be assessed and officially certified. This certification can serve as a mean to prove the recyclability of a packaging towards EPR systems and can be used in communication with consumers.

SUEZ.circpack[®] is proud to be an accredited certifying body of RecyClass for plastic based packaging. This partnership lead to co-development of the guidelines, test protocols, scoring mechanism and the certification protocol.

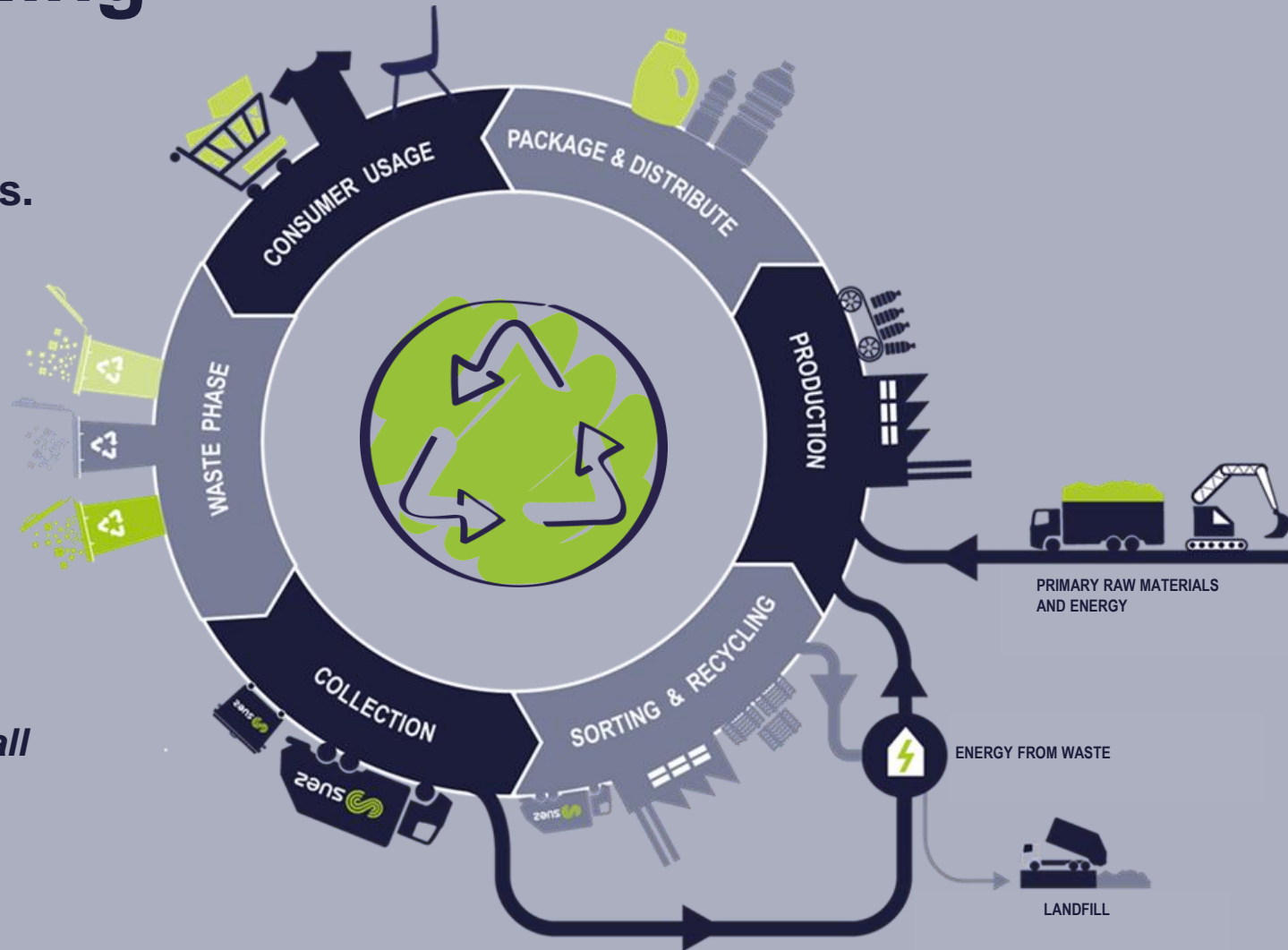
Essential steps in recycling

We believe that recyclability only exists when it is part of our day-to-day operations.

So, before we consider a packaging to be 'recyclable', four ESSENTIAL STEPS IN RECYCLING have to be met:

1. Collection
2. Sorting
3. Reprocessing
4. Application

Only if a packaging (or its materials) can follow all these steps, we consider it to be recyclable.



Steps in recycling

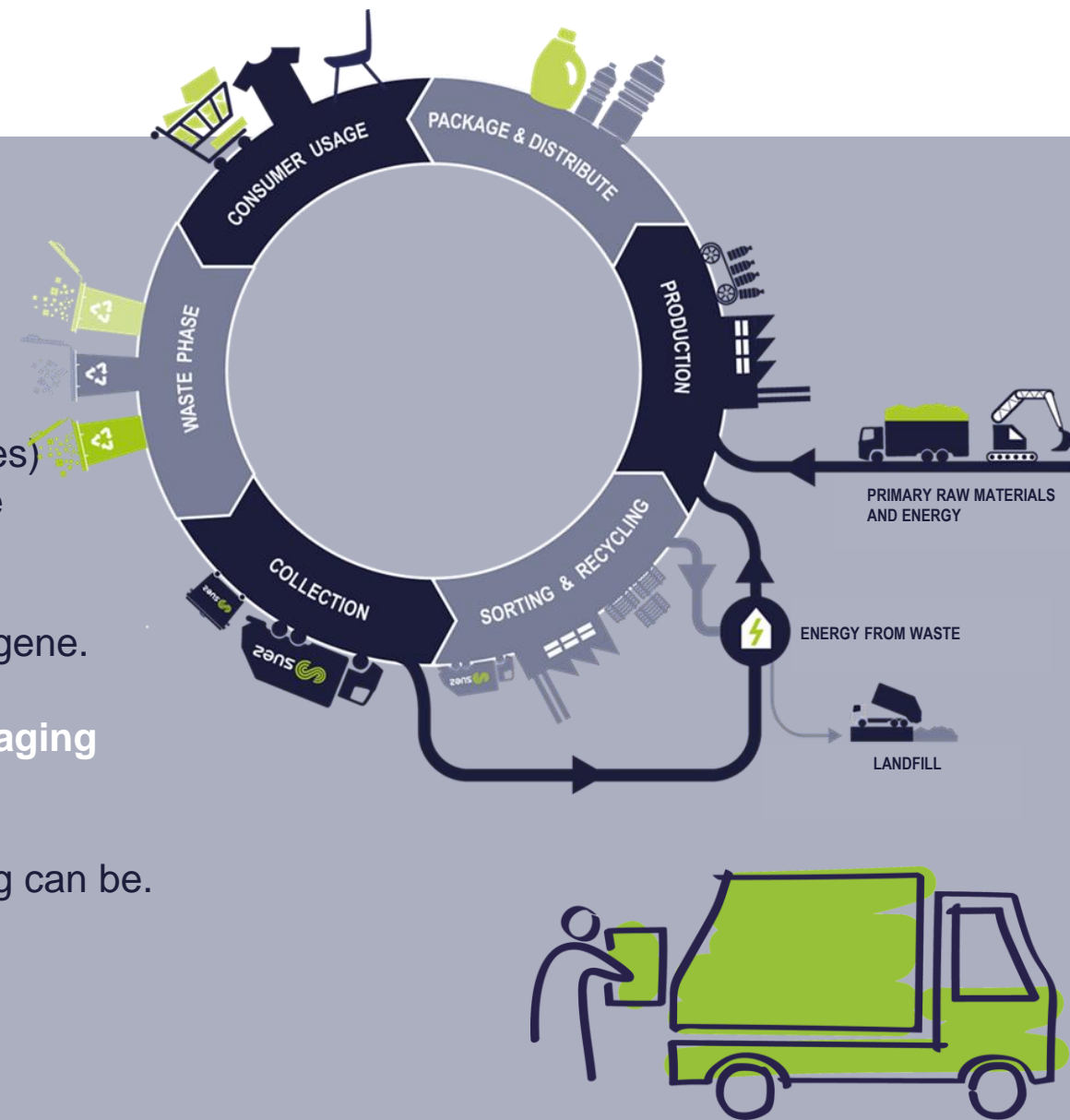
4 COLLECTION

- In most Western- European countries, household packaging is collected separately from paper-, residual- and organic-waste.
- For the collection of special waste streams (soda bottles, batteries) local deposit systems can be in place. Consumers can return the used product or packaging for recycling.
- The collection of Business to Business waste is often less homogeneous.

! Inform the consumer WHERE and HOW to dispose the packaging

- The better the packaging can get emptied the better the recycling can be.

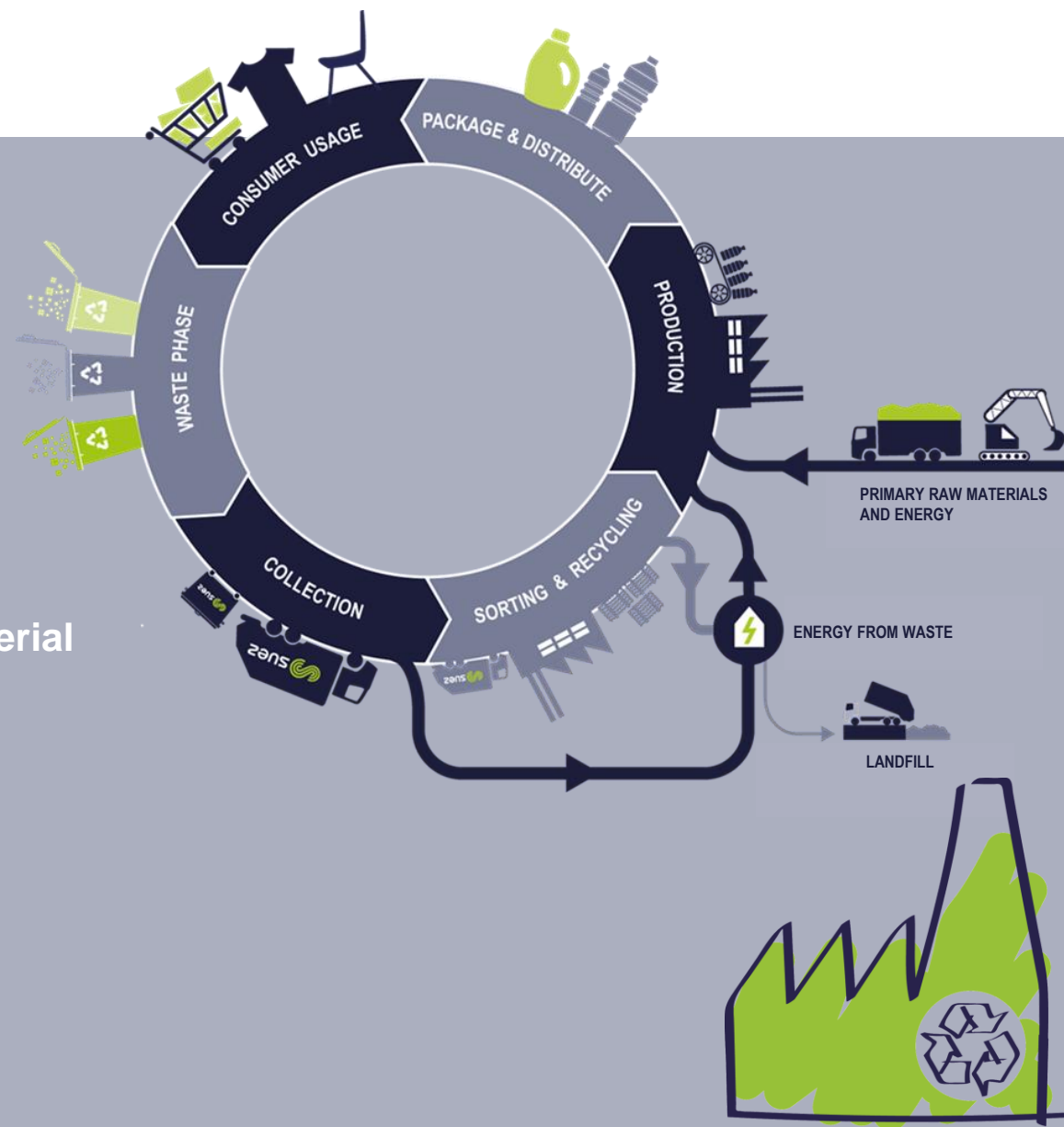
! Optimise the shape of the packaging for easy emptying



Steps in recycling

2 SORTING

- One of the first steps in the sorting process of **household packaging waste** is, to sort the material by size.
! Small items (<2 cm) will not be recycled
- Infra-red scanners **detect** the used type of material.
! Make sure that the scanners can identify the main used material
- The most **common materials** that are sorted, are *PP, PE, PET, Aluminium, Tin* and *Beverage cardboards*.
! Please use the commonly sorted & recycled materials



Steps in recycling

3 RECYCLING

At the plastic recycler the material gets shredded and washed.
! Make sure that labels and glues can be washed off.

The packaging will now pass through a sink-float-tank to separate types of plastics based on their different densities.

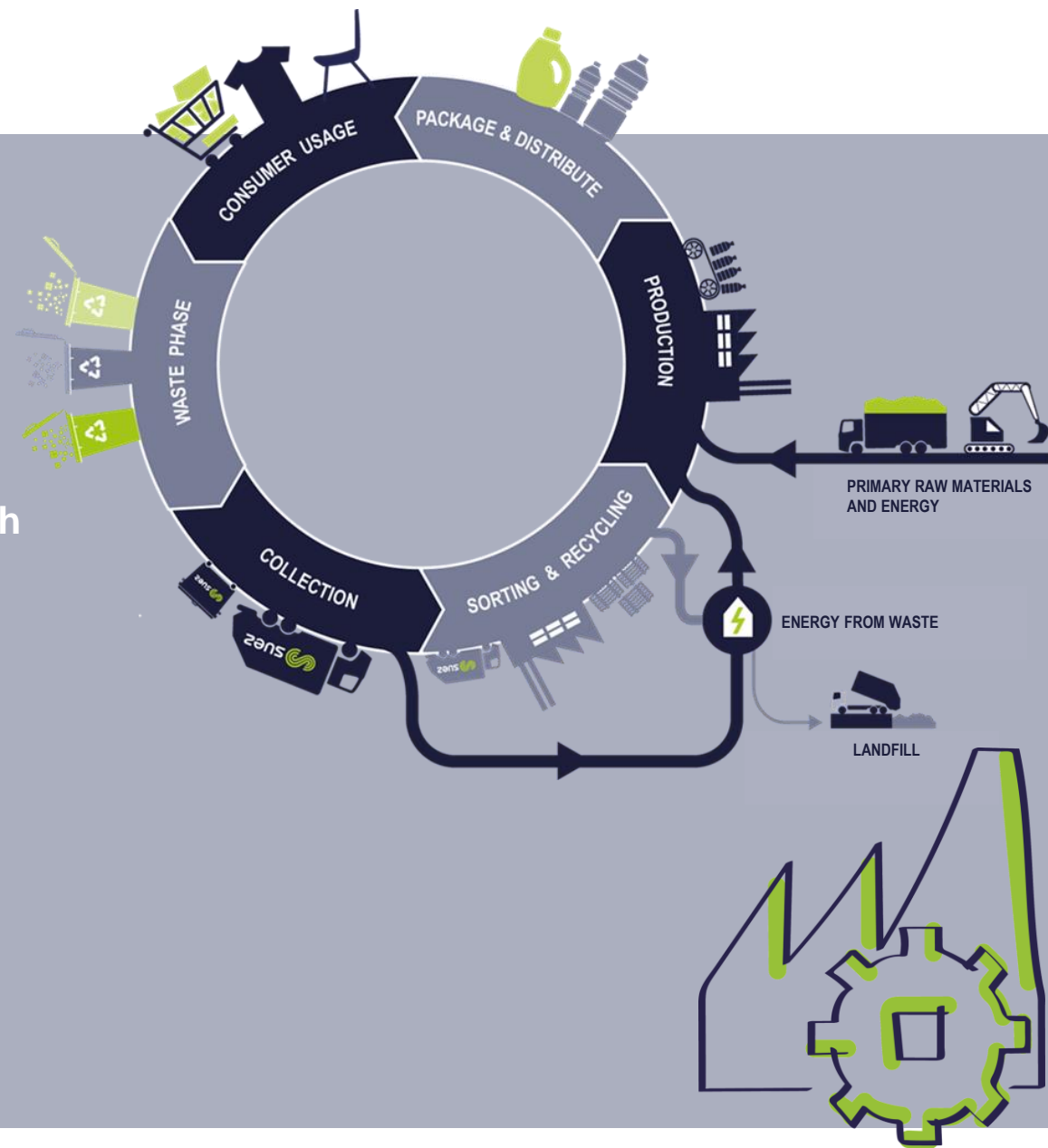
! Make sure that you do not use different kind of materials with alike density to prevent contamination

There are substances which are hazardous for the recycling because they contaminate the plastics and can obstruct recycling process (e.g. silicone)

! Do not use material which will obstruct the reprocessing

For the reusability of plastics it's important to limit colourisation.

! Use transparent and light coloured plastics



Steps in recycling

ADDITIONAL DESIGN QUESTIONS

Which requirements does the packaging have to meet:

- ✓ Are all these requirements still essential?
- ✓ Can these requirements be rethought?

Which different packaging can meet these requirements:

- ✓ Is it possible to replace a mixture of materials with mono-material?
- ✓ Can you use a lighter colour or transparent packaging?
- ✓ Is it possible to change the shape of the packaging to make it more easy to empty?
- ✓ Do you really need such a long shelf life?

Search for optimization potential:

- ✓ Can we use a label made from the same material as the packaging?
- ✓ Can the label be smaller?
- ✓ How can we make sure, that all materials will get separated (in households or at the latest during the sorting process)?



Questions to answer...

DESIGN FOR RECYCLING GUIDELINES

DESIGN GUIDELINES

On the following pages you will find an overview of different types of materials used in packaging.

For each material, we provide you with details on:

1. **Fully compatible** materials, which can be **fully recycled**,
2. **Limited compatible** materials, which can **not be recycled**, but will not hinder the recycling of recyclable materials in the packaging
3. **Low or non-compatible** materials, that can **not be recycled** & will **also obstruct** the recycling of the recyclable materials in the packaging





DESIGN GUIDELINES

PET bottles

BOTTLE BODY:

- transparent or clear, not printed
- PET monomaterial



CAP:

- use PE or PP
(density < 1g/cm³)

SLEEVE:

- Density < 1g/cm³
→ PE or PP
- smaller than 50%
of the surface



PET Bottles

Transparent Clear and light-blue

DESIGN GUIDELINES

	Yes! ☺	Conditional ☹	No ☹
	Full compatibility for reprocessing	Limited compatibility for reprocessing	Low (or no) compatibility for reprocessing
Main Material Bottle	PET		PLA; PVC; PS; PETG
Size			< 4 cm (compacted); > 5 liter content
Colours	Transparent light colours	Transparent dark colours	Opaque; Fluorescence; Metallic.
Barrier	SiOx plasma coating.	Carbon plasma-coating; PA multilayer with <5wt% PA and no tie layers; PGA multilayer; PTN alloy.	PA multilayer with >5wt% PA or tie layers; Monolayer PA blend; EVOH.
Additives		UV stabilisers; Acetaldehyde (AA) blockers; Optical brighteners; Oxygen scavengers;	Bio-/oxo-/photodegradable additives; Nanocomposites
Closure Systems	PE (with density <1 g/cm ³); PP (with density <1 g/cm ³);		Materials and blends with density >1 g/cm ³ (e.g. highly filled PE, metals,...); Non-detaching or welded closures.
Liners, Seals and Valves	All with a density < 1 g/cm ³ : - PE; PE + EVA; PP.	Silicone with density <0.95g/cm ³ Foamed PET	Materials with density >1 g/cm ³ (e.g. PVC, silicone, metals)
Labels	Labels in PE; PP; OPP (all with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PET-polymer. * indication label size of bottles > 500 ml: < 70% coverage * indication label size of bottles ≤ 500 ml: < 50% coverage	Labels in EPS, foamed PET or foamed PETG, LDPET (all with density < 1 g/cm ³) with a size... Labels in other materials (all with density <1 g/cm ³) with a size that does not hinder the recognition of the underlying PET-polymer; Lightly metallized labels; Paper labels without fibre loss	Labels which hinder the recognition of the underlying PET-polymer (e.g. too large, metallised, heavily inked); Labels with density >1 g/cm ³ (e.g. PVC; PS; PET; PETG; PLA); Non-detaching or welded labels; Paper labels with fibre loss Foamed PETG labels (even with density <1 g/cm ³); PET labels with washable inks
Sleeves	Sleeves in PE; PP; OPP (all with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PET-polymer * Indication sleevesize of bottles > 500 ml: < 70% coverage * Indication sleevesize of bottles ≤ 500 ml: < 50% coverage	Sleeves in EPS; foamed PET or foamed PETG (all with density <1 g/cm ³) which do not hinder the recognition of the underlying PET-polymer INTERIM: Twin-perforated sleeves for household personal care conform guidelines by EPBP	Sleeves which hinder the recognition of the underlying PET-polymer (e.g. too large, metallised, heavily inked); Sleeves with density >1 g/cm ³ (e.g. PVC; PS; PET; PETG); Foamed PETG sleeves (even with density <1 g/cm ³); PET sleeves with washable inks
Tamper Evidence Wrap	PE; PP; OPP; (all with density <1 g/cm ³)	EPS, Foamed PET or foamed PETG (with density <1 g/cm ³)	Materials with density >1 g/cm ³ (e.g. metal; PVC; PS; PET, PETG); Metallised materials.
Adhesives for labels	Alkali/water soluble and alkali/water releasable adhesives at 60-80°C without reactivation Water or alkali soluble and/or water-releasable? in 60-80 °C	Hot-melts; Pressure-sensitive labels.	Non-soluble in water or alkaline at 60-80°C; Non-releasable in water or alkaline at 60-80°C Adhesives non-soluble in water or alkaline at 60-80°C
Inks	Non-toxic (according to EUPIA guidelines)		Inks that bleed; Toxic or hazardous inks; Metallic inks
Direct Printing	Laser marked print;	Printed production or expiry date	Any other direct printing
Other Components	Base cup, handles or other components which are separated by grinding and float/sink - all with density <1 g/cm ³ ; Unpigmented PET		Materials with density >1 g/cm ³ (e.g. metal, RFID tags); Non detaching or welded components Coloured PET.



PET Bottles

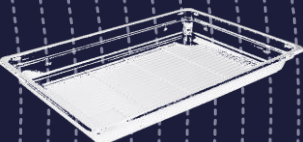
Transparent Coloured

DESIGN GUIDELINES

	Yes! ☺ Full compatibility for reprocessing	Conditional ☹ Limited compatibility for reprocessing	No ☹ Low (or no) compatibility for reprocessing
Main Material Bottle	PET		PLA; PVC; PS; PETG
Size			< 4 cm (compacted); > 5 liter content
Colours	Transparent light colours	Transparent dark colours	Opaque; Fluorescence; Metallic.
Barrier	SiOx coating; Carbon plasma-coating; PA multilayer with <5wt% PA and no tie layers; PTN alloy.	EVOH multilayer with <3 wt%; EVOH and no tie layers; PA multilayer with <5wt% PA including tie layers; Monolayer PA-blend; PGA multilayer.	EVOH multilayer with >3wt% EVOH or EVOH tie layers. PA multilayer with >5wt% PA or tie layers;
Additives		UV stabilisers; Acetaldehyde (AA) blockers; Optical brighteners; Oxygen scavengers;	Bio-/oxo-/photodegradable additives; Nanocomposites.
Closure Systems	PE (with density <1 g/cm³); PP (with density <1 g/cm³);		Materials and blends with density >1 g/cm³ (e.g. highly filled PE, metals,...); Non-detaching or welded closures.
Liners, Seals and Valves	PE, PE + EVA, PP (all with a density < 1 g/cm³).	Silicone with density <0.95g/cm³ Foamed PET	Materials with density >1 g/cm³ (e.g. PVC, silicone, metals)
Labels	Labels in PE; PP; OPP (all with density <1 g/cm³), with a size that does not hinder* the recognition of the underlying PET-polymer * Indication labelsize of bottles > 500 ml: < 70% coverage * Indication labelsize of bottles ≤ 500 ml: < 50% coverage	Labels in EPS, foamed PET, LDPE (all with density <1 g/cm³) with a size that does not hinder the recognition of the underlying PET-polymer; Lightly metallized labels Paper labels without fibreloss	Labels which hinder the recognition of the underlying PET-polymer (e.g. too large, metallised, heavily inked); Labels with density >1 g/cm³ (e.g. PVC; PS; PET; PETG; PLA); Non-detaching labels or welded labels; Paper labels with fibreloss; Foamed PETG labels (even with density < 1 g/cm³) PET labels with washable inks
Sleeves	Sleeves in PE; PP; OPP (all with density <1 g/cm³), with a size that does not hinder* the recognition of the underlying PET-polymer * Indication sleevesize of bottles > 500 ml: < 70% coverage * Indication sleevesize of bottles ≤ 500 ml: < 50% coverage	Sleeves in EPS; foamed PET or foamed PETG (all with density <1 g/cm³) which do not hinder the recognition of the underlying PET-polymer INTERIM: Twin-perforated sleeves for household personal care conform guidelines by EPBP	Sleeves which hinder the recognition of the underlying PET-polymer (e.g. too large, metallised, heavily inked); Sleeves with density >1 g/cm³ (e.g. PVC; PS; PET; PETG); Foamed PETG sleeves (even with density < 1 g/cm³) PET sleeves with washable inks
Tamper Evidence Wrap	PE; PP; OPP; (all with density <1 g/cm³)	EPS, Foamed PET or foamed PETG (with density <1 g/cm³)	Materials with density >1 g/cm³ (e.g. metal; PVC; PS; PETG); Metallised materials. PET with washable inks
Adhesives for labels	Alkali/water soluble and alkali/water releasable adhesives at 60-80°C without reactivation Water or alkali soluble and/or water-releasable in 60-80 °C	Hot-melts; Pressure-sensitive labels.	Non-soluble in water or alkaline at 60-80°C; Non-releasable in water or alkaline at 60-80°C Non-soluble adhesives (or non-water-releasable) in water or alkaline at 60-80°C
Inks	Non-toxic (according to EUPA guidelines)		Inks that bleed; Toxic or hazardous inks.
Direct Printing	Laser marked print;	Printed production or expiry date	Any other direct printing
Other Components	Base cup, handles or other components which are separated by grinding and float/sink - all with density <1 g/cm³; Transparent PET (clear or light colours) /	Transparent PET (dark colours)	Materials with density >1 g/cm³ (e.g. metal, RFID tags); Non-detaching or welded components;



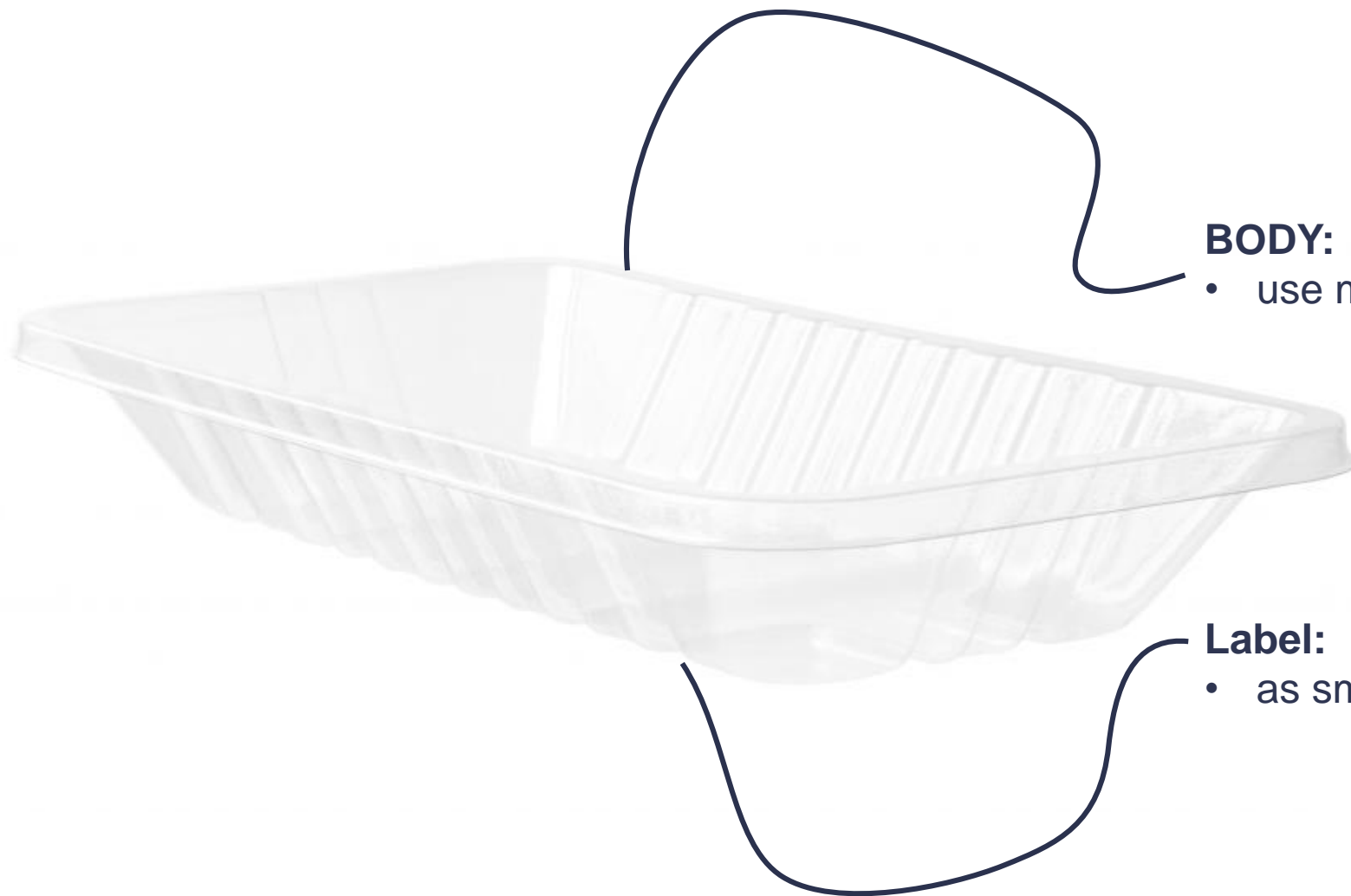
DESIGN GUIDELINES



PET
trays

Transparent clear

15 l



BODY:

- use monolayer material

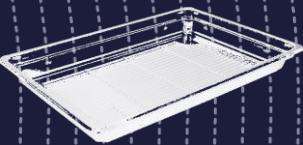
Label:

- as small as possible



DESIGN GUIDELINES

	Yes! ☺ Full compatibility for reprocessing	Conditional ☹ Limited compatibility for reprocessing	No ☹ Low (or no) compatibility for reprocessing
Main Material	PET		Any PET based multilayer material including PET/PE; PLA; PVC; PS; PETG; C-PET; PET-GAG; Expanded PET
Colours	Transparent clear; Transparent light blue.		Opaque; Other transparent colours; Metallic; Opaque;
Barrier	PET based oxygen scavenger <u>without</u> yellowing effect after EPBP oven test.	PET based oxygen scavenger <u>with limited</u> yellowing effect after EPBP oven test.	EVOH; PA; any other barrier; any other oxygen scavenger.
Additives	Silicone surface coating (on coating area); Antiblocking masterbatch (max 3%).	UV stabilisers; AA blockers; optical brighteners; antiblocking masterbatch (> 3%); anti-stat agents; antiblocking agents; anti-fogging agents (on coating area)	Bio/Oxo/Photodegradable additives; Nanocomposites
Closure Systems: Lidding films	Unprinted PET; Lidding made from PE, PP, OPP with density < 1 g/cm ³ and easily removal from the tray and without glue residuals; foamed PET		Any other film
Labels	Labels in PE; PP; OPP (all with density <1 g/cm ³ and also in the more heavily prin), with a size that does not hinder* the recognition of the underlaying PET-polymer * Indication labelsize of bottles > 500 ml: < 70% coverage * Indication labelsize of bottles ≤ 500 ml: < 50% coverage Plastic labels made from PE, PP or OPP with density < 1 g/cm ³ (also in more heavily printed and glued area's) Labelsize of packaging > 500 ml: < 70% coverage Labelsize of packaging ≤ 500 ml: < 50% coverage	BPA-free paper labels without fibreloss during recycling process	Plastic labels with density > 1 g/cm ³ (also in more heavily printed and glued area's); Paper labels with fibreloss during recycling process; Paper labels containing BPA.
Label Adhesives	100% removable adhesives leaving no adhesive residuals on flakes at 70°C.	100% removable adhesives leaving no adhesive residuals on flakes at 85°C.	All other adhesives
Adhesives on other parts than lidding film and labels	Alkali/water soluble and alkali/water releasable adhesives at 60-80°C without reactivation Water or alkali soluble at 60-80°C		Any other adhesive
Inks	Non toxic following the EuPIA Guidelines		Inks that bleed; Toxic or hazardous inks.
Direct Printing	Laser marked;	Production or best-before date.	Any other direct printing
Other Components	Inserts in HDPE / LDPE / PP like Soaker pads, bubble pads (all inserts should be completely removable, leave no traces and have a density of <1,0 g/cm ³)	Paper & cardboard not loosing fibres	PVC / PS / EPS / PU / PA; Thermoset plastics; Metals; Paper & cardboard loosing fibres.



PET
trays
Transparent Clear

DESIGN GUIDELINES

PP
rigids

BODY:

- use PP monomaterial



CAP:

- use PE or PP (density < 1g/cm³)

ADDITIVES:

- don't use density changing additives



DESIGN GUIDELINES

PP
rigids
Natural

	Yes! ☺ Full compatibility for reprocessing	Not conflicting ☹ Limited compatibility for reprocessing	No ☹ Low (or no) compatibility for reprocessing
Main Material	PP		Multilayers PP with PLA; PVC; PS; PET; PETG
Size		Items compacted < 5 cm	Items compacted < than 2 cm;
Colours	Natural (clear)	Light colours	Black Inner layer; Black; Carbon Black; Other dark colours
Barrier			- EVOH; - PA; - PVDC; - Aluminium
Additives			Additives changing the material density > 1g/cm ³
Closure Systems	PP	- HDPE; LDPE; LLDPE; MDPE; - PET; PETG; PS; PLA (all with a density >1g/cm ³).	- Non-PO and/or foams with density <1g/cm ³ ; - Aluminium; Metal; - PVC
Liners, Seals and Valves	PP	- HDPE; LDPE; LLDPE; MDPE; - PET, PETG, PS, PLA (all with a density >1g/cm ³). - Removable aluminium fasteners	- Non-PO and/or foams with density <1g/cm ³ ; - Aluminium; Metal; - Foiled paper; - PVC
Labels	Labels in PP (all with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PP-polymer. * indication label size of bottles > 500 ml: < 70% coverage * indication label size of bottles ≤ 500 ml: < 50% coverage	- Labels in PE (with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PP-polymer; - Labels in PET, PETG, PS, PLA (all with density >1 g/cm ³) which do not hinder* the recognition of the underlying PP-polymer; - Labels in Paper which do not hinder* the recognition of the underlying PP-polymer and without fibre loss during the recycling process; - PO-foamed labels * indication label size of bottles > 500 ml: < 70% coverage * indication label size of bottles ≤ 500 ml: < 50% coverage	- Labels that hinder the recognition of the PP; - Paper labels with fibre loss during recycling process; - Aluminium; - Metalised labels; - Non-PO foamed labels; - PVC
Sleeves	Sleeves in PP (with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PP-polymer * Indication sleevesize of bottles > 500 ml: < 70% coverage * Indication sleevesize of bottles ≤ 500 ml: < 50% coverage	- Sleeves in PP (with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PE-polymer; - Sleeves in PET, PETG, PS, PLA (all with density >1 g/cm ³) which do not hinder* the recognition of the underlying PE-polymer. * Indication sleevesize of bottles > 500 ml: < 70% coverage * Indication sleevesize of bottles ≤ 500 ml: < 50% coverage	Sleeves that hinder the recognition of the PE; Sleeves in non PO-materials with density <1 g/cm ³ ; Aluminium; Metalised Sleeves; Heavily inked sleeves; PVC
Adhesives for labels	Water soluble or water releasable adhesive (@ less than	Pressure sensitive labels	Non water soluble or water releasable adhesives;
Inks	Non toxic following the EuPIA Guidelines		Inks that bleed; Toxic or hazardous inks.
Direct Printing	Laser marked; Production or best-before date		Any other direct printing
Other Components	PP	PE with density <1 g/cm ³ ; PET; PETG; PS; PLA all with density >1 g/cm ³	Aluminium; PVC; Glass components; Non-PO and /or foams with density < 1 g/cm ³



DESIGN GUIDELINES

PP
rigids
Coloured

	Yes! ☺ Full compatibility for reprocessing	Not conflicting ☺ Limited compatibility for reprocessing	No ☹ Low (or no) compatibility for reprocessing
Main Material	PP		Multilayers PP with PLA; PVC; PS; PET; PETG
Size		Items compacted < 5 cm	Items compacted < than 2 cm;
Colours	All colours	Black inner layer	Black; Carbon black
Barrier		EVOH ≤ 1%	- EVOH > 1%; - PA; - PVDC; - Aluminium
Additives			Additives changing the material density > 1g/cm ³
Closure Systems	PP	- HDPE; LDPE; LLDPE; MDPE; - PET; PETG; PS; PLA (all with a density >1g/cm ³).	- Non-PO and/or foams with density <1g/cm ³ ; - Aluminium; Metal; PVC
Liners, Seals and Valves	PP	- HDPE; LDPE; LLDPE; MDPE; - PET, PETG, PS, PLA (all with a density >1g/cm ³). - Removable aluminium fasteners	- Non-PO and/or foams with density <1g/cm ³ ; - Aluminium; Metal; - Foiled paper; PVC
Labels	Labels in PP (all with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PP-polymer. * indication label size of bottles > 500 ml: < 70% coverage * indication label size of bottles ≤ 500 ml: < 50% coverage	- Labels in PE (with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PP-polymer; - Labels in PET, PETG, PS, PLA (all with density >1 g/cm ³) which do not hinder* the recognition of the underlying PP-polymer; - Labels in Paper which do not hinder* the recognition of the underlying PP-polymer and without fibre loss during the recycling process; - PO-foamed labels * indication label size of bottles > 500 ml: < 70% coverage * indication label size of bottles ≤ 500 ml: < 50% coverage	- Labels that hinder the recognition of the PP; - Paper labels with fibre loss during recycling process; - Aluminium; - Metalised labels; - Non-PO foamed labels; - PVC
Sleeves	Sleeves in PP (with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PP-polymer * Indication sleevesize of bottles > 500 ml: < 70% coverage * Indication sleevesize of bottles ≤ 500 ml: < 50% coverage	Sleeves in PP (with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PP-polymer; Sleeves in PET, PETG, PS, PLA (all with density >1 g/cm ³) which do not hinder* the recognition of the underlying PP-polymer. * Indication sleevesize of bottles > 500 ml: < 70% coverage * Indication sleevesize of bottles ≤ 500 ml: < 50% coverage	- Sleeves that hinder the recognition of the PP; - Sleeves in non PO-materials with density <1 g/cm ³ ; - Aluminium; - Metalised Sleeves; - Heavily inked sleeves; - PVC
Adhesives for labels	Water soluble or water releasable adhesive (@ less than 40°C)	Pressure sensitive labels	Non water soluble or water releasable adhesives;
Inks	Non toxic following the EuPIA Guidelines		Inks that bleed; Toxic or hazardous inks.
Direct Printing	Laser marked; Production or best-before date	Any other direct printing	
Other Components	PP	PE with density <1 g/cm ³ ; PET; PETG; PS; PLA all with density >1 g/cm ³	Aluminium; PVC; Glass components; Non-PO and /or foams with density < 1 g/cm ³



DESIGN GUIDELINES



pp
flexibles

BODY:

- use light and transparent colours
- don't use inks





pp
flexibles
Natural

DESIGN GUIDELINES

	Yes! ☺	Conditional ☺	No ☹
	Full compatibility for reprocessing	Limited compatibility for reprocessing	Low (or no) compatibility for reprocessing
Main Material	PP	multilayer PE/PP	any other polymer (ex. PET, PVC, etc.)
Colours	unpigmented; transparent	light colours; translucent colours	dark colours; black; carbon black
Barrier	barrier in the polymer matrix; SiOx and AlOx without additional coatings	EVOH (in polyolefin combination film); metalized layers without coatings	barrier layer PVC, PVDC, PA; any other barrier layer; foaming agents used as expandant chemical agents; aluminium
Additives			Bio-/oxo-/photodegradable additives; additives concentration > 0,97 g/cm ³
Closure Systems	PP	PE, PET, PETG, PS, PLA	metal, aluminium, PVC, non PO or foams with density < 1 g/cm ³
Liners, Seals and Valves	PP	PE, PET, PETG, PS, PLA, removable aluminium fasteners	metal, aluminium, PVC, foiled paper, non PO or foams with density < 1 g/cm ³
Labels	PP	PE, paper labels without fiberloss	metallized labels, any other; paper labels with fibreloss
Adhesives	Water soluble or water-releasable at less than 60°C		Adhesives non-soluble in water or non-releasable in water at less than 60°C
Inks	no inks	Non-toxic (according to EUPIA guidelines)	Inks that bleed; Toxic or hazardous inks
Direct Printing	Laser marked print; Printed production or expiry date	printing covering < 50%**	printing covering > 50%**
Other Attachments	PP	PE, PET, PETG, PS, PLA	metal, aluminium, PVC, paper, foams with density < 1 g/cm ³

**temporary solution



pp
flexibles
Coloured

DESIGN GUIDELINES

	Yes! ☺	Conditional ☺	No ☹
	Full compatibility for reprocessing	Limited compatibility for reprocessing	Low (or no) compatibility for reprocessing
Main Material	PP	multilayer PE/PP	any other polymer (ex. PET, PVC, etc.)
Colours	light colours; translucent colours	dark colours (NIR detectable)	Non-NIR detectable colours
Barrier	barrier in the polymer matrix; SiOx and AlOx without additional coatings	EVOH (in polyolefin combination film); metalized layers without coating	barrier layer PVC, PVDC, PA; any other barrier layer; foaming agents used as expandant chemical agents; aluminium
Additives			Bio-/oxo-/photodegradable additives; additives concentration > 0,97 g/cm ³
Closure Systems	PP	PE, PET, PETG, PS, PLA	metal, aluminium, PVC, non PO or foams with density < 1 g/cm ³
Liners, Seals and Valves	PP	PE, PET, PETG, PS, PLA, removable aluminium fasteners	metal, aluminium, PVC, foiled paper, non PO or foams with density < 1 g/cm ³
Labels	PP	PE, paper labels without fiberloss	metallized labels, any other; paper labels with fibreloss
Adhesives	Water soluble or water-releasable at less than 60°C		Adhesives non-soluble in water or non-releasable in water at less than 60°C
Inks	no inks; non-toxic (according to EUPIA guidelines)		Inks that bleed; Toxic or hazardous inks
Direct Printing	Laser marked print; Printed production or expiry date; printing covering < 50%**	printing covering > 50%**	
Other Attachments	PP	PE, PET, PETG, PS, PLA	metal, aluminium, PVC, paper, foams with density < 1 g/cm ³



DESIGN GUIDELINES



HDPE
rigids

BODY:

- use HDPE monolayer
- no carbon black colourisation



CAP:

- only use PP

LABELS:

- use labels from the same material (only PE)



HDPE
rigids
Natural

DESIGN GUIDELINES

	Yes! ☺ Full compatibility for reprocessing	Not conflicting ☹ Limited compatibility for reprocessing	No ☹ Low (or no) compatibility for reprocessing
Main Material	HDPE; Multilayer HDPE with other PE (LLDPE, LDPE, MDPE).		Multilayers HDPE with PLA; PVC; PS; PET; PETG
Size		Items compacted < 5 cm	Items (compacted) < than 2 cm;
Colours	Natural (clear);	Light colours	Black Inner layer; Black; Carbon Black; Other dark colours
Barrier	EVOH < 6.0%wt + 3.0% PE-g-MAH tie layers with MAH > 0.1%wt; Enkase (fluorination);	EVOH > 6.0%wt + 3.0% PE-g-MAH tie layers with MAH > 0.1%wt;	EVOH > 1% with any other tie layers; PA; PVDC; Aluminium
Additives			Additives changing the material density > 1g/cm ³
Closure Systems	HDPE; LDPE; LLDPE; MDPE	PP; PET; PETG; PS; PLA (all with a density >1g/cm ³).	Non-PO and/or foams with density <1g/cm ³ ; Aluminium; Metal; PVC
Liners, Seals and Valves	HDPE; LDPE; LLDPE; MDPE	PP; PET, PETG, PS, PLA (all with a density >1g/cm ³). Removable aluminium fasteners	Non-PO and/or foams with density <1g/cm ³ ; Aluminium; Metal; Foiled paper; PVC
Labels	Labels in HDPE, LDPE, LLDPE, MDPE (all with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PE-polymer. * indication label size of bottles > 500 ml: < 70% coverage * indication label size of bottles ≤ 500 ml: < 50% coverage	- Labels in PP (with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PE-polymer; - Labels in PET, PETG, PS, PLA (all with density >1 g/cm ³) which do not hinder* the recognition of the underlying PE-polymer. - Labels in Paper which do not hinder* the recognition of the underlying PE-polymer and without fibre loss during the recycling process - PO-foamed labels * indication label size of bottles > 500 ml: < 70% coverage * indication label size of bottles ≤ 500 ml: < 50% coverage	Labels that hinder the recognition of the PE; Paper labels with fibre loss during recycling process Metalised labels Non-PO foamed labels PVC
Sleeves	Sleeves in HDPE; LDPE; LLDPE; MDPE (all with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PE-polymer * Indication sleevesize of bottles > 500 ml: < 70% coverage * Indication sleevesize of bottles ≤ 500 ml: < 50% coverage	Sleeves in PP (with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PE-polymer; Sleeves in PET, PETG, PS, PLA (all with density >1 g/cm ³) which do not hinder* the recognition of the underlying PE-polymer. * Indication sleevesize of bottles > 500 ml: < 70% coverage * Indication sleevesize of bottles ≤ 500 ml: < 50% coverage Pressure sensitive labels	Sleeves that hinder the recognition of the PE; Sleeves in non PO-materials with density <1 g/cm ³ ; Aluminium; Metalised Sleeves; Heavily inked sleeves; PVC.
Adhesives for labels	Water soluble or water releasable adhesive (@ less than 40°C)		Non water soluble or non water releasable adhesives
Inks	Non toxic following the EuPIA Guidelines		Inks that bleed; Toxic or hazardous inks.
Direct Printing	Laser marked; Production or best-before date.		Any other direct printing
Other Components	HDPE, LDPE, LLDPE, MDPE	PP; PET; PETG; PS; PLA all with density >1 g/cm ³ .	Aluminium; PVC; Glass components; Foams with density < 1 g/cm ³ .



HDPE
rigids
Coloured

25 l

DESIGN GUIDELINES

	Yes! ☺ Full compatibility for reprocessing	Not conflicting ☹ Limited compatibility for reprocessing	No ☹ Low (or no) compatibility for reprocessing
Main Material	HDPE; Multilayer HDPE with other PE (LLDPE, LDPE, MDPE).		Multilayers HDPE with PLA; PVC; PS; PET; PETG
Size		Items compacted < 5 cm	Items (compacted) < than 2 cm;
Colours	All colours	Black inner layer	Black; Carbon black;
Barrier	EVOH < 6.0%wt + 3.0% PE-g-MAH tie layers with MAH > 0.1%wt; Enkase (fluorination);	EVOH > 6.0%wt + 3.0% PE-g-MAH tie layers with MAH>0.10wt%; EVOH <1% with any other tie layers; Metalisation.	EVOH > 1% with any other tie layers; PA; PVDC; Aluminium
Additives		Additives NOT changing the material density > 1 g/cm³	Additives changing the material density > 1g/cm³
Closure Systems	HDPE; LDPE; LLDPE; MDPE	PP; PET; PETG; PS; PLA (all with a density >1g/cm3).	Non-PO and/or foams with density <1g/cm3; Aluminium; Metal; PVC
Liners, Seals and Valves	HDPE; LDPE; LLDPE; MDPE	PP; PET, PETG, PS, PLA (all with a density >1g/cm3). Removable aluminium fasteners; Metalisation.	Non-PO and/or foams with density <1g/cm3; Aluminium; Metal; Foiled paper; PVC
Labels	Labels in HDPE, LDPE, LLDPE, MDPE (all with density <1 g/cm³), with a size that does not hinder* the recognition of the underlaying PE-polymer. * indication label size of bottles > 500 ml: < 70% coverage * indication label size of bottles ≤ 500 ml: < 50% coverage	- Labels in PP (with density <1 g/cm³), with a size that does not hinder* the recognition of the underlaying PE-polymer; - Labels in PET, PETG, PS, PLA (all with density >1 g/cm³) which do not hinder* the recognition of the underlaying PE-polymer. - Labels in Paper which do not hinder* the recognition of the underlaying PE-polymer and without fibre loss during the recycling process - Labels without fibre loss - PO-foamed labels. * indication label size of bottles > 500 ml: < 70% coverage * indication label size of bottles ≤ 500 ml: < 50% coverage	Labels that hinder the recognition of the PE; Paper labels with fibre loss during recycling process Metallised labels; Non-PO foamed labels; PVC
Sleeves	Sleeves in HDPE; LDPE; LLDPE; MDPE (all with density <1 g/cm³), with a size that does not hinder* the recognition of the underlaying PE-polymer * Indication sleevesize of bottles > 500 ml: < 70% coverage * Indication sleevesize of bottles ≤ 500 ml: < 50% coverage	- Sleeves in PP (with density <1 g/cm³), with a size that does not hinder* the recognition of the underlaying PE-polymer; - Sleeves in PET, PETG, PS, PLA (all with density >1 g/cm³) which do not hinder* the recognition of the underlaying PE-polymer. * Indication sleevesize of bottles > 500 ml: < 70% coverage * Indication sleevesize of bottles ≤ 500 ml: < 50% coverage	- Sleeves that hinder the recognition of the PE; - Sleeves in non PO-materials with density <1 g/cm³ ; - Aluminium; - Metallised sleeves; - Heavily inked sleeves - PVC
Adhesives for labels	Water soluble or water releasable adhesive (@ less than 100°C)	Pressure sensitive labels	Non water soluble or non water releasable adhesives
Inks	Non toxic following the EuPIA Guidelines		Inks that bleed; Toxic or hazardous inks.
Direct Printing	Laser marked; Production or best-before date.	Any other direct printing	
Other Components	HDPE, LDPE, LLDPE, MDPE	PP with density <1 g/cm³; PET; PETG; PS; PVC; PLA all with density >1 g/cm³.	Aluminium; PVC; Glass components; Non-PO and/or Foams with density < 1 g/cm³.



DESIGN GUIDELINES



LDPE
flexibles

BODY:

- use light and transparent colours
- don't use inks





LDPE
flexibles
Natural

DESIGN GUIDELINES

	Yes! ☺	Conditional ☹	No ☹
	Full compatibility for reprocessing	Limited compatibility for reprocessing	Low (or no) compatibility for reprocessing
Main Material	PE-LD, PE-LLD; PE-HD	multilayer PE/PP	any other polymer (ex. PET, PVC, etc.)
Colours	unpigmented; transparent	light colours; translucent colours	dark colours; black; carbon black
Barrier	barrier in the polymer matrix, SiOx and AlOx without additional coatings	< 5% EVOH (in polyolefin combination film); metalized layers; EcoLam High Plus; VO+ LLDPE	> 5% EVOH (in polyolefin combination film); barrier layer PVC, PVDC, PA; any other barrier layer; foaming agents used as expandant chemical agents; aluminium
Additives			Bio-/oxo-/photodegradable additives; additives concentration > 0,97 g/cm ³
Closure Systems	PE-LD, PE-LLD, PE-HD	PP, PET, PETG, PS, PLA	metal, aluminium, PVC, non PO or foams with density < 1
Liners, Seals and Valves	PE-LD, PE-LLD, PE-HD	PP, PET, PETG, PS, PLA, removable aluminium fasteners	metal, aluminium, PVC, foiled paper, non PO or foams with density < 1 g/cm ³
Labels	PE	PP, paper labels without fiberloss	metallized labels, any other; paper labels with fibreloss
Adhesives	Water soluble or water-releasable at less than 60°C		Adhesives non-soluble in water or non-releasable in water at less than 60°C
Inks	no inks	Non-toxic (according to EUPIA guidelines)	Inks that bleed; Toxic or hazardous inks.
Direct Printing	Laser marked print; Printed production or expiry date	printing covering < 50%**	printing covering > 50%**
Other Attachments	PE-LD, PE-LLD, PE-HD	PP, PET, PETG, PS, PLA	metal, aluminium, PVC, paper, foams with density < 1 g/cm ³

**temporary solution



LDPE
flexibles
Coloured

28 l

DESIGN GUIDELINES

	Yes! ☺ Full compatibility for reprocessing	Not conflicting ☺ Limited compatibility for reprocessing	No ☹ Low (or no) compatibility for reprocessing
General (according to DIN643)	natural fibre-based paper and board suitable for recycling;	Unwanted material (outthrows) max 1.5% Non-paper components, paper and board not according to grade definition, paper and board conflicting with production, paper not suitable for de-inking	Prohibited Material (any material which present a hazard for health, safety and environment, such as medical waste, contaminated products of personal hygiene, hazardous waste, organic waste including foodstuffs, bitumen, toxic powders and similar)
Main Material	Paper fibres	Polyolefins (PE, PP); Aluminium	Non-de-inking
Colours		Suitable for de-inking	Two-sided plastic coating or plastic laminate, if fibre content < country specific threshold
Coating & laminations	Without coating or lamination	One-sided plastic coating or plastic laminate, if fibre content is > the country specific threshold	Foil lined papers
Barrier		Coating	Insoluble adhesives; heavy foils; Latex/Hotmelt; Self-Adhesive; Polycoat Wax;
Labels and Adhesives	Hotmelts with a softening point > 68°C and layer thickness of > 120µm	Water soluble adhesives	Hotmelts with a softening point < 68°C
Additives	mineral filler (talc, kaolin, TiO ₂ , starch, calcium carbonate)		Wet strength agents, as far as fibre recovery and recycling is not proven; components of EuPIA
Inks		Non toxic following the EuPIA Guidelines	Inks that bleed; toxic or hazardous inks (Inks that are on the EuPIA exclusion list)

In a lot of countries combination of cardboard and plastic is not allowed in the collection system



DESIGN GUIDELINES



PS
polystyrene

BODY:

- use light and transparent colours
- just minimal printing





DESIGN GUIDELINES

Main Material
Colours
Closure Systems
Labels and Adhesives
Inks

Yes! 😊
Full compatibility for reprocessing
PS
Clear or lightly tinted colours
PS; OPS; PBT/PS; PS with PE insert; PS with EVA insert
PS; PS/OPS (same density as main material)

Not conflicting 😊
Limited compatibility for reprocessing
Opaque
Polyolefins, lightweight aluminium foil
Lightweight lidding films:
Metalized PET; metalized OPP; combi PET/light paper;
Polyolefin; Paper; IML
Non-PS-cover with
Packaging > 500 ml: < 70% coverage area and
Packaging ≤ 500 ml: < 50% coverage on surface;
Adhesives water soluble
Non toxic following the EuPIA Guidelines

No 😞
Low (or no) compatibility for reprocessing
Dark colorants with carbon black
Heavyweight aluminium foil;
Multilayers;
PET; PETG; PVC; Aluminium/steel;
PET; PETG; PVC; metalised labels;
Adhesives not soluble in water
Inks that bleed; toxic or hazardous inks

PS is only being recycled in a limited amount of countries



PS
polystyrene



DESIGN GUIDELINES



Paper & cardboard

BODY:

- use only paper
- water based inks





DESIGN GUIDELINES

	Yes! ☺	Not conflicting ☹	No ☹
	Full compatibility for reprocessing	Limited compatibility for reprocessing	Low (or no) compatibility for reprocessing
General (according to DIN643)	natural fibre-based paper and board suitable for recycling;	Unwanted material (outthrows) max 1.5% Non-paper components, paper and board not according to grade definition, paper and board conflicting with production, paper not suitable for de-inking	Prohibited Material (any material which present a hazard for health, safety and environment, such as medical waste, contaminated products of personal hygiene, hazardous waste, organic waste including foodstuffs, bitumen, toxic powders and similar)
Main Material	Paper fibres	Polyolefins (PE, PP); Aluminium	
Colours		Suitable for de-inking	Non-de-inking
Coating & laminations	Without coating or lamination	One-sided plastic coating or plastic laminate, if fibre content is > the country specific threshold	Two-sided plastic coating or plastic laminate, if fibre content < country specific threshold
Barrier		Coating	Foil lined papers
Labels and Adhesives	Hotmelts with a softening point > 68°C and layer thickness of > 120µm	Water soluble adhesives	Insoluble adhesives; heavy foils; Latex/Hotmelt; Self-Adhesive; Polycoat Wax; Hotmelts with a softening point < 68°C
Additives	mineral filler (talc, kaolin, TiO ₂ , starch, calcium carbonate)		Wet strength agents, as far as fibre recovery and recycling is not proven; components of EuPIA
Inks		Non toxic following the EuPIA Guidelines	Inks that bleed; toxic or hazardous inks (Inks that are on the EuPIA exclusion list)

In a lot of countries combination of cardboard and plastic is not allowed in the collection system

Paper
& cardboard



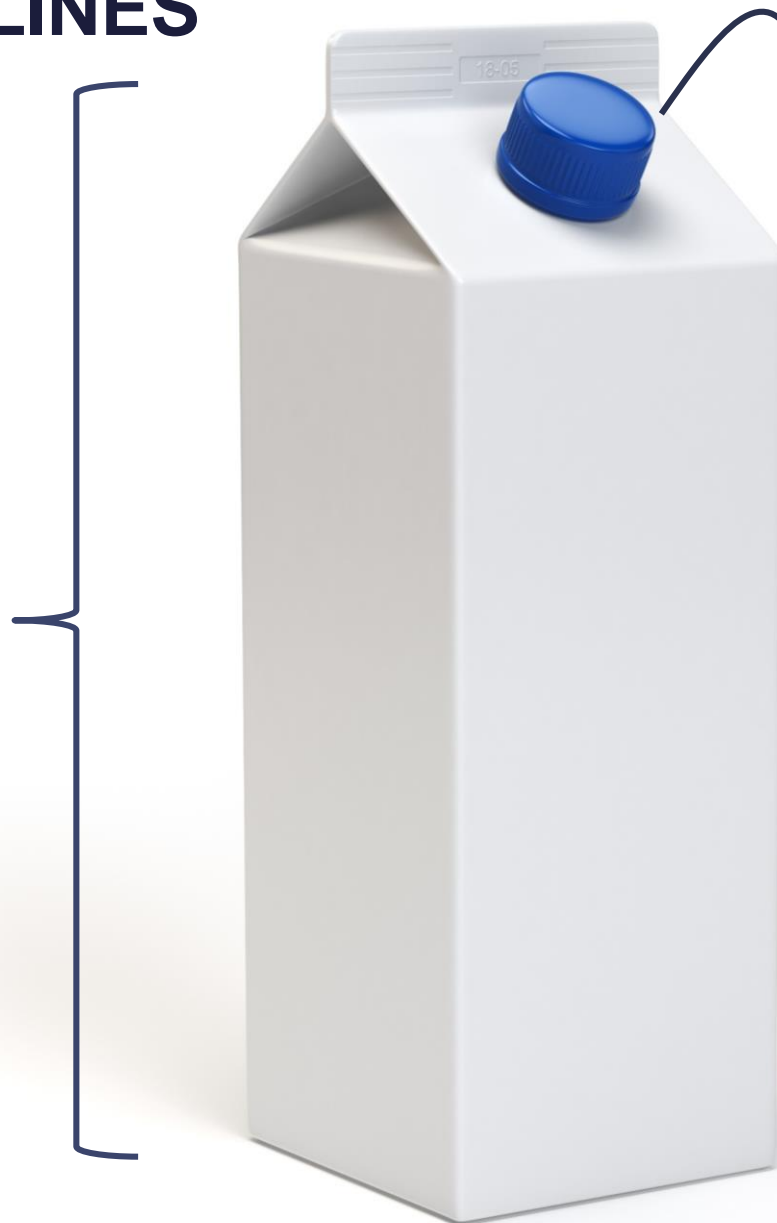
Drinking
cardboard

33 l

DESIGN GUIDELINES

BODY:

- only paper, aluminium and polyolefins



CAP:

- only aluminium and polyolefins



Drinking
cardboard

34 l

DESIGN GUIDELINES

	Yes! 😊	Not conflicting 😊	No ☹️
	Full compatibility for reprocessing	Limited compatibility for reprocessing	Low (or no) compatibility for reprocessing
Main Material	Paper fibres	Polyolefins (PE, PP), aluminium	
Colours	All colours		
Barrier		Polyolefins (PE, PP), aluminium	Wax, any other barrier solution except aluminium and polyolefins
Closure Systems		Polyolefins (PE, PP), aluminium	
Labels and Adhesives			Insoluble dispersing adhesives, Latex, hotmelt and wet-strength adhesives
Inks		Non toxic following the EuPIA Guidelines	Inks that bleed; toxic or hazardous inks (Inks that are on the EuPIA exclusion list), metal inks
Other Components		Wet strength agents, as far as fibre recovery and recycling is not proven; components of EuPIA	



DESIGN GUIDELINES



Glass

BODY:

- Use transparent glass
- Do not print directly on the glass



LABEL:

- use small and washable labels



Glass

DESIGN GUIDELINES

	Yes! 😊	Not conflicting 😊	No ☹️
	Full compatibility for reprocessing	Limited compatibility for reprocessing	Low (or no) compatibility for reprocessing
Main Material	Glas; Ferro metals, Non-ferro metals	Glas composites with metal or plastic layers	Pyrex (oven-proof glass), chrystal
Colours	All colours (focus to the separately collected colours white, green and brown)		
Closure Systems	Polyolefins and metals (including aluminium)	Other	
Labels and Adhesives		All	
Inks			Heavy metal inks;
Direct Printing		Solid colours direct print on glass	
Other Components			



DESIGN GUIDELINES



**Metal
ferro**

+ avoid residues after usage





DESIGN GUIDELINES



**Metal
non-ferro**

38 l

+ avoid residues after usage



Summary

- Use light or transparent colours
- Avoid material mix and use mono-material instead
- Use barriers, labels, caps, ... which are compatible with the recycling of the major material
- Optimize labels and caps
- Make sure that the different (material) components get separated while sorting
- Don't use substances hazardous to recycling (bleeding inks, not washable glues, labels from different material, additives, silicon, ...)

Disclaimer:

The information provided in these guidelines is for general information purpose only. To our knowledge, the information was accurate at the time of writing. However, as the recycling industry is still in the process of coming to standards, errors, differences and changes will occur. Please be aware that there will be local differences in the infrastructure for collection, sorting & recycling of packaging waste. This will ultimately determine the locally valid guidelines.

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Going Further - Our support for you:



Do not hesitate to contact us!

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